

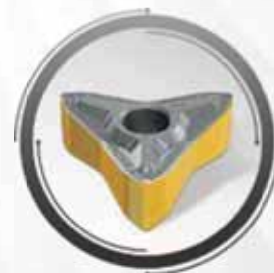
**YOU**

INTELLIGENTLY?

MACHINING

# ISCAR TURNING LINES

Metric Catalog



ISO  
TURNING

GROOVING

PARTING

FACE  
GROOVING

TOOL  
BLOCKS

THREADING

HOLDERS

GRADES

# THREADING TOOLS AND INSERTS

**YOU**

INTELLIGENTLY?

**THREADING**



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# THREADING INSERTS



### Main Types of Laydown Inserts

| B/M-TYPE                                                                          | U-TYPE                                                                            | REGULAR TYPE                                                                       | MULTI-TOOTH                                                                         |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |



### Additional Threading Systems

#### External

| CUT-GRIP External                                                                 |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |

| SWISSCUT External                                                                 |                                                                                    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |

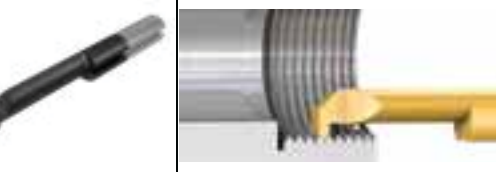
| PENTACUT External                                                                   |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |

-  Partial profile
-  Full profile

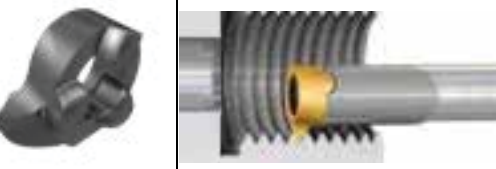
#### Internal

| MINICHAM Internal                                                                 |                                                                                    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |

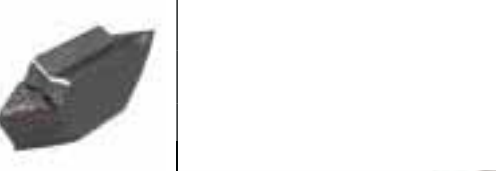
Minimum bore dia. 4 mm

| PICCOCUT Mini-Bar                                                                  |                                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |

Minimum bore dia. 2.4 mm

| CHAMGROOVE Internal                                                                 |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |

Minimum bore dia. 8.0 mm

| CUT-GRIP Internal                                                                   |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |

Minimum bore dia. 12.5 mm

|                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

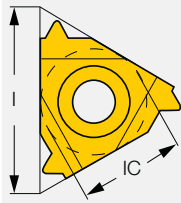
Minimum bore dia. 20 mm

-  Partial profile
-  Full profile

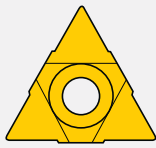
# Insert Identification System

|    |   |   |   |      |     |    |       |
|----|---|---|---|------|-----|----|-------|
| 16 | E | R | M | 1.50 | ISO | 2M | IC808 |
| 1  | 2 | 3 | 4 | 5    | 6   | 7  | 8     |

| 1. Insert Size |       |
|----------------|-------|
| I (mm)         | IC    |
| 06             | 5/32" |
| 08             | 3/16" |
| 11             | 1/4"  |
| 16             | 3/8"  |
| 22             | 1/2"  |
| 27             | 5/8"  |



| 2. Application |                               |
|----------------|-------------------------------|
| E              | External                      |
| I              | Internal                      |
| UE             | U-type, External              |
| UI             | U-type, Internal              |
| UEI            | U-type, External and Internal |



U-type



Regular Type

| 3. Hand of Tool |                      |
|-----------------|----------------------|
| R               | Right-hand           |
| L               | Left-hand            |
| RL              | Right- and Left-hand |

| 4. Type |                                  |
|---------|----------------------------------|
| B       | Peripherally ground & chipformer |
| M       | Press to size with a chipformer  |
| □       | No indication regular type       |

| 5. Pitch                          |          |          |
|-----------------------------------|----------|----------|
| Full Profile (value by number)    |          |          |
| 0.35-9.0 mm                       |          |          |
| 72-2 TPI                          |          |          |
| Partial Profile (range by letter) |          |          |
|                                   | mm       | TPI      |
| A                                 | 0.5-1.5  | 48-16    |
| AG                                | 0.5-3.0  | 48-8     |
| G                                 | 1.75-3.0 | 14-8     |
| N                                 | 3.5-5.0  | 7-5      |
| Q                                 | 5.5-6.0  | 4.5-4    |
| U                                 | 5.5-9.0  | 4.5-2.75 |

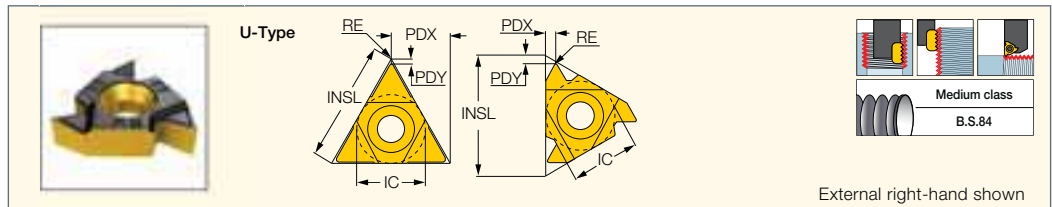
| 6. Thread Standard |                     |
|--------------------|---------------------|
| 60                 | Partial Profile 60° |
| 55                 | Partial Profile 55° |
| ISO                | ISO Metric          |
| UN                 | American UN         |
| W                  | Whitworth           |
| BSPT               | British BSPT        |
| RND                | Round DIN 405       |
| TR                 | Trapeze DIN 103     |
| ACME               | ACME                |
| STACME             | Stub ACME           |
| ABUT               | American Buttress   |
| UNJ                | UNJ                 |
| NPT                | NPT                 |
| API RD             | API Round           |
| BUT                | API Buttress Casing |
| API                | API                 |
| H90                | H-90                |
| EL                 | Extreme Line Casing |
| MJ                 | ISO 5855            |

| 7. No. of Teeth (Optional) |         |
|----------------------------|---------|
| 2M                         | 2 teeth |
| 3M                         | 3 teeth |

| 8. Grade |  |
|----------|--|
| IC1007   |  |
| IC908    |  |
| IC808    |  |
| IC508    |  |
| IC250    |  |
| IC228    |  |
| IC50M    |  |
| IC806    |  |

**ER/L-55°**

External Laydown Threading  
Inserts with a 55° Partial Profile  
for General Applications



External right-hand shown

| Designation                       | Dimensions |                     |                     |       |      |       |      | Tough ↔ Hard |       |       |       |       |        |
|-----------------------------------|------------|---------------------|---------------------|-------|------|-------|------|--------------|-------|-------|-------|-------|--------|
|                                   | IC         | TPIN <sup>(2)</sup> | TPIX <sup>(3)</sup> | INSL  | RE   | PDX   | PDY  | IC228        | IC50M | IC250 | IC808 | IC908 | IC1007 |
| 11ER A 55 IC250                   | 6.35       | 16.00               | 48.00               | 11.00 | 0.05 | 0.90  | 0.80 |              |       | •     |       |       |        |
| 11ER A 55 IC908                   | 6.35       | 16.00               | 48.00               | 11.00 | 0.05 | 0.90  | 0.80 |              |       |       |       | •     |        |
| 16EL A 55 IC250                   | 9.52       | 16.00               | 48.00               | 16.49 | 0.05 | 0.90  | 0.80 |              |       | •     |       |       |        |
| 16EL A 55 IC50M                   | 9.52       | 16.00               | 48.00               | 16.49 | 0.05 | 0.90  | 0.80 |              | •     |       |       |       |        |
| 16ER A 55 IC250                   | 9.52       | 16.00               | 48.00               | 16.49 | 0.06 | 0.90  | 0.80 |              |       | •     |       |       |        |
| 16ER A 55 IC50M                   | 9.52       | 16.00               | 48.00               | 16.49 | 0.06 | 0.90  | 0.80 |              | •     |       |       |       |        |
| 16ER A 55 IC908                   | 9.52       | 16.00               | 48.00               | 16.49 | 0.06 | 0.90  | 0.80 |              |       |       |       | •     |        |
| 16ER/L AG 55 IC250                | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       | •     |       |       |        |
| 16EL AG 55 IC908                  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       |       |       | •     |        |
| 16ER AG 55 IC1007                 | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.00 |              |       |       |       |       | •      |
| 16ER AG 55 IC228                  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 | •            |       |       |       |       |        |
| 16ER AG 55 IC908                  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       |       |       | •     |        |
| 16ERB AG 55 IC908 <sup>(1)</sup>  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       |       |       | •     |        |
| 16ERM AG 55 IC1007 <sup>(1)</sup> | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       |       |       |       | •      |
| 16ERM AG 55 IC250 <sup>(1)</sup>  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       | •     |       |       |        |
| 16ERM AG 55 IC50M <sup>(1)</sup>  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              | •     |       |       |       |        |
| 16ERM AG 55 IC808 <sup>(1)</sup>  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       |       | •     |       |        |
| 16ERM AG 55 IC908 <sup>(1)</sup>  | 9.52       | 8.00                | 48.00               | 16.49 | 0.07 | 1.70  | 1.20 |              |       |       |       | •     |        |
| 16EL G 55 IC250                   | 9.52       | 8.00                | 14.00               | 16.49 | 0.23 | 1.70  | 1.17 |              |       | •     |       |       |        |
| 16ER G 55 IC250                   | 9.52       | 8.00                | 14.00               | 16.49 | 0.23 | 1.70  | 1.20 |              |       | •     |       |       |        |
| 16ER G 55 IC908                   | 9.52       | 8.00                | 14.00               | 16.49 | 0.23 | 1.70  | 1.17 |              |       |       |       | •     |        |
| 16ERB G 55 IC908 <sup>(1)</sup>   | 9.52       | 8.00                | 14.00               | 16.49 | 0.23 | 1.70  | 1.20 |              |       |       |       | •     |        |
| 16ERM G 55 IC1007                 | 9.52       | 8.00                | 14.00               | 16.49 | 0.25 | 1.70  | 1.15 |              |       |       |       |       | •      |
| 16ERM G 55 IC250 <sup>(1)</sup>   | 9.52       | 8.00                | 14.00               | 16.49 | 0.25 | 1.70  | 1.15 |              |       | •     |       |       |        |
| 16ERM G 55 IC808 <sup>(1)</sup>   | 9.52       | 8.00                | 14.00               | 16.49 | 0.25 | 1.70  | 1.14 |              |       |       | •     |       |        |
| 16ERM G 55 IC908 <sup>(1)</sup>   | 9.52       | 8.00                | 14.00               | 16.49 | 0.25 | 1.70  | 1.14 |              |       |       |       | •     |        |
| 22EL N 55 IC250                   | 12.70      | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              |       | •     |       |       |        |
| 22ER N 55 IC250                   | 12.70      | 5.00                | 7.00                | 22.00 | 0.48 | 2.50  | 1.70 |              |       | •     |       |       |        |
| 22ER N 55 IC908                   | 12.70      | 5.00                | 7.00                | 22.00 | 0.48 | 2.50  | 1.70 |              |       |       |       | •     |        |
| 22UEIRL U 55 IC250                | 12.70      | 3.25                | 4.50                | 22.00 | 0.60 | 11.00 | 0.90 |              |       | •     |       |       |        |
| 22UEIRL U 55 IC50M                | 12.70      | 3.25                | 4.50                | 22.00 | 0.60 | 11.00 | 0.90 |              | •     |       |       |       |        |
| 27ER Q 55 IC250                   | 15.88      | 4.00                | 4.50                | 27.50 | 0.60 | 2.90  | 2.00 |              |       | •     |       |       |        |
| 27ER Q 55 IC908                   | 15.88      | 4.00                | 4.50                | 27.50 | 0.60 | 2.90  | 2.00 |              |       |       |       | •     |        |
| 27UEIRL U 55 IC250                | 15.88      | 2.75                | 4.00                | 27.50 | 0.81 | 13.70 | 1.20 |              |       | •     |       |       |        |

- For insert identification system, see page 714
- For threading between walls use GRIP-type inserts TIP-WT, GEPI-WT, TIPI-WT
- For detailed cutting data, see page 809

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Threads per inch minimum

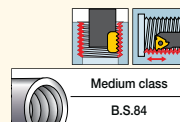
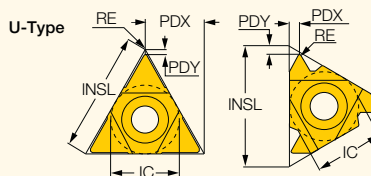
<sup>(3)</sup> Threads per inch maximum

**For tools, see pages:** C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

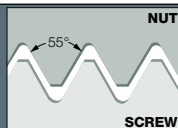
# ISCAR THREAD

## IR/L-55°

Internal Laydown Threading  
Inserts with a 55° Partial Profile  
for General Applications



Internal left-hand shown



| Designation                       | Dimensions |                     |                     |       |      |      |      | Tough ↔ Hard |       |       |       |       |       |       |        |
|-----------------------------------|------------|---------------------|---------------------|-------|------|------|------|--------------|-------|-------|-------|-------|-------|-------|--------|
|                                   | IC         | TPIX <sup>(2)</sup> | TPIN <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | IC228        | IC928 | IC50M | IC250 | IC508 | IC808 | IC908 | IC1007 |
| 06IL A 55 IC228                   | 4.00       | 48.00               | 20.00               | 6.88  | 0.07 | 0.60 | 0.55 | •            |       |       |       |       |       |       |        |
| 06IR A 55 IC228                   | 4.00       | 48.00               | 20.00               | 6.88  | 0.08 | 0.60 | 0.55 | •            |       |       |       |       |       |       |        |
| 08IL A 55 IC228                   | 5.00       | 48.00               | 16.00               | 8.24  | 0.08 | 0.70 | 0.60 | •            |       |       |       |       |       |       |        |
| 08IR A 55 IC228                   | 5.00       | 48.00               | 16.00               | 8.24  | 0.08 | 0.70 | 0.60 | •            |       |       |       |       |       |       |        |
| 08IR A 55 IC908                   | 5.00       | 48.00               | 16.00               | 8.24  | 0.08 | 0.70 | 0.60 |              |       |       |       |       |       | •     |        |
| 08IR A 55 IC928                   | 5.00       | 48.00               | 16.00               | 8.24  | 0.08 | 0.70 | 0.60 |              | •     |       |       |       |       |       |        |
| 08IURL U 55 IC228                 | 5.00       | 18.00               | 12.00               | 8.66  | 0.10 | 4.33 | 0.90 | •            |       |       |       |       |       |       |        |
| 11IL A 55 IC250                   | 6.35       | 48.00               | 16.00               | 11.00 | 0.05 | 0.90 | 0.80 |              |       |       | •     |       |       |       |        |
| 11IL A 55 IC908                   | 6.35       | 48.00               | 16.00               | 11.00 | 0.05 | 0.90 | 0.80 |              |       |       |       |       |       | •     |        |
| 11IR A 55 IC1007                  | 6.35       | 48.00               | 16.00               | 11.00 | 0.05 | 0.90 | 0.80 |              |       |       |       |       |       |       | •      |
| 11IR A 55 IC228                   | 6.35       | 48.00               | 16.00               | 11.00 | 0.05 | 0.90 | 0.80 | •            |       |       |       |       |       |       |        |
| 11IR A 55 IC250                   | 6.35       | 48.00               | 16.00               | 11.00 | 0.05 | 0.90 | 0.80 |              |       |       | •     |       |       |       |        |
| 11IR A 55 IC908                   | 6.35       | 48.00               | 16.00               | 11.00 | 0.05 | 0.90 | 0.80 |              |       |       |       |       |       | •     |        |
| 16IR A 55 IC50M                   | 9.52       | 48.00               | 16.00               | 16.49 | 0.05 | 0.90 | 0.80 |              |       | •     |       |       |       |       |        |
| 16IR A 55 IC908                   | 9.52       | 48.00               | 16.00               | 16.49 | 0.05 | 0.90 | 0.80 |              |       |       |       |       |       | •     |        |
| 16IL AG 55 IC908                  | 9.52       | 48.00               | 8.00                | 16.49 | 0.07 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 16IR AG 55 IC250                  | 9.52       | 48.00               | 8.00                | 16.49 | 0.07 | 1.70 | 1.20 |              |       |       | •     |       |       |       |        |
| 16IR AG 55 IC908                  | 9.52       | 48.00               | 8.00                | 16.49 | 0.07 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 16IRB AG 55 IC908 <sup>(1)</sup>  | 9.52       | 48.00               | 8.00                | 16.49 | 0.07 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 16IRM AG 55 IC1007 <sup>(1)</sup> | 9.52       | 48.00               | 8.00                | 16.49 | 0.05 | 1.70 | 1.20 |              |       |       |       |       |       |       | •      |
| 16IRM AG 55 IC250 <sup>(1)</sup>  | 9.52       | 48.00               | 8.00                | 16.49 | 0.05 | 1.70 | 1.20 |              |       |       | •     |       |       |       |        |
| 16IRM AG 55 IC808 <sup>(1)</sup>  | 9.52       | 48.00               | 8.00                | 16.49 | 0.05 | 1.70 | 1.20 |              |       |       |       | •     |       |       |        |
| 16IRM AG 55 IC908 <sup>(1)</sup>  | 9.52       | 48.00               | 8.00                | 16.49 | 0.05 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 16IL G 55 IC908                   | 9.52       | 14.00               | 8.00                | 16.49 | 0.20 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 16IR G 55 IC250                   | 9.52       | 14.00               | 8.00                | 16.49 | 0.23 | 1.70 | 1.20 |              |       |       | •     |       |       |       |        |
| 16IR G 55 IC508                   | 9.52       | 14.00               | 8.00                | 16.49 | 0.23 | 1.70 | 1.20 |              |       |       |       | •     |       |       |        |
| 16IR G 55 IC908                   | 9.52       | 14.00               | 8.00                | 16.49 | 0.23 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 16IRB G 55 IC908 <sup>(1)</sup>   | 9.52       | 14.00               | 8.00                | 16.49 | 0.23 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 16IRM G 55 IC1007                 | 9.52       | 14.00               | 8.00                | 16.49 | 0.20 | 1.70 | 1.20 |              |       |       |       |       |       |       | •      |
| 16IRM G 55 IC250 <sup>(1)</sup>   | 9.52       | 14.00               | 8.00                | 16.49 | 0.20 | 1.70 | 1.20 |              |       |       | •     |       |       |       |        |
| 16IRM G 55 IC808 <sup>(1)</sup>   | 9.52       | 14.00               | 8.00                | 16.49 | 0.20 | 1.70 | 1.20 |              |       |       |       | •     |       |       |        |
| 16IRM G 55 IC908 <sup>(1)</sup>   | 9.52       | 14.00               | 8.00                | 16.49 | 0.20 | 1.70 | 1.20 |              |       |       |       |       |       | •     |        |
| 22IR N 55 IC250                   | 12.70      | 7.00                | 5.00                | 22.00 | 0.42 | 2.50 | 1.70 |              |       |       | •     |       |       |       |        |
| 22IR N 55 IC50M                   | 12.70      | 7.00                | 5.00                | 22.00 | 0.42 | 2.50 | 1.70 |              |       | •     |       |       |       |       |        |
| 22IR N 55 IC908                   | 12.70      | 7.00                | 5.00                | 22.00 | 0.42 | 2.50 | 1.70 |              |       |       |       |       |       | •     |        |
| 27IR Q 55 IC908                   | 15.88      | 4.00                | 4.50                | 27.50 | 0.60 | 2.90 | 2.00 |              |       |       |       |       |       | •     |        |

- For insert identification system, see page 714
- For threading between walls use GRIP-type inserts TIP-WT, GEPI-WT, TIPI-WT.
- For detailed cutting data, see page 809

<sup>(1)</sup> With pressed chipformer

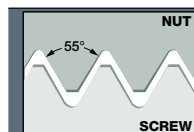
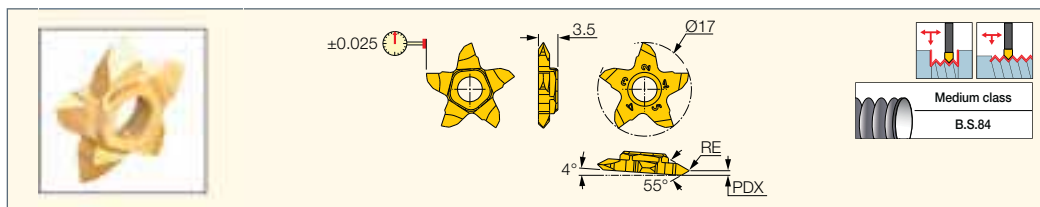
<sup>(2)</sup> Threads per inch maximum

<sup>(3)</sup> Threads per inch minimum

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)



**PENTA 17-WT-RS/LS**  
 Precision Ground Pentagonal  
 External Threading Inserts  
 with a 55° Partial Profile  
 for General Applications



| Designation              | TPIX <sup>(1)</sup> | TPIN <sup>(2)</sup> | RE   | PDX  | IC1008 |
|--------------------------|---------------------|---------------------|------|------|--------|
| PENTA 17-WTL003LS IC1008 | 72.00               | 16.00               | 0.03 | 0.80 | •      |
| PENTA 17-WTR003RS IC1008 | 72.00               | 16.00               | 0.03 | 0.80 | •      |
| PENTA 17-WTL008LS IC1008 | 31.00               | 8.00                | 0.08 | 1.40 | •      |
| PENTA 17-WTR008RS IC1008 | 31.00               | 8.00                | 0.08 | 1.40 | •      |

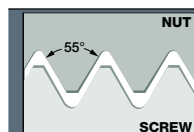
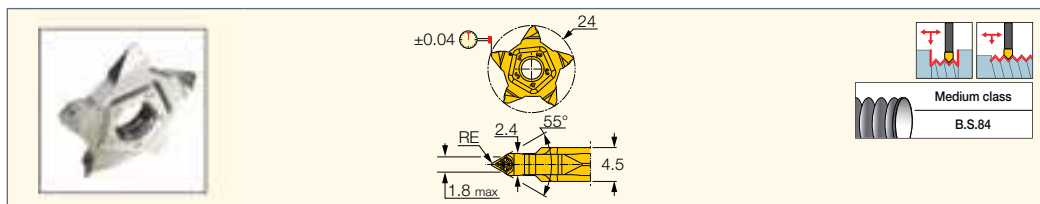
<sup>(1)</sup> Threads per inch maximum

<sup>(2)</sup> Threads per inch minimum

**For tools, see pages:** NQCH-PCHR/L-S-JHP (433) • PCADRS/LS-JHP (354) • PCHRS/LS-17 (339) • PCHRS/LS-17-JHP (340) • Y-PCHRS-17 (340)

• Y-PCHRS-17-JHP (341)

**PENTA 24-WT**  
 Precision Ground Pentagonal  
 External Threading Inserts  
 with a Whitworth 55°  
 Partial Profile



| Designation                            | TPIX <sup>(2)</sup> | TPIN <sup>(3)</sup> | RE   | IC908 |
|----------------------------------------|---------------------|---------------------|------|-------|
| PENTA 24A-WT-0.15 IC908 <sup>(1)</sup> | 24.00               | 8.00                | 0.15 | •     |
| PENTA 24A-WT-0.05 IC908 <sup>(1)</sup> | 80.00               | 8.00                | 0.05 | •     |

• TPIN=6.4/D(inch) D-nominal thread diameter (inch)

<sup>(1)</sup> Flat rake (without a chipformer)

<sup>(2)</sup> Threads per inch maximum

<sup>(3)</sup> Threads per inch minimum

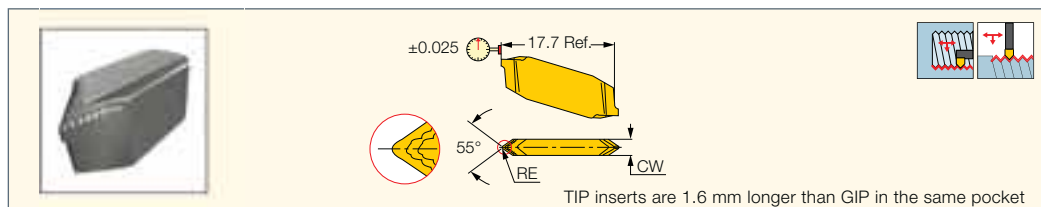
**For tools, see pages:** NQCH-PCHR/L-24-JHP (348) • PCAD RE/LE-JHP (561) • PCADR/L (353) • PCADR/L-JHP (353) • PCHBR/L (355) • PCHR/L-24 (346)

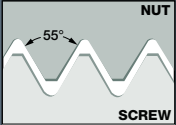
• PCHR/L-24-JHP (347) • PCHR/L-24-JHP-MC (348)

# CUTGRIP ISCARTHREAD

## TIP-WT

Precision Ground Double-Ended Threading Inserts with a 55° Partial Profile and a Chipformer



| <br>Designation | Dimensions |      |                      |                     |                     | Tough ↔ Hard |       |
|--------------------------------------------------------------------------------------------------|------------|------|----------------------|---------------------|---------------------|--------------|-------|
|                                                                                                  | CW         | RE   | RETOL <sup>(2)</sup> | TPIX <sup>(3)</sup> | TPIN <sup>(4)</sup> | IC08         | IC908 |
| TIP 2WT-0.05 IC08                                                                                | 2.40       | 0.05 | 0.030                | 54.00               | 12.00               | ●            |       |
| TIP 2WT-0.05 IC908 <sup>(1)</sup>                                                                | 2.40       | 0.05 | 0.030                | 54.00               | 12.00               |              | ●     |
| TIP 4WT-0.15 IC08                                                                                | 4.00       | 0.15 | 0.030                | 19.00               | 7.00                | ●            |       |
| TIP 4WT-0.15 IC908 <sup>(1)</sup>                                                                | 4.00       | 0.15 | 0.030                | 19.00               | 7.00                |              | ●     |
| TIP 5WT-0.25 IC908 <sup>(1)</sup>                                                                | 5.50       | 0.25 | 0.030                | 12.00               | 6.00                |              | ●     |

• Toolholder seat needs to be modified according to insert profile to ensure clearance

• Pitch max 0.187xD

• Internal & External tolerance: B.S.84 Medium class

<sup>(1)</sup> TPIN(thread per inch minimum) = D/6.4

• D-Diameter of thread (inch)

<sup>(2)</sup> Corner radius tolerance (+/-)

<sup>(3)</sup> Threads per inch maximum

<sup>(4)</sup> Threads per inch minimum

**For tools, see pages:** C#-GHDR/L (301) • CGHN 26-M (399) • CGHN 32-DGM (400) • CGHN 32-M (400) • CGHN-D (310) • CGHN-DG (310) • CGHN-S (309)

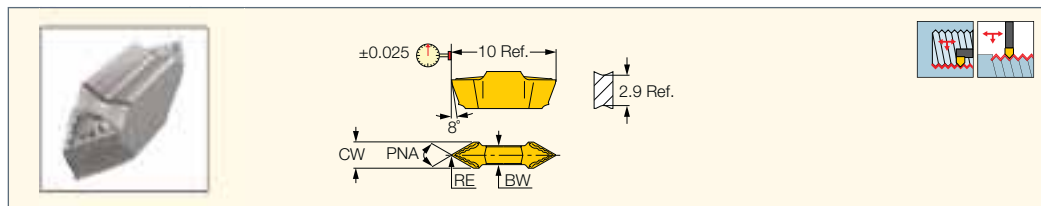
• CGPAD (308) • CGPAD-JHP (309) • GHDR/L (short pocket) (302) • GHDR/L-JHP (short pocket) (303) • GHDR/L-JHP-MC (short pocket) (304) • GHGR/L (305)

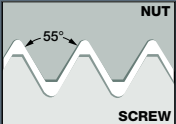
• GHMPR/L (300) • GHMR/L (300) • GHSLR/L (428) • GHSLR/L-JHP-SL (429) • NQCH-GHSLR/L-JHP (428)

# CUTGRIP ISCARTHREAD

## GEPI-WT

Precision Ground Double-Ended Threading Inserts with a 55° Partial Profile and a Chipformer for 11.5 mm Bore Diameter



| <br>Designation | Dimensions |      |                      |      |      |                    |                    |                     |                     | Tough ↔ Hard |       |
|----------------------------------------------------------------------------------------------------|------------|------|----------------------|------|------|--------------------|--------------------|---------------------|---------------------|--------------|-------|
|                                                                                                    | CW         | RE   | RETOL <sup>(1)</sup> | PNA  | BW   | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | IC08         | IC908 |
| GEPI 2.5-WT0.05 IC08                                                                               | 2.50       | 0.05 | 0.030                | 55.0 | 1.80 | 0.470              | 2.540              | 10.00               | 54.00               | ●            |       |
| GEPI 2.5-WT0.05 IC908                                                                              | 2.50       | 0.05 | 0.030                | 55.0 | 1.80 | 0.470              | 2.540              | 10.00               | 54.00               |              | ●     |

• Toolholder seat needs to be modified according to insert profile to ensure clearance

• Pitch max 0.167xD, TPI min D/6.0 • Internal & External tolerance: B.S.84 Medium class

<sup>(1)</sup> Corner radius tolerance (+/-)

<sup>(2)</sup> Thread pitch minimum (mm)

<sup>(3)</sup> Thread pitch maximum (mm)

<sup>(4)</sup> Threads per inch minimum

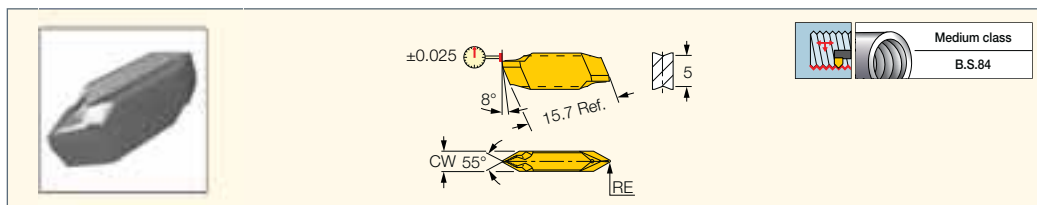
<sup>(5)</sup> Threads per inch maximum

**For tools, see pages:** AVC-GEAIR/L (389) • E-GEHIR / E-GHIR (383) • GEAIR/L (383) • GEHIMR/L (380) • GEHIMR/L-SC (380) • GEHIR/L (381) • GEHIR/L-SC (382)

• GEHSR (427) • GEHSR/L-SL (426)

**CUTGRIP****ISCARTHREAD****TIPI-WT**

Double-Ended Internal Threading Inserts with a 55° Partial Profile and a Chipformer for 20 mm Min. Bore Diameter



| Designation           | Dimensions |      |                      |                    |                     |                     | Tough ↔ Hard |       |
|-----------------------|------------|------|----------------------|--------------------|---------------------|---------------------|--------------|-------|
|                       | CW         | RE   | RETOL <sup>(1)</sup> | TPN <sup>(2)</sup> | TPIX <sup>(3)</sup> | TPIN <sup>(4)</sup> | IC08         | IC908 |
| TIPI 3.4WT-0.10 IC08  | 3.40       | 0.10 | 0.030                | 0.950              | 27.00               | 8.00                | ●            |       |
| TIPI 3.4WT-0.10 IC908 | 3.40       | 0.10 | 0.030                | 0.950              | 27.00               | 8.00                |              | ●     |
| TIPI 5.4WT-0.20 IC908 | 5.40       | 0.20 | 0.030                | 1.670              | 15.00               | 5.00                |              | ●     |

• Toolholder seat needs to be modified according to insert profile to ensure clearance

• Pitch max 0.187xD, TPI min D/5.25 D=Diameter of thread (pitch max=CW)

<sup>(1)</sup> Corner radius tolerance (+/-)

<sup>(2)</sup> Thread pitch minimum (mm)

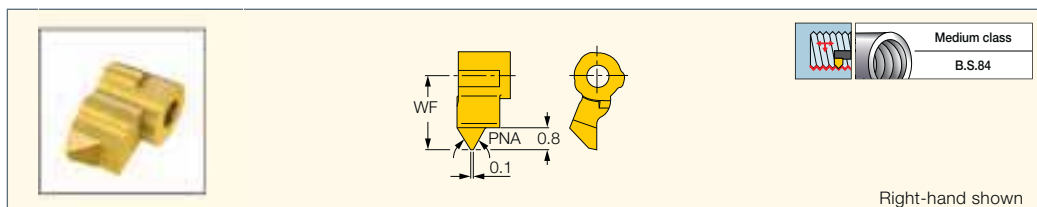
<sup>(3)</sup> Threads per inch maximum

<sup>(4)</sup> Threads per inch minimum

For tools, see pages: AVC-GAIR/L (390) • GAIR/L (389) • GHIR/L (W=1.9-6.4) (387) • GHIR/L-SC (W=2-4.8) (388)

**MINICHAM****ISCARTHREAD****UMGR-A55**

Mini Indexable Inserts with Whitworth Partial Profile for Threading in 5.2 mm and Larger Holes



| Designation        | Dimensions |      |                     |                     |                    |                    |      | IC508 |
|--------------------|------------|------|---------------------|---------------------|--------------------|--------------------|------|-------|
|                    | WF         | PNA  | TPIX <sup>(1)</sup> | TPIN <sup>(2)</sup> | TPN <sup>(3)</sup> | TPX <sup>(4)</sup> | DMIN |       |
| UMGR 4.0-A55 IC508 | 2.70       | 55.0 | 40.00               | 24.00               | 0.500              | 1.400              | 5.20 | ●     |

<sup>(1)</sup> Threads per inch maximum

<sup>(2)</sup> Threads per inch minimum

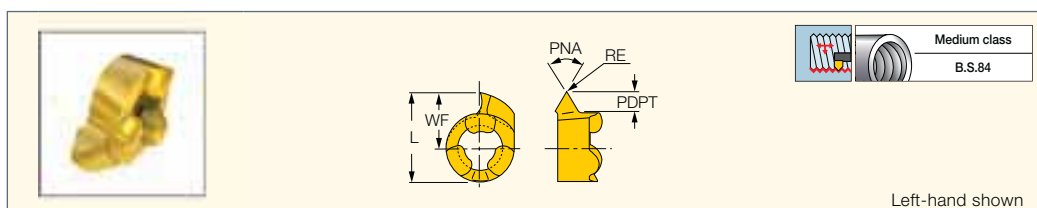
<sup>(3)</sup> Thread pitch minimum (mm)

<sup>(4)</sup> Thread pitch maximum (mm)

For tools, see page: MGUHR (467)

**CHAMGROOVE****ISCARTHREAD****GIQR/L-WT**

Internal Inserts with Whitworth Partial Profile for Threading in 8 mm and Larger Holes



| Designation             | Dimensions |      |      |                     |      |       |                     |                     | IC528 |
|-------------------------|------------|------|------|---------------------|------|-------|---------------------|---------------------|-------|
|                         | L          | RE   | PNA  | PDPT <sup>(1)</sup> | WF   | DMIN  | TPIN <sup>(2)</sup> | TPIX <sup>(3)</sup> |       |
| GIQR/L 8-WT-0.05 IC528  | 7.78       | 0.05 | 55.0 | 1.50                | 4.80 | 8.00  | 16.00               | 50.00               | ●     |
| GIQR/L 11-WT-0.05 IC528 | 10.68      | 0.05 | 55.0 | 2.00                | 6.70 | 11.00 | 11.00               | 50.00               | ●     |

• Can be used for thread milling by circular interpolation • TPI min D/5.9

• D=diameter of thread (pitch max=W)

• For cutting speed recommendations, see page 809

<sup>(1)</sup> Cutting depth maximum

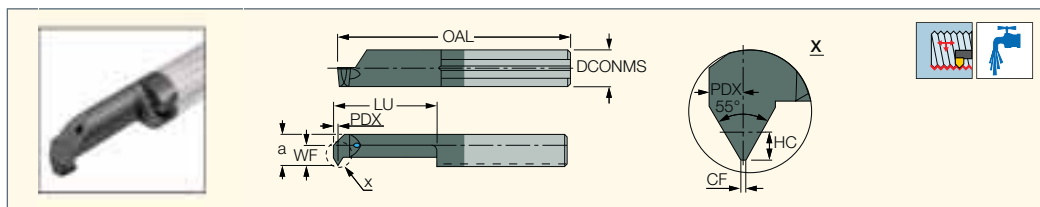
<sup>(2)</sup> Threads per inch minimum

<sup>(3)</sup> Threads per inch maximum

For tools, see pages: MG (470) • MGCH (470)

**PICCOJET**  
COOLANT THROUGH  
**ISCAR THREAD**

**PICJ RTH (55° Threading)**  
Inserts with Inner Coolant  
Channel for 55° Internal  
Threading Profile



|  | Dimensions        |        |      |      |      |      |      |      |                    |       |                     | IC908 |                     |
|-----------------------------------------------------------------------------------|-------------------|--------|------|------|------|------|------|------|--------------------|-------|---------------------|-------|---------------------|
|                                                                                   | Designation       | DCONMS | DMIN | HC   | CF   | PDX  | WF   | a    | OHN <sup>(1)</sup> | OAL   | TPIX <sup>(2)</sup> |       | TPIN <sup>(3)</sup> |
|                                                                                   | PICJ RTH14W24D060 | 6.00   | 6.00 | 0.81 | 0.12 | 0.80 | 2.30 | 5.30 | 15.0               | 30.00 | 24.00               |       | 16.00               |
|                                                                                   | PICJ RTH14W24D070 | 7.00   | 7.00 | 0.81 | 0.12 | 0.80 | 2.80 | 6.30 | 15.0               | 30.00 | 24.00               |       | 16.00               |

**NEW**

- All mini-bars have sharp corners
- For detailed cutting data, see page 823
- PICJ items are suitable for: PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420) type holders only

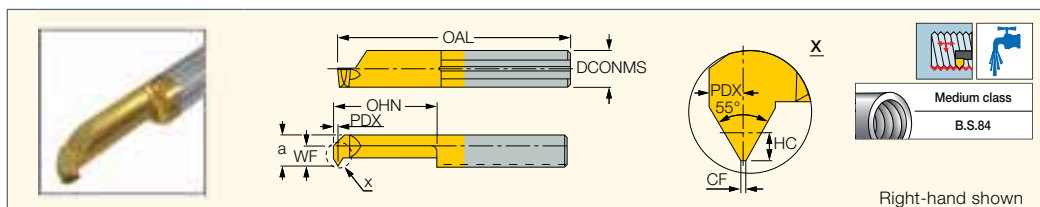
<sup>(1)</sup> Minimum overhang

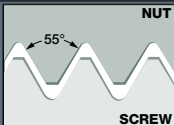
<sup>(2)</sup> Threads per inch maximum

<sup>(3)</sup> Threads per inch minimum

**PICCO CUT**  
**ISCAR THREAD**

**PICCO-55°-Thread**  
Inserts for 55° Internal  
Thread Profile



|  | Dimensions          |        |      |      |      |      |      |      |                    |       |                     | IC228 |                     |   |
|------------------------------------------------------------------------------------|---------------------|--------|------|------|------|------|------|------|--------------------|-------|---------------------|-------|---------------------|---|
|                                                                                    | Designation         | DCONMS | DMIN | HC   | CF   | PDX  | WF   | a    | OHN <sup>(1)</sup> | OAL   | TPIN <sup>(2)</sup> |       | TPIX <sup>(3)</sup> |   |
|                                                                                    | PICCO R 005.5548-15 | 5.00   | 4.80 | 0.40 | 0.06 | 0.50 | 1.90 | 4.40 | 15.0               | 30.00 | 24.00               |       | 48.00               | ● |
|                                                                                    | PICCO R 006.5548-15 | 6.00   | 6.00 | 0.40 | 0.06 | 0.50 | 2.30 | 5.30 | 15.0               | 30.00 | 24.00               |       | 48.00               | ● |
|                                                                                    | PICCO R 006.5524-15 | 6.00   | 6.00 | 0.81 | 0.12 | 0.80 | 2.30 | 5.30 | 15.0               | 30.00 | 16.00               |       | 24.00               | ● |
|                                                                                    | PICCO R 007.5524-15 | 7.00   | 7.00 | 0.81 | 0.12 | 0.80 | 2.80 | 6.30 | 15.0               | 30.00 | 16.00               |       | 24.00               | ● |

- All mini-bars have sharp corners
- For detailed cutting data, see page 823

<sup>(1)</sup> Minimum overhang

<sup>(2)</sup> Threads per inch minimum

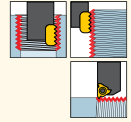
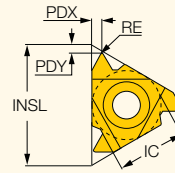
<sup>(3)</sup> Threads per inch maximum

For holders, see pages: PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420)



**ER/L-60°**

External Laydown Threading  
Inserts with a 60° Partial Profile  
for General Applications



External right-hand shown

| Designation                       | Dimensions |                    |                    |                     |                     |       |      |      |      | Tough ↔ Hard |       |       |      |       |       |       |        |
|-----------------------------------|------------|--------------------|--------------------|---------------------|---------------------|-------|------|------|------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                   | IC         | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | INSL  | RE   | PDX  | PDY  | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 11EL A 60 IC908                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.90 | 0.80 |              |       |       |      |       |       | •     |        |
| 11ER A 60 IC908                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.06 | 0.90 | 0.80 |              |       |       |      |       |       | •     |        |
| 16EL A 60 IC250                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.08 | 0.90 | 1.00 |              |       | •     |      |       |       |       |        |
| 16EL A 60 IC50M                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 1.00 |              | •     |       |      |       |       |       |        |
| 16EL A 60 IC908                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 1.00 |              |       |       |      |       |       | •     |        |
| 16ER A 60 IC08                    | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.80 | 1.00 |              |       |       | •    |       |       |       |        |
| 16ER A 60 IC1007                  | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 1.00 |              |       |       |      |       |       |       | •      |
| 16ER A 60 IC228                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 1.00 | •            |       |       |      |       |       |       |        |
| 16ER A 60 IC250                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 1.00 |              |       | •     |      |       |       |       |        |
| 16ER A 60 IC908                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.80 | 1.00 |              |       |       |      |       |       | •     |        |
| 16ERB A 60 IC08 <sup>(1)</sup>    | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.80 | 1.00 |              |       |       | •    |       |       |       |        |
| 16ERB A 60 IC908 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.80 | 1.00 |              |       |       |      |       |       | •     |        |
| 16ERM A 60 IC1007 <sup>(1)</sup>  | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 0.80 |              |       |       |      |       |       |       | •      |
| 16ERM A 60 IC250 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 0.80 |              |       | •     |      |       |       |       |        |
| 16ERM A 60 IC50M <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 0.80 |              | •     |       |      |       |       |       |        |
| 16ERM A 60 IC808 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 0.80 |              |       |       |      |       | •     |       |        |
| 16ERM A 60 IC908 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.07 | 0.90 | 0.80 |              |       |       |      |       |       | •     |        |
| 16EL AG 60 IC250                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.06 | 1.70 | 1.20 |              |       | •     |      |       |       |       |        |
| 16EL AG 60 IC50M                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.06 | 1.70 | 1.20 |              | •     |       |      |       |       |       |        |
| 16EL AG 60 IC908                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.06 | 1.70 | 1.20 |              |       |       | •    |       |       | •     |        |
| 16ER AG 60 IC08                   | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.06 | 1.70 | 1.20 |              |       |       |      | •     |       |       |        |
| 16ER AG 60 IC1007                 | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.50 | 1.20 |              |       |       |      |       |       |       | •      |
| 16ER AG 60 IC228                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 | •            |       |       |      |       |       |       |        |
| 16ER AG 60 IC250                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              |       | •     |      |       |       |       |        |
| 16ER AG 60 IC50M                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              | •     |       |      |       |       |       |        |
| 16ER AG 60 IC508                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.50 | 1.20 |              |       |       |      | •     |       |       |        |
| 16ER AG 60 IC908                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.50 | 1.20 |              |       |       |      |       |       | •     |        |
| 16ERB AG 60 IC908 <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.06 | 1.70 | 1.20 |              |       |       |      |       |       | •     |        |
| 16ERM AG 60 IC1007 <sup>(1)</sup> | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              |       |       |      |       |       |       | •      |
| 16ERM AG 60 IC250 <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              |       | •     |      |       |       |       |        |
| 16ERM AG 60 IC50M <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              | •     |       |      |       |       |       |        |
| 16ERM AG 60 IC508 <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              |       |       |      | •     |       |       |        |
| 16ERM AG 60 IC808 <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              |       |       |      |       | •     |       |        |
| 16ERM AG 60 IC908 <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.08 | 1.70 | 1.20 |              |       |       |      |       |       | •     |        |

• For Insert Identification System, see page 714 • For threading between walls use GRIP-type inserts SCIR/L B/F -MTR/L, TIP-MT, GEPI-MT, TIPI-MT.

• For technical information and detailed cutting data, see pages 809-825 • DIN13 , ISO 68-1, ISO 965 (1&2) - External tolerance: 6g

• ANSI/ASME B1.1 - External tolerance: 2A

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Thread pitch minimum (mm)

<sup>(3)</sup> Thread pitch maximum (mm)

<sup>(4)</sup> Threads per inch minimum

<sup>(5)</sup> Threads per inch maximum

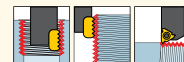
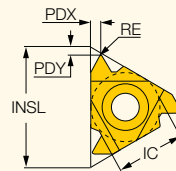
For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

Continued

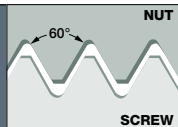
# ISCARTHREAD

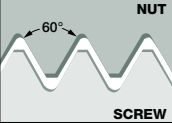
## ER/L-60°

External Laydown Threading  
Inserts with a 60° Partial Profile  
for General Applications



External right-hand shown



|  | Dimensions |                    |                    |                     |                     |       |      |       |      | Tough ↔ Hard |       |       |      |       |       |       |        |
|-----------------------------------------------------------------------------------|------------|--------------------|--------------------|---------------------|---------------------|-------|------|-------|------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                                                                   | IC         | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | INSL  | RE   | PDX   | PDY  | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| Designation                                                                       |            |                    |                    |                     |                     |       |      |       |      |              |       |       |      |       |       |       |        |
| 16EL G 60 IC250                                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 |              |       | ●     |      |       |       |       |        |
| 16EL G 60 IC908                                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 |              |       |       | ●    |       |       | ●     |        |
| 16ER G 60 IC08                                                                    | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 |              |       |       | ●    |       |       |       |        |
| 16ER G 60 IC1007                                                                  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 |              |       |       |      |       |       |       | ●      |
| 16ER G 60 IC228                                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 | ●            |       |       |      |       |       |       |        |
| 16ER G 60 IC250                                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 |              |       | ●     |      |       |       |       |        |
| 16ER G 60 IC908                                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 |              |       |       |      |       |       | ●     |        |
| 16ERB G 60 IC908 <sup>(1)</sup>                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.22 | 1.70  | 1.20 |              |       |       |      |       |       | ●     |        |
| 16ERM G 60 IC1007 <sup>(1)</sup>                                                  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.25 | 1.50  | 1.00 |              |       |       |      |       |       |       | ●      |
| 16ERM G 60 IC250 <sup>(1)</sup>                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.25 | 1.50  | 1.00 |              |       | ●     |      |       |       |       |        |
| 16ERM G 60 IC50M <sup>(1)</sup>                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.25 | 1.50  | 1.00 |              | ●     |       |      |       |       |       |        |
| 16ERM G 60 IC808 <sup>(1)</sup>                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.25 | 1.50  | 1.00 |              |       |       |      | ●     |       |       |        |
| 16ERM G 60 IC908 <sup>(1)</sup>                                                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.25 | 1.50  | 1.00 |              |       |       |      |       |       | ●     |        |
| 22EL N 60 IC50M                                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              | ●     |       |      |       |       |       |        |
| 22EL N 60 IC908                                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              |       |       |      |       |       | ●     |        |
| 22ER N 60 IC08                                                                    | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              |       |       | ●    |       |       |       |        |
| 22ER N 60 IC1007                                                                  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              |       |       |      |       |       |       | ●      |
| 22ER N 60 IC228                                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 | ●            |       |       |      |       |       |       |        |
| 22ER N 60 IC250                                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              |       | ●     |      |       |       |       |        |
| 22ER N 60 IC50M                                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              | ●     |       |      |       |       |       |        |
| 22ER N 60 IC908                                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.42 | 2.50  | 1.70 |              |       |       |      |       |       | ●     |        |
| 22ERM N 60 IC1007 <sup>(1)</sup>                                                  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.32 | 2.50  | 1.70 |              |       |       |      |       |       |       | ●      |
| 22ERM N 60 IC250 <sup>(1)</sup>                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.32 | 2.50  | 1.70 |              |       | ●     |      |       |       |       |        |
| 22ERM N 60 IC50M <sup>(1)</sup>                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.32 | 2.50  | 1.70 |              | ●     |       |      |       |       |       |        |
| 22ERM N 60 IC808 <sup>(1)</sup>                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.32 | 2.50  | 1.70 |              |       |       |      | ●     |       |       |        |
| 22ERM N 60 IC908 <sup>(1)</sup>                                                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.32 | 2.50  | 1.70 |              |       |       |      |       |       | ●     |        |
| 22UEIRL U 60 IC250                                                                | 12.70      | 5.500              | 8.000              | 3.25                | 4.50                | 22.00 | 0.28 | 11.00 | 0.60 |              |       | ●     |      |       |       |       |        |
| 22UEIRL U 60 IC908                                                                | 12.70      | 5.500              | 8.000              | 3.25                | 4.50                | 22.00 | 0.28 | 11.00 | 0.60 |              |       |       |      |       |       | ●     |        |
| 27EL Q 60 IC228                                                                   | 15.88      | 5.500              | 6.000              | 4.00                | 4.50                | 27.50 | 0.63 | 3.00  | 2.00 | ●            |       |       |      |       |       |       |        |
| 27ER Q 60 IC250                                                                   | 15.88      | 5.500              | 6.000              | 4.00                | 4.50                | 27.50 | 0.63 | 3.00  | 2.00 |              |       | ●     |      |       |       |       |        |
| 27ER Q 60 IC50M                                                                   | 15.88      | 5.500              | 6.000              | 4.00                | 4.50                | 27.50 | 0.63 | 3.00  | 2.00 |              | ●     |       |      |       |       |       |        |
| 27ER Q 60 IC908                                                                   | 15.88      | 5.500              | 6.000              | 4.00                | 4.50                | 27.50 | 0.63 | 3.00  | 2.00 |              |       |       |      |       |       | ●     |        |
| 27UEIRL U 60 IC250                                                                | 15.88      | 6.500              | 9.000              | 2.75                | 4.00                | 27.50 | 0.50 | 13.75 | 1.03 |              |       | ●     |      |       |       |       |        |
| 27UEIRL U 60 IC50M                                                                | 15.88      | 6.500              | 9.000              | 2.75                | 4.00                | 27.50 | 0.50 | 13.75 | 1.03 |              | ●     |       |      |       |       |       |        |

• For Insert Identification System, see page 714 • For threading between walls use GRIP-type inserts SCIR/L B/F -MTR/L, TIP-MT, GEPI-MT, TIPI-MT.

• For technical information and detailed cutting data, see pages 809-825 • DIN13 , ISO 68-1, ISO 965 (1&2) - External tolerance: 6g

• ANSI/ASME B1.1 - External tolerance: 2A

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Thread pitch minimum (mm)

<sup>(3)</sup> Thread pitch maximum (mm)

<sup>(4)</sup> Threads per inch minimum

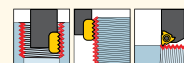
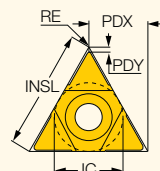
<sup>(5)</sup> Threads per inch maximum

For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

# ISCARTHREAD

## EIR/L U

External Laydown Threading  
Inserts with a 60° Partial Profile  
for General Applications



| Designation        | Dimensions |                    |                    |         |         |                     |                     |          |          |       |      |       |      | Tough ↔ Hard |       |       |
|--------------------|------------|--------------------|--------------------|---------|---------|---------------------|---------------------|----------|----------|-------|------|-------|------|--------------|-------|-------|
|                    | IC         | TPN <sup>(1)</sup> | TPX <sup>(2)</sup> | TPN_DF2 | TPX_DF2 | TPIN <sup>(3)</sup> | TPIX <sup>(4)</sup> | TPIN_DF2 | TPIX_DF2 | INSL  | RE   | PDX   | PDY  | IC50M        | IC250 | IC908 |
| 22UEIRL U 60 IC250 | 12.70      | 3.000              | 8.000              | 1.750   | 8.000   | 4.00                | 8.00                | 4.00     | 14.00    | 22.00 | 0.28 | 11.00 | 0.60 |              | •     |       |
| 22UEIRL U 60 IC908 | 12.70      | 3.000              | 8.000              | 1.750   | 8.000   | 4.00                | 8.00                | 4.00     | 14.00    | 22.00 | 0.28 | 11.00 | 0.60 |              |       | •     |
| 27UEIRL U 60 IC250 | 15.88      | 5.500              | 8.000              | 3.000   | 8.000   | 4.00                | 4.50                | 4.00     | 8.00     | 27.50 | 0.50 | 13.75 | 1.03 |              | •     |       |
| 27UEIRL U 60 IC50M | 15.88      | 5.500              | 8.000              | 3.000   | 8.000   | 4.00                | 4.50                | 4.00     | 8.00     | 27.50 | 0.50 | 13.75 | 1.03 | •            |       |       |

• For Insert Identification System, see page 714

<sup>(1)</sup> Thread pitch minimum (mm)

<sup>(2)</sup> Thread pitch maximum (mm)

<sup>(3)</sup> Threads per inch minimum

<sup>(4)</sup> Threads per inch maximum

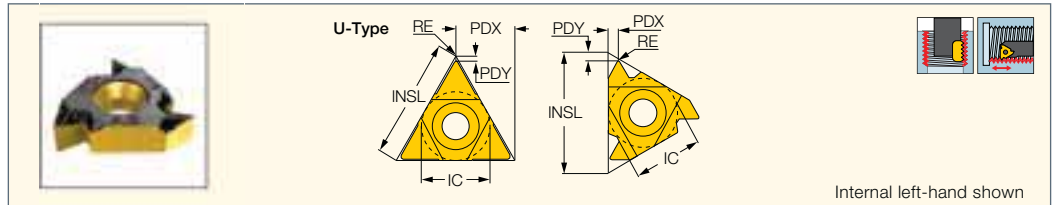
For tools, see page: SER/L (798)

ISCAR



**IR/L-60°**

Internal Laydown Threading  
Inserts with a 60° Partial Profile  
for General Applications



| Designation                       | Dimensions |                    |                    |                     |                     |       |      |      |      | Tough ↔ Hard |       |       |       |      |       |       |       |
|-----------------------------------|------------|--------------------|--------------------|---------------------|---------------------|-------|------|------|------|--------------|-------|-------|-------|------|-------|-------|-------|
|                                   | IC         | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | INSL  | RE   | PDY  | PDX  | IC28         | IC228 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 |
| 06IL A 60 IC228                   | 4.00       | 0.500              | 1.250              | 20.00               | 48.00               | 6.88  | 0.05 | 0.50 | 0.60 |              | •     |       |       |      |       |       |       |
| 06IR A 60 IC908                   | 4.00       | 0.500              | 1.250              | 20.00               | 48.00               | 6.88  | 0.05 | 0.50 | 0.60 |              |       |       |       |      |       |       | •     |
| 06IR A 60 IC228                   | 4.00       | 0.500              | 1.250              | 20.00               | 48.00               | 6.88  | 0.05 | 0.50 | 0.60 |              | •     |       |       |      |       |       |       |
| 06IR A 60 IC28                    | 4.00       | 0.500              | 1.250              | 20.00               | 48.00               | 6.88  | 0.05 | 0.50 | 0.60 | •            |       |       |       |      |       |       |       |
| 06IRM A 60 IC228 <sup>(1)</sup>   | 4.00       | 0.500              | 1.250              | 20.00               | 48.00               | 6.88  | 0.05 | 0.50 | 0.60 |              | •     |       |       |      |       |       |       |
| 08IL A 60 IC228                   | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.60 | 0.70 |              | •     |       |       |      |       |       |       |
| 08IR A 60 IC08                    | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.50 | 0.70 |              |       |       |       | •    |       |       |       |
| 08IR A 60 IC1007                  | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.50 | 0.70 |              |       |       |       |      |       |       | •     |
| 08IR A 60 IC228                   | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.50 | 0.70 |              | •     |       |       |      |       |       |       |
| 08IR A 60 IC28                    | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.50 | 0.70 | •            |       |       |       |      |       |       |       |
| 08IR A 60 IC908                   | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.50 | 0.70 |              |       |       |       |      |       | •     |       |
| 08IRM A 60 IC1007 <sup>(1)</sup>  | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.60 | 0.70 |              |       |       |       |      |       |       | •     |
| 08IRM A 60 IC228 <sup>(1)</sup>   | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.60 | 0.70 |              | •     |       |       |      |       |       |       |
| 08IRM A 60 IC808 <sup>(1)</sup>   | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.04 | 0.60 | 0.70 |              |       |       |       |      | •     |       |       |
| 08IRM A 60 IC908 <sup>(1)</sup>   | 5.00       | 0.500              | 1.500              | 16.00               | 48.00               | 8.24  | 0.05 | 0.60 | 0.70 |              |       |       |       |      |       | •     |       |
| 08IURL U 60 IC228                 | 5.00       | 1.250              | 2.000              | 12.00               | 18.00               | 8.66  | 0.10 | 0.80 | 4.33 |              | •     |       |       |      |       |       |       |
| 11IL A 60 IC250                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       |       | •     |      |       |       |       |
| 11IL A 60 IC50M                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       | •     |       |      |       |       |       |
| 11IL A 60 IC908                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       |       |       |      |       | •     |       |
| 11IR A 60 IC08                    | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       |       |       | •    |       |       |       |
| 11IR A 60 IC1007                  | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       |       |       |      |       |       | •     |
| 11IR A 60 IC228                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              | •     |       |       |      |       |       |       |
| 11IR A 60 IC250                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       |       | •     |      |       |       |       |
| 11IR A 60 IC50M                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       | •     |       |      |       |       |       |
| 11IR A 60 IC908                   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.80 | 0.90 |              |       |       |       |      |       | •     |       |
| 11IRM A 60 IC1007 <sup>(1)</sup>  | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.70 | 0.90 |              |       |       |       |      |       |       | •     |
| 11IRM A 60 IC250 <sup>(1)</sup>   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.70 | 0.90 |              |       |       | •     |      |       |       |       |
| 11IRM A 60 IC808 <sup>(1)</sup>   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.70 | 0.90 |              |       |       |       |      | •     |       |       |
| 11IRM A 60 IC908 <sup>(1)</sup>   | 6.35       | 0.500              | 1.500              | 16.00               | 48.00               | 11.00 | 0.05 | 0.70 | 0.90 |              |       |       |       |      |       | •     |       |
| 16IL A 60 IC250                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.70 | 0.80 |              |       |       | •     |      |       |       |       |
| 16IL A 60 IC908                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.70 | 0.80 |              |       |       |       |      |       | •     |       |
| 16IR A 60 IC1007                  | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.80 | 0.90 |              |       |       |       |      |       |       | •     |
| 16IR A 60 IC228                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.70 | 0.80 |              | •     |       |       |      |       |       |       |
| 16IR A 60 IC250                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.70 | 0.80 |              |       |       | •     |      |       |       |       |
| 16IR A 60 IC50M                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.70 | 0.80 |              |       | •     |       |      |       |       |       |
| 16IR A 60 IC908                   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.70 | 0.80 |              |       |       |       |      |       | •     |       |
| 16IRB A 60 IC908 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.04 | 0.80 | 0.80 |              |       |       |       |      |       | •     |       |
| 16IRM A 60 IC1007 <sup>(1)</sup>  | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.80 | 0.90 |              |       |       |       |      |       |       | •     |
| 16IRM A 60 IC250 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.80 | 0.90 |              |       |       | •     |      |       |       |       |
| 16IRM A 60 IC808 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.80 | 0.90 |              |       |       |       |      | •     |       |       |
| 16IRM A 60 IC908 <sup>(1)</sup>   | 9.52       | 0.500              | 1.500              | 16.00               | 48.00               | 16.49 | 0.05 | 0.80 | 0.90 |              |       |       |       |      |       | •     |       |
| 16IL AG 60 IC1007                 | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IL AG 60 IC250                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       | •     |      |       |       |       |
| 16IL AG 60 IC908                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       | •     |       |
| 16IR AG 60 IC1007                 | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IR AG 60 IC228                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              | •     |       |       |      |       |       |       |
| 16IR AG 60 IC250                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       | •     |      |       |       |       |
| 16IR AG 60 IC50M                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       | •     |       |      |       |       |       |
| 16IR AG 60 IC508                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       | •    |       |       |       |
| 16IR AG 60 IC908                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       | •     |       |
| 16IRB AG 60 IC908 <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       | •     |       |
| 16IRM AG 60 IC1007 <sup>(1)</sup> | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IRM AG 60 IC250 <sup>(1)</sup>  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       | •     |      |       |       |       |

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

• DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H

• ANSI/ASME B1.1 - Internal tolerance: 2B

<sup>(1)</sup> With a pressed chipformer

<sup>(2)</sup> Thread pitch minimum (mm)

<sup>(3)</sup> Thread pitch maximum (mm)

<sup>(4)</sup> Threads per inch minimum

<sup>(5)</sup> Threads per inch maximum

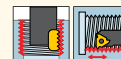
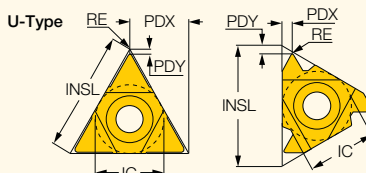
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

Continued

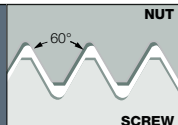
**ISCAR THREAD**

**IR/L-60°**

Internal Laydown Threading  
Inserts with a 60° Partial Profile  
for General Applications



Internal left-hand shown



| Designation                      | Dimensions |                    |                    |                     |                     |       |      |      |      | Tough ↔ Hard |       |       |       |      |       |       |       |
|----------------------------------|------------|--------------------|--------------------|---------------------|---------------------|-------|------|------|------|--------------|-------|-------|-------|------|-------|-------|-------|
|                                  | IC         | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | INSL  | RE   | PDY  | PDX  | IC28         | IC228 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 |
| 16IRM AG 60 IC50M <sup>(1)</sup> | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       | •     |       |      |       |       |       |
| 16IRM AG 60 IC808 <sup>(1)</sup> | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       | •     |       |
| 16IRM AG 60 IC908 <sup>(1)</sup> | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IL G 60 IC908                  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IR G 60 IC08                   | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 |              |       |       |       | •    |       |       |       |
| 16IR G 60 IC1007                 | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IR G 60 IC228                  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 | •            |       |       |       |      |       |       |       |
| 16IR G 60 IC250                  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 |              |       | •     |       |      |       |       |       |
| 16IR G 60 IC50M                  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 |              |       | •     |       |      |       |       |       |
| 16IR G 60 IC908                  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IRB G 60 IC908 <sup>(1)</sup>  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.13 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IRM G 60 IC1007 <sup>(1)</sup> | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.10 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 16IRM G 60 IC250 <sup>(1)</sup>  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.10 | 1.20 | 1.70 |              |       | •     |       |      |       |       |       |
| 16IRM G 60 IC50M <sup>(1)</sup>  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.10 | 1.20 | 1.70 |              |       | •     |       |      |       |       |       |
| 16IRM G 60 IC808 <sup>(1)</sup>  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.10 | 1.20 | 1.70 |              |       |       |       |      | •     |       |       |
| 16IRM G 60 IC908 <sup>(1)</sup>  | 9.52       | 1.750              | 3.000              | 8.00                | 14.00               | 16.49 | 0.10 | 1.20 | 1.70 |              |       |       |       |      |       |       | •     |
| 22IL N 60 IC908                  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.22 | 1.70 | 2.50 |              |       |       |       |      |       |       | •     |
| 22IR N 60 IC08                   | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.22 | 1.70 | 2.50 |              |       |       |       | •    |       |       |       |
| 22IR N 60 IC1007                 | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.22 | 1.70 | 2.50 |              |       |       |       |      |       |       | •     |
| 22IR N 60 IC250                  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.22 | 1.70 | 2.50 |              |       | •     |       |      |       |       |       |
| 22IR N 60 IC908                  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.22 | 1.70 | 2.50 |              |       |       |       |      |       |       | •     |
| 22IRM N 60 IC1007 <sup>(1)</sup> | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.19 | 1.70 | 2.50 |              |       |       |       |      |       |       | •     |
| 22IRM N 60 IC250 <sup>(1)</sup>  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.19 | 1.70 | 2.50 |              |       | •     |       |      |       |       |       |
| 22IRM N 60 IC50M <sup>(1)</sup>  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.19 | 1.70 | 2.50 |              |       | •     |       |      |       |       |       |
| 22IRM N 60 IC808 <sup>(1)</sup>  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.19 | 1.70 | 2.50 |              |       |       |       |      | •     |       |       |
| 22IRM N 60 IC908 <sup>(1)</sup>  | 12.70      | 3.500              | 5.000              | 5.00                | 7.00                | 22.00 | 0.19 | 1.70 | 2.50 |              |       |       |       |      |       |       | •     |
| 27IL Q 60 IC50M                  | 15.88      | 5.500              | 6.000              | 4.00                | 4.50                | 27.50 | 0.40 | 1.90 | 2.40 |              |       | •     |       |      |       |       |       |
| 27IR Q 60 IC250                  | 15.88      | 5.500              | 6.000              | 4.00                | 4.50                | 27.50 | 0.40 | 1.90 | 2.40 |              |       | •     |       |      |       |       |       |
| 27IR Q 60 IC908                  | 15.88      | 5.500              | 6.000              | 4.00                | 4.50                | 27.50 | 0.40 | 1.90 | 2.40 |              |       |       |       |      |       |       | •     |
| 16IL AG 60 IC08                  | 9.52       | 0.500              | 3.000              | 8.00                | 48.00               | 16.49 | 0.05 | 1.20 | 1.70 |              |       |       |       | •    |       |       |       |

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

• DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H

• ANSI/ASME B1.1 - Internal tolerance: 2B

<sup>(1)</sup> With a pressed chipformer

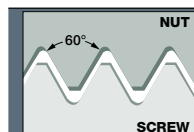
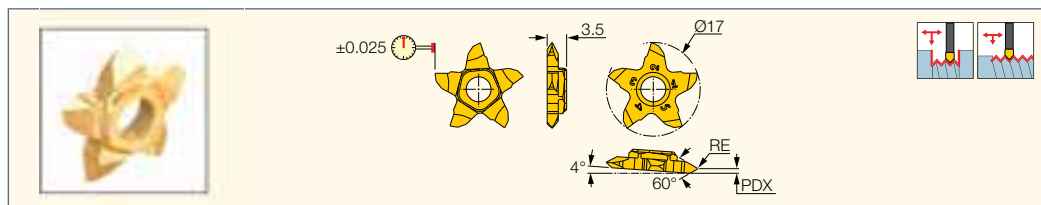
<sup>(2)</sup> Thread pitch minimum (mm)

<sup>(3)</sup> Thread pitch maximum (mm)

<sup>(4)</sup> Threads per inch minimum

<sup>(5)</sup> Threads per inch maximum

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

**PENTA 17-MT-RS/LS**  
 Precision Ground Pentagonal  
 External Threading Inserts  
 with a 60° Partial Profile  
 for General Applications


| Designation              | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | TPN <sup>(3)</sup> | TPX <sup>(4)</sup> | RE   | PDX  | IC1008 |
|--------------------------|---------------------|---------------------|--------------------|--------------------|------|------|--------|
| PENTA 17-MTL008LS IC1008 | 8.00                | 36.00               | 0.700              | 3.000              | 0.08 | 1.40 | •      |
| PENTA 17-MTR008RS IC1008 | 8.00                | 36.00               | 0.700              | 3.000              | 0.08 | 1.40 | •      |
| PENTA 17-MTL003LS IC1008 | 17.00               | 80.00               | 0.300              | 1.500              | 0.03 | 0.80 | •      |
| PENTA 17-MTR003RS IC1008 | 17.00               | 80.00               | 0.300              | 1.500              | 0.03 | 0.80 | •      |

• DIN13 , ISO 68-1, ISO 965 (1&2) - External tolerance: 6g • ANSI/ASME B1.1 - External tolerance: 2A

<sup>(1)</sup> Threads per inch minimum

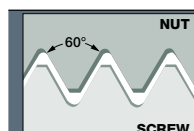
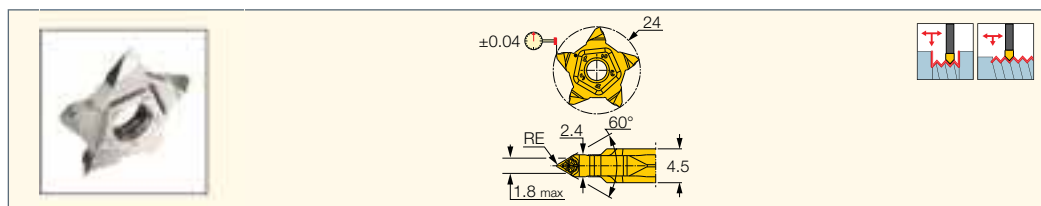
<sup>(2)</sup> Threads per inch maximum

<sup>(3)</sup> Thread pitch minimum (mm)

<sup>(4)</sup> Thread pitch maximum (mm)

**For tools, see pages:** NQCH-PCHR/L-S-JHP (433) • PCADRS/LS-JHP (354) • PCHRS/LS-17 (339) • PCHRS/LS-17-JHP (340) • Y-PCHRS-17 (340)

• Y-PCHRS-17-JHP (341)

**PENTA 24-MT**  
 Precision Ground Pentagonal  
 External Threading Inserts  
 with a 60° Partial Profile  
 for General Applications


| Designation                            | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | RE   | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | IC908 |
|----------------------------------------|--------------------|--------------------|------|---------------------|---------------------|-------|
| PENTA 24A-MT-0.05 IC908 <sup>(1)</sup> | 0.250              | 3.000              | 0.05 | 8.00                | 80.00               | •     |
| PENTA 24-MT-0.05 IC908                 | 0.250              | 3.500              | 0.05 | 8.00                | 80.00               | •     |
| PENTA 24N3-MT010RS IC908               | 0.500              | 3.500              | 0.10 | 7.00                | 48.00               | •     |
| PENTA 24A-MT-0.15 IC908                | 0.800              | 3.000              | 0.15 | 8.00                | 32.00               | •     |

• TPX=0.175xD • DIN13 , ISO 68-1, ISO 965 (1&2) - External tolerance: 6g • ANSI/ASME B1.1 - External tolerance: 2A

<sup>(1)</sup> Flat rake (without a chipformer)

<sup>(2)</sup> Thread pitch minimum (mm)

<sup>(3)</sup> Thread pitch maximum (mm)

<sup>(4)</sup> Threads per inch minimum

<sup>(5)</sup> Threads per inch maximum

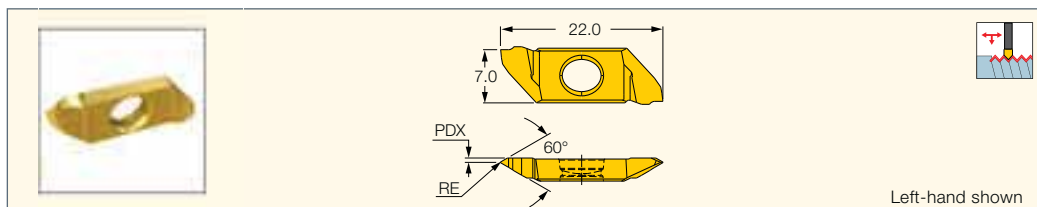
**For tools, see pages:** NQCH-PCHR/L-24-JHP (348) • PCAD RE/LE-JHP (561) • PCADR/L (353) • PCADR/L-JHP (353) • PCHBR/L (355)

• PCHR/L-24 (346) • PCHR/L-24-JHP (347) • PCHR/L-24-JHP-MC (348)

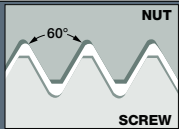
**SWISSCUT**  
INNOVAL LINE  
**ISCARTHREAD**

**SCIR/L-22-MTR/MTL**

Threading Inserts with  
a 60° Partial Profile



Left-hand shown

|  | Dimensions |     |                    |                    |                     |                     | Tough ↔ Hard |      |        |
|-----------------------------------------------------------------------------------|------------|-----|--------------------|--------------------|---------------------|---------------------|--------------|------|--------|
|                                                                                   | RE         | PDX | TPN <sup>(1)</sup> | TPX <sup>(2)</sup> | TPIX <sup>(3)</sup> | TPIN <sup>(4)</sup> | IC1008       | IC07 | IC1007 |
| SCIL 22-MTL003 IC07                                                               | 0.03       | 0.4 | 0.300              | 0.900              | 83.00               | 28.00               |              | •    |        |
| SCIL 22-MTL003 IC1007                                                             | 0.03       | 0.4 | 0.300              | 0.900              | 83.00               | 28.00               |              |      | •      |
| SCIL 22-MTL003 IC1008                                                             | 0.03       | 0.4 | 0.300              | 0.900              | 83.00               | 28.00               | •            |      |        |
| SCIR 22-MTR003 IC07                                                               | 0.03       | 0.4 | 0.300              | 0.900              | 83.00               | 28.00               |              | •    |        |
| SCIR 22-MTR003 IC1007                                                             | 0.03       | 0.4 | 0.300              | 0.900              | 83.00               | 28.00               |              |      | •      |
| SCIR 22-MTR003 IC1008                                                             | 0.03       | 0.4 | 0.300              | 0.900              | 83.00               | 28.00               | •            |      |        |
| SCIL 22-MTL007 IC07                                                               | 0.07       | 0.5 | 0.700              | 1.100              | 36.00               | 23.00               |              | •    |        |
| SCIL 22-MTL007 IC1007                                                             | 0.07       | 0.5 | 0.700              | 1.100              | 36.00               | 23.00               |              |      | •      |
| SCIL 22-MTR/L007 IC1008                                                           | 0.07       | 0.5 | 0.700              | 1.100              | 36.00               | 23.00               | •            |      |        |
| SCIR 22-MTR/L007 IC1008                                                           | 0.07       | 0.5 | 0.700              | 1.100              | 36.00               | 23.00               | •            |      |        |
| SCIR 22-MTR007 IC07                                                               | 0.07       | 0.5 | 0.700              | 1.100              | 36.00               | 23.00               |              | •    |        |
| SCIR 22-MTR007 IC1007                                                             | 0.07       | 0.5 | 0.700              | 1.100              | 36.00               | 23.00               |              |      | •      |
| SCIL 22-MTL010 IC07                                                               | 0.10       | 0.8 | 0.900              | 1.700              | 28.00               | 15.00               |              | •    |        |
| SCIL 22-MTL010 IC1007                                                             | 0.10       | 0.8 | 0.900              | 1.700              | 28.00               | 15.00               |              |      | •      |
| SCIL 22-MTL010 IC1008                                                             | 0.10       | 0.8 | 0.900              | 1.700              | 28.00               | 15.00               | •            |      |        |
| SCIR 22-MTR010 IC07                                                               | 0.10       | 0.8 | 0.900              | 1.700              | 28.00               | 15.00               |              | •    |        |
| SCIR 22-MTR010 IC1007                                                             | 0.10       | 0.8 | 0.900              | 1.700              | 28.00               | 15.00               |              |      | •      |
| SCIR 22-MTR010 IC1008                                                             | 0.10       | 0.8 | 0.900              | 1.700              | 28.00               | 15.00               | •            |      | •      |

• For detailed cutting data, see page 714 • DIN13 , ISO 68-1, ISO 965 (1&2) - External tolerance: 6g • ANSI/ASME B1.1 - External tolerance: 2A

<sup>(1)</sup> Thread pitch minimum (mm)

<sup>(2)</sup> Thread pitch maximum (mm)

<sup>(3)</sup> Threads per inch maximum

<sup>(4)</sup> Threads per inch minimum

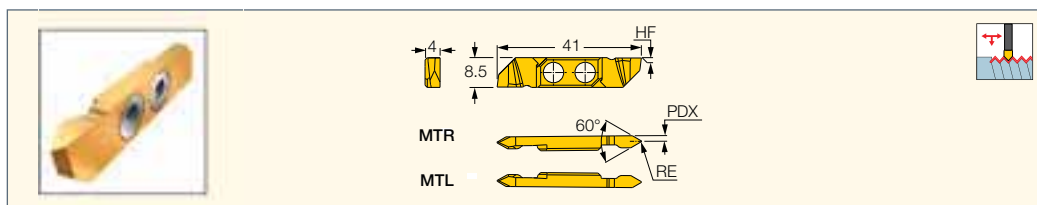
For tools, see pages: NQCH-SCHR/L-BF-JHP (408) • NQCH-Y-SCHR-BF-JHP (408) • SCHR/L-22BF (407) • SCHR/L-22BF-JHP (407) • Y-SCHR-22BF (407)

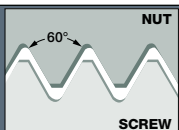
• Y-SCHR-22BF-JHP (408)

**SWISSCUT**  
EXTRA LONG  
**ISCARTHREAD**

**SCIR/L-41-MTR/MTL**

Threading Inserts with  
a 60° Partial Profile



|  | Dimensions |      |                    |                    |                     |                     |                   | IC1008 |
|-------------------------------------------------------------------------------------|------------|------|--------------------|--------------------|---------------------|---------------------|-------------------|--------|
|                                                                                     | RE         | PDX  | TPN <sup>(1)</sup> | TPX <sup>(2)</sup> | TPIN <sup>(3)</sup> | TPIX <sup>(4)</sup> | HF <sup>(5)</sup> |        |
| SCIL 41-MTL006 IC1008                                                               | 0.06       | 0.90 | 0.400              | 1.500              | 17.00               | 64.00               | 0.2               | •      |
| SCIR 41-MTR006 IC1008                                                               | 0.06       | 0.90 | 0.400              | 1.500              | 17.00               | 64.00               | 0.2               | •      |
| SCIL 41-MTL020 IC1008                                                               | 0.20       | 1.60 | 1.500              | 2.500              | 10.00               | 17.00               | 0.2               | •      |
| SCIR 41-MTR020 IC1008                                                               | 0.20       | 1.60 | 1.500              | 2.500              | 10.00               | 17.00               | 0.2               | •      |

• For detailed cutting data, see page 714 • DIN13 , ISO 68-1, ISO 965 (1&2) - External tolerance: 6g • ANSI/ASME B1.1 - External tolerance: 2A

<sup>(1)</sup> Thread pitch minimum (mm)

<sup>(2)</sup> Thread pitch maximum (mm)

<sup>(3)</sup> Threads per inch minimum

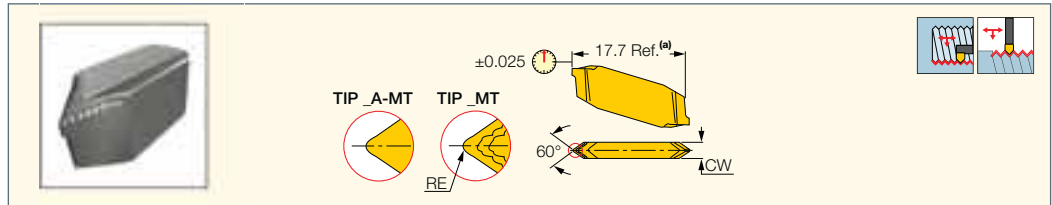
<sup>(4)</sup> Threads per inch maximum

<sup>(5)</sup> Cutting edge below center

For tools, see page: SCHR/L-41BF (412)

## TIP-MT

Precision Ground Double-Ended Threading Inserts with a 60° Partial Profile and Chipformer



| Designation                         | Dimensions |      |                      |                    |                     |                     |                    | Tough ↔ Hard |       |
|-------------------------------------|------------|------|----------------------|--------------------|---------------------|---------------------|--------------------|--------------|-------|
|                                     | CW         | RE   | RETOL <sup>(2)</sup> | TPN <sup>(3)</sup> | TPIX <sup>(4)</sup> | TPIN <sup>(5)</sup> | TPX <sup>(6)</sup> | IC08         | IC908 |
| TIP 2A-MT-0.05 IC908 <sup>(1)</sup> | 2.40       | 0.05 | 0.030                | 0.450              | 56.00               | 12.00               | 2.120              | •            | •     |
| TIP 2MT-0.05 IC08                   | 2.40       | 0.05 | 0.030                | 0.450              | 56.00               | 12.00               | 2.120              | •            | •     |
| TIP 2MT-0.05 IC908                  | 2.40       | 0.05 | 0.030                | 0.450              | 56.00               | 12.00               | 2.120              | •            | •     |
| TIP 2MT-0.14 IC08                   | 2.40       | 0.14 | 0.030                | 1.110              | 23.00               | 12.00               | 2.120              | •            | •     |
| TIP 2MT-0.14 IC908                  | 2.40       | 0.14 | 0.030                | 1.110              | 23.00               | 12.00               | 2.120              | •            | •     |
| TIP 4A-MT-0.15 IC908 <sup>(1)</sup> | 4.00       | 0.15 | 0.030                | 1.270              | 20.00               | 7.00                | 3.630              | •            | •     |
| TIP 4MT-0.15 IC908                  | 4.00       | 0.15 | 0.030                | 1.270              | 20.00               | 7.00                | 3.630              | •            | •     |
| TIP 4MT-0.20 IC08                   | 4.00       | 0.20 | 0.030                | 1.600              | 16.00               | 7.00                | 3.630              | •            | •     |
| TIP 4MT-0.20 IC908                  | 4.00       | 0.20 | 0.030                | 1.600              | 16.00               | 7.00                | 3.630              | •            | •     |
| TIP 5MT-0.25 IC08                   | 5.50       | 0.25 | 0.030                | 1.950              | 13.00               | 5.00                | 5.100              | •            | •     |
| TIP 5MT-0.25 IC908                  | 5.50       | 0.25 | 0.030                | 1.950              | 13.00               | 5.00                | 5.100              | •            | •     |

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance
- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A

(1) Without chipformer (flat rake)

(2) Corner radius tolerance (+/-)

(3) Thread pitch minimum (mm)

(4) Threads per inch maximum

(5) Threads per inch minimum

(6) Thread pitch maximum (mm)

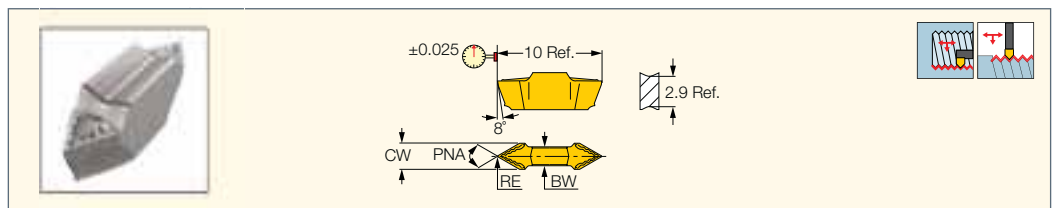
For tools, see pages: C#-GHDR/L (301) • CGHN 26-M (399) • CGHN 32-DGM (400) • CGHN 32-M (400) • CGHN-D (310) • CGHN-DG (310)

• CGHN-S (309) • CGPAD (308) • CGPAD-JHP (309) • GHDR/L (short pocket) (302) • GHDR/L-JHP (short pocket) (303) • GHDR/L-JHP-MC (short pocket) (304)

• GHGR/L (305) • GHMPR/L (300) • GHMR/L (300) • GHSR/L (428) • GHSR/L-JHP-SL (429) • NQCH-GHSR/L-JHP (428)

## GEPI-MT

Precision Ground Internal Double-Ended Threading Inserts with a 60° Partial Profile for General Applications



| Designation           | Dimensions |      |                      |      |      |                    |                    |                     |                     | Tough ↔ Hard |       |
|-----------------------|------------|------|----------------------|------|------|--------------------|--------------------|---------------------|---------------------|--------------|-------|
|                       | CW         | RE   | RETOL <sup>(1)</sup> | PNA  | BW   | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | IC08         | IC908 |
| GEPI 2.5-MT0.05 IC08  | 2.50       | 0.05 | 0.030                | 60.0 | 1.80 | 0.910              | 2.540              | 10.00               | 28.00               | •            | •     |
| GEPI 2.5-MT0.05 IC908 | 2.50       | 0.05 | 0.030                | 60.0 | 1.80 | 0.910              | 2.540              | 10.00               | 28.00               | •            | •     |

- Toolholder seat needs to be modified according to insert profile to ensure clearance
- Pitch max 0.187xD, TPI min D/5.35
- D=Diameter of thread (pitch max<=CW)
- DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A

(1) Corner radius tolerance (+/-)

(2) Thread pitch minimum (mm)

(3) Thread pitch maximum (mm)

(4) Threads per inch minimum

(5) Threads per inch maximum

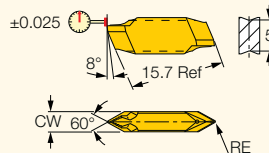
For tools, see pages: AVC-GEAIR/L (389) • E-GEHIR / E-GHIR (383) • GEAIR/L (383) • GEHMR/L (380) • GEHMR/L-SC (380) • GEHIR/L (381)

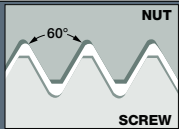
• GEHIR/L-SC (382) • GEHSR (427) • GEHSR/L-SL (426)

# CUTGRIP ISCARTHREAD

## TIPI-MT

Precision Ground Double-Ended Internal Threading Inserts with 60° Partial Profile and Chipformer for 20mm Min. Bore Dia.



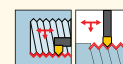
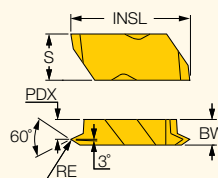
| <br>Designation | Dimensions |      |                      |                    |                     |                     |                    | Tough ↔ Hard |       |
|--------------------------------------------------------------------------------------------------|------------|------|----------------------|--------------------|---------------------|---------------------|--------------------|--------------|-------|
|                                                                                                  | CW         | RE   | RETOL <sup>(1)</sup> | TPN <sup>(2)</sup> | TPIX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPX <sup>(5)</sup> | IC08         | IC908 |
| TIPI 3.4MT-0.10 IC08                                                                             | 3.40       | 0.10 | 0.030                | 1.800              | 14.00               | 8.00                | 3.180              | ●            |       |
| TIPI 3.4MT-0.10 IC908                                                                            | 3.40       | 0.10 | 0.030                | 1.800              | 14.00               | 8.00                | 3.180              |              | ●     |
| TIPI 5.4MT-0.20 IC08                                                                             | 5.40       | 0.20 | 0.030                | 3.190              | 8.00                | 5.00                | 5.100              | ●            |       |
| TIPI 5.4MT-0.20 IC908                                                                            | 5.40       | 0.20 | 0.030                | 3.190              | 8.00                | 5.00                | 5.100              |              | ●     |

- Toolholder seat needs to be modified according to insert profile to ensure clearance.
  - Pitch max 0.205xD, TPI min D/4.8
  - D=Diameter of thread (pitch max<=CW)
  - TIPI inserts are 1.6 mm longer than GIPI in the same pocket
  - DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H
  - ANSI/ASME B1.1 - Internal tolerance: 2B
  - (1) Corner radius tolerance (+/-)
  - (2) Thread pitch minimum (mm)
  - (3) Threads per inch maximum
  - (4) Threads per inch minimum
  - (5) Thread pitch maximum (mm)
- For tools, see pages:** AVC-GAIR/L (390) • CGIN 26 (391) • GAIR/L (389) • GHIR/L (W=1.9-6.4) (387) • GHIR/L-C (W=4-6.4) (387) • GHIR/L-SC (W=2-4.8) (388)

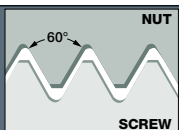
# NOTCHGRIP ISCARTHREAD

## 60° PARTIAL PROFILE THREADING FLTf

Double-Ended Precision Flat Top Threading Inserts



Right-hand shown

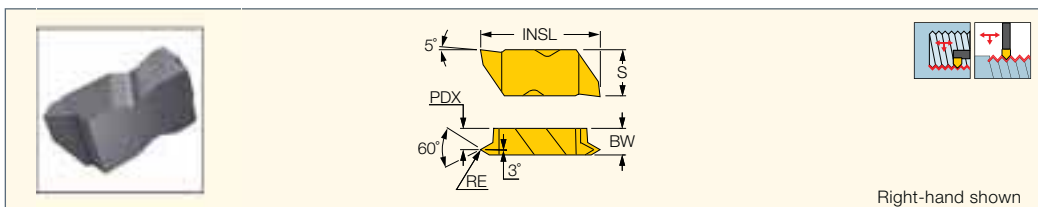
| <br>Designation | Dimensions          |                     |                                   |                                    |      |      |      |       |       |                    |                    |                    |                    | IC908 |
|----------------------------------------------------------------------------------------------------|---------------------|---------------------|-----------------------------------|------------------------------------|------|------|------|-------|-------|--------------------|--------------------|--------------------|--------------------|-------|
|                                                                                                    | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | TPN <sub>DF2</sub> <sup>(3)</sup> | TPIX <sub>DF2</sub> <sup>(4)</sup> | RE   | PDX  | BW   | S     | INSL  | TPN <sup>(5)</sup> | TPX <sup>(6)</sup> | TPN <sub>DF2</sub> | TPX <sub>DF2</sub> |       |
| FLTf-2R/L IC908                                                                                    | 12.00               | 24.00               | 14.00                             | 44.00                              | 0.08 | 2.80 | 3.81 | 5.56  | 12.95 | 1.000              | 2.000              | 0.500              | 1.750              | ●     |
| FLTf-3R/L IC908                                                                                    | 9.00                | 24.00               | 10.00                             | 44.00                              | 0.08 | 3.60 | 4.95 | 8.74  | 22.60 | 1.000              | 2.500              | 0.500              | 2.500              | ●     |
| FLTf-4R/L IC908                                                                                    | 9.00                | 24.00               | 10.00                             | 44.00                              | 0.08 | 5.10 | 6.48 | 11.51 | 28.45 | 1.000              | 2.500              | 0.500              | 2.500              | ●     |

- DMIN according to related boring bar
  - For 60° V-thread limits, see pages 822-823
  - DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
  - ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A
  - (1) TPI int. min.
  - (2) TPI int. max.
  - (3) TPI ext. min.
  - (4) TPI ext. max.
  - (5) Thread pitch minimum (mm)
  - (6) Thread pitch maximum (mm)
- For tools, see pages:** FLASR/L (807) • FLSR/L (807)



**60° PARTIAL PROFILE  
THREADING FLT-K**

Double-Ended Precision Positive  
Rake Threading Inserts



| Designation             | Dimensions          |                     |                             |                             |      |      |      |      |       |       |                    |                    |             |             | IC908 |
|-------------------------|---------------------|---------------------|-----------------------------|-----------------------------|------|------|------|------|-------|-------|--------------------|--------------------|-------------|-------------|-------|
|                         | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | TPIN_<br>DF2 <sup>(3)</sup> | TPIX_<br>DF2 <sup>(4)</sup> | RE   | TTP  | PDX  | BW   | S     | INS_L | TPN <sup>(5)</sup> | TPX <sup>(6)</sup> | TPN_<br>DF2 | TPX_<br>DF2 |       |
| <b>FLT-K-3R/L IC908</b> | 9.00                | 24.00               | 10.00                       | 44.00                       | 0.08 | BOTH | 3.60 | 4.95 | 8.74  | 22.60 | 1.000              | 2.500              | 0.500       | 2.500       | ●     |
| <b>FLT-K-4R/L IC908</b> | 9.00                | 24.00               | 10.00                       | 44.00                       | 0.08 | BOTH | 5.10 | 6.48 | 11.51 | 28.45 | 1.000              | 2.500              | 0.500       | 2.500       | ●     |
| <b>FLT-K-2R/L IC908</b> | 12.00               | 24.00               | 14.00                       | 44.00                       | 0.08 | BOTH | 2.80 | 3.81 | 5.56  | 12.95 | 1.000              | 2.000              | 0.500       | 1.750       | ●     |

- DMIN according to related boring bar
- For 60° V-thread limits, see pages 822-823
- DIN13, ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A

(1) TPI int. min.

(2) TPI int. max.

(3) TPI ext. min.

(4) TPI ext. max.

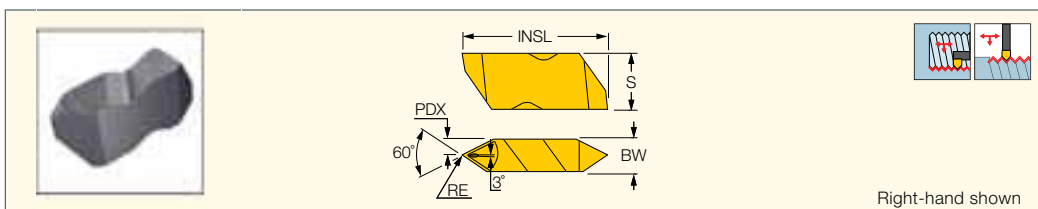
(5) Thread pitch minimum (mm)

(6) Thread pitch maximum (mm)

For tools, see pages: FLASR/L (807) • FLSR/L (807)

**60° PARTIAL PROFILE  
THREADING FLT-CB**

Double-Ended Precision  
Threading Inserts with  
Chipbreakers



|  | Dimensions  |                     |                     |                             |                             |      |      |       |       |       |                    |                    |             | IC908 |
|-------------------------------------------------------------------------------------|-------------|---------------------|---------------------|-----------------------------|-----------------------------|------|------|-------|-------|-------|--------------------|--------------------|-------------|-------|
|                                                                                     | Designation | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | TPIN_<br>DF2 <sup>(3)</sup> | TPIX_<br>DF2 <sup>(4)</sup> | RE   | PDX  | BW    | S     | INSL  | TPN <sup>(5)</sup> | TPX <sup>(6)</sup> | TPN_<br>DF2 |       |
| FLT-4R/L-HCB IC908                                                                  | 4.00        | 12.00               | 4.00                | 20.00                       | 0.17                        | 3.30 | 6.48 | 11.51 | 28.45 | 2.000 | 6.000              | 1.250              | 6.000       | ●     |
| FLT-3R/LC-HCB IC908                                                                 | 5.00        | 6.00                | 6.00                | 11.00                       | 0.34                        | 2.50 | 4.95 | 8.74  | 22.60 | 4.000 | 5.000              | 2.250              | 4.000       | ●     |
| FLT-3R/L-HCB IC908                                                                  | 5.00        | 12.00               | 6.00                | 20.00                       | 0.17                        | 2.50 | 4.95 | 8.74  | 22.60 | 2.000 | 5.000              | 1.250              | 4.000       | ●     |
| FLT-3R/L-FCB IC908                                                                  | 7.00        | 20.00               | 8.00                | 36.00                       | 0.10                        | 2.50 | 4.95 | 8.74  | 22.60 | 1.250 | 3.500              | 0.500              | 3.000       | ●     |
| FLT-3R/L-CB IC908                                                                   | 8.00        | 12.00               | 8.00                | 20.00                       | 0.17                        | 2.50 | 4.95 | 8.74  | 22.60 | 2.000 | 3.000              | 1.250              | 3.000       | ●     |

- DMIN according to related boring bar
- For 60° V-thread limits, see pages 822-823
- DIN13, ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g

- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A

(1) TPI int. min.

(2) TPI int. max.

(3) TPI ext. min.

(4) TPI ext. max.

(5) Thread pitch minimum (mm)

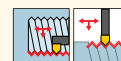
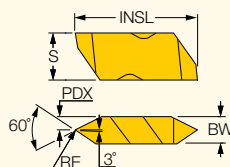
(6) Thread pitch maximum (mm)

For tools, see pages: FLASR/L (807) • FLSR/L (807)

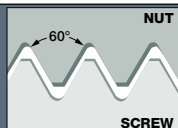
**NOTCH GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**60° PARTIAL PROFILE  
THREADING FLT**

Double-Ended Precision Flat  
Top Threading Inserts



Right-hand shown



Dimensions

| Designation       | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | TPIN_<br>DF2 <sup>(3)</sup> | TPIX_<br>DF2 <sup>(4)</sup> | RE   | PDX  | BW   | S     | INSL  | TPN <sup>(5)</sup> | TPX <sup>(6)</sup> | TPN_<br>DF2 | TPX_<br>DF2 | IC908 |
|-------------------|---------------------|---------------------|-----------------------------|-----------------------------|------|------|------|-------|-------|--------------------|--------------------|-------------|-------------|-------|
| FLT-4R/L IC908    | 4.00                | 12.00               | 4.00                        | 20.00                       | 0.17 | 3.30 | 6.48 | 11.51 | 28.45 | 2.000              | 6.000              | 1.250       | 6.000       | •     |
| FLT-3R/L IC908    | 5.00                | 12.00               | 6.00                        | 20.00                       | 0.26 | 2.50 | 4.95 | 8.74  | 22.60 | 2.000              | 5.000              | 1.250       | 4.000       | •     |
| FLT-3010R/L IC908 | 5.00                | 12.00               | 6.00                        | 18.00                       | 0.10 | 2.50 | 4.95 | 8.74  | 22.60 | 2.000              | 5.000              | 1.250       | 4.000       | •     |
| FLT-2R/L IC908    | 7.00                | 20.00               | 8.00                        | 36.00                       | 0.10 | 1.90 | 3.81 | 5.56  | 12.95 | 1.250              | 3.500              | 0.500       | 3.000       | •     |

- DMIN according to related boring bar
- For 60° V-thread limits, see pages 822-823
- DIN13, ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A

(1) TPI int. min.

(2) TPI int. max.

(3) TPI ext. min.

(4) TPI ext. max.

(5) Thread pitch minimum (mm)

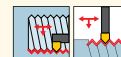
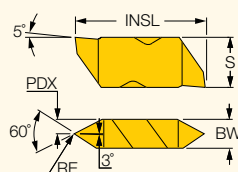
(6) Thread pitch maximum (mm)

For tools, see pages: FLASR/L (807) • FLSR/L (807)

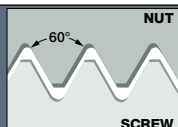
**NOTCH GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**60° PARTIAL PROFILE  
THREADING FLTP**

Double-Ended Precision Positive  
Rake Threading Inserts



Right-hand shown



Dimensions

| Designation     | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | TPIN_<br>DF2 <sup>(3)</sup> | TPIX_<br>DF2 <sup>(4)</sup> | RE   | PDX  | BW   | S     | INSL  | TPN <sup>(5)</sup> | TPX <sup>(6)</sup> | TPN_<br>DF2 | TPX_<br>DF2 | IC908 |
|-----------------|---------------------|---------------------|-----------------------------|-----------------------------|------|------|------|-------|-------|--------------------|--------------------|-------------|-------------|-------|
| FLTP-4R/L IC908 | 4.00                | 12.00               | 4.00                        | 20.00                       | 0.17 | 3.30 | 6.50 | 11.51 | 28.45 | 2.000              | 6.000              | 1.250       | 6.000       | •     |
| FLTP-3R/L IC908 | 5.00                | 12.00               | 6.00                        | 20.00                       | 0.17 | 2.50 | 5.00 | 8.74  | 22.60 | 2.000              | 5.000              | 1.250       | 4.000       | •     |
| FLTP-2R/L IC908 | 7.00                | 20.00               | 8.00                        | 36.00                       | 0.10 | 1.90 | 3.80 | 5.56  | 12.95 | 1.250              | 3.500              | 0.500       | 3.000       | •     |

- DMIN according to related boring bar
- For 60° V-thread limits, see pages 822-823
- DIN13, ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g
- ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A

(1) TPI int. min.

(2) TPI int. max.

(3) TPI ext. min.

(4) TPI ext. max.

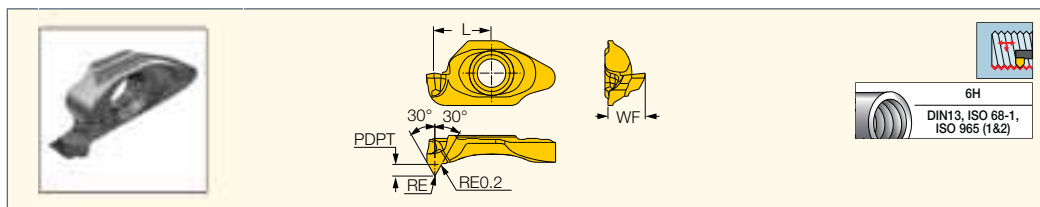
(5) Thread pitch minimum (mm)

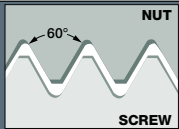
(6) Thread pitch maximum (mm)

For tools, see pages: FLASR/L (807) • FLSR/L (807)

**MITR 8-MT**

Internal ISO Metric Threading  
Inserts for Partial Profile



| <br><b>Designation</b> | Dimensions          |      |      |      |                     |                    |                    | IC908 |
|---------------------------------------------------------------------------------------------------------|---------------------|------|------|------|---------------------|--------------------|--------------------|-------|
|                                                                                                         | PDPT <sup>(1)</sup> | RE   | L    | WF   | DMIN <sup>(2)</sup> | TPN <sup>(3)</sup> | TPX <sup>(4)</sup> |       |
| <b>MITR 8-MT2-0.1 IC908</b>                                                                             | 1.17                | 0.10 | 5.75 | 3.80 | 10.00               | 1.500              | 2.000              | •     |
| <b>MITR 8-MT1-0.05 IC908</b>                                                                            | 1.23                | 0.05 | 5.75 | 3.80 | 10.00               | 0.750              | 1.250              | •     |

<sup>(1)</sup> Cutting depth maximum

<sup>(2)</sup> Minimum diameter

<sup>(3)</sup> Thread pitch minimum (mm)

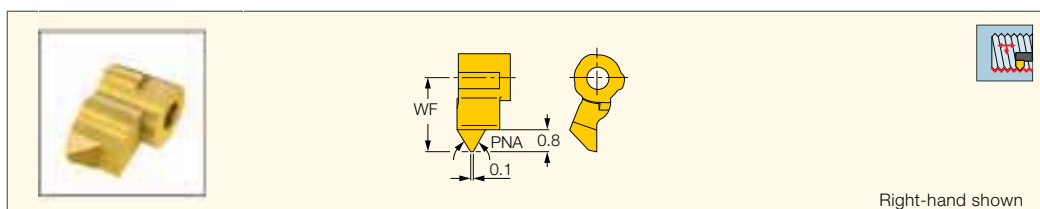
<sup>(4)</sup> Thread pitch maximum (mm)

For tools, see page: MIFHR (468)

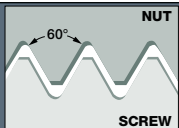
**MINICHAM**  
**ISCARTHREAD**

**UMGR-A60**

Mini Indexable Inserts with a  
60° Partial Profile for Threading  
in 5.2 mm and Larger Holes



Right-hand shown

| <br><b>Designation</b> | Dimensions |      |      |                    |                    |                     |                     | IC508 |
|----------------------------------------------------------------------------------------------------------|------------|------|------|--------------------|--------------------|---------------------|---------------------|-------|
|                                                                                                          | PNA        | WF   | DMIN | TPN <sup>(1)</sup> | TPX <sup>(2)</sup> | TPIN <sup>(3)</sup> | TPIX <sup>(4)</sup> |       |
| <b>UMGR 4.0-A60 IC508</b>                                                                                | 60.0       | 2.70 | 5.20 | 0.600              | 1.250              | 20.00               | 40.00               | •     |

• For detailed cutting data, see page 714 • DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H • ANSI/ASME B1.1 - Internal tolerance: 2B

<sup>(1)</sup> Thread pitch minimum (mm)

<sup>(2)</sup> Thread pitch maximum (mm)

<sup>(3)</sup> Threads per inch minimum

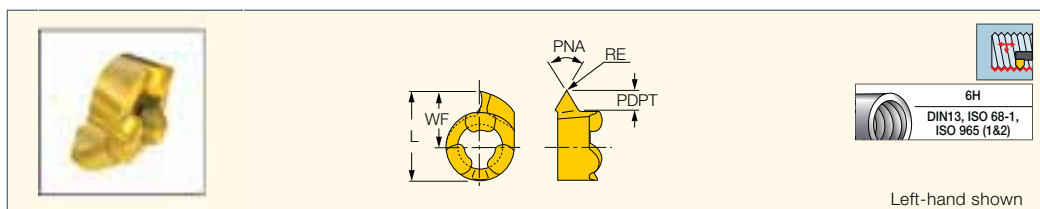
<sup>(4)</sup> Threads per inch maximum

For tools, see page: MGUHR (467)

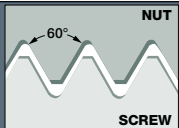
**CHAMGROOVE**  
**ISCARTHREAD**

**GIQR/L-MT**

Internal Threading Inserts with a  
60° Partial Profile for Threading  
in 8 mm and Larger Holes



Left-hand shown

| <br><b>Designation</b> | Dimensions |      |      |                     |      |                     |                    |                    |                     |                     | IC528 |
|-----------------------------------------------------------------------------------------------------------|------------|------|------|---------------------|------|---------------------|--------------------|--------------------|---------------------|---------------------|-------|
|                                                                                                           | L          | RE   | PNA  | PDPT <sup>(1)</sup> | WF   | DMIN <sup>(2)</sup> | TPN <sup>(3)</sup> | TPX <sup>(4)</sup> | TPIN <sup>(5)</sup> | TPIX <sup>(6)</sup> |       |
| <b>GIQR/L 8-MT-0.05 IC528</b>                                                                             | 7.78       | 0.05 | 60.0 | 1.50                | 4.80 | 8.00                | 0.500              | 1.590              | 16.00               | 50.00               | •     |
| <b>GIQR/L 11-MT-0.05 IC528</b>                                                                            | 10.68      | 0.05 | 60.0 | 2.00                | 6.70 | 11.00               | 0.500              | 2.300              | 11.00               | 50.00               | •     |

• Can be used for thread milling by circular interpolation • Pitch max 0.19xD • D-diameter of thread • For cutting speed recommendations, see page 809

• DIN13 , ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H • ANSI/ASME B1.1 - Internal tolerance: 2B

<sup>(1)</sup> Cutting depth maximum

<sup>(2)</sup> Minimum diameter

<sup>(3)</sup> Thread pitch minimum (mm)

<sup>(4)</sup> Thread pitch maximum (mm)

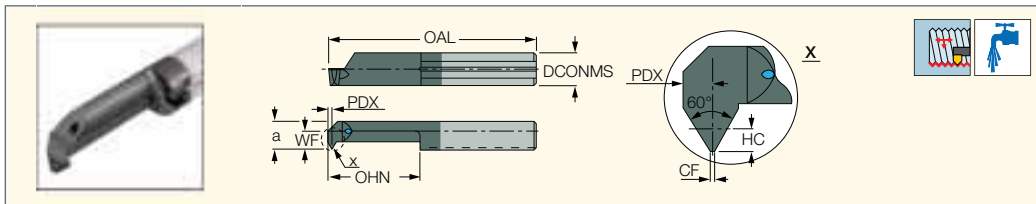
<sup>(5)</sup> Threads per inch minimum

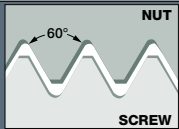
<sup>(6)</sup> Threads per inch maximum

For tools, see pages: MG (470) • MGCH (470)

**PICCOJET**  
COOLANT THROUGH  
**ISCARTHREAD**

**PICJ R/LTH (60° Threading)**  
Inserts with a 60° Internal Thread Profile and Inner Coolant Channel for 2.4mm min. Bore Diameter



| <br><b>Designation</b> | Dimensions |      |      |      |      |      |      |                    |       |                    |                    |                     |                     | IC908 |
|---------------------------------------------------------------------------------------------------------|------------|------|------|------|------|------|------|--------------------|-------|--------------------|--------------------|---------------------|---------------------|-------|
|                                                                                                         | DCONMS     | DMIN | HC   | CF   | PDX  | WF   | a    | OHN <sup>(1)</sup> | OAL   | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> |       |
| PICJ RTH710.50D024                                                                                      | 4.00       | 2.40 | 0.27 | 0.04 | 0.30 | 0.30 | 2.30 | 8.0                | 22.00 | 0.500              | 0.700              | 36.00               | 48.00               | ●     |
| PICJ RTH910.50D032                                                                                      | 4.00       | 3.20 | 0.27 | 0.09 | 0.40 | 1.00 | 3.00 | 10.0               | 24.00 | 0.500              | 0.750              | 36.00               | 48.00               | ●     |
| PICJ RTH1410.50D040                                                                                     | 4.00       | 4.00 | 0.27 | 0.06 | 0.40 | 1.50 | 3.50 | 15.0               | 30.00 | 0.500              | 0.750              | 36.00               | 48.00               | ●     |
| PICJ RTH1410.50D050                                                                                     | 5.00       | 5.00 | 0.27 | 0.06 | 0.40 | 1.90 | 4.40 | 15.0               | 30.00 | 0.500              | 0.750              | 36.00               | 48.00               | ●     |
| PICJ RTH1410.75D050                                                                                     | 5.00       | 5.00 | 0.40 | 0.09 | 0.50 | 1.90 | 4.40 | 15.0               | 30.00 | 0.750              | 1.000              | 24.00               | 36.00               | ●     |
| PICJ R/LTH1411.00D048                                                                                   | 5.00       | 4.80 | 0.55 | 0.12 | 0.60 | 1.90 | 4.40 | 15.0               | 30.00 | 1.000              | 1.250              | 20.00               | 24.00               | ●     |
| PICJ RTH1911.00D048                                                                                     | 5.00       | 4.80 | 0.55 | 0.12 | 0.60 | 1.90 | 4.40 | 20.0               | 35.00 | 1.000              | 1.250              | 20.00               | 24.00               | ●     |
| PICJ RTH1411.00D060                                                                                     | 6.00       | 6.00 | 0.55 | 0.12 | 0.60 | 2.30 | 5.30 | 15.0               | 30.00 | 1.000              | 1.250              | 20.00               | 24.00               | ●     |
| PICJ RTH2111.00D060                                                                                     | 6.00       | 6.00 | 0.55 | 0.12 | 0.60 | 2.30 | 5.30 | 22.0               | 37.00 | 1.000              | 1.250              | 20.00               | 24.00               | ●     |
| PICJ RTH1411.25D060                                                                                     | 6.00       | 6.00 | 0.68 | 0.15 | 0.70 | 2.30 | 5.30 | 15.0               | 30.00 | 1.250              | 1.500              | 16.00               | 20.00               | ●     |
| PICJ RTH1411.50D060                                                                                     | 6.00       | 6.00 | 0.81 | 0.18 | 0.80 | 2.30 | 5.30 | 15.0               | 30.00 | 1.500              | 1.750              | 14.00               | 16.00               | ●     |
| PICJ R/LTH1411.5D070                                                                                    | 7.00       | 7.00 | 0.81 | 0.18 | 0.80 | 2.70 | 6.30 | 15.0               | 30.00 | 1.500              | 1.750              | 14.00               | 16.00               | ●     |

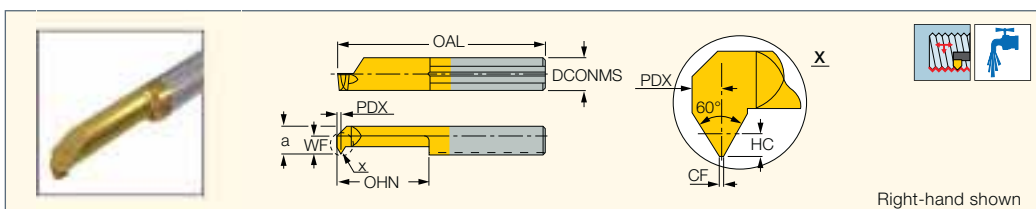
**NEW**

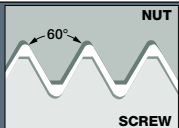
- For detailed cutting data, see page 714 • DIN13, ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H • ANSI/ASME B1.1 - Internal tolerance: 2B
- PICJ items are suitable for: PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420) type holders only

- (1) Minimum overhang  
(2) Thread pitch minimum (mm)  
(3) Thread pitch maximum (mm)  
(4) Threads per inch minimum  
(5) Threads per inch maximum

**PICCO CUT**  
**ISCARTHREAD**

**PICCO R/L-60°-Thread**  
Inserts with a 60° Internal Thread Profile for 2.4 mm Min. Bore Diameter



| <br><b>Designation</b> | Dimensions |      |      |      |      |      |      |                    |       |                    |                    |                     |                     | Tough ↔ Hard |       |
|-----------------------------------------------------------------------------------------------------------|------------|------|------|------|------|------|------|--------------------|-------|--------------------|--------------------|---------------------|---------------------|--------------|-------|
|                                                                                                           | DCONMS     | DMIN | HC   | CF   | PDX  | WF   | a    | OHN <sup>(1)</sup> | OAL   | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | IC228        | IC908 |
| PICCO R 003.0105-8                                                                                        | 4.00       | 2.40 | 0.27 | 0.04 | 0.30 | 0.30 | 2.30 | 8.0                | 22.00 | 0.500              | 0.700              | 36.00               | 48.00               |              | ●     |
| PICCO R 004.0105-10                                                                                       | 4.00       | 3.20 | 0.27 | 0.09 | 0.40 | 1.00 | 3.00 | 10.0               | 24.00 | 0.500              | 0.750              | 36.00               | 48.00               |              | ●     |
| PICCO R/L 004.0205-15                                                                                     | 4.00       | 4.00 | 0.27 | 0.06 | 0.40 | 1.50 | 3.50 | 15.0               | 30.00 | 0.500              | 0.750              | 36.00               | 48.00               | ●            |       |
| PICCO R/L 005.0205-15                                                                                     | 5.00       | 5.00 | 0.27 | 0.06 | 0.40 | 1.90 | 4.40 | 15.0               | 30.00 | 0.500              | 0.750              | 36.00               | 48.00               | ●            |       |
| PICCO L 005.0407-15                                                                                       | 5.00       | 5.00 | 0.40 | 0.09 | 0.50 | 1.90 | 4.40 | 15.0               | 30.00 | 0.750              | 1.000              | 24.00               | 36.00               | ●            |       |
| PICCO R 005.0407-15                                                                                       | 5.00       | 5.00 | 0.40 | 0.09 | 0.50 | 1.90 | 4.40 | 15.0               | 30.00 | 0.750              | 1.000              | 24.00               | 36.00               | ●            | ●     |
| PICCO R 005.0407-20                                                                                       | 5.00       | 5.00 | 0.40 | 0.09 | 0.50 | 1.90 | 4.40 | 20.0               | 35.00 | 0.750              | 1.000              | 24.00               | 36.00               | ●            | ●     |
| PICCO R/L 005.0510-15                                                                                     | 5.00       | 4.80 | 0.55 | 0.12 | 0.60 | 1.90 | 4.40 | 15.0               | 30.00 | 1.000              | 1.250              | 20.00               | 24.00               | ●            |       |
| PICCO R 005.0510-20                                                                                       | 5.00       | 4.80 | 0.55 | 0.12 | 0.60 | 1.90 | 4.40 | 20.0               | 35.00 | 1.000              | 1.250              | 20.00               | 24.00               |              | ●     |
| PICCO R/L 006.0510-15                                                                                     | 6.00       | 6.00 | 0.55 | 0.12 | 0.60 | 2.30 | 5.30 | 15.0               | 30.00 | 1.000              | 1.250              | 20.00               | 24.00               | ●            |       |
| PICCO R 006.0510-22                                                                                       | 6.00       | 6.00 | 0.55 | 0.12 | 0.60 | 2.30 | 5.30 | 22.0               | 37.00 | 1.000              | 1.250              | 20.00               | 24.00               |              | ●     |
| PICCO R/L 006.0612-15                                                                                     | 6.00       | 6.00 | 0.68 | 0.15 | 0.70 | 2.30 | 5.30 | 15.0               | 30.00 | 1.250              | 1.500              | 16.00               | 20.00               | ●            |       |
| PICCO R 006.0612-22                                                                                       | 6.00       | 6.00 | 0.68 | 0.15 | 0.70 | 2.30 | 5.30 | 22.0               | 37.00 | 1.250              | 1.500              | 16.00               | 20.00               |              | ●     |
| PICCO R/L 006.0815-15                                                                                     | 6.00       | 6.00 | 0.81 | 0.18 | 0.80 | 2.30 | 5.30 | 15.0               | 30.00 | 1.500              | 1.750              | 14.00               | 16.00               | ●            |       |
| PICCO R 006.0815-22                                                                                       | 6.00       | 6.00 | 0.81 | 0.18 | 0.80 | 2.30 | 5.30 | 22.0               | 37.00 | 1.500              | 1.750              | 14.00               | 16.00               |              | ●     |
| PICCO R/L 007.0815-15                                                                                     | 7.00       | 7.00 | 0.81 | 0.18 | 0.80 | 2.70 | 6.30 | 15.0               | 30.00 | 1.500              | 1.750              | 14.00               | 16.00               | ●            |       |

- For detailed cutting data, see page 714 • DIN13, ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H • ANSI/ASME B1.1 - Internal tolerance: 2B

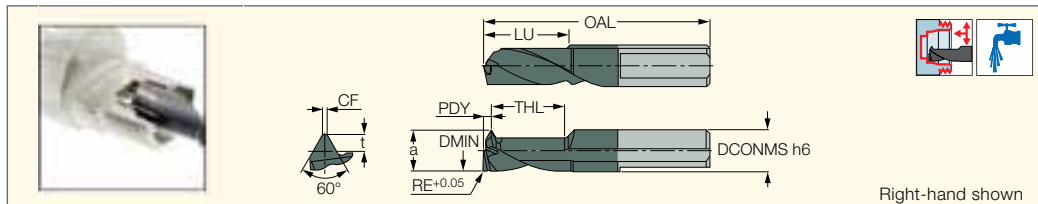
- (1) Minimum overhang  
(2) Thread pitch minimum (mm)  
(3) Thread pitch maximum (mm)  
(4) Threads per inch minimum  
(5) Threads per inch maximum

For holders, see pages: PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420)

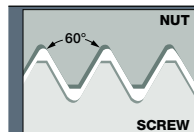
## PICCOMFT

### PICCO-MFT

Solid Carbide Tools for Drilling, Facing, Internal / External Turning and Threading on Swiss and Small CNC Machines



Right-hand shown



| Designation                            | Dimensions |      |       |                    |                    |                     |                     |      |      |      |      |       |      |      | IC908 |
|----------------------------------------|------------|------|-------|--------------------|--------------------|---------------------|---------------------|------|------|------|------|-------|------|------|-------|
|                                        | DCONMS     | DMIN | LU    | TPN <sup>(2)</sup> | TPX <sup>(3)</sup> | TPIN <sup>(4)</sup> | TPIX <sup>(5)</sup> | t    | a    | CF   | THL  | OAL   | PDY  | RE   |       |
| PICCO R-MFT60 6-4 L08                  | 6.00       | 4.00 | 8.00  | 0.500              | 0.750              | 32.00               | 48.00               | 0.46 | 3.90 | 0.06 | 7.3  | 30.00 | 1.30 | 0.10 | ●     |
| PICCO R-MFT60 6-4 L12                  | 6.00       | 4.00 | 12.00 | 0.500              | 0.750              | 32.00               | 48.00               | 0.46 | 3.90 | 0.06 | 11.6 | 34.00 | 1.20 | 0.20 | ●     |
| PICCO R/L-MFT60 6-5 L10                | 6.00       | 5.00 | 10.00 | 0.500              | 1.000              | 24.00               | 48.00               | 0.61 | 4.90 | 0.06 | 9.0  | 32.00 | 1.40 | 0.10 | ●     |
| PICCO R/L-MFT60 6-5 L15 <sup>(1)</sup> | 6.00       | 5.00 | 15.00 | 0.500              | 1.000              | 24.00               | 48.00               | 0.61 | 4.90 | 0.06 | 14.4 | 37.00 | 1.40 | 0.30 | ●     |
| PICCO R/L-MFT60 6-6 L18 <sup>(1)</sup> | 6.00       | 6.00 | 18.00 | 0.500              | 1.000              | 24.00               | 48.00               | 0.61 | 5.90 | 0.06 | 17.3 | 43.00 | 1.40 | 0.30 | ●     |
| PICCO R-MFT60 6-6 L12                  | 6.00       | 6.00 | 12.00 | 0.500              | 1.000              | 24.00               | 48.00               | 0.61 | 5.90 | 0.06 | 11.0 | 34.00 | 1.40 | 0.10 | ●     |
| PICCO R/L-MFT60 8-7 L14                | 8.00       | 7.00 | 14.00 | 0.750              | 1.250              | 20.00               | 32.00               | 0.76 | 6.90 | 0.09 | 13.0 | 41.00 | 1.50 | 0.10 | ●     |
| PICCO R-MFT60 8-7 L21                  | 8.00       | 7.00 | 21.00 | 0.750              | 1.250              | 20.00               | 32.00               | 0.76 | 6.90 | 0.09 | 20.0 | 55.00 | 1.50 | 0.30 | ●     |
| PICCO R/L-MFT60 8-8 L16                | 8.00       | 8.00 | 16.00 | 0.900              | 1.500              | 16.00               | 28.00               | 0.92 | 7.90 | 0.11 | 15.0 | 43.00 | 1.50 | 0.10 | ●     |
| PICCO L-MFT60 8-8 L24 <sup>(1)</sup>   | 8.00       | 8.00 | 24.00 | 0.900              | 1.500              | 16.00               | 28.00               | 0.92 | 7.90 | 0.11 | 23.0 | 57.00 | 1.50 | 0.30 | ●     |
| PICCO R-MFT60 8-8 L24                  | 8.00       | 8.00 | 24.00 | 0.900              | 1.500              | 16.00               | 28.00               | 0.92 | 7.90 | 0.11 | 23.0 | 51.00 | 1.50 | 0.30 | ●     |

• Applications: Drilling; face turning; internal chamfering; internal turning/boring; internal profiling; external chamfering; external turning; internal and external 60° threading (right- and left-hand)

• DIN13, ISO 68-1, ISO 965 (1&2) - Internal tolerance: 6H, External tolerance: 6g • ANSI/ASME B1.1 - Internal tolerance: 2B, External tolerance: 2A

<sup>(1)</sup> Available on request

<sup>(2)</sup> Thread pitch minimum (mm)

<sup>(3)</sup> Thread pitch maximum (mm)

<sup>(4)</sup> Threads per inch minimum

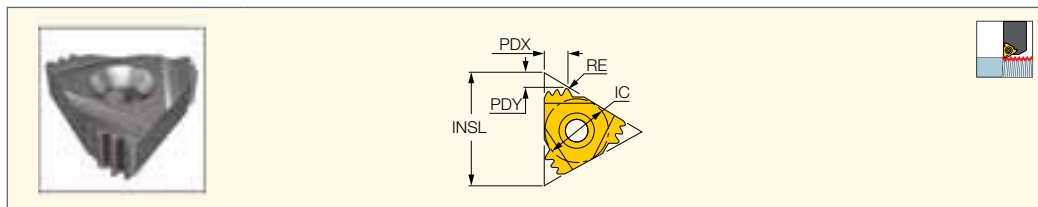
<sup>(5)</sup> Threads per inch maximum

For holders, see page: PICCO/MG PCO (Holder) (399)

## QUICKTHREAD

### ER-ISO 3M-Q

External ISO Metric (DIN13 12-1986 class: 6g) Laydown Threading Inserts for General Applications



| Designation              | Dimensions |                   |       |      |      |      |                     | IC908 |
|--------------------------|------------|-------------------|-------|------|------|------|---------------------|-------|
|                          | IC         | TP <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(2)</sup> |       |
| 16ER 0.75 ISO 3M-Q IC908 | 9.53       | 0.750             | 16.00 | 0.12 | 1.90 | 1.40 | 3                   | ●     |
| 16ER 1.00 ISO 3M-Q IC908 | 9.53       | 1.000             | 16.00 | 0.13 | 2.50 | 1.70 | 3                   | ●     |
| 22ER 1.50 ISO 3M-Q IC908 | 12.70      | 1.500             | 22.00 | 0.23 | 3.70 | 2.40 | 3                   | ●     |
| 22ER 2.00 ISO 3M-Q IC908 | 12.70      | 2.000             | 22.00 | 0.26 | 4.80 | 2.90 | 3                   | ●     |

### NEW

• For Insert Identification System, see page 714 • For threading between walls use GRIP-type inserts TIP-ISO class: 6g

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Thread pitch

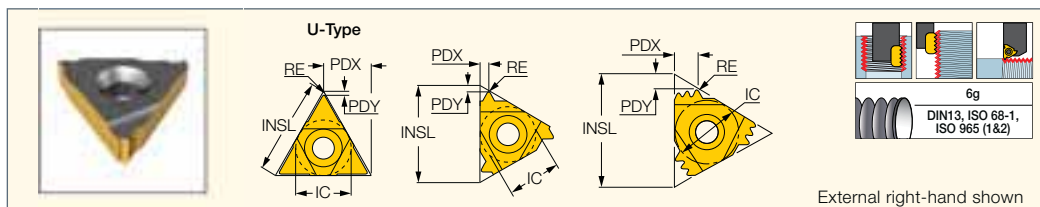
<sup>(2)</sup> Number of teeth per corner

For tools, see pages: C#-SER/L (799) • SER-D (800) • SER/L (798)

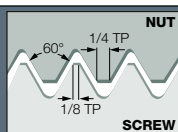
# ISCARTHREAD

## ER/L-ISO

External ISO Metric (DIN13  
12-1986 class: 6g) Laydown  
Threading Inserts for  
General Applications



External right-hand shown



| Designation                           | Dimensions |                   |       |      |      |      |                     | Tough ↔ Hard |       |       |      |       |       |       |        |
|---------------------------------------|------------|-------------------|-------|------|------|------|---------------------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                       | IC         | TP <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(5)</sup> | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 11EL 0.35 ISO IC908                   | 6.35       | 0.350             | 11.00 | 0.04 | 0.40 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 0.35 ISO IC908                   | 6.35       | 0.350             | 11.00 | 0.04 | 0.40 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 0.40 ISO IC908                   | 6.35       | 0.400             | 11.00 | 0.04 | 0.40 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 0.45 ISO IC228                   | 6.35       | 0.450             | 11.00 | 0.05 | 0.40 | 0.70 | 1                   | •            |       |       |      |       |       |       |        |
| 11ER/L 0.50 ISO IC908                 | 6.35       | 0.500             | 11.00 | 0.07 | 0.60 | 0.57 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 0.50 ISO IC250                   | 6.35       | 0.500             | 11.00 | 0.07 | 0.60 | 0.57 | 1                   |              |       | •     |      |       |       |       |        |
| 11ER 0.60 ISO IC908                   | 6.35       | 0.600             | 11.00 | 0.07 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 0.70 ISO IC908                   | 6.35       | 0.700             | 11.00 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11EL 0.75 ISO IC908                   | 6.35       | 0.750             | 11.00 | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 0.75 ISO IC908                   | 6.35       | 0.750             | 11.00 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 0.80 ISO IC908                   | 6.35       | 0.800             | 11.00 | 0.12 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11EL 1.00 ISO IC250                   | 6.35       | 1.000             | 11.00 | 0.15 | 0.65 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 11ER 1.00 ISO IC908                   | 6.35       | 1.000             | 11.00 | 0.15 | 0.65 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 1.25 ISO IC908                   | 6.35       | 1.250             | 11.00 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 11EL 1.50 ISO IC908                   | 6.35       | 1.500             | 11.00 | 0.19 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 1.50 ISO IC250                   | 6.35       | 1.500             | 11.00 | 0.19 | 0.80 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 11ER 1.50 ISO IC908                   | 6.35       | 1.500             | 11.00 | 0.19 | 0.80 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 1.75 ISO IC250                   | 6.35       | 1.750             | 11.00 | 0.22 | 0.80 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 0.35 ISO IC908                 | 9.52       | 0.350             | 16.49 | 0.04 | 0.40 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 0.40 ISO IC908                   | 9.52       | 0.400             | 16.49 | 0.05 | 0.40 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 0.40 ISO IC908                   | 9.52       | 0.400             | 16.49 | 0.05 | 0.40 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 0.45 ISO IC908                   | 9.52       | 0.450             | 16.49 | 0.05 | 0.40 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 0.50 ISO IC908                 | 9.52       | 0.500             | 16.49 | 0.07 | 0.45 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 0.50 ISO IC08                    | 9.52       | 0.500             | 16.49 | 0.07 | 0.45 | 0.60 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 0.50 ISO IC1007                  | 9.52       | 0.500             | 16.49 | 0.07 | 0.45 | 0.60 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 0.50 ISO IC250                   | 9.52       | 0.500             | 16.49 | 0.07 | 0.45 | 0.60 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 0.50 ISO IC908                  | 9.52       | 0.500             | 16.49 | 0.06 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 0.60 ISO IC908                   | 9.52       | 0.600             | 16.49 | 0.10 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 0.70 ISO IC908                 | 9.52       | 0.700             | 16.49 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 0.70 ISO IC1007                  | 9.52       | 0.700             | 16.49 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 0.70 ISO IC250                   | 9.52       | 0.700             | 16.49 | 0.11 | 0.60 | 0.60 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 0.75 ISO IC908                 | 9.52       | 0.750             | 16.49 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 0.75 ISO IC08                    | 9.52       | 0.750             | 16.49 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 0.75 ISO IC1007                  | 9.52       | 0.750             | 16.49 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 0.75 ISO IC250                   | 9.52       | 0.750             | 16.49 | 0.11 | 0.60 | 0.60 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 0.75 ISO 3M IC908 <sup>(1)</sup> | 9.52       | 0.750             | 16.49 | 0.07 | 1.90 | 1.40 | 3                   |              |       |       |      |       |       | •     |        |
| 16ERM 0.75 ISO IC1007                 | 9.52       | 0.750             | 16.49 | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 0.75 ISO IC808 <sup>(2)</sup>   | 9.52       | 0.750             | 16.49 | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 0.75 ISO IC908 <sup>(2)</sup>   | 9.52       | 0.750             | 16.49 | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 0.80 ISO IC250                   | 9.52       | 0.800             | 16.49 | 0.12 | 0.60 | 0.60 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 0.80 ISO IC1007                  | 9.52       | 0.800             | 16.49 | 0.12 | 0.60 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 0.80 ISO IC250                   | 9.52       | 0.800             | 16.49 | 0.12 | 0.60 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 0.80 ISO IC908                   | 9.52       | 0.800             | 16.49 | 0.12 | 0.60 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERB 0.80 ISO IC908 <sup>(2)</sup>   | 9.52       | 0.800             | 16.49 | 0.12 | 0.70 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 1.00 ISO IC08                    | 9.52       | 1.000             | 16.49 | 0.15 | 0.80 | 0.70 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER/L 1.00 ISO IC250                 | 9.52       | 1.000             | 16.49 | 0.15 | 0.75 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 16EL 1.00 ISO IC908                   | 9.52       | 1.000             | 16.49 | 0.15 | 0.75 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 1.00 ISO IC08                    | 9.52       | 1.000             | 16.49 | 0.15 | 0.70 | 1.00 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 1.00 ISO IC1007                  | 9.52       | 1.000             | 16.49 | 0.15 | 0.70 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 1.00 ISO IC228                   | 9.52       | 1.000             | 16.49 | 0.15 | 0.75 | 1.00 | 1                   | •            |       |       |      |       |       |       |        |
| 16ER 1.00 ISO IC50M                   | 9.52       | 1.000             | 16.49 | 0.15 | 0.75 | 0.70 | 1                   |              | •     |       |      |       |       |       |        |
| 16ER 1.00 ISO IC908                   | 9.52       | 1.000             | 16.49 | 0.15 | 0.70 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 1.00 ISO 3M IC908 <sup>(1)</sup> | 9.52       | 1.000             | 16.49 | 0.07 | 2.50 | 1.70 | 3                   |              |       |       |      |       |       | •     |        |
| 16ERB 1.00 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.000             | 16.49 | 0.15 | 0.70 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 1.00 ISO IC1007 <sup>(2)</sup>  | 9.52       | 1.000             | 16.49 | 0.11 | 0.70 | 0.70 | 1                   |              |       |       |      |       |       |       | •      |

• For Insert Identification System, see page 714 • For threading between walls use GRIP-type inserts TIP-ISO class: 6g

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Multi-tooth

<sup>(2)</sup> With pressed chipformer

<sup>(3)</sup> With pressed chipformer

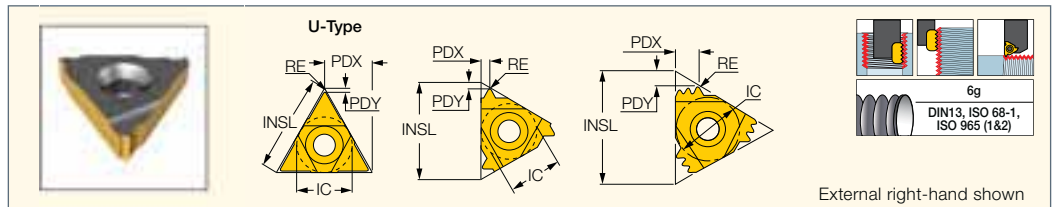
<sup>(4)</sup> Thread pitch

<sup>(5)</sup> Number of teeth per corner

For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

**ER/L-ISO**

External ISO Metric (DIN13  
12-1986 class: 6g) Laydown  
Threading Inserts for  
General Applications



| Designation                           | Dimensions |                   |       |      |      |      |                     | Tough ↔ Hard |       |       |      |       |       |       |        |
|---------------------------------------|------------|-------------------|-------|------|------|------|---------------------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                       | IC         | TP <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(5)</sup> | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16ERM 1.00 ISO IC250 <sup>(2)</sup>   | 9.52       | 1.000             | 16.49 | 0.11 | 0.70 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 1.00 ISO IC50M <sup>(2)</sup>   | 9.52       | 1.000             | 16.49 | 0.11 | 0.70 | 0.70 | 1                   |              | •     |       |      |       |       |       |        |
| 16ERM 1.00 ISO IC508 <sup>(2)</sup>   | 9.52       | 1.000             | 16.49 | 0.11 | 0.70 | 0.70 | 1                   |              |       |       |      | •     |       |       |        |
| 16ERM 1.00 ISO IC808 <sup>(2)</sup>   | 9.52       | 1.000             | 16.49 | 0.11 | 0.70 | 0.70 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 1.00 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.000             | 16.49 | 0.11 | 0.70 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 1.25 ISO IC08                  | 9.52       | 1.250             | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER/L 1.25 ISO IC250                 | 9.52       | 1.250             | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 1.25 ISO IC908                 | 9.52       | 1.250             | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 1.25 ISO IC1007                  | 9.52       | 1.250             | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERB 1.25 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.250             | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 1.25 ISO IC1007 <sup>(2)</sup>  | 9.52       | 1.250             | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 1.25 ISO IC250 <sup>(2)</sup>   | 9.52       | 1.250             | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 1.25 ISO IC808 <sup>(2)</sup>   | 9.52       | 1.250             | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 1.25 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.250             | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 1.50 ISO IC08                  | 9.52       | 1.500             | 16.49 | 0.22 | 1.15 | 1.00 | 1                   |              |       |       | •    |       |       |       |        |
| 16EL 1.50 ISO IC1007                  | 9.52       | 1.500             | 16.49 | 0.22 | 1.15 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16EL 1.50 ISO IC250                   | 9.52       | 1.500             | 16.49 | 0.22 | 1.20 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 1.50 ISO IC908                 | 9.52       | 1.500             | 16.49 | 0.22 | 1.15 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 1.50 ISO IC1007                  | 9.52       | 1.500             | 16.49 | 0.19 | 1.15 | 0.90 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 1.50 ISO IC228                   | 9.52       | 1.500             | 16.49 | 0.19 | 1.20 | 0.90 | 1                   | •            |       |       |      |       |       |       |        |
| 16ER 1.50 ISO IC250                   | 9.52       | 1.500             | 16.49 | 0.19 | 1.20 | 0.90 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 1.50 ISO IC50M                   | 9.52       | 1.500             | 16.49 | 0.19 | 1.20 | 0.90 | 1                   |              | •     |       |      |       |       |       |        |
| 16ER 1.50 ISO 2M IC908 <sup>(1)</sup> | 9.52       | 1.500             | 16.49 | 0.18 | 2.30 | 1.50 | 2                   |              |       |       |      |       |       | •     |        |
| 16ERB 1.50 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.500             | 16.49 | 0.19 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 1.50 ISO IC1007 <sup>(2)</sup>  | 9.52       | 1.500             | 16.49 | 0.19 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 1.50 ISO IC250 <sup>(2)</sup>   | 9.52       | 1.500             | 16.49 | 0.19 | 1.00 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 1.50 ISO IC50M <sup>(2)</sup>   | 9.52       | 1.500             | 16.49 | 0.19 | 1.00 | 0.80 | 1                   |              | •     |       |      |       |       |       |        |
| 16ERM 1.50 ISO IC508 <sup>(2)</sup>   | 9.52       | 1.500             | 16.49 | 0.19 | 1.00 | 0.80 | 1                   |              |       |       |      | •     |       |       |        |
| 16ERM 1.50 ISO IC808 <sup>(2)</sup>   | 9.52       | 1.500             | 16.49 | 0.19 | 1.00 | 0.80 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 1.50 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.500             | 16.49 | 0.19 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 1.75 ISO IC908                   | 9.52       | 1.750             | 16.49 | 0.26 | 1.15 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 1.75 ISO IC08                    | 9.52       | 1.750             | 16.49 | 0.26 | 1.20 | 1.00 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 1.75 ISO IC1007                  | 9.52       | 1.750             | 16.49 | 0.26 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 1.75 ISO IC228                   | 9.52       | 1.750             | 16.49 | 0.26 | 1.15 | 1.10 | 1                   | •            |       |       |      |       |       |       |        |
| 16ER 1.75 ISO IC250                   | 9.52       | 1.750             | 16.49 | 0.26 | 1.15 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 1.75 ISO IC908                   | 9.52       | 1.750             | 16.49 | 0.26 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERB 1.75 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.750             | 16.49 | 0.26 | 1.15 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 1.75 ISO IC1007 <sup>(2)</sup>  | 9.52       | 1.750             | 16.49 | 0.25 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 1.75 ISO IC250 <sup>(2)</sup>   | 9.52       | 1.750             | 16.49 | 0.25 | 1.20 | 0.90 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 1.75 ISO IC808 <sup>(2)</sup>   | 9.52       | 1.750             | 16.49 | 0.25 | 1.20 | 0.90 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 1.75 ISO IC908 <sup>(2)</sup>   | 9.52       | 1.750             | 16.49 | 0.25 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 2.00 ISO IC228                   | 9.52       | 2.000             | 16.49 | 0.25 | 1.30 | 1.00 | 1                   | •            |       |       |      |       |       |       |        |
| 16EL 2.00 ISO IC250                   | 9.52       | 2.000             | 16.49 | 0.25 | 1.30 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16EL 2.00 ISO IC908                   | 9.52       | 2.000             | 16.49 | 0.25 | 1.30 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 2.00 ISO IC08                    | 9.52       | 2.000             | 16.49 | 0.26 | 1.25 | 1.00 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 2.00 ISO IC1007                  | 9.52       | 2.000             | 16.49 | 0.26 | 1.25 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 2.00 ISO IC228                   | 9.52       | 2.000             | 16.49 | 0.26 | 1.30 | 1.00 | 1                   | •            |       |       |      |       |       |       |        |
| 16ER 2.00 ISO IC250                   | 9.52       | 2.000             | 16.49 | 0.26 | 1.30 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 2.00 ISO IC50M                   | 9.52       | 2.000             | 16.49 | 0.26 | 1.30 | 1.00 | 1                   |              | •     |       |      |       |       |       |        |
| 16ER 2.00 ISO IC908                   | 9.52       | 2.000             | 16.49 | 0.26 | 1.25 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 2.00 ISO 2M IC908 <sup>(1)</sup> | 9.52       | 2.000             | 16.49 | 0.09 | 2.90 | 1.80 | 2                   |              |       |       |      |       |       | •     |        |
| 16ERB 2.00 ISO IC908 <sup>(2)</sup>   | 9.52       | 2.000             | 16.49 | 0.25 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 2.00 ISO IC1007 <sup>(2)</sup>  | 9.52       | 2.000             | 16.49 | 0.28 | 1.30 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 2.00 ISO IC250 <sup>(2)</sup>   | 9.52       | 2.000             | 16.49 | 0.28 | 1.30 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 2.00 ISO IC508 <sup>(2)</sup>   | 9.52       | 2.000             | 16.49 | 0.28 | 1.30 | 1.00 | 1                   |              |       |       |      | •     |       |       |        |

• For Insert Identification System, see page 714 • For threading between walls use GRIP-type inserts TIP-ISO class: 6g

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Multi-tooth

<sup>(2)</sup> With pressed chipformer

<sup>(3)</sup> With pressed chipformer

<sup>(4)</sup> Thread pitch

<sup>(5)</sup> Number of teeth per corner

For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

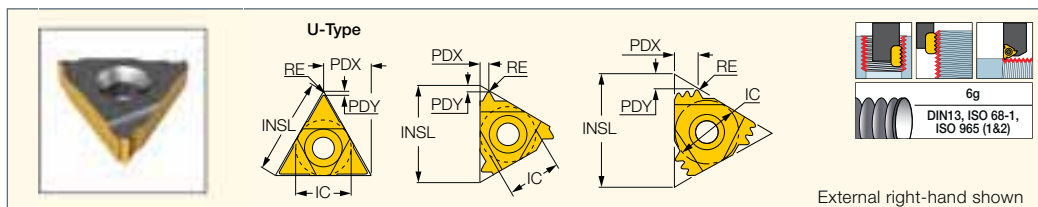


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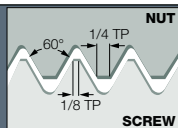
**ISCAR THREAD**

**ER/L-ISO**

External ISO Metric (DIN13  
12-1986 class: 6g) Laydown  
Threading Inserts for  
General Applications



External right-hand shown



| Designation                           | Dimensions |                   |       |      |       |      |                     | Tough ↔ Hard |       |       |      |       |       |       |        |
|---------------------------------------|------------|-------------------|-------|------|-------|------|---------------------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                       | IC         | TP <sup>(4)</sup> | INSL  | RE   | PDX   | PDY  | CICT <sup>(5)</sup> | IC28         | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16ERM 2.00 ISO IC808 <sup>(2)</sup>   | 9.52       | 2.000             | 16.49 | 0.28 | 1.30  | 1.00 | 1                   |              |       |       |      |       | •     | •     |        |
| 16ERM 2.00 ISO IC908 <sup>(3)</sup>   | 9.52       | 2.000             | 16.49 | 0.28 | 1.30  | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 2.50 ISO IC908                 | 9.52       | 2.500             | 16.49 | 0.32 | 1.50  | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 2.50 ISO IC1007                  | 9.52       | 2.500             | 16.49 | 0.32 | 1.50  | 1.10 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 2.50 ISO IC250                   | 9.52       | 2.500             | 16.49 | 0.32 | 1.50  | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 2.50 ISO IC50M                   | 9.52       | 2.500             | 16.49 | 0.32 | 1.50  | 1.10 | 1                   |              | •     |       |      |       |       |       |        |
| 16ERB 2.50 ISO IC908                  | 9.52       | 2.500             | 16.49 | 0.32 | 1.50  | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 2.50 ISO IC1007 <sup>(2)</sup>  | 9.52       | 2.500             | 16.49 | 0.30 | 1.50  | 1.10 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 2.50 ISO IC250 <sup>(2)</sup>   | 9.52       | 2.500             | 16.49 | 0.30 | 1.50  | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 2.50 ISO IC808 <sup>(2)</sup>   | 9.52       | 2.500             | 16.49 | 0.30 | 1.50  | 1.10 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 2.50 ISO IC908 <sup>(2)</sup>   | 9.52       | 2.500             | 16.49 | 0.30 | 1.50  | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 3.00 ISO IC908                   | 9.52       | 3.000             | 16.49 | 0.44 | 1.60  | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 3.00 ISO IC1007                  | 9.52       | 3.000             | 16.49 | 0.44 | 1.65  | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 3.00 ISO IC228                   | 9.52       | 3.000             | 16.49 | 0.44 | 1.60  | 1.20 | 1                   | •            |       |       |      |       |       |       |        |
| 16ER 3.00 ISO IC250                   | 9.52       | 3.000             | 16.49 | 0.44 | 1.60  | 1.20 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 3.00 ISO IC50M                   | 9.52       | 3.000             | 16.49 | 0.44 | 1.60  | 1.20 | 1                   |              | •     |       |      |       |       |       |        |
| 16ER 3.00 ISO IC508                   | 9.52       | 3.000             | 16.49 | 0.44 | 1.60  | 1.20 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 3.00 ISO IC908                   | 9.52       | 3.000             | 16.49 | 0.44 | 1.65  | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERB 3.00 ISO IC908 <sup>(2)</sup>   | 9.52       | 3.000             | 16.49 | 0.44 | 1.60  | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 3.00 ISO IC1007 <sup>(2)</sup>  | 9.52       | 3.000             | 16.49 | 0.38 | 1.60  | 1.20 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 3.00 ISO IC250 <sup>(2)</sup>   | 9.52       | 3.000             | 16.49 | 0.38 | 1.60  | 1.20 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 3.00 ISO IC50M <sup>(2)</sup>   | 9.52       | 3.000             | 16.49 | 0.38 | 1.60  | 1.20 | 1                   |              | •     |       |      |       |       |       |        |
| 16ERM 3.00 ISO IC508 <sup>(2)</sup>   | 9.52       | 3.000             | 16.49 | 0.38 | 1.60  | 1.20 | 1                   |              |       |       | •    |       |       |       |        |
| 16ERM 3.00 ISO IC808 <sup>(2)</sup>   | 9.52       | 3.000             | 16.49 | 0.38 | 1.60  | 1.20 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 3.00 ISO IC908 <sup>(2)</sup>   | 9.52       | 3.000             | 16.49 | 0.38 | 1.60  | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERB 3.50 ISO IC908                  | 9.52       | 3.500             | 16.49 | 0.51 | 1.60  | 1.30 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER 1.50 ISO 3M IC250 <sup>(1)</sup> | 12.70      | 1.500             | 22.00 | 0.18 | 3.70  | 2.30 | 3                   |              |       | •     |      |       |       | •     |        |
| 22ER 1.50 ISO 3M IC908 <sup>(1)</sup> | 12.70      | 1.500             | 22.00 | 0.07 | 3.70  | 2.30 | 3                   |              |       |       |      |       |       | •     |        |
| 22ER 2.00 ISO 2M IC908 <sup>(1)</sup> | 12.70      | 2.000             | 22.00 | 0.25 | 3.00  | 2.00 | 2                   |              |       |       |      |       |       | •     |        |
| 22ER 2.00 ISO 3M IC250 <sup>(1)</sup> | 12.70      | 2.000             | 22.00 | 0.25 | 5.00  | 3.10 | 3                   |              |       | •     |      |       |       | •     |        |
| 22ER 2.00 ISO 3M IC908 <sup>(1)</sup> | 12.70      | 2.000             | 22.00 | 0.25 | 5.00  | 3.10 | 3                   |              |       |       |      |       |       | •     |        |
| 22EL 3.50 ISO IC228                   | 12.70      | 3.500             | 22.00 | 0.46 | 2.30  | 1.60 | 1                   | •            |       |       |      |       |       |       |        |
| 22ER/L 3.50 ISO IC250                 | 12.70      | 3.500             | 22.00 | 0.46 | 2.30  | 1.60 | 1                   |              |       | •     |      |       |       |       |        |
| 22ER 3.50 ISO IC908                   | 12.70      | 3.500             | 22.00 | 0.46 | 2.30  | 1.60 | 1                   |              |       |       |      |       |       | •     |        |
| 22ERM 3.50 ISO IC808 <sup>(2)</sup>   | 12.70      | 3.500             | 22.00 | 0.48 | 2.30  | 1.60 | 1                   |              |       |       |      |       | •     |       |        |
| 22ERM 3.50 ISO IC908 <sup>(2)</sup>   | 12.70      | 3.500             | 22.00 | 0.48 | 2.30  | 1.60 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER/L 4.00 ISO IC250                 | 12.70      | 4.000             | 22.00 | 0.52 | 2.30  | 1.60 | 1                   |              |       | •     |      |       |       |       |        |
| 22ER/L 4.00 ISO IC908                 | 12.70      | 4.000             | 22.00 | 0.52 | 2.30  | 1.60 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER 4.00 ISO IC1007                  | 12.70      | 4.000             | 22.00 | 0.52 | 2.30  | 1.60 | 1                   |              |       |       |      |       |       |       | •      |
| 22ER 4.00 ISO IC50M                   | 12.70      | 4.000             | 22.00 | 0.52 | 2.30  | 1.60 | 1                   |              | •     |       |      |       |       |       |        |
| 22ERM 4.00 ISO IC808 <sup>(2)</sup>   | 12.70      | 4.000             | 22.00 | 0.52 | 2.30  | 1.60 | 1                   |              |       |       |      |       | •     |       |        |
| 22ERM 4.00 ISO IC908 <sup>(2)</sup>   | 12.70      | 4.000             | 22.00 | 0.52 | 2.30  | 1.60 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER 4.50 ISO IC250                   | 12.70      | 4.500             | 22.00 | 0.58 | 2.30  | 1.60 | 1                   |              |       | •     |      |       |       |       |        |
| 22ER 4.50 ISO IC908                   | 12.70      | 4.500             | 22.00 | 0.58 | 2.30  | 1.60 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER/L 5.00 ISO IC250                 | 12.70      | 5.000             | 22.00 | 0.66 | 2.50  | 1.70 | 1                   |              |       | •     |      |       |       |       |        |
| 22ER 5.00 ISO IC908                   | 12.70      | 5.000             | 22.00 | 0.66 | 2.50  | 1.70 | 1                   |              |       |       |      |       |       | •     |        |
| 22UERL 5.50 ISO IC250                 | 12.70      | 5.500             | 22.00 | 0.80 | 11.00 | 1.90 | 1                   |              |       | •     |      |       |       |       |        |
| 22ER/L 6.00 ISO IC250                 | 12.70      | 6.000             | 22.00 | 0.87 | 2.70  | 1.80 | 1                   |              |       | •     |      |       |       |       |        |
| 22UERL 6.00 ISO IC228                 | 12.70      | 6.000             | 22.00 | 0.78 | 11.00 | 2.60 | 1                   | •            |       |       |      |       |       |       |        |
| 22UERL 6.00 ISO IC250                 | 12.70      | 6.000             | 22.00 | 0.78 | 11.00 | 2.60 | 1                   |              |       | •     |      |       |       |       |        |
| 27ER 3.00 ISO 2M IC908 <sup>(1)</sup> | 15.88      | 3.000             | 27.50 | 0.38 | 4.60  | 2.90 | 2                   |              |       |       |      |       |       | •     |        |
| 27ER 5.50 ISO IC908                   | 15.88      | 5.500             | 27.50 | 0.71 | 2.90  | 2.00 | 1                   |              |       |       |      |       |       | •     |        |
| 27ER/L 6.00 ISO IC908                 | 15.88      | 6.000             | 27.50 | 0.87 | 2.90  | 2.00 | 1                   |              |       |       |      |       |       | •     |        |
| 27ER 6.00 ISO IC228                   | 15.88      | 6.000             | 27.50 | 0.87 | 2.90  | 2.00 | 1                   | •            |       |       |      |       |       |       |        |
| 27ER 6.00 ISO IC250                   | 15.88      | 6.000             | 27.50 | 0.87 | 2.90  | 2.00 | 1                   |              |       | •     |      |       |       |       |        |
| 27UERL 8.00 ISO IC908                 | 15.88      | 8.000             | 27.50 | 1.08 | 13.70 | 2.40 | 1                   |              |       |       |      |       |       | •     |        |

• For Insert Identification System, see page 714 • For threading between walls use GRIP-type inserts TIP-ISO class: 6g

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Multi-tooth

<sup>(2)</sup> With pressed chipformer

<sup>(3)</sup> With pressed chipformer

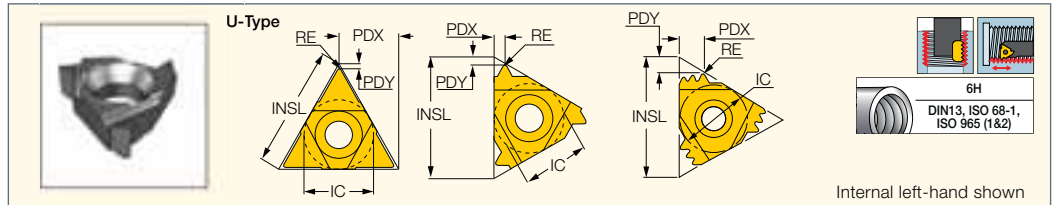
<sup>(4)</sup> Thread pitch

<sup>(5)</sup> Number of teeth per corner

For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

**IR/L-ISO**

Internal ISO Metric (DIN13  
12-1986 class 6H) Laydown  
Threading Inserts for  
General Applications



| Designation           | Dimensions |                   |       |      |      |      |                     | Tough ↔ Hard |       |       |       |       |      |       |       |       |        |
|-----------------------|------------|-------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|-------|------|-------|-------|-------|--------|
|                       | IC         | TP <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC28         | IC228 | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 06IL 0.50 ISO IC228   | 4.00       | 0.500             | 6.88  | 0.04 | 0.40 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 0.50 ISO IC228   | 4.00       | 0.500             | 6.88  | 0.04 | 0.40 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 0.50 ISO IC908   | 4.00       | 0.500             | 6.88  | 0.04 | 0.40 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 06IR 0.50 ISO IC928   | 4.00       | 0.500             | 6.88  | 0.04 | 0.40 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 06IL 0.75 ISO IC228   | 4.00       | 0.750             | 6.88  | 0.06 | 0.50 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 0.75 ISO IC228   | 4.00       | 0.750             | 6.88  | 0.06 | 0.50 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 0.75 ISO IC908   | 4.00       | 0.750             | 6.88  | 0.06 | 0.50 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 06IR 0.75 ISO IC928   | 4.00       | 0.750             | 6.88  | 0.06 | 0.50 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 06IL 1.00 ISO IC228   | 4.00       | 1.000             | 6.88  | 0.05 | 0.60 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 1.00 ISO IC228   | 4.00       | 1.000             | 6.88  | 0.05 | 0.60 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 1.00 ISO IC908   | 4.00       | 1.000             | 6.88  | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 06IR 1.00 ISO IC928   | 4.00       | 1.000             | 6.88  | 0.05 | 0.60 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 06IL 1.25 ISO IC228   | 4.00       | 1.250             | 6.88  | 0.07 | 0.60 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 1.25 ISO IC228   | 4.00       | 1.250             | 6.88  | 0.07 | 0.60 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 06IR 1.25 ISO IC908   | 4.00       | 1.250             | 6.88  | 0.07 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 06IR 1.25 ISO IC928   | 4.00       | 1.250             | 6.88  | 0.07 | 0.60 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 08IL 0.50 ISO IC228   | 5.00       | 0.500             | 8.24  | 0.04 | 0.40 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 0.50 ISO IC228   | 5.00       | 0.500             | 8.24  | 0.04 | 0.40 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 0.50 ISO IC908   | 5.00       | 0.500             | 8.24  | 0.04 | 0.40 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 08IR 0.50 ISO IC928   | 5.00       | 0.500             | 8.24  | 0.04 | 0.40 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 08IR 0.75 ISO IC228   | 5.00       | 0.750             | 8.24  | 0.06 | 0.45 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 0.75 ISO IC908   | 5.00       | 0.750             | 8.24  | 0.06 | 0.50 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 08IR 0.75 ISO IC928   | 5.00       | 0.750             | 8.24  | 0.06 | 0.50 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 08IL 1.00 ISO IC228   | 5.00       | 1.000             | 8.24  | 0.07 | 0.60 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.00 ISO IC228   | 5.00       | 1.000             | 8.24  | 0.07 | 0.60 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.00 ISO IC908   | 5.00       | 1.000             | 8.24  | 0.07 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 08IR 1.00 ISO IC928   | 5.00       | 1.000             | 8.24  | 0.07 | 0.60 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 08IL 1.25 ISO IC228   | 5.00       | 1.250             | 8.24  | 0.09 | 0.70 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.25 ISO IC228   | 5.00       | 1.250             | 8.66  | 0.09 | 0.70 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.25 ISO IC908   | 5.00       | 1.250             | 8.24  | 0.09 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 08IR 1.25 ISO IC928   | 5.00       | 1.250             | 8.24  | 0.09 | 0.70 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 08IL 1.50 ISO IC228   | 5.00       | 1.500             | 8.24  | 0.12 | 0.70 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.50 ISO IC228   | 5.00       | 1.500             | 8.24  | 0.12 | 0.70 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.50 ISO IC28    | 5.00       | 1.500             | 8.24  | 0.12 | 0.70 | 0.60 | 1                   | •            |       |       |       |       |      |       |       |       |        |
| 08IR 1.50 ISO IC908   | 5.00       | 1.500             | 8.24  | 0.12 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 08IR 1.50 ISO IC928   | 5.00       | 1.500             | 8.24  | 0.12 | 0.70 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 08IL 1.75 ISO IC228   | 5.00       | 1.750             | 8.24  | 0.15 | 0.90 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.75 ISO IC228   | 5.00       | 1.750             | 8.66  | 0.15 | 0.90 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 08IR 1.75 ISO IC908   | 5.00       | 1.750             | 8.24  | 0.15 | 0.90 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 08IR 1.75 ISO IC928   | 5.00       | 1.750             | 8.24  | 0.15 | 0.85 | 0.60 | 1                   |              |       | •     |       |       |      |       |       |       |        |
| 08UIRL 2.00 ISO IC228 | 5.00       | 2.000             | 8.66  | 0.14 | 4.33 | 0.80 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 11IL 0.35 ISO IC08    | 6.35       | 0.350             | 11.00 | 0.03 | 0.30 | 0.60 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 11IR 0.35 ISO IC908   | 6.35       | 0.350             | 11.00 | 0.03 | 0.30 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 0.40 ISO IC908   | 6.35       | 0.400             | 11.00 | 0.03 | 0.40 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IL 0.50 ISO IC908   | 6.35       | 0.500             | 11.00 | 0.04 | 0.60 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 0.50 ISO IC08    | 6.35       | 0.500             | 11.00 | 0.04 | 0.60 | 0.80 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 11IR 0.50 ISO IC250   | 6.35       | 0.500             | 11.00 | 0.04 | 0.60 | 0.80 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 11IR 0.50 ISO IC908   | 6.35       | 0.500             | 11.00 | 0.04 | 0.60 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRB 0.50 ISO IC908  | 6.35       | 0.500             | 11.00 | 0.04 | 0.60 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRM 0.50 ISO IC908  | 6.35       | 0.500             | 11.00 | 0.04 | 0.40 | 0.30 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 0.70 ISO IC908   | 6.35       | 0.700             | 11.00 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IL 0.75 ISO IC908   | 6.35       | 0.750             | 11.00 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 0.75 ISO IC908   | 6.35       | 0.750             | 11.00 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRB 0.75 ISO IC908  | 6.35       | 0.750             | 11.00 | 0.05 | 0.60 | 0.10 | 1                   |              |       |       |       |       |      |       |       | •     |        |

• For Insert Identification System, see page 714 • Tolerance: Class 6H. • For technical information and detailed cutting data, see pages 809-825

(1) With pressed chipformer

(2) Multi-tooth

(3) Thread pitch

(4) Number of teeth per corner

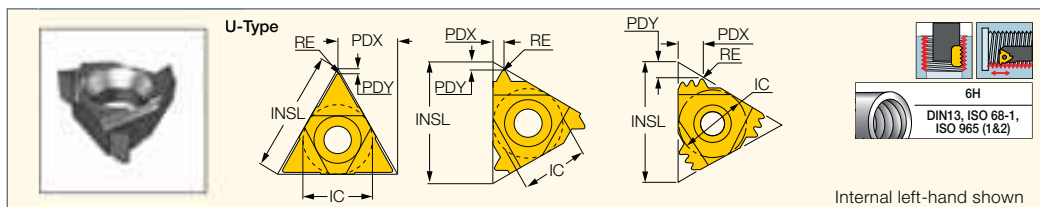
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

Continued

**ISCAR THREAD**

**IR/L-ISO**

Internal ISO Metric (DIN13  
12-1986 class 6H) Laydown  
Threading Inserts for  
General Applications



| Designation                          | Dimensions |                   |       |      |      |      |                     | Tough ↔ Hard |       |       |       |       |      |       |       |       |        |
|--------------------------------------|------------|-------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|-------|------|-------|-------|-------|--------|
|                                      | IC         | TP <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC28         | IC228 | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 11IRM 0.75 ISO IC908                 | 6.35       | 0.750             | 11.00 | 0.06 | 0.50 | 0.30 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 0.80 ISO IC908                  | 6.35       | 0.800             | 11.00 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRB 0.80 ISO IC908                 | 6.35       | 0.800             | 11.00 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IL 1.00 ISO IC908                  | 6.35       | 1.000             | 11.00 | 0.07 | 0.65 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 1.00 ISO IC08                   | 6.35       | 1.000             | 11.00 | 0.07 | 0.65 | 0.60 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 11IR 1.00 ISO IC1007                 | 6.35       | 1.000             | 11.00 | 0.07 | 0.65 | 0.77 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 11IR 1.00 ISO IC228                  | 6.35       | 1.000             | 11.00 | 0.07 | 0.65 | 0.60 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 11IR 1.00 ISO IC250                  | 6.35       | 1.000             | 11.00 | 0.07 | 0.65 | 0.60 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 11IR 1.00 ISO IC50M                  | 6.35       | 1.000             | 11.00 | 0.07 | 0.65 | 0.60 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 11IR 1.00 ISO IC908                  | 6.35       | 1.000             | 11.00 | 0.07 | 0.65 | 0.77 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRB 1.00 ISO IC908                 | 6.35       | 1.000             | 11.00 | 0.07 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRM 1.00 ISO IC1007                | 6.35       | 1.000             | 11.00 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 11IRM 1.00 ISO IC808 <sup>(1)</sup>  | 6.35       | 1.000             | 11.00 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       | •     |       |        |
| 11IRM 1.00 ISO IC908 <sup>(1)</sup>  | 6.35       | 1.000             | 11.00 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IL 1.25 ISO IC908                  | 6.35       | 1.250             | 11.00 | 0.09 | 0.80 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 1.25 ISO IC908                  | 6.35       | 1.250             | 11.00 | 0.09 | 0.80 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRB 1.25 ISO IC908                 | 6.35       | 1.250             | 11.00 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IL 1.50 ISO IC250                  | 6.35       | 1.500             | 11.00 | 0.12 | 1.00 | 0.80 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 11IL 1.50 ISO IC908                  | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 1.50 ISO IC08                   | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 11IR 1.50 ISO IC1007                 | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 11IR 1.50 ISO IC228                  | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 11IR 1.50 ISO IC250                  | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 11IR 1.50 ISO IC50M                  | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 11IR 1.50 ISO IC908                  | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRB 1.50 ISO IC908                 | 6.35       | 1.500             | 11.00 | 0.12 | 0.95 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRM 1.50 ISO IC1007 <sup>(1)</sup> | 6.35       | 1.500             | 11.00 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 11IRM 1.50 ISO IC250 <sup>(1)</sup>  | 6.35       | 1.500             | 11.00 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 11IRM 1.50 ISO IC908 <sup>(1)</sup>  | 6.35       | 1.500             | 11.00 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IL 1.75 ISO IC50M                  | 6.35       | 1.750             | 11.00 | 0.12 | 1.00 | 0.80 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 11IL 1.75 ISO IC908                  | 6.35       | 1.750             | 11.00 | 0.12 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 1.75 ISO IC908                  | 6.35       | 1.750             | 11.00 | 0.12 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRB 1.75 ISO IC908                 | 6.35       | 1.750             | 11.00 | 0.12 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRM 1.75 ISO IC908                 | 6.35       | 1.750             | 11.00 | 0.15 | 0.90 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IL 2.00 ISO IC908                  | 6.35       | 2.000             | 11.00 | 0.15 | 0.90 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 2.00 ISO IC1007                 | 6.35       | 2.000             | 11.00 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 11IR 2.00 ISO IC228                  | 6.35       | 2.000             | 11.00 | 0.15 | 1.00 | 0.80 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 11IR 2.00 ISO IC250                  | 6.35       | 2.000             | 11.00 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 11IR 2.00 ISO IC508                  | 6.35       | 2.000             | 11.00 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      | •     |       |       |        |
| 11IR 2.00 ISO IC908                  | 6.35       | 2.000             | 11.00 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IRM 2.00 ISO IC908                 | 6.35       | 2.000             | 11.00 | 0.16 | 1.00 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 11IR 2.5 ISO IC908                   | 6.35       | 2.500             | 11.00 | 0.18 | 1.20 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 0.35 ISO IC908                  | 9.52       | 0.350             | 16.49 | 0.02 | 0.30 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 0.40 ISO IC908                  | 9.52       | 0.400             | 16.49 | 0.03 | 0.40 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 0.40 ISO IC908                  | 9.52       | 0.400             | 16.49 | 0.03 | 0.40 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 0.45 ISO IC908                  | 9.52       | 0.450             | 16.49 | 0.02 | 0.40 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 0.50 ISO IC908                  | 9.52       | 0.500             | 16.49 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 0.50 ISO IC08                   | 9.52       | 0.500             | 16.49 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 16IR 0.50 ISO IC250                  | 9.52       | 0.500             | 16.49 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IR 0.50 ISO IC908                  | 9.52       | 0.500             | 16.49 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 0.60 ISO IC908                  | 9.52       | 0.600             | 16.49 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 0.70 ISO IC250                  | 9.52       | 0.700             | 16.49 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IR 0.70 ISO IC908                  | 9.52       | 0.700             | 16.49 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 0.75 ISO IC908                  | 9.52       | 0.750             | 16.49 | 0.06 | 0.60 | 1.00 | 1                   |              |       |       |       |       |      |       |       | •     |        |

• For Insert Identification System, see page 714 • Tolerance: Class 6H. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

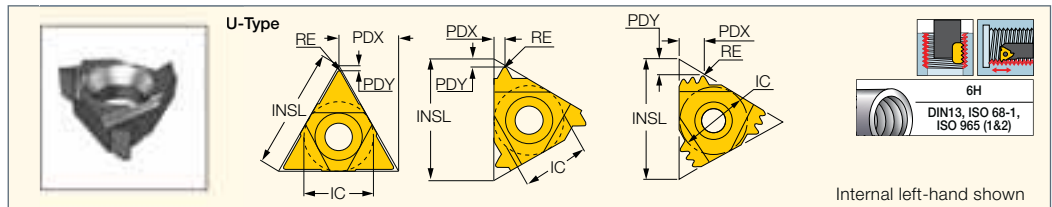
<sup>(3)</sup> Thread pitch

<sup>(4)</sup> Number of teeth per corner

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

**IR/L-ISO**

Internal ISO Metric (DIN13  
12-1986 class 6H) Laydown  
Threading Inserts for  
General Applications



| Designation                           | Dimensions |                   |       |      |      |      |                     | Tough ↔ Hard |       |       |       |       |      |       |       |       |        |
|---------------------------------------|------------|-------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|-------|------|-------|-------|-------|--------|
|                                       | IC         | TP <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC28         | IC228 | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16IR 0.75 ISO IC08                    | 9.52       | 0.750             | 16.49 | 0.06 | 0.60 | 1.00 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 16IR 0.75 ISO IC908                   | 9.52       | 0.750             | 16.49 | 0.06 | 0.60 | 1.00 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 0.80 ISO IC50M                   | 9.52       | 0.800             | 16.49 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 16IR 0.80 ISO IC250                   | 9.52       | 0.800             | 16.49 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IL 1.00 ISO IC908                   | 9.52       | 1.000             | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 1.00 ISO IC08                    | 9.52       | 1.000             | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 16IR 1.00 ISO IC1007                  | 9.52       | 1.000             | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 16IR 1.00 ISO IC250                   | 9.52       | 1.000             | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IR 1.00 ISO IC50M                   | 9.52       | 1.000             | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 16IR 1.00 ISO IC908                   | 9.52       | 1.000             | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 1.00 ISO 3M IC908 <sup>(2)</sup> | 9.52       | 1.000             | 16.49 | 0.07 | 2.50 | 1.50 | 3                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRB 1.00 ISO IC908 <sup>(1)</sup>   | 9.52       | 1.000             | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRM 1.00 ISO IC1007 <sup>(1)</sup>  | 9.52       | 1.000             | 16.49 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 16IRM 1.00 ISO IC250 <sup>(1)</sup>   | 9.52       | 1.000             | 16.49 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IRM 1.00 ISO IC50M <sup>(1)</sup>   | 9.52       | 1.000             | 16.49 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 16IRM 1.00 ISO IC508 <sup>(1)</sup>   | 9.52       | 1.000             | 16.49 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      | •     |       |       |        |
| 16IRM 1.00 ISO IC808 <sup>(1)</sup>   | 9.52       | 1.000             | 16.49 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       | •     |       |        |
| 16IRM 1.00 ISO IC908 <sup>(1)</sup>   | 9.52       | 1.000             | 16.49 | 0.05 | 0.70 | 0.60 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 1.25 ISO IC08                    | 9.52       | 1.250             | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 16IL 1.25 ISO IC50M                   | 9.52       | 1.250             | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 16IL 1.25 ISO IC908                   | 9.52       | 1.250             | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 1.25 ISO IC08                    | 9.52       | 1.250             | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 16IR 1.25 ISO IC250                   | 9.52       | 1.250             | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IR 1.25 ISO IC908                   | 9.52       | 1.250             | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRB 1.25 ISO IC908 <sup>(1)</sup>   | 9.52       | 1.250             | 16.49 | 0.09 | 0.80 | 0.70 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRM 1.25 ISO IC1007                 | 9.52       | 1.250             | 16.49 | 0.06 | 0.90 | 0.80 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 16IRM 1.25 ISO IC250 <sup>(1)</sup>   | 9.52       | 1.250             | 16.49 | 0.06 | 0.90 | 0.80 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IRM 1.25 ISO IC908 <sup>(1)</sup>   | 9.52       | 1.250             | 16.49 | 0.06 | 0.90 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 1.50 ISO IC1007                  | 9.52       | 1.500             | 16.49 | 0.12 | 1.15 | 0.90 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 16IL 1.50 ISO IC250                   | 9.52       | 1.500             | 16.49 | 0.12 | 1.20 | 0.90 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IL 1.50 ISO IC50M                   | 9.52       | 1.500             | 16.49 | 0.12 | 1.15 | 0.90 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 16IL 1.50 ISO IC908                   | 9.52       | 1.500             | 16.49 | 0.12 | 1.15 | 0.90 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 1.50 ISO IC08                    | 9.52       | 1.500             | 16.49 | 0.12 | 1.00 | 0.90 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 16IR 1.50 ISO IC1007                  | 9.52       | 1.500             | 16.49 | 0.12 | 1.00 | 0.90 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 16IR 1.50 ISO IC228                   | 9.52       | 1.500             | 16.49 | 0.12 | 1.15 | 0.90 | 1                   |              | •     |       |       |       |      |       |       |       |        |
| 16IR 1.50 ISO IC250                   | 9.52       | 1.500             | 16.49 | 0.12 | 1.00 | 0.90 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IR 1.50 ISO IC50M                   | 9.52       | 1.500             | 16.49 | 0.12 | 1.15 | 0.90 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 16IR 1.50 ISO IC908                   | 9.52       | 1.500             | 16.49 | 0.12 | 1.00 | 0.90 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 1.50 ISO 2M IC908 <sup>(2)</sup> | 9.52       | 1.500             | 16.49 | 0.10 | 2.30 | 1.50 | 2                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRB 1.50 ISO IC908 <sup>(1)</sup>   | 9.52       | 1.500             | 16.49 | 0.12 | 1.15 | 0.90 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRM 1.50 ISO IC1007 <sup>(1)</sup>  | 9.52       | 1.500             | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 16IRM 1.50 ISO IC250 <sup>(1)</sup>   | 9.52       | 1.500             | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IRM 1.50 ISO IC50M <sup>(1)</sup>   | 9.52       | 1.500             | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       | •     |       |      |       |       |       |        |
| 16IRM 1.50 ISO IC508 <sup>(1)</sup>   | 9.52       | 1.500             | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      | •     |       |       |        |
| 16IRM 1.50 ISO IC808 <sup>(1)</sup>   | 9.52       | 1.500             | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       | •     |       |        |
| 16IRM 1.50 ISO IC908 <sup>(1)</sup>   | 9.52       | 1.500             | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IL 1.75 ISO IC908                   | 9.52       | 1.750             | 16.49 | 0.12 | 1.20 | 0.90 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IR 1.75 ISO IC08                    | 9.52       | 1.750             | 16.49 | 0.12 | 1.20 | 0.90 | 1                   |              |       |       |       |       | •    |       |       |       |        |
| 16IR 1.75 ISO IC250                   | 9.52       | 1.750             | 16.49 | 0.12 | 1.20 | 0.90 | 1                   |              |       |       |       | •     |      |       |       |       |        |
| 16IR 1.75 ISO IC908                   | 9.52       | 1.750             | 16.49 | 0.12 | 1.20 | 0.90 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRB 1.75 ISO IC908 <sup>(1)</sup>   | 9.52       | 1.750             | 16.49 | 0.12 | 1.20 | 0.90 | 1                   |              |       |       |       |       |      |       |       | •     |        |
| 16IRM 1.75 ISO IC1007                 | 9.52       | 1.750             | 16.49 | 0.10 | 1.20 | 0.90 | 1                   |              |       |       |       |       |      |       |       |       | •      |
| 16IRM 1.75 ISO IC250 <sup>(1)</sup>   | 9.52       | 1.750             | 16.49 | 0.10 | 1.20 | 0.90 | 1                   |              |       |       |       | •     |      |       |       |       |        |

• For Insert Identification System, see page 714 • Tolerance: Class 6H. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Thread pitch

<sup>(4)</sup> Number of teeth per corner

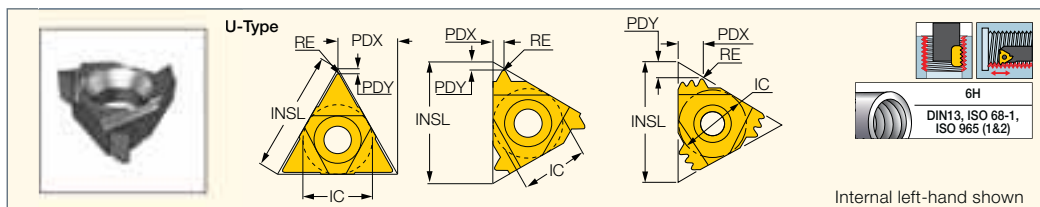
**For tools, see pages:** AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

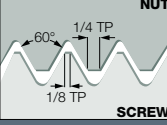
Continued

**ISCAR THREAD**

**IR/L-ISO**

Internal ISO Metric (DIN13  
12-1986 class 6H) Laydown  
Threading Inserts for  
General Applications



|  | Dimensions  |       |                   |      |      |      |     | Tough ↔ Hard        |      |       |       |       |       |      |       |       |       |        |
|-----------------------------------------------------------------------------------|-------------|-------|-------------------|------|------|------|-----|---------------------|------|-------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                   | Designation | IC    | TP <sup>(3)</sup> | INSL | RE   | PDX  | PDY | CICT <sup>(4)</sup> | IC28 | IC228 | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16IRM 1.75 ISO IC808 <sup>(1)</sup>                                               | 9.52        | 1.750 | 16.49             | 0.10 | 1.20 | 0.90 | 1   |                     |      |       |       |       |       |      |       | •     |       |        |
| 16IRM 1.75 ISO IC908 <sup>(1)</sup>                                               | 9.52        | 1.750 | 16.49             | 0.10 | 1.20 | 0.90 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IL 2.00 ISO IC250                                                               | 9.52        | 2.000 | 16.49             | 0.16 | 1.20 | 0.90 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 16IL 2.00 ISO IC908                                                               | 9.52        | 2.000 | 16.49             | 0.16 | 1.20 | 0.90 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IR 2.00 ISO IC1007                                                              | 9.52        | 2.000 | 16.49             | 0.16 | 1.20 | 0.90 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 16IR 2.00 ISO IC228                                                               | 9.52        | 2.000 | 16.49             | 0.16 | 1.20 | 0.90 | 1   |                     | •    |       |       |       |       |      |       |       |       |        |
| 16IR 2.00 ISO IC250                                                               | 9.52        | 2.000 | 16.49             | 0.16 | 1.20 | 0.90 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 16IR 2.00 ISO IC508                                                               | 9.52        | 2.000 | 16.49             | 0.16 | 1.20 | 0.90 | 1   |                     |      |       |       |       |       |      | •     |       |       |        |
| 16IR 2.00 ISO IC908                                                               | 9.52        | 2.000 | 16.49             | 0.16 | 1.20 | 0.90 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IR 2.00 ISO 2M IC908 <sup>(2)</sup>                                             | 9.52        | 2.000 | 16.49             | 0.14 | 2.70 | 1.60 | 2   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IRB 2.00 ISO IC908 <sup>(1)</sup>                                               | 9.52        | 2.000 | 16.49             | 0.14 | 1.15 | 1.00 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IRM 2.00 ISO IC1007 <sup>(1)</sup>                                              | 9.52        | 2.000 | 16.49             | 0.11 | 1.30 | 1.00 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 16IRM 2.00 ISO IC250 <sup>(1)</sup>                                               | 9.52        | 2.000 | 16.49             | 0.11 | 1.30 | 1.00 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 16IRM 2.00 ISO IC508 <sup>(1)</sup>                                               | 9.52        | 2.000 | 16.49             | 0.11 | 1.30 | 1.00 | 1   |                     |      |       |       |       |       |      | •     |       |       |        |
| 16IRM 2.00 ISO IC808 <sup>(1)</sup>                                               | 9.52        | 2.000 | 16.49             | 0.11 | 1.30 | 1.00 | 1   |                     |      |       |       |       |       |      |       | •     |       |        |
| 16IRM 2.00 ISO IC908 <sup>(1)</sup>                                               | 9.52        | 2.000 | 16.49             | 0.11 | 1.30 | 1.00 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IL 2.50 ISO IC908                                                               | 9.52        | 2.500 | 16.49             | 0.19 | 1.40 | 1.15 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IR 2.50 ISO IC1007                                                              | 9.52        | 2.500 | 16.49             | 0.19 | 1.40 | 1.20 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 16IR 2.50 ISO IC228                                                               | 9.52        | 2.500 | 16.49             | 0.19 | 1.40 | 1.15 | 1   |                     | •    |       |       |       |       |      |       |       |       |        |
| 16IR 2.50 ISO IC250                                                               | 9.52        | 2.500 | 16.49             | 0.19 | 1.40 | 1.15 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 16IR 2.50 ISO IC908                                                               | 9.52        | 2.500 | 16.49             | 0.19 | 1.40 | 1.15 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IRB 2.50 ISO IC908                                                              | 9.52        | 2.500 | 16.49             | 0.19 | 1.50 | 1.20 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IRM 2.50 ISO IC1007 <sup>(1)</sup>                                              | 9.52        | 2.500 | 16.49             | 0.14 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 16IRM 2.50 ISO IC250 <sup>(1)</sup>                                               | 9.52        | 2.500 | 16.49             | 0.14 | 1.50 | 1.10 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 16IRM 2.50 ISO IC808 <sup>(1)</sup>                                               | 9.52        | 2.500 | 16.49             | 0.14 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       | •     |       |        |
| 16IRM 2.50 ISO IC908 <sup>(1)</sup>                                               | 9.52        | 2.500 | 16.49             | 0.14 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IL 3.00 ISO IC908                                                               | 9.52        | 3.000 | 16.49             | 0.21 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IR 3.00 ISO IC1007                                                              | 9.52        | 3.000 | 16.49             | 0.21 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 16IR 3.00 ISO IC228                                                               | 9.52        | 3.000 | 16.49             | 0.21 | 1.50 | 1.10 | 1   |                     | •    |       |       |       |       |      |       |       |       |        |
| 16IR 3.00 ISO IC250                                                               | 9.52        | 3.000 | 16.49             | 0.21 | 1.50 | 1.10 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 16IR 3.00 ISO IC908                                                               | 9.52        | 3.000 | 16.49             | 0.21 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IRB 3.00 ISO IC908 <sup>(1)</sup>                                               | 9.52        | 3.000 | 16.49             | 0.21 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IRM 3.00 ISO IC1007 <sup>(1)</sup>                                              | 9.52        | 3.000 | 16.49             | 0.22 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 16IRM 3.00 ISO IC250 <sup>(1)</sup>                                               | 9.52        | 3.000 | 16.49             | 0.22 | 1.50 | 1.10 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 16IRM 3.00 ISO IC508 <sup>(1)</sup>                                               | 9.52        | 3.000 | 16.49             | 0.22 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      | •     |       |       |        |
| 16IRM 3.00 ISO IC808 <sup>(1)</sup>                                               | 9.52        | 3.000 | 16.49             | 0.22 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       | •     |       |        |
| 16IRM 3.00 ISO IC908 <sup>(1)</sup>                                               | 9.52        | 3.000 | 16.49             | 0.22 | 1.50 | 1.10 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 16IR 3.50 ISO IC1007                                                              | 9.52        | 3.500 | 16.49             | 0.26 | 1.60 | 1.50 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 22IR 1.50 ISO 3M IC250 <sup>(2)</sup>                                             | 12.70       | 1.500 | 22.00             | 0.11 | 3.70 | 2.30 | 3   |                     |      |       |       |       | •     |      |       |       |       |        |
| 22IR 1.50 ISO 3M IC908 <sup>(2)</sup>                                             | 12.70       | 1.500 | 22.00             | 0.11 | 3.70 | 2.30 | 3   |                     |      |       |       |       |       |      |       |       | •     |        |
| 22IR 2.00 ISO 2M IC908 <sup>(2)</sup>                                             | 12.70       | 2.000 | 22.00             | 0.15 | 3.00 | 2.30 | 2   |                     |      |       |       |       |       |      |       |       | •     |        |
| 22IR 2.00 ISO 3M IC908 <sup>(2)</sup>                                             | 12.70       | 2.000 | 22.00             | 0.13 | 5.00 | 3.10 | 3   |                     |      |       |       |       |       |      |       |       | •     |        |
| 22IL 3.00 ISO IC228                                                               | 12.70       | 3.000 | 22.00             | 0.17 | 1.50 | 1.10 | 1   |                     | •    |       |       |       |       |      |       |       |       |        |
| 22IL 3.50 ISO IC250                                                               | 12.70       | 3.500 | 22.00             | 0.23 | 2.30 | 1.60 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 22IR 3.50 ISO IC1007                                                              | 12.70       | 3.500 | 22.00             | 0.23 | 2.30 | 1.60 | 1   |                     |      |       |       |       |       |      |       |       |       | •      |
| 22IR 3.50 ISO IC250                                                               | 12.70       | 3.500 | 22.00             | 0.23 | 2.30 | 1.60 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 22IR 3.50 ISO IC908                                                               | 12.70       | 3.500 | 22.00             | 0.23 | 2.30 | 1.60 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 22IL 4.00 ISO IC908                                                               | 12.70       | 4.000 | 22.00             | 0.27 | 2.30 | 1.60 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 22IR 4.00 ISO IC250                                                               | 12.70       | 4.000 | 22.00             | 0.27 | 2.30 | 1.60 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 22IR 4.00 ISO IC50M                                                               | 12.70       | 4.000 | 22.00             | 0.27 | 2.30 | 1.60 | 1   |                     |      |       |       | •     |       |      |       |       |       |        |
| 22IR 4.00 ISO IC908                                                               | 12.70       | 4.000 | 22.00             | 0.27 | 2.30 | 1.60 | 1   |                     |      |       |       |       |       |      |       |       | •     |        |
| 22IL 4.50 ISO IC250                                                               | 12.70       | 4.500 | 22.00             | 0.31 | 2.30 | 1.60 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |
| 22IR 4.50 ISO IC250                                                               | 12.70       | 4.500 | 22.00             | 0.31 | 2.30 | 1.60 | 1   |                     |      |       |       |       | •     |      |       |       |       |        |

• For Insert Identification System, see page 714 • Tolerance: Class 6H. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

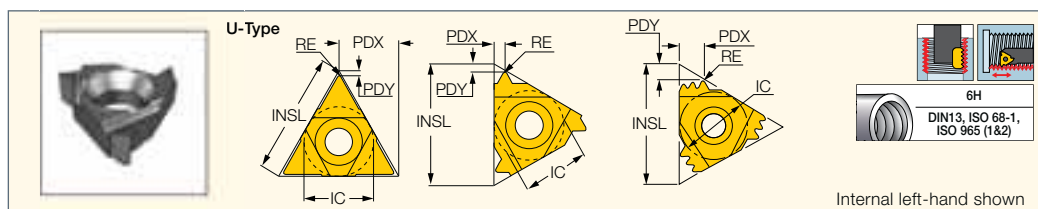
<sup>(3)</sup> Thread pitch

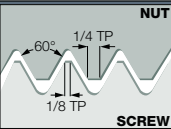
<sup>(4)</sup> Number of teeth per corner

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

**IR/L-ISO**

Internal ISO Metric (DIN13  
12-1986 class 6H) Laydown  
Threading Inserts for  
General Applications



|  | Dimensions |                   |       |      |       |      |                     | Tough ↔ Hard |       |       |       |       |      |       |       |       |        |
|-----------------------------------------------------------------------------------|------------|-------------------|-------|------|-------|------|---------------------|--------------|-------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                   | IC         | TP <sup>(3)</sup> | INSL  | RE   | PDX   | PDY  | CICT <sup>(4)</sup> | IC28         | IC228 | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| Designation                                                                       |            |                   |       |      |       |      |                     |              |       |       |       |       |      |       |       |       |        |
| 22IR 4.50 ISO IC908                                                               | 12.70      | 4.500             | 22.00 | 0.31 | 2.30  | 1.60 | 1                   |              |       |       |       |       |      |       |       | ●     |        |
| 22IL 5.00 ISO IC50M                                                               | 12.70      | 5.000             | 22.00 | 0.32 | 2.50  | 1.70 | 1                   |              |       |       | ●     |       |      |       |       | ●     |        |
| 22IL 5.00 ISO IC908                                                               | 12.70      | 5.000             | 22.00 | 0.32 | 2.50  | 1.70 | 1                   |              |       |       |       |       |      |       |       | ●     |        |
| 22IR 5.00 ISO IC250                                                               | 12.70      | 5.000             | 22.00 | 0.32 | 2.50  | 1.70 | 1                   |              |       |       |       | ●     |      |       |       | ●     |        |
| 22IR 5.00 ISO IC908                                                               | 12.70      | 5.000             | 22.00 | 0.32 | 2.50  | 1.70 | 1                   |              |       |       |       |       |      |       |       | ●     |        |
| 22UIRL 5.50 ISO IC250                                                             | 12.70      | 5.500             | 22.00 | 0.36 | 11.00 | 2.30 | 1                   |              |       |       |       | ●     |      |       |       | ●     |        |
| 22IR 6.00 ISO IC908                                                               | 12.70      | 6.000             | 22.00 | 0.40 | 2.50  | 1.70 | 1                   |              |       |       |       |       |      |       |       | ●     |        |
| 22UIRL 6.00 ISO IC250                                                             | 12.70      | 6.000             | 22.00 | 0.40 | 11.00 | 2.10 | 1                   |              |       |       |       | ●     |      |       |       | ●     |        |
| 27IR 3.00 ISO 2M IC908 <sup>(2)</sup>                                             | 15.88      | 3.000             | 27.50 | 0.21 | 4.60  | 3.10 | 2                   |              |       |       |       |       |      |       |       | ●     |        |
| 27IR 5.50 ISO IC250                                                               | 15.88      | 5.500             | 27.50 | 0.36 | 2.50  | 1.80 | 1                   |              |       |       |       | ●     |      |       |       | ●     |        |
| 27IR 5.50 ISO IC908                                                               | 15.88      | 5.500             | 27.50 | 0.36 | 2.50  | 1.80 | 1                   |              |       |       |       |       |      |       |       | ●     |        |
| 27IR 6.00 ISO IC250                                                               | 15.88      | 6.000             | 27.50 | 0.45 | 2.40  | 1.85 | 1                   |              |       |       |       | ●     |      |       |       | ●     |        |
| 27IR 6.00 ISO IC908                                                               | 15.88      | 6.000             | 27.50 | 0.45 | 2.40  | 1.85 | 1                   |              |       |       |       |       |      |       |       | ●     |        |
| 27UIRL 8.00 ISO IC908                                                             | 15.88      | 8.000             | 27.50 | 0.50 | 13.80 | 2.50 | 1                   |              |       |       |       |       |      |       |       | ●     |        |

• For Insert Identification System, see page 714 • Tolerance: Class 6H. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Thread pitch

<sup>(4)</sup> Number of teeth per corner

**For tools, see pages:** AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

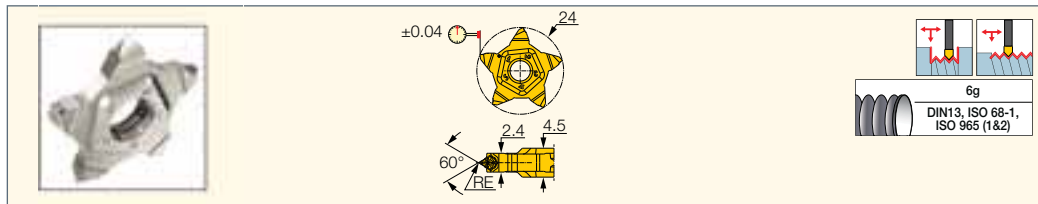


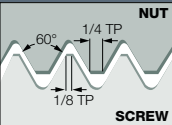
# PENTACUT

THREADING LINE

## PENTA 24-ISO

Precision Ground ISO Metric  
Full Profile Pentagonal  
External Threading Inserts  
with a Chipformer



|  | Dimensions              |                   |      | IC908 |
|-----------------------------------------------------------------------------------|-------------------------|-------------------|------|-------|
|                                                                                   | Designation             | TP <sup>(1)</sup> | RE   |       |
|                                                                                   | PENTA 24-0.5-ISO IC908  | 0.500             | 0.08 |       |
|                                                                                   | PENTA 24-0.75-ISO IC908 | 0.750             | 0.11 |       |
|                                                                                   | PENTA 24-0.8-ISO IC908  | 0.800             | 0.12 |       |
|                                                                                   | PENTA 24-1.0-ISO IC908  | 1.000             | 0.14 |       |
|                                                                                   | PENTA 24-1.25-ISO IC908 | 1.250             | 0.18 |       |
|                                                                                   | PENTA 24-1.5-ISO IC908  | 1.500             | 0.22 |       |
|                                                                                   | PENTA 24-1.75-ISO IC908 | 1.750             | 0.25 |       |
|                                                                                   | PENTA 24-2.0-ISO IC908  | 2.000             | 0.28 |       |

• DMIN(mm)=5.435xTP

<sup>(1)</sup> Thread pitch

For tools, see pages: NQCH-PCHR/L-24-JHP (348) • PCAD RE/LE-JHP (561) • PCADR/L (353) • PCADR/L-JHP (353) • PCHBR/L (355)

• PCHR/L-24 (346) • PCHR/L-24-JHP (347) • PCHR/L-24-JHP-MC (348)

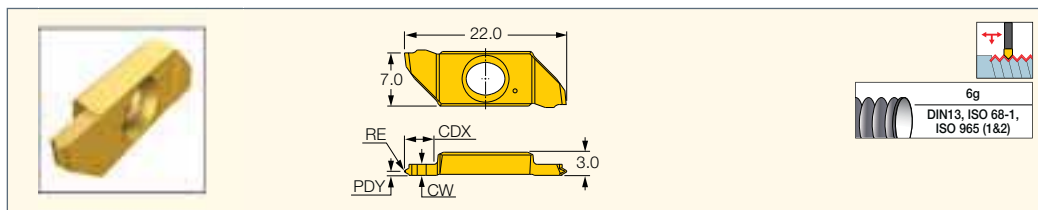
# SWISSCUT

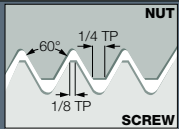
INNOVATION LINE

## ISCARTHREAD

## SCIR-22-MTR-ISO

Precision Ground ISO Metric  
Full Profile Threading Inserts



|  | Dimensions                 |                   |      |                    |      |     | IC1008 |
|-------------------------------------------------------------------------------------|----------------------------|-------------------|------|--------------------|------|-----|--------|
|                                                                                     | Designation                | TP <sup>(1)</sup> | CW   | CDX <sup>(2)</sup> | RE   | PDY |        |
|                                                                                     | SCIR 22-MTR-0.3ISO IC1008  | 0.300             | 1.00 | 3.00               | 0.03 | 0.2 | ●      |
|                                                                                     | SCIR 22-MTR-0.4ISO IC1008  | 0.400             | 1.00 | 3.00               | 0.04 | 0.2 | ●      |
|                                                                                     | SCIR 22-MTR-0.5ISO IC1008  | 0.500             | 1.00 | 3.00               | 0.06 | 0.3 | ●      |
|                                                                                     | SCIR 22-MTR-0.75ISO IC1008 | 0.750             | 1.00 | 3.00               | 0.10 | 0.4 | ●      |
|                                                                                     | SCIR 22-MTR-1.0ISO IC1008  | 1.000             | 1.50 | 4.00               | 0.14 | 0.6 | ●      |
|                                                                                     | SCIR 22-MTR-1.5ISO IC1008  | 1.500             | 2.00 | 4.00               | 0.20 | 0.8 | ●      |

<sup>(1)</sup> Thread pitch

<sup>(2)</sup> Cutting depth maximum

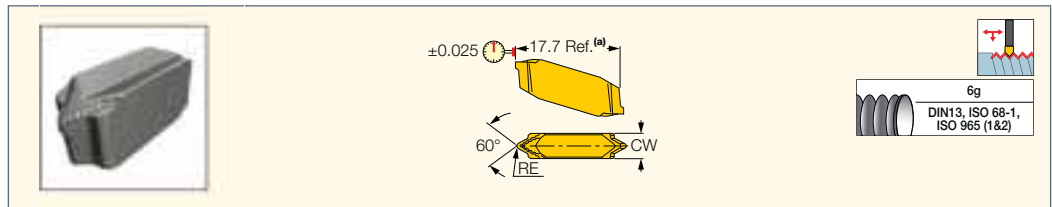
For tools, see pages: NQCH-SCHR/L-BF-JHP (408) • NQCH-Y-SCHR-BF-JHP (408) • SCHR/L-22BF (407) • SCHR/L-22BF-JHP (407) • Y-SCHR-22BF (407)

• Y-SCHR-22BF-JHP (408)



**TIP-P-ISO**

Precision Ground ISO  
Metric Full Profile Double-  
Ended External Threading  
Inserts with a Chipformer



| Designation          | Dimensions        |      |      |                      | Tough ↔ Hard |       |
|----------------------|-------------------|------|------|----------------------|--------------|-------|
|                      | TP <sup>(1)</sup> | CW   | RE   | RETOL <sup>(2)</sup> | IC08         | IC908 |
| TIP 2P0.5-ISO IC08   | 0.500             | 2.40 | 0.08 | 0.030                | •            |       |
| TIP 2P0.5-ISO IC908  | 0.500             | 2.40 | 0.08 | 0.030                |              | •     |
| TIP 2P0.75-ISO IC08  | 0.750             | 2.40 | 0.11 | 0.030                | •            |       |
| TIP 2P0.75-ISO IC908 | 0.750             | 2.40 | 0.11 | 0.030                |              | •     |
| TIP 2P0.8-ISO IC08   | 0.800             | 2.40 | 0.12 | 0.030                | •            |       |
| TIP 2P0.8-ISO IC908  | 0.800             | 2.40 | 0.12 | 0.030                |              | •     |
| TIP 2P1.0-ISO IC08   | 1.000             | 2.40 | 0.14 | 0.030                | •            |       |
| TIP 2P1.0-ISO IC908  | 1.000             | 2.40 | 0.14 | 0.030                |              | •     |
| TIP 2P1.25-ISO IC08  | 1.250             | 2.40 | 0.18 | 0.030                | •            |       |
| TIP 2P1.25-ISO IC908 | 1.250             | 2.40 | 0.18 | 0.030                |              | •     |
| TIP 2P1.5-ISO IC08   | 1.500             | 2.40 | 0.22 | 0.030                | •            |       |
| TIP 2P1.5-ISO IC908  | 1.500             | 2.40 | 0.22 | 0.030                |              | •     |
| TIP 2P1.75-ISO IC08  | 1.750             | 2.40 | 0.25 | 0.030                | •            |       |
| TIP 2P1.75-ISO IC908 | 1.750             | 2.40 | 0.25 | 0.030                |              | •     |
| TIP 4P2.0-ISO IC08   | 2.000             | 4.00 | 0.28 | 0.030                | •            |       |
| TIP 4P2.0-ISO IC908  | 2.000             | 4.00 | 0.28 | 0.030                |              | •     |
| TIP 4P2.5-ISO IC08   | 2.500             | 4.00 | 0.35 | 0.050                | •            |       |
| TIP 4P2.5-ISO IC908  | 2.500             | 4.00 | 0.35 | 0.050                |              | •     |
| TIP 4P3.0-ISO IC908  | 3.000             | 4.00 | 0.42 | 0.050                |              | •     |
| TIP 4P3.5-ISO IC908  | 3.500             | 4.00 | 0.48 | 0.050                |              | •     |
| TIP 5P4.0-ISO IC908  | 4.000             | 5.50 | 0.55 | 0.050                |              | •     |
| TIP 5P5.0-ISO IC908  | 5.000             | 5.50 | 0.68 | 0.050                |              | •     |

- (a) TIP inserts are 1.6 mm longer than GIP in the same pocket
- Toolholder seat needs to be modified according to insert profile to ensure clearance

<sup>(1)</sup> Thread pitch

<sup>(2)</sup> Corner radius tolerance (+/-)

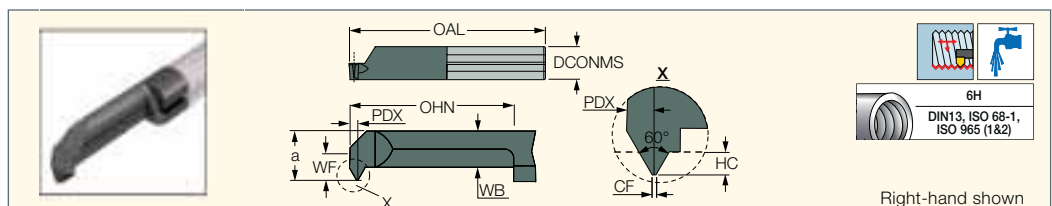
**For tools, see pages:** C#-GHDR/L (301) • CGHN-D (310) • CGHN-DG (310) • CGHN-S (309) • CGPAD (308) • CGPAD-JHP (309) • GHDR/L (short pocket) (302)

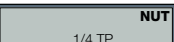
• GHDR/L-JHP (short pocket) (303) • GHDR/L-JHP-MC (short pocket) (304) • GHGR/L (305) • GHMPR/L (300) • GHMR/L (300) • GHSLR/L (428)

• GHSLR/L-JHP-SL (429) • NQCH-GHSLR/L-JHP (428)

**PICCO CUT**

**PICCO ISO Full Profile**  
ISO Standard Inserts for  
Full Profile Threads



|  | Dimensions            |        |      |      |      |      |      |      |      |                    |       | IC908 |                   |   |
|-------------------------------------------------------------------------------------|-----------------------|--------|------|------|------|------|------|------|------|--------------------|-------|-------|-------------------|---|
|                                                                                     | Designation           | DCONMS | DMIN | HC   | CF   | PDX  | WF   | a    | WB   | OHN <sup>(1)</sup> | OAL   |       | TP <sup>(2)</sup> |   |
|                                                                                     | PICCO R/L 105.0510-15 | 5.00   | 4.80 | 0.54 | 0.12 | 0.60 | 1.90 | 4.40 | 3.30 | 15.0               | 30.00 |       | 1.000             | ● |
|                                                                                     | PICCO R/L 106.0612-15 | 6.00   | 6.00 | 0.67 | 0.15 | 0.70 | 2.30 | 5.30 | 3.40 | 15.0               | 30.00 |       | 1.250             | ● |
|                                                                                     | PICCO R/L 106.0815-15 | 6.00   | 6.00 | 0.81 | 0.18 | 0.80 | 2.30 | 5.30 | 3.40 | 15.0               | 30.00 |       | 1.500             | ● |
|                                                                                     | PICCO R/L 107.0815-15 | 7.00   | 7.00 | 0.81 | 0.18 | 0.80 | 2.80 | 6.30 | 3.80 | 15.0               | 30.00 |       | 1.500             | ● |

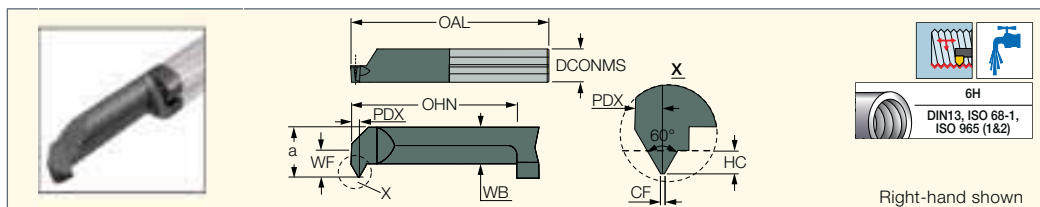
<sup>(1)</sup> Minimum overhang

<sup>(2)</sup> Thread pitch

**For holders, see pages:** PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420)

# PICCO CUT

**PICCO ISO Full Profile Fine**  
ISO Fine Pitch Inserts for  
Full Profile Threads



| Designation           | Dimensions |      |      |      |      |      |      |                    |      |       |                   | IC908 |
|-----------------------|------------|------|------|------|------|------|------|--------------------|------|-------|-------------------|-------|
|                       | DCONMS     | DMIN | HC   | CF   | PDX  | WF   | a    | OHN <sup>(1)</sup> | WB   | OAL   | TP <sup>(2)</sup> |       |
| PICCO R/L 104.0205-15 | 5.00       | 4.00 | 0.27 | 0.06 | 0.40 | 1.50 | 3.50 | 15.0               | 2.40 | 30.00 | 0.500             | •     |
| PICCO R/L 105.0205-15 | 5.00       | 5.00 | 0.27 | 0.06 | 0.40 | 1.90 | 4.40 | 15.0               | 3.30 | 30.00 | 0.500             | •     |
| PICCO R/L 105.0407-15 | 5.00       | 5.00 | 0.40 | 0.09 | 0.50 | 1.90 | 4.40 | 15.0               | 3.30 | 30.00 | 0.750             | •     |
| PICCO R/L 106.0510-15 | 6.00       | 6.00 | 0.54 | 0.12 | 0.60 | 2.30 | 5.30 | 15.0               | 3.40 | 30.00 | 1.000             | •     |

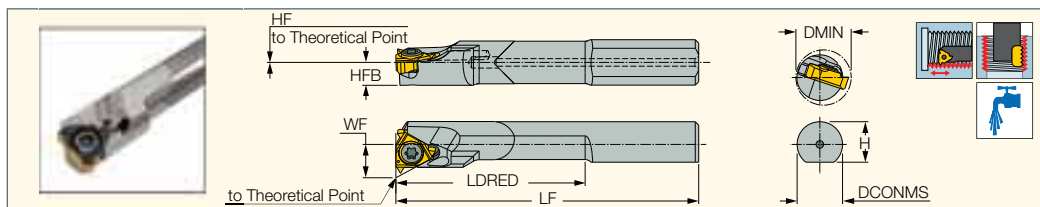
<sup>(1)</sup> Minimum overhang

<sup>(2)</sup> Thread pitch

For holders, see pages: PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420)

# PICCOINDEX

**PICIN-MGSIR/L**  
Solid Carbide PICCO Tools on which  
Internal Laydown  
Threading Inserts are Mounted



| Designation            | DCONMS | DMIN | LDRED | H   | HFB | WF   | HF  | LF    | MIID <sup>(1)</sup> |           |       |
|------------------------|--------|------|-------|-----|-----|------|-----|-------|---------------------|-----------|-------|
| PICIN E06-T25-MGSIL-06 | 6.00   | 7.30 | 25.0  | 5.4 | 3.0 | 4.41 | 0.0 | 40.00 | 06IL A 55           | SR 14-552 | T-6/5 |
| PICIN E06-T25-MGSIR-06 | 6.00   | 7.30 | 25.0  | 5.4 | 3.0 | 4.41 | 0.0 | 40.00 | 06IR A 55           |           |       |

- B-steel shank with coolant hole, CB-carbide shank with coolant hole • All toolholders provide 1.5 helix angle, either via the pocket or the anvil supplied
- For GTGA inserts, use anvil AL 16-0

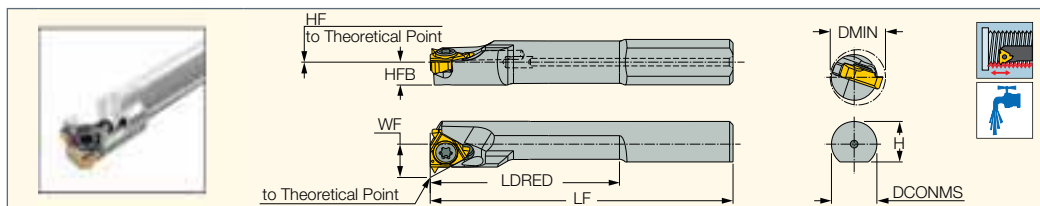
<sup>(1)</sup> Master insert identification

For inserts, see pages: IR/L-55° (716) • IR/L-60° (723) • IR/L-BSPT (767) • IR/L-ISO (737) • IR/L-NPT (762) • IR/L-NPTF (765) • IR/L-UN (749) • IR/L-W (757)

For holders, see pages: PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420)

# PICCOINDEX

**PICIN-A-SIR/L**  
PICCO Tools on which  
Internal Laydown Threading  
Inserts are Mounted



| Designation            | DCONMS | DMIN | LDRED | H   | HFB | WF   | LF    | HF  | MIID <sup>(1)</sup> |           |       |
|------------------------|--------|------|-------|-----|-----|------|-------|-----|---------------------|-----------|-------|
| PICIN A06-T15-SIR-06   | 6.00   | 7.30 | 15.0  | 5.4 | 3.0 | 4.41 | 30.00 | 0.1 | 06IL A 55           | SR 14-552 | T-6/5 |
| PICIN A06-T25-SIR/L-06 | 6.00   | 7.30 | 25.0  | 5.4 | 3.0 | 4.41 | 40.00 | 0.1 | 06IL/R A 55         | SR 14-552 | T-6/5 |

## NEW

- B-steel shank with coolant hole, CB-carbide shank with coolant hole • All toolholders provide 1.5 helix angle, either via the pocket or the anvil supplied
- For GTGA inserts, use anvil AL 16-0

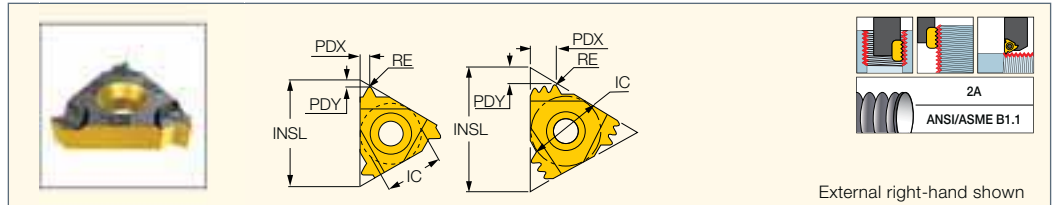
<sup>(1)</sup> Master insert identification

For inserts, see pages: IR/L-55° (716) • IR/L-60° (723) • IR/L-BSPT (767) • IR/L-ISO (737) • IR/L-NPT (762) • IR/L-NPTF (765) • IR/L-UN (749) • IR/L-W (757)

For holders, see pages: PICCO ACE (440) • PICCO/MG PCO (Holder) (441) • SC-PICCO (420)

**ER/L-UN**

External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



External right-hand shown

| Designation                      | Dimensions |                    |       |      |      |      |                     | Tough ← Hard |       |       |      |       |       |       |        |
|----------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                  | IC         | TPI <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC228        | IC50M | IC250 | IC08 | IC508 | IC908 | IC908 | IC1007 |
| 11ER 56 UN IC908                 | 6.35       | 56.0               | 11.00 | 0.07 | 0.40 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 48 UN IC250                 | 6.35       | 48.0               | 11.00 | 0.08 | 0.45 | 0.60 | 1                   |              |       | •     |      |       |       | •     |        |
| 11ER 44 UN IC908                 | 6.35       | 44.0               | 11.00 | 0.09 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11EL 32 UN IC250                 | 6.35       | 32.0               | 11.00 | 0.12 | 0.60 | 0.70 | 1                   |              |       | •     |      |       |       | •     |        |
| 11ER 32 UN IC908                 | 6.35       | 32.0               | 11.00 | 0.12 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 28 UN IC08                  | 6.35       | 28.0               | 11.00 | 0.10 | 0.70 | 0.60 | 1                   |              |       |       | •    |       |       | •     |        |
| 11ER 28 UN IC908                 | 6.35       | 28.0               | 11.00 | 0.10 | 0.70 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 24 UN IC908                 | 6.35       | 24.0               | 11.00 | 0.12 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER/L 20 UN IC908               | 6.35       | 20.0               | 11.00 | 0.19 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 20 UN IC08                  | 6.35       | 20.0               | 11.00 | 0.19 | 0.80 | 0.70 | 1                   |              |       |       | •    |       |       |       |        |
| 11ER 20 UN IC250                 | 6.35       | 20.0               | 11.00 | 0.19 | 0.80 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 11ER 18 UN IC08                  | 6.35       | 18.0               | 11.00 | 0.17 | 1.00 | 0.80 | 1                   |              |       |       | •    |       |       |       |        |
| 11ER 18 UN IC908                 | 6.35       | 18.0               | 11.00 | 0.17 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 11ER 16 UN IC250                 | 6.35       | 16.0               | 11.00 | 0.18 | 1.10 | 0.90 | 1                   |              |       | •     |      |       |       |       |        |
| 11ER 16 UN IC50M                 | 6.35       | 16.0               | 11.00 | 0.18 | 1.10 | 0.90 | 1                   |              | •     |       |      |       |       |       |        |
| 11ER 16 UN IC908                 | 6.35       | 16.0               | 11.00 | 0.18 | 1.10 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 72 UN IC908                 | 9.52       | 72.0               | 16.49 | 0.05 | 0.40 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 64 UN IC250                 | 9.52       | 64.0               | 16.49 | 0.06 | 0.40 | 0.60 | 1                   |              |       | •     |      |       |       | •     |        |
| 16ER 56 UN IC908                 | 9.52       | 56.0               | 16.49 | 0.05 | 0.40 | 0.65 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 48 UN IC908                 | 9.52       | 48.0               | 16.49 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 40 UN IC250                 | 9.52       | 40.0               | 16.49 | 0.10 | 0.50 | 0.60 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 40 UN IC08                  | 9.52       | 40.0               | 16.49 | 0.10 | 0.50 | 0.60 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 40 UN IC508                 | 9.52       | 40.0               | 16.49 | 0.10 | 0.50 | 0.60 | 1                   |              |       |       |      | •     |       |       |        |
| 16ER 40 UN IC908                 | 9.52       | 40.0               | 16.49 | 0.10 | 0.50 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 36 UN IC908                 | 9.52       | 36.0               | 16.49 | 0.07 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 36 UN IC908                 | 9.52       | 36.0               | 16.49 | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 32 UN IC908               | 9.52       | 32.0               | 16.49 | 0.10 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 32 UN IC1007                | 9.52       | 32.0               | 16.49 | 0.10 | 0.60 | 0.60 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 32 UN IC250                 | 9.52       | 32.0               | 16.49 | 0.10 | 0.60 | 0.60 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 28 UN IC908               | 9.52       | 28.0               | 16.49 | 0.11 | 0.70 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 28 UN IC08                  | 9.52       | 28.0               | 16.49 | 0.11 | 0.70 | 0.60 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 28 UN IC1007                | 9.52       | 28.0               | 16.49 | 0.11 | 0.70 | 0.60 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 28 UN IC250                 | 9.52       | 28.0               | 16.49 | 0.11 | 0.70 | 0.60 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 27 UN IC50M                 | 9.52       | 27.0               | 16.49 | 0.13 | 0.70 | 0.70 | 1                   |              | •     |       |      |       |       |       |        |
| 16ER 27 UN IC908                 | 9.52       | 27.0               | 16.49 | 0.13 | 0.70 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 24 UN IC908               | 9.52       | 24.0               | 16.49 | 0.13 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 24 UN IC08                  | 9.52       | 24.0               | 16.49 | 0.13 | 0.80 | 0.70 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 24 UN IC1007                | 9.52       | 24.0               | 16.49 | 0.13 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 24 UN IC250                 | 9.52       | 24.0               | 16.49 | 0.13 | 0.80 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 24 UN 2M IC250              | 9.52       | 24.0               | 16.49 | 0.15 | 1.70 | 1.10 | 2                   |              |       | •     |      |       |       |       |        |
| 16ERB 24 UN IC908 <sup>(1)</sup> | 9.52       | 24.0               | 16.49 | 0.13 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 24 UN IC1007               | 9.52       | 24.0               | 16.49 | 0.11 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 24 UN IC250 <sup>(1)</sup> | 9.52       | 24.0               | 16.49 | 0.11 | 0.80 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 24 UN IC908 <sup>(1)</sup> | 9.52       | 24.0               | 16.49 | 0.11 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 20 UN IC250                 | 9.52       | 20.0               | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 16EL 20 UN IC08                  | 9.52       | 20.0               | 16.49 | 0.16 | 0.80 | 0.90 | 1                   |              |       |       | •    |       |       |       |        |
| 16EL 20 UN IC908                 | 9.52       | 20.0               | 16.49 | 0.16 | 0.80 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |

- For Insert Identification System, see page 714
- Tolerance: Class 2A
- For threading between walls use GRIP-type insert TIP-UN
- For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer.

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Threads per inch

<sup>(4)</sup> Number of teeth per corner

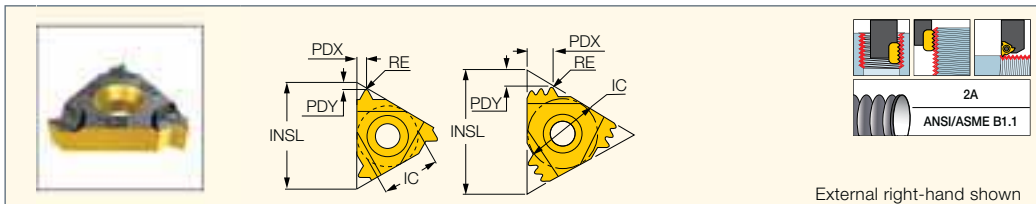
For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

Continued

# ISCAR THREAD

## ER/L-UN

External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



External right-hand shown

| Designation                        | Dimensions |                    |       |      |      |      |                     | Tough ← Hard |       |       |      |       |       |       |        |
|------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                    | IC         | TPI <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16ER 20 UN IC08                    | 9.52       | 20.0               | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 20 UN IC1007                  | 9.52       | 20.0               | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 20 UN IC250                   | 9.52       | 20.0               | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 20 UN IC908                   | 9.52       | 20.0               | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERB 20 UN IC908 <sup>(1)</sup>   | 9.52       | 20.0               | 16.49 | 0.16 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 20 UN IC1007 <sup>(1)</sup>  | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 20 UN IC250 <sup>(1)</sup>   | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 20 UN IC808 <sup>(1)</sup>   | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 20 UN IC908 <sup>(1)</sup>   | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 18 UN IC08                    | 9.52       | 18.0               | 16.49 | 0.17 | 1.00 | 0.80 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER/L 18 UN IC908                 | 9.52       | 18.0               | 16.49 | 0.17 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 18 UN IC1007                  | 9.52       | 18.0               | 16.49 | 0.17 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 18 UN IC250                   | 9.52       | 18.0               | 16.49 | 0.17 | 0.80 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 18 UN IC50M                   | 9.52       | 18.0               | 16.49 | 0.17 | 0.80 | 0.70 | 1                   |              | •     |       |      |       |       |       |        |
| 16ER 18 UN 2M IC908                | 9.52       | 18.0               | 16.49 | 0.20 | 2.25 | 1.50 | 2                   |              |       |       |      |       |       | •     |        |
| 16ERB 18 UN IC908 <sup>(1)</sup>   | 9.52       | 18.0               | 16.49 | 0.18 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 18 UN IC1007 <sup>(1)</sup>  | 9.52       | 18.0               | 16.49 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 18 UN IC250 <sup>(1)</sup>   | 9.52       | 18.0               | 16.49 | 0.15 | 1.00 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 18 UN IC808 <sup>(1)</sup>   | 9.52       | 18.0               | 16.49 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 18 UN IC908 <sup>(1)</sup>   | 9.52       | 18.0               | 16.49 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 16 UN IC250                   | 9.52       | 16.0               | 16.49 | 0.23 | 1.20 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16EL 16 UN IC908                   | 9.52       | 16.0               | 16.49 | 0.23 | 1.15 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 16 UN IC1007                  | 9.52       | 16.0               | 16.49 | 0.23 | 1.15 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 16 UN IC228                   | 9.52       | 16.0               | 16.49 | 0.23 | 1.15 | 1.10 | 1                   | •            |       |       |      |       |       |       |        |
| 16ER 16 UN IC250                   | 9.52       | 16.0               | 16.49 | 0.23 | 1.15 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 16 UN IC908                   | 9.52       | 16.0               | 16.49 | 0.23 | 1.15 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 16 UN 2M IC908 <sup>(2)</sup> | 9.52       | 16.0               | 16.49 | 0.09 | 2.30 | 1.50 | 2                   |              |       |       |      |       |       | •     |        |
| 16ERB 16 UN IC908 <sup>(1)</sup>   | 9.52       | 16.0               | 16.49 | 0.23 | 1.10 | 1.15 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 16 UN IC1007 <sup>(1)</sup>  | 9.52       | 16.0               | 16.49 | 0.23 | 1.10 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 16 UN IC250 <sup>(1)</sup>   | 9.52       | 16.0               | 16.49 | 0.23 | 1.10 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 16 UN IC808 <sup>(1)</sup>   | 9.52       | 16.0               | 16.49 | 0.23 | 1.10 | 1.00 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 16 UN IC908 <sup>(1)</sup>   | 9.52       | 16.0               | 16.49 | 0.23 | 1.10 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER/L 14 UN IC250                 | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16EL 14 UN IC508                   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |      | •     |       |       |        |
| 16ER 14 UN IC1007                  | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 14 UN IC908                   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 14 UN 2M IC908 <sup>(2)</sup> | 9.52       | 14.0               | 16.49 | 0.09 | 2.60 | 1.60 | 2                   |              |       |       |      |       |       | •     |        |
| 16ERB 14 UN IC908 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 14 UN IC1007 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.22 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 14 UN IC250 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.22 | 1.20 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 14 UN IC808 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.22 | 1.20 | 1.00 | 1                   |              |       |       |      |       | •     |       |        |
| 16ERM 14 UN IC908 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.22 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 13 UN IC250                   | 9.52       | 13.0               | 16.49 | 0.24 | 1.30 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 13 UN IC908                 | 9.52       | 13.0               | 16.49 | 0.24 | 1.20 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 13 UN IC08                    | 9.52       | 13.0               | 16.49 | 0.24 | 1.20 | 1.00 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 13 UN IC250                   | 9.52       | 13.0               | 16.49 | 0.24 | 1.20 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERB 13 UN IC908 <sup>(1)</sup>   | 9.52       | 13.0               | 16.49 | 0.25 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 13 UN IC908 <sup>(1)</sup>   | 9.52       | 13.0               | 16.49 | 0.24 | 1.30 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |

- For Insert Identification System, see page 714 • Tolerance: Class 2A • For threading between walls use GRIP-type insert TIP-UN
- For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer.

<sup>(2)</sup> Multi-tooth

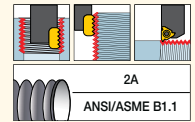
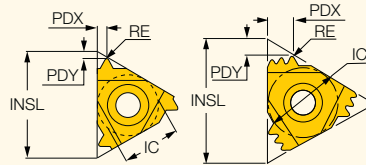
<sup>(3)</sup> Threads per inch

<sup>(4)</sup> Number of teeth per corner

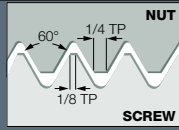
For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

**ER/L-UN**

External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



External right-hand shown



| Designation                        | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |      |       |       |       |        |
|------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                    | IC         | TPI <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16EL 12 UN IC250                   | 9.52       | 12.0               | 16.49 | 0.27 | 1.20 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16EL 12 UN IC908                   | 9.52       | 12.0               | 16.49 | 0.27 | 1.20 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 12 UN IC08                    | 9.52       | 12.0               | 16.49 | 0.30 | 1.25 | 1.00 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 12 UN IC1007                  | 9.52       | 12.0               | 16.49 | 0.30 | 1.25 | 1.00 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 12 UN IC250                   | 9.52       | 12.0               | 16.49 | 0.30 | 1.30 | 1.00 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 12 UN IC908                   | 9.52       | 12.0               | 16.49 | 0.30 | 1.25 | 1.00 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 12 UN 2M IC908 <sup>(2)</sup> | 9.52       | 12.0               | 16.49 | 0.27 | 3.40 | 2.20 | 2                   |              |       |       |      |       |       | •     |        |
| 16ERB 12 UN IC908 <sup>(1)</sup>   | 9.52       | 12.0               | 16.49 | 0.27 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 12 UN IC1007 <sup>(1)</sup>  | 9.52       | 12.0               | 16.49 | 0.25 | 1.40 | 1.10 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 12 UN IC250 <sup>(1)</sup>   | 9.52       | 12.0               | 16.49 | 0.25 | 1.40 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 12 UN IC50M <sup>(1)</sup>   | 9.52       | 12.0               | 16.49 | 0.25 | 1.40 | 1.10 | 1                   |              | •     |       |      |       |       |       |        |
| 16ERM 12 UN IC808 <sup>(1)</sup>   | 9.52       | 12.0               | 16.49 | 0.25 | 1.40 | 1.10 | 1                   |              |       |       |      | •     |       |       |        |
| 16ERM 12 UN IC908 <sup>(1)</sup>   | 9.52       | 12.0               | 16.49 | 0.25 | 1.40 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 11.5 UN IC250                 | 9.52       | 11.5               | 16.49 | 0.27 | 1.50 | 1.20 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 11.5 UN IC908                 | 9.52       | 11.5               | 16.49 | 0.27 | 1.50 | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 11 UN IC908                   | 9.52       | 11.0               | 16.49 | 0.28 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 11 UN IC250                   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER 11 UN IC908                   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERB 11 UN IC908 <sup>(1)</sup>   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 10 UN IC250                   | 9.52       | 10.0               | 16.49 | 0.37 | 1.50 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 10 UN IC908                 | 9.52       | 10.0               | 16.49 | 0.37 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 10 UN IC08                    | 9.52       | 10.0               | 16.49 | 0.37 | 1.50 | 1.10 | 1                   |              |       |       | •    |       |       |       |        |
| 16ER 10 UN IC1007                  | 9.52       | 10.0               | 16.49 | 0.37 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 10 UN IC250                   | 9.52       | 10.0               | 16.49 | 0.37 | 1.50 | 1.10 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERB 10 UN IC908 <sup>(1)</sup>   | 9.52       | 10.0               | 16.49 | 0.37 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 10 UN IC908                  | 9.52       | 10.0               | 16.49 | 0.32 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 9 UN IC908                    | 9.52       | 9.0                | 16.49 | 0.35 | 1.60 | 1.30 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERB 9 UN IC908 <sup>(1)</sup>    | 9.52       | 9.0                | 16.49 | 0.35 | 1.60 | 1.30 | 1                   |              |       |       |      |       |       | •     |        |
| 16EL 8 UN IC250                    | 9.52       | 8.0                | 16.49 | 0.40 | 1.60 | 1.20 | 1                   |              |       | •     |      |       |       |       |        |
| 16ER/L 8 UN IC908                  | 9.52       | 8.0                | 16.49 | 0.40 | 1.60 | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 16ER 8 UN IC1007                   | 9.52       | 8.0                | 16.49 | 0.40 | 1.60 | 1.20 | 1                   |              |       |       |      |       |       |       | •      |
| 16ER 8 UN IC250                    | 9.52       | 8.0                | 16.49 | 0.40 | 1.60 | 1.20 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERB 8 UN IC908 <sup>(1)</sup>    | 9.52       | 8.0                | 16.49 | 0.43 | 1.60 | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 16ERM 8 UN IC1007                  | 9.52       | 8.0                | 16.49 | 0.41 | 1.60 | 1.20 | 1                   |              |       |       |      |       |       |       | •      |
| 16ERM 8 UN IC250 <sup>(1)</sup>    | 9.52       | 8.0                | 16.49 | 0.41 | 1.60 | 1.20 | 1                   |              |       | •     |      |       |       |       |        |
| 16ERM 8 UN IC908 <sup>(1)</sup>    | 9.52       | 8.0                | 16.49 | 0.41 | 1.60 | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER 13 UN 3M IC250                | 12.70      | 13.0               | 22.00 | 0.28 | 4.70 | 2.90 | 3                   |              |       | •     |      |       |       |       |        |
| 22ER 12 UN 2M IC908 <sup>(2)</sup> | 12.70      | 12.0               | 22.00 | 0.27 | 3.40 | 2.20 | 2                   |              |       |       |      |       |       | •     |        |
| 22ER 12 UN 3M IC250                | 12.70      | 12.0               | 22.00 | 0.30 | 5.15 | 3.20 | 3                   |              |       | •     |      |       |       |       |        |
| 22ER 12 UN 3M IC50M <sup>(2)</sup> | 12.70      | 12.0               | 22.00 | 0.30 | 5.20 | 3.20 | 3                   |              | •     |       |      |       |       |       |        |
| 22ER 12 UN 3M IC908 <sup>(2)</sup> | 12.70      | 12.0               | 22.00 | 0.30 | 5.20 | 3.20 | 3                   |              |       |       |      |       |       | •     |        |
| 22ER 7 UN IC250                    | 12.70      | 7.0                | 22.00 | 0.47 | 2.30 | 1.60 | 1                   |              |       | •     |      |       |       |       |        |
| 22ER 7 UN IC908                    | 12.70      | 7.0                | 22.00 | 0.47 | 2.30 | 1.60 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER 6 UN IC08                     | 12.70      | 6.0                | 22.00 | 0.67 | 2.30 | 1.60 | 1                   |              |       |       | •    |       |       |       |        |
| 22ER 6 UN IC908                    | 12.70      | 6.0                | 22.00 | 0.56 | 2.30 | 1.60 | 1                   |              |       |       |      |       |       | •     |        |
| 22ER 5 UN IC250                    | 12.70      | 5.0                | 22.00 | 0.67 | 2.50 | 1.70 | 1                   |              |       | •     |      |       |       |       |        |
| 22ER 5 UN IC50M                    | 12.70      | 5.0                | 22.00 | 0.67 | 2.50 | 1.70 | 1                   |              | •     |       |      |       |       |       |        |
| 22ER 5 UN IC908                    | 12.70      | 5.0                | 22.00 | 0.69 | 2.50 | 1.80 | 1                   |              |       |       |      |       |       | •     |        |

• For Insert Identification System, see page 714 • Tolerance: Class 2A • For threading between walls use GRIP-type insert TIP-UN

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer.

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Threads per inch

<sup>(4)</sup> Number of teeth per corner

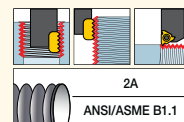
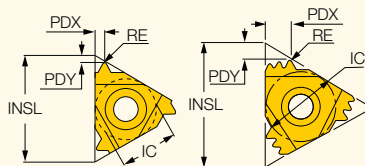
For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

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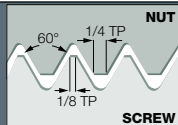
# ISCAR THREAD

## ER/L-UN

External American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



External right-hand shown



### Dimensions

### Tough ↔ Hard

| Designation                       | IC    | TPI <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC228 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
|-----------------------------------|-------|--------------------|-------|------|------|------|---------------------|-------|-------|-------|------|-------|-------|-------|--------|
| 27ER 8 UN 2M IC908 <sup>(2)</sup> | 15.88 | 8.0                | 27.50 | 0.41 | 4.90 | 3.10 | 2                   |       |       |       |      |       |       | •     |        |
| 27ER 4.5 UN IC908                 | 15.88 | 4.5                | 27.50 | 0.75 | 2.70 | 1.90 | 1                   |       |       |       |      |       |       | •     |        |
| 27ER 4 UN IC08                    | 15.88 | 4.0                | 27.50 | 0.85 | 2.90 | 2.00 | 1                   |       |       |       | •    |       |       |       |        |
| 27ER 4 UN IC250                   | 15.88 | 4.0                | 27.50 | 0.85 | 2.90 | 2.00 | 1                   |       |       | •     |      |       |       |       |        |
| 27ER 4 UN IC50M                   | 15.88 | 4.0                | 27.50 | 0.85 | 2.90 | 2.00 | 1                   |       | •     |       |      |       |       |       |        |
| 27ER 4 UN IC908                   | 15.88 | 4.0                | 27.50 | 0.85 | 2.90 | 2.00 | 1                   |       |       |       |      |       |       | •     |        |

• For Insert Identification System, see page 714 • Tolerance: Class 2A • For threading between walls use GRIP-type insert TIP-UN

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer.

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Threads per inch

<sup>(4)</sup> Number of teeth per corner

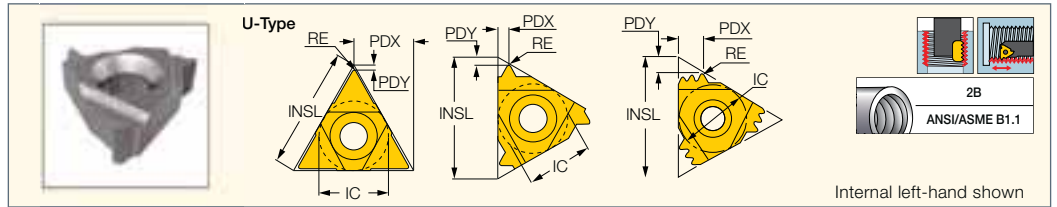
For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

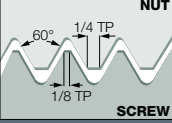




**IR/L-UN**

Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



|  | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |       |      |       |       |       |        |
|-----------------------------------------------------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                   | IC         | TPI <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(5)</sup> | IC228        | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 06IR 32 UN IC228                                                                  | 4.00       | 32.0               | 6.88  | 0.05 | 0.50 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 06IR 28 UN IC908                                                                  | 4.00       | 28.0               | 6.88  | 0.07 | 0.50 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 06IR 28 UN IC228                                                                  | 4.00       | 28.0               | 6.88  | 0.07 | 0.50 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 06IL 24 UN IC228                                                                  | 4.00       | 24.0               | 6.88  | 0.08 | 0.60 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 06IR 24 UN IC228                                                                  | 4.00       | 24.0               | 6.88  | 0.08 | 0.60 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 06IR 24 UN IC908                                                                  | 4.00       | 24.0               | 6.88  | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 06IR 20 UN IC228                                                                  | 4.00       | 20.0               | 6.88  | 0.09 | 0.60 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 06IL 18 UN IC228                                                                  | 4.00       | 18.0               | 6.88  | 0.07 | 0.70 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 06IR 18 UN IC228                                                                  | 4.00       | 18.0               | 6.88  | 0.10 | 0.70 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 32 UN IC228                                                                  | 5.00       | 32.0               | 8.24  | 0.06 | 0.50 | 0.50 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IL 28 UN IC228                                                                  | 5.00       | 28.0               | 8.24  | 0.07 | 0.60 | 0.50 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 28 UN IC228                                                                  | 5.00       | 28.0               | 8.24  | 0.07 | 0.60 | 0.50 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 28 UN IC908                                                                  | 5.00       | 28.0               | 8.24  | 0.07 | 0.60 | 0.50 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 08IR 27 UN IC228                                                                  | 5.00       | 27.0               | 8.24  | 0.08 | 0.50 | 0.50 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IL 24 UN IC228                                                                  | 5.00       | 24.0               | 8.24  | 0.08 | 0.55 | 0.57 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 24 UN IC228                                                                  | 5.00       | 24.0               | 8.24  | 0.08 | 0.60 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 24 UN IC908                                                                  | 5.00       | 24.0               | 8.24  | 0.08 | 0.55 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 08IL 20 UN IC228                                                                  | 5.00       | 20.0               | 8.24  | 0.08 | 0.70 | 0.70 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 20 UN IC228                                                                  | 5.00       | 20.0               | 8.24  | 0.09 | 0.65 | 0.65 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 18 UN IC228                                                                  | 5.00       | 18.0               | 8.24  | 0.12 | 0.70 | 0.50 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 18 UN IC908                                                                  | 5.00       | 18.0               | 8.24  | 0.12 | 0.70 | 0.55 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 08IR 16 UN IC228                                                                  | 5.00       | 16.0               | 8.24  | 0.12 | 0.70 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 14 UN IC228                                                                  | 5.00       | 14.0               | 8.24  | 0.13 | 0.72 | 0.54 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 14 UN IC908                                                                  | 5.00       | 14.0               | 8.24  | 0.13 | 0.72 | 0.54 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 08IR 13 UN IC908                                                                  | 5.00       | 13.0               | 8.24  | 0.14 | 0.85 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 08IR 13 UN IC228                                                                  | 5.00       | 13.0               | 8.24  | 0.14 | 0.85 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08UIRL 13 UN IC908                                                                | 5.00       | 13.0               | 8.66  | 0.14 | 4.33 | 0.75 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 08UIRL 12 UN IC928                                                                | 5.00       | 12.0               | 8.66  | 0.13 | 4.33 | 0.80 | 1                   |              | ●     |       |       |      |       |       |       |        |
| 08UIRL 11 UN IC228                                                                | 5.00       | 11.0               | 8.66  | 0.10 | 4.33 | 0.90 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 11IR 64 UN IC250                                                                  | 6.35       | 64.0               | 11.00 | 0.04 | 0.40 | 0.78 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 48 UN IC250                                                                  | 6.35       | 48.0               | 11.00 | 0.04 | 0.92 | 0.77 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 44 UN IC250                                                                  | 6.35       | 44.0               | 11.00 | 0.04 | 0.92 | 0.77 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 40 UN IC250                                                                  | 6.35       | 40.0               | 11.00 | 0.05 | 0.92 | 0.76 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 36 UN IC908                                                                  | 6.35       | 36.0               | 11.00 | 0.06 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 32 UN IC908                                                                  | 6.35       | 32.0               | 11.00 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 32 UN IC908                                                                  | 6.35       | 32.0               | 11.00 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 32 UN IC908                                                                 | 6.35       | 32.0               | 11.00 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 28 UN IC908                                                                  | 6.35       | 28.0               | 11.00 | 0.04 | 0.70 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 28 UN IC908                                                                  | 6.35       | 28.0               | 11.00 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 28 UN IC908                                                                 | 6.35       | 28.0               | 11.00 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 24 UN IC908                                                                  | 6.35       | 24.0               | 11.00 | 0.07 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 24 UN IC1007                                                                 | 6.35       | 24.0               | 11.00 | 0.07 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 11IR 24 UN IC908                                                                  | 6.35       | 24.0               | 11.00 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 24 UN IC908                                                                 | 6.35       | 24.0               | 11.00 | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 20 UN IC908                                                                  | 6.35       | 20.0               | 11.00 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 20 UN IC908                                                                  | 6.35       | 20.0               | 11.00 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 20 UN IC908                                                                 | 6.35       | 20.0               | 11.00 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 18 UN IC908                                                                  | 6.35       | 18.0               | 11.00 | 0.10 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 18 UN IC1007                                                                 | 6.35       | 18.0               | 11.00 | 0.07 | 1.00 | 0.80 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 11IR 18 UN IC250                                                                  | 6.35       | 18.0               | 11.00 | 0.10 | 1.00 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 18 UN IC908                                                                  | 6.35       | 18.0               | 11.00 | 0.10 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 18 UN IC908                                                                 | 6.35       | 18.0               | 11.00 | 0.10 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |

• For Insert Identification System, see page 714 • Tolerance: class 2B, ANSI B1, 3M-1986. • For technical information and detailed cutting data, see pages 809-825

(1) With pressed chipformer

(2) Multi-tooth

(3) With pressed chipformer.

(4) Threads per inch

(5) Number of teeth per corner

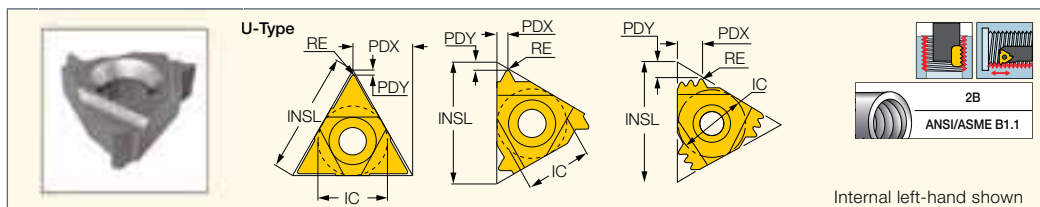
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

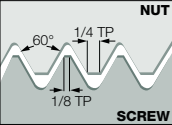
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**ISCAR THREAD**

**IR/L-UN**

Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



|  | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |       |      |       |       |       |        |
|-----------------------------------------------------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                   | IC         | TPI <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(5)</sup> | IC228        | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| Designation                                                                       |            |                    |       |      |      |      |                     |              |       |       |       |      |       |       |       |        |
| 11IL 16 UN IC908                                                                  | 6.35       | 16.0               | 11.00 | 0.11 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       |       |        |
| 11IR 16 UN IC250                                                                  | 6.35       | 16.0               | 11.00 | 0.09 | 1.10 | 0.90 | 1                   |              |       |       | ●     |      |       |       | ●     |        |
| 11IR 16 UN IC1007                                                                 | 6.35       | 16.0               | 11.00 | 0.11 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 11IR 16 UN IC908                                                                  | 6.35       | 16.0               | 11.00 | 0.11 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 16 UN IC908                                                                 | 6.35       | 16.0               | 11.00 | 0.11 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 14 UN IC250                                                                  | 6.35       | 14.0               | 11.00 | 0.10 | 1.10 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IL 14 UN IC908                                                                  | 6.35       | 14.0               | 11.00 | 0.10 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 14 UN IC250                                                                  | 6.35       | 14.0               | 11.00 | 0.10 | 1.10 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 14 UN IC50M                                                                  | 6.35       | 14.0               | 11.00 | 0.13 | 1.00 | 0.90 | 1                   |              |       | ●     |       |      |       |       |       |        |
| 11IR 14 UN IC908                                                                  | 6.35       | 14.0               | 11.00 | 0.13 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 14 UN IC908                                                                 | 6.35       | 14.0               | 11.00 | 0.13 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 13 UN IC908                                                                  | 6.35       | 13.0               | 11.00 | 0.15 | 0.95 | 0.75 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 12 UN IC250                                                                  | 6.35       | 12.0               | 11.00 | 0.15 | 1.00 | 0.75 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 12 UN IC908                                                                  | 6.35       | 12.0               | 11.00 | 0.15 | 1.00 | 0.75 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 12 UN IC908                                                                 | 6.35       | 12.0               | 11.00 | 0.15 | 1.00 | 0.75 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 11 UN IC250                                                                  | 6.35       | 11.0               | 11.00 | 0.14 | 1.10 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 11 UN IC908                                                                  | 6.35       | 11.0               | 11.00 | 0.14 | 1.00 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 10 UN IC908                                                                  | 6.35       | 10.0               | 11.00 | 0.19 | 1.23 | 0.85 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 64 UN IC250                                                                  | 9.52       | 64.0               | 16.49 | 0.04 | 0.40 | 0.58 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 40 UN IC908                                                                  | 9.52       | 40.0               | 16.49 | 0.05 | 0.40 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 36 UN IC908                                                                  | 9.52       | 36.0               | 16.49 | 0.06 | 0.60 | 0.58 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 32 UN IC250                                                                  | 9.52       | 32.0               | 16.49 | 0.04 | 0.60 | 0.60 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 32 UN IC908                                                                  | 9.52       | 32.0               | 16.49 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 28 UN IC908                                                                  | 9.52       | 28.0               | 16.49 | 0.04 | 0.70 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 28 UN IC908                                                                  | 9.52       | 28.0               | 16.49 | 0.05 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 24 UN 2M IC908                                                               | 9.52       | 24.0               | 16.49 | 0.08 | 1.50 | 1.30 | 2                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 24 UN IC250                                                                  | 9.52       | 24.0               | 16.49 | 0.05 | 0.80 | 0.70 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 24 UN IC908                                                                  | 9.52       | 24.0               | 16.49 | 0.08 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 24 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 24.0               | 16.49 | 0.07 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 20 UN IC250                                                                  | 9.52       | 20.0               | 16.49 | 0.06 | 0.90 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 20 UN IC908                                                                  | 9.52       | 20.0               | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 20 UN IC08                                                                   | 9.52       | 20.0               | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 16IR 20 UN IC1007                                                                 | 9.52       | 20.0               | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IR 20 UN IC250                                                                  | 9.52       | 20.0               | 16.49 | 0.06 | 0.90 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 20 UN IC50M                                                                  | 9.52       | 20.0               | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       | ●     |       |      |       |       |       |        |
| 16IR 20 UN IC908                                                                  | 9.52       | 20.0               | 16.49 | 0.09 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 20 UN 2M IC250                                                               | 9.52       | 20.0               | 16.49 | 0.11 | 2.00 | 1.60 | 2                   |              |       |       | ●     |      |       |       |       |        |
| 16IRB 20 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 20.0               | 16.49 | 0.09 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 20 UN IC1007                                                                | 9.52       | 20.0               | 16.49 | 0.06 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IRM 20 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 20.0               | 16.49 | 0.06 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 18 UN IC908                                                                  | 9.52       | 18.0               | 16.49 | 0.08 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 18 UN IC1007                                                                 | 9.52       | 18.0               | 16.49 | 0.12 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IR 18 UN IC250                                                                  | 9.52       | 18.0               | 16.49 | 0.10 | 1.00 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 18 UN IC908                                                                  | 9.52       | 18.0               | 16.49 | 0.10 | 1.00 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 18 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 18.0               | 16.49 | 0.12 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 18 UN IC808 <sup>(1)</sup>                                                  | 9.52       | 18.0               | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |      |       | ●     |       |        |
| 16IRM 18 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 18.0               | 16.49 | 0.08 | 1.00 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 16 UN IC908                                                                  | 9.52       | 16.0               | 16.49 | 0.11 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 16 UN IC250                                                                  | 9.52       | 16.0               | 16.49 | 0.11 | 1.20 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 16 UN IC908                                                                  | 9.52       | 16.0               | 16.49 | 0.11 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 16 UN-2M IC508 <sup>(2)</sup>                                                | 9.52       | 16.0               | 16.49 | 0.09 | 2.30 | 1.50 | 2                   |              |       |       |       |      | ●     |       |       |        |
| 16IR 16 UN-2M IC908                                                               | 9.52       | 16.0               | 16.49 | 0.09 | 2.30 | 1.50 | 2                   |              |       |       |       |      |       |       | ●     |        |

• For Insert Identification System, see page 714 • Tolerance: class 2B, ANSI B1, 3M-1986. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> With pressed chipformer.

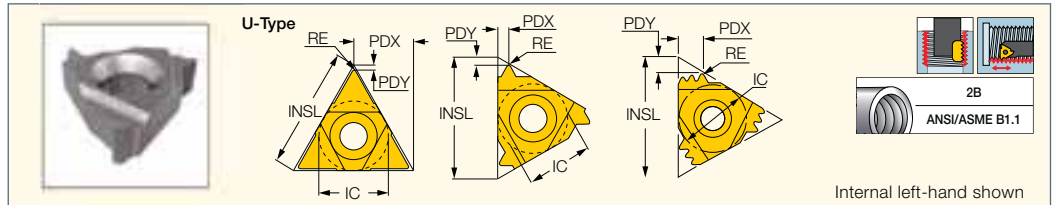
<sup>(4)</sup> Threads per inch

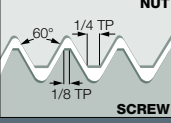
<sup>(5)</sup> Number of teeth per corner

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

**IR/L-UN**

Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



|  | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |       |      |       |       |       |        |
|-----------------------------------------------------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                   | IC         | TPI <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(5)</sup> | IC228        | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| Designation                                                                       |            |                    |       |      |      |      |                     |              |       |       |       |      |       |       |       |        |
| 16IRB 16 UN IC908 <sup>(3)</sup>                                                  | 9.52       | 16.0               | 16.49 | 0.11 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 16 UN IC1007 <sup>(1)</sup>                                                 | 9.52       | 16.0               | 16.49 | 0.09 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IRM 16 UN IC250 <sup>(1)</sup>                                                  | 9.52       | 16.0               | 16.49 | 0.09 | 1.10 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IRM 16 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 16.0               | 16.49 | 0.09 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 14 UN IC250                                                                  | 9.52       | 14.0               | 16.49 | 0.10 | 1.20 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 14 UN IC908                                                                  | 9.52       | 14.0               | 16.49 | 0.13 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 14 UN IC250                                                                  | 9.52       | 14.0               | 16.49 | 0.13 | 1.20 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 14 UN IC908                                                                  | 9.52       | 14.0               | 16.49 | 0.13 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 14 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 14.0               | 16.49 | 0.13 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 14 UN IC1007                                                                | 9.52       | 14.0               | 16.49 | 0.11 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IRM 14 UN IC250 <sup>(1)</sup>                                                  | 9.52       | 14.0               | 16.49 | 0.11 | 1.20 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IRM 14 UN IC808                                                                 | 9.52       | 14.0               | 16.49 | 0.11 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       | ●     |       |        |
| 16IRM 14 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 14.0               | 16.49 | 0.11 | 1.20 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 13 UN IC250                                                                  | 9.52       | 13.0               | 16.49 | 0.14 | 1.00 | 1.50 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 13 UN IC908                                                                  | 9.52       | 13.0               | 16.49 | 0.14 | 1.00 | 1.50 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 12 UN IC250                                                                  | 9.52       | 12.0               | 16.49 | 0.15 | 1.40 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 12 UN IC908                                                                  | 9.52       | 12.0               | 16.49 | 0.15 | 1.10 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 12 UN IC08                                                                   | 9.52       | 12.0               | 16.49 | 0.15 | 1.10 | 1.00 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 16IR 12 UN IC1007                                                                 | 9.52       | 12.0               | 16.49 | 0.15 | 1.10 | 1.00 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IR 12 UN IC250                                                                  | 9.52       | 12.0               | 16.49 | 0.15 | 1.10 | 1.00 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 12 UN IC908                                                                  | 9.52       | 12.0               | 16.49 | 0.15 | 1.10 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 12 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 12.0               | 16.49 | 0.13 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 12 UN IC1007 <sup>(1)</sup>                                                 | 9.52       | 12.0               | 16.49 | 0.12 | 1.40 | 1.10 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IRM 12 UN IC250 <sup>(1)</sup>                                                  | 9.52       | 12.0               | 16.49 | 0.12 | 1.40 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IRM 12 UN IC808 <sup>(1)</sup>                                                  | 9.52       | 12.0               | 16.49 | 0.12 | 1.40 | 1.10 | 1                   |              |       |       |       |      |       | ●     |       |        |
| 16IRM 12 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 12.0               | 16.49 | 0.12 | 1.40 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 11.5 UN IC908                                                                | 9.52       | 11.5               | 16.49 | 0.14 | 1.10 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 11 UN IC908                                                                  | 9.52       | 11.0               | 16.49 | 0.18 | 1.00 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 11 UN IC908                                                                  | 9.52       | 11.0               | 16.49 | 0.18 | 1.00 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 10 UN IC250                                                                  | 9.52       | 10.0               | 16.49 | 0.15 | 1.50 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 10 UN IC908                                                                  | 9.52       | 10.0               | 16.49 | 0.15 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 10 UN IC250                                                                  | 9.52       | 10.0               | 16.49 | 0.15 | 1.50 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 10 UN IC908                                                                  | 9.52       | 10.0               | 16.49 | 0.15 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 10 UN IC908 <sup>(1)</sup>                                                  | 9.52       | 10.0               | 16.49 | 0.15 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 9 UN IC908                                                                   | 9.52       | 9.0                | 16.49 | 0.17 | 1.70 | 1.20 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 8 UN IC08                                                                    | 9.52       | 8.0                | 16.49 | 0.22 | 1.45 | 1.04 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 16IL 8 UN IC250                                                                   | 9.52       | 8.0                | 16.49 | 0.23 | 1.50 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 8 UN IC908                                                                   | 9.52       | 8.0                | 16.49 | 0.23 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 8 UN IC08                                                                    | 9.52       | 8.0                | 16.49 | 0.23 | 1.50 | 1.10 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 16IR 8 UN IC1007                                                                  | 9.52       | 8.0                | 16.49 | 0.23 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IR 8 UN IC250                                                                   | 9.52       | 8.0                | 16.49 | 0.23 | 1.50 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 8 UN IC908                                                                   | 9.52       | 8.0                | 16.49 | 0.23 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 8 UN IC908 <sup>(1)</sup>                                                   | 9.52       | 8.0                | 16.49 | 0.23 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 8 UN IC1007                                                                 | 9.52       | 8.0                | 16.49 | 0.20 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IRM 8 UN IC250 <sup>(1)</sup>                                                   | 9.52       | 8.0                | 16.49 | 0.20 | 1.50 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IRM 8 UN IC808 <sup>(1)</sup>                                                   | 9.52       | 8.0                | 16.49 | 0.20 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       | ●     |       |        |
| 16IRM 8 UN IC908 <sup>(1)</sup>                                                   | 9.52       | 8.0                | 16.49 | 0.20 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 16 UN 3M IC908 <sup>(2)</sup>                                                | 12.70      | 16.0               | 22.00 | 0.07 | 4.00 | 2.50 | 3                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 12 UN 2M IC908 <sup>(2)</sup>                                                | 12.70      | 12.0               | 22.00 | 0.15 | 2.95 | 2.25 | 2                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 12 UN 3M IC908 <sup>(2)</sup>                                                | 12.70      | 12.0               | 22.00 | 0.15 | 5.20 | 3.15 | 3                   |              |       |       |       |      |       |       | ●     |        |
| 22IL 7 UN IC908                                                                   | 12.70      | 7.0                | 22.00 | 0.22 | 2.30 | 1.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 7 UN IC228                                                                   | 12.70      | 7.0                | 22.00 | 0.22 | 2.30 | 1.60 | 1                   | ●            |       |       |       |      |       |       |       |        |

• For Insert Identification System, see page 714 • Tolerance: class 2B, ANSI B1, 3M-1986. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> With pressed chipformer.

<sup>(4)</sup> Threads per inch

<sup>(5)</sup> Number of teeth per corner

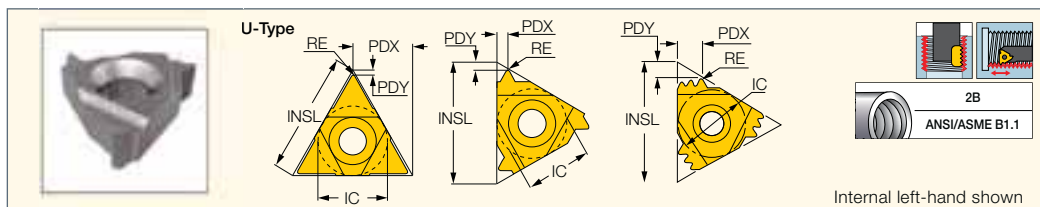
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

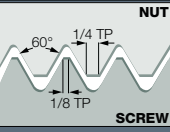
Continued

# ISCAR THREAD

## IR/L-UN

Internal American UN Full Profile (UN, UNC, UNF, UNEF) Laydown Threading Inserts for General Applications



| <div></div> | Dimensions |                    |       |      |       |      |                     | Tough ↔ Hard |       |       |       |      |       |       |       |        |
|----------------------------------------------------------------------------------------------|------------|--------------------|-------|------|-------|------|---------------------|--------------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                              | IC         | TPI <sup>(4)</sup> | INSL  | RE   | PDX   | PDY  | CICT <sup>(5)</sup> | IC228        | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| Designation                                                                                  |            |                    |       |      |       |      |                     |              |       |       |       |      |       |       |       |        |
| 22IR 7 UN IC250                                                                              | 12.70      | 7.0                | 22.00 | 0.22 | 2.30  | 1.60 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 22IR 7 UN IC908                                                                              | 12.70      | 7.0                | 22.00 | 0.22 | 2.30  | 1.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22IL 6 UN IC250                                                                              | 12.70      | 6.0                | 22.00 | 0.27 | 2.30  | 1.57 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 22IL 6 UN IC908                                                                              | 12.70      | 6.0                | 22.00 | 0.27 | 2.30  | 1.57 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 6 UN IC250                                                                              | 12.70      | 6.0                | 22.00 | 0.26 | 2.30  | 1.60 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 22IR 6 UN IC908                                                                              | 12.70      | 6.0                | 22.00 | 0.26 | 2.30  | 1.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 5 UN IC250                                                                              | 12.70      | 5.0                | 22.00 | 0.38 | 2.30  | 1.70 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 22IR 5 UN IC908                                                                              | 12.70      | 5.0                | 22.00 | 0.38 | 2.30  | 1.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22UIRL 4.5 UN IC250                                                                          | 12.70      | 4.5                | 22.00 | 0.36 | 11.00 | 2.40 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 27IR 8 UN 2M IC908 <sup>(2)</sup>                                                            | 15.88      | 8.0                | 27.50 | 0.19 | 4.90  | 3.10 | 2                   |              |       |       |       |      |       |       | ●     |        |
| 27IR 4.5 UN IC908                                                                            | 15.88      | 4.5                | 27.50 | 0.45 | 2.50  | 1.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 27IR 4.5 UN IC250                                                                            | 15.88      | 4.5                | 27.50 | 0.45 | 2.50  | 1.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 27IR 4 UN IC250                                                                              | 15.88      | 4.0                | 27.50 | 0.47 | 2.50  | 1.84 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 27IR 4 UN IC908                                                                              | 15.88      | 4.0                | 27.50 | 0.47 | 2.50  | 1.90 | 1                   |              |       |       |       |      |       |       | ●     |        |

• For Insert Identification System, see page 714 • Tolerance: class 2B, ANSI B1, 3M-1986. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> With pressed chipformer.

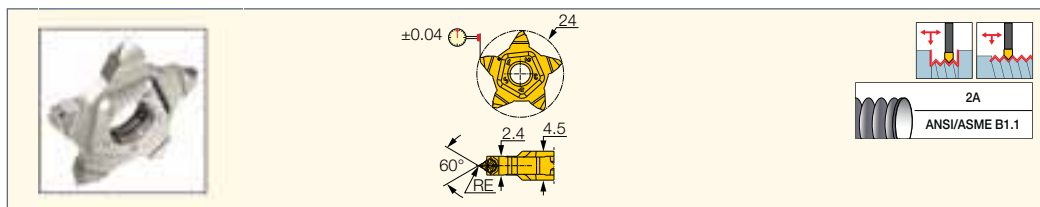
<sup>(4)</sup> Threads per inch

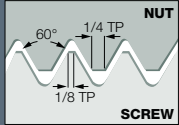
<sup>(5)</sup> Number of teeth per corner

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

**PENTA 24-UN**

American UN (UNC, UNF, UNEF) Precision Ground Full Profile Pentagonal External Inserts with a Chipformer



| <br>Designation | Dimensions         |      |  | IC908 |
|--------------------------------------------------------------------------------------------------|--------------------|------|--|-------|
|                                                                                                  | TPI <sup>(1)</sup> | RE   |  |       |
| PENTA 24-24-UN IC908                                                                             | 24.0               | 0.13 |  | •     |
| PENTA 24-20-UN IC908                                                                             | 20.0               | 0.16 |  | •     |
| PENTA 24-18-UN IC908                                                                             | 18.0               | 0.18 |  | •     |
| PENTA 24-16-UN IC908                                                                             | 16.0               | 0.21 |  | •     |
| PENTA 24-14-UN IC908                                                                             | 14.0               | 0.23 |  | •     |

• DMN(inch)=5.435/TPI • Tolerance: Class 2A

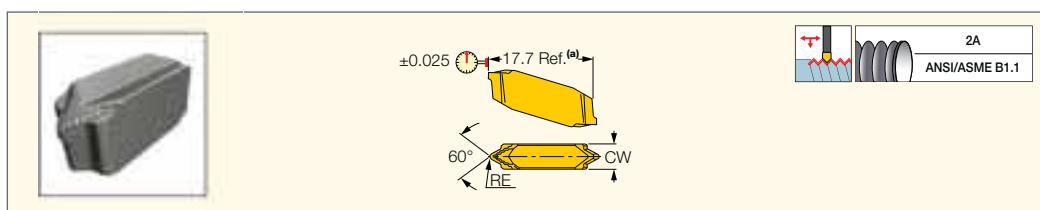
<sup>(1)</sup> Threads per inch

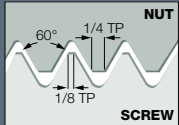
For tools, see pages: NQCH-PCHR/L-24-JHP (348) • PCAD RE/LE-JHP (561) • PCADR/L (353) • PCADR/L-JHP (353) • PCHBR/L (355)

• PCHR/L-24 (346) • PCHR/L-24-JHP (347) • PCHR/L-24-JHP-MC (348)

**CUTGRIP**
**ISCARTHREAD**
**TIP-P-UN**

American UN (UNC, UNF, UNEF) Precision Ground External Double-Ended Full Profile Threading Inserts with a Chipformer



| <br>Designation | Dimensions |      |                      |                    | Tough ↔ Hard |       |       |
|---------------------------------------------------------------------------------------------------|------------|------|----------------------|--------------------|--------------|-------|-------|
|                                                                                                   | CW         | RE   | RETOL <sup>(1)</sup> | TPI <sup>(2)</sup> | IC08         | IC808 | IC908 |
| TIP 2P32-UN IC08                                                                                  | 2.40       | 0.10 | 0.030                | 32.0               | •            |       |       |
| TIP 2P32-UN IC908                                                                                 | 2.40       | 0.10 | 0.030                | 32.0               |              |       | •     |
| TIP 2P28-UN IC08                                                                                  | 2.40       | 0.11 | 0.030                | 28.0               | •            |       |       |
| TIP 2P28-UN IC908                                                                                 | 2.40       | 0.11 | 0.030                | 28.0               |              |       | •     |
| TIP 2P24-UN IC08                                                                                  | 2.40       | 0.13 | 0.030                | 24.0               | •            |       |       |
| TIP 2P24-UN IC908                                                                                 | 2.40       | 0.13 | 0.030                | 24.0               |              |       | •     |
| TIP 2P20-UN IC08                                                                                  | 2.40       | 0.16 | 0.030                | 20.0               | •            |       |       |
| TIP 2P20-UN IC908                                                                                 | 2.40       | 0.16 | 0.030                | 20.0               |              |       | •     |
| TIP 2P18-UN IC08                                                                                  | 2.40       | 0.18 | 0.030                | 18.0               | •            |       |       |
| TIP 2P18-UN IC908                                                                                 | 2.40       | 0.18 | 0.030                | 18.0               |              |       | •     |
| TIP 2P16-UN IC08                                                                                  | 2.40       | 0.20 | 0.030                | 16.0               | •            |       |       |
| TIP 2P16-UN IC908                                                                                 | 2.40       | 0.20 | 0.030                | 16.0               |              |       | •     |
| TIP 2P14-UN IC08                                                                                  | 2.40       | 0.23 | 0.030                | 14.0               | •            |       |       |
| TIP 2P14-UN IC908                                                                                 | 2.40       | 0.23 | 0.030                | 14.0               |              |       | •     |
| TIP 2P13-UN IC08                                                                                  | 2.40       | 0.25 | 0.030                | 13.0               | •            |       |       |
| TIP 2P13-UN IC908                                                                                 | 2.40       | 0.25 | 0.030                | 13.0               |              |       | •     |
| TIP 2P12-UN IC08                                                                                  | 2.40       | 0.27 | 0.030                | 12.0               | •            |       |       |
| TIP 2P12-UN IC908                                                                                 | 2.40       | 0.27 | 0.030                | 12.0               |              |       | •     |
| TIP 4P11-UN IC908                                                                                 | 4.00       | 0.30 | 0.030                | 11.0               |              |       | •     |
| TIP 4P10-UN IC808                                                                                 | 4.00       | 0.33 | 0.050                | 10.0               |              | •     |       |
| TIP 4P10-UN IC908                                                                                 | 4.00       | 0.33 | 0.050                | 10.0               |              |       | •     |
| TIP 4P08-UN IC908                                                                                 | 4.00       | 0.41 | 0.050                | 8.0                |              |       | •     |

• (a) TIP inserts are 1.6 mm longer than GIP in the same pocket • Toolholder seat needs to be modified according to insert profile to ensure clearance

<sup>(1)</sup> Corner radius tolerance (+/-)

<sup>(2)</sup> Threads per inch

For tools, see pages: C#-GHDR/L (301) • CGHN-D (310) • CGHN-DG (310) • CGHN-S (309) • CGPAD (308) • CGPAD-JHP (309) • GHDR/L (short pocket) (302)

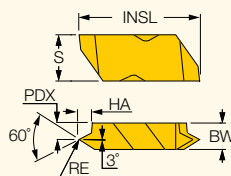
• GHDR/L-JHP (short pocket) (303) • GHDR/L-JHP-MC (short pocket) (304) • GHGR/L (305) • GHMPR/L (300) • GHMR/L (300) • GHSLR/L (428)

• GHSLR/L-JHP-SL (429) • NQCH-GHSLR/L-JHP (428)

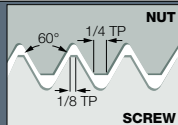
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**UN THREADING FLTC-E**

Double-Ended, Precision, Flat  
Top Full Profile Threading Inserts



Right-hand shown



Dimensions

| Designation        | TPI <sup>(1)</sup> | RE   | HA   | PDX  | BW   | S    | INSL  | IC908 |
|--------------------|--------------------|------|------|------|------|------|-------|-------|
| FLTC-3R/L7E IC908  | 7.0                | 0.43 | 2.74 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L8E IC908  | 8.0                | 0.38 | 2.39 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L9E IC908  | 9.0                | 0.33 | 2.13 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L10E IC908 | 10.0               | 0.30 | 1.93 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L11E IC908 | 11.0               | 0.28 | 1.75 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L12E IC908 | 12.0               | 0.25 | 1.30 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L14E IC908 | 14.0               | 0.23 | 1.37 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L16E IC908 | 16.0               | 0.20 | 1.17 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L18E IC908 | 18.0               | 0.18 | 1.04 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L20E IC908 | 20.0               | 0.15 | 0.94 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L24E IC908 | 24.0               | 0.13 | 0.79 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L28E IC908 | 28.0               | 0.08 | 0.58 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L32E IC908 | 32.0               | 0.08 | 0.53 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |

• For internal thread limits, see pages 822-823

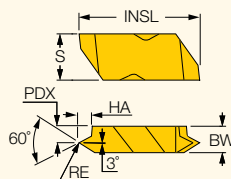
<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLSR/L (807)

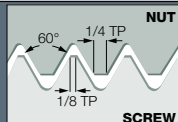
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**UN THREADING FLTC-I**

Double-Ended, Precision, Flat  
Top Full Profile Threading Inserts



Right-hand shown



Dimensions

| Designation        | TPI <sup>(1)</sup> | RE   | HA   | PDX  | BW   | S    | INSL  | IC908 |
|--------------------|--------------------|------|------|------|------|------|-------|-------|
| FLTC-3R/L7I IC908  | 7.0                | 0.23 | 2.34 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L8I IC908  | 8.0                | 0.18 | 2.06 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L9I IC908  | 9.0                | 0.15 | 1.83 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L10I IC908 | 10.0               | 0.13 | 1.65 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L11I IC908 | 11.0               | 0.13 | 1.50 | 2.70 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L12I IC908 | 12.0               | 0.10 | 1.22 | 3.80 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L14I IC908 | 14.0               | 0.08 | 1.12 | 3.76 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L16I IC908 | 16.0               | 0.08 | 1.02 | 3.76 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L18I IC908 | 18.0               | 0.08 | 0.91 | 3.76 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L20I IC908 | 20.0               | 0.08 | 0.79 | 3.76 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L24I IC908 | 24.0               | 0.08 | 0.66 | 3.76 | 4.95 | 8.74 | 22.60 | ●     |
| FLTC-3R/L28I IC908 | 28.0               | 0.08 | 0.58 | 3.76 | 4.95 | 8.74 | 22.60 | ●     |

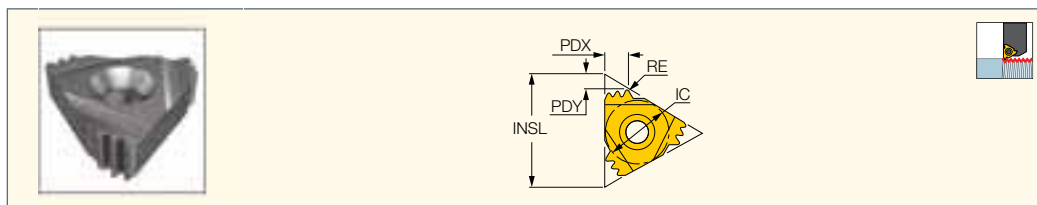
• For internal thread limits, see pages 822-823

<sup>(1)</sup> Threads per inch

## QUICKTHREAD

### ER-W 3M-Q

External Whitworth (BSW, BSF, BSP) B.S.84-1956 DIN 259 Medium Class Full Profile Laydown Threading Inserts



| Designation                 | Dimensions |                    |       |      |      |      |                     | IC908 |
|-----------------------------|------------|--------------------|-------|------|------|------|---------------------|-------|
|                             | IC         | TPI <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(2)</sup> |       |
| <b>22ER 14 W 3M-Q IC908</b> | 12.70      | 14.0               | 22.00 | 0.23 | 4.30 | 2.60 | 3                   | •     |

#### NEW

- For Insert Identification System, see page 714 • For threading between walls use GRIP-type insert TIP-BSW • Tolerance: medium class
- For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Threads per inch

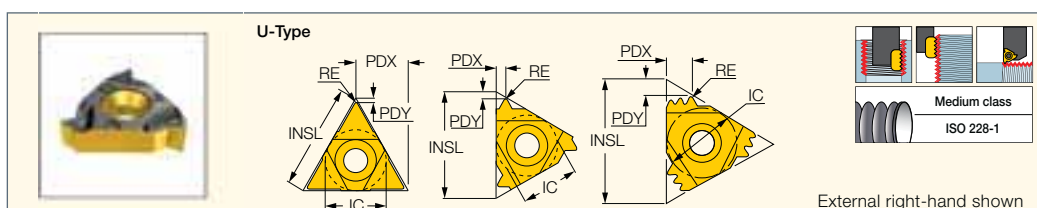
<sup>(2)</sup> Number of teeth per corner

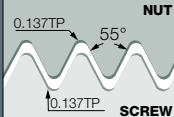
For tools, see pages: C#-SER/L (799) • SER-D (800) • SER/L (798)

## ISCARTHREAD

### ER/L-W

External Whitworth (BSW, BSF, BSP) B.S.84-1956 DIN 259 Medium Class Full Profile Laydown Threading Inserts



|  | Dimensions  |      |                    |      |    |                     |      | Tough ↔ Hard |       |       |       |      |       |       |       |        |
|------------------------------------------------------------------------------------|-------------|------|--------------------|------|----|---------------------|------|--------------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                    | Designation | IC   | TPI <sup>(3)</sup> | INSL | RE | CICT <sup>(4)</sup> | PDX  | PDY          | IC228 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 11ER/L 19 W IC908                                                                  | 6.35        | 19.0 | 11.00              | 0.15 | 1  | 1.00                | 0.80 |              |       |       |       |      |       |       | ●     |        |
| 11ER 14 W IC908                                                                    | 6.35        | 14.0 | 11.00              | 0.23 | 1  | 1.00                | 0.70 |              |       |       |       |      |       |       | ●     |        |
| 16ER 32 W IC50M                                                                    | 9.52        | 32.0 | 16.49              | 0.09 | 1  | 0.60                | 0.60 |              | ●     |       |       |      |       |       |       |        |
| 16ER 28 W IC1007                                                                   | 9.52        | 28.0 | 16.49              | 0.11 | 1  | 0.70                | 0.60 |              |       |       |       |      |       |       |       | ●      |
| 16ER 28 W IC250                                                                    | 9.52        | 28.0 | 16.49              | 0.11 | 1  | 0.70                | 0.60 |              |       |       | ●     |      |       |       |       |        |
| 16ER 28 W IC908                                                                    | 9.52        | 28.0 | 16.49              | 0.11 | 1  | 0.70                | 0.60 |              |       |       |       |      |       |       | ●     |        |
| 16ER 26 W IC908                                                                    | 9.52        | 26.0 | 16.49              | 0.12 | 1  | 0.70                | 0.70 |              |       |       |       |      |       |       | ●     |        |
| 16ER 24 W IC908                                                                    | 9.52        | 24.0 | 16.49              | 0.14 | 1  | 0.80                | 0.70 |              |       |       |       |      |       |       | ●     |        |
| 16ER 22 W IC908                                                                    | 9.52        | 22.0 | 16.49              | 0.13 | 1  | 0.90                | 0.80 |              |       |       |       |      |       |       | ●     |        |
| 16ER 20 W IC908                                                                    | 9.52        | 20.0 | 16.49              | 0.16 | 1  | 0.80                | 0.70 |              |       |       |       |      |       |       | ●     |        |
| 16ER/L 19 W IC908                                                                  | 9.52        | 19.0 | 16.49              | 0.17 | 1  | 0.80                | 0.70 |              |       |       |       |      |       |       | ●     |        |
| 16ER 19 W IC1007                                                                   | 9.52        | 19.0 | 16.49              | 0.17 | 1  | 0.80                | 0.70 |              |       |       |       |      |       |       |       | ●      |
| 16ER 19 W IC228                                                                    | 9.52        | 19.0 | 16.49              | 0.17 | 1  | 0.80                | 0.70 | ●            |       |       |       |      |       |       |       |        |
| 16ER 19 W IC250                                                                    | 9.52        | 19.0 | 16.49              | 0.17 | 1  | 0.80                | 0.70 |              |       |       | ●     |      |       |       |       |        |
| 16ERB 19 W IC908 <sup>(1)</sup>                                                    | 9.52        | 19.0 | 16.49              | 0.17 | 1  | 0.80                | 0.70 |              |       |       |       |      |       |       | ●     |        |
| 16ERM 19 W IC1007 <sup>(1)</sup>                                                   | 9.52        | 19.0 | 16.49              | 0.16 | 1  | 1.00                | 0.80 |              |       |       |       |      |       |       |       | ●      |
| 16ERM 19 W IC250 <sup>(1)</sup>                                                    | 9.52        | 19.0 | 16.49              | 0.16 | 1  | 1.00                | 0.80 |              |       |       | ●     |      |       |       |       |        |
| 16ERM 19 W IC50M <sup>(1)</sup>                                                    | 9.52        | 19.0 | 16.49              | 0.16 | 1  | 1.00                | 0.80 |              | ●     |       |       |      |       |       |       |        |
| 16ERM 19 W IC808 <sup>(1)</sup>                                                    | 9.52        | 19.0 | 16.49              | 0.16 | 1  | 1.00                | 0.80 |              |       |       |       |      |       | ●     |       |        |
| 16ERM 19 W IC908 <sup>(1)</sup>                                                    | 9.52        | 19.0 | 16.49              | 0.16 | 1  | 1.00                | 0.80 |              |       |       |       |      |       |       | ●     |        |
| 16ER/L 18 W IC908                                                                  | 9.52        | 18.0 | 16.49              | 0.19 | 1  | 1.15                | 1.10 |              |       |       |       |      |       |       | ●     |        |
| 16ER 18 W IC50M                                                                    | 9.52        | 18.0 | 16.49              | 0.19 | 1  | 1.15                | 1.10 |              | ●     |       |       |      |       |       |       |        |
| 16ER 16 W IC908                                                                    | 9.52        | 16.0 | 16.49              | 0.20 | 1  | 1.20                | 0.90 |              |       |       |       |      |       |       | ●     |        |
| 16ERB 16 W IC908 <sup>(1)</sup>                                                    | 9.52        | 16.0 | 16.49              | 0.20 | 1  | 1.20                | 0.90 |              |       |       |       |      |       |       | ●     |        |
| 16ERM 16 W IC1007                                                                  | 9.52        | 16.0 | 16.49              | 0.20 | 1  | 1.10                | 0.90 |              |       |       |       |      |       |       |       | ●      |
| 16ERM 16 W IC250 <sup>(1)</sup>                                                    | 9.52        | 16.0 | 16.49              | 0.20 | 1  | 1.10                | 0.90 |              |       |       | ●     |      |       |       |       |        |
| 16ERM 16 W IC808 <sup>(1)</sup>                                                    | 9.52        | 16.0 | 16.49              | 0.20 | 1  | 1.10                | 0.90 |              |       |       |       |      |       | ●     |       |        |
| 16ERM 16 W IC908 <sup>(1)</sup>                                                    | 9.52        | 16.0 | 16.49              | 0.20 | 1  | 1.10                | 0.90 |              |       |       |       |      |       |       | ●     |        |
| 16ER/L 14 W IC908                                                                  | 9.52        | 14.0 | 16.49              | 0.23 | 1  | 1.20                | 1.00 |              |       |       |       |      |       |       | ●     |        |
| 16ER 14 W IC228                                                                    | 9.52        | 14.0 | 16.49              | 0.23 | 1  | 1.20                | 1.00 | ●            |       |       |       |      |       |       |       |        |
| 16ER 14 W IC250                                                                    | 9.52        | 14.0 | 16.49              | 0.23 | 1  | 1.20                | 1.00 |              |       |       | ●     |      |       |       |       |        |

- For Insert Identification System, see page 714 • For threading between walls use GRIP-type insert TIP-BSW • Tolerance: medium class
- For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Threads per inch

<sup>(4)</sup> Number of teeth per corner

For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

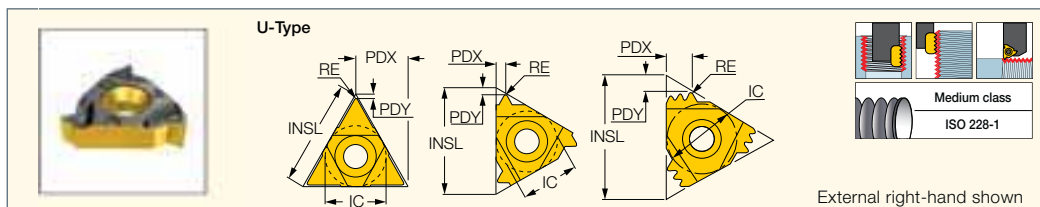


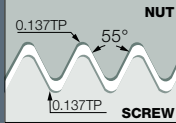
Continued

**ISCAR THREAD**

**ER/L-W**

External Whitworth (BSW, BSF, BSP) B.S.84-1956 DIN 259 Medium Class Full Profile Laydown Threading Inserts



| <br><b>Designation</b> | Dimensions |                    |       |      |                     |       |      | Tough ↔ Hard |       |       |      |       |       |       |        |
|---------------------------------------------------------------------------------------------------------|------------|--------------------|-------|------|---------------------|-------|------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                                                                                         | IC         | TPI <sup>(3)</sup> | INSL  | RE   | CICT <sup>(4)</sup> | PDX   | PDY  | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16ER 14 W 2M IC908 <sup>(2)</sup>                                                                       | 9.52       | 14.0               | 16.49 | 0.21 | 2                   | 2.70  | 1.70 |              |       |       |      |       |       | •     |        |
| 16ERB 14 W IC908 <sup>(1)</sup>                                                                         | 9.52       | 14.0               | 16.49 | 0.23 | 1                   | 1.20  | 1.00 |              |       |       |      |       |       | •     |        |
| 16ERM 14 W IC1007 <sup>(1)</sup>                                                                        | 9.52       | 14.0               | 16.49 | 0.24 | 1                   | 1.20  | 1.00 |              |       |       |      |       |       |       | •      |
| 16ERM 14 W IC250 <sup>(1)</sup>                                                                         | 9.52       | 14.0               | 16.49 | 0.24 | 1                   | 1.20  | 1.00 |              |       | •     |      |       |       |       |        |
| 16ERM 14 W IC50M <sup>(1)</sup>                                                                         | 9.52       | 14.0               | 16.49 | 0.24 | 1                   | 1.20  | 1.00 |              | •     |       |      |       |       |       |        |
| 16ERM 14 W IC808 <sup>(1)</sup>                                                                         | 9.52       | 14.0               | 16.49 | 0.24 | 1                   | 1.20  | 1.00 |              |       |       |      |       | •     |       |        |
| 16ERM 14 W IC908 <sup>(1)</sup>                                                                         | 9.52       | 14.0               | 16.49 | 0.24 | 1                   | 1.20  | 1.00 |              |       |       |      |       |       | •     |        |
| 16ER/L 12 W IC908                                                                                       | 9.52       | 12.0               | 16.49 | 0.27 | 1                   | 1.40  | 1.20 |              |       |       |      |       |       | •     |        |
| 16ER/L 11 W IC250                                                                                       | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 |              |       | •     |      |       |       | •     |        |
| 16ER/L 11 W IC908                                                                                       | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 |              |       |       |      |       |       | •     |        |
| 16ER 11 W IC08                                                                                          | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 |              |       |       | •    |       |       |       |        |
| 16ER 11 W IC1007                                                                                        | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 |              |       |       |      |       |       |       | •      |
| 16ER 11 W IC228                                                                                         | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 | •            |       |       |      |       |       |       |        |
| 16ER 11 W IC50M                                                                                         | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 |              | •     |       |      |       |       |       |        |
| 16ER 11 W IC508                                                                                         | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 |              |       |       |      | •     |       |       |        |
| 16ERB 11 W IC908 <sup>(1)</sup>                                                                         | 9.52       | 11.0               | 16.49 | 0.29 | 1                   | 1.50  | 1.10 |              |       |       |      |       |       | •     |        |
| 16ERM 11 W IC1007 <sup>(1)</sup>                                                                        | 9.52       | 11.0               | 16.49 | 0.27 | 1                   | 1.50  | 1.10 |              |       |       |      |       |       |       | •      |
| 16ERM 11 W IC250 <sup>(1)</sup>                                                                         | 9.52       | 11.0               | 16.49 | 0.27 | 1                   | 1.50  | 1.10 |              |       | •     |      |       |       |       |        |
| 16ERM 11 W IC508 <sup>(1)</sup>                                                                         | 9.52       | 11.0               | 16.49 | 0.27 | 1                   | 1.50  | 1.10 |              |       |       |      | •     |       |       |        |
| 16ERM 11 W IC808 <sup>(1)</sup>                                                                         | 9.52       | 11.0               | 16.49 | 0.27 | 1                   | 1.50  | 1.10 |              |       |       |      |       | •     |       |        |
| 16ERM 11 W IC908 <sup>(1)</sup>                                                                         | 9.52       | 11.0               | 16.49 | 0.27 | 1                   | 1.50  | 1.10 |              |       |       |      |       |       | •     |        |
| 16ER 10 W IC250                                                                                         | 9.52       | 10.0               | 16.49 | 0.32 | 1                   | 1.45  | 1.10 |              |       | •     |      |       |       |       |        |
| 16ER 10 W IC908                                                                                         | 9.52       | 10.0               | 16.49 | 0.32 | 1                   | 1.45  | 1.10 |              |       |       |      |       |       | •     |        |
| 16ERB 10 W IC908 <sup>(1)</sup>                                                                         | 9.52       | 10.0               | 16.49 | 0.32 | 1                   | 1.45  | 1.10 |              |       |       |      |       |       | •     |        |
| 16ER 9 W IC250                                                                                          | 9.52       | 9.0                | 16.49 | 0.34 | 1                   | 1.70  | 1.20 |              |       | •     |      |       |       |       |        |
| 16EL 8 W IC908                                                                                          | 9.52       | 8.0                | 16.49 | 0.39 | 1                   | 1.50  | 1.20 |              |       |       |      |       |       | •     |        |
| 16ER 8 W IC908                                                                                          | 9.52       | 8.0                | 16.49 | 0.41 | 1                   | 1.60  | 1.20 |              |       |       |      |       |       | •     |        |
| 22ER 14 W 3M IC908 <sup>(2)</sup>                                                                       | 12.70      | 14.0               | 22.00 | 0.21 | 3                   | 4.50  | 2.80 |              |       |       |      |       |       | •     |        |
| 22ER 11 W 2M IC908 <sup>(2)</sup>                                                                       | 12.70      | 11.0               | 22.00 | 0.09 | 2                   | 3.40  | 2.20 |              |       |       |      |       |       | •     |        |
| 22ER 7 W IC908                                                                                          | 12.70      | 7.0                | 22.00 | 0.45 | 1                   | 2.30  | 1.60 |              |       |       |      |       |       | •     |        |
| 22ER 6 W IC908                                                                                          | 12.70      | 6.0                | 22.00 | 0.52 | 1                   | 2.30  | 1.60 |              |       |       |      |       |       | •     |        |
| 22ER 5 W IC250                                                                                          | 12.70      | 5.0                | 22.00 | 0.65 | 1                   | 2.40  | 1.70 |              |       | •     |      |       |       |       |        |
| 27ER 4 W IC908                                                                                          | 15.88      | 4.0                | 27.50 | 0.85 | 1                   | 2.90  | 2.00 |              |       |       |      |       |       | •     |        |
| 27UEIRL 3.5 W IC908                                                                                     | 15.88      | 3.5                | 27.50 | 0.95 | 1                   | 13.70 | 2.10 |              |       |       |      |       |       | •     |        |

- For Insert Identification System, see page 714 • For threading between walls use GRIP-type insert TIP-BSW • Tolerance: medium class
- For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

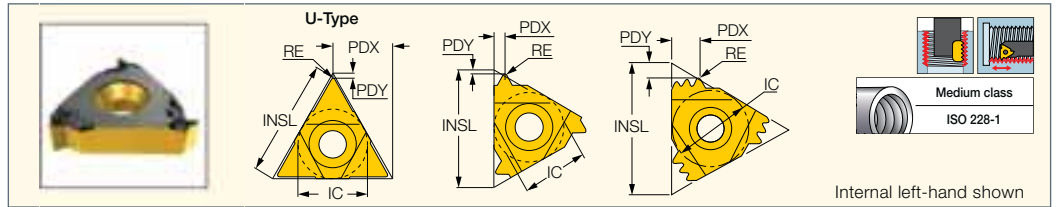
<sup>(3)</sup> Threads per inch

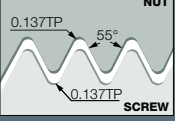
<sup>(4)</sup> Number of teeth per corner

**For tools, see pages:** C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

**IR/L-W**

Internal Whitworth (BSW, BSF, BSP) B.S.84-1956 DIN 259 Medium Class Full Profile Laydown Threading Inserts



|  | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |       |      |       |       |       |        |
|-----------------------------------------------------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|------|-------|-------|-------|--------|
|                                                                                   | IC         | TPI <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(5)</sup> | IC228        | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| Designation                                                                       |            |                    |       |      |      |      |                     |              |       |       |       |      |       |       |       |        |
| 06IR 26 W IC228                                                                   | 4.00       | 26.0               | 6.88  | 0.10 | 0.60 | 0.70 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 28 W IC228                                                                   | 5.00       | 28.0               | 8.24  | 0.12 | 0.60 | 0.50 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 19 W IC228                                                                   | 5.00       | 19.0               | 8.24  | 0.16 | 0.70 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 19 W IC908                                                                   | 5.00       | 19.0               | 8.24  | 0.16 | 0.70 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 08IR 19 W IC928                                                                   | 5.00       | 19.0               | 8.24  | 0.16 | 0.70 | 0.60 | 1                   |              | ●     |       |       |      |       |       |       |        |
| 08IR 18 W IC228                                                                   | 5.00       | 18.0               | 8.24  | 0.16 | 0.70 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 08IR 16 W IC228                                                                   | 5.00       | 16.0               | 8.24  | 0.18 | 0.70 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 11IR 36 W IC08                                                                    | 6.35       | 36.0               | 11.00 | 0.08 | 0.60 | 0.60 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 11IR 28 W IC250                                                                   | 6.35       | 28.0               | 11.00 | 0.13 | 0.60 | 0.60 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IRB 28 W IC908                                                                  | 6.35       | 28.0               | 11.00 | 0.10 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 26 W IC228                                                                   | 6.35       | 26.0               | 11.00 | 0.12 | 0.60 | 0.60 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 11IL 24 W IC908                                                                   | 6.35       | 24.0               | 11.00 | 0.15 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 24 W IC908                                                                   | 6.35       | 24.0               | 11.00 | 0.15 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 24 W IC908                                                                  | 6.35       | 24.0               | 11.00 | 0.11 | 0.60 | 0.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 20 W IC250                                                                   | 6.35       | 20.0               | 11.00 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 20 W IC908                                                                   | 6.35       | 20.0               | 11.00 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 20 W IC908                                                                  | 6.35       | 20.0               | 11.00 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 19 W IC1007                                                                  | 6.35       | 19.0               | 11.00 | 0.18 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 11IR 19 W IC250                                                                   | 6.35       | 19.0               | 11.00 | 0.18 | 0.90 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 19 W IC908                                                                   | 6.35       | 19.0               | 11.00 | 0.18 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 19 W IC908                                                                  | 6.35       | 19.0               | 11.00 | 0.17 | 0.90 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 18 W IC908                                                                   | 6.35       | 18.0               | 11.00 | 0.16 | 1.00 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 18 W IC908                                                                   | 6.35       | 18.0               | 11.00 | 0.18 | 1.00 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 18 W IC908                                                                  | 6.35       | 18.0               | 11.00 | 0.18 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 16 W IC908                                                                   | 6.35       | 16.0               | 11.00 | 0.18 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 16 W IC908                                                                  | 6.35       | 16.0               | 11.00 | 0.18 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IL 14 W IC908                                                                   | 6.35       | 14.0               | 11.00 | 0.23 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IR 14 W IC08                                                                    | 6.35       | 14.0               | 11.00 | 0.23 | 1.10 | 0.90 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 11IR 14 W IC1007                                                                  | 6.35       | 14.0               | 11.00 | 0.23 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 11IR 14 W IC228                                                                   | 6.35       | 14.0               | 11.00 | 0.23 | 1.10 | 0.90 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 11IR 14 W IC250                                                                   | 6.35       | 14.0               | 11.00 | 0.23 | 1.10 | 0.90 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 11IR 14 W IC908                                                                   | 6.35       | 14.0               | 11.00 | 0.23 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 11IRB 14 W IC908                                                                  | 6.35       | 14.0               | 11.00 | 0.23 | 1.00 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 32 W IC50M                                                                   | 9.52       | 32.0               | 16.49 | 0.09 | 0.60 | 0.60 | 1                   |              |       | ●     |       |      |       |       |       |        |
| 16IR 28 W IC250                                                                   | 9.52       | 28.0               | 16.49 | 0.09 | 0.70 | 0.60 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 26 W IC908                                                                   | 9.52       | 26.0               | 16.49 | 0.12 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 24 W IC908                                                                   | 9.52       | 24.0               | 16.49 | 0.11 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 22 W IC908                                                                   | 9.52       | 22.0               | 16.49 | 0.13 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 20 W IC250                                                                   | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 20 W IC908                                                                   | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 20 W IC250                                                                   | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 20 W IC908                                                                   | 9.52       | 20.0               | 16.49 | 0.16 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 20 W IC908 <sup>(1)</sup>                                                   | 9.52       | 20.0               | 16.49 | 0.14 | 0.90 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 19 W IC250                                                                   | 9.52       | 19.0               | 16.49 | 0.17 | 0.80 | 0.70 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 19 W IC908                                                                   | 9.52       | 19.0               | 16.49 | 0.17 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 19 W IC908 <sup>(1)</sup>                                                   | 9.52       | 19.0               | 16.49 | 0.17 | 0.80 | 0.70 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 19 W IC250 <sup>(1)</sup>                                                   | 9.52       | 19.0               | 16.49 | 0.15 | 1.00 | 0.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 18 W IC908                                                                   | 9.52       | 18.0               | 16.49 | 0.18 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 18 W IC908                                                                   | 9.52       | 18.0               | 16.49 | 0.18 | 0.80 | 0.80 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 16 W IC908                                                                   | 9.52       | 16.0               | 16.49 | 0.20 | 1.00 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 16 W IC908 <sup>(1)</sup>                                                   | 9.52       | 16.0               | 16.49 | 0.20 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 16 W IC808 <sup>(2)</sup>                                                   | 9.52       | 16.0               | 16.49 | 0.18 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       | ●     |       |        |
| 16IRM 16 W IC908 <sup>(1)</sup>                                                   | 9.52       | 16.0               | 16.49 | 0.18 | 1.10 | 0.90 | 1                   |              |       |       |       |      |       |       | ●     |        |

• For Insert Identification System, see page 714 • Tolerance: medium class • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> With pressed chipformer.

<sup>(3)</sup> Multi-tooth

<sup>(4)</sup> Threads per inch

<sup>(5)</sup> Number of teeth per corner

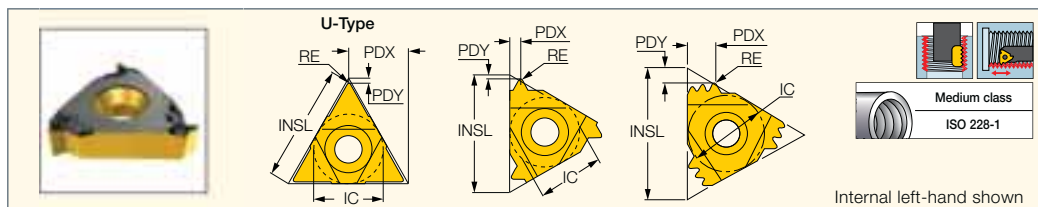
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

Continued

**ISCAR THREAD**

**IR/L-W**

Internal Whitworth (BSW, BSF, BSP) B.S.84-1956 DIN 259 Medium Class Full Profile Laydown Threading Inserts



| Designation                       | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |       |      |       |       |       |        |
|-----------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|------|-------|-------|-------|--------|
|                                   | IC         | TPI <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(5)</sup> | IC228        | IC928 | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 16IL 14 W IC908                   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 14 W IC08                    | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 16IR 14 W IC1007                  | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IR 14 W IC228                   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 16IR 14 W IC250                   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 14 W IC908                   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 14 W 2M IC1007               | 9.52       | 14.0               | 16.49 | 0.19 | 2.60 | 1.70 | 2                   |              |       |       |       |      |       |       |       | ●      |
| 16IR 14 W 2M IC908 <sup>(3)</sup> | 9.52       | 14.0               | 16.49 | 0.23 | 2.60 | 1.70 | 2                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 14 W IC908 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 14 W IC1007 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IRM 14 W IC250 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IRM 14 W IC808 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       | ●     |       |        |
| 16IRM 14 W IC908 <sup>(1)</sup>   | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 12 W IC908                   | 9.52       | 12.0               | 16.49 | 0.27 | 1.50 | 1.20 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IL 11 W IC908                   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 11 W IC08                    | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       |       |       | ●    |       |       |       |        |
| 16IR 11 W IC1007                  | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IR 11 W IC228                   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   | ●            |       |       |       |      |       |       |       |        |
| 16IR 11 W IC250                   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IR 11 W IC50M                   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       | ●     |       |      |       |       |       |        |
| 16IR 11 W IC908                   | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 11 W IC908 <sup>(1)</sup>   | 9.52       | 11.0               | 16.49 | 0.28 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRM 11 W IC1007 <sup>(1)</sup>  | 9.52       | 11.0               | 16.49 | 0.27 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       |       | ●      |
| 16IRM 11 W IC250 <sup>(1)</sup>   | 9.52       | 11.0               | 16.49 | 0.27 | 1.50 | 1.10 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IRM 11 W IC508 <sup>(1)</sup>   | 9.52       | 11.0               | 16.49 | 0.27 | 1.50 | 1.10 | 1                   |              |       |       |       |      | ●     |       |       |        |
| 16IRM 11 W IC808 <sup>(1)</sup>   | 9.52       | 11.0               | 16.49 | 0.27 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       | ●     |       |        |
| 16IRM 11 W IC908 <sup>(1)</sup>   | 9.52       | 11.0               | 16.49 | 0.27 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 10 W IC908                   | 9.52       | 10.0               | 16.49 | 0.32 | 1.10 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IRB 10 W IC908 <sup>(1)</sup>   | 9.52       | 10.0               | 16.49 | 0.31 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 9 W IC250                    | 9.52       | 9.0                | 16.49 | 0.34 | 1.70 | 1.20 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 16IL 8 W IC50M                    | 9.52       | 8.0                | 16.49 | 0.41 | 1.10 | 1.10 | 1                   |              |       | ●     |       |      |       |       |       |        |
| 16IL 8 W IC908                    | 9.52       | 8.0                | 16.49 | 0.41 | 1.50 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 16IR 8 W IC908                    | 9.52       | 8.0                | 16.49 | 0.41 | 1.10 | 1.10 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 14 W 3M IC908 <sup>(3)</sup> | 12.70      | 14.0               | 22.00 | 0.21 | 4.50 | 2.80 | 3                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 11 W 2M IC908 <sup>(3)</sup> | 12.70      | 11.0               | 22.00 | 0.09 | 3.40 | 2.30 | 2                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 7 W IC908                    | 12.70      | 7.0                | 22.00 | 0.45 | 2.30 | 1.60 | 1                   |              |       |       |       |      |       |       | ●     |        |
| 22IR 6 W IC250                    | 12.70      | 6.0                | 22.00 | 0.52 | 2.30 | 1.60 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 22IR 5 W IC250                    | 12.70      | 5.0                | 22.00 | 0.65 | 2.40 | 1.70 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 27IR 4.5 W IC250                  | 15.88      | 4.5                | 27.50 | 0.73 | 2.60 | 1.80 | 1                   |              |       |       | ●     |      |       |       |       |        |
| 27IR 4 W IC908                    | 15.88      | 4.0                | 27.50 | 0.82 | 2.90 | 2.00 | 1                   |              |       |       |       |      |       |       | ●     |        |

• For Insert Identification System, see page 714 • Tolerance: medium class • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> With pressed chipformer.

<sup>(3)</sup> Multi-tooth

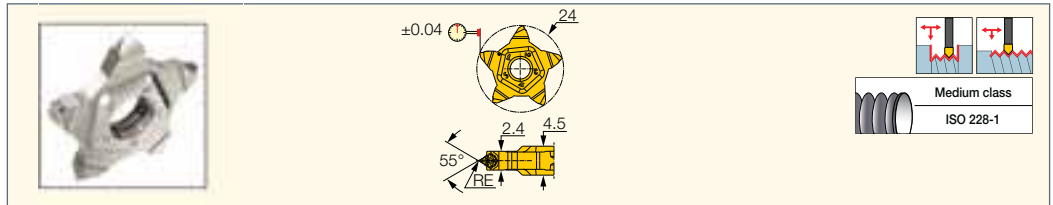
<sup>(4)</sup> Threads per inch

<sup>(5)</sup> Number of teeth per corner

**For tools, see pages:** AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

**PENTA 24-W**

Whitworth (BSW, BSF, BSP)  
 B.S.84-1956 DIN 259 Pentagonal  
 Full Profile External Threading  
 Inserts with a Chipformer



| Dimensions          |                    |      |       |
|---------------------|--------------------|------|-------|
| Designation         | TPI <sup>(1)</sup> | RE   | IC908 |
| PENTA 24-28-W IC908 | 28.0               | 0.09 | •     |
| PENTA 24-19-W IC908 | 19.0               | 0.15 | •     |
| PENTA 24-14-W IC908 | 14.0               | 0.21 | •     |

• DMIN(inch)=5.435/TPI

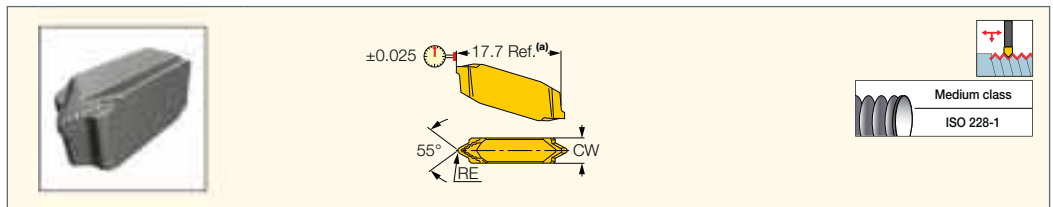
(1) Threads per inch

For tools, see pages: NQCH-PCHR/L-24-JHP (348) • PCAD RE/LE-JHP (561) • PCADR/L (353) • PCADR/L-JHP (353) • PCHBR/L (355)

• PCHR/L-24 (346) • PCHR/L-24-JHP (347) • PCHR/L-24-JHP-MC (348)

**CUTGRIP**
**ISCARTHREAD**
**TIP-P-BSW**

American (BSW, BSF, BSP)  
 Precision Ground External  
 Double-Ended Full Profile  
 Threading Inserts with a Chipformer



| Dimensions         |      |      |                    | Tough ↔ Hard |       |
|--------------------|------|------|--------------------|--------------|-------|
| Designation        | CW   | RE   | TPI <sup>(1)</sup> | IC08         | IC908 |
| TIP 2P28-BSW IC08  | 2.40 | 0.11 | 28.0               | •            | •     |
| TIP 2P28-BSW IC908 | 2.40 | 0.11 | 28.0               | •            | •     |
| TIP 2P26-BSW IC08  | 2.40 | 0.12 | 26.0               | •            | •     |
| TIP 2P26-BSW IC908 | 2.40 | 0.12 | 26.0               | •            | •     |
| TIP 2P24-BSW IC08  | 2.40 | 0.12 | 24.0               | •            | •     |
| TIP 2P24-BSW IC908 | 2.40 | 0.12 | 24.0               | •            | •     |
| TIP 2P20-BSW IC08  | 2.40 | 0.16 | 20.0               | •            | •     |
| TIP 2P20-BSW IC908 | 2.40 | 0.16 | 20.0               | •            | •     |
| TIP 2P19-BSW IC08  | 2.40 | 0.16 | 19.0               | •            | •     |
| TIP 2P19-BSW IC908 | 2.40 | 0.16 | 19.0               | •            | •     |
| TIP 2P18-BSW IC08  | 2.40 | 0.17 | 18.0               | •            | •     |
| TIP 2P18-BSW IC908 | 2.40 | 0.17 | 18.0               | •            | •     |
| TIP 2P16-BSW IC08  | 2.40 | 0.19 | 16.0               | •            | •     |
| TIP 2P16-BSW IC908 | 2.40 | 0.19 | 16.0               | •            | •     |
| TIP 2P14-BSW IC08  | 2.40 | 0.22 | 14.0               | •            | •     |
| TIP 2P14-BSW IC908 | 2.40 | 0.22 | 14.0               | •            | •     |
| TIP 4P12-BSW IC908 | 4.00 | 0.25 | 12.0               | •            | •     |
| TIP 4P11-BSW IC08  | 4.00 | 0.28 | 11.0               | •            | •     |
| TIP 4P11-BSW IC908 | 4.00 | 0.28 | 11.0               | •            | •     |
| TIP 4P10-BSW IC908 | 4.00 | 0.31 | 10.0               | •            | •     |

• (a) TIP inserts are 1.6 mm longer than GIP in the same pocket • Toolholder seat needs to be modified according to insert profile to ensure clearance

(1) Threads per inch

For tools, see pages: C#-GHDR/L (301) • CGHN-D (310) • CGHN-DG (310) • CGHN-S (309) • CGPAD (308) • CGPAD-JHP (309) • GHDR/L (short pocket) (302)

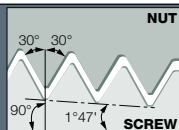
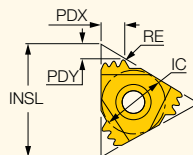
• GHDR/L-JHP (short pocket) (303) • GHDR/L-JHP-MC (short pocket) (304) • GHGR/L (305) • GHMPR/L (300) • GHMR/L (300) • GHSLR/L (428)

• GHSLR/L-JHP-SL (429) • NQCH-GHSLR/L-JHP (428)

# **QUICKTHREAD**

## **ER-NPT 3M-Q**

External NPT (National Pipe Threads) Full Profile Laydown Threading Inserts for Steam, Gas and Water Pipes



### **Designation**

**27ER 11.5 NPT 3M-Q IC908**

### **Dimensions**

| IC    | TPJ <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(2)</sup> | IC908 |
|-------|--------------------|-------|------|------|------|---------------------|-------|
| 15.88 | 11.5               | 27.00 | 0.09 | 5.50 | 3.30 | 3                   | •     |

### **NEW**

- For Insert Identification System, see page 714 • For threading between walls use GRIP-type insert TIP-NPT. • National Pipe Threads ANSI/ASME B1.20.1-1983
- For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Threads per inch

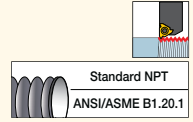
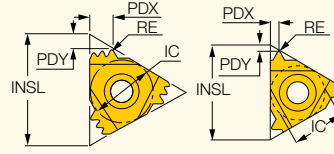
<sup>(2)</sup> Number of teeth per corner

For tools, see page: SER/L (798)



**ER/L-NPT**

External NPT (National Pipe Threads) Full Profile Laydown Threading Inserts for Steam, Gas, and Water Pipes



External right-hand shown

| Designation                           | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |       |       |        |
|---------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|-------|-------|--------|
|                                       | IC         | TPI <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC228        | IC50M | IC250 | IC808 | IC908 | IC1007 |
| 16ER 27 NPT IC250                     | 9.52       | 27.0               | 16.49 | 0.04 | 0.80 | 0.70 | 1                   |              |       | •     |       |       |        |
| 16ER 27 NPT IC908                     | 9.52       | 27.0               | 16.49 | 0.04 | 0.80 | 0.70 | 1                   |              |       |       |       | •     |        |
| 16ER 18 NPT IC250                     | 9.52       | 18.0               | 16.49 | 0.06 | 1.00 | 0.80 | 1                   |              |       | •     |       |       |        |
| 16ER 18 NPT IC1007                    | 9.52       | 18.0               | 16.49 | 0.06 | 1.10 | 0.90 | 1                   |              |       |       |       |       | •      |
| 16ER 18 NPT IC228                     | 9.52       | 18.0               | 16.49 | 0.06 | 1.10 | 0.90 | 1                   | •            |       |       |       |       |        |
| 16ER 18 NPT IC908                     | 9.52       | 18.0               | 16.49 | 0.06 | 1.10 | 0.90 | 1                   |              |       |       |       | •     |        |
| 16ERB 18 NPT IC908 <sup>(1)</sup>     | 9.52       | 18.0               | 16.49 | 0.06 | 1.10 | 0.90 | 1                   |              |       |       |       | •     |        |
| 16ERM 18 NPT IC1007                   | 9.52       | 18.0               | 16.49 | 0.05 | 1.00 | 0.80 | 1                   |              |       |       |       |       | •      |
| 16ERM 18 NPT IC808 <sup>(1)</sup>     | 9.52       | 18.0               | 16.49 | 0.05 | 1.00 | 0.80 | 1                   |              |       |       | •     |       |        |
| 16ERM 18 NPT IC908 <sup>(1)</sup>     | 9.52       | 18.0               | 16.49 | 0.05 | 1.00 | 0.80 | 1                   |              |       |       |       | •     |        |
| 16EL 14 NPT IC908                     | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 | 1                   |              |       |       |       | •     |        |
| 16ER 14 NPT IC250                     | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 | 1                   |              |       | •     |       |       |        |
| 16ER 14 NPT IC1007                    | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 | 1                   |              |       |       |       |       | •      |
| 16ER 14 NPT IC228                     | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 | 1                   | •            |       |       |       |       |        |
| 16ER 14 NPT IC908                     | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 | 1                   |              |       |       |       | •     |        |
| 16ERB 14 NPT IC908 <sup>(1)</sup>     | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 | 1                   |              |       |       |       | •     |        |
| 16ERM 14 NPT IC1007 <sup>(1)</sup>    | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       |       |       |       | •      |
| 16ERM 14 NPT IC250 <sup>(1)</sup>     | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       | •     |       |       |        |
| 16ERM 14 NPT IC50M <sup>(1)</sup>     | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   | •            |       |       |       |       |        |
| 16ERM 14 NPT IC808 <sup>(1)</sup>     | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       |       | •     |       |        |
| 16ERM 14 NPT IC908 <sup>(1)</sup>     | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       |       |       | •     |        |
| 16EL 11.5 NPT IC908                   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |       | •     |        |
| 16ER 11.5 NPT IC1007                  | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |       |       | •      |
| 16ER 11.5 NPT IC250                   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       | •     |       |       |        |
| 16ER 11.5 NPT IC50M                   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   | •            |       |       |       |       |        |
| 16ER 11.5 NPT IC908                   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |       | •     |        |
| 16ERB 11.5 NPT IC908 <sup>(1)</sup>   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |       | •     |        |
| 16ERM 11.5 NPT IC1007 <sup>(1)</sup>  | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |       |       | •      |
| 16ERM 11.5 NPT IC250 <sup>(1)</sup>   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       | •     |       |       |        |
| 16ERM 11.5 NPT IC808 <sup>(1)</sup>   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       | •     |       |        |
| 16ERM 11.5 NPT IC908 <sup>(1)</sup>   | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |       | •     |        |
| 16ER 8 NPT IC250                      | 9.52       | 8.0                | 16.49 | 0.12 | 1.60 | 1.30 | 1                   |              |       | •     |       |       |        |
| 16ER 8 NPT IC50M                      | 9.52       | 8.0                | 16.49 | 0.12 | 1.60 | 1.30 | 1                   | •            |       |       |       |       |        |
| 16ER 8 NPT IC908                      | 9.52       | 8.0                | 16.49 | 0.12 | 1.60 | 1.30 | 1                   |              |       |       |       | •     |        |
| 16ERB 8 NPT IC908 <sup>(1)</sup>      | 9.52       | 8.0                | 16.49 | 0.11 | 1.70 | 1.40 | 1                   |              |       |       |       | •     |        |
| 16ERM 8 NPT IC1007                    | 9.52       | 8.0                | 16.49 | 0.12 | 1.80 | 1.30 | 1                   |              |       |       |       |       | •      |
| 16ERM 8 NPT IC250 <sup>(1)</sup>      | 9.52       | 8.0                | 16.49 | 0.12 | 1.80 | 1.30 | 1                   |              |       | •     |       |       |        |
| 16ERM 8 NPT IC808 <sup>(1)</sup>      | 9.52       | 8.0                | 16.49 | 0.12 | 1.80 | 1.30 | 1                   |              |       |       | •     |       |        |
| 16ERM 8 NPT IC908 <sup>(1)</sup>      | 9.52       | 8.0                | 16.49 | 0.12 | 1.80 | 1.30 | 1                   |              |       |       |       | •     |        |
| 22ER 11.5 NPT 2M IC908 <sup>(2)</sup> | 12.70      | 11.5               | 22.00 | 0.09 | 3.50 | 2.30 | 2                   |              |       |       |       | •     |        |
| 27ER 11.5 NPT 3M IC908 <sup>(2)</sup> | 15.88      | 11.5               | 27.50 | 0.09 | 5.50 | 3.30 | 3                   |              |       |       |       | •     |        |
| 27ER 8 NPT 2M IC908 <sup>(2)</sup>    | 15.88      | 8.0                | 27.50 | 0.12 | 4.90 | 3.10 | 2                   |              |       |       |       | •     |        |

• For Insert Identification System, see page 714 • For threading between walls use GRIP-type insert TIP-NPT. • National Pipe Threads ANSI/ASME B1.20.1-1983

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Threads per inch

<sup>(4)</sup> Number of teeth per corner

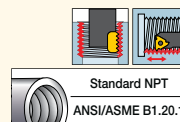
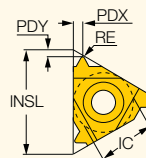
For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)



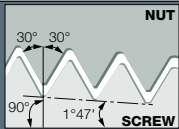
# ISCAR THREAD

## IR/L-NPT

Internal NPT (National Pipe Threads) Full Profile Laydown Threading Inserts for Steam, Gas, and Water Pipes



Internal left-hand shown

| <br>Designation | Dimensions |                    |       |      |      |      |                     | Tough ↔ Hard |       |       |      |       |       |       |        |
|--------------------------------------------------------------------------------------------------|------------|--------------------|-------|------|------|------|---------------------|--------------|-------|-------|------|-------|-------|-------|--------|
|                                                                                                  | IC         | TPI <sup>(3)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(4)</sup> | IC228        | IC50M | IC250 | IC08 | IC508 | IC808 | IC908 | IC1007 |
| 06IR 27 NPT IC228                                                                                | 4.00       | 27.0               | 6.88  | 0.04 | 0.60 | 0.60 | 1                   | •            |       |       |      |       |       |       |        |
| 08IR 18 NPT IC228                                                                                | 5.00       | 18.0               | 8.24  | 0.06 | 0.80 | 0.60 | 1                   | •            |       |       |      |       |       |       |        |
| 08IR 18 NPT IC908                                                                                | 5.00       | 18.0               | 8.24  | 0.06 | 0.80 | 0.60 | 1                   |              |       |       |      |       |       | •     |        |
| 11IL 18 NPT IC908                                                                                | 6.35       | 18.0               | 11.00 | 0.06 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 11IR 18 NPT IC250                                                                                | 6.35       | 18.0               | 11.00 | 0.06 | 1.00 | 0.80 | 1                   |              |       | •     |      |       |       | •     |        |
| 11IR 18 NPT IC908                                                                                | 6.35       | 18.0               | 11.00 | 0.06 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 11IRB 18 NPT IC908                                                                               | 6.35       | 18.0               | 11.00 | 0.06 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 11IL 14 NPT IC250                                                                                | 6.35       | 14.0               | 11.00 | 0.07 | 1.00 | 0.80 | 1                   |              |       | •     |      |       |       |       |        |
| 11IR 14 NPT IC1007                                                                               | 6.35       | 14.0               | 11.00 | 0.07 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       |       | •      |
| 11IR 14 NPT IC250                                                                                | 6.35       | 14.0               | 11.00 | 0.07 | 1.00 | 0.80 | 1                   |              |       | •     |      |       |       | •     |        |
| 11IR 14 NPT IC908                                                                                | 6.35       | 14.0               | 11.00 | 0.07 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16IL 27 NPT IC250                                                                                | 9.52       | 27.0               | 16.49 | 0.05 | 0.80 | 0.70 | 1                   |              |       | •     |      |       |       |       |        |
| 16IR 27 NPT IC908                                                                                | 9.52       | 27.0               | 16.49 | 0.05 | 0.80 | 0.70 | 1                   |              |       |       |      |       |       | •     |        |
| 16IR 18 NPT IC908                                                                                | 9.52       | 18.0               | 16.49 | 0.06 | 1.00 | 0.80 | 1                   |              |       |       |      |       |       | •     |        |
| 16IRM 14 NPT IC1007 <sup>(1)</sup>                                                               | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       |       | •      |
| 16IRM 14 NPT IC250 <sup>(1)</sup>                                                                | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       | •     |      |       |       |       |        |
| 16IRM 14 NPT IC808 <sup>(1)</sup>                                                                | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       |       |      |       | •     |       |        |
| 16IRM 14 NPT IC908 <sup>(1)</sup>                                                                | 9.52       | 14.0               | 16.49 | 0.05 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16IRB 14 NPT IC908 <sup>(1)</sup>                                                                | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16IL 14 NPT IC908                                                                                | 9.52       | 14.0               | 16.49 | 0.08 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16IR 14 NPT IC1007                                                                               | 9.52       | 14.0               | 16.49 | 0.08 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       |       | •      |
| 16IR 14 NPT IC228                                                                                | 9.52       | 14.0               | 16.49 | 0.08 | 1.20 | 0.90 | 1                   | •            |       |       |      |       |       |       |        |
| 16IR 14 NPT IC250                                                                                | 9.52       | 14.0               | 16.49 | 0.08 | 1.20 | 0.90 | 1                   |              |       | •     |      |       |       |       |        |
| 16IR 14 NPT IC908                                                                                | 9.52       | 14.0               | 16.49 | 0.08 | 1.20 | 0.90 | 1                   |              |       |       |      |       |       | •     |        |
| 16IRB 11.5 NPT IC908 <sup>(1)</sup>                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16IRM 11.5 NPT IC1007 <sup>(1)</sup>                                                             | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       |       | •      |
| 16IRM 11.5 NPT IC508 <sup>(1)</sup>                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      | •     |       |       |        |
| 16IRM 11.5 NPT IC808 <sup>(1)</sup>                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      |       | •     |       |        |
| 16IRM 11.5 NPT IC908 <sup>(1)</sup>                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16IL 11.5 NPT IC250                                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       | •     |      |       |       | •     |        |
| 16IL 11.5 NPT IC908                                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16IR 11.5 NPT IC1007                                                                             | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       |       | •      |
| 16IR 11.5 NPT IC50M                                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              | •     |       |      |       |       |       |        |
| 16IR 11.5 NPT IC908                                                                              | 9.52       | 11.5               | 16.49 | 0.09 | 1.50 | 1.10 | 1                   |              |       |       |      |       |       | •     |        |
| 16IRM 8 NPT IC1007 <sup>(1)</sup>                                                                | 9.52       | 8.0                | 16.49 | 0.12 | 1.80 | 1.30 | 1                   |              |       |       |      |       |       |       | •      |
| 16IRM 8 NPT IC808 <sup>(1)</sup>                                                                 | 9.52       | 8.0                | 16.49 | 0.12 | 1.80 | 1.30 | 1                   |              |       |       |      |       | •     |       |        |
| 16IRM 8 NPT IC908 <sup>(1)</sup>                                                                 | 9.52       | 8.0                | 16.49 | 0.12 | 1.80 | 1.30 | 1                   |              |       |       |      |       |       | •     |        |
| 16IRB 8 NPT IC908 <sup>(1)</sup>                                                                 | 9.52       | 8.0                | 16.49 | 0.11 | 1.70 | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 16IL 8 NPT IC250                                                                                 | 9.52       | 8.0                | 16.49 | 0.11 | 1.80 | 1.30 | 1                   |              |       | •     |      |       |       |       |        |
| 16IL 8 NPT IC908                                                                                 | 9.52       | 8.0                | 16.49 | 0.11 | 1.80 | 1.30 | 1                   |              |       |       |      |       |       | •     |        |
| 16IR 8 NPT IC08                                                                                  | 9.52       | 8.0                | 16.49 | 0.11 | 1.80 | 1.30 | 1                   |              |       |       | •    |       |       |       |        |
| 16IR 8 NPT IC250                                                                                 | 9.52       | 8.0                | 16.49 | 0.11 | 1.80 | 1.30 | 1                   |              |       | •     |      |       |       |       |        |
| 16IR 8 NPT IC908                                                                                 | 9.52       | 8.0                | 16.49 | 0.11 | 1.70 | 1.20 | 1                   |              |       |       |      |       |       | •     |        |
| 22IR 11.5 NPT 2M IC908 <sup>(2)</sup>                                                            | 12.70      | 11.5               | 22.00 | 0.09 | 3.50 | 2.30 | 2                   |              |       |       |      |       |       | •     |        |
| 27IR 11.5 NPT 3M IC908 <sup>(2)</sup>                                                            | 15.88      | 11.5               | 27.50 | 0.09 | 5.50 | 3.30 | 3                   |              |       |       |      |       |       | •     |        |
| 27IR 8 NPT 2M IC908 <sup>(2)</sup>                                                               | 15.88      | 8.0                | 27.50 | 0.12 | 5.00 | 3.10 | 2                   |              |       |       |      |       |       | •     |        |

• For Insert Identification System, see page 714 • National Pipe Threads ANSI/ASME B1.20.1-1983.

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Multi-tooth

<sup>(3)</sup> Threads per inch

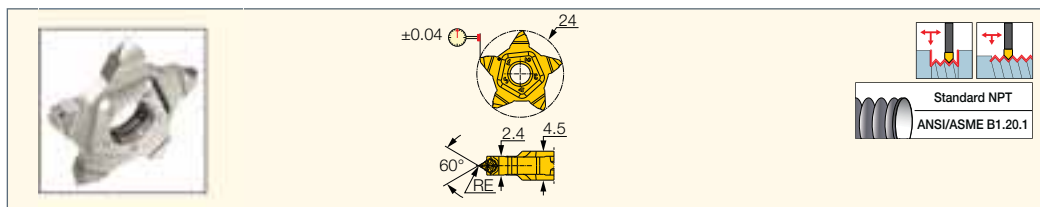
<sup>(4)</sup> Number of teeth per corner

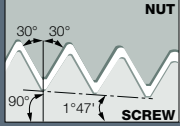
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)



**PENTA 24-NPT**

NPT (National Pipe Threads)  
 Precision Ground Pentagonal  
 External Full Profile Threading  
 Inserts with a Chipformer



|  | Dimensions            |                    |      | IC908 |
|-----------------------------------------------------------------------------------|-----------------------|--------------------|------|-------|
|                                                                                   | Designation           | TPI <sup>(1)</sup> | RE   |       |
|                                                                                   | PENTA 24-18-NPT IC908 | 18.0               | 0.07 | •     |
|                                                                                   | PENTA 24-14-NPT IC908 | 14.0               | 0.09 | •     |

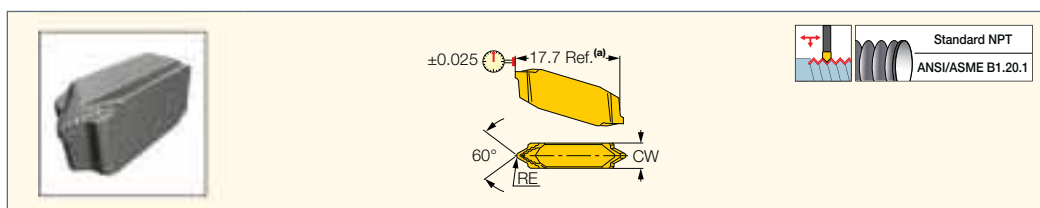
<sup>(1)</sup> Threads per inch

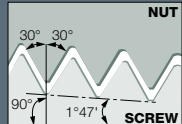
For tools, see pages: NQCH-PCHR/L-24-JHP (348) • PCAD RE/LE-JHP (561) • PCADR/L (353) • PCADR/L-JHP (353) • PCHBR/L (355)

• PCHR/L-24 (346) • PCHR/L-24-JHP (347) • PCHR/L-24-JHP-MC (348)

**CUTGRIP**
**ISCARTHREAD**
**TIP-P-NPT**

NPT (National Pipe Threads)  
 Precision Ground Double-Ended  
 External Full Profile Threading  
 Inserts with a Chipformer



|  | Dimensions  |      |       |                      | Tough ↔ Hard       |      |
|------------------------------------------------------------------------------------|-------------|------|-------|----------------------|--------------------|------|
|                                                                                    | Designation | CW   | RE    | RETOL <sup>(1)</sup> | TPI <sup>(2)</sup> | IC08 |
| TIP 2P27-NPT IC08                                                                  | 2.40        | 0.05 | 0.030 | 27.0                 | ●                  | ●    |
| TIP 2P27-NPT IC908                                                                 | 2.40        | 0.05 | 0.030 | 27.0                 | ●                  | ●    |
| TIP 2P18-NPT IC08                                                                  | 2.40        | 0.07 | 0.030 | 18.0                 | ●                  | ●    |
| TIP 2P18-NPT IC908                                                                 | 2.40        | 0.07 | 0.030 | 18.0                 | ●                  | ●    |
| TIP 2P14-NPT IC908                                                                 | 2.40        | 0.09 | 0.030 | 14.0                 | ●                  | ●    |
| TIP 4P11.5-NPT IC08                                                                | 4.00        | 0.10 | 0.030 | 11.5                 | ●                  | ●    |
| TIP 4P11.5-NPT IC908                                                               | 4.00        | 0.10 | 0.030 | 11.5                 | ●                  | ●    |
| TIP 4P8-NPT IC08                                                                   | 4.00        | 0.13 | 0.030 | 8.0                  | ●                  | ●    |
| TIP 4P8-NPT IC908                                                                  | 4.00        | 0.13 | 0.030 | 8.0                  | ●                  | ●    |

• (a) TIP inserts are 1.6 mm longer than GIP in the same pocket

• Toolholder seat needs to be modified according to insert profile to ensure clearance

<sup>(1)</sup> Corner radius tolerance (+/-)

<sup>(2)</sup> Threads per inch

For tools, see pages: C#-GHDR/L (301) • CGHN-D (310) • CGHN-DG (310) • CGHN-S (309) • CGPAD (308) • CGPAD-JHP (309) • GHDR/L (short pocket) (302)

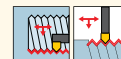
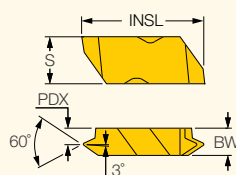
• GHDR/L-JHP (short pocket) (303) • GHDR/L-JHP-MC (short pocket) (304) • GHGR/L (305) • GHMPR/L (300) • GHMR/L (300) • GHSLR/L (428)

• GHSLR/L-JHP-SL (429) • NQCH-GHSLR/L-JHP (428)

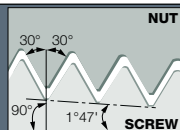
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**NPT THREADING FLDC-V-75**

Double-Ended, Precision,  
Flat Top Threading Inserts



Right-hand shown

|  | Dimensions             |                    |     |      |      |      | IC908 |       |   |
|-----------------------------------------------------------------------------------|------------------------|--------------------|-----|------|------|------|-------|-------|---|
|                                                                                   | Designation            | TPI <sup>(1)</sup> | IPF | PDX  | BW   | S    |       | INSL  |   |
|                                                                                   | FLDC-3-8VR/L75 IC908   | 8.0                | 3/4 | 2.50 | 4.95 | 8.74 |       | 22.60 | ● |
|                                                                                   | FLDC-3-115VR/L75 IC908 | 11.5               | 3/4 | 3.70 | 4.95 | 8.74 |       | 22.60 | ● |
|                                                                                   | FLDC-3-14VR/L-75 IC908 | 14.0               | 3/4 | 3.80 | 4.95 | 8.74 |       | 22.60 | ● |
|                                                                                   | FLDC-3-18VR/L-75 IC908 | 18.0               | 3/4 | 3.90 | 4.95 | 8.74 |       | 22.60 | ● |
|                                                                                   | FLDC-3-27VR/L-75 IC908 | 27.0               | 3/4 | 4.10 | 4.95 | 8.74 |       | 22.60 | ● |

• DMIN according to related boring bar • Internal & External tolerance: ANSI/ASME B1.20.1 - Standard NPT

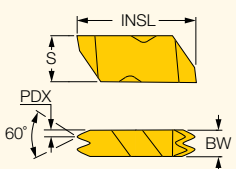
<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLSR/L (807)

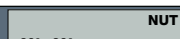
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**NPT THREADING  
FLDC-NPT-E**

Double-Ended, Precision, Flat  
Top Multi-Tooth Threading Inserts



Right-hand shown

|  | Dimensions              |                    |     |      |      |      | IC908 |       |   |
|-------------------------------------------------------------------------------------|-------------------------|--------------------|-----|------|------|------|-------|-------|---|
|                                                                                     | Designation             | TPI <sup>(1)</sup> | IPF | PDX  | BW   | S    |       | INSL  |   |
|                                                                                     | FLDC-3-8NPT 2E IC908    | 8.0                | 3/4 | 1.50 | 6.35 | 8.74 |       | 22.60 | ● |
|                                                                                     | FLDC-3-11.5NPT-2E IC908 | 11.5               | 3/4 | 1.20 | 6.35 | 8.74 |       | 22.60 | ● |

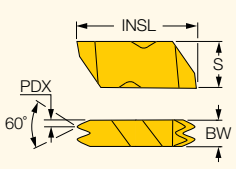
<sup>(1)</sup> Threads per inch

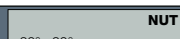
For tools, see pages: FLASR/L (807) • FLSR/L (807)

**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**NPT THREADING FLDC-NPT-I**

Double-Ended, Precision, Flat  
Top Multi-Tooth Threading Inserts



|  | Dimensions              |                    |     |      |      |      | IC908 |       |
|-------------------------------------------------------------------------------------|-------------------------|--------------------|-----|------|------|------|-------|-------|
|                                                                                     | Designation             | TPI <sup>(1)</sup> | IPF | PDX  | BW   | S    |       | INSL  |
|                                                                                     | FLDC-3-8NPT 2I IC908    | 8.0                | 3/4 | 1.50 | 6.35 | 8.74 |       | 22.60 |
|                                                                                     | FLDC-3-11.5NPT-2I IC908 | 11.5               | 3/4 | 1.20 | 6.35 | 8.74 |       | 22.60 |

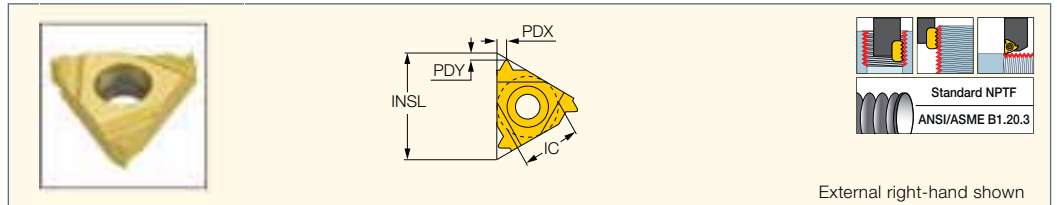
• For internal thread limits, see pages 822-823

<sup>(1)</sup> Threads per inch

# ISCAR THREAD

## ER-NPTF

External NPTF (National Pipe Threads) Full Profile Laydown Threading Inserts for Steam, Gas, and Water Pipes



| Designation          | Dimensions |                    |       |      |      |   | Tough ↔ Hard |       |
|----------------------|------------|--------------------|-------|------|------|---|--------------|-------|
|                      | IC         | TPI <sup>(1)</sup> | INSL  | PDX  | PDY  |   | IC250        | IC908 |
| 11ER 14 NPTF IC908   | 6.35       | 14.0               | 11.00 | 1.00 | 0.73 |   |              | •     |
| 16ER 27 NPTF IC908   | 9.52       | 27.0               | 16.49 | 0.60 | 0.55 |   |              | •     |
| 16ER 18 NPTF IC908   | 9.52       | 18.0               | 16.49 | 0.90 | 0.80 |   |              | •     |
| 16ER 14 NPTF IC250   | 9.52       | 14.0               | 16.49 | 1.20 | 0.90 | • |              |       |
| 16ER 14 NPTF IC908   | 9.52       | 14.0               | 16.49 | 1.20 | 0.90 |   |              | •     |
| 16ER 11.5 NPTF IC908 | 9.52       | 11.5               | 16.49 | 1.50 | 1.10 |   |              | •     |

• For Insert Identification System, see page 714 • (National Pipe Threads-Dry Seal) ANSI/ASME B1.20.1-1976 full profile

• For technical information and detailed cutting data, see pages 809-825

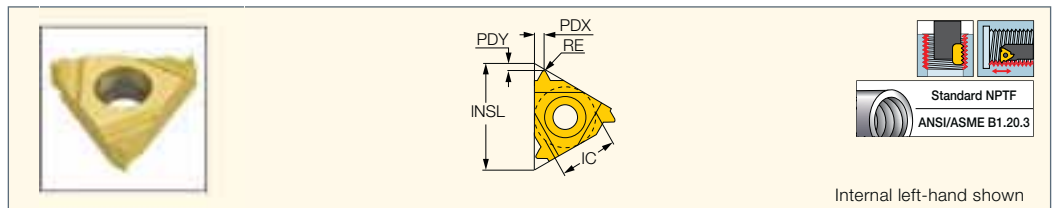
<sup>(1)</sup> Threads per inch

For tools, see pages: NQCH-SER/L-JHP (800) • SER/L (798)

# ISCAR THREAD

## IR/L-NPTF

Internal NPTF (National Pipe Threads) Full Profile Laydown Threading Inserts for Steam, Gas, and Water Pipes



| Designation          | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |       |
|----------------------|------------|--------------------|-------|------|------|------|--------------|-------|-------|
|                      | IC         | TPI <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | IC228        | IC250 | IC908 |
| 06IR 27 NPTF IC228   | 4.00       | 27.0               | 6.88  | 0.04 | 0.60 | 0.70 | •            |       |       |
| 08IR 27 NPTF IC228   | 5.00       | 27.0               | 8.24  | 0.04 | 0.60 | 0.60 | •            |       |       |
| 08IL 18 NPTF IC228   | 5.00       | 18.0               | 8.24  | 0.04 | 0.80 | 0.58 | •            |       |       |
| 08IR 18 NPTF IC228   | 5.00       | 18.0               | 8.24  | 0.04 | 0.80 | 0.60 | •            |       |       |
| 11IR 18 NPTF IC908   | 6.35       | 18.0               | 11.00 | 0.04 | 1.00 | 0.80 |              |       | •     |
| 11IRB 18 NPTF IC908  | 6.35       | 18.0               | 11.00 | 0.04 | 1.00 | 0.80 |              |       | •     |
| 11IR 14 NPTF IC908   | 6.35       | 14.0               | 16.49 | 0.04 | 1.10 | 0.80 |              |       | •     |
| 16IR 18 NPTF IC908   | 9.52       | 18.0               | 16.49 | 0.06 | 1.00 | 0.80 |              |       | •     |
| 16IL 14 NPTF IC908   | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 |              |       | •     |
| 16IR 14 NPTF IC250   | 9.52       | 14.0               | 16.49 | 0.07 | 1.20 | 0.90 |              | •     |       |
| 16IR 14 NPTF IC908   | 9.52       | 14.0               | 16.49 | 0.04 | 1.20 | 0.90 |              |       | •     |
| 16IR 11.5 NPTF IC250 | 9.52       | 11.5               | 16.49 | 0.06 | 1.45 | 1.00 |              | •     |       |
| 16IR 11.5 NPTF IC908 | 9.52       | 11.5               | 16.49 | 0.05 | 1.45 | 1.00 |              |       | •     |

• For Insert Identification System, see page 714 • (National Pipe Threads-Dry seal) ANSI/ASME B1.20.1-1976

• For technical information and detailed cutting data, see pages 809-825

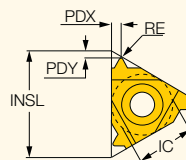
<sup>(1)</sup> Threads per inch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

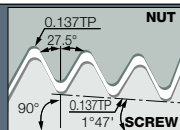
# ISCAR THREAD

## ER/L-BSPT

External BSPT (British Standard Pipe) B.S.21-1957 Full Profile Laydown Threading Inserts



External right-hand shown



| Designation                         | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |       |        |
|-------------------------------------|------------|--------------------|-------|------|------|------|--------------|-------|-------|--------|
|                                     | IC         | TPI <sup>(2)</sup> | INSL  | RE   | PDX  | PDY  | IC250        | IC808 | IC908 | IC1007 |
| 16ER 28 BSPT IC250                  | 9.52       | 28.0               | 16.49 | 0.11 | 0.60 | 0.60 | •            |       |       |        |
| 16ER 28 BSPT IC908                  | 9.52       | 28.0               | 16.49 | 0.11 | 0.60 | 0.60 |              |       | •     |        |
| 16EL 19 BSPT IC908                  | 9.52       | 19.0               | 16.49 | 0.16 | 0.80 | 0.70 |              |       | •     |        |
| 16ER 19 BSPT IC250                  | 9.52       | 19.0               | 16.49 | 0.16 | 0.90 | 0.80 | •            |       |       |        |
| 16ER 19 BSPT IC1007                 | 9.52       | 19.0               | 16.49 | 0.16 | 0.80 | 0.70 |              |       |       | •      |
| 16ER 19 BSPT IC908                  | 9.52       | 19.0               | 16.49 | 0.16 | 0.80 | 0.70 |              |       | •     |        |
| 16EL 14 BSPT IC908                  | 9.52       | 14.0               | 16.49 | 0.25 | 1.15 | 0.90 |              |       | •     |        |
| 16ER 14 BSPT IC1007                 | 9.52       | 14.0               | 16.49 | 0.25 | 1.15 | 0.90 |              |       |       | •      |
| 16ER 14 BSPT IC250                  | 9.52       | 14.0               | 16.49 | 0.25 | 1.15 | 0.90 | •            |       |       |        |
| 16ER 14 BSPT IC908                  | 9.52       | 14.0               | 16.49 | 0.25 | 1.15 | 0.90 |              |       | •     |        |
| 16ERB 14 BSPT IC908 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.23 | 1.15 | 1.00 |              |       | •     |        |
| 16ERM 14 BSPT IC1007 <sup>(1)</sup> | 9.52       | 14.0               | 16.49 | 0.24 | 1.20 | 1.00 |              |       |       | •      |
| 16ERM 14 BSPT IC808 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.24 | 1.20 | 1.00 |              | •     |       |        |
| 16ERM 14 BSPT IC908 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.24 | 1.20 | 1.00 |              |       | •     |        |
| 16EL 11 BSPT IC908                  | 9.52       | 11.0               | 16.49 | 0.32 | 1.45 | 1.10 |              |       | •     |        |
| 16ER 11 BSPT IC250                  | 9.52       | 11.0               | 16.49 | 0.32 | 1.45 | 1.10 | •            |       |       |        |
| 16ER 11 BSPT IC908                  | 9.52       | 11.0               | 16.49 | 0.32 | 1.45 | 1.10 |              |       | •     |        |
| 16ERB 11 BSPT IC908 <sup>(1)</sup>  | 9.52       | 11.0               | 16.49 | 0.32 | 1.45 | 1.10 |              |       | •     |        |
| 16ERM 11 BSPT IC1007 <sup>(1)</sup> | 9.52       | 11.0               | 16.49 | 0.31 | 1.50 | 1.10 |              |       |       | •      |
| 16ERM 11 BSPT IC908 <sup>(1)</sup>  | 9.52       | 11.0               | 16.49 | 0.31 | 1.50 | 1.10 |              |       | •     |        |

• For Insert Identification System, see page 714 • For threading between walls use insert TIP-BSPT

• For technical information and detailed cutting data, see pages 809-825

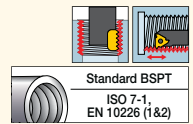
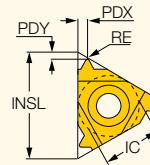
<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Threads per inch

For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

**IR/L-BSPT**

Internal BSPT (British Standard Pipe) B.S.21-1957 Full Profile Laydown Threading Inserts



Internal left-hand shown

| Designation                         | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |       |       |        |
|-------------------------------------|------------|--------------------|-------|------|------|------|--------------|-------|-------|-------|--------|
|                                     | IC         | TPI <sup>(2)</sup> | INSL  | RE   | PDX  | PDY  | IC228        | IC250 | IC808 | IC908 | IC1007 |
| 06IR 28 BSPT IC228                  | 4.00       | 28.0               | 6.88  | 0.11 | 0.60 | 0.70 | •            |       |       |       |        |
| 08IR 28 BSPT IC228                  | 5.00       | 28.0               | 8.24  | 0.13 | 0.60 | 0.50 | •            |       |       |       |        |
| 08IR 19 BSPT IC228                  | 5.00       | 19.0               | 8.24  | 0.18 | 0.80 | 0.60 | •            |       |       |       |        |
| 11IR 19 BSPT IC250                  | 6.35       | 19.0               | 11.00 | 0.16 | 0.90 | 0.80 |              | •     |       |       |        |
| 11IR 19 BSPT IC1007                 | 6.35       | 19.0               | 11.00 | 0.16 | 0.90 | 0.90 |              |       |       |       | •      |
| 11IR 19 BSPT IC908                  | 6.35       | 19.0               | 11.00 | 0.16 | 0.90 | 0.90 |              |       |       | •     |        |
| 11IL 14 BSPT IC908                  | 6.35       | 14.0               | 11.00 | 0.23 | 1.00 | 0.90 |              |       |       | •     |        |
| 11IR 14 BSPT IC908                  | 6.35       | 14.0               | 11.00 | 0.23 | 1.00 | 0.90 |              |       |       | •     |        |
| 16IR 28 BSPT IC908                  | 9.52       | 28.0               | 16.49 | 0.11 | 0.60 | 0.60 |              |       |       | •     |        |
| 16IR 19 BSPT IC250                  | 9.52       | 19.0               | 16.49 | 0.16 | 0.90 | 0.80 |              | •     |       |       |        |
| 16IL 14 BSPT IC908                  | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 |              |       |       | •     |        |
| 16IR 14 BSPT IC908                  | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 |              |       |       | •     |        |
| 16IRB 14 BSPT IC908 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.23 | 1.20 | 1.00 |              |       |       | •     |        |
| 16IRM 14 BSPT IC1007 <sup>(1)</sup> | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 |              |       |       |       | •      |
| 16IRM 14 BSPT IC808 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 |              |       | •     |       |        |
| 16IRM 14 BSPT IC908 <sup>(1)</sup>  | 9.52       | 14.0               | 16.49 | 0.21 | 1.20 | 1.00 |              |       |       | •     |        |
| 16IL 11 BSPT IC908                  | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 |              |       |       | •     |        |
| 16IR 11 BSPT IC228                  | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 | •            |       |       |       |        |
| 16IR 11 BSPT IC250                  | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 |              | •     |       |       |        |
| 16IR 11 BSPT IC908                  | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 |              |       |       | •     |        |
| 16IRB 11 BSPT IC908 <sup>(1)</sup>  | 9.52       | 11.0               | 16.49 | 0.29 | 1.50 | 1.10 |              |       |       | •     |        |
| 16IRM 11 BSPT IC1007 <sup>(1)</sup> | 9.52       | 11.0               | 16.49 | 0.28 | 1.50 | 1.10 |              |       |       |       | •      |
| 16IRM 11 BSPT IC808 <sup>(1)</sup>  | 9.52       | 11.0               | 16.49 | 0.28 | 1.50 | 1.10 |              |       | •     |       |        |
| 16IRM 11 BSPT IC908 <sup>(1)</sup>  | 9.52       | 11.0               | 16.49 | 0.28 | 1.50 | 1.10 |              |       |       | •     |        |

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

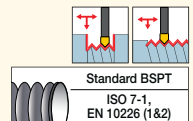
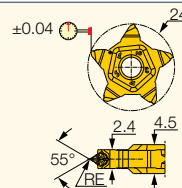
<sup>(2)</sup> Threads per inch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • MGSIR/L (156) • PICIN-A-SIR/L (466) • PICIN-MGSIR/L (466) • SIR/L (801)

**PENTACUT**  
THREADING LINE

**PENTA 24-BSPT**

BSPT (British Standard Pipe) Precision Ground External Pentagonal Full Profile Threading Inserts with a Chipformer



| Designation            | Dimensions         |      | IC908 |
|------------------------|--------------------|------|-------|
|                        | TPI <sup>(1)</sup> | RE   |       |
| PENTA 24-19-BSPT IC908 | 19.0               | 0.16 | •     |
| PENTA 24-14-BSPT IC908 | 14.0               | 0.22 | •     |

• DMIN(inch)=5.435/TPI

<sup>(1)</sup> Threads per inch

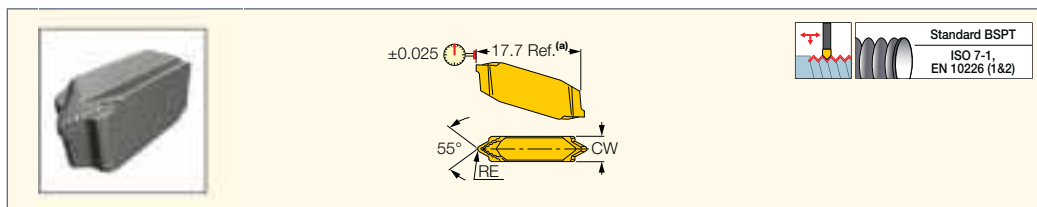
For tools, see pages: NQCH-PCHR/L-24-JHP (348) • PCAD RE/LE-JHP (561) • PCADR/L (353) • PCADR/L-JHP (353) • PCHBR/L (355)

• PCHR/L-24 (346) • PCHR/L-24-JHP (347) • PCHR/L-24-JHP-MC (348)

# CUTGRIP ISCARTHREAD

## TIP-P-BSPT

Precision Ground BSPT (British Standard Pipe) External Double-Ended Full Profile Threading Inserts with a Chipformer



| Designation         | Dimensions |      |                      |                    | Tough ↔ Hard |       |
|---------------------|------------|------|----------------------|--------------------|--------------|-------|
|                     | CW         | RE   | RETOL <sup>(1)</sup> | TPI <sup>(2)</sup> | IC08         | IC908 |
| TIP 2P28-BSPT IC08  | 2.40       | 0.11 | 0.030                | 28.0               | ●            |       |
| TIP 2P28-BSPT IC908 | 2.40       | 0.11 | 0.030                | 28.0               |              | ●     |
| TIP 2P19-BSPT IC08  | 2.40       | 0.16 | 0.030                | 19.0               | ●            |       |
| TIP 2P19-BSPT IC908 | 2.40       | 0.16 | 0.030                | 19.0               |              | ●     |
| TIP 2P14-BSPT IC08  | 2.40       | 0.22 | 0.030                | 14.0               | ●            |       |
| TIP 2P14-BSPT IC908 | 2.40       | 0.22 | 0.030                | 14.0               |              | ●     |
| TIP 4P11-BSPT IC08  | 4.00       | 0.28 | 0.030                | 11.0               | ●            |       |
| TIP 4P11-BSPT IC908 | 4.00       | 0.28 | 0.030                | 11.0               |              | ●     |

• (a) TIP inserts are 1.6 mm longer than GIP in the same pocket • Toolholder seat needs to be modified according to insert profile to ensure clearance

<sup>(1)</sup> Corner radius tolerance (+/-)

<sup>(2)</sup> Threads per inch

**For tools, see pages:** C#-GHDR/L (301) • CGHN-D (310) • CGHN-DG (310) • CGHN-S (309) • CGPAD (308) • CGPAD-JHP (309) • GHDR/L (short pocket) (302)

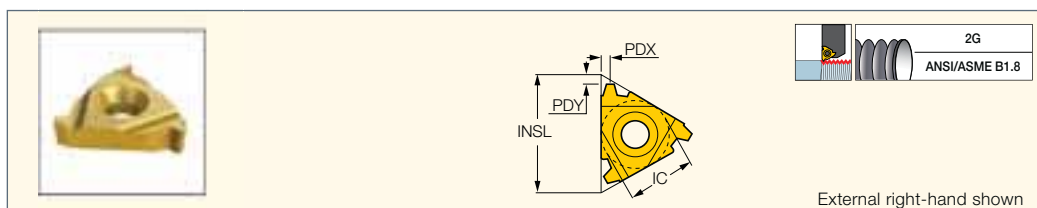
• GHDR/L-JHP (short pocket) (303) • GHDR/L-JHP-MC (short pocket) (304) • GHGR/L (305) • GHMPR/L (300) • GHMR/L (300) • GHSLR/L (428)

• GHSLR/L-JHP-SL (429) • NQCH-GHSLR/L-JHP (428)

# ISCARTHREAD

## ER/L-STACME

External STUB ACME Laydown Threading Inserts with a Shallow ACME Profile for Control Valves



External right-hand shown

| Designation          | Dimensions |                    |       |      |      | Tough ↔ Hard |       |       |
|----------------------|------------|--------------------|-------|------|------|--------------|-------|-------|
|                      | IC         | TPI <sup>(1)</sup> | INSL  | PDX  | PDY  | IC50M        | IC250 | IC908 |
| 16EL 16 STACME IC250 | 9.52       | 16.0               | 16.49 | 1.00 | 1.00 |              | ●     |       |
| 16ER 16 STACME IC908 | 9.52       | 16.0               | 16.49 | 1.00 | 1.00 |              |       | ●     |
| 16ER 14 STACME IC250 | 9.52       | 14.0               | 16.49 | 1.00 | 1.00 |              | ●     |       |
| 16EL 12 STACME IC908 | 9.52       | 12.0               | 16.49 | 1.20 | 1.20 |              |       | ●     |
| 16ER 12 STACME IC250 | 9.52       | 12.0               | 16.49 | 1.20 | 1.20 |              | ●     |       |
| 16ER 12 STACME IC908 | 9.52       | 12.0               | 16.49 | 1.20 | 1.30 |              |       | ●     |
| 16EL 10 STACME IC50M | 9.52       | 10.0               | 16.49 | 1.30 | 1.30 | ●            |       |       |
| 16ER 10 STACME IC908 | 9.52       | 10.0               | 16.49 | 1.20 | 1.30 |              |       | ●     |
| 16EL 8 STACME IC908  | 9.52       | 8.0                | 16.49 | 1.50 | 1.50 |              |       | ●     |
| 16ER 8 STACME IC250  | 9.52       | 8.0                | 16.49 | 1.50 | 1.50 |              | ●     |       |
| 16ER 8 STACME IC50M  | 9.52       | 8.0                | 16.49 | 1.50 | 1.50 | ●            |       |       |
| 16ER 8 STACME IC908  | 9.52       | 8.0                | 16.49 | 1.70 | 1.70 |              |       | ●     |
| 16EL 6 STACME IC908  | 9.52       | 6.0                | 16.49 | 1.80 | 1.80 |              |       | ●     |
| 16ER 6 STACME IC250  | 9.52       | 6.0                | 16.49 | 1.80 | 1.80 |              | ●     |       |
| 16ER 6 STACME IC908  | 9.52       | 6.0                | 16.49 | 1.70 | 1.70 |              |       | ●     |
| 22EL 5 STACME IC50M  | 12.70      | 5.0                | 22.00 | 2.30 | 2.00 | ●            |       |       |
| 22ER 5 STACME IC908  | 12.70      | 5.0                | 22.00 | 2.30 | 2.00 |              |       | ●     |
| 22ER 4 STACME IC908  | 12.70      | 4.0                | 22.00 | 2.20 | 2.20 |              |       | ●     |
| 27EL 4 STACME IC50M  | 15.88      | 4.0                | 27.50 | 2.40 | 2.20 | ●            |       |       |
| 27ER 4 STACME IC908  | 15.88      | 4.0                | 27.50 | 2.40 | 2.20 |              |       | ●     |
| 27EL 3 STACME IC908  | 15.88      | 3.0                | 27.50 | 2.90 | 2.80 |              |       | ●     |
| 27ER 3 STACME IC250  | 15.88      | 3.0                | 27.50 | 2.90 | 2.80 |              | ●     |       |

• For Insert Identification System, see page 714 • STUB ACME ASME/ANSI B1.8-1988 Class 2G • For technical information and detailed cutting data, see pages 809-825

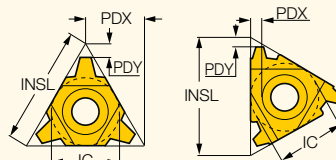
<sup>(1)</sup> Threads per inch

**For tools, see pages:** NQCH-SER/L-JHP (800) • SER/L (798)



**IR/L-STACME**

Internal STUB ACME Laydown  
Threading Inserts with a Shallow  
ACME Profile for Control Valves



Internal left-hand shown

| Designation           | Dimensions |                    |       |       |      | Tough ↔ Hard |       |       |
|-----------------------|------------|--------------------|-------|-------|------|--------------|-------|-------|
|                       | IC         | TPI <sup>(1)</sup> | INSL  | PDX   | PDY  | IC50M        | IC250 | IC908 |
| 16IR 16 STACME IC908  | 9.52       | 16.0               | 16.49 | 1.00  | 1.00 |              |       | •     |
| 16IR 16 STACME IC50M  | 9.52       | 16.0               | 16.49 | 1.00  | 1.00 | •            |       |       |
| 16IR 12 STACME IC908  | 9.52       | 12.0               | 16.49 | 1.20  | 1.20 |              |       | •     |
| 16IR 10 STACME IC50M  | 9.52       | 10.0               | 16.49 | 1.30  | 1.30 | •            |       |       |
| 16IR 10 STACME IC908  | 9.52       | 10.0               | 16.49 | 1.20  | 1.20 |              |       | •     |
| 16IL 8 STACME IC908   | 9.52       | 8.0                | 16.49 | 1.50  | 1.60 |              |       | •     |
| 16IR 8 STACME IC50M   | 9.52       | 8.0                | 16.49 | 1.50  | 1.60 | •            |       |       |
| 16IR 8 STACME IC908   | 9.52       | 8.0                | 16.49 | 1.50  | 1.60 |              |       | •     |
| 16IR 6 STACME IC250   | 9.52       | 6.0                | 16.49 | 1.80  | 1.80 |              | •     |       |
| 16IR 6 STACME IC908   | 9.52       | 6.0                | 16.49 | 1.70  | 1.60 |              |       | •     |
| 22IL 5 STACME IC50M   | 12.70      | 5.0                | 22.00 | 2.30  | 2.00 | •            |       |       |
| 22IR 5 STACME IC50M   | 12.70      | 5.0                | 22.00 | 2.30  | 2.00 | •            |       |       |
| 22IR 4 STACME IC908   | 12.70      | 4.0                | 22.00 | 2.40  | 2.30 |              |       | •     |
| 22UIRL 3 STACME IC250 | 12.70      | 3.0                | 22.00 | 11.00 | 3.30 |              | •     |       |
| 27IL 4 STACME IC50M   | 15.88      | 4.0                | 27.50 | 2.40  | 2.30 | •            |       |       |
| 27IR 4 STACME IC908   | 15.88      | 4.0                | 27.50 | 2.40  | 2.30 |              |       | •     |
| 27IL 3 STACME IC250   | 15.88      | 3.0                | 27.50 | 2.90  | 2.90 |              | •     |       |
| 27IR 3 STACME IC250   | 15.88      | 3.0                | 27.50 | 2.90  | 2.90 |              | •     |       |

• For Insert Identification System, see page 714 • Tolerance: Class 2G. • For technical information and detailed cutting data, see pages 809-825

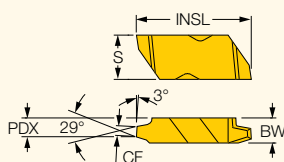
<sup>(1)</sup> Threads per inch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

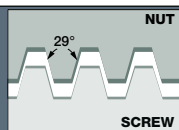
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**STUB ACME THREADING  
FLAS-PT-I**

Double-Ended, Precision, Flat  
Top on Internal Threading Inserts



Right-hand shown



Dimensions

| Designation          | TPI <sup>(1)</sup> | CF   | PDX  | BW   | S     | INSL  | IC908 |
|----------------------|--------------------|------|------|------|-------|-------|-------|
| FLAS-6L2-PT-I IC908  | 2.0                | 5.23 | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLAS-4L3-PT-I IC908  | 3.0                | 3.44 | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLAS-3L4-PT-I IC908  | 4.0                | 2.55 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3L5-PT-I IC908  | 5.0                | 2.01 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3L6-PT-I IC908  | 6.0                | 1.66 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3L8-PT-I IC908  | 8.0                | 1.21 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3L10-PT-I IC908 | 10.0               | 0.94 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3L12-PT-I IC908 | 12.0               | 0.83 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3L14-PT-I IC908 | 14.0               | 0.70 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3L16-PT-I IC908 | 16.0               | 0.60 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |

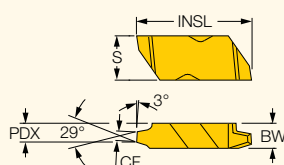
• For internal thread limits, see pages 822-823

<sup>(1)</sup> Threads per inch

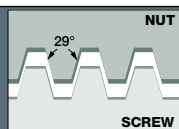
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**STUB ACME THREADING  
FLAS-PT-E**

Double-Ended, Precision, Flat  
Top External Threading Inserts



Right-hand shown



Dimensions

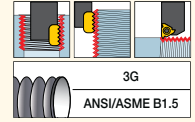
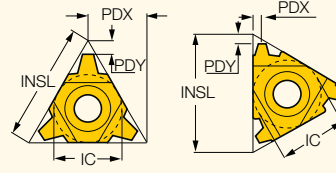
| Designation          | TPI <sup>(1)</sup> | CF   | PDX  | BW   | S     | INSL  | IC908 |
|----------------------|--------------------|------|------|------|-------|-------|-------|
| FLAS-3R4-PT-E IC908  | 4.0                | 2.55 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R5-PT-E IC908  | 5.0                | 2.01 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R6-PT-E IC908  | 6.0                | 1.66 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R8-PT-E IC908  | 8.0                | 1.21 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R10-PT-E IC908 | 10.0               | 0.94 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R12-PT-E IC908 | 12.0               | 0.83 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R14-PT-E IC908 | 14.0               | 0.70 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R16-PT-E IC908 | 16.0               | 0.60 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-4R3-PT-E IC908  | 3.0                | 3.44 | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLAS-6R2-PT-E IC908  | 2.0                | 5.23 | 7.20 | 9.73 | 11.51 | 28.45 | ●     |

<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLISR/L (807)

**ER/L-ACME**

External ACME Profile  
Laydown Threading Inserts  
for Feed Screws



External right-hand shown

| Designation         | Dimensions |                    |       |       |      | Tough ↔ Hard |       |      |       |        |
|---------------------|------------|--------------------|-------|-------|------|--------------|-------|------|-------|--------|
|                     | IC         | TPI <sup>(1)</sup> | INSL  | PDX   | PDY  | IC50M        | IC250 | IC08 | IC908 | IC1007 |
| 11ER 16 ACME IC908  | 6.35       | 16.0               | 11.00 | 1.00  | 0.90 |              |       |      | •     |        |
| 16ER 16 ACME IC250  | 9.52       | 16.0               | 16.49 | 1.00  | 1.00 |              | •     |      |       |        |
| 16ER 16 ACME IC908  | 9.52       | 16.0               | 16.49 | 1.00  | 1.00 |              |       |      | •     |        |
| 16ER 14 ACME IC250  | 9.52       | 14.0               | 16.49 | 1.00  | 1.00 |              | •     |      |       |        |
| 16ER 12 ACME IC908  | 9.52       | 12.0               | 16.49 | 1.00  | 1.00 |              |       |      | •     |        |
| 16ER 10 ACME IC250  | 9.52       | 10.0               | 16.49 | 1.30  | 1.40 |              | •     |      |       |        |
| 16ER 10 ACME IC908  | 9.52       | 10.0               | 16.49 | 1.30  | 1.40 |              |       |      | •     |        |
| 16EL 8 ACME IC250   | 9.52       | 8.0                | 16.49 | 1.50  | 1.50 |              | •     |      |       |        |
| 16EL 8 ACME IC908   | 9.52       | 8.0                | 16.49 | 1.50  | 1.30 |              |       |      | •     |        |
| 16ER 8 ACME IC250   | 9.52       | 8.0                | 16.49 | 1.50  | 1.50 |              | •     |      |       |        |
| 16ER 8 ACME IC908   | 9.52       | 8.0                | 16.49 | 1.50  | 1.30 |              |       |      | •     |        |
| 16EL 6 ACME IC250   | 9.52       | 6.0                | 16.49 | 1.70  | 1.40 |              | •     |      |       |        |
| 16ER 6 ACME IC250   | 9.52       | 6.0                | 16.49 | 1.70  | 1.40 |              | •     |      |       |        |
| 16ER 6 ACME IC1007  | 9.52       | 6.0                | 16.49 | 1.70  | 1.40 |              |       |      |       | •      |
| 16EL 6 ACME IC908   | 9.52       | 6.0                | 16.49 | 1.70  | 1.40 |              |       |      | •     |        |
| 22EL 6 ACME IC908   | 12.70      | 6.0                | 22.00 | 2.10  | 1.80 |              |       |      | •     |        |
| 22ER 6 ACME IC50M   | 12.70      | 6.0                | 22.00 | 2.10  | 1.80 | •            |       |      |       |        |
| 22ER 6 ACME IC908   | 12.70      | 6.0                | 22.00 | 2.10  | 1.80 |              |       |      | •     |        |
| 22EL 5 ACME IC908   | 12.70      | 5.0                | 22.00 | 2.40  | 2.00 |              |       |      | •     |        |
| 22ER 5 ACME IC250   | 12.70      | 5.0                | 22.00 | 2.40  | 2.00 |              | •     |      |       |        |
| 22ER 5 ACME IC908   | 12.70      | 5.0                | 22.00 | 2.40  | 2.00 |              |       |      | •     |        |
| 22EL 4 ACME IC908   | 12.70      | 4.0                | 22.00 | 2.30  | 2.10 |              |       |      | •     |        |
| 22ER 4 ACME IC908   | 12.70      | 4.0                | 22.00 | 2.30  | 2.10 |              |       |      | •     |        |
| 22UERL 4 ACME IC50M | 12.70      | 4.0                | 22.00 | 11.00 | 2.30 | •            |       |      |       |        |
| 22UERL 4 ACME IC908 | 12.70      | 4.0                | 22.00 | 11.00 | 2.30 |              |       |      | •     |        |
| 27EL 4 ACME IC908   | 15.88      | 4.0                | 27.50 | 2.70  | 2.30 |              |       |      | •     |        |
| 27ER 4 ACME IC08    | 15.88      | 4.0                | 27.50 | 2.70  | 2.30 |              |       | •    |       |        |
| 27ER 4 ACME IC250   | 15.88      | 4.0                | 27.50 | 2.70  | 2.30 |              | •     |      |       |        |
| 27ER 4 ACME IC908   | 15.88      | 4.0                | 27.50 | 2.60  | 2.30 |              |       |      | •     |        |
| 27UERL 3 ACME IC250 | 15.88      | 3.0                | 27.50 | 13.70 | 2.80 |              | •     |      |       |        |
| 27UERL 3 ACME IC908 | 15.88      | 3.0                | 27.50 | 13.70 | 2.80 |              |       |      | •     |        |

• For Insert Identification System, see page 714 • ACME ASME/ANSI B1.5-1988 Class 3G

• For technical information and detailed cutting data, see pages 809-825

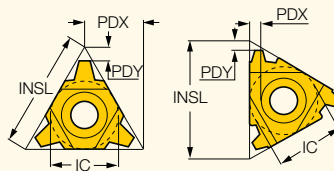
<sup>(1)</sup> Threads per inch

**For tools, see pages:** C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

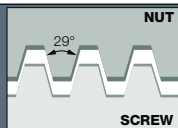
# ISCAR THREAD

## IR/L-ACME

Internal ACME Profile  
Laydown Threading Inserts  
for Feed Screws



Internal left-hand shown



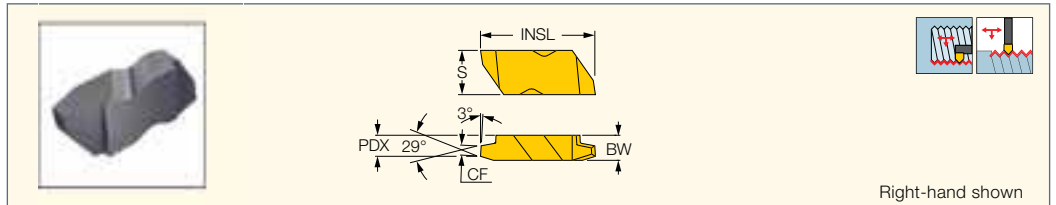
| Designation                       | Dimensions |                    |       |       |      | Tough ↔ Hard |       |      |       |       |        |
|-----------------------------------|------------|--------------------|-------|-------|------|--------------|-------|------|-------|-------|--------|
|                                   | IC         | TPI <sup>(2)</sup> | INSL  | PDX   | PDY  | IC50M        | IC250 | IC08 | IC508 | IC908 | IC1007 |
| 16IL 16 ACME IC50M                | 9.52       | 16.0               | 16.49 | 1.00  | 0.90 | ●            |       |      |       |       |        |
| 16IR 16 ACME IC250                | 9.52       | 16.0               | 16.49 | 1.00  | 0.90 |              | ●     |      |       |       |        |
| 16IR 16 ACME IC50M                | 9.52       | 16.0               | 16.49 | 1.00  | 0.90 | ●            |       |      |       |       |        |
| 16IL 14 ACME IC50M                | 9.52       | 14.0               | 16.49 | 1.20  | 1.00 | ●            |       |      |       |       |        |
| 16IL 12 ACME IC50M                | 9.52       | 12.0               | 16.49 | 1.20  | 1.10 | ●            |       |      |       |       |        |
| 16IR 12 ACME IC08                 | 9.52       | 12.0               | 16.49 | 1.20  | 1.10 |              |       | ●    |       |       |        |
| 16IR 12 ACME IC250                | 9.52       | 12.0               | 16.49 | 1.20  | 1.10 |              | ●     |      |       |       |        |
| 16IR 12 ACME IC908                | 9.52       | 12.0               | 16.49 | 1.20  | 1.10 |              |       |      |       | ●     |        |
| 16IL 10 ACME IC50M                | 9.52       | 10.0               | 16.49 | 1.30  | 1.30 | ●            |       |      |       |       |        |
| 16IR 10 ACME IC250                | 9.52       | 10.0               | 16.49 | 1.40  | 1.30 |              | ●     |      |       |       |        |
| 16IL 8 ACME IC908                 | 9.52       | 8.0                | 16.49 | 1.50  | 1.50 |              |       |      |       | ●     |        |
| 16IR 8 ACME IC250                 | 9.52       | 8.0                | 16.49 | 1.50  | 1.30 |              | ●     |      |       |       |        |
| 16IR 8 ACME IC908                 | 9.52       | 8.0                | 16.49 | 1.50  | 1.30 |              |       |      |       | ●     |        |
| 16IR 6 ACME IC250 <sup>(1)</sup>  | 9.52       | 6.0                | 16.49 | 1.65  | 1.40 |              | ●     |      |       |       |        |
| 16IR 6 ACME IC908 <sup>(1)</sup>  | 9.52       | 6.0                | 16.49 | 1.65  | 1.40 |              |       |      |       | ●     |        |
| 16IR 6 ACME IC1007 <sup>(1)</sup> | 9.52       | 6.0                | 16.49 | 1.65  | 1.40 |              |       |      |       |       | ●      |
| 22IL 6 ACME IC250                 | 12.70      | 6.0                | 22.00 | 2.10  | 1.90 |              | ●     |      |       |       |        |
| 22IL 6 ACME IC50M                 | 12.70      | 6.0                | 22.00 | 2.10  | 1.90 | ●            |       |      |       |       |        |
| 22IR 6 ACME IC250                 | 12.70      | 6.0                | 22.00 | 2.10  | 1.90 |              | ●     |      |       |       |        |
| 22IR 6 ACME IC50M                 | 12.70      | 6.0                | 22.00 | 2.10  | 1.90 | ●            |       |      |       |       |        |
| 22IR 6 ACME IC908                 | 12.70      | 6.0                | 22.00 | 2.10  | 1.90 |              |       |      |       | ●     |        |
| 22IL 5 ACME IC50M                 | 12.70      | 5.0                | 22.00 | 2.10  | 1.80 | ●            |       |      |       |       |        |
| 22IL 5 ACME IC508                 | 12.70      | 5.0                | 22.00 | 2.10  | 1.80 |              |       |      | ●     |       |        |
| 22IL 5 ACME IC908                 | 12.70      | 5.0                | 22.00 | 2.10  | 1.80 |              |       |      |       | ●     |        |
| 22IR 5 ACME IC250                 | 12.70      | 5.0                | 22.00 | 2.30  | 1.80 |              | ●     |      |       |       |        |
| 22IR 5 ACME IC908                 | 12.70      | 5.0                | 22.00 | 2.10  | 1.80 |              |       |      |       | ●     |        |
| 22IL 4 ACME IC250                 | 12.70      | 4.0                | 22.00 | 2.10  | 1.95 |              | ●     |      |       |       |        |
| 22IR 4 ACME IC908                 | 12.70      | 4.0                | 22.00 | 2.10  | 1.95 |              |       |      |       | ●     |        |
| 22UIRL 4 ACME IC908               | 12.70      | 4.0                | 22.00 | 11.00 | 2.00 |              |       |      |       | ●     |        |
| 22UIRL 4 ACME IC08                | 12.70      | 4.0                | 22.00 | 11.00 | 2.00 |              |       | ●    |       |       |        |
| 27IL 4 ACME IC908                 | 15.88      | 4.0                | 27.50 | 2.60  | 2.30 |              |       |      |       | ●     |        |
| 27IR 4 ACME IC250                 | 15.88      | 4.0                | 27.50 | 2.60  | 2.30 |              | ●     |      |       |       |        |
| 27IR 4 ACME IC908                 | 15.88      | 4.0                | 27.50 | 2.60  | 2.30 |              |       |      |       | ●     |        |
| 27UIRL 3 ACME IC908               | 15.88      | 3.0                | 27.50 | 13.70 | 2.80 |              |       |      |       | ●     |        |

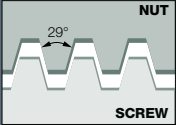
• For Insert Identification System, see page 714 • ACME ASME/ANSI B1.5-1988 Class 3G • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Can be used only on special/modified holders

<sup>(2)</sup> Threads per inch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

**ACME THREADING FLA**  
 Double-Ended, Precision,  
 Flat Top Threading Inserts


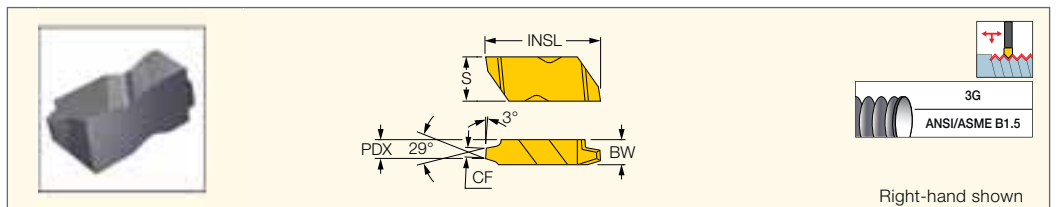
|  | Dimensions  |                    |      |      |       |       | IC908 |
|-----------------------------------------------------------------------------------|-------------|--------------------|------|------|-------|-------|-------|
|                                                                                   | Designation | TPI <sup>(1)</sup> | CF   | PDX  | BW    | S     |       |
| FLA-6R/L2 IC908                                                                   | 2.0         | 4.58               | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLA-6R/L2.5 IC908                                                                 | 2.5         | 3.63               | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLA-6R/L3 IC908                                                                   | 3.0         | 3.01               | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLA-3L4 IC908                                                                     | 4.0         | 2.22               | 3.40 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-4R/L4 IC908                                                                   | 4.0         | 2.22               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-3R/L5 IC908                                                                   | 5.0         | 1.75               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-4L5 IC908                                                                     | 5.0         | 1.75               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4R5 IC908                                                                     | 5.0         | 1.75               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-3L6 IC908                                                                     | 6.0         | 1.44               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R6 IC908                                                                     | 6.0         | 1.44               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-4L6 IC908                                                                     | 6.0         | 1.44               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4R6 IC908                                                                     | 6.0         | 1.44               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-3L8 IC908                                                                     | 8.0         | 1.04               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R8 IC908                                                                     | 8.0         | 1.04               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-4L8 IC908                                                                     | 8.0         | 1.04               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4R8 IC908                                                                     | 8.0         | 1.04               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-3R/L10 IC908                                                                  | 10.0        | 0.81               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R/L12 IC908                                                                  | 12.0        | 0.72               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R/L14 IC908                                                                  | 14.0        | 0.61               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R/L16 IC908                                                                  | 16.0        | 0.52               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |

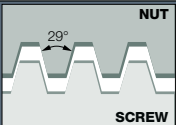
● Internal & External tolerance: ANSI/ASME B1.5 - 3G

<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLSR/L (807)

**ACME THREADING FLA-PT-E**

 Double-Ended, Precision, Flat  
 Top External Threading Inserts


|  | Dimensions  |                    |      |      |       |       | IC908 |
|-------------------------------------------------------------------------------------|-------------|--------------------|------|------|-------|-------|-------|
|                                                                                     | Designation | TPI <sup>(1)</sup> | CF   | PDX  | BW    | S     |       |
| FLA-3R4-PT-E IC908                                                                  | 4.0         | 2.22               | 3.40 | 4.95 | 8.74  | 28.45 | ●     |
| FLA-3R5-PT-E IC908                                                                  | 5.0         | 1.75               | 3.80 | 4.95 | 8.74  | 28.45 | ●     |
| FLA-3R6-PT-E IC908                                                                  | 6.0         | 1.44               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R8-PT-E IC908                                                                  | 8.0         | 1.04               | 3.80 | 4.95 | 8.74  | 28.45 | ●     |
| FLA-3R10-PT-E IC908                                                                 | 10.0        | 0.81               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R12-PT-E IC908                                                                 | 12.0        | 0.72               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R14-PT-E IC908                                                                 | 14.0        | 0.61               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3R16-PT-E IC908                                                                 | 16.0        | 0.52               | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-4R4-PT-E IC908                                                                  | 4.0         | 2.22               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4R5-PT-E IC908                                                                  | 5.0         | 1.75               | 5.10 | 6.48 | 11.51 | 22.60 | ●     |
| FLA-4R6-PT-E IC908                                                                  | 6.0         | 1.44               | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4R8-PT-E IC908                                                                  | 8.0         | 1.04               | 5.10 | 6.48 | 11.51 | 22.60 | ●     |
| FLA-6R2-PT-E IC908                                                                  | 2.0         | 4.58               | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLA-6R2.5-PT-E IC908                                                                | 2.5         | 3.63               | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLA-6R3-PT-E IC908                                                                  | 3.0         | 3.01               | 7.20 | 9.73 | 11.51 | 28.45 | ●     |

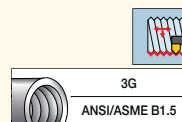
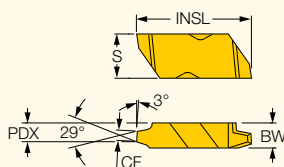
<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLSR/L (807)

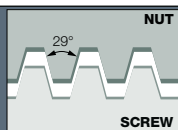
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**ACME THREADING FLA-PT-I**

Double-Ended, Precision, Flat  
Top Internal Threading Inserts



Right-hand shown



Dimensions

| Designation          | TPI <sup>(1)</sup> | CF   | PDX  | BW   | S     | INSL  | IC908 |
|----------------------|--------------------|------|------|------|-------|-------|-------|
| FLA-3L16-PT-I IC908  | 16.0               | 0.52 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3L14-PT-I IC908  | 14.0               | 0.61 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3L12-PT-I IC908  | 12.0               | 0.72 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3L10-PT-I IC908  | 10.0               | 0.81 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3L8-PT-I IC908   | 8.0                | 1.04 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3L6-PT-I IC908   | 6.0                | 1.44 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3L5-PT-I IC908   | 5.0                | 1.75 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-3L4-PT-I IC908   | 4.0                | 2.22 | 3.40 | 4.95 | 8.74  | 22.60 | ●     |
| FLA-4L8-PT-I IC908   | 8.0                | 1.04 | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4L6-PT-I IC908   | 6.0                | 1.44 | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4L5-PT-I IC908   | 5.0                | 1.75 | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-4L4-PT-I IC908   | 4.0                | 2.22 | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLA-6L3-PT-I IC908   | 3.0                | 3.01 | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLA-6L2.5-PT-I IC908 | 2.5                | 3.63 | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLA-6L2-PT-I IC908   | 2.0                | 4.58 | 7.20 | 9.73 | 11.51 | 28.45 | ●     |

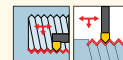
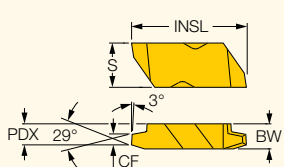
• For internal thread limits, see pages 822-823

<sup>(1)</sup> Threads per inch

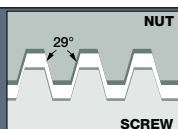
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**ACME THREADING FLAS**

Double-Ended, Precision,  
Flat Top Threading Inserts



Right-hand shown



Dimensions

| Designation       | TPI <sup>(1)</sup> | CF   | PDX  | BW   | S     | INSL  | IC908 |
|-------------------|--------------------|------|------|------|-------|-------|-------|
| FLAS-6R/L2 IC908  | 2.0                | 5.23 | 7.20 | 9.73 | 11.51 | 28.45 | ●     |
| FLAS-4R/L3 IC908  | 3.0                | 3.44 | 5.10 | 6.48 | 11.51 | 28.45 | ●     |
| FLAS-3L4 IC908    | 4.0                | 2.55 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R/L5 IC908  | 5.0                | 2.01 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R/L6 IC908  | 6.0                | 1.66 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R/L8 IC908  | 8.0                | 1.21 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R/L10 IC908 | 10.0               | 0.94 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R/L12 IC908 | 12.0               | 0.83 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R/L14 IC908 | 14.0               | 0.70 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |
| FLAS-3R/L16 IC908 | 16.0               | 0.60 | 3.80 | 4.95 | 8.74  | 22.60 | ●     |

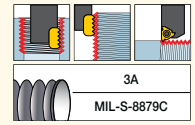
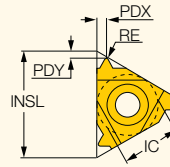
• DMIN according to related boring bar • Internal & External tolerance: ANSI/ASME B1.5 - 3G

<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLASR/L (807)

**ER/L-UNJ**

External UNJ Profile Laydown  
Threading Inserts for the Aviation  
and Aerospace Industries



External right-hand shown

| Designation         | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |      |       |       |        |
|---------------------|------------|--------------------|-------|------|------|------|--------------|-------|------|-------|-------|--------|
|                     | IC         | TPI <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | IC50M        | IC250 | IC08 | IC908 | IC806 | IC1007 |
| 11ER 28 UNJ IC908   | 6.35       | 28.0               | 11.00 | 0.15 | 0.60 | 0.60 |              |       |      | •     |       |        |
| 11ER 24 UNJ IC908   | 6.35       | 24.0               | 11.00 | 0.16 | 0.80 | 0.70 |              |       |      | •     |       |        |
| 11ER 20 UNJ IC908   | 6.35       | 20.0               | 11.00 | 0.19 | 0.90 | 0.80 |              |       |      | •     |       |        |
| 11ER 18 UNJ IC908   | 6.35       | 18.0               | 11.00 | 0.23 | 1.00 | 0.80 |              |       |      | •     |       |        |
| 16ER 40 UNJ IC908   | 9.52       | 40.0               | 16.49 | 0.10 | 0.60 | 0.60 |              |       |      | •     |       |        |
| 16ER 36 UNJ IC908   | 9.52       | 36.0               | 16.49 | 0.11 | 0.60 | 0.60 |              |       |      | •     |       |        |
| 16ER 32 UNJ IC806   | 9.52       | 32.0               | 16.49 | 0.13 | 0.60 | 0.60 |              |       |      |       | •     |        |
| 16ER 32 UNJ IC908   | 9.52       | 32.0               | 16.49 | 0.13 | 0.60 | 0.60 |              |       |      | •     |       |        |
| 16ER/L 28 UNJ IC908 | 9.52       | 28.0               | 16.49 | 0.15 | 0.60 | 0.60 |              |       |      | •     |       |        |
| 16ER 28 UNJ IC806   | 9.52       | 28.0               | 16.49 | 0.15 | 0.60 | 0.60 |              |       |      |       | •     |        |
| 16EL 24 UNJ IC250   | 9.52       | 24.0               | 16.49 | 0.16 | 0.80 | 0.70 |              | •     |      |       |       |        |
| 16ER 24 UNJ IC806   | 9.52       | 24.0               | 16.49 | 0.18 | 0.80 | 0.70 |              |       |      |       | •     |        |
| 16ER 24 UNJ IC908   | 9.52       | 24.0               | 16.49 | 0.18 | 0.80 | 0.70 |              |       |      | •     |       |        |
| 16ER/L 20 UNJ IC908 | 9.52       | 20.0               | 16.49 | 0.21 | 0.90 | 0.80 |              |       |      | •     |       |        |
| 16ER 20 UNJ IC1007  | 9.52       | 20.0               | 16.49 | 0.21 | 0.90 | 0.80 |              |       |      |       |       | •      |
| 16ER 20 UNJ IC250   | 9.52       | 20.0               | 16.49 | 0.21 | 0.90 | 0.80 |              | •     |      |       |       |        |
| 16ER 20 UNJ IC806   | 9.52       | 20.0               | 16.49 | 0.21 | 0.90 | 0.80 |              |       |      |       | •     |        |
| 16EL 18 UNJ IC08    | 9.52       | 18.0               | 16.49 | 0.23 | 0.80 | 0.70 |              |       | •    |       |       |        |
| 16ER 18 UNJ IC1007  | 9.52       | 18.0               | 16.49 | 0.23 | 0.80 | 0.70 |              |       |      |       |       | •      |
| 16ER 18 UNJ IC806   | 9.52       | 18.0               | 16.49 | 0.23 | 0.80 | 0.70 |              |       |      |       | •     |        |
| 16ER 18 UNJ IC908   | 9.52       | 18.0               | 16.49 | 0.23 | 0.80 | 0.70 |              |       |      | •     |       |        |
| 16ER/L 16 UNJ IC908 | 9.52       | 16.0               | 16.49 | 0.26 | 1.20 | 0.90 |              |       |      | •     |       |        |
| 16ER 16 UNJ IC1007  | 9.52       | 16.0               | 16.49 | 0.26 | 1.20 | 0.90 |              |       |      |       |       | •      |
| 16ER 16 UNJ IC50M   | 9.52       | 16.0               | 16.49 | 0.26 | 1.20 | 0.90 | •            |       |      |       |       |        |
| 16ER 16 UNJ IC806   | 9.52       | 16.0               | 16.49 | 0.26 | 1.20 | 0.90 |              |       |      |       | •     |        |
| 16ER/L 14 UNJ IC908 | 9.52       | 14.0               | 16.49 | 0.30 | 1.20 | 1.10 |              |       |      | •     |       |        |
| 16ER 14 UNJ IC250   | 9.52       | 14.0               | 16.49 | 0.30 | 1.20 | 1.00 |              | •     |      |       |       |        |
| 16ER 14 UNJ IC806   | 9.52       | 14.0               | 16.49 | 0.30 | 1.20 | 1.10 |              |       |      |       | •     |        |
| 16ER 13 UNJ IC908   | 9.52       | 13.0               | 16.49 | 0.29 | 1.30 | 1.10 |              |       |      | •     |       |        |
| 16EL 12 UNJ IC908   | 9.52       | 12.0               | 16.49 | 0.35 | 1.20 | 1.10 |              |       |      | •     |       |        |
| 16ER 12 UNJ IC806   | 9.52       | 12.0               | 16.49 | 0.35 | 1.20 | 1.00 |              |       |      |       | •     |        |
| 16ER 12 UNJ IC908   | 9.52       | 12.0               | 16.49 | 0.35 | 1.20 | 1.00 |              |       |      | •     |       |        |
| 16ER 11 UNJ IC908   | 9.52       | 11.0               | 16.49 | 0.38 | 1.50 | 1.20 |              |       |      | •     |       |        |
| 16ER 10 UNJ IC908   | 9.52       | 10.0               | 16.49 | 0.38 | 1.50 | 1.10 |              |       |      | •     |       |        |
| 16ER 10 UNJ IC806   | 9.52       | 10.0               | 16.49 | 0.38 | 1.50 | 1.10 |              |       |      |       | •     |        |
| 16ER 9 UNJ IC250    | 9.52       | 9.0                | 16.49 | 0.47 | 1.45 | 1.15 |              | •     |      |       |       |        |
| 16EL 8 UNJ IC250    | 9.52       | 8.0                | 16.49 | 0.48 | 1.60 | 1.20 |              | •     |      |       |       |        |
| 16ER 8 UNJ IC908    | 9.52       | 8.0                | 16.49 | 0.48 | 1.60 | 1.20 |              |       |      | •     |       |        |

• UNJ MIL-S-8879C 9-1992 Class 3A • Only right-hand inserts are available in grade IC806 and IC1007

• Thread milling application available only for inserts size 06, 08, 11

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Threads per inch

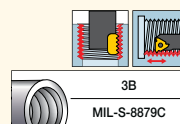
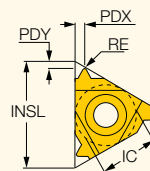
**For tools, see pages:** C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)



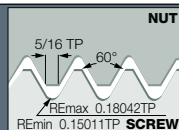
# ISCAR THREAD

## IR/L-UNJ

Internal UNJ Profile Laydown  
Threading Inserts for the Aviation  
and Aerospace Industries



Internal left-hand shown



| Designation         | Dimensions |                   |       |      |      |      | Tough ↔ Hard |       |       |      |       |       |
|---------------------|------------|-------------------|-------|------|------|------|--------------|-------|-------|------|-------|-------|
|                     | IC         | TP <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | IC228        | IC50M | IC250 | IC08 | IC908 | IC806 |
| 08IR 20 UNJ IC228   | 5.00       | 20.0              | 8.24  | 0.09 | 0.65 | 0.57 | •            |       |       |      |       |       |
| 08IR 18 UNJ IC228   | 5.00       | 18.0              | 8.24  | 0.10 | 0.65 | 0.57 | •            |       |       |      |       |       |
| 11IR 40 UNJ IC250   | 6.35       | 40.0              | 11.00 | 0.04 | 0.50 | 0.63 |              |       | •     |      |       |       |
| 11IR 32 UNJ IC908   | 6.35       | 32.0              | 11.00 | 0.04 | 0.60 | 0.60 |              |       |       |      | •     |       |
| 11IRB 32 UNJ IC908  | 6.35       | 32.0              | 11.00 | 0.04 | 0.60 | 0.60 |              |       |       |      | •     |       |
| 11IR 28 UNJ IC908   | 6.35       | 28.0              | 11.00 | 0.05 | 0.60 | 0.60 |              |       |       |      | •     |       |
| 11IR 24 UNJ IC08    | 6.35       | 24.0              | 11.00 | 0.05 | 0.80 | 0.70 |              |       |       | •    |       |       |
| 11IR 24 UNJ IC908   | 6.35       | 24.0              | 11.00 | 0.05 | 0.80 | 0.70 |              |       |       |      | •     |       |
| 11IRB 24 UNJ IC908  | 6.35       | 24.0              | 11.00 | 0.05 | 0.60 | 0.60 |              |       |       |      | •     |       |
| 11IR 20 UNJ IC908   | 6.35       | 20.0              | 11.00 | 0.07 | 0.90 | 0.80 |              |       |       |      | •     |       |
| 11IR 18 UNJ IC806   | 6.35       | 18.0              | 11.00 | 0.08 | 0.90 | 0.80 |              |       |       |      |       | •     |
| 11IR 18 UNJ IC908   | 6.35       | 18.0              | 11.00 | 0.08 | 0.90 | 0.80 |              |       |       |      | •     |       |
| 11IR 16 UNJ IC908   | 6.35       | 16.0              | 11.00 | 0.09 | 0.90 | 0.80 |              |       |       |      | •     |       |
| 11IR 16 UNJ IC806   | 6.35       | 16.0              | 11.00 | 0.09 | 0.90 | 0.80 |              |       |       |      |       | •     |
| 11IRB 14 UNJ IC908  | 6.35       | 14.0              | 11.00 | 0.10 | 0.90 | 0.80 |              |       |       |      | •     |       |
| 16IR 32 UNJ IC908   | 9.52       | 32.0              | 16.49 | 0.04 | 0.40 | 0.60 |              |       |       |      | •     |       |
| 16IR 24 UNJ IC908   | 9.52       | 24.0              | 16.49 | 0.06 | 0.80 | 0.70 |              |       |       |      | •     |       |
| 16IR 24 UNJ IC50M   | 9.52       | 24.0              | 16.49 | 0.06 | 0.80 | 0.70 |              | •     |       |      |       |       |
| 16IR 20 UNJ IC908   | 9.52       | 20.0              | 16.49 | 0.07 | 0.80 | 0.80 |              |       |       |      | •     |       |
| 16IR 18 UNJ IC908   | 9.52       | 18.0              | 16.49 | 0.08 | 0.80 | 0.70 |              |       |       |      | •     |       |
| 16IR 18 UNJ IC806   | 9.52       | 18.0              | 16.49 | 0.07 | 0.80 | 0.70 |              |       |       |      |       | •     |
| 16IR/L 16 UNJ IC908 | 9.52       | 16.0              | 16.49 | 0.09 | 1.20 | 1.00 |              |       | •     |      | •     |       |
| 16IR 16 UNJ IC250   | 9.52       | 16.0              | 16.49 | 0.09 | 1.20 | 1.00 |              |       | •     |      |       |       |
| 16IR 16 UNJ IC806   | 9.52       | 16.0              | 16.49 | 0.09 | 1.20 | 1.00 |              |       |       |      |       | •     |
| 16IR 14 UNJ IC908   | 9.52       | 14.0              | 16.49 | 0.10 | 1.10 | 1.10 |              |       |       |      | •     |       |
| 16IR 14 UNJ IC806   | 9.52       | 14.0              | 16.49 | 0.10 | 1.20 | 1.00 |              |       |       |      |       | •     |
| 16IR/L 12 UNJ IC908 | 9.52       | 12.0              | 16.49 | 0.12 | 1.00 | 1.10 |              |       |       |      | •     |       |
| 16IR 12 UNJ IC806   | 9.52       | 12.0              | 16.49 | 0.12 | 1.00 | 1.10 |              |       |       |      |       | •     |
| 16IR 10 UNJ IC908   | 9.52       | 10.0              | 16.49 | 0.14 | 1.45 | 1.20 |              |       |       |      | •     |       |
| 16IR/L 8 UNJ IC908  | 9.52       | 8.0               | 16.49 | 0.19 | 1.60 | 1.20 |              |       |       |      | •     |       |

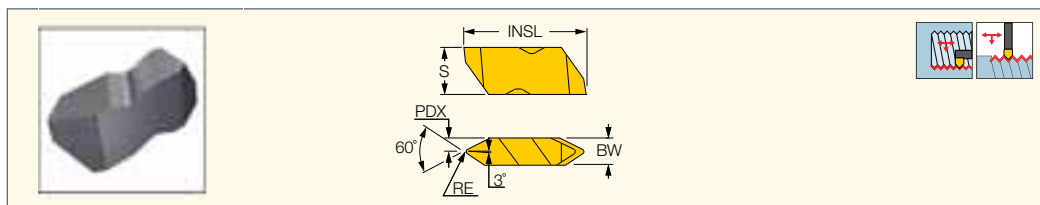
• Thread milling application available only for inserts size 06, 08, 11 • For Insert Identification System, see page 714

• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Threads per inch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

**UNJ THREADING FLJ**  
Double-Ended, Precision,  
Flat Top Threading Inserts



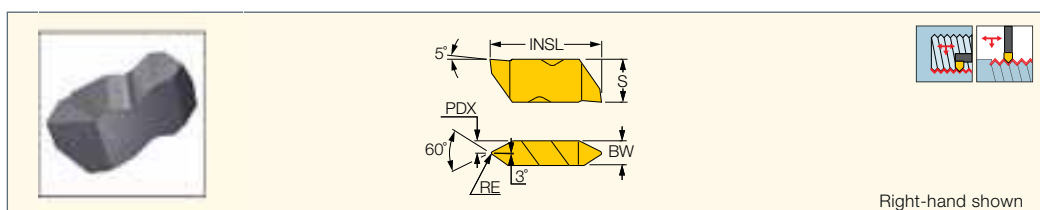
| <br><b>Designation</b>     | Dimensions         |      |      |      |      |       | IC908 |
|----------------------------|--------------------|------|------|------|------|-------|-------|
|                            | TPI <sup>(1)</sup> | RE   | PDX  | BW   | S    | INSL  |       |
| <b>FLJ-3020R/L8 IC908</b>  | 8.0                | 0.48 | 2.49 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJ-3014R/L12 IC908</b> | 12.0               | 0.32 | 2.49 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJ-3010R/L16 IC908</b> | 16.0               | 0.24 | 2.49 | 4.95 | 8.74 | 22.60 | ●     |

• DMIN according to related boring bar • Internal tolerance: MIL-S-8879C - 3B • External tolerance: MIL-S-8879C - 3A

<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLJR/L (807)

**UNJ THREADING FLJP**  
Double-Ended, Precision  
Threading Inserts with  
a Positive Rake



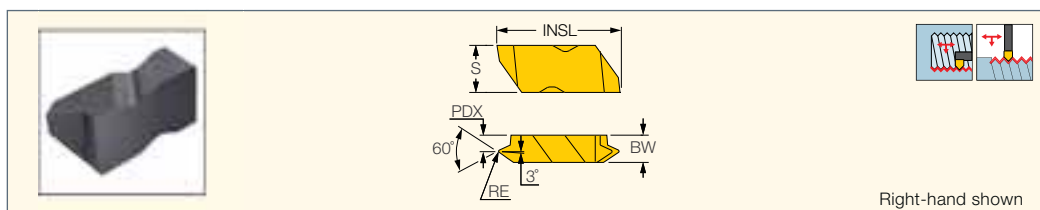
| <br><b>Designation</b>      | Dimensions         |      |      |      |      |       | IC908 |
|-----------------------------|--------------------|------|------|------|------|-------|-------|
|                             | TPI <sup>(1)</sup> | RE   | PDX  | BW   | S    | INSL  |       |
| <b>FLJP-3020R/L8 IC908</b>  | 8.0                | 0.48 | 2.50 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJP-3014R/L12 IC908</b> | 12.0               | 0.32 | 2.50 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJP-3010R/L16 IC908</b> | 16.0               | 0.24 | 2.50 | 4.95 | 8.74 | 22.60 | ●     |

• DMIN according to related boring bar • Internal tolerance: MIL-S-8879C - 3B • External tolerance: MIL-S-8879C - 3A

<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLJR/L (807)

**UNJ THREADING FLJF**  
Double-Ended, Precision  
Flat Top Threading Inserts



| <br><b>Designation</b>      | Dimensions         |      |      |      |      |       | IC908 |
|-----------------------------|--------------------|------|------|------|------|-------|-------|
|                             | TPI <sup>(1)</sup> | RE   | PDX  | BW   | S    | INSL  |       |
| <b>FLJF-3012R/L14 IC908</b> | 14.0               | 0.27 | 3.58 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJF-3010R/L16 IC908</b> | 16.0               | 0.24 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJF-3009R/L18 IC908</b> | 18.0               | 0.21 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJF-3008R/L20 IC908</b> | 20.0               | 0.19 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJF-3007R/L24 IC908</b> | 24.0               | 0.16 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJF-3006R/L28 IC908</b> | 28.0               | 0.14 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| <b>FLJF-3005R/L32 IC908</b> | 32.0               | 0.12 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |

• DMIN according to related boring bar • Internal tolerance: MIL-S-8879C - 3B • External tolerance: MIL-S-8879C - 3A

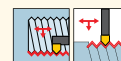
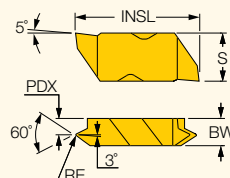
<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLJR/L (807)

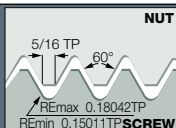
**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**UNJ THREADING FLJK**

Double-Ended, Precision  
Threading Inserts with a  
Positive Rake



Right-hand shown



Dimensions

| Designation          | TPI <sup>(1)</sup> | RE   | PDX  | BW   | S    | INSL  | IC908 |
|----------------------|--------------------|------|------|------|------|-------|-------|
| FLJK-3012R/L14 IC908 | 14.0               | 0.27 | 3.58 | 4.95 | 8.74 | 22.60 | ●     |
| FLJK-3010R/L16 IC908 | 16.0               | 0.24 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| FLJK-3009R/L18 IC908 | 18.0               | 0.21 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| FLJK-3008R/L20 IC908 | 20.0               | 0.19 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| FLJK-3007R/L24 IC908 | 24.0               | 0.16 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| FLJK-3006R/L28 IC908 | 28.0               | 0.14 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |
| FLJK-3005R/L32 IC908 | 32.0               | 0.12 | 3.60 | 4.95 | 8.74 | 22.60 | ●     |

• DMIN according to related boring bar • Internal tolerance: MIL-S-8879C - 3B • External tolerance: MIL-S-8879C - 3A

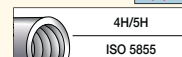
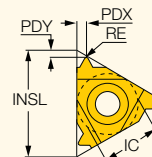
<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLSR/L (807)

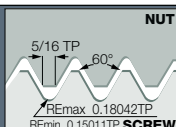
**ISCARTHREAD**

**IR-MJ**

Internal MJ ISO 5855 Metric  
Full Profile Laydown Threading  
Inserts for the Aviation and  
Aerospace Industries



Internal left-hand shown



Dimensions

Tough ↔ Hard

| Designation         | IC   | TP <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | IC908 | IC806 |
|---------------------|------|-------------------|-------|------|------|------|-------|-------|
| 11IR 1.00 MJ IC908  | 6.35 | 1.000             | 11.00 | 0.05 | 0.60 | 0.60 | ●     |       |
| 11IR 1.00 MJ IC806  | 6.35 | 1.000             | 11.00 | 0.05 | 0.60 | 0.60 |       | ●     |
| 11IRB 1.00 MJ IC908 | 6.35 | 1.000             | 11.00 | 0.05 | 0.60 | 0.60 | ●     |       |
| 11IR 1.25 MJ IC908  | 6.35 | 1.250             | 11.00 | 0.07 | 0.90 | 0.80 | ●     |       |
| 11IR 1.25 MJ IC806  | 6.35 | 1.250             | 11.00 | 0.07 | 0.90 | 0.80 |       | ●     |
| 11IR 1.50 MJ IC908  | 6.35 | 1.500             | 11.00 | 0.08 | 1.00 | 0.80 | ●     |       |
| 11IR 1.50 MJ IC806  | 6.35 | 1.500             | 11.00 | 0.08 | 1.00 | 0.80 |       | ●     |
| 11IRB 1.50 MJ IC908 | 6.35 | 1.500             | 11.00 | 0.08 | 0.90 | 0.80 | ●     |       |
| 11IR 2.00 MJ IC908  | 6.35 | 2.000             | 11.00 | 0.12 | 1.00 | 0.90 | ●     |       |
| 11IR 2.00 MJ IC806  | 6.35 | 2.000             | 11.00 | 0.12 | 1.00 | 0.90 |       | ●     |
| 16IR 1.00 MJ IC908  | 9.52 | 1.000             | 16.49 | 0.05 | 0.70 | 1.00 | ●     |       |
| 16IR 1.00 MJ IC806  | 9.52 | 1.000             | 16.49 | 0.05 | 0.70 | 1.00 |       | ●     |
| 16IR 1.25 MJ IC908  | 9.52 | 1.250             | 16.49 | 0.07 | 0.90 | 0.80 | ●     |       |
| 16IR 1.25 MJ IC806  | 9.52 | 1.250             | 16.49 | 0.07 | 0.90 | 0.80 |       | ●     |
| 16IR 1.50 MJ IC908  | 9.52 | 1.500             | 16.49 | 0.08 | 1.20 | 1.10 | ●     |       |
| 16IR 1.50 MJ IC806  | 9.52 | 1.500             | 16.49 | 0.08 | 1.20 | 1.10 |       | ●     |

• Thread milling application available only for inserts size 06, 08, 11 • For Insert Identification System, see page 714

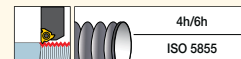
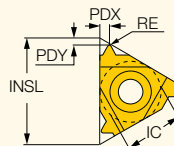
• For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Thread pitch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

**ER-MJ**

External MJ ISO 5855 Metric  
Full Profile Laydown Threading  
Inserts for the Aviation and  
Aerospace Industries



External right-hand shown

| Designation               | Dimensions |                   |       |      |      |      | Tough ↔ Hard |       |       |
|---------------------------|------------|-------------------|-------|------|------|------|--------------|-------|-------|
|                           | IC         | TP <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | IC250        | IC908 | IC806 |
| <b>16ER 1.00 MJ IC806</b> | 9.52       | 1.000             | 16.49 | 0.17 | 0.80 | 0.70 |              |       | •     |
| <b>16ER 1.00 MJ IC908</b> | 9.52       | 1.000             | 16.49 | 0.17 | 0.80 | 0.70 |              | •     |       |
| <b>16ER 1.25 MJ IC806</b> | 9.52       | 1.250             | 16.49 | 0.21 | 0.80 | 0.80 |              |       | •     |
| <b>16ER 1.25 MJ IC908</b> | 9.52       | 1.250             | 16.49 | 0.21 | 0.80 | 0.80 |              | •     |       |
| <b>16ER 1.50 MJ IC250</b> | 9.52       | 1.500             | 16.49 | 0.25 | 1.20 | 1.00 | •            |       |       |
| <b>16ER 1.50 MJ IC806</b> | 9.52       | 1.500             | 16.49 | 0.25 | 1.20 | 1.00 |              |       | •     |
| <b>16ER 1.50 MJ IC908</b> | 9.52       | 1.500             | 16.49 | 0.25 | 1.20 | 1.00 |              | •     |       |
| <b>16ER 2.00 MJ IC908</b> | 9.52       | 2.000             | 16.49 | 0.33 | 1.20 | 1.00 |              | •     |       |
| <b>16ER 2.00 MJ IC806</b> | 9.52       | 2.000             | 16.49 | 0.33 | 1.20 | 1.00 |              |       | •     |

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

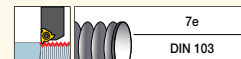
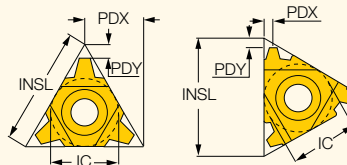
<sup>(1)</sup> Thread pitch

For tools, see pages: NQCH-SER/L-JHP (800) • SER/L (798)

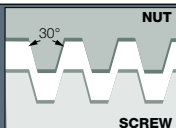
# ISCAR THREAD

## ER/L-TR

External Trapezoid Shaped  
DIN 103 Laydown Threading  
Inserts for Feed Screws



External right-hand shown



| Designation                       | Dimensions |                   |       |      |       | Tough ↔ Hard |       |       |       |        |
|-----------------------------------|------------|-------------------|-------|------|-------|--------------|-------|-------|-------|--------|
|                                   | IC         | TP <sup>(2)</sup> | INSL  | PDY  | PDX   | IC228        | IC50M | IC250 | IC908 | IC1007 |
| 16EL 1.5 TR IC250                 | 9.52       | 1.500             | 16.49 | 1.00 | 1.00  |              |       | •     |       |        |
| 16ER 1.5 TR IC250                 | 9.52       | 1.500             | 16.49 | 1.00 | 1.00  |              |       | •     |       |        |
| 16ER 1.5 TR IC908                 | 9.52       | 1.500             | 16.49 | 1.00 | 1.00  |              |       |       | •     |        |
| 16EL 2 TR IC250                   | 9.52       | 2.000             | 16.49 | 1.00 | 1.00  |              |       | •     |       |        |
| 16ER 2 TR IC250                   | 9.52       | 2.000             | 16.49 | 1.00 | 1.00  |              |       | •     |       |        |
| 16ER 2 TR IC908                   | 9.52       | 2.000             | 16.49 | 1.00 | 1.00  |              |       |       | •     |        |
| 16EL 3 TR IC908                   | 9.52       | 3.000             | 16.49 | 1.40 | 1.60  |              |       |       | •     |        |
| 16ER 3 TR IC1007                  | 9.52       | 3.000             | 16.49 | 1.40 | 1.60  |              |       |       |       | •      |
| 16ER 3 TR IC228                   | 9.52       | 3.000             | 16.49 | 1.40 | 1.60  | •            |       |       |       |        |
| 16ER 3 TR IC250                   | 9.52       | 3.000             | 16.49 | 1.40 | 1.60  |              |       | •     |       |        |
| 16ER 3 TR IC908                   | 9.52       | 3.000             | 16.49 | 1.40 | 1.60  |              |       |       | •     |        |
| 16ER 4 TR IC250                   | 9.52       | 4.000             | 16.49 | 1.35 | 1.50  |              |       | •     |       |        |
| 16ER 4 TR IC908                   | 9.52       | 4.000             | 16.49 | 1.35 | 1.50  |              |       |       | •     |        |
| 22EL 4 TR IC908                   | 12.70      | 4.000             | 22.00 | 1.80 | 1.90  |              |       |       | •     |        |
| 22ER 4 TR IC250                   | 12.70      | 4.000             | 22.00 | 1.80 | 1.90  |              |       | •     |       |        |
| 22ER 4 TR IC908                   | 12.70      | 4.000             | 22.00 | 1.80 | 1.90  |              |       |       | •     |        |
| 22EL 5 TR IC250                   | 12.70      | 5.000             | 22.00 | 2.00 | 2.40  |              |       | •     |       |        |
| 22EL 5 TR IC908                   | 12.70      | 5.000             | 22.00 | 2.00 | 2.40  |              |       |       | •     |        |
| 22ER 5 TR IC250                   | 12.70      | 5.000             | 22.00 | 2.00 | 2.40  |              |       | •     |       |        |
| 22ER 5 TR IC50M                   | 12.70      | 5.000             | 22.00 | 2.00 | 2.40  |              | •     |       |       |        |
| 22ER 5 TR IC908                   | 12.70      | 5.000             | 22.00 | 2.00 | 2.40  |              |       |       | •     |        |
| 22EL 6 TR IC908                   | 12.70      | 6.000             | 22.00 | 2.00 | 2.40  |              |       |       | •     |        |
| 22ER 6 TR IC908                   | 12.70      | 6.000             | 22.00 | 2.00 | 2.40  |              |       |       | •     |        |
| 22UERL 6 TR IC250                 | 12.70      | 6.000             | 22.00 | 2.00 | 11.00 |              |       | •     |       |        |
| 22UERL 6 TR IC50M                 | 12.70      | 6.000             | 22.00 | 2.00 | 11.00 |              | •     |       |       |        |
| 22UERL 6 TR IC908                 | 12.70      | 6.000             | 22.00 | 2.00 | 11.00 |              |       |       | •     |        |
| 22UERL 7 TR IC250                 | 12.70      | 7.000             | 22.00 | 2.30 | 11.00 |              |       | •     |       |        |
| 22UERL 8 TR IC250                 | 12.70      | 8.000             | 22.00 | 2.30 | 11.00 |              |       | •     |       |        |
| 27EL 6 TR IC908                   | 15.88      | 6.000             | 27.50 | 2.30 | 2.60  |              |       |       | •     |        |
| 27ER 6 TR IC250                   | 15.88      | 6.000             | 27.50 | 2.30 | 2.70  |              |       | •     |       |        |
| 27ER 6 TR IC908                   | 15.88      | 6.000             | 27.50 | 2.30 | 2.60  |              |       |       | •     |        |
| 27EL 7 TR IC250                   | 15.88      | 7.000             | 27.50 | 2.20 | 2.70  |              |       | •     |       |        |
| 27ER 7 TR IC250                   | 15.88      | 7.000             | 27.50 | 2.20 | 2.70  |              |       | •     |       |        |
| 27ER 7 TR IC908                   | 15.88      | 7.000             | 27.50 | 2.20 | 2.70  |              |       |       | •     |        |
| 27UERL 8 TR IC250                 | 15.88      | 8.000             | 27.50 | 2.68 | 13.75 |              |       | •     |       |        |
| 27UERL 8 TR IC908                 | 15.88      | 8.000             | 27.50 | 2.68 | 13.75 |              |       |       | •     |        |
| 27UERL 9 TR IC250                 | 15.88      | 9.000             | 27.50 | 3.00 | 13.70 |              |       | •     |       |        |
| 27UERL 9 TR IC908                 | 15.88      | 9.000             | 27.50 | 3.00 | 13.70 |              |       |       | •     |        |
| 27UERL 10 TR IC250 <sup>(1)</sup> | 15.88      | 10.000            | 27.50 | 3.00 | 13.70 |              |       | •     |       |        |
| 27UERL 10 TR IC908 <sup>(1)</sup> | 15.88      | 10.000            | 27.50 | 3.00 | 13.70 |              |       |       | •     |        |

• For Insert Identification System, see page 714 • DIN 103 04/1977,1502901/1977 Class 7e • For technical information and detailed cutting data, see pages 809-825

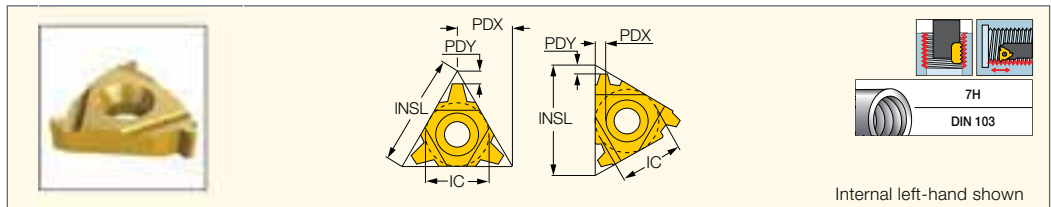
<sup>(1)</sup> One cutting edge only. Special anvil required.

<sup>(2)</sup> Thread pitch

For tools, see pages: NQCH-SER/L-JHP (800) • SER/L (798)

**IR/L-TR**

Internal Trapezoid Shaped  
DIN 103 Laydown Threading  
Inserts for Feed Screws



Internal left-hand shown

| Designation                       | Dimensions |       |                   |       |      | Tough ↔ Hard |       |       |       |
|-----------------------------------|------------|-------|-------------------|-------|------|--------------|-------|-------|-------|
|                                   | IC         | INSL  | TP <sup>(2)</sup> | PDX   | PDY  | IC228        | IC50M | IC250 | IC908 |
| 08IR 1.5 TR IC228 <sup>(1)</sup>  | 5.00       | 8.24  | 1.500             | 0.60  | 0.60 | •            |       |       |       |
| 08UIRL 2 TR IC228                 | 5.00       | 8.66  | 2.000             | 4.33  | 0.90 | •            |       |       |       |
| 16IL 2 TR IC250                   | 9.52       | 16.49 | 2.000             | 1.30  | 1.00 |              |       | •     |       |
| 16IL 2 TR IC908                   | 9.52       | 16.49 | 2.000             | 1.30  | 1.00 |              |       |       | •     |
| 16IL 3 TR IC908                   | 9.52       | 16.49 | 3.000             | 1.50  | 1.30 |              |       |       | •     |
| 16IR 1.5 TR IC250                 | 9.52       | 16.49 | 1.500             | 1.00  | 1.00 |              |       | •     |       |
| 16IR 1.5 TR IC908                 | 9.52       | 16.49 | 1.500             | 1.10  | 1.00 |              |       |       | •     |
| 16IR 2 TR IC250                   | 9.52       | 16.49 | 2.000             | 1.30  | 1.00 |              |       | •     |       |
| 16IR 2 TR IC908                   | 9.52       | 16.49 | 2.000             | 1.10  | 1.00 |              |       |       | •     |
| 16IR 3 TR IC228                   | 9.52       | 16.49 | 3.000             | 1.50  | 1.30 | •            |       |       |       |
| 16IR 3 TR IC908                   | 9.52       | 16.49 | 3.000             | 1.50  | 1.30 |              |       |       | •     |
| 22IL 4 TR IC908                   | 12.70      | 22.00 | 4.000             | 2.00  | 1.90 |              |       |       | •     |
| 22IL 5 TR IC908                   | 12.70      | 22.00 | 5.000             | 2.10  | 1.90 |              |       |       | •     |
| 22IL 6 TR IC908                   | 12.70      | 22.00 | 6.000             | 2.10  | 1.80 |              |       |       | •     |
| 22IR 4 TR IC250                   | 12.70      | 22.00 | 4.000             | 2.00  | 1.90 |              |       | •     |       |
| 22IR 4 TR IC908                   | 12.70      | 22.00 | 4.000             | 2.00  | 1.90 |              |       |       | •     |
| 22IR 5 TR IC250                   | 12.70      | 22.00 | 5.000             | 2.10  | 1.90 |              |       | •     |       |
| 22IR 5 TR IC908                   | 12.70      | 22.00 | 5.000             | 2.10  | 1.90 |              |       |       | •     |
| 22IR 6 TR IC250                   | 12.70      | 22.00 | 6.000             | 2.10  | 1.80 |              |       | •     |       |
| 22IR 6 TR IC50M                   | 12.70      | 22.00 | 6.000             | 2.10  | 1.80 |              | •     |       |       |
| 22IR 6 TR IC908                   | 12.70      | 22.00 | 6.000             | 2.10  | 1.80 |              |       |       | •     |
| 22UIRL 6 TR IC250                 | 12.70      | 22.00 | 6.000             | 11.00 | 2.00 |              |       | •     |       |
| 22UIRL 6 TR IC908                 | 12.70      | 22.00 | 6.000             | 11.00 | 2.00 |              |       |       | •     |
| 22UIRL 7 TR IC250                 | 12.70      | 22.00 | 7.000             | 11.00 | 2.30 |              |       | •     |       |
| 27IL 6 TR IC908                   | 15.88      | 27.50 | 6.000             | 2.70  | 2.30 |              |       |       | •     |
| 27IR 6 TR IC250                   | 15.88      | 27.50 | 6.000             | 2.70  | 2.30 |              |       | •     |       |
| 27IR 6 TR IC908                   | 15.88      | 27.50 | 6.000             | 2.60  | 2.30 |              |       |       | •     |
| 27IR 7 TR IC250                   | 15.88      | 27.50 | 7.000             | 2.60  | 2.20 |              |       | •     |       |
| 27UIRL 10 TR IC908 <sup>(1)</sup> | 15.88      | 27.50 | 10.000            | 13.75 | 2.96 |              |       |       | •     |
| 27UIRL 8 TR IC228                 | 15.88      | 27.50 | 8.000             | 13.70 | 2.50 | •            |       |       |       |
| 27UIRL 8 TR IC250                 | 15.88      | 27.50 | 8.000             | 13.70 | 2.50 |              |       | •     |       |
| 27UIRL 8 TR IC908                 | 15.88      | 27.50 | 8.000             | 13.75 | 2.90 |              |       |       | •     |
| 27UIRL 9 TR IC250                 | 15.88      | 27.50 | 9.000             | 13.70 | 3.00 |              |       | •     |       |
| 27UIRL 9 TR IC908                 | 15.88      | 27.50 | 9.000             | 13.70 | 3.00 |              |       |       | •     |

• For Insert Identification System, see page 714 • Tolerance: Class 7H • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> A single threading corner

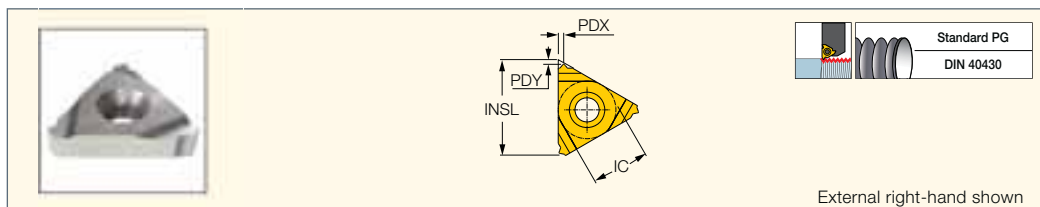
<sup>(2)</sup> Thread pitch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

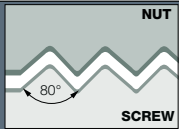
# ISCARTHREAD

## ER-PG

External Threading Inserts  
for the Electric Industry



External right-hand shown

| <br>Designation | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |
|--------------------------------------------------------------------------------------------------|------------|--------------------|-------|------|------|------|--------------|-------|
|                                                                                                  | IC         | TPI <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | IC08         | IC908 |
| 16ER 20 PG IC908                                                                                 | 9.52       | 20.0               | 16.49 | 0.13 | 0.80 | 0.70 |              | •     |
| 16ER 18 PG IC08                                                                                  | 9.52       | 18.0               | 16.49 | 0.15 | 0.90 | 0.80 | •            |       |
| 16ER 18 PG IC908                                                                                 | 9.52       | 18.0               | 16.49 | 0.15 | 0.90 | 0.80 |              | •     |
| 16ER 16 PG IC908                                                                                 | 9.52       | 16.0               | 16.49 | 0.17 | 1.00 | 0.80 |              | •     |

• For Insert Identification System, see page 714

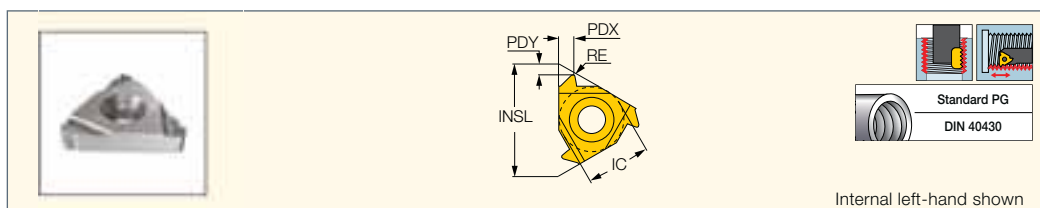
<sup>(1)</sup> Threads per inch

For tools, see pages: NQCH-SER/L-JHP (800) • SER/L (798)

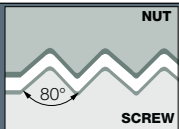
# ISCARTHREAD

## IR/L-PG

Internal Thread Profile Inserts  
for the Electric Industry



Internal left-hand shown

| <br>Designation | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |
|----------------------------------------------------------------------------------------------------|------------|--------------------|-------|------|------|------|--------------|-------|
|                                                                                                    | IC         | TPI <sup>(1)</sup> | INSL  | RE   | PDX  | PDY  | IC228        | IC908 |
| 08IR 20 PG IC228                                                                                   | 5.00       | 20.0               | 8.24  | 0.14 | 0.70 | 0.55 | •            |       |
| 11IR 18 PG IC908                                                                                   | 6.35       | 18.0               | 11.00 | 0.15 | 0.90 | 0.80 |              | •     |
| 16IR 18 PG IC908                                                                                   | 9.52       | 18.0               | 16.49 | 0.15 | 0.90 | 0.80 |              | •     |
| 16IR 16 PG IC908                                                                                   | 9.52       | 16.0               | 16.49 | 0.17 | 0.90 | 0.70 |              | •     |

• For Insert Identification System, see page 714

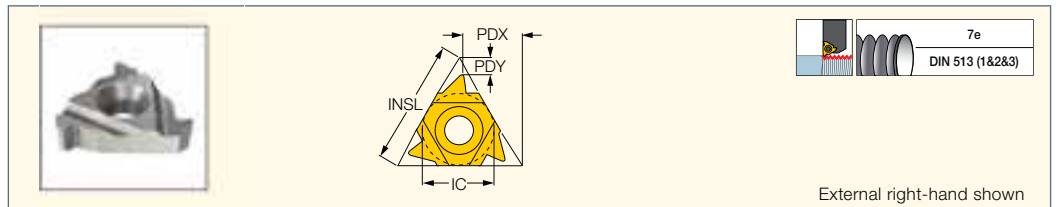
<sup>(1)</sup> Threads per inch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)



**ER/L-SAGE**

External Buttress Thread  
(DIN 513) for High Force in  
One Direction Applications



| Designation                       | Dimensions |                   |       |       |      | Tough ↔ Hard |       |
|-----------------------------------|------------|-------------------|-------|-------|------|--------------|-------|
|                                   | IC         | TP <sup>(2)</sup> | INSL  | PDX   | PDY  | IC250        | IC908 |
| 16EL 2 SAGE IC908                 | 9.52       | 2.000             | 16.49 | 1.60  | 1.10 |              | ●     |
| 16ER 2 SAGE IC908                 | 9.52       | 2.000             | 16.49 | 1.60  | 1.10 |              | ●     |
| 22ER 3 SAGE IC908                 | 12.70      | 3.000             | 22.00 | 2.40  | 1.50 |              | ●     |
| 22EL 4 SAGE IC908                 | 12.70      | 4.000             | 22.00 | 3.10  | 1.90 |              | ●     |
| 22ER 4 SAGE IC250                 | 12.70      | 4.000             | 22.00 | 3.10  | 1.90 | ●            |       |
| 22UER 5 SAGE IC908 <sup>(1)</sup> | 12.70      | 5.000             | 22.00 | 11.60 | 1.20 |              | ●     |
| 22UEL 6 SAGE IC908 <sup>(1)</sup> | 12.70      | 6.000             | 22.00 | 11.70 | 1.20 |              | ●     |
| 22UER 6 SAGE IC908 <sup>(1)</sup> | 12.70      | 6.000             | 22.00 | 11.70 | 1.20 |              | ●     |

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Requires special anvil

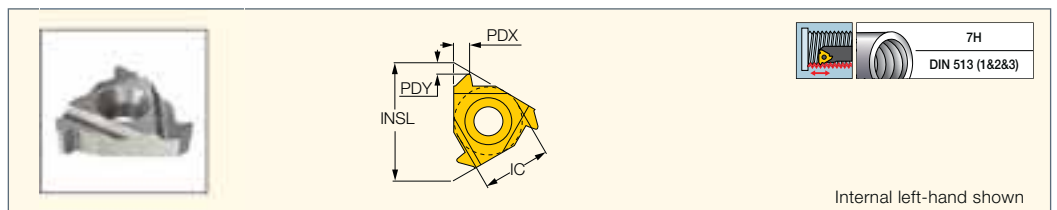
<sup>(2)</sup> Thread pitch

**For tools, see pages:** SER/L (798) • SER-D (800) • SER/L-JHP (799) • SER/L-JHP-MC (800) • C#-SER/L (799) • NQCH-SER/L-JHP (800)

• SBT#-16ER/L-JHP (418)

**IR/L-SAGE**

Internal Sagengwinde  
(DIN 513) Thread Application  
for High Force in One  
Direction Application



| Designation                       | Dimensions |       |                   |       |      | IC908 |
|-----------------------------------|------------|-------|-------------------|-------|------|-------|
|                                   | IC         | INSL  | TP <sup>(2)</sup> | PDX   | PDY  |       |
| 16IL 2 SAGE IC908                 | 9.52       | 16.49 | 2.000             | 1.70  | 1.20 | ●     |
| 16IR 2 SAGE IC908                 | 9.52       | 16.49 | 2.000             | 1.70  | 1.20 | ●     |
| 22IR 3 SAGE IC908                 | 12.70      | 22.00 | 3.000             | 2.90  | 1.90 | ●     |
| 22IR 4 SAGE IC908                 | 12.70      | 22.00 | 4.000             | 3.30  | 2.20 | ●     |
| 22UIR 5 SAGE IC908                | 12.70      | 22.00 | 5.000             | 11.70 | 1.90 | ●     |
| 22UIR 6 SAGE IC908 <sup>(1)</sup> | 12.70      | 22.00 | 6.000             | 11.90 | 2.10 | ●     |

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Requires special anvil

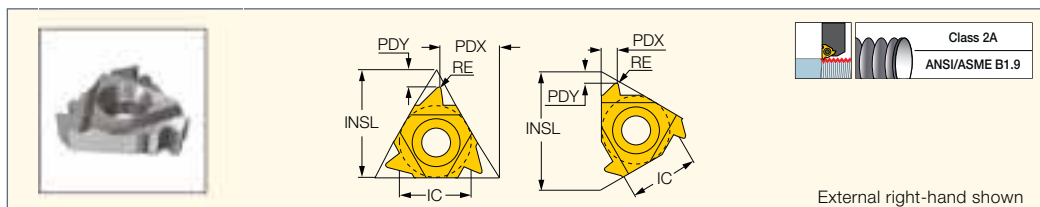
<sup>(2)</sup> Thread pitch

**For tools, see pages:** AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

# ISCAR THREAD

## ER/L-ABUT

External American Buttress  
Laydown Threading Inserts  
for High Force Transmission  
in One Direction



External right-hand shown

| Designation        | Dimensions |                    |       |      |       |      | Tough ↔ Hard |       |
|--------------------|------------|--------------------|-------|------|-------|------|--------------|-------|
|                    | IC         | TPI <sup>(1)</sup> | INSL  | RE   | PDX   | PDY  | IC250        | IC908 |
| 16ER 20 ABUT IC908 | 9.52       | 20.0               | 16.49 | 0.07 | 1.30  | 1.00 |              | •     |
| 16EL 16 ABUT IC908 | 9.52       | 16.0               | 16.49 | 0.09 | 1.50  | 1.10 |              | •     |
| 16ER 16 ABUT IC250 | 9.52       | 16.0               | 16.49 | 0.09 | 1.50  | 1.30 | •            |       |
| 16ER 16 ABUT IC908 | 9.52       | 16.0               | 16.49 | 0.09 | 1.50  | 1.10 |              | •     |
| 16EL 12 ABUT IC908 | 9.52       | 12.0               | 16.49 | 0.12 | 2.00  | 1.40 |              | •     |
| 16ER 12 ABUT IC250 | 9.52       | 12.0               | 16.49 | 0.12 | 2.00  | 1.40 | •            |       |
| 16ER 12 ABUT IC908 | 9.52       | 12.0               | 16.49 | 0.12 | 2.00  | 1.40 |              | •     |
| 16EL 10 ABUT IC908 | 9.52       | 10.0               | 16.49 | 0.15 | 2.30  | 1.50 |              | •     |
| 16ER 10 ABUT IC908 | 9.52       | 10.0               | 16.49 | 0.15 | 2.30  | 1.50 |              | •     |
| 22ER 8 ABUT IC250  | 12.70      | 8.0                | 22.00 | 0.18 | 3.30  | 2.10 | •            |       |
| 22ER 8 ABUT IC908  | 12.70      | 8.0                | 22.00 | 0.18 | 3.30  | 2.10 |              | •     |
| 22ER 6 ABUT IC908  | 12.70      | 6.0                | 22.00 | 0.25 | 3.40  | 2.10 |              | •     |
| 22UER 4 ABUT IC250 | 12.70      | 4.0                | 22.00 | 0.41 | 9.80  | 2.30 | •            |       |
| 22UER 4 ABUT IC908 | 12.70      | 4.0                | 22.00 | 0.41 | 9.50  | 2.30 |              | •     |
| 27UEL 3 ABUT IC908 | 15.88      | 3.0                | 27.50 | 0.45 | 12.30 | 2.60 |              | •     |
| 27UER 3 ABUT IC250 | 15.88      | 3.0                | 27.50 | 0.45 | 12.30 | 2.60 | •            |       |
| 27UER 3 ABUT IC908 | 15.88      | 3.0                | 27.50 | 0.45 | 12.30 | 2.60 |              | •     |

• For Insert Identification System, see page 714 • ANSI B1.9-1973 Class 2 • For technical information and detailed cutting data, see pages 809-825

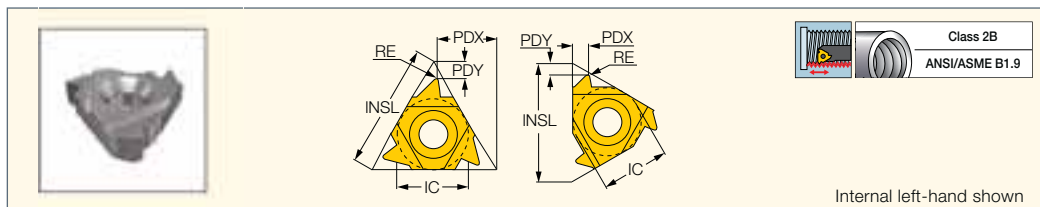
<sup>(1)</sup> Threads per inch

For tools, see pages: NQCH-SER/L-JHP (800) • SER/L (798)

# ISCAR THREAD

## IR/L-ABUT

Internal American Buttress  
Laydown Threading Inserts  
for High Force Transmission  
in One Direction



Internal left-hand shown

| Designation        | Dimensions |                    |       |      |       |      | Tough ↔ Hard |       |       |
|--------------------|------------|--------------------|-------|------|-------|------|--------------|-------|-------|
|                    | IC         | TPI <sup>(1)</sup> | INSL  | RE   | PDX   | PDY  | IC50M        | IC250 | IC908 |
| 11IR 20 ABUT IC908 | 6.35       | 20.0               | 11.00 | 0.07 | 1.20  | 0.85 |              |       | •     |
| 11IL 16 ABUT IC250 | 6.35       | 16.0               | 11.00 | 0.09 | 1.50  | 1.00 |              | •     |       |
| 11IR 16 ABUT IC908 | 6.35       | 16.0               | 11.00 | 0.09 | 1.50  | 1.00 |              |       | •     |
| 16IR 20 ABUT IC250 | 9.52       | 20.0               | 16.49 | 0.07 | 1.30  | 1.00 |              | •     |       |
| 16IR 20 ABUT IC908 | 9.52       | 20.0               | 16.49 | 0.07 | 1.30  | 1.00 |              |       | •     |
| 16IL 16 ABUT IC908 | 9.52       | 16.0               | 16.49 | 0.09 | 1.50  | 1.00 |              |       | •     |
| 16IR 16 ABUT IC908 | 9.52       | 16.0               | 16.49 | 0.09 | 1.50  | 1.00 |              |       | •     |
| 16IL 12 ABUT IC908 | 9.52       | 12.0               | 16.49 | 0.12 | 2.00  | 1.40 |              |       | •     |
| 16IR 12 ABUT IC250 | 9.52       | 12.0               | 16.49 | 0.12 | 2.00  | 1.40 |              | •     |       |
| 16IR 12 ABUT IC908 | 9.52       | 12.0               | 16.49 | 0.12 | 2.00  | 1.40 |              |       | •     |
| 16IL 10 ABUT IC908 | 9.52       | 10.0               | 16.49 | 0.15 | 2.40  | 1.50 |              |       | •     |
| 16IR 10 ABUT IC250 | 9.52       | 10.0               | 16.49 | 0.15 | 2.40  | 1.50 |              | •     |       |
| 16IR 10 ABUT IC908 | 9.52       | 10.0               | 16.49 | 0.15 | 2.40  | 1.50 |              |       | •     |
| 22IR 8 ABUT IC908  | 12.70      | 8.0                | 22.00 | 0.18 | 3.30  | 2.20 |              |       | •     |
| 22IR 6 ABUT IC908  | 12.70      | 6.0                | 22.00 | 0.25 | 3.40  | 2.20 |              |       | •     |
| 22UIR 4 ABUT IC250 | 12.70      | 4.0                | 22.00 | 0.41 | 9.50  | 2.30 | •            | •     |       |
| 22UIR 4 ABUT IC50M | 12.70      | 4.0                | 22.00 | 0.41 | 9.50  | 2.30 |              |       |       |
| 22UIR 4 ABUT IC908 | 12.70      | 4.0                | 22.00 | 0.41 | 9.77  | 2.24 |              |       | •     |
| 27UIR 3 ABUT IC908 | 15.88      | 3.0                | 27.50 | 0.60 | 11.70 | 3.10 |              |       | •     |

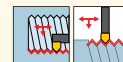
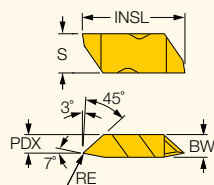
• For Insert Identification System, see page 714 • ANSI B1.9-1973 Class 2 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Threads per inch

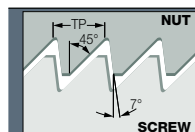
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

**AMERICAN STANDARD  
BUTTRESS THREADING  
FLT-B-A**

Double-Ended, Precision, Flat  
Top Threading Inserts for 7° Lead



Right-hand shown



| Designation              | Dimensions          |                     |      |      |      |       |       | IC908 |
|--------------------------|---------------------|---------------------|------|------|------|-------|-------|-------|
|                          | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | RE   | PDX  | BW   | S     | INSL  |       |
| <b>FLT-B-4R/LA IC908</b> | 4.00                | 6.00                | 0.20 | 5.20 | 6.48 | 11.51 | 28.45 | •     |
| <b>FLT-B-3R/LA IC908</b> | 8.00                | 16.00               | 0.13 | 4.20 | 4.95 | 8.74  | 22.60 | •     |
| <b>FLT-B-2R/LA IC908</b> | 16.00               | 20.00               | 0.05 | 3.20 | 3.81 | 5.56  | 12.95 | •     |

- For user guide, see pages 809-825 • DMIN according to related boring bar • Internal tolerance: ANSI/ASME B1.9 - Class 2B
- External tolerance: ANSI/ASME B1.9 - Class 2A

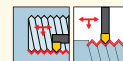
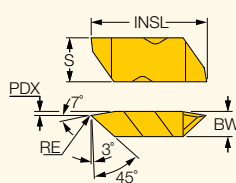
<sup>(1)</sup> TPI min.

<sup>(2)</sup> TPI max.

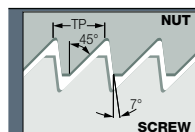
For tools, see pages: FLASR/L (807) • FLNR/L (807)

**AMERICAN STANDARD  
BUTTRESS THREADING  
FLT-B-B**

Double-Ended, Precision, Flat Top  
Threading Inserts for 45° Lead



Left-hand shown



| Designation              | Dimensions          |                     |      |      |      |       |       | IC908 |
|--------------------------|---------------------|---------------------|------|------|------|-------|-------|-------|
|                          | TPIN <sup>(1)</sup> | TPIX <sup>(2)</sup> | RE   | PDX  | BW   | S     | INSL  |       |
| <b>FLT-B-4LB IC908</b>   | 4.00                | 6.00                | 0.20 | 0.40 | 6.48 | 11.51 | 28.45 | •     |
| <b>FLT-B-3R/LB IC908</b> | 8.00                | 16.00               | 0.13 | 0.30 | 4.95 | 8.74  | 22.60 | •     |
| <b>FLT-B-2R/LB IC908</b> | 16.00               | 20.00               | 0.05 | 0.30 | 3.81 | 5.56  | 12.95 | •     |

- For user guide, see pages 809-825 • DMIN according to related boring bar • Internal tolerance: ANSI/ASME B1.9 - Class 2B
- External tolerance: ANSI/ASME B1.9 - Class 2A

<sup>(1)</sup> TPI min.

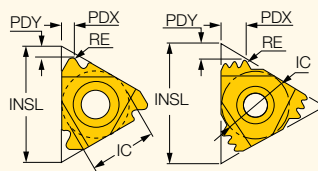
<sup>(2)</sup> TPI max.

For tools, see pages: FLASR/L (807) • FLNR/L (807)

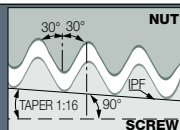
# ISCAR THREAD

## ER/L-API RD

External API - Oil Thread Round  
Profile Laydown Threading Inserts



External right-hand shown



| Designation                            | Dimensions |      |                    |       |      |      |      |                     | Tough ↔ Hard |       |
|----------------------------------------|------------|------|--------------------|-------|------|------|------|---------------------|--------------|-------|
|                                        | IC         | IPF  | TPI <sup>(2)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(3)</sup> | IC250        | IC908 |
| 16ER 10 API RD IC250                   | 9.52       | 0.75 | 10.0               | 16.49 | 0.36 | 1.50 | 1.20 | 1                   | ●            | ●     |
| 16ER 10 API RD IC908                   | 9.52       | 0.75 | 10.0               | 16.49 | 0.36 | 1.50 | 1.20 | 1                   |              | ●     |
| 16EL 8 API RD IC908                    | 9.52       | 0.75 | 8.0                | 16.49 | 0.43 | 1.60 | 1.35 | 1                   |              | ●     |
| 16ER 8 API RD IC250                    | 9.52       | 0.75 | 8.0                | 16.49 | 0.43 | 1.60 | 1.35 | 1                   | ●            |       |
| 16ER 8 API RD IC908                    | 9.52       | 0.75 | 8.0                | 16.49 | 0.43 | 1.60 | 1.35 | 1                   |              | ●     |
| 22ER 10 API RD 2M IC908 <sup>(1)</sup> | 12.70      | 0.75 | 10.0               | 22.00 | 0.36 | 3.70 | 2.40 | 2                   |              | ●     |
| 27ER 8 API RD 2M IC908 <sup>(1)</sup>  | 15.88      | 0.75 | 8.0                | 27.50 | 0.43 | 4.50 | 3.00 | 2                   |              | ●     |

• For Insert Identification System, see page 714 • API Spec 5B8-1996. • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Multi-tooth

<sup>(2)</sup> Threads per inch

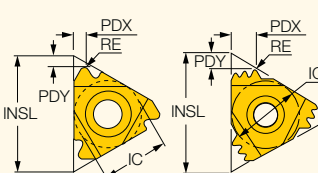
<sup>(3)</sup> Number of teeth per corner

For tools, see pages: C#-SER/L (799) • NQCH-SER/L-JHP (800) • SBTT#-16ER/L-JHP (418) • SER-D (800) • SER/L (798) • SER/L-JHP (799) • SER/L-JHP-MC (800)

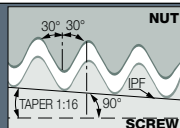
# ISCAR THREAD

## IR/L-API RD

Internal API - Oil Thread Round  
Profile Laydown Threading Inserts



Internal left-hand shown



| Designation                            | Dimensions |      |                    |       |      |      |      |                     | Tough ↔ Hard |       |
|----------------------------------------|------------|------|--------------------|-------|------|------|------|---------------------|--------------|-------|
|                                        | IC         | IPF  | TPI <sup>(2)</sup> | INSL  | RE   | PDX  | PDY  | CICT <sup>(3)</sup> | IC250        | IC908 |
| 16IL 10 API RD IC908                   | 9.52       | 0.75 | 10.0               | 16.49 | 0.36 | 1.45 | 1.30 | 1                   |              | ●     |
| 16IR 10 API RD IC250                   | 9.52       | 0.75 | 10.0               | 16.49 | 0.36 | 1.50 | 1.30 | 1                   | ●            |       |
| 16IR 10 API RD IC908                   | 9.52       | 0.75 | 10.0               | 16.49 | 0.36 | 1.50 | 1.30 | 1                   |              | ●     |
| 16IL 8 API RD IC250                    | 9.52       | 0.75 | 8.0                | 16.49 | 0.43 | 1.45 | 1.10 | 1                   | ●            |       |
| 16IR 8 API RD IC250                    | 9.52       | 0.75 | 8.0                | 16.49 | 0.43 | 1.50 | 1.10 | 1                   | ●            |       |
| 16IR 8 API RD IC908                    | 9.52       | 0.75 | 8.0                | 16.49 | 0.43 | 1.50 | 1.10 | 1                   |              | ●     |
| 22IR 10 API RD 2M IC908 <sup>(1)</sup> | 12.70      | 0.75 | 10.0               | 22.00 | 0.37 | 3.70 | 2.30 | 2                   |              | ●     |
| 27IR 8 API RD 2M IC908 <sup>(1)</sup>  | 15.88      | 0.75 | 8.0                | 27.50 | 0.43 | 4.50 | 3.00 | 2                   |              | ●     |

• For Insert Identification System, see page 714 • API Spec 5B8-1996 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Multi-tooth

<sup>(2)</sup> Threads per inch

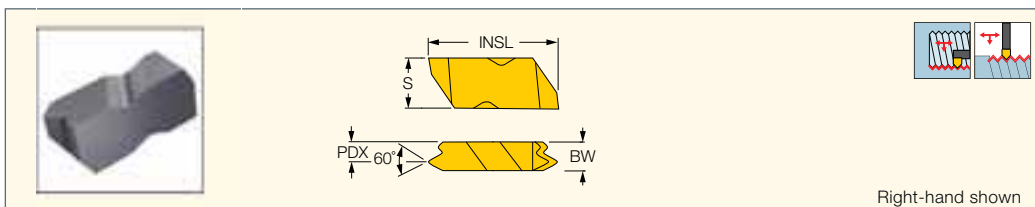
<sup>(3)</sup> Number of teeth per corner

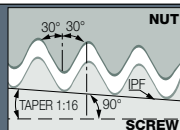
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**API ROUND THREADING  
FLDC-RD-75**

Double-Ended, Precision,  
Flat Top Threading Inserts



|  | Dimensions             |                    |     |      |      |      | IC908 |       |
|-----------------------------------------------------------------------------------|------------------------|--------------------|-----|------|------|------|-------|-------|
|                                                                                   | Designation            | TPI <sup>(1)</sup> | IPF | PDX  | BW   | S    |       | INSL  |
|                                                                                   | FLDC-3-8RDR/L75 IC908  | 8.0                | 3/4 | 5.00 | 3.18 | 8.74 |       | 22.60 |
|                                                                                   | FLDC-3-10RDR/L75 IC908 | 10.0               | 3/4 | 5.00 | 3.18 | 8.74 |       | 22.60 |

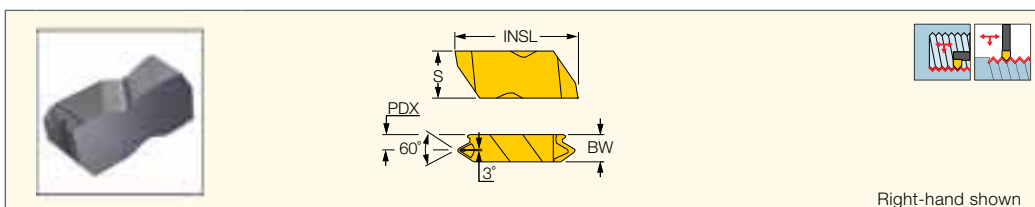
• DMIN according to related boring bar • API Spec STD 5B Internal & External tolerance: Standard API RD  
(1) Threads per inch

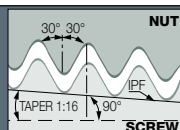
For tools, see pages: FLASR/L (807) • FLSR/L (807)

**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**API ROUND THREADING  
FLDC-RD-75-CB**

Double-Ended, Precision,  
Threading Inserts with  
a Chipbreaker



|  | Dimensions               |                    |     |      |      |      | IC908 |       |
|-------------------------------------------------------------------------------------|--------------------------|--------------------|-----|------|------|------|-------|-------|
|                                                                                     | Designation              | TPI <sup>(1)</sup> | IPF | PDX  | BW   | S    |       | INSL  |
|                                                                                     | FLDC-3-8RDR/L75-CB IC908 | 8.0                | 3/4 | 4.95 | 3.18 | 8.74 |       | 25.15 |

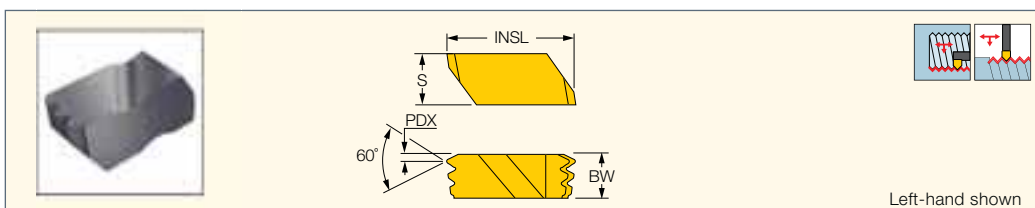
• DMIN according to related boring bar • API Spec STD 5B Internal & External tolerance: Standard API RD  
(1) Threads per inch

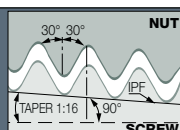
For tools, see pages: FLASR/L (807) • FLSR/L (807)

**NOTCH-GRIP**  
GROOVE-TURN LINE  
**ISCARTHREAD**

**API ROUND THREADING  
FLDC-RD-75M**

Double-Ended Precision, Flat Top  
Multi-Tooth Threading Inserts



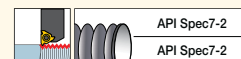
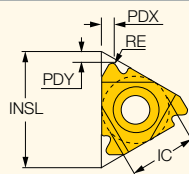
|  | Dimensions          |                    |     |      |      |       | IC908 |       |
|-------------------------------------------------------------------------------------|---------------------|--------------------|-----|------|------|-------|-------|-------|
|                                                                                     | Designation         | TPI <sup>(1)</sup> | IPF | PDX  | BW   | S     |       | INSL  |
|                                                                                     | FLDC-6-8RDR75 IC908 | 8.0                | 3/4 | 1.80 | 9.73 | 11.51 |       | 28.45 |

• DMIN according to related boring bar • API Spec STD 5B Internal & External tolerance: Standard API RD  
(1) Threads per inch

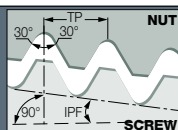
# ISCAR THREAD

## ER/L-API

External API - Oil Thread Profile  
Laydown Threading Inserts



External right-hand shown



| Designation                         | Dimensions |     |     |                    |       |      |      |      |                      | Tough ↔ Hard |       |
|-------------------------------------|------------|-----|-----|--------------------|-------|------|------|------|----------------------|--------------|-------|
|                                     | IC         | IPF | TPF | TPI <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | Size <sup>(5)</sup>  | IC250        | IC908 |
| 22ER 5 API 403 IC250 <sup>(1)</sup> | 12.70      | 3   | 3   | 5.0                | 22.00 | 0.49 | 2.45 | 1.70 | 2.375"-4.5"REG       | ●            |       |
| 22ER 5 API 403 IC908 <sup>(1)</sup> | 12.70      | 3   | 3   | 5.0                | 22.00 | 0.49 | 2.45 | 1.70 | 2.375"-4.5"REG       |              | ●     |
| 27ER 5 API 403 IC908                | 15.88      | 3   | 3   | 5.0                | 27.50 | 0.51 | 2.60 | 2.10 | 2.375"-4.5"REG       |              | ●     |
| 27ER 4 API 503 IC908 <sup>(2)</sup> | 15.88      | 3   | 3   | 2.0                | 27.50 | 0.64 | 3.10 | 2.00 | 5-1/2,7-5/8,8-5/8REG |              | ●     |
| 27EL 4 API 502 IC250 <sup>(2)</sup> | 15.88      | 2   | 2   | 4.0                | 27.50 | 0.64 | 3.00 | 2.00 | 6-5/8" REG           | ●            |       |
| 27ER 4 API 502 IC250 <sup>(2)</sup> | 15.88      | 2   | 2   | 4.0                | 27.50 | 0.64 | 3.00 | 2.00 | 6-5/8" REG           | ●            |       |
| 27ER 4 API 502 IC908 <sup>(2)</sup> | 15.88      | 2   | 2   | 4.0                | 27.50 | 0.64 | 3.00 | 2.00 | 6-5/8" REG           |              | ●     |
| 27ER 4 API 382 IC250 <sup>(3)</sup> | 15.88      | 2   | 2   | 4.0                | 27.50 | 0.97 | 2.90 | 2.06 | NC23-NC50            | ●            |       |
| 27ER 4 API 382 IC908 <sup>(3)</sup> | 15.88      | 2   | 2   | 4.0                | 27.50 | 0.97 | 2.90 | 2.06 | NC23-NC50            |              | ●     |
| 27ER 4 API 383 IC908 <sup>(3)</sup> | 15.88      | 3   | 3   | 4.0                | 27.50 | 0.97 | 2.90 | 2.20 | NC56-NC77            |              | ●     |

• For Insert Identification System, see page 714 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> V-0.040

<sup>(2)</sup> V-0.050

<sup>(3)</sup> V-0.038R

<sup>(4)</sup> Threads per inch

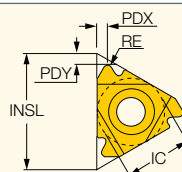
<sup>(5)</sup> Connection no. or size

For tools, see pages: C#-SER/L (799) • SER-D (800) • SER/L (798)

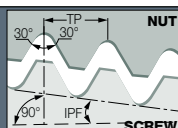
# ISCAR THREAD

## IR/L-API

Internal API - Oil Thread Profile  
Laydown Threading Inserts



Internal left-hand shown



| Designation                         | Dimensions |                    |       |      |      |      |                      |    | Tough ↔ Hard |       |
|-------------------------------------|------------|--------------------|-------|------|------|------|----------------------|----|--------------|-------|
|                                     | IC         | TPI <sup>(4)</sup> | INSL  | RE   | PDX  | PDY  | Size <sup>(5)</sup>  | IH | IC250        | IC908 |
| 22IR 5 API 403 IC250 <sup>(1)</sup> | 12.70      | 5.0                | 22.00 | 0.51 | 2.40 | 1.90 | 2.375"-4.5"REG       | R  | ●            |       |
| 22IR 5 API 403 IC908 <sup>(1)</sup> | 12.70      | 5.0                | 22.00 | 0.51 | 2.40 | 1.90 | 2.375"-4.5"REG       | R  |              | ●     |
| 27IR 5 API 403 IC908                | 15.88      | 5.0                | 27.50 | 0.51 | 2.55 | 2.10 | 2.375"-4.5"REG       | R  |              | ●     |
| 27IR 4 API 503 IC250 <sup>(2)</sup> | 15.88      | 4.0                | 27.50 | 0.64 | 3.00 | 2.10 | 5-1/2,7-5/8,8-5/8REG | R  | ●            |       |
| 27IL 4 API 502 IC250 <sup>(2)</sup> | 15.88      | 4.0                | 27.50 | 0.64 | 3.00 | 2.00 | 6-5/8" REG           | L  | ●            |       |
| 27IR 4 API 502 IC250 <sup>(2)</sup> | 15.88      | 4.0                | 27.50 | 0.64 | 3.00 | 2.00 | 6-5/8" REG           | R  | ●            |       |
| 27IR 4 API 383 IC908 <sup>(3)</sup> | 15.88      | 4.0                | 27.50 | 0.97 | 2.90 | 2.10 | NC56-NC77            | R  |              | ●     |
| 27IR 4 API 382 IC250 <sup>(3)</sup> | 15.88      | 4.0                | 27.50 | 0.97 | 3.00 | 2.10 | NC23-NC50            | R  | ●            |       |
| 27IR 4 API 382 IC908 <sup>(3)</sup> | 15.88      | 4.0                | 27.50 | 0.97 | 3.00 | 2.10 | NC23-NC50            | R  |              | ●     |

• For Insert Identification System, see page 714 • 0.050, API Spec 74-1994 • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> V-0.040

<sup>(2)</sup> V-0.050

<sup>(3)</sup> V-0.038R

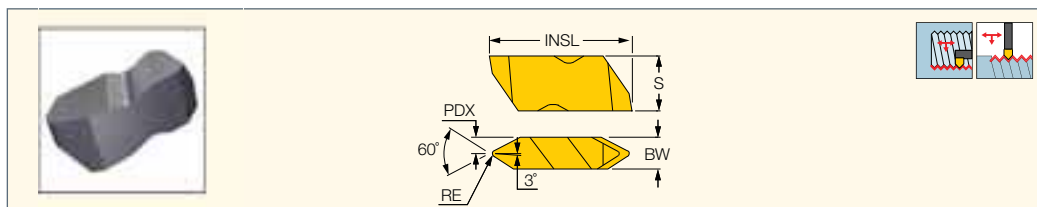
<sup>(4)</sup> Threads per inch

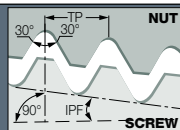
<sup>(5)</sup> Connection no. or size

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

**API PARTIAL PROFILE  
THREADING FLD**

Double-Ended, Precision,  
Flat Top Partial Profile  
Threading Inserts



|  | Dimensions        |                    |      |      |      |       | IC908 |       |
|-----------------------------------------------------------------------------------|-------------------|--------------------|------|------|------|-------|-------|-------|
|                                                                                   | Designation       | TPI <sup>(1)</sup> | RE   | PDX  | BW   | S     |       | INSL  |
|                                                                                   | FLD-4050R/L IC908 | 4.0                | 0.51 | 3.25 | 6.48 | 11.51 |       | 28.45 |
|                                                                                   | FLD-3038R/L IC908 | 4.0                | 0.84 | 2.08 | 4.95 | 8.74  |       | 22.60 |
|                                                                                   | FLD-4038R/L IC908 | 4.0                | 0.84 | 3.25 | 6.48 | 11.51 |       | 28.45 |
|                                                                                   | FLD-3040R/L IC908 | 5.0                | 0.38 | 2.08 | 4.95 | 8.74  |       | 22.60 |
|                                                                                   | FLD-4040R/L IC908 | 5.0                | 0.38 | 3.25 | 6.48 | 11.51 |       | 28.45 |

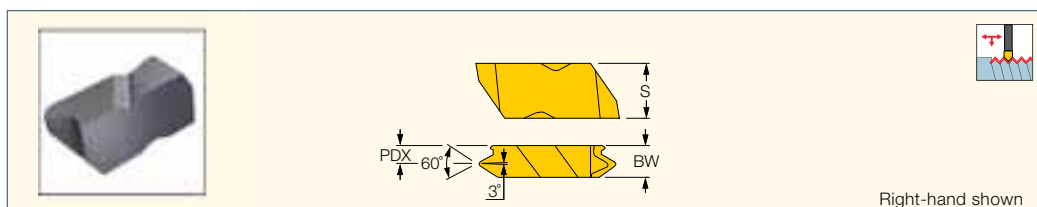
• DMIN according to related boring bar • API Spec7 Internal & External tolerance: API Spec7

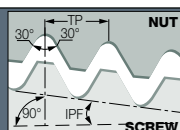
<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (807) • FLSR/L (807)

**API THREADING FLDC-E**

Double-Ended, Precision,  
Flat Top Threading Inserts



|  | Dimensions        |                    |     |      |      |       | IC908 |       |
|-------------------------------------------------------------------------------------|-------------------|--------------------|-----|------|------|-------|-------|-------|
|                                                                                     | Designation       | TPI <sup>(1)</sup> | TPF | PDX  | BW   | S     |       | INSL  |
|                                                                                     | FLDC-4-425E IC908 | 4.0                | 2   | 4.65 | 7.92 | 11.51 |       | 28.45 |
|                                                                                     | FLDC-4-428E IC908 | 4.0                | 2   | 4.65 | 7.92 | 11.51 |       | 28.45 |
|                                                                                     | FLDC-4-435E IC908 | 4.0                | 3   | 4.65 | 7.92 | 11.51 |       | 28.45 |
|                                                                                     | FLDC-4-438E IC908 | 4.0                | 3   | 4.65 | 7.92 | 11.51 |       | 28.45 |
|                                                                                     | FLDC-3-530E IC908 | 5.0                | 3   | 3.73 | 6.35 | 8.74  |       | 22.60 |

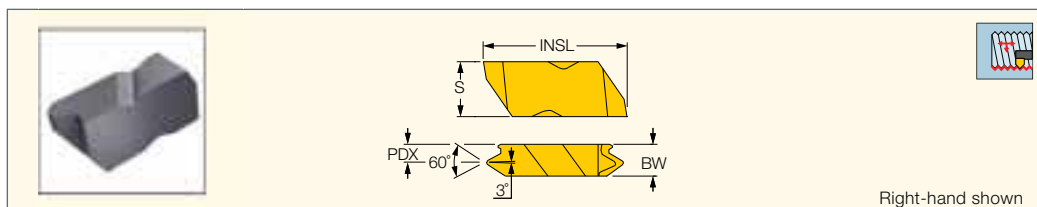
• API Spec7 Internal & External tolerance: API Spec7

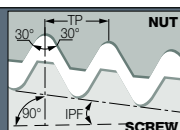
<sup>(1)</sup> Threads per inch

For tools, see pages: FLASR/L (708) • FLSR/L (708)

**API THREADING FLDC-I**

Double-Ended, Precision,  
Flat Top Threading Inserts



|  | Dimensions  |                    |      |      |       |       | IC908 |
|-------------------------------------------------------------------------------------|-------------|--------------------|------|------|-------|-------|-------|
|                                                                                     | Designation | TPI <sup>(1)</sup> | TPF  | PDX  | BW    | S     |       |
| FLDC-4-425I IC908                                                                   | 4.0         | 2                  | 4.65 | 7.92 | 11.51 | 28.45 | ●     |
| FLDC-4-428I IC908                                                                   | 4.0         | 2                  | 4.65 | 7.92 | 11.51 | 28.45 | ●     |
| FLDC-4-435I IC908                                                                   | 4.0         | 3                  | 4.65 | 7.92 | 11.51 | 28.45 | ●     |
| FLDC-4-438I IC908                                                                   | 4.0         | 3                  | 4.65 | 7.92 | 11.51 | 28.45 | ●     |
| FLDC-3-530I IC908                                                                   | 5.0         | 3                  | 3.73 | 6.35 | 8.74  | 22.60 | ●     |

• API Spec7 Internal & External tolerance: API Spec7

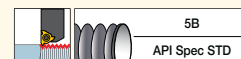
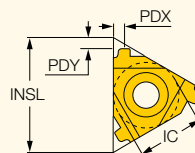
<sup>(1)</sup> Threads per inch



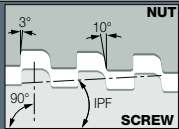
# ISCAR THREAD

## ER-BUT

External BUT - Oil Thread  
Profile Laydown Threading  
Inserts for Butress Casing



External right-hand shown

| <br>Designation | Dimensions |                    |      |       |      |      |                     | Tough ↔ Hard |       |
|--------------------------------------------------------------------------------------------------|------------|--------------------|------|-------|------|------|---------------------|--------------|-------|
|                                                                                                  | IC         | TPI <sup>(1)</sup> | IPF  | INSL  | PDX  | PDY  | Size <sup>(2)</sup> | IC250        | IC908 |
| 22ER 5 BUT 0.75 IC250                                                                            | 12.70      | 5.0                | 0.75 | 22.00 | 2.40 | 2.20 | 4-1/2" - 13-3/8"    | ●            |       |
| 22ER 5 BUT 0.75 IC908                                                                            | 12.70      | 5.0                | 0.75 | 22.00 | 2.40 | 2.20 | 4-1/2" - 13-3/8"    |              | ●     |
| 22ER 5 BUT-1.00 IC250                                                                            | 12.70      | 5.0                | 1.0  | 22.00 | 2.40 | 2.20 | 16" - 20"           | ●            |       |

• For Insert Identification System, see page 714 • API STD.5B • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Threads per inch

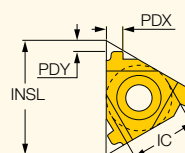
<sup>(2)</sup> Connection no. or size

For tools, see page: SER/L (798)

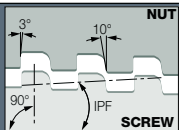
# ISCAR THREAD

## IR-BUT

Internal BUT - Oil Thread  
Profile Laydown Threading  
Inserts for Butress Casing



Internal left-hand shown

| <br>Designation | Dimensions |      |                    |       |      |      |                     | Tough ↔ Hard |       |
|----------------------------------------------------------------------------------------------------|------------|------|--------------------|-------|------|------|---------------------|--------------|-------|
|                                                                                                    | IC         | IPF  | TPI <sup>(1)</sup> | INSL  | PDX  | PDY  | Size <sup>(2)</sup> | IC250        | IC908 |
| 22IR 5 BUT 0.75 IC908                                                                              | 12.70      | 0.75 | 5.0                | 22.00 | 2.40 | 2.30 | 4-1/2" - 13-3/8"    |              | ●     |
| 22IR 5 BUT 1.00 IC250                                                                              | 12.70      | 1.00 | 5.0                | 22.00 | 3.50 | 2.30 | 16" - 20"           | ●            |       |

• For Insert Identification System, see page 714 • API STD.5B • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> Threads per inch

<sup>(2)</sup> Connection no. or size

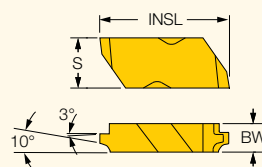
For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

# NOTCH GRIP

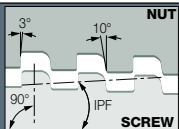
# ISCAR THREAD

## API BUTRESS THREADING FLDC-B-E

Double-Ended, Precision,  
Flat Top Threading Inserts



Right-hand shown

| <br>Designation | Dimensions         |                    |      |       |       |  | IC908 |
|----------------------------------------------------------------------------------------------------|--------------------|--------------------|------|-------|-------|--|-------|
|                                                                                                    | TPI <sup>(1)</sup> | IPF <sup>(2)</sup> | BW   | S     | INSL  |  |       |
| FLDC-3-5B1E IC908                                                                                  | 5.0                | 1                  | 6.35 | 8.74  | 22.60 |  | ●     |
| FLDC-4-5B1E IC908                                                                                  | 5.0                | 1                  | 6.48 | 11.51 | 28.45 |  | ●     |
| FLDC-3-5B75E IC908                                                                                 | 5.0                | 3/4                | 6.35 | 8.74  | 22.60 |  | ●     |
| FLDC-4-5B75E IC908                                                                                 | 5.0                | 3/4                | 6.48 | 11.51 | 28.45 |  | ●     |

• API Spec STD Internal & External tolerance: 5B

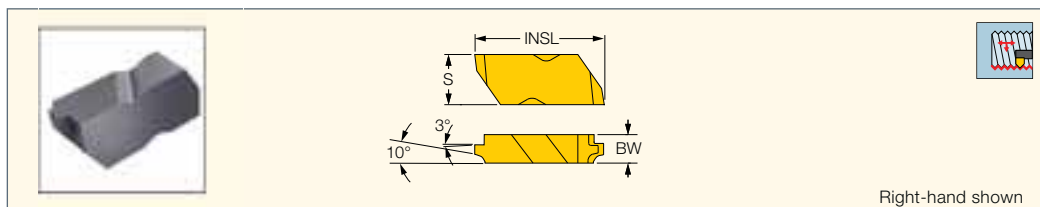
<sup>(1)</sup> Threads per inch

<sup>(2)</sup> Taper Per Foot (TPF) or Inch Per Foot (IPF)

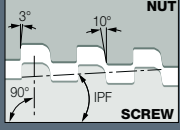
For tools, see pages: FLASR/L (807) • FLNR/L (807)

**API BUTTRESS THREADING  
FLDC-B-I**

Double-Ended, Precision,  
Flat Top Threading Inserts



Right-hand shown

|  | Dimensions         |                    |                    |      |       |       | IC908 |
|-----------------------------------------------------------------------------------|--------------------|--------------------|--------------------|------|-------|-------|-------|
|                                                                                   | Designation        | TPI <sup>(1)</sup> | IPF <sup>(2)</sup> | BW   | S     | INSL  |       |
|                                                                                   | FLDC-3-5B1I IC908  | 5.0                | 1                  | 6.35 | 8.74  | 22.60 | •     |
|                                                                                   | FLDC-4-5B1I IC908  | 5.0                | 1                  | 6.48 | 11.51 | 28.45 | •     |
|                                                                                   | FLDC-3-5B75I IC908 | 5.0                | 3/4                | 6.35 | 8.74  | 22.60 | •     |
|                                                                                   | FLDC-4-5B75I IC908 | 5.0                | 3/4                | 6.48 | 11.51 | 28.45 | •     |

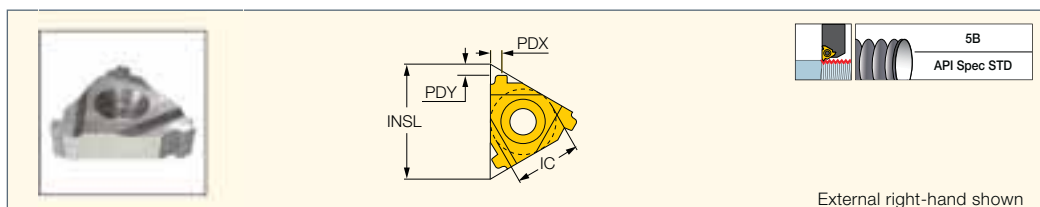
• API Spec STD Internal & External tolerance: 5B

<sup>(1)</sup> Threads per inch

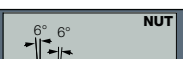
<sup>(2)</sup> Taper Per Foot (TPF) or Inch Per Foot (IPF)

**ISCARTHREAD**

**ER-EL**  
External EL - Extreme Line  
Oil Thread Profile Laydown  
Threading Inserts



External right-hand shown

|  | Dimensions           |       |                    |      |       |      |      | Tough ↔ Hard        |       |       |
|-------------------------------------------------------------------------------------|----------------------|-------|--------------------|------|-------|------|------|---------------------|-------|-------|
|                                                                                     | Designation          | IC    | TPI <sup>(1)</sup> | IPF  | INSL  | PDX  | PDY  | Size <sup>(2)</sup> | IC250 | IC908 |
|                                                                                     | 22ER 6 EL 1.5 IC250  | 12.70 | 6.0                | 1.5  | 22.00 | 1.90 | 2.10 | 5" - 7-5/8"         | ●     | ●     |
|                                                                                     | 22ER 6 EL 1.5 IC908  | 12.70 | 6.0                | 1.5  | 22.00 | 1.90 | 2.10 | 5" - 7-5/8"         | ●     | ●     |
|                                                                                     | 22ER 5 EL 1.25 IC908 | 12.70 | 5.0                | 1.25 | 22.00 | 2.00 | 2.10 | 8-5/8" - 10-3/4"    | ●     | ●     |

• For Insert Identification System, see page 714 • ANSI B1.9.1973 Class 2

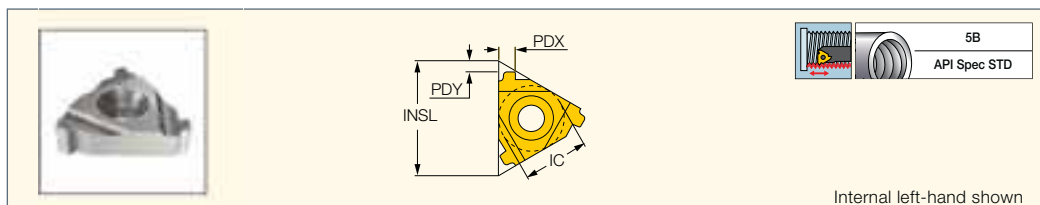
<sup>(1)</sup> Threads per inch

<sup>(2)</sup> Connection no. or size

For tools, see pages: C#-SER/L (799) • SER-D (800) • SER/L (798)

**ISCARTHREAD**

**IR-EL**  
Internal EL - Extreme Line  
Oil Thread Profile Laydown  
Threading Inserts



Internal left-hand shown

|                                                                                     |            |     |                    |       |      |      |                     |            |
|-------------------------------------------------------------------------------------|------------|-----|--------------------|-------|------|------|---------------------|------------|
|  | Dimensions |     |                    |       |      |      |                     | IC908<br>● |
| Designation                                                                         | IC         | IPF | TPI <sup>(1)</sup> | INSL  | PDX  | PDY  | Size <sup>(2)</sup> |            |
| 22IR 6 EL 1.5 IC908                                                                 | 12.70      | 1.5 | 6.0                | 22.00 | 1.90 | 1.90 | 5" - 7-5/8"         |            |

• For Insert Identification System, see page 714 • ANSI B1.9.1973 Class 2

<sup>(1)</sup> Threads per inch

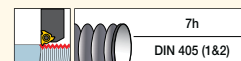
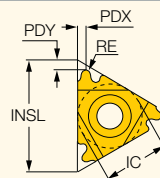
<sup>(2)</sup> Connection no. or size

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

# ISCARTHREAD

## ER/L-RND

External DIN 405 Round Laydown Threading Inserts for Fire Fighting and Food Industry Pipe Couplings



External right-hand shown

| Designation                      | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |       |       |
|----------------------------------|------------|--------------------|-------|------|------|------|--------------|-------|-------|-------|
|                                  | IC         | TPI <sup>(2)</sup> | INSL  | RE   | PDX  | PDY  | IC228        | IC250 | IC508 | IC908 |
| 16EL 6 RND IC250                 | 9.52       | 6.0                | 16.49 | 1.01 | 1.70 | 1.50 |              | •     |       |       |
| 16ER 6 RND IC250                 | 9.52       | 6.0                | 16.49 | 1.01 | 1.70 | 1.50 |              | •     |       |       |
| 16ER 6 RND IC908                 | 9.52       | 6.0                | 16.49 | 1.01 | 1.60 | 1.50 |              |       |       | •     |
| 16ERM 6 RND IC508 <sup>(1)</sup> | 9.52       | 6.0                | 16.49 | 1.01 | 1.70 | 1.50 |              |       | •     |       |
| 16ERM 6 RND IC908 <sup>(1)</sup> | 9.52       | 6.0                | 16.49 | 1.01 | 1.70 | 1.50 |              |       |       | •     |
| 16EL 8 RND IC250                 | 9.52       | 8.0                | 16.49 | 0.76 | 1.30 | 1.40 |              | •     |       |       |
| 16EL 8 RND IC908                 | 9.52       | 8.0                | 16.49 | 0.76 | 1.30 | 1.40 |              |       |       | •     |
| 16ER 8 RND IC250                 | 9.52       | 8.0                | 16.49 | 0.76 | 1.30 | 1.40 |              | •     |       |       |
| 16ER 8 RND IC908                 | 9.52       | 8.0                | 16.49 | 0.76 | 1.30 | 1.40 |              |       |       | •     |
| 16ERM 8 RND IC908 <sup>(1)</sup> | 9.52       | 8.0                | 16.49 | 0.75 | 1.30 | 1.40 |              |       |       | •     |
| 16EL 10 RND IC908                | 9.52       | 10.0               | 16.49 | 0.61 | 1.20 | 1.10 |              |       |       | •     |
| 16ER 10 RND IC250                | 9.52       | 10.0               | 16.49 | 0.61 | 1.20 | 1.10 |              | •     |       |       |
| 16ER 10 RND IC908                | 9.52       | 10.0               | 16.49 | 0.61 | 1.30 | 1.40 |              |       |       | •     |
| 22EL 4 RND IC908                 | 12.70      | 4.0                | 22.00 | 1.51 | 2.30 | 2.20 |              |       |       | •     |
| 22ER 4 RND IC250                 | 12.70      | 4.0                | 22.00 | 1.51 | 2.30 | 2.20 |              | •     |       |       |
| 22ER 4 RND IC908                 | 12.70      | 4.0                | 22.00 | 1.51 | 2.30 | 2.20 |              |       |       | •     |
| 22EL 6 RND IC250                 | 12.70      | 6.0                | 22.00 | 1.01 | 1.70 | 1.50 |              | •     |       |       |
| 22ER 6 RND IC228                 | 12.70      | 6.0                | 22.00 | 1.01 | 1.70 | 1.50 | •            |       |       |       |
| 22ER 6 RND IC908                 | 12.70      | 6.0                | 22.00 | 1.01 | 1.70 | 1.50 |              |       |       | •     |
| 27ER 4 RND IC250                 | 15.88      | 4.0                | 27.50 | 1.51 | 2.30 | 2.20 |              | •     |       |       |

• For Insert Identification System, see page 714 • Tolerance: Class 7H • For technical information and detailed cutting data, see pages 809-825

<sup>(1)</sup> With pressed chipformer

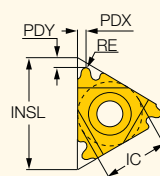
<sup>(2)</sup> Threads per inch

For tools, see pages: NQCH-SER/L-JHP (800) • SER/L (798)

# ISCARTHREAD

## IR/L-RND

Internal DIN 405 Round Laydown Threading Inserts for Fire Fighting and Food Industry Pipe Couplings



Internal left-hand shown

| Designation                      | Dimensions |                    |       |      |      |      | Tough ↔ Hard |       |
|----------------------------------|------------|--------------------|-------|------|------|------|--------------|-------|
|                                  | IC         | TPI <sup>(2)</sup> | INSL  | RE   | PDX  | PDY  | IC250        | IC908 |
| 16IR 10 RND IC908                | 9.52       | 10.0               | 16.49 | 0.36 | 1.20 | 1.10 |              | •     |
| 16IL 8 RND IC908                 | 9.52       | 8.0                | 16.49 | 0.70 | 1.40 | 1.40 |              | •     |
| 16IR 8 RND IC908                 | 9.52       | 8.0                | 16.49 | 0.70 | 1.40 | 1.40 |              | •     |
| 16IL 6 RND IC908                 | 9.52       | 6.0                | 16.49 | 0.94 | 1.50 | 1.40 |              | •     |
| 16IR 6 RND IC250                 | 9.52       | 6.0                | 16.49 | 0.94 | 1.50 | 1.40 | •            |       |
| 16IR 6 RND IC908                 | 9.52       | 6.0                | 16.49 | 0.94 | 1.40 | 1.50 |              | •     |
| 16IRM 6 RND IC908 <sup>(1)</sup> | 9.52       | 6.0                | 16.49 | 0.94 | 1.50 | 1.40 |              | •     |
| 22IR 6 RND IC908                 | 12.70      | 6.0                | 22.00 | 0.94 | 1.70 | 1.50 |              | •     |
| 22IR 4 RND IC908                 | 12.70      | 4.0                | 22.00 | 1.40 | 2.30 | 2.20 |              | •     |
| 27IR 4 RND IC250                 | 15.88      | 4.0                | 27.50 | 1.40 | 2.30 | 2.20 | •            |       |

• For Insert Identification System, see page 714 • Tolerance: Class 7H • For technical information and detailed cutting data, see pages 809-825

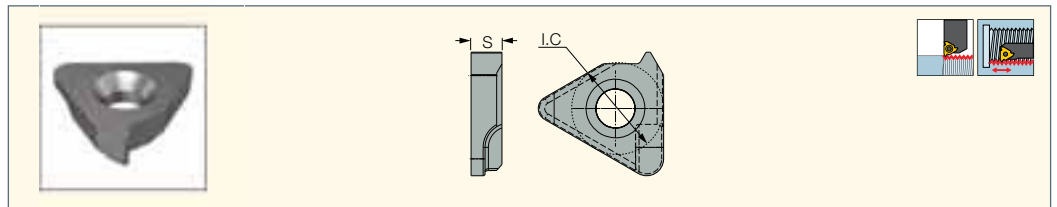
<sup>(1)</sup> With pressed chipformer

<sup>(2)</sup> Threads per inch

For tools, see pages: AVC-D-SIR/L (805) • C#-SIR/L (803) • SIR/L (801)

## Accessories

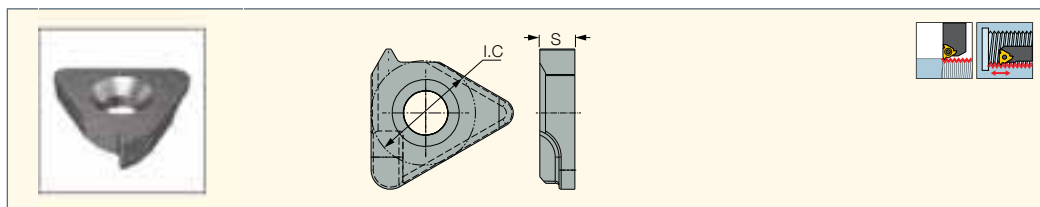
**Thread anvils EL/IR**  
Thread Anvils for External  
Left & Internal Right



| Designation  | IC    | a°   | S    |
|--------------|-------|------|------|
| AI16 -0      | 9.52  | 0    | 3.20 |
| AI16M-0      | 9.52  | 0    | 3.20 |
| AI16 -0.50   | 9.52  | -0.5 | 3.20 |
| AI16 +0.5    | 9.52  | 0.5  | 3.20 |
| AI16M+0.5    | 9.52  | 0.5  | 3.20 |
| AI16 -1.50   | 9.52  | -1.5 | 3.20 |
| AI16         | 9.52  | 1.5  | 3.20 |
| AI16M        | 9.52  | 1.5  | 3.20 |
| AI16 +2.5    | 9.52  | 2.5  | 3.20 |
| AI16M+2.5    | 9.52  | 2.5  | 3.20 |
| AI16 +3.5    | 9.52  | 3.5  | 3.20 |
| AI16 +4.5    | 9.52  | 4.5  | 3.20 |
| AI22-0       | 12.70 | 0    | 4.00 |
| AI22M-0      | 12.70 | 0    | 4.00 |
| AI22U-0      | 12.70 | 0    | 4.00 |
| AI22 -0.5    | 12.70 | -0.5 | 4.00 |
| AI22U -0.5   | 12.70 | -0.5 | 4.00 |
| AI22 +0.50   | 12.70 | 0.5  | 4.00 |
| AI22M+0.5    | 12.70 | 0.5  | 4.00 |
| AI22 -1.50   | 12.70 | -1.5 | 4.00 |
| AI22U -1.5   | 12.70 | -1.5 | 4.00 |
| AI22         | 12.70 | 1.5  | 4.00 |
| AI22M        | 12.70 | 1.5  | 4.00 |
| AI22U        | 12.70 | 1.5  | 4.00 |
| AI22 +2.5    | 12.70 | 2.5  | 4.00 |
| AI22M+2.5    | 12.70 | 2.5  | 4.00 |
| AI22U +2.50  | 12.70 | 2.5  | 4.00 |
| AI22 +3.5    | 12.70 | 3.5  | 4.00 |
| AI22U +3.5   | 12.70 | 3.5  | 4.00 |
| AI22 +4.5    | 12.70 | 4.5  | 4.00 |
| AI22U +4.5   | 12.70 | 4.5  | 4.00 |
| AI27-0       | 15.88 | 0    | 5.50 |
| AI27M-0      | 15.88 | 0    | 5.50 |
| AI27U-0      | 15.88 | 0    | 5.50 |
| AI27 -0.5    | 15.88 | -0.5 | 3.20 |
| AI27U-0.50   | 15.88 | -0.5 | 5.50 |
| AI27 +0.5-P  | 15.88 | 0.5  | 5.50 |
| AI27M+0.5    | 15.88 | 0.5  | 4.00 |
| AI27U +0.50  | 15.88 | 0.5  | 5.50 |
| AI27 -1.5    | 15.88 | -1.5 | 5.50 |
| AI27U -1.5   | 15.88 | -1.5 | 5.50 |
| AI27         | 15.88 | 1.5  | 5.50 |
| AI27M        | 15.88 | 1.5  | 5.50 |
| AI27U        | 15.88 | 1.5  | 5.50 |
| AI27 +2.5    | 15.88 | 2.5  | 5.50 |
| AI27U +2.5   | 15.88 | 2.5  | 5.50 |
| AI27U +2.5TR | 15.88 | 2.5  | 5.50 |
| AI27 +3.5    | 15.88 | 3.5  | 5.50 |
| AI27U +3.5   | 15.88 | 3.5  | 5.50 |
| AI27U +3.5TR | 15.88 | 3.5  | 5.50 |
| AI27 +4.5    | 15.88 | 4.5  | 5.50 |
| AI27U +4.5   | 15.88 | 4.5  | 5.50 |
| AI27U +4.5TR | 15.88 | 4.5  | 5.50 |

## Accessories

**Thread anvils ER/IL**  
Thread Anvils for External  
Right & Internal Left



| Designation  | IC    | a°   | S    |
|--------------|-------|------|------|
| AE16 -0      | 9.52  | 0    | 3.20 |
| AE16M -0     | 9.52  | 0    | 3.20 |
| AE16 -0.5    | 9.52  | -0.5 | 3.20 |
| AE16M -0.5   | 9.52  | -0.5 | 3.20 |
| AE16 +0.5    | 9.52  | 0.5  | 3.20 |
| AE16M +0.5   | 9.52  | 0.5  | 3.20 |
| AE16 -1.5    | 9.52  | -1.5 | 3.20 |
| AE16M -1.5   | 9.52  | -1.5 | 3.20 |
| AE16         | 9.52  | 1.5  | 3.20 |
| AE16M        | 9.52  | 1.5  | 3.20 |
| AE16 +2.5    | 9.52  | 2.5  | 3.20 |
| AE16M +2.5   | 9.52  | 2.5  | 3.20 |
| AE16 +3.5    | 9.52  | 3.5  | 3.20 |
| AE16 +4.5    | 9.52  | 4.5  | 3.20 |
| AE22 -0      | 12.70 | 0    | 4.00 |
| AE22M -0     | 12.70 | 0    | 4.00 |
| AE22U -0     | 12.70 | 0    | 4.00 |
| AE22 -0.5    | 12.70 | -0.5 | 4.00 |
| AE22M -0.5   | 12.70 | -0.5 | 4.00 |
| AE22U -0.5   | 12.70 | -0.5 | 4.00 |
| AE22 +0.5    | 12.70 | 0.5  | 4.00 |
| AE22M +0.5   | 12.70 | 0.5  | 4.00 |
| AE22U +0.5   | 12.70 | 0.5  | 4.00 |
| AE22 -1.5    | 12.70 | -1.5 | 4.00 |
| AE22U -1.5   | 12.70 | -1.5 | 4.00 |
| AE22         | 12.70 | 1.5  | 4.00 |
| AE22M        | 12.70 | 1.5  | 4.00 |
| AE22U        | 12.70 | 1.5  | 4.00 |
| AE22 +2.5    | 12.70 | 2.5  | 4.00 |
| AE22M +2.5   | 12.70 | 2.5  | 4.00 |
| AE22U +2.5   | 12.70 | 2.5  | 4.00 |
| AE22 +3.5    | 12.70 | 3.5  | 4.00 |
| AE22U +3.5   | 12.70 | 3.5  | 4.00 |
| AE22 +4.5    | 12.70 | 4.5  | 4.00 |
| AE22U +4.5   | 12.70 | 4.5  | 4.00 |
| AE27 -0      | 15.88 | 0    | 5.50 |
| AE27M -0     | 15.88 | 0    | 5.50 |
| AE27U -0     | 15.88 | 0    | 5.50 |
| AE27 -0.5    | 15.88 | -0.5 | 5.50 |
| AE27U -0.5   | 15.88 | -0.5 | 5.50 |
| AE27 +0.5    | 15.88 | 0.5  | 5.50 |
| AE27M +0.5   | 15.88 | 0.5  | 5.50 |
| AE27U +0.5   | 15.88 | 0.5  | 5.50 |
| AE27 -1.5    | 15.88 | -1.5 | 5.50 |
| AE27U -1.5   | 15.88 | -1.5 | 5.50 |
| AE27         | 15.88 | 1.5  | 5.50 |
| AE27M        | 15.88 | 1.5  | 5.50 |
| AE27U        | 15.88 | 1.5  | 5.50 |
| AE27 +2.5    | 15.88 | 2.5  | 5.50 |
| AE27U +2.5   | 15.88 | 2.5  | 5.50 |
| AE27U +2.5TR | 15.88 | 2.5  | 5.50 |
| AE27 +3.5    | 15.88 | 3.5  | 5.50 |
| AE27U +3.5   | 15.88 | 3.5  | 5.50 |
| AE27U +3.5TR | 15.88 | 3.5  | 5.50 |
| AE27 +4.5    | 15.88 | 4.5  | 5.50 |
| AE27U +4.5   | 15.88 | 4.5  | 5.50 |
| AE27U +4.5TR | 15.88 | 4.5  | 5.50 |

# THREADING TOOLS



## Toolholder Identification System

|          |          |          |             |          |           |                                                                                     |
|----------|----------|----------|-------------|----------|-----------|-------------------------------------------------------------------------------------|
| <b>S</b> | <b>E</b> | <b>R</b> | <b>2020</b> | <b>K</b> | <b>16</b> |  |
| <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b>    | <b>5</b> | <b>6</b>  | <b>7</b>                                                                            |

### 1 Clamping System

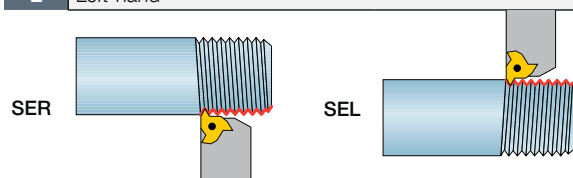
|          |                |
|----------|----------------|
| <b>S</b> | Screw Clamping |
|----------|----------------|

### 2 Application

|          |          |
|----------|----------|
| <b>E</b> | External |
| <b>I</b> | Internal |

### 3 Hand of Tool

|          |            |
|----------|------------|
| <b>R</b> | Right-hand |
| <b>L</b> | Left-hand  |



### 4 Type

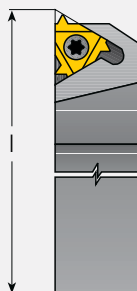
External Toolholders  
Shank: hxb  
2020-20x20 mm

#### \* Optional Prefix

|            |                                  |
|------------|----------------------------------|
| <b>C</b>   | ] Exchangeable Adaptation System |
| <b>HSK</b> |                                  |
| <b>KM</b>  |                                  |

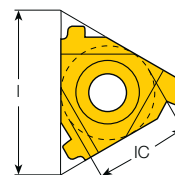
### 5 Tool Length

|          | mm  |
|----------|-----|
| <b>D</b> | 60  |
| <b>F</b> | 80  |
| <b>H</b> | 100 |
| <b>K</b> | 125 |
| <b>L</b> | 140 |
| <b>M</b> | 150 |
| <b>P</b> | 170 |
| <b>R</b> | 200 |
| <b>S</b> | 250 |
| <b>T</b> | 300 |
| <b>U</b> | 350 |
| <b>V</b> | 400 |



### 6 Insert Size

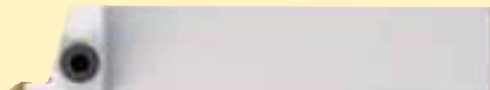
| I (mm)     | IC    |
|------------|-------|
| <b>06</b>  | 5/32" |
| <b>08</b>  | 3/16" |
| <b>08U</b> | 3/16" |
| <b>11</b>  | 1/4"  |
| <b>16</b>  | 3/8"  |
| <b>22</b>  | 1/2"  |
| <b>22U</b> | 1/2"  |
| <b>27</b>  | 5/8"  |
| <b>27U</b> | 5/8"  |



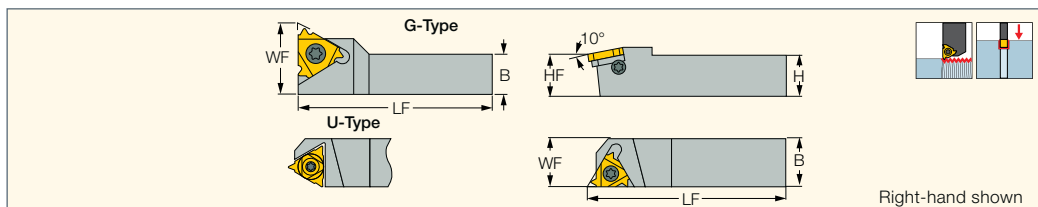
### 7 Optional Specifications

|           |                    |
|-----------|--------------------|
| <b>U</b>  | For U-type inserts |
| <b>B</b>  | Bore for coolant   |
| <b>C</b>  | Carbide shank      |
| <b>O</b>  | Offset style       |
| <b>D</b>  | Drop head          |
| <b>G</b>  | Gang tool          |
| <b>SP</b> | Special            |



| Tool Types                                                                                                     |                                                                                      |                                                                                              |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| C#-SER/L<br>HSK-SEL                                                                                            |     | Standard   |
|                                                                                                                |                                                                                      | U-Type     |
| ISCAR GROOVE-TURN TOOLS                                                                                        |    |                                                                                              |
| PENTACUT Carrying Inserts with 5 Threading Corners. For tool information, refer to the section on GROOVE-TURN. |    |                                                                                              |
| Boring Bars                                                                                                    |                                                                                      |                                                                                              |
| E-SIR-HEAD                                                                                                     |    | Standard  |
|                                                                                                                |                                                                                      | U-Type   |
| GROOVE-TURN Boring Bars                                                                                        |  |                                                                                              |
| CHAMGROOVE Holder and Carbide Bar                                                                              |  |                                                                                              |
| CHAMGROOVE Integral                                                                                            |  |                                                                                              |
| PICCOCUT Holders and Carbide Bars                                                                              |  |                                                                                              |

**SER/L**  
External Threading Toolholders



| Designation                   | H    | HF   | B    | LF     | WF    | Insert <sup>(2)</sup> |
|-------------------------------|------|------|------|--------|-------|-----------------------|
| SER 0808 H11 <sup>(1)</sup>   | 8.0  | 8.0  | 8.0  | 100.00 | 11.00 | 11 ER/L...            |
| SER/L 1010 H11 <sup>(1)</sup> | 10.0 | 10.0 | 10.0 | 100.00 | 11.00 | 11 ER/L...            |
| SER/L 1212 F16                | 12.0 | 12.0 | 12.0 | 80.00  | 12.00 | 16 ER/L...            |
| SER 1212 X16                  | 12.0 | 12.0 | 12.0 | 120.00 | 12.00 | 16 ER/L...            |
| SER/L 1616 H16                | 16.0 | 16.0 | 16.0 | 100.00 | 16.00 | 16 ER/L...            |
| SER 1616 K16G                 | 16.0 | 16.0 | 16.0 | 125.00 | 21.70 | 16 ER/L...            |
| SER/L 2020-16-AD              | 20.0 | 20.0 | 20.0 | 67.00  | 20.00 | 16 ER/L...            |
| SER/L 2020 K16                | 20.0 | 20.0 | 20.0 | 125.00 | 20.00 | 16 ER/L...            |
| SER/L 2525 M16                | 25.0 | 25.0 | 25.0 | 150.00 | 25.00 | 16 ER/L...            |
| SER/L 3232 P16                | 32.0 | 32.0 | 32.0 | 170.00 | 32.00 | 16 ER/L...            |
| SER/L 2525 M22                | 25.0 | 25.0 | 25.0 | 150.00 | 25.00 | 22 ER/L...            |
| SER/L 3232 P22                | 32.0 | 32.0 | 32.0 | 170.00 | 32.00 | 22 ER/L...            |
| SER 4040 R22                  | 40.0 | 40.0 | 40.0 | 200.00 | 40.00 | 22 ER/L...            |
| SER/L 2525 M22U               | 25.0 | 25.0 | 25.0 | 150.00 | 28.00 | 22 UER/L...           |
| SER/L 3232 P22U               | 32.0 | 32.0 | 32.0 | 170.00 | 32.00 | 22 UER/L...           |
| SEL 4040 R22U                 | 40.0 | 40.0 | 40.0 | 200.00 | 40.00 | 22 UER/L...           |
| SER/L 2525 M27                | 25.0 | 25.0 | 25.0 | 150.00 | 25.00 | 27 ER/L...            |
| SER/L 3232 P27                | 32.0 | 32.0 | 32.0 | 170.00 | 32.00 | 27 ER/L...            |
| SER 4040 R27                  | 40.0 | 40.0 | 40.0 | 200.00 | 40.00 | 27 ER/L...            |
| SER/L 2525 M27U               | 25.0 | 25.0 | 25.0 | 150.00 | 32.00 | 27 UER/L...           |
| SER/L 3232 P27U               | 32.0 | 32.0 | 32.0 | 170.00 | 32.00 | 27 UER/L...           |
| SER/L 4040 R27U               | 40.0 | 40.0 | 40.0 | 200.00 | 40.00 | 27 UER/L...           |

• All tools are made for 1.5 helix angle • For multi-tooth inserts use anvils AE16M / AI16M; AE22M / AI22M; AE27M / AI27M • For GTGA inserts, use anvil AE 16-0

<sup>(1)</sup> Toolholder without anvil

<sup>(2)</sup> Right-hand inserts (ER) for right-hand tools (SER)

**For inserts, see pages:** EIR/L U (722) • ER/L-55° (715) • ER/L-60° (721) • ER/L-ABUT (784) • ER/L-ACME (771) • ER/L-API (788)

• ER/L-API RD (786) • ER/L-BSPT (766) • ER/L-ISO (734) • ER/L-NPT (761) • ER/L-RND (792) • ER/L-STACME (768) • ER/L-TR (780)

• ER/L-UN (745) • ER/L-UNJ (775) • ER/L-W (755) • ER/L-SAGE (783) • ER-BUT (790) • ER-EL (791) • ER-PG (782) • ER-MJ (779)

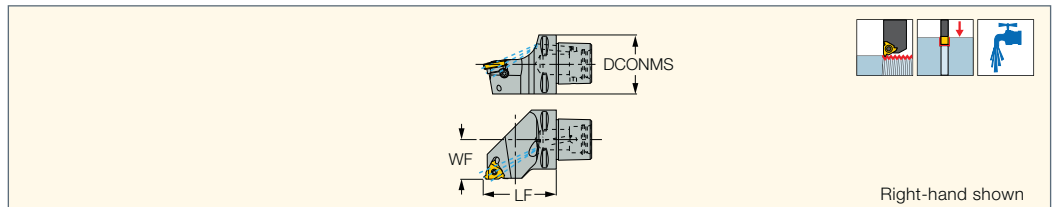
• ER-NPTF (765) • ER-ISO 3M-Q (733) • ER-NPT 3M-Q (760) • ER-W 3M-Q (755) • GTGA (365) • GTMA (366)

**Spare Parts**

| Designation    |  |  |  |  |  |
|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| SER 0808 H11   | SR M2.6-L6.7-S11                                                                    |                                                                                     |                                                                                     |                                                                                       | T-8/5                                                                                 |
| SER/L 1010 H11 | SR M2.6-L6.7-S11                                                                    |                                                                                     |                                                                                     |                                                                                       | T-8/5                                                                                 |
| SEL 1212 F16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    |                                                                                     | AI16                                                                                  | T-10/5                                                                                |
| SER 1212 F16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SER 1212 X16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SEL 1616 H16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    |                                                                                     | AI16                                                                                  | T-10/5                                                                                |
| SER 1616 H16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SER 1616 K16G  | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SEL 2020-16-AD | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    |                                                                                     | AI16                                                                                  | T-10/5                                                                                |
| SER 2020-16-AD | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SEL 2020 K16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    |                                                                                     | AI16                                                                                  | T-10/5                                                                                |
| SER 2020 K16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SEL 2525 M16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    |                                                                                     | AI16                                                                                  | T-10/5                                                                                |
| SER 2525 M16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SEL 3232 P16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    |                                                                                     | AI16                                                                                  | T-10/5                                                                                |
| SER 3232 P16   | SR 5-40-L12.2-S16                                                                   | SR 5-40-L6.8-A16                                                                    | AE16                                                                                |                                                                                       | T-10/5                                                                                |
| SEL 2525 M22   | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    |                                                                                     | AI22                                                                                  | T-20/5                                                                                |
| SER 2525 M22   | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    | AE22                                                                                |                                                                                       | T-20/5                                                                                |
| SEL 3232 P22   | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    |                                                                                     | AI22                                                                                  | T-20/5                                                                                |
| SER 3232 P22   | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    | AE22                                                                                |                                                                                       | T-20/5                                                                                |
| SER 4040 R22   | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    | AE22                                                                                |                                                                                       | T-20/5                                                                                |
| SEL 2525 M22U  | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    |                                                                                     | AI22U                                                                                 | T-20/5                                                                                |
| SER 2525 M22U  | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    | AE22U                                                                               |                                                                                       | T-20/5                                                                                |
| SEL 3232 P22U  | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    |                                                                                     | AI22U                                                                                 | T-20/5                                                                                |
| SER 3232 P22U  | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    | AE22U                                                                               |                                                                                       | T-20/5                                                                                |
| SEL 4040 R22U  | SR 8-32-L15-S22                                                                     | SR 8-32-L5.8-A22                                                                    |                                                                                     | AI22U                                                                                 | T-20/5                                                                                |
| SEL 2525 M27   | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      |                                                                                     | AI27                                                                                  | T-25/3                                                                                |
| SER 2525 M27   | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      | AE27                                                                                |                                                                                       | T-25/3                                                                                |
| SEL 3232 P27   | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      |                                                                                     | AI27                                                                                  | T-25/3                                                                                |
| SER 3232 P27   | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      | AE27                                                                                |                                                                                       | T-25/3                                                                                |
| SER 4040 R27   | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      | AE27                                                                                |                                                                                       | T-25/3                                                                                |
| SEL 2525 M27U  | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      |                                                                                     | AI27U                                                                                 | T-25/3                                                                                |
| SER 2525 M27U  | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      | AE27U                                                                               |                                                                                       | T-25/3                                                                                |
| SEL 3232 P27U  | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      |                                                                                     | AI27U                                                                                 | T-25/3                                                                                |
| SER 3232 P27U  | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      | AE27U                                                                               |                                                                                       | T-25/3                                                                                |
| SEL 4040 R27U  | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      |                                                                                     | AI27U                                                                                 | T-25/3                                                                                |
| SER 4040 R27U  | SR M5-L22-S40                                                                       | SR M5-L5.8-A27                                                                      | AE27U                                                                               |                                                                                       | T-25/3                                                                                |

**C#-SER/L**

External Threading Tools with  
CAMFIX Exchangeable Shanks



| Designation       | DCONMS | WF    | LF    | CP <sup>(1)</sup> | DCP <sup>(2)</sup> | Insert <sup>(3)</sup> |
|-------------------|--------|-------|-------|-------------------|--------------------|-----------------------|
| C4 SER/L-27050-16 | 40.00  | 27.00 | 50.00 | 200               | 1                  | 16ER/L...             |
| C5 SER/L-35060-16 | 50.00  | 35.00 | 60.00 | 200               | 1                  | 16ER/L...             |
| C5 SER/L-35060-16 | 50.00  | 35.00 | 60.00 | 200               | 1                  | 16ER/L...             |
| C6 SER/L-45065-16 | 63.00  | 45.00 | 65.00 | 200               | 1                  | 16ER/L...             |
| C4 SER/L-27050-22 | 40.00  | 27.00 | 50.00 | 200               | 1                  | 22ER/L...             |
| C5 SER/L-35060-22 | 50.00  | 35.00 | 60.00 | 200               | 1                  | 22ER/L...             |
| C6 SER/L-45065-22 | 63.00  | 45.00 | 65.00 | 200               | 1                  | 22ER/L...             |
| C8 SER/L-55080-22 | 80.00  | 55.00 | 80.00 | 200               | 1                  | 22ER/L...             |

<sup>(1)</sup> Coolant pressure (Bar)

<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

<sup>(3)</sup> Right-hand inserts for right-hand tools and vice versa

**For inserts, see pages:** ER-EL (791) • ER-ISO 3M-Q (733) • ER-W 3M-Q (755) • ER/L-55° (715) • ER/L-60° (721) • ER/L-ACME (771)

• ER/L-API (788) • ER/L-API RD (786) • ER/L-BSPT (766) • ER/L-ISO (734) • ER/L-NPT (761) • ER/L-SAGE (783) • ER/L-UN (745)

• ER/L-UNJ (775) • ER/L-W (755) • GTGA (365) • GTMA (366)

**For holders, see page:** HSK-C# (835)

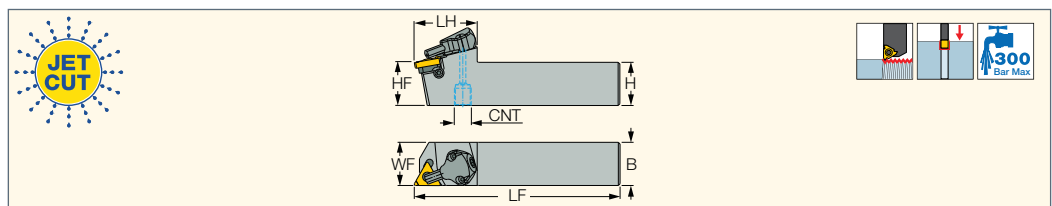
**Spare Parts**

| Designation     |       |                  |                   |        |        |
|-----------------|-------|------------------|-------------------|--------|--------|
| C4 SEL-27050-16 | AI16  | SR 5-40-L6.8-A16 | SR 5-40-L12.2-S16 | T-10/5 | EZ 83  |
| C4 SER-27050-16 | AE16  | SR 5-40-L6.8-A16 | SR 5-40-L12.2-S16 | T-10/5 | EZ 83  |
| C5 SEL-35060-16 | AI16* | SR 5-40-L6.8-A16 | SR 5-40-L12.2-S16 | T-10/5 | EZ 104 |
| C5 SER-35060-16 | AE16  | SR 5-40-L6.8-A16 | SR 5-40-L12.2-S16 | T-10/5 | EZ 104 |
| C6 SER-45065-16 | AI16  | SR 5-40-L6.8-A16 | SR 5-40-L12.2-S16 | T-10/5 | EZ 104 |
| C6 SER-45065-16 | AE16  | SR 5-40-L6.8-A16 | SR 5-40-L12.2-S16 | T-10/5 | EZ 104 |
| C4 SEL-27050-22 | AI22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 83  |
| C4 SER-27050-22 | AE22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 83  |
| C5 SEL-35060-22 | AI22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 104 |
| C5 SER-35060-22 | AE22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 104 |
| C6 SER-45065-22 | AI22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 104 |
| C6 SER-45065-22 | AE22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 104 |
| C8 SEL-55080-22 | AI22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 125 |
| C8 SER-55080-22 | AE22  | SR 8-32-L5.8-A22 | SR 8-32-L15-S22   | T-20/5 | EZ 125 |

\* Optional, to be ordered separately

**SER/L-JHP**

External Threading Tools  
with Coolant Channels



| Designation        | H    | B    | HF   | LF     | LH   | WF    | CNT     | Insert <sup>(1)</sup> |
|--------------------|------|------|------|--------|------|-------|---------|-----------------------|
| SER/L 2020 K16-JHP | 20.0 | 20.0 | 20.0 | 125.00 | 37.0 | 20.00 | G1/8-28 | 16 ER/L..             |
| SER/L 2525 M16-JHP | 25.0 | 25.0 | 25.0 | 150.00 | 37.0 | 25.00 | G1/8-28 | 16 ER/L..             |
| SER/L 3232 P16-JHP | 32.0 | 32.0 | 32.0 | 170.00 | 37.0 | 32.00 | G1/8-28 | 16 ER/L..             |

• All tools are made for 1.5 helix angle • For multi-tooth inserts use anvils AE16M / AI16M; AE22M / AI22M; AE27M / AI27M

• For GTGA inserts, use anvil AE 16-0

<sup>(1)</sup> Right-hand inserts (ER) for right-hand tools (SER)

**For inserts, see pages:** ER/L-55° (715) • ER/L-60° (721) • ER/L-ACME (771) • ER/L-API RD (786) • ER/L-BSPT (766) • ER/L-ISO (734)

• ER/L-NPT (761) • ER/L-SAGE (783) • ER/L-UN (745) • ER/L-UNJ (775) • ER/L-W (755) • GTGA (365) • GTMA (366)

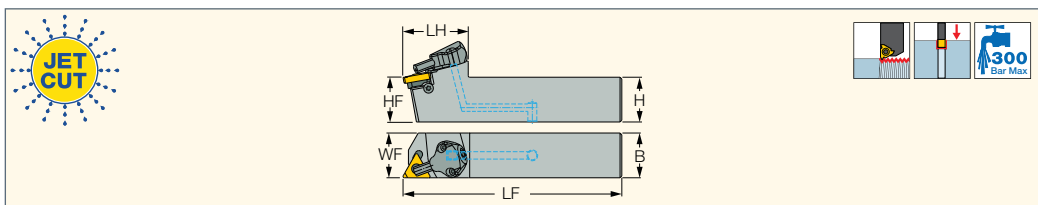
**Spare Parts**

| Designation      |                   |      |       |                  |        |          |
|------------------|-------------------|------|-------|------------------|--------|----------|
| SEL 2020 K16-JHP | SR 5-40-L12.2-S16 | AI16 | T-8/5 | SR 5-40-L6.8-A16 | T-10/5 | CU-V-JHP |
| SER 2020 K16-JHP | SR 5-40-L12.2-S16 | AE16 | T-8/5 | SR 5-40-L6.8-A16 | T-10/5 | CU-V-JHP |
| SEL 2525 M16-JHP | SR 5-40-L12.2-S16 | AI16 | T-8/5 | SR 5-40-L6.8-A16 | T-10/5 | CU-V-JHP |
| SER 2525 M16-JHP | SR 5-40-L12.2-S16 | AE16 | T-8/5 | SR 5-40-L6.8-A16 | T-10/5 | CU-V-JHP |
| SEL 3232 P16-JHP | SR 5-40-L12.2-S16 | AI16 | T-8/5 | SR 5-40-L6.8-A16 | T-10/5 | CU-V-JHP |
| SER 3232 P16-JHP | SR 5-40-L12.2-S16 | AE16 | T-8/5 | SR 5-40-L6.8-A16 | T-10/5 | CU-V-JHP |

# JETCUT ISCARTHREAD

## SER/L-JHP-MC

External Threading Tools with Bottom Inlet Coolant Channels



| Designation          | H    | HF   | B    | LF     | LH   | WF    | Insert <sup>(1)</sup> |
|----------------------|------|------|------|--------|------|-------|-----------------------|
| SER/L 2020X16 JHP-MC | 20.0 | 20.0 | 20.0 | 107.00 | 36.2 | 20.00 | 16 ER/L..             |
| SER/L 2525X16 JHP-MC | 25.0 | 25.0 | 25.0 | 122.00 | 36.2 | 25.00 | 16 ER/L..             |

• All tools are made for 1.5 helix angle • For multi-tooth inserts use anvils AE16M / AI16M; AE22M / AI22M; AE27M / AI27M

• For GTGA inserts, use anvil AE 16-0

<sup>(1)</sup> Right-hand inserts (ER) for right-hand tools (SER)

For inserts, see pages: ER/L-55° (640) • ER/L-60° (644) • ER/L-ACME (677) • ER/L-API RD (688) • ER/L-BSPT (673) • ER/L-ISO (653)

• ER/L-NPT (669) • ER/L-SAGE (686) • ER/L-UN (660) • ER/L-UNJ (680) • ER/L-W (666) • GTGA (325) • GTMA (326)

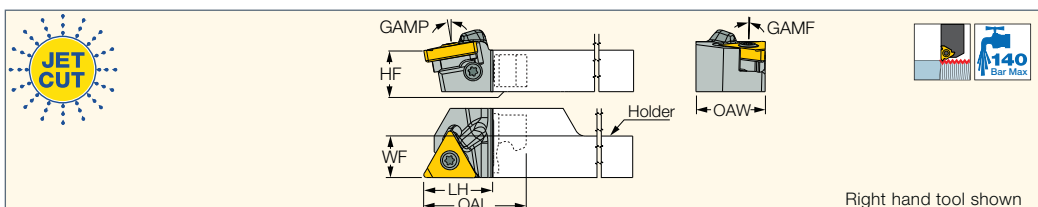
## Spare Parts

| Designation        |  |  |  |  |  |  |
|--------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| SEL 2020X16 JHP-MC | SR 5-40-L12.2-S16                                                                 | AI16                                                                              | T-8/5                                                                             | SR 5-40-L6.8-A16                                                                    | T-10/5                                                                              | CU-V-JHP                                                                            |
| SER 2020X16 JHP-MC | SR 5-40-L12.2-S16                                                                 | AE16                                                                              | T-8/5                                                                             | SR 5-40-L6.8-A16                                                                    | T-10/5                                                                              | CU-V-JHP                                                                            |
| SEL 2525X16 JHP-MC | SR 5-40-L12.2-S16                                                                 | AI16                                                                              | T-8/5                                                                             | SR 5-40-L6.8-A16                                                                    | T-10/5                                                                              | CU-V-JHP                                                                            |
| SER 2525X16 JHP-MC | SR 5-40-L12.2-S16                                                                 | AE16                                                                              | T-8/5                                                                             | SR 5-40-L6.8-A16                                                                    | T-10/5                                                                              | CU-V-JHP                                                                            |

# NEOSWISS JETCUT

## NQCH-SER/L-JHP

Screw Lock JETCUT Modular Heads which Mount ISO Laydown Threading Inserts for Swiss-Type Machines



| Designation       | WF    | HF   | LH   | OAL   | OAW   | GAMP <sup>(1)</sup> | GAMF <sup>(2)</sup> | Insert |
|-------------------|-------|------|------|-------|-------|---------------------|---------------------|--------|
| NQCH12-SEL-16-JHP | 12.00 | 11.8 | 20.6 | 29.40 | 20.00 | 10.0                | 1.5                 | 16EL.. |
| NQCH12-SER-16-JHP | 12.00 | 11.8 | 20.6 | 29.40 | 20.00 | 10.0                | 1.5                 | 16ER.. |
| NQCH16-SEL-16-JHP | 16.00 | 15.8 | 20.6 | 29.40 | 20.00 | 10.0                | 1.5                 | 16EL.. |
| NQCH16-SER-16-JHP | 16.00 | 15.8 | 20.6 | 29.40 | 20.00 | 10.0                | 1.5                 | 16ER.. |

## NEW

• Use only RH Shank with RH Head and LH Shank with LH Head

<sup>(1)</sup> Rake angle axial

<sup>(2)</sup> Rake angle radial

For inserts, see pages: ER-MJ (779) • ER-NPTF (765) • ER-PG (782) • ER/L-55° (715) • ER/L-60° (721) • ER/L-ABUT (784) • ER/L-ACME (771)

• ER/L-API RD (786) • ER/L-BSPT (766) • ER/L-ISO (734) • ER/L-NPT (761) • ER/L-RND (792) • ER/L-SAGE (783) • ER/L-STACME (768)

• ER/L-TR (780) • ER/L-UN (745) • ER/L-UNJ (775) • ER/L-W (755) • GTGA (365) • GTMA (366)

For holders, see page: NQCH-JHP (424)

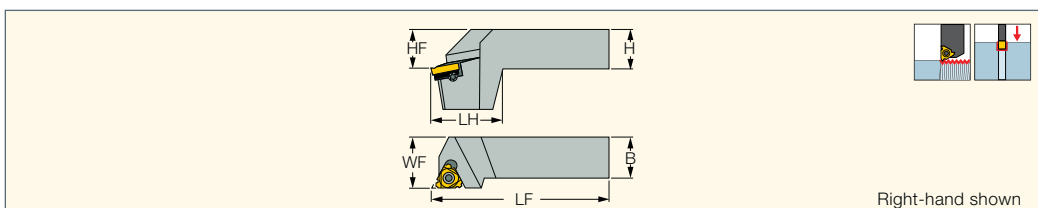
## Spare Parts

| Designation       |  |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| NQCH12-SEL-16-JHP | AI16                                                                                | SR 5-40-L6.8-A16                                                                    | SR 5-40-L12.2-S16                                                                     | T-10/5                                                                                |
| NQCH12-SER-16-JHP | AE16                                                                                | SR 5-40-L6.8-A16                                                                    | SR 5-40-L12.2-S16                                                                     | T-10/5                                                                                |
| NQCH16-SEL-16-JHP | AI16                                                                                | SR 5-40-L6.8-A16                                                                    | SR 5-40-L12.2-S16                                                                     | T-10/5                                                                                |
| NQCH16-SER-16-JHP | AE16                                                                                | SR 5-40-L6.8-A16                                                                    | SR 5-40-L12.2-S16                                                                     | T-10/5                                                                                |

# ISCARTHREAD

## SER-D

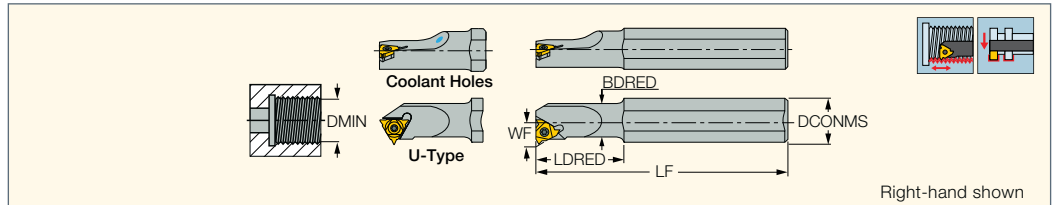
External Threading Drophead Toolholders



| Designation   | H    | HF   | B    | LF     | WF    | LH   | Insert  |  |  |  |  |
|---------------|------|------|------|--------|-------|------|---------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| SER 2525 M16D | 25.0 | 25.0 | 25.0 | 150.00 | 32.00 | 38.0 | 16 ER.. | SR 5-40-L12.2-S16                                                                     | T-10/5                                                                                | AE16                                                                                  | SR 5-40-L6.8-A16                                                                      |
| SER 2525 M22D | 25.0 | 25.0 | 25.0 | 150.00 | 32.00 | 38.0 | 22 ER.. | SR 8-32-L15-S22                                                                       | T-20/5                                                                                | AE22                                                                                  | SR 8-32-L5.8-A22                                                                      |

• All toolholders are made for 1.5 helix angle. • For GTGA inserts, use anvil AE 16-0

For inserts, see pages: ER-ISO 3M-Q (733) • ER-W 3M-Q (755) • GTMA (366)



| Designation                     | DMIN  | DCONMS | BDRED | LF     | LDRED | WF    | CSP <sup>(4)</sup> | BMC <sup>(5)</sup> | Insert <sup>(6)</sup> |
|---------------------------------|-------|--------|-------|--------|-------|-------|--------------------|--------------------|-----------------------|
| SIR/L 0005 H06CB <sup>(1)</sup> | 6.40  | 6.00   | 5.10  | 100.00 | 25.0  | 4.30  | 1                  | H                  | 06 IR/L..             |
| SIR/L 0005 H06 <sup>(2)</sup>   | 6.40  | 12.00  | 5.10  | 100.00 | 12.0  | 4.30  | 0                  | S                  | 06 IR/L..             |
| SIR/L 0007 K08CB <sup>(1)</sup> | 9.00  | 8.00   | 6.60  | 125.00 | 30.0  | 5.30  | 1                  | H                  | 08 IR/L..             |
| SIR/L 0008 K08UCB               | 9.00  | 8.00   | 7.30  | 125.00 | 35.0  | 6.40  | 1                  | H                  | 08 UIRL..             |
| SIR/L 0007 K08 <sup>(2)</sup>   | 9.00  | 16.00  | 6.60  | 125.00 | 18.0  | 5.30  | 0                  | S                  | 08 IR/L..             |
| SIR/L 0008 K08U <sup>(2)</sup>  | 9.00  | 16.00  | 7.30  | 125.00 | 21.0  | 6.60  | 0                  | S                  | 08 UIRL..             |
| SIR/L 0010 H11 <sup>(2)</sup>   | 12.00 | 10.00  | 10.00 | 100.00 | -     | 7.40  | 0                  | S                  | 11 IR/L..             |
| SIR/L 0010 M11CB <sup>(1)</sup> | 12.00 | 10.00  | 10.00 | 150.00 | -     | 7.40  | 1                  | H                  | 11 IR/L..             |
| SIR 0010 H11B <sup>(2)</sup>    | 12.00 | 10.00  | 10.00 | 100.00 | -     | 7.40  | 1                  | S                  | 11 IR/L..             |
| SIR/L 0010 K11 <sup>(2)</sup>   | 12.00 | 16.00  | 10.00 | 125.00 | 25.0  | 6.50  | 0                  | S                  | 11 IR/L..             |
| SIR/L 0010 K11B <sup>(2)</sup>  | 12.00 | 16.00  | 10.00 | 125.00 | 25.0  | 7.40  | 1                  | S                  | 11 IR/L..             |
| SIR/L 0012 P11CB <sup>(1)</sup> | 15.00 | 12.00  | 12.00 | 170.00 | -     | 8.40  | 1                  | H                  | 11 IR/L..             |
| SIR/L 0013 L11 <sup>(2)</sup>   | 15.00 | 16.00  | 13.00 | 140.00 | 32.0  | 8.90  | 0                  | S                  | 11 IR/L..             |
| SIR/L 0013 M16 <sup>(2)</sup>   | 16.00 | 16.00  | 13.00 | 150.00 | 32.0  | 10.00 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0013 M16B <sup>(2)</sup>  | 16.00 | 16.00  | 13.00 | 150.00 | 32.0  | 10.20 | 1                  | S                  | 16 IR/L..             |
| SIR/L 0016 R16CB <sup>(2)</sup> | 19.00 | 16.00  | 16.00 | 200.00 | -     | 11.70 | 1                  | H                  | 16 IR/L..             |
| SIR/L 0016 P16 <sup>(2)</sup>   | 19.00 | 20.00  | 16.00 | 170.00 | 40.0  | 11.40 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0016 P16B <sup>(2)</sup>  | 19.00 | 20.00  | 16.00 | 170.00 | 40.0  | 11.70 | 1                  | S                  | 16 IR/L..             |
| SIR/L 0020 P16                  | 24.00 | 20.00  | 20.00 | 170.00 | -     | 13.70 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0020 P16B                 | 24.00 | 20.00  | 20.00 | 170.00 | -     | 13.70 | 1                  | S                  | 16 IR/L..             |
| SIR/L 0020 P22 <sup>(2)</sup>   | 24.00 | 20.00  | 20.00 | 170.00 | -     | 15.60 | 0                  | S                  | 22 IR/L..             |
| SIR/L 0020-16-AD                | 24.00 | 20.00  | 20.00 | 80.00  | -     | 13.70 | 0                  | S                  | 16 IR/L..             |
| SIR 0020 S16CB                  | 24.00 | 20.00  | 20.00 | 250.00 | -     | 13.70 | 1                  | H                  | 16 IR/L..             |
| SIR 0025 S16CB                  | 28.00 | 25.00  | 25.00 | 250.00 | -     | 16.20 | 1                  | H                  | 16 IR/L..             |
| SIR/L 0025 R16                  | 29.00 | 25.00  | 25.00 | 200.00 | -     | 16.30 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0025 R16B                 | 29.00 | 25.00  | 25.00 | 200.00 | -     | 16.20 | 1                  | S                  | 16 IR/L..             |
| SIR/L 0025 R22                  | 29.00 | 25.00  | 25.00 | 200.00 | -     | 17.20 | 0                  | S                  | 22 IR/L..             |
| SIR/L 0025 R22B                 | 29.00 | 25.00  | 25.00 | 200.00 | -     | 18.10 | 1                  | S                  | 22 IR/L..             |
| SIR/L 0025-16-AD                | 29.00 | 25.00  | 25.00 | 100.00 | -     | 16.20 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0032 S16                  | 36.00 | 32.00  | 32.00 | 250.00 | -     | 19.70 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0032 S22                  | 38.00 | 32.00  | 32.00 | 250.00 | -     | 21.50 | 0                  | S                  | 22 IR/L..             |
| SIR/L 0032 S22U                 | 38.00 | 32.00  | 32.00 | 250.00 | -     | 25.50 | 0                  | S                  | 22 UIRL..             |
| SIR/L 0032 S27                  | 40.00 | 32.00  | 32.00 | 250.00 | -     | 22.40 | 0                  | S                  | 27 IR/L..             |
| SIR/L 0032 S27U <sup>(3)</sup>  | 40.00 | 32.00  | 32.00 | 250.00 | -     | 24.70 | 0                  | S                  | 27 UIRL..             |
| SIR/L 0040 T16                  | 44.00 | 40.00  | 40.00 | 300.00 | -     | 23.70 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0040 T22                  | 46.00 | 40.00  | 40.00 | 300.00 | -     | 25.80 | 0                  | S                  | 22 IR/L..             |
| SIR 0040 T22U                   | 46.00 | 40.00  | 40.00 | 300.00 | -     | 29.50 | 0                  | S                  | 22 UIRL..             |
| SIR/L 0040 T27                  | 48.00 | 40.00  | 40.00 | 300.00 | -     | 26.60 | 0                  | S                  | 27 IR/L..             |
| SIR 0040 T27U <sup>(3)</sup>    | 48.00 | 40.00  | 40.00 | 300.00 | -     | 29.40 | 0                  | S                  | 27 UIRL..             |
| SIR/L 0050 U16                  | 54.00 | 50.00  | 50.00 | 350.00 | -     | 28.70 | 0                  | S                  | 16 IR/L..             |
| SIR/L 0050 U22                  | 56.00 | 50.00  | 50.00 | 350.00 | -     | 30.60 | 0                  | S                  | 22 IR/L..             |
| SIR/L 0050 U27                  | 58.00 | 50.00  | 50.00 | 350.00 | -     | 31.60 | 0                  | S                  | 27 IR/L..             |
| SIR 0050 U27U <sup>(3)</sup>    | 58.00 | 50.00  | 50.00 | 350.00 | -     | 34.30 | 0                  | S                  | 27 UIRL..             |
| SIR/L 0060 V27U <sup>(3)</sup>  | 68.00 | 60.00  | 60.00 | 400.00 | -     | 39.30 | 0                  | S                  | 27 UIRL..             |
| SIR 0060 V27                    | 68.00 | 60.00  | 60.00 | 400.00 | -     | 36.60 | 0                  | S                  | 27 IR/L..             |

• B-steel shank with coolant hole, CB-carbide shank with coolant hole • All toolholders provide 1.5° helix angle, either via the pocket or the anvil supplied

• For GTGA inserts, use anvil AL 16-0

<sup>(1)</sup> Carbide shank without anvil

<sup>(2)</sup> Toolholder without anvil

<sup>(3)</sup> For ACME, STUB ACME, TRAPEZ (DIN 103) and ROUND (DIN 405) thread profiles check in user guide for anvil information

<sup>(4)</sup> 0 - Without coolant supply, 1 - With coolant supply

<sup>(5)</sup> H-carbide, S-steel

<sup>(6)</sup> Right-hand inserts (IR) for right-hand tools (SIR)

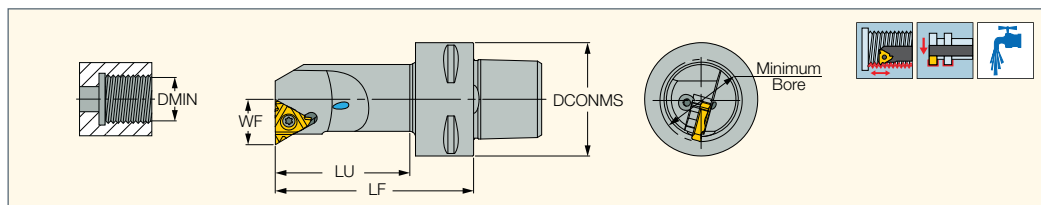
**For inserts, see pages:** IR/L-55° (716) • IR/L-60° (723) • IR/L-ABUT (784) • IR/L-ACME (772) • IR/L-API (788) • IR/L-API RD (786) • IR/L-BSPT (767) • IR-L-BUT (790) • IR-EL (791) • IR-MJ (778) • IR/L-ISO (737) • IR/L-NPT (762) • IR/L-RND (792) • IR/L-STACME (769) • IR/L-TR (781) • IR/L-UN (749) • IR/L-W (757) • IR/L-UNJ (776) • IR/L-PG (782) • IR/L-SAGE (783) • IR/L-NPTF (765) • GTGA (365) • GTMA (366)

Spare Parts

| Designation       |  |  |  |  |  |  |
|-------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| SIR/L 0005 H06CB  |                                                                                   |                                                                                   |                                                                                   | SR 14-552                                                                           | T-6/5                                                                               |                                                                                     |
| SIR/L 0005 H06    |                                                                                   |                                                                                   |                                                                                   | SR 14-552                                                                           | T-6/5                                                                               |                                                                                     |
| SIR/L 0007 K08CB  |                                                                                   |                                                                                   |                                                                                   | SR 14-558                                                                           | T-6/5                                                                               |                                                                                     |
| SIR/L 0008 K08UCB |                                                                                   |                                                                                   |                                                                                   | SR 14-558                                                                           | T-6/5                                                                               |                                                                                     |
| SIR/L 0007 K08    |                                                                                   |                                                                                   |                                                                                   | SR 14-558                                                                           | T-6/5                                                                               |                                                                                     |
| SIR/L 0008 K08U   |                                                                                   |                                                                                   |                                                                                   | SR 14-558                                                                           | T-6/5                                                                               |                                                                                     |
| SIR/L 0010 H11    |                                                                                   |                                                                                   |                                                                                   | SR M2.6-L6.7-S11                                                                    | T-8/5                                                                               |                                                                                     |
| SIR/L 0010 M11CB  |                                                                                   |                                                                                   |                                                                                   | SR M2.6-L6.7-S11                                                                    | T-8/5                                                                               |                                                                                     |
| SIR 0010 H11B     |                                                                                   |                                                                                   |                                                                                   | SR M2.6-L6.7-S11                                                                    | T-8/5                                                                               |                                                                                     |
| SIR/L 0010 K11    |                                                                                   |                                                                                   |                                                                                   | SR M2.6-L6.7-S11                                                                    | T-8/5                                                                               |                                                                                     |
| SIR/L 0010 K11B   |                                                                                   |                                                                                   |                                                                                   | SR M2.6-L6.7-S11                                                                    | T-8/5                                                                               | PL 16                                                                               |
| SIR/L 0012 P11CB  |                                                                                   |                                                                                   |                                                                                   | SR M2.6-L6.7-S11                                                                    | T-8/5                                                                               |                                                                                     |
| SIR/L 0013 L11    |                                                                                   |                                                                                   |                                                                                   | SR M2.6-L6.7-S11                                                                    | T-8/5                                                                               |                                                                                     |
| SIR/L 0013 M16    |                                                                                   |                                                                                   |                                                                                   | SR 5-40-L9.7-S16S                                                                   | T-10/5                                                                              |                                                                                     |
| SIR/L 0013 M16B   |                                                                                   |                                                                                   |                                                                                   | SR 5-40-L9.7-S16S                                                                   | T-10/5                                                                              | PL 16                                                                               |
| SIL 0016 R16CB    |                                                                                   |                                                                                   |                                                                                   | SR 5-40-L9.7-S16S                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0016 R16CB    |                                                                                   |                                                                                   |                                                                                   | SR 5-40-L9.7-S16S                                                                   | T-10/5                                                                              |                                                                                     |
| SIR/L 0016 P16    |                                                                                   |                                                                                   |                                                                                   | SR 5-40-L9.7-S16S                                                                   | T-10/5                                                                              |                                                                                     |
| SIR/L 0016 P16B   |                                                                                   |                                                                                   |                                                                                   | SR 5-40-L9.7-S16S                                                                   | T-10/5                                                                              | PL 20                                                                               |
| SIL 0020 P16      |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIL 0020 P16B     |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              | PL 20                                                                               |
| SIR/L 0020 P22    |                                                                                   |                                                                                   |                                                                                   | SR 8-32-L12-S22S                                                                    | T-20/5                                                                              |                                                                                     |
| SIL 0020-16-AD    |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0020 P16      | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0020 P16B     | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              | PL 20                                                                               |
| SIR 0020 S16CB    | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0020-16-AD    | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0025 S16CB    | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIL 0025 R16      |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIL 0025 R16B     |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              | PL 25                                                                               |
| SIL 0025 R22      |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIL 0025 R22B     |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              | PL 25                                                                               |
| SIL 0025-16-AD    |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0025 R16      | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0025 R16B     | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              | PL 25                                                                               |
| SIR 0025 R22      | Al22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIR 0025 R22B     | Al22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              | PL 25                                                                               |
| SIR 0025-16-AD    | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIL 0032 S16      |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0032 S16      | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIL 0032 S22      |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIL 0032 S22U     |                                                                                   | AE22U                                                                             | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIR 0032 S22      | Al22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIR 0032 S22U     | Al22U                                                                             |                                                                                   | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIL 0032 S27      |                                                                                   | AE27                                                                              | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIL 0032 S27U     |                                                                                   | AE27U                                                                             | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0032 S27      | Al27                                                                              |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0032 S27U     | Al27U                                                                             |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIL 0040 T16      |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0040 T16      | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIL 0040 T22      |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIR 0040 T22      | Al22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIR 0040 T22U     | Al22U                                                                             |                                                                                   | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIL 0040 T27      |                                                                                   | AE27                                                                              | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0040 T27      | Al27                                                                              |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0040 T27U     | Al27U                                                                             |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIL 0050 U16      |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIR 0050 U16      | Al16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                  | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |                                                                                     |
| SIL 0050 U22      |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIR 0050 U22      | Al22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                  | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |                                                                                     |
| SIL 0050 U27      |                                                                                   | AE27                                                                              | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0050 U27      | Al27                                                                              |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0050 U27U     | Al27U                                                                             |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIL 0060 V27U     |                                                                                   | AE27U                                                                             | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0060 V27      | Al27                                                                              |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |
| SIR 0060 V27U     | Al27U                                                                             |                                                                                   | SR M5-L5.8-A27                                                                    | SR M5-L22-S40                                                                       | T-25/3                                                                              |                                                                                     |

**C#-SIR/L**

Internal Threading Bars with  
CAMFIX Exchangeable Shanks



| Designation              | DCONMS | DMIN  | WF    | LU   | LF     | Insert    | CP <sup>(1)</sup> | DCP <sup>(2)</sup> |
|--------------------------|--------|-------|-------|------|--------|-----------|-------------------|--------------------|
| <b>C4 SIR/L-12060-16</b> | 40.00  | 20.00 | 11.70 | 37.0 | 60.00  | 16 IR/L.. | 200               | 1                  |
| <b>C4 SIR/L-14060-16</b> | 40.00  | 25.00 | 13.50 | 38.0 | 60.00  | 16 IR/L.. | 200               | 1                  |
| <b>C4 SIR-15065-22</b>   | 40.00  | 25.00 | 15.40 | 42.0 | 65.00  | 22 IR/L.. | 200               | 1                  |
| <b>C4 SIR/L-17070-16</b> | 40.00  | 29.00 | 16.00 | 48.0 | 70.00  | 16 IR/L.. | 200               | 1                  |
| <b>C4 SIR/L-19070-22</b> | 40.00  | 29.00 | 17.90 | 48.0 | 70.00  | 22 IR/L.. | 200               | 1                  |
| <b>C4 SIR/L-22090-16</b> | 40.00  | 36.00 | 19.50 | 69.0 | 90.00  | 16 IR/L.. | 200               | 1                  |
| <b>C4 SIR/L-22090-22</b> | 40.00  | 38.00 | 21.40 | 69.0 | 90.00  | 22 IR/L.. | 200               | 1                  |
| <b>C4 SIR/L-27080-16</b> | 40.00  | 44.00 | 23.50 | 60.0 | 80.00  | 16 IR/L.. | 200               | 1                  |
| <b>C4 SIR/L-27080-22</b> | 40.00  | 46.00 | 25.40 | 60.0 | 80.00  | 22 IR/L.. | 200               | 1                  |
| <b>C5 SIL-12060-16</b>   | 50.00  | 20.00 | 11.70 | 37.0 | 60.00  | 16 IR/L.. | 200               | 1                  |
| <b>C5 SIR-12060-16</b>   | 50.00  | 20.00 | 11.70 | 35.0 | 60.00  | 16 IR/L.. | 200               | 1                  |
| <b>C5 SIL-14060-16</b>   | 50.00  | 25.00 | 13.50 | 36.0 | 60.00  | 16 IR/L.. | 200               | 1                  |
| <b>C5 SIR/L-15065-22</b> | 50.00  | 25.00 | 15.40 | 42.0 | 65.00  | 22 IR/L.. | 200               | 1                  |
| <b>C5 SIR-14060-16</b>   | 50.00  | 25.00 | 13.50 | 38.0 | 60.00  | 16 IR/L.. | 200               | 1                  |
| <b>C5 SIR/L-17070-16</b> | 50.00  | 29.00 | 16.00 | 48.0 | 70.00  | 16 IR/L.. | 200               | 1                  |
| <b>C5 SIR/L-19070-22</b> | 50.00  | 29.00 | 17.90 | 48.0 | 70.00  | 22 IR/L.. | 200               | 1                  |
| <b>C5 SIR/L-22090-16</b> | 50.00  | 36.00 | 19.50 | 68.0 | 90.00  | 16 IR/L.. | 200               | 1                  |
| <b>C5 SIR/L-22090-22</b> | 50.00  | 38.00 | 21.40 | 68.0 | 90.00  | 22 IR/L.. | 200               | 1                  |
| <b>C5 SIR/L-27105-16</b> | 50.00  | 44.00 | 23.50 | 84.0 | 105.00 | 16 IR/L.. | 200               | 1                  |
| <b>C5 SIR/L-27105-22</b> | 50.00  | 46.00 | 25.40 | 84.0 | 105.00 | 22 IR/L.. | 200               | 1                  |
| <b>C6 SIR/L-14070-16</b> | 63.00  | 25.00 | 13.50 | 45.0 | 70.00  | 16 IR/L.. | 200               | 1                  |
| <b>C6 SIR/L-17075-16</b> | 63.00  | 29.00 | 16.00 | 50.0 | 75.00  | 16 IR/L.. | 200               | 1                  |
| <b>C6 SIR/L-19075-22</b> | 63.00  | 29.00 | 17.90 | 50.0 | 75.00  | 22 IR/L.. | 200               | 1                  |
| <b>C6 SIR/L-22090-16</b> | 63.00  | 36.00 | 19.50 | 65.0 | 90.00  | 16 IR/L.. | 200               | 1                  |
| <b>C6 SIR/L-22090-22</b> | 63.00  | 38.00 | 21.40 | 64.0 | 90.00  | 22 IR/L.. | 200               | 1                  |
| <b>C6 SIR/L-27105-16</b> | 63.00  | 44.00 | 23.50 | 80.0 | 105.00 | 16 IR/L.. | 200               | 1                  |
| <b>C6 SIR/L-27105-22</b> | 63.00  | 46.00 | 25.40 | 80.0 | 105.00 | 22 IR/L.. | 200               | 1                  |

<sup>(1)</sup> Coolant pressure (Bar)

<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

**For inserts, see pages:** GTMA (366) • IR-BUT (790) • IR-EL (791) • IR-MJ (778) • IR/L-55° (716) • IR/L-60° (723) • IR/L-ABUT (784) • IR/L-ACME (772) • IR/L-API (788) • IR/L-API RD (786) • IR/L-BSPT (767) • IR/L-ISO (737) • IR/L-NPT (762) • IR/L-NPTF (765) • IR/L-PG (782) • IR/L-RND (792) • IR/L-SAGE (783) • IR/L-STACME (769) • IR/L-TR (781) • IR/L-UN (749) • IR/L-UNJ (776) • IR/L-W (757) • GTGA (365)

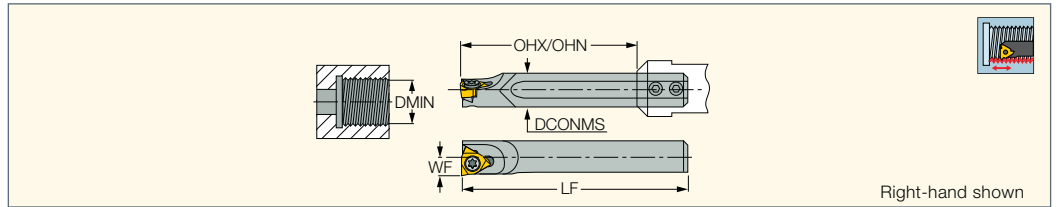


# Spare Parts

| Designation       |  |  |  |  |  |
|-------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| C4 SIL-12060-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIR-12060-16   |                                                                                   |                                                                                   |                                                                                    |                                                                                     | T-10/5                                                                              |
| C4 SIL-14060-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIR-14060-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIR-15065-22   |                                                                                   |                                                                                   |                                                                                    |                                                                                     | T-20/5                                                                              |
| C4 SIL-17070-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIL-19070-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C4 SIR-17070-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIR-19070-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C4 SIL-22090-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIR-22090-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIL-22090-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C4 SIR-22090-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C4 SIL-27080-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIR-27080-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C4 SIL-27080-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C4 SIR-27080-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIR/L-12060-16 |                                                                                   |                                                                                   |                                                                                    |                                                                                     | T-10/5                                                                              |
| C5 SIL-14060-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIL-15065-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIR-14060-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIR-15065-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIL-17070-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIL-19070-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIR-17070-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIR-19070-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIL-22090-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIR-22090-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIL-22090-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIR-22090-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIL-27105-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIR-27105-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C5 SIL-27105-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C5 SIR-27105-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C6 SIL-14070-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIR-14070-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIL-17075-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIL-19075-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C6 SIR-17075-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIR-19075-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C6 SIL-22090-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIR-22090-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIL-22090-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C6 SIR-22090-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C6 SIL-27105-16   |                                                                                   | AE16                                                                              | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIR-27105-16   | AI16                                                                              |                                                                                   | SR 5-40-L6.8-A16                                                                   | SR 5-40-L12.2-S16                                                                   | T-10/5                                                                              |
| C6 SIL-27105-22   |                                                                                   | AE22                                                                              | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |
| C6 SIR-27105-22   | AI22                                                                              |                                                                                   | SR 8-32-L5.8-A22                                                                   | SR 8-32-L15-S22                                                                     | T-20/5                                                                              |

**MGSIR/L**

Solid Carbide Bars for Internal Turning and Threading



Right-hand shown

| Designation        | DCONMS | LF    | OHN <sup>(1)</sup> | OHX <sup>(2)</sup> | WF   | DMIN | Insert        |           |       |
|--------------------|--------|-------|--------------------|--------------------|------|------|---------------|-----------|-------|
| <b>MGSIL 06-06</b> | 6.00   | 59.00 | 16.0               | 42.0               | 3.90 | 7.00 | 06 IL../ILM.. | SR 14-552 | T-6/5 |
| <b>MGSIR 06-06</b> | 6.00   | 59.00 | 16.0               | 42.0               | 3.90 | 7.00 | 06 IR../IRM.. | SR 14-552 | T-6/5 |
| <b>MGSIL 08-06</b> | 8.00   | 72.00 | 20.0               | 56.0               | 5.00 | 9.20 | 06 IL../ILM.. | SR 14-552 | T-6/5 |
| <b>MGSIR 08-06</b> | 8.00   | 72.00 | 20.0               | 56.0               | 5.00 | 9.20 | 06 IR../IRM.. | SR 14-552 | T-6/5 |

• In order to maintain high machining reliability, we strongly recommend replacing the clamping screw every 10 insert indexes

<sup>(1)</sup> Minimum overhang in adjustment range

<sup>(2)</sup> Maximum overhang in adjustment range

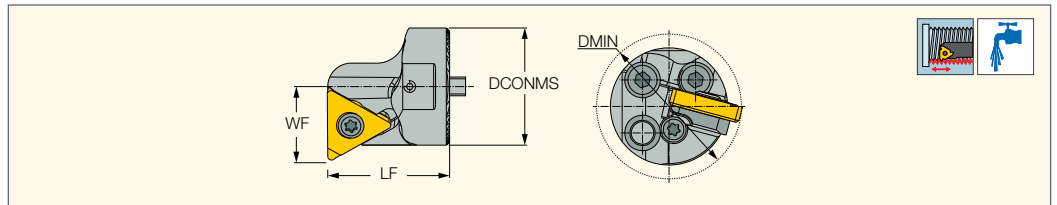
**For inserts, see pages:** IR/L-55° (716) • IR/L-60° (723) • IR/L-BSPT (767) • IR/L-ISO (737) • IR/L-NPT (762) • IR/L-NPTF (765)

• IR/L-UN (749) • IR/L-W (757)

**For holders, see page:** SC-PICCO (420)

**WHISPERLINE**
**AVC-D-SIR/L**

Interchangeable Boring Heads for Threading Inserts



| Designation                            | WF    | DCONMS | DMIN  | LF    | CSP <sup>(2)</sup> |
|----------------------------------------|-------|--------|-------|-------|--------------------|
| <b>AVC-D25-SIR/L-16</b>                | 16.20 | 25.00  | 29.00 | 26.00 | 1                  |
| <b>AVC-D32-SIR/L-16</b>                | 19.70 | 32.00  | 36.00 | 27.00 | 1                  |
| <b>AVC-D40-SIR/L-16 <sup>(1)</sup></b> | 23.70 | 40.00  | 44.00 | 30.00 | 1                  |
| <b>AVC-D32-SIR/L-22</b>                | 21.60 | 32.00  | 38.00 | 32.00 | 1                  |
| <b>AVC-D40-SIR/L-22 <sup>(1)</sup></b> | 25.60 | 40.00  | 46.00 | 38.00 | 1                  |

<sup>(1)</sup> DMIN of 50mm shank is DMIN of requested head + 10mm • DMIN of 60mm shanks is DMIN of requested head + 20mm

<sup>(2)</sup> 0 - Without coolant supply, 1 - With coolant supply

**For inserts, see pages:** GTGA (365) • GTMA (366) • IR-BUT (790) • IR-EL (791) • IR-MJ (778) • IR/L-55° (716) • IR/L-60° (723) • IR/L-ABUT (784) • IR/L-ACME (772)

• IR/L-API (788) • IR/L-API RD (786) • IR/L-BSPT (767) • IR/L-ISO (737) • IR/L-NPT (762) • IR/L-NPTF (765) • IR/L-PG (782) • IR/L-RND (792) • IR/L-SAGE (783)

• IR/L-STACME (769) • IR/L-TR (781) • IR/L-UN (749) • IR/L-UNJ (776) • IR/L-W (757)

**For holders, see pages:** AV-D (117) • C#-AV-C (118) • C#-SH-E-JHP (704) • C#-SH-JHP (704) • SH-D (116)

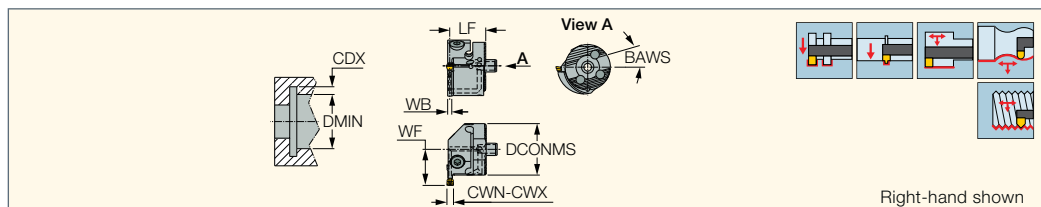
**Spare Parts**

| Designation           |      |                   |                  |        |
|-----------------------|------|-------------------|------------------|--------|
| <b>AVC-D25-SIL-16</b> | AE16 | SR 5-40-L12.2-S16 | SR 5-40-L6.8-A16 | T-10/5 |
| <b>AVC-D25-SIR-16</b> | AI16 | SR 5-40-L12.2-S16 | SR 5-40-L6.8-A16 | T-10/5 |
| <b>AVC-D32-SIL-16</b> | AE16 | SR 5-40-L12.2-S16 | SR 5-40-L6.8-A16 | T-10/5 |
| <b>AVC-D32-SIR-16</b> | AI16 | SR 5-40-L12.2-S16 | SR 5-40-L6.8-A16 | T-10/5 |
| <b>AVC-D40-SIL-16</b> | AE16 | SR 5-40-L12.2-S16 | SR 5-40-L6.8-A16 | T-10/5 |
| <b>AVC-D40-SIR-16</b> | AI16 | SR 5-40-L12.2-S16 | SR 5-40-L6.8-A16 | T-10/5 |
| <b>AVC-D32-SIL-22</b> | AE22 | SR 8-32-L15-S22   | SR 8-32-L5.8-A22 | T-20/5 |
| <b>AVC-D32-SIR-22</b> | AI22 | SR 8-32-L15-S22   | SR 8-32-L5.8-A22 | T-20/5 |
| <b>AVC-D40-SIL-22</b> | AE22 | SR 8-32-L15-S22   | SR 8-32-L5.8-A22 | T-20/5 |
| <b>AVC-D40-SIR-22</b> | AI22 | SR 8-32-L15-S22   | SR 8-32-L5.8-A22 | T-20/5 |

# CUTGRIP

## AVC-GEAIR/L

Internal Grooving, Turning and Threading Adapters



| Designation       | DMIN  | CWN <sup>(1)</sup> | CWX <sup>(2)</sup> | DCONMS | CDX <sup>(3)</sup> | WF    | LF    | WB   | BAWS | MIID <sup>(4)</sup> |
|-------------------|-------|--------------------|--------------------|--------|--------------------|-------|-------|------|------|---------------------|
| AVC-D16-GEAIR/L-2 | 21.00 | 1.90               | 2.40               | 16.00  | 3.00               | 12.00 | 14.50 | 1.60 | 45   | GEPI 2.00-0.10      |
| AVC-D16-GEAIR/L-3 | 21.00 | 2.40               | 2.70               | 16.00  | 3.00               | 12.00 | 14.50 | 2.00 | 45   | GEPI 3.00-0.20      |
| AVC-D20-GEAIR/L-2 | 26.00 | 1.90               | 2.40               | 20.00  | 3.00               | 14.70 | 13.50 | 1.60 | 15   | GEPI 2.00-0.10      |
| AVC-D20-GEAIR/L-3 | 26.00 | 2.40               | 3.18               | 20.00  | 3.00               | 14.70 | 13.50 | 2.00 | 15   | GEPI 3.00-0.20      |
| AVC-D25-GEAIR/L-2 | 31.00 | 1.90               | 2.40               | 25.00  | 4.00               | 17.50 | 17.50 | 1.60 | 15   | GEPI 2.00-0.10      |
| AVC-D25-GEAIR/L-3 | 31.00 | 2.40               | 3.18               | 25.00  | 4.00               | 17.50 | 17.50 | 2.00 | 15   | GEPI 3.00-0.20      |

• Using the adapters with CAMFIX & SH-D holders is possible in case the machine has an option to rotate the holders • For user guide, see pages 809-825

<sup>(1)</sup> Minimum cutting width

<sup>(2)</sup> Maximum cutting width

<sup>(3)</sup> Cutting depth maximum

<sup>(4)</sup> Master insert identification

**For inserts, see pages:** GEMI (384) • GEMI (full radius) (384) • GEPI (385) • GEPI (full radius) (386) • GEPI-MT (727) • GEPI-WT (718)

**For holders, see pages:** AV-D (117) • C#-AV-C (118) • C#-SH-E-JHP (704) • C#-SH-JHP (704)

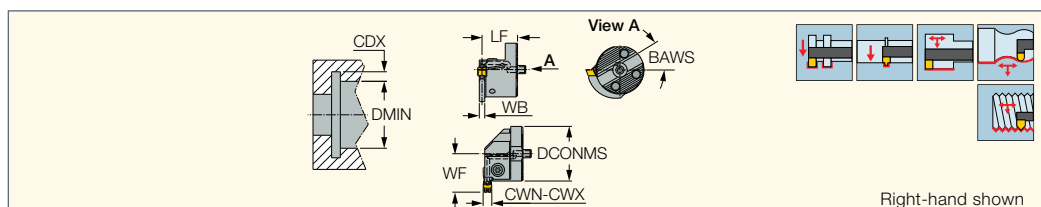
## Spare Parts

| Designation       |  |  |  |  |  |
|-------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| AVC-D16-GEAIR/L-2 | SR 14-551                                                                         |                                                                                   |                                                                                    |                                                                                     | T-9/5                                                                               |
| AVC-D16-GEAIR/L-3 | SR 14-551                                                                         |                                                                                   |                                                                                    |                                                                                     | T-9/5                                                                               |
| AVC-D20-GEAIR/L-2 | SR 34-510                                                                         |                                                                                   | SW6-SD                                                                             | BLD T15/M7                                                                          |                                                                                     |
| AVC-D20-GEAIR/L-3 | SR 34-510                                                                         |                                                                                   | SW6-SD                                                                             | BLD T15/M7                                                                          |                                                                                     |
| AVC-D25-GEAIR/L-2 | SR M4X14 DIN912                                                                   | HW 3.0                                                                            |                                                                                    |                                                                                     |                                                                                     |
| AVC-D25-GEAIR/L-3 | SR M4X14 DIN912                                                                   | HW 3.0                                                                            |                                                                                    |                                                                                     |                                                                                     |

# CUTGRIP

## AVC-GAIR/L

Internal Grooving Turning and Threading Adapters



| Designation                     | DMIN  | CWN <sup>(2)</sup> | CWX <sup>(3)</sup> | DCONMS | CDX <sup>(4)</sup> | WF    | LF    | WB   | BAWS |
|---------------------------------|-------|--------------------|--------------------|--------|--------------------|-------|-------|------|------|
| AVC-D32-GAIR/L-2                | 37.00 | 1.50               | 2.10               | 32.00  | 3.00               | 20.00 | 23.00 | 1.20 | 30   |
| AVC-D32-GAIR/L-3                | 37.00 | 2.10               | 3.00               | 32.00  | 3.00               | 20.00 | 23.00 | 1.80 | 30   |
| AVC-D32-GAIR/L-4                | 39.00 | 3.00               | 4.50               | 32.00  | 5.00               | 22.00 | 23.00 | 2.50 | 30   |
| AVC-D32-GAIR/L-5                | 39.00 | 4.50               | 6.40               | 32.00  | 5.00               | 22.00 | 26.00 | 4.00 | 30   |
| AVC-D40-GAIR/L-2 <sup>(1)</sup> | 45.00 | 1.50               | 2.10               | 40.00  | 3.00               | 24.00 | 23.00 | 1.20 | 30   |
| AVC-D40-GAIR/L-3 <sup>(1)</sup> | 46.00 | 2.10               | 3.00               | 40.00  | 4.00               | 25.00 | 23.00 | 1.80 | 30   |
| AVC-D40-GAIR/L-4                | 49.00 | 3.00               | 4.50               | 40.00  | 7.00               | 28.00 | 23.00 | 2.50 | 30   |
| AVC-D40-GAIR/L-5                | 49.00 | 4.50               | 6.40               | 40.00  | 7.00               | 28.00 | 26.00 | 4.00 | 30   |

• When using TIPI inserts, toolholder seat needs to be modified according to insert profile to ensure clearance

• Using the adapters with CAMFIX & SH-D holders is possible in case the machine has an option to rotate the holders

• For user guide, see pages 809-825

<sup>(1)</sup> DMIN of 50mm shank is DMIN of requested head + 10mm • DMIN of 60mm shanks is DMIN of requested head + 20mm

<sup>(2)</sup> Minimum cutting width

<sup>(3)</sup> Maximum cutting width

<sup>(4)</sup> Cutting depth maximum

**For inserts, see pages:** GIF (395) • GIF-E (392) • GIF-E (full radius) (392) • GINI-E (393) • GIPI (394) • GIPI (CW<BW) (393)

• GIPI (full radius CW<BW) (394) • GIPI (full radius) (395) • GIPI-E (392) • GIPI-RX/LX (395) • TIPI-MT (728) • TIPI-WT (719)

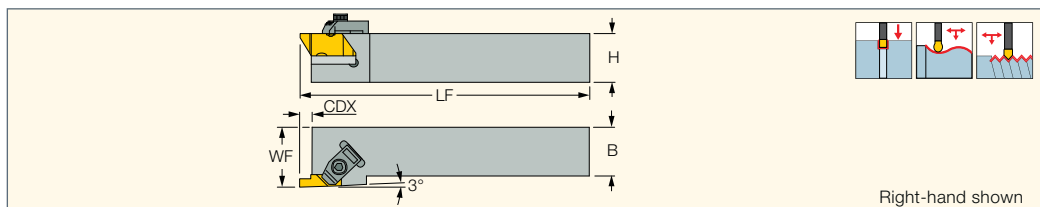
**For holders, see pages:** AV-D (117) • C#-AV-C (118) • C#-SH-E-JHP (704) • C#-SH-JHP (704) • SH-D (116)

## Spare Parts

| Designation |  |  |  |
|-------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| AVC-GAIR/L  | SR 76-1021                                                                          | T-20/5                                                                              | SR M3X3DIN913                                                                       |

**FLSR/L**

Tools for External Grooving  
and Threading Inserts



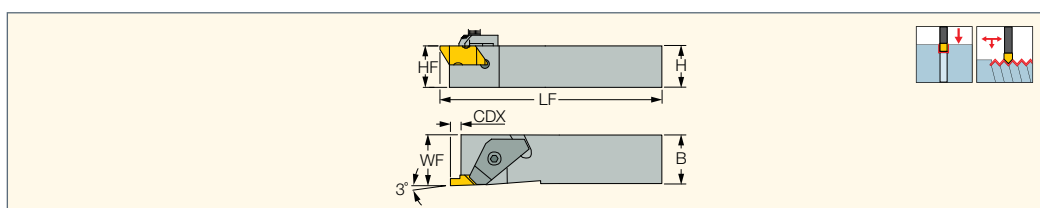
| Designation   | SSC <sup>(1)</sup> | H    | B    | CDX  | WF    | Insert   |
|---------------|--------------------|------|------|------|-------|----------|
| FLSR/L-2020M2 | 2.0                | 20.0 | 20.0 | 3.00 | 25.00 | FL/IN_-2 |
| FLSR/L-2020M3 | 3.0                | 20.0 | 20.0 | 5.00 | 25.00 | FL/IN_-3 |
| FLSR/L-2525M2 | 2.0                | 25.0 | 25.0 | 3.00 | 32.00 | FL/IN_-2 |
| FLSR/L-2525M3 | 3.0                | 25.0 | 25.0 | 5.00 | 32.00 | FL/IN_-3 |

<sup>(1)</sup> Seat size code

**For inserts, see pages:** 60° PARTIAL PROFILE THREADING FLT (730) • 60° PARTIAL PROFILE THREADING FLT-CB (729) • 60° PARTIAL PROFILE THREADING FLT-F (728)  
• 60° PARTIAL PROFILE THREADING FLT-K (729) • 60° PARTIAL PROFILE THREADING FLT-P (730) • ACME THREADING FLA (773) • ACME THREADING FLA-PT-E (773)  
• ACME THREADING FLAS (774) • AMERICAN STANDARD BUTTRESS THREADING FLTB-A (785) • AMERICAN STANDARD BUTTRESS THREADING FLTB-B (785)  
• API BUTTRESS THREADING FLDC-B-E (790) • API PARTIAL PROFILE THREADING FLD (789) • API ROUND THREADING FLDC-RD-75 (787)  
• API ROUND THREADING FLDC-RD-75-CB (787) • API THREADING FLDC-E (789) • NPT THREADING FLDC-NPT-E (764) • NPT THREADING FLDC-V-75 (764)  
• STUB ACME THREADING FLAS-PT-E (770) • UN THREADING FLTC-E (754) • UNJ THREADING FLJ (777) • UNJ THREADING FLJF (777) • UNJ THREADING FLJK (778)  
• UNJ THREADING FLJP (777)

**FLASR/L**

External Tools for Grooving  
and Threading intended for  
Swiss-Type Machines

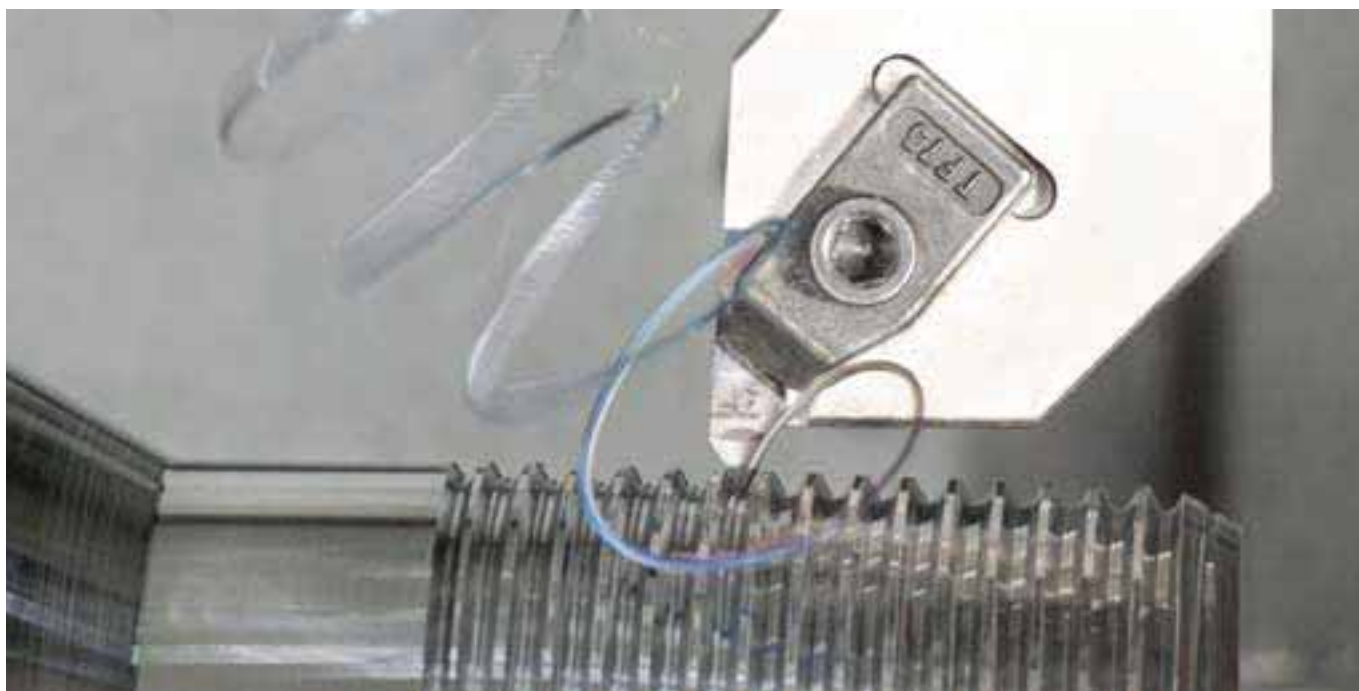


| Designation    | SSC <sup>(1)</sup> | H    | HF   | B    | CDX  | WF    | Insert   |
|----------------|--------------------|------|------|------|------|-------|----------|
| FLASR/L-1010M2 | 2.0                | 10.0 | 10.0 | 10.0 | 3.51 | 10.00 | FL/IN_-2 |
| FLASR/L-1212M2 | 2.0                | 12.0 | 12.0 | 12.0 | 3.51 | 12.00 | FL/IN_-2 |
| FLASR/L-1616M2 | 2.0                | 16.0 | 16.0 | 16.0 | 3.51 | 16.00 | FL/IN_-2 |
| FLASR/L-1616M3 | 3.0                | 16.0 | 16.0 | 16.0 | 5.31 | 16.00 | FL/IN_-3 |

<sup>(1)</sup> Seat size code

**For inserts, see pages:** 60° PARTIAL PROFILE THREADING FLT (730) • 60° PARTIAL PROFILE THREADING FLT-CB (729) • 60° PARTIAL PROFILE THREADING FLT-F (728)  
• 60° PARTIAL PROFILE THREADING FLT-K (729) • 60° PARTIAL PROFILE THREADING FLT-P (730) • ACME THREADING FLA (773) • ACME THREADING FLA-PT-E (773)  
• ACME THREADING FLAS (774) • AMERICAN STANDARD BUTTRESS THREADING FLTB-A (785) • AMERICAN STANDARD BUTTRESS THREADING FLTB-B (785)  
• API BUTTRESS THREADING FLDC-B-E (790) • API PARTIAL PROFILE THREADING FLD (789) • API ROUND THREADING FLDC-RD-75 (787)  
• API ROUND THREADING FLDC-RD-75-CB (787) • API THREADING FLDC-E (789) • NPT THREADING FLDC-NPT-E (764) • NPT THREADING FLDC-V-75 (764)  
• STUB ACME THREADING FLAS-PT-E (770) • UN THREADING FLTC-E (754) • UNJ THREADING FLJ (777) • UNJ THREADING FLJF (777) • UNJ THREADING FLJK (778)  
• UNJ THREADING FLJP (777)

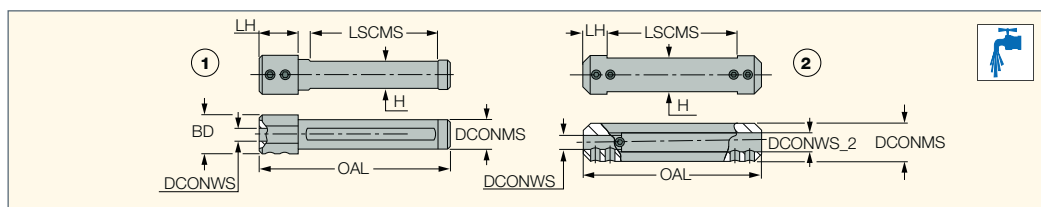
**For holders, see page:** SBTH-JHP (421)



**PASSCUT**  
PICCO CUT HOLDER

# **PICCO/MG PCO (Holder)**

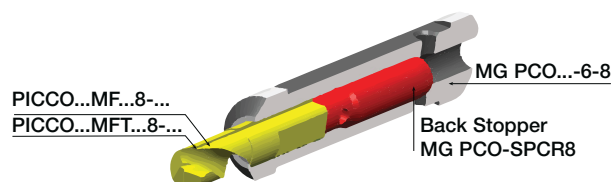
Holders for PICCO-CUT Inserts  
and Small Diameter Boring Bars



| Designation                  | DCONMS | DCONWS | DCONWS_2 | OAL   | LH   | LSCMS | H    | BD    | Fig. |            |        |                   |       |
|------------------------------|--------|--------|----------|-------|------|-------|------|-------|------|------------|--------|-------------------|-------|
| PICCO 12-4-5                 | 12.00  | 4.00   | 5.00     | 75.00 | 10.0 | 55.00 | 10.3 | -     | 2    | SR M5X6-PF | HW 2.5 | PIN 2X8 ISO2338B  |       |
| PICCO 16-4-5                 | 16.00  | 4.00   | 5.00     | 75.00 | 10.0 | 55.00 | 14.0 | -     | 2    | SR M5X6-PF | HW 2.5 | PIN 2X12 ISO2338B |       |
| PICCO 20-4-5                 | 20.00  | 4.00   | 5.00     | 90.00 | 10.0 | 70.00 | 18.0 | -     | 2    | SR M5X6-PF | HW 2.5 | PIN 3X16 ISO2338B |       |
| PICCO 22-4-5 <sup>(1)</sup>  | 22.00  | 4.00   | 5.00     | 90.00 | 10.0 | 70.00 | 20.0 | -     | 2    | SR M5X6-PF | HW 2.5 | PIN 3X18 ISO2338B |       |
| PICCO 16-6-7                 | 16.00  | 6.00   | 7.00     | 75.00 | 10.0 | 55.00 | 14.0 | -     | 2    | SR M5X6-PF | HW 2.5 | PIN 3X12 ISO2338B |       |
| PICCO 20-6-7                 | 20.00  | 6.00   | 7.00     | 90.00 | 10.0 | 70.00 | 18.0 | -     | 2    | SR M5X6-PF | HW 2.5 | PIN 3X16 ISO2338B |       |
| PICCO 22-6-7 <sup>(1)</sup>  | 22.00  | 6.00   | 7.00     | 90.00 | 10.0 | 70.00 | 20.0 | -     | 2    | SR M5X6-PF | HW 2.5 | PIN 3X18 ISO2338B |       |
| PICCO 25-4-5                 | 25.00  | 4.00   | 5.00     | 90.00 | 10.0 | 70.00 | 23.4 | -     | 2    | SR M5X6-PF | HW 2.5 |                   |       |
| MG PCO-12-6                  | 12.00  | 6.00   | -        | 75.00 | 15.0 | 50.80 | 11.0 | 18.00 | 1    | SR M5X6-PF | HW 2.5 |                   |       |
| MG PCO-16-6-8                | 16.00  | 6.00   | 8.00     | 75.00 | 10.0 | 55.00 | 14.0 | -     | 2    | SR M5X6-PF | HW 2.5 | MG PCO-SPCR8      |       |
| MG PCO-20-6-8                | 20.00  | 6.00   | 8.00     | 90.00 | 10.0 | 70.00 | 18.0 | -     | 2    | SR M5X6-PF | HW 2.5 | MG PCO-SPCR8      |       |
| MG PCO-22-6-8 <sup>(1)</sup> | 22.00  | 6.00   | 8.00     | 90.00 | 10.0 | 70.00 | 20.0 | -     | 2    | SR M5X6-PF | HW 2.5 | MG PCO-SPCR8      |       |
| MG PCO-25-6-8                | 25.00  | 6.00   | 8.00     | 90.00 | 10.0 | 70.00 | 23.0 | -     | 2    | SR M5X6-PF | HW 2.5 | MG PCO-SPCR8      |       |
| MG PCO-16-9                  | 16.00  | 9.00   | -        | 75.00 | 15.0 | 53.00 | 15.0 | 20.00 | 1    | SR M5X6-PF | HW 2.5 |                   | PL 16 |

• Holders are suitable for right- and left-hand inserts, and boring bars

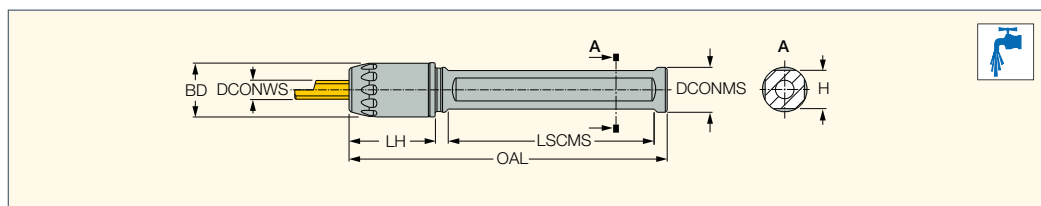
<sup>(1)</sup> Tools for Swiss-type CNC



**ACECUT**  
PICCO CUT HOLDER

# **PICCO ACE**

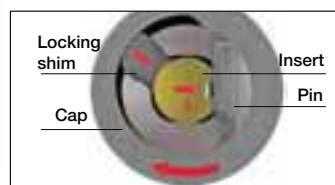
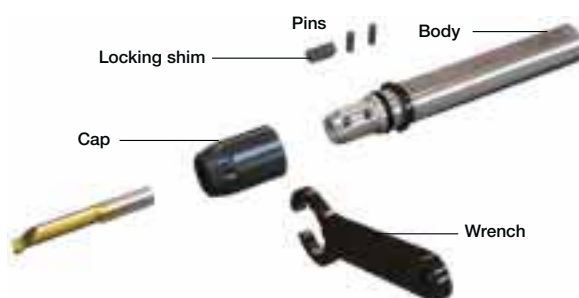
Holders for PICCO-CUT Inserts



| Designation    | DCONMS | DCONWS | BD    | OAL    | LH    | LSCMS  | H    |             |                |
|----------------|--------|--------|-------|--------|-------|--------|------|-------------|----------------|
| PICCO ACE 12-4 | 12.00  | 4.00   | 14.50 | 85.00  | 23.00 | 53.00  | 10.3 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 12-5 | 12.00  | 5.00   | 14.50 | 85.00  | 23.00 | 53.00  | 10.3 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 16-4 | 16.00  | 4.00   | 14.50 | 85.00  | 21.50 | 53.50  | 14.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 16-5 | 16.00  | 5.00   | 14.50 | 85.00  | 21.50 | 53.00  | 14.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 16-6 | 16.00  | 6.00   | 19.90 | 85.00  | 23.00 | 53.50  | 14.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |
| PICCO ACE 16-7 | 16.00  | 7.00   | 19.90 | 85.00  | 23.00 | 53.50  | 14.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |
| PICCO ACE 20-4 | 20.00  | 4.00   | 14.50 | 150.00 | 21.50 | 118.00 | 18.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 20-5 | 20.00  | 5.00   | 14.50 | 150.00 | 21.50 | 118.00 | 18.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 20-6 | 20.00  | 6.00   | 19.90 | 150.00 | 21.50 | 118.00 | 18.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |
| PICCO ACE 20-7 | 20.00  | 7.00   | 19.90 | 150.00 | 21.50 | 118.00 | 18.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |
| PICCO ACE 22-4 | 22.00  | 4.00   | 14.50 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 22-5 | 22.00  | 5.00   | 14.50 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 22-6 | 22.00  | 6.00   | 19.90 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |
| PICCO ACE 22-7 | 22.00  | 7.00   | 19.90 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |
| PICCO ACE 25-4 | 25.00  | 4.00   | 14.50 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 25-5 | 25.00  | 5.00   | 14.50 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 4-5 |
| PICCO ACE 25-6 | 25.00  | 6.00   | 19.90 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |
| PICCO ACE 25-7 | 25.00  | 7.00   | 19.90 | 150.00 | 21.50 | 118.00 | 20.0 | PL 16 M6-D5 | WRENCH ACE 6-7 |

• Holders are suitable for right- and left-hand PICCO inserts

For tools, see pages: PICIN-A-SCLCR/L (464) • PICIN-A-SIR/L (466) • PICIN-A-SWUBR/L (465) • PICIN-MGSIR/L (466) • PICIN-SCLCR/L (464) • PICIN-SWUBR/L (465)

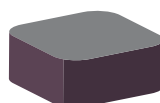
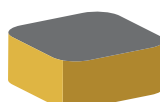


## Machining Data for Threading

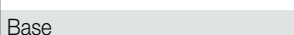
| ISO         | Material                                                     |                              | Condition             | Tensile Strength (N/mm²) | Hardness HB | Material Group No. | Coated                |         |         |         |
|-------------|--------------------------------------------------------------|------------------------------|-----------------------|--------------------------|-------------|--------------------|-----------------------|---------|---------|---------|
|             |                                                              |                              |                       |                          |             |                    | IC228                 | IC908   | IC808   | IC1007  |
|             |                                                              |                              |                       |                          |             |                    | Cutting Speed (m/min) |         |         |         |
| P           | non-alloy steel and cast steel, free cutting steel           | <0.25% C                     | annealed              | 420                      | 125         | 1                  | 60-100                | 115-190 | 125-205 | 135-230 |
|             |                                                              | ≥0.25% C                     | annealed              | 650                      | 190         | 2                  | 60-95                 | 110-180 | 120-195 | 130-220 |
|             |                                                              | <0.55% C                     | quenched and tempered | 850                      | 250         | 3                  | 50-90                 | 100-175 | 105-185 | 120-210 |
|             |                                                              |                              | annealed              | 750                      | 220         | 4                  | 45-85                 | 90-165  | 95-175  | 110-200 |
|             |                                                              |                              | quenched and tempered | 1000                     | 300         | 5                  | 45-85                 | 90-165  | 95-175  | 110-200 |
|             | low alloy and cast steel (less than 5% of alloying elements) | annealed                     | 600                   | 200                      | 6           | 50-95              | 100-180               | 105-195 | 120-215 |         |
|             |                                                              |                              | 930                   | 275                      | 7           | 40-75              | 75-140                | 80-150  | 90-170  |         |
|             |                                                              |                              | 1000                  | 300                      | 8           | 35-70              | 70-135                | 75-145  | 85-160  |         |
|             |                                                              |                              | 1200                  | 350                      | 9           | 35-70              | 70-135                | 75-145  | 85-160  |         |
|             | high alloyed steel, cast steel and tool steel                | annealed                     | 680                   | 200                      | 10          | 40-65              | 80-120                | 85-130  | 95-145  |         |
|             |                                                              | quenched and tempered        | 1100                  | 325                      | 11          | 25-50              | 50-100                | 55-105  | 60-120  |         |
|             | stainless steel and cast steel                               | ferritic / martensitic       | 680                   | 200                      | 12          | 35-70              | 70-130                | 75-140  | 85-155  |         |
|             |                                                              | martensitic                  | 820                   | 240                      | 13          | 45-60              | 85-110                | 90-120  | 100-130 |         |
| M           | stainless steel and cast steel                               | austenitic, duplex           | 600                   | 180                      | 14          | 45-75              | 90-140                | 95-150  | 110-170 |         |
| K           | gray cast iron (GG)                                          | ferritic / pearlitic         |                       | 180                      | 15          | 65-85              | 125-160               | 135-170 | 150-190 |         |
|             |                                                              | pearlitic / martensitic      |                       | 260                      | 16          | 45-65              | 90-120                | 95-130  | 110-145 |         |
|             | nodular cast iron (GGG)                                      | ferritic                     |                       | 160                      | 17          | 35-70              | 70-130                | 75-140  | 85-155  |         |
|             |                                                              | pearlitic                    |                       | 250                      | 18          | 30-60              | 60-115                | 65-125  | 70-140  |         |
|             | malleable cast iron                                          | ferritic                     |                       | 130                      | 19          | 30-35              | 60-70                 | 65-75   | 70-85   |         |
|             |                                                              | pearlitic                    |                       | 230                      | 20          | 30-75              | 60-145                | 65-155  | 70-175  |         |
| N           | aluminum-wrought alloys                                      | not hardenable               |                       | 60                       | 21          | 50-195             | 100-365               | 105-390 | 120-440 |         |
|             |                                                              | hardenable                   |                       | 100                      | 22          | 40-115             | 80-220                | 85-235  | 95-265  |         |
|             | aluminum-cast alloys                                         | ≤12% Si                      | not hardenable        | 75                       | 23          | 105-215            | 200-400               | 215-430 | 240-480 |         |
|             |                                                              | hardenable                   | 90                    | 24                       | 105-150     | 200-280            | 215-300               | 240-335 |         |         |
|             | >12% Si                                                      | high temperature             | 130                   | 25                       | 105-150     | 200-280            | 215-300               | 240-335 |         |         |
|             | copper alloys                                                | >1% Pb                       | free cutting          | 110                      | 26          | 40-135             | 80-255                | 85-275  | 95-305  |         |
|             |                                                              | brass                        | 90                    | 27                       | 40-135      | 80-255             | 85-275                | 95-305  |         |         |
|             |                                                              | electrolytic copper          | 100                   | 28                       | 40-130      | 80-255             | 85-275                | 95-305  |         |         |
|             | non metallic                                                 | duroplastics, fiber plastics |                       |                          | 29          | 40-130             | 80-250                | 85-265  | 95-300  |         |
| hard rubber |                                                              |                              |                       | 30                       | 40-130      | 80-250             | 85-265                | 95-300  |         |         |
| S           | high temperature alloys                                      | Fe based                     | annealed              |                          | 200         | 31                 | 25-30                 | 45-60   | 50-65   | 55-70   |
|             |                                                              |                              | hardened              |                          | 280         | 32                 | 15-25                 | 35-50   | 35-55   | 40-60   |
|             |                                                              | Ni or Co based               | annealed              |                          | 250         | 33                 | 10-15                 | 20-30   | 20-30   | 25-35   |
|             |                                                              |                              | hardened              |                          | 350         | 34                 | 5-10                  | 15-25   | 15-25   | 18-30   |
|             |                                                              |                              | cast                  |                          | 320         | 35                 | 5-10                  | 15-25   | 15-25   | 18-30   |
|             | titanium alloys                                              | pure                         | 400                   |                          | 36          | 75-90              | 140-170               | 150-180 | 170-205 |         |
|             |                                                              | alpha+beta alloys, hardened  | 1050                  |                          | 37          | 25-35              | 50-70                 | 55-75   | 60-85   |         |
| H           | hardened steel                                               | hardened                     |                       | 55 HRC                   | 38          | 25-30              | 45-60                 | 50-65   | 55-70   |         |
|             |                                                              | hardened                     |                       | 60 HRC                   | 39          | 25-30              | 45-60                 | 50-65   | 55-70   |         |
|             | chilled cast iron                                            | cast                         |                       | 400                      | 40          | 25-30              | 45-60                 | 50-65   | 55-70   |         |
|             | cast iron                                                    | hardened                     |                       | 55 HRC                   | 41          | 25-30              | 45-60                 | 50-65   | 55-70   |         |



Threading Materials Grades Chart

|            | Grade  | ISO     | Grade Description                                                                                                                                                                                                                                                                                                                                                         | Coating Layers                                                                       | Coating Color*                                                                        |
|------------|--------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| PVD COATED | IC228  | P30-P45 | A very tough substrate with PVD coating, suitable for machining steels and stainless steel at low to medium cutting speeds.                                                                                                                                                                                                                                               |    |    |
|            |        | M25-M40 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        |         |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        |         |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            | IC250  | P15-P35 | A tough substrate with PVD coating. Suitable for machining steels and alloy steels at low to medium cutting speeds.                                                                                                                                                                                                                                                       |    |    |
|            |        | M20-M40 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        |         |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        |         |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            | IC806  |         | A hard submicron grain size substrate with PVD coating and a special SUMOTEC surface treatment. Excellent for machining high temperature alloys and Titanium alloys, at moderate to relatively high cutting speeds. Features high wear resistance and plastic deformation durability.                                                                                     |    |    |
|            |        | M05-M15 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        |         |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        | S10-S20 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            | IC808  | P15-P30 | A tough submicron grain size substrate with PVD coating and a special SUMOTEC surface treatment. Recommended for general use for a large variety of applications and materials such as steels, alloy steels, austenitic stainless steel and high temperature alloys at moderate cutting speeds and feeds. Features high wear resistance and chipping durability.          |   |   |
|            |        | M20-M30 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        | K20-K40 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        |         |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            | IC908  |         | A tough submicron grain size substrate with PVD coating, recommended for general use in a large variety of operations and materials such as steels, alloy steels, austenitic stainless steel and high temperature alloys at moderate cutting speeds. Features high wear resistance and chipping durability.                                                               |  |  |
|            |        | P15-P30 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        | M20-M30 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        | K20-K40 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            | IC1007 |         | A hard submicron grain size substrate with PVD coating, suitable for a wide range of materials such as steels, alloy steels, hard steels, austenitic stainless steel and heat resistant alloys at moderate to high speeds under stable conditions. Features high wear resistance and plastic deformation durability. Good choice for non-ferrous materials and cast iron. |  |  |
|            |        | P10-P20 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        | M05-M15 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |
|            |        | K15-K30 |                                                                                                                                                                                                                                                                                                                                                                           |                                                                                      |                                                                                       |

\* For coated grades

|          | Grade | ISO     | Grade Description                                                                                                                                                        | Coating Layers                                                                       | Uncoated                                                                              |
|----------|-------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| UNCOATED | IC08  |         | A tough uncoated submicron carbide grade, suitable for steels, stainless steel and high temperature alloys at low cutting speeds. Good choice for non-ferrous materials. |  |  |
|          |       | M15-M30 |                                                                                                                                                                          |                                                                                      |                                                                                       |
|          |       |         |                                                                                                                                                                          |                                                                                      |                                                                                       |
|          |       | N10-N25 |                                                                                                                                                                          |                                                                                      |                                                                                       |
|          |       | S20-S30 |                                                                                                                                                                          |                                                                                      |                                                                                       |



## User Guide and Cutting Data

### Types and Profiles of Threading Inserts

#### Partial Profile

- Performs different thread standards and is suitable for a wide range of pitches that have a common angle (60° or 55°)
- Inserts with a small root-corner radius suitable for the smallest pitch of the range
- Additional operations to complete the outer/ internal diameter are necessary
- Not recommended for mass production
- Eliminates the need for different inserts

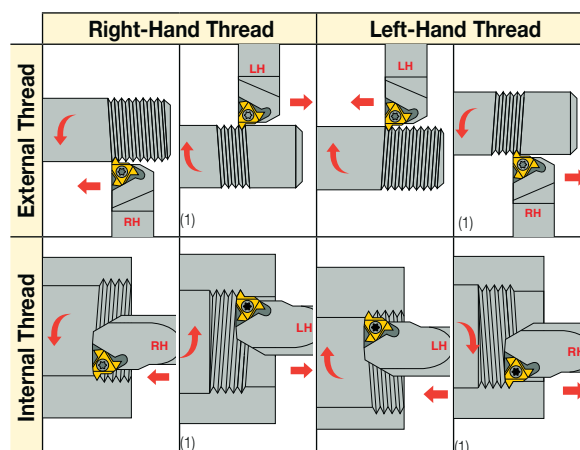


#### Full Profile

- Performs a complete thread profile
- Root corner radius is only suitable for the relevant pitch
- Recommended for mass production
- Suitable for one profile only



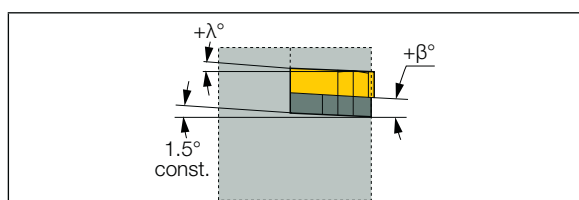
### Thread Turning Methods



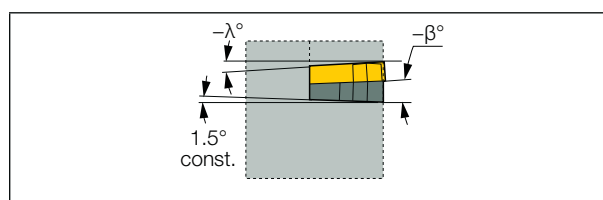
(1) Change anvil to negative

## Anvil Selection According to Thread Helix Angle $\lambda$

| Standard                     |                           |                   |                   |                   |                   |                   |                 |              |
|------------------------------|---------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|--------------|
| Thread Helix Angle $\lambda$ |                           | $>4^\circ$        | $3^\circ-4^\circ$ | $2^\circ-3^\circ$ | $1^\circ-2^\circ$ | $0^\circ-1^\circ$ | Negative Anvils |              |
|                              | Inclination Angle $\beta$ | $4.5^\circ$       | $3.5^\circ$       | $2.5^\circ$       | $1.5^\circ$       | $0.5^\circ$       | $-0.5^\circ$    | $-1.5^\circ$ |
| I (d)                        | Toolholder                | Anvil Designation |                   |                   |                   |                   |                 |              |
| 16                           | EX RH OR IN LH            | AE16+4.5          | AE16+3.5          | AE16+2.5          | AE16              | AE16+0.5          | AE16-0.5        | AE16-1.5     |
| (3/8)                        | EX LH OR IN RH            | AI16+4.5          | AI16+3.5          | AI16+2.5          | AI16              | AI16+0.5          | AI16-0.5        | AI16-1.5     |
| 22                           | EX RH OR IN LH            | AE22+4.5          | AE22+3.5          | AE22+2.5          | AE22              | AE22+0.5          | AE22-0.5        | AE22-1.5     |
| (1/2)                        | EX LH OR IN RH            | AI22+4.5          | AI22+3.5          | AI22+2.5          | AI22              | AI22+0.5          | AI22-0.5        | AI22-1.5     |
| 27                           | EX RH OR IN LH            | AE27+4.5          | AE27+3.5          | AE27+2.5          | AE27              | AE27+0.5          | AE27-0.5        | AE27-1.5     |
| (5/8)                        | EX LH OR IN RH            | AI27+4.5          | AI27+3.5          | AI27+2.5          | AI27              | AI27+0.5          | AI27-0.5        | AI27-1.5     |
| 22U                          | EX RH OR IN LH            | AE22U+4.5         | AE22U+3.5         | AE22U+2.5         | AE22U             | AE22U+0.5         | AE22U-0.5       | AE22U-1.5    |
| (1/2U)                       | EX LH OR IN RH            | AI22U+4.5         | AI22U+3.5         | AI22U+2.5         | AI22U             | AI22U+0.5         | AI22U-0.5       | AI22U-1.5    |
| 27U                          | EX RH OR IN LH            | AE27U+4.5         | AE27U+3.5         | AE27U+2.5         | AE27U             | AE27U+0.5         | AE27U-0.5       | AE27U-1.5    |
| (5/8U)                       | EX LH OR IN RH            | AI27U+4.5         | AI27U+3.5         | AI27U+2.5         | AI27U             | AI27U+0.5         | AI27U-0.5       | AI27U-1.5    |



Anvils for positive inclination angle applicable when turning RH thread with RH holders or LH thread with LH toolholders.



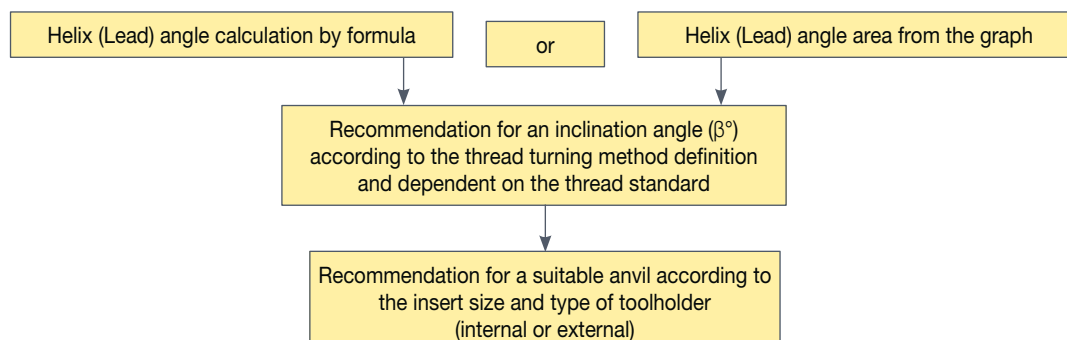
Anvils for negative inclination used when turning RH thread with LH holder or LH thread with RH toolholder.

## Anvils for Laydown Inserts

The parameter for tilting the threading insert relative to the helix angle of threading is of great importance when threading is produced. This parameter ensures proper operation of the insert during threading production in terms of equal load distribution applied to the insert, equal distribution of forces operating on the insert, development of uniform wear on both sides of the cutting edge, and avoiding friction of the insert with the side of the threading profile. If the side clearance insert angles ( $\alpha$ ) are not equal in relation to the helix angle ( $\phi$ ), the insert must be tilted. This is performed by using anvils.

| Recommended           | Less Recommended         |
|-----------------------|--------------------------|
| $\alpha_L = \alpha_R$ | $\alpha_L \neq \alpha_R$ |
|                       |                          |

## Quick and easy way to select a correct anvil



The anvil should be selected from the table according to the threading standard. The correct anvil depends on the right inclination angle ( $\beta$ ) and insert size. The inclination angle ( $\beta$ ) is obtained by selecting the thread turning method and finding the helix angle ( $\phi$ ) for single-start threading, or lead angle ( $\phi_L$ ) for the multi-start threading.

The helix angle ( $\phi$ ) and the lead angle ( $\phi_L$ ) are determined as exact values by using the formula below or as a graph area (see below: Helix (Lead) angle area by using graph, depending on the threading diameter and lead.

| Helix angle ( $\phi$ ) calculation by using the Single-Start Threading Formula                                                                                                                                             | Lead angle ( $\phi_L$ ) calculation by using the Single-Start Threading Formula                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\phi = \arctan\left(\frac{P}{\pi \times D_{pitch}}\right)$                                                                                                                                                                | $\phi_L = \arctan\left(\frac{\text{Lead}}{\pi \times D_{pitch}}\right)$ $\text{Lead} = n \times P$                                                                                                                                                                             |
| <p>When:</p> <p><math>\phi</math> = Helix angle</p> <p><math>D_{pitch}</math> = Pitch diameter*</p> <p>* effective diameter of threading</p> <p><math>P</math> = Threading pitch</p> <p><math>\pi \approx 3.142</math></p> | <p>When:</p> <p><math>\phi_L</math> = Lead angle</p> <p><math>D_{pitch}</math> = Pitch diameter*</p> <p>* effective diameter of threading</p> <p><math>P</math> = Threading pitch</p> <p><math>n</math> = number of threading starts</p> <p><math>\pi \approx 3.142</math></p> |

#### Usable formulas

$$\text{Lead (inch)} = \frac{1 \text{ inch}}{\text{TPI}} \times \text{No. of starts}$$

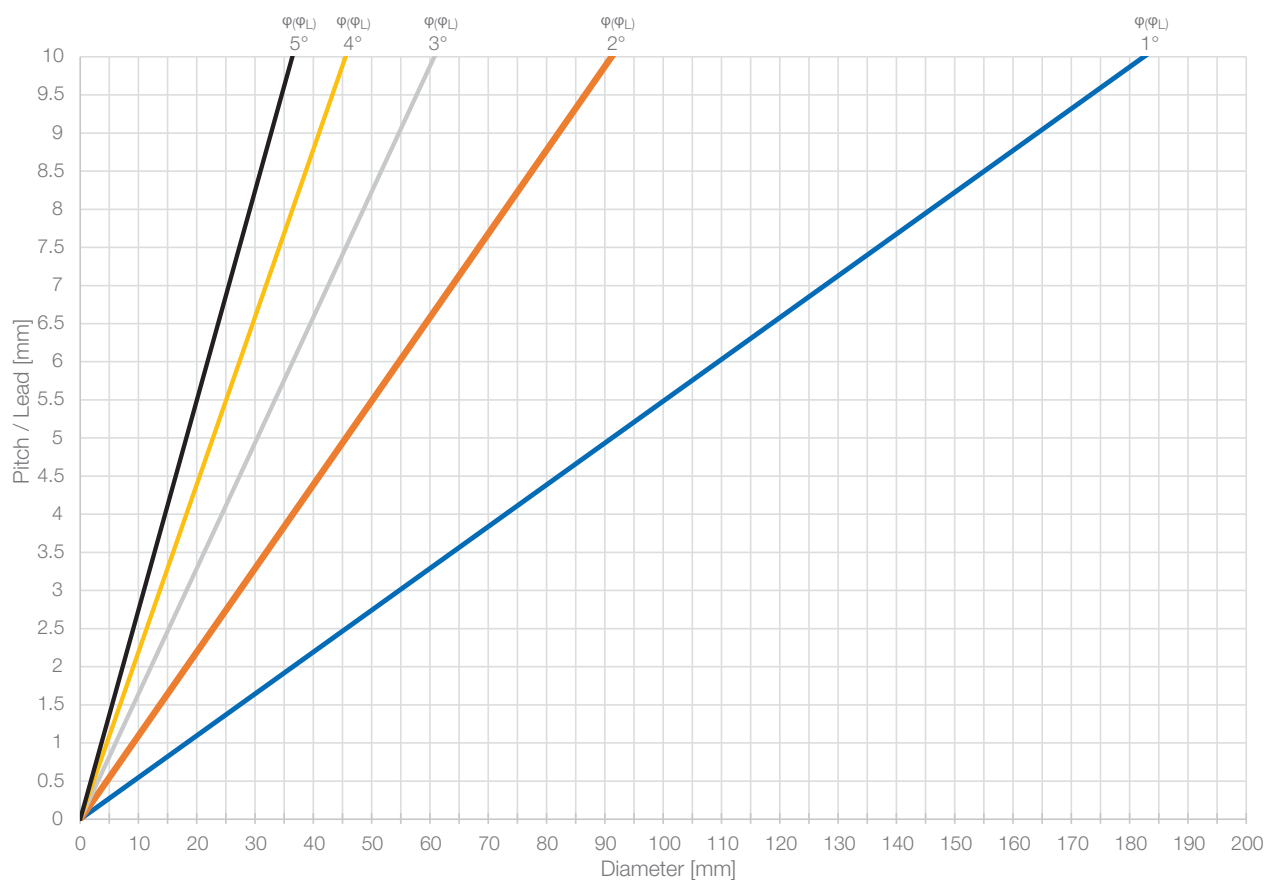
$$\text{TPI} = \text{No. of threading per inch}$$

$$1 \text{ inch} = 25.4 \text{ mm}$$

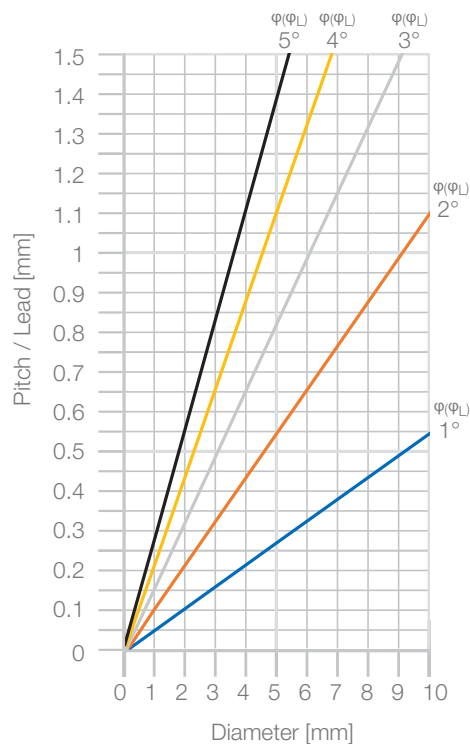
$$\text{Pitch (mm)} = \frac{25.4}{\text{TPI}}$$

# Helix (Lead) angle area by using graph

Helix angle evaluation

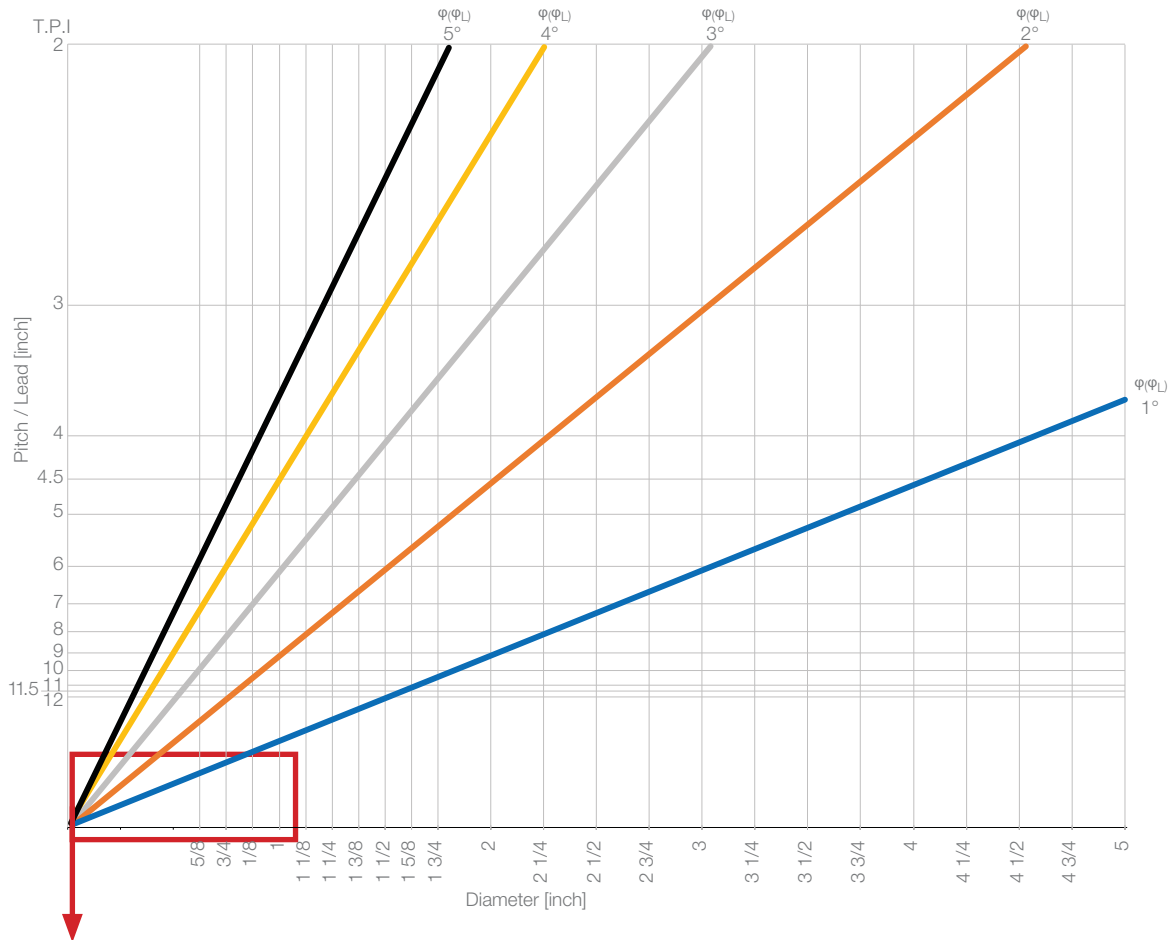


Detailed view for small pitch/diameter

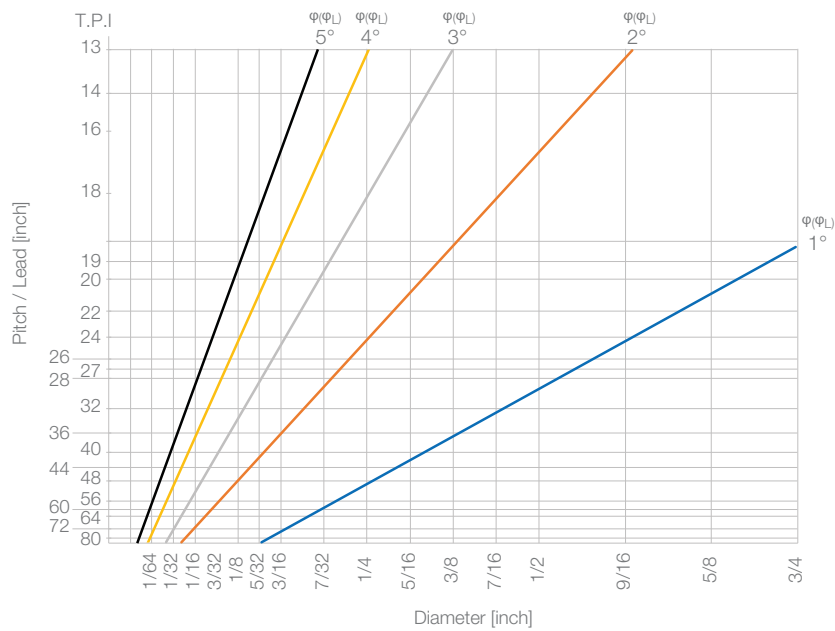


# Helix (Lead) angle area by using graph

Helix angle evaluation



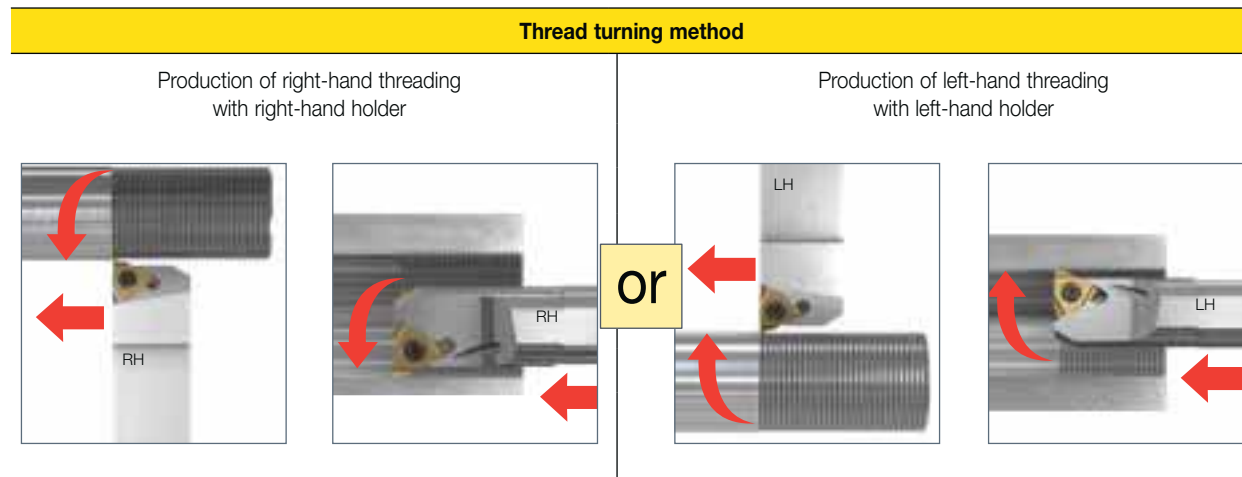
Detailed view for small pitch/diameter



## Anvil selection for symmetric threading profiles

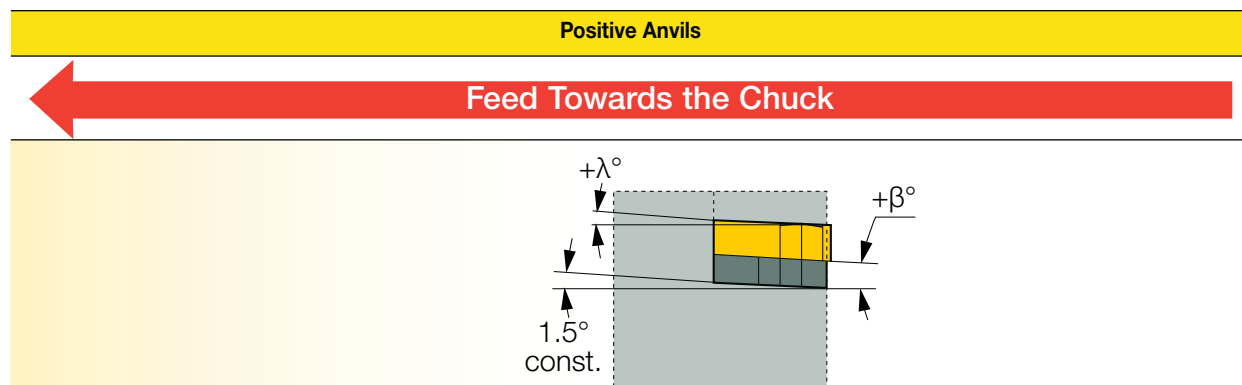
The table below defines the recommended insert inclination angle ( $\beta$ ) and anvil selection according to the helix angle ( $\phi$ ) for single-start threading and the lead angle ( $\phi_L$ ) for multi-start threading, depending on the threading turning method for machining the following symmetric threading profiles:

- partial profile threading with an angle profile of 60°, 55° only
- full profile threading according to ISO, UN, Whitworth, NPT, BSPT, Trapeze, ACME, RD standards only

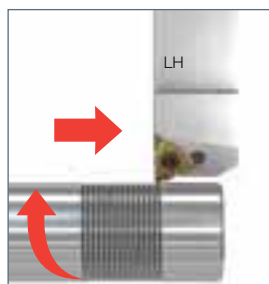


| Anvil selection                                     |                                  |                                    |                                              |                                              |                                              |                                              |                                              |
|-----------------------------------------------------|----------------------------------|------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|
| Threading helix (lead)<br>angle $\phi$ ( $\phi_L$ ) |                                  | Positive Anvils                    |                                              |                                              |                                              |                                              |                                              |
|                                                     |                                  | $\phi$ ( $\phi_L$ ) $\geq 5^\circ$ | $4^\circ \leq \phi$ ( $\phi_L$ ) $< 5^\circ$ | $3^\circ < \phi$ ( $\phi_L$ ) $\leq 4^\circ$ | $2^\circ < \phi$ ( $\phi_L$ ) $\leq 3^\circ$ | $1^\circ < \phi$ ( $\phi_L$ ) $\leq 2^\circ$ | $0^\circ < \phi$ ( $\phi_L$ ) $\leq 1^\circ$ |
| Inclination Angle $\beta$                           |                                  |                                    | 4.5°                                         | 3.5°                                         | 2.5°                                         | 1.5° (std)                                   | 0.5°                                         |
| IC                                                  | Toolholder                       | Anvil Designation                  |                                              |                                              |                                              |                                              |                                              |
| 16<br>(3/8)                                         | EX RH OR IN LH<br>EX RH OR IN LH | special solution                   | AE 16+4.5<br>AI 16+4.5                       | AE 16+3.5<br>AI 16-3.5                       | AE 16+2.5<br>AI 16+2.5                       | * AE 16+1.5<br>* AI 16+1.5                   | AE 16+0.5<br>AI 16+0.5                       |
| 22<br>(1/2)                                         | EX RH OR IN LH<br>EX RH OR IN LH |                                    | AE 22+4.5<br>AI 22+4.5                       | AE 22+3.5<br>AI 22+3.5                       | AE 22+2.5<br>AI 22+2.5                       | * AE 22+1.5<br>* AI 22+1.5                   | AE 22+0.5<br>AI 22+0.5                       |
| 27<br>(5/8)                                         | EX RH OR IN LH<br>EX RH OR IN LH |                                    | AE 27-4.5<br>AI 27+4.5                       | AE 27+3.5<br>AI 27+3.5                       | AE 27+2.5<br>AI 27+2.5                       | * AE 27+1.5<br>* AI 27+1.5                   | AE 27+0.5<br>AI 27+0.5                       |
| 22U<br>(1/2U)                                       | EX RH OR IN LH<br>EX RH OR IN LH |                                    | AE 22U+4.5<br>AI 22U+4.5                     | AE 22U+3.5<br>AI 22U+3.5                     | AE 22U+2.5<br>AI 22U+2.5                     | * AE 22U+1.5<br>* AI 22U+1.5                 | AE 22U+0.5<br>AI 22U+0.5                     |
| 27U<br>(5/8U)                                       | EX RH OR IN LH<br>EX RH OR IN LH |                                    | AE 27U+4.5<br>AI 27U+4.5                     | AE 27U+3.5<br>AI 27U+3.5                     | AE 27U+2.5<br>AI 27U+2.5                     | * AE 27U+1.5<br>* AI 27U+1.5                 | AE 27U+0.5<br>AI 27U+0.5                     |

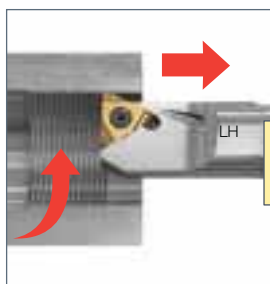
\* Standard anvil supplied with tool



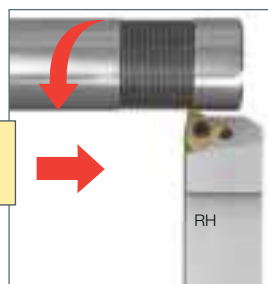
## Thread turning method

Production of right-hand threading  
with left-hand holder\*

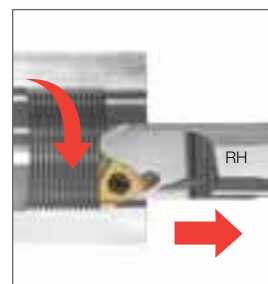
\* Change anvil to negative



or

Production of left-hand threading  
with right-hand holder\*

\* Change anvil to negative



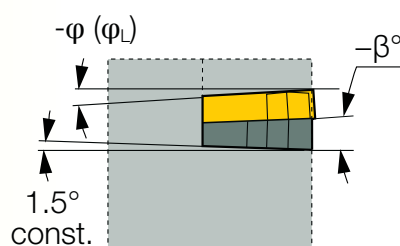
## Anvil selection

|                                                  |                                  | Negative Anvils                              |                                              |                                    |
|--------------------------------------------------|----------------------------------|----------------------------------------------|----------------------------------------------|------------------------------------|
| Threading helix (lead) angle $\phi$ ( $\phi_L$ ) |                                  | $0^\circ < \phi$ ( $\phi_L$ ) $\leq 1^\circ$ | $1^\circ < \phi$ ( $\phi_L$ ) $\leq 2^\circ$ | $\phi$ ( $\phi_L$ ) $\geq 2^\circ$ |
| Inclination Angle $\beta$                        |                                  | $-0.5^\circ$                                 | $-1.5^\circ$                                 |                                    |
| IC                                               | Toolholder                       | Anvil Designation                            |                                              |                                    |
| 16<br>(3/8)                                      | EX RH OR IN LH<br>EX RH OR IN LH | AE 16-0.5<br>AI 16-0.5                       | AE 16-1.5<br>AI 16-1.5                       | special solution                   |
| 22<br>(1/2)                                      | EX RH OR IN LH<br>EX RH OR IN LH | AE 22-0.5<br>AI 22-0.5                       | AE 22-1.5<br>AI 22-1.5                       |                                    |
| 27<br>(5/8)                                      | EX RH OR IN LH<br>EX RH OR IN LH | AE 27-0.5<br>AI 27-0.5                       | AE 27-1.5<br>AI 27-1.5                       |                                    |
| 22U<br>(1/2U)                                    | EX RH OR IN LH<br>EX RH OR IN LH | AE 22U-0.5<br>AI 22U-0.5                     | AE22U-1.5<br>AI 22U-1.5                      |                                    |
| 27U<br>(5/8U)                                    | EX RH OR IN LH<br>EX RH OR IN LH | AE 27U-0.5<br>AI 27U-0.5                     | AE 27U-1.5<br>AI 27U-1.5                     |                                    |

- EX - Anvil for external threading
- IN - Anvil for internal threading

## Negative Anvils

Feed Towards the Tailstock

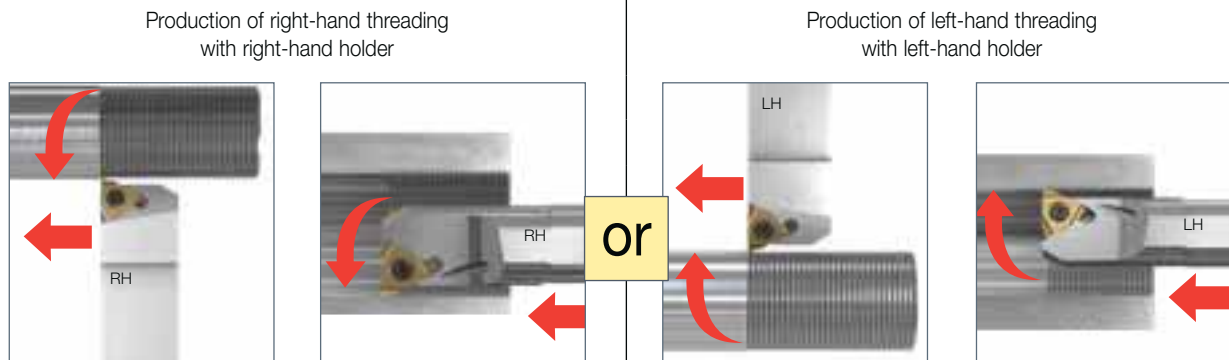




# Anvil selection for ABUT threading standard only

The table below defines the recommended insert inclination angle ( $\beta$ ) and anvil selection according to helix angle ( $\phi$ ) for single-start threading and according to lead angle ( $\phi_L$ ) for multi-start threading, depending on the threading turning method for machining asymmetric threading profile according to ABUT threading standard only.

## Threading turning method

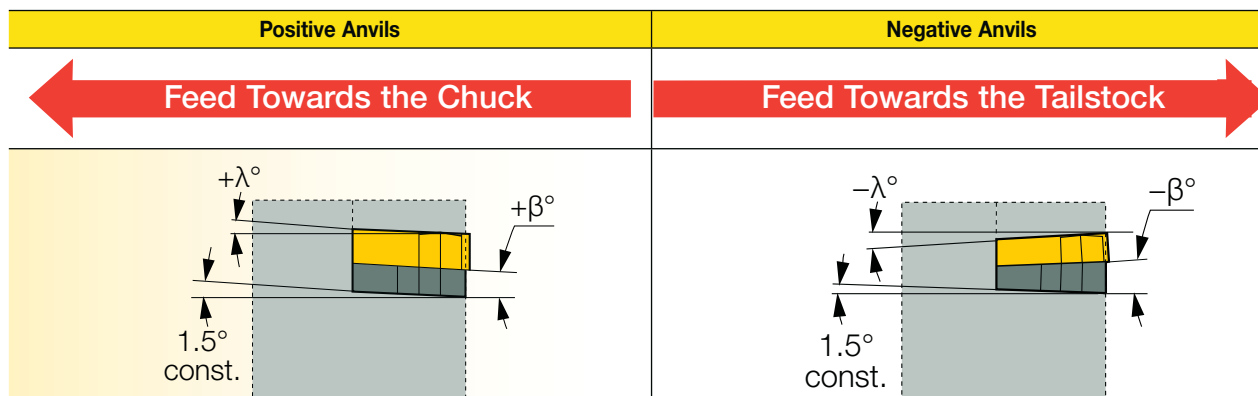


## Anvil selection

|                                                  |                                  | Positive Anvils          |                                | Negative Anvils            |                            |                            |
|--------------------------------------------------|----------------------------------|--------------------------|--------------------------------|----------------------------|----------------------------|----------------------------|
| Threading helix (lead) angle $\phi$ ( $\phi_L$ ) |                                  | $\phi$ ( $\phi_L$ )>3.5° | 3°< $\phi$ ( $\phi_L$ )≤3.5°   | 2°< $\phi$ ( $\phi_L$ )≤3° | 1°< $\phi$ ( $\phi_L$ )≤2° | 0°< $\phi$ ( $\phi_L$ )≤1° |
| Inclination angle $\beta$                        |                                  |                          | 1.5° (std)                     | 0.5                        | -0.5°                      | -1.5°                      |
| IC                                               | Toolholder                       | Anvil designation        |                                |                            |                            |                            |
| 16<br>(3/8)                                      | EX RH OR IN LH<br>EX LH OR IN RH | special solution         | * AE 16 +1.5<br>* AI16 +1.5    | AE 16 +0.5<br>AI16 +0.5    | AE 16 -0.5<br>AI 16 -0.5   | AE 16 -1.5<br>AI 16 -1.5   |
| 22<br>(1/2)                                      | EX RH OR IN LH<br>EX LH OR IN RH |                          | * AE 22 +1.5<br>* AI 22 +1.5   | AE 22 +0.5<br>AI 22 +0.5   | AE 22 -0.5<br>AI 22 -0.5   | AE 22 -1.5<br>AI 22 -1.5   |
| 27<br>(5/8)                                      | EX RH OR IN LH<br>EX LH OR IN RH |                          | * AE 27 +1.5<br>* AI 27 +1.5   | AE 27 +0.5<br>AI 27 +0.5   | AE 27 -0.5<br>AI 27 -0.5   | AE 27 -1.5<br>AI 27 -1.5   |
| 22U<br>(1/2U)                                    | EX RH OR IN LH<br>EX LH OR IN RH |                          | * AE 22U +1.5<br>* AI 22U +1.5 | AE 22U +0.5<br>AI 22U +0.5 | AE 22U -0.5<br>AI 22U -0.5 | AE 22U -1.5<br>AI 22U -1.5 |
| 27U<br>(5/8U)                                    | EX RH OR IN LH<br>EX LH OR IN RH |                          | * AE 27U +1.5<br>* AI 27U +1.5 | AE 27U +0.5<br>AI 27U +0.5 | AE 27U -0.5<br>AI 27U -0.5 | AE 27U -1.5<br>AI 27U -1.5 |

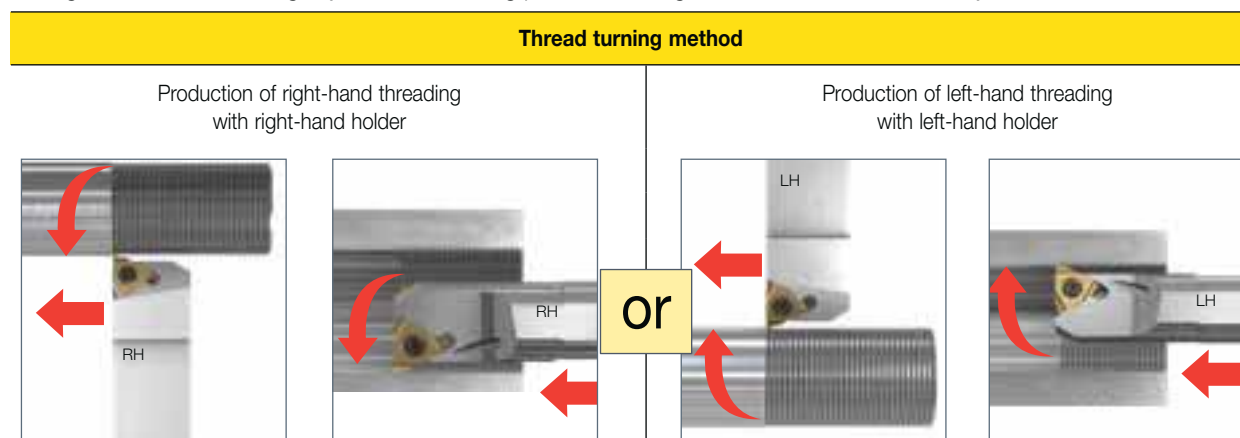
\* Standard anvil supplied with tool

- EX - Anvil for external threading
- IN - Anvil for internal threading



## Anvil selection for SAGE threading standard only

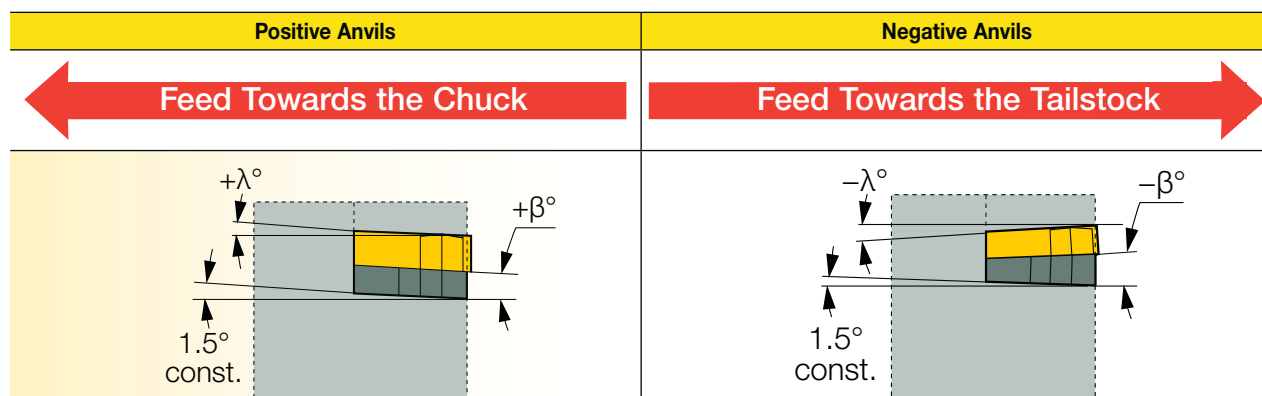
The table below defines the recommended insert inclination angle ( $\beta$ ) and anvil selection according to helix angle ( $\phi$ ) for single-start threading and according to lead angle ( $\phi_L$ ) for multi-start threading, depending on the thread turning method for machining asymmetric threading profile according to SAGE thread standard only.



| Anvil selection                                  |                                  |                                   |                                                |                                              |                                              |                                              |                                              |
|--------------------------------------------------|----------------------------------|-----------------------------------|------------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|
|                                                  |                                  | Positive Anvils                   |                                                |                                              | Negative Anvils                              |                                              |                                              |
| Threading helix (lead) angle $\phi$ ( $\phi_L$ ) |                                  | $\phi$ ( $\phi_L$ ) $> 5.6^\circ$ | $5^\circ < \phi$ ( $\phi_L$ ) $\leq 5.6^\circ$ | $3^\circ < \phi$ ( $\phi_L$ ) $\leq 5^\circ$ | $2^\circ < \phi$ ( $\phi_L$ ) $\leq 3^\circ$ | $1^\circ < \phi$ ( $\phi_L$ ) $\leq 2^\circ$ | $0^\circ < \phi$ ( $\phi_L$ ) $\leq 1^\circ$ |
| Inclination angle $\beta$                        |                                  |                                   | $2.5^\circ$                                    | $1.5^\circ$ (std)                            | $0.5^\circ$                                  | $-0.5^\circ$                                 | $-1.5^\circ$                                 |
| IC                                               | Toolholder                       | Anvil designation                 |                                                |                                              |                                              |                                              |                                              |
| 16<br>(3/8)                                      | EX RH OR IN LH<br>EX RH OR IN LH | special solution                  | AE 16 +2.5<br>AI 16 +2.5                       | * AE 16 +1.5<br>* AI 16 +1.5                 | AE 16 +0.5<br>AI 16 +0.5                     | AE 16 -0.5<br>AI 16 -0.5                     | AE 16 -1.5<br>AI 16 -1.5                     |
| 22<br>(1/2)                                      | EX RH OR IN LH<br>EX RH OR IN LH |                                   | AE 22 +2.5<br>AI 22 +2.5                       | * AE 22 +1.5<br>* AI 22 +1.5                 | AE 22 +0.5<br>AI 22 +0.5                     | AE 22 -0.5<br>AI 22 -0.5                     | AE 22 -1.5<br>AI 22 -1.5                     |
| 27<br>(5/8)                                      | EX RH OR IN LH<br>EX RH OR IN LH |                                   | AE 27 +2.5<br>AI 27 +2.5                       | * AE 27 +1.5<br>* AI 27 +1.5                 | AE 27 +0.5<br>AI 27 +0.5                     | AE 27 -0.5<br>AI 27 -0.5                     | AE 27 -1.5<br>AI 27 -1.5                     |
| 22U<br>(1/2U)                                    | EX RH OR IN LH<br>EX RH OR IN LH |                                   | AE 22U +2.5<br>AI 22U +2.5                     | * AE 22U +1.5<br>* AI 22U +1.5               | AE 22U +0.5<br>AI 22U +0.5                   | AE 22U -0.5<br>AI 22U -0.5                   | AE 22U -1.5<br>AI 22U -1.5                   |
| 27U<br>(5/8U)                                    | EX RH OR IN LH<br>EX RH OR IN LH |                                   | AE 27U +2.5<br>AI 27U +2.5                     | * AE 27U +1.5<br>* AI 27U +1.5               | AE 27U +0.5<br>AI 27U +0.5                   | AE 27U -0.5<br>AI 27U -0.5                   | AE 27U -1.5<br>AI 27U -1.5                   |

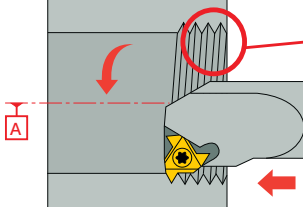
\* Standard anvil supplied with tool

- EX - Anvil for external threading
- IN - Anvil for internal threading



# Mini-Tool Features

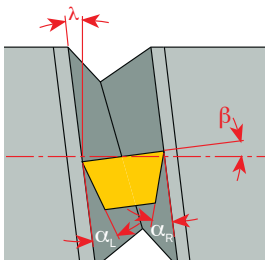
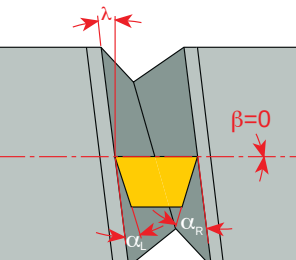
|     |                            |      |
|-----|----------------------------|------|
| (1) | øD M8; 5/16"-UN; 1/16"-NPT |      |
| (2) | 4H+8H/1B+3B                |      |
| (3) | A                          | 0.00 |



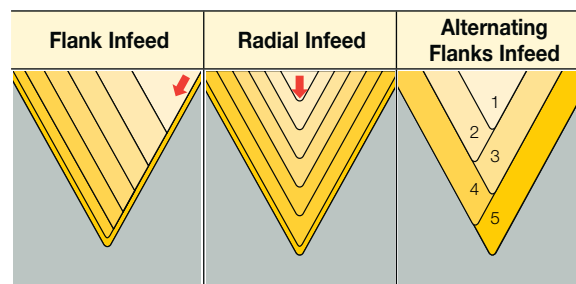
- (1) Smallest possible thread
- (2) All tolerances
- (3) Minimum runout
- (4) High surface quality

# Flank Clearance and Effective Inclination Angle

Inclination angle  $\beta$  of the cutting edges corresponds to a specific thread helix angle  $\lambda$  and ensures an equal clearance angle on both sides of the insert.

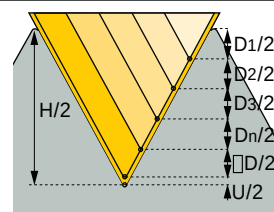
|                                                                                                                                                  |                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| $\alpha_l = \alpha_r$                                           | <b>Incorrect</b><br>$\alpha_l < \alpha_r$                  |
|                                                                |                                                           |
| $\alpha$ - Flank clearance angle<br>$\lambda$ - Helix angle<br>$\beta$ - Effective inclination angle is achieved by selecting the suitable anvil | $H$ - Depth of thread profile (on $\emptyset$ )<br>$D$ - Depth of pass (on $\emptyset$ )<br>$U$ - Depth of finishing pass (on $\emptyset$ ) |

# Infeed Methods for Threading Operations



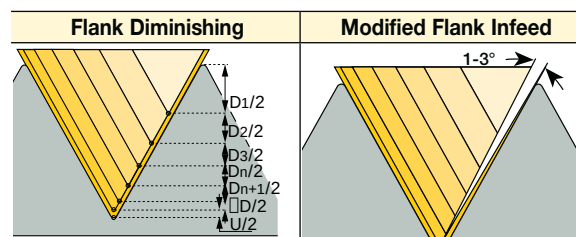
# Flank Equal

Equal depth of cut for each pass



$$\frac{D_1}{2} = \frac{D_2}{2} = \frac{D_3}{2} = \frac{D_n}{2}$$

# Diminished depth of cut for each pass



$$\frac{D_1}{2} > \frac{D_2}{2} > \frac{D_3}{2} > \frac{D_n}{2} > \frac{D_{n+1}}{2}$$

## Depth per Pass and Number of Passes

In order to produce threads, the cutting tool needs to make several numbers of cuts along the workpiece surface. The parameters of depth per pass and number of passes have a very important role in threading production. These parameters have a direct effect on cutting edge wear, tool life, threading surface quality, and threading production stability.

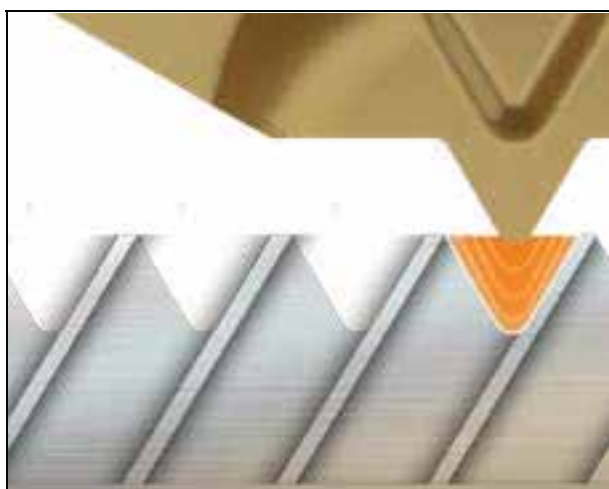
The two methods most common in determining the depth per pass and the number of passes are constant chip area by decreasing depth per pass or constant depth per pass. The choice of method does not depend on the selected infeed methods (radial infeed, flank infeed, modified flank infeed, alternating flank infeed), which are described in chapter 2.12.

The depth per pass and number of passes parameters depend on the type of equipment, tool overhang, machine stability, workpiece material, cutter geometry and the threading depth required.

### Constant chip area by decreasing depth per pass (recommended)

This is the most common method and is generally recommended, as in most cases it ensures high productivity. The principle of this method is that the initial cutting depth at the first pass is the largest, and then gradually decreases at each pass to ensure material removal within a constant chip area.

The calculation of passes is designed so that the last pass, which is destined to be a finish pass, will be 0.05 - 0.1 mm (0.0019 - 0.0039 inches). Using this method ensures constant loads on cutting edge and uniform wear, which increases tool life.



### Formula for calculation of depth per pass

$$\Delta a_{p(i)} = \frac{a_p}{\sqrt{n_a - 1}} \times \sqrt{C}$$

#### When:

$\Delta a_{p(i)}$  — Depth of cut  $i$  pass ( $i = 1 \dots n_a$ )

$i$  — Pass

$a_p$  — Total depth of cut

$n_a$  — Number of passes

$C$  — Constant value:  
For 1<sup>st</sup> pass:  $C=0.3$ ; For 2<sup>nd</sup> pass:  $C=1$ ; For 3<sup>rd</sup> pass and higher:  $C = i - 1$

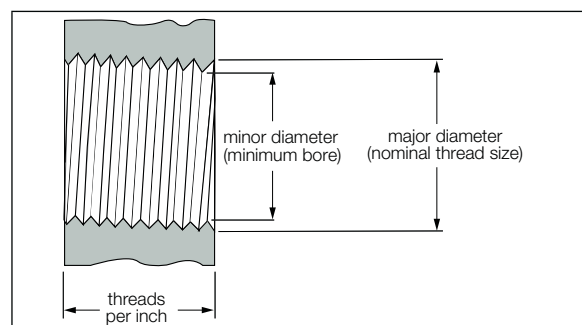
# Threading Limits with Standard NOTCH-GRIP Inserts

The following charts list the largest pitch 6.

## 60° V-Threading Limits

| FLT-2 Inserts Internal Threading Limitations |                     |                        |       |
|----------------------------------------------|---------------------|------------------------|-------|
| Threads Per Inch                             | Nominal Thread Size | Minimum Minor Diameter |       |
|                                              |                     | Inch                   | MM    |
| 6                                            | 1-7/8               | 1.695                  | 43.05 |
| 7                                            | 1-3/4               | 1.595                  | 40.51 |
| 8                                            | 1-5/8               | 1.490                  | 37.85 |
| 9                                            | 1-9/16              | 1.442                  | 36.63 |
| 10                                           | 1-1/2               | 1.392                  | 35.36 |
| 11                                           | 1-7/16              | 1.339                  | 34.01 |
| 12                                           | 1-3/8               | 1.285                  | 32.64 |
| 13                                           | 1-5/16              | 1.229                  | 31.22 |
| 14                                           | 1-1/4               | 1.173                  | 29.79 |
| 16                                           | 1-1/4               | 1.182                  | 30.02 |
| 18                                           | 1-1/8               | 1.065                  | 27.05 |
| 20                                           | 1-1/8               | 1.071                  | 27.20 |
| 24                                           | 1-1/16              | 1.017                  | 25.83 |

\* 24 TPI and finer can be cut with a #2 series insert provided that the minor diameter is 1.000 or larger.



| FLT-3 & 4 Inserts Internal Threading Limitations |                     |                        |       |
|--------------------------------------------------|---------------------|------------------------|-------|
| Threads Per Inch                                 | Nominal Thread Size | Minimum Minor Diameter |       |
|                                                  |                     | Inch                   | MM    |
| 4**                                              | 3                   | 2.729                  | 69.32 |
| 4-1/2**                                          | 2-7/8               | 2.634                  | 66.90 |
| 5                                                | 2-3/4               | 2.534                  | 64.36 |
| 6                                                | 2-1/2               | 2.320                  | 58.93 |
| 7                                                | 2-1/4               | 2.095                  | 53.21 |
| 8                                                | 2                   | 1.865                  | 47.37 |
| 9                                                | 1-15/16             | 1.817                  | 46.15 |
| 10                                               | 1-7/8               | 1.767                  | 44.88 |
| 11                                               | 1-13/16             | 1.714                  | 43.54 |
| 12                                               | 1-3/4               | 1.660                  | 42.16 |
| 13                                               | 1-5/8               | 1.542                  | 39.17 |
| 14                                               | 1-9/16              | 1.485                  | 37.72 |
| 16*                                              | 1-7/16              | 1.370                  | 34.80 |

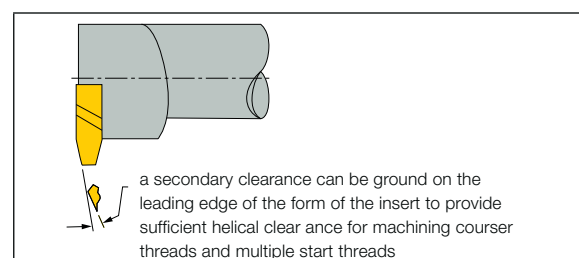
\* 16 pitch acme threads and finer can be cut provided the minor diameter is 1.370 or larger.

\*\* FLT-4 only.

## Acme Threading Limits

| FLA-2 Internal Threading Limitations |                     |                        |       |
|--------------------------------------|---------------------|------------------------|-------|
| Threads Per Inch                     | Nominal Thread Size | Minimum Minor Diameter |       |
|                                      |                     | Inch                   | MM    |
| 6                                    | 2-1/2               | 2.333                  | 59.26 |
| 8                                    | 2-1/4               | 2.125                  | 53.98 |
| 10                                   | 2                   | 1.900                  | 48.26 |
| 12                                   | 1-3/4               | 1.667                  | 42.34 |
| 14                                   | 1-5/8               | 1.554                  | 39.47 |
| 16*                                  | 1-1/2               | 1.438                  | 36.53 |

\* 16 pitch acme threads and finer can be cut provided the minor diameter is 1.438 or larger.



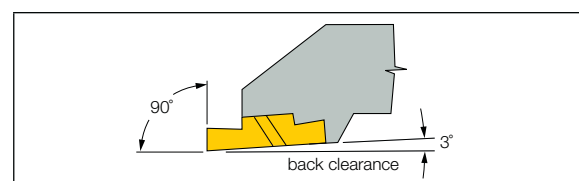
Modified standard inserts may be produced for special threads or ones not listed on the charts shown. quoted upon request.

| FLA-3, 4 & 6 Internal Threading Limitations |                     |                        |        |
|---------------------------------------------|---------------------|------------------------|--------|
| Threads Per Inch                            | Nominal Thread Size | Minimum Minor Diameter |        |
|                                             |                     | Inch                   | MM     |
| 2*                                          | 5                   | 4.500                  | 114.30 |
| 2-1/2**                                     | 4-1/2               | 4.100                  | 104.14 |
| 3**                                         | 4                   | 3.665                  | 93.09  |
| 4                                           | 3-1/2               | 3.250                  | 82.55  |
| 5                                           | 3                   | 2.800                  | 71.12  |
| 6                                           | 2-1/2               | 2.333                  | 59.26  |
| 8                                           | 2-1/4               | 2.125                  | 53.98  |
| 10                                          | 2                   | 1.900                  | 48.26  |
| 12                                          | 1-3/4               | 1.667                  | 42.34  |
| 14                                          | 1-5/8               | 1.554                  | 39.47  |
| 16*                                         | 1-1/2               | 1.438                  | 36.53  |

\* 16 pitch acme threads and finer can be cut provided the minor diameter is 1.438 or larger.

\*\* FLA-6 only.

**Note:** positive rake ACME inserts are recommended for stainless steels and high-temp alloy applications. Quoted upon request.



**Note:** tool holders are designed to locate the insert at a 3° angle to provide back clearance down the side.

| FLTБ-2A & 2B Internal Threading Limitations |                     |                        |       |
|---------------------------------------------|---------------------|------------------------|-------|
| Threads Per Inch                            | Nominal Thread Size | Minimum Minor Diameter |       |
|                                             |                     | Inch                   | MM    |
| 8                                           | 1-3/4               | 1.600                  | 40.64 |
| 10                                          | 1-5/8               | 1.505                  | 38.23 |
| 12                                          | 1-1/2               | 1.400                  | 35.56 |
| 16                                          | 1-1/4               | 1.175                  | 29.85 |
| 20                                          | 1-1/16              | 1.002                  | 25.45 |

| FLTБ-3A & 4A Internal Threading Limitations |                     |                        |       |
|---------------------------------------------|---------------------|------------------------|-------|
| Threads Per Inch                            | Nominal Thread Size | Minimum Minor Diameter |       |
|                                             |                     | Inch                   | MM    |
| 4*                                          | 2-1/2               | 2.200                  | 55.88 |
| 5                                           | 2-1/4               | 2.010                  | 51.05 |
| 6                                           | 2                   | 1.800                  | 45.72 |
| 8                                           | 1-3/4               | 1.600                  | 40.64 |
| 10                                          | 1-5/8               | 1.505                  | 38.23 |
| 12**                                        | 1-1/2               | 1.400                  | 35.56 |

\* FLTБ-4A insert only

\*\* 16 or 20 threads per inch can be cut providing minor diameter is 1.375 or larger.

| FLTБ-3B & 4B Internal Threading Limitations |                     |                        |       |
|---------------------------------------------|---------------------|------------------------|-------|
| Threads Per Inch                            | Nominal Thread Size | Minimum Minor Diameter |       |
|                                             |                     | Inch                   | MM    |
| 4                                           | *2-7/8              | 2.575                  | 65.41 |
| 5                                           | 2-3/4               | 2.510                  | 63.75 |
| 6                                           | 2-3/8               | 1.175                  | 29.85 |
| 8                                           | 2-1/8               | 1.975                  | 50.17 |
| 10                                          | 1-7/8               | 1.755                  | 44.58 |
| 12                                          | 1-5/8               | 1.525                  | 38.74 |
| 16                                          | 1-1/2               | 1.407                  | 35.74 |
| 20                                          | 1-7/16              | 1.378                  | 35.00 |

\* FLTБ-4B insert only

## American Standard Buttress Thread Designations

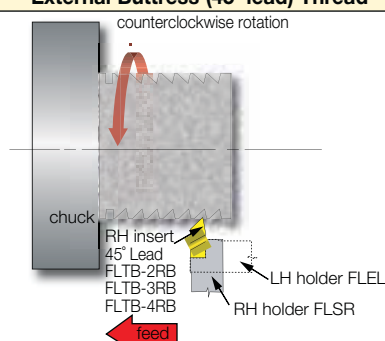
When only the designation BUTT is used, the thread is a "pull" type buttress (external thread pulls) with the clearance flank (45°) leading and the pressure flank (7°) following.

When the designation PUSH-BUTT is used, the thread is a push type buttress (external thread pushes) with the load flank (7°) leading and the 45° clearance flank following.

Whenever possible this description should be confirmed by a simplified view showing thread angles on the drawing of the product that has the buttress thread.

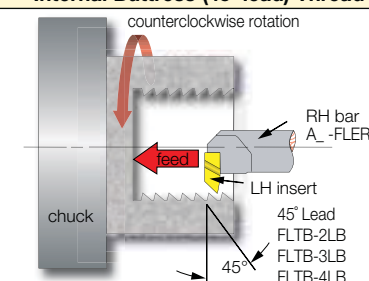
Always remember that the position of your holder and direction of your feed will determine the lead angle on the insert.

### External Buttress (45° lead) Thread



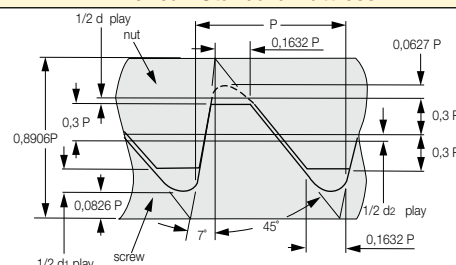
45° clearance angle of this buttress thread becomes the leading angle in this application.

### Internal Buttress (45° lead) Thread



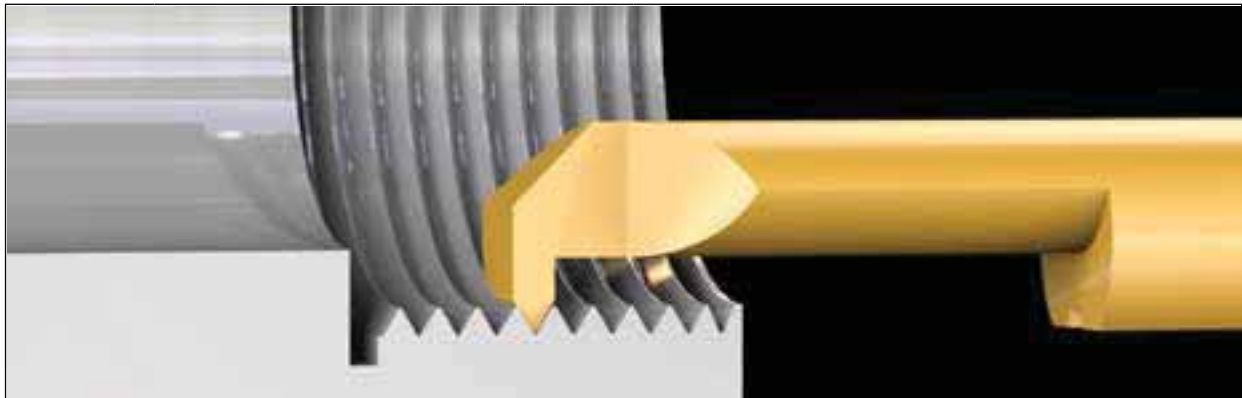
45° clearance flank of this buttress thread becomes the leading angle in this application.

### American Standard Buttress



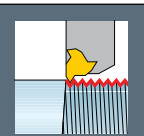
Use: fittings and pipe couplings

# Cutting Data



| Carbide Grade                  |       | Steel (N/mm Tensile Strength) |         |         |          |       | Stainless Steel | Cast Iron | Non-ferrous |
|--------------------------------|-------|-------------------------------|---------|---------|----------|-------|-----------------|-----------|-------------|
|                                |       | 400-500                       | 500-700 | 700-850 | 850-1150 | >1150 |                 |           |             |
| Cutting Speed<br>$V_c$ (m/min) | IC228 | 160                           | 140     | 120     | 90       | 70    | 90              | 100       | 300         |
|                                | IC908 | 185                           | 160     | 140     | 105      | 80    | 105             | 115       | 350         |
| Pitch (p) mm                   | TPI   | No. of Passes                 |         |         |          |       |                 |           |             |
| 0.5                            | 48    | 6                             | 6       | 7       | 7        | 8     | 8               | 7         | 6           |
| 0.75                           | 32    | 8                             | 8       | 9       | 9        | 10    | 10              | 9         | 8           |
| 1.0                            | 24    | 10                            | 10      | 12      | 12       | 12    | 12              | 12        | 10          |
| 1.25                           | 20-19 | 12                            | 12      | 14      | 14       | 15    | 15              | 14        | 12          |
| 1.5                            | 16    | 15                            | 15      | 17      | 17       | 18    | 18              | 17        | 15          |

For internal threading of small diameters, the PVD coated grade IC228 is recommended.

| Material groups                                                                                      |         | ISO P         |                                           | ISO M                                                           | ISO K         | ISO N       | ISO S                   | ISO H                  |
|------------------------------------------------------------------------------------------------------|---------|---------------|-------------------------------------------|-----------------------------------------------------------------|---------------|-------------|-------------------------|------------------------|
|                                                                                                      |         | 1-11          | 12-13                                     | 14                                                              | 15-20         | 21-28       | 31-37                   | 38-41                  |
|                                                                                                      |         | Steel         | Stainless Steel<br>Ferritic & Martensitic | Stainless Steel<br>Austenitic & Duplex<br>(Ferritic-Austenitic) | Cast Iron     | Non-ferrous | High Temperature Alloys | Hard Steel & Cast Iron |
|  <b>THREADING</b> | Harder  | IC1007        | IC1007                                    | IC1007                                                          | IC1007        | IC08        | IC806                   | IC1007                 |
|                                                                                                      |         | IC808 (IC908) |                                           |                                                                 | IC808 (IC908) |             | IC1007                  |                        |
|                                                                                                      |         | IC250 (IC950) | IC808 (IC908)                             | IC808 (IC908)                                                   | IC250 (IC950) | IC228       | IC808 (IC908)           | IC808 (IC908)          |
|                                                                                                      | Tougher | IC228         | IC228                                     | IC228                                                           | IC228         | IC28        |                         |                        |

■ First choice



## Troubleshooting

|                             |                                                                                     | Cause                                                                                                                                                                                                                                                                                                           | Solution                                                                                                                                                                                                                                                                                                                   |
|-----------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plastic Deformation         |    | <ul style="list-style-type: none"> <li>Excessive heat in cutting zone</li> <li>Wrong carbide grade</li> <li>Inadequate coolant supply</li> <li>Depth of cut too large</li> <li>Cutting speed too high</li> <li>Nose radius too small</li> </ul>                                                                 | <ul style="list-style-type: none"> <li>Reduce RPM / Reduce depth of cut / Check turned dia.</li> <li>Use coated grade / Use harder grade</li> <li>Apply coolant</li> <li>Reduce depth of cut / Increase no. of passes</li> <li>Reduce cutting speed</li> <li>If possible use insert with larger radius</li> </ul>          |
| Premature Wear              |    | <ul style="list-style-type: none"> <li>Cutting speed too high</li> <li>Infeed depth too small</li> <li>Highly abrasive material</li> <li>Inadequate coolant supply</li> <li>Wrong inclination anvil</li> <li>Wrong turned dia. prior to threading</li> <li>Insert is above center line</li> </ul>               | <ul style="list-style-type: none"> <li>Reduce RPM</li> <li>Modify flank infeed / Increase depth of cut</li> <li>Use coated grade</li> <li>Apply coolant</li> <li>Reselect anvil</li> <li>Check turned dia.</li> <li>Check center height</li> </ul>                                                                         |
| Insert Breakage             |    | <ul style="list-style-type: none"> <li>Wrong turned dia. prior to threading</li> <li>Wrong grade</li> <li>Poor chip control</li> <li>Incorrect center height</li> </ul>                                                                                                                                         | <ul style="list-style-type: none"> <li>Check turned dia.</li> <li>Use tougher grade</li> <li>Change to M-Type / B-Type inserts and use modified flank infeed</li> <li>Check center height</li> </ul>                                                                                                                       |
| Build Up Edge               |   | <ul style="list-style-type: none"> <li>Cutting edge too cold</li> <li>Wrong grade</li> <li>Inadequate coolant supply</li> <li>Incorrect cutting speed</li> </ul>                                                                                                                                                | <ul style="list-style-type: none"> <li>Increase RPM / Increase depth of cut</li> <li>Use coated grade</li> <li>Apply coolant</li> <li>Increase cutting speed</li> </ul>                                                                                                                                                    |
| Vibration                   |  | <ul style="list-style-type: none"> <li>Incorrect workpiece clamping</li> <li>Incorrect tool setup</li> <li>Incorrect cutting speed</li> <li>Incorrect center height</li> </ul>                                                                                                                                  | <ul style="list-style-type: none"> <li>Use soft jaws</li> <li>Check tool overhang / Use anti-vibration bars</li> <li>Increase cutting speed</li> <li>Check center height</li> </ul>                                                                                                                                        |
| Incorrect Thread Profile    |                                                                                     | <ul style="list-style-type: none"> <li>Unsuitable threading profile</li> <li>Incorrect center height</li> <li>Incorrect pitch in the program</li> </ul>                                                                                                                                                         | <ul style="list-style-type: none"> <li>Adjust to correct tool, anvil, and insert</li> <li>Adjust center height</li> <li>Change the program</li> </ul>                                                                                                                                                                      |
| Broken Nose During 1st Pass |  | <ul style="list-style-type: none"> <li>Cutting edge too cold</li> <li>Depth of cut too large</li> <li>Wrong grade</li> <li>Wrong turned dia. prior to threading</li> <li>Incorrect center height</li> <li>Infeed depth too shallow</li> <li>Wrong inclination anvil</li> <li>Tool overhang tool long</li> </ul> | <ul style="list-style-type: none"> <li>Reduce RPM</li> <li>Reduce depth of cut/Increase number of infeed passes</li> <li>Use tougher grade</li> <li>Check turned dia.</li> <li>Adjust center height</li> <li>Change depth of cut</li> <li>Reselect anvil</li> <li>Reduce tool overhang / Use Anti-vibration bar</li> </ul> |
| Poor Surface Finish         |  | <ul style="list-style-type: none"> <li>Wrong cutting speed</li> <li>Excessive heat in cutting zone</li> <li>Poor chip control</li> <li>Inadequate coolant supply</li> <li>Wrong inclination anvil</li> <li>Tool overhang too long</li> <li>Incorrect center height</li> </ul>                                   | <ul style="list-style-type: none"> <li>Increase/reduce RPM</li> <li>Reduce depth of cut</li> <li>Modify flank infeed</li> <li>Apply coolant</li> <li>Reselect anvil</li> <li>Reduce tool overhang</li> <li>Check center height</li> </ul>                                                                                  |
| Poor Chip Control           |  | <ul style="list-style-type: none"> <li>Excessive heat in cutting zone</li> <li>Wrong grade</li> <li>Inadequate coolant supply</li> <li>Wrong turned dia. prior to threading</li> <li>Incorrect method of infeed</li> </ul>                                                                                      | <ul style="list-style-type: none"> <li>Reduce RPM /change depth of cut /check turned dia.</li> <li>Use coated grade /check turned dia./use M/B-Type inserts</li> <li>Apply coolant</li> <li>Check turned dia.</li> <li>Modify flank infeed 3-5°</li> </ul>                                                                 |

# Special Request Form Thread Turning

|                            |                                              |                                     |                                    |                              |                                         |
|----------------------------|----------------------------------------------|-------------------------------------|------------------------------------|------------------------------|-----------------------------------------|
| <b>Project Information</b> | Customer                                     | Industry                            | Country                            |                              |                                         |
|                            | Customer Goal (Productivity, Economy, etc.): |                                     |                                    |                              |                                         |
|                            | Proposal for:                                | <input type="radio"/> Finish Insert | <input type="radio"/> Rough Insert | <input type="radio"/> Holder | <input type="radio"/> Machining Concept |
|                            | ISCAR Representative:                        | Email:                              | Tel:                               |                              |                                         |
|                            | Competitors:                                 | Target Price:                       | Annual Consumption:                |                              |                                         |

|                  |                                                                                                     |                                    |                                  |                  |
|------------------|-----------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------|------------------|
| <b>Threading</b> | Designation                                                                                         | Pitch                              | Standard                         | Tolerance Clas   |
|                  | Major Dia.                                                                                          | Minor Dia.                         | Pitch Dia.                       | Number of Starts |
|                  | Threading Depth                                                                                     | <input type="radio"/> Through Hole | <input type="radio"/> Blind Hole |                  |
|                  | Special Form                                                                                        |                                    |                                  |                  |
|                  | For non-standard profiles, detailed information must be supplied (drawing, dimensions & tolerances) |                                    |                                  |                  |

|                                   |      |          |          |
|-----------------------------------|------|----------|----------|
| <b>Application</b>                | Part | Material | Hardness |
| <b>RH</b><br>Right-hand Threading |      |          |          |
|                                   |      |          |          |
| <b>LH</b><br>Left-hand Threading  |      |          |          |
|                                   |      |          |          |
| Insert Profile:                   |      |          |          |
|                                   |      |          |          |
| Infeed:                           |      |          |          |
|                                   |      |          |          |

|                    |                               |                             |                              |                             |
|--------------------|-------------------------------|-----------------------------|------------------------------|-----------------------------|
| <b>Attachments</b> | <input type="radio"/> Drawing | <input type="radio"/> Model | <input type="radio"/> Sketch | <input type="radio"/> Photo |
|--------------------|-------------------------------|-----------------------------|------------------------------|-----------------------------|

|                |          |                                                                                          |
|----------------|----------|------------------------------------------------------------------------------------------|
| <b>Machine</b> | Model    | Shank Type/Size                                                                          |
|                | Coolant: | <input type="radio"/> Internal <input type="radio"/> External <input type="radio"/> None |
|                | Type:    |                                                                                          |

|          |
|----------|
| Remarks: |
|----------|

# NON-ROTATING HOLDERS

**YOU**

INTELLIGENTLY?

**TURNING**



# CONTENTS

## **HOLDERS FOR SQUARE AND ROUND SHANK TOOLS 829**

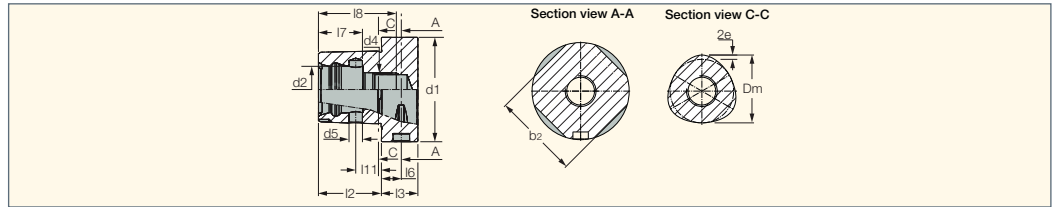
|                          |     |
|--------------------------|-----|
| CAMFIX Shanks.....       | 829 |
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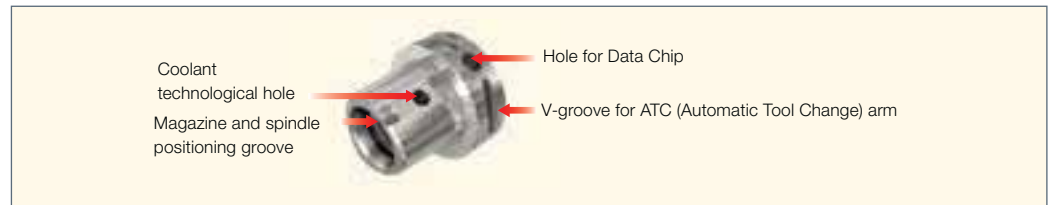
## **TOOL BLOCKS 689**

## **EXCHANGEABLE HEAD HOLDERS 693**



| CAMFIX     | b2   | d1 $\pm 0.1$ | d2 | d4      | d5 $\pm 0.1$ | Dm | e    | l1  | l2 $\pm 0.1$ | l3 min | l6 $\pm 0.15$ | l7 $\pm 0.15$ | l8 min | l11 $\pm 0.1$ |
|------------|------|--------------|----|---------|--------------|----|------|-----|--------------|--------|---------------|---------------|--------|---------------|
| <b>C3</b>  | 28.3 | 32           | 15 | M12x1.5 | 3.6          | 22 | 0.7  | 2.5 | 19           | 15     | 6             | 13            | 25     | 8             |
| <b>C4</b>  | 35.3 | 40           | 18 | M14x1.5 | 4.6          | 28 | 0.9  | 2.5 | 24           | 20     | 8             | 15            | 30     | 8             |
| <b>C5</b>  | 44.4 | 50           | 21 | M16x1.5 | 6.1          | 35 | 1.12 | 3   | 30           | 20     | 10            | 20            | 37     | 14            |
| <b>C6</b>  | 55.8 | 63           | 28 | M20x2   | 8.1          | 44 | 1.4  | 3   | 38           | 22     | 12            | 27            | 47     | 15.5          |
| <b>C8</b>  | 71.1 | 80           | 32 | M20x2   | 9.1          | 55 | 2    | 3   | 48           | 30     | 12            | 28            | 48     | 25            |
| <b>C8X</b> | 88.7 | 100          | 32 | M20x2   | 9.1          | 55 | 2    | 3   | 48           | 32     | 16            | 28            | 48     | 25            |
| <b>C10</b> | 88.3 | 100          | 43 | M20x2   | 12           | 72 | 2.8  | 3   | 60           | 36     | 16            | 40            | 70     | 26.5          |

### CAMFIX - ISO 26623-1 Standard Quick Change Shanks



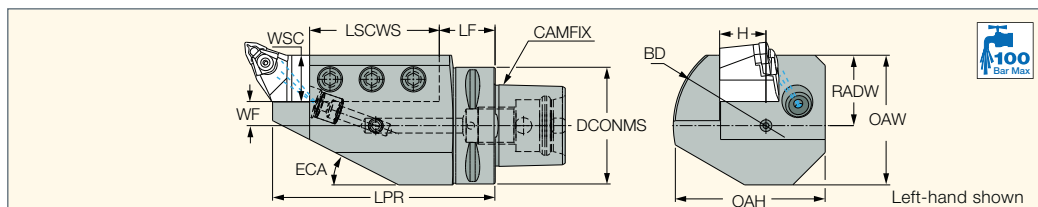
#### Features

- **Symmetrical design:** Due to the symmetrical design, the torque load is distributed on the polygon, providing a self-centering effect.
- **Rigidity:** The **CAMFIX** clamping mechanism is extremely rigid to counter bending forces.
- **Accuracy:** The taper and face contact ensure high repeatability within 2 microns, when operated with an automatic tool changer.

# CAMFIX

## C#-ASHR/L

Holders with CAMFIX  
Exchangeable Shanks for  
External Square Shank Tools



| Designation                          | DCONMS | H    | WSC  | WF    | LPR    | LSCWS | LF    | OAH   | RADW | OAW   | ECA  | BD     | DCP <sup>(2)</sup> |
|--------------------------------------|--------|------|------|-------|--------|-------|-------|-------|------|-------|------|--------|--------------------|
| <b>C4 ASHR/L 16-1</b>                | 40.00  | 16.0 | 16.0 | 7.00  | 104.00 | 70.00 | 34.00 | 50.00 | 23.0 | 43.50 | 30.0 | 60.00  | 1                  |
| <b>C5 ASHR/L 20-1</b>                | 50.00  | 20.0 | 20.0 | 10.00 | 98.00  | 63.50 | 24.50 | 78.00 | 30.0 | 59.00 | 30.0 | 90.00  | 1                  |
| <b>C6 ASHR/L 20-1</b>                | 63.00  | 20.0 | 20.0 | 10.00 | 100.00 | 63.50 | 26.50 | 78.00 | 30.0 | 59.00 | 30.0 | 90.00  | 1                  |
| <b>C6 ASHR/L 25-1</b>                | 63.00  | 25.0 | 25.0 | 13.00 | 120.00 | 70.00 | 30.00 | 82.00 | 38.0 | 70.00 | 27.0 | 100.00 | 1                  |
| <b>C6 ASHR 25 1-J <sup>(1)</sup></b> | 63.00  | 25.0 | 25.0 | 4.50  | 120.00 | 82.00 | 38.00 | 86.50 | 29.5 | 61.00 | 4.1  | 90.00  | 1                  |
| <b>C8 ASHR/L 32-1</b>                | 80.00  | 32.0 | 32.0 | 8.00  | 140.00 | 90.00 | 40.00 | 87.00 | 40.0 | 80.00 | 27.0 | 110.00 | 1                  |

<sup>(1)</sup> Recommended for Mazak INTEGREX! No interference problem on machine magazine

<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

## Spare Parts

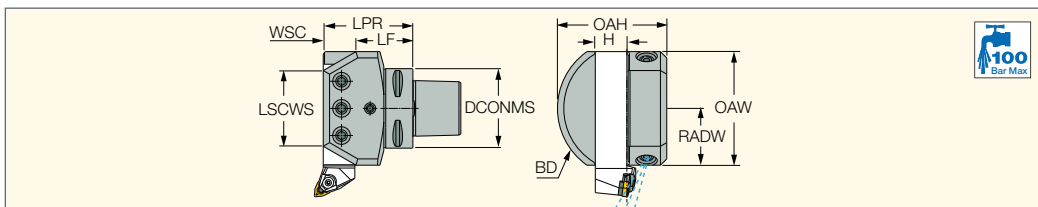
| Designation           |  |  |  |  |  |  |
|-----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>C4 ASHR/L 16-1</b> | SR M8X16 DIN915                                                                   | HW 5.0*                                                                           | SATZ-M10X1-M5                                                                     | COOLING TUBE C4*                                                                  | WRENCH NOZZLE HP M10*                                                               | WRENCH COOL TUBE C4*                                                                |
| <b>C5 ASHR/L 20-1</b> | SR M10X25 DIN915                                                                  | HW 5.0*                                                                           | SATZ-M10X1-M5                                                                     | COOLING TUBE C5*                                                                  | WRENCH NOZZLE HP M10*                                                               | WRENCH COOL TUBE C5*                                                                |
| <b>C6 ASHR/L 20-1</b> | SR M10X25 DIN915                                                                  | HW 5.0*                                                                           | SATZ-M10X1-M5                                                                     | COOLING TUBE C6*                                                                  | WRENCH NOZZLE HP M10*                                                               | WRENCH COOL TUBE C6*                                                                |
| <b>C6 ASHR/L 25-1</b> | SR M12X30 DIN915                                                                  | HW 6.0*                                                                           | SATZ-M12X1-M6                                                                     | COOLING TUBE C6*                                                                  | WRENCH NOZZLE HP M12*                                                               | WRENCH COOL TUBE C6*                                                                |
| <b>C8 ASHR/L 32-1</b> | SR M12X30 DIN915                                                                  | HW 6.0*                                                                           | SATZ-M12X1-M6                                                                     | COOLING TUBE C8*                                                                  | WRENCH NOZZLE HP M12*                                                               | WRENCH COOL TUBE C8*                                                                |

\* Optional, to be ordered separately

# CAMFIX

## C#-ASHA

Perpendicular Holders with  
CAMFIX Shanks for External  
Square Shank Tools



| Designation       | DCONMS | H    | WSC  | LPR   | LSCWS | LF    | RADW | OAW    | OAH  | BD     | DCP <sup>(1)</sup> |
|-------------------|--------|------|------|-------|-------|-------|------|--------|------|--------|--------------------|
| <b>C5 ASHA 20</b> | 50.00  | 20.0 | 20.0 | 58.00 | 46.00 | 38.00 | 38.0 | 76.00  | 76.5 | 90.00  | 1                  |
| <b>C6 ASHA 20</b> | 63.00  | 20.0 | 20.0 | 60.00 | 46.00 | 40.00 | 38.0 | 76.00  | 76.5 | 90.00  | 1                  |
| <b>C6 ASHA 25</b> | 63.00  | 25.0 | 25.0 | 71.00 | 61.00 | 46.00 | 45.0 | 90.00  | 86.6 | 110.00 | 1                  |
| <b>C8 ASHA 32</b> | 80.00  | 32.0 | 32.0 | 85.00 | 80.00 | 53.00 | 55.0 | 110.00 | 95.0 | 142.00 | 1                  |

<sup>(1)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

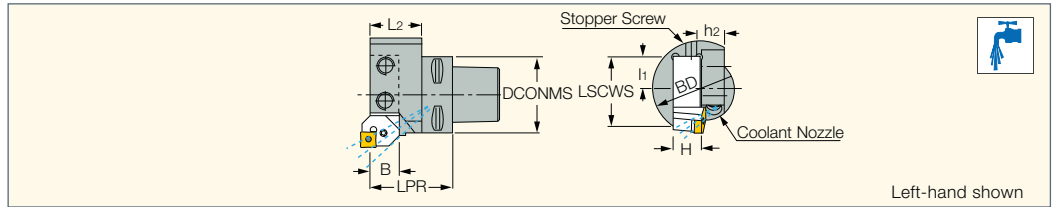
## Spare Parts

| Designation       |  |  |  |  |  |  |
|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>C5 ASHA 20</b> | SR M10X25 DIN915                                                                    | HW 5.0*                                                                             | SATZ-M10X1-M5                                                                       | WRENCH NOZZLE HP M10*                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C6 ASHA 20</b> | SR M10X25 DIN915                                                                    | HW 5.0*                                                                             | SATZ-M10X1-M5                                                                       | WRENCH NOZZLE HP M10*                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ASHA 25</b> | SR M12X30 DIN915                                                                    | HW 6.0*                                                                             | SATZ-M12X1-M6                                                                       | WRENCH NOZZLE HP M12*                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C8 ASHA 32</b> | SR M12X30 DIN915                                                                    | HW 6.0*                                                                             | SATZ-M12X1-M6                                                                       | WRENCH NOZZLE HP M12*                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |

\* Optional, to be ordered separately

**C#-ADE**

Holders with CAMFIX  
Exchangeable Shanks for  
External Square Shank Tools



Left-hand shown

| Designation         | DCONMS | LPR   | L2    | B    | BD    | LSCWS | I1    | H    | h2   | CP <sup>(1)</sup> | DCP <sup>(2)</sup> |
|---------------------|--------|-------|-------|------|-------|-------|-------|------|------|-------------------|--------------------|
| <b>C3 ADE 16R/L</b> | 32.00  | 45.00 | 28.10 | 16.0 | 65.00 | 45.0  | 20.00 | 16.0 | 20.0 | 100               | 0                  |
| <b>C4 ADE-20L</b>   | 40.00  | 49.20 | 29.10 | 20.0 | 87.00 | 57.0  | 32.00 | 20.0 | 26.0 | 100               | 1                  |
| <b>C4 ADE-20R</b>   | 40.00  | 49.20 | 27.30 | 20.0 | 87.00 | 57.0  | 32.00 | 20.0 | 26.0 | 100               | 1                  |
| <b>C5 ADE-20R/L</b> | 50.00  | 55.20 | 35.10 | 20.0 | 87.00 | 57.0  | 32.00 | 20.0 | 26.0 | 100               | 1                  |

- Use the tools with AD suffix
- Regular tools should be shortened

<sup>(1)</sup> Coolant pressure (Bar)

<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

**Spare Parts**

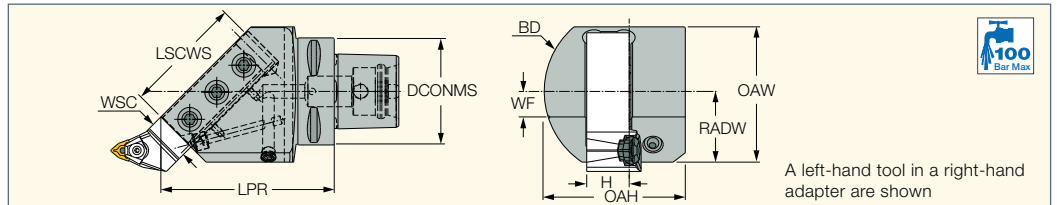
| Designation         |  |  |  |  |  |  |  |
|---------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>C3 ADE 16R/L</b> | SR M10X20 DIN915                                                                  | HW 3.0*                                                                           | SR M6X8 DIN916 <sup>(a)</sup>                                                     | HW 5.0*                                                                           |                                                                                    |                                                                                     | SATZ-M8X1-M3                                                                        |
| <b>C4 ADE-20L</b>   | SR M10X16DIN912                                                                   | HW 4.0*                                                                           | SR M8X10 DIN913 <sup>(a)</sup>                                                    | HW 8.0*                                                                           | COOLING TUBE C4*                                                                   | WRENCH COOL TUBE C4*                                                                | SATZ-M10X1-M5                                                                       |
| <b>C4 ADE-20R</b>   | SR M10X16DIN912                                                                   |                                                                                   | SR M8X10 DIN913 <sup>(a)</sup>                                                    | HW 8.0*                                                                           | COOLING TUBE C4*                                                                   | WRENCH COOL TUBE C4*                                                                | SATZ-M10X1-M5                                                                       |
| <b>C5 ADE-20L</b>   |                                                                                   | HW 4.0                                                                            | SR M8X10 DIN916 <sup>(a)</sup>                                                    | HW 8.0*                                                                           | COOLING TUBE C5*                                                                   | WRENCH COOL TUBE C5*                                                                | EZ 125                                                                              |
| <b>C5 ADE-20R</b>   |                                                                                   |                                                                                   | SR M8X10 DIN916 <sup>(a)</sup>                                                    |                                                                                   | COOLING TUBE C5*                                                                   | WRENCH COOL TUBE C5*                                                                | SATZ-M10X1-M5                                                                       |

\* Optional, to be ordered separately

<sup>(a)</sup> Stopper screw

**C#-ASHR/L-45**

Holders with CAMFIX  
Exchangeable Shanks Carrying  
Square Shank Tools for 45°  
Mounting on Turn-Mill Machines



A left-hand tool in a right-hand adapter are shown

| Designation            | DCONMS | H    | WSC  | WF    | LPR    | LSCWS  | OAH    | RADW | OAW    | BD     | DCP <sup>(1)</sup> |
|------------------------|--------|------|------|-------|--------|--------|--------|------|--------|--------|--------------------|
| <b>C5 ASHR/L 20-45</b> | 50.00  | 20.0 | 20.0 | 15.00 | 96.30  | -      | 62.00  | 36.0 | 67.50  | 72.00  | 1                  |
| <b>C6 ASHR/L 20-45</b> | 63.00  | 20.0 | 20.0 | 15.00 | 98.30  | -      | 62.00  | 36.0 | 67.50  | 72.00  | 1                  |
| <b>C6 ASHR/L 25-45</b> | 63.00  | 25.0 | 25.0 | 15.00 | 102.00 | 70.00  | 83.00  | 41.6 | 79.60  | 100.00 | 1                  |
| <b>C8 ASHR/L 32-45</b> | 80.00  | 32.0 | 32.0 | 17.00 | 140.00 | 100.00 | 110.00 | 50.0 | 110.00 | 140.00 | 1                  |

<sup>(1)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

**Spare Parts**

| Designation            |  |  |  |  |  |  |
|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>C5 ASHR/L 20-45</b> | SR M10X25 DIN915                                                                    | HW 5.0*                                                                             | SATZ-M10X1-M5                                                                       | WRENCH NOZZLE HP M10*                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C6 ASHR/L 20-45</b> | SR M10X25 DIN915                                                                    | HW 5.0*                                                                             | SATZ-M10X1-M5                                                                       | WRENCH NOZZLE HP M10*                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ASHR/L 25-45</b> | SR M12X30 DIN915                                                                    | HW 6.0*                                                                             | SATZ-M10X1-M5                                                                       | WRENCH NOZZLE HP M10*                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C8 ASHR/L 32-45</b> | SR M12X30 DIN915                                                                    | HW 6.0*                                                                             | SATZ-M12X1-M6                                                                       | WRENCH NOZZLE HP M12*                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |

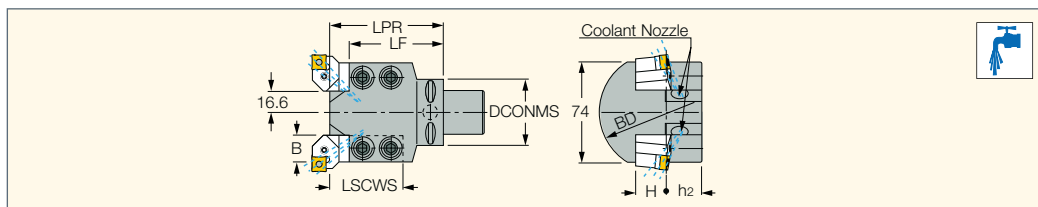
\* Optional, to be ordered separately



# CAMFIX

## C#-ADES

Holders with CAMFIX  
Exchangeable Shanks for  
External Square Shank Tools



| Designation       | DCONMS | LPR   | LSCWS | LF    | B    | BD    | H    | h2   | DCP <sup>(1)</sup> |
|-------------------|--------|-------|-------|-------|------|-------|------|------|--------------------|
| <b>C4 ADES-20</b> | 40.00  | 85.00 | 54.00 | 71.00 | 20.0 | 90.00 | 20.0 | 26.0 | 1                  |
| <b>C5 ADES-20</b> | 50.00  | 85.00 | 54.00 | 71.00 | 20.0 | 90.00 | 20.0 | 26.0 | 1                  |

• Use the tools with AD suffix. Regular tools should be shortened.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## Spare Parts

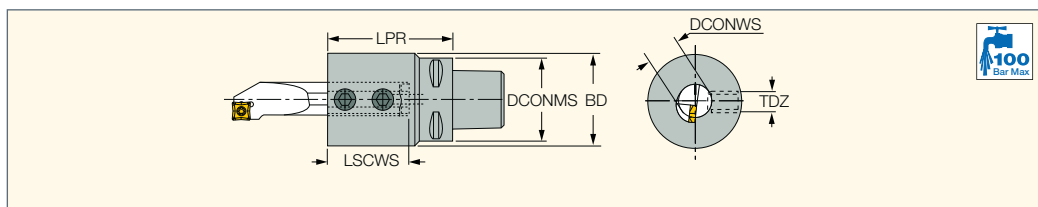
| Designation       |  |  |  |  |  |
|-------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>C4 ADES-20</b> |                                                                                   | SR M8X6 DIN913                                                                    | SATZ-M10X1-M5                                                                     | COOLING TUBE C4*                                                                    | WRENCH COOL TUBE C4*                                                                |
| <b>C5 ADES-20</b> | SR M10X16DIN912                                                                   | SR M8X6 DIN913                                                                    | SATZ-M10X1-M5                                                                     | COOLING TUBE C5*                                                                    | WRENCH COOL TUBE C5*                                                                |

\* Optional, to be ordered separately

# CAMFIX

## C#-ADI

Holders with CAMFIX  
Exchangeable Shanks  
for Boring Bars



| Designation      | DCONMS | LPR    | LSCWS | DCONWS | BD    | TDZ |  kg | DCP <sup>(1)</sup> |  |  |  |  |
|------------------|--------|--------|-------|--------|-------|-----|----------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>C3 ADI 10</b> | 32.00  | 50.00  | 20.0  | 10.00  | 36.00 | M6  | 0.30                                                                                   | 0                  | SR M6X10 DIN1835B                                                                   | HW 3.0*                                                                               |                                                                                       |                                                                                       |
| <b>C3 ADI 12</b> | 32.00  | 50.00  | 21.5  | 12.00  | 36.00 | M8  | 0.30                                                                                   | 0                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               |                                                                                       |                                                                                       |
| <b>C3 ADI 16</b> | 32.00  | 50.00  | 29.5  | 16.00  | 36.00 | M8  | 0.30                                                                                   | 0                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               |                                                                                       |                                                                                       |
| <b>C4 ADI 10</b> | 40.00  | 50.00  | 20.0  | 10.00  | 36.00 | M6  | 0.47                                                                                   | 1                  | SR M6X10 DIN1835B                                                                   | HW 3.0*                                                                               | COOLING TUBE C4*                                                                      | WRENCH COOL TUBE C4*                                                                  |
| <b>C4 ADI 12</b> | 40.00  | 50.00  | 24.0  | 12.00  | 36.00 | M8  | 0.46                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C4*                                                                      | WRENCH COOL TUBE C4*                                                                  |
| <b>C4 ADI 16</b> | 40.00  | 50.00  | 32.0  | 16.00  | 36.00 | M8  | 0.43                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C4*                                                                      | WRENCH COOL TUBE C4*                                                                  |
| <b>C4 ADI 20</b> | 40.00  | 60.00  | 40.0  | 20.00  | 36.00 | M10 | 0.47                                                                                   | 1                  | SR M10X12 DIN1835-B                                                                 | HW 5.0*                                                                               | COOLING TUBE C4*                                                                      | WRENCH COOL TUBE C4*                                                                  |
| <b>C4 ADI 25</b> | 40.00  | 70.00  | 45.0  | 25.00  | 54.00 | M12 | 0.97                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C4*                                                                      | WRENCH COOL TUBE C4*                                                                  |
| <b>C5 ADI 10</b> | 50.00  | 60.00  | 26.0  | 10.00  | 36.00 | M6  | 0.73                                                                                   | 1                  | SR M6X10 DIN1835B                                                                   | HW 3.0*                                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C5 ADI 12</b> | 50.00  | 60.00  | 26.0  | 12.00  | 36.00 | M8  | 0.72                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C5 ADI 16</b> | 50.00  | 60.00  | 32.0  | 16.00  | 36.00 | M8  | 0.69                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C5 ADI 20</b> | 50.00  | 60.00  | 40.0  | 20.00  | 36.00 | M10 | 0.69                                                                                   | 1                  | SR M10X12 DIN1835-B                                                                 | HW 5.0*                                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C5 ADI 25</b> | 50.00  | 70.00  | 50.0  | 25.00  | 54.00 | M12 | 1.11                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C5 ADI 32</b> | 50.00  | 100.00 | 76.0  | 32.00  | 68.00 | M12 | 2.15                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C5*                                                                      | WRENCH COOL TUBE C5*                                                                  |
| <b>C6 ADI 12</b> | 63.00  | 65.00  | 36.0  | 12.00  | 36.00 | M8  | 1.07                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ADI 16</b> | 63.00  | 65.00  | 36.0  | 16.00  | 36.00 | M8  | 1.05                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ADI 20</b> | 63.00  | 65.00  | 40.0  | 20.00  | 36.00 | M10 | 1.00                                                                                   | 1                  | SR M10X12 DIN1835-B                                                                 | HW 5.0*                                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ADI 25</b> | 63.00  | 76.00  | 51.0  | 25.00  | 54.00 | M12 | 0.80                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ADI 32</b> | 63.00  | 100.00 | 76.0  | 32.00  | 68.00 | M12 | 2.44                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ADI 40</b> | 63.00  | 100.00 | 76.0  | 40.00  | 98.00 | M12 | 4.47                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C6 ADI 50</b> | 63.00  | 115.00 | 76.0  | 50.00  | 98.00 | M12 | 4.80                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C6*                                                                      | WRENCH COOL TUBE C6*                                                                  |
| <b>C8 ADI 12</b> | 80.00  | 70.00  | 36.0  | 12.00  | 36.00 | M8  | 2.05                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |
| <b>C8 ADI 16</b> | 80.00  | 70.00  | 36.0  | 16.00  | 36.00 | M8  | 2.00                                                                                   | 1                  | SR M8X10 DIN1835-B                                                                  | HW 4.0*                                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |
| <b>C8 ADI 20</b> | 80.00  | 70.00  | 40.0  | 20.00  | 36.00 | M10 | 1.98                                                                                   | 1                  | SR M10X12 DIN1835-B                                                                 | HW 5.0*                                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |
| <b>C8 ADI 25</b> | 80.00  | 80.00  | 51.0  | 25.00  | 54.00 | M12 | 2.43                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |
| <b>C8 ADI 32</b> | 80.00  | 110.00 | 86.0  | 32.00  | 68.00 | M12 | 3.44                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |
| <b>C8 ADI 40</b> | 80.00  | 115.00 | 86.0  | 40.00  | 98.00 | M12 | 5.81                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |
| <b>C8 ADI 50</b> | 80.00  | 115.00 | 86.0  | 50.00  | 98.00 | M12 | 5.36                                                                                   | 1                  | SR M12X16 DIN1835-B                                                                 | HW 6.0*                                                                               | COOLING TUBE C8*                                                                      | WRENCH COOL TUBE C8*                                                                  |

• Use the tools with "AD" suffix

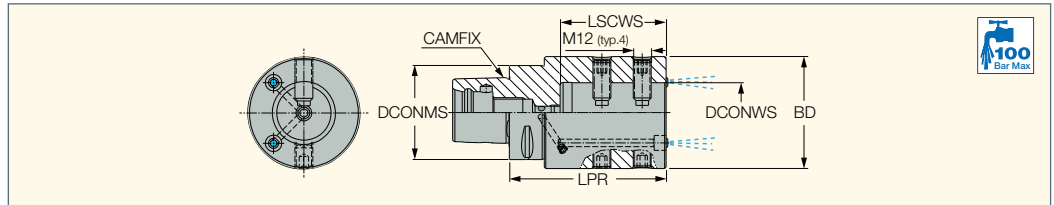
• Regular tools should be shortened

(1) 1 - Slot for data chip, 0 - Without slot for data chip

\* Optional, to be ordered separately

**C#-ABB**

Adapters with CAMFIX  
Exchangeable Shanks for Boring  
Bars with Reduction Sleeves



| Designation                       | DCONMS | DCONWS | BD    | LPR    | LSCWS | DCP <sup>(2)</sup> |
|-----------------------------------|--------|--------|-------|--------|-------|--------------------|
| <b>C4 ABB 25-60</b>               | 40.00  | 25.00  | 63.00 | 100.00 | 60.0  | 1                  |
| <b>C5 ABB-25-60</b>               | 50.00  | 25.00  | 63.00 | 100.00 | 60.0  | 1                  |
| <b>C6 ABB-25-60</b>               | 63.00  | 25.00  | 63.00 | 100.00 | 60.0  | 1                  |
| <b>C6ABB-25-60C<sup>(1)</sup></b> | 63.00  | 25.00  | 63.00 | 95.00  | 60.0  | 0                  |
| <b>C6 ABB-40-70</b>               | 63.00  | 40.00  | 75.00 | 105.00 | 71.0  | 1                  |
| <b>C6ABB-40-70C<sup>(1)</sup></b> | 63.00  | 40.00  | 75.00 | 105.00 | 71.0  | 0                  |
| <b>C8 ABB 25-60</b>               | 80.00  | 25.00  | 63.00 | 100.00 | 60.0  | 1                  |
| <b>C8 ABB 40-72</b>               | 80.00  | 40.00  | 75.00 | 105.00 | 71.0  | 1                  |

• For SC reduction sleeves, see page 840

<sup>(1)</sup> Different coolant outlet position and number of screws

<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

**Spare Parts**

| Designation         |                                    |                                 |                               |         |               |                       |                  |                      |
|---------------------|------------------------------------|---------------------------------|-------------------------------|---------|---------------|-----------------------|------------------|----------------------|
| <b>C4 ABB 25-60</b> | SR M10X12 DIN1835-B <sup>(a)</sup> | SR M10X20 DIN915 <sup>(b)</sup> | SR M10X6DIN913 <sup>(c)</sup> | HW 5.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C4* | WRENCH COOL TUBE C4* |
| <b>C5 ABB-25-60</b> | SR M10X12 DIN1835-B <sup>(a)</sup> | SR M10X20 DIN915 <sup>(b)</sup> | SR M10X6DIN913 <sup>(c)</sup> | HW 5.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C5* | WRENCH COOL TUBE C5* |
| <b>C6 ABB-25-60</b> | SR M10X12 DIN1835-B <sup>(a)</sup> | SR M10X20 DIN915 <sup>(b)</sup> | SR M10X6DIN913 <sup>(c)</sup> | HW 5.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C6* | WRENCH COOL TUBE C6* |
| <b>C6ABB-25-60C</b> | SR M10X12 DIN1835-B                | SR M10X20 DIN915*               | SR M10X6DIN913                | HW 6.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C6* | WRENCH COOL TUBE C6* |
| <b>C6 ABB-40-70</b> | SR M12X16 DIN1835-B <sup>(a)</sup> | SR M12X30 DIN915 <sup>(b)</sup> | SR M10X6DIN913 <sup>(c)</sup> | HW 6.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C6* | WRENCH COOL TUBE C6* |
| <b>C6ABB-40-70C</b> | SR M12X16 DIN1835-B                | SR M12X30 DIN915*               | SR M10X6DIN913                | HW 6.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C6* | WRENCH COOL TUBE C6* |
| <b>C8 ABB 25-60</b> | SR M10X12 DIN1835-B <sup>(a)</sup> | SR M10X20 DIN915 <sup>(b)</sup> | SR M10X6DIN913 <sup>(c)</sup> | HW 5.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C8* | WRENCH COOL TUBE C8* |
| <b>C8 ABB 40-72</b> | SR M12X16 DIN1835-B <sup>(a)</sup> | SR M12X30 DIN915 <sup>(b)</sup> | SR M10X6DIN913 <sup>(c)</sup> | HW 6.0° | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | COOLING TUBE C8* | WRENCH COOL TUBE C8* |

\* Optional, to be ordered separately

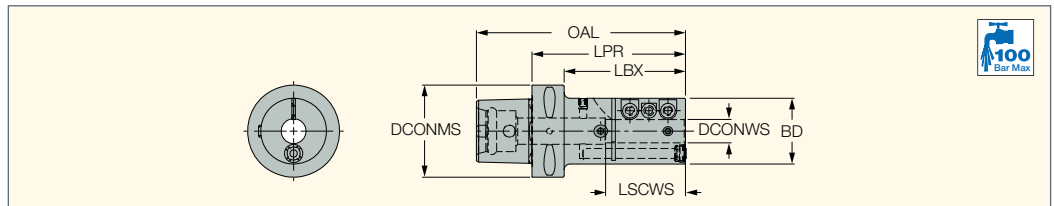
<sup>(a)</sup> Used on A-type sleeves

<sup>(b)</sup> Used on B-type sleeves

<sup>(c)</sup> Rear stopper screw

**C#-AV-JHP**

CAMFIX Holders for  
Anti-Vibration Tools

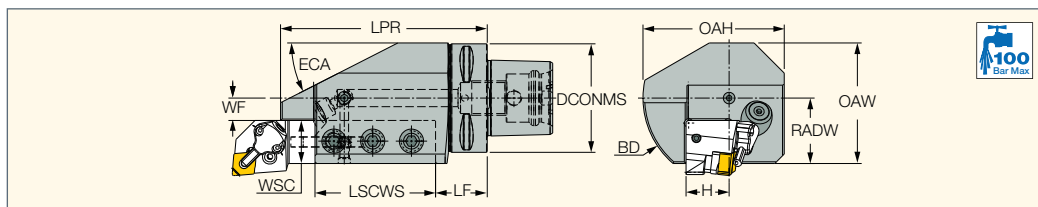


| Designation          | DCONMS | DCONWS | OAL    | BD    | LPR    | LSCWS | LBX   |      |
|----------------------|--------|--------|--------|-------|--------|-------|-------|------|
| <b>C6 AV-D16-JHP</b> | 63.00  | 16.00  | 143.00 | 45.00 | 105.00 | 55.00 | 83.00 | 1.57 |
| <b>C6 AV-D20-JHP</b> | 63.00  | 20.00  | 143.00 | 55.00 | 105.00 | 80.00 | 83.00 | 2.00 |
| <b>C6 AV-D25-JHP</b> | 63.00  | 25.00  | 143.00 | 55.00 | 105.00 | 80.00 | 83.00 | 1.89 |
| <b>C6 AV-D32-JHP</b> | 63.00  | 32.00  | 143.00 | 65.00 | 105.00 | 85.00 | 66.60 | 2.23 |
| <b>C6 AV-D40-JHP</b> | 63.00  | 40.00  | 143.00 | 75.00 | 105.00 | 85.00 | 64.00 | 2.49 |

## CAMFIX

### C#-ASHR/L-HPMC

Holders with CAMFIX  
Exchangeable Shanks for  
External Square Shank Tools with  
High-Pressure Multi-Connection



| Designation                        | DCONMS | LPR    | LSCWS | LF    | WF    | H    | WSC  | OAH   | RADW  | OAW   | BD     | ECA  | DCP <sup>(2)</sup> |
|------------------------------------|--------|--------|-------|-------|-------|------|------|-------|-------|-------|--------|------|--------------------|
| C6 ASHR/L 25-1 HPMC                | 63.00  | 120.00 | 70.00 | 30.00 | 13.00 | 25.0 | 25.0 | 82.00 | 38.00 | 70.00 | 100.00 | 27.0 | 1                  |
| C6 ASHR 25-1-J HPMC <sup>(1)</sup> | 63.00  | 120.00 | 82.00 | 38.00 | 4.50  | 25.0 | 25.0 | 76.00 | 29.50 | 61.00 | 90.00  | 4.1  | 1                  |

<sup>(1)</sup> Recommended for Mazak INTEGREX! No interference problem on machine magazine

<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

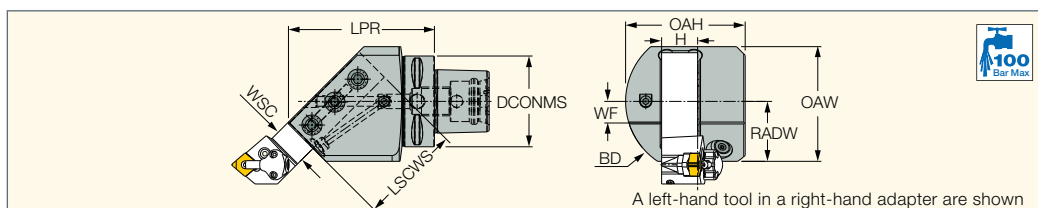
| Designation         |  |  |  |  |  |  |  |  |
|---------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| C6 ASHR/L 25-1 HPMC | SATZ-M12X1-M6                                                                     | SR M12X30 DIN915                                                                  | SR M8X6 DIN913                                                                    | SR M6X6 DIN913                                                                    | HW 6.0°                                                                           | COOLING TUBE C6*                                                                   | WRENCH COOL TUBE C6*                                                                | WRENCH NOZZLE HP M12*                                                               |

\* Optional, to be ordered separately

## CAMFIX

### C#-ASHR/L-45-HPMC

Holders with CAMFIX  
Exchangeable Shanks Carrying  
Square Shank Tools for 45°  
Mounting on Turn-Mill  
Machines with HPMC



| Designation          | DCONMS | H    | WSC  | LSCWS | LPR    | OAH   | RADW  | OAW   | WF    | BD     | DCP <sup>(1)</sup> |
|----------------------|--------|------|------|-------|--------|-------|-------|-------|-------|--------|--------------------|
| C6 ASHR/L 25-45 HPMC | 63.00  | 25.0 | 25.0 | 70.00 | 101.30 | 83.00 | 38.00 | 79.60 | 15.00 | 100.00 | 1                  |

<sup>(1)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

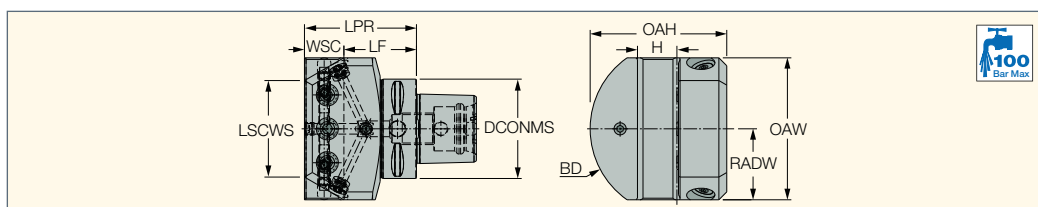
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|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| C6 ASHR/L 25-45 HPMC | SATZ-M10X1-M5                                                                       | SR M12X30 DIN915                                                                    | SR M8X6 DIN913                                                                      | SR M6X6 DIN913                                                                      | HW 6.0°                                                                             | COOLING TUBE C6*                                                                     | WRENCH COOL TUBE C6*                                                                  | WRENCH NOZZLE HP M10*                                                                 |

\* Optional, to be ordered separately

## CAMFIX

### C#-ASHA-HPMC

Perpendicular Holders with  
CAMFIX Shanks for External  
Square Shank Tools with High-  
Pressure Multi-Connection



| Designation     | DCONMS | H    | WSC  | LPR   | LSCWS | LF    | RADW  | OAW   | OAH   | BD     | DCP <sup>(1)</sup> |
|-----------------|--------|------|------|-------|-------|-------|-------|-------|-------|--------|--------------------|
| C6 ASHA 25 HPMC | 63.00  | 25.0 | 25.0 | 71.00 | 61.20 | 46.00 | 45.00 | 90.00 | 86.50 | 110.00 | 1                  |

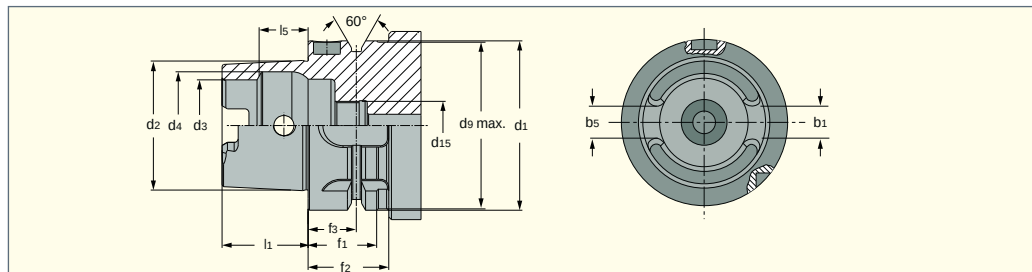
<sup>(1)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

| Designation     |  |  |  |  |  |  |  |  |
|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| C6 ASHA 25 HPMC | SATZ-M12X1-M6                                                                       | SR M12X30 DIN915                                                                    | SR M8X6 DIN913                                                                      | SR M6X6 DIN913                                                                      | HW 6.0°                                                                             | COOLING TUBE C6*                                                                     | WRENCH COOL TUBE C6*                                                                  | WRENCH NOZZLE HP M12*                                                                 |

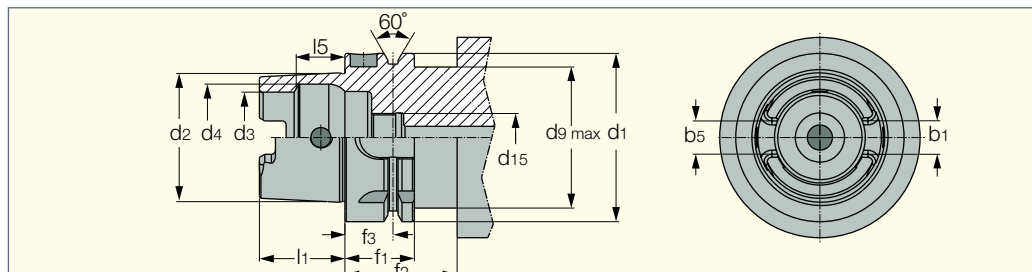
\* Optional, to be ordered separately

## HSK A WH Complies with ICTM Standards (ISO 12164-3)



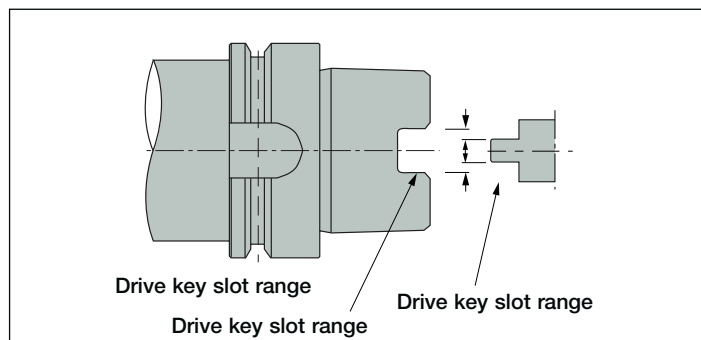
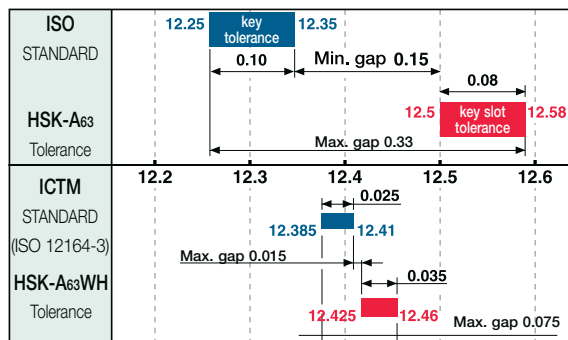
| HSK-A WH | d <sub>1</sub> h <sub>10</sub> | d <sub>2</sub> | d <sub>3</sub> H <sub>10</sub> | d <sub>4</sub> H <sub>11</sub> | d <sub>9</sub> max | d <sub>15</sub> | l <sub>1</sub> -0.2 | l <sub>5</sub> JS10 | b <sub>1</sub> ±0.04 | b <sub>5</sub> ±0.035 | f <sub>1</sub> -0.1 | f <sub>2</sub> min | f <sub>3</sub> ±0.1 |
|----------|--------------------------------|----------------|--------------------------------|--------------------------------|--------------------|-----------------|---------------------|---------------------|----------------------|-----------------------|---------------------|--------------------|---------------------|
| 63       | 63                             | 48             | 34                             | 40                             | 62                 | M18X1           | 32                  | 18.13               | 12.54                | 12.425                | 26                  | 30                 | 18                  |
| 100      | 100                            | 75             | 53                             | 63                             | 99                 | M24X1.5         | 50                  | 28.56               | 20.02                | 19.91                 | 29                  | 34                 | 20                  |

## HSK A TM Suitable for all Multi-Tasking Machines Models



| HSK A-TM | d <sub>1</sub> h <sub>10</sub> | d <sub>2</sub> | d <sub>3</sub> H <sub>10</sub> | d <sub>4</sub> H <sub>11</sub> | d <sub>9</sub> max | d <sub>15</sub> | l <sub>1</sub> -0.2 | l <sub>5</sub> JS10 | b <sub>1</sub> ±0.04 | b <sub>5</sub> ±0.035 | f <sub>1</sub> -0.1 | f <sub>2</sub> min | f <sub>3</sub> ±0.1 |
|----------|--------------------------------|----------------|--------------------------------|--------------------------------|--------------------|-----------------|---------------------|---------------------|----------------------|-----------------------|---------------------|--------------------|---------------------|
| 63       | 63                             | 48             | 34                             | 40                             | 52.8               | M18x1           | 32                  | 18.13               | 12.54                | 12.425                | 26                  | 42                 | 18                  |

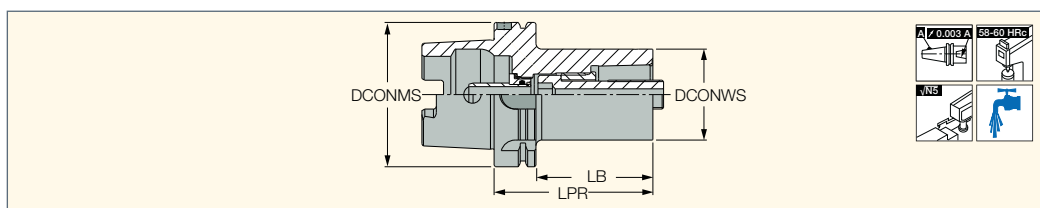
### HSK A vs. HSK A...WH Tolerance



## HSK

### HSK-C#

CAMFIX (ISO 26623-1) Holders with HSK ISO 12164-3 Form A Tapered Shanks



| Designation          | DCONMS | DCONWS | LPR    | LB    | DCP <sup>(1)</sup> | kg   |
|----------------------|--------|--------|--------|-------|--------------------|------|
| C4 AD HSK A63WHX080  | 63.00  | 40.00  | 80.00  | 54.00 | 1                  | 1.10 |
| C5 AD HSK A63WHX90   | 63.00  | 50.00  | 90.00  | 64.00 | 1                  | 1.44 |
| C5 AD HSK A100WHX100 | 100.00 | 50.00  | 100.00 | 71.00 | 1                  | 2.90 |
| C6 AD HSK A100WHX110 | 100.00 | 63.00  | 110.00 | 81.00 | 1                  | 3.61 |
| C8 AD HSK A100WHX120 | 100.00 | 80.00  | 120.00 | 91.00 | 1                  | 4.79 |

• Note: To enable clamping the part to be attached, first remove the cooling tube

<sup>(1)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

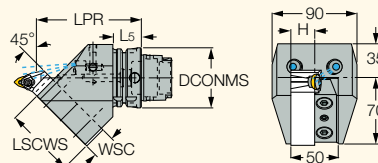
| Designation          |                |          |                     |                           |                          |                      |
|----------------------|----------------|----------|---------------------|---------------------------|--------------------------|----------------------|
| C4 AD HSK A63WHX080  | SR M14X58 C4   | HW 8.0°  | MT RING M22X17XC4   | COOLING TUBE HSK A63      | WRENCH COOL TUBE HSK63*  | WRENCH C4 DRW NUT*   |
| C5 AD HSK A63WHX90   | SR M16X70 C5   | HW 10.0° | MT RING M25X20XC5   | COOLING TUBE HSK A63      | WRENCH COOL TUBE HSK63*  | WRENCH C5 DRW NUT*   |
| C5 AD HSK A100WHX100 | SR M16X70 C5   | HW 10.0° | MT RING M25X20XC5   | COOLING TUBE HSK A100     | WRENCH COOL TUBE HSK100* | WRENCH C5 DRW NUT*   |
| C6 AD HSK A100WHX110 | SR M20X87 C6/8 | HW 14.0° | MT RING M30X24XC6/8 | COOLING TUBE HSK A100C6/8 | WRENCH COOL TUBE HSK100* | WRENCH C6-8 DRW NUT* |
| C8 AD HSK A100WHX120 | SR M20X87 C6/8 | HW 14.0° | MT RING M30X24XC6/8 | COOLING TUBE HSK A100C6/8 | WRENCH COOL TUBE HSK100* | WRENCH C6-8 DRW NUT* |

\* Optional, to be ordered separately

## HSK

### HSK A-WH-ASHN-45

Square Shank Tool Adapters with HSK Exchangeable Shanks for 45° Mounting on Turn-Mill Machines



Right-hand shown

| Designation                         | DCONMS | H    | WSC  | LPR    | LSCWS  | L5    | DCP <sup>(2)</sup> |                  |                 |               |                       |
|-------------------------------------|--------|------|------|--------|--------|-------|--------------------|------------------|-----------------|---------------|-----------------------|
| HSK A63WH ASHN 25 45 <sup>(1)</sup> | 63.00  | 25.0 | 25.0 | 110.00 | 72.00  | 30.00 | 1                  | SR M10X25 DIN912 | SR M8X20 DIN916 | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* |
| HSK A100WH ASHN 32 45*              | 100.00 | 32.0 | 32.0 | 145.00 | 100.00 | 35.00 | 1                  | SR M10X35 DIN912 |                 | SATZ-M12X1-M6 |                       |

- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)
- For using left-hand toolholder, the position of the clamping spacer must be changed
- Complies with ICTM standard (ISO 12164-3)

<sup>(1)</sup> Not suitable for ATC (automatic tool changer) on some multi-tasking machine models, please consult your MTB

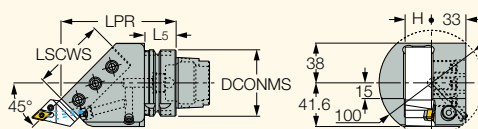
<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

\* Optional, to be ordered separately

## HSK

### HSK A63WH-ASHR/L-45

Square Shank Tool Adapters with HSK-T Exchangeable Shanks for 45° Mounting on Turn-Mill Machines



A left-hand tool in a right-hand adapter are shown

| Designation                           | DCONMS | H    | LPR    | LSCWS | L5    | DCP <sup>(2)</sup> |                  |               |                       |
|---------------------------------------|--------|------|--------|-------|-------|--------------------|------------------|---------------|-----------------------|
| HSK A63WH ASHR/L 25 45 <sup>(1)</sup> | 63.00  | 25.0 | 110.00 | 70.00 | 30.00 | 1                  | SR M12X30 DIN915 | SATZ-M10X1-M5 | WRENCH NOZZLE HP M10* |

- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)
- Complies with ICTM standard (ISO 12164-3)

<sup>(1)</sup> Not suitable for ATC (automatic tool changer) on some multi-tasking machine models, please consult your MTB

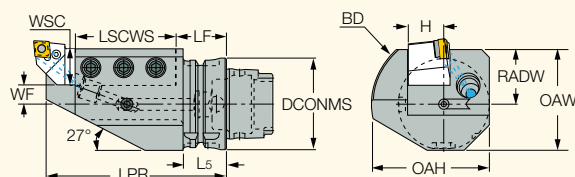
<sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

\* Optional, to be ordered separately

## HSK

### HSK A-WH-ASHR/L-1

Square Shank Tool Adapters with HSK Exchangeable Shanks for Turn-Mill Machines



Left-hand shown

| Designation            | DCONMS | H    | WSC  | WF    | LPR    | LSCWS | LF    | L5    | OAH   | RADW | OAW   | BD     | DCP <sup>(1)</sup> |
|------------------------|--------|------|------|-------|--------|-------|-------|-------|-------|------|-------|--------|--------------------|
| HSK A63WH ASHR/L 25 1  | 63.00  | 25.0 | 25.0 | 13.00 | 125.00 | 70.00 | 35.00 | 30.00 | 82.00 | 38.0 | 70.00 | 100.00 | 1                  |
| HSK A100WH ASHR/L 32 1 | 100.00 | 32.0 | 32.0 | 8.00  | 145.00 | 90.00 | 45.00 | 38.00 | 85.00 | 40.0 | 84.00 | 100.00 | 1                  |

- Complies with ICTM standard (ISO 12164-3)

Not suitable for ATC (automatic tool changer) on some multi-tasking machine models, please consult your MTB

- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)

<sup>(1)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

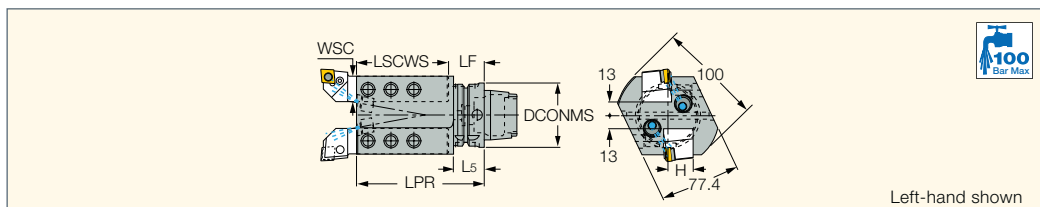
| Designation       |                  |         |               |                       |
|-------------------|------------------|---------|---------------|-----------------------|
| HSK A-WH-ASHR/L-1 | SR M12X30 DIN915 | HW 6.0* | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* |

\* Optional, to be ordered separately

## HSK

### HSK A63WH-ASHR/L-2

Twin Square Shank Tool  
Adapters with HSK Exchangeable  
Shanks for Turn-Mill Machines



Left-hand shown

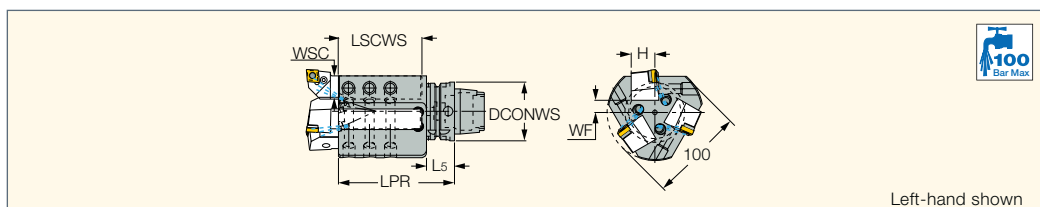
| Designation                          | DCONMS | H    | LF    | WSC  | LPR    | LSCWS | L5    | DCP <sup>(2)</sup> |                  |               |                       |
|--------------------------------------|--------|------|-------|------|--------|-------|-------|--------------------|------------------|---------------|-----------------------|
| HSK A63WH ASHR/L 25 2 <sup>(1)</sup> | 63.00  | 25.0 | 35.00 | 25.0 | 125.00 | 95.00 | 30.00 | 1                  | SR M12X30 DIN915 | SATZ-M12X1-M6 | WRENCH NOZZLE-HP M12* |

- Complies with ICTM standard (ISO 12164-3)
- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)
- <sup>(1)</sup> Not suitable for ATC (automatic tool changer) on some multi-tasking machine models, please consult your MTB
- <sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip
- \* Optional, to be ordered separately

## HSK

### HSK A63WH-ASHR/L-3

Triple Square Shank  
Tool Adapters with HSK  
Exchangeable Shanks for  
Mounting on Turn-Mill Machines



Left-hand shown

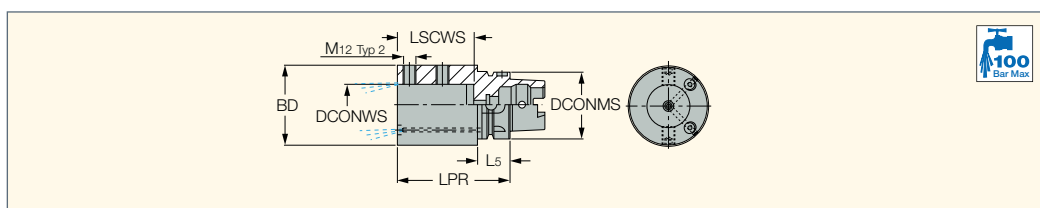
| Designation                          | DCONMS | H    | WSC  | WF    | LPR    | LSCWS | L5    | DCP <sup>(2)</sup> |                  |              |
|--------------------------------------|--------|------|------|-------|--------|-------|-------|--------------------|------------------|--------------|
| HSK A63WH ASHR/L 25 3 <sup>(1)</sup> | 63.00  | 25.0 | 25.0 | 13.00 | 125.00 | 90.00 | 30.00 | 1                  | SR M12X30 DIN915 | SATZ-M8X1-M3 |

- Complies with ICTM standard (ISO 12164-3)
- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)
- <sup>(1)</sup> Not suitable for ATC (automatic tool changer) on some multi-tasking machine models, please consult your MTB
- <sup>(2)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

## HSK

### HSK A-WH ABB

Adapters with HSK  
Exchangeable Shanks for Boring  
Bars with Reduction Sleeves



| Designation       | DCONMS | BD    | DCONWS | LPR    | LSCWS | L5    | DCP <sup>(1)</sup> |
|-------------------|--------|-------|--------|--------|-------|-------|--------------------|
| HSK A63WH ABB 40  | 63.00  | 75.00 | 40.00  | 105.00 | 71.0  | 30.00 | 1                  |
| HSK A100WH ABB 40 | 100.00 | 82.00 | 40.00  | 115.00 | 71.0  | 29.00 | 1                  |
| HSK A100WH ABB 50 | 100.00 | 92.00 | 50.00  | 125.00 | 83.0  | 29.00 | 1                  |

- Complies with ICTM standard (ISO 12164-3)
- Not suitable for ATC (automatic tool changer) on some multi-tasking machine models, please consult your MTB
- A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)
- <sup>(1)</sup> 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

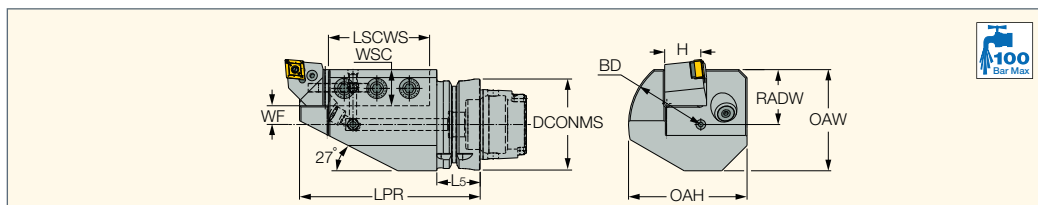
| Designation  |                                    |                                 |                               |         |               |                       |
|--------------|------------------------------------|---------------------------------|-------------------------------|---------|---------------|-----------------------|
| HSK A-WH ABB | SR M12X16 DIN1835-B <sup>(a)</sup> | SR M12X30 DIN915 <sup>(b)</sup> | SR M10X6DIN913 <sup>(c)</sup> | HW 6.0* | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* |

- \* Optional, to be ordered separately
- <sup>(a)</sup> Used on A-type sleeves
- <sup>(b)</sup> Used on B type sleeves
- <sup>(c)</sup> Rear stopper screw

## HSK

### HSK A63WH-ASHR/L-HPMC

Holders with HSK Exchangeable Shanks for External Square Shank Tools with High-Pressure Multi-Connection



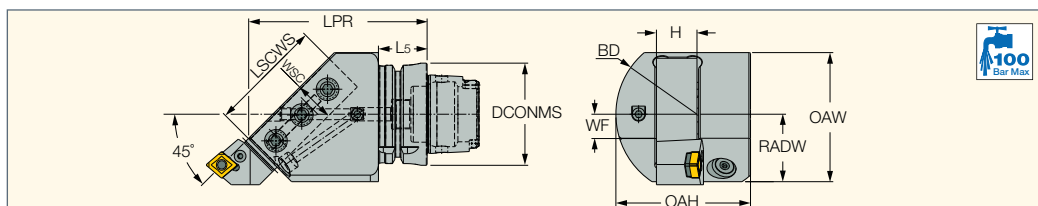
| Designation               | DCONMS | LPR    | LSCWS | L5    | WF    | H    | WSC  | OAH   | RADW  | OAW   | BD     | DCP <sup>(1)</sup> |
|---------------------------|--------|--------|-------|-------|-------|------|------|-------|-------|-------|--------|--------------------|
| HSK A63WH ASHR/L25-1 HPMC | 63.00  | 125.00 | 70.00 | 30.00 | 13.00 | 25.0 | 25.0 | 82.00 | 38.00 | 70.00 | 100.00 | 1                  |

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## HSK

### HSK A63WH-ASHR/L-45-HPMC

Holders with HSK Exchangeable Shanks Carrying Square Shank Tools for 45° Mounting on Turn-Mill Machines with HPMC



| Designation                | DCONMS | H    | WSC  | LSCWS | LPR    | L5    | OAH   | RADW  | OAW   | WF    | BD     | DCP <sup>(1)</sup> |
|----------------------------|--------|------|------|-------|--------|-------|-------|-------|-------|-------|--------|--------------------|
| HSK A63WH ASHR/L25-45 HPMC | 63.00  | 25.0 | 25.0 | 70.00 | 110.00 | 30.00 | 83.00 | 41.60 | 79.60 | 15.00 | 100.00 | 1                  |

(1) 1 - Slot for data chip, 0 - Without slot for data chip

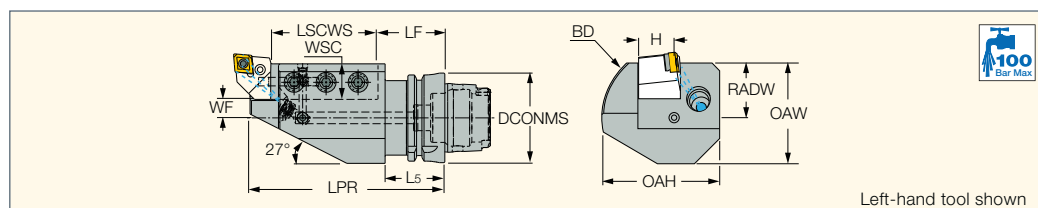
## Spare Parts

| Designation              |  |  |
|--------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| HSK A63WH ASHL25-45 HPMC | SR M6X6 DIN913                                                                      | SR M12X30 DIN915                                                                    |
| HSK A63WH ASHR25-45 HPMC | SR M6X6 DIN913                                                                      | SR M8X6 DIN913                                                                      |

## HSK

### HSK A-TM-ASHR/L-1-HPMC

Square Shank Tool Adapters with HSK Exchangeable Shanks for Multi-Tasking Machines with High-Pressure Coolant Channels



| Designation                | DCONMS | H    | WSC  | WF    | LPR    | LSCWS | LF    | L5    | OAH   | RADW | OAW   | BD     | DCP <sup>(1)</sup> |
|----------------------------|--------|------|------|-------|--------|-------|-------|-------|-------|------|-------|--------|--------------------|
| HSK A63TM ASHR/L 25 1 HPMC | 63.00  | 25.0 | 25.0 | 13.00 | 137.00 | 70.00 | 47.00 | 42.00 | 82.00 | 38.0 | 70.00 | 100.00 | 1                  |

• A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## Spare Parts

| Designation                |  |  |  |  |  |
|----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HSK A63TM ASHR/L 25 1 HPMC | SR M12X30 DIN915                                                                    | SR M8X6 DIN913                                                                      | SATZ-M12X1-M6                                                                       | WRENCH NOZZLE HP M12"                                                                 | SR M6X6 DIN913                                                                        |

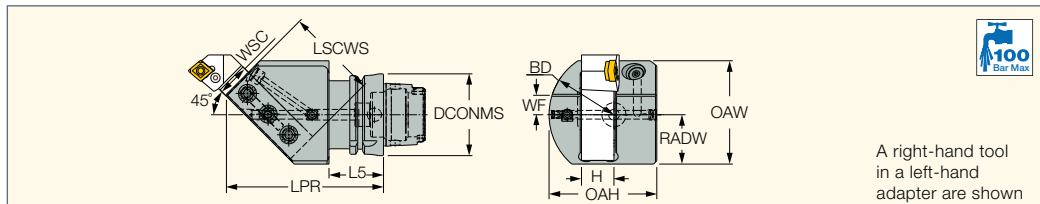
\* Optional, to be ordered separately



## HSK

### HSK A63TM-ASHR/L-45-HPMC

Square Shank Tool Adapters with HSK-T Exchangeable Shanks for 45° Mounting on Multi-Tasking Machines



A right-hand tool in a left-hand adapter are shown

| Designation                 | DCONMS | H    | WSC  | WF    | LPR    | LSCWS | L5    | OAH   | RADW  | OAW   | BD     | DCP <sup>(1)</sup> |
|-----------------------------|--------|------|------|-------|--------|-------|-------|-------|-------|-------|--------|--------------------|
| HSK A63TM ASHR/L 25 45 HPMC | 63.00  | 25.0 | 25.0 | 15.00 | 121.00 | 70.00 | 42.00 | 58.00 | 38.00 | 79.60 | 100.00 | 1                  |

• A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)

(1) 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

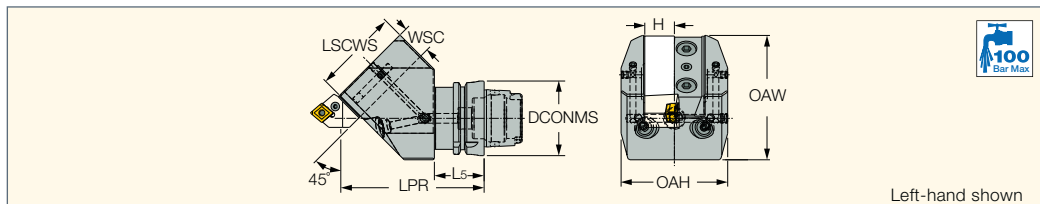
| Designation                 |                  |                |               |                       |                |
|-----------------------------|------------------|----------------|---------------|-----------------------|----------------|
| HSK A63TM ASHR/L 25 45 HPMC | SR M12X30 DIN915 | SR M8X6 DIN913 | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | SR M6X6 DIN913 |

\* Optional, to be ordered separately

## HSK

### HSK A63TM-ASHN-45-HPMC

Square Shank Tool Adapters with HSK Exchangeable Shanks for 45° Mounting on Multi-Tasking Machines



Left-hand shown

| Designation               | DCONMS | H    | WSC  | LPR    | LSCWS | L5    | OAH   | OAW    | DCP <sup>(1)</sup> |
|---------------------------|--------|------|------|--------|-------|-------|-------|--------|--------------------|
| HSK A63TM ASHN 25 45 HPMC | 63.00  | 25.0 | 25.0 | 121.00 | 72.00 | 42.00 | 90.00 | 105.00 | 1                  |

• A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)

• For using left-hand toolholder, the position of the clamping spacer must be changed

(1) 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

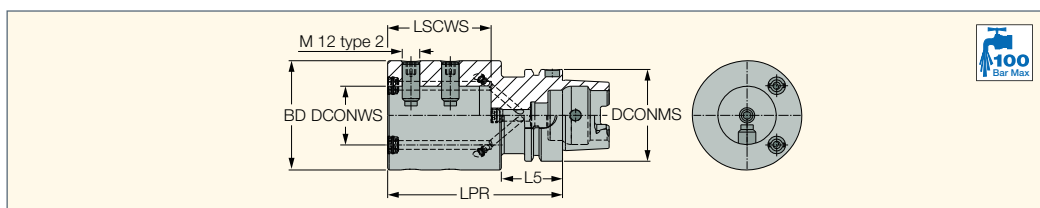
| Designation               |                  |                 |               |                       |                         |                |                |  |
|---------------------------|------------------|-----------------|---------------|-----------------------|-------------------------|----------------|----------------|--|
| HSK A63TM ASHN 25 45 HPMC | SR M10X25 DIN912 | SR M8X20 DIN916 | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | SPRING PIN DIN 1481 3X5 | SR M8X6 DIN913 | SR M6X6 DIN913 |  |

\* Optional, to be ordered separately

## HSK

### HSK A63TM ABB

Adapters with HSK Exchangeable Shanks for Boring Bars with Reduction Sleeves



| Designation      | DCONMS | DCONWS | BD    | LPR    | LSCWS | L5    | DCP <sup>(1)</sup> |
|------------------|--------|--------|-------|--------|-------|-------|--------------------|
| HSK A63TM ABB 40 | 63.00  | 40.00  | 75.00 | 120.00 | 71.0  | 42.00 | 1                  |

• A cooling tube must be used with all coolant through HSK spindles (should be ordered separately)

• For SC reduction sleeves, see page 840

(1) 1 - Slot for data chip, 0 - Without slot for data chip

### Spare Parts

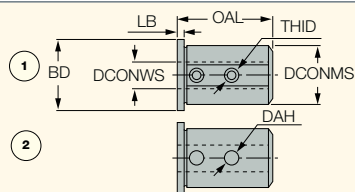
| Designation      |                  |                     |               |                       |                |                |                       |
|------------------|------------------|---------------------|---------------|-----------------------|----------------|----------------|-----------------------|
| HSK A63TM ABB 40 | SR M12X30 DIN915 | SR M12X16 DIN1835-B | SATZ-M12X1-M6 | WRENCH NOZZLE HP M12* | SR M10X6DIN913 | SR M5X4 DIN913 | COOLING TUBE HSK A63* |

\* Optional, to be ordered separately

## Accessories

### SC-T (sleeves)

Reduction Sleeves for Holders with Exchangeable Adaptation



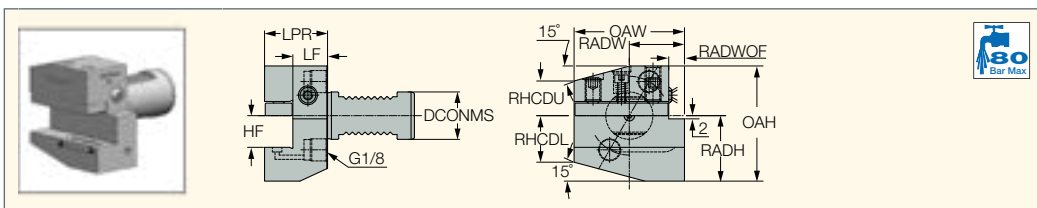
| Designation | DCONMS | DCONWS | BD    | OAL   | LB    | THID | DAH   | Fig. |                    |         |
|-------------|--------|--------|-------|-------|-------|------|-------|------|--------------------|---------|
| SC 32T10A   | 32.00  | 10.00  | 39.00 | 70.00 | 8.00  | M6   | -     | 1    |                    |         |
| SC 32T12A   | 32.00  | 12.00  | 39.00 | 70.00 | 8.00  | M6   | -     | 1    |                    |         |
| SC 32T16A   | 32.00  | 16.00  | 39.00 | 70.00 | 8.00  | M6   | -     | 1    |                    |         |
| SC 32T20A   | 32.00  | 20.00  | 39.00 | 70.00 | 8.00  | M6   | -     | 1    |                    |         |
| SC 32T25B   | 32.00  | 25.00  | 39.00 | 80.00 | 15.00 | -    | -     | 2    |                    |         |
| SC 25T10A   | 25.00  | 10.00  | 31.00 | 62.00 | 6.00  | M8   | -     | 1    | SR M8X6 DIN916     | HW 4.0* |
| SC 25T12A   | 25.00  | 12.00  | 31.00 | 62.00 | 6.00  | M8   | -     | 1    | SR M8X6 DIN916     | HW 4.0* |
| SC 25T16B   | 25.00  | 16.00  | 31.00 | 62.00 | 6.00  | -    | 12.00 | 2    |                    |         |
| SC 25T20B   | 25.00  | 20.00  | 31.00 | 62.00 | 6.00  | -    | 12.00 | 2    |                    |         |
| SC 25T6A    | 25.00  | 6.00   | 31.00 | 62.00 | 6.00  | M6   | -     | 1    | SR M6X6 DIN916     | HW 3.0* |
| SC 25T8A    | 25.00  | 8.00   | 31.00 | 62.00 | 6.00  | M8   | -     | 1    | SR M8X6 DIN916     | HW 4.0* |
| SC 40T10A   | 40.00  | 10.00  | 46.00 | 66.00 | 6.00  | M8   | -     | 1    | SR M8X10 DIN1835-B | HW 4.0* |
| SC 40T12A   | 40.00  | 12.00  | 46.00 | 66.00 | 6.00  | M8   | -     | 1    | SR M8X10 DIN1835-B | HW 4.0* |
| SC 40T16B   | 40.00  | 16.00  | 46.00 | 66.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 40T20B   | 40.00  | 20.00  | 46.00 | 66.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 40T25B   | 40.00  | 25.00  | 46.00 | 66.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 40T32B   | 40.00  | 32.00  | 46.00 | 66.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 40T6A    | 40.00  | 6.00   | 46.00 | 66.00 | 6.00  | M6   | -     | 1    | SR M6X10 DIN1835B  | HW 3.0* |
| SC 40T8A    | 40.00  | 8.00   | 46.00 | 66.00 | 6.00  | M6   | -     | 1    | SR M8X10 DIN1835-B | HW 4.0* |
| SC 50 T40B  | 50.00  | 40.00  | 56.00 | 86.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 50T10A   | 50.00  | 10.00  | 56.00 | 76.00 | 6.00  | M8   | -     | 1    | SR M8X6 DIN916     | HW 4.0* |
| SC 50T12A   | 50.00  | 12.00  | 56.00 | 76.00 | 6.00  | M8   | -     | 1    | SR M8X6 DIN916     | HW 4.0* |
| SC 50T16B   | 50.00  | 16.00  | 56.00 | 86.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 50T20B   | 50.00  | 20.00  | 56.00 | 86.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 50T25B   | 50.00  | 25.00  | 56.00 | 86.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 50T32B   | 50.00  | 32.00  | 56.00 | 86.00 | 6.00  | -    | 15.00 | 2    |                    |         |
| SC 50T6A    | 50.00  | 6.00   | 56.00 | 76.00 | 6.00  | M6   | -     | 1    | SR M6X6 DIN916     | HW 3.0* |
| SC 50T8A    | 50.00  | 8.00   | 56.00 | 76.00 | 6.00  | M8   | -     | 1    | SR M8X6 DIN916     | HW 4.0* |

\* Optional, to be ordered separately

## TOOL BLOCKS

### VDI-B1/B4A-JHPMC

Radially Oriented, Short, Right-Hand Holders with VDI DIN69880 Shanks for Square Shank Tools



| Designation              | DCONMS | HF   | LPR   | OAW   | RADW  | RADWOF | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|--------------------------|--------|------|-------|-------|-------|--------|-------|-------|-------|-------|--------------------|
| VDI16 B1A-161234-JHPMC   | 16.00  | 12.0 | 34.00 | 42.00 | 23.00 | 5.00   | 16.00 | 15.00 | 22.00 | 42.00 | 0                  |
| VDI16 B4A-161234-JHPMC   | 16.00  | 12.0 | 34.00 | 42.00 | 23.00 | 5.00   | 16.00 | 15.00 | 22.00 | 42.00 | 0                  |
| VDI20 B1A-201640-JHPMC   | 20.00  | 16.0 | 40.00 | 55.00 | 30.00 | 7.00   | 19.00 | 19.00 | 30.00 | 55.00 | 0                  |
| VDI20 B4A-201640-JHPMC   | 20.00  | 16.0 | 40.00 | 55.00 | 30.00 | 7.00   | 19.00 | 19.00 | 30.00 | 55.00 | 0                  |
| VDI25 B1A-252040-JHPMC   | 25.00  | 20.0 | 40.00 | 70.00 | 35.00 | 10.00  | 29.50 | 22.00 | 38.50 | 70.00 | 0                  |
| VDI30 B1B4A-302040-JHPMC | 30.00  | 20.0 | 40.00 | 70.00 | 35.00 | 10.00  | 29.50 | 22.00 | 41.50 | 73.00 | 0                  |
| VDI40 B1B4A-402544-JHPMC | 40.00  | 25.0 | 44.00 | 85.00 | 42.50 | 12.50  | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 B1B4A-502544-JHPMC | 50.00  | 25.0 | 44.00 | 85.00 | 42.50 | 12.50  | 43.00 | 30.00 | 48.00 | 91.00 | 0                  |

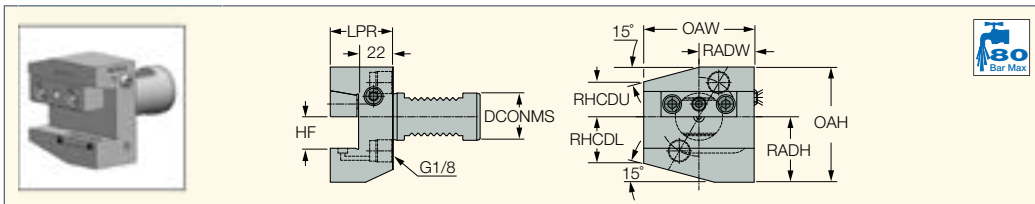
• Form B1 radial R.H. short, form B4 radial overhead L.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## TOOL BLOCKS

### VDI-B1/B4AK-JHPMC

Radially Oriented, Short, Right-Hand, Wedge Clamping Holders with VDI DIN69880 Shanks for Square Shank Tools



| Designation               | DCONMS | HF   | LPR   | OAW   | RADW  | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|---------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|--------------------|
| VDI30 B1B4AK-302040-JHPMC | 30.00  | 20.0 | 40.00 | 70.00 | 35.00 | 29.50 | 22.00 | 41.50 | 73.00 | 0                  |
| VDI40 B1B4AK-402544-JHPMC | 40.00  | 25.0 | 44.00 | 85.00 | 42.50 | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 B1B4AK-502544-JHPMC | 50.00  | 25.0 | 44.00 | 85.00 | 42.50 | 43.00 | 30.00 | 48.00 | 91.00 | 0                  |

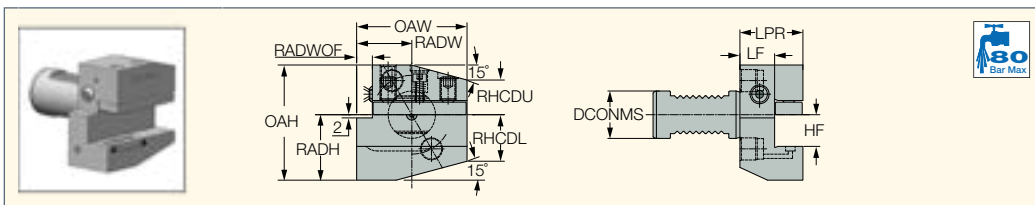
• Form B1 radial R.H. short, form B4 radial overhead L.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## TOOL BLOCKS

### VDI-B2/B3A-JHPMC

Radially Oriented, Short, Left-Hand Holders with VDI DIN69880 Shanks for Square Shank Tools



| Designation              | DCONMS | HF   | LPR   | OAW   | RADW  | RADWOF | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|--------------------------|--------|------|-------|-------|-------|--------|-------|-------|-------|-------|--------------------|
| VDI16 B2A-161234-JHPMC   | 16.00  | 12.0 | 34.00 | 42.00 | 23.00 | 5.00   | 16.00 | 15.00 | 22.00 | 42.00 | 0                  |
| VDI16 B3A-161234-JHPMC   | 16.00  | 12.0 | 34.00 | 42.00 | 23.00 | 5.00   | 16.00 | 15.00 | 22.00 | 42.00 | 0                  |
| VDI20 B2A-201640-JHPMC   | 20.00  | 16.0 | 40.00 | 55.00 | 30.00 | 7.00   | 19.00 | 19.00 | 30.00 | 55.00 | 0                  |
| VDI20 B3A-201640-JHPMC   | 20.00  | 16.0 | 40.00 | 55.00 | 30.00 | 7.00   | 19.00 | 19.00 | 30.00 | 55.00 | 0                  |
| VDI25 B2A-252040-JHPMC   | 25.00  | 20.0 | 40.00 | 70.00 | 35.00 | 10.00  | 29.50 | 22.00 | 38.50 | 70.00 | 0                  |
| VDI30 B2B3A-302040-JHPMC | 30.00  | 20.0 | 40.00 | 70.00 | 35.00 | 10.00  | 29.50 | 27.00 | 41.50 | 73.00 | 0                  |
| VDI40 B2B3A-402544-JHPMC | 40.00  | 25.0 | 44.00 | 85.00 | 42.50 | 12.50  | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 B2B3A-502544-JHPMC | 50.00  | 25.0 | 44.00 | 85.00 | 42.50 | 12.50  | 43.00 | 38.00 | 48.00 | 91.00 | 0                  |

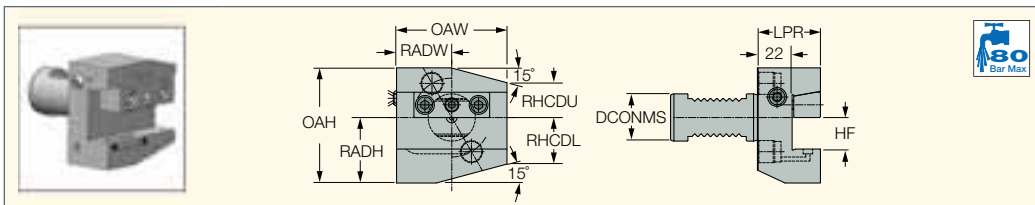
• Form B2 radial L.H. short, form B3 radial overhead R.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## TOOL BLOCKS

### VDI-B2/B3AK-JHPMC

Radially Oriented, Short, Left-Hand, Wedge Clamping Holders with VDI DIN69880 Shanks for Square Shank Tools



| Designation               | DCONMS | HF   | LPR   | OAW   | RADW  | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|---------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|--------------------|
| VDI30 B2B3AK-302040-JHPMC | 30.00  | 20.0 | 40.00 | 70.00 | 35.00 | 29.50 | 27.00 | 41.50 | 73.00 | 0                  |
| VDI40 B2B3AK-402544-JHPMC | 40.00  | 25.0 | 44.00 | 85.00 | 42.50 | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 B2B3AK-502544-JHPMC | 50.00  | 25.0 | 44.00 | 85.00 | 42.50 | 35.00 | 38.00 | 48.00 | 91.00 | 0                  |

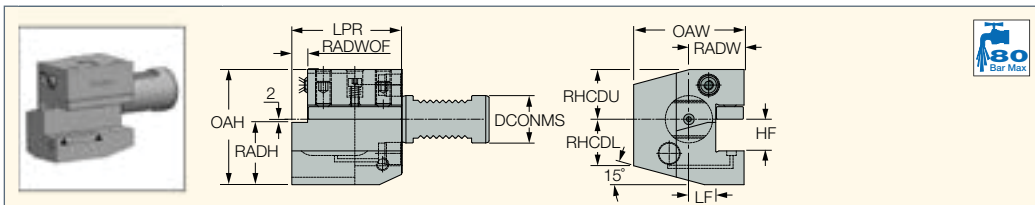
• Form B2 radial L.H. short, form B3 radial overhead R.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## TOOL BLOCKS

### VDI-C1/C4A-JHPMC

Axially Oriented, Short, Right-Hand Holders with VDI DIN69880 Shanks for Square Shank Tools



| Designation              | DCONMS | HF   | LPR   | OAW   | RADW  | LF    | RADWOF | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|--------------------------|--------|------|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------------------|
| VDI16 C1C4A-161244-JHPMC | 16.00  | 12.0 | 44.00 | 43.00 | 5.00  | 13.00 | 5.00   | 15.00 | 15.00 | 23.00 | 45.00 | 0                  |
| VDI20 C1C4A-201655-JHPMC | 20.00  | 16.0 | 55.00 | 52.00 | 7.00  | 13.00 | 7.00   | 19.00 | 19.00 | 23.00 | 55.00 | 0                  |
| VDI25 C1C4A-252055-JHPMC | 25.00  | 20.0 | 55.00 | 58.00 | 33.00 | 13.00 | 7.00   | 26.00 | 28.00 | 36.00 | 66.00 | 0                  |
| VDI30 C1C4A-302070-JHPMC | 30.00  | 20.0 | 70.00 | 70.00 | 35.00 | 17.00 | 10.00  | 26.00 | 22.00 | 38.00 | 70.00 | 0                  |
| VDI40 C1C4A-402585-JHPMC | 40.00  | 25.0 | 85.00 | 85.00 | 42.50 | 21.00 | 12.50  | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 C1C4A-502585-JHPMC | 50.00  | 25.0 | 85.00 | 90.50 | 48.00 | 26.00 | 12.50  | 42.00 | 35.00 | 48.00 | 92.00 | 0                  |

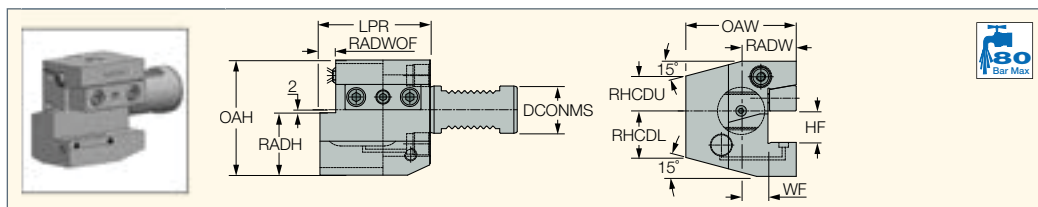
• Form C1 axial R.H., form C4 axial overhead L.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## TOOL BLOCKS

### VDI-C1/C4AK-JHPMC

Axially Oriented, Short, Right-Hand, Wedge Clamping Holders with VDI DIN69880 Shanks for Square Shank Tools



| Designation               | DCONMS | HF   | LPR   | OAW   | RADW  | WF    | RADWOF | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|---------------------------|--------|------|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------------------|
| VDI30 C1C4AK-302070-JHPMC | 30.00  | 20.0 | 70.00 | 70.00 | 35.00 | 17.00 | 10.00  | 26.00 | 22.00 | 38.00 | 70.00 | 0                  |
| VDI40 C1C4AK-402585-JHPMC | 40.00  | 25.0 | 85.00 | 85.00 | 42.50 | 21.00 | 12.50  | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 C1C4AK-502585-JHPMC | 50.00  | 25.0 | 85.00 | 90.50 | 48.00 | 26.00 | 12.50  | 42.00 | 35.00 | 48.00 | 92.00 | 0                  |

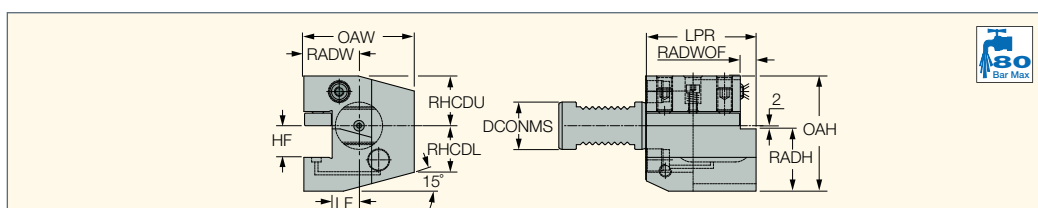
• Form C1 axial R.H., form C4 axial overhead L.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## TOOL BLOCKS

### VDI-C2/C3A-JHPMC

Axially Oriented, Short, Left-Hand Holders with VDI DIN69880 Shanks for Square Shank Tools



| Designation              | DCONMS | HF   | LPR   | OAW   | RADW  | LF    | RADWOF | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|--------------------------|--------|------|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------------------|
| VDI16 C2C3A-161244-JHPMC | 16.00  | 12.0 | 44.00 | 43.00 | 24.00 | 13.00 | 5.00   | 15.00 | 15.00 | 23.00 | 45.00 | 0                  |
| VDI25 C2C3A-252055-JHPMC | 25.00  | 20.0 | 55.00 | 52.00 | 37.00 | 15.00 | 7.00   | 38.00 | 38.00 | 36.00 | 66.00 | 0                  |
| VDI30 C2C3A-302070-JHPMC | 30.00  | 20.0 | 70.00 | 76.00 | 41.00 | 17.00 | 10.00  | 26.00 | 26.00 | 38.00 | 70.00 | 0                  |
| VDI40 C2C3A-402585-JHPMC | 40.00  | 25.0 | 85.00 | 90.00 | 47.50 | 21.00 | 12.50  | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 C2C3A-502585-JHPMC | 50.00  | 25.0 | 85.00 | 95.00 | 52.50 | 26.00 | 12.50  | 42.00 | 37.00 | 48.00 | 92.00 | 0                  |

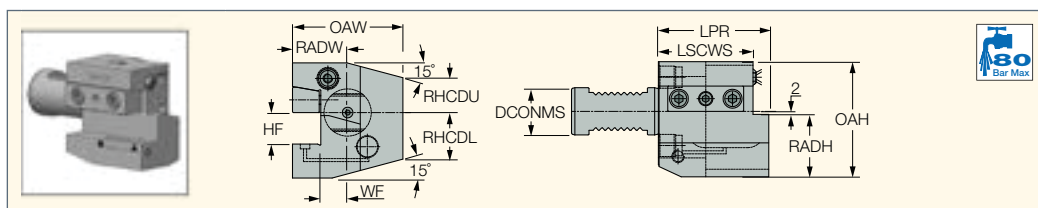
• Form C2 axial L.H., form C3 axial overhead R.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

## TOOL BLOCKS

### VDI-C2/C3AK-JHPMC

Axially Oriented, Short, Left-Hand, Wedge Clamping Holders with VDI DIN69880 Shanks for Square Shank Tools

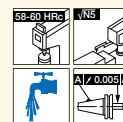
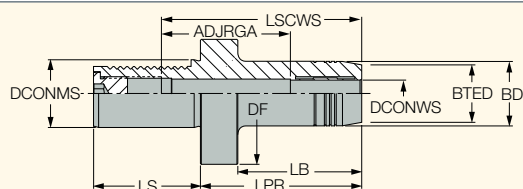


| Designation               | DCONMS | HF   | LPR   | LSCWS | OAW   | RADW  | WF    | RHCDL | RHCDU | RADH  | OAH   | DCP <sup>(1)</sup> |
|---------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|
| VDI30 C2C3AK-302070-JHPMC | 30.00  | 20.0 | 70.00 | 60.00 | 76.00 | 41.00 | 23.00 | 26.00 | 22.00 | 38.00 | 70.00 | 0                  |
| VDI40 C2C3AK-402585-JHPMC | 40.00  | 25.0 | 85.00 | 72.50 | 90.00 | 47.50 | 25.50 | 35.00 | 30.00 | 48.00 | 86.00 | 0                  |
| VDI50 C2C3AK-502585-JHPMC | 50.00  | 25.0 | 85.00 | 72.50 | 65.00 | 52.50 | 30.50 | 42.00 | 35.00 | 48.00 | 92.00 | 0                  |

• Form C2 axial L.H., form C3 axial overhead R.H. short.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

**DIN69880-HYDRO**

 Hydraulic Chucks with VDI  
 Shanks, for Semi-Finish  
 and Finish Applications


| Designation              | DCONMS | BTED  | BD    | DF    | DCONWS | LS    | LPR    | LB   | ADJRGA | LSCWS | kg   |
|--------------------------|--------|-------|-------|-------|--------|-------|--------|------|--------|-------|------|
| DIN69880 30 HYDRO 20X89  | 30.00  | 38.00 | 42.00 | 68.00 | 20.00  | 55.00 | 95.00  | 73.0 | 37.00  | 85.0  | 1.24 |
| DIN69880 30 HYDRO 25X100 | 30.00  | 46.00 | 50.00 | 68.00 | 25.00  | 55.00 | 100.00 | 84.0 | 31.00  | 85.0  | 1.20 |
| DIN69880 40 HYDRO 20X95  | 40.00  | 38.00 | 42.00 | 83.00 | 20.00  | 63.00 | 95.00  | 73.0 | 82.00  | 130.0 | 2.00 |
| DIN69880 40 HYDRO 25X95  | 40.00  | 46.00 | 50.00 | 83.00 | 25.00  | 63.00 | 95.00  | 73.0 | 76.00  | 130.0 | 2.14 |
| DIN69880 40 HYDRO 32X95  | 40.00  | 56.00 | 60.00 | 83.00 | 32.00  | 63.00 | 95.00  | 73.0 | 32.00  | 90.0  | 2.00 |

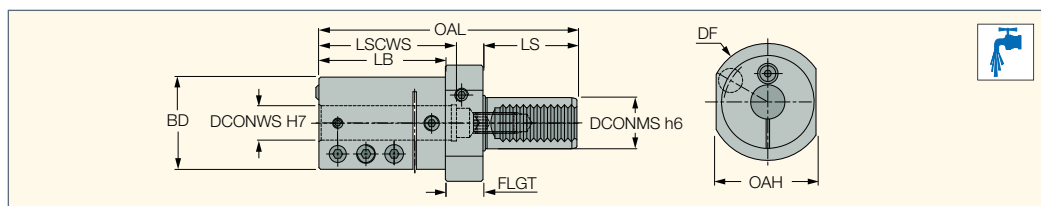
- Chucking forces will be reduced by 25% if reduction sleeves are used
- Reduction sleeves are available for 12, 20, 25 and 32 mm bore diameters (ordered separately)
- Clamping wrench (wrench HYDRO HEX 4) and test bar should be ordered separately

**Spare Parts**

| Designation              |                         |                     |                    |
|--------------------------|-------------------------|---------------------|--------------------|
| DIN69880 30 HYDRO 20X89  | HYDRO CLAMP SCREW M8X14 | WRENCH HYDRO HEX 4* | TEST BAR HYDRO 20* |
| DIN69880 30 HYDRO 25X100 | HYDRO CLAMP SCREW M8X14 | WRENCH HYDRO HEX 4* | TEST BAR HYDRO 25* |
| DIN69880 40 HYDRO 20X95  | HYDRO CLAMP SCREW M8X14 | WRENCH HYDRO HEX 4* | TEST BAR HYDRO 20* |
| DIN69880 40 HYDRO 25X95  | HYDRO CLAMP SCREW M8X14 | WRENCH HYDRO HEX 4* | TEST BAR HYDRO 25* |
| DIN69880 40 HYDRO 32X95  | HYDRO CLAMP SCREW M8X14 | WRENCH HYDRO HEX 4* | TEST BAR HYDRO 32* |

\* Optional, to be ordered separately

**WHISPERLINE**
**VDI AV-JHP**

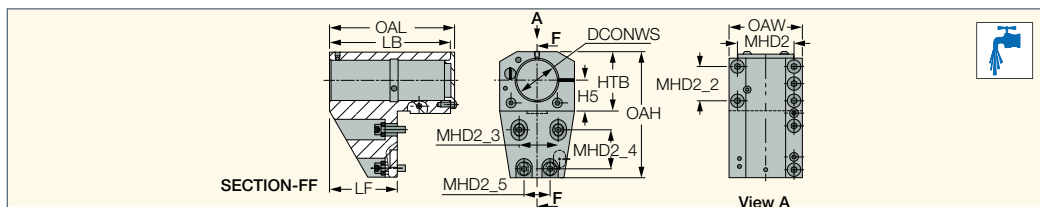
 VDI Holders For  
 Anti-Vibration Tools


| Designation      | DCONMS | DCONWS | OAL    | LS   | BD     | DF     | LSCWS  | LB    | FLGT  | OAH   |
|------------------|--------|--------|--------|------|--------|--------|--------|-------|-------|-------|
| VDI30 AV-D16-JHP | 30.00  | 16.00  | 143.00 | 55.0 | 50.00  | 68.00  | 70.00  | 66.0  | 22.00 | 56.00 |
| VDI30 AV-D20-JHP | 30.00  | 20.00  | 151.00 | 55.0 | 54.00  | 68.00  | 80.00  | 74.0  | 22.00 | 56.00 |
| VDI30 AV-D25-JHP | 30.00  | 25.00  | 167.00 | 55.0 | 58.00  | 68.00  | 100.00 | 90.0  | 22.00 | 56.00 |
| VDI30 AV-D32-JHP | 30.00  | 32.00  | 197.00 | 55.0 | 63.00  | 68.00  | 128.00 | 120.0 | 22.00 | 56.00 |
| VDI40 AV-D16-JHP | 40.00  | 16.00  | 151.00 | 63.0 | 50.00  | 83.00  | 70.00  | 66.0  | 22.00 | 65.00 |
| VDI40 AV-D20-JHP | 40.00  | 20.00  | 159.00 | 63.0 | 54.00  | 83.00  | 80.00  | 74.0  | 22.00 | 65.00 |
| VDI40 AV-D25-JHP | 40.00  | 25.00  | 175.00 | 63.0 | 58.00  | 83.00  | 100.00 | 90.0  | 22.00 | 65.00 |
| VDI40 AV-D32-JHP | 40.00  | 32.00  | 205.00 | 63.0 | 63.00  | 83.00  | 128.00 | 120.0 | 22.00 | 65.00 |
| VDI40 AV-D40-JHP | 40.00  | 40.00  | 237.00 | 63.0 | 73.00  | 83.00  | 150.00 | 152.0 | 22.00 | 65.00 |
| VDI50 AV-D16-JHP | 50.00  | 16.00  | 181.00 | 78.0 | 50.00  | 98.00  | 85.00  | 81.0  | 22.00 | 70.00 |
| VDI50 AV-D20-JHP | 50.00  | 20.00  | 181.00 | 78.0 | 54.00  | 98.00  | 89.00  | 73.0  | 30.00 | 70.00 |
| VDI50 AV-D25-JHP | 50.00  | 25.00  | 198.00 | 78.0 | 59.00  | 98.00  | 106.00 | 90.0  | 30.00 | 70.00 |
| VDI50 AV-D32-JHP | 50.00  | 32.00  | 228.00 | 78.0 | 65.00  | 98.00  | 128.00 | 120.0 | 30.00 | 70.00 |
| VDI50 AV-D40-JHP | 50.00  | 40.00  | 260.00 | 78.0 | 73.00  | 98.00  | 160.00 | 152.0 | 30.00 | 70.00 |
| VDI50 AV-D50-JHP | 50.00  | 50.00  | 260.00 | 78.0 | 83.00  | 98.00  | 160.00 | 152.0 | 30.00 | 70.00 |
| VDI60 AV-D25-JHP | 60.00  | 25.00  | 214.00 | 94.0 | 59.00  | 123.00 | 106.00 | 90.0  | 30.00 | 85.00 |
| VDI60 AV-D32-JHP | 60.00  | 32.00  | 244.00 | 94.0 | 65.00  | 123.00 | 128.00 | 120.0 | 30.00 | 85.00 |
| VDI60 AV-D40-JHP | 60.00  | 40.00  | 276.00 | 94.0 | 73.00  | 123.00 | 160.00 | 152.0 | 30.00 | 85.00 |
| VDI60 AV-D50-JHP | 60.00  | 50.00  | 296.00 | 94.0 | 83.00  | 123.00 | 180.00 | 172.0 | 30.00 | 85.00 |
| VDI60 AV-D60-JHP | 60.00  | 60.00  | 296.00 | 94.0 | 102.00 | 123.00 | 180.00 | 172.0 | 30.00 | 85.00 |

# WHISPERLINE

## BLKT AV-JHP

BLKT Sleeve Type Blocks  
for DMG Machines

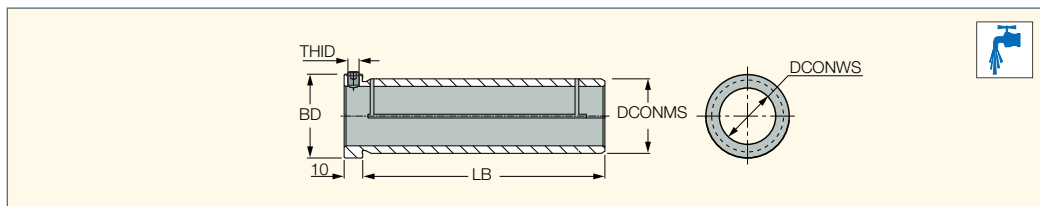


| Designation      | DCONWS | OAW    | OAH    | OAL    | H5    | LB     | LF    | HTB   | MHD2  | MHD2_2 | MHD2_3 | MHD2_4 | MHD2_5 |
|------------------|--------|--------|--------|--------|-------|--------|-------|-------|-------|--------|--------|--------|--------|
| BLKT AV-2540-JHP | 40.00  | 92.00  | 145.00 | 145.00 | 30.00 | 140.00 | 74.00 | 63.0  | 71.0  | 43.0   | 48.0   | 48.0   | 32.0   |
| BLKT AV-3240-JHP | 40.00  | 135.00 | 172.00 | 145.00 | 40.00 | 140.00 | 58.00 | 75.0  | 115.0 | 63.0   | 50.0   | 63.0   | 50.0   |
| BLKT AV-3250-JHP | 50.00  | 135.00 | 172.00 | 155.00 | 40.00 | 150.00 | 68.00 | 75.0  | 115.0 | 63.0   | 50.0   | 63.0   | 50.0   |
| BLKT AV-3260-JHP | 60.00  | 135.00 | 177.00 | 165.00 | 40.00 | 160.00 | 78.00 | 80.0  | 115.0 | 63.0   | 50.0   | 63.0   | 50.0   |
| BLKT AV-3280-JHP | 80.00  | 134.00 | 179.00 | 185.00 | 50.00 | 180.00 | 98.00 | 100.0 | 115.0 | 63.0   | 50.0   | 63.0   | 50.0   |

# WHISPERLINE

## AV FLEX-SLEEVE

Reduction Sleeves for Tool  
Blocks and VDI Holders

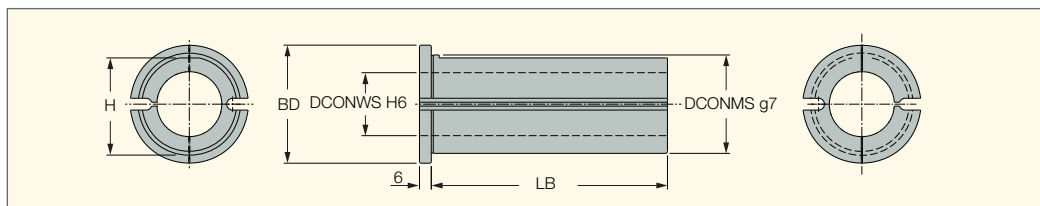


| Designation      | DCONMS | DCONWS | BD    | LB     | THID |
|------------------|--------|--------|-------|--------|------|
| RED PU1S-AV-3225 | 32.00  | 25.00  | 37.00 | 115.00 | M6   |
| RED PU1S-AV-4032 | 40.00  | 32.00  | 45.00 | 127.00 | M6   |
| RED PU1S-AV-5040 | 50.00  | 40.00  | 55.00 | 127.00 | M6   |
| RED PU1S-AV-6050 | 60.00  | 50.00  | 65.00 | 154.00 | M6   |

# WHISPERLINE

## AV-BUSH

Reduction Sleeves for Tool  
Blocks and VDI Holders



| Designation   | DCONMS | DCONWS | BD    | LB     | H    |
|---------------|--------|--------|-------|--------|------|
| AV-BUSH-32-16 | 32.00  | 16.00  | 42.00 | 60.00  | 31.0 |
| AV-BUSH-32-20 | 32.00  | 20.00  | 42.00 | 60.00  | 31.0 |
| AV-BUSH-32-25 | 32.00  | 25.00  | 42.00 | 60.00  | 31.0 |
| AV-BUSH-40-16 | 40.00  | 16.00  | 50.00 | 100.00 | 38.5 |
| AV-BUSH-40-20 | 40.00  | 20.00  | 50.00 | 100.00 | 38.5 |
| AV-BUSH-40-25 | 40.00  | 25.00  | 50.00 | 100.00 | 38.5 |
| AV-BUSH-40-32 | 40.00  | 32.00  | 50.00 | 100.00 | 38.5 |
| AV-BUSH-50-20 | 50.00  | 20.00  | 60.00 | 120.00 | 48.5 |
| AV-BUSH-50-25 | 50.00  | 25.00  | 60.00 | 120.00 | 48.5 |
| AV-BUSH-50-32 | 50.00  | 32.00  | 60.00 | 120.00 | 48.5 |
| AV-BUSH-50-40 | 50.00  | 40.00  | 60.00 | 120.00 | 48.5 |
| AV-BUSH-60-32 | 60.00  | 32.00  | 70.00 | 150.00 | 58.5 |
| AV-BUSH-60-40 | 60.00  | 40.00  | 70.00 | 150.00 | 58.5 |
| AV-BUSH-60-50 | 60.00  | 50.00  | 70.00 | 150.00 | 58.5 |

NEW

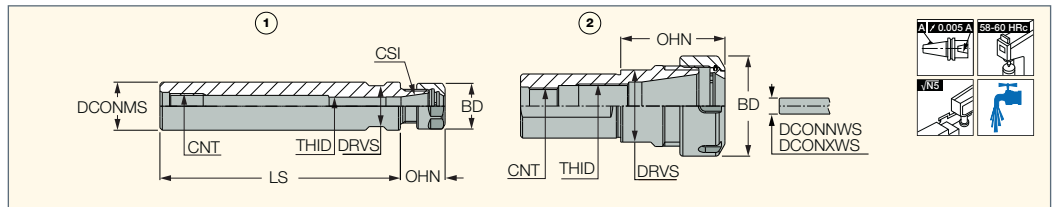




## Straight Shank

### ST-ER

DIN 6499 ER Collet Chucks  
with Straight Shanks



| Designation      | DCONMS | CSI  | DCONNWS <sup>(1)</sup> | DCONXWS <sup>(2)</sup> | LS    | OHN <sup>(3)</sup> | CNT  | THID     | BD    | DRVS <sup>(4)</sup> | Fig. | kg   |
|------------------|--------|------|------------------------|------------------------|-------|--------------------|------|----------|-------|---------------------|------|------|
| ST 16X 50 ER11 F | 16.00  | ER11 | 0.50                   | 7.00                   | 50.0  | 18.5               | G1/8 | M7.5X0.5 | 19.00 | 13.0                | 1.   | 0.06 |
| ST 20X 50 ER11 F | 20.00  | ER11 | 0.50                   | 7.00                   | 50.0  | 18.5               | G1/8 | M7.5X0.5 | 19.00 | 17.0                | 1.   | 0.10 |
| ST 20X100 ER11   | 20.00  | ER11 | 0.50                   | 7.00                   | 100.0 | 18.5               | G1/8 | M7.5X0.5 | 19.00 | 17.0                | 1.   | 0.20 |
| ST 20X150 ER11   | 20.00  | ER11 | 0.50                   | 7.00                   | 150.0 | 18.5               | -    | M10      | 19.00 | 17.0                | 1.   | 0.25 |
| ST 20X 50 ER16 F | 20.00  | ER16 | 0.50                   | 10.00                  | 50.0  | 32.3               | -    | M12      | 28.00 | 19.0                | 1.   | 0.07 |
| ST 20X100 ER16   | 20.00  | ER16 | 0.50                   | 10.00                  | 100.0 | 30.0               | -    | M12      | 28.00 | 19.0                | 1.   | 0.20 |
| ST 20X100 ER16 F | 20.00  | ER16 | 0.50                   | 10.00                  | 100.0 | 30.0               | -    | M12      | 28.00 | 19.0                | 1.   | 0.20 |
| ST 20X150 ER16   | 20.00  | ER16 | 0.50                   | 10.00                  | 150.0 | 30.0               | -    | M12      | 28.00 | 19.0                | 1.   | 0.28 |
| ST 20X 50 ER20 F | 20.00  | ER20 | 1.00                   | 13.00                  | 50.0  | 42.5               | -    | M12      | 34.00 | 22.0                | 1.   | 0.15 |
| ST 25X100 ER20   | 25.00  | ER20 | 1.00                   | 13.00                  | 100.0 | 36.0               | G1/4 | M14X1    | 34.00 | 22.0                | 1.   | 0.30 |
| ST 25X150 ER20   | 25.00  | ER20 | 1.00                   | 13.00                  | 150.0 | 36.0               | -    | M16      | 34.00 | 22.0                | 1.   | 0.39 |
| ST 20X 50 ER25 F | 20.00  | ER25 | 1.00                   | 16.00                  | 50.0  | 46.0               | G1/8 | M14X1    | 42.00 | 28.0                | 2.   | 0.21 |
| ST 20X100 ER25   | 20.00  | ER25 | 1.00                   | 16.00                  | 100.0 | 46.0               | -    | M12      | 42.00 | 28.0                | 2.   | 0.29 |
| ST 20X100 ER25 F | 20.00  | ER25 | 1.00                   | 16.00                  | 100.0 | 46.0               | -    | M12      | 42.00 | 28.0                | 2.   | 0.09 |
| ST 25X 50 ER25 F | 25.00  | ER25 | 1.00                   | 16.00                  | 50.0  | 46.0               | G1/4 | M18X1    | 42.00 | 28.0                | 2.   | 0.22 |
| ST 25X100 ER25   | 25.00  | ER25 | 1.00                   | 16.00                  | 100.0 | 46.0               | -    | M16      | 42.00 | 28.0                | 2.   | 0.36 |
| ST 20X 50 ER32 F | 20.00  | ER32 | 2.00                   | 20.00                  | 50.0  | 54.0               | G1/8 | M14X1    | 50.00 | 36.0                | 2.   | 0.30 |
| ST 20X100 ER32   | 20.00  | ER32 | 2.00                   | 20.00                  | 100.0 | 54.0               | G1/8 | M14X1    | 50.00 | 36.0                | 2.   | 0.40 |
| ST 25X 50 ER32 F | 25.00  | ER32 | 2.00                   | 20.00                  | 50.0  | 52.0               | G1/4 | M18X1    | 50.00 | 36.0                | 2.   | 0.32 |
| ST 30X 50 ER32 F | 30.00  | ER32 | 2.00                   | 20.00                  | 50.0  | 52.0               | G1/4 | M22X1.5  | 50.00 | 36.0                | 2.   | 0.39 |
| ST 32X 50 ER32 F | 32.00  | ER32 | 2.00                   | 20.00                  | 50.0  | 52.0               | G1/4 | M22X1.5  | 50.00 | 36.0                | 2.   | 0.42 |
| ST 32X150 ER32   | 32.00  | ER32 | 2.00                   | 20.00                  | 150.0 | 52.0               | G1/4 | M22X1.5  | 50.00 | 36.0                | 2.   | 0.88 |
| ST 40X 75 ER32 F | 40.00  | ER32 | 2.00                   | 20.00                  | 75.0  | 46.0               | -    | M22X1.5  | 50.00 | 44.0                | 2.   | 0.72 |
| ST 25X 50 ER40 F | 25.00  | ER40 | 3.00                   | 26.00                  | 50.0  | 60.0               | -    | M16X2    | 63.00 | 45.0                | 2.   | 0.52 |
| ST 30X 50 ER40 F | 30.00  | ER40 | 3.00                   | 26.00                  | 50.0  | 60.0               | -    | M18X1.5  | 63.00 | 45.0                | 2.   | 0.57 |
| ST 32X 50 ER40 F | 32.00  | ER40 | 3.00                   | 26.00                  | 50.0  | 60.0               | -    | M18X1.5  | 63.00 | 45.0                | 2.   | 0.60 |
| ST 40X 75 ER40 F | 40.00  | ER40 | 3.00                   | 26.00                  | 75.0  | 55.0               | -    | M22X1.5  | 63.00 | 45.0                | 2.   | 0.84 |
| ST 50X 80 ER40 F | 50.00  | ER40 | 3.00                   | 26.00                  | 80.0  | 60.0               | -    | M28X1.5  | 63.00 | 54.0                | 2.   | 1.30 |
| ST 50X 80 ER50 F | 50.00  | ER50 | 10.00                  | 34.00                  | 80.0  | 77.0               | -    | M36X1.5  | 78.00 | 58.0                | 2.   | 1.32 |

(1) Minimum diameter

(2) Maximum diameter

(3) Minimum overhang

(4) Torque key size

## Spare Parts

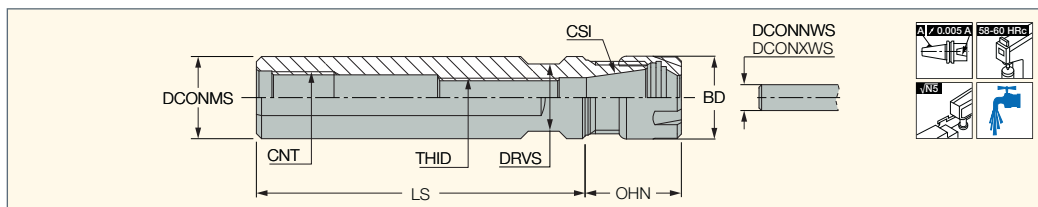
| Designation      |  |  |  |  |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ST 16X 50 ER11 F | NUT ER11 UM                                                                         | WRENCH ER11*                                                                        | PRESET ER-JET 8X1.25*                                                                 |                                                                                       |
| ST 20X 50 ER11 F | NUT ER11 UM                                                                         | WRENCH ER11*                                                                        | PRESET ER-JET 10X1.5*                                                                 |                                                                                       |
| ST 20X100 ER11   | NUT ER11 UM                                                                         | WRENCH ER11*                                                                        | PRESET ER-JET 10X1.5*                                                                 |                                                                                       |
| ST 20X150 ER11   | NUT ER11 UM                                                                         | WRENCH ER11*                                                                        | PRESET ER-JET 10X1.5*                                                                 |                                                                                       |
| ST 20X 50 ER16 F | NUT ER16 TOP                                                                        | WRENCH ER16*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 20X100 ER16   | NUT ER16 TOP                                                                        | WRENCH ER16*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 20X100 ER16 F | NUT ER16 TOP                                                                        | WRENCH ER16*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 20X150 ER16   | NUT ER16 TOP                                                                        | WRENCH ER16*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 20X 50 ER20 F | NUT ER20 TOP                                                                        | WRENCH ER20*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 25X100 ER20   | NUT ER20 TOP                                                                        | WRENCH ER20*                                                                        | PRESET ER-JET 16X2*                                                                   | PRESET ER-JET 16X2L*                                                                  |
| ST 25X150 ER20   | NUT ER20 TOP                                                                        | WRENCH ER20*                                                                        | PRESET ER-JET 16X2*                                                                   | PRESET ER-JET 16X2L*                                                                  |
| ST 20X 50 ER25 F | NUT ER25 TOP                                                                        | WRENCH ER25*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 20X100 ER25   | NUT ER25 TOP                                                                        | WRENCH ER25*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 20X100 ER25 F | NUT ER25 TOP                                                                        | WRENCH ER25*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 25X 50 ER25 F | NUT ER25 TOP                                                                        | WRENCH ER25*                                                                        | PRESET ER-JET 16X2*                                                                   | PRESET ER-JET 16X2L*                                                                  |
| ST 25X100 ER25   | NUT ER25 TOP                                                                        | WRENCH ER25*                                                                        | PRESET ER-JET 16X2*                                                                   | PRESET ER-JET 16X2L*                                                                  |
| ST 20X 50 ER32 F | NUT ER32 TOP                                                                        | WRENCH ER32*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 20X100 ER32   | NUT ER32 TOP                                                                        | WRENCH ER32*                                                                        | PRESET ER-JET 12X1.75*                                                                | PRESET ER-JET 12X1.75L*                                                               |
| ST 25X 50 ER32 F | NUT ER32 TOP                                                                        | WRENCH ER32*                                                                        | PRESET ER-JET 16X2*                                                                   | PRESET ER-JET 16X2L*                                                                  |
| ST 30X 50 ER32 F | NUT ER32 TOP                                                                        | WRENCH ER32*                                                                        | PRESET ER-JET 18X1.5*                                                                 | PRESET ER-JET 18X1.5L*                                                                |
| ST 32X 50 ER32 F | NUT ER32 TOP                                                                        | WRENCH ER32*                                                                        | PRESET ER-JET 18X1.5*                                                                 | PRESET ER-JET 18X1.5L*                                                                |
| ST 32X150 ER32   | NUT ER32 TOP                                                                        | WRENCH ER32*                                                                        | PRESET ER-JET 18X1.5*                                                                 | PRESET ER-JET 18X1.5L*                                                                |
| ST 40X 75 ER32 F | NUT ER32 TOP                                                                        | WRENCH ER32*                                                                        | PRESET ER-JET 22X1.5*                                                                 | PRESET ER-JET 22X1.5L*                                                                |
| ST 25X 50 ER40 F | NUT ER40 TOP                                                                        | WRENCH ER40*                                                                        | PRESET ER-JET 16X2*                                                                   | PRESET ER-JET 16X2L*                                                                  |
| ST 30X 50 ER40 F | NUT ER40 TOP                                                                        | WRENCH ER40*                                                                        | PRESET ER-JET 18X1.5*                                                                 | PRESET ER-JET 18X1.5L*                                                                |
| ST 32X 50 ER40 F | NUT ER40 TOP                                                                        | WRENCH ER40*                                                                        | PRESET ER-JET 18X1.5*                                                                 | PRESET ER-JET 18X1.5L*                                                                |
| ST 40X 75 ER40 F | NUT ER40 TOP                                                                        | WRENCH ER40*                                                                        | PRESET ER-JET 22X1.5*                                                                 | PRESET ER-JET 22X1.5L*                                                                |
| ST 50X 80 ER40 F | NUT ER40 TOP                                                                        | WRENCH ER40*                                                                        | PRESET ER-JET 28X1.5*                                                                 |                                                                                       |
| ST 50X 80 ER50 F | NUT ER50 UM                                                                         | WRENCH ER50*                                                                        |                                                                                       |                                                                                       |

\* Optional, to be ordered separately



## Straight Shank

**ST-ER-MF (mini flat)**  
DIN 6499 ER Mini Collet  
Chucks with Cylindrical  
Shanks and a Clamping Flat  
for Swiss-Type CNC Lathes



| Designation                      | DCONMS | CSI  | LS     | DCONNWS <sup>(6)</sup> | DCONXWS <sup>(7)</sup> | OHN <sup>(8)</sup> | CNT  | THID     | BD    | DRVS <sup>(9)</sup> |      |
|----------------------------------|--------|------|--------|------------------------|------------------------|--------------------|------|----------|-------|---------------------|------|
| ST 16X 38 ER11 MF <sup>(1)</sup> | 16.00  | ER11 | 38.00  | 0.5                    | 7.0                    | 18.50              | -    | M8X1     | 16.00 | 14.0                | 0.05 |
| ST 16X 50 ER11 MF                | 16.00  | ER11 | 50.00  | 0.5                    | 7.0                    | 18.50              | G1/8 | M7.5X0.5 | 16.00 | 13.0                | 0.07 |
| ST 16X140 ER11 MF                | 16.00  | ER11 | 140.00 | 0.5                    | 7.0                    | 18.50              | G1/8 | M7.5X0.5 | 16.00 | 14.0                | 0.18 |
| ST 16X 35 ER16 MF <sup>(1)</sup> | 16.00  | ER16 | 35.00  | 0.5                    | 10.0                   | 36.00              | -    | M8X1     | 22.00 | 17.0                | 0.08 |
| ST 20X 50 ER16 MF <sup>(2)</sup> | 20.00  | ER16 | 50.00  | 0.5                    | 10.0                   | 26.00              | G1/8 | M11X1    | 22.00 | 17.0                | 0.10 |
| ST 20X 70 ER16 MF <sup>(2)</sup> | 20.00  | ER16 | 70.00  | 0.5                    | 10.0                   | 26.00              | G1/8 | M11X1    | 22.00 | 17.0                | 0.17 |
| ST 20X120 ER16 MF <sup>(2)</sup> | 20.00  | ER16 | 120.00 | 0.5                    | 10.0                   | 26.00              | G1/8 | M11X1    | 22.00 | 17.0                | 0.19 |
| ST 20X140 ER16 MF <sup>(2)</sup> | 20.00  | ER16 | 140.00 | 0.5                    | 10.0                   | 26.00              | G1/8 | M11X1    | 22.00 | 17.0                | 0.40 |
| ST 22X 38 ER16 MF <sup>(1)</sup> | 22.00  | ER16 | 38.00  | 0.5                    | 10.0                   | 26.00              | -    | M12X1    | 22.00 | 19.0                | 0.10 |
| ST 22X 70 ER16 MF <sup>(1)</sup> | 22.00  | ER16 | 70.00  | 0.5                    | 10.0                   | 26.00              | G1/4 | M11X1    | 22.00 | 19.0                | 0.16 |
| ST 22X100 ER16 MF <sup>(1)</sup> | 22.00  | ER16 | 100.00 | 0.5                    | 10.0                   | 28.00              | -    | M12X1    | 22.00 | 19.0                | 0.23 |
| ST 22X 80 ER20 MF <sup>(1)</sup> | 22.00  | ER20 | 80.00  | 1.0                    | 13.0                   | 39.00              | -    | M12X1    | 28.00 | 21.0                | 0.21 |
| ST 22X 70 ER25 MF <sup>(1)</sup> | 22.00  | ER25 | 70.00  | 1.0                    | 16.0                   | 47.00              | -    | M12X1    | 35.00 | 27.0                | 0.25 |
| ST 25X 65 ER16 MF                | 25.00  | ER16 | 65.00  | 0.5                    | 10.0                   | 28.00              | -    | M12X1    | 22.00 | 22.0                | 0.22 |
| ST 25X100 ER20 MF <sup>(3)</sup> | 25.00  | ER20 | 100.00 | 1.0                    | 13.0                   | 28.00              | -    | M14X1    | 28.00 | 22.0                | 0.15 |
| ST 25X154 ER20 MF <sup>(3)</sup> | 25.00  | ER20 | 154.00 | 1.0                    | 13.0                   | 28.00              | -    | M14X1    | 28.00 | 22.0                | 0.40 |
| ST 25X 75 ER25 MF <sup>(4)</sup> | 25.00  | ER25 | 75.00  | 1.0                    | 16.0                   | 48.00              | -    | M14X1    | 35.00 | 27.0                | 0.30 |
| ST 25X145 ER25 MF <sup>(3)</sup> | 25.00  | ER25 | 145.00 | 1.0                    | 16.0                   | 36.00              | -    | M14X1    | 35.00 | 27.0                | 0.08 |
| ST 32X 70 ER25 MF <sup>(5)</sup> | 32.00  | ER25 | 70.00  | 1.0                    | 16.0                   | 30.00              | G1/4 | M18X1    | 35.00 | 27.0                | 0.35 |

<sup>(1)</sup> For Star machines

<sup>(2)</sup> For Citizen machines

<sup>(3)</sup> For Tornos-Bechler machines

<sup>(4)</sup> For Manurhin machines

<sup>(5)</sup> For Schutte machines

<sup>(6)</sup> Minimum diameter

<sup>(7)</sup> Maximum diameter

<sup>(8)</sup> Minimum overhang

<sup>(9)</sup> Torque key size

## Spare Parts

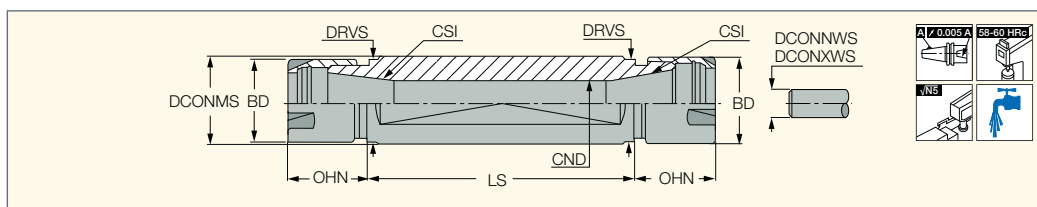
| Designation       |               |                   |                     |
|-------------------|---------------|-------------------|---------------------|
| ST 16X 38 ER11 MF | NUT ER11 MINI | WRENCH ER11 MINI* | PRESET ER-JET 8X1*  |
| ST 16X 50 ER11 MF | NUT ER11 MINI | WRENCH ER11 MINI* | PRESET ER-JET 8X1*  |
| ST 16X140 ER11 MF | NUT ER11 MINI | WRENCH ER11 MINI* | PRESET ER-JET 8X1*  |
| ST 16X 35 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 8X1*  |
| ST 20X 50 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 20X 70 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 20X120 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 20X140 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 22X 38 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 22X 70 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 22X100 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 22X 80 ER20 MF | NUT ER20 MINI | WRENCH ER20 MINI* | PRESET ER-JET 12X1* |
| ST 22X 70 ER25 MF | NUT ER25 MINI | WRENCH ER25 MINI* | PRESET ER-JET 12X1* |
| ST 25X 65 ER16 MF | NUT ER16 MINI | WRENCH ER16 MINI* | PRESET ER-JET 12X1* |
| ST 25X100 ER20 MF | NUT ER20 MINI | WRENCH ER20 MINI* | PRESET ER-JET 14X1* |
| ST 25X154 ER20 MF | NUT ER20 MINI | WRENCH ER20 MINI* | PRESET ER-JET 14X1* |
| ST 25X 75 ER25 MF | NUT ER25 MINI | WRENCH ER25 MINI* | PRESET ER-JET 14X1* |
| ST 25X145 ER25 MF | NUT ER25 MINI | WRENCH ER25 MINI* | PRESET ER-JET 14X1* |
| ST 32X 70 ER25 MF | NUT ER25 MINI | WRENCH ER25 MINI* | PRESET ER-JET 18X1* |

\* Optional, to be ordered separately

## Straight Shank

### ST-ER-MF-D (double-ended)

Double-Ended Mini Collets with Cylindrical Shanks and a Clamping Flat



| Designation                        | DCONMS | LS    | CSI  | DCONNWS <sup>(3)</sup> | DCONXWS <sup>(4)</sup> | BD    | CND <sup>(5)</sup> | OHN <sup>(6)</sup> | DRVS <sup>(7)</sup> | kg   |
|------------------------------------|--------|-------|------|------------------------|------------------------|-------|--------------------|--------------------|---------------------|------|
| ST 16X 50 ER11 MF D                | 16.00  | 50.00 | ER11 | 0.5                    | 7.0                    | 16.00 | 7.5                | 18.50              | 14.0                | 0.07 |
| ST 20X 30 ER11 MF D <sup>(1)</sup> | 20.00  | 30.00 | ER11 | 0.5                    | 7.0                    | 16.00 | 7.5                | 18.50              | 17.0                | 0.09 |
| ST 20X 50 ER11 MF D <sup>(1)</sup> | 20.00  | 50.00 | ER11 | 0.5                    | 7.0                    | 16.00 | 7.5                | 18.50              | 17.0                | 0.13 |
| ST 20X 55 ER16 MF D <sup>(1)</sup> | 20.00  | 55.00 | ER16 | 0.5                    | 10.0                   | 22.00 | 10.5               | 25.00              | 17.0                | 0.12 |
| ST 22X 55 ER16 MF D <sup>(2)</sup> | 22.00  | 55.00 | ER16 | 0.5                    | 10.0                   | 22.00 | 10.5               | 28.00              | 19.0                | 0.17 |
| ST 22X 75 ER16 MF D <sup>(2)</sup> | 22.00  | 75.00 | ER16 | 0.5                    | 10.0                   | 22.00 | 10.5               | 28.00              | 19.0                | 0.21 |
| ST 25X 62 ER16 MF D                | 25.00  | 62.00 | ER16 | 0.5                    | 10.0                   | 22.00 | 10.5               | 28.00              | 22.0                | 0.23 |
| ST 32X 55 ER20 MF D <sup>(2)</sup> | 32.00  | 55.00 | ER20 | 1.0                    | 13.0                   | 28.00 | 13.5               | 28.00              | 27.0                | 0.34 |
| ST 32X 75 ER20 MF D <sup>(2)</sup> | 32.00  | 75.00 | ER20 | 1.0                    | 13.0                   | 28.00 | 13.5               | 28.00              | 27.0                | 0.44 |

<sup>(1)</sup> For Citizen machines

<sup>(2)</sup> For Star machines

<sup>(3)</sup> Minimum diameter

<sup>(4)</sup> Maximum diameter

<sup>(5)</sup> Coolant entry diameter

<sup>(6)</sup> Minimum overhang

<sup>(7)</sup> Torque key size

### Spare Parts

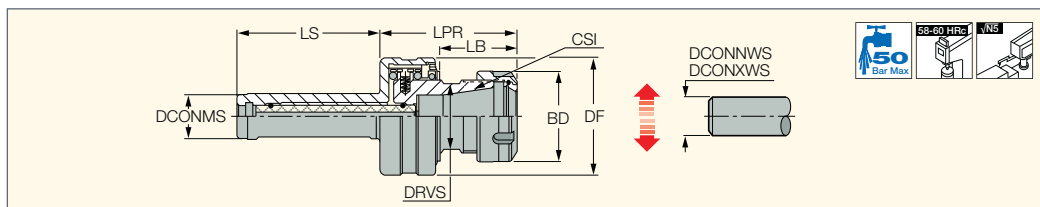
| Designation         |  |  |
|---------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| ST 16X 50 ER11 MF D | NUT ER11 MINI                                                                     | WRENCH ER11 MINI*                                                                 |
| ST 20X 30 ER11 MF D | NUT ER11 MINI                                                                     | WRENCH ER11 MINI*                                                                 |
| ST 20X 50 ER11 MF D | NUT ER11 MINI                                                                     | WRENCH ER11 MINI*                                                                 |
| ST 20X 55 ER16 MF D | NUT ER16 MINI                                                                     | WRENCH ER16 MINI*                                                                 |
| ST 22X 55 ER16 MF D | NUT ER16 MINI                                                                     | WRENCH ER16 MINI*                                                                 |
| ST 22X 75 ER16 MF D | NUT ER16 MINI                                                                     | WRENCH ER16 MINI*                                                                 |
| ST 25X 62 ER16 MF D | NUT ER16 MINI                                                                     | WRENCH ER16 MINI*                                                                 |
| ST 32X 55 ER20 MF D | NUT ER20 MINI                                                                     | WRENCH ER20 MINI*                                                                 |
| ST 32X 75 ER20 MF D | NUT ER20 MINI                                                                     | WRENCH ER20 MINI*                                                                 |

\* Optional, to be ordered separately

## Straight Shank

### GFI ST-ER

Floating Reamer DIN 6499  
Collet Chucks and Cylindrical  
Shanks with a Clamping Flat

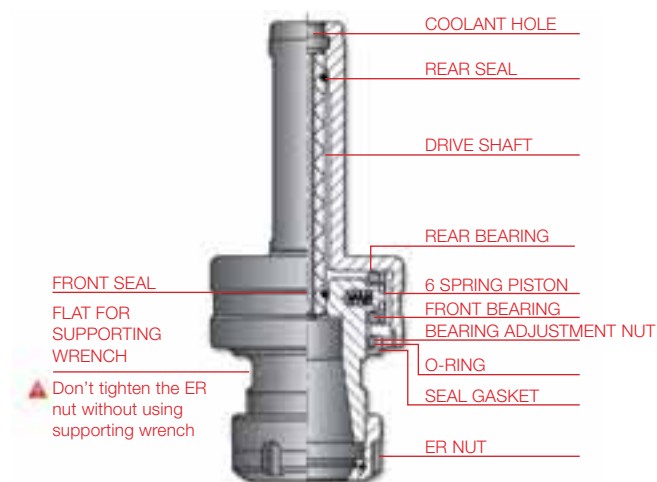


| Designation                         | DCONMS | CSI  | DCONNWS <sup>(2)</sup> | DCONXWS <sup>(3)</sup> | LS    | LPR   | LB   | BD    | DF    | RFI  | DRVS <sup>(4)</sup> |      |
|-------------------------------------|--------|------|------------------------|------------------------|-------|-------|------|-------|-------|------|---------------------|------|
| <b>GFI ST20 ER20</b> <sup>(1)</sup> | 20.00  | ER20 | 1.0                    | 13.0                   | 65.00 | 55.50 | 31.0 | 34.00 | 50.00 | 0.50 | 22.0                | 0.56 |
| <b>GFI ST25 ER32</b> <sup>(1)</sup> | 25.00  | ER32 | 2.0                    | 20.0                   | 80.00 | 76.90 | 45.9 | 50.00 | 65.00 | 0.80 | 36.0                | 1.20 |

- Maximum 2000 RPM!
- <sup>(1)</sup> Radial float from center
- <sup>(2)</sup> Minimum diameter
- <sup>(3)</sup> Maximum diameter
- <sup>(4)</sup> Torque key size

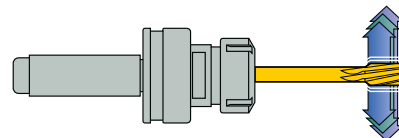
### GFI ER - Floating Reamer Collet Chuck

Floating chuck - adjusts the misalignment between the reamer and workpiece hole to ensure the same accuracy as the reamer itself.



### Application:

The **GFI** floating chuck is a unique holder that compensates for the radial misalignment existing in reaming operations carried out on vertical and horizontal machine tools.



### Features:

Radial self-floating mechanism compensates for misalignment between the reamer and workpiece to ensure the same tolerance as the reamer itself. The special self-centering mechanism eliminates tapered and oversized bores.

### Advantages:

Unique ball bearing and axle drive shaft structure enables vertical and horizontal machining.  
Precise and efficient clamping with ER spring collets or ER Coolit collets.

### Spare Parts

| Designation          |              |              |
|----------------------|--------------|--------------|
| <b>GFI ST20 ER20</b> | NUT ER20 TOP | WRENCH ER20* |
| <b>GFI ST25 ER32</b> | NUT ER32 TOP | WRENCH ER32* |

\* Optional, to be ordered separately

# MODULAR-GRIP ADAPTATIONS



## Modular-Grip Adaptations

### Modular Adaptation Systems for Turning Lathes and Multi-Spindle Machine Tools Carrying ISCAR's MODULAR-GRIP Adapters Featuring Directed Internal Coolant Channels

#### Product Features

- The unique combination of a rigid tool and efficient coolant improves the insert's tool life, surface finish and part straightness
- Designed for high-pressure coolant up to 150 Bar and also very efficient when using low coolant pressure of 7-10 Bar
- No coolant tubes involved, which means no obstruction for chip evacuation
- Each adapter can carry several types of MODULAR-GRIP blades
- Excellent tool location repeatability after blade replacement for fast setup
- Easy and user-friendly mounting

#### Available adapters for the following specific machines:

- STAR
- DOOSAN / HAAS
- MAZAK
- DMG MORI
- BIGLIA / EUROTECH
- MIYANO
- NAKAMURA-TOME
- INDEX ABC
- TRAUB
- OKUMA
- TSUGAMI

#### Multi-Spindle machine tools

- INDEX CNC
- Schütte
- Göltenbodt



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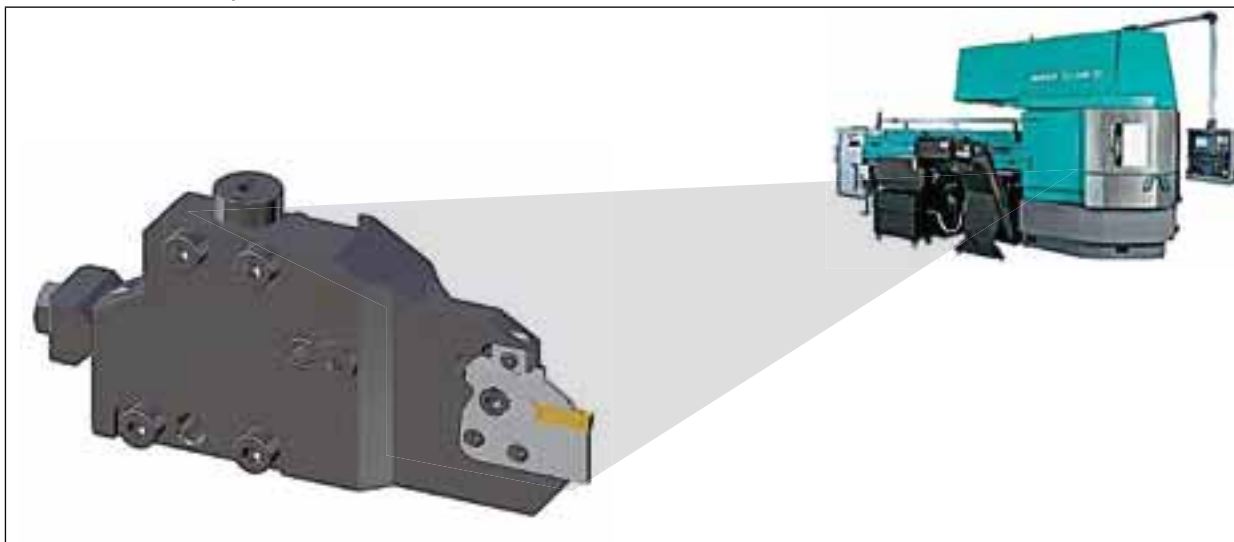
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# ISCAR Modular System for Multi-Spindle Machines

## **MODULAR-GRIP . JETCUT**

Toolholder Systems for INDEX CNC Multi-Spindle Machines with MODULAR-GRIP Adaptation and Directed Internal Coolant

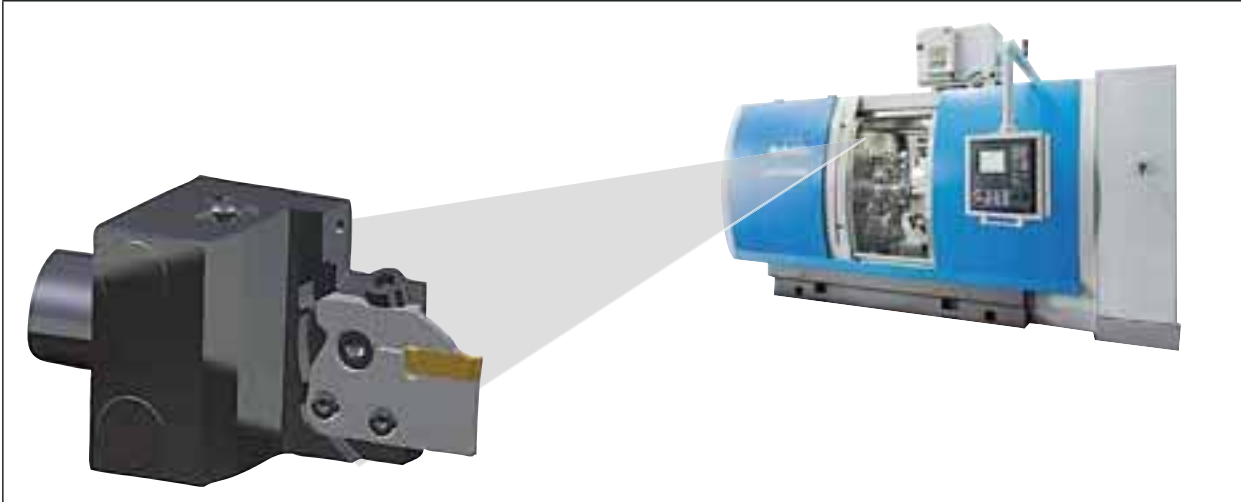


### Features and Benefits of Directed Internal Coolant

|           | Customized to the Work Space                                                                                                                                                                                                                               | No Coolant Tube                                                                                                                                                                                                                | Coolant Connection through the Slide                                                                                                                         | Easy Indexing                                                                                                                                     |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: | <p>Bar stopper      Adapter</p>                                                                                                                                                                                                                            |                                                                                                                                                                                                                                | <p>Slide</p> <p>Coolant hole</p>                                                                                                                             |                                                                                                                                                   |
| Benefits: | <ul style="list-style-type: none"> <li>• High-end stability due to optimized holder design</li> <li>• No interfering contour with the sub-spindle</li> <li>• Reduced setup time due to fixed adapter length</li> <li>• Exchangeable bar stopper</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube/ hose required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li> </ul> | <ul style="list-style-type: none"> <li>• No tube/hose in the work space</li> <li>• Reduced setup time as there are no tube/ hoses to be installed</li> </ul> | <ul style="list-style-type: none"> <li>• Easy handling due to clamping screw accessible from the side</li> <li>• Stable screw clamping</li> </ul> |



### Toolholder Systems for Schütte CNC Multi-Spindle Machines with MODULAR-GRIP Adaptation and Directed Internal Coolant



#### Features and Benefits of Directed Internal Coolant

|          | Adjustable Center Height                                                                                                                                                                                                                                   | No Coolant Tube                                                                                                                                                                                                          |                                                                                    | Optimized Holder Design                                                                                                                                                                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features |                                                                                                                                                                          |                                                                                                                                        |  |                                                                                                        |
| Benefits | <ul style="list-style-type: none"> <li>• High-end stability due to optimized holder design</li> <li>• No interfering contour with the sub-spindle</li> <li>• Reduced setup time due to fixed adapter length</li> <li>• Exchangeable bar stopper</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube/hoses required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no free coolant nozzle)</li> </ul> |                                                                                    | <ul style="list-style-type: none"> <li>• Low risk of collision</li> <li>• Customized for outer diameter of the sub-spindle</li> <li>• Slim design</li> <li>• Short bar overhang</li> </ul> |



### ISCAR Modular System for Multi-Spindle Machines

Toolholder Systems for Göltebott GWS Multi-Spindle Machines with MODULAR-GRIP Adaptation and Directed Internal Coolant



For various common multi-spindle machines such as:

| Gildemeister                                                                      | MORI-SAY.                                                                         | INDEX                                                                             | TORNOS and others                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |

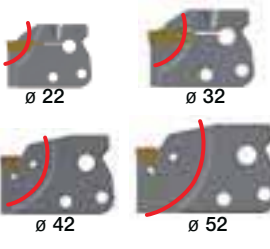
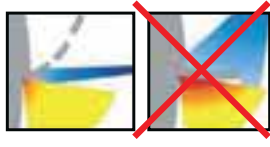
#### Features and Benefits of Directed Internal Coolant

|          | Matches intermediate holders with internal coolant                                                                                | Coolant connection directly from the intermediate holder                                                                                                                                                                                                          | Flexible system due to different adapters                                                                                                                     |
|----------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features |                                                |                                                                                                                                                                               |                                                                          |
| Benefits | <ul style="list-style-type: none"> <li>• Low investment</li> <li>• Easy switching to toolholders with internal coolant</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube/hose required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li> <li>• Uninterrupted work space</li> </ul> | <ul style="list-style-type: none"> <li>• Variable tool length due to different adapters</li> <li>• Tool length can be adjusted to the travel slide</li> </ul> |

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## Adapters with Internal Coolant

### Modular-Grip Adapters with Directed Internal Coolant

|          | Extremely Stable                                                                                                                                                                                          | Coolant Connection from the Holder into the Adapter                                                                                                                                                                      | Coolant / lubrication in the cutting zone                                                                                                 | Vario System                                                                                                                                                                                             |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features |  <p>                     ø 22      ø 32<br/>                     ø 42      ø 52                 </p>                     |                                                                                                                                         |                                                         |  <p>                     TAGPAD-JHP    HGPAD-JHP<br/>                     DGPAD-JHP    CGPAD-JHP                 </p> |
| Benefits | <ul style="list-style-type: none"> <li>• Adapters designed for common bar diameters</li> <li>• Reduced vibration due to strong adapter body</li> <li>• Strong clamping force by screw clamping</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube/hose required)</li> <li>• No tube/hoses to be removed in case of tool breakage</li> <li>• Free work space</li> </ul> | <ul style="list-style-type: none"> <li>• Increased tool life</li> <li>• Improved process safety</li> <li>• Better chip control</li> </ul> | <ul style="list-style-type: none"> <li>• Different cutting systems can be used. Grooving and turn-groove operations can be performed with the same holder</li> <li>• Extremely flexible</li> </ul>       |

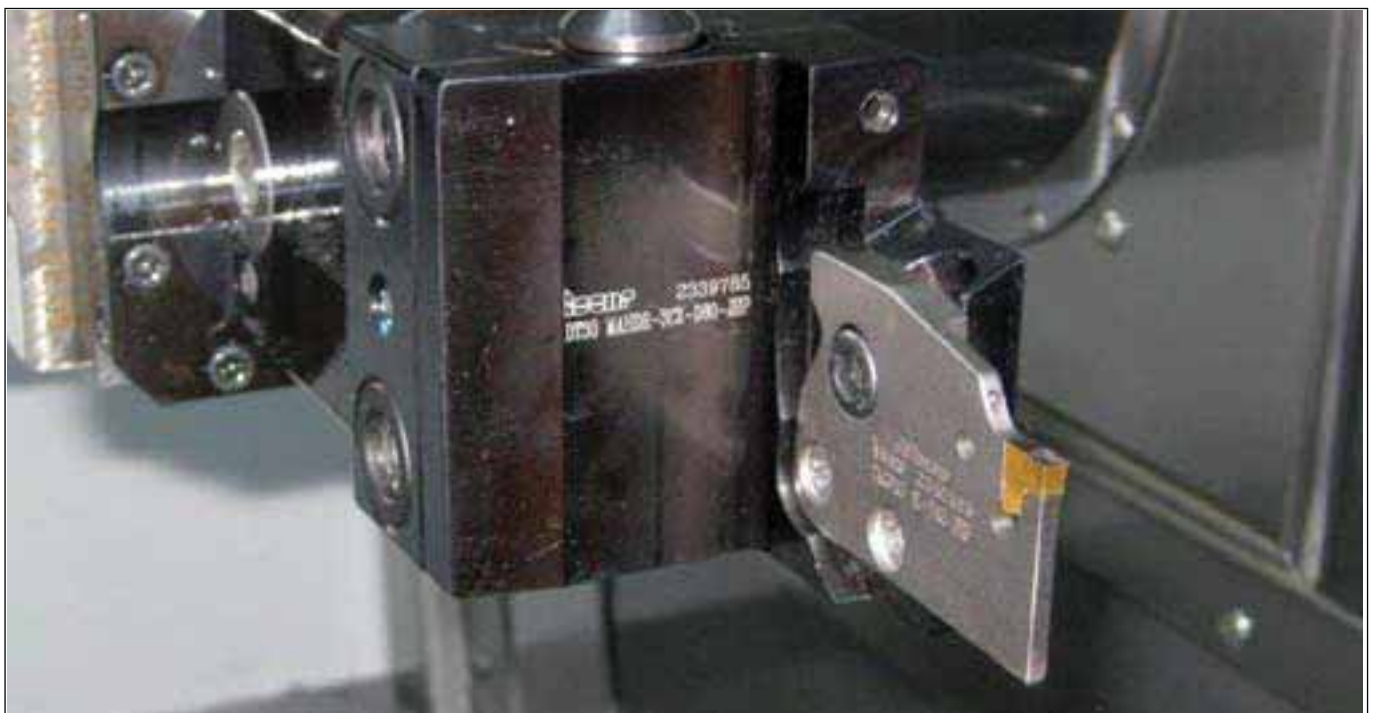
## Tool Selection for INDEX CNC Multi-Spindle Machines

| Machine                                                                                               | Toolholder                                                                        | Width                                                                             | Adapter                                                                                    |                                                                                             | Insert                                                                                    |                                                                                            | Geometry / Feed                                                                          | Tough  Hard |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                                       |  |  | DGPAD<br> | TAGPAD<br> | TAG<br> | DGN<br> |                                                                                          | IC830<br>   | IC5400<br> | IC808<br> |                                                                                       |                                                                                       |
| <br><br>Index MS16   | MS16- JHP                                                                         | 1,5 mm                                                                            | DGFH MS16-1.5D16-JHP                                                                       |                                                                                             | DGN 150..J                                                                                |                                                                                            | LF    |             | low                                                                                           |           |    |    |
|                                                                                                       |                                                                                   | 2 mm                                                                              | DGFH MS16-1.5D16-JHP                                                                       |                                                                                             | DGN 2002                                                                                  |                                                                                            | MF    |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           |                                                                                            |                                                                                          |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
| <br><br>Index MS18   | MS18- 22-MG- JHP                                                                  | 2 mm                                                                              | DGPAD 2L-D22-JHP                                                                           |                                                                                             | DGN 2002                                                                                  |                                                                                            | LF    |             | low                                                                                           |           |    |    |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           | MF      | C     |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           |                                                                                            |                                                                                          |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
| <br><br>Index MS22  | MS18- 22-MG- JHP                                                                  | 2 mm                                                                              | DGPAD 2L-D22-JHP                                                                           |                                                                                             | DGN 2002                                                                                  |                                                                                            | LF   |            | low                                                                                           |          |   |   |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           | MF    | C   |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           |                                                                                            |                                                                                          |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
| <br><br>Index MS32 | MS32- 40-MG- JHP                                                                  | 2 mm                                                                              | DGPAD 2L-D32-JHP                                                                           |                                                                                             | DGN 2002                                                                                  |                                                                                            | LF  |           | low                                                                                           |         |  |  |
|                                                                                                       |                                                                                   | 3,1 mm                                                                            | DGPAD 3L-D32-JHP                                                                           |                                                                                             | DGN 3102                                                                                  |                                                                                            | MF  |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           |                                                                                            |                                                                                          |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
| <br><br>Index MS40 | MS32- 40-MG- JHP                                                                  | 2 mm                                                                              | TAGPAD 2L-D42-JHP                                                                          |                                                                                             | TAG N2                                                                                    |                                                                                            | LF  |           | low                                                                                           |         |  |  |
|                                                                                                       |                                                                                   | 3 mm                                                                              | TAGPAD 3L-D42-JHP                                                                          |                                                                                             | TAG N3                                                                                    |                                                                                            | MF  |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           |                                                                                            |                                                                                          |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
| <br><br>Index MS52 | MS32- 40-MG- JHP<br>oder MS52-MG-JHP                                              | 2 mm                                                                              | TAGPAD 2L-D52-JHP                                                                          |                                                                                             | TAG N2                                                                                    |                                                                                            | LF  |           | low                                                                                           |         |  |  |
|                                                                                                       |                                                                                   | 3 mm                                                                              | TAGPAD 3L-D52-JHP                                                                          |                                                                                             | TAG N3                                                                                    |                                                                                            | MF  |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |
|                                                                                                       |                                                                                   |                                                                                   |                                                                                            |                                                                                             |                                                                                           |                                                                                            |                                                                                          |                                                                                                |                                                                                               |                                                                                              |                                                                                       |                                                                                       |

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# Tool Selection for Schütte CNC Multi-Spindle Machines SCX

| System Size                                                                                  | Toolholder                                                                        | Intermediate holder                                                               | Width                                                                             | Adapter                                                                           |                                                                                   | Insert                                                                              |                                                                                     | Geometry / Feed                                                                                                                                                                    | Tough <span>↔</span> Hard                                                                                                                                                                                                                                         |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                              |  |  |  | DGPAD                                                                             | TAGPAD                                                                            | TAG                                                                                 | DGN                                                                                 |                                                                                                                                                                                    | <br><br> |  |  |  |   |
|                                                                                              |                                                                                   |                                                                                   |                                                                                   |  |  |  |  |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
|                                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
| <br>SCX-32  | C3 DT30/2-L23                                                                     | DT30/2 MAHDR-SCX-D80-JHP                                                          | 2 mm                                                                              | DGPAD 2L-D32-JHP                                                                  |                                                                                   | DGN 2002                                                                            |                                                                                     | LF                                                                                              |                                                                                                                                                                                |  |  |  |                                                                                      |
|                                                                                              | C4 DT30/2-L23                                                                     |                                                                                   | 3,1 mm                                                                            | DGPAD 3L-D32-JHP                                                                  |                                                                                   | DGN 3102                                                                            |                                                                                     | MF <br>C     |                                                                                                                                                                                                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
| <br>SCX-46 | C3 DT30/2-L23                                                                     | DT30/2 MAHDR-SCX-D80-JHP                                                          | 2 mm                                                                              | TAGPAD 2L-D52-JHP                                                                 |                                                                                   | TAG N2                                                                              |                                                                                     | LF                                                                                              |                                                                                                                                                                                                                                                                   |                                                                                     |                                                                                     |                                                                                     |  |
|                                                                                              | C4 DT30/2-L23                                                                     |                                                                                   | 3 mm                                                                              | TAGPAD 3L-D52-JHP                                                                 |                                                                                   | TAG N3                                                                              |                                                                                     | MF <br>C  |                                                                                                                                                                                                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                      |



## Tool Selection for Göltebott GWS Systems

| System Size                                                                                 | Max. Diameter                                                                                | Width of Cut (W) | Length L | Toolholder            |                       | Adapter                     |                             | Insert   |                                                                                       | Geometry / Feed                                                                       | Tough ↔ Hard                                                                         |        |       |  |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------|----------|-----------------------|-----------------------|-----------------------------|-----------------------------|----------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------|-------|--|
|                                                                                             |                                                                                              |                  |          | Right Hand            | Left Hand             | DGPAD                       | TAGPAD                      | TAG      | DGN                                                                                   |                                                                                       | IC830                                                                                | IC5400 | IC808 |  |
|                                                                                             |                                                                                              |                  |          |                       |                       |                             |                             |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              |                  |          |                       |                       |                             |                             |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
| <br>GWS02  | 20 mm                                                                                        | 2 mm             | 51 mm    | MS-ES02012-GWS-MG-JHP |                       | DGPAD 2R/<br>L-D20-GWS-JHP* | DGN 2002                    | LF       |    | low                                                                                   |   |        |       |  |
|                                                                                             |                                                                                              |                  | 59 mm    | MS-ES02013-GWS-MG-JHP |                       |                             |                             | MF       |    |                                                                                       |                                                                                      |        |       |  |
|                                                                                             | 32 mm                                                                                        | 2 mm             | 59,5 mm  | MS-ES02012-GWS-MG-JHP |                       | DGPAD 2R/<br>L-D32-JHP*     | DGN 3102                    | C        |    |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              |                  | 67,5 mm  | MS-ES02013-GWS-MG-JHP |                       |                             |                             |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              | 3,1 mm           | 59,5 mm  | MS-ES02012-GWS-MG-JHP |                       | DGPAD 3R/<br>L-D32-JHP*     |                             |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              |                  | 67,5 mm  | MS-ES02013-GWS-MG-JHP |                       |                             |                             |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
| <br>GWS09 | 20 mm                                                                                        | 2 mm             | 61 mm    | MS-ES09003-GWS-MG-JHP |                       | DGPAD 2R/<br>L-D20-GWS-JHP* | DGN 2002                    | LF       |    | low                                                                                   |  |        |       |  |
|                                                                                             | 32 mm                                                                                        | 2 mm             | 59,5 mm  | MS-ES09003-GWS-MG-JHP |                       | DGPAD 2R/<br>L-D32-JHP*     |                             |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              | 3,1 mm           | 59,5 mm  | MS-ES09003-GWS-MG-JHP |                       | DGPAD 3R/<br>L-D32-JHP*     | DGN 3102                    | MF       |  |                                                                                       |                                                                                      |        |       |  |
|                                                                                             | 42 mm                                                                                        | 2 mm             | 62,6 mm  | MS-ES09003-GWS-MG-JHP |                       | TAGPAD 2R/<br>L-D42-JHP*    | TAG N2                      | C        |  |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              | 3 mm             | 62,4 mm  | MS-ES09003-GWS-MG-JHP |                       | TAGPAD 3R/<br>L-D42-JHP*    | TAG N3                      |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             | 52 mm                                                                                        | 2 mm             | 67,6 mm  | MS-ES09003-GWS-MG-JHP |                       | TAGPAD 2R/<br>L-D52-JHP*    | TAG N2                      |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              | 3 mm             | 67,4 mm  | MS-ES09003-GWS-MG-JHP |                       | TAGPAD 3R/<br>L-D52-JHP*    | TAG N3                      |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             | <br>GWS41 | 20 mm            | 2 mm     | 59 mm                 | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP       | DGPAD 2R/<br>L-D20-GWS-JHP* | DGN 2002 | LF                                                                                    |  |                                                                                      |        |       |  |
| 32 mm                                                                                       |                                                                                              | 2 mm             | 67,5 mm  | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP | DGPAD 2R/<br>L-D32-JHP*     |                             |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              | 3,1 mm           | 67,5 mm  | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP | DGPAD 3R/<br>L-D32-JHP*     | DGN 3102                    | MF       |  |                                                                                       |                                                                                      |        |       |  |
| 42 mm                                                                                       |                                                                                              | 2 mm             | 70,6 mm  | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP | TAGPAD 2R/<br>L-D42-JHP*    | TAG N2                      | C        |  |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              | 3 mm             | 70,4 mm  | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP | TAGPAD 3R/<br>L-D42-JHP*    | TAG N3                      |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
| 52 mm                                                                                       |                                                                                              | 2 mm             | 75,6 mm  | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP | TAGPAD 2R/<br>L-D52-JHP*    | TAG N2                      |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |
|                                                                                             |                                                                                              | 3 mm             | 75,4 mm  | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP | TAGPAD 3R/<br>L-D52-JHP*    | TAG N3                      |          |                                                                                       |                                                                                       |                                                                                      |        |       |  |

\*Selection of right hand or left hand adapter see page 861

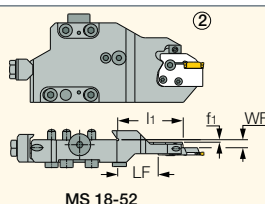
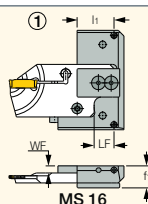


## INDEX

### MODULAR-GRIP

#### MS##-##-MG-JHP

Toolholders for INDEX CNC Multi-Spindle Machines with Internal Coolant Supply for MODULAR-GRIP Adapters



WF (assembly) = WF+WF (Adapter)

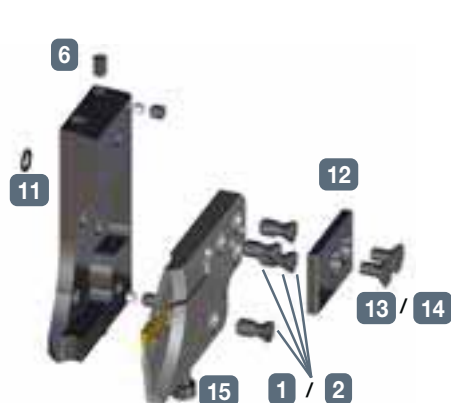
| Designation            | LF    | l1    | WF    | f1   | Fig. | Adapter              | Adapter2            |
|------------------------|-------|-------|-------|------|------|----------------------|---------------------|
| MS 16-JHP              | 14.00 | 26.00 | 5.00  | 15.5 | 1    | DGFH MS16-1.5D16-JHP | -                   |
| MS 18/22-MG-JHP        | 46.20 | 67.00 | 13.60 | 8.1  | 2    | DGPAD 2L-D22-JHP     | -                   |
| MS 18/22-MG-JHP L-69.7 | 24.20 | 48.00 | 13.60 | 8.0  | 2    | DGPAD 2L-D22-JHP     | -                   |
| MS 32/40-MG-JHP        | 45.00 | 69.80 | 13.50 | 8.0  | 2    | DGPAD 2/3L-D32-JHP   | TAGPAD 2/3-D42-JHP  |
| MS 32/40-MG-JHP-5.1    | 45.00 | 69.80 | 13.50 | 8.0  | 2    | DGPAD 2/3L-D32-JHP   | TAGPAD 2/3-D42-JHP  |
| MS 32C-HUBVERL-MG-JHP  | 74.50 | 99.30 | 13.50 | 8.0  | 2    | DGPAD 2/3L-D32-JHP   | TAGPAD 2/3L-D32-JHP |
| MS 40-6/8-MG-JHP       | 55.00 | 79.80 | 13.50 | 8.0  | 2    | TAGPAD 2/3L-D42-JHP  | DGPAD 2/3L-D42-JHP  |
| MS 40-6/8-MG-JHP-7.1   | 55.00 | 79.80 | 13.50 | 8.0  | 2    | TAGPAD 2/3L-D42-JHP  | DGPAD 2/3L-D42-JHP  |
| MS 52-MG-JHP           | 46.60 | -     | 4.50  | -    | 2    | TAGPAD 2/3-D52-JHP   | -                   |

• For user guide, see pages 852-858 • All trademarks and logos are the property of their respective companies

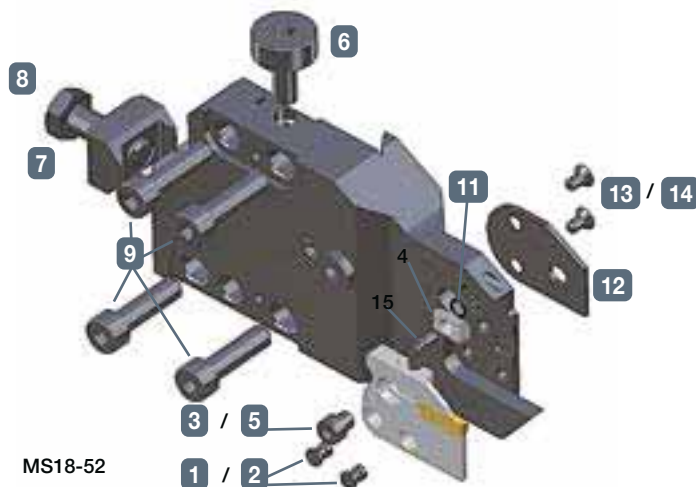
For tools, see pages: CGPAD-JHP (309) • DGPAD-D12/22-JHP (539) • DGPAD-JHP (538) • HGPAD-JHP (291) • PCADR/L-JHP (353) • PCADRS/LS-JHP (354)

• PCLNR/L-PAD-JHP (25) • PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88)

• TAGPAD-JHP (562) • TGPAD-JHP (298)



MS16



MS18-52

#### Spare Parts MS##-##-MG-JHP

| No. | Designation   | MS16-JHP           | MS18/22-MG-JHP         | MS32/40-MG-JHP          |
|-----|---------------|--------------------|------------------------|-------------------------|
| 1   | Screw         | SR M5-04451-L10.5  | SR 16-212-L7.5         | SR 16-212-L7.5          |
| 2   | Key           | T-20/5             | T-20/5                 | T-20/5                  |
| 3   | Screw         |                    | SR M6X6DIN6912-5112367 | SR M6X6DIN6912-5112367  |
| 4   | Wedge         |                    | KEIL 12X30DEG-5112247  | KEIL 12X30DEG-5112247   |
| 5   | Key           |                    | HW 5.0                 | HW 5.0                  |
| 6   | Screw         | SR M4x6 DIN913 45H | WN99-08.0010.0         | WN99-08.0010.0          |
| 7   | Wedge         |                    | WN-11.0012.0           | W00014.0017             |
| 8   | ZI screw      |                    | ISO 4017-DIN 933 M8X30 | ISO 4017-DIN 933 M10X30 |
| 9   | Screw         |                    | SR M6X20DIN912 12.9    | SR M8X30DIN912          |
| 10  | Coolant Tube* |                    | ROHR M4X1-40           | ROHR M4X1-40            |
| 11  | O-Ring        | OR 5X1N            | OR 5X1N                | OR 5X1N                 |
| 12  | Bar stopper   | W00019.0064        | PLATTE-MS18-22-5112868 | PLATTE-MS18-22-5112868  |
| 13  | Screw         | DIN7991-M4X8-8.8   | DIN7991-M4X8-8.8       | DIN7991-M4X8-8.8        |
| 14  | Key           | HW 2.5             | HW 2.5                 | HW 2.5                  |
| 15  | Screw         | SR M4x30DIN912     | SR 34-535              | SR 34-535               |

| No. | Designation   | MS32/40-MG-JHP-5.1      | MS52-MG-JHP             |
|-----|---------------|-------------------------|-------------------------|
| 1   | Screw         | SR 16-212-L7.5          | SR 16-212-L7.5          |
| 2   | Key           | T-20/5                  | T-20/5                  |
| 3   | Screw         | SR M6X6DIN6912-5112367  | SR M6X6DIN6912-5112367  |
| 4   | Wedge         | KEIL 12X30DEG-5112247   | KEIL 12X30DEG-5112247   |
| 5   | Key           | HW 5.0                  | HW 5.0                  |
| 6   | Screw         | WN99-08.0010.0          | WN99-08.0010.0          |
| 7   | Wedge         | W00014.0017             | WN-11.0014.0            |
| 8   | ZI screw      | ISO 4017-DIN 933 M10X30 | ISO 4017-DIN 933 M10X30 |
| 9   | Screw         | SR M8X30DIN912          | ROHR M4X1-40            |
| 10  | Coolant Tube* | ROHR M4X1-40            | ROHR M4X1-40            |
| 11  | O-Ring        | OR 5X1N                 | OR 5X1N                 |
| 12  | Bar stopper   | PLATTE-MS18-22-5112868  | PLATTE-MS18-22-5112868* |
| 13  | Screw         | DIN7991-M4X8-8.8        | DIN7991-M4X8-8.8*       |
| 14  | Key           | HW 2.5                  | HW 2.5                  |
| 15  | Screw         | SR 34-535               | SR 34-535               |

\* Optional, please order separately.

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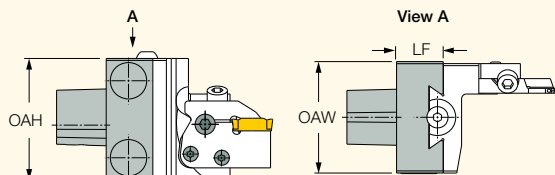




## MODULAR-GRIP

### C#-DT##/2-L23

Toolholder with CAMFIX  
Adaptation on DT for  
SCHUTTE Machine Tools



| Designation   | OAH   | OAW   | LF    |
|---------------|-------|-------|-------|
| C3 DT20/2-L23 | 57.00 | 45.00 | 23.50 |
| C3 DT30/2-L23 | 60.00 | 55.00 | 23.50 |
| C4 DT30/2-L23 | 60.00 | 55.00 | 23.50 |

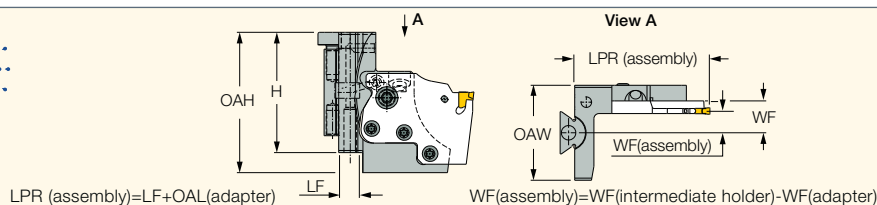
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## MODULAR-GRIP

### DT##/2 MAHD#-#-XL-JHP

Intermediate Holder with DT  
Adaptation for MODULAR-GRIP  
Adapters on SCHUTTE Machine Tools



| Designation           | H    | OAW   | LF   | WF    | OAH   |
|-----------------------|------|-------|------|-------|-------|
| DT20/2 MAHDL-L-XL-JHP | 57.0 | 45.00 | 9.10 | 4.50  | 66.50 |
| DT20/2 MAHDN-L-XL-JHP | 57.0 | 45.00 | 9.10 | 6.50  | 66.50 |
| DT30/2 MAHDR-L-XL-JHP | 57.0 | 55.00 | 9.10 | 20.10 | 65.85 |
| DT30/2 MAHDR-R-XL-JHP | 57.0 | 55.00 | 9.10 | 21.50 | 65.85 |

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For tools, see pages: DGPAD-JHP (480) • PCADRS/LS-JHP (317) • PCLNR/L-PAD-JHP (25) • PDJNR/L-PAD-JHP (38)

• SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88) • TAGPAD-JHP (500)

### Spare Parts

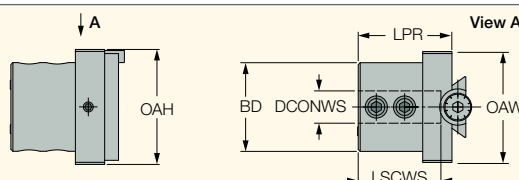
| Designation           |                       |        |             |        |                      |         |        |
|-----------------------|-----------------------|--------|-------------|--------|----------------------|---------|--------|
| DT##/2 MAHD#-#-XL-JHP | SUPPORT MG-XL-5113377 | T-20/5 | SR M5-04451 | HW 5.0 | SR M5x5 DIN913 TL360 | OR 5X1N | HW 2.5 |



## MODULAR-GRIP

### DT30/2 #L70WN

Intermediate Holder with DT30  
Adaptation for Boring Bars on  
SCHUTTE Machine Tools



| Designation    | OAH   | OAW   | DCONWS | BD    | LPR   | LSCWS |
|----------------|-------|-------|--------|-------|-------|-------|
| DT30/2 16L70WN | 57.00 | 55.00 | 16.00  | 44.00 | 46.50 | 41.00 |
| DT30/2 20L70WN | 57.00 | 55.00 | 20.00  | 48.00 | 46.50 | 41.00 |

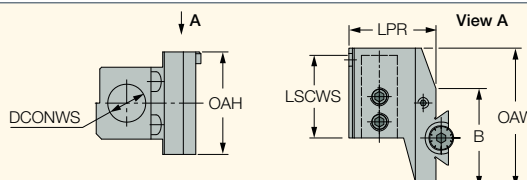
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## MODULAR-GRIP

### DT30/2 ADR-##-20-55

Intermediate Holder with DT30  
Adaptation for Boring Bars on  
SCHUTTE Machine Tools



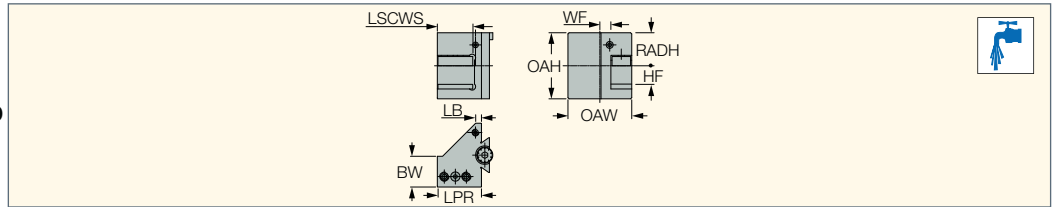
| Designation         | OAH   | OAW   | DCONWS | LPR   | B    | LSCWS |
|---------------------|-------|-------|--------|-------|------|-------|
| DT30/2 ADR-20-55    | 57.00 | 65.00 | 20.00  | 45.50 | 55.0 | 41.00 |
| DT30/2 ADR-Z0-20-55 | 57.00 | 77.50 | 20.00  | 48.50 | 55.0 | 46.00 |

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**DT30/2 ASH# 16/20-1-35080**

Intermediate Holder with  
DT30 Adaptation for  
Square Shank Tools on  
SCHÜTTE Machine Tools

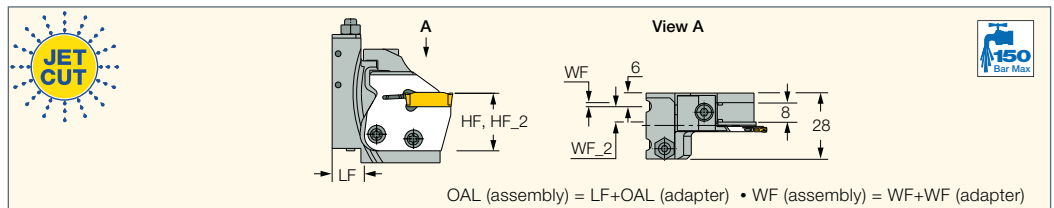


| Designation               | HF   | WF   | LPR   | OAH   | LB   | RADH  | BW    | OAW   | LSCWS |
|---------------------------|------|------|-------|-------|------|-------|-------|-------|-------|
| DT30/2 ASH# 16/20-1-35080 | 16.0 | 9.50 | 38.00 | 57.00 | 5.00 | 28.50 | 26.50 | 55.00 | 32.00 |

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**MS-ES####-GWS-MG-JHP**

Toolholders for Gölbodt  
GWS Systems with  
Internal Coolant Supply for  
MODULAR-GRIP Adapters



OAL (assembly) = LF+OAL (adapter) • WF (assembly) = WF+WF (adapter)

| Designation           | LF    | WF   | WF_2 | HF <sup>(1)</sup> | HF_2 <sup>(2)</sup> |
|-----------------------|-------|------|------|-------------------|---------------------|
| MS-ES02012-GWS-MG-JHP | 14.00 | 2.00 | 6.00 | 24.0              | 27.0                |
| MS-ES02013-GWS-MG-JHP | 22.00 | 2.00 | 6.00 | 24.0              | 27.0                |
| MS-ES09003-GWS-MG-JHP | 14.00 | 2.00 | 6.00 | 24.0              | 30.0                |
| MS-ES41008-GWS-MG-JHP | 22.00 | 2.00 | 6.00 | 24.0              | 27.0                |
| MS-ES41009-GWS-MG-JHP | 22.00 | 2.00 | 6.00 | 24.0              | 27.0                |

• For user guide, see pages 852-858 • All trademarks and logos are the property of their respective companies

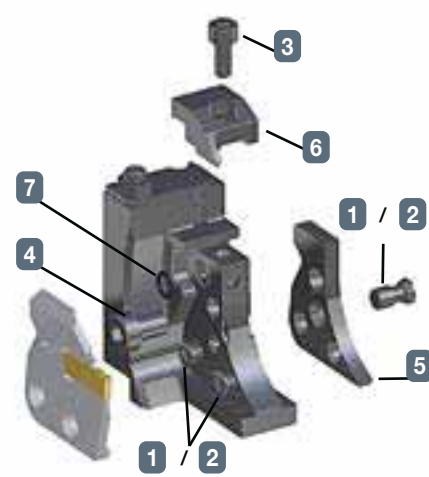
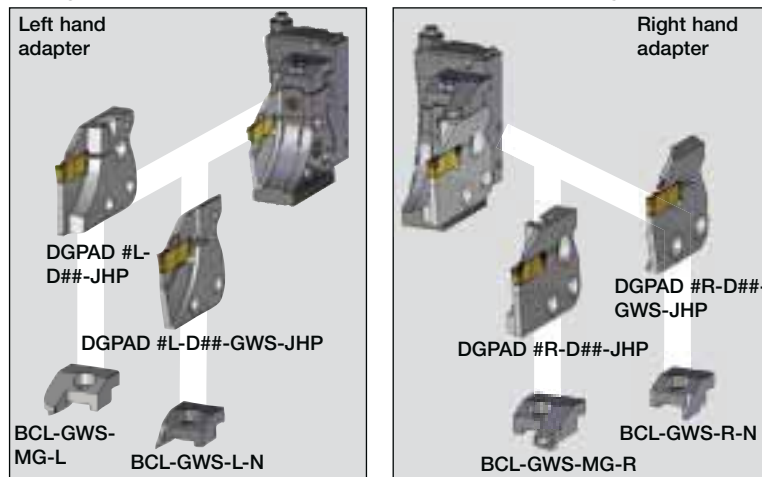
<sup>(1)</sup> Center height adjustment for GWS43

<sup>(2)</sup> Center height adjustment for GWS60

**For tools, see pages:** PCLNR/L-PAD-JHP (25) • PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78)

SVJCR/L-PAD-JHP (88) • DGPAD-JHP (538) • TAGPAD-JHP (562) • CGPAD-JHP (309) • HGPAD-JHP (291) • PCADR/L-JHP (353) • TGPAD-JHP (298)

PCADRS/LS-JHP (354)

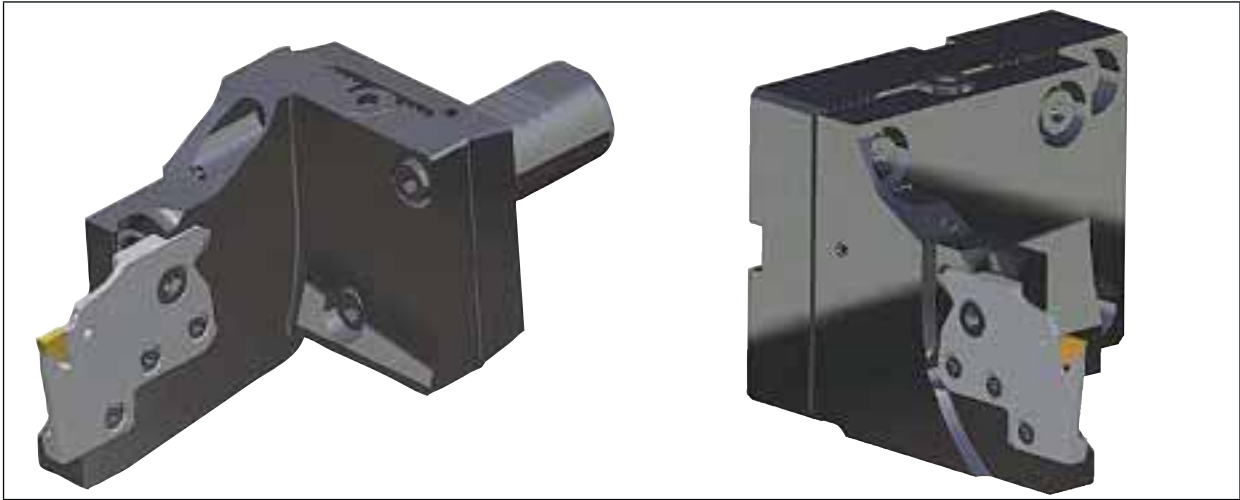
**Wedge Selection Guide (must be ordered separately)**

**Spare Parts MS-ES####-GWS-MG-JHP**

| No. | Designation | MS-ES02012-GWS-MG-JHP | MS-ES02013-GWS-MG-JHP | MS-ES09003-GWS-MG-JHP | MS-ES41008-GWS-MG-JHP | MS-ES41009-GWS-MG-JHP |
|-----|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1   | Screw       | SR 16-212-L9.5        | SR 16-212-L9.5        | SR 16-212-L9.5        | SR 16-212-L9.5        | SR 16-212-L9.5        |
| 2   | Key         | T-20/5                | T-20/5                | T-20/5                | T-20/5                | T-20/5                |
| 3   | Screw       | DIN912-M4X10-12.9     | DIN912-M4X10-12.9     | DIN912-M4X10-12.9     | DIN912-M4X10-12.9     | DIN912-M4X10-12.9     |
| 4   | Screw       | SR M6X6-DIN6912-10.9  | SR M6X6-DIN6912-10.9  | SR M6X6-DIN6912-10.9  | SR M6X6-DIN6912-10.9  | SR M6X6-DIN6912-10.9  |
| 5   | Dummy       | GWS Dummy             | GWS Dummy             | GWS Dummy             | GWS Dummy             | GWS Dummy             |
| 6   | Wedges*     |                       |                       |                       |                       |                       |
| 7   | O-Ring      | OR 5X1N               | OR 5X1N               | OR 5X1N               | OR 5X1N               | OR 5X1N               |

\* Should be ordered separately

ISCAR Modular System for Turning Lathes

Toolholder System with Machine-Specific Adaptations for Turning Lathes



Features and Benefits of Machine-Specific Toolholder Systems

|           | Flexible Vario System                                                                                                                                                              | Adjustable Center Height                                                                                                                                                           | Optimized Holder Design                                                                                                                                                                                                                 | No Coolant Tubes / Hoses                                                                                                                                                                                                        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: |                                                                                                                                                                                    |                                                                                                                                                                                    |                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                 |
| Benefits: | <ul style="list-style-type: none"> <li>• Uniform intermediate holders and adapters on different machine adaptations</li> <li>• Low tool stock</li> <li>• Modular design</li> </ul> | <ul style="list-style-type: none"> <li>• Optimal tool life due to adjustable center height</li> <li>• Reliable tool life</li> <li>• Turret malpositions can be balanced</li> </ul> | <ul style="list-style-type: none"> <li>• Long tool life due to reduced bar overhang, less vibrations</li> <li>• Slim design</li> <li>• Low risk of collision</li> <li>• Suitable for any machine-specific clamping interface</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li> </ul> |

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# ISCAR Modular System for Turning Lathes

## System Overview

VDI



CAMFIX



DMG MORI



Mazak



Nakamura-Tome



OKUMA



VDI-P



HSK



BMT



Miyano



Biglia / EUROTECH



TSUGAMI



Tang-Grip-XL

Tang-Grip

Do-Grip

Cut-Grip

Heli-Grip

TRAUB TNL18 / 32



TRAUB TNK 42 / 65



TRAUB TNK 36 / TNL26

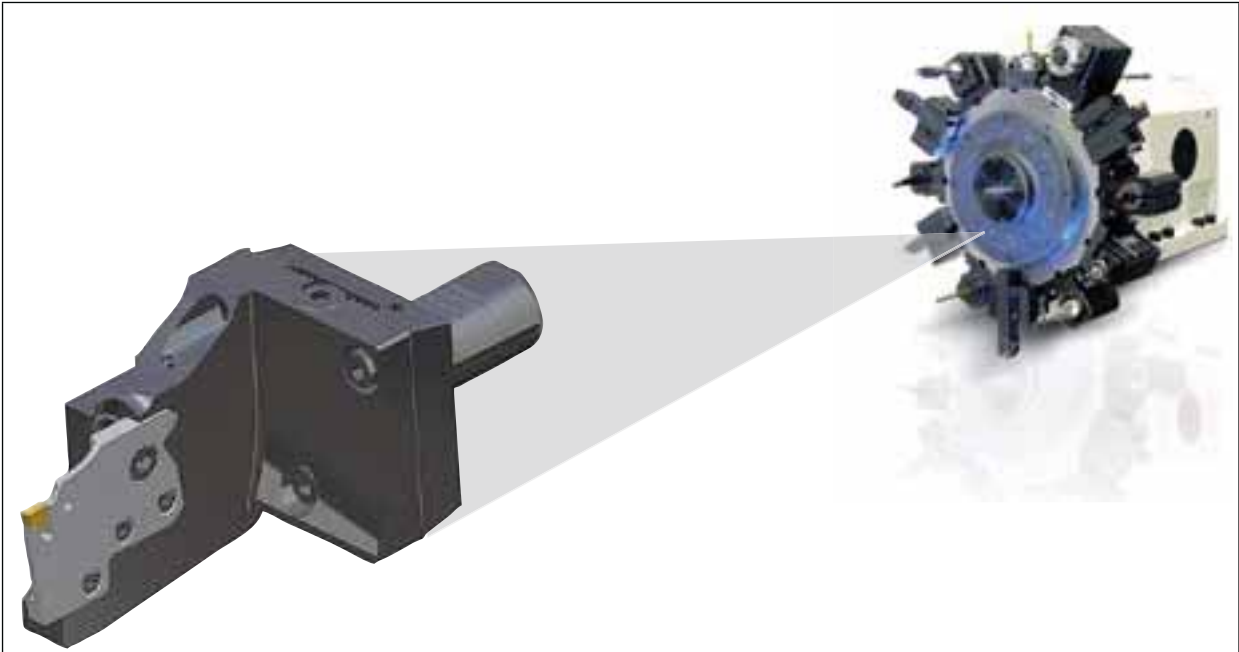


INDEX ABC



ISCAR Modular System for Turning Lathes

Toolholder System for Star Turrets with VDI and MODULAR-GRIP-XL Adaptations and Directed Internal Coolant



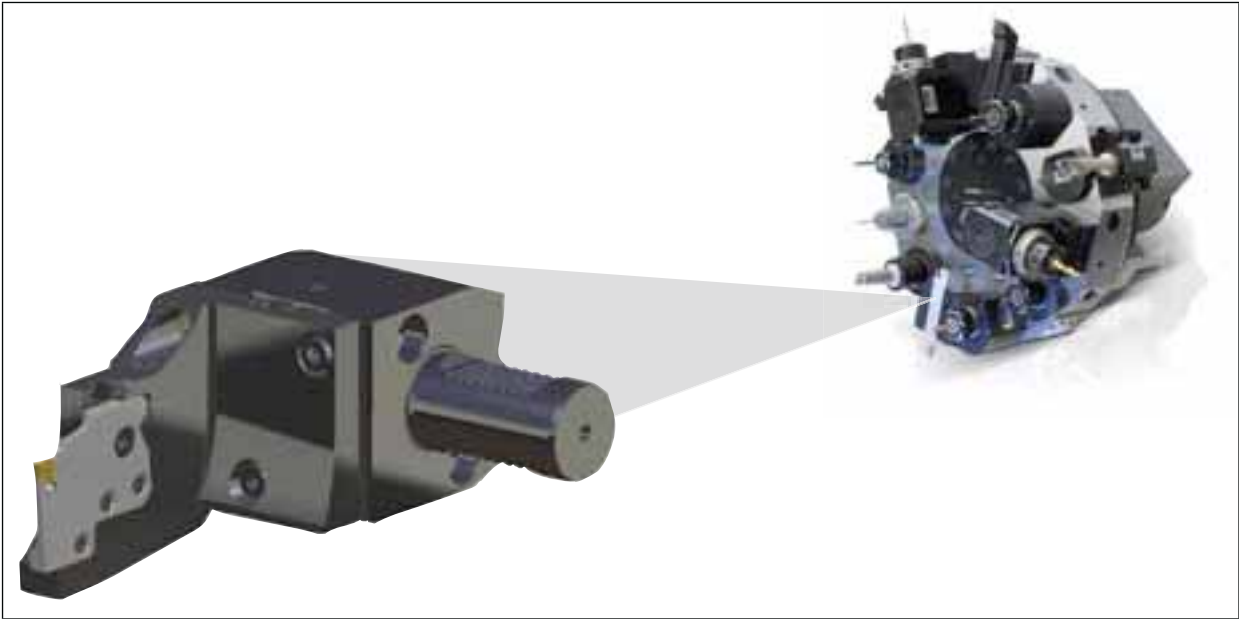
Features and Benefits of Machine-Specific Toolholder Systems

|           | Adaptation Sizes                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Alignment Systems                                                                                                                                                                                                                                                                                                                                                     | VDI shank can be rotated by 180°                                                                                                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: | <div>  VDI20                      VDI25                 </div> <div>  VDI30                      VDI40                 </div> | <div>  W serration                      Vee bar                 </div> <div>  TRI-FIX                 </div> | <div>  </div> <div>  Turned by 180°                 </div> |
| Benefits: | <ul style="list-style-type: none"> <li>DIN69880 (ISO 10889-1)</li> <li>VDI20</li> <li>VDI25</li> <li>VDI30</li> <li>VDI40</li> </ul>                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>Extremely stable, torsion resistant and high-end precision</li> </ul>                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>The serration can be mounted at the top or bottom</li> <li>Double-serration is not necessary</li> </ul>                                                                                       |

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ISCAR Modular System for Turning Lathes

Toolholder System for Disc-Type Turrets with VDI and MODULAR-GRIP-XL Adaptations and Directed Internal Coolant



Features and Benefits of Machine-Specific Toolholder Systems

|           | Adaptation Sizes                                                                                             | Parting Next to Main Spindle or Sub-Spindle                                                                                                                                              | Reliable Processes                                                                                                                                                                                                           |
|-----------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: | <br>VDI30-P<br>VDI40-P    |                                                                                                       |                                                                                                                                         |
| Benefits: | <ul style="list-style-type: none"><li>• DIN69880 (ISO 10889-1)</li><li>• VDI30-P</li><li>• VDI40-P</li></ul> | <ul style="list-style-type: none"><li>• Low risk of collision due to optimized tool design</li><li>• Parting next to main spindle or sub-spindle depending on component length</li></ul> | <ul style="list-style-type: none"><li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li><li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li></ul> |

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ISCAR Modular System for Turning Lathes

Toolholder System for DOOSAN / HAAS Machines with BMT and MODULAR-GRIP-XL Adaptations and Directed Internal Coolant



Features and Benefits of Machine-Specific Toolholder Systems

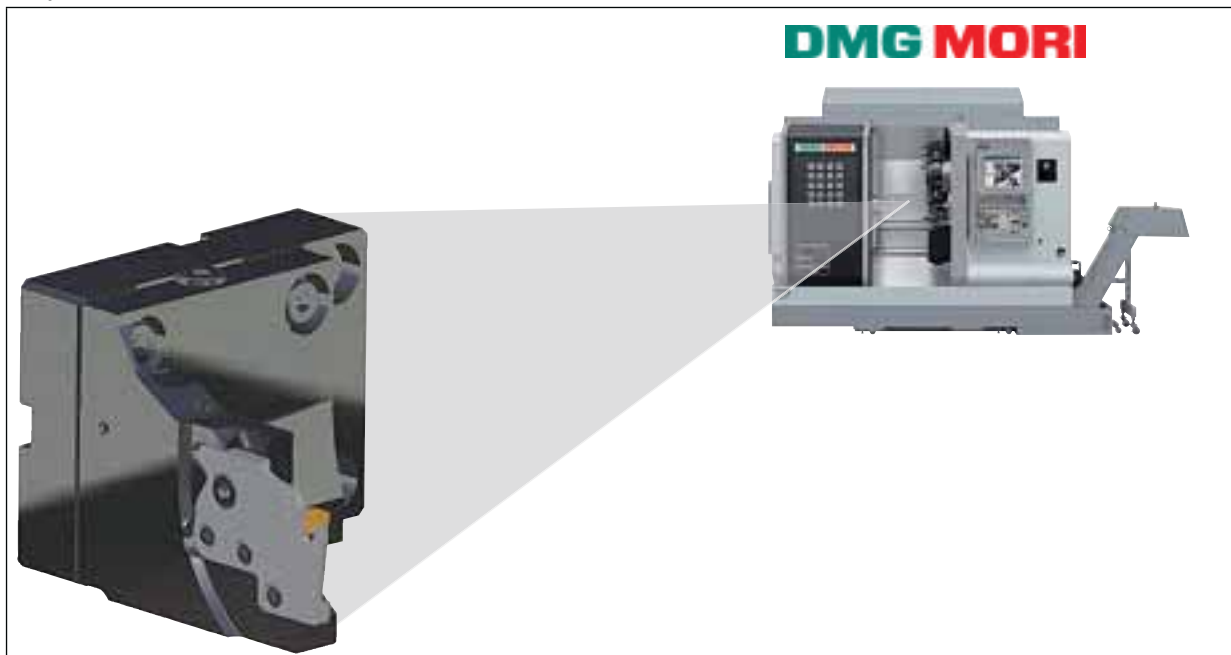
|           | Adaptation Sizes                                                                                                                 | Holder Turning Ability 180°                                                                                                                                  | Reliable Processes                                                                                                                                                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: |  <p>BMT45<br/>BMT55<br/>BMT65</p>             |                                                                           |                                                                                                                                            |
| Benefits: | <ul style="list-style-type: none"> <li>• BMT (Base Mounted Turret)</li> <li>• BMT45</li> <li>• BMT55</li> <li>• BMT65</li> </ul> | <ul style="list-style-type: none"> <li>• Tool can be mounted on the left or right of the turret</li> <li>• Extremely flexible due to few elements</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li> </ul> |

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## ISCAR Modular System for Turning Lathes

Toolholder System for **DMG MORI** Machines with MODULAR-GRIP-XL  
Adaptation and Directed Internal Coolant

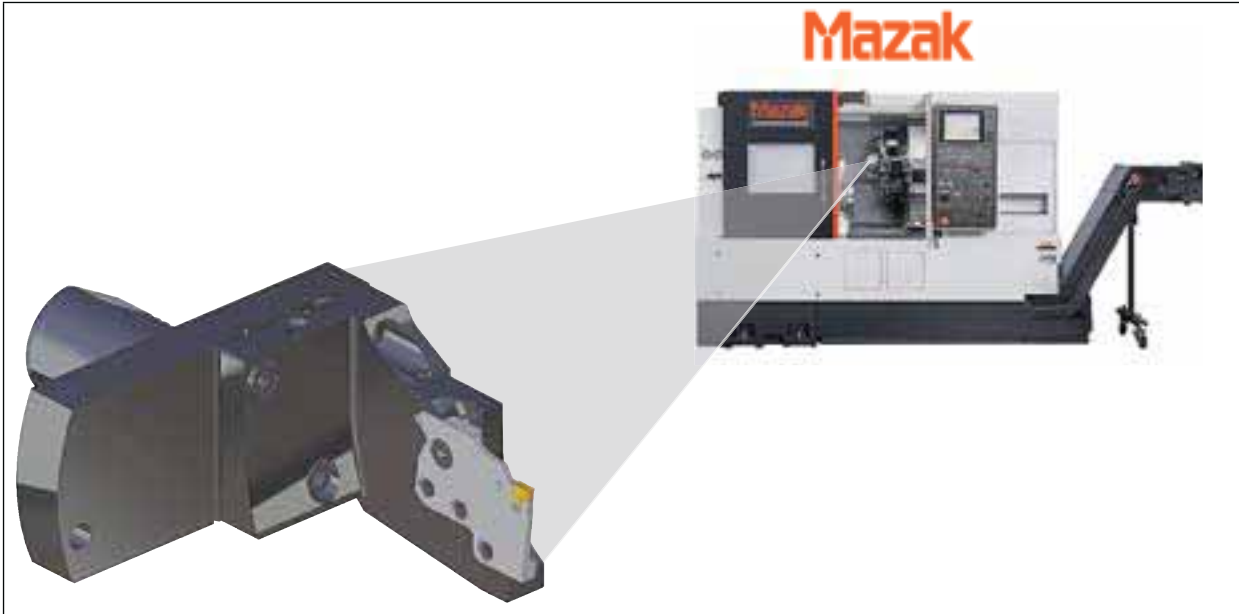


### Features and Benefits of Machine-Specific Toolholder Systems

|                  | Adaptation Sizes                                                                                                                            | Two Pockets for Intermediate Holders                                                                                                                                          | Reliable Processes                                                                                                                                                                                                        |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Features:</b> | <p>MORI40                      MORI60</p> <p>ø 40                      ø 60</p>                                                             | <p>(For MORI60)</p> <p>1. pocket next to (main) spindle      2. pocket next to (sub-) spindle</p>                                                                             |                                                                                                                                                                                                                           |
| <b>Benefits:</b> | <ul style="list-style-type: none"> <li>DMG MORI turrets for NZ machines</li> <li>MORI40</li> <li>For NL machines</li> <li>MORI60</li> </ul> | <ul style="list-style-type: none"> <li>Intermediate holder can be mounted on the left or right side of the turret</li> <li>Modular flexibility due to few elements</li> </ul> | <ul style="list-style-type: none"> <li>Chips do not accumulate in the work space (no coolant tube/hose required)</li> <li>Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li> </ul> |

ISCAR Modular System for Turning Lathes

Toolholder System for **MAZAK** Machines with MODULAR-GRIP-XL  
Adaptation and Directed Internal Coolant



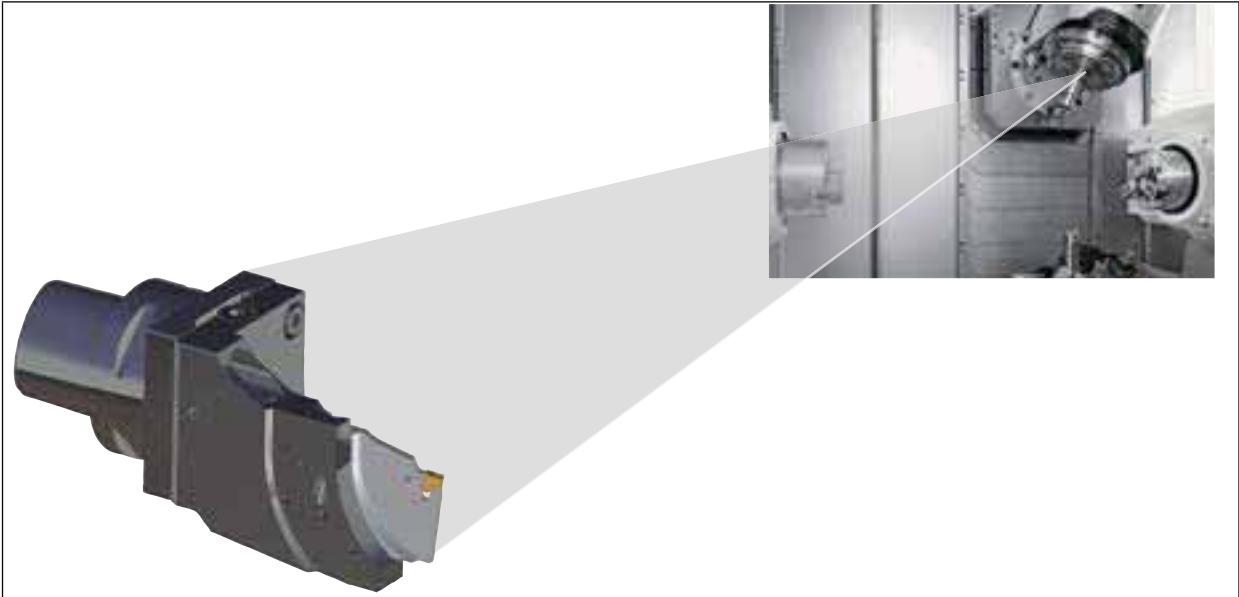
Features and Benefits of Machine-Specific Toolholder Systems

|           | Adaptation Sizes                                                                                                                                                                                               | Adaptation Features                                                                           | Reliable Processes                                                                                                                                                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: | <p>MA4016E    MA4020E    MA4020T</p> <p>MA5020E    MA4016T</p>                                                                                                                                                 | <p>MA####E</p> <p>MA####T</p>                                                                 |                                                                                                                                                                                                                                 |
| Benefits: | <ul style="list-style-type: none"> <li>• For Mazak Quick Turn, Hyper Quardrex and Multiplex machines</li> <li>• MA4016E</li> <li>• MA4020E</li> <li>• MA5020E</li> <li>• MA4016T</li> <li>• MA4020T</li> </ul> | <ul style="list-style-type: none"> <li>• Suitable for any common Mazak adaptations</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li> </ul> |

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ISCAR Modular System for Turning Lathes

Toolholder System for Machines with **CAMFIX** MODULAR-GRIP-XL Adaptations and Directed Internal Coolant



Features and Benefits of Machine-Specific Toolholder Systems

|           | Adaptation Sizes                                                                                                                                                               | Parting Next to Main Spindle and Sub-Spindle                                                                                                                                                 | Reliable Processes                                                                                                                                                                                                           |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: |                                                                                             |                                                                                                           |                                                                                                                                         |
| Benefits: | <ul style="list-style-type: none"><li>• For CAMFIX turrets and for turn-mill centers with a CAMFIX ISO26623-1 milling spindle</li><li>• C4</li><li>• C5</li><li>• C6</li></ul> | <ul style="list-style-type: none"><li>• Low risk of collision due to optimized tool design</li><li>• Parting next to main spindle or sub-spindle depending on the component length</li></ul> | <ul style="list-style-type: none"><li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li><li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li></ul> |

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ISCAR Modular System for Turning Lathes

Toolholder Systems for Turn-Mill Centers with HSK Shank and MODULAR-GRIP-XL  
Adaptation and Directed Internal Coolant



Features and Benefits of Machine-Specific Toolholder Systems

|           | Adaptation Sizes                                                                                                                                                    | Relief for Automatic Tool Changers                                                                                   | Reliable Processes                                                                                                                                                                                                            |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: |  <p>HSK T 40</p> <p>HSK T 63</p>                                                 |  <p>Relief for tool exchanger</p> |                                                                                                                                          |
| Benefits: | <ul style="list-style-type: none"> <li>• For HSK T turrets and for turn-mill centers with HSK T milling spindles</li> <li>• HSK T 40</li> <li>• HSK T 63</li> </ul> | <ul style="list-style-type: none"> <li>• Tools can be used on machines with an automatic tool exchanger</li> </ul>   | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no flexible coolant nozzle)</li> </ul> |

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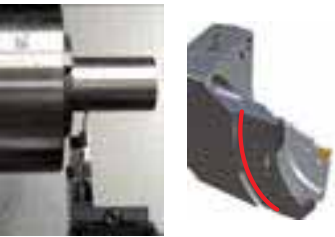
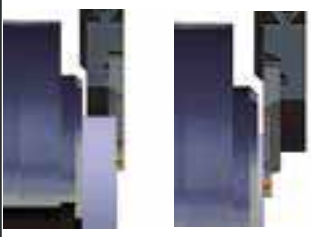
## ISCAR Modular System for Turning Lathes

Toolholder Systems for **Biglia / EUROTECH**, **MIYANO** and **NAKAMURA TOME** with MODULAR-GRIP-XL Adaptation and Directed internal Coolant

### Toolholder Systems for Biglia / EUROTECH, Miyano and Nakamura Tome

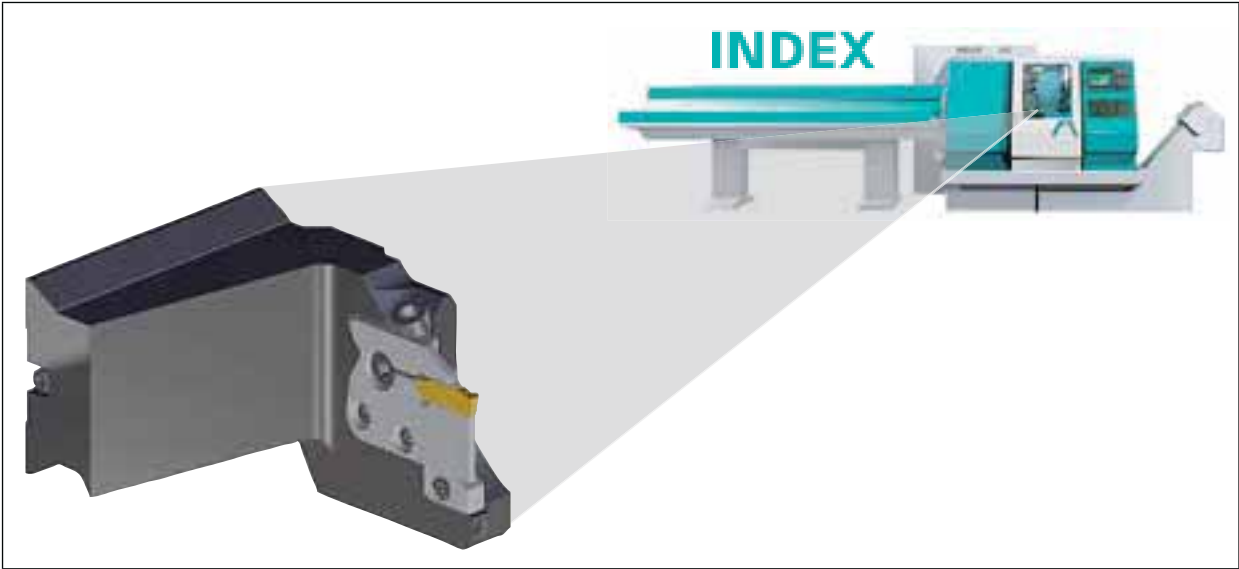
| Biglia                                                                                                                   | EUROTECH                                                                                                                      | Miyano                                                                                                               | Nakamura-Tome |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------|
|                                         |                                              |                                   |               |
| <ul style="list-style-type: none"> <li>• Holder for Biglia / EUROTECH turrets</li> <li>• BI40</li> <li>• BI55</li> </ul> | <ul style="list-style-type: none"> <li>• Holder for MIYANO turrets</li> <li>• MI40</li> <li>• MI45</li> <li>• MI55</li> </ul> | <ul style="list-style-type: none"> <li>• Holder for NAKAMURA-TOME turrets</li> <li>• NT55</li> <li>• NT65</li> </ul> |               |

### Features and Benefits of Machine-Specific Toolholder Systems

|           | Optimized Holder Design                                                                                                                                                                                                               | Parting Next to Main Spindle and Sub-Spindle                                                                                                                                                        | Reliable Processes                                                                                                                                                                                                              |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: |                                                                                                                                                     |                                                                                                                   |                                                                                                                                             |
| Benefits: | <ul style="list-style-type: none"> <li>• Long tool life due to small bar overhang and less vibrations</li> <li>• Slim design</li> <li>• Low risk of collision</li> <li>• Suitable for any machine-specific clamping device</li> </ul> | <ul style="list-style-type: none"> <li>• Low risk of collision due to optimized tool design</li> <li>• Parting next to main spindle or sub-spindle depending on the correspondent length</li> </ul> | <ul style="list-style-type: none"> <li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li> <li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li> </ul> |

ISCAR Modular System for Turning Lathes

Toolholder System for INDEX ABC Machines with MODULAR-GRIP-XL  
Adaptation and Directed Internal Coolant



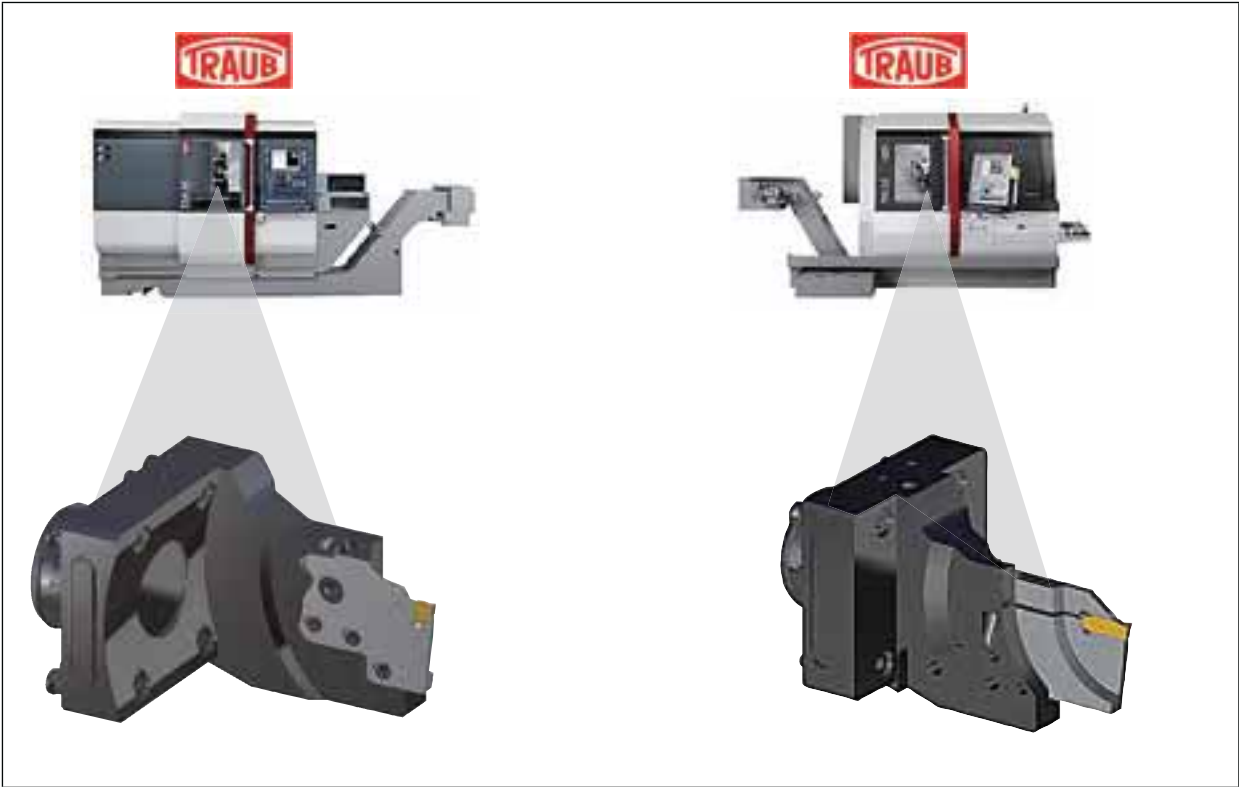
Features and Benefits of Machine-Specific Toolholder Systems

|           | Adaptation Sizes                                                                                                 | Height Adjustment +0.2 mm                                                                                                                           | Machine Optimized Tool Design                                                                                                                                                                                                                                     |
|-----------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: |                                                                                                                  |                                                                                                                                                     |                                                                                                                                                                                                                                                                   |
| Benefits: | <ul style="list-style-type: none"><li>• For Index ABC machines turret 2</li><li>• Prismatic adaptation</li></ul> | <ul style="list-style-type: none"><li>• Mismatch of turrets can be adjusted</li><li>• Extremely long tool life due to exact center height</li></ul> | <ul style="list-style-type: none"><li>• Extremely long tool life due to very stable tool design</li><li>• Reduced vibrations due to reduced bar overhang</li><li>• Reliable coolant supply due to fixed flow orientation (no adjustable coolant nozzle)</li></ul> |

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ISCAR Modular System for Turning Lathes

Toolholder System for Integral Shank 45 with MODULAR-GRIP-XL  
Adaptation and Directed Internal Coolant



Features and Benefits of Machine-Specific Toolholder Systems

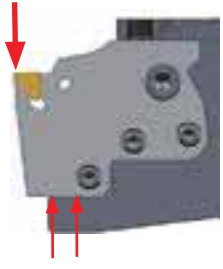
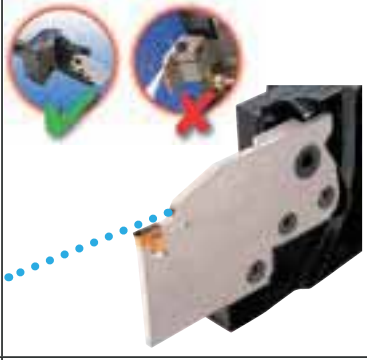
|           | TNK 36 / TNL 26                                                                                                                                                                                                                         | TNL 18 / TNL 32                                                                                                                                                                                                                             | TNK 42 / TNK 65                                                                                                                                                                                                                          |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features: |                                                                                                                                                      |                                                                                                                                                          |                                                                                                                                                     |
| Benefits: | <ul style="list-style-type: none"><li>• Dovetail connection for Traub TNK36 and TNL26 Machines</li><li>• Tools are suitable for parting and grooving applications</li><li>• Suitable for any machine-specific clamping device</li></ul> | <ul style="list-style-type: none"><li>• Integral shank 45 for Traub TNL18 and TNL32</li><li>• Tools are suitable for parting and grooving applications</li><li>• Suitable for any grooving systems with directed internal coolant</li></ul> | <ul style="list-style-type: none"><li>• Low risk of collision due to machine-specific tool design</li><li>• Tool is suitable for parting and grooving applications</li><li>• Suitable for any machine-specific clamping device</li></ul> |

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## Adapters with internal coolant

## Features and Benefits of Machine-Specific Toolholder Systems

|                  | Extremely Stable                                                                                                                                                                                                                                                                                    | Coolant Directly to the Cutting Zone                                                                                                                                                                                                                                                                             | Additional External Diameters                                                                                                                                          |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Features:</b> |                                                                                                                                                                                                                    |                                                                                                                                                                                                                                 |                                                                                     |
| <b>Benefits:</b> | <ul style="list-style-type: none"> <li>• Very long tool life as the cutting forces are directly transmitted to the intermediate holder</li> <li>• Very rigid due to additional clamping screw in the Modular-Grip-XL adapters pocket</li> <li>• Less vibrations due to rigid tool design</li> </ul> | <ul style="list-style-type: none"> <li>• Reliable tool life due to fixed flow orientation (no adjustable coolant nozzle)</li> <li>• Chips do not accumulate in the work space (no coolant tube / hose required)</li> <li>• Very efficient due to small distance between coolant exit and cutting zone</li> </ul> | <ul style="list-style-type: none"> <li>• Long tool life due to reduced vibrations by reinforced tool body</li> <li>• Suitable for all popular bar diameters</li> </ul> |

## Features and Benefits of Machine-Specific Toolholder Systems

|                  | MODULAR-GRIP/<br>MODULAR-GRIP-XL                                                                                                                                                                                                                                    | Vario System                                                                                                                                                                                                                                                                                                                                                                                                                            | Coolant Connection from the<br>Turret into the Cutting Zone                                                                                                                    |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Features:</b> |                                                                                                                                                                                  |   <br>  |                                                                                           |
| <b>Benefits:</b> | <ul style="list-style-type: none"> <li>• Very flexible due to compatibility with existing adapter systems</li> <li>• Modular-Grip and Modular-Grip-XL adapters can be mounted</li> <li>• High rigidity using Modular-Grip adapters by additional support</li> </ul> | <ul style="list-style-type: none"> <li>• Very flexible</li> <li>• Suitable for any JHP grooving systems</li> <li>• Direct cooling for grooving and turn-groove operations</li> <li>• A variety of options with a single holder</li> </ul>                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>• Fast setup, less downtime</li> <li>• Chips do not accumulate in the work space</li> <li>• Easy handling, low risk of error</li> </ul> |

ISCAR Modular System for Turning Lathes

Tool Design Overview

|     |                                                                                                            |                                                                                                     |
|-----|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| L-R | #### MAHDL-R-XL-JHP<br>   | <br>Upside down   |
| R-L | #### MAHDR-L-XL-JHP<br>   | <br>Upside down   |
| R-R | #### MAHDR-R-XL-JHP<br>  | <br>Upside down  |
| L-L | #### MAHDL-L-XL-JHP<br> | <br>Upside down |

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## ISCAR Modular System for Turning Lathes

### Tool Selection

Example:



### 1 Defined Machine Adaptations

| Type | VDI   | VDI with W-serration | VDI with Vee-bar | VDI for disc type turret | BMT   | DMG MORI | MAZAK              | CAMFIX | HSK T    | Biglia / EUROTECH | Miyano | Nakamura-Tome |
|------|-------|----------------------|------------------|--------------------------|-------|----------|--------------------|--------|----------|-------------------|--------|---------------|
| Size | VDI20 | VDI25W               | VDI25V           | VDI30-P                  | BMT45 | MORI40   | MA4016E            | C4     | HSK T 40 | BI40              | MI40   | NT45          |
|      | VDI25 | VDI30W               | VDI30V           | VDI40-P                  | BMT55 | MORI60   | MA4020E            | C5     | HSK T 63 | BI55              | MI45   | NT55          |
|      | VDI30 | VDI40W               | VDI40V           |                          | BMT65 |          | MA5020E            | C6     |          |                   | MI55   | NT65          |
|      | VDI40 |                      |                  |                          |       |          | MA4016T<br>MA4020T |        |          |                   |        |               |

For details on adaptation please see technical information (starting at page 877).

### 2 Defined Turning Direction at the Main Spindle

View through the spindle into the work space

| Right-Turn Direction<br>M3 in CNC program | Left-Turn Direction<br>M4 in CNC program |
|-------------------------------------------|------------------------------------------|
|                                           |                                          |

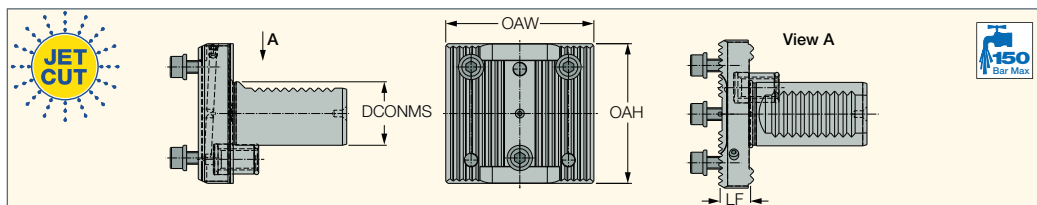
### 3 Position of the Adapter Pocket

| Adapter on the Right | Adapter on the Left |
|----------------------|---------------------|
|                      |                     |

## VDI MODULAR-GRIP

### VDI### V##-JHP

Toolholders for Star Turrets with VDI Adaptation and Internal Coolant Supply for MODULAR-GRIP-XL Adapters



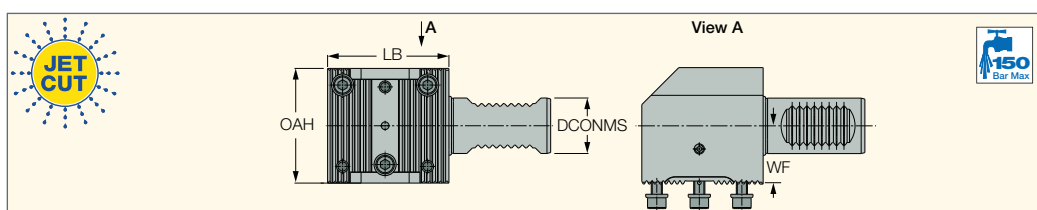
| Designation     | DCONMS | OAW   | OAH   | LF    | Align.     |
|-----------------|--------|-------|-------|-------|------------|
| VDI20 V60-JHP   | 20.00  | 60.00 | 56.00 | 13.50 | -          |
| VDI25 V60-JHP   | 25.00  | 60.00 | 61.20 | 12.75 | -          |
| VDI25TF V60-JHP | 25.00  | 60.00 | 61.20 | 12.75 | TriFix     |
| VDI25V V60-JHP  | 25.00  | 60.00 | 61.20 | 12.75 | V-Bar      |
| VDI25W V60-JHP  | 25.00  | 60.00 | 61.20 | 13.40 | W-toothing |
| VDI30 V60-JHP   | 30.00  | 70.00 | 66.00 | 13.75 | -          |
| VDI30TF V60-JHP | 30.00  | 70.00 | 66.00 | 13.75 | TriFix     |
| VDI30V V60-JHP  | 30.00  | 70.00 | 66.00 | 13.75 | V-Bar      |
| VDI30W V60-JHP  | 30.00  | 70.00 | 66.00 | 14.40 | W-toothing |
| VDI40 V85-JHP   | 40.00  | 85.00 | 82.00 | 15.75 | -          |
| VDI40TF V85-JHP | 40.00  | 85.00 | 82.00 | 15.75 | TriFix     |
| VDI40V V85-JHP  | 40.00  | 85.00 | 82.00 | 15.75 | V-Bar      |
| VDI40W V85-JHP  | 40.00  | 85.00 | 82.00 | 16.35 | W-toothing |

• For user guide, see pages 862-876

## VDI MODULAR-GRIP

### VDI##-P V60-JHP

Toolholders for Disc-Type Turrets with VDI Adaptation and Internal Coolant Supply for MODULAR-GRIP-XL Adapters



| Designation     | DCONMS | LB    | OAH   | WF    | WB    |
|-----------------|--------|-------|-------|-------|-------|
| VDI30-P V60-JHP | 30.00  | 65.60 | 62.00 | 30.75 | 63.00 |
| VDI40-P V60-JHP | 40.00  | 65.60 | 80.00 | 34.75 | 70.50 |

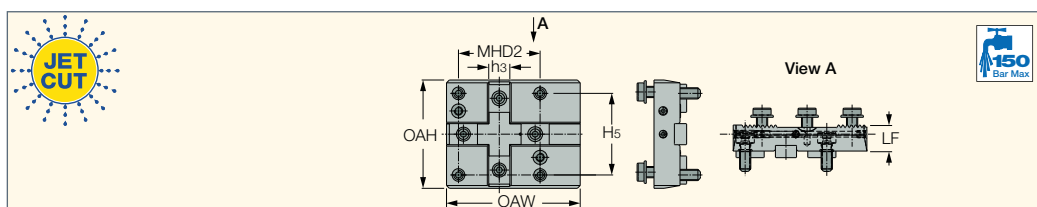
• For user guide, see pages 862-876



## MODULAR-GRIP

### BMT## V85-JHP

Toolholders for BMT Turrets with Internal Coolant Supply for MODULAR-GRIP-XL Adapters



| Designation                  | OAW    | OAH    | LF    | H5    | MHD2 | h3   |
|------------------------------|--------|--------|-------|-------|------|------|
| BMT45 V85-JHP <sup>(1)</sup> | 95.00  | 77.00  | 17.45 | 58.00 | 58.0 | 15.0 |
| BMT55 V85-JHP                | 103.50 | 84.00  | 20.75 | 64.00 | 64.0 | 15.0 |
| BMT65 V85-JHP                | 114.50 | 98.00  | 25.75 | 73.00 | 70.0 | 18.0 |
| BMT75 V85-JHP                | 120.00 | 112.00 | 29.25 | 90.00 | 90.0 | 25.0 |

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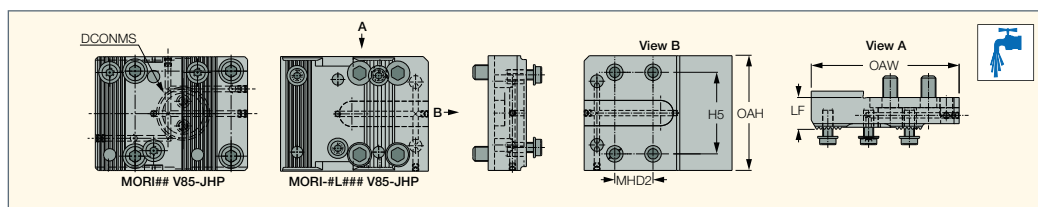
• For user guide, see pages 862-876

<sup>(1)</sup> Suitable for Hyundai-Wia SE2200 Turning Centers

## DMG MORI MODULAR-GRIP

### MORI## V85-JHP

Toolholders for DMG MORI  
Turrets with Internal Coolant  
Supply for MODULAR-  
GRIP-XL Adapters



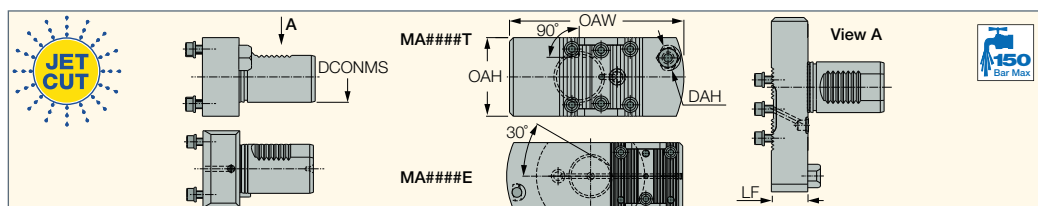
| Designation        | OAW    | OAH    | LF    | H5    | MHD2 | DCONMS |
|--------------------|--------|--------|-------|-------|------|--------|
| MORI40 V85-JHP     | 111.00 | 83.00  | 25.75 | 62.00 | 70.0 | 39.90  |
| MORI-DL151 V85-JHP | 116.00 | 90.00  | 24.25 | 64.00 | 30.0 | -      |
| MORI-SL200 V85-JHP | 126.00 | 100.00 | 24.25 | 76.00 | 35.0 | -      |
| MORI60 V85-JHP     | 172.00 | 109.30 | 29.25 | 84.00 | 94.0 | 59.90  |

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## Mazak MODULAR-GRIP

### MA#### V##-JHP

Toolholders for Mazak Turrets  
with Internal Coolant Supply for  
MODULAR-GRIP-XL Adapters



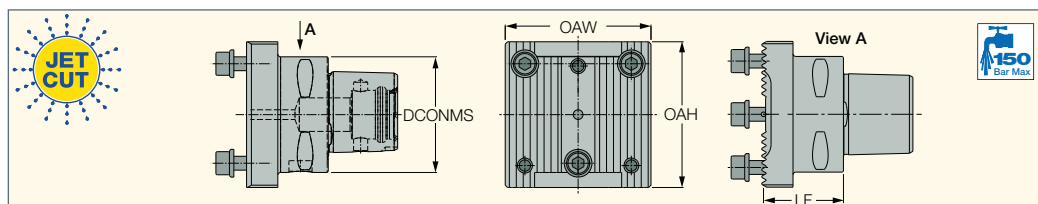
| Designation     | DCONMS | DAH   | OAW    | OAH    | LF    |
|-----------------|--------|-------|--------|--------|-------|
| MA4016T V60-JHP | 40.00  | 16.00 | 132.50 | 62.00  | 28.15 |
| MA4020T V60-JHP | 40.00  | 20.00 | 137.50 | 62.00  | 28.15 |
| MA4016E V60-JHP | 40.00  | 16.00 | 162.50 | 62.00  | 29.25 |
| MA4020E V60-JHP | 40.00  | 20.00 | 170.00 | 62.00  | 29.25 |
| MA5020E V85-JHP | 50.00  | 20.00 | 168.50 | 100.00 | 45.75 |

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## MODULAR-GRIP CAMFIX

### C#-V60-JHP

Toolholders for CAMFIX  
Adaptations with Internal  
Coolant Supply for MODULAR-  
GRIP-XL Adapters



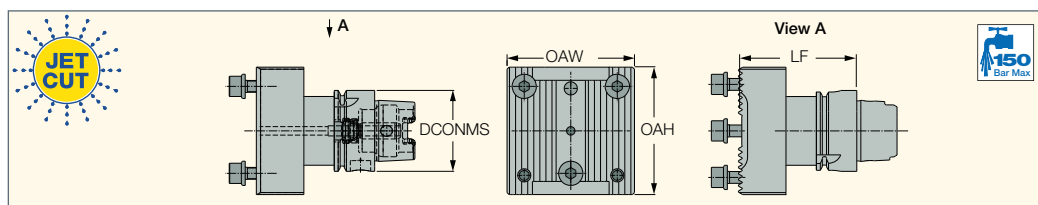
| Designation | DCONMS | OAW   | OAH   | LF    |
|-------------|--------|-------|-------|-------|
| C4 V60-JHP  | 40.00  | 63.00 | 63.00 | 34.55 |
| C5 V60-JHP  | 50.00  | 63.00 | 63.00 | 34.55 |
| C6 V60-JHP  | 63.00  | 63.00 | 63.00 | 36.55 |

• For user guide, see pages 862-876

## MODULAR-GRIP HSK

### HSK T ## V60-JHP

Toolholders for HSK-T  
Adaptations with Internal  
Coolant Supply for MODULAR-  
GRIP-XL Adapters



| Designation      | DCONMS | OAW   | OAH   | LF    |
|------------------|--------|-------|-------|-------|
| HSK T 40 V60-JHP | 40.00  | 63.00 | 63.00 | 57.75 |
| HSK T 63 V60-JHP | 63.00  | 63.00 | 63.00 | 57.75 |

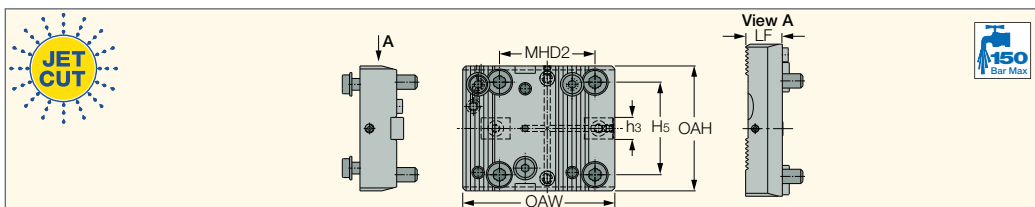
• For user guide, see pages 862-876

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## MODULAR-GRIP

### BI## V##-JHP

Toolholders for Biglia/  
EUROTECH Adaptation with  
Internal Coolant Supply for  
MODULAR-GRIP-XL Adapters



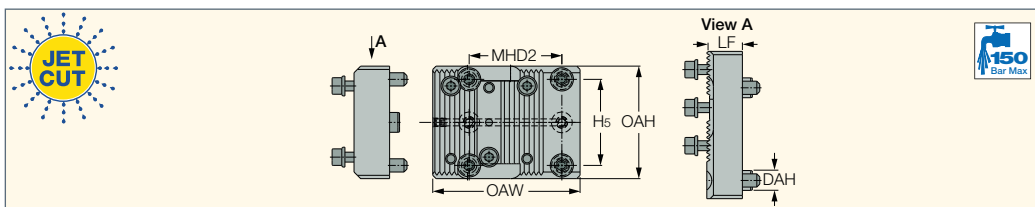
| Designation  | OAW    | OAH   | LF    | H5    | MHD2 | h3   |
|--------------|--------|-------|-------|-------|------|------|
| BI40 V60-JHP | 83.00  | 70.00 | 20.75 | 50.00 | 50.0 | 12.0 |
| BI55 V85-JHP | 103.50 | 85.00 | 24.25 | 63.00 | 65.0 | 15.0 |

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## MODULAR-GRIP

### MI## V60-JHP

Toolholders for Miyano  
Adaptation with Directed  
Internal Coolant for  
MODULAR-GRIP-XL Adapters



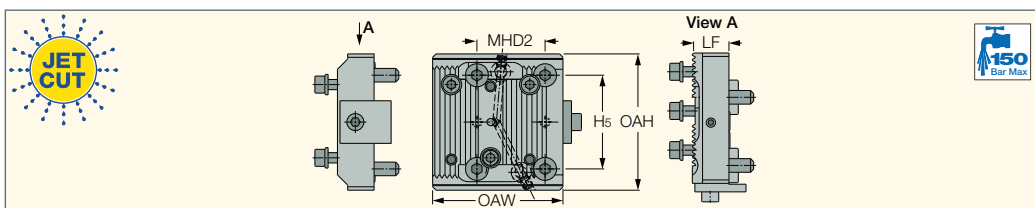
| Designation  | OAW    | OAH   | LF    | H5    | MHD2 | DAH   |
|--------------|--------|-------|-------|-------|------|-------|
| MI40 V60-JHP | 89.00  | 68.00 | 20.75 | 52.00 | 56.0 | 12.00 |
| MI45 V60-JHP | 102.00 | 72.00 | 13.95 | 56.00 | 68.0 | 12.00 |
| MI55 V60-JHP | 104.00 | 91.00 | 15.25 | 75.00 | 60.0 | 12.00 |

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## MODULAR-GRIP

### NT## V60-JHP

Toolholders for Nakamura-  
Tome Adaptation with  
Internal Coolant Supply for  
MODULAR-GRIP-XL Adapters



| Designation                 | OAW   | OAH    | LF    | H5    | MHD2 |
|-----------------------------|-------|--------|-------|-------|------|
| NT45 V60-JHP                | 76.50 | 80.00  | 20.75 | 55.00 | 40.0 |
| NT55 V60-JHP <sup>(1)</sup> | 87.50 | 86.00  | 20.75 | 60.00 | 50.0 |
| NT65 V60-JHP                | 99.50 | 100.00 | 20.75 | 71.00 | 69.0 |

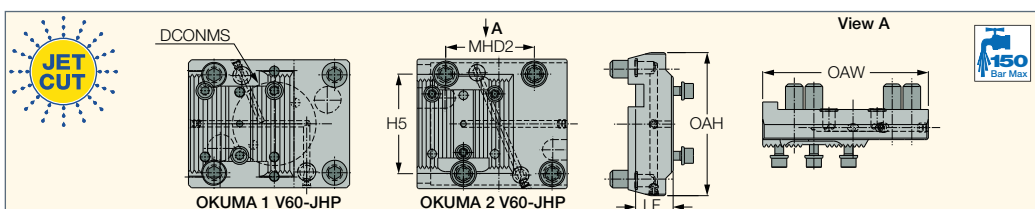
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<sup>(1)</sup> Suitable for CMZ machines

## MODULAR-GRIP

### OKUMA # V60-JHP

Toolholders for OKUMA  
Adaptation with Internal  
Coolant Supply for  
MODULAR-GRIP-XL Adapters



| Designation     | OAW                   | OAH   | LF    | H5    | MHD2 | DCONMS |
|-----------------|-----------------------|-------|-------|-------|------|--------|
| OKUMA 1 V60-JHP | 107.00                | 85.00 | 19.25 | 65.00 | 80.0 | 55.40  |
| OKUMA 2 V60-JHP | 110.00 <sup>(1)</sup> | 95.00 | 24.25 | 73.00 | 65.0 | -      |

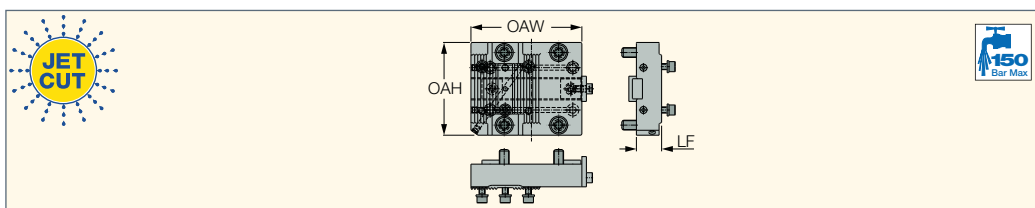
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<sup>(1)</sup> also available in 100.00 mm

## MODULAR-GRIP

### TSU-M08 V60-JHP

Base Holders for TSUGAMI  
Adaptation with Internal Coolant  
for MODULAR-GRIP-XL Adapters



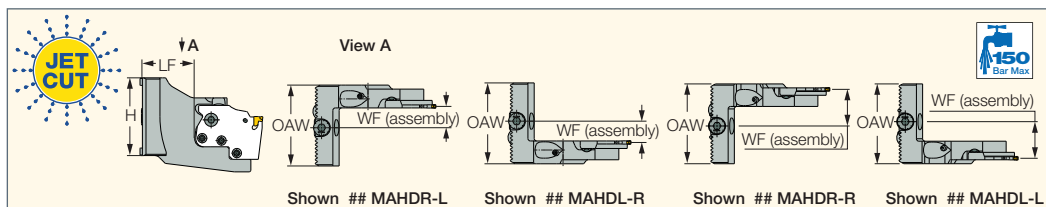
| Designation        | OAW    | OAH   | LF    |
|--------------------|--------|-------|-------|
| TSU-M08-SY V60-JHP | 110.00 | 92.00 | 25.00 |

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All trademarks and logos are the property of their respective companies

**MODULAR-GRIP****V## MAHD#-#-XL-##-JHP**

Intermediate Holders for ISCAR  
Modular System Holders with  
Directed Internal Coolant for  
MODULAR-GRIP-XL Adapters



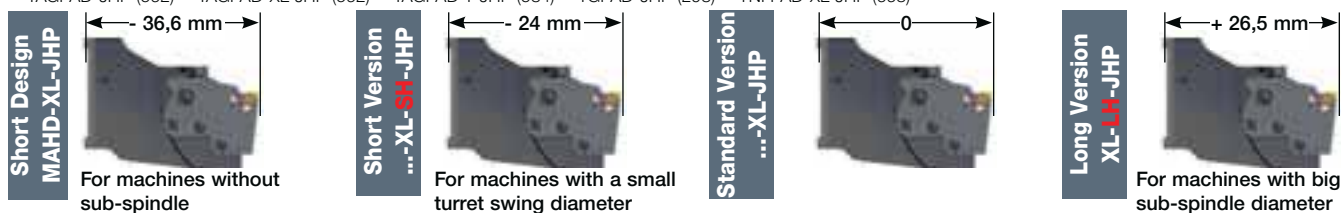
| Designation           | CSI | H    | OAW   | LF    | WF    |
|-----------------------|-----|------|-------|-------|-------|
| V60 MAHDL-L-XL-JHP    | V60 | 62.0 | 64.50 | 42.65 | 29.60 |
| V60 MAHDL-L-XL-SH-JHP | V60 | 62.0 | 64.50 | 18.65 | 32.80 |
| V85 MAHDL-L-XL-JHP    | V85 | 83.0 | 85.00 | 43.65 | 38.10 |
| V85 MAHDL-L-XL-LH-JHP | V85 | 83.0 | 85.00 | 69.15 | 38.10 |
| V60 MAHDL-R-XL-JHP    | V60 | 62.0 | 64.50 | 42.65 | 17.00 |
| V60 MAHDL-R-XL-LH-JHP | V60 | 62.0 | 64.50 | 69.15 | 17.00 |
| V60 MAHDL-R-XL-SH-JHP | V60 | 62.0 | 64.50 | 18.65 | 20.20 |
| V85 MAHDL-R-XL-JHP    | V85 | 83.0 | 85.00 | 43.65 | 25.50 |
| V85 MAHDL-R-XL-LH-JHP | V85 | 83.0 | 85.00 | 69.15 | 25.50 |
| V85 MAHDL-R-XL-SH-JHP | V85 | 83.0 | 85.00 | 26.65 | 25.50 |
| V60 MAHDR-L-XL-JHP    | V60 | 62.0 | 64.50 | 42.65 | 17.00 |
| V60 MAHDR-L-XL-LH-JHP | V60 | 62.0 | 64.50 | 69.15 | 17.00 |
| V60 MAHDR-L-XL-SH-JHP | V60 | 62.0 | 64.50 | 18.65 | 20.20 |
| V85 MAHDR-L-XL-JHP    | V85 | 83.0 | 85.00 | 43.65 | 25.50 |
| V85 MAHDR-L-XL-LH-JHP | V85 | 83.0 | 85.00 | 69.15 | 25.50 |
| V85 MAHDR-L-XL-SH-JHP | V85 | 83.0 | 85.00 | 26.65 | 25.50 |
| V60 MAHDR-R-XL-JHP    | V60 | 62.0 | 64.50 | 42.65 | 29.60 |
| V60 MAHDR-R-XL-LH-JHP | V60 | 62.0 | 64.50 | 69.15 | 29.60 |
| V60 MAHDR-R-XL-SH-JHP | V60 | 62.0 | 64.50 | 18.65 | 32.80 |
| V85 MAHDR-R-XL-JHP    | V85 | 83.0 | 85.00 | 43.65 | 38.10 |
| V85 MAHDR-R-XL-LH-JHP | V85 | 83.0 | 85.00 | 69.15 | 38.10 |
| V85 MAHDR-R-XL-SH-JHP | V85 | 83.0 | 85.00 | 26.65 | 41.30 |

• For user guide, see pages 862-876

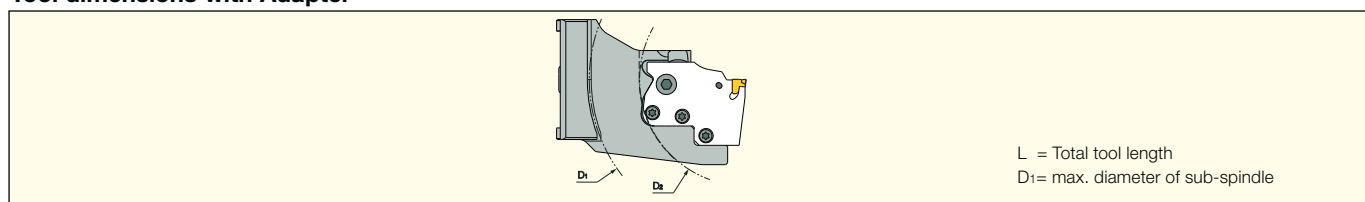
**For tools, see pages:** CGPAD-JHP (309) • DGPAD-JHP (538) • DGPAD-XL-JHP (538) • HGPAD-JHP (291) • PCADR/L-JHP (353) • PCADRS/LS-JHP (354)

• PCLNR/L-PAD-JHP (25) • PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88)

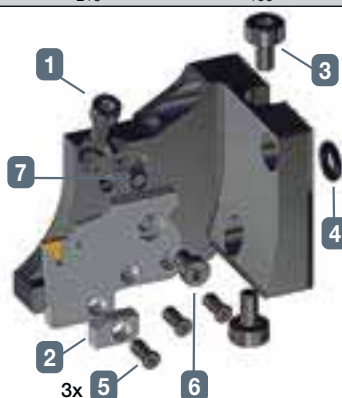
• TAGPAD-JHP (562) • TAGPAD-XL-JHP (562) • TAGPAD-Y-JHP (584) • TGPAD-JHP (298) • TNFPAD-XL-JHP (668)

**Intermediate holder spare parts**

| Designation           | (1) Clamping Screw  | (2) Dummy           | (3) Height Adjustment Screw | (4) O-Ring        | (5) Screw   | (6) Screw       | (7) O-Ring |
|-----------------------|---------------------|---------------------|-----------------------------|-------------------|-------------|-----------------|------------|
| V## MAHD#-#-XL-##-JHP | SR M6x16DIN912 12.9 | Dummy-MG-XL-5113377 | SR 14-0194-5113373          | O RING 8x3 NBR 70 | SR M5-04451 | SR M6x10DIN6912 | OR 5x1N    |

**Tool dimensions with Adapter**

| Adapter                | V## MAHD#-#- XL-SH-JHP |     | V## MAHD#-#- XL-JHP |     | V## MAHD#-#- XL-LH-JHP |     |
|------------------------|------------------------|-----|---------------------|-----|------------------------|-----|
|                        | D1                     | D2  | D1                  | D2  | D1                     | D2  |
| DGPAD ...-D22-JHP      | 99                     | 46  | 147                 | 94  | 200                    | 147 |
| DGPAD ...-D32-JHP      | 99                     | 46  | 147                 | 94  | 200                    | 147 |
| TAGPAD ...-D42-JHP     | 104                    | 52  | 152                 | 100 | 205                    | 153 |
| TAGPAD ...-D52-JHP     | 114                    | 62  | 162                 | 110 | 215                    | 163 |
| TAGPAD-XL ...-D52-JHP  | 114                    | 62  | 162                 | 110 | 215                    | 163 |
| TAGPAD-XL ...-D65-JHP  | 127                    | 70  | 175                 | 118 | 228                    | 171 |
| TAGPAD-XL ...-D82-JHP  | 146                    | 86  | 194                 | 134 | 247                    | 187 |
| TAGPAD-XL ...-D102-JHP | 170                    | 107 | 218                 | 155 | 271                    | 208 |



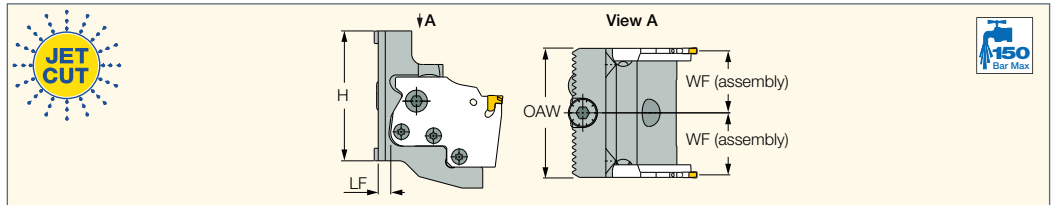
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## MODULAR-GRIP

### V## MAHD-XL-JHP

Intermediate Holders for ISCAR Modular System Holders with Directed Internal Coolant for MODULAR-GRIP-XL Adapters



| Designation     | CSI | H    | OAW   | LF   | WF    |
|-----------------|-----|------|-------|------|-------|
| V60 MAHD-XL-JHP | V60 | 62.0 | 61.60 | 6.05 | 29.50 |
| V85 MAHD-XL-JHP | V85 | 85.0 | 85.00 | 6.05 | 41.30 |

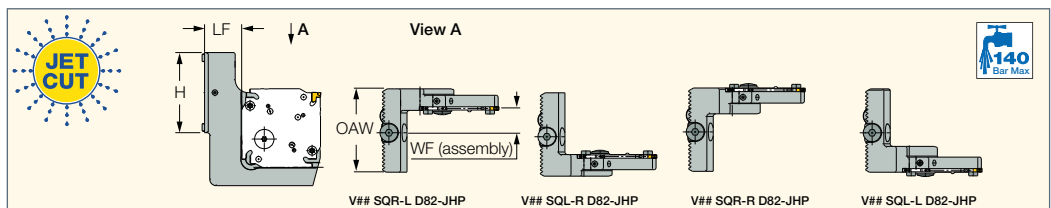
• For user guide, see pages 862-876

**For tools, see pages:** CGPAD-JHP (309) • DGPAD-JHP (538) • HGPAD-JHP (291) • PCADR/L-JHP (353) • PCADRS/LS-JHP (354) • PCLNR/L-PAD-JHP (25) • PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88) • TAGPAD-JHP (562) • TAGPAD-XL-JHP (562) • TGPAD-JHP (298) • TNFPAD-XL-JHP (668)

## LOGIQ FGRIP

### V## SQ#-#-D82-JHP

Intermediate Holders for TANG-F-GRIP and DO-F-GRIP Square Type D82 Adapters Designed for Modular Tooling Systems



| Designation       | H    | LF    | OAW   | WF <sup>(1)</sup> |
|-------------------|------|-------|-------|-------------------|
| V60 SQL-L-D82-JHP | 62.0 | 34.70 | 64.50 | 28.95             |
| V60 SQL-R-D82-JHP | 62.0 | 34.70 | 64.50 | 15.35             |
| V60 SQR-L-D82-JHP | 62.0 | 34.70 | 64.50 | 18.85             |
| V60 SQR-R-D82-JHP | 62.0 | 34.70 | 64.50 | 32.45             |
| V85 SQL-L-D82-JHP | 83.0 | 34.70 | 85.00 | 40.95             |
| V85 SQL-R-D82-JHP | 83.0 | 34.70 | 85.00 | 27.35             |
| V85 SQR-L-D82-JHP | 83.0 | 34.70 | 85.00 | 27.35             |
| V85 SQR-R-D82-JHP | 83.0 | 34.70 | 85.00 | 40.95             |

<sup>(1)</sup> When 3mm width insert is used.

**For tools, see pages:** DGAQ (580) • DGAQ-JHP (580) • TGAQ (579) • TGAQ-JHP (578)

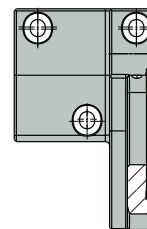
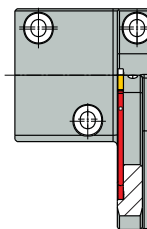
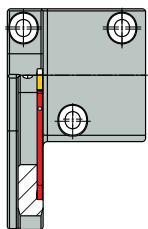
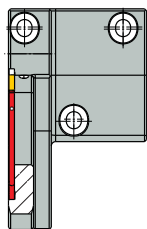
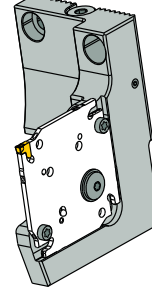
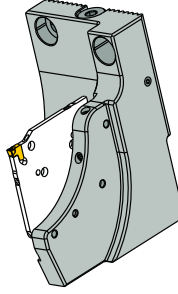
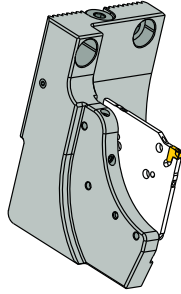
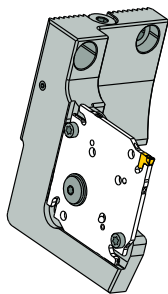
## Identification Legend

### V60 SQL-L-D82-JHP

### V60 SQL-R-D82-JHP

### V60 SQR-L-D82-JHP

### V60 SQR-R-D82-JHP



L- Holder (prism) orientation  
L- Pocket side

L- Holder (prism) orientation  
R- Pocket side

R- Holder (prism) orientation  
L- Pocket side

R- Holder (prism) orientation  
R- Pocket side

## Spare Parts

| Designation       |                  |                      |                 |                     |                  |
|-------------------|------------------|----------------------|-----------------|---------------------|------------------|
| V## SQ#-#-D82-JHP | SR M4X9-SEAL-JHP | JHP COPPER SEAL 1/8" | O-RING 10X2 NBR | SIDE THRUST PIN 3mm | SR M4X10-8.8-T20 |

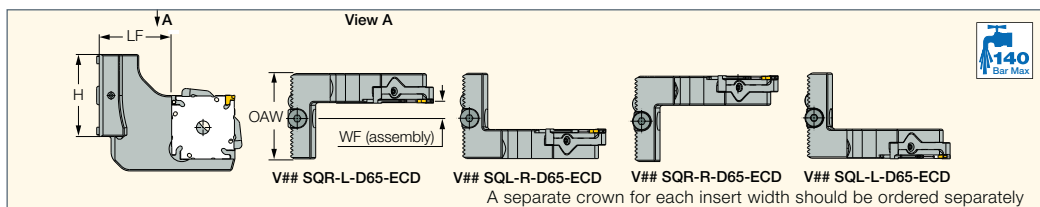
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# JETCROWN

LOGIQ JET COOLANT

## V## SQ#-#-D65-ECD

Intermediate Holders for TANG-F-GRIP (TGAQ-ECD) Square D65 Adapters Designed for Modular Tooling Systems



| Designation       | H    | LF    | OAW   | WF    | CUTDIA |
|-------------------|------|-------|-------|-------|--------|
| V60 SQL-L-D65-ECD | 62.0 | 55.00 | 64.50 | 29.30 | 65.0   |
| V60 SQL-R-D65-ECD | 62.0 | 55.00 | 64.50 | 9.80  | 65.0   |
| V60 SQR-L-D65-ECD | 62.0 | 55.00 | 64.50 | 13.30 | 65.0   |
| V60 SQR-R-D65-ECD | 62.0 | 55.00 | 64.50 | 32.80 | 65.0   |
| V85 SQL-L-D65-ECD | 83.0 | 55.00 | 85.00 | 41.30 | 65.0   |
| V85 SQL-R-D65-ECD | 83.0 | 55.00 | 85.00 | 20.80 | 65.0   |
| V85 SQR-L-D65-ECD | 83.0 | 55.00 | 85.00 | 20.80 | 65.0   |
| V85 SQR-R-D65-ECD | 83.0 | 55.00 | 85.00 | 41.30 | 65.0   |

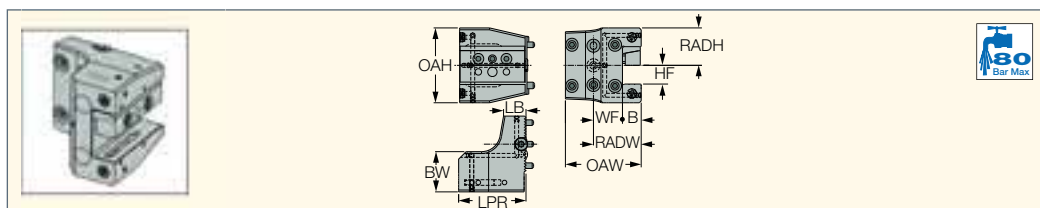
### NEW

For tools, see pages: TGAQ-ECD (JET-CROWN) (582)

## TOOL BLOCKS

### V-ASH-MC

Axially Oriented, Short, Right-Hand, Wedge Clamping Holders for Square Shank Tools

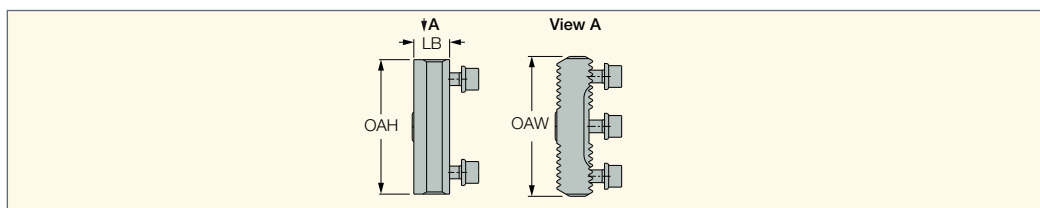


| Designation    | HF   | WF    | LPR   | OAH    | RADW  | B    | LB    | RADH  | BW    | OAW    |
|----------------|------|-------|-------|--------|-------|------|-------|-------|-------|--------|
| V60 ASH 20-MC  | 20.0 | 31.00 | 72.00 | 80.00  | 51.00 | 20.0 | 24.00 | 40.00 | 43.00 | 81.00  |
| V60 ASH 25-MC  | 25.0 | 32.00 | 87.00 | 90.00  | 57.00 | 25.0 | 24.00 | 45.00 | 48.00 | 87.00  |
| V85 ASH 25-MC  | 25.0 | 43.00 | 87.00 | 100.00 | 68.00 | 25.0 | 26.00 | 50.00 | 55.00 | 110.50 |
| V85 ASHD 25-MC | 25.0 | 43.00 | 87.00 | 100.00 | 68.00 | 25.0 | 26.00 | 50.00 | 55.00 | 110.50 |

## MODULAR-GRIP

### V## V##-L##

Spacer for ISCAR Modular System



| Designation | CSI | OAH   | OAW   | LB    |
|-------------|-----|-------|-------|-------|
| V60 V60-L15 | V60 | 62.00 | 64.50 | 15.00 |
| V60 V60-L30 | V60 | 62.00 | 64.50 | 30.00 |
| V85 V85-L30 | V85 | 83.00 | 85.00 | 30.00 |

- For user guide, see pages 862-876



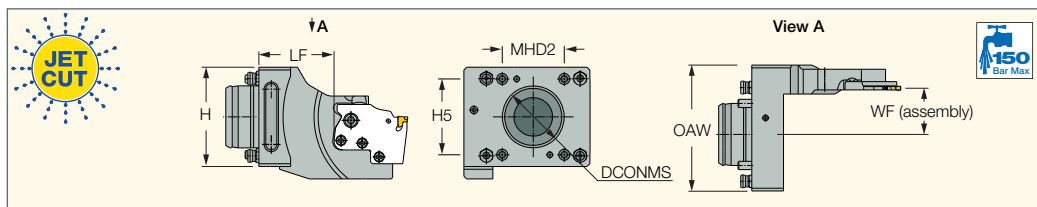
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## MODULAR-GRIP

### TR45 MAHDR-#-XL-JHP

Toolholders for TRAUB TNK45  
/ TNK 65 Machines with  
Directed Internal Coolant for  
MODULAR-GRIP-XL Adapters



| Designation         | H    | OAW   | H5    | MHD2 | DCONMS | LF    | WF    |
|---------------------|------|-------|-------|------|--------|-------|-------|
| TR45 MAHDR-L-XL-JHP | 72.0 | 91.50 | 55.00 | 45.0 | 45.00  | 54.40 | 33.50 |

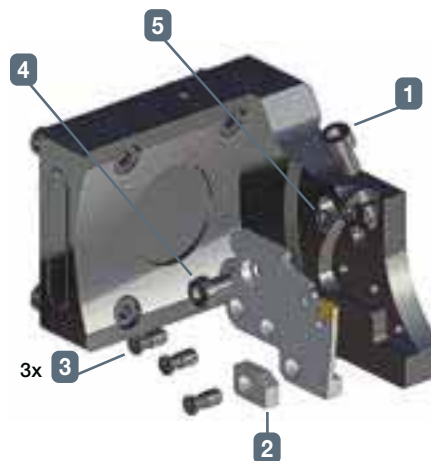
• All trademarks and logos are the property of their respective companies • For user guide, see pages 862-876

**For tools, see pages:** CGPAD-JHP (309) • DGPAD-JHP (538) • HGPAD-JHP (291) • PCADR/L-JHP (353) • PCADRS/LS-JHP (354) • PCLNR/L-PAD-JHP (25)  
• PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88) • TAGPAD-JHP (562) • TAGPAD-XL-JHP (562)  
• TAGPAD-Y-JHP (584) • TGPAD-JHP (298)

#### Spare Parts

| Designation         | (1) Clamping Screw  | (2) Dummy           |
|---------------------|---------------------|---------------------|
| TR45 MAHDR-L-XL-JHP | SR M6x16DIN912 12.9 | Dummy-MG-XL-5113377 |

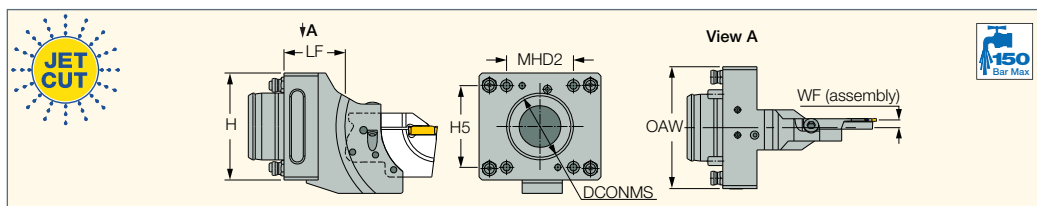
| (3) Screw   | (4) Screw       | (5) O-Ring |
|-------------|-----------------|------------|
| SR M5-04451 | SR M6x10DIN6912 | OR 5x1N    |



## MODULAR-GRIP

### TR45TNL MAHDN-R-XL-JHP

Toolholders for TRAUB TNL16  
to TNL18 / TNL32 Machines  
with Internal Coolant Supply for  
MODULAR-GRIP-XL Adapters



| Designation            | H    | OAW   | H5    | MHD2 | DCONMS | LF    | WF   |
|------------------------|------|-------|-------|------|--------|-------|------|
| TR45TNL MAHDN-R-XL-JHP | 72.0 | 82.00 | 55.00 | 45.0 | 45.00  | 41.30 | 6.00 |

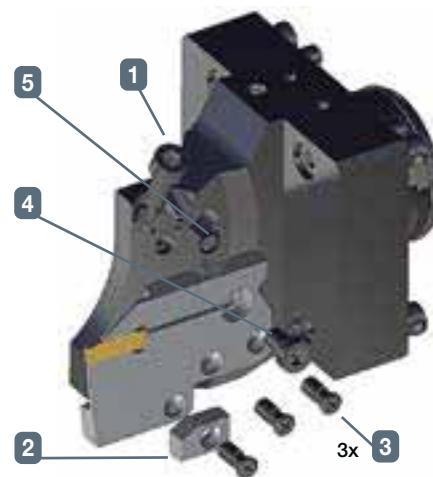
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**For tools, see pages:** CGPAD-JHP (309) • DGPAD-XL-JHP (538) • HGPAD-JHP (291) • PCADR/L-JHP (353) • PCADRS/LS-JHP (354) • PCLNR/L-PAD-JHP (25)  
• PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88) • TAGPAD-XL-JHP (562) • TGPAD-JHP (298)

#### Spare Parts

| Designation            | (1) Clamping Screw  | (2) Dummy           |
|------------------------|---------------------|---------------------|
| TR45TNL MAHDN-R-XL-JHP | SR M6x16DIN912 12.9 | Dummy-MG-XL-5113377 |

| (3) Screw   | (4) Screw       | (5) O-Ring |
|-------------|-----------------|------------|
| SR M5-04451 | SR M6x10DIN6912 | OR 5x1N    |

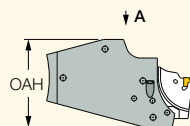




## MODULAR-GRIP

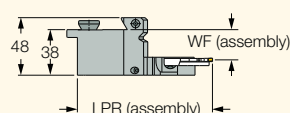
### TR TNK36 MAHDL-R-XL-JHP

Toolholders for TRAUB TNK36 / TNL26 Machines with Internal Coolant Supply for MODULAR-GRIP-XL Adapters



TR45

View A



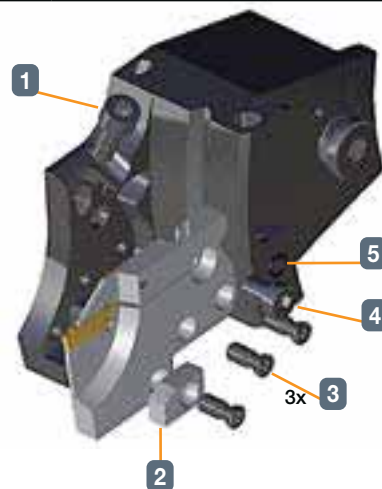
| Designation             | OA    | LPR   | WF    |
|-------------------------|-------|-------|-------|
| TR TNK36 MAHDL-R-XL-JHP | 74.00 | 91.50 | 24.50 |

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**For tools, see pages:** CGPAD-JHP (309) • DGPAD-XL-JHP (538) • HGPAD-JHP (291) • PCADR/L-JHP (353) • PCADRS/LS-JHP (354) • PCLNR/L-PAD-JHP (25) • PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88) • TAGPAD-XL-JHP (562) • TGPAD-JHP (298) • TNFPAD-XL-JHP (668)

### Spare Parts

| Designation             | (1) Clamping Screw  | (2) Dummy           | (3) Screw   | (4) Screw       | (5) O-Ring |
|-------------------------|---------------------|---------------------|-------------|-----------------|------------|
| TR TNK36 MAHDL-R-XL-JHP | SR M6x16DIN912 12.9 | Dummy-MG-XL-5113377 | SR M5-04451 | SR M6x10DIN6912 | OR 5x1N    |

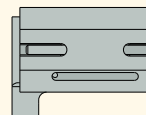
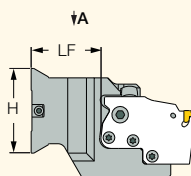


## INDEX

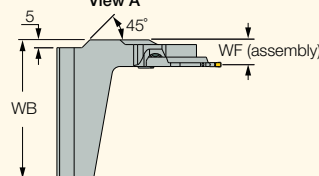
## MODULAR-GRIP

### ABC MAHDR-#-XL-JHP

Toolholders for Index ABC Speedline with Internal Coolant Supply for MODULAR-GRIP-XL Adapters



View A



| Designation        | H    | WB    | LF    | WF    |
|--------------------|------|-------|-------|-------|
| ABC MAHDR-L-XL-JHP | 56.0 | 91.50 | 44.55 | 17.00 |

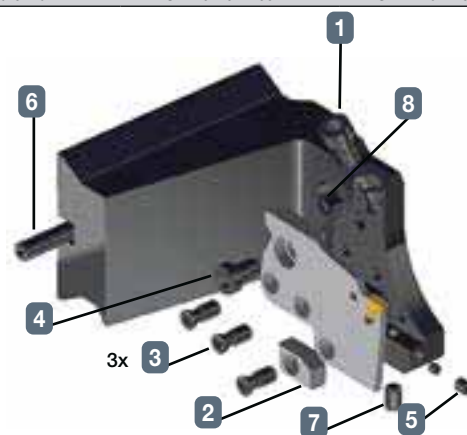
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**For tools, see pages:** CGPAD-JHP (309) • DGPAD-JHP (538) • DGPAD-XL-JHP (538) • HGPAD-JHP (291) • PCADR/L-JHP (353) • PCADRS/LS-JHP (354) • PCLNR/L-PAD-JHP (25) • PDJNR/L-PAD-JHP (38) • SCLCR/L-PAD-JHP (71) • SDJCR/L-PAD-JHP (78) • SVJCR/L-PAD-JHP (88) • TAGPAD-JHP (562) • TAGPAD-XL-JHP (562) • TAGPAD-Y-JHP (584) • TGPAD-JHP (298) • TNFPAD-XL-JHP (668)

### Spare Parts

| Designation        | (1) Clamping Screw  | (2) Dummy           | (3) Screw   | (4) Screw       | (5) Pin           |
|--------------------|---------------------|---------------------|-------------|-----------------|-------------------|
| ABC MAHDR-#-XL-JHP | SR M6x16DIN912 12.9 | Dummy-MG-XL-5113377 | SR M5-04451 | SR M6x10DIN6912 | SR M4x5DIN913 45H |

| Designation        | (6) Stopper Screw | (7) Height Adjustment Screw | (8) O-Ring |
|--------------------|-------------------|-----------------------------|------------|
| ABC MAHDR-#-XL-JHP | DIN913-M6x80-45H  | SR M5x8DIN913 45H           | OR 5x1N    |



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# MATERIALS AND GRADES

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**MACHINING**



## MATERIAL GROUPS

Based on ISO 513 and VDI 3323 standards

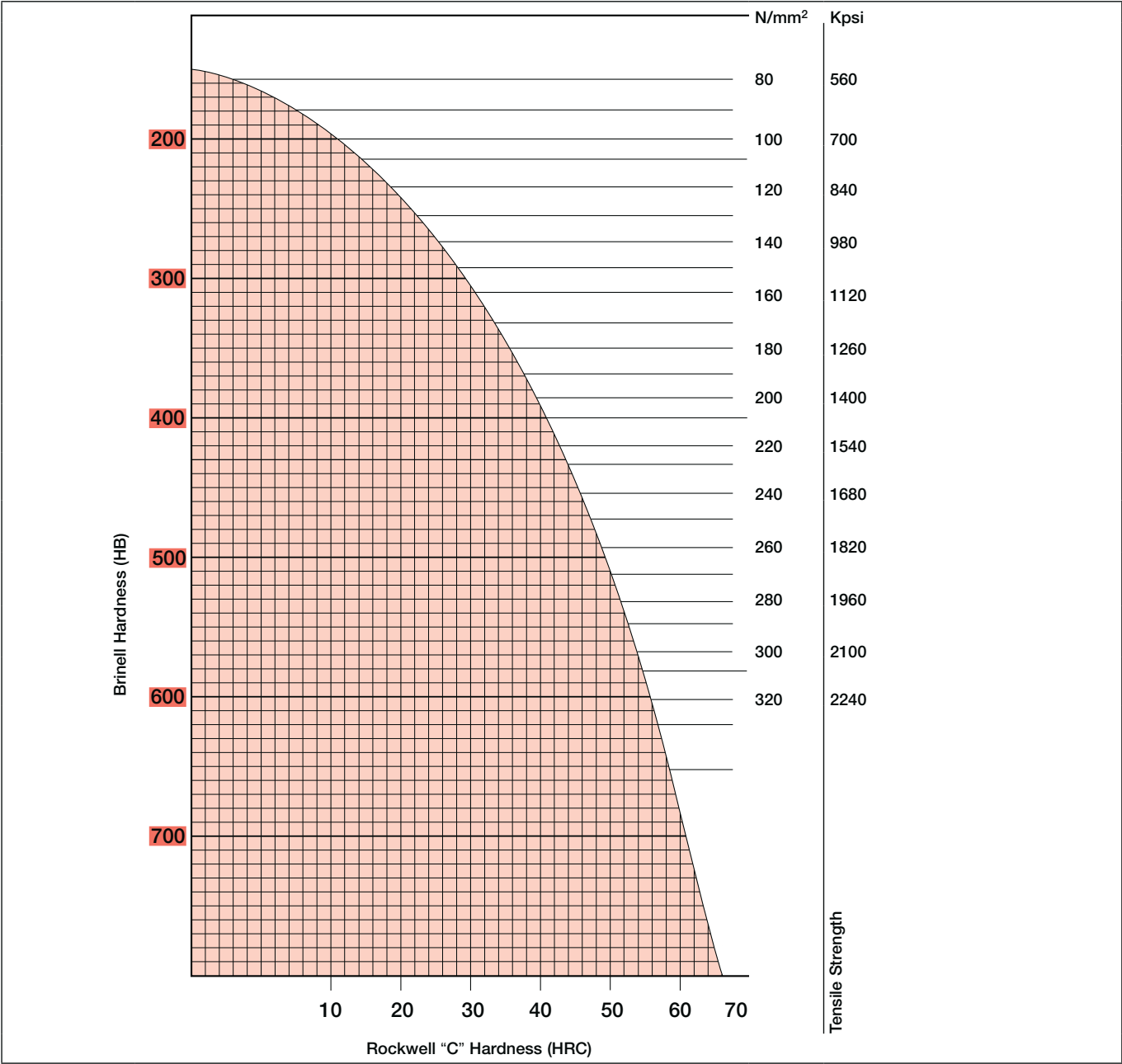
| ISO | Material                                                     | Condition                         | Tensile Strength<br>[N/mm <sup>2</sup> ] | Kc1 <sup>(1)</sup> [N/mm <sup>2</sup> ] | mc <sup>(2)</sup> | Hardness<br>HB | Material<br>Group<br>No. |
|-----|--------------------------------------------------------------|-----------------------------------|------------------------------------------|-----------------------------------------|-------------------|----------------|--------------------------|
| P   | non-alloy steel and cast steel, free cutting steel           | <0.25% C<br>annealed              | 420                                      | 1350                                    | 0.21              | 125            | 1                        |
|     |                                                              | ≥0.25% C<br>annealed              | 650                                      | 1525                                    | 0.22              | 190            | 2                        |
|     |                                                              | <0.55% C<br>quenched and tempered | 850                                      | 1675                                    | 0.24              | 250            | 3                        |
|     |                                                              | ≥0.55% C<br>annealed              | 750                                      | 1675                                    | 0.24              | 220            | 4                        |
|     |                                                              | quenched and tempered             | 1000                                     | 1900                                    | 0.24              | 300            | 5                        |
|     | low alloy and cast steel (less than 5% of alloying elements) | annealed                          | 600                                      | 1775                                    | 0.24              | 200            | 6                        |
|     |                                                              | quenched and tempered             | 930                                      | 1675                                    | 0.24              | 275            | 7                        |
|     |                                                              |                                   | 1000                                     | 1725                                    | 0.24              | 300            | 8                        |
|     |                                                              |                                   | 1200                                     | 1800                                    | 0.24              | 350            | 9                        |
|     | high alloyed steel, cast steel and tool steel                | annealed                          | 680                                      | 2450                                    | 0.23              | 200            | 10                       |
|     |                                                              | quenched and tempered             | 1100                                     | 2500                                    | 0.23              | 325            | 11                       |
|     | stainless steel and cast steel                               | ferritic / martensitic            | 680                                      | 1875                                    | 0.21              | 200            | 12                       |
|     |                                                              | martensitic                       | 820                                      | 1875                                    | 0.21              | 240            | 13                       |
| M   | stainless steel and cast steel                               | austenitic, duplex                | 600                                      | 2150                                    | 0.20              | 180            | 14                       |
| K   | gray cast iron (GG)                                          | ferritic / pearlitic              |                                          | 1150                                    | 0.20              | 180            | 15                       |
|     |                                                              | pearlitic / martensitic           |                                          | 1350                                    | 0.28              | 260            | 16                       |
|     | nodular cast iron (GGG)                                      | ferritic                          |                                          | 1225                                    | 0.25              | 160            | 17                       |
|     |                                                              | pearlitic                         |                                          | 1350                                    | 0.28              | 250            | 18                       |
|     | malleable cast iron                                          | ferritic                          |                                          | 1225                                    | 0.25              | 130            | 19                       |
|     |                                                              | pearlitic                         |                                          | 1420                                    | 0.3               | 230            | 20                       |
| N   | aluminum-wrought alloys                                      | not hardenable                    |                                          | 700                                     | 0.25              | 60             | 21                       |
|     |                                                              | hardenable                        |                                          | 800                                     | 0.25              | 100            | 22                       |
|     | aluminum-cast alloys                                         | ≤12% Si<br>not hardenable         |                                          | 700                                     | 0.25              | 75             | 23                       |
|     |                                                              | hardenable                        |                                          | 700                                     | 0.28              | 90             | 24                       |
|     |                                                              | >12% Si<br>high temperature       |                                          | 750                                     | 0.25              | 130            | 25                       |
|     | copper alloys                                                | >1% Pb<br>free cutting            |                                          | 700                                     | 0.27              | 110            | 26                       |
|     |                                                              | brass                             |                                          | 700                                     | 0.27              | 90             | 27                       |
|     |                                                              | electrolytic copper               |                                          | 700                                     | 0.27              | 100            | 28                       |
|     | non metallic                                                 | duroplastics, fiber plastics      |                                          | 200                                     | 0.20              | 70 Shore D     | 29                       |
|     |                                                              | hard rubber                       |                                          | 200                                     | 0.20              | 55 Shore D     | 30                       |
| S   | high temperature alloys                                      | Fe based<br>annealed              |                                          | 2600                                    | 0.24              | 200            | 31                       |
|     |                                                              | hardened                          |                                          | 3100                                    | 0.24              | 280            | 32                       |
|     |                                                              | Ni or Co based<br>annealed        |                                          | 3300                                    | 0.24              | 250            | 33                       |
|     |                                                              | hardened                          |                                          | 3300                                    | 0.24              | 350            | 34                       |
|     |                                                              | cast                              |                                          | 3300                                    | 0.24              | 320            | 35                       |
|     | titanium alloys                                              | pure                              | 400                                      | 1160                                    | 0.24              | 190            | 36                       |
|     |                                                              | alpha+beta alloys, hardened       | 1050                                     | 1245                                    | 0.24              | 310            | 37                       |
| H   | hardened steel                                               | hardened                          |                                          | 4600                                    | 0.25              | 55 HRC         | 38                       |
|     |                                                              | hardened                          |                                          | 4700                                    | 0.25              | 60 HRC         | 39                       |
|     | chilled cast iron                                            | cast                              |                                          | 4600                                    | 0.27              | 400            | 40                       |
|     | cast iron                                                    | hardened                          |                                          | 4500                                    | 0.27              | 55 HRC         | 41                       |

|  |                          |
|--|--------------------------|
|  | steel                    |
|  | stainless steel          |
|  | cast iron                |
|  | non-ferrous metals       |
|  | superalloys and titanium |
|  | hard materials           |

<sup>(1)</sup> Specific cutting force for 1 mm<sup>2</sup> chip section

<sup>(2)</sup> Chip thickness factor

MATERIAL GROUPS  
Hardness Conversion Table





## Material Designation in Accordance with Selected Standards

|                                                                                                                            |  | Material Group No.                                                                                                              |                                                          |                                                                      |                                   |                     |                             |                                                                                                            |                                   |                                                                                                |                                                            |
|----------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------|---------------------|-----------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Standards                                                                                                                  |  | 1                                                                                                                               | 1                                                        | 1                                                                    | 1                                 | 1                   | 1                           | 1                                                                                                          | 1                                 | 1                                                                                              | 1                                                          |
|  NF/AFNOR (FRANCE)                        |  | E 28-2                                                                                                                          | A 50-2                                                   | E 36-2                                                               | E 28-3                            | SPH 265;<br>A 42 AP | E                           | E 28-3;<br>E 28-4                                                                                          | C;<br>TC                          | E 24-2                                                                                         | A 33                                                       |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  | 1020;<br>G10200;<br>K02301;<br>K02595;<br>K02596;<br>K02597;<br>K02598;<br>K02599;<br>K02702;<br>K0300                          |                                                          | K02404;<br>K02702                                                    | K02702                            |                     | A 619                       | K02601;<br>K03000;<br>A 573 Gr. 70;<br>A 611 Gr.D                                                          | 1008;<br>G10080;<br>A 621         | 1015;<br>G10150;<br>K02401                                                                     |                                                            |
|  BS (UK)                                  |  | En 43 B;<br>Fe 430 B FN;<br>43/25 HR;<br>43/25HS;<br>43 B;<br>HPW4;<br>HFS4;<br>ERW 3                                           | Fe 490-2 FN;<br>50 B                                     | 50 B;<br>4360-50 B                                                   | 43C;<br>4360-43C                  | 164-400B LT 20      | 2 CR;<br>3 CR               | Fe 430 D1 FF;<br>4360-43 C;<br>4360-43 D                                                                   | CR 4;<br>CS 4                     | Fe 360 B;<br>4360-40 B;<br>ERW 3;<br>CEW 3;<br>37/23 HR;<br>37/23 HS;<br>37/23 CR;<br>37/23 CS | Fe 310-0;<br>15 HR;<br>15 HS;<br>1449 15 HR;<br>1449 15 HS |
|  DIN (GERMANY)                            |  | S275JR;<br>St 44-2;<br>Fe 430 B;<br>S275J2G3                                                                                    | E295;<br>St 50-2;<br>Fe 490-2;<br>ST 50-2 G<br>(E295+CR) | S355JR;<br>Fe 510 B                                                  | S275J0;<br>St 44-3 U;<br>Fe 430 C | P265S;<br>SPH 265   | DC03G1;<br>UST 3;<br>UST 13 | S275J2G3 (S275J2);<br>St 44-3 (Fe 430 D 1)                                                                 | DC01;<br>DC 01;<br>St 2;<br>St 12 | S235JR<br>(Fe 360 B);<br>St 37-2                                                               | S185 (Fe 310-0);<br>St 33                                  |
|  Werkstoff (GERMANY)                     |  | 1.0044                                                                                                                          | 1.0050                                                   | 1.0045                                                               | 1.0143                            | 1.0130              | 1.0333                      | 1.0144                                                                                                     | 1.0330                            | 1.0037                                                                                         | 1.0035                                                     |
|  EN (EUROPE)                            |  | S275JR                                                                                                                          |                                                          | S355JR                                                               | S275J0                            | P265S               | DC03G1                      |                                                                                                            | DC01 (FeP 05)                     |                                                                                                | S185                                                       |
|  GOST (RUSSIA)                          |  | St4ps;<br>St4sp                                                                                                                 | St5ps;<br>St5sp                                          |                                                                      |                                   |                     |                             | St4kp;<br>St4ps;<br>St4sp                                                                                  |                                   |                                                                                                | St0                                                        |
|  JIS (JAPAN)                            |  | SN 400 B;<br>SN 400 C;<br>SN 490 B;<br>SN 490 C;<br>SS 400;<br>STK 400;<br>STKM 19 C;<br>STKR 400;<br>19 C;<br>SS 41;<br>STK 41 | SS 490;<br>SS 50                                         | SN 400 B;<br>SN 400 C;<br>SN 490 B;<br>SN 490 C;<br>SS 490;<br>SS 50 |                                   |                     | SPCD                        | SM 400 A;<br>SM 400 B;<br>SM 400 C;<br>SS 400;<br>STK 400;<br>STKR 400;<br>SM 41 A;<br>SM 41 B;<br>SM 41 C | SPCC;<br>CR 1                     | STKM 12 A;<br>STKM 12 AC                                                                       | SGP;<br>SS 330;<br>SS 34                                   |
|  SS (SWEDEN)                            |  | 1411;<br>1412                                                                                                                   | 1550;<br>2172                                            |                                                                      | 1414-01                           |                     |                             | 1411;<br>1412;<br>1414                                                                                     | 1142                              | 1311                                                                                           | 1300                                                       |
|  UNE (SPAIN)                            |  | AE 275 B;<br>Fe 430 B FN                                                                                                        | A 490-2;<br>Fe 490-2 FN                                  | AE 355 B                                                             | AE 275 D                          | SPH 265             | AP 02                       | AE 275 D;<br>Fe 430 D1 FF                                                                                  | AP 11;<br>FeP 01;<br>AP 00        | AE 235 B;<br>Fe 360 B                                                                          | Fe 310-0;<br>A 310-0                                       |
|  UNI (ITALY)                            |  | Fe 430 B FN;<br>Fe 430 B                                                                                                        | Fe 490                                                   | Fe 510 B FN                                                          | Fe 430 C FN                       |                     | FeP 02                      | Fe 430 B;<br>Fe 430 C (FN);<br>Fe 430 D (FF)                                                               | FeP 01;<br>FeP 00                 | Fe 360 B;<br>1449 37/23<br>HR                                                                  | Fe 320                                                     |
|  IS (INDIA)                             |  |                                                                                                                                 | Fe 490                                                   | IS 961                                                               | Fe410WA                           |                     |                             | Fe410WC                                                                                                    | IS 513/94 O                       |                                                                                                |                                                            |
|  KS (REP. OF KOREA)                     |  | SB 41                                                                                                                           | SS 490                                                   | SS 490                                                               |                                   |                     | SPCD                        | SWS 41C;<br>SWS 4 B;<br>SWS 41A;<br>SM 400A;<br>SM 400B;<br>SM 400C                                        |                                   | STKM 12A;<br>STKM 12C                                                                          | SS 330                                                     |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  | Q255A;<br>Q255D                                                                                                                 | Q295A                                                    | Q345B                                                                | Q275                              | 20                  | 10F                         | Q275                                                                                                       | 8                                 | 15                                                                                             | Q195                                                       |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                                            |                    |                                                            |                         |                                                                                                                                       |                                                                                |                                     |                   |                                                                           |                   |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|--------------------|------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------|-------------------|---------------------------------------------------------------------------|-------------------|
|                                                                                     |                                          | 1                                                             | 1                  | 1                                                          | 1                       | 1                                                                                                                                     | 1                                                                              | 1                                   | 1                 | 1                                                                         | 1                 |
|    | NF/AFNOR<br>(FRANCE)                     | A 34-2 NE                                                     | 2 C                | 3 C                                                        | ES                      | A 37 CP                                                                                                                               | C10RR;<br>XC 10;<br>C 10;<br>AF 34<br>C 10                                     | E 28-3                              | GC                | E 24-3                                                                    |                   |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | K02502                                                        |                    | 1006;<br>G10060                                            | A 620                   | K01700;<br>K02001;<br>K02200;<br>K02201;<br>K02203;<br>K02503;<br>K02601;<br>K02801                                                   | 1010;<br>G10100                                                                |                                     |                   | A 1011<br>(SS Grade 36 (230) Type 2);<br>A1011 (SS Grade 36 (250) Type 1) | A572-60           |
|    | BS<br>(UK)                               | CEW 2;<br>34/20 HR;<br>34/20 HS;<br>34/20 CR;<br>1449 34/20CS |                    | 1 CR;<br>1 CS;<br>1 HR;<br>2 HR;<br>2 HS;<br>2 CR;<br>2 CS | CR 1;<br>CR 2           | 141-360;<br>151-360;<br>154-360;<br>161-360;<br>164-360                                                                               | 040 A 10;<br>045 M 10;<br>En 2 A;<br>En 2 A/1;<br>En 2 B;<br>En 32 A;<br>10 CS | 43 C;<br>4360-43C                   | Z2                | 40 C;<br>4360-40C                                                         | 4360 55 E         |
|    | DIN<br>(GERMANY)                         | E195;<br>RSt 34-2                                             | DD12G1;<br>UStW 23 | DD13;<br>StW 24                                            | DC04;<br>St 4;<br>St 14 | P235GH;<br>Hl;<br>H I                                                                                                                 | C10;<br>C 10                                                                   | S275JOH;<br>St 44-3 U;<br>RoSt 44-2 | DX51D;<br>St 02 Z | S235JO;<br>St 37-3 U;<br>Fe 360 C                                         | S380N;<br>StE 380 |
|   | Werkstoff<br>(GERMANY)                   | 1.0034                                                        | 1.0334             | 1.0335                                                     | 1.0338                  | 1.0345                                                                                                                                | 1.0301                                                                         | 1.0149                              | 1.0226            |                                                                           | 1.8900            |
|  | EN<br>(EUROPE)                           | E195                                                          |                    | DD13                                                       | DC04 (FeP 04)           | P235GH                                                                                                                                | C10                                                                            | S275JOH                             |                   | S235JO                                                                    | S380N             |
|  | GOST<br>(RUSSIA)                         | St2ps;<br>St2sp                                               | 10kp               | 08kp                                                       | 08JuA                   |                                                                                                                                       | 10                                                                             |                                     |                   |                                                                           |                   |
|  | JIS<br>(JAPAN)                           |                                                               | SPHD               | SPHE                                                       | SPCE;<br>HR 4           | SGV 410;<br>SGV 450;<br>SGV 480;<br>SPV 235;<br>SPV 450;<br>SPV 490;<br>SGV 42;<br>SGV 46;<br>SGV 49;<br>SPV 24;<br>SPV 46;<br>SPV 50 | S 10C                                                                          |                                     | SGC C             | SS 330;<br>SS 34                                                          | S 25 C            |
|  | SS<br>(SWEDEN)                           |                                                               |                    |                                                            | 1147                    | 1330;<br>1331                                                                                                                         |                                                                                | 1412-04                             | 1151 10           |                                                                           | 2145              |
|  | UNE<br>(SPAIN)                           |                                                               | AP 12              | AP13                                                       | AP 04;<br>FeP 04        | A 37 Grado RA II;<br>A 37 Grado RC I                                                                                                  | F.151;<br>F.151.A                                                              | Fe 430 C;<br>AE 275 C               | FeP 02 G          | AE 235 C                                                                  |                   |
|  | UNI<br>(ITALY)                           | Fe 330 BFN                                                    | FeP 12             | FeP 13                                                     | FeP 04                  | FeE 235;<br>Fe 360 1 KW;<br>Fe 360 1 KG;<br>Fe 360 2 KW;<br>Fe 360 2 KG                                                               | 1 C 10;<br>C 10                                                                | Fe 430 C                            | FeP 02 G          | Fe 360 C FN                                                               | FeE 390 KG        |
|  | IS<br>(INDIA)                            |                                                               |                    |                                                            |                         | IS 2002 Grade 1                                                                                                                       | 5C4                                                                            |                                     |                   | Fe410-S                                                                   |                   |
|  | KS<br>(REP. OF KOREA)                    |                                                               | SPHD               | SPHE                                                       | SPCE                    | SPV 24;<br>SGV 49;<br>SGV 46;<br>SGV 42;<br>SGV 410;<br>SGV 450;<br>SGV 480                                                           | SM 10C                                                                         |                                     |                   | SS 330                                                                    | SM 25C            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | Q215B                                                         | Q195               | 08F                                                        |                         | A3R                                                                                                                                   | 10                                                                             |                                     |                   | Q195                                                                      |                   |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                             |                        |                                      |                       |                                                                    |                                                               |                                              |                                                      |                                                                    |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------|------------------------|--------------------------------------|-----------------------|--------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|
|                                                                                     |                                          | 1                                              | 1                      | 1                                    | 1                     | 1                                                                  | 1                                                             | 1                                            | 1                                                    | 1                                                                  |
|    | NF/AFNOR<br>(FRANCE)                     | A 60-2                                         | A 34-2                 | A 37 AP;<br>SPH 235                  | 10 PbF 2              | 10 F 2                                                             | S 250 Pb                                                      | S 250                                        | XC 25;<br>XC 18;<br>2 C 22                           | E 560 D;<br>S 560 MC                                               |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A 572 Gr. 65                                   |                        | K01700;<br>K02200;<br>K02801         |                       | 1108;<br>1109;<br>1111;<br>B 1111;<br>B 1111;<br>G11080;<br>G11090 | 12L13;<br>12L14;<br>12 L 13;<br>12 L 14;<br>G12134;<br>G12144 | 1213;<br>1215;<br>G12130;<br>G12150          | 1020;<br>1023;<br>G10200;<br>G10230                  | A 1008 (HSLAS-F Grade 80 [550]);<br>A 1011 (HLAS-F Grade 80 [550]) |
|    | BS<br>(UK)                               | En 55 C;<br>Fe 590-2-FN;<br>55 E;<br>4360-55 E |                        | 164-360B LT20;<br>1501-164-360B LT20 |                       |                                                                    | 230 M 07 Pb;<br>En 1A Pb                                      | 230 M 07;<br>En 1 A                          | 055 M 15;<br>070 M 20;<br>En 3 A;<br>En 3 C;<br>En 2 | 60F55 HR;<br>60F55 HS;<br>60F55 CS                                 |
|    | DIN<br>(GERMANY)                         | E335;<br>St 60-2<br>(Fe 590-2 B)               | S250G1T;<br>USt 34-2   | P235S;<br>SPH 235                    | 10SPb20;<br>10 SPb 20 | 10S20;<br>10 S 20                                                  | 11SMnPb30;<br>9 SMnPb 28                                      | 11SMn30;<br>9 SMn 28                         | C22E;<br>Ck 22                                       | S500MC;<br>QStE 500 TM                                             |
|    | Werkstoff<br>(GERMANY)                   | 1.0060                                         | 1.0028                 | 1.0112                               | 1.0722                | 1.0721                                                             | 1.0718                                                        | 1.0715                                       | 1.1151                                               | 1.0986                                                             |
|  | EN<br>(EUROPE)                           | E335                                           |                        | P235S                                | 10SPb20               | 10S20                                                              | 11SMnPb30                                                     | 11SMn30                                      | C22E                                                 | S500MC                                                             |
|  | GOST<br>(RUSSIA)                         | St6ps;<br>St6sp                                |                        |                                      |                       |                                                                    |                                                               |                                              | 20                                                   |                                                                    |
|  | JIS<br>(JAPAN)                           | SM 570;<br>SM 58                               | SS 330;<br>SS 34       |                                      |                       |                                                                    | SUM 22 L;<br>SUM 23 L;<br>SUM 24 L                            | SUM 22                                       | S 20 C;<br>S 20 CK;<br>S 22 C                        |                                                                    |
|  | SS<br>(SWEDEN)                           | 1650                                           |                        |                                      |                       |                                                                    | 1914                                                          | 1912                                         | 1450                                                 |                                                                    |
|  | UNE<br>(SPAIN)                           | A 590;<br>Fe 590-2 FN                          |                        | AE 235 C                             | 10 SPb 20;<br>F.2122  | 10 S 20;<br>F. 2121                                                | F.210.C;<br>F.210.M;<br>11 SMnPb 28;<br>F.2112                | F.210.A;<br>F.210.L;<br>11 SMn 28;<br>F.2111 | F.1120;<br>C 25 K                                    |                                                                    |
|  | UNI<br>(ITALY)                           | Fe 590;<br>Fe 60-2                             | Fe 330;<br>Fe 330 B FU | Fe 360 C                             | CF 10 SPb 20          | CF 10 S 20                                                         | CF 9 SMnPb<br>28                                              | CF 9 S 22                                    | C 20;<br>C 25                                        | FeE 560 TM                                                         |
|  | IS<br>(INDIA)                            | St 58                                          |                        |                                      |                       |                                                                    |                                                               | 10C14S14                                     | 20C8                                                 |                                                                    |
|  | KS<br>(REP. OF<br>KOREA)                 | SM 570                                         | SS 330                 |                                      |                       |                                                                    | SUM 23 L;<br>SUM 24 L                                         | SUM 22;<br>SUM 24L                           | S 20C;<br>S 22C;<br>S 20CK                           |                                                                    |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | Q235C                                          | Q215A                  |                                      |                       | Y12                                                                |                                                               | Y15                                          | 20                                                   |                                                                    |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                                                        |                                                                                 |                                                                                 |                                                                                                             |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|                                                                                     |                                          | 1                                                                         | 1                                                                               | 1                                                                               | 1                                                                                                           |
|    | NF/AFNOR<br>(FRANCE)                     | E 490 D;<br>S 490 MC                                                      |                                                                                 | E 355 D                                                                         | E 315 D                                                                                                     |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A 1008 (HSLAS-F Grade 70 [480]);<br>A 1008 (HSLAS Grade 70 [480] Class 1) | A 1008 (HSLAS Grade 65 [450] Class 1);<br>A 1008 (HSLAS Grade 65 [450] Class 2) | A 1008 (HSLAS Grade 50 [340] Class 1);<br>A 1008 (HSLAS Grade 50 [340] Class 2) | A 1008 (HSLAS Grade 50 [340]);<br>A 1008 (HSLAS Grade 45 [310] Class 2);<br>A 1011 (HSLAS-F Grade 50 [340]) |
|    | BS<br>(UK)                               |                                                                           | 1501-50F45;<br>50F45 HR;<br>50F45 HS;<br>50F45 CS                               | 46F40 HR;<br>46F40 HS;<br>46F40 CS                                              | 1501-40F30;<br>43F35 HR;<br>43F35 HS;<br>43F35 CS                                                           |
|    | DIN<br>(GERMANY)                         | S500MC;<br>QStE 500 TM                                                    | S460MC;<br>QStE 460 TM                                                          | S355MC;<br>QStE 360 TM                                                          | S315MC;<br>QStE 300 TM                                                                                      |
|    | Werkstoff<br>(GERMANY)                   | 1.0984                                                                    | 1.0982                                                                          | 1.0976                                                                          | 1.0972                                                                                                      |
|  | EN<br>(EUROPE)                           | S500MC                                                                    | S460MC                                                                          | S355MC                                                                          |                                                                                                             |
|  | GOST<br>(RUSSIA)                         |                                                                           |                                                                                 |                                                                                 |                                                                                                             |
|  | JIS<br>(JAPAN)                           |                                                                           |                                                                                 |                                                                                 |                                                                                                             |
|  | SS<br>(SWEDEN)                           | 2662                                                                      |                                                                                 | 2642                                                                            |                                                                                                             |
|  | UNE<br>(SPAIN)                           |                                                                           |                                                                                 |                                                                                 |                                                                                                             |
|  | UNI<br>(ITALY)                           | FeE 490 TM                                                                |                                                                                 | FeE 355 TM                                                                      |                                                                                                             |
|  | IS<br>(INDIA)                            |                                                                           |                                                                                 |                                                                                 |                                                                                                             |
|  | KS<br>(REP. OF KOREA)                    |                                                                           |                                                                                 |                                                                                 |                                                                                                             |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                           |                                                                                 |                                                                                 |                                                                                                             |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                                                                                                              |                                                                                                                                |                                                                                                                            |                                                                                      |                       |                                   |                                       |                                               |                                                                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------|-----------------------------------|---------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                     |                                          | 1                                                                                                                               | 1                                                                                                                              | 1                                                                                                                          | 1                                                                                    | 1                     | 1                                 | 1                                     | 1                                             | 1                                                                                   |
|    | NF/AFNOR<br>(FRANCE)                     | FeE 355 KG N;<br>E 355 R/FP;<br>A 510 AP                                                                                        |                                                                                                                                | A 510 FP                                                                                                                   | A 510 AP                                                                             |                       | E 36-3                            | TSE 355-3;<br>E 36-3                  |                                               | AF 42 C 20;<br>XC 25;<br>1 C 22                                                     |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | K01600;<br>K02007;<br>K02700;<br>K02701;<br>K02803;<br>K02900;<br>K03009;<br>K03300;<br>K11803;<br>K12000;<br>K12001;<br>K12037 | 1024;<br>K03011;<br>K03014;<br>K12037;<br>K12709                                                                               | K01600;<br>K02302;<br>K02700;<br>K02701;<br>K02803;<br>K03301;<br>K11803;<br>K12037;<br>K12609;<br>A 299 (A);<br>A 299 (B) | K01600;<br>K02007;<br>K02701;<br>K02803;<br>K117803;<br>K12001;<br>K12037;<br>K12609 | K12037                | K12000                            | A 252 (1);<br>A 252 (2);<br>A 252 (3) | K02502                                        | 1020;<br>1022;<br>1023;<br>G10200;<br>G10220;<br>G10230                             |
|    | BS<br>(UK)                               | 225-490A                                                                                                                        |                                                                                                                                | 225-490 A                                                                                                                  | 225/490;<br>225-490 A;<br>500 Nb                                                     | 50 EE                 | 50 C;<br>4360-50C                 | 50 C;<br>4360-50C                     | Fe 360 B FU;<br>Fe 360 B FN                   | 055 M 15;<br>070 M 20;<br>En 3 A;<br>En 3 B;<br>En 3 C;<br>En 2;<br>22 HS;<br>22 CS |
|   | DIN<br>(GERMANY)                         | P355N;<br>StE 355                                                                                                               | S355J2G3 (S355J2);<br>St 52-3 N (Fe 510 D1)                                                                                    | P355NL1;<br>TSIE 355                                                                                                       | P355NH;<br>WSIE 355                                                                  | S355 NLH;<br>TSIE 355 | S355JO;<br>St 52-3 U;<br>Fe 510 C | S355JOH;<br>St 52-3 U                 | S235JRG1;<br>S235JR;<br>Fe 360 B;<br>USt 37-2 | C22                                                                                 |
|  | Werkstoff<br>(GERMANY)                   | 1.0562                                                                                                                          | 1.0570                                                                                                                         | 1.0566                                                                                                                     | 1.0565                                                                               | 1.0549                | 1.0553                            | 1.0547                                | 1.0036                                        | 1.0402                                                                              |
|  | EN<br>(EUROPE)                           | P355N                                                                                                                           | S355J2G3                                                                                                                       | P355NL1                                                                                                                    | P355NH                                                                               | S355 NLH              | S355JO                            | S355JOH                               |                                               | C22;<br>2C/2D                                                                       |
|  | GOST<br>(RUSSIA)                         | 15GF                                                                                                                            | 17GS;<br>17G1S                                                                                                                 |                                                                                                                            |                                                                                      |                       |                                   |                                       | 16D;<br>St3Kp                                 | 20                                                                                  |
|  | JIS<br>(JAPAN)                           | SM 490 A;<br>SM 490 B;<br>SM 490 C;<br>SM 490 YA;<br>SM 490YB STK 490 YB;<br>STK 490;<br>STK 500;<br>SM 50 A;<br>SM 50 B        | SM 490 A;<br>SM 490 B;<br>SM 490 C;<br>SM 490 YA;<br>SM 490 YB;<br>SM 520 B;<br>SM 520 C;<br>STK 490;<br>STK 500;<br>STKM 16 C | SLA 365;<br>STK 490;<br>STK 500;<br>SLA 37;<br>STK 50;<br>STK 51                                                           |                                                                                      |                       | SCC 3                             |                                       |                                               | S 20 C;<br>S 22 C                                                                   |
|  | SS<br>(SWEDEN)                           | 2106                                                                                                                            | 2132;<br>2134                                                                                                                  | 2107                                                                                                                       | 2106                                                                                 | 2135                  |                                   |                                       | 1311;<br>1312                                 | 1450                                                                                |
|  | UNE<br>(SPAIN)                           | AE 355 KG;<br>AE 355 DD                                                                                                         | AE 355 D;<br>Fe 510 D1 FF                                                                                                      |                                                                                                                            |                                                                                      | FeE 355 KTM           | AE 355 C                          | AE 355 C;<br>Fe 510 C                 | AE 235 B;<br>Fe 360 B                         | F.112;<br>1 C 22                                                                    |
|  | UNI<br>(ITALY)                           | FeE 355;<br>FeE 355 KG;<br>FeE 355 KW                                                                                           | fE 510                                                                                                                         | Fe E 355 KT                                                                                                                | FeE 355-2;<br>FeE 355 KW                                                             | Fe 510 D              | Fe 510 C FN                       | Fe 510 C                              | Fe 360 B;<br>Fe 360 C;<br>Fe 360 D            | C 20;<br>C 21                                                                       |
|  | IS<br>(INDIA)                            |                                                                                                                                 | Fe540WHT                                                                                                                       |                                                                                                                            |                                                                                      |                       |                                   |                                       | IS226                                         |                                                                                     |
|  | KS<br>(REP. OF<br>KOREA)                 | SM 490A;<br>SM 490 ;<br>SM 490C;<br>YA;<br>YB                                                                                   | SM 490A;<br>SM 490B;<br>SM 490C;<br>YA;<br>YB                                                                                  |                                                                                                                            |                                                                                      |                       |                                   |                                       |                                               | SM 20C;<br>SM 20CK                                                                  |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                                                                                 | 20Mn2                                                                                                                          |                                                                                                                            |                                                                                      |                       | Q345C                             |                                       | Q235B                                         | 20Mn                                                                                |

## Material Designation in Accordance with Selected Standards

|                                                                                                                            |  | Material Group No.                                                                                                                  |                                 |                     |                                                                                                                              |                              |                                              |                       |                                                                                                     |                              |                                                                      |
|----------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------|
| Standards                                                                                                                  |  | 1                                                                                                                                   | 1                               | 1                   | 1                                                                                                                            | 1                            | 1                                            | 1                     | 1                                                                                                   | 1                            | 1                                                                    |
|  NF/AFNOR (FRANCE)                        |  | A 42 CP;<br>A 42 AP                                                                                                                 | E 23-45 M                       | E 355 FP            | E 355 R                                                                                                                      | S355NH;<br>TSE 355-4         | S 250                                        | 10 PbF 2              | S 300                                                                                               | S 300 Pb                     | C10RR;<br>XC 10                                                      |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  | K01701;<br>K02505;<br>K02704;<br>K02801                                                                                             | A27 65-35                       | K12000;<br>K12037   | K12709                                                                                                                       | K02705;<br>K02305;<br>K12709 | 1213;<br>1215;<br>G12130;<br>G12150          |                       | 1215;<br>G12150;<br>A 29 (1215);<br>A 108 (1215);<br>A 510 (1215);<br>A 519 (1215);<br>A 521 (1215) | 12L14;<br>12 L 14;<br>G12144 | 1010;<br>G10100                                                      |
|  BS (UK)                                  |  | 151-400;<br>154-400;<br>161-400;<br>164-400                                                                                         |                                 | 50 EE;<br>4360-50EE | 50 E;<br>4360-50E                                                                                                            | S355NH                       | 230 M 07;<br>220 M 07                        |                       |                                                                                                     |                              | 040 A 10;<br>045 M 10;<br>En 2 A;<br>En 2 A/1;<br>En 2 B;<br>En 32 A |
|  DIN (GERMANY)                            |  | P265GH;<br>H II                                                                                                                     | HX300PD;<br>H300PD;<br>H 300 PD | S355NL;<br>TSIE 355 | S355N;<br>StE 355                                                                                                            | S355NH;<br>StE 335 N         | 11SMn30;<br>9 SMn 28                         | 10SPb20;<br>10 SPb 20 | 11SMn37;<br>9 SMn 36                                                                                | 11SMnPb37;<br>9 SMnPb 36     | C10E;<br>Ck 10                                                       |
|  Werkstoff (GERMANY)                      |  | 1.0425                                                                                                                              | 1.0443                          | 1.0546              | 1.0545                                                                                                                       | 1.0539                       | 1.0715                                       | 1.0722                | 1.0736                                                                                              | 1.0737                       | 1.1121                                                               |
|  EN (EUROPE)                             |  | P265GH                                                                                                                              | HX300PD                         |                     | S355N                                                                                                                        | S355NH                       | 11SMn30                                      | 10SPb20               | 11SMn37                                                                                             | 11SMnPb37                    | C10E                                                                 |
|  GOST (RUSSIA)                          |  | 16K;<br>20K                                                                                                                         |                                 |                     |                                                                                                                              |                              |                                              |                       |                                                                                                     |                              | 08;<br>10                                                            |
|  JIS (JAPAN)                            |  | SG 295;<br>SGV 410;<br>SGV 450;<br>SGV 480;<br>SPV 315;<br>SPV 355;<br>SG 30;<br>SGV 42;<br>SGV 46;<br>SGV 49;<br>SPV 32;<br>SPV 36 |                                 |                     | SM 490 A;<br>SM 490 B;<br>SM 490 C;<br>SM 490 YA;<br>SM 490 YB;<br>SM 50 A;<br>SM 50 B;<br>SM 50 C;<br>SM 50 YA;<br>SM 50 YB |                              | SUM 22                                       |                       | SUM 25                                                                                              |                              | S 09 CK;<br>S 10 C                                                   |
|  SS (SWEDEN)                            |  | 1431;<br>1430;<br>1432                                                                                                              | 1305                            | 2135;<br>2135-01    | 2134                                                                                                                         | 2134-04                      | 1912                                         |                       |                                                                                                     | 1926                         | 1265                                                                 |
|  UNE (SPAIN)                            |  | A 42 Grado RC I;<br>A 42 Grado RC II;<br>F.6306;<br>F.6307                                                                          |                                 | AE 355 Grado KT     | AE 355 Grado KG                                                                                                              | Fe 355 KGN                   | F.210.A;<br>F.210.L;<br>11 SMn 28;<br>F.2111 | 10 SPb 20;<br>F.2122  | 12 SMn 35;<br>F.2113                                                                                | 12 SMnPb 35;<br>F.2114       | C 10 k;<br>F.1510                                                    |
|  UNI (ITALY)                            |  | Fe 410 1 KW;<br>Fe 410 1 KG;<br>Fe 410 1 KT;<br>Fe 410 2 KW;<br>Fe 410 2 KG                                                         |                                 | FeE 355 KT          | FeE 355 KG                                                                                                                   | Fe 510 B                     | CF 9 S 22                                    | CF 10 SPb 20          | CF 9 Mn 36                                                                                          | CF 9 SMnPb 36                | 2 C 10;<br>2 C 15;<br>1 C 10;<br>C 10                                |
|  IS (INDIA)                             |  | IS 2002 Grade 2B                                                                                                                    |                                 |                     |                                                                                                                              |                              | 11C10S25                                     |                       |                                                                                                     |                              | 10C4                                                                 |
|  KS (REP. OF KOREA)                     |  | SPPV 32;<br>SGV 49;<br>SGV 46;<br>SGV 42;<br>SGV 410;<br>SGV 450;<br>SGV 48;<br>SPV 450;<br>SPV 480                                 |                                 |                     |                                                                                                                              |                              | SUM 22                                       |                       | SUM 25                                                                                              |                              | S 10 C                                                               |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  | 16Mn                                                                                                                                |                                 |                     |                                                                                                                              |                              | Y15                                          |                       | Y13                                                                                                 |                              | 08                                                                   |

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|                                                                                     |                                          | Material Group No.                      |                                                                                                                                 |                                                |                     |                         |                                                                                               |                                                      |                                                    |                                                                                              |                       |                           |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------|-------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------|---------------------------|
| Standards                                                                           |                                          | 1                                       | 1                                                                                                                               | 1                                              | 1                   | 1                       | 1                                                                                             | 1                                                    | 1                                                  | 1                                                                                            | 1                     |                           |
|    | NF/AFNOR<br>(FRANCE)                     | XC 12;<br>XC 15;<br>XC 18               | E 28 A;<br>NFA 35-501 E 28                                                                                                      | S 320 GD                                       |                     | ES                      | E 24-3;<br>E 24-4;<br>E 24-U                                                                  | C18RR;<br>XC 18;<br>C 18;<br>AF 37 C 12              | E                                                  | E 24-2 NE                                                                                    |                       |                           |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 1015;<br>1017;<br>G10150;<br>G10170     | 1020;<br>G10200;<br>K02301;<br>K02595;<br>K02596;<br>K02597;<br>K02598;<br>K02599;<br>K02702;<br>K03000                         |                                                |                     |                         | K02001;<br>K02601;<br>K02701                                                                  | 1015;<br>1017;<br>G10150;<br>G10170                  |                                                    | K01500;<br>K01702;<br>K02401;<br>K02502;<br>K03000;<br>A570.36                               | J03001                | 1117;<br>C1117;<br>G11170 |
|    | BS<br>(UK)                               | 080 A 15;<br>080 M 15;<br>En 32 C       | En 43 B;<br>Fe 430 B;<br>43/25 HR;<br>43/25 HS;<br>43 B;<br>HFW 4;<br>HFS 4;<br>ERW 3;<br>CEW 4;<br>SAW 4                       |                                                |                     | CR 1;<br>CS 2           | Fe 360 D1 FF;<br>37/23 CR;<br>37/23 CS;<br>37/23 HR;<br>37/23 HS;<br>40 D;<br>HFW 4;<br>HFS 4 | 080 A 15;<br>080 M 15;<br>En32 C;<br>17 CS;<br>17 HS | CR2;<br>CR3;<br>CS3;<br>1449 3<br>CR;<br>1449 2 CR | Fe 360 B FU;<br>37/23 CR;<br>37/23 CS;<br>37/23 HR;<br>37/23 HS;<br>HFW 3;<br>HFS 3;<br>40 B | A 1                   |                           |
|   | DIN<br>(GERMANY)                         | C15E;<br>Ck 15                          | S275JR;<br>St 44-2;<br>Fe 430 B                                                                                                 | S320GD;<br>StE 320-3 Z                         | P265NL;<br>P 265 NL | DC04;<br>St 4;<br>St 14 | S235J2G3 (S235J2);<br>St 37-3 N;<br>Fe 360 D 1                                                | C15;<br>C 15                                         | DC03;<br>RRSt;<br>RRSt 13                          | S235JR;<br>S235JRG2;<br>RSt 37-2;<br>Fe 360 B                                                | GE240;<br>GS-45       | 18S10;<br>15SMn13         |
|  | Werkstoff<br>(GERMANY)                   | 1.1141                                  | 1.0044                                                                                                                          | 1.0250                                         | 1.0453              | 1.0338                  | 1.0116                                                                                        | 1.0401                                               | 1.0347                                             | 1.0038                                                                                       | 1.0446                | 1.0712;<br>1.0725         |
|  | EN<br>(EUROPE)                           | C15E                                    | S275JR                                                                                                                          | S320GD                                         | P265NL              | DC04                    | S235J2G3                                                                                      | C15                                                  | DC03                                               | S235JR                                                                                       | GE240                 | 18S10;<br>15SMn13         |
|  | GOST<br>(RUSSIA)                         | 15                                      | St4ps;<br>St4sp                                                                                                                 |                                                |                     | 08JuA                   | 16D;<br>St3sp                                                                                 |                                                      | 08Ju                                               | St3ps;<br>St3sp                                                                              | 25L-3                 |                           |
|  | JIS<br>(JAPAN)                           | S 15 C;<br>S 15 CK                      | SN 400 B;<br>SN 400 C;<br>SN 490 B;<br>SN 490 C;<br>SS 400;<br>STK 400;<br>STKM 19 C;<br>STKR 400;<br>19 C;<br>SS 41;<br>STK 41 | SGC 440;<br>SZAC 440;<br>SZA4 440;<br>SGLH 440 |                     | SPCE;<br>HR 4           | SS 330;<br>SS 34                                                                              | S 15 C                                               | SPCD;<br>CR 3                                      | SS 330;<br>SS 34                                                                             | 230-450;<br>230-450 W |                           |
|  | SS<br>(SWEDEN)                           | 1370                                    | 1411;<br>1412                                                                                                                   |                                                |                     | 1147                    | 1312;<br>1313                                                                                 | 1350                                                 | 1146                                               | 1312                                                                                         |                       |                           |
|  | UNE<br>(SPAIN)                           | C 16 k;<br>F.1511;<br>F.1110;<br>C 15 k | AE 275 B;<br>Fe 430 B FN                                                                                                        |                                                |                     | AP 04;<br>FeP 04        |                                                                                               | F.111                                                | AP 02;<br>AP02;<br>FeP03                           | AE 235 B FN;<br>AE 235 B FU;<br>Fe 360 B FN;<br>Fe 360 B FU                                  |                       |                           |
|  | UNI<br>(ITALY)                           | 1 C 15;<br>C 15                         | Fe 430 B FN                                                                                                                     |                                                |                     | FeP 04                  | Fe 360 C;<br>D;<br>Fe 360 C FN;<br>Fe 360 D FF;<br>Fe 37-2                                    | 1 C 15;<br>C15;<br>C16                               | FeP 02;<br>FeP 03                                  | Fe 360 B FN                                                                                  |                       |                           |
|  | IS<br>(INDIA)                            | 15C4                                    |                                                                                                                                 |                                                |                     |                         |                                                                                               | 15C4                                                 |                                                    |                                                                                              |                       |                           |
|  | KS<br>(REP. OF<br>KOREA)                 | SM 15C;<br>SM 15CK                      | SB 41                                                                                                                           |                                                |                     | SPCE                    | SS 330                                                                                        | SM 15C                                               | SPCD                                               | SS 330                                                                                       |                       | SS 330                    |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 15                                      | Q255A ;<br>Q255D                                                                                                                |                                                |                     |                         | Q195                                                                                          | 15                                                   |                                                    | Q235C                                                                                        | ZG230-450             | Q215A                     |



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|                                                                                     |                                          | Material Group No.  |                                          |                           |                                     |                           |                   |                           |                                                           |                   |                                     |                                     |                                 |                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------|------------------------------------------|---------------------------|-------------------------------------|---------------------------|-------------------|---------------------------|-----------------------------------------------------------|-------------------|-------------------------------------|-------------------------------------|---------------------------------|-------------------------------------|
| Standards                                                                           |                                          | 1                   | 1                                        | 1                         | 2                                   | 2                         | 2                 | 2                         | 2                                                         | 2                 | 2                                   | 2                                   | 2                               | 2                                   |
|    | NF/AFNOR<br>(FRANCE)                     | E24-4               | 14-13-12E                                |                           | C 35;<br>AF 55;<br>1 C 35;<br>XC 38 | XC 38 TS                  | 35 M 5            | AF 60;<br>C 40;<br>1 C 40 | C45RR;<br>XC 45;<br>XC 48 H-1                             | 2 C 25;<br>XC 25  | C 45;<br>AF 65;<br>C 45;<br>1 C 45  | XC 48 TS                            | 35 MF 4                         | 45 MF 4                             |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A 36                | 1018;<br>G10180;<br>5069D                |                           | 1035;<br>G10350                     | 1035;<br>G10350           | 1039;<br>G10390   | 1040;<br>G10400           | 1045;<br>1045 H;<br>1042;<br>G10450;<br>H10450;<br>G10420 | 1025;<br>G10250   | 1043;<br>1045;<br>G10430;<br>G10450 | 1050;<br>1055;<br>G10500;<br>G10550 | 1140;<br>G11400                 | 1139;<br>1146;<br>G11390;<br>G11460 |
|    | BS<br>(UK)                               | En 40 D             | 43A                                      |                           | 080 M 30;<br>En 5;<br>080 M 36      | 080 A 35                  |                   | En 8;<br>080 M 40         | 080 H 46;<br>080 M 46                                     | 070 M 26          | 080 M 46                            |                                     | 212 M 36                        |                                     |
|    | DIN<br>(GERMANY)                         | S235J2;<br>S235J2G4 | L355;<br>RSt 44-2                        | C15R;<br>C15RPb;<br>Cm 15 | C35G;<br>C 35 G                     | C35G;<br>C 35 G;<br>Cf 35 | 40Mn4;<br>40 Mn 4 | C40;<br>C 40              | C45E;<br>Ck 45                                            | C25E;<br>Ck 25    | C45;<br>C 45                        | C53G;<br>C53E;<br>Cf 53             | 35S20;<br>35 S 20               | 46S20;<br>45 S 20                   |
|    | Werkstoff<br>(GERMANY)                   | 1.0117              | 1.0419                                   | 1.1140                    | 1.0501                              | 1.1183                    | 1.1157            | 1.0511                    | 1.1191                                                    | 1.1158            | 1.0503                              | 1.1213                              | 1.0726                          | 1.0727                              |
|  | EN<br>(EUROPE)                           | S235J2              | L355                                     | C15R;<br>C15RPb           | C35G                                | C35G                      |                   | C40                       | C45E                                                      | C25E              | C45                                 |                                     | 35S20;<br>8M                    | 46S20                               |
|  | GOST<br>(RUSSIA)                         |                     | St3sp                                    |                           |                                     | 35                        | 40G               |                           | 45                                                        | 25                | 45                                  | 50                                  |                                 |                                     |
|  | JIS<br>(JAPAN)                           | SS 330;<br>SS 34    | SWRCH 18 A;<br>SWRCH 18 K;<br>SWRCH 19 A |                           | S 35 C;<br>S 35 CM                  | S 35 C;<br>S 35 CM        |                   |                           | S 45 C;<br>S 45 CM;<br>S 48 C                             | S 25 C;<br>S 28 C | S 45 C;<br>S 45 CM                  | S 50 C;<br>S 50 CM                  |                                 |                                     |
|  | SS<br>(SWEDEN)                           | 1313                |                                          |                           | 1572;<br>1550                       | 1572                      |                   |                           | 1672                                                      |                   | 1650                                |                                     | 1957                            |                                     |
|  | UNE<br>(SPAIN)                           |                     |                                          |                           | F.113                               | F.1130;<br>C 35 k         |                   | F.114.A                   | F.1140;<br>F.1142;<br>C 45 k;<br>C48 k                    | F.1120;<br>C 25 k | F.114                               |                                     | F.210.G;<br>35 MnS 6;<br>F.2131 |                                     |
|  | UNI<br>(ITALY)                           | Fe 360 D            |                                          |                           | C 35;<br>1 C 35                     | C 36;<br>C 38             |                   | C 40;<br>1 C 40           | C 45                                                      | C 25              | C 45;<br>1 C 45                     | C 53                                |                                 |                                     |
|  | IS<br>(INDIA)                            |                     | 15C8                                     |                           | 35C8                                |                           | 40C8              |                           | 45C8                                                      |                   |                                     |                                     | 40C10S18                        | 40C15S12                            |
|  | KS<br>(REP. OF<br>KOREA)                 |                     |                                          |                           | SM 35C                              | SM 35C                    |                   |                           | SM 45C;<br>S 48C                                          | SM 25C            | SM 45C                              | SM 50C;<br>SB 450M                  |                                 |                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                     |                                          |                           | 35                                  | 35Mn                      | 40Mn              | 40Mn                      | 45                                                        | 25                | 45                                  | 50Mn                                |                                 | Y40Mn                               |

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| Standards                                                                           |                                          | Material Group No.                |         |                                                    |                |                                   |                                     |                                     |                                                                    |                       |                    |                                     |                                                              |                 |                       |
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|                                                                                     |                                          | 2                                 | 2       | 2                                                  | 2              | 2                                 | 2                                   | 2                                   | 2                                                                  | 2                     | 2                  | 2                                   | 2                                                            | 2               | 2                     |
|    | NF/AFNOR<br>(FRANCE)                     | E 36-3                            |         | A 52 CP                                            | 20-400 M       | A 52 FP                           | XC 50;<br>2 C 50                    | 20 M 5                              | XC35RR;<br>XC32;<br>XC 35;<br>XC 38 H 2;<br>XC 38 H 1;<br>2 C 35   | XC 38 H 1 u;<br>Cm 35 | XC 32              | C50                                 |                                                              | 1 C 25          |                       |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | K12000                            |         | K02700;<br>K02803;<br>K03103;<br>K03300;<br>K12437 |                | K12447                            | 1049;<br>1050;<br>G10490;<br>G10500 | 1330;<br>1527;<br>G13300;<br>G15270 | 1034;<br>1035;<br>1038;<br>G10340;<br>G10350;<br>G10380;<br>C 1034 |                       | 1030;<br>G10300    | 1049;<br>1050;<br>G10490;<br>G10500 | 1536;<br>G15360                                              | 1025;<br>G10250 |                       |
|    | BS<br>(UK)                               | 50 C                              |         |                                                    |                |                                   | 080 M 50                            | 150 M 19;<br>En 14 A;<br>En 14 B    | 080 M 30;<br>En 5;<br>080 M 36                                     | 080 A 35              | 080 M 30;<br>En 5  | En 43 A;<br>080 M 50                |                                                              | 070 M 26        | 210 A 15;<br>210 M 15 |
|    | DIN<br>(GERMANY)                         | S355J0;<br>St 52-3 U;<br>Fe 510-C | S355JRC | P355GH;<br>19 Mn 6                                 | C18D;<br>GS-38 | S355J2;<br>S355J2G4;<br>Fe 510 D2 | C50E;<br>Ck 50                      | 28Mn6                               | C35E;<br>Ck 35                                                     | C35R;<br>Cm 35        | C30E;<br>Ck 30     | C50                                 | 34Mn5                                                        | C25             | 15S22;<br>15 S 20     |
|  | Werkstoff<br>(GERMANY)                   | 1.0553                            | 1.0551  | 1.0473                                             | 1.0416         | 1.0577                            | 1.1206                              | 1.1170                              | 1.1181                                                             | 1.1180                | 1.1178             | 1.0540                              | 1.1166                                                       | 1.0406          | 1.0723                |
|  | EN<br>(EUROPE)                           | S355J0                            | S355JRC | P355GH                                             | C18D           |                                   | C50E                                | 28Mn6                               | C35E                                                               | C35R                  | C30E               | C50                                 |                                                              |                 |                       |
|  | GOST<br>(RUSSIA)                         |                                   |         |                                                    |                |                                   | 50                                  | 30G                                 | 35                                                                 |                       |                    |                                     |                                                              |                 |                       |
|  | JIS<br>(JAPAN)                           | SCC 3                             |         | SGV 410;<br>SGV 450;<br>SGV 480                    |                |                                   |                                     | SCMn 1                              | S 35 C;<br>S 35 CM;<br>S 38 C                                      |                       | S 30 C;<br>S 30 CM | S 50 C                              | SMn 433 H;<br>SMn 433<br>HRCH;<br>SMn 433<br>RCH;<br>SMn 1 H |                 | SUM 32                |
|  | SS<br>(SWEDEN)                           |                                   |         | 2101;<br>2102                                      | 1306           | 2107                              | 1674                                |                                     | 1572                                                               |                       |                    | 1674                                |                                                              |                 | 1922                  |
|  | UNE<br>(SPAIN)                           | AE 355 C                          |         | A 52 RC I;<br>RA II                                |                | A 52 RB II;<br>AE 355 D           |                                     |                                     | F.1130;<br>C 35 k                                                  | F.1135;<br>C 35 k-1   | 2 C 30             | 1 C 50                              | TO.B                                                         |                 | F.210F;<br>F.210.F    |
|  | UNI<br>(ITALY)                           | Fe 510 C FN                       |         | Fe E 355-2                                         |                |                                   | C 50                                | C 28 Mn                             | C 35                                                               | C 35                  | C 30               | C 50                                |                                                              | C 25;<br>1 C 25 |                       |
|  | IS<br>(INDIA)                            | Fe570HT                           |         |                                                    |                |                                   |                                     | 27C15                               | 35C8                                                               |                       | 30C8               | 50C4                                | 37C15                                                        | 25C4            |                       |
|  | KS<br>(REP. OF<br>KOREA)                 |                                   |         | SGV 410;<br>SGV 450;<br>SGV 480                    |                |                                   |                                     | SCMn 1                              | SM 35C;<br>SGV 480                                                 |                       |                    | SM 50C                              | SMn 433H                                                     |                 | SUM 32                |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | Q345C                             |         |                                                    | ZG15           | Q345D                             | 50Mn                                | 30Mn2                               | 35                                                                 |                       | 30Mn               | 50Mn                                | 30Mn2                                                        | 25              | Y20                   |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                  |                                              |                              |                                             |                      |                                     |                            |                            |                                                          |                                                                                                              |                                     |                                                                                 |                                                           |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------|----------------------------------------------|------------------------------|---------------------------------------------|----------------------|-------------------------------------|----------------------------|----------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------|
| Standards                                                                           |                                          | 2                                   | 2                                            | 2                            | 3                                           | 3                    | 3                                   | 3                          | 3                          | 3                                                        | 3                                                                                                            | 3                                   | 3                                                                               | 3                                                         |
|    | NF/AFNOR<br>(FRANCE)                     |                                     |                                              |                              | 3 C 45;<br>XC 42 H 1;<br>XC 48 H 1 u        | 2 C 40;<br>XC 42 H 1 | XC 75                               | XC 90                      | XC 80                      |                                                          | A 48 CP;<br>A 48 AP                                                                                          | C 45;<br>AF 65;<br>C 45;<br>1 C 45  | 40 M 5;<br>35 Mn 5                                                              | C45RR;<br>XC 45;<br>XC 48 H 1                             |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                     | K03504;<br>A105;<br>SA-105                   |                              | 1045;<br>1049;<br>G10450;<br>G10490         | 1040;<br>G10400      | 1074;<br>1075;<br>G10740;<br>G10750 | 1095;<br>G10950            | 1086;<br>G10860            |                                                          | K01700;<br>K02001;<br>K02200;<br>K02201;<br>A 516 Gr.70;<br>A 515 Gr. 70;<br>A 414 Gr.F;<br>A 414 Gr.G       | 1043;<br>1045;<br>G10430;<br>G10450 | 1335;<br>1335 H;<br>1541;<br>1541 H;<br>G13350;<br>G15410;<br>H13350;<br>H15410 | 1045;<br>1045 H;<br>1042;<br>G10450;<br>H10450;<br>G10420 |
|    | BS<br>(UK)                               |                                     |                                              |                              | 080 M 46                                    | 080 M 40;<br>En 8    |                                     | 95 HS;<br>95 CS            | 80 HS;<br>80 CS            | A 5;<br>A 6                                              | 224-469 B                                                                                                    | 080 M 46                            | 150 M 36                                                                        | 089 H 46;<br>080 M 46                                     |
|    | DIN<br>(GERMANY)                         | C45U;<br>C45W;<br>C 45 U;<br>C 45 U | A105;<br>C21;<br>P250GH;<br>C22.8;<br>C22 G2 | C53E;<br>C 53<br>E;<br>Ck 53 | C45R;<br>Cm 45                              | C40E;<br>Ck 40       | C76D;<br>C 76 D;<br>D 75-2          | C92D;<br>C 92 D;<br>D 95-2 | C86D;<br>C 86 D;<br>D 85-2 | G28Mn6;<br>GS-30 Mn 5                                    | P295GH;<br>17Mn4;<br>17 Mn 4                                                                                 | C45;<br>C 45                        | 36Mn5;<br>36 Mn 5                                                               | C45E;<br>Ck 45                                            |
|    | Werkstoff<br>(GERMANY)                   | 1.1730                              | 1.9443;<br>1.0432;<br>1.0460                 | 1.1210                       | 1.1201                                      | 1.1186               | 1.0614                              | 1.0618                     | 1.0616                     | 1.1165                                                   | 1.0481                                                                                                       | 1.0503                              | 1.1167                                                                          | 1.1191                                                    |
|  | EN<br>(EUROPE)                           | C45U                                | P250GH                                       |                              | C45R                                        | C40E                 | C76D                                | C92D                       | C86D                       | G28Mn6                                                   | P295GH                                                                                                       | C45                                 | 36Mn5                                                                           | C45E                                                      |
|  | GOST<br>(RUSSIA)                         |                                     |                                              |                              | 45                                          | 40                   | 75                                  |                            |                            | 27ChGSNMDTL;<br>30GSL                                    | 14G2                                                                                                         |                                     | 35G2;<br>35GL                                                                   | 45                                                        |
|  | JIS<br>(JAPAN)                           |                                     |                                              | S 53 C                       | S 45 C;<br>S 45 CM                          | S 40 C               |                                     |                            |                            | SCMn 2                                                   | SG 365;<br>SGV 410;<br>SGV 450;<br>SGV 480;<br>SPV 315;<br>SG 37;<br>SGV 42;<br>SGV 46;<br>SGV 49;<br>SPV 32 | S 45 C;<br>S 45 CM                  | SMn 438;<br>SMn 438H;<br>SCMn 3                                                 | S 45 C;<br>S 45 CM;<br>S 48 C                             |
|  | SS<br>(SWEDEN)                           |                                     |                                              |                              | 1660                                        |                      |                                     |                            |                            |                                                          | 2102                                                                                                         | 1650                                | 2120                                                                            | 1672                                                      |
|  | UNE<br>(SPAIN)                           |                                     |                                              |                              | F.1145;<br>F.1147;<br>C 45 k-1;<br>C 48 k-1 |                      |                                     |                            |                            | 30 Mn 5;<br>AM 30 Mn 5;<br>F.120.D;<br>F.8211;<br>F.8311 | A 47 RC I;<br>RA II                                                                                          | F.114                               | F. 1203-36 Mn 6;<br>F. 8212-36 Mn 5                                             | F.1140;<br>F.1142;<br>C 45 k;<br>C 48 k                   |
|  | UNI<br>(ITALY)                           |                                     |                                              |                              | C 45                                        | C 40                 | 3 CD 75                             | 3 CD 95                    | C 85;<br>3 CD 85           |                                                          | Fe 295                                                                                                       | C 45;<br>1 C 45                     |                                                                                 | C 45                                                      |
|  | IS<br>(INDIA)                            |                                     |                                              | 55C4;<br>C55                 | 45C8                                        |                      |                                     |                            |                            |                                                          |                                                                                                              |                                     | 37C15                                                                           | 45C8                                                      |
|  | KS<br>(REP. OF KOREA)                    |                                     |                                              |                              | SM 45C                                      | SM 40C               |                                     |                            |                            | SCMn 2                                                   | SPPV 32;<br>SGV 49;<br>SGV 46;<br>SGV 42;<br>SGV 410;<br>SGV 450;<br>SGV 48;<br>SPV 450;<br>SPV 480          | SM 45C                              | SMn 438H;<br>SCMn 3                                                             | SM 45C;<br>S 48C                                          |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                     |                                              |                              | 45                                          | 40Mn                 | 75                                  | 1A95                       |                            | 20Mn2                                                    | 16Mn                                                                                                         | 45                                  | 35Mn2                                                                           | 45                                                        |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.    |                       |                                              |                                   |                                                    |                                                              |                                   |                                                         |                   |                                                    |                           |                         |                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-----------------------|----------------------------------------------|-----------------------------------|----------------------------------------------------|--------------------------------------------------------------|-----------------------------------|---------------------------------------------------------|-------------------|----------------------------------------------------|---------------------------|-------------------------|-------------------------------------|
| Standards                                                                           |                                          | 3                     | 3                     |                                              | 4                                 | 4                                                  | 4                                                            | 4                                 | 4                                                       | 4                 | 4                                                  | 4                         | 4                       | 4                                   |
|    | NF/AFNOR<br>(FRANCE)                     |                       | 44SMn28;<br>45 MF 6.3 | P355GH                                       | C54;<br>1 C 55;<br>AF 70;<br>C 55 | C50RR;<br>XC 54;<br>XC 50;<br>2 C 55;<br>XC 55 H 1 | C60;<br>1 C 60                                               | C68RR;<br>XC 68                   | C75RR;<br>XC 75                                         | C100RR;<br>XC 100 | Y2 120;<br>C120E3U                                 | C90RR;<br>XC 90           | 3 C 55;<br>XC 55<br>H 1 | C 75                                |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                       | 1144;<br>G11440       | K11852;<br>K12437;<br>AH36;<br>DH36;<br>EH36 | 1055;<br>G10550                   | 1055;<br>G10550                                    | 1060;<br>G10600                                              | 1070;<br>G10700                   | 1074;<br>1075;<br>1078;<br>G10700;<br>G10750;<br>G10780 | 1095;<br>G10950   | W112;<br>W1;<br>T72301                             | 1086;<br>G10860           | 1055;<br>G10550         | 1074;<br>1075;<br>G10740;<br>G10750 |
|    | BS<br>(UK)                               |                       | 44SMn28;<br>226 M 44  |                                              | 070 M 55;<br>En 9                 | 070 M 55;<br>En 9                                  | 060 A 62;<br>En 43 D                                         | 060 A 67;<br>080 A 67;<br>En 43 E | 060 A 78;<br>80                                         | 95                |                                                    |                           | 070 M 55;<br>En 9       | 060 A 78                            |
|    | DIN<br>(GERMANY)                         | 38MnVS6;<br>38 MnVS 6 | 44SMn28               | GL-A 36;<br>GL-AH 36;<br>S 355 G 1 S         | C55                               | C55E;<br>Ck 55                                     | C60                                                          | C67S;<br>Ck 67                    | C75S;<br>Ck 75                                          | C100S;<br>Ck 101  | C125U;<br>C 125 W                                  | C80S;<br>Ck 85;<br>C 85 E | C55R;<br>Cm 55          | C75                                 |
|   | Werkstoff<br>(GERMANY)                   | 1.1303                | 1.0762                | 1.0583                                       | 1.0535                            | 1.1203                                             | 1.0601                                                       | 1.1231                            | 1.1248                                                  | 1.1274            | 1.1563                                             | 1.1269                    | 1.1209                  | 1.0605                              |
|  | EN<br>(EUROPE)                           | 38MnVS6               | 44SMn28               |                                              | C55                               | C55E                                               | C60;<br>43D                                                  | C67S                              | C75S                                                    | C100S             | C125U                                              | C80S                      | C55R                    |                                     |
|  | GOST<br>(RUSSIA)                         |                       | A40G                  | A36                                          | 55                                | 55                                                 | 60;<br>60G                                                   | 65GA;<br>68GA                     | 75A                                                     |                   | U12-1                                              | 85A                       |                         | 75                                  |
|  | JIS<br>(JAPAN)                           |                       | SUM 43                | SPV 36                                       | S 55 C;<br>S 55 C-CSP;<br>S 55 CM | S 55 C;<br>S 55 C-CSP;<br>S 55 CM                  | S 58 C;<br>S 60-C-CSP;<br>S 60 CM;<br>S 65 C-CSP;<br>S 65 CM | S 70 C-CSP;<br>S 70 CM            | S 75 CM                                                 | SK 95 -CSP        | SK 120;<br>SK 120 M;<br>SK 2;<br>SK 2 M;<br>TC 120 | SK 85-CP                  |                         |                                     |
|  | SS<br>(SWEDEN)                           |                       |                       |                                              | 1655                              | 1655                                               |                                                              | 1770                              | 1774                                                    | 1870              |                                                    |                           |                         |                                     |
|  | UNE<br>(SPAIN)                           |                       |                       |                                              | F.115                             | F.1150;<br>C 55 K                                  |                                                              |                                   |                                                         |                   | F.5123;<br>C 120                                   |                           | F.1155;<br>C 55 k-1     |                                     |
|  | UNI<br>(ITALY)                           |                       | CF 44 SMn 28          |                                              | C 55;<br>1 C 55                   | C 55                                               | C 60;<br>1 C 60                                              | C 67                              | C 75                                                    | C 100             | C 120 KU                                           | C 85                      | C 55                    | C 75                                |
|  | IS<br>(INDIA)                            |                       |                       |                                              | 55C4                              |                                                    | 60C4                                                         |                                   | 80C6                                                    |                   |                                                    | 85C6                      |                         | 75C6                                |
|  | KS<br>(REP. OF<br>KOREA)                 |                       | SUM 43                |                                              | SM 55C                            | SM 55C                                             | SM 58C                                                       |                                   |                                                         |                   |                                                    |                           |                         |                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                       | Y40Mn                 |                                              | 55                                | 55                                                 | 60                                                           | 65                                | 75                                                      | 1A95              | T12                                                | T8A                       | 55                      | 75                                  |

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|                                                                                     |                                          | Material Group No.                                  |                 |                    |                                     |                                                              |                                                    |                                                  |                                       |                                          |                     |                                 |                                                                   |                                                                                                      |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------|-----------------|--------------------|-------------------------------------|--------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------|---------------------------------------|------------------------------------------|---------------------|---------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Standards                                                                           |                                          | 4                                                   | 4               | 5                  | 5                                   | 5                                                            | 5                                                  | 6                                                | 6                                     | 6                                        | 6                   | 6                               | 6                                                                 | 6                                                                                                    |
|    | NF/AFNOR<br>(FRANCE)                     | C68;<br>XC 65                                       |                 | C 56 D 2           | C90RR;<br>XC 90;<br>XC90;<br>C90E2U | C60RR;<br>XC 60;<br>X 65;<br>2 C 60                          | C50RR;<br>XC 54;<br>XC 50;<br>XC 55 H 1;<br>2 C 55 | 60 S 7                                           | 60 S 7                                | 55 S 7                                   | 50S7;<br>51 Si 7    | 45 S 7;<br>Y 46 S 7;<br>46 Si 7 | 100C2                                                             | 12 CD 9-10;<br>10 CD 9.10                                                                            |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 1070;<br>G10700                                     |                 | 1055;<br>G10550    |                                     | 1060;<br>1064;<br>G10600;<br>G10640                          | 1055;<br>G10550                                    | 9260;<br>G92600                                  | 9260 H;<br>H92600;<br>9260;<br>G92600 | 9255;<br>G92550                          | 9255;<br>G22550     |                                 | G50986;<br>ASTM Grade E50100;<br>ASTM Grade G15116;<br>SAE E50100 | K21390;<br>K21590;<br>ASTM A182 F22;<br>ASTM A387 Grade 22;<br>A387-22-2                             |
|    | BS<br>(UK)                               | 060 A 67;<br>080 A 67;<br>En 43 E;<br>1449 70<br>HS |                 |                    | CS95                                | 060 A 62;<br>070 M 60;<br>En 43 D                            | 070 M 55;<br>En 9                                  |                                                  | 251 A 60;<br>251 H 60                 | 251 A 58;<br>En 45 A                     |                     |                                 | GCr6;<br>B00040;<br>GCr4                                          | 622;<br>622-490;<br>622/515;<br>622/690                                                              |
|    | DIN<br>(GERMANY)                         | C67                                                 | C56E2;<br>Cf 54 | C56D2;<br>C 56 D 2 | C90S;<br>C 90 S                     | C60E;<br>Ck 60                                               | C55E;<br>Ck 55                                     | 65Si7;<br>65 Si 7                                | 60Si7                                 | 56Si7;<br>56 Si 7;<br>55Si7;<br>55 Si 7  | 51Si7;<br>51 S 7    | 46Si7                           | 100Cr2;<br>100 Cr 2                                               | 10CrMo9-10;<br>10 CrMo 9 10                                                                          |
|    | Werkstoff<br>(GERMANY)                   | 1.0603                                              | 1.1219          | 1.1220             | 1.1217                              | 1.1221                                                       | 1.1203                                             | 1.5028                                           | 1.5027                                | 1.5026                                   | 1.5025              | 1.5024                          | 1.3501                                                            | 1.7380                                                                                               |
|   | EN<br>(EUROPE)                           | C67                                                 | C56E2           | C56D2              | C90S                                | C60E                                                         | C55E                                               |                                                  |                                       | 56Si7;<br>55Si7                          | 51Si7               | 46Si7                           |                                                                   | 10CrMo9-10                                                                                           |
|  | GOST<br>(RUSSIA)                         |                                                     |                 |                    |                                     | 60GA                                                         | 55                                                 | 60S2G                                            | 60S2                                  | 55S2;<br>60S2                            |                     |                                 | SchCh4                                                            | 12Ch8                                                                                                |
|  | JIS<br>(JAPAN)                           | S 70<br>C-CSP;<br>S 70 CM                           | C56E2;<br>S55C  |                    | SK 95                               | S 58 C;<br>S 60 C-CSP;<br>S 60 CM;<br>C 65 C-CSP;<br>C 60 CM | S 55 C;<br>S 55<br>C-CSP;<br>S 55 CM               | 50 P 7;<br>SUP 6;<br>SUP 6 M;<br>SUP 7;<br>SWOSM |                                       |                                          |                     |                                 |                                                                   | SCMQ4E;<br>SCMV 4;<br>SFVA F 22.A;<br>SFVA F 22.B;<br>SFVCM F22B;<br>STBA 24;<br>STFA 24;<br>STPA 24 |
|  | SS<br>(SWEDEN)                           |                                                     |                 |                    |                                     | 1678                                                         | 1655                                               |                                                  |                                       | 2085;<br>2090                            |                     |                                 |                                                                   | 2218                                                                                                 |
|  | UNE<br>(SPAIN)                           |                                                     |                 |                    |                                     |                                                              | F.1150;<br>C 55 k                                  |                                                  | F.144.B;<br>F.1441                    | F.144;<br>F.144.A;<br>56 Si 7;<br>F.1440 | F.145.B             | F.1451                          |                                                                   | TU.H                                                                                                 |
|  | UNI<br>(ITALY)                           | C 67                                                |                 |                    |                                     | C 60                                                         | C 55                                               |                                                  | 60 Si 7                               | 55 Si 7                                  | 48 Si 7;<br>50 Si 7 |                                 |                                                                   | 12 CrMo 9 10                                                                                         |
|  | IS<br>(INDIA)                            | 65C6                                                |                 |                    |                                     |                                                              | 55C4                                               | 65Si7                                            | 60Si7                                 | 55Si7                                    |                     |                                 |                                                                   |                                                                                                      |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                     | S 55C           |                    |                                     | SM 58C                                                       | SM 55C                                             | SPS 6                                            |                                       |                                          |                     |                                 |                                                                   | SPA 24                                                                                               |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 70                                                  |                 | 55                 |                                     | 60Mn                                                         | 55                                                 | 60Si2Mn                                          | 60Si2Mn                               | 55Si2Mn                                  | 55Si2Mn             |                                 | GCr6                                                              | 12Cr2Mo1                                                                                             |

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|                                                                                     |                                          | Material Group No.      |                              |                                    |                       |                                        |                                                          |                   |                   |                          |                                                                                                  |                       |                                               |
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| Standards                                                                           |                                          | 6                       | 6                            | 6                                  | 6                     | 6                                      | 6                                                        | 6                 | 6                 | 6                        | 6                                                                                                | 6                     | 6                                             |
|    | NF/AFNOR<br>(FRANCE)                     | 90 MnV 8;<br>90 MV 8    | 55 WC 20                     |                                    | 100 C 3               | 105 WCr 5;<br>105 WC 13                | 20 MC 5                                                  | 55 S 7            | 55 S 7            | 60 SC 6                  | 34 CD 4;<br>34CrMo4RR;<br>35 CD 4;                                                               |                       | 100Cr6RR;<br>100 C 6;<br>100Cr6;<br>Y 100 C 6 |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | O2;<br>T31502           |                              |                                    | L2;<br>T61202         |                                        | 4820;<br>5120;<br>5120H;<br>G48200;<br>G51200;<br>H51200 | 9255;<br>G92550   | 9254;<br>G92550   | 9262;<br>G95620          | 4135;<br>4137;<br>4135H;<br>4137H;<br>G41350;<br>G41370;<br>H41350;<br>H41370                    |                       | L3;<br>T61203                                 |
|    | BS<br>(UK)                               | BO 2;<br>BO2            | BS1;<br>BS 1                 |                                    |                       | 105WC 13                               | 150 M 19                                                 | 250A53            | 250 A 53          |                          | 708 A 30                                                                                         |                       | BL 3;<br>BL3                                  |
|    | DIN<br>(GERMANY)                         | 90MnCrV8;<br>90 MnCrV 8 | 60WCrV7;<br>60 WCrV 7        | 51CrMnV4;<br>51 CrV 4;<br>50 CrV 4 | 115CrV3;<br>115 CrV 3 | 105WCr6;<br>105 WCr 6                  | 20MnCr5;<br>20 MnCr 5                                    | 55Si7;<br>55 Si 7 | 55Si7;<br>55 Si 7 | HDT 450 F;<br>S340 MGC   | 34CrMo4;<br>GS34 CrMo 4;<br>G34 CrMo 4                                                           | 38MnSi4;<br>38 MnSi 4 | 102Cr6;<br>102 Cr 6;<br>100Cr6                |
|    | Werkstoff<br>(GERMANY)                   | 1.2842                  | 1.2550                       | 1.2241                             | 1.2210                | 1.2419                                 | 1.7147                                                   | 1.0904            | 1.0904            | 1.0961                   | 1.7220                                                                                           | 1.5120                | 1.2067                                        |
|  | EN<br>(EUROPE)                           | 90MnCrV8                | 60WCrV7                      |                                    | 115CrV3               | 105WCr6                                | 20MnCr5                                                  |                   |                   |                          | 34CrMo4                                                                                          |                       | 102Cr6                                        |
|  | GOST<br>(RUSSIA)                         |                         |                              |                                    |                       | ChW1G;<br>ChWG                         | 18ChG                                                    |                   |                   | 60S2;<br>55S2;<br>50ChFA | 35ChM;<br>AS38ChGM                                                                               |                       | Ch                                            |
|  | JIS<br>(JAPAN)                           |                         |                              |                                    |                       | SKS 2;<br>SKS 2 M;<br>SKS 3;<br>SKS 31 | SMnC<br>420 H;<br>SMnC 420<br>RCH;<br>SMnC<br>21 H       |                   |                   |                          | SCM 435 H;<br>SCM 435<br>HRCH;<br>SCM 435 M;<br>SCM 435 RCH;<br>SCM 435TK;<br>SCM 3 H;<br>STKS 3 |                       | SUJ 2                                         |
|  | SS<br>(SWEDEN)                           |                         | 2710                         |                                    |                       | 2140                                   | 2172                                                     | 2085              | 2090              |                          | 2234                                                                                             |                       |                                               |
|  | UNE<br>(SPAIN)                           | 90 MnCrV 8;<br>F.5229   | 60 WCrSiV 8;<br>F.5242       |                                    | F.520.L;<br>F.5125    | F.5233;<br>105 WCr 5                   | F.150.D                                                  | 56 Si 7           |                   | 60 SiCr 8;<br>F.1442     | 35 CrMo 4 DF;<br>F.125.A;<br>F.125.B;<br>F.1254;<br>F.1250                                       |                       | F.5230;<br>100 Cr 6                           |
|  | UNI<br>(ITALY)                           | 90 MnVCr 8 KU           | 55 WCrV 8 KU;<br>58 WCr 9 KU |                                    | 107 CrV 3 KU          | 107 WCr 5 KU                           | 20 MnCr 5;<br>Fe52                                       | 55 Si 8           |                   | 60 SiCr 8                | 34 CrMo 4 KB;<br>35 CrMo 4                                                                       |                       | 102 Cr 6 KU                                   |
|  | IS<br>(INDIA)                            |                         |                              |                                    |                       | T110W2Cr1                              | 20MnCr1                                                  | 55Si2Mn90         |                   |                          |                                                                                                  |                       |                                               |
|  | KS<br>(REP. OF<br>KOREA)                 |                         |                              |                                    |                       | STS 31                                 |                                                          |                   |                   |                          | SCM 435 TK                                                                                       |                       | STB 2                                         |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 9Mn2V                   |                              |                                    |                       | 9CrWMo                                 | 15CrMn                                                   | 55Si2Mn           | 55Si2Mn           |                          | 35CrMo                                                                                           | 42SiMn                | Cr2                                           |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.    |                       |                                                |                                 |                                                             |          |                                 |                                                                 |                                 |                                             |                                     |                                                                                        |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------|-----------------------|------------------------------------------------|---------------------------------|-------------------------------------------------------------|----------|---------------------------------|-----------------------------------------------------------------|---------------------------------|---------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------|
| Standards                                                                           |                                          | 6                     | 6                     | 6                                              | 6                               | 6                                                           | 6        | 6                               | 6                                                               | 6                               | 6                                           | 6                                   | 6                                                                                      |
|    | NF/AFNOR<br>(FRANCE)                     |                       | 34 CD 4               | 90MnWCrV5;<br>90 MWCv 5;<br>8 MO 8             | 45 WCrV 8;<br>45 WCrV 20        | 55 NCDV 7                                                   | 55 NCV 6 | 100Cr6RR;<br>100 C 6;<br>100Cr6 | 15 D 3                                                          |                                 | 16 N 6                                      | 14 NC 11                            | 10 NC 12;<br>12 NC 15;<br>14 NC 12;<br>16 NC 12;<br>16 NCD 13                          |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | L1                    | P20;<br>T51620        | O1;<br>T31501                                  | S1;<br>T41901                   | L6;<br>T61206                                               |          | E52100;<br>G52986               | K11820;<br>K12020;<br>K12320;<br>A204 Grade A;<br>A182 Grade F1 | 4422;<br>G44220;<br>J12522      | A 350-LF 5;<br>K13050;<br>K21703;<br>K22103 | 3415                                | 3310;<br>3310 RH;<br>3312;<br>3316;<br>9315;<br>E 3310;<br>E 3316;<br>E9315;<br>G33106 |
|    | BS<br>(UK)                               |                       | 708 A 37              | BO1;<br>BO0;<br>BO 1;<br>BO 0                  | BS1;<br>BS 1                    | BH 224;<br>BH 225                                           |          | 2 S.135;<br>535 A 99            | 1503-243 B                                                      | 245;<br>B 1;<br>B1              |                                             |                                     | 655 M 13;<br>655 H 13;<br>En 36 A                                                      |
|    | DIN<br>(GERMANY)                         | 90CrSi5;<br>90 CrSi 5 | 35CrMo4;<br>35 CrMo 4 | 100MnCrW4;<br>100 MnCrW 4                      | 45WCrV7;<br>45 WCrV 7           | 55NiCrMoV6;<br>56NiCrMoV6;<br>55 NiCrMoV 6;<br>56 NiCrMoV 6 | 50NiCr13 | 100Cr6;<br>100 Cr 6             | 16Mo3;<br>15 Mo 3                                               | G20Mo5;<br>20Mo4;<br>GS-22 Mo 4 | 14Ni6;<br>14 Ni 6                           | 14NiCr10;<br>14 NiCr 10             | 15NiCr13;<br>14NiCr14;<br>15 NiCr 13;<br>14NiCr14                                      |
|    | Werkstoff<br>(GERMANY)                   | 1.2108                | 1.2330                | 1.2510                                         | 1.2542                          | 1.2713                                                      | 1.2721   | 1.3505                          | 1.5415                                                          | 1.5419                          | 1.5622                                      | 1.5732                              | 1.5752                                                                                 |
|  | EN<br>(EUROPE)                           | 90CrSi5               | 35CrMo4               | 100MnCrW4                                      | 45WCrV7                         | 55NiCrMoV6                                                  |          | 100Cr6                          |                                                                 | G20Mo5                          | 14Ni6                                       | 14NiCr10                            | 15NiCr13                                                                               |
|  | GOST<br>(RUSSIA)                         |                       |                       |                                                | 5ChW25F                         | 5ChNM                                                       |          | SchCh 15                        |                                                                 |                                 |                                             | 12ChN3A                             |                                                                                        |
|  | JIS<br>(JAPAN)                           |                       |                       | SKS 31                                         |                                 | SKT 4                                                       |          | SUJ 2;<br>SUJ 4                 | STBA 12;<br>STFA 12;<br>STPA 12                                 | SCPH 11                         |                                             | SNC 415;<br>SNC 415 H;<br>SNC 415 M | SNC 815 H;<br>SNC 815 HRCH;<br>SNC 815 RCH;<br>SNC 22 H                                |
|  | SS<br>(SWEDEN)                           | 2092                  | 2234                  | 2140                                           | 2710                            |                                                             | 2550     | 2258                            | 2912;<br>16Mo3                                                  |                                 |                                             |                                     |                                                                                        |
|  | UNE<br>(SPAIN)                           |                       |                       | F.522.A;<br>F.5220;<br>95 MnCrW5;<br>105 WCr 5 | F.524;<br>F.5241;<br>45 WCrSi 8 | F.520.S                                                     | F.528    | F.131;<br>100 Cr 6;<br>F.1310   | F. 2601;<br>16 Mo 3                                             |                                 | F.2641;<br>15 Ni 6                          | 15 NiCr 11                          | 15 NiCr 11;<br>F.1540                                                                  |
|  | UNI<br>(ITALY)                           | 105 WCr 5             | 35 CrMo 4             | 95 MnWCr 5 KU;<br>10 WCr 6                     | 45 WCrV 8 KU                    |                                                             |          | 100 Cr 6                        | 16 Mo 3 KG;<br>16 Mo 3 KW;<br>16 Mo 5 KG;<br>16 Mo 5 KW         |                                 | 14 Ni 6 KG;<br>14 Ni 6 KT                   | 16 NiCr 11                          |                                                                                        |
|  | IS<br>(INDIA)                            |                       |                       |                                                |                                 |                                                             |          | 105Cr1Mn60                      |                                                                 |                                 |                                             |                                     | 13Ni3Cr80                                                                              |
|  | KS<br>(REP. OF<br>KOREA)                 |                       | SCM 435 TK            | STS 31                                         |                                 | STF 4                                                       |          | STB 2                           | SPA 10                                                          | SCPH 11                         |                                             |                                     |                                                                                        |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 9SiCr                 | 3CrMo                 | CrWMn                                          | 5CrW2Si                         | 5CrNiMo                                                     |          | Gr15;<br>45G                    | 16Mo                                                            |                                 |                                             | 12CrNi2                             | 12CrNi3A                                                                               |



## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                                                   |                           |                                                                                       |                                                                     |                                                                    |                                                   |                   |                                     |                         |                                                           |                       |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------|-------------------|-------------------------------------|-------------------------|-----------------------------------------------------------|-----------------------|
| Standards                                                                           |                                          | 6                                                                                    | 6                         | 6                                                                                     | 6                                                                   | 6                                                                  | 6                                                 | 6                 | 6                                   | 6                       | 6                                                         | 6                     |
|    | NF/AFNOR<br>(FRANCE)                     | 12 CD 4                                                                              | 18 NCD 6                  | 16 NCD 13                                                                             | 12 C 3;<br>15Cr2RR;<br>15 C 2                                       | 32 C 4                                                             | 42 C 4                                            | 42 C 4 TS         | 16MnCr5RR;<br>16 MC 5               | 16MnCrS5                | 55 C 3;<br>55Cr3                                          | MOC 2;<br>V320        |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                                                                      |                           | 9310;<br>9310H;<br>9310 RH;<br>E 9310 H;<br>G93106;<br>H93100;<br>H93106;<br>AMS 6265 | 5015;<br>G50150                                                     | 5132;<br>5132 H;<br>G51320;<br>H51320                              | 5140;<br>5140 H;<br>5140 RH;<br>G51400;<br>H51400 | 5140;<br>G51400   | 5115;<br>5117;<br>G51150;<br>G51170 |                         | 5155;<br>5155 H;<br>5150;<br>G51550;<br>H51550;<br>G51600 | 4142;<br>G41420       |
|    | BS<br>(UK)                               |                                                                                      | 820A16                    | 832 H 13;<br>832 M 13;<br>S.157;<br>En 36 C                                           | 523 M 15                                                            | 530 A 32;<br>530 H 32;<br>530 M 32                                 | 530 A 40;<br>530 M 40;<br>530 H 40;<br>En 18      | 530 A 40          | 527 M 17;<br>590 H 17;<br>590 M 17  |                         | 525 A 58;<br>525 A 60;<br>En 48                           |                       |
|    | DIN<br>(GERMANY)                         | 15CrMo5;<br>15 CrMo 5                                                                | 17CrNiMo6;<br>17 CrNiMo 6 | 14NiCrMo13-4;<br>14 NiCrMo 13 4                                                       | 15Cr3;<br>15 Cr 3                                                   | 34Cr4;<br>34 Cr 4                                                  | 41Cr4;<br>41 Cr 4                                 | 42Cr4;<br>42 Cr 4 | 16MnCr5;<br>16 MnCr 5               | 16MnCrS5;<br>16 MnCrS 5 | 55Cr3;<br>55 Cr 3                                         | 41CrMo4;<br>41 CrMo 4 |
|    | Werkstoff<br>(GERMANY)                   | 1.7262                                                                               | 1.6587                    | 1.6657                                                                                | 1.7015                                                              | 1.7033                                                             | 1.7035                                            | 1.7045            | 1.7131                              | 1.7139                  | 1.7176                                                    | 1.7223                |
|  | EN<br>(EUROPE)                           | 15CrMo5                                                                              |                           |                                                                                       | 15Cr3                                                               | 34Cr4                                                              | 41Cr4                                             |                   | 16MnCrS5                            | 16MnCrS5                | 55Cr3                                                     |                       |
|  | GOST<br>(RUSSIA)                         |                                                                                      |                           |                                                                                       | 15Ch                                                                | 35Ch                                                               | 40Ch                                              |                   | 18ChG                               |                         | 50ChGA                                                    | 40ChFA                |
|  | JIS<br>(JAPAN)                           | SCM 415 H;<br>SCM 415 HRCH;<br>SCM 415 M;<br>SCM 415 RCH;<br>SCM 415 TK;<br>SCM 21 H |                           |                                                                                       | SCr 415;<br>SCr 415 H;<br>SCr 415 HRCH;<br>SCr 415 RCH;<br>SCr 21 H | SCr 430;<br>SCr 430 H;<br>SCr 430 HRCH;<br>SCr 430 RCH;<br>SCr 2 H | SCr 440;<br>SCr 440 H                             | SCr 440           |                                     |                         | SUP 9;<br>SUP 9 A;<br>SUP 9 M                             | SNB 22-1              |
|  | SS<br>(SWEDEN)                           |                                                                                      |                           |                                                                                       |                                                                     |                                                                    |                                                   | 2245              | 2173                                | 2127                    | 2253                                                      |                       |
|  | UNE<br>(SPAIN)                           | 12 CrMo 4;<br>F.150.J;<br>F.155;<br>F.1551                                           | 14 NiCrMo 13              | 14 NiCrMo 13;<br>14 NiCrMo 13-1;<br>F.1560;<br>F.1569                                 |                                                                     | 35 Cr 4;<br>F.8221                                                 | 41 Cr 4 DF;<br>F.1211;<br>F.1202                  | 42 Cr 4           | F.1516                              |                         | F.1431                                                    | 42 CrMo 4             |
|  | UNI<br>(ITALY)                           |                                                                                      |                           | 15 NiCrMo 13;<br>16 NiCrMo 12                                                         |                                                                     | 34 Cr 4;<br>34 Cr KB                                               | 41 Cr 4;<br>41 Cr 4 KB                            | 41 Cr 4           | 16 MnCr 5                           |                         | 55 Cr 3                                                   | 41 CrMo 4             |
|  | IS<br>(INDIA)                            |                                                                                      | 15Ni2Cr1Mo15              |                                                                                       | 15Cr3                                                               |                                                                    | 40Cr1                                             |                   | 17Mn1Cr95                           |                         | 55Cr3                                                     |                       |
|  | KS<br>(REP. OF KOREA)                    |                                                                                      |                           |                                                                                       |                                                                     | SCr 430;<br>SCr 430H                                               | SCr 440                                           | SCr 440           |                                     |                         | SPS 9A                                                    | SNB 22-1              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 15CrMnMo                                                                             |                           |                                                                                       | 15Cr                                                                | 35Cr                                                               | 40Cr                                              | 40Cr              | 15Cr                                |                         | 50CrMn                                                    | 40CrMoA               |

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| Standards                                                                           |                                          | Material Group No.                                                                                                         |                                                                                                                           |                                      |                                                                                 |                                                                                                          |                         |                                               |             |              |                         |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------|-------------|--------------|-------------------------|
|                                                                                     |                                          | 6                                                                                                                          | 6                                                                                                                         | 6                                    | 6                                                                               | 6                                                                                                        | 6                       | 6                                             | 6           | 6            | 6                       |
|    | NF/AFNOR<br>(FRANCE)                     | 42 CD 4;<br>40 CD 4;<br>42CrMo4RR                                                                                          |                                                                                                                           |                                      | 15 CD 4-05                                                                      | 12 CD 9-10;<br>10 CD 9.10                                                                                |                         | 40 CAD 6.12                                   |             | 40 CMD 8 S   |                         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 4140;<br>4140 H;<br>4140 RH;<br>4142;<br>4142 H;<br>4145;<br>G41400;<br>H41400;<br>G41420;<br>H41420;<br>K14248;<br>K14047 | 4147;<br>4147 H;<br>4150;<br>4150 H;<br>8650;<br>8650 H;<br>G41470;<br>G41500;<br>G86500;<br>H41470;<br>H41500;<br>H86500 | 4118;<br>4118H;<br>G41180;<br>H41180 | K11547;<br>K11562;<br>K11564;<br>K11757;<br>K11789;<br>K12052;<br>ASTM A182 F12 | K21390;<br>K21590;<br>ASTM A182 F22                                                                      |                         | E71400;<br>K24065;<br>K24728;<br>A355 Class A |             | P20+S        |                         |
|    | BS<br>(UK)                               | 708 M 40;<br>709 M 40;<br>En 19;<br>En 19 A                                                                                | 708 M 40;<br>708 A 47                                                                                                     |                                      | 620;<br>620-440;<br>620-470;<br>620-540;<br>621                                 | 622;<br>622-490;<br>622-515;<br>622/690;<br>1502-622                                                     | 1503-660-440            | 905 M 39;<br>En 41 B                          |             |              |                         |
|    | DIN<br>(GERMANY)                         | 42CrMo4;<br>42CrMo4V;<br>42 CrMo 4;<br>42 CrMo 4 V                                                                         | 50CrMo4;<br>50 CrMo 4                                                                                                     | 20MoCr4;<br>20 MoCr 4                | 13CrMo4-5;<br>13 CrMo4 4                                                        | 10CrMo9-10;<br>10 CrMo 9 10;<br>GS-12CrMo9-10;<br>GS-12 CrMo 9 10;<br>G 12 CrMo9-12                      | 14MoV6-3;<br>14 MoV 6 3 | 41CrAlMo7-10;<br>41CrAlMo7;<br>41 CrAlMo 7    | 17NiCrMo6-4 | 40CrMnMoS8-6 | 20MnCrS5;<br>20 MnCrS 5 |
|  | Werkstoff<br>(GERMANY)                   | 1.7225;<br>1.7227                                                                                                          | 1.7228                                                                                                                    | 1.7321                               | 1.7335                                                                          | 1.7380                                                                                                   | 1.7715                  | 1.8509                                        | 1.6566      | 1.2312       | 1.7149                  |
|  | EN<br>(EUROPE)                           | 42CrMo4                                                                                                                    | 50CrMo4                                                                                                                   | 20MoCr4                              | 13CrMo4-5                                                                       | 10CrMo9-10                                                                                               |                         | 41B                                           | 17NiCrMo6-4 |              | 20MnCrS5                |
|  | GOST<br>(RUSSIA)                         | 40ChFA                                                                                                                     |                                                                                                                           | BGH 7321;<br>E320;<br>SIQUAL<br>7321 | 12ChM;<br>15ChM                                                                 | 12Ch8                                                                                                    |                         | 38Ch2MJuA                                     |             |              |                         |
|  | JIS<br>(JAPAN)                           | SCM 440 H;<br>SCM 440 HRCH;<br>SCM 440 M;<br>SCM 440 RCH;<br>SCM 440 TK;<br>SNB 7 Class 2;<br>SCM 4 H;<br>SNB 22-1         | SCM 445 H;<br>SCM 445<br>HRCH;<br>SCM 445<br>RCH;<br>SCM 5 H                                                              |                                      | SCMV 2;<br>SFVA 12;<br>STBA 22;<br>STFA 22;<br>STPA 20;<br>STPA 22              | SCMQ 4 E;<br>SCMV 4;<br>SFVA F 22 A;<br>SFVA F 22 B;<br>SFVCM F 22 B;<br>STBA 24;<br>STFA 24;<br>STPA 24 |                         | SACM 645;<br>SACM 1                           |             |              |                         |
|  | SS<br>(SWEDEN)                           | 2244;<br>42CrMo4                                                                                                           | 2512                                                                                                                      | 2625                                 | 2216                                                                            | 2218                                                                                                     |                         | 2940                                          |             |              |                         |
|  | UNE<br>(SPAIN)                           | TO.D;<br>TU.L                                                                                                              |                                                                                                                           |                                      | TU.E;<br>TU.F;<br>F.2631;<br>14 CrMo 4 5                                        | TU.H                                                                                                     | 13 MoCrV 6              | F.174;<br>41 CrAlMo 7;<br>F1740               |             |              |                         |
|  | UNI<br>(ITALY)                           | 42 CrMo 4;<br>38 CrMo 4 KB;<br>41 CrMo 4                                                                                   | 653 M 31                                                                                                                  |                                      | 14 CrMo 3;<br>14CrMo4 5                                                         | 12 CrMo 9;<br>12 CrMo 10                                                                                 |                         | 41 CrAlMo 7                                   |             |              |                         |
|  | IS<br>(INDIA)                            | 40Cr4Mo3                                                                                                                   |                                                                                                                           |                                      |                                                                                 |                                                                                                          |                         | 40Cr2Al1Mo18                                  |             |              |                         |
|  | KS<br>(REP. OF<br>KOREA)                 | SNB 22-1                                                                                                                   |                                                                                                                           |                                      | SPA 22                                                                          | SPA 24                                                                                                   |                         |                                               |             |              |                         |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 42CrMo;<br>42CrMnMo                                                                                                        |                                                                                                                           | 20CrMo                               | 12CrMo                                                                          | 12Cr2Mo1                                                                                                 |                         | 38CrMoAl                                      |             |              |                         |

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|                                                                                     |                                          | 6                                     | 6                         | 6                     | 6                                    | 6                                              | 6                                                         | 6                                                                                                                           | 6       | 6                                                   | 6                             |
|    | NF/AFNOR<br>(FRANCE)                     | 40 CMND 8                             | 40 CMD 8                  |                       | 51 CDV 4;<br>51CrMoV4                |                                                | 15 CD 3.5                                                 |                                                                                                                             |         |                                                     |                               |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | P20+Ni                                |                           |                       | 4150;<br>G41500                      |                                                |                                                           | 4419;<br>4419 H;<br>4520;<br>G44190;<br>H44190;<br>G45200;<br>K11522;<br>K11820;<br>K12020;<br>K12023;<br>K12320;<br>K12821 |         | HY-80;<br>HY 80;<br>HY80;<br>K31820;<br>MIL-S-21952 |                               |
|    | BS<br>(UK)                               |                                       |                           |                       |                                      |                                                |                                                           |                                                                                                                             |         |                                                     | 605 M 36;<br>En 16;<br>En 16T |
|    | DIN<br>(GERMANY)                         | 40CrMnNiMo8-6-4;<br>40 CrMnNiMo 8 6 4 | 40CrMnMo7;<br>40 CrMnMo 7 | 49CrMo4;<br>49 CrMo 4 | 52CrMoV4;<br>51CrMoV4;<br>51 CrMoV 4 | 16CrMo4-4;<br>16 CrMo 4 4                      | 16CrMo4;<br>16 CrMo 4                                     | 16Mo5                                                                                                                       |         |                                                     |                               |
|  | Werkstoff<br>(GERMANY)                   | 1.2738                                | 1.2311                    | 1.7238                | 1.7701                               | 1.7337                                         | 1.7242                                                    | 1.5423                                                                                                                      |         |                                                     |                               |
|  | EN<br>(EUROPE)                           | 40CrMnNiMo8-6-4                       | 40CrMnMo7                 |                       | 51CrMoV4                             |                                                | 16CrMo4                                                   |                                                                                                                             |         |                                                     |                               |
|  | GOST<br>(RUSSIA)                         | 40Ch2GNM                              |                           |                       |                                      |                                                |                                                           |                                                                                                                             | 30ChGSA |                                                     |                               |
|  | JIS<br>(JAPAN)                           |                                       |                           |                       |                                      | SCM 415 M;<br>SCM 415;<br>STBA 22;<br>SFVA F12 | SCM 418 H;<br>SCM 418 HRCH;<br>SCM 418 RCH;<br>SCM 418 TK | SB 450 M;<br>SB 480 M;<br>SB 46 M SB 49 M                                                                                   |         |                                                     |                               |
|  | SS<br>(SWEDEN)                           |                                       |                           |                       |                                      |                                                |                                                           |                                                                                                                             |         |                                                     |                               |
|  | UNE<br>(SPAIN)                           |                                       | F.5302                    |                       |                                      |                                                | F.1550;<br>18 CrMo 4                                      | TU.D;<br>F.2602                                                                                                             |         |                                                     |                               |
|  | UNI<br>(ITALY)                           |                                       | 35 CrMo 8 KU              |                       | 51 CrMoV 4                           | A 18 CrMo 45 KW                                | 18 CrMo 4                                                 | 16 Mo 5 KG;<br>16 Mo 5 KW                                                                                                   |         |                                                     |                               |
|  | IS<br>(INDIA)                            |                                       |                           |                       |                                      |                                                |                                                           |                                                                                                                             |         |                                                     |                               |
|  | KS<br>(REP. OF<br>KOREA)                 |                                       |                           |                       |                                      |                                                |                                                           | SB 450M                                                                                                                     |         |                                                     |                               |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                       | 5CrMnMo                   |                       |                                      | 15CrMo                                         |                                                           | 15Mn                                                                                                                        |         |                                                     |                               |

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|                                                                                     |                                          | 6                                          | 6                                    | 6         | 6                 | 6                                       | 6                   | 6                       | 6                     | 6                       | 6                           | 6                     | 6                   |
|    | NF/AFNOR<br>(FRANCE)                     |                                            | 16 NC 6                              |           | 35 C 2;<br>38 C 2 |                                         |                     |                         |                       | E 690 D                 |                             | 38 B 3;<br>38B3       |                     |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | K52440                                     | 4320;<br>4320H;<br>G43200;<br>H43200 |           | 5140;<br>G51400   | E51100;<br>E52100;<br>G51986;<br>G52986 |                     | P6;<br>T51606           |                       | A514 Grade B;<br>K11630 | A709-100;<br>A709 Grade 100 |                       |                     |
|    | BS<br>(UK)                               |                                            | 815 M 17                             |           | 120 M 36          |                                         |                     |                         |                       | 75 F 70                 |                             |                       |                     |
|    | DIN<br>(GERMANY)                         | 34CrAlNi7-10;<br>34CrAlNi7;<br>34 CrAlNi 7 | 15 CrNi 6                            | 17CrNi6-6 | 38Cr2;<br>38 Cr 2 | 105Cr4;<br>105 Cr 4                     | 140Cr2;<br>140 Cr 3 | 15NiCr14;<br>15 NiCr 14 | S690QL1;<br>ESTe 690V | 26CrMo4-2;<br>26 CrMo 4 | S700MC;<br>QSTE 690 TM      | S690QL;<br>TSTE 690 V | 20MnB4;<br>20 MnB 4 |
|    | Werkstoff<br>(GERMANY)                   | 1.8550;<br>1.2891                          | 1.5919                               | 1.5918    | 1.7003            | 1.2057                                  | 1.2008              | 1.2735                  | 1.8988                | 1.7219                  | 1.8974                      | 1.8928                | 1.5525              |
|  | EN<br>(EUROPE)                           | 34CrAlNi7-10                               |                                      | 17CrNi6-6 | 38Cr2             |                                         |                     |                         | S690QL1               | 26CrMo4-2               | S700MC                      | S690QL                | 20MnB4              |
|  | GOST<br>(RUSSIA)                         |                                            | 12ChN2                               |           |                   |                                         | 13Ch                |                         |                       |                         |                             |                       |                     |
|  | JIS<br>(JAPAN)                           |                                            | SNCM 415                             |           |                   | SUJ 1                                   |                     |                         |                       |                         |                             |                       |                     |
|  | SS<br>(SWEDEN)                           |                                            | 2511;<br>2512                        |           |                   |                                         |                     |                         |                       |                         |                             | 2625                  |                     |
|  | UNE<br>(SPAIN)                           |                                            |                                      |           | F.1200            | F.120.J                                 |                     |                         |                       |                         |                             |                       |                     |
|  | UNI<br>(ITALY)                           | 34 CrAlNi 7                                |                                      |           | 41 Cr 2 KB        |                                         |                     |                         |                       |                         |                             |                       |                     |
|  | IS<br>(INDIA)                            |                                            | 15NiCr1Mo12                          |           | 40Cr1             | 105Cr1                                  |                     |                         |                       |                         |                             |                       |                     |
|  | KS<br>(REP. OF<br>KOREA)                 |                                            |                                      |           |                   |                                         |                     |                         |                       |                         |                             |                       |                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                            |                                      |           | 40Cr              | GCr9                                    | Cr06                |                         |                       |                         |                             |                       |                     |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                |                                                            |                                                                                                                             |                                           |                   |                                                                    |                               |                                     |               |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------|--------------------------------------------------------------------|-------------------------------|-------------------------------------|---------------|
| Standards                                                                           |                                          | 6                                 | 6                                                          | 6                                                                                                                           | 6                                         | 6                 | 7                                                                  | 7                             | 7                                   | 7             |
|    | NF/AFNOR<br>(FRANCE)                     | P460NL1;<br>A 590 FP              |                                                            |                                                                                                                             | 18 NCD 6                                  |                   | 25 CD 4                                                            |                               |                                     | 20 CDV 6      |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | K12202                            | A217 WC6;<br>A372 Grade J;<br>J12072;<br>J12073;<br>K11598 | ASTM A387 Grade 11 Class 2;<br>A 387 Grade 11 Class 2;<br>SA387 GR 11 CLASS 2;<br>SA387 Gr.11 CL2;<br>SA387-11-2;<br>K11789 |                                           | 5120;<br>G51200   | 4130;<br>4130 H;<br>4130 RH;<br>G41300;<br>H41300                  |                               |                                     |               |
|    | BS<br>(UK)                               |                                   |                                                            | 621 A;<br>621 B                                                                                                             |                                           |                   | 708 A 25                                                           |                               |                                     |               |
|    | DIN<br>(GERMANY)                         | P460NL1;<br>P460 NL1;<br>TSIE 460 | G17CrMo5-5;<br>GS-17 CrMo 5 5                              | 13CrMoSi5-5                                                                                                                 | 18CrNiMo7-6;<br>17CrNiMo6;<br>17 CrNiMo 6 | 20Cr4;<br>20 Cr 4 | 25CrMo4;<br>25 CrMo 4;<br>GS-25 CrMo 4;<br>G 25 CrMo 4             | 21CrMoV5-11;<br>21 CrMoV 5 11 | GS-35 CrMoV 10 4;<br>G35 CrMoV 10-4 | 24CrMoV5-5    |
|    | Werkstoff<br>(GERMANY)                   | 1.8915                            | 1.7357                                                     | 1.7336                                                                                                                      | 1.6587                                    | 1.7027            | 1.7218                                                             | 1.8070                        | 1.7755                              | 1.7733        |
|  | EN<br>(EUROPE)                           | P460NL1;<br>P460 NL1              | G17CrMo5-5                                                 | 13CrMoSi5-5                                                                                                                 | 18CrNiMo7-6                               | 20Cr4             | 25CrMo4                                                            |                               |                                     |               |
|  | GOST<br>(RUSSIA)                         |                                   |                                                            |                                                                                                                             |                                           | 20Ch              | 20ChM;<br>30ChM                                                    |                               |                                     |               |
|  | JIS<br>(JAPAN)                           | SHY 685 N;<br>SHY 685 NS          | SCPH 21                                                    |                                                                                                                             |                                           | SCr 420           | SCM 420 TK;<br>SCM 430 M;<br>SCM 430 RCH;<br>SCM 430 TK;<br>STKS 1 |                               |                                     |               |
|  | SS<br>(SWEDEN)                           |                                   |                                                            |                                                                                                                             |                                           |                   | 2225                                                               |                               |                                     |               |
|  | UNE<br>(SPAIN)                           | P460NL1                           |                                                            |                                                                                                                             | F.1560;<br>14 NiCrMo 13                   |                   | F.222;<br>F.1256                                                   |                               |                                     |               |
|  | UNI<br>(ITALY)                           |                                   |                                                            |                                                                                                                             | 18 NiCrMo 7                               |                   | 25 CrMo 4;<br>25 CrMo KB                                           | 35 NiCr 9                     |                                     | 21 CrMoV 5 11 |
|  | IS<br>(INDIA)                            |                                   |                                                            |                                                                                                                             |                                           |                   |                                                                    |                               |                                     |               |
|  | KS<br>(REP. OF<br>KOREA)                 |                                   |                                                            |                                                                                                                             |                                           | SCr 420           | SCM 420;<br>SCM 430                                                |                               |                                     |               |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                   |                                                            |                                                                                                                             |                                           | 20Cr;<br>A20202   | 30CrMo                                                             |                               |                                     | 12Cr1MoV      |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                                                            |                                                                                                                |                                                                                                                 |                         |                       |                                     |                         |                               |                       |                                     |                           |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------|-------------------------------------|-------------------------|-------------------------------|-----------------------|-------------------------------------|---------------------------|
|                                                                                     |                                          | 7                                                                             | 7                                                                                                              | 7                                                                                                               | 7                       | 7                     | 7                                   | 7                       | 7                             | 7                     | 7                                   | 7                         |
|    | NF/AFNOR<br>(FRANCE)                     |                                                                               | 40 NCD 2;<br>40 NCD TS                                                                                         | 20 NCD 2                                                                                                        | 18 NC 13                | 35 NC 6               | 34 CrNiMo 8;<br>35 NCD 6            |                         | 30 NCD 2                      | 30 CND 8;<br>30 NCD 8 | 20MV6;<br>TS E 455 4;<br>TU E 455 4 |                           |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 4340;<br>4340 H;<br>9850;<br>G43400;<br>G98500;<br>H43400;<br>K23028          | 8640;<br>8640 H;<br>8740;<br>8740 H;<br>8742;<br>G86400;<br>G87400;<br>G87420;<br>H86400;<br>H87400;<br>K11640 | 8617;<br>8617 H;<br>8620;<br>8620 H;<br>8620 RH;<br>8617;<br>G86170;<br>G86200;<br>H86170;<br>H86200;<br>K12147 |                         | 3135                  | 4340;<br>G43400;<br>4337;<br>G43370 |                         | 8630                          | 4340;<br>G43400       | K01907                              | 300M;<br>4340M;<br>K44220 |
|    | BS<br>(UK)                               | 817 M 40;<br>En 24                                                            |                                                                                                                | 805 H 20;<br>805 M 20;<br>806 M 20;<br>En 362                                                                   | 653 M 31                | 640 A 35              | 816 M 6;<br>817 M 40                |                         |                               | 823 M 30              | 55 C;<br>GR 55;<br>Grade 55         | S 155                     |
|    | DIN<br>(GERMANY)                         | 40NiCrMo6;<br>40 NiCrMo 6                                                     | 40NiCrMo2-2;<br>40 NiCrMo 2 2                                                                                  | 20NiCrMo2-2;<br>21NiCrMo2;<br>21 NiCrMo 2                                                                       | 31NiCr14;<br>31 NiCr 14 | 36NiCr6;<br>36 NiCr 6 | 34CrNiMo6;<br>34 CrNiMo 6           | 31CrMoV9;<br>31 CrMoV 9 | 30NiCrMo2-2;<br>30 NiCrMo 2 2 | 30CrNiMo8             | 20MnV6;<br>20MnVS6;<br>20 MnV 6 N   | 41SiNiCrMoV7-6            |
|    | Werkstoff<br>(GERMANY)                   | 1.6565                                                                        |                                                                                                                | 1.6523                                                                                                          | 1.5755                  | 1.5710                | 1.6582                              | 1.8519                  | 1.6545                        | 1.6580                | 1.5217                              | 1.6928                    |
|  | EN<br>(EUROPE)                           | 40NiCrMo6                                                                     |                                                                                                                | 20NiCrMo2-2                                                                                                     |                         | 36NiCr6               | 34CrNiMo6                           | 31CrMoV9                |                               |                       | 20MnV6;<br>S460                     |                           |
|  | GOST<br>(RUSSIA)                         | 40Ch2N2MA                                                                     | 38ChGNM                                                                                                        | 20ChGNM                                                                                                         |                         |                       | 38Ch2N2MA                           | 30Ch3MF                 |                               |                       |                                     |                           |
|  | JIS<br>(JAPAN)                           | SNB 24-1;<br>SNB 24-2;<br>SNB 24-3;<br>SNB 24-4;<br>SNB 24-5;<br>SNCM 439 RCH | SNCM 240;<br>SNCM 240 RCH                                                                                      | SNCM 220;<br>SNCM 220 H;<br>SNCM 220 HRCH;<br>SNCM 220 M;<br>SNCM 220 RCH;<br>SNCM 21 H                         |                         | SNC 236               |                                     |                         |                               | SNCM 431              |                                     |                           |
|  | SS<br>(SWEDEN)                           |                                                                               |                                                                                                                | 2506                                                                                                            |                         |                       | 2541                                |                         |                               |                       |                                     |                           |
|  | UNE<br>(SPAIN)                           | F.1275;<br>40 NiCrMo 7                                                        | 40 NiCrMo 2 DF;<br>F.1205;<br>F.1204;<br>TO.E                                                                  | 20 NiCrMo 2;<br>20 NiCrMo 3-1;<br>F.1522;<br>F.1534                                                             |                         |                       | F.1272                              |                         |                               | 30 CrNi Mo 8          |                                     |                           |
|  | UNI<br>(ITALY)                           |                                                                               | 40 NiCrMo 2;<br>40 NiCrMo 2 KB                                                                                 | 20 NiCrMo 2                                                                                                     |                         |                       | 35 NiCrMo 6 KB                      |                         | 30 NiCrMo 2 KB                |                       |                                     |                           |
|  | IS<br>(INDIA)                            | 40Ni2Cr1Mo28                                                                  |                                                                                                                | 20NiCrMo2                                                                                                       |                         |                       |                                     |                         |                               |                       |                                     |                           |
|  | KS<br>(REP. OF<br>KOREA)                 | SNB 24-1;<br>SNB 24-2;<br>SNB 24-3;<br>SNB 24-4;<br>SNB 24-5                  | SNCM 240                                                                                                       | SNCM 220;<br>SNCM 220H                                                                                          |                         | SNC 236               |                                     |                         |                               |                       |                                     |                           |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 40CrNiMoA                                                                     |                                                                                                                | 21NiCrMo2                                                                                                       | 30CrNi3A                | 40CrNi                | 40CrNiMoA                           |                         |                               |                       | 20MnV                               |                           |

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| Standards                                                                           |                                          | Material Group No.           |                           |                       |                           |                             |                                                         |                 |                        |            |                                 |                         |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------------|---------------------------|-----------------------|---------------------------|-----------------------------|---------------------------------------------------------|-----------------|------------------------|------------|---------------------------------|-------------------------|
|                                                                                     |                                          | 7                            | 7                         | 7                     | 7                         | 7                           | 7                                                       | 7               | 7                      | 7          | 7                               | 7                       |
|    | NF/AFNOR<br>(FRANCE)                     | E690D                        | 20 NCD 2;<br>20NiCrMo2    |                       |                           |                             | 15 CDV 6;<br>9160/C 33;<br>9160 C 073                   |                 |                        |            |                                 |                         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A514;<br>A514/T-1;<br>K11630 |                           |                       |                           |                             |                                                         |                 | WC5;<br>A217 grade WC5 |            |                                 | E4340;<br>G43406        |
|    | BS<br>(UK)                               | 75 F 70                      |                           |                       |                           |                             |                                                         |                 |                        |            | S 153;<br>S 154                 |                         |
|    | DIN<br>(GERMANY)                         | S700MC;<br>QStE 690 TM       | 20NiCrMo2                 | 47CrMo4;<br>47 CrMo 4 | 38MnSiVS5;<br>38 MnSiVS 5 | 20NiCrMoS2-2;<br>21NiCrMoS2 | 12CrMoV6-9;<br>12 CrMoV 6 9                             |                 | G22NiMoCr5-6           | St 145/160 | 32NiCrMo10-4;<br>32 NiCrMo 10 4 | 30CrMoV9;<br>30 CrMoV 9 |
|    | Werkstoff<br>(GERMANY)                   | 1.8974;<br>1.0966            | 1.6522                    | 1.2332                | 1.5231                    | 1.6526                      | 1.7734;<br>1.7736                                       |                 | 1.6760                 | 1.8863     | 1.6743                          | 1.7707                  |
|    | EN<br>(EUROPE)                           | S700MC                       | 20NiCrMo2                 |                       |                           | 20NiCrMoS2-2                | 15CrMnMoV5-4-9-3;<br>4334;<br>FE-WL 1806;<br>FE-PL 52 S | 19MnV6;<br>E470 |                        | St 145/160 |                                 | 30CrMoV9                |
|  | GOST<br>(RUSSIA)                         |                              |                           |                       |                           |                             |                                                         |                 |                        |            | 38ChN3MA                        |                         |
|  | JIS<br>(JAPAN)                           |                              | SNM<br>220 H;<br>SNM 21 H |                       |                           |                             |                                                         |                 |                        |            |                                 |                         |
|  | SS<br>(SWEDEN)                           |                              |                           |                       |                           | 92506                       |                                                         | 2142            |                        |            |                                 |                         |
|  | UNE<br>(SPAIN)                           |                              | 20 NiCrMo 2;<br>F.1527    |                       |                           |                             |                                                         |                 |                        |            | F.127                           |                         |
|  | UNI<br>(ITALY)                           |                              |                           |                       |                           |                             | 15CrMoV6                                                |                 |                        |            |                                 |                         |
|  | IS<br>(INDIA)                            |                              |                           |                       |                           |                             |                                                         |                 |                        |            |                                 |                         |
|  | KS<br>(REP. OF<br>KOREA)                 |                              |                           |                       |                           |                             |                                                         |                 |                        |            |                                 |                         |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                              |                           | 42CrMo ;<br>42CrMnMo  |                           |                             |                                                         |                 |                        |            |                                 |                         |



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|                                                                                                                            |  | Material Group No.                            |                         |                     |                         |                                  |                                                           |                                     |                                                          |                     |                                |           |
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| Standards                                                                                                                  |  | 8                                             | 8                       | 8                   | 8                       | 8                                | 8                                                         | 8                                   | 8                                                        | 8                   | 8                              | 8         |
|  NF/AFNOR (FRANCE)                        |  |                                               | 30 CD 12                |                     | 30 CD 12                | 40 NCD 3;<br>35 NCD 5            | 50CrV4RR;<br>50 CV 4;<br>51 CV 4                          | 30 NC 11                            | Z 120 M 12                                               | 42 CD 4             |                                |           |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  |                                               |                         |                     |                         | 9840;<br>G98400                  | 6145;<br>6150;<br>6150 H;<br>G61500;<br>H61500            | 3435                                | A128 Grade A;<br>J91109;<br>J91129;<br>J91139;<br>J91149 | 4142;<br>G41420     | 4140 H;<br>4140 RH;<br>4140 HT |           |
|  BS (UK)                                  |  | 897 M 39                                      | 722 M 24                |                     | 722 M 24                | 817 M 37;<br>816 M 40            | 735 A 50;<br>735 A 51;<br>735 H 51;<br>735 M 50;<br>En 47 |                                     | BW 10                                                    | 708 M 40            |                                |           |
|  DIN (GERMANY)                            |  | 40CrMoV13-9;<br>39CrMoV13-9;<br>39 CrMoV 13 9 | 31CrMo12;<br>31 CrMo 12 | 58CrV4;<br>58 CrV 4 | 32CrMo12;<br>32 CrMo 12 | 36CrNiMo4;<br>36 CrNiMo 4        | 51CrV4;<br>50CrV4;<br>50 CrV 4                            | 36NiCr10;<br>36 NiCr 10             | X120Mn12;<br>X 120 Mn 12;<br>G-X120 Mn 12                | 47CrMo4             | 42CrMo4+QT                     | 21MnCr6-5 |
|  Werkstoff (GERMANY)                      |  | 1.8523                                        | 1.8515                  | 1.8161              | 1.7361                  | 1.6511                           | 1.8159                                                    | 1.5736                              | 1.3401;<br>1.3403                                        | 1.2332              |                                | 1.8705    |
|  EN (EUROPE)                            |  | 40CrMoV13-9                                   | 31CrMo12;<br>40B        |                     | 32CrMo12                | 36CrNiMo4                        | 51CrV4                                                    |                                     |                                                          | 47CrMo4             |                                |           |
|  GOST (RUSSIA)                          |  |                                               |                         |                     |                         | 40ChGNM;<br>40ChN2MA             | 50ChFA;<br>50ChGFA                                        |                                     | 110G13L                                                  |                     |                                |           |
|  JIS (JAPAN)                            |  |                                               |                         |                     |                         | SUP 10                           | SUP 10;<br>SUP 10-CSP;<br>SUP 10 M                        | SNC 631;<br>SNC 631 H;<br>SNC 631 M | SCMnH 1;<br>SCMnH 11                                     | SCM;<br>SCM 440     |                                |           |
|  SS (SWEDEN)                            |  |                                               | 2240                    |                     | 2240                    |                                  | 2230                                                      |                                     | 2183                                                     | 2244                |                                |           |
|  UNE (SPAIN)                            |  |                                               | F.1712;<br>F.124.A      |                     | F.124.A                 | F.128;<br>F.1280;<br>35 NiCrMo 4 | F.143;<br>F.143.A;<br>51 CrV 4;<br>F.1430                 |                                     | F.240.A;<br>F.240.A1;<br>AM-X 120 Mn 12;<br>F.8251       | 42 CrMo 4           |                                |           |
|  UNI (ITALY)                            |  | 36 CrMoV 12                                   | 32 CrMo 12              |                     | 30 CrMo 12              | 39 NiCrMo 4;<br>39 NiCrMo 4 KB   | 50 CrV 4                                                  |                                     | GX 120 Mn 12                                             | 42 CrMo 4           |                                |           |
|  IS (INDIA)                             |  |                                               |                         |                     |                         |                                  | T50Cr1V23                                                 |                                     |                                                          |                     |                                |           |
|  KS (REP. OF KOREA)                     |  |                                               |                         |                     |                         | SPS 10                           | SPS 10                                                    |                                     | SCMnH 1,<br>SCMn H 11                                    |                     |                                |           |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  |                                               |                         |                     |                         | 40CrNiMo                         | 50CrVA                                                    | 20CrNi3A                            | ZGMn13                                                   | 42CrMo;<br>42CrMnMo | 42CrMo;<br>42CrMnMo            |           |

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| Standards                                                                           |                                          | Material Group No.      |        |        |              |          |           |                                                                    |                           |                             |                           |                                    |                                              |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------|--------|--------|--------------|----------|-----------|--------------------------------------------------------------------|---------------------------|-----------------------------|---------------------------|------------------------------------|----------------------------------------------|
|                                                                                     |                                          | 8                       | 8      | 8      | 9            | 9        | 9         | 9                                                                  | 9                         | 9                           | 9                         | 9                                  | 9                                            |
|    | NF/AFNOR<br>(FRANCE)                     | 45 SCV 6                |        |        |              |          |           | 42 C 2;<br>45 C 2                                                  |                           |                             |                           |                                    | 16 NCD 17                                    |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                         |        |        |              |          |           | 5045;<br>5046;<br>5150;<br>5150 H;<br>G50460;<br>G51500;<br>H51500 |                           |                             |                           |                                    |                                              |
|    | BS<br>(UK)                               |                         |        |        | 830 M 31     |          |           |                                                                    |                           |                             |                           |                                    | 5 S.82;<br>835 H 15;<br>835 N 15;<br>En 39 B |
|    | DIN<br>(GERMANY)                         | 45SiCrV6;<br>45 SiCrV 6 | S890Q  | 45B2   | 31NiCrMo13-4 | 35NiCr18 | 17MnCr5-3 | 46Cr2;<br>46 Cr 2;<br>45 Cr 2                                      | 62SiMnCr4;<br>62 SiMnCr 4 | 48CrMoV6-7;<br>48 CrMoV 6 7 | 65MnCrMo4;<br>65 MnCrMo 4 | 80CrV2;<br>80 CrV 2;<br>80 CrV 2 3 | 15NiCrMo16-5;<br>15 NiCrMo 16 5              |
|    | Werkstoff<br>(GERMANY)                   | 1.2249                  | 1.8940 | 1.5513 | 1.6659       | 1.5864   | 1.8715    | 1.7006;<br>1.7005                                                  | 1.2101                    | 1.2323                      | 1.2309                    | 1.2235;<br>1.2236                  | 1.6723                                       |
|  | EN<br>(EUROPE)                           |                         | S890Q  |        |              |          | 17MnCr5-3 | 46Cr2                                                              |                           |                             |                           | 80CrV2                             |                                              |
|  | GOST<br>(RUSSIA)                         |                         |        |        |              |          |           |                                                                    |                           |                             |                           | 8ChF;<br>9ChF                      |                                              |
|  | JIS<br>(JAPAN)                           |                         |        |        |              |          |           |                                                                    |                           |                             |                           |                                    |                                              |
|  | SS<br>(SWEDEN)                           |                         |        |        | 2534         |          |           |                                                                    |                           |                             |                           |                                    |                                              |
|  | UNE<br>(SPAIN)                           |                         |        |        | F.270        |          |           |                                                                    |                           |                             |                           | F.520.J                            | F.156                                        |
|  | UNI<br>(ITALY)                           |                         |        |        |              |          |           | 45 Cr 2                                                            |                           |                             |                           |                                    |                                              |
|  | IS<br>(INDIA)                            |                         |        |        |              | 30Ni4Cr1 |           |                                                                    |                           |                             |                           |                                    |                                              |
|  | KS<br>(REP. OF<br>KOREA)                 |                         |        |        |              |          |           |                                                                    |                           |                             |                           |                                    |                                              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 4SiCrV                  |        |        |              |          |           | 50Cr                                                               |                           |                             |                           |                                    |                                              |

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| Standards                                                                           |                                          | Material Group No.                  |                                                                                             |                                              |                                                |                               |                                                 |                           |                                |                         |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------|-------------------------------|-------------------------------------------------|---------------------------|--------------------------------|-------------------------|
|                                                                                     |                                          | 9                                   | 10                                                                                          | 10                                           | 10                                             | 10                            | 10                                              | 10                        | 10                             | 10                      |
|    | NF/AFNOR<br>(FRANCE)                     | 55 NCDV 7;<br>55 NiCrMoV7           | 9 Ni;<br>Z 8 N 09                                                                           | Z 18 N 5;<br>Z 10 N 05;<br>5 Ni              | Z 200 CD 12;<br>Z 210 CW 12-01;<br>X210CrW12-1 | X 40 CrMoV 5;<br>Z 40 CDV 5   | X 100 CrMoV 5;<br>Z 100 CDW 5                   | Z 30 WCV 9                |                                |                         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | L6;<br>T61206                       | K71340;<br>K81340                                                                           | 2515;<br>A2515;<br>2517;<br>E2517;<br>K41583 | D4;<br>T30404;<br>D6;<br>T30406                | H13;<br>T20813                | A2;<br>T30102                                   | H21;<br>T20821            |                                |                         |
|    | BS<br>(UK)                               |                                     | 1501-509;<br>1501-510;<br>502-650;<br>509-690                                               |                                              | BD6                                            | BH 13                         | BA 2                                            | BH 21                     |                                |                         |
|    | DIN<br>(GERMANY)                         | 55NiCrMoV7;<br>56 NiCrMoV 7         | X8Ni9                                                                                       | X12Ni5;<br>12Ni19;                           | X210CrW12;<br>X 210 CrW 12                     | X40CrMoV5-1;<br>X40 CrMoV 5 1 | X100CrMoV5;<br>X100CrMoV5-1;<br>X 100 CrMoV 5 1 | X30WCrV9-3;<br>X30WCrV9 3 | X165CrMoV12;<br>X 165 CrMoV 12 | X36CrMo17;<br>X38CrMo16 |
|    | Werkstoff<br>(GERMANY)                   | 1.2714                              | 1.5662                                                                                      | 1.5680                                       | 1.2436                                         | 1.2344                        | 1.2363                                          | 1.2581                    | 1.2601                         | 1.2316                  |
|  | EN<br>(EUROPE)                           | 55NiCrMoV7                          | X8Ni9                                                                                       | X12Ni5                                       | X210CrW12                                      | X40CrMoV5-1                   | X100CrMoV5                                      | X30WCrV9-3;<br>X30WCrV9 3 | X165CrMoV12                    | X38CrMo16               |
|  | GOST<br>(RUSSIA)                         | 5ChGNM                              |                                                                                             |                                              |                                                | 4Ch5MF1S                      |                                                 | 3Ch2W8F                   |                                |                         |
|  | JIS<br>(JAPAN)                           | SKT 4                               | SL9N520;<br>SL9N590;<br>STBL 690;<br>STPL 690;<br>SL9N53;<br>SL9N60;<br>STBL 70;<br>STPL 70 | SL5N590;<br>SL5N60                           | SKD 2                                          | SKD 61                        | SKD 12                                          | SKD 5                     |                                |                         |
|  | SS<br>(SWEDEN)                           |                                     |                                                                                             |                                              | 2312                                           | 2242                          | 2260                                            |                           | 2310                           |                         |
|  | UNE<br>(SPAIN)                           | F.520.B;<br>55 NiCrMoV 7;<br>F.5307 | F.2645;<br>XBNI 09                                                                          |                                              | F.5213;<br>X210 CrW 12                         | F.5318;<br>X 40 CrMoSiV 5     | F.536;<br>F.5227;<br>X 100 CrMoV 5              | F.5323;<br>X 30 WCrV 9    |                                |                         |
|  | UNI<br>(ITALY)                           | 55 NiCrMoV 7 KU;<br>56 NiCrMoV 7 KU | X 10 Ni 9;<br>X 12 Ni 09                                                                    |                                              | X 215 CrW 12 1 KU                              | X 40 CrMoV 5 1 1 KU           | X 100 CrMoV 5 1 KU                              | X 30 WCrV 9 3 KU          | X165CrMoV12KU                  |                         |
|  | IS<br>(INDIA)                            |                                     |                                                                                             |                                              |                                                |                               |                                                 |                           |                                |                         |
|  | KS<br>(REP. OF KOREA)                    | STF 4                               | SL9N590;<br>SL9N520                                                                         |                                              |                                                | STD 61                        | STD 12                                          | STD 5                     |                                |                         |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 5CrNiMo                             |                                                                                             |                                              |                                                | 40CrMoV5                      | Cr5Mo1V                                         | 3Cr2W8V                   | Cr12MoV                        |                         |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                          |                                       |                                                                 |                                                   |                          |                       |                                             |                                              |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------|---------------------------------------|-----------------------------------------------------------------|---------------------------------------------------|--------------------------|-----------------------|---------------------------------------------|----------------------------------------------|
| Standards                                                                           |                                          | 10                                          | 10                                    | 10                                                              | 10                                                | 10                       | 10                    | 10                                          | 10                                           |
|    | NF/AFNOR<br>(FRANCE)                     | Z 85 WDCV 06-05-04-02;<br>6-5-2;<br>HS6-5-2 | Z 38 CDV 5;<br>X38CrMoV               | Z 35 CWDV 5;<br>X35CrWMoV5                                      | X 160 CrMoV 12;<br>Z 160 CDV 12                   | Z 35 V CD 17.S           | 20 MC 5               | 45 NCD 16                                   |                                              |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | M2;<br>T11302                               | H11;<br>T20811                        | H12;<br>T20812                                                  | D2;<br>T30402                                     |                          |                       |                                             |                                              |
|    | BS<br>(UK)                               | BM 2;<br>BM2                                | BH 11                                 | BH 12                                                           | BD 2                                              |                          |                       |                                             |                                              |
|    | DIN<br>(GERMANY)                         | HS6-5-2;<br>HS 6-5-2;<br>S 6-5-2            | X37CrMoV5-1;<br>X38CrMoV5-1           | X37CrMoW5-1;<br>X 37 CrMoW 5 1;<br>X35CrWMoV5;<br>X 35 CrWMoV 5 | X153CrMoV12;<br>X155CrVMo12-1;<br>X155 CrVMo 12 1 | X33CrS16;<br>X 33 CrS 16 | 21MnCr5;<br>21 MnCr 5 | X45NiCrMo4;<br>45NiCrMo16;<br>X 45 NiCrMo 4 | X19NiCrMo4;<br>X 19 NiCrMo 4;<br>GX19NiCrMo4 |
|   | Werkstoff<br>(GERMANY)                   | 1.3343                                      | 1.2343                                | 1.2606;<br>1.2605                                               | 1.2379                                            | 1.2085                   | 1.2162                | 1.2767                                      | 1.2764                                       |
|  | EN<br>(EUROPE)                           | HS6-5-2                                     | X37CrMoV5-1                           | X37CrMoW5-1;<br>X35CrWMoV5                                      | X153CrMoV12                                       | X33CrS16                 | 21MnCr5               | X45NiCrMo4                                  | X19NiCrMo4                                   |
|  | GOST<br>(RUSSIA)                         | R6M5                                        | 4Ch5MFS                               |                                                                 |                                                   |                          |                       |                                             |                                              |
|  | JIS<br>(JAPAN)                           | SKH 51                                      | SKD 6                                 | SKD 62                                                          | SKD 10;<br>SKD 11                                 |                          |                       |                                             |                                              |
|  | SS<br>(SWEDEN)                           | 2722                                        |                                       |                                                                 | 2310                                              |                          |                       |                                             |                                              |
|  | UNE<br>(SPAIN)                           | F.550.A;<br>F.5604                          | F.520.G;<br>F.5137;<br>X 37 CrMoSiV 5 | F.537                                                           | F.520.A                                           |                          |                       |                                             |                                              |
|  | UNI<br>(ITALY)                           |                                             | X 37 CrMoV 5 1 KU                     | X 35 CrMoW 05 KU                                                | X 155 CrVMo 12 1 KU                               |                          |                       | 40 NiCrMoV 8 KU                             |                                              |
|  | IS<br>(INDIA)                            |                                             |                                       |                                                                 |                                                   |                          |                       |                                             |                                              |
|  | KS<br>(REP. OF KOREA)                    | SKH 51                                      |                                       |                                                                 |                                                   |                          |                       |                                             |                                              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | W6Mo5Cr4V2                                  | 4Cr5MoVS                              | 4Cr5W2VSi                                                       | Cr12MoV                                           |                          |                       |                                             |                                              |

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| Standards                                                                           |                                          | Material Group No.               |                                |                                                     |                                                                                                                        |                                 |                     |                                                |                                                                           |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------|--------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------|------------------------------------------------|---------------------------------------------------------------------------|
|                                                                                     |                                          | 10                               | 10                             | 10                                                  | 10                                                                                                                     | 10                              | 10                  | 10                                             | 10                                                                        |
|    | NF/AFNOR<br>(FRANCE)                     | X200Cr12;<br>Z 200 C 12          |                                |                                                     |                                                                                                                        | 80 DCV 40;<br>80MoCrV42-16      |                     |                                                | Z 120 WDCV 06-05-04-03;<br>HS6-5-3;<br>Z 120 WDCV 06-05-04-04;<br>HS6-5-4 |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | D3;<br>T30403                    |                                |                                                     | 501;<br>502;<br>S50100;<br>S50200;<br>K41545;<br>SA213 T5                                                              | M50;<br>T11350                  | K91231;<br>AMS 6278 | S7;<br>T41907                                  | M3 Class 2;<br>T11323                                                     |
|    | BS<br>(UK)                               | BD 3                             |                                |                                                     |                                                                                                                        |                                 |                     |                                                |                                                                           |
|    | DIN<br>(GERMANY)                         | X210Cr12;<br>X 210 Cr 12         | X38CrMoV5-3;<br>X 38 CrMoV 5 3 | 27NiCrMoV15-6;<br>26NiCrMoV14-5;<br>26 NiCrMoV 14 5 | X12CrMo5;<br>X 11 CrMo 5;<br>12CrMo19-5;<br>12 CrMo 19 5;<br>X16CrMo5-1                                                | 80MoCrV42-16;<br>80 MoCrV 42 16 | M50NiL              | 50CrMoV13-4;<br>50 CrMoV 13 4;<br>50CrMoV13-15 | HS6-5-3;<br>HS 6-5-3;<br>S 6-5-3                                          |
|   | Werkstoff<br>(GERMANY)                   | 1.2080                           | 1.2367                         | 1.6957                                              | 1.7362;<br>1.7366                                                                                                      | 1.3551                          | 1.3590              | 1.2357;<br>1.2355                              | 1.3344                                                                    |
|  | EN<br>(EUROPE)                           | X210Cr12                         | X38CrMoV5-3                    |                                                     | X12CrMo5;<br>X16CrMo5-1                                                                                                | 80MoCrV42-16                    | 13MoCrNiV42-16-14   | 50CrMoV13-15                                   | HS6-5-3                                                                   |
|  | GOST<br>(RUSSIA)                         | Ch12                             |                                |                                                     |                                                                                                                        |                                 |                     |                                                |                                                                           |
|  | JIS<br>(JAPAN)                           | SKD 1                            |                                |                                                     | SCMV 6;<br>SFVA F 5 A;<br>SFVA F 5 B;<br>SFVA F 5 C;<br>SFVA 5 D;<br>SNB 5 Class 1;<br>STBA 29;<br>STFA 25;<br>STPA 25 |                                 |                     |                                                | SKH 52;<br>SKH 53                                                         |
|  | SS<br>(SWEDEN)                           |                                  |                                |                                                     |                                                                                                                        |                                 |                     |                                                | 2725                                                                      |
|  | UNE<br>(SPAIN)                           | F.521;<br>F.5212;<br>X 210 Cr 12 |                                |                                                     | F.240.B;<br>TU.J                                                                                                       | 80 MoCrV 40-16;<br>F.1351       |                     |                                                | F.5605;<br>6-5-3                                                          |
|  | UNI<br>(ITALY)                           | X 205 Cr 12 KU                   |                                |                                                     |                                                                                                                        |                                 |                     |                                                |                                                                           |
|  | IS<br>(INDIA)                            | T215Cr12                         |                                |                                                     |                                                                                                                        |                                 |                     |                                                |                                                                           |
|  | KS<br>(REP. OF KOREA)                    |                                  |                                |                                                     |                                                                                                                        |                                 |                     |                                                |                                                                           |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | Cr12                             |                                |                                                     | 1Cr5Mo                                                                                                                 |                                 |                     |                                                |                                                                           |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.      |                                   |                            |                                                      |                                                          |                           |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------|-----------------------------------|----------------------------|------------------------------------------------------|----------------------------------------------------------|---------------------------|
| Standards                                                                           |                                          | 10                      | 11                                | 11                         | 11                                                   | 11                                                       | 11                        |
|    | NF/AFNOR<br>(FRANCE)                     |                         |                                   | Z 110 WKCDV 07-05-04-04-02 | Z 110 DKCWW 09-08-04-02-01;<br>2-9-1-8;<br>HS2-9-1-8 | Z 130 WKCDV 10-10-04-04-03;<br>10-4-3-10;<br>HS10-4-3-10 | HS12-1-4-5                |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                         | M33;<br>T11333;<br>M34;<br>T11334 | M41;<br>T11341             | M42;<br>T11342                                       |                                                          | T15;<br>T12015            |
|    | BS<br>(UK)                               |                         | BM 34                             |                            | BM 42                                                | BT 42                                                    | BT 15                     |
|    | DIN<br>(GERMANY)                         | HS6-5-3C;<br>HS 6-5-3 C | HS2-9-2-8;<br>S 2-9-2-8           | HS7-4-2-5;<br>S 7-4-2-5    | HS2-10-1-8;<br>S 2-10-1-8                            | HS10-4-3-10;<br>S 10-4-3-10                              | HS12-1-4-5;<br>S 12-1-4-5 |
|    | Werkstoff<br>(GERMANY)                   | 1.3345                  | 1.3249                            | 1.3246                     | 1.3247                                               | 1.3207                                                   | 1.3202                    |
|  | EN<br>(EUROPE)                           | HS6-5-3C                |                                   | HS7-4-2-5                  | HS2-10-1-8                                           | HS10-4-3-10                                              |                           |
|  | GOST<br>(RUSSIA)                         |                         |                                   |                            |                                                      | R12F3K10M3-SCh                                           | R13F4K5                   |
|  | JIS<br>(JAPAN)                           |                         |                                   |                            | SKH 59                                               | SKH 57                                                   |                           |
|  | SS<br>(SWEDEN)                           |                         |                                   |                            | 2716                                                 |                                                          |                           |
|  | UNE<br>(SPAIN)                           |                         | 2-9-2-8;<br>F.5611                | F.5615;<br>HS 7-4-2-5      | F.5617;<br>HS 2-10-1-8                               | F.550.B;<br>F.5553;<br>HS 10-4-3-10                      | F.5563;<br>HS 12-1-5-5    |
|  | UNI<br>(ITALY)                           |                         |                                   |                            | HS 2-9-1-8                                           | HS 10-4-3-10                                             | HS 12-1-5-5               |
|  | IS<br>(INDIA)                            |                         |                                   |                            |                                                      |                                                          |                           |
|  | KS<br>(REP. OF<br>KOREA)                 |                         |                                   |                            |                                                      |                                                          |                           |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                         |                                   | W7Mo4Cr4V2Co5              | W2Mo9Cr4VCo8                                         |                                                          | W12Cr4V5Co5               |

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|                                                                                     |                                          | Material Group No.                                                                                               |                                              |                                       |                                               |                       |                                         |                                                      |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------|-----------------------------------------------|-----------------------|-----------------------------------------|------------------------------------------------------|
| Standards                                                                           |                                          | 11                                                                                                               | 11                                           | 11                                    | 11                                            | 11                    | 11                                      | 11                                                   |
|    | NF/AFNOR<br>(FRANCE)                     | 6-5-2-5;<br>6-5-2-5 HC;<br>HS6-5-2-5;<br>HS6-5-2-5HC;<br>Z 85 WDKCV 06-05-05-04-02;<br>Z 90 WDKCV 06-05-05-04-02 | Z 100 DCWV 09-04-02-02;<br>2-9-2;<br>HS2-9-2 | Z 80 WKCV 19-05-04-01;<br>HS 18-1-1-5 | 18-0-1;<br>HS 18-0-1;<br>Z 80 WCV<br>18-04-01 |                       |                                         |                                                      |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                                                                                                  | M7;<br>T11307                                | T4;<br>T12004                         | T1;<br>T12001                                 | HY 130;<br>UNS K51255 | H19;<br>T20819                          | HY 100;<br>K32045;<br>J42240                         |
|    | BS<br>(UK)                               | BM 35                                                                                                            |                                              | BT 4                                  | BT 1                                          |                       |                                         |                                                      |
|    | DIN<br>(GERMANY)                         | HS6-5-2-5;<br>S 6-5-2-5                                                                                          | HS2-9-2;<br>S 2-9-2                          | HS18-1-2-5;<br>S 18-1-2-5             | HS18-0-1;<br>S 18-0-1                         | X10NiMoCrV6           | 38CrCoWV18-17-17;<br>38 CrCoWV 18 17 17 | 20NiCrMo14-6;<br>G19NiCrMo12-6;<br>GS-19 NiCrMo 12 6 |
|    | Werkstoff<br>(GERMANY)                   | 1.3243                                                                                                           | 1.3348                                       | 1.3255                                | 1.3355                                        |                       | 1.2661                                  | 1.6742;<br>1.6783                                    |
|  | EN<br>(EUROPE)                           | HS6-5-2-5                                                                                                        | HS2-9-2                                      | HS18-1-2-5                            | HS18-0-1                                      |                       | 38CrCoWV18-17-17                        |                                                      |
|  | GOST<br>(RUSSIA)                         | R6M5K5                                                                                                           |                                              |                                       | R18                                           |                       |                                         | 12ChN3MD;<br>12ChN3MDF;<br>AB2                       |
|  | JIS<br>(JAPAN)                           | SKH 55                                                                                                           | SKH 58                                       | SKH 3                                 | SKH 2                                         |                       |                                         |                                                      |
|  | SS<br>(SWEDEN)                           | 2723                                                                                                             | 2782                                         |                                       | 2750                                          |                       |                                         |                                                      |
|  | UNE<br>(SPAIN)                           | F.550.C;<br>F.5613;<br>HS 6-5-2-5                                                                                | F.5607;<br>HS 2-9-2                          | F.5530;<br>HS 18-1-1-5                | F.5520;<br>HS 18-0-1                          |                       |                                         |                                                      |
|  | UNI<br>(ITALY)                           | HS 6-5-2-5                                                                                                       | HS 2 9 2                                     | HS 18-1-1-5                           | HS 18-0-1                                     |                       |                                         |                                                      |
|  | IS<br>(INDIA)                            |                                                                                                                  |                                              | T75W18Co6Cr4V1Mo75                    |                                               |                       |                                         |                                                      |
|  | KS<br>(REP. OF<br>KOREA)                 | SKH 55                                                                                                           |                                              |                                       |                                               |                       |                                         |                                                      |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                                                                  | W2Mo9Cr4V2                                   | W18Cr4VCo5                            | W18Cr4V                                       |                       |                                         |                                                      |



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|                                                                                     |                                          | Material Group No. |                |                                   |                     |                                     |                              |                           |                                            |                              |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|----------------|-----------------------------------|---------------------|-------------------------------------|------------------------------|---------------------------|--------------------------------------------|------------------------------|
| Standards                                                                           |                                          | 11                 | 11             | 11                                | 11                  | 11                                  | 12                           | 12                        | 12                                         | 12                           |
|    | NF/AFNOR<br>(FRANCE)                     |                    | Z 2 CN 18-10 M |                                   |                     |                                     | Z 13 CF 17                   | Z 12 CAS 18               |                                            | Z 8 CD 17-01                 |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | M62, T11362        | K92710         | K92890;<br>AMS 6512               | K93120;<br>AMS 6514 | K93540;<br>AMS 6515                 | 430 F;<br>S43020             |                           |                                            | 434;<br>S43400               |
|    | BS<br>(UK)                               |                    |                | BS S162                           |                     |                                     |                              |                           |                                            | 434 S 17                     |
|    | DIN<br>(GERMANY)                         |                    | X2NiCoMo18-8-5 | X2NiCoMo18-9-5;<br>X2NiCoMo18-8-5 | X2NiCoMo18-8-5      | X2NiCoMo18-12;<br>X2NiCoMoTi18-12-4 | X12CrMoS17;<br>X 12 CrMoS 17 | X10CrAlSi18;<br>X10CrAl18 | X10CrAlSi13;<br>X10CrAl13;<br>X 10 CrAl 13 | X6CrMo17-1;<br>X 6 CrMo 17 1 |
|    | Werkstoff<br>(GERMANY)                   |                    | 1.636          | 1.6358;<br>1.6359                 | 1.6354;<br>1.6359   | 1.6355;<br>1.6356                   | 1.4104                       | 1.4742                    | 1.4724                                     | 1.4113                       |
|   | EN<br>(EUROPE)                           | HS 6-10-2          | X2NiCoMo18-8-5 | X2NiCoMo18-8-5                    | X2NiCoMo18-8-5      |                                     | X12CrMoS17                   | X10CrAlSi18               | X10CrAlSi13                                | X6CrMo17-1                   |
|  | GOST<br>(RUSSIA)                         |                    |                |                                   |                     |                                     |                              | 15Ch18SJ <sub>u</sub>     | 10Ch13SJ <sub>u</sub>                      |                              |
|  | JIS<br>(JAPAN)                           |                    |                |                                   |                     |                                     | SUS 430 F                    | SUS 21                    |                                            | SUS 434                      |
|  | SS<br>(SWEDEN)                           |                    |                |                                   |                     |                                     | 2383                         |                           |                                            | 2325                         |
|  | UNE<br>(SPAIN)                           |                    |                |                                   |                     |                                     | F.3413                       | F.3113;<br>X 10 CrAl 18   | F.3152;<br>X 10 CrAl 13                    | F.3116                       |
|  | UNI<br>(ITALY)                           |                    |                |                                   |                     |                                     | X 10 CrS 17                  |                           | X 10 CrAl 12                               |                              |
|  | IS<br>(INDIA)                            |                    |                |                                   |                     |                                     |                              |                           |                                            |                              |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |                |                                   |                     |                                     |                              |                           |                                            | STS 434                      |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |                |                                   |                     |                                     | Y1Cr17                       | Cr17                      | 1Cr13SiAl                                  | 1Cr17Mo                      |

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| Standards                                                                           |                                          | Material Group No.             |                                            |                                      |                 |                                      |                                                                                                                       |                                       |                          |        |                                                                       |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------|--------------------------------------------|--------------------------------------|-----------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------|--------|-----------------------------------------------------------------------|
|                                                                                     |                                          | 12                             | 12                                         | 12                                   | 12              | 12                                   | 12                                                                                                                    | 12                                    | 12                       | 12     | 12                                                                    |
|    | NF/AFNOR<br>(FRANCE)                     | Z 80 CSN 20-02                 | Z 10 CAS 24                                | Z 8 C 13 FF                          | X 89 CrMoV 18-1 | Z 8 C 12                             | Z 10 C 13;<br>Z 13 C 13                                                                                               | Z 8 CA 12                             | Z 11 CF 13               |        | Z 8 C 17                                                              |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | HNV-6;<br>HNV6;<br>S65006      | 446;<br>S44600                             | 429;<br>S42900                       | 440B;<br>S44003 | 410S;<br>403;<br>S41008;<br>S40300   | 410;<br>S41000;<br>S41001;<br>CA-15;<br>ASTM A182 Fa                                                                  | 405;<br>S40500                        | 416;<br>S41600           |        | 430;<br>S43000                                                        |
|    | BS<br>(UK)                               | 443 S 65                       |                                            |                                      |                 | 403 S 17                             | 410 S 21;<br>ANC 1 grade A;<br>En 56 A                                                                                | 405 S 17                              | 416 S 21;<br>En 56 AM    |        | 430 S 17;<br>430 S 15;<br>430 S 18                                    |
|    | DIN<br>(GERMANY)                         | X80CrNiSi20;<br>X 80 CrNiSi 20 | X10CrAlSi25;<br>X10CrAl24;<br>X 10 CrAl 24 | X7Cr14;<br>X 7 Cr 14;<br>G-X 7 Cr 13 | X90CrMoV18      | X6Cr13;<br>X 6 Cr 13                 | X12Cr13;<br>GX12Cr13;<br>X 12 Cr 13;<br>X 10 Cr 13                                                                    | X6CrAl13;<br>X 6 CrAl 13              | X12CrS13;<br>X 12 CrS 13 | X8Cr17 | X6Cr17;<br>X 6 Cr 17                                                  |
|    | Werkstoff<br>(GERMANY)                   | 1.4747                         | 1.4762                                     | 1.4001                               | 1.4112          | 1.4000                               | 1.4006                                                                                                                | 1.4002                                | 1.4005                   | 1.4015 | 1.4016                                                                |
|   | EN<br>(EUROPE)                           |                                | X10CrAlSi25                                | X7Cr14                               | X90CrMoV18      | X6Cr13                               | X13Cr13                                                                                                               | X6CrAl13                              | X12CrS13                 |        | X6Cr17                                                                |
|  | GOST<br>(RUSSIA)                         |                                |                                            |                                      |                 | 08Ch13                               | 12Ch13;<br>15Ch13L                                                                                                    |                                       |                          |        | 12Ch17                                                                |
|  | JIS<br>(JAPAN)                           | SUH 4                          | SUH 446                                    | SUS 4105                             |                 | SUS 403;<br>SUS 403 FB;<br>SUS 410 S | SUS 410;<br>SUS 410 FB;<br>SUS 410 TB;<br>SUS 410 TKA;<br>SUS 410 TKC;<br>SUS F 410-A;<br>SUS F 410-B;<br>SUS F 410-C | SUS 405;<br>SUS 405 TB;<br>SUS 405 TP | SUS 416                  |        | SUS 430;<br>SUS 430 TB;<br>SUS 430 TKA;<br>SUS 430 TKC;<br>SUS 430 TP |
|  | SS<br>(SWEDEN)                           |                                | 2322                                       |                                      |                 | 2301                                 | 2302                                                                                                                  |                                       | 2380                     |        | 2320                                                                  |
|  | UNE<br>(SPAIN)                           | F.320B                         | F.3154                                     |                                      | SUS 440B        | F.3110                               | F.3401                                                                                                                | F.3111                                | F.3411                   |        | F.310.D;<br>F.3113                                                    |
|  | UNI<br>(ITALY)                           | X 80 CrSiNi 20                 |                                            |                                      |                 | X 6 Cr 13                            | X 12 Cr 13 KG;<br>X 12 Cr 13 KW                                                                                       | X 6 CrAl 13                           | X12 CrS 13               |        | X 8 Cr 17                                                             |
|  | IS<br>(INDIA)                            | X80Cr20Si2Ni1                  |                                            |                                      |                 |                                      |                                                                                                                       |                                       |                          |        |                                                                       |
|  | KS<br>(REP. OF<br>KOREA)                 | STR 1                          | STR 446                                    |                                      |                 | STS 403                              | STS 410                                                                                                               | STS 405                               | STS 416                  |        | STS 430                                                               |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                | 2Cr25N                                     | Mi0Cr18Ni12                          | 9Cr18MoV        | 1Cr13;<br>1Cr12                      | 1Cr13                                                                                                                 | 0Cr13Al                               | Y1Cr13                   |        | 1Cr17                                                                 |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                        |                                                                                      |                             |                            |                                               |           |                             |                                          |                                    |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------|----------------------------|-----------------------------------------------|-----------|-----------------------------|------------------------------------------|------------------------------------|
| Standards                                                                           |                                          | 12                                                        | 12                                                                                   | 12                          | 12                         | 12                                            | 12        | 12                          | 12                                       | 12                                 |
|    | NF/AFNOR<br>(FRANCE)                     | Z 20 C 13 M                                               | Z 33 C 13 Cl;<br>Z 33 C 13;<br>Z 30 C 13                                             |                             |                            | Z 4 CT 17                                     | Z 12 C 25 | Z 4 CNb 17                  | Z 3 CT 12                                | Z 6 CND 16-04-01                   |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                                           | 420F;<br>S42020                                                                      |                             |                            | 439;<br>430 Ti;<br>S43035;<br>S43036;<br>XM 8 | 446-1     |                             | 409;<br>S40900                           |                                    |
|    | BS<br>(UK)                               | ANC 1 grade B;<br>ANC 1 grade C;<br>420 C 24;<br>420 C 29 | 420 S 37;<br>420 S 45;<br>En 56 C;<br>En 56 D                                        | 452 C 11                    |                            |                                               |           |                             | LW 19;<br>409 S 19                       |                                    |
|    | DIN<br>(GERMANY)                         | GX20Cr14                                                  | X30Cr13;<br>X 30 Cr 13                                                               | GX120Cr29;<br>G-X 120 Cr 29 | X20CrMo13;<br>X 20 CrMo 13 | X3CrTi17;<br>X 6 CrTi 17                      | X18CrN28  | X3CrNb17;<br>X 6 CrNb 17    | X2CrTi12;<br>X 6 CrTi 12                 | X4CrNiMo16-5-1;<br>X 4 CrNiMo 16 5 |
|    | Werkstoff<br>(GERMANY)                   | 1.4027                                                    | 1.4028                                                                               | 1.4086                      | 1.4720                     | 1.4510                                        | 1.4749    | 1.4511                      | 1.4512                                   | 1.4418                             |
|   | EN<br>(EUROPE)                           |                                                           | X30Cr13                                                                              |                             |                            | X3CrTi17                                      | X18CrN28  | X3CrNb17                    | X2CrTi12                                 | X4CrNiMo16-5-1                     |
|  | GOST<br>(RUSSIA)                         | 20Ch13L                                                   | 30Ch13                                                                               |                             |                            | 08Ch17T                                       |           |                             |                                          |                                    |
|  | JIS<br>(JAPAN)                           | SCS 2                                                     | SUS 420 F;<br>SUS 420 J 2;<br>SUS 420 J 2-CSP;<br>SUS 420 J 2 FB;<br>SUS 420 J 2 TKA |                             |                            | SUS 430 LX;<br>SUS 430 LXTB;<br>SUS XM8TB     |           | SUS 430 LX;<br>SUS 430 LXTB | SUH 409 L;<br>SUS 409 LTB;<br>SUS 409 TB |                                    |
|  | SS<br>(SWEDEN)                           |                                                           | 2304                                                                                 |                             |                            |                                               |           |                             |                                          | 2387                               |
|  | UNE<br>(SPAIN)                           |                                                           | F.3403                                                                               |                             |                            | F.3115;<br>X 5 CrTi 17                        |           | F.3122;<br>X 5 CrNb 17      | F.3121                                   |                                    |
|  | UNI<br>(ITALY)                           |                                                           | X 30 Cr 13                                                                           |                             |                            | X 6 CrTi 17                                   |           | X 6 CrNb 17                 | X 6 CrTi 12                              |                                    |
|  | IS<br>(INDIA)                            |                                                           | X30Cr13                                                                              |                             |                            |                                               |           |                             |                                          |                                    |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                           | STS 420J2                                                                            |                             |                            | STS 430LX                                     |           | STS 430LX                   | SUH 409                                  |                                    |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | ZG2Cr13                                                   | 3Cr13                                                                                |                             |                            | 1Cr17Ti                                       |           | 1Cr17                       |                                          |                                    |

## Material Designation in Accordance with Selected Standards

|                                                                                                                            |  | Material Group No.                                 |                                               |                                       |                            |                                                   |                                                     |                                                    |                                            |
|----------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------|-----------------------------------------------|---------------------------------------|----------------------------|---------------------------------------------------|-----------------------------------------------------|----------------------------------------------------|--------------------------------------------|
| Standards                                                                                                                  |  | 12                                                 | 12                                            | 12                                    | 13                         | 13                                                | 13                                                  | 13                                                 | 13                                         |
|  NF/AFNOR (FRANCE)                        |  | Z 20 C 13 Cl;<br>Z 20 C 13                         | TU Z 10 CDVNA 49-213;<br>TU Z 10 CDVNA 49-219 | Z 3 CDT 18-02;<br>Z 3 CDT 18-2        | Z 40 C 14 Cl;<br>Z 40 C 14 |                                                   | Z 20 CDNbV 11                                       | Z 20 C 13 Cl;<br>Z 20 C 13                         | Z 44 C 14 Cl;<br>Z 44 C 14;<br>Z 38 C 13 M |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  | 420;<br>S42000                                     | K91560;<br>K90901;<br>P91;<br>F91;<br>T91     | 443;<br>444;<br>S44300;<br>S44400     | 420;<br>S42000;<br>S42080  |                                                   |                                                     | 420;<br>S42000                                     | 420;<br>S42000                             |
|  BS (UK)                                  |  | 420 S 37;<br>420 S 29;<br>En 56 C                  |                                               |                                       |                            | BS 762                                            |                                                     | 420 S 37;<br>420 S 29;<br>En 56 C                  |                                            |
|  DIN (GERMANY)                            |  | X20Cr13;<br>X 20 Cr 13                             | X10CrMoVNb9-1;<br>X 10 CrMoVNb 9 1            | X2CrMoTi18-2;<br>X 2 CrMoTi 18 2      | X39Cr13;<br>X 38 Cr 13     | X20CrMoV11-1;<br>X20CrMoV12-1;<br>X 20 CrMoV 12 1 | X22CrMoV12-1;<br>X21CrMoNiV12-1;<br>X 22 CrMoV 12 1 | X20Cr13;<br>X 20 Cr 13                             | X46Cr13;<br>X 46 Cr 13                     |
|  Werkstoff (GERMANY)                      |  | 1.4021                                             | 1.4903                                        | 1.4521                                | 1.4031                     | 1.4922                                            | 1.4923;<br>1.4934                                   | 1.4021                                             | 1.4034                                     |
|  EN (EUROPE)                             |  | X20Cr13                                            | X10CrMoVNb9-1                                 | X2CrMoTi18-2                          | X39Cr13                    | X20CrMoV11-1;<br>X20CrMoV12-1                     | X22CrMoV12-1;<br>X21CrMoNiV12-1                     | X20Cr13                                            | X46Cr13                                    |
|  GOST (RUSSIA)                          |  | 20Ch13                                             |                                               |                                       | 40Ch13                     |                                                   | 18Ch11MNFb;<br>EP 291;<br>2Ch11MFBn                 | 20Ch13                                             | 40Ch13                                     |
|  JIS (JAPAN)                            |  | SUS 420 J 1;<br>SUS 420 J 1 FB;<br>SUS 420 J 1 TKA |                                               | SUS 444;<br>SUS 444 TB;<br>SUS 444 TP | SUS 420 J 2                |                                                   |                                                     | SUS 420 J 1;<br>SUS 420 J 1 FB;<br>SUS 420 J 1 TKA |                                            |
|  SS (SWEDEN)                            |  | 2303                                               |                                               | 2326                                  | 2304                       | 2317                                              |                                                     | 2303                                               |                                            |
|  UNE (SPAIN)                            |  | F.310.J;<br>F.3402                                 |                                               | F.3123;<br>X 2 CrMoTiNb 18 2          | F.3404;<br>X40 Cr 13       |                                                   |                                                     | F.310.J;<br>F.3402;<br>X 20 Cr 13                  | F.3405;<br>X 40 Cr 13                      |
|  UNI (ITALY)                            |  | X 20 Cr 13                                         |                                               |                                       | X 40 Cr 14                 | X 20 CrMoNi 12 01                                 |                                                     | X 20 Cr 13                                         | X 40 Cr 14                                 |
|  IS (INDIA)                             |  | X20Cr13                                            |                                               |                                       |                            |                                                   |                                                     | X20Cr13                                            |                                            |
|  KS (REP. OF KOREA)                     |  |                                                    |                                               | STS 444                               |                            |                                                   |                                                     |                                                    |                                            |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  | 2Cr13                                              |                                               | 1Cr15                                 | 3Cr13                      |                                                   |                                                     | 2Cr13                                              | 4Cr13                                      |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                              |                                                          |                              |                                    |                                                 |                        |                                 |                                                 |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------|----------------------------------------------------------|------------------------------|------------------------------------|-------------------------------------------------|------------------------|---------------------------------|-------------------------------------------------|
| Standards                                                                           |                                          | 13                                              | 13                                                       | 13                           | 13                                 | 13                                              | 13                     | 13                              | 13                                              |
|    | NF/AFNOR<br>(FRANCE)                     | Z 15 CN 16.02 C1;<br>Z 15 CN 16-02              | Z 6 CN 13-04;<br>Z 6 CN 13-4;<br>Z 4 CND 13.4 M          |                              |                                    | Z 45 CS 9                                       | X40Cr14;<br>Z 40 C 14  | Z 4 CND 13 4 M                  | MARVAL X12H                                     |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 431;<br>S43100                                  | 415;<br>CA 6-NM;<br>S41500;<br>J91540;<br>ASTM A182 F6NM |                              | 422;<br>HNV 8;<br>S42200           | HNV 3;<br>S65007                                |                        | CA 6-NM;<br>J91540              | S10120;<br>AMS 5935                             |
|    | BS<br>(UK)                               | 431 S 29;<br>En 57                              |                                                          |                              |                                    | 401 S 45;<br>En 52                              |                        | 425 C 11;<br>425 C 12           |                                                 |
|    | DIN<br>(GERMANY)                         | X17CrNi16-2;<br>X 20 CrNi 17 2;<br>X 22 CrNi 17 | X3CrNiMo13-4;<br>X 4 CrNi 13 4                           | X39CrMo17-1;<br>X 35 CrMo 17 | X20CrMoWV12-1;<br>X 20 CrMoWV 12 1 | X45CrSi9-3;<br>X 45 CrS 9 3;<br>G-X 45 CrNi 9 3 | X40Cr14;<br>X 42 Cr 13 | GX4CrNi13-4;<br>G-X 5 CrNi 13 4 | X1CrNiMoAlTi 12-10-2;<br>X 1 CrNiMoAlTi 12 10 2 |
|    | Werkstoff<br>(GERMANY)                   | 1.4057                                          | 1.4313                                                   | 1.4122                       | 1.4935                             | 1.4718                                          | 1.2083;<br>1.2083 ESR  | 1.4317                          | 1.4596                                          |
|   | EN<br>(EUROPE)                           | X17CrNi16-2                                     | X3CrNiMo13-4                                             | X39CrMo17-1                  | X20CrMoWV12-1                      | X45CrSi9-3                                      | X40Cr14                | GX4CrNi13-4                     | X1CrNiMoAlTi 12-10-2                            |
|  | GOST<br>(RUSSIA)                         | 14Ch17N2;<br>20Ch17N2                           |                                                          |                              |                                    | 40Ch9S2;<br>4Ch9S2                              |                        |                                 |                                                 |
|  | JIS<br>(JAPAN)                           | SUS 431;<br>SUS 431 FB                          |                                                          |                              |                                    | SUH 1                                           | SUS 420 J 2            | SCS 6;<br>SCS 6X                |                                                 |
|  | SS<br>(SWEDEN)                           | 2321                                            | 2384                                                     |                              |                                    |                                                 | 2314                   |                                 |                                                 |
|  | UNE<br>(SPAIN)                           | F.313;<br>F.3427;<br>X 19 CrNi 17 2             |                                                          |                              |                                    | F.322;<br>F.3220                                | F.5263;<br>X 40 Cr 13  |                                 |                                                 |
|  | UNI<br>(ITALY)                           | X16 CrNi 16                                     |                                                          | X 39 CrMo 17-1               |                                    | X 45 CrSi 8                                     | X 41 Cr 13 KU          | GX 6 CrNi 13 04                 |                                                 |
|  | IS<br>(INDIA)                            |                                                 |                                                          |                              |                                    | X45Cr9Si3                                       |                        |                                 |                                                 |
|  | KS<br>(REP. OF<br>KOREA)                 | STS 431                                         |                                                          |                              |                                    | STR 1                                           |                        |                                 |                                                 |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 1Cr17Ni2                                        |                                                          |                              |                                    | 4Cr9Si2                                         | 3Cr13                  |                                 |                                                 |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.             |                                       | Material Group No.                                                                                                             |                 |                                                                                                                     |               |                                        |                                                  |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------|---------------|----------------------------------------|--------------------------------------------------|
| Standards                                                                           |                                          | 13                             | 13                                    | 14                                                                                                                             | 14              | 14                                                                                                                  | 14            | 14                                     | 14                                               |
|    | NF/AFNOR<br>(FRANCE)                     | Z 100 CD 17 Cl;<br>Z 100 CD 17 |                                       | Z 6 CNT 18-10                                                                                                                  |                 | Z 6 CND 17-11;<br>Z 6 CND 17-11-02-FF;<br>Z 7 CND 17-11-02;<br>Z 7 CND 17-12-02                                     | Z20CNS25.04   | Z 10 CN 18.9 M                         |                                                  |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 440C;<br>S44004;<br>S44025     |                                       | 321;<br>S32100                                                                                                                 |                 | 316;<br>316H;<br>316 H;<br>S31600;<br>S31609                                                                        |               | J92701                                 |                                                  |
|    | BS<br>(UK)                               |                                |                                       | 321 S 31;<br>LW 18;<br>LW 24;<br>LWCF 18;<br>LWCF 24;<br>321 S 12;<br>321 S 50;<br>321 S 51;<br>321 S 50-490;<br>1010;<br>1115 |                 | 316 S 31;<br>316 S 33;<br>316 S 17;<br>316 S 19;<br>316 S 40;<br>316 S 41;<br>845                                   |               | ANC 3 grade A;<br>ANC 3 A;<br>302 C 25 |                                                  |
|    | DIN<br>(GERMANY)                         | X105CrMo17;<br>X105 CrMo 17    | GX4CrNiMo16-5-1;<br>G-X 5 CrNiMo 15 5 | X6CrNiTi18-10                                                                                                                  | X2CrNiMo18-13-3 | X5CrNiMo17-12-2;<br>X 5 CrNiMo 18 10                                                                                | X20CrNiSi25-4 | GX10CrNi18-8                           | GX7CrNiMoCuNb18-18;<br>G-X 7 CrNiMoCuNb<br>18 18 |
|  | Werkstoff<br>(GERMANY)                   | 1.4125                         | 1.441                                 | 1.4541                                                                                                                         | 1.4425          | 1.4401                                                                                                              | 1.4821        | 1.4312                                 | 1.4585                                           |
|  | EN<br>(EUROPE)                           | X105CrMo17                     |                                       | X6CrNiTi18-10                                                                                                                  |                 | X5CrNiMo17-12-2                                                                                                     | X20CrNiSi25-4 |                                        |                                                  |
|  | GOST<br>(RUSSIA)                         | 95Ch18;<br>110Ch18M-SchD       |                                       | 06Ch18N10T;<br>08Ch18N10T;<br>09Ch18N10T;<br>12Ch18N10T                                                                        |                 | 08Ch16N11M3                                                                                                         |               | 10Ch18N9L                              |                                                  |
|  | JIS<br>(JAPAN)                           | SUS 440 C                      |                                       | SUS 321                                                                                                                        |                 | SUS 316;<br>SUS 316 A;<br>SUS 316 FB;<br>SUS 316 HFB;<br>SUS 316 HTB;<br>SUS 316 HTP;<br>SUS 316 TB;<br>SUS 316 TBS |               | SCS 12;<br>SCS 13A                     |                                                  |
|  | SS<br>(SWEDEN)                           |                                |                                       | 2337                                                                                                                           |                 | 2347                                                                                                                |               |                                        |                                                  |
|  | UNE<br>(SPAIN)                           |                                |                                       | F.332;<br>F.3523;<br>X 6 CrNiTi 18 10                                                                                          |                 | F.310.A;<br>F.3534;<br>X 5 CrNiMo 17 12 2                                                                           |               |                                        |                                                  |
|  | UNI<br>(ITALY)                           |                                |                                       | X 6 CrNiTi 18 11;<br>X 6 CrNiTi 18 11 KG;<br>X 6 CrNiTi 18 11 KW;<br>X 6 CrNiTi 18 11 KT                                       |                 | X 5 CrNiMo 17 12;<br>X 5 CrNiMo 17 12 KG;<br>X 5 CrNiMo 17 12 KW                                                    |               |                                        | X 6 CrNiMoTi 17 12                               |
|  | IS<br>(INDIA)                            |                                |                                       |                                                                                                                                |                 |                                                                                                                     |               |                                        |                                                  |
|  | KS<br>(REP. OF<br>KOREA)                 |                                |                                       | STS 321                                                                                                                        |                 | STS 316                                                                                                             |               | SSC 13A                                |                                                  |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 9Cr18                          |                                       | 1Cr18Ni9Ti                                                                                                                     |                 | 0Cr17Ni12Mo2                                                                                                        |               | ZG0Cr18Ni9Ti                           |                                                  |

## Material Designation in Accordance with Selected Standards

|                                                                                                                 |  | Material Group No.                    |                                               |                                                                                                                                 |                                                                                                        |                                                                     |                                         |                   |
|-----------------------------------------------------------------------------------------------------------------|--|---------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------|-------------------|
| Standards                                                                                                       |  | 14                                    | 14                                            | 14                                                                                                                              | 14                                                                                                     | 14                                                                  | 14                                      | 14                |
|  NF/AFNOR (FRANCE)             |  | Z 4 CnNb 19.10 M;<br>Z 6 CnNb 18.10 M | 23 NCDU 25.20 M                               | Z 4 CN 19-10 FF;<br>Z 5 CN 17-08;<br>Z 6 CN 18-09;<br>Z 7 CN 18-09                                                              | Z 1 CN 18-12;<br>Z 2 CN 18-10;<br>Z 3 CN 19.10 M;<br>Z 3 CN 18-10;<br>Z 3 CN 19-11;<br>Z 3 CN 19-11 FF | Z 6 CN 18.10 M;<br>Z 6 CN 19.9 M                                    | Z 10 CND 18.9 M                         | Z 12 CMN 17-07 Az |
|  AISI/ASM/ASTM/SAE/UNS/AA (US) |  | 347;<br>J92640;<br>J82710             |                                               | 304;<br>S30400                                                                                                                  | 304L;<br>304 L;<br>S30403;<br>J92500;<br>J92600                                                        | 304H;<br>304 H;<br>CF-8;<br>J92590;<br>J92600;<br>J92650;<br>J92710 | J92701                                  | 201;<br>S20100    |
|  BS (UK)                       |  | 347 C 17;<br>821 grade Nb             |                                               | 304 S 15;<br>304 S 31;<br>LW 13;<br>LW 15;<br>LW 21;<br>LWCF 13;<br>LWCF 15;<br>302 S 17;<br>304 S 16;<br>304 S 17;<br>304 S 40 | 304 S 11;<br>LW 20;<br>LWCF 20;<br>S.536;<br>T.74;<br>304 C 12;<br>305 S 11                            | 304 C 15                                                            | ANC 3 grade A;<br>ANC 3 A;<br>3025 S 25 |                   |
|  DIN (GERMANY)                |  | GX5CrNiNb19-11;<br>G-X 5 CrNiNb 18 9  | GX7NiCrMoCuNb25-20;<br>G-X 7 NiCrMoCuNb 25-20 | X5CrNi18-10;<br>X 5 CrNi 18 9                                                                                                   | X2CrNi19-11;<br>GXCrNi19-11                                                                            | GX5CrNi19-10;<br>G-X 6 CrNi 18 9                                    | GX10CrNi18-8;<br>G-X 10 CrNi 18 8       | X12CrMnNiN17-7-5  |
|  Werkstoff (GERMANY)         |  | 1.4552                                | 1.4500                                        | 1.430                                                                                                                           | 1.4306;<br>1.4309                                                                                      | 1.4308                                                              | 1.4312                                  | 1.4372            |
|  EN (EUROPE)                 |  | GX5CrNiNb19-11                        |                                               | X5CrNi18-10                                                                                                                     | X2CrNi19-11;<br>GXCrNi19-11                                                                            | GX5CrNi19-10;<br>58E                                                | GX10CrNi18-8                            | X12CrMnNiN17-7-5  |
|  GOST (RUSSIA)               |  |                                       |                                               | 08Ch18N10                                                                                                                       | 03Ch18N11                                                                                              | 07Ch18N9L                                                           | 10Ch18N9L                               |                   |
|  JIS (JAPAN)                 |  | SCS 21;<br>SCS 21 X                   |                                               | SUS 304;<br>SUS 304 A;<br>SUS 304-CSP;<br>SUS 304 FB;<br>SUS 304 TB;<br>SUS 304 TBS;<br>SUS 304 TKA;<br>SUS 304 TKC             | SCS19                                                                                                  | SCS 13;<br>SCS 13 A;<br>SCS 13 X                                    | SCS 12                                  | SUS 201           |
|  SS (SWEDEN)                 |  |                                       |                                               | 2333;<br>2332                                                                                                                   | 2352                                                                                                   |                                                                     |                                         |                   |
|  UNE (SPAIN)                 |  | AM-X 7 CrNiNb 20 10;<br>F.8413        |                                               | F.3504;<br>X 5 CrNi 18 10                                                                                                       | F.310.G;<br>F.3503;<br>X 2 CrNi 19 10;<br>AM-X 2 CrNi 19 10;<br>F.8412                                 | AM-X 7 CrNi 20 10;<br>F.8411                                        |                                         |                   |
|  UNI (ITALY)                 |  |                                       |                                               | X 5 CrNi 18 10;<br>X 5 CrNi 18 10 KG;<br>X 5 CrNi 18 10 KW;<br>X 5 CrNi 18 10 KT                                                | X 3 CrNi 18 11;<br>X 2 CrNi 18 11;<br>GX 2 CrNi 19 10                                                  |                                                                     |                                         |                   |
|  IS (INDIA)                  |  |                                       |                                               |                                                                                                                                 |                                                                                                        |                                                                     |                                         |                   |
|  KS (REP. OF KOREA)          |  |                                       |                                               | STS 304                                                                                                                         |                                                                                                        |                                                                     |                                         |                   |
|  GB/YB/JB/SY/NB (PRC)        |  | ZG1Cr18Ni9Ti                          |                                               | 0Cr19Ni9                                                                                                                        | ZG0Cr18Ni9                                                                                             | ZG1Cr18Ni9                                                          | ZG0Cr18Ni9Ti                            | 1Cr17Mn6Ni5N      |



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|                                                                                     |                                          | Material Group No.                                                                                                 |                                                                                                      |                                                               |                                                        |                                          |                                                                                 |                                          |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------|
| Standards                                                                           |                                          | 14                                                                                                                 | 14                                                                                                   | 14                                                            | 14                                                     | 14                                       | 14                                                                              | 14                                       |
|    | NF/AFNOR<br>(FRANCE)                     | Z 6 CND 18-12-03;<br>Z 6 CND 18-13;<br>Z 7 CND 18-12-03                                                            | Z 2 CND 17-12;<br>Z 3 CND 17-11-02;<br>Z 3 CND 17-12-02;<br>Z 3 CND 17-12-02 FF;<br>Z 3 CND 18-12-03 | Z 2 CND 17-11 Az                                              |                                                        | Z 3 CND 17-12 Az                         | Z 3 CND 17-12-03;<br>Z 3 CND 18-14-03                                           | Z 3 CND 18-14-05 Az                      |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 316;<br>S31600                                                                                                     | 316L;<br>316 L;<br>S31603;<br>J92700;<br>J92800                                                      | 316LN;<br>316 LN;<br>S31653                                   | CF-8M;<br>J92900                                       | 316LN;<br>316 LN;<br>S31563              | 316L;<br>316 L;<br>S31603;<br>J92800                                            | S31726                                   |
|    | BS<br>(UK)                               | 316 S 31;<br>316 S 33;<br>LW 23;<br>LWCF 23;<br>316 S 19;<br>316 S 40;<br>316 S 41;<br>1.4436                      | 316 S 11;<br>316 S 13;<br>316 S 14;<br>316 S 30;<br>S.161;<br>S.537;<br>T.75                         | 316 S 61;<br>316 S 63                                         | ANC 4 grade B;<br>ANC 4 B;<br>316 C 16;<br>845 grade B | 316 S 63                                 | 316 S 13;<br>316 S 11;<br>316 S 14;<br>316 S 31;<br>LW 22;<br>LWCF 22;<br>845 B |                                          |
|   | DIN<br>(GERMANY)                         | X3CrNiMo17-13-3;<br>X 5 CrNiMo 17 13 3                                                                             | X2CrNiMo17-12-2;<br>X2CrNiMo17-13-2;<br>X 2 CrNiMo 17 12 2;<br>X 2 CrNiMo 17 13 2                    | X2CrNiMoN17-11-2;<br>X2CrNiMoN17-12-2;<br>X 2 CrNiMoN 17 12 2 | GX5CrNiMo 19-11-2;<br>G-X 6 CrNiMo 18 10               | X2CrNiMoN17-13-3;<br>X 2 CrNiMoN 17 13 3 | X2CrNiMo18-4-3;<br>X 2 CrNiMo18 14 3                                            | X2CrNiMoN17-13-5;<br>X 2 CrNiMoN 17 13 5 |
|  | Werkstoff<br>(GERMANY)                   | 1.444                                                                                                              | 1.4404                                                                                               | 1.4406                                                        | 1.4408                                                 | 1.4429                                   | 1.4435                                                                          | 1.4439                                   |
|  | EN<br>(EUROPE)                           | X3CrNiMo17-13-3                                                                                                    | X2CrNiMo17-13-2                                                                                      | X2CrNiMoN17-11-2                                              | GX5CrNiMo 19-11-2                                      | X2CrNiMoN17-13-3                         | X2CrNiMo18-4-3                                                                  | X2CrNiMoN17-13-5                         |
|  | GOST<br>(RUSSIA)                         |                                                                                                                    |                                                                                                      |                                                               | 07Ch18N10G2S2M2L                                       |                                          | O3Ch17N14M3                                                                     |                                          |
|  | JIS<br>(JAPAN)                           | SUS 316;<br>SUS 316 A;<br>SUS 316 FB;<br>SUS 316 TB;<br>SUS 316 TBS;<br>SUS 316 TKA;<br>SUS 316 TKC;<br>SUS 316 TP | SUS 316 L;<br>SUS 316 LFB;<br>SUS 316 LTBS;<br>SUS 316 LTP;<br>SUS 316 F 316 L                       | SUS 316 LN;<br>SUS F 316 LN                                   | SCS 14;<br>SCS 14 A;<br>SCS 14 X                       | SUS 316 LN;<br>SUS F 316 LN              | SUS 316 L;<br>SUS 316 LFB;<br>SUS 316 LTBS;<br>SUS 316 LTP;<br>SUS F 316 L      |                                          |
|  | SS<br>(SWEDEN)                           | 2343                                                                                                               | 2348                                                                                                 |                                                               |                                                        | 2375                                     | 2353                                                                            |                                          |
|  | UNE<br>(SPAIN)                           | F.3538;<br>X 5 CrNiMo 17 13 3                                                                                      | F.310.K;<br>F.3533;<br>F.3537                                                                        | F.3542;<br>X 2 CrNiMoN 17 12 2                                | AM-X 7 CrNiMo 20 10;<br>F.8414                         | F.3543;<br>X 2 CrNiMoN 17 13 3           | F.3533-X2 CrNiMo 17 13 2                                                        | F.3544;<br>X 2 CrNiMoN 17 13 5           |
|  | UNI<br>(ITALY)                           | X 5 CrNiMo 17 13;<br>X 8 CrNiMo 17 13                                                                              | X 2 CrNiMo 17 12                                                                                     | X 2 CrNiMoN 17 12                                             |                                                        | X 2 CrNiMoN 17 13                        | X 2 CrNiMoN 17 13;<br>X 2 CrNiMoN 17 13 KG;<br>X 2 CrNiMoN 17 13 KW             |                                          |
|  | IS<br>(INDIA)                            |                                                                                                                    |                                                                                                      |                                                               |                                                        |                                          |                                                                                 |                                          |
|  | KS<br>(REP. OF KOREA)                    | STS 316                                                                                                            | STS 316L                                                                                             | STS 316LN                                                     | SSC 14                                                 | STS 316LN                                | STS 316L                                                                        |                                          |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 0Cr17Ni12Mo2                                                                                                       | 00Cr17Ni14Mo2                                                                                        | 00Cr18Ni14Mo2Cu2                                              | ZG1Cr24Ni20Mo2Cu3                                      | 0Cr17Ni13Mo                              | 00Cr17Ni14Mo2                                                                   |                                          |

## Material Designation in Accordance with Selected Standards

|                                                                                                                            |  | Material Group No.                                  |                                                                        |                                              |                                   |                                      |                                                 |                                                         |
|----------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|--------------------------------------|-------------------------------------------------|---------------------------------------------------------|
| Standards                                                                                                                  |  | 14                                                  | 14                                                                     | 14                                           | 14                                | 14                                   | 14                                              | 14                                                      |
|  NF/AFNOR<br>(FRANCE)                     |  |                                                     | Z 6 CNDT 17-12                                                         | Z 15 CN 23-13;<br>Z 15 CN 24-13              |                                   |                                      | Z 5 CN 18-09                                    | Z 4 CNDNb 18.12 M                                       |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  | 317;<br>S31700                                      | 316 Ti;<br>S31635                                                      | 309S;<br>309 S;<br>309;<br>S30908;<br>S30900 | S30415                            | S30815                               | 304H;<br>304 H;<br>S30409;<br>S30480            |                                                         |
|  BS<br>(UK)                               |  | 317 S 16                                            | 320 S 31;<br>320 S 18                                                  | 309 S 24                                     |                                   |                                      | 304 S 50;<br>304 S 51;<br>801 grade A           | ANC 4 grade C;<br>ANC 4 C;<br>318 C 17;<br>845 grade Nb |
|  DIN<br>(GERMANY)                         |  | X3CrNiMo18-12-3                                     | X6CrNiMoTi17-12-2;<br>X 6 CrNiMoTi 17 12 2                             | X12CrNi23-13;<br>X 7 CrNi 23 14              | X4CrNiSi18-10;<br>X 4 CrNiSi18 10 | X9CrNiSiN18-11-2;<br>X 8 CrNiSi18 11 | X6CrNi18-10;<br>X6CrNi18-11;<br>X 6 CrNi 18 11; | GX5CrNiMoNb19-11-2;<br>G X 5 CrNiMoNb 18 10             |
|  Werkstoff<br>(GERMANY)                   |  | 1.4449                                              | 1.4571                                                                 | 1.4833                                       | 1.4891                            | 1.4893                               | 1.4948                                          | 1.4581                                                  |
|  EN<br>(EUROPE)                          |  | X3CrNiMo18-12-3                                     | X6CrNiMoTi17-12-2                                                      | X12CrNi23-13                                 | X4CrNiSi18-10                     | X9CrNiSiN18-11-2                     | X6CrNi18-10                                     | GX5CrNiMoNb19-11-2                                      |
|  GOST<br>(RUSSIA)                       |  |                                                     | 08Ch16N11M3T;<br>08Ch17N13M2T;<br>10Ch17N13M2T                         |                                              |                                   |                                      |                                                 |                                                         |
|  JIS<br>(JAPAN)                         |  | SUS 317;<br>SUS 317 TB;<br>SUS 317 TP;<br>SUS F 317 | SUS 316 Ti;<br>SUS 316 TITB;<br>SUS 316 TITP                           | SUS 309 S;<br>SUS 309 S TB;<br>SUS 309 S TP  |                                   |                                      | SUS 302                                         | SCS 22                                                  |
|  SS<br>(SWEDEN)                         |  |                                                     | 2350                                                                   |                                              | 2372                              | 2368                                 |                                                 |                                                         |
|  UNE<br>(SPAIN)                         |  |                                                     | F.310.B;<br>F.3535;<br>X 6 CrNiMoTi 17 12 2                            |                                              |                                   |                                      |                                                 |                                                         |
|  UNI<br>(ITALY)                         |  | X 5 CrNiMo 18 15                                    | X 6 CrNiMoTi 17 12;<br>X 6 CrNiMoTi 17 12 KG;<br>X 6 CrNiMoTi 17 12 KW | X 6 CrNi 23 14                               |                                   |                                      |                                                 | GX 6 CrNiMoNb 20 11                                     |
|  IS<br>(INDIA)                          |  |                                                     |                                                                        |                                              |                                   |                                      |                                                 |                                                         |
|  KS<br>(REP. OF<br>KOREA)               |  | STS 317                                             |                                                                        | SSC17                                        |                                   |                                      | STS 302                                         | SSC 22                                                  |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  | 1Cr18Ni12Mo3Ti                                      | 1Cr18Ni12Mo2Ti                                                         | 1Cr23Ni13                                    |                                   |                                      | 1Cr18Ni9                                        | ZG1Cr18Mn8Ni4N                                          |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                      |                                                                                                  |                                                    |                                     |                                                                                             |                                                                                           |                                                                                                                    |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Standards                                                                           |                                          | 14                                      | 14                                                                                               | 14                                                 | 14                                  | 14                                                                                          | 14                                                                                        | 14                                                                                                                 |
|    | NF/AFNOR<br>(FRANCE)                     | Z 8 CNF 18-09                           | Z 1 CN 18-12;<br>Z 3 CN 18-10;<br>Z 3 CN 19-11;<br>Z 3 CN 19-11 FF                               | Z 11 CN 17-08;<br>Z 11 CN 18-08;<br>Z 12 18-09     | Z 3 CN 18-10 Az;<br>Z 3 CN 18-07 Az | Z 6 CN 18.09                                                                                | Z 2 CND 19-15-04;<br>Z 3 CND 19-15-04                                                     | Z 6 CNT 18-10                                                                                                      |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 303;<br>S30300                          | 304L;<br>304 L;<br>S30403                                                                        | 301;<br>J 230;<br>S30100;<br>S30200                | 304LN;<br>304 LN;<br>S30453         | 304B1;<br>304B2;<br>304B3;<br>304 B1;<br>304 B2;<br>304 B3;<br>S30461;<br>S30462;<br>S30463 | 317L;<br>317 L;<br>S31703                                                                 | 321H;<br>321 H;<br>S32109                                                                                          |
|    | BS<br>(UK)                               | 303 S 31                                | 304 S 11;<br>LW14;<br>LW 20;<br>LWCF 14;<br>LWCF 20;<br>S.536;<br>T.74;<br>304 C 12;<br>304 S 11 | 301 S 21;<br>301 S 22                              | 304 S 61                            | 304 S 31                                                                                    | 317 S 12                                                                                  | 321 S 31                                                                                                           |
|  | DIN<br>(GERMANY)                         | X8CrNiS18-9;<br>X 10 CrNiS 18 9         | X2CrNi19-11;<br>X 2 CrNi 19 11                                                                   | X10CrNi18-8;<br>X 12 CrNi 17 7                     | X2CrNiN18-10;<br>X 2 CrNiN 18 10    | X5CrNi18-9                                                                                  | X2CrNiMo18-15-4;<br>X2 CrNiMo 18 16 4                                                     | X12CrNiTi18-10;<br>X 12 CrNiTi 18-9                                                                                |
|  | Werkstoff<br>(GERMANY)                   | 1.4305                                  | 1.4306                                                                                           | 1.4310                                             | 1.4311                              | 1.4350                                                                                      | 1.4438                                                                                    | 1.4878                                                                                                             |
|  | EN<br>(EUROPE)                           | X8CrNiS18-9;<br>58M                     | X2CrNi19-11                                                                                      | X10CrNi18-8                                        | X2CrNiN18-10                        | 58E                                                                                         | X2CrNiMo18-15-4                                                                           | X12CrNiTi18-10;<br>58B                                                                                             |
|  | GOST<br>(RUSSIA)                         | 30Ch18N11                               | 03Ch18N11                                                                                        | 12Ch18N9                                           |                                     |                                                                                             |                                                                                           |                                                                                                                    |
|  | JIS<br>(JAPAN)                           | SUS 303                                 | SUS 304 L;<br>SUS 304 LFP;<br>SUS 304 LTb;<br>SUS 304 LTbS;<br>SUS 304 LTP;<br>SUS F 304 L       | SUS 301;<br>SUS 301-CSP;<br>SUS 302;<br>SUS 302 FB | SUS 304 LN;<br>SUS F 304 LN         |                                                                                             | SUS 317 L;<br>SUS 317 LFB;<br>SUS 317 LTb;<br>SUS 317 LTP;<br>SUS F 317 L;<br>SUS Y 317 L | SUS 321;<br>SUS 321 HFB;<br>SUS 321 HTb;<br>SUS 321 HTP;<br>SUS 321 TKA;<br>SUS 321 TP;<br>SUS F 321;<br>SUS Y 321 |
|  | SS<br>(SWEDEN)                           | 2346                                    | 2352                                                                                             | 2331                                               | 2371                                | 2332;<br>2333                                                                               | 2367                                                                                      | 2337                                                                                                               |
|  | UNE<br>(SPAIN)                           | F.310.C;<br>F.3508;<br>X 10 CrNiS 18-09 | F.310.G;<br>F.3503;<br>X 2 CrNi 18 10                                                            | F.3517;<br>X 2 CrNiN 18 10                         | F.3541;<br>X 2 CrNiN 18 10          | F.3551                                                                                      | F.3539;<br>X2 CrNiMo 18 16 4                                                              | F.3553                                                                                                             |
|  | UNI<br>(ITALY)                           | X 10 CrNiS 18 09                        | X 2 CrNi 18 11;<br>X 3 CrNi 18 11                                                                | X 12 CrNi 17 07                                    | X 2 CrNiN 18 11                     | X 5 CrNi 18 10                                                                              | X 2 CrNiMo 18 16                                                                          | X 6 CrNiTi 18.11                                                                                                   |
|  | IS<br>(INDIA)                            |                                         |                                                                                                  |                                                    |                                     |                                                                                             |                                                                                           |                                                                                                                    |
|  | KS<br>(REP. OF KOREA)                    | STS 303                                 | STS 304L                                                                                         | STS 302                                            | STS 304LN                           | STS 304L                                                                                    | STS 317L                                                                                  | STS 321                                                                                                            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 1Cr18Ni9MoZr                            | 00Cr19Ni10                                                                                       | Cr17Ni7                                            | 00Cr18Ni10N                         | 0Cr18Ni9                                                                                    | 00Cr19Ni13Mo                                                                              | 0Cr18Ni9Ti                                                                                                         |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                                                                                 |                                         |                                          |                                       |                                             |                                                                 |                                           |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------|---------------------------------------|---------------------------------------------|-----------------------------------------------------------------|-------------------------------------------|
|                                                                                     |                                          | 14                                                                                                 | 14                                      | 14                                       | 14                                    | 14                                          | 14                                                              | 14                                        |
|    | NF/AFNOR<br>(FRANCE)                     | Z 6 CnNb 18-10                                                                                     | Z 6 CNDNb 18-12                         |                                          | Z 9 CN 24-13;<br>Z 17 CNS 20-12       | Z 15 CNS 25-20                              |                                                                 | Z 10 CNT 18-11;<br>9160/C 63;<br>9160C201 |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 347;<br>348;<br>S34700;<br>S34800                                                                  | 318;<br>S31803                          |                                          | 309;<br>S30900                        | 310;<br>314;<br>S3100;<br>S31400;<br>S31500 | 348;<br>S34800                                                  |                                           |
|    | BS<br>(UK)                               | 347 S 31;<br>ANC 3 grade B;<br>ANC 3 B;<br>347 S 20;<br>347 S 40;<br>347 S 50;<br>347 S 51         |                                         |                                          | 309 S 24                              | 314 S 25                                    | 2 S.130;<br>2 S.143;<br>3 S.144;<br>3 S.145;<br>S.525;<br>S.527 | S.524;<br>S.526;<br>2 S 129               |
|    | DIN<br>(GERMANY)                         | X6CrNiNb18-10;<br>X 6 CrNiNb 18 10                                                                 | X10CrNiMoNb18-12;<br>X 10CrNiMoNb 18 12 | X1CrNiMoN25-22-2;<br>X 2 CrNiMoN 25 22 7 | X15CrNiSi20-12;<br>X 15 CrNiSi 20 12  | X15CrNiSi25-21;<br>X 15 CrNiSi 25 20        | X5CrNiNb18-10                                                   |                                           |
|    | Werkstoff<br>(GERMANY)                   | 1.4550                                                                                             | 1.4583                                  | 1.4465;<br>1.4466                        | 1.4828                                | 1.4841                                      | 1.4546                                                          | 1.4544;<br>1.4544.9                       |
|  | EN<br>(EUROPE)                           | X6CrNiNb18-10;<br>58F;                                                                             |                                         | X1CrNiMoN25-22-2                         | 58C;<br>X15CrNiSi20-12                | X15CrNiSi25-21                              |                                                                 | FE-PA 13                                  |
|  | GOST<br>(RUSSIA)                         | 08Ch18N12B                                                                                         |                                         |                                          | 20Ch20N14S2                           | 20Ch25N20S2                                 |                                                                 | 08Ch18N12T                                |
|  | JIS<br>(JAPAN)                           | SUS 347;<br>SUS 347 FB;<br>SUS 347 HTB;<br>SUS 347 TB;<br>SUS 347 TKA;<br>SUS 347 TP;<br>SUS F 347 |                                         |                                          | SUH 309;<br>SUS 309 TB;<br>SUS 309 TP | SUH 310;<br>SUS 310 TB;<br>SUS Y 310        |                                                                 |                                           |
|  | SS<br>(SWEDEN)                           | 2338                                                                                               |                                         |                                          |                                       |                                             |                                                                 |                                           |
|  | UNE<br>(SPAIN)                           | F.3524;<br>X 6 CrNiNb 18 10                                                                        |                                         |                                          | F.3312;<br>X 15 CrNiSi 20-12          | F.3310;<br>X 15 CrNiSi 25-20                |                                                                 |                                           |
|  | UNI<br>(ITALY)                           | X 6 CrNiNb 18 11;<br>X 6 CrNiNb 18 11 KG;<br>X 6 CrNiNb 18 11 KW;<br>X 6 CrNiNb 18 11 KT           | X 6 CrNiMoNb 20 11                      |                                          | X 16 CrNi 23 14                       | X 16 CrNiSi 25 20                           |                                                                 | X 6 CrNiTi 18 11                          |
|  | IS<br>(INDIA)                            |                                                                                                    |                                         |                                          |                                       |                                             |                                                                 |                                           |
|  | KS<br>(REP. OF<br>KOREA)                 | STS 347                                                                                            |                                         |                                          |                                       | STR 310                                     |                                                                 |                                           |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 1Cr18Ni11Nb                                                                                        | Cr17Ni12Mo3Mb                           |                                          | 1Cr20Ni14Si2                          | 1Cr25Ni20Si2                                |                                                                 |                                           |

## Material Designation in Accordance with Selected Standards

|                                                                                                                 |  | Material Group No.             |                                  |                                           |                                  |                                                        |                              |                                                            |
|-----------------------------------------------------------------------------------------------------------------|--|--------------------------------|----------------------------------|-------------------------------------------|----------------------------------|--------------------------------------------------------|------------------------------|------------------------------------------------------------|
| Standards                                                                                                       |  | 14                             | 14                               | 14                                        | 14                               | 14                                                     | 14                           | 14                                                         |
|  NF/AFNOR (FRANCE)             |  |                                |                                  | Z 3 CND 19.10 M                           | Z 3 CN 19.10 M                   |                                                        | Z 2 CN 18 10                 | Z 6 CNU 18 10                                              |
|  AISI/ASM/ASTM/SAE/UNS/AA (US) |  |                                |                                  | 316N;<br>316 N;<br>J92804                 | 304L;<br>304 L J92500;<br>J92620 |                                                        |                              | 302 HQ;<br>304 Cu;<br>304 HQ;<br>XM-7;<br>EV-17;<br>S30430 |
|  BS (UK)                       |  |                                |                                  |                                           | 304 C 12                         |                                                        | 304 S 12                     | 394 S 17                                                   |
|  DIN (GERMANY)                 |  | X12CrNi18-9;<br>X 12 CrNi 18 9 | X12CrNi22-12;<br>X 12 CrNi 22 12 | GX2CrNiMo19-11-2;<br>G-X 2 CrNiMo 19 11 2 | GX2CrNi19-11                     | GX2CrNiMnMoNNb21-15-4-3;<br>G-X 2 CrNiMnMoNNb 21 15 43 | X2CrNi18-9;<br>X 2 CrNi 18 9 | X3CrNiCu18-9-4;<br>X 3 CrNiCu 18 9                         |
|  Werkstoff (GERMANY)          |  | 1.6900                         | 1.4829                           | 1.4409                                    | 1.4309                           | 1.4569                                                 | 1.431                        | 1.457                                                      |
|  EN (EUROPE)                 |  |                                |                                  | GX2CrNiMo19-11-2                          | GX2CrNi19-11                     |                                                        | X2CrNi18-9                   | X3CrNiCu18-9-4                                             |
|  GOST (RUSSIA)               |  |                                |                                  |                                           |                                  |                                                        |                              |                                                            |
|  JIS (JAPAN)                 |  |                                |                                  | SCS 16 A;<br>SCS 16 AX SCS 16 AXN         | SCS 19;<br>SCS 19 A              |                                                        |                              | SUS XM 7                                                   |
|  SS (SWEDEN)                 |  |                                |                                  |                                           |                                  |                                                        |                              |                                                            |
|  UNE (SPAIN)                 |  |                                |                                  | AM-X 2 CrNiMo 19 11;<br>F.8415            | AM-X 2 CrNi 19 10;<br>F.8412     |                                                        |                              |                                                            |
|  UNI (ITALY)                 |  |                                |                                  | GX2 CrNiMo 19 11                          | GX 2 CrNi 19 10                  |                                                        |                              |                                                            |
|  IS (INDIA)                  |  |                                |                                  |                                           |                                  |                                                        |                              |                                                            |
|  KS (REP. OF KOREA)          |  |                                |                                  |                                           | SSC 19                           |                                                        |                              |                                                            |
|  GB/YB/JB/SY/NB (PRC)        |  |                                |                                  |                                           | ZG00Cr18Ni9                      |                                                        |                              |                                                            |

## Material Designation in Accordance with Selected Standards

|                                                                                                                            |                     | Material Group No. |                       |                  |                                   |        |                                       |                   |                                       |
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| Standards                                                                                                                  |                     | 14                 | 14                    | 14               | 14                                | 14     | 14                                    | 14                | 14                                    |
|  NF/AFNOR<br>(FRANCE)                     |                     |                    |                       |                  | Z 5 CN 18-11 FF                   |        |                                       |                   |                                       |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | S21800;<br>AMS 5848 |                    | S20910;<br>XM-19      | S24100;<br>XM-28 | 305;<br>308;<br>S30500;<br>S30800 | S31630 |                                       |                   |                                       |
|  BS<br>(UK)                               |                     |                    |                       |                  | 305 S 17;<br>305 S 19             |        |                                       |                   |                                       |
|  DIN<br>(GERMANY)                         |                     |                    | X2CrNiMnMoNb21-16-5-3 |                  | X4CrNi18-12;<br>X 5 CrNi 18 12    |        | GX6CrNiMo18-12;<br>G-X 6 CrNiMo 18 12 | GX2CrNiMoM17-13-4 | GX6CrNiMo17-13;<br>G-X 6 CrNiMo 17 13 |
|  Werkstoff<br>(GERMANY)                   |                     |                    | 1.396                 |                  | 1.430                             |        | 1.444                                 | 1.445             | 1.445                                 |
|  EN<br>(EUROPE)                          |                     |                    |                       |                  | X4CrNi18-12                       |        |                                       | GX2CrNiMoM17-13-4 |                                       |
|  GOST<br>(RUSSIA)                       |                     |                    |                       |                  | 06Ch18N11                         |        |                                       |                   |                                       |
|  JIS<br>(JAPAN)                         |                     |                    |                       |                  | SUS 305 J 1;<br>SUS 305           |        |                                       |                   |                                       |
|  SS<br>(SWEDEN)                         |                     |                    |                       |                  |                                   |        |                                       |                   |                                       |
|  UNE<br>(SPAIN)                         |                     |                    |                       |                  | F.3513;<br>X 8 CrNi 18 12         |        |                                       |                   |                                       |
|  UNI<br>(ITALY)                         |                     |                    |                       |                  | X 7 CrNi 18 10;<br>X 8 CrNi 19 10 |        |                                       |                   |                                       |
|  IS<br>(INDIA)                          |                     |                    |                       |                  |                                   |        |                                       |                   |                                       |
|  KS<br>(REP. OF<br>KOREA)               |                     |                    |                       |                  |                                   |        |                                       |                   |                                       |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |                     |                    |                       |                  |                                   |        |                                       |                   |                                       |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.  |                                             |                                                 |                                                                                        |                            |                                         |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------|---------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------|-----------------------------------------|
|                                                                                     |                                          | 14                  | 14                                          | 14                                              | 14                                                                                     | 14                         | 14                                      |
|    | NF/AFNOR<br>(FRANCE)                     |                     | Z 2 NCDU 25-20                              |                                                 | Z 8 CN 25-20;<br>Z 12 CN 25-20;<br>Z 12 CN 26-21                                       |                            | Z 52 CMN 21-09 Az;<br>Z 53 CMN 21-09 Az |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | J93254;<br>CK3MCuN  | 904L;<br>904 L;<br>N08904                   |                                                 | 310H;<br>310 H;<br>310S;<br>310 S;<br>S31008;<br>S31009                                | 254 SMO;<br>S31254;<br>F44 | EV 8;<br>S63008                         |
|    | BS<br>(UK)                               |                     | 904 S 13                                    |                                                 | 310 S 16;<br>310 S 24;<br>310 S 25;<br>310 S 31                                        |                            | 349 S 52                                |
|    | DIN<br>(GERMANY)                         | GX2CrNiMoCuN20-18-6 | X1NiCrMoCu25-20-5;<br>X 1 NiCrMoCuN 25 20 5 | GX1NiCrMoCuN25-20-5;<br>G-X 1 NiCrMoCuN 25 20 5 | X8CrNi25-21;<br>X 12 CrNi 25 21                                                        | X1CrNiMoN20-18-7           | X53CrMnNiN21-9;<br>X 53 CrMnNiN 21 9    |
|   | Werkstoff<br>(GERMANY)                   | 1.456               | 1.4539                                      | 1.454                                           | 1.4845                                                                                 | 1.4547                     | 1.4871                                  |
|  | EN<br>(EUROPE)                           | GX2CrNiMoCuN20-18-6 | X1NiCrMoCu25-20-5                           |                                                 | X12CrNi25-21                                                                           | X1CrNiMoN20-18-7           | X53CrMnNiN21-9                          |
|  | GOST<br>(RUSSIA)                         |                     |                                             |                                                 | 10Ch23N18;<br>20Ch23N18                                                                |                            | 55Ch20G9AN4                             |
|  | JIS<br>(JAPAN)                           |                     |                                             |                                                 | SUS 310 S;<br>SUS 310 FB;<br>SUS 310 STG;<br>SUS 310 STP;<br>SUS310 TB;<br>SYS Y 310 S |                            | SUH 35;<br>SUH 36                       |
|  | SS<br>(SWEDEN)                           |                     | 2562                                        |                                                 | 2361                                                                                   | 2378                       |                                         |
|  | UNE<br>(SPAIN)                           |                     |                                             |                                                 | F.331                                                                                  |                            | F.3217;<br>X 53 CrMnNiN 21-09           |
|  | UNI<br>(ITALY)                           |                     |                                             |                                                 | X 6 CrNi 25 20 (X 6 CrNi 25 20)                                                        |                            | X 53 CrMnNiN 21 9                       |
|  | IS<br>(INDIA)                            |                     |                                             |                                                 |                                                                                        |                            | X53Cr22Mn9Ni4N                          |
|  | KS<br>(REP. OF<br>KOREA)                 |                     |                                             |                                                 |                                                                                        |                            | STR 35;<br>STR 36                       |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                     |                                             |                                                 | 0Cr25Ni20                                                                              |                            | 5Cr2Mn9Ni4N                             |



## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                              |                                      |                                       |                                          |                                      |                                         |
|-------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------------------|--------------------------------------|---------------------------------------|------------------------------------------|--------------------------------------|-----------------------------------------|
| Standards                                                                           |                                          | 14                                                              | 14                                   | 14                                    | 14                                       | 14                                   | 14                                      |
|    | NF/AFNOR<br>(FRANCE)                     | Z 6 CND 15-07;<br>9160/C 65;<br>9160C 211                       | Z 55 CMN 20-08 Az                    | Z 50 CMNNb 21.09;<br>Z 50 CMNNb 21-09 | Z 53 CMNB 21-09-02 Az                    |                                      | Z 9 CNA 17-07;<br>Z 8 CNA 17-07         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 632;<br>S15700;<br>15-7 PH;<br>15-7PH;<br>AMS 5520;<br>AMS 5657 | EV 12;<br>S63012                     | XEV-F;<br>S63019                      |                                          | EV 16;<br>S63018                     | 631;<br>17-7PH;<br>17-7 PH;<br>S17700   |
|    | BS<br>(UK)                               |                                                                 |                                      |                                       | 352 S 52                                 |                                      | 301 S 81                                |
|    | DIN<br>(GERMANY)                         | X8CrNiMoAl15-7-2;<br>X 7 CrNiMoAl 15-7                          | X55CrMoNiN20-8;<br>X 55 CrMoNiN 20 8 | X50CrMnNiNbN21-9                      | X53CrMnNiNbN21-9;<br>X 53 CrMnNiNbN 21 9 | X33CrNiMnN23-8;<br>X 33 CrNiMnN 23 8 | X7CrNiAl17-7;<br>X 7 CrNiAl 17 7        |
|    | Werkstoff<br>(GERMANY)                   | 1.4532;<br>1.4574                                               | 1.488                                | 1.4882                                | 1.487                                    | 1.487                                | 1.4568;<br>1.4564;<br>1.4504            |
|   | EN<br>(EUROPE)                           | X8CrNiMoAl15-7-2                                                | X55CrMoNiN20-8                       | X50CrMnNiNbN21-9                      | X53CrMnNiNbN21-9                         | X33CrNiMnN23-8                       | X7CrNiAl17-7                            |
|  | GOST<br>(RUSSIA)                         |                                                                 |                                      |                                       |                                          |                                      | 09Ch17N7Ju1                             |
|  | JIS<br>(JAPAN)                           |                                                                 |                                      |                                       |                                          |                                      | SUS 631;<br>SUS 631 J 1;<br>SUS 631-CSP |
|  | SS<br>(SWEDEN)                           |                                                                 |                                      |                                       |                                          |                                      | 2388                                    |
|  | UNE<br>(SPAIN)                           |                                                                 |                                      |                                       |                                          |                                      | X 2 CrNiMo 17 12                        |
|  | UNI<br>(ITALY)                           |                                                                 | X 55 CrMnNiN 20.8                    |                                       | X 53 CrMnNiNbN 21.9                      |                                      |                                         |
|  | IS<br>(INDIA)                            |                                                                 |                                      |                                       |                                          |                                      |                                         |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                                 |                                      |                                       |                                          |                                      |                                         |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                 |                                      |                                       |                                          |                                      | 0Cr17Ni7Al                              |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.  |                    |                   |                                |                                                                      |                                                                               |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------|--------------------|-------------------|--------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------|
|                                                                                     |                                          | 14                  | 14                 | 14                | 14                             | 14                                                                   | 14                                                                            |
|    | NF/AFNOR<br>(FRANCE)                     |                     |                    |                   | Z 3 CN 23-04 Az                | Z 5 CND 27-05 Az;<br>Z 3 CND 25-07 Az                                | Z 2 CND 24-08 Az;<br>Z 3 CND 25-06-03 Az;<br>Z 3 CND 25 -05 Az                |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | S31266              | 654 SMO;<br>S32654 | J94650;<br>CN7MS  | S32304                         | 329;<br>S31260;<br>S32900                                            | S31803;<br>S31260;<br>S32900;<br>A182 F51;<br>A182 Gr. F51;<br>A182 Grade F51 |
|    | BS<br>(UK)                               |                     |                    |                   |                                |                                                                      | 318 S 13;<br>1.4462                                                           |
|    | DIN<br>(GERMANY)                         | X1CrNiMoCuNW24-22-6 | X1CrNiMoCuN24-22-8 | GX2NiCrMoCuN25-20 | X2CrNiN23-4;<br>X 2 CrNiN 23 4 | X3CrNiMoN27-5-2;<br>X 4 CrNiMoN 27 5 2                               | X2CrNiMoN22-5-3;<br>X 2 CrNiMoN 22 5 3                                        |
|   | Werkstoff<br>(GERMANY)                   | 1.466               | 1.465              | 1.454             | 1.4362                         | 1.4460                                                               | 1.4462                                                                        |
|  | EN<br>(EUROPE)                           | X1CrNiMoCuNW24-22-6 | X1CrNiMoCuN24-22-8 |                   | X2CrNiN23-4                    | X3CrNiMoN27-5-2                                                      | X2CrNiMoN22-5-3                                                               |
|  | GOST<br>(RUSSIA)                         |                     |                    |                   | 03Ch3N6                        | 10Ch26N5M;<br>08Ch21N6M2T                                            |                                                                               |
|  | JIS<br>(JAPAN)                           |                     |                    |                   |                                | SUS 329 J 1;<br>SUS 329 J 1 FB;<br>SUS 329 J 1 TB;<br>SUS 329 J 1 TP | SUS 329 J 3 L;<br>SUS 329 J 3 LTB;<br>SUS 329 J 3 LTP                         |
|  | SS<br>(SWEDEN)                           |                     |                    |                   | 2327                           | 2324                                                                 | 2377                                                                          |
|  | UNE<br>(SPAIN)                           |                     |                    |                   |                                | F.3552;<br>F.3309;<br>X 8 CrNiMo 27-05;<br>X 8 CrNiMo 26 6           |                                                                               |
|  | UNI<br>(ITALY)                           |                     |                    |                   |                                |                                                                      |                                                                               |
|  | IS<br>(INDIA)                            |                     |                    |                   |                                |                                                                      |                                                                               |
|  | KS<br>(REP. OF KOREA)                    |                     |                    |                   |                                | STS 329J1                                                            | STS 329J3L                                                                    |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                     |                    |                   | 0Cr26Ni5Mo2                    | 0Cr26Ni5Mo2                                                          |                                                                               |

## Material Designation in Accordance with Selected Standards

|                                                                                                                            |  | Material Group No.                    |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |
|----------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------|--------------------------------------|---------------------------------------------------------|------------|-------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------|
| Standards                                                                                                                  |  | 14                                    | 14                                   | 14                                                      | 14         | 14                                        | 14                                                                                     | 14                                                     | 14                                      |
|  NF/AFNOR<br>(FRANCE)                     |  |                                       |                                      |                                                         |            |                                           | Z 2 CND 18.05.03                                                                       |                                                        |                                         |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  | J92605;<br>J93005                     | 329;<br>S32900                       | S33100;<br>A182 F10;<br>A182 Gr. F10;<br>A182 Grade F10 |            |                                           | S31500                                                                                 |                                                        |                                         |
|  BS<br>(UK)                               |  |                                       |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |
|  DIN<br>(GERMANY)                         |  | GX40CrNiSi27-4;<br>G-X 40 CrNiSi 27 4 | X6CrNiMo26-4-2;<br>X 6 CrNiMo 26 4 2 |                                                         |            | GX2CrNiMoN25-6-3;<br>G-X 3 CrNiMoN 26 6 3 | GX2CrNiMoN25-7-3;<br>G-X 2 CrNiMoN 25 7 3;<br>X2CrNiMoSi18-5-3;<br>X 2 CrNiMoSi 18 5 3 | GX4CrNiN26-7;<br>G-X 8 CrNiN 26-7;<br>G-X 6 CrNiN 26-7 | GX6CrNiMo24-8-2;<br>G-X 6 CrNiMo 24 8 2 |
|  Werkstoff<br>(GERMANY)                   |  | 1.4823                                | 1.448                                |                                                         |            | 1.447                                     | 1.4417;<br>1.4424                                                                      | 1.435                                                  | 1.446                                   |
|  EN<br>(EUROPE)                          |  | GX40CrNiSi27-4                        |                                      |                                                         |            | GX2CrNiMoN25-6-3                          | GX2CrNiMoN25-7-3;<br>X2CrNiMoSi18-5-3                                                  | GX4CrNiN26-7                                           |                                         |
|  GOST<br>(RUSSIA)                       |  |                                       |                                      |                                                         | 03Ch22N6M2 | 03Ch24N6AM3                               |                                                                                        |                                                        |                                         |
|  JIS<br>(JAPAN)                         |  | SCH 11 X                              |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |
|  SS<br>(SWEDEN)                         |  |                                       |                                      |                                                         |            |                                           | 2376                                                                                   |                                                        |                                         |
|  UNE<br>(SPAIN)                         |  |                                       |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |
|  UNI<br>(ITALY)                         |  |                                       |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |
|  IS<br>(INDIA)                          |  |                                       |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |
|  KS<br>(REP. OF<br>KOREA)               |  |                                       |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  |                                       |                                      |                                                         |            |                                           |                                                                                        |                                                        |                                         |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                     |                                                   |                                                         |               |                                   |                                        |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------|---------------------------------------------------|---------------------------------------------------------|---------------|-----------------------------------|----------------------------------------|
| Standards                                                                           |                                          | 14                                     | 14                                                | 14                                                      | 14            | 14                                | 14                                     |
|    | NF/AFNOR<br>(FRANCE)                     |                                        |                                                   |                                                         |               |                                   | Z 3 CNDU 25-06 Az                      |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | J92205;<br>CD3MN 4A;<br>A 995 Grade 4A |                                                   | J93372;<br>CD4MCuN;<br>A890 Grade 1B;<br>A 995 Grade 1B |               | J92615;<br>CC 50;<br>CC-50        | S32760;<br>SA351/995;<br>25Cr-7Ni-Mo-N |
|    | BS<br>(UK)                               |                                        |                                                   |                                                         |               |                                   |                                        |
|    | DIN<br>(GERMANY)                         | GX2CrNiMoN22-5-3                       | GX3CrNiMoCuN26-6-3-3;<br>G-X 2 CrNiMoCuN 26 6 3 3 | GX2CrNiMoCuN25-6-3-3;<br>G-X 3 CrNiMoCuN 26 6 3 3       | GX32CrNi28-10 | GX40CrNi27-4;<br>G-X 40 CrNi 27 4 | X2CrNiMoCuWN25-7-4                     |
|    | Werkstoff<br>(GERMANY)                   | 1.447                                  | 1.452                                             | 1.452                                                   | 1.434         | 1.4340                            | 1.4501                                 |
|  | EN<br>(EUROPE)                           | GX2CrNiMoN22-5-3                       |                                                   | GX2CrNiMoCuN25-6-3-3                                    |               |                                   | X2CrNiMoCuWN25-7-4                     |
|  | GOST<br>(RUSSIA)                         |                                        |                                                   |                                                         |               |                                   |                                        |
|  | JIS<br>(JAPAN)                           |                                        |                                                   | SCS 32                                                  |               |                                   |                                        |
|  | SS<br>(SWEDEN)                           |                                        |                                                   |                                                         |               |                                   |                                        |
|  | UNE<br>(SPAIN)                           |                                        |                                                   |                                                         |               |                                   |                                        |
|  | UNI<br>(ITALY)                           |                                        |                                                   |                                                         |               |                                   |                                        |
|  | IS<br>(INDIA)                            |                                        |                                                   |                                                         |               |                                   |                                        |
|  | KS<br>(REP. OF<br>KOREA)                 |                                        |                                                   |                                                         |               |                                   |                                        |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                        |                                                   |                                                         |               |                                   | 0Cr26Ni5Mo2                            |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                   |                                           |                                         |                            |                                                     |                                                           |                                         |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------------------------------|-----------------------------------------------------------|-----------------------------------------|
|                                                                                     |                                          | 14                                   | 14                                        | 14                                      | 14                         | 14                                                  | 14                                                        | 14                                      |
|    | NF/AFNOR<br>(FRANCE)                     | Z 5 CND 25-06 Az                     |                                           | Z 3 CNDU 25-06 Az;<br>Z 3 CNDU 25-07 Az |                            |                                                     |                                                           |                                         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | S32750                               |                                           | S32520;<br>S32550;<br>F61               | S32950;<br>SA276;<br>SA479 | J93380;<br>CD3MnWCuN;<br>A890 Grade 6A              | J93503;<br>J94003;<br>J94013;<br>HK 30;<br>HH;<br>A297-HH | J94203;<br>J94204;<br>J94224;<br>HK     |
|    | BS<br>(UK)                               |                                      |                                           |                                         |                            |                                                     | 309 C 30                                                  | 310 C 40;<br>310 C 45                   |
|    | DIN<br>(GERMANY)                         | X2CrNiMoN25-7-4;<br>X 10 CrNiMo 18 9 | GX2CrNiMoN26-7-4;<br>G-X 2 CrNiMoN 25-7-4 | X2CrNiMoCuN25-6-3                       |                            | GX3CrNiMoWCuN27-6-3-1;<br>G-X 3 CrNiMoWCuN 27 6 3 1 | GX40CrNiSi25-12;<br>G-X 40 CrNiSi 25 12                   | GX40CrNiSi25-20;<br>G-X 40 CrNiSi 25 20 |
|    | Werkstoff<br>(GERMANY)                   | 1.4410                               | 1.447                                     | 1.451                                   |                            | 1.447                                               | 1.4837;<br>1.4848+Nb                                      | 1.4848                                  |
|   | EN<br>(EUROPE)                           | X2CrNiMoN25-7-4                      | GX2CrNiMoN26-7-4                          | X2CrNiMoCuN25-6-3                       |                            |                                                     | GX40CrNiSi25-12                                           | GX40CrNiSi25-20                         |
|  | GOST<br>(RUSSIA)                         |                                      |                                           |                                         |                            |                                                     | 40Ch24N12SL                                               |                                         |
|  | JIS<br>(JAPAN)                           |                                      |                                           |                                         |                            |                                                     | SCH 13;<br>SCH 13 A;<br>SCH 13 X;<br>SCH 17;<br>SCS 17    | SCH 21;<br>SCH 22;<br>SCH 22 X          |
|  | SS<br>(SWEDEN)                           | 2328                                 |                                           |                                         |                            |                                                     |                                                           |                                         |
|  | UNE<br>(SPAIN)                           |                                      |                                           |                                         |                            |                                                     |                                                           | AM-X 40 CrNi 25 20;<br>F.8452           |
|  | UNI<br>(ITALY)                           |                                      |                                           |                                         |                            |                                                     | G X 35 CrNi 25 12                                         | G X 40 CrNi 26 20                       |
|  | IS<br>(INDIA)                            |                                      |                                           |                                         |                            |                                                     |                                                           |                                         |
|  | KS<br>(REP. OF<br>KOREA)                 |                                      |                                           |                                         |                            |                                                     | SSC 17                                                    | HRSC 21;<br>HRSC 22                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                      |                                           |                                         |                            |                                                     |                                                           | ZG4Cr25Ni20Si2                          |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                        |                                             |                 |                                                 |                                             |                                         |                                       |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------|---------------------------------------------|-----------------|-------------------------------------------------|---------------------------------------------|-----------------------------------------|---------------------------------------|
| Standards                                                                           |                                          | 14                                        | 14                                          | 14              | 14                                              | 14                                          | 14                                      | 14                                    |
|    | NF/AFNOR<br>(FRANCE)                     |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                           |                                             |                 | J94202;<br>CK 20;<br>AMS 5365;<br>A351;<br>A743 |                                             |                                         |                                       |
|    | BS<br>(UK)                               |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|    | DIN<br>(GERMANY)                         | GX40NiCrSiNb38-19;<br>G-X 40 NiCrSi 38 18 | GX40NiCrSiNb35-26;<br>G-X 40 NiCrSiNb 35 25 | GX25CrNiSi20-14 | GX15CrNi25-20                                   | GX40CrNiSiNb24-24;<br>G-X 30 CrNiSiNb 24 24 | GX40NiCrSi35-26;<br>G-X 40 NiCrSi 35 25 | GX25CrNiSi18-9;<br>G-X 25 CrNiSi 18 9 |
|    | Werkstoff<br>(GERMANY)                   | 1.4849                                    | 1.485                                       | 1.483           | 1.484                                           | 1.486                                       | 1.486                                   | 1.483                                 |
|   | EN<br>(EUROPE)                           | GX40NiCrSiNb38-19                         | GX40NiCrSiNb35-26                           | GX25CrNiSi20-14 |                                                 | GX40CrNiSiNb24-24                           | GX40NiCrSi35-26                         | GX25CrNiSi18-9                        |
|  | GOST<br>(RUSSIA)                         |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|  | JIS<br>(JAPAN)                           |                                           |                                             |                 | SCS 18                                          | SCH 33                                      | SCH 24 X                                |                                       |
|  | SS<br>(SWEDEN)                           |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|  | UNE<br>(SPAIN)                           |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|  | UNI<br>(ITALY)                           |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|  | IS<br>(INDIA)                            |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|  | KS<br>(REP. OF<br>KOREA)                 |                                           |                                             |                 |                                                 |                                             |                                         |                                       |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                           |                                             |                 |                                                 |                                             |                                         |                                       |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                     |                                          |                                                       | Material Group No.                                      |                                           |                                                                        |                                           |                                                                       |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------|------------------------------------------|-------------------------------------------------------|---------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------|
|                                                                                     |                                          | 14                                     | 14                                       | 14                                                    | 15                                                      | 15                                        | 15                                                                     | 15                                        | 15                                                                    |
|    | NF/AFNOR<br>(FRANCE)                     |                                        |                                          |                                                       | Ft 10 D                                                 |                                           | Ft 15 D;<br>R 15 D;<br>FGL 150                                         |                                           | Ft 20 D;<br>FGL 200                                                   |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                        | N08151;<br>CT15C                         |                                                       | F11401;<br>A48-20;<br>A48-20 B;<br>Class 20;<br>No 20 B | H10 J431                                  | F11701;<br>A48-25;<br>A48 25 B;<br>Class 25;<br>No 25 B;<br>G9H12 J431 | H11 J431                                  | F12101;<br>A48-30;<br>A48-30 B;<br>Class 30, No.30 B;<br>G110H18 J431 |
|    | BS<br>(UK)                               |                                        |                                          |                                                       | Grade 100                                               |                                           | Grade 150                                                              |                                           | Grade 220                                                             |
|    | DIN<br>(GERMANY)                         | GX40CrNiSi22-10;<br>G-X 40 CrNiSi 22 9 | GX10NiCrSiNb32-20;<br>G-X 10NiCrNb 32 20 | GX50NiCrCoW35-25-15-5;<br>G-X 50 NiCrCoWSi 35 25 15 5 | EN-GJL-100;<br>EN-JL 1010;<br>GG-10                     | EN-GJL-HB155;<br>EN-JL 2010;<br>GG-150 HB | EN-GJL-150;<br>EN-GJL-150C;<br>EN-JL 1020;<br>GG-15                    | EN-GJL-HB175;<br>EN-JL 2020;<br>GG-170 HB | EN-GJL-200;<br>EN-GJL-200C;<br>EN-JL 1030;<br>GG-20                   |
|    | Werkstoff<br>(GERMANY)                   | 1.483                                  | 1.486                                    | 1.487                                                 | 0.6010;<br>5.1100                                       | 0.6012;<br>5.1101                         | 0.6015;<br>5.1200                                                      | 0.6017;<br>5.1201                         | 0.6020;<br>5.1300                                                     |
|   | EN<br>(EUROPE)                           | GX40CrNiSi22-10                        | GX10NiCrSiNb32-20                        | GX50NiCrCoW35-25-15-5                                 | EN-GJL-100;<br>EN-JL 1010                               | EN-GJL-HB155;<br>EN-JL 2010               | EN-GJL-150;<br>EN-GJL-150C;<br>EN-JL 1020                              | EN-GJL-HB175;<br>EN-JL 2020               | EN-GJL-200;<br>EN-GJL-200C;<br>EN-JL 1030                             |
|  | GOST<br>(RUSSIA)                         |                                        |                                          |                                                       | SCh10                                                   |                                           | SCh 15                                                                 |                                           | SCh 20                                                                |
|  | JIS<br>(JAPAN)                           | SCH12                                  | SCH 34                                   | SCH 46                                                | FC 10;<br>FC 100                                        |                                           | FC 15;<br>FC 150                                                       |                                           | FC 20;<br>FC 200                                                      |
|  | SS<br>(SWEDEN)                           |                                        |                                          |                                                       | 0110-00                                                 |                                           | 0115-00                                                                |                                           | 0120-00                                                               |
|  | UNE<br>(SPAIN)                           |                                        |                                          |                                                       | FG 10                                                   |                                           | FG 15                                                                  |                                           | FG 20                                                                 |
|  | UNI<br>(ITALY)                           |                                        |                                          |                                                       | G 10                                                    |                                           | G 14;<br>G 15                                                          |                                           | G 20;<br>Gh 190                                                       |
|  | IS<br>(INDIA)                            |                                        |                                          |                                                       |                                                         |                                           |                                                                        |                                           |                                                                       |
|  | KS<br>(REP. OF<br>KOREA)                 |                                        |                                          |                                                       | GC 10                                                   |                                           | GC 15                                                                  |                                           | GC 20                                                                 |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                        |                                          |                                                       | HT100                                                   |                                           | HT150                                                                  |                                           | HT200                                                                 |



## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                    |                                       |                                         |                                                                                |                                                                     |                                                                     |                                          |                                          |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------|------------------------------------------|
|                                                                                     |                                          | 15                                    | 15                                    | 15                                      | 16                                                                             | 16                                                                  | 16                                                                  | 16                                       | 16                                       |
|    | NF/AFNOR<br>(FRANCE)                     |                                       |                                       |                                         | Ft 25 D;<br>FGL 250                                                            | Ft 30 D;<br>FGL 300                                                 | Ft 35 D;<br>FGL 350                                                 |                                          |                                          |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | F10004;<br>G1800;<br>A159 Grade G1800 | F10005;<br>G2500;<br>A159 Grade G2500 | F10009;<br>G2500a;<br>A159 Grade G2500a | F12401;<br>A48-40;<br>A48-40 B;<br>Class 40;<br>No 40 B;<br>A278-35;<br>G11H20 | F13101;<br>A48-45;<br>A48-45 B;<br>Class 45;<br>No 45 B;<br>A278-45 | F13501;<br>A48-50;<br>A48-50 B;<br>Class 50;<br>No 50 B;<br>A278-50 | H13 J431;<br>H14 J431                    | H16 J431                                 |
|    | BS<br>(UK)                               |                                       |                                       |                                         | Grade 260;<br>Grade 250                                                        | Grade 300                                                           | Grade 350                                                           |                                          |                                          |
|    | DIN<br>(GERMANY)                         |                                       |                                       |                                         | EN-GJL-250;<br>EN-GJL-250C;<br>EN-JL1040;<br>GG-25                             | EN-GJL-300;<br>EN-GJL-300C;<br>EN-JL 1050;<br>GG-30                 | EN-GJL-350;<br>EN-GJL-350C;<br>EN-JL 1060;<br>GG-35                 | EN-GJL-HB195;<br>EN-JL2030;<br>GG-190 HB | EN-GJL-HB215;<br>EN-JL2040;<br>GG-220 HB |
|  | Werkstoff<br>(GERMANY)                   |                                       |                                       |                                         | 0.6025;<br>5.1301                                                              | 0.6030;<br>5.1302                                                   | 0.6035;<br>5.1303                                                   | 0.6022;<br>5.1304                        | 0.6027;<br>5.1305                        |
|  | EN<br>(EUROPE)                           |                                       |                                       |                                         | EN-GJL-250;<br>EN-GJL-250C;<br>EN-JL1040                                       | EN-GJL-300;<br>EN-GJL-300C;<br>EN-JL 1050                           | EN-GJL-350;<br>EN-GJL-350C;<br>EN-JL 1060                           | EN-GJL-HB195;<br>EN-JL2030               | EN-GJL-HB215;<br>EN-JL2040               |
|  | GOST<br>(RUSSIA)                         |                                       |                                       |                                         | SCh 25                                                                         | SCh 30                                                              | SCh 35                                                              |                                          |                                          |
|  | JIS<br>(JAPAN)                           |                                       |                                       |                                         | FC 25;<br>FC250                                                                | FC 30;<br>FC 300                                                    | FC 35;<br>FC350                                                     |                                          |                                          |
|  | SS<br>(SWEDEN)                           |                                       |                                       |                                         | 0125-00                                                                        | 0130-00                                                             | 0135-00                                                             |                                          |                                          |
|  | UNE<br>(SPAIN)                           |                                       |                                       |                                         | FG 25                                                                          | FG 30                                                               | FG 35                                                               |                                          |                                          |
|  | UNI<br>(ITALY)                           |                                       |                                       |                                         | G 25                                                                           | G 30                                                                | G 35                                                                |                                          |                                          |
|  | IS<br>(INDIA)                            |                                       |                                       |                                         |                                                                                |                                                                     |                                                                     |                                          |                                          |
|  | KS<br>(REP. OF KOREA)                    |                                       |                                       |                                         | GC 25;<br>GC 250                                                               | GC 30                                                               | GC 350                                                              |                                          |                                          |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                       |                                       |                                         | HT250                                                                          | HT300                                                               | HT350                                                               |                                          |                                          |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                       |                                          |                                                         |                                              |                                       |                                       |                                         | 16                                      |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|---------------------------------------------------------|----------------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------------|-----------------------------------------|
|                                                                                     |                                          | 16                                       | 16                                       | 16                                                      | 16                                           | 16                                    | 16                                    | 16                                      |                                         |
|    | NF/AFNOR<br>(FRANCE)                     |                                          |                                          |                                                         | Ft 40 D                                      |                                       |                                       |                                         |                                         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | H18 J431                                 | H20 J431                                 | F13801;<br>A48-55;<br>A48-55 B;<br>Class 55;<br>No 60 B | F14101;<br>A48-60 B;<br>Class 60;<br>No 60 B | F10006;<br>G3000;<br>A159 Grade G3000 | F10007;<br>G3500;<br>A159 Grade G3500 | F10010;<br>G3500b;<br>A159 Grade G3500b | F10011;<br>G3500c;<br>A159 Grade G3500c |
|    | BS<br>(UK)                               |                                          |                                          |                                                         | Grade 400                                    |                                       |                                       |                                         |                                         |
|    | DIN<br>(GERMANY)                         | EN-GJL-HB235;<br>EN-JL2050;<br>GG-240 HB | EN-GJL-HB255;<br>EN-JL2060;<br>GG-260 HB |                                                         | EN-JLZ;<br>GG-40                             |                                       |                                       |                                         |                                         |
|    | Werkstoff<br>(GERMANY)                   | 0.6032;<br>5.1306                        | 0.6037;<br>5.1307                        |                                                         | 0.6040                                       |                                       |                                       |                                         |                                         |
|   | EN<br>(EUROPE)                           | EN-GJL-HB235;<br>EN-JL2050               | EN-GJL-HB255;<br>EN-JL2060               |                                                         | EN-JLZ                                       |                                       |                                       |                                         |                                         |
|  | GOST<br>(RUSSIA)                         |                                          |                                          |                                                         | SCh 40                                       |                                       |                                       |                                         |                                         |
|  | JIS<br>(JAPAN)                           |                                          |                                          |                                                         |                                              |                                       |                                       |                                         |                                         |
|  | SS<br>(SWEDEN)                           |                                          |                                          |                                                         | 0140-00                                      |                                       |                                       |                                         |                                         |
|  | UNE<br>(SPAIN)                           |                                          |                                          |                                                         |                                              |                                       |                                       |                                         |                                         |
|  | UNI<br>(ITALY)                           |                                          |                                          |                                                         |                                              |                                       |                                       |                                         |                                         |
|  | IS<br>(INDIA)                            |                                          |                                          |                                                         |                                              |                                       |                                       |                                         |                                         |
|  | KS<br>(REP. OF<br>KOREA)                 |                                          |                                          |                                                         |                                              |                                       |                                       |                                         |                                         |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                          |                                          |                                                         | HT400                                        |                                       |                                       |                                         |                                         |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                    |                                         |                                                                                          |                                                                                          |                                                                                               |                                                                                                       |                                                                                          |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                                                     |                                          | 16                                    | 16                                      | 17                                                                                       | 17                                                                                       | 17                                                                                            | 17                                                                                                    | 17                                                                                       |
|    | NF/AFNOR<br>(FRANCE)                     |                                       |                                         | FGS 370-/17                                                                              |                                                                                          |                                                                                               | FGS 370-17                                                                                            |                                                                                          |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | F10008;<br>G4000;<br>A159 Grade G4000 | F10012;<br>G4000d;<br>A159 Grade G4000d |                                                                                          |                                                                                          |                                                                                               | F32800;<br>60-40-18;<br>A395 60-40-18;<br>A536 60-40-18                                               |                                                                                          |
|    | BS<br>(UK)                               |                                       |                                         | 350/22 L 40                                                                              |                                                                                          |                                                                                               | 370/17;<br>Grade 370/17;<br>400/18;<br>Grade 400/18;<br>SG 24/17                                      |                                                                                          |
|    | DIN<br>(GERMANY)                         |                                       |                                         | EN-GJS-350-22-LT;<br>GGG-35.3                                                            |                                                                                          |                                                                                               | EN-GJS-400-18-LT;<br>EN-GJS-400-18C-LT;<br>EN-GJS-400-18U-LT;<br>EN-JS1025;<br>EN-JS1049;<br>GGG-40.3 |                                                                                          |
|  | Werkstoff<br>(GERMANY)                   |                                       |                                         | 0.7033;<br>5.3100                                                                        | 5.310                                                                                    | 5.310                                                                                         | 0.7043;<br>5.3103                                                                                     | 5.310                                                                                    |
|  | EN<br>(EUROPE)                           |                                       |                                         | EN-GJS-350-22-LT;<br>EN-GJS-350-22C-LT;<br>EN-GJS-350-22U-LT;<br>EN-JS1015;<br>EN-JS1019 | EN-GJS-350-22-RT;<br>EN-GJS-350-22C-RT;<br>EN-GJS-350-22U-RT;<br>EN-JS1014;<br>EN-JS1029 | EN-GJS-350-22;<br>EN-GJS-350-22C;<br>EN-GJS-350-22U;<br>EN-JS1010;<br>EN-JS1032;<br>EN-JS2010 | EN-GJS-400-18-LT;<br>EN-GJS-400-18C-LT;<br>EN-GJS-400-18U-LT;<br>EN-JS1025;<br>EN-JS1049              | EN-GJS-400-18-RT;<br>EN-GJS-400-18C-RT;<br>EN-GJS-400-18U-RT;<br>EN-JS1024;<br>EN-JS1059 |
|  | GOST<br>(RUSSIA)                         |                                       |                                         | VCh 42-12                                                                                | VCh 35                                                                                   | VCh 35                                                                                        | VCh 42-2                                                                                              |                                                                                          |
|  | JIS<br>(JAPAN)                           |                                       |                                         | FCD 350-22L                                                                              | FCD 350-22                                                                               | FCD 350-22                                                                                    | FCD 400-18L;<br>FCD 400-18AL;<br>FCD 370                                                              | FCD 400-18;<br>FCD 400-18A                                                               |
|  | SS<br>(SWEDEN)                           |                                       |                                         |                                                                                          |                                                                                          |                                                                                               | 0717-15                                                                                               |                                                                                          |
|  | UNE<br>(SPAIN)                           |                                       |                                         | FNG 38-17                                                                                |                                                                                          |                                                                                               |                                                                                                       |                                                                                          |
|  | UNI<br>(ITALY)                           |                                       |                                         | GS 370/17                                                                                |                                                                                          |                                                                                               | GSO 42/15                                                                                             |                                                                                          |
|  | IS<br>(INDIA)                            |                                       |                                         |                                                                                          |                                                                                          |                                                                                               |                                                                                                       |                                                                                          |
|  | KS<br>(REP. OF KOREA)                    |                                       |                                         |                                                                                          |                                                                                          |                                                                                               |                                                                                                       |                                                                                          |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                       |                                         | QT350-22L                                                                                |                                                                                          |                                                                                               |                                                                                                       |                                                                                          |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                                                                                                |                                                                                                                            |                                                                                                                  |                                  |                                                                                                                           |                                                                                                                        |                                                                                                             | 18                               |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                                     |                                          | 17                                                                                                                | 17                                                                                                                         | 17                                                                                                               | 17                               | 18                                                                                                                        | 18                                                                                                                     | 18                                                                                                          |                                  |
|    | NF/AFNOR<br>(FRANCE)                     |                                                                                                                   | FCS 400-12;<br>FCS 400-12                                                                                                  | FGS 450-10                                                                                                       |                                  | FGS 500-7                                                                                                                 | FGS 600-3                                                                                                              | FGS 700-2                                                                                                   |                                  |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | F32800;<br>60-40-18;<br>A395 60-40-18;<br>A536 60- 40-18;<br>D400 J434;<br>D4018 J434                             | F32800;<br>60-40-18;<br>A395 60-40-18;<br>A536 60-40-18                                                                    | F33100;<br>A395 65-45-15;<br>65-45-15;<br>A536 65-45-12;<br>65-45-12                                             |                                  | F33500;<br>D5006 J 434;<br>D5006                                                                                          | F33800;<br>A536 80-55-06;<br>80-55-06;<br>F34100;<br>A538 80-60-03;<br>80-60-03                                        | F34800;<br>A536 100-70-03;<br>100-70-03;<br>A536 100-70-03;<br>D700 J434;<br>D7003 J434                     |                                  |
|    | BS<br>(UK)                               | 400/18;<br>Grade 400/18;<br>SG 24/17                                                                              | 420/12;<br>Grade 420/12                                                                                                    | 420/12;<br>Grade 420/12;<br>SG 27/12                                                                             |                                  | 500/7;<br>Grade 500/7;<br>SG 32/7                                                                                         | 600/3;<br>Grade 600/3                                                                                                  | 700/2;<br>Grade 700/2;<br>SG42/2;<br>SNG700/2                                                               |                                  |
|    | DIN<br>(GERMANY)                         |                                                                                                                   | EN-GJS-400-15;<br>EN-GJS-400-15C;<br>EN-GJS-400-15U;<br>EN-GJS-HB155;<br>EN-JS 1030;<br>EN-JS1072;<br>EN-JS2030;<br>GGG-40 |                                                                                                                  |                                  | EN-GJS-500-7;<br>EN-GJS-500-7C;<br>EN-GJS-500-7U;<br>EN-GJS-HB200;<br>EN-JS-1050;<br>EN-JS-1082;<br>EN-JS-2050;<br>GGG-50 | EN-GJS-600-3;<br>EN-GJS-600-3C;<br>EN-GJS-600-3U;<br>EN-GJS-HB230;<br>EN-JS1060;<br>EN-JS1092;<br>EN-JS2060;<br>GGG-60 | EN-GJS-700-2;<br>EN-JS 1070;<br>GGG-70                                                                      |                                  |
|  | Werkstoff<br>(GERMANY)                   | 0.7043;<br>5.3105                                                                                                 | 0.7040;<br>5.3106                                                                                                          | 5.311                                                                                                            | 5.311                            | 0.7050;<br>5.3200                                                                                                         | 0.7060;<br>5.3201                                                                                                      | 0.7070;<br>5.3300                                                                                           | 5.311                            |
|  | EN<br>(EUROPE)                           | EN-GJS-400-18;<br>EN-GJS-400-18-C;<br>EN-GJS-400-18U;<br>EN-GJS-HB-150;<br>EN-JS1020;<br>EN_JS1062;<br>EN-JS-2020 | EN-GJS-400-15;<br>EN-GJS-400-15C;<br>EN-GJS-400-15U;<br>EN-GJS-HB155;<br>EN-JS 1030;<br>EN-JS1072;<br>EN-JS2030            | EN-GJS-450-10;<br>EN-GJS-450-10C;<br>EN-GJS-450-10U;<br>EN-GJS-HB185;<br>EN-JS1040;<br>EN-JS1132;<br>EN-JS-HB185 | EN-GJS-450-18;<br>EN-GJS-450-18C | EN-GJS-500-7;<br>EN-GJS-500-7C;<br>EN-GJS-500-7U;<br>EN-GJS-HB200;<br>EN-JS-1050;<br>EN-JS-1082;<br>EN-JS-2050            | EN-GJS-600-3;<br>EN-GJS-600-3C;<br>EN-GJS-600-3U;<br>EN-GJS-HB230;<br>EN-JS1060;<br>EN-JS1092;<br>EN-JS2060            | EN-GJS-700-2;<br>EN-GJS-700-2C;<br>EN-GJS-700-2U;<br>EN GJS-HB265;<br>EN-JS1070;<br>EN-JS1102;<br>EN-JS2070 | EN-GJS-500-14;<br>EN-GJS-500-14C |
|  | GOST<br>(RUSSIA)                         | VCh 40                                                                                                            | VCh 40;<br>VCh 42-12                                                                                                       | VCh 45                                                                                                           |                                  | VCh 50;<br>VCh 50-2;<br>VCh 50-2-2                                                                                        | VCh 60;<br>VCh 60-2                                                                                                    | VCh 70;<br>VCh 70-2;<br>VCh 70-3                                                                            |                                  |
|  | JIS<br>(JAPAN)                           | FCD 400-18;<br>FCD 400-18A                                                                                        | FCD 400-15;<br>FCD 400-15A;<br>FCD 400;<br>FCD 40                                                                          | FCD 450-10                                                                                                       |                                  | FCD 500-7;<br>FCD 500-7A;<br>FCD 500;<br>FCD 50                                                                           | FCD 600-3;<br>FCD 600-3A;<br>FCD 600;<br>FCD 60;<br>FCD 550-7;<br>FCD 550                                              | FCD 700-2;<br>FCD 700;<br>FCD 70                                                                            |                                  |
|  | SS<br>(SWEDEN)                           |                                                                                                                   | 0717-02                                                                                                                    |                                                                                                                  |                                  | 0727-02                                                                                                                   | 0732-03                                                                                                                | 0737-01                                                                                                     |                                  |
|  | UNE<br>(SPAIN)                           |                                                                                                                   | FGE 38-17                                                                                                                  |                                                                                                                  |                                  | FGE 50-7                                                                                                                  | FGE 60-2                                                                                                               | FGE 70-2                                                                                                    |                                  |
|  | UNI<br>(ITALY)                           |                                                                                                                   | GS 400/12                                                                                                                  |                                                                                                                  |                                  | GS 500/7                                                                                                                  | GS 600/3                                                                                                               | GS 700-2                                                                                                    |                                  |
|  | IS<br>(INDIA)                            |                                                                                                                   | SG370/17                                                                                                                   | SG400/12                                                                                                         |                                  | SG500/7                                                                                                                   | SG600/3                                                                                                                | SG700/2                                                                                                     |                                  |
|  | KS<br>(REP. OF KOREA)                    |                                                                                                                   | DC 40;<br>GCD 42                                                                                                           |                                                                                                                  |                                  | GCD 50;<br>GCD 500-7                                                                                                      | GCD 600-3                                                                                                              | GCD 700-2                                                                                                   |                                  |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | QT400-18                                                                                                          | QT400-15                                                                                                                   | QT400-18L                                                                                                        |                                  | QT500-7                                                                                                                   | QT600-3                                                                                                                | QT700-2                                                                                                     |                                  |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.               |                                                                                                                        |                                                                                           |                                                                        |                                                |                                                              |                                                                                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Standards                                                                           |                                          | 18                               | 18                                                                                                                     | 18                                                                                        | 19                                                                     | 19                                             | 19                                                           | 20                                                                                                  |
|    | NF/AFNOR<br>(FRANCE)                     |                                  |                                                                                                                        | FGS 900-2                                                                                 | MN 35-10;<br>A32-702 MN 350-10                                         | MN 380-18;<br>A32-702 MN 380-18                |                                                              | MP 60-3;<br>A32-703 MP 60-3;<br>Mn 550-4                                                            |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                  | F36200;<br>A536 120-90-02;<br>120-90-02                                                                                |                                                                                           | A47-32510;<br>A47 Class 32510;<br>A47 Grade 32510;<br>32510;<br>F22200 | A47-35018, A47 Class 35018;<br>A47 Grade 35018 | A47-22010;<br>A47 Class 22010;<br>A47 Grade 22010;<br>F22200 | A220-50005;<br>A220 Class 50005;<br>A220 Grade 50005;<br>A220-60004;<br>A220 Class 60004;<br>F24130 |
|    | BS<br>(UK)                               |                                  | 800/2;<br>Grade 800/2                                                                                                  | 900/2;<br>Grade 900/2                                                                     | B 340/12;<br>310 B340/12                                               |                                                | B 32-10;<br>6681 B 32-10                                     | P 55-04;<br>P 510/4                                                                                 |
|    | DIN<br>(GERMANY)                         |                                  | EN-GJS-800-2;<br>EN-GJS-800-2C;<br>EN-GJS-800-2U;<br>EN-GJS-HB300;<br>EN-JS1080;<br>EN-JS1112;<br>EN-JS2080;<br>GGG-80 |                                                                                           | EN-GJMB-350-10;<br>EN-JM 1130;<br>GTS-35-10;<br>GTS-35                 |                                                |                                                              | EN-GJMB-550-4;<br>EN-JM1160;<br>GTS-55-04                                                           |
|   | Werkstoff<br>(GERMANY)                   | 5.3110                           | 0.7080;<br>5.3301                                                                                                      | 5.330                                                                                     | 0.8135;<br>5.4101                                                      |                                                |                                                              | 0.8155;<br>5.4207                                                                                   |
|  | EN<br>(EUROPE)                           | EN-GJS-600-10;<br>EN-GJS-600-10C | EN-GJS-800-2;<br>EN-GJS-800-2C;<br>EN-GJS-800-2U;<br>EN-GJS-HB300;<br>EN-JS1080;<br>EN-JS1112;<br>EN-JS2080            | EN-GJS-900-2;<br>EN-GJS-900-2U;<br>EN-GJS-HB330;<br>EN-JS1090;<br>EN-JS1122;<br>EN-JS2090 | EN-GJMB-350-10;<br>EN-JM 1130                                          |                                                |                                                              | EN-GJMB-550-4;<br>EN-JM1160                                                                         |
|  | GOST<br>(RUSSIA)                         |                                  | VCh 80;<br>VCh 80-2;<br>VCh 80-3                                                                                       | VCh 100;<br>VCh 100-4                                                                     | KCh 35-10                                                              | KCh 37-12                                      | KCh 33-8                                                     | KCh 55-4                                                                                            |
|  | JIS<br>(JAPAN)                           |                                  | FCD 800-2;<br>FCD 800                                                                                                  |                                                                                           | FCMB 35-10;<br>FCMB 340                                                |                                                | FCMB 310                                                     | FCMP 55-04;<br>FCMP 540                                                                             |
|  | SS<br>(SWEDEN)                           |                                  |                                                                                                                        |                                                                                           | 0810;<br>0815-00                                                       |                                                |                                                              | 0856-00                                                                                             |
|  | UNE<br>(SPAIN)                           |                                  |                                                                                                                        |                                                                                           | GTS 35;<br>36114 Type A                                                |                                                |                                                              | Type C;<br>36116 Type C                                                                             |
|  | UNI<br>(ITALY)                           |                                  | GS 800/2                                                                                                               |                                                                                           | B 35-10                                                                |                                                |                                                              | P 55-04                                                                                             |
|  | IS<br>(INDIA)                            |                                  |                                                                                                                        |                                                                                           |                                                                        |                                                |                                                              |                                                                                                     |
|  | KS<br>(REP. OF KOREA)                    |                                  |                                                                                                                        |                                                                                           |                                                                        |                                                |                                                              |                                                                                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                  |                                                                                                                        |                                                                                           | KTH350-10                                                              | KTH370-12                                      | KTH330-08                                                    | KTZ550-04                                                                                           |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                                                                                 |                                                                                                     |                                                                                                                     |                                                                                                                        |                                                                                |                                                      |                                                      |                                                      |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
| Standards                                                                           |                                          | 20                                                                                                                 | 20                                                                                                  | 20                                                                                                                  | 20                                                                                                                     | 20                                                                             | 20                                                   | 20                                                   | 20                                                   |
|    | NF/AFNOR<br>(FRANCE)                     |                                                                                                                    | Mn 650-3                                                                                            | MP 70-2;<br>A 32-703 MP 70-2;<br>Mn 700-2                                                                           | MP 50-5;<br>A32-703 MP 50-5                                                                                            | MN 700-2                                                                       |                                                      |                                                      |                                                      |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A220-70003;<br>A220 Class 70003;<br>A220 Grade 70003;<br>A220-480M3;<br>A220 Class 480M3;<br>A602-M5503;<br>F24830 | A220-70003;<br>A220 Class 70003;<br>A220 Grade 70003;<br>A220-80002;<br>A220 Class 80002;<br>F25530 | A220-70003;<br>A220 Class 70003;<br>A220 Grade 70003;<br>F26230;<br>F20004;<br>F24830;<br>A220-90001;<br>A220-620M1 | A220-45006;<br>A220 Class 45006;<br>A220 Grade 45006<br>A220-45008;<br>A220-310M6;<br>A220-310M8;<br>F23130;<br>F23131 | A220-80002;<br>A220 Class 80002;<br>A220 Grade 80002;<br>A602-M8501;<br>F20005 | A220-90001;<br>A220 Class 90001;<br>A220 Grade 90001 | A220-60004;<br>A220 Class 60004;<br>A220 Grade 60004 | A220-40010;<br>A220 Class 40010;<br>A220 Grade 40010 |
|    | BS<br>(UK)                               |                                                                                                                    | P 65-02;<br>6681 P 65-02;<br>P 570/3                                                                | P 70-2;<br>6681 P 70-2;<br>P 690/2                                                                                  | P 45-06;<br>6681 P 45-06                                                                                               |                                                                                |                                                      |                                                      |                                                      |
|    | DIN<br>(GERMANY)                         | EN-GJMB-600-3;<br>EN-JM1170                                                                                        | EN-GJMB-650-2;<br>EN-JM1180;<br>GTS-65-02                                                           | EN-GJMB-700-2;<br>EN-JM1190;<br>GTS-70-02                                                                           | EN-GJMD-450-6;<br>EN-JM1140;<br>GTS-45-06;<br>GTS-45                                                                   | EN-GJMB-800-1;<br>EN-JM1200                                                    |                                                      |                                                      |                                                      |
|    | Werkstoff<br>(GERMANY)                   | 5.421                                                                                                              | 0.8165;<br>5.4300                                                                                   | 0.8170;<br>5.4301                                                                                                   | 0.8145;<br>5.4205                                                                                                      | 5.4302                                                                         |                                                      |                                                      |                                                      |
|  | EN<br>(EUROPE)                           | EN-GJMB-600-3;<br>EN-JM1170                                                                                        | EN-GJMB-650-2;<br>EN-JM1180                                                                         | EN-GJMB-700-2;<br>EN-JM1190                                                                                         | EN-GJMD-450-6;<br>EN-JM1140                                                                                            | EN-GJMB-800-1;<br>EN-JM1200                                                    |                                                      |                                                      |                                                      |
|  | GOST<br>(RUSSIA)                         | KCh60-3                                                                                                            | KCh 63-3;<br>KCh 65-3                                                                               | KCh 70-2                                                                                                            | KCh 45-7                                                                                                               | KCh 80-1.5                                                                     |                                                      |                                                      |                                                      |
|  | JIS<br>(JAPAN)                           | FCMP 60-03                                                                                                         | FCMP 65-02;<br>FCMP 590                                                                             | FCMP 70-02;<br>FCMP 690                                                                                             | FCMP 45-06                                                                                                             | FCMP 80-01;<br>FCMP 70;<br>FCMP 700                                            |                                                      |                                                      |                                                      |
|  | SS<br>(SWEDEN)                           |                                                                                                                    | 0862-030                                                                                            | 0862-03                                                                                                             | 0854-00                                                                                                                |                                                                                |                                                      |                                                      | 0852-00                                              |
|  | UNE<br>(SPAIN)                           |                                                                                                                    | Type B;<br>36116 Type B                                                                             | 36116 Type A                                                                                                        | Type E;<br>36116 Type E                                                                                                |                                                                                |                                                      |                                                      |                                                      |
|  | UNI<br>(ITALY)                           |                                                                                                                    | GMN 65;<br>P 65-02                                                                                  | P 70-2;<br>GMN 70                                                                                                   | P 45-06                                                                                                                |                                                                                |                                                      |                                                      |                                                      |
|  | IS<br>(INDIA)                            |                                                                                                                    |                                                                                                     |                                                                                                                     |                                                                                                                        |                                                                                |                                                      |                                                      |                                                      |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                                                                                    |                                                                                                     |                                                                                                                     |                                                                                                                        | PMC 490                                                                        | PMC 590                                              |                                                      |                                                      |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                                                                    | KTZ650-02                                                                                           | KTZ700-02                                                                                                           | KTZ450-06                                                                                                              | KTZ650-02                                                                      | KTZ700-02                                            | KTZ550-04                                            |                                                      |

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| Standards                                                                           |                                          | Material Group No.          |                             |                                              | Material Group No.                                                  |                                      |                                      |                                        |                                           |
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|                                                                                     |                                          | 20                          | 20                          | 20                                           | 21                                                                  | 21                                   | 21                                   | 21                                     | 22                                        |
|    | NF/AFNOR<br>(FRANCE)                     | MB 400-5                    | MB 35-7                     | MB 380-12                                    | A G0-6                                                              | A5                                   | A4                                   | A-G4.5MC                               | A-U4G                                     |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                             |                             |                                              | AA5005;<br>AA5006;<br>A95005;<br>A95006;<br>5005;<br>5005A;<br>5006 | AA1050;<br>A91050;<br>1050;<br>1050A | AA1200;<br>A91200;<br>1200;<br>1200A | AA5083;<br>A95083;<br>5083             | AA2017;<br>A92017;<br>2017;<br>2017A      |
|    | BS<br>(UK)                               | W 40-05                     | W 35-04                     |                                              | N41                                                                 | 1B                                   | 1C                                   | N8                                     |                                           |
|    | DIN<br>(GERMANY)                         | EN-GJMW-400-5;<br>GTW-40-05 | EN-GJMW-350-4;<br>GTW-35-04 | GTW-S-38-12;<br>EN-GJMW-360-12;<br>EN-JM1020 | AlMg1;<br>AlMg1C                                                    | Al99.5;<br>Al99.5                    | Al99.0;<br>Al99.0;<br>Al99           | AlMg4.5Mn;<br>AlMg4.5Mn                | AlCu2.5Si(A);<br>AlCu2.5Si(A);<br>AlCuMg1 |
|   | Werkstoff<br>(GERMANY)                   | 0.8040;<br>5.4202           | 0.8035;<br>5.4200           | 0.8038;<br>5.4201                            | 3.3315                                                              | 3.0255                               | 3.0205                               | 3.355                                  | 3.1325;<br>3.1124                         |
|  | EN<br>(EUROPE)                           | EN-GJMW-400-5;<br>EN-JM1030 | EN-GJMW-350-4;<br>EN-JM1010 | EN-GJMW-360-12;<br>EN-JM1020                 | AlMg1C;<br>5005A                                                    | Al99.5;<br>Al99.5;<br>1050A          | Al99.0;<br>Al99.0;<br>1200           | EN AW-5083;<br>AlMg4.5Mn;<br>AlMg4.5Mn | AlCu2.5Si(A);<br>AlCu2.5Si(A);<br>2017A   |
|  | GOST<br>(RUSSIA)                         |                             |                             |                                              | 1510;<br>AlMg1                                                      | AD0                                  | A0                                   |                                        | V65                                       |
|  | JIS<br>(JAPAN)                           | FCMW 40-05;<br>FCMW 370     | FCMW 35-04;<br>FCMW 330     | FCMW 38-12;<br>FCMW 370                      | A5005                                                               |                                      | A1200                                | A5083                                  |                                           |
|  | SS<br>(SWEDEN)                           |                             |                             |                                              | 144106                                                              | 14407                                | 144010                               | 144140                                 |                                           |
|  | UNE<br>(SPAIN)                           | 36113 Type A                | 36113 Type B                |                                              | L-3350                                                              | L-3051                               | L-3001                               | L-3321                                 | L-3120                                    |
|  | UNI<br>(ITALY)                           | W 40-05                     | W 35-04                     |                                              | 9005/1                                                              | 9001/2                               | Al99.0                               | 9005/5                                 |                                           |
|  | IS<br>(INDIA)                            |                             |                             |                                              | 51000                                                               | 19500                                | 19000                                |                                        | 24534                                     |
|  | KS<br>(REP. OF<br>KOREA)                 |                             |                             |                                              |                                                                     |                                      |                                      |                                        |                                           |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | KTB380-12                   | KTB350-04                   | KTB380-12                                    | 5005                                                                | 1A50                                 | 1200;<br>L50                         |                                        | 2A11;<br>LY11                             |

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|                                                                                     |                                          | Material Group No.               |                                      |                        |                                                             |                            |                                    |                                              |                                   |
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| Standards                                                                           |                                          | 22                               | 22                                   | 22                     | 22                                                          | 22                         | 22                                 | 22                                           | 22                                |
|    | NF/AFNOR<br>(FRANCE)                     | A-SGM0.7                         |                                      | A-U5PbBi               | A-Z5GU                                                      | A-U4G1                     | A-Z5G                              | A-GSUC                                       |                                   |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                  |                                      |                        | AA7075;<br>A97075;<br>7075                                  | AA2024;<br>A92024;<br>2024 |                                    | AA6061;<br>A96061;<br>6061                   | AA7010;<br>A97010;<br>7010        |
|    | BS<br>(UK)                               | H30                              |                                      | FC1                    | 7075;<br>L95;<br>L96                                        | 2024;<br>2L97              | H17                                | H20                                          | 5120 B;<br>5130 A                 |
|    | DIN<br>(GERMANY)                         | AlMgSi1                          | AlZnMgCu0.5;<br>AlZnMgCu0.5          | AlCu6BiPb;<br>AlCuBiPb | AlZn5.5MgCu;<br>AlZn5.5MgCu;<br>AlZnMgCu1.5;<br>AlZnMgCu1.5 | AlCuMg2                    | AlZn4.5Mg1;<br>AlZn4.5Mg1          | AlMg1SiCu                                    | AlZn6MgCu                         |
|    | Werkstoff<br>(GERMANY)                   | 3.2315                           | 3.4345                               | 3.1655                 | 3.4365;<br>3.4364                                           | 3.1355;<br>3.1354          | 3.4335                             | 3.3211;<br>3.3214                            | 3.4394                            |
|   | EN<br>(EUROPE)                           | AlSiMgMn;<br>6082;<br>EN AW-6082 | AlZnMgCu0.5;<br>AlZnMgCu0.5;<br>7022 | AlCu6BiPb;<br>2011     | AlZn5.5MgCu;<br>AlZn5.5MgCu;<br>AW-7075;<br>7075            | AlCu4Mg1;<br>2024          | AlZn4.5Mg1;<br>AlZn4.5Mg1;<br>7020 | EN AW-6061;<br>EN AW-AlMg1SiCu;<br>AlMg1SiCu | EN AW-7010;<br>AlZn6MgCu          |
|  | GOST<br>(RUSSIA)                         | AD35                             |                                      |                        | B95                                                         | D16                        |                                    | AD33                                         |                                   |
|  | JIS<br>(JAPAN)                           |                                  |                                      | A2011                  | A7075                                                       | A2024                      |                                    | A6061                                        |                                   |
|  | SS<br>(SWEDEN)                           | 144312                           |                                      | 144355                 |                                                             |                            | 144425                             |                                              |                                   |
|  | UNE<br>(SPAIN)                           | L-3453                           |                                      | L-3192                 | L-3710                                                      | L-3140                     | L-3741                             | L-3420                                       |                                   |
|  | UNI<br>(ITALY)                           | 9006/4                           |                                      | 9002/5                 | 9007/2                                                      | 9002/4;<br>3583            | 9007/1                             | 9006/2                                       | 9007/4;<br>P-AlZn6 2Mg2 3Cu 1.8Zr |
|  | IS<br>(INDIA)                            | 64430                            |                                      |                        | 76528                                                       | 24530                      | 74530                              | 65032                                        |                                   |
|  | KS<br>(REP. OF<br>KOREA)                 |                                  |                                      |                        | A7075P                                                      |                            |                                    | A6061P                                       |                                   |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                  | 7022                                 |                        | 7075                                                        | 2A12                       | 7020                               | 6061                                         |                                   |



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| Standards                                                                           |                                          | Material Group No.                               |                            |                                                  |                                                  |                                                         |                                                                             |                               |                               |                                                   |
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|                                                                                     |                                          | 22                                               | 22                         | 22                                               | 22                                               | 23                                                      | 23                                                                          | 23                            | 23                            | 23                                                |
|    | NF/AFNOR<br>(FRANCE)                     |                                                  |                            | A-U2GN;<br>2618A                                 |                                                  |                                                         | A-S12U                                                                      | A-G10S                        |                               |                                                   |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | AA7050;<br>A97050;<br>7050                       | AA6063;<br>A96063;<br>6063 | AA2618;<br>A92618;<br>A2618;<br>2618             | AA7050;<br>A97050;<br>7050                       |                                                         |                                                                             | 520.0;<br>AA 520.0;<br>A05200 | 222.0;<br>AA 222.0;<br>A02220 | 518.0;<br>AA 518.0;<br>A05180                     |
|    | BS<br>(UK)                               |                                                  | H9                         | 2618A;<br>H16                                    |                                                  | LM5                                                     |                                                                             |                               | LM12                          |                                                   |
|    | DIN<br>(GERMANY)                         | AlZn6CuMgZr                                      | AlMg0.7Si                  | AlCu2Mg1.5Ni                                     | AlZn6CuMgZr                                      | G-AlMg5Si;<br>GK-AlMg5Si;<br>AlMg5Si;<br>VDS 245        | GD-AISI12(Cu);<br>G-AISI12(Cu);<br>AlSi12(Cu);<br>VDS 231 D                 |                               |                               | G-AlMg9;<br>GD-AlMg9;<br>AlMg9;<br>VDS 349        |
|    | Werkstoff<br>(GERMANY)                   |                                                  |                            | 3.192                                            | 3.4144                                           | 3.3261                                                  | 3.2982                                                                      |                               |                               | 3.3292                                            |
|  | EN<br>(EUROPE)                           | EN AW-7050;<br>EN AW-AlZn6CuMgZr;<br>AlZn6CuMgZr | EN AW-6063;<br>AlMg0.7Si   | EN AW-2618A;<br>AlCu2Mg1.5Ni;<br>2618A           | EN AW-7050;<br>EN AW-AlZn6CuMgZr;<br>AlZn6CuMgZr | EN AC-51400;<br>EN AC-AlMg5Si;<br>G-AlMg5Si;<br>AlMg5Si | EN AC-47100;<br>EN AC-AISI12C;<br>G-AISI12Cu;<br>AlSi12Cu;<br>AlSi12Cu1(Fe) |                               |                               | EN AC-51200;<br>EN AC-AlMg9;<br>G-AlMg9;<br>AlMg9 |
|  | GOST<br>(RUSSIA)                         |                                                  |                            |                                                  |                                                  | AL13                                                    |                                                                             | A18                           |                               |                                                   |
|  | JIS<br>(JAPAN)                           | A7050                                            | A6063                      | A2618                                            | A7050                                            |                                                         |                                                                             | AC7B                          |                               |                                                   |
|  | SS<br>(SWEDEN)                           |                                                  | 144104                     |                                                  |                                                  | 144163                                                  |                                                                             |                               |                               |                                                   |
|  | UNE<br>(SPAIN)                           |                                                  | L-3441                     | L-3171;<br>2618A;<br>Al-2CuMgNi                  |                                                  |                                                         |                                                                             | L-2310                        | L-2110                        |                                                   |
|  | UNI<br>(ITALY)                           |                                                  |                            | 9002/6;<br>3578;<br>P-AlCu2.3Mg1.5FeNi;<br>2618A |                                                  |                                                         | 3048                                                                        | 3056                          | 3041                          |                                                   |
|  | IS<br>(INDIA)                            |                                                  |                            |                                                  |                                                  |                                                         | 4685                                                                        |                               |                               |                                                   |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                  |                            |                                                  |                                                  |                                                         |                                                                             |                               |                               |                                                   |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                  |                            | LD7                                              | 7050                                             | ZL303                                                   |                                                                             | ZL301                         |                               |                                                   |

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|                                                                                     |                                          | Material Group No.            |                         |                                                                     |                                                                 |                                                                    |                                           |                                 |                                                         |                                                                  |                                      |
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| Standards                                                                           |                                          | 23                            | 23                      | 23                                                                  | 23                                                              | 23                                                                 | 23                                        | 23                              | 23                                                      | 24                                                               | 24                                   |
|    | NF/AFNOR<br>(FRANCE)                     | AU5NKZr                       |                         | A-Z5GF                                                              | A-G6                                                            | A-S13                                                              |                                           |                                 | A-G3T                                                   |                                                                  | A-S9G                                |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 203.0;<br>AA 203.0;<br>A02030 | ER4047;<br>A94047       | 712.0;<br>AA 712.0;<br>A07120                                       | 514.0;<br>514.1;<br>AA 514.0;<br>AA 514.1;<br>A05140;<br>A05141 | B413.0;<br>AA B413.0;<br>A24130;<br>B213.0;<br>AA 213.0;<br>A22130 |                                           | A444.0;<br>AA A444.0;<br>A14440 |                                                         | 515.0;<br>AA 515.0;<br>A05150                                    |                                      |
|    | BS<br>(UK)                               |                               | 4047A;<br>NG2           |                                                                     |                                                                 | LM6                                                                |                                           |                                 | H20                                                     |                                                                  |                                      |
|    | DIN<br>(GERMANY)                         | G-AlCu5Ni1.5;<br>G-AlCu5Ni1.5 | SG-AISI12               | G-AlZn10Si8Mg;<br>GK-AlZn10Si8Mg;<br>AlZn10Si8Mg;<br>VDS 108        | G-AlMg5;<br>GK-AlMg5;<br>AlMg5;<br>EN AC-51300;<br>VDS 244      | G-AISI12;<br>GK-AISI12;<br>GD-AISI12;<br>AISI12                    | G-AISI11;<br>GK-AISI11;<br>AISI11         |                                 | G-AlMg3;<br>GK-AlMg3;<br>GF-AlMg3;<br>AlMg3;<br>VDC 244 | G-AlMg3Si;<br>GK-AlMg3Si;<br>GF-AlMg3Si;<br>AlMg3Si;<br>AlMg3Si1 | G-AISI9Mg;<br>GK-AISI9Mg;<br>AISI9Mg |
|    | Werkstoff<br>(GERMANY)                   | 3.1754                        | 3.2585                  |                                                                     | 3.3561                                                          | 3.2581;<br>3.2582                                                  | 3.2211                                    |                                 | 3.3541                                                  | 3.3241                                                           | 3.2373                               |
|   | EN<br>(EUROPE)                           |                               | SG-AISI12;<br>EL-AISI12 | EN AC-71100;<br>EN AC-AlZn10Si8Mg;<br>G-AlZn10Si8Mg;<br>AlZn10Si8Mg | EN AC-51300;<br>EN AC-AlMg5;<br>G-AlMg5;<br>AlMg5               | EN AC-44200;<br>EN AC-AISI12;<br>G-AISI12;<br>GD-AISI12;<br>AISI12 | EN AC-44000;<br>EN AC-AISI11;<br>G-AISI11 |                                 | EN AC-51100;<br>EN AC-AlMg3;<br>G-AlMg3;<br>AlMg3       | G-AlMg3Si1;<br>AlMg3Si                                           | G-AISI9Mg;<br>AISI9Mg                |
|  | GOST<br>(RUSSIA)                         |                               |                         |                                                                     | AL28;<br>AMg5Mz;                                                |                                                                    |                                           | AK7                             |                                                         |                                                                  | AK9                                  |
|  | JIS<br>(JAPAN)                           |                               |                         |                                                                     |                                                                 | AC3                                                                |                                           |                                 | ADC6                                                    |                                                                  | AC4A                                 |
|  | SS<br>(SWEDEN)                           |                               | 144262                  |                                                                     |                                                                 | 144261                                                             |                                           |                                 | 144224                                                  |                                                                  |                                      |
|  | UNE<br>(SPAIN)                           |                               |                         |                                                                     | L-2331                                                          | L-2520                                                             |                                           |                                 | L-2341                                                  |                                                                  |                                      |
|  | UNI<br>(ITALY)                           |                               |                         | 3602                                                                | 3058                                                            | 4514                                                               |                                           |                                 | 3059                                                    |                                                                  | 3051                                 |
|  | IS<br>(INDIA)                            |                               |                         |                                                                     |                                                                 |                                                                    |                                           |                                 | 53000                                                   |                                                                  |                                      |
|  | KS<br>(REP. OF<br>KOREA)                 |                               |                         |                                                                     |                                                                 |                                                                    |                                           |                                 |                                                         |                                                                  | AC4A                                 |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                               | 4047                    | ZL402                                                               | YI302                                                           | YL102                                                              |                                           |                                 | 5754                                                    |                                                                  | ZL102                                |

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|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------|
| Standards                                                                           |                                          | 24                                                                  | 24                                                          | 24                                               | 24                                                         | 24                                                | 24                                                         | 24                                                                                                    | 24                                                                  | 24                                                      |
|    | NF/AFNOR<br>(FRANCE)                     | A-S7G03                                                             | AU5GT                                                       |                                                  | A-S9U3                                                     |                                                   | A-S5UZ                                                     | A-S10UG                                                                                               | A-S10G                                                              |                                                         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A356.0;<br>AA A356.0;<br>A13560;<br>A356.2;<br>AA A356.2;<br>A13562 | 204.0;<br>AA 204.0;<br>A02040                               | A333.0;<br>AA A333.0;<br>A13330                  | 380.0;<br>AA 380.0;<br>A03800                              | 365.0;<br>AA 365.0;<br>A03650                     | 319.0;<br>AA 319.0;<br>A03190                              |                                                                                                       |                                                                     |                                                         |
|    | BS<br>(UK)                               | 2L99                                                                |                                                             |                                                  | LM24                                                       |                                                   | LM21                                                       |                                                                                                       |                                                                     |                                                         |
|    | DIN<br>(GERMANY)                         | G-AISI7Mg;<br>GK-AISI7Mg;<br>GF-AISI7Mg;<br>AISI7Mg                 | G-AICu4TiMg;<br>GK-AICu4TiMg;<br>GF-AICu4TiMg;<br>AICu4TiMg | G-AISI8Cu3;<br>GK-AISI8Cu3                       | G-AISI9Cu3;<br>GD-AISI9Cu3;<br>AISI9Cu3;<br>VDS 226        | G-AISI10MnMg                                      | G-AISI6Cu4;<br>GK-AISI6Cu4;<br>AISI6Cu4;<br>VDS 225        | G-AISI10MgCu;<br>GK-AISI10MgCu;<br>G-AISI10Mg(Cu);<br>GK-AISI10Mg(Cu);<br>AISI10MgCu;<br>AISI10Mg(Cu) | G-AISI10Mg;<br>GK-AISI10Mg;<br>GD-AISI10Mg;<br>AISI10Mg;<br>VDS 239 | G-AICu4Ti;<br>AICu4Ti                                   |
|   | Werkstoff<br>(GERMANY)                   | 3.2371                                                              | 3.1371                                                      | 3.2161                                           | 3.2163                                                     |                                                   | 3.2151                                                     | 3.2383                                                                                                | 3.2381;<br>3.2385                                                   | 3.1841                                                  |
|  | EN<br>(EUROPE)                           | G-AISI7Mg;<br>AISI7Mg                                               | EN AC-21000;<br>EN AC-AICu4TiMg;<br>G-AICu4TiMg             | EN AC-AISI8Cu3;<br>EN AC-AISI8Cu3;<br>G-AISI8Cu3 | EN AC-46200;<br>EN AC-AISI8Cu3;<br>G-AISI9Cu3;<br>AISI8Cu3 | EN AC-43500;<br>EN AC-AISI10MnMg;<br>G-AISI10MnMg | EN AC-45000;<br>EN AC-AISI6Cu4;<br>G-AISI6Cu4;<br>AISI6Cu4 |                                                                                                       | EN AC-43000;<br>EN AC-AISI10Mg;<br>G-AISI10Mg;<br>AISI10Mg          | EN AC-21100;<br>EN AC-AICu4Ti;<br>G-AICu4Ti;<br>AICu4Ti |
|  | GOST<br>(RUSSIA)                         | AL9                                                                 |                                                             | AL13                                             | AK8M3;<br>AK8                                              |                                                   | AK5M                                                       |                                                                                                       |                                                                     | AL19                                                    |
|  | JIS<br>(JAPAN)                           | AC4CH                                                               | AC1B                                                        |                                                  | AC4B                                                       |                                                   | AC2B                                                       |                                                                                                       |                                                                     |                                                         |
|  | SS<br>(SWEDEN)                           |                                                                     |                                                             | 144163                                           | 144252                                                     |                                                   | 144230                                                     |                                                                                                       | 144253                                                              |                                                         |
|  | UNE<br>(SPAIN)                           | L-2651                                                              | L-2140                                                      |                                                  | L-2630                                                     |                                                   | L-2620                                                     |                                                                                                       |                                                                     |                                                         |
|  | UNI<br>(ITALY)                           |                                                                     |                                                             |                                                  | 3610                                                       |                                                   | 7369/4                                                     |                                                                                                       |                                                                     |                                                         |
|  | IS<br>(INDIA)                            |                                                                     |                                                             |                                                  |                                                            |                                                   |                                                            |                                                                                                       |                                                                     | 2280                                                    |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                                     |                                                             |                                                  |                                                            |                                                   |                                                            |                                                                                                       |                                                                     |                                                         |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | ZL101                                                               | ZL201                                                       |                                                  | ZL105A                                                     |                                                   | ZL107                                                      |                                                                                                       | YL104                                                               | ZL203                                                   |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No. |                                                               |                                 |                                   |                               |                                        |                                                                          |                                                            |                                                                              |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|---------------------------------------------------------------|---------------------------------|-----------------------------------|-------------------------------|----------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------|
| Standards                                                                           |                                          | 24                 | 25                                                            | 25                              | 25                                | 26                            | 26                                     | 26                                                                       | 26                                                         | 26                                                                           |
|    | NF/AFNOR<br>(FRANCE)                     |                    |                                                               |                                 |                                   |                               | CuPb5Sn5Zn5;<br>UE5;<br>U-E 5 Pb 5 Z 5 | CuSn7Pb6Zn4;<br>UE7;<br>U-E 7 Z 5 Pb 4                                   | U-Pb15E8;<br>U-Pb 15 E8                                    | U-Pb10<br><br>CuZn36Pb3                                                      |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A304               | 390.0;<br>AA 390.0;<br>A03900                                 | 393.0;<br>AA 393.0;<br>A03930   |                                   | C83810                        | C83600                                 | C93200                                                                   | C93800                                                     | C93700<br><br>C36000                                                         |
|    | BS<br>(UK)                               |                    | LM30                                                          | LM29                            | LM28                              | LG1                           | LG2                                    | GC 493K                                                                  | LB1                                                        | LB2<br><br>CZ124                                                             |
|    | DIN<br>(GERMANY)                         |                    | G-AISI17Cu4Mg                                                 | G-AISI20CuMgNi;<br>AISI20CuMgNi | G-AISI18Cu1MgNi;<br>AISI18Cu1MgNi | CuSn3Zn8Pb5-C;<br>G-CuSn2ZnPb | CuSn5Zn5Pb5-C;<br>G-CuSn5ZnPb;<br>Rg 5 | CuSn7Zn4Pb7-C;<br>G-CuSn7ZnPb;<br>GC-CuSn7ZnPb;<br>GZ-CuSn7ZnPb;<br>Rg 7 | CuSn7Pb15-C;<br>G-CuPb15Sn;<br>GC-CuPb15Sn;<br>GZ-CuPb15Sn | CuSn10Pb10-C;<br>G-CuPb10Sn;<br>GC-CuPb10Sn;<br>GZ-CuPb10Sn<br><br>CuZn36Pb3 |
|    | Werkstoff<br>(GERMANY)                   |                    |                                                               |                                 |                                   | 2.1098                        | 2.1096;<br>2.1096.01                   | 2.1090                                                                   | 2.1182                                                     | 2.1176<br><br>2.0375                                                         |
|   | EN<br>(EUROPE)                           |                    | EN AB-48100;<br>EN AC-48100;<br>G-AISI17Cu4Mg;<br>AISI17Cu4Mg |                                 |                                   | CuSn3Zn8Pb5-C                 | CuSn5Zn5Pb5-C                          | CuSn7Zn4Pb7-C                                                            | CuSn7Pb15-C;<br>CC496K                                     | CuSn10Pb10-C<br><br>CuZn36Pb3;<br>CW603N                                     |
|  | GOST<br>(RUSSIA)                         |                    |                                                               | AK21M2N2                        |                                   |                               | Br05Ts5S5                              |                                                                          |                                                            |                                                                              |
|  | JIS<br>(JAPAN)                           |                    | ADC14                                                         |                                 |                                   |                               | H5111;<br>H2203                        |                                                                          |                                                            | C3600;<br>C3601;<br>C3602                                                    |
|  | SS<br>(SWEDEN)                           |                    | 4282                                                          |                                 |                                   |                               | 5204-15                                |                                                                          |                                                            |                                                                              |
|  | UNE<br>(SPAIN)                           |                    |                                                               |                                 |                                   |                               |                                        |                                                                          | C-3300                                                     |                                                                              |
|  | UNI<br>(ITALY)                           |                    |                                                               |                                 |                                   |                               |                                        |                                                                          |                                                            | 12167                                                                        |
|  | IS<br>(INDIA)                            |                    |                                                               |                                 |                                   |                               |                                        |                                                                          |                                                            |                                                                              |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |                                                               |                                 |                                   |                               |                                        |                                                                          |                                                            |                                                                              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |                                                               |                                 |                                   |                               | QSn4-0.3                               |                                                                          |                                                            | ZCuPb10Sn10<br><br>HPb63-3                                                   |

## Material Designation in Accordance with Selected Standards

|                                                                                                                            |  | Material Group No.        |                          |                     |                                                                     |                   |                     |                                                                                |                           |                                 |
|----------------------------------------------------------------------------------------------------------------------------|--|---------------------------|--------------------------|---------------------|---------------------------------------------------------------------|-------------------|---------------------|--------------------------------------------------------------------------------|---------------------------|---------------------------------|
| Standards                                                                                                                  |  | 26                        | 26                       | 27                  | 27                                                                  | 27                | 27                  | 27                                                                             | 27                        | 27                              |
|  NF/AFNOR (FRANCE)                        |  | CuZn38Pb2                 |                          | U-Z10;<br>CuZn10    | U-Z36N3;<br>CuZn19Al6Y20                                            | U-Z36;<br>CuZn 36 |                     |                                                                                |                           | U-Z15;<br>CuZn15                |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  | C37000                    | C67300;<br>J461;<br>J463 | C22000              | C86200;<br>SAE 430A                                                 | C27200            | C27400              | C86400                                                                         | C46400                    | C23000;<br>85Cu-15Zn            |
|  BS (UK)                                  |  | CZ129                     |                          | CZ101               | HTB 1                                                               | CZ108             | CZ108               | HTB 1                                                                          | CZ112                     | CZ102                           |
|  DIN (GERMANY)                            |  | CuZn38Pb2;<br>CuZn38Pb1.5 |                          | CuZn10;<br>Ms90     | CuZn34Mn3Al2Fe1-C;<br>G-CuZn34Al2;<br>GK-CuZn34Al2;<br>GZ-CuZn34Al2 | CuZn36;<br>Ms64   | CuZn37;<br>Ms63     | CuZn35Mn2Al1Fe1-C;<br>G-CuZn35Al1;<br>GK-CuZn35Al1;<br>GZ-CuZn35Al1;<br>G-Ms60 | CuZn38Sn1As;<br>CuZn38Sn1 | CuZn15 ;<br>CuZn 15             |
|  Werkstoff (GERMANY)                      |  | 2.037                     |                          | 2.0230              | 2.0596                                                              | 2.0335            | 2.0321              | 2.0592                                                                         | 2.0530                    | 2.0240                          |
|  EN (EUROPE)                            |  | CuZn38Pb2;<br>CW608N      | CuZn35Mn3Pb2Si1          | CuZn10;<br>CW501L   | CuZn34Mn3Al2Fe1-C;<br>CC764S                                        | CuZn36;<br>CW507L | CuZn37;<br>CW508L   | CuZn35Mn2Al1Fe1-C;<br>CC765S                                                   | CuZn38Sn1As;<br>CW717R    | CuZn15;<br>CW502L               |
|  GOST (RUSSIA)                          |  | LS59-1                    |                          | L90                 | LTs23A;<br>LTs23A6Zh3MTs2                                           | L63               | L63                 |                                                                                | LO60-1                    |                                 |
|  JIS (JAPAN)                            |  | C3710                     |                          | C2200               | HBSC4;<br>H5102/class 3;<br>H5102/class 4                           |                   | C2720               | HBSC1;<br>CAC301                                                               | C4640                     | C2300                           |
|  SS (SWEDEN)                            |  |                           |                          |                     |                                                                     |                   |                     |                                                                                |                           | 5112-02;<br>5112-04;<br>5112-05 |
|  UNE (SPAIN)                            |  |                           |                          |                     |                                                                     |                   |                     |                                                                                |                           |                                 |
|  UNI (ITALY)                            |  |                           |                          | P-CuZn10;<br>P-OT90 |                                                                     | C 2700            | P-CuZn37;<br>P-OT63 |                                                                                | P-CuZn39Sn1               |                                 |
|  IS (INDIA)                             |  |                           |                          |                     |                                                                     |                   |                     |                                                                                |                           |                                 |
|  KS (REP. OF KOREA)                     |  |                           |                          |                     |                                                                     |                   |                     |                                                                                |                           |                                 |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  |                           |                          | H90                 | ZCuZn25Al6Fe3Mn3                                                    | H65               | H63                 | ZCuZn35Al2Mn2Fe1                                                               | H50-1                     | H85                             |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.              |                    |                     |                           |                         |                   |                                    |                                   |                                                             |                                                  |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------|--------------------|---------------------|---------------------------|-------------------------|-------------------|------------------------------------|-----------------------------------|-------------------------------------------------------------|--------------------------------------------------|
|                                                                                     |                                          | 27                              | 27                 | 27                  | 27                        | 27                      | 27                | 28                                 | 28                                | 28                                                          | 28                                               |
|    | NF/AFNOR<br>(FRANCE)                     | CuZn20                          | CuZn30             |                     |                           |                         | CuZn40            | U-A10N;<br>CuAl9Ni5Fe3             | CuSn8                             | UE12P                                                       | CuAl10Fe5Ni5 Y70                                 |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | C24000;<br>80Cu-20Zn            | C26000;<br>CA260   | C27453              |                           | C85566                  | C28000            | C63000                             | C90700                            | C90800;<br>C91700                                           | C95800;<br>C95810                                |
|    | BS<br>(UK)                               | CZ103                           | CZ106              |                     |                           |                         | CZ109             | CA 104                             | CT1                               | PB2                                                         |                                                  |
|    | DIN<br>(GERMANY)                         | CuZn20;<br>CuZn 20;<br>Ms80     | CuZn30;<br>CuZn 30 |                     |                           |                         | CuZn40            | CuAl10Ni5Fe4;<br>CuAl 10 Ni 5 Fe 4 | CuSn10-C;<br>G-CuSn 10;<br>SnBz10 | CuSn12-C;<br>G-CuSn12;<br>GZ-CuSn12;<br>SnBz12, Gbz12       | G-CuAl10Fe5Ni5-C;<br>G-CuAl 10 Ni;<br>NiAlBz-F60 |
|    | Werkstoff<br>(GERMANY)                   | 2.0250                          | 2.0265             |                     |                           |                         | 2.036             | 2.0966                             | 2.1050                            | 2.1052;<br>2.1052.01;<br>2.1052.04;<br>2.1052.03;<br>2.1056 | 2.0975                                           |
|   | EN<br>(EUROPE)                           | CuZn20;<br>CW503L               | CuZn30;<br>CW505L  | CuZn38As;<br>CW511L | CuZn36AlAsSb-B;<br>CB771S | CuZn38AsSb-C;<br>CC771S | CuZn40;<br>CW509L | CuAl10Ni5Fe4;<br>CW307G            | CuSn10-C;<br>CC480K               | CuSn12-C;<br>CC483K                                         | CC333G                                           |
|  | GOST<br>(RUSSIA)                         |                                 |                    |                     |                           |                         | L60               | BrAD;<br>BrAZhN10-4-4;<br>N10-4-4  |                                   |                                                             |                                                  |
|  | JIS<br>(JAPAN)                           | C2400                           | C2600              |                     |                           |                         | C2801             | C6301                              |                                   | CAC502C;<br>PBC2C                                           | CAC703C                                          |
|  | SS<br>(SWEDEN)                           | 5114-02;<br>5114-04;<br>5114-05 |                    |                     |                           |                         |                   |                                    |                                   |                                                             |                                                  |
|  | UNE<br>(SPAIN)                           |                                 |                    |                     |                           |                         |                   |                                    |                                   |                                                             |                                                  |
|  | UNI<br>(ITALY)                           |                                 |                    |                     |                           |                         |                   | P-CuAl10Ni5Fe5                     |                                   |                                                             |                                                  |
|  | IS<br>(INDIA)                            |                                 |                    |                     |                           |                         |                   |                                    |                                   |                                                             |                                                  |
|  | KS<br>(REP. OF<br>KOREA)                 |                                 |                    |                     |                           |                         |                   |                                    |                                   |                                                             |                                                  |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | H80                             | H70                |                     |                           |                         |                   | QAI10-4-4                          |                                   |                                                             |                                                  |

## Material Designation in Accordance with Selected Standards

|                                                                                                                 |  | Material Group No.            |            |                                         |                   |                          |                     |                                        |             |                   |                         |                                                   |
|-----------------------------------------------------------------------------------------------------------------|--|-------------------------------|------------|-----------------------------------------|-------------------|--------------------------|---------------------|----------------------------------------|-------------|-------------------|-------------------------|---------------------------------------------------|
| Standards                                                                                                       |  | 28                            | 28         | 28                                      | 28                | 28                       | 28                  | 28                                     | 28          | 28                | 28                      | 28                                                |
|  NF/AFNOR (FRANCE)             |  | Cu-B                          | U-Cr0.8Zr  |                                         | Cl-c1;<br>Cu-c2   |                          | U-C1Z;<br>U-Cr0.8Zr | Cu-B                                   | UA9         | CuAl8             | CuNi10Fe1Mn             | CuZn16Si4-C                                       |
|  AISI/ASM/ASTM/SAE/UNS/AA (US) |  | C11000                        | C81500     | C10300                                  | C10100;<br>C10200 | C86550                   | C18100;<br>C18150   | C11000;<br>C12200                      | C95500      | C61000            | C70600;<br>90Cu-10Ni    | C87500;<br>C87400;<br>C87800                      |
|  BS (UK)                       |  | C101                          | CC1-FF     |                                         | C103;<br>C110     |                          | CC102               | C106                                   |             |                   | CN 102;<br>CN102        | ZCuZn16Si4                                        |
|  DIN (GERMANY)                 |  | Cu-ETP;<br>E-Cu57;<br>E Cu 57 | G-CuCrF 35 | Cu-HCP;<br>Cu-PHC;<br>SE-Cu             | Cu-OF;<br>OF-Cu   | G-CuZn40Fe;<br>G-SoMsF30 | CuCr1Zr;<br>CuCrZr  | Cu-DHP;<br>E-Cu58;<br>E Cu 58<br>SF-Cu | CuAl9Ni3Fe2 | CuAl8;<br>Cu Al 8 | CuNi10Fe1Mn             | G-CuZn15Si4;<br>GD-CuZn15Si4;<br>GK-CuZn15Si4     |
|  Werkstoff (GERMANY)           |  | 2.0060                        | 2.1292     | 2.0070                                  | 2.0040            | 2.0590                   | 2.1293              | 2.0090                                 | 2.0971      | 2.0920            | 2.0872                  | 2.0492;<br>2.0492-01;<br>2.0492-02;<br>2.0492-05  |
|  EN (EUROPE)                 |  | Cu-ETP;<br>E-Cu57;<br>CW004A  |            | Cu-HCP;<br>CW020A;<br>Cu-PHC;<br>CW021A | Cu-OF;<br>CW008A  | G-CuZn40Fe               | CuCr1Zr;<br>CW106C  | Cu-DHP;<br>E-Cu58;<br>CW024A           |             | CuAl8             | CW 352H;<br>CuNi10Fe1Mn | CuZn16Si4-B;<br>CuZn16Si4-C;<br>CB761S;<br>CC761S |
|  GOST (RUSSIA)               |  | M1                            |            | LS60-2                                  | M0b               |                          |                     | M1f                                    | BrA10Zh4N4L | BrA7              | MNZhMtZ10-1-1           | LTs16K4                                           |
|  JIS (JAPAN)                 |  | C1100                         |            | C103                                    | C1011;<br>C1020   |                          |                     | C1100;<br>C1220                        |             |                   | C7060;<br>YCuNi-1       | SzBC2;<br>H5112/class 2;<br>H5112/class 3         |
|  SS (SWEDEN)                 |  |                               |            |                                         |                   |                          |                     |                                        |             |                   | 5667                    |                                                   |
|  UNE (SPAIN)                 |  | C11020                        |            |                                         | C-1120            |                          |                     |                                        |             |                   | CW 352H                 |                                                   |
|  UNI (ITALY)                 |  | Cu-DHP                        |            |                                         |                   |                          |                     |                                        |             |                   |                         |                                                   |
|  IS (INDIA)                  |  |                               |            |                                         |                   |                          |                     |                                        |             |                   |                         |                                                   |
|  KS (REP. OF KOREA)          |  |                               |            |                                         |                   |                          |                     |                                        |             |                   |                         |                                                   |
|  GB/YB/JB/SY/NB (PRC)        |  | T2                            |            |                                         | TU2               |                          | QC0.6-0.4-0.05      | TP2                                    |             | QA17              | BFe10-1-1               |                                                   |

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| Standards                                                                           |                                          | Material Group No. |                                                             |      |            |                                  |                                                     | Material Group No.                                     |                                                          |                                       |                                           |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|-------------------------------------------------------------|------|------------|----------------------------------|-----------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|---------------------------------------|-------------------------------------------|
|                                                                                     |                                          | 29                 | 29                                                          | 29   | 29         | 29                               | 29                                                  | 31                                                     | 31                                                       | 31                                    | 31                                        |
|    | NF/AFNOR<br>(FRANCE)                     |                    |                                                             |      |            |                                  |                                                     | Z 20 NCS 33-16;<br>Z 12 NCS 37-18;<br>Z 12 NCS 35-16   |                                                          |                                       |                                           |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                    |                                                             |      |            |                                  |                                                     | 330;<br>N08330                                         | N08002;<br>N08004;<br>N08005;<br>N08030                  |                                       | N08031                                    |
|    | BS<br>(UK)                               |                    |                                                             |      |            |                                  |                                                     | NA 17;<br>INCOLOY alloy DS                             | 330 C 11;<br>330 C 40;<br>331 C 40                       | NA 15                                 |                                           |
|    | DIN<br>(GERMANY)                         |                    |                                                             |      |            |                                  |                                                     | X12NiCrSi35-16;<br>X12NiCrSi36-16;<br>X12 NiCrSi 36 16 | GX40NiCrSi38-19<br>GX40NiCrSi38-18;<br>G-X40 NiCrSi38 18 | X2NiCrAlTi32-20;<br>X2 NiCrAlTi 32 20 | X1NiCrMoCu32-28-7;<br>X1 NiCrMoCu 32 28 7 |
|    | Werkstoff<br>(GERMANY)                   |                    |                                                             |      |            |                                  |                                                     | 1.486                                                  | 1.487                                                    | 1.456                                 | 1.456                                     |
|   | EN<br>(EUROPE)                           |                    |                                                             |      |            |                                  |                                                     | X12NiCrSi35-16                                         | GX40NiCrSi38-18                                          | X2NiCrAlTi32-20                       | X1NiCrMoCu32-28-7                         |
|  | GOST<br>(RUSSIA)                         | Capron;<br>Nylon   | Polymetylmetakrylat;<br>orgsteklo;<br>SOL;<br>ST-1;<br>2-55 | PVCh | Polystyrol | Teflon;<br>PTFE;<br>Ftoroplast-4 | RST;<br>RST-250;<br>RST-275;<br>RST-320;<br>RST-410 |                                                        |                                                          |                                       |                                           |
|  | JIS<br>(JAPAN)                           |                    |                                                             |      |            |                                  |                                                     | SUH 330                                                | SCH 15;<br>SCH 16                                        | NCF 800                               |                                           |
|  | SS<br>(SWEDEN)                           |                    |                                                             |      |            |                                  |                                                     |                                                        |                                                          |                                       |                                           |
|  | UNE<br>(SPAIN)                           |                    |                                                             |      |            |                                  |                                                     | F.3313;<br>X 12 CrNiSi 36-16                           |                                                          |                                       |                                           |
|  | UNI<br>(ITALY)                           |                    |                                                             |      |            |                                  |                                                     |                                                        | GX 50 NiCr 39 19                                         |                                       |                                           |
|  | IS<br>(INDIA)                            |                    |                                                             |      |            |                                  |                                                     |                                                        |                                                          |                                       |                                           |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |                                                             |      |            |                                  |                                                     | STR 330                                                | HRSC 15                                                  |                                       |                                           |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |                                                             |      |            |                                  |                                                     | 1Cr16Ni35                                              |                                                          | NS111                                 | NS1404                                    |



## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                    |                                       |                                           |                                                              |                 |                         |                                       |            |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------------|--------------------------------------------------------------|-----------------|-------------------------|---------------------------------------|------------|
| Standards                                                                           |                                          | 31                                    | 31                                    | 31                                        | 31                                                           | 31              | 31                      | 31                                    | 31         |
|    | NF/AFNOR<br>(FRANCE)                     |                                       | Z 8 NC 33-21;<br>Z 10 NC 32-21        | Z 2 NCDU 31-27;<br>Z 1 NCDU 31-27-03      | Z 10 NC 32-21;<br>Z 8 NC 33-21                               |                 |                         |                                       |            |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                       | N08811                                | N08028                                    | B 163;<br>N08800;<br>N08810;<br>N08332;<br>N08811            |                 |                         |                                       |            |
|    | BS<br>(UK)                               | NA 15                                 | NA 15;<br>NA 15 H                     |                                           | NA 15;<br>NA 15 H                                            |                 |                         |                                       |            |
|    | DIN<br>(GERMANY)                         | X5NiCrAlTi31-20;<br>X5 NiCrAlTi 31 20 | X8NiCrAlTi32-21;<br>X8 NiCrAlTi 32 21 | X1NiCrMoCu31-27-4;<br>X1 NiCrMoCu 31 27 4 | X10NiCrAlTi32-21;<br>X10NiCrAlTi32-20;<br>X10 NiCrAlTi 32 20 |                 |                         |                                       |            |
|    | Werkstoff<br>(GERMANY)                   | 1.496                                 | 1.496                                 | 1.456                                     | 1.488                                                        |                 |                         |                                       |            |
|   | EN<br>(EUROPE)                           | X5NiCrAlTi31-20                       | X8NiCrAlTi32-21                       | X1NiCrMoCu31-27-4                         | X10NiCrAlTi32-21                                             |                 |                         |                                       |            |
|  | GOST<br>(RUSSIA)                         |                                       |                                       | EK77;<br>ChN30MDB                         |                                                              | 08Ch15N25M3TYuB | 06Ch16N15M3B;<br>El 847 | 08Ch15N24VTR;<br>Ch15N24VT;<br>EP 164 | 08Ch16N9M2 |
|  | JIS<br>(JAPAN)                           | NCF 800 H;<br>NCF 718                 |                                       |                                           | NCF 800;<br>NCF 800 TB;<br>NCF 800 TP                        |                 |                         |                                       |            |
|  | SS<br>(SWEDEN)                           |                                       |                                       | 2584                                      |                                                              |                 |                         |                                       |            |
|  | UNE<br>(SPAIN)                           |                                       |                                       |                                           | F.3314;<br>F.3545                                            |                 |                         |                                       |            |
|  | UNI<br>(ITALY)                           |                                       |                                       |                                           |                                                              |                 |                         |                                       |            |
|  | IS<br>(INDIA)                            |                                       |                                       |                                           |                                                              |                 |                         |                                       |            |
|  | KS<br>(REP. OF<br>KOREA)                 |                                       |                                       |                                           |                                                              |                 |                         |                                       |            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                       |                                       |                                           | NS112                                                        |                 |                         |                                       |            |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No. |                             |                                      |                        |                                     |                                                                                    |                                 |                                     |        |                                                              |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|-----------------------------|--------------------------------------|------------------------|-------------------------------------|------------------------------------------------------------------------------------|---------------------------------|-------------------------------------|--------|--------------------------------------------------------------|
| Standards                                                                           |                                          | 31                 | 31                          | 31                                   | 31                     | 32                                  | 32                                                                                 | 32                              | 32                                  | 32     | 32                                                           |
|    | NF/AFNOR<br>(FRANCE)                     |                    | A54-301                     |                                      |                        | Z 42 CNKDOWNb                       | Z 3 NCT 25;<br>Z 6 NCTDV 25.15 B                                                   | Z 6 NCTDV 25-15 B               |                                     |        |                                                              |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                    | K94610;<br>AMS 7726;<br>F15 | K93600;<br>K93601;<br>B388;<br>F1684 | K93500;<br>AMS 1-23011 | S590;<br>J 467                      | 660;<br>S66286;<br>AMS 5731;<br>AMS 5732;<br>AMS 5737;<br>AMS 5525                 |                                 | 661;<br>R30155                      | R30556 | S41880;<br>AMS 5508;<br>AMS 5616;<br>A565 Grade 615;<br>J467 |
|    | BS<br>(UK)                               |                    |                             | 4J36                                 |                        |                                     | HR 51;<br>HR 52;<br>286 S 31                                                       | HR 51                           |                                     |        |                                                              |
|    | DIN<br>(GERMANY)                         |                    | NiCo 29 18;<br>X3NiCo29-18  | Ni36;<br>Ni 36                       |                        | X40CoCrNi20-20;<br>X40 CoCrNi 20 20 | X6NiCrTiMoVB25-15-2;<br>X5NiCrTi26-15 X6<br>NiCrTiMoVB 25 15 2;<br>X5 NiCrTi 26 15 | X4NiCrTi25-15;<br>X5NiCrTi26-15 | X12CrCoNi21-20;<br>X12 CrCoNi 21 20 |        |                                                              |
|    | Werkstoff<br>(GERMANY)                   |                    | 1.398                       | 1.391                                |                        | 1.4977                              | 1.4980                                                                             | 1.4943;<br>1.4944               | 1.4971                              |        |                                                              |
|   | EN<br>(EUROPE)                           |                    |                             |                                      |                        |                                     | X6NiCrTiMoVB25-15-2;<br>X5NiCrTi26-15                                              | X4NiCrTi25-15;<br>X5NiCrTi26-15 | X12CrCoNi21-20                      |        |                                                              |
|  | GOST<br>(RUSSIA)                         | 20Ch12N2V2MF       |                             | 36N;<br>36N-VI                       |                        |                                     |                                                                                    | 36NChTYu                        |                                     |        |                                                              |
|  | JIS<br>(JAPAN)                           |                    |                             |                                      |                        |                                     |                                                                                    |                                 |                                     |        |                                                              |
|  | SS<br>(SWEDEN)                           |                    |                             |                                      |                        |                                     |                                                                                    | 2570                            |                                     |        |                                                              |
|  | UNE<br>(SPAIN)                           |                    |                             |                                      |                        |                                     |                                                                                    |                                 |                                     |        |                                                              |
|  | UNI<br>(ITALY)                           |                    |                             |                                      |                        |                                     |                                                                                    |                                 |                                     |        |                                                              |
|  | IS<br>(INDIA)                            |                    |                             |                                      |                        |                                     |                                                                                    |                                 |                                     |        |                                                              |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |                             |                                      |                        |                                     |                                                                                    |                                 |                                     |        |                                                              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |                             |                                      |                        |                                     | 0Cr15Ni25Ti2MoA                                                                    | GH2132                          | GH19                                |        |                                                              |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                       |          |                             |                  |          |                  |                                         |               |              |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|----------|-----------------------------|------------------|----------|------------------|-----------------------------------------|---------------|--------------|
| Standards                                                                           |                                          | 32                                       | 32       | 32                          | 32               | 32       | 32               | 32                                      | 32            | 32           |
|    | NF/AFNOR<br>(FRANCE)                     |                                          |          |                             |                  |          |                  |                                         |               |              |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | 651;<br>S63198;<br>AMS 5579;<br>AMS 5526 | AMS 5725 | 662;<br>S66220;<br>AMS 5733 | R30590;<br>S-590 |          |                  | S38100;<br>XM-15;<br>A249 Grade TPXM-15 |               | S66009       |
|    | BS<br>(UK)                               |                                          |          |                             |                  |          |                  |                                         |               |              |
|    | DIN<br>(GERMANY)                         |                                          |          | X4NiCrMoTiMnSiB26-14-3-2    |                  |          | X5NiCrTiMoV26-15 |                                         |               |              |
|    | Werkstoff<br>(GERMANY)                   |                                          |          | 1.464                       |                  |          | 1.3980           |                                         |               |              |
|   | EN<br>(EUROPE)                           |                                          |          |                             |                  |          |                  |                                         |               |              |
|  | GOST<br>(RUSSIA)                         |                                          |          |                             |                  | 36NChTYu | 08Ch15N25T2MFR   | 08Ch20N14S2;<br>08Ch20N14S2;<br>EI 732  | 37Ch12N8G8MFB | 45Ch14N14B2M |
|  | JIS<br>(JAPAN)                           |                                          |          |                             |                  |          |                  |                                         |               |              |
|  | SS<br>(SWEDEN)                           |                                          |          |                             |                  |          |                  |                                         |               |              |
|  | UNE<br>(SPAIN)                           |                                          |          |                             |                  |          |                  |                                         |               |              |
|  | UNI<br>(ITALY)                           |                                          |          |                             |                  |          |                  |                                         |               |              |
|  | IS<br>(INDIA)                            |                                          |          |                             |                  |          |                  |                                         |               |              |
|  | KS<br>(REP. OF<br>KOREA)                 |                                          |          |                             |                  |          |                  |                                         |               |              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                          |          |                             |                  |          |                  |                                         |               |              |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.       |                      |        |                                       |                                                                 |                                       |                         |                          |                                    |                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------|----------------------|--------|---------------------------------------|-----------------------------------------------------------------|---------------------------------------|-------------------------|--------------------------|------------------------------------|-------------------------------------|
|                                                                                     |                                          | 32                       | 32                   | 32     | 33                                    | 33                                                              | 33                                    | 33                      | 33                       | 33                                 | 33                                  |
|    | NF/AFNOR<br>(FRANCE)                     |                          |                      |        | KC 20 WN                              | K 13 C 20 N16 Fe<br>15 D 7                                      |                                       | NC 21 Fe DU             |                          | NC 20 T                            | NC 22 FeDNb                         |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                          |                      | S66315 | R30605;<br>670;<br>5537C;<br>AMS 5759 | R30003;<br>R30008;<br>F1058;<br>F1058 Grade 1;<br>F1058 Grade 2 | R31233;<br>B815;<br>B818              | Incoloy 825;<br>N08825; | Hastelloy C-4;<br>N06455 | Nimonic 75;<br>N06075;<br>AMS 5715 | Inconel 625;<br>N06625;<br>AMS 5666 |
|    | BS<br>(UK)                               |                          |                      |        |                                       |                                                                 |                                       | NA 16                   |                          | HR 5;<br>HR 203-4                  | NA 21                               |
|    | DIN<br>(GERMANY)                         |                          |                      |        | CoCr20W15Ni                           | CoCr20Ni15Mo7;<br>CoCr 20 Ni 15 Mo                              | CoCr26Ni9Mo5W;<br>CoCr 26 Ni 9 Mo 5 W | NiCr21Mo                | NiMo16Cr16Ti             | NiCr20Ti                           | NiCr22Mo9Nb                         |
|    | Werkstoff<br>(GERMANY)                   |                          |                      |        | 2.4964                                | 2.471                                                           | 2.468                                 | 2.4858                  | 2.4610                   | 2.4630;<br>2.4951                  | 2.4856                              |
|   | EN<br>(EUROPE)                           |                          |                      |        | CoCr20W15Ni                           |                                                                 |                                       |                         |                          |                                    |                                     |
|  | GOST<br>(RUSSIA)                         | 40Ch15N7GF2MS;<br>EI 388 | ChN35VTYu;<br>EI 787 |        |                                       |                                                                 |                                       | ChN38VT                 |                          |                                    |                                     |
|  | JIS<br>(JAPAN)                           |                          |                      |        |                                       |                                                                 |                                       |                         |                          |                                    |                                     |
|  | SS<br>(SWEDEN)                           |                          |                      |        |                                       |                                                                 |                                       |                         |                          |                                    |                                     |
|  | UNE<br>(SPAIN)                           |                          |                      |        |                                       |                                                                 |                                       |                         |                          |                                    |                                     |
|  | UNI<br>(ITALY)                           |                          |                      |        |                                       |                                                                 |                                       |                         |                          |                                    |                                     |
|  | IS<br>(INDIA)                            |                          |                      |        |                                       |                                                                 |                                       |                         |                          |                                    |                                     |
|  | KS<br>(REP. OF<br>KOREA)                 |                          |                      |        |                                       |                                                                 |                                       |                         |                          |                                    |                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                          |                      |        | GH25                                  |                                                                 |                                       | NS142                   | GH182                    |                                    | GH984                               |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.     |                      |                                                                           |                                     |                                                            |                       |                                                           |                                        |                        |                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------|----------------------|---------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------|-----------------------|-----------------------------------------------------------|----------------------------------------|------------------------|-------------------------------------|
| Standards                                                                           |                                          | 33                     | 33                   | 33                                                                        | 33                                  | 33                                                         | 33                    | 33                                                        | 33                                     | 33                     | 33                                  |
|    | NF/AFNOR<br>(FRANCE)                     | NC 30 Fe               | NU 30                | NC 22 FeD                                                                 | NC 14 K 9 T 5 DWA                   | Z 8 NCDT 42                                                |                       | NC 19 KDT                                                 |                                        | NU 30                  | NC 16 FeT                           |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | Inconel 690;<br>N06690 | Monel 400;<br>N04400 | Hastelloy X;<br>Inconel HX;<br>N06002;<br>5390A;<br>AMS 5754;<br>AMS 5536 | Inconel 617;<br>N06617;<br>AMS 5887 | Nimonic 90;<br>N07090;<br>AMS 5829                         | Haynes 214;<br>N07214 | Rene 41;<br>N07041;<br>AMS 5712;<br>AMS 5713;<br>AMS 5800 | Hastelloy B2;<br>N10665                | Monel R-405;<br>N04405 | Inconel 600;<br>N06600;<br>AMS 5665 |
|    | BS<br>(UK)                               |                        | NA 13;<br>ANC 18     | HR 6;<br>HR 204                                                           |                                     | HR 2;<br>HR202;<br>HR 402;<br>HR 501;<br>HR 502;<br>HR 503 |                       |                                                           |                                        | NA 13                  | NA 14                               |
|    | DIN<br>(GERMANY)                         | NiC29Fe                | NiCu30Fe             | NiCr30FeMo;<br>NiCr22Fe18Mo;<br>NiCr21Fe18Mo9                             | NiCr23Co12Mo                        | NiCr20Co18Ti;<br>NiCr 20 Co 18 Ti                          | NiCr16Al              | NiCr19Co11MoTi;<br>NiCr 19 CoMo                           | NiMo28;<br>EL-NiMo29;<br>SG(UP)-NiMo27 | NiCu30Fe               | NiCr15Fe8;<br>NiCr 15 Fe            |
|    | Werkstoff<br>(GERMANY)                   | 2.464                  | 2.4360;<br>2.4361    | 2.4603;<br>2.4665                                                         | 2.4663a                             | 2.4632;<br>2.4969                                          | 2.4646                | 2.4973                                                    | 2.4617;<br>2.4616;<br>2.4615           | 2.4360;<br>2.4361      | 2.4816                              |
|   | EN<br>(EUROPE)                           |                        |                      |                                                                           |                                     | NiCr20Co18Ti                                               |                       |                                                           | NiMo28                                 |                        | NiCr15Fe8                           |
|  | GOST<br>(RUSSIA)                         |                        |                      |                                                                           |                                     |                                                            |                       |                                                           |                                        |                        | ChN78T                              |
|  | JIS<br>(JAPAN)                           |                        |                      |                                                                           |                                     |                                                            |                       |                                                           | YNiMo-7                                |                        |                                     |
|  | SS<br>(SWEDEN)                           |                        |                      |                                                                           |                                     |                                                            |                       |                                                           |                                        |                        |                                     |
|  | UNE<br>(SPAIN)                           |                        |                      |                                                                           |                                     |                                                            |                       |                                                           |                                        |                        |                                     |
|  | UNI<br>(ITALY)                           |                        |                      |                                                                           |                                     |                                                            |                       |                                                           |                                        |                        |                                     |
|  | IS<br>(INDIA)                            |                        |                      |                                                                           |                                     |                                                            |                       |                                                           |                                        |                        |                                     |
|  | KS<br>(REP. OF<br>KOREA)                 |                        |                      |                                                                           |                                     |                                                            |                       |                                                           |                                        |                        |                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | NS315                  |                      | GH22;<br>GH334;<br>GH536GH739;<br>SG-5                                    |                                     | GH4037                                                     |                       | GH141                                                     | NS322                                  |                        | NS312                               |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.         |                                                  |                           |                                 |             |                              |                  |                                            |                          |            |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------|--------------------------------------------------|---------------------------|---------------------------------|-------------|------------------------------|------------------|--------------------------------------------|--------------------------|------------|
|                                                                                     |                                          | 33                         | 33                                               | 33                        | 33                              | 33          | 33                           | 33               | 33                                         | 33                       | 33         |
|    | NF/AFNOR<br>(FRANCE)                     | N C 23 FeA                 | NCK 20 D                                         |                           | NC 17 D                         |             | A54-301;<br>Fe-Ni48          | NW 11 AC         |                                            |                          |            |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | Inconel 601;<br>N06601     | Nimonic 263;<br>N07263;<br>AMS 5872;<br>AMS 5886 | Hastelloy C-22;<br>N06022 | Hastelloy C-276;<br>N10276      | N06025      | K94800;<br>F 30              | Nimonic PE 16    | Haynes HR-120;<br>N08120;<br>B408;<br>B409 | Haynes HR-160;<br>N12160 | Udimet 520 |
|    | BS<br>(UK)                               |                            | HR 10;<br>HR 206;<br>HR 404                      |                           |                                 |             |                              | HR 55;<br>HR 207 |                                            |                          |            |
|    | DIN<br>(GERMANY)                         | NiCr23Fe15A;<br>NiCr 23 Fe | NiCo20Cr20MoTi;<br>NiCo 20 Cr 20 MoTi MoTi       | NiCr21Mo14W               | NiMo16Cr15W;<br>NiMo 16 Cr 15 W | NiCr25FeAlY | Ni 48;<br>RNi 12;<br>RNi 8   |                  |                                            | NiCo29Cr28Si             |            |
|    | Werkstoff<br>(GERMANY)                   | 2.4851                     | 2.4650                                           | 2.4602                    | 2.482                           | 2.463       | 1.3922;<br>1.3926;<br>1.3927 |                  |                                            | 2.488                    |            |
|   | EN<br>(EUROPE)                           | NiCr23Fe15A                | NiCo20Cr20MoTi                                   |                           |                                 | NiCr25FeAlY |                              |                  |                                            |                          |            |
|  | GOST<br>(RUSSIA)                         | ChN60Yu                    |                                                  |                           |                                 |             |                              |                  |                                            |                          |            |
|  | JIS<br>(JAPAN)                           |                            |                                                  | NW 6022                   |                                 | NCF 625     |                              |                  |                                            |                          |            |
|  | SS<br>(SWEDEN)                           |                            |                                                  |                           |                                 |             |                              |                  |                                            |                          |            |
|  | UNE<br>(SPAIN)                           |                            |                                                  |                           |                                 |             |                              |                  |                                            |                          |            |
|  | UNI<br>(ITALY)                           |                            |                                                  |                           |                                 |             |                              |                  |                                            |                          |            |
|  | IS<br>(INDIA)                            |                            |                                                  |                           |                                 |             |                              |                  |                                            |                          |            |
|  | KS<br>(REP. OF<br>KOREA)                 |                            |                                                  |                           |                                 |             |                              |                  |                                            |                          |            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | NS313                      | GH163                                            |                           | NS334                           |             |                              |                  |                                            |                          |            |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No. |                                |                                  |                                                |        |                 |        |                            |                                                    |                                       |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|--------------------------------|----------------------------------|------------------------------------------------|--------|-----------------|--------|----------------------------|----------------------------------------------------|---------------------------------------|
| Standards                                                                           |                                          | 33                 | 33                             | 34                               | 34                                             | 34     | 34              | 34     | 34                         | 34                                                 | 34                                    |
|    | NF/AFNOR<br>(FRANCE)                     |                    |                                | KC 22 WN                         |                                                |        |                 |        | NU 30 AT                   | NC 19 Fe Nb                                        | NiFe25Cr20NbTi                        |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | Incoloy 840        | N08020                         | R30188;<br>AMS 5608;<br>AMS 5772 | R30816;<br>S-816;<br>B639;<br>Grade 671 Cobalt |        |                 | R30600 | Monel K-500;<br>N05500     | Inconel 718;<br>N07718;<br>AMS 5596;<br>AMS 5589   |                                       |
|    | BS<br>(UK)                               |                    | GH 1015;<br>NS 1403;<br>NS 143 |                                  |                                                |        |                 |        | NA 18                      | HR 8                                               |                                       |
|    | DIN<br>(GERMANY)                         | X8CrNiAlTi20-20    | NiCr20CuMo                     | CoCr22W14Ni                      | CoCr20Ni20W                                    |        |                 |        | NiCu30Al3Ti;<br>NiCu 30 Al | NiCr19Nb5Mo3;<br>NiCr 19 NbMo;<br>NiCr19Fe19Nb5Mo3 | NiFe25Cr20NbTi;<br>NiFe 25 Cr 20 NbTi |
|    | Werkstoff<br>(GERMANY)                   | 1.485              | 2.466                          | 2.4964                           | 2.4989                                         |        |                 | 2.478  | 2.438                      | 2.467                                              | 2.496                                 |
|   | EN<br>(EUROPE)                           |                    | NiCr20CuMo                     | CoCr22W14Ni                      | CoCr20Ni20W                                    |        |                 |        | NiCu30Al3Ti                | NiCr19Nb5Mo3                                       | NiFe25Cr20NbTi                        |
|  | GOST<br>(RUSSIA)                         |                    | ChN28VMAB                      |                                  | Altemp S-816                                   |        |                 |        |                            |                                                    |                                       |
|  | JIS<br>(JAPAN)                           |                    |                                |                                  |                                                |        |                 |        |                            |                                                    |                                       |
|  | SS<br>(SWEDEN)                           |                    |                                |                                  |                                                |        |                 |        |                            |                                                    |                                       |
|  | UNE<br>(SPAIN)                           |                    |                                |                                  |                                                |        |                 |        |                            |                                                    |                                       |
|  | UNI<br>(ITALY)                           |                    |                                |                                  |                                                |        |                 |        |                            |                                                    |                                       |
|  | IS<br>(INDIA)                            |                    |                                |                                  |                                                |        |                 |        |                            |                                                    |                                       |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |                                |                                  |                                                |        |                 |        |                            |                                                    |                                       |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |                                | GH25                             |                                                | GH4169 | GH901;<br>GH109 | GH146  |                            |                                                    |                                       |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.     |                                                       |                                    |                             |                                   |                                     |                                                                                      |                      |                                                           |          |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------|-------------------------------------------------------|------------------------------------|-----------------------------|-----------------------------------|-------------------------------------|--------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------|----------|
|                                                                                     |                                          | 34                     | 34                                                    | 34                                 | 34                          | 34                                | 34                                  | 34                                                                                   | 34                   | 34                                                        | 34       |
|    | NF/AFNOR<br>(FRANCE)                     |                        | Z 8 NCDT 42                                           | NCK 19 DAT                         | NC 20 TA                    |                                   |                                     | NC 20 K 14                                                                           |                      | NC 19 KDT                                                 | NC 14 K8 |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | Incoloy 925;<br>N09925 | Nimonic 901;<br>N09901;<br>AMS 5660;<br>AMS 5661      | Udimet 500;<br>N07500;<br>AISI 684 | Nimonic 80A;<br>N07080      | MAR-M 246                         | Inconel 722;<br>N07722;<br>AMS 5411 | Waspaloy;<br>N07001;<br>AISI 685;<br>AMS 5704;<br>AMS 5706;<br>AMS 5708;<br>AMS 5544 |                      | Rene 41;<br>N07041;<br>AMS 5712;<br>AMS 5713;<br>AMS 5800 | Rene 95  |
|    | BS<br>(UK)                               |                        |                                                       |                                    | HR 401;<br>HR 601           |                                   |                                     |                                                                                      |                      |                                                           |          |
|    | DIN<br>(GERMANY)                         |                        | NiFe35Cr14MoTi;<br>NiCr13Mo6Ti3;<br>NiCr 13 Mo 6 Ti 3 | NiCr18Co18MoAlTi                   | NiCr20TiAl;<br>NiCr 20 TiAl | NiCr23Mo16Cu;<br>NiCr 23 Mo 16 Cu |                                     | NiCr20Co13Mo4Ti3AL;<br>NiCr 19 Co 14 Mo 4 Ti                                         |                      | NiCr19Co11MoTi;<br>NiCr 19 CoMo                           |          |
|   | Werkstoff<br>(GERMANY)                   |                        | 2.4662                                                | 2.4983                             | 2.4631;<br>2.4952           | 2.4675                            |                                     | 2.4654                                                                               |                      | 2.4973                                                    |          |
|  | EN<br>(EUROPE)                           |                        |                                                       | NiCr18Co18MoAlTi                   | NiCr20TiAl                  | NiCr23Mo16Cu                      |                                     | NiCr20Co13Mo4Ti3AL                                                                   |                      |                                                           |          |
|  | GOST<br>(RUSSIA)                         |                        |                                                       |                                    | ChN77TYuR;<br>ChN56VMTYu    |                                   |                                     |                                                                                      | ChN75VMYy;<br>EI 827 |                                                           |          |
|  | JIS<br>(JAPAN)                           |                        |                                                       |                                    | NCF 80 A                    |                                   |                                     |                                                                                      |                      |                                                           |          |
|  | SS<br>(SWEDEN)                           |                        |                                                       |                                    |                             |                                   |                                     |                                                                                      |                      |                                                           |          |
|  | UNE<br>(SPAIN)                           |                        |                                                       |                                    |                             |                                   |                                     |                                                                                      |                      |                                                           |          |
|  | UNI<br>(ITALY)                           |                        |                                                       |                                    |                             |                                   |                                     |                                                                                      |                      |                                                           |          |
|  | IS<br>(INDIA)                            |                        |                                                       |                                    |                             |                                   |                                     |                                                                                      |                      |                                                           |          |
|  | KS<br>(REP. OF<br>KOREA)                 |                        |                                                       |                                    |                             |                                   |                                     |                                                                                      |                      |                                                           |          |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                        |                                                       |                                    | GH80A                       |                                   | GH141                               | GH738                                                                                |                      |                                                           |          |



## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.               |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------|------------|------------|--------------------------------------------------------|------------------------------------------|------------------------------------------|------------------|------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------|
|                                                                                     |                                          | 34                               | 34         | 34         | 34                                                     | 34                                       | 34                                       | 34               | 34                                                                           |                                                             |                                                                            |
|    | NF/AFNOR<br>(FRANCE)                     |                                  |            |            |                                                        | NK 20 CDA;<br>NCK 20 Atv                 | NCK 15 ATD                               | NC 19 KDu/v      | NC 16 FeTNb                                                                  |                                                             | Z 3 NK 28;<br>Z 3 NK 38                                                    |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | N06230;<br>AMS 5891;<br>AMS 5878 |            |            | Udimet 700;<br>687;<br>AMS 5846;<br>J467;<br>GE C50T67 | Nimonic 105;<br>N13021;<br>C565          | Nimonic 115;<br>N06115;<br>AMS 5666      | Nimonic<br>PK 33 | Inconel X-750;<br>N07750;<br>AMS 5542;<br>AMS 5582;<br>AMS 5670;<br>AMS 5667 | Astrolloy;<br>N13017;<br>AMS 5851;<br>AMS 5852;<br>AMS 5882 | Incoloy 903;<br>N19903;<br>AMS 5803;<br>AMS 5884;<br>AMS 5892;<br>AMS 5893 |
|    | BS<br>(UK)                               |                                  |            |            |                                                        | HR 3                                     | HR 4                                     |                  |                                                                              |                                                             |                                                                            |
|    | DIN<br>(GERMANY)                         | NiCr22W14Mo                      |            |            |                                                        | NiCo20Cr15MoAlTi;<br>NiCo 20 Cr 5 MoAlTi | NiCo15Cr15MoAlTi;<br>NiCo 15 Cr 5 MoAlTi |                  | NiCr15Fe7TiAl;<br>NiCr15Fe7Ti2Al                                             |                                                             |                                                                            |
|    | Werkstoff<br>(GERMANY)                   | 2.473                            |            |            |                                                        | 2.463                                    | 2.464                                    |                  | 2.467                                                                        |                                                             |                                                                            |
|   | EN<br>(EUROPE)                           |                                  |            |            |                                                        |                                          |                                          |                  | NiCr15Fe7TiAl;<br>NiCr15Fe7Ti2Al                                             |                                                             |                                                                            |
|  | GOST<br>(RUSSIA)                         |                                  | ChN72MVKYu | ChN60MVTYu |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|  | JIS<br>(JAPAN)                           |                                  |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|  | SS<br>(SWEDEN)                           |                                  |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|  | UNE<br>(SPAIN)                           |                                  |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|  | UNI<br>(ITALY)                           |                                  |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|  | IS<br>(INDIA)                            |                                  |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|  | KS<br>(REP. OF<br>KOREA)                 |                                  |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                  |            |            |                                                        |                                          |                                          |                  |                                                                              |                                                             |                                                                            |

## Material Designation in Accordance with Selected Standards

|                                                                                                                 |  | Material Group No. |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|-----------------------------------------------------------------------------------------------------------------|--|--------------------|-------------------------|-------------------------------|-------------------------|-------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------|--------------------------|
| Standards                                                                                                       |  | 34                 | 34                      | 35                            | 35                      | 35                                  | 35                                    | 35                                    | 35                                                     | 35                       |
|  NF/AFNOR (FRANCE)             |  |                    |                         |                               | ND 30 M                 |                                     | NK 15 CAT                             |                                       | NC 13 AD                                               |                          |
|  AISI/ASM/ASTM/SAE/UNS/AA (US) |  |                    | Inconel 740H;<br>N07740 | 5388C;<br>N30002;<br>CW-12MW; | N7M;<br>N-7M;<br>N30007 | N12MV;<br>N-12MV;<br>N30012         | Nimocast PK24;<br>N13100;<br>AMS 5397 | Jethete M-252;<br>N07252;<br>AMS 5551 | Nimocast 713;<br>N07713;<br>AMS 5391;<br>Inconel 713LC | M-35-1;<br>N214135       |
|  BS (UK)                       |  |                    |                         |                               |                         |                                     | HC 204                                |                                       | HC 203                                                 |                          |
|  DIN (GERMANY)                 |  | NoCr25Co20TiMo     |                         | G-NiM16CrW                    | G-NiMo28                | G-NiMo30                            | G-NiCo15Cr10AlTiMo                    | G-NiCr19Co;<br>G-NiCr 19 Co           | G-NiCr13Al6MoNb                                        | G-NiCu40Nb               |
|  Werkstoff (GERMANY)           |  | 2.488              |                         | 2.4883                        | 2.4685                  | 2.4882;<br>9.4810;<br>2.4810/9.4810 | 2.4674                                | 2.4916                                | 2.467                                                  | 2.4365;<br>2.4365/9.4365 |
|  EN (EUROPE)                  |  | NoCr25Co20TiMo     |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|  GOST (RUSSIA)               |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|  JIS (JAPAN)                 |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        | NiCuC                    |
|  SS (SWEDEN)                 |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|  UNE (SPAIN)                 |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|  UNI (ITALY)                 |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|  IS (INDIA)                  |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|  KS (REP. OF KOREA)          |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |
|  GB/YB/JB/SY/NB (PRC)        |  |                    |                         |                               |                         |                                     |                                       |                                       |                                                        |                          |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No. |         |                |          |             |            |            |                   |           |           |          |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|---------|----------------|----------|-------------|------------|------------|-------------------|-----------|-----------|----------|
| Standards                                                                           |                                          | 35                 | 35      | 35             | 35       | 35          | 35         | 35         | 35                | 35        | 35        | 35       |
|    | NF/AFNOR<br>(FRANCE)                     |                    |         | NC14 K9 T5 DWA |          |             |            |            |                   |           |           |          |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                    | Rene 77 | Rene 80        |          |             |            |            | MAR-M 247         | MAR-M 421 | MAR-M 432 | Rene 125 |
|    | BS<br>(UK)                               |                    |         |                |          |             |            |            |                   |           |           |          |
|    | DIN<br>(GERMANY)                         | G-NiCr28W          |         |                | G-NiCr15 |             |            |            | G-NiCo10W10CrAlNb |           |           |          |
|    | Werkstoff<br>(GERMANY)                   | 2.488              |         |                | 2.482    |             |            |            | 2.468             |           |           |          |
|   | EN<br>(EUROPE)                           | G-NiCr28W          |         |                | G-NiCr15 |             |            |            |                   |           |           |          |
|  | GOST<br>(RUSSIA)                         |                    |         |                |          | ChN62MVKYuL | ChN65VMYyL | ChN67VMYyL |                   |           |           |          |
|  | JIS<br>(JAPAN)                           |                    |         |                |          |             |            |            |                   |           |           |          |
|  | SS<br>(SWEDEN)                           |                    |         |                |          |             |            |            |                   |           |           |          |
|  | UNE<br>(SPAIN)                           |                    |         |                |          |             |            |            |                   |           |           |          |
|  | UNI<br>(ITALY)                           |                    |         |                |          |             |            |            |                   |           |           |          |
|  | IS<br>(INDIA)                            |                    |         |                |          |             |            |            |                   |           |           |          |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |         |                |          |             |            |            |                   |           |           |          |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |         |                |          |             |            |            |                   |           |           |          |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No. |             |                   |                                                       |          |            |                                            |                                                                      |                                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|-------------|-------------------|-------------------------------------------------------|----------|------------|--------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------|
| Standards                                                                           |                                          | 35                 | 35          | 35                | 35                                                    | 35       | 35         | 36                                         | 36                                                                   | 36                                                  |
|    | NF/AFNOR<br>(FRANCE)                     |                    |             | KD 27 DN          | KC 25 NW;<br>KC 25 N 10 W 7 Fe                        |          |            | T-35                                       | T-40                                                                 | T-50                                                |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | Rene 220C          | Udimet 700B | F75;<br>AMS 5385D | A567;<br>AMS 5382E;<br>Cobalt Alloy 31;<br>Cobalt #31 |          |            | R50250;<br>Titanium Grade 1;<br>ASTM GR. 1 | R50400;<br>Titanium Grade 2;<br>AMS 4902;<br>AMS 4941;<br>ASTM Gr. 2 | R50500;<br>R50550;<br>Titanium Grade 3;<br>AMS 4900 |
|    | BS<br>(UK)                               |                    |             | ANC 14            | ANC 13;<br>3146.2                                     |          |            | TA1                                        | TA2;<br>TA3;<br>TA4;<br>TA5                                          | DTD 5023, DTD 5273                                  |
|    | DIN<br>(GERMANY)                         |                    |             | CoCr28MoNi        | CoCr25NiW                                             | G-CoCr28 | G-CoCr28Nb | Ti 1;<br>Ti 99.8;<br>Titan Grade 1         | Ti 2;<br>Ti 99.7                                                     | Ti 3;<br>Ti 99.6;<br>Titan Grade 3                  |
|    | Werkstoff<br>(GERMANY)                   |                    |             | 2.498             | 2.497                                                 | 2.478    | 2.478      | 3.7024;<br>3.7025                          | 3.7034;<br>3.7035;<br>3.7036                                         | 3.7055;<br>3.7056                                   |
|   | EN<br>(EUROPE)                           |                    |             |                   |                                                       | G-CoCr28 |            | Ti 99.8                                    | Ti 99.7                                                              | Ti 99.6                                             |
|  | GOST<br>(RUSSIA)                         |                    |             |                   |                                                       |          |            | VT1-00                                     | VT1-0                                                                |                                                     |
|  | JIS<br>(JAPAN)                           |                    |             |                   |                                                       |          |            | Class 2;<br>Gr-1                           | Class 2;<br>Gr-2                                                     | Class 3;<br>Gr-3                                    |
|  | SS<br>(SWEDEN)                           |                    |             |                   |                                                       |          |            |                                            |                                                                      |                                                     |
|  | UNE<br>(SPAIN)                           |                    |             |                   |                                                       |          |            | Ti-PO1                                     | Ti-PO2;<br>38-711L-7001;<br>38-712L-7002                             |                                                     |
|  | UNI<br>(ITALY)                           |                    |             |                   |                                                       |          |            | Ti1-Type 1                                 | Ti1-Type 2                                                           | Ti1-Type 3                                          |
|  | IS<br>(INDIA)                            |                    |             |                   |                                                       |          |            |                                            |                                                                      |                                                     |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |             |                   |                                                       |          |            |                                            |                                                                      |                                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |             |                   |                                                       |          |            | TA0                                        | TA1                                                                  | TA2                                                 |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                    |                                           |                                            |                                            |                                            |                                           |                                           |                                                              |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------|-------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------------------------------------------|
| Standards                                                                           |                                          | 36                                                    | 36                                        | 36                                         | 36                                         | 36                                         | 36                                        | 36                                        | 36                                                           |
|    | NF/AFNOR<br>(FRANCE)                     | T-60                                                  |                                           |                                            |                                            |                                            |                                           |                                           |                                                              |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | R50700;<br>Titanium Grade 4;<br>AMS 4901;<br>AMS 4921 | R52400;<br>Titanium Grade 7;<br>Ti-0.15Pd | R52250;<br>Titanium Grade 11;<br>Ti-0.15Pd | R52402;<br>Titanium Grade 16;<br>Ti-0.05Pd | R52252;<br>Titanium Grade 17;<br>Ti-0.05Pd | R52404;<br>Titanium Grade 26;<br>Ti-0.1Ru | R52254;<br>Titanium Grade 27;<br>Ti-0.1Ru | R53400;<br>Titanium Grade 12;<br>Ti-0.3Mo-0.8Ni;<br>AMS 4902 |
|    | BS<br>(UK)                               | TA7;<br>TA8;<br>TA9                                   |                                           |                                            |                                            |                                            |                                           |                                           |                                                              |
|    | DIN<br>(GERMANY)                         | Ti 4;<br>Ti 99.5;<br>Titan Grade 4                    |                                           |                                            |                                            |                                            |                                           |                                           | TiNi0.8Mo0.3                                                 |
|    | Werkstoff<br>(GERMANY)                   | 3.7064;<br>3.7065;<br>3.7066                          | 3.724                                     | 3.723                                      |                                            |                                            |                                           |                                           | 3.711                                                        |
|   | EN<br>(EUROPE)                           | Ti 99.5                                               |                                           |                                            |                                            |                                            |                                           |                                           | TiNi0.8Mo0.3                                                 |
|  | GOST<br>(RUSSIA)                         |                                                       |                                           |                                            |                                            |                                            |                                           |                                           |                                                              |
|  | JIS<br>(JAPAN)                           | Class 4;<br>Gr-4                                      | Class 13;<br>Gr-13                        | Class 13;<br>Gr-13                         |                                            |                                            |                                           |                                           |                                                              |
|  | SS<br>(SWEDEN)                           |                                                       |                                           |                                            |                                            |                                            |                                           |                                           |                                                              |
|  | UNE<br>(SPAIN)                           | 38-714L-7004                                          | 38-715L-7021                              | 38-715L-7021                               |                                            |                                            |                                           |                                           |                                                              |
|  | UNI<br>(ITALY)                           | Ti1-Type 4                                            | Ti2Pd-Type 7                              | Ti2Pd-Type 7                               |                                            |                                            |                                           |                                           |                                                              |
|  | IS<br>(INDIA)                            |                                                       |                                           |                                            |                                            |                                            |                                           |                                           |                                                              |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                       |                                           |                                            |                                            |                                            |                                           |                                           |                                                              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | TA3                                                   | TA9                                       |                                            |                                            |                                            |                                           |                                           |                                                              |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                                  |                                                                                                      |                                                   |                                                                                                            |                                                                       |                                 |                                                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------|
| Standards                                                                           |                                          | 37                                                                  | 37                                                                                                   | 37                                                | 37                                                                                                         | 37                                                                    | 37                              | 37                                                                  |
|    | NF/AFNOR<br>(FRANCE)                     | TA6V;<br>T-A6V;<br>Ti-P.63                                          | TA6ZR4DE;<br>T-A6ZR4DE                                                                               |                                                   | TA6V6E2;<br>T-A6V6E2                                                                                       |                                                                       | TU2;<br>T-U2                    | TA4DE;<br>T-A4DE                                                    |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | R56400;<br>Titanium Grade 5;<br>Ti-6Al-4V;<br>AMS 4911;<br>AMS 4928 | R54620;<br>Titanium Grade 6Al-2Sn-4Zr-2Mo;<br>6Al-2Sn-4Zr-2Mo;<br>AMS 4975;<br>AMS 4976;<br>AMS 4919 | R54790;<br>Ti-679;<br>AMS 4974                    | R56620;<br>Titanium Grade 6Al-6V-2Sn;<br>Ti-6Al-6V-2Sn;<br>AMS 4918;<br>AMS 4936;<br>AMS 4971;<br>AMS 4978 | R56320;<br>Titanium Grade 9;<br>Ti-3Al-2.5V;<br>AMS 4943;<br>AMS 4944 |                                 |                                                                     |
|    | BS<br>(UK)                               | TA10;<br>TA11;<br>TA12;<br>TA13;<br>TA 28;<br>TA56;<br>Ti-Al-V      | TA18;<br>TA19;<br>TA20;<br>TA25;<br>TA26;<br>TA27                                                    | TA18;<br>TA19;<br>TA20;<br>TA25;<br>TA26;<br>TA27 |                                                                                                            |                                                                       | TA21;<br>TA22;<br>TA23;<br>TA24 | TA45;<br>TA46;<br>TA47;<br>TA48;<br>TA49;<br>TA50;<br>TA51;<br>TA57 |
|    | DIN<br>(GERMANY)                         | Ti6Al4V;<br>Titan Grade 5;<br>Titan 6 Al 4V                         | TiAl6Sn2Zr4Mo2                                                                                       |                                                   | Ti-6Al-2Sn-4Zr-6Mo                                                                                         | Ti6Al2.5V;<br>Titan Grade 9;<br>Titan 3Al 2.5V                        | TiCu2                           | Ti4Al4Mo2Sn;<br>TiAl4Mo4Sn4Si0.5                                    |
|  | Werkstoff<br>(GERMANY)                   | 3.7165;<br>3.7164                                                   | 3.7145;<br>3.7144                                                                                    |                                                   | 3.7175;<br>3.7174                                                                                          | 3.7195;<br>3.7194                                                     | 3.712                           | 3.7185;<br>3.7184                                                   |
|  | EN<br>(EUROPE)                           | Ti6Al4V                                                             | TiAl6Sn2Zr4Mo2                                                                                       |                                                   | Ti-6Al-6V-2Sn                                                                                              | Ti6Al2.5V                                                             |                                 |                                                                     |
|  | GOST<br>(RUSSIA)                         | VT6;<br>VT6L                                                        | VT25                                                                                                 |                                                   |                                                                                                            | PT-3V                                                                 |                                 |                                                                     |
|  | JIS<br>(JAPAN)                           | Class 6 0;<br>Gr 6 0;<br>SAT-64;<br>TAB 6400E;<br>TAF 6400          |                                                                                                      |                                                   |                                                                                                            | Class 6 1;<br>Gr 6 1                                                  |                                 |                                                                     |
|  | SS<br>(SWEDEN)                           |                                                                     |                                                                                                      |                                                   |                                                                                                            |                                                                       |                                 |                                                                     |
|  | UNE<br>(SPAIN)                           | Ti-P63;<br>38-723L-7301                                             |                                                                                                      |                                                   | 38-725L-7303                                                                                               |                                                                       | Ti-P11                          | Ti-P68                                                              |
|  | UNI<br>(ITALY)                           | TiAl6V4-Type 5                                                      |                                                                                                      |                                                   |                                                                                                            | TiAl3V2.5-Type 9                                                      |                                 |                                                                     |
|  | IS<br>(INDIA)                            |                                                                     |                                                                                                      |                                                   |                                                                                                            |                                                                       |                                 |                                                                     |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                                     |                                                                                                      |                                                   |                                                                                                            |                                                                       |                                 |                                                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                     |                                                                                                      |                                                   | TC4                                                                                                        | TC2                                                                   |                                 |                                                                     |

## Material Designation in Accordance with Selected Standards

|                                                                                                                            |  | Material Group No.                                                             |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------|------|---------------------------------------------------------------------------------------------------------------|
| Standards                                                                                                                  |  | 37                                                                             | 37                                                                                        | 37                                       | 37                                                                                               | 37                 | 37   | 37                                                                                                            |
|  NF/AFNOR (FRANCE)                        |  | TA5E;<br>T-A5E;<br>Ti-P.65                                                     |                                                                                           |                                          | TA6VE;<br>T-A6VE                                                                                 | TA4D3V;<br>T-A4D3V |      | TA8DV;<br>T-A8DV                                                                                              |
|  AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |  | R54520;<br>Titanium Grade 6;<br>Ti-5Al-2.5Sn;<br>Gr6;<br>AMS 4910;<br>AMS 4926 | R54521;<br>Titanium Grade Ti-5Al-2.5Sn-ELI;<br>Ti-5Al-2.5Sn-ELI;<br>AMS 4909;<br>AMS 4924 | R56410;<br>Titanium Grade Ti-10V-2Fe-3Al | R56401;<br>R56407;<br>Titanium Grade 23;<br>Ti-6Al-4V-ELI;<br>AMS 4907;<br>AMS 4930;<br>AMS 4956 | Ti-4Al-3Mo-1V      |      | R54810;<br>Titanium Grade Ti-8Al-1Mo-1V;<br>Ti-8Al-1Mo-1V;<br>AMS 4915;<br>AMS 4916;<br>AMS 4972;<br>AMS 4973 |
|  BS (UK)                                  |  | TA14;<br>TA17                                                                  | TA32                                                                                      |                                          | TA11                                                                                             |                    |      | TA40                                                                                                          |
|  DIN (GERMANY)                            |  | TiAl5Sn2.5;<br>TiAl 5 Sn 22;<br>Titan 5Al2.5Sn;<br>Ti5Al2.5Sn                  | TiAl5Sn2.5 ELI                                                                            |                                          | Ti6Al4V ELI                                                                                      |                    |      |                                                                                                               |
|  Werkstoff (GERMANY)                     |  | 3.7115.1;<br>3.7115;<br>3.7114                                                 |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |
|  EN (EUROPE)                            |  | TiAl5Sn2.5                                                                     |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |
|  GOST (RUSSIA)                          |  | VT5-1                                                                          | VT5-1                                                                                     |                                          | VT6S                                                                                             | VT14               | VT22 |                                                                                                               |
|  JIS (JAPAN)                            |  | SAT-525                                                                        |                                                                                           |                                          | Class 6 1;<br>Gr 6 1                                                                             |                    |      |                                                                                                               |
|  SS (SWEDEN)                            |  |                                                                                |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |
|  UNE (SPAIN)                            |  | 38-716L-7101                                                                   |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |
|  UNI (ITALY)                            |  |                                                                                |                                                                                           |                                          | TiAl6V4ELI-Type 5.1                                                                              |                    |      |                                                                                                               |
|  IS (INDIA)                             |  |                                                                                |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |
|  KS (REP. OF KOREA)                     |  |                                                                                |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |
|  GB/YB/JB/<br>SY/NB<br>(PRC)            |  | TA7                                                                            |                                                                                           |                                          |                                                                                                  |                    |      |                                                                                                               |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                                      |                                                    |                                                            |                                                                                |                                                                            |                                            |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------|
| Standards                                                                           |                                          | 37                                                                      | 37                                                 | 37                                                         | 37                                                                             | 37                                                                         | 37                                         |
|    | NF/AFNOR<br>(FRANCE)                     |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | R56322;<br>Titanium Grade 18;<br>Ti-3Al-2.5V-0.05Pd;<br>Ti-Pd18;<br>F18 | R56323;<br>Titanium Grade 28;<br>Ti-3Al-2.5V-0.1Ru | R54250;<br>Titanium Grade 38;<br>Ti-4Al-2.5V;<br>AMS 6946B | R56260;<br>Titanium Grade 6Al-2Sn-4Zr-6Mo;<br>Ti-6Al-2Sn-4Zr-6Mo;<br>AMS 4981B | R58650;<br>Titanium Grade Ti-5Al-2Sn-2Zr-4Cr-4Mo;<br>AMS 4995;<br>AMS 4997 | Ti-6Al-2Sn-2Zr-2Mo-2Cr-0.15Si;<br>AMS 4898 |
|    | BS<br>(UK)                               |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|    | DIN<br>(GERMANY)                         |                                                                         |                                                    |                                                            | Ti6Al2Sn4Zr6Mo                                                                 | Ti5Al2Sn2Zr4Mo4Cr                                                          |                                            |
|    | Werkstoff<br>(GERMANY)                   |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|   | EN<br>(EUROPE)                           |                                                                         |                                                    |                                                            | Ti6Al2Sn4Zr6Mo                                                                 | Ti5Al2Sn2Zr4Mo4Cr                                                          |                                            |
|  | GOST<br>(RUSSIA)                         |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|  | JIS<br>(JAPAN)                           |                                                                         | TAT 3250 Class 61                                  |                                                            |                                                                                |                                                                            |                                            |
|  | SS<br>(SWEDEN)                           |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|  | UNE<br>(SPAIN)                           |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|  | UNI<br>(ITALY)                           |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|  | IS<br>(INDIA)                            |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                         |                                                    |                                                            |                                                                                |                                                                            |                                            |



## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.               |                                                |        |               |                                                                               |                                                                                           |                                                                                | 37                                         |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------|------------------------------------------------|--------|---------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------|
|                                                                                     |                                          | 37                               | 37                                             | 37     | 37            | 37                                                                            | 37                                                                                        | 37                                                                             |                                            |
|    | NF/AFNOR<br>(FRANCE)                     |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | Ti-4.5Al-3V-2Mo-2Fe;<br>AMS 4899 | R56700;<br>Titanium Grade Ti-6Al-7Nb;<br>F1295 |        |               | R56410;<br>Ti-10V-2Fe-3Al;<br>AMS 4983;<br>AMS 4984;<br>AMS 4986;<br>AMS 4987 | R58010;<br>Ti-13V-11Cr-3Al;<br>AMS 4917;<br>AMS 4959;<br>B120VCA;<br>B-1;<br>3Al-13V-11Cr | R58030;<br>Titanium Grade 10;<br>Ti-11.5Mo-6Zr-4.5Sn;<br>AMS 4977;<br>AMS 4980 | R58153;<br>Ti-15V-3Cr-3Al-3Sn;<br>AMS 4914 |
|    | BS<br>(UK)                               |                                  |                                                |        |               |                                                                               | TA3                                                                                       | TA5                                                                            |                                            |
|    | DIN<br>(GERMANY)                         |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |
|   | Werkstoff<br>(GERMANY)                   |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |
|  | EN<br>(EUROPE)                           |                                  |                                                |        | Ti5Al6V5Mo3Cr |                                                                               |                                                                                           |                                                                                |                                            |
|  | GOST<br>(RUSSIA)                         |                                  |                                                | OT4-1  | VST 5553      |                                                                               |                                                                                           |                                                                                |                                            |
|  | JIS<br>(JAPAN)                           |                                  |                                                | ST-A90 |               |                                                                               |                                                                                           |                                                                                |                                            |
|  | SS<br>(SWEDEN)                           |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |
|  | UNE<br>(SPAIN)                           |                                  |                                                |        |               |                                                                               | 38-729L-7701                                                                              |                                                                                |                                            |
|  | UNI<br>(ITALY)                           |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |
|  | IS<br>(INDIA)                            |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |
|  | KS<br>(REP. OF<br>KOREA)                 |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                  |                                                |        |               |                                                                               |                                                                                           |                                                                                |                                            |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No.                                                |                                                        |                                                        |                                                                |      |        |      | Material Group No.                 |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------|------|--------|------|------------------------------------|
|                                                                                     |                                          | 37                                                                | 37                                                     | 37                                                     | 37                                                             | 37   | 37     | 37   | 38                                 |
|    | NF/AFNOR<br>(FRANCE)                     |                                                                   |                                                        |                                                        |                                                                |      |        |      | C 105 E 2 U;<br>Y1 105;<br>C105E2U |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | R58210;<br>Titanium Grade 21;<br>Ti-15Mo-2.7Nb-3Al-0.2Si;<br>B265 | R58640;<br>Titanium Grade 19;<br>Ti-3Al-8V-6Cr-4Mo-4Zr | R58645;<br>Titanium Grade 20;<br>Ti-3Al-8V-6Cr-4Mo-4Zr | R58820;<br>Titanium Grade 8Mo-8V-2Fe-3Al;<br>Ti-8Mo-8V-2Fe-3Al |      |        |      | W110;<br>T72301                    |
|    | BS<br>(UK)                               |                                                                   | TA38                                                   |                                                        |                                                                |      |        |      |                                    |
|    | DIN<br>(GERMANY)                         |                                                                   |                                                        |                                                        |                                                                |      |        |      | C105U;<br>C 105 W 1;<br>C 105 U    |
|    | Werkstoff<br>(GERMANY)                   |                                                                   |                                                        |                                                        |                                                                |      |        |      | 1.1545                             |
|   | EN<br>(EUROPE)                           |                                                                   |                                                        |                                                        |                                                                |      |        |      | C105U                              |
|  | GOST<br>(RUSSIA)                         |                                                                   |                                                        |                                                        |                                                                | VT15 | VT15-1 | VT19 | U10A-1;<br>U10A-2;<br>U11-1        |
|  | JIS<br>(JAPAN)                           |                                                                   |                                                        |                                                        |                                                                |      |        |      | SK 105;<br>SK 3;<br>TC 105         |
|  | SS<br>(SWEDEN)                           |                                                                   |                                                        |                                                        |                                                                |      |        |      | 1880                               |
|  | UNE<br>(SPAIN)                           |                                                                   |                                                        |                                                        |                                                                |      |        |      | F.515;<br>F.516                    |
|  | UNI<br>(ITALY)                           |                                                                   |                                                        |                                                        |                                                                |      |        |      | C 100 KU                           |
|  | IS<br>(INDIA)                            |                                                                   |                                                        |                                                        |                                                                |      |        |      |                                    |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                                   |                                                        |                                                        |                                                                |      |        |      | STC 105;<br>STC 3                  |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                   |                                                        |                                                        |                                                                |      |        |      | T10                                |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.              |                                         |                                                           |                       |           |                        |                           |         |                           |                                                |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------|-----------------------------------------|-----------------------------------------------------------|-----------------------|-----------|------------------------|---------------------------|---------|---------------------------|------------------------------------------------|
| Standards                                                                           |                                          | 38                              | 38                                      | 38                                                        | 38                    | 38        | 38                     | 38                        | 38      | 38                        | 38                                             |
|    | NF/AFNOR<br>(FRANCE)                     | 35 NCD 14                       | C 105 E 2 UV 1;<br>Y1 105 V;<br>100 V 2 | 50CrV4RR;<br>50 CV 4;<br>51 CV 4                          | 34 CD 4               |           | X40Cr14;<br>Z 40 C 14  |                           |         | Z 30 WCV 9                |                                                |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                 | W210;<br>T72302                         | 6145;<br>6150;<br>6150 H;<br>G61500;<br>H61500            | P20;<br>T51620        |           |                        | 300M;<br>4340M;<br>K44220 |         | H21;<br>T20821            | S7;<br>T41907                                  |
|    | BS<br>(UK)                               | 832 M 31                        | BW 2                                    | 735 A 50;<br>735 A 51;<br>735 H 51;<br>735 M 50;<br>En 47 | 708 A 37              |           |                        |                           |         | BH 21                     |                                                |
|    | DIN<br>(GERMANY)                         | 32NiCrMo14-5;<br>32 NiCrMo 14-5 | 100V1;<br>100 V 1                       | 51CrV4;<br>50CrV4;<br>50 CrV 4                            | 35CrMo4;<br>35 CrMo 4 | 26MnCr6-3 | X40Cr14;<br>X 42 Cr 13 | 41SiNiCrMoV7-6            |         | X30WCrV9-3;<br>X30WCrV9 3 | 50CrMoV13-4;<br>50 CrMoV 13 4;<br>50CrMoV13-15 |
|    | Werkstoff<br>(GERMANY)                   | 1.6746                          | 1.2833                                  | 1.8159                                                    | 1.2330                | 1.8721    | 1.2083;<br>1.2083 ESR  | 1.6928                    |         | 1.2581                    |                                                |
|   | EN<br>(EUROPE)                           | 32NiCrMo14-5                    | 100V1                                   | 51CrV4                                                    | 35CrMo4               | 26MnCr6-3 | X40Cr14                | S 155                     |         | X30WCrV9-3;<br>X30WCrV9 3 | 50CrMoV13-15                                   |
|  | GOST<br>(RUSSIA)                         |                                 |                                         | 50ChFA;<br>50ChGFA                                        |                       |           |                        |                           | 30ChGSA | 3Ch2W8F                   |                                                |
|  | JIS<br>(JAPAN)                           |                                 | SKS 43                                  | SUP 10;<br>SUP 10-CSP;<br>SUP 10 M                        |                       |           | SUS 420 J 2            |                           |         | SKD 5                     |                                                |
|  | SS<br>(SWEDEN)                           |                                 |                                         | 2230                                                      | 2234                  |           | 2314                   |                           |         |                           |                                                |
|  | UNE<br>(SPAIN)                           | F.1262-32 NiCrMo 12             |                                         | F.143;<br>F.143.A;<br>51 CrV 4;<br>F.1430                 |                       |           | F.5263;<br>X 40 Cr 13  |                           |         | F.5323;<br>X 30 WCrV 9    | 1.2357;<br>1.2355                              |
|  | UNI<br>(ITALY)                           |                                 | 102 V 2 KU                              | 50 CrV 4                                                  | 35 CrMo 4             |           | X 41 Cr 13 KU          |                           |         | X 30 WCrV 9 3 KU          |                                                |
|  | IS<br>(INDIA)                            |                                 |                                         |                                                           |                       |           |                        |                           |         |                           |                                                |
|  | KS<br>(REP. OF<br>KOREA)                 |                                 | SPS 4                                   | SPS 10                                                    | SCM 435TK             |           | STS 420J2              |                           |         |                           |                                                |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                 | T9 ;<br>V                               | 50CrVA                                                    | 3CrMo                 |           | 3Cr13                  |                           |         |                           |                                                |

## Material Designation in Accordance with Selected Standards

| Standards                                                                           |                                          | Material Group No. |               |                        |                             |                       |                |                                   |                     |                                     |                                                   |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|---------------|------------------------|-----------------------------|-----------------------|----------------|-----------------------------------|---------------------|-------------------------------------|---------------------------------------------------|
|                                                                                     |                                          | 38                 | 38            | 38                     | 38                          | 38                    | 38             | 38                                | 38                  | 38                                  | 39                                                |
|    | NF/AFNOR<br>(FRANCE)                     |                    |               | Z 40 C 13              |                             | 55WC20;<br>55 WC 20   | Z 2 CN 18-10 M |                                   |                     |                                     | X 160 CrMoV 12;<br>Z 160 CDV 12                   |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A9;<br>T30109      | S6;<br>T41906 | 420 C                  | 414;<br>S41400;<br>AMS 5615 | S1;<br>T41901         | K92710         | K92890;<br>AMS 6512               | K93120;<br>AMS 6514 | K93540;<br>AMS 6515                 | D2;<br>T30402                                     |
|    | BS<br>(UK)                               |                    |               | 420 S 45               |                             | BS 1                  |                | BS S162                           |                     |                                     | BD 2                                              |
|    | DIN<br>(GERMANY)                         |                    |               | X39Cr13;<br>X 38 Cr 13 |                             | 60WCrV8;<br>60 WCrV 7 | X2NiCoMo18-8-5 | X2NiCoMo18-9-5;<br>X2NiCoMo18-8-5 | X2NiCoMo18-8-5      | X2NiCoMo18-12;<br>X2NiCoMoTi18-12-4 | X153CrMoV12;<br>X155CrVMo12-1;<br>X155 CrVMo 12 1 |
|    | Werkstoff<br>(GERMANY)                   |                    |               | 1.4031                 |                             | 1.2550                | 1.6359         | 1.6358;<br>1.6359                 | 1.6354;<br>1.6359   | 1.6355;<br>1.6356                   | 1.238                                             |
|   | EN<br>(EUROPE)                           |                    |               | X39Cr13                |                             | 60WCrV8               | X2NiCoMo18-8-5 | X2NiCoMo18-8-5                    | X2NiCoMo18-8-5      |                                     | X153CrMoV12                                       |
|  | GOST<br>(RUSSIA)                         |                    |               | 40Ch13                 |                             | 6ChV2S;<br>5ChV2S     |                |                                   |                     |                                     |                                                   |
|  | JIS<br>(JAPAN)                           |                    |               |                        |                             |                       |                |                                   |                     |                                     | SKD 10;<br>SKD 11                                 |
|  | SS<br>(SWEDEN)                           |                    |               |                        |                             |                       |                |                                   |                     |                                     | 2310                                              |
|  | UNE<br>(SPAIN)                           |                    |               |                        |                             |                       |                |                                   |                     |                                     | F.520.A                                           |
|  | UNI<br>(ITALY)                           |                    |               | X 40 Cr 14             |                             | 55 WCrV 8 KU          |                |                                   |                     |                                     | X 155 CrVMo 12 1 KU                               |
|  | IS<br>(INDIA)                            |                    |               |                        |                             |                       |                |                                   |                     |                                     |                                                   |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |               |                        |                             |                       |                |                                   |                     |                                     |                                                   |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |               |                        |                             |                       |                |                                   |                     |                                     | Cr12MoV                                           |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.               |                                               |                         |                               |         |                                |                            |                           |                       |                                     |
|-------------------------------------------------------------------------------------|------------------------------------------|----------------------------------|-----------------------------------------------|-------------------------|-------------------------------|---------|--------------------------------|----------------------------|---------------------------|-----------------------|-------------------------------------|
| Standards                                                                           |                                          | 39                               | 39                                            | 39                      | 39                            | 39      | 39                             | 39                         | 39                        | 39                    | 39                                  |
|    | NF/AFNOR<br>(FRANCE)                     | X200Cr12;<br>Z 200 C 12          | 100Cr6RR;<br>100 C 6;<br>100Cr6;<br>Y 100 C 6 | 90 MnV 8;<br>90 MV 8    | X 40 CrMoV 5;<br>Z 40 CDV 5   |         | Z 100 CD 17 Cl;<br>Z 100 CD 17 |                            |                           | 100 C 3               | 55 NCDV 7;<br>55 NiCrMoV7           |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | D3;<br>T30403                    | L3;<br>T61203                                 | O2;<br>T31502           | H13;<br>T20813                |         | 440C;<br>S44004;<br>S44025     | 440A;<br>S44002;<br>J91606 |                           | L2;<br>T61202         | L6;<br>T61206                       |
|    | BS<br>(UK)                               | BD 3                             | BL 3;<br>BL3                                  | BO 2;<br>BO2            | BH 13                         |         |                                |                            |                           |                       |                                     |
|    | DIN<br>(GERMANY)                         | X210Cr12;<br>X 210 Cr 12         | 102Cr6;<br>102 Cr 6;<br>100 Cr 6              | 90MnCrV8;<br>90 MnCrV 8 | X40CrMoV5-1;<br>X40 CrMoV 5 1 |         | X105CrMo17;<br>X105 CrMo 17    | X70CrMo15;<br>X 65 CrMo 14 | 62SiMnCr4;<br>62 SiMnCr 4 | 115CrV3;<br>115 CrV 3 | 55NiCrMoV7;<br>56 NiCrMoV 7         |
|    | Werkstoff<br>(GERMANY)                   | 1.2080                           | 1.2067                                        | 1.284                   | 1.2344                        |         | 1.4125                         | 1.411                      | 1.2101                    | 1.2210                | 1.2714                              |
|   | EN<br>(EUROPE)                           | X210Cr12                         | 102Cr6                                        | 90MnCrV8                | X40CrMoV5-1                   |         | X105CrMo17                     | X70CrMo15                  |                           | 115CrV3               | 55NiCrMoV7                          |
|  | GOST<br>(RUSSIA)                         | Ch12                             | Ch                                            |                         | 4Ch5MF1S                      |         | 95Ch18;<br>110Ch18M-SchD       |                            |                           |                       | 5ChGNM                              |
|  | JIS<br>(JAPAN)                           | SKD 1                            | SUJ 2                                         |                         | SKD 61                        |         | SUS 440 C                      |                            |                           |                       | SKT 4                               |
|  | SS<br>(SWEDEN)                           |                                  |                                               |                         | 2242                          |         |                                |                            |                           |                       |                                     |
|  | UNE<br>(SPAIN)                           | F.521;<br>F.5212;<br>X 210 Cr 12 | F.5230;<br>100 Cr 6                           | 90 MnCrV 8;<br>F.5229   | F.5318;<br>X 40 CrMoSiV 5     |         |                                |                            |                           | F.520.L;<br>F.5125    | F.520.B;<br>55 NiCrMoV 7;<br>F.5307 |
|  | UNI<br>(ITALY)                           | X 205 Cr 12 KU                   | 102 Cr 6 KU                                   | 90 MoVCr 8 KU           | X 40 CrMoV 5 1 1 KU           |         |                                |                            |                           | 107 CrV 3 KU          | 55 NiCrMoV 7 KU;<br>56 NiCrMoV 7 KU |
|  | IS<br>(INDIA)                            | T215Cr12                         |                                               |                         |                               |         |                                |                            |                           |                       |                                     |
|  | KS<br>(REP. OF<br>KOREA)                 | STR 3                            | STB 2                                         |                         | STD 61                        | STF 4   |                                |                            |                           |                       |                                     |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | Cr12                             | Cr2                                           | 9Mn2V                   | 40CrMoV5                      | 5CrNiMo | 9Cr18                          |                            |                           |                       |                                     |

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|                                                                                     |                                          | Material Group No. |               |               |               |               |                 |                                     |                                                          |                                    |                                  |                                    |                                            |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|---------------|---------------|---------------|---------------|-----------------|-------------------------------------|----------------------------------------------------------|------------------------------------|----------------------------------|------------------------------------|--------------------------------------------|
| Standards                                                                           |                                          | 39                 | 39            | 39            | 39            | 39            | 39              | 39                                  | 39                                                       | 39                                 | 39                               | 39                                 | 39                                         |
|    | NF/AFNOR<br>(FRANCE)                     |                    |               |               |               |               |                 |                                     |                                                          | C 105 E 2 U;<br>Y1 105;<br>C105E2U | X200Cr12;<br>Z 200 C 12          | HS 2-8-1;<br>Z 85 DCWV 08-04-02-01 | 18-0-1;<br>HS 18-0-1;<br>Z 80 WCV 18-04-01 |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | S2;<br>T41902      | S5;<br>T41905 | D7;<br>T30407 | A6;<br>T30106 | A8;<br>T30108 | 440F;<br>S44020 | K93540;<br>AMS 6515                 | W1;<br>T72301                                            | W110;<br>T72301                    | D3;<br>T30403                    | M1;<br>H41;<br>T11301;<br>T20841   | T1;<br>T12001                              |
|    | BS<br>(UK)                               |                    |               |               |               |               |                 |                                     | BW 18                                                    |                                    | BD 3                             | BM 1                               | BT 1                                       |
|    | DIN<br>(GERMANY)                         |                    |               |               |               |               |                 | X2NiCoMo18-12;<br>X2NiCoMoTi18-12-4 | C80W2;<br>C 80 W2                                        | C105U;<br>C 105 W 1;<br>C 105 U    | X210Cr12;<br>X 210 Cr 12         | HS2-9-1;<br>S 2-9-1                | HS18-0-1;<br>S 18-0-1                      |
|    | Werkstoff<br>(GERMANY)                   |                    |               |               |               |               |                 | 1.6355;<br>1.6356                   | 1.1625                                                   | 1.1545                             | 1.2080                           | 1.3346                             | 1.336                                      |
|   | EN<br>(EUROPE)                           |                    |               |               |               |               |                 |                                     | C80W2                                                    | C105U                              | X210Cr12                         | HS2-9-1                            | HS18-0-1                                   |
|  | GOST<br>(RUSSIA)                         |                    |               |               |               |               |                 |                                     | U8-1                                                     | U10A-1;<br>U10A-2;<br>U11-1        | Ch12                             |                                    | R18                                        |
|  | JIS<br>(JAPAN)                           |                    |               |               |               |               |                 |                                     | SK 75;<br>SK 85;<br>SK 85 M;<br>SK 5;<br>SK 5 M;<br>SK 6 | SK 105;<br>SK 3;<br>TC 105         | SKD 1                            |                                    | SKH 2                                      |
|  | SS<br>(SWEDEN)                           |                    |               |               |               |               |                 |                                     |                                                          | 1880                               |                                  |                                    | 2750                                       |
|  | UNE<br>(SPAIN)                           |                    |               |               |               |               |                 |                                     | F.520.U;<br>F.5107;<br>C 80                              | F.515;<br>F.516                    | F.521;<br>F.5212;<br>X 210 Cr 12 |                                    | F.5520;<br>HS 18-0-1                       |
|  | UNI<br>(ITALY)                           |                    |               |               |               |               |                 |                                     |                                                          | C 100 KU                           | X 205 Cr 12 KU                   |                                    | HS 18-0-1                                  |
|  | IS<br>(INDIA)                            |                    |               |               |               |               |                 |                                     |                                                          |                                    |                                  |                                    |                                            |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |               |               |               |               |                 |                                     |                                                          | STC 105;<br>STC 3                  |                                  |                                    |                                            |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |               |               |               |               |                 |                                     | T7                                                       | T10                                |                                  |                                    | W18Cr4V                                    |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.      |                                                |               |               |               |               |                          |                                          |                                                                                 |                                                                                  |
|-------------------------------------------------------------------------------------|------------------------------------------|-------------------------|------------------------------------------------|---------------|---------------|---------------|---------------|--------------------------|------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Standards                                                                           |                                          | 39                      | 39                                             | 39            | 39            | 39            | 39            | 39                       | 39                                       | 39                                                                              | 40                                                                               |
|    | NF/AFNOR<br>(FRANCE)                     | 90 MnV 8;<br>90 MV 8    | Z 85 WDCV<br>06-05-04-02;<br>6-5-2;<br>HS6-5-2 |               |               |               |               |                          | Z 80 WDCV<br>19-05-04-01;<br>HS 18-1-1-5 | Z 120 WDCV<br>06-05-04-03;<br>HS6-5-3;<br>Z 120 WDCV<br>06-05-04-04;<br>HS6-5-4 |                                                                                  |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | O2;<br>T31502           | M2;<br>T11302                                  | D7;<br>T30407 | A3;<br>T30103 | A7;<br>T30107 | W5;<br>T72305 | P4;<br>T51604            | T4;<br>T12004                            | M3 Class 2;<br>T11323                                                           | A532 IB;<br>Ni-Hard 2;<br>Ni-Cr-Lc;<br>F45001                                    |
|    | BS<br>(UK)                               | BO 2;<br>BO2            | BM 2;<br>BM2                                   |               |               |               |               |                          | BT 4                                     |                                                                                 | Grade 2 A                                                                        |
|    | DIN<br>(GERMANY)                         | 90MnCrV8;<br>90 MnCrV 8 | HS6-5-2;<br>HS 6-5-2;<br>S 6-5-2               |               |               |               |               | 6CrMo15-5;<br>X 6 CrMo 4 | HS18-1-2-5;<br>S 18-1-2-5                | HS6-5-3;<br>HS 6-5-3;<br>S 6-5-3                                                | HS6-5-3C<br><br>G-X 260 NiCr 4 2;<br>EN-GJN-HV520;<br>EN-GJN-HB480;<br>EN-JN2029 |
|    | Werkstoff<br>(GERMANY)                   | 1.284                   | 1.3343                                         |               |               |               |               | 1.234                    | 1.3255                                   | 1.334                                                                           | 1.335<br><br>0.9620;<br>5.5602                                                   |
|  | EN<br>(EUROPE)                           | 90MnCrV8                | HS6-5-2                                        |               |               |               |               |                          | HS18-1-2-5                               | HS6-5-3                                                                         | HS6-5-3C<br><br>EN-GJN-HB480;<br>EN-JN2029                                       |
|  | GOST<br>(RUSSIA)                         |                         | R6M5                                           |               |               |               |               |                          |                                          |                                                                                 |                                                                                  |
|  | JIS<br>(JAPAN)                           |                         | SKH 51                                         |               |               |               |               |                          | SKH 3                                    | SKH 52;<br>SKH 53                                                               |                                                                                  |
|  | SS<br>(SWEDEN)                           |                         | 2722                                           |               |               |               |               |                          |                                          | 2725                                                                            | 0512-00                                                                          |
|  | UNE<br>(SPAIN)                           | 90 MnCrV 8;<br>F.5229   | F.550.A;<br>F.5604                             |               |               |               |               |                          | F.5530;<br>HS 18-1-1-5                   | F.5605;<br>6-5-3                                                                |                                                                                  |
|  | UNI<br>(ITALY)                           | 90 MoVCr 8 KU           |                                                |               |               |               |               |                          | HS 18-1-1-5                              |                                                                                 |                                                                                  |
|  | IS<br>(INDIA)                            |                         | T83MoW6Cr4V2                                   |               |               |               |               |                          |                                          |                                                                                 |                                                                                  |
|  | KS<br>(REP. OF<br>KOREA)                 |                         | SKH 51                                         |               |               |               |               |                          |                                          |                                                                                 |                                                                                  |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              | 9Mn2V                   | W6Mo5Cr4V2                                     |               |               |               |               |                          |                                          |                                                                                 |                                                                                  |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                          |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------|----------------------------|--------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------|-------|---------|--------|--------|
| Standards                                                                           |                                          | 40                                          | 40                         | 40           | 40                   | 40                                                                                                                                      | 40                  | 40      | 40    | 40      | 40     | 40     |
|    | NF/AFNOR<br>(FRANCE)                     |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                                             |                            |              | SAE J2477 AD<br>1400 | F37006;<br>A897 230-185-01;<br>A897 (230/185/01);<br>A897M 1600-1300-01;<br>A897M (1600/1300/01);<br>A897 Grade 5;<br>SAE J2477 AD 1600 |                     |         |       |         |        |        |
|    | BS<br>(UK)                               | Grade 1 A;<br>Grade 1 B;<br>Grade 1 C       |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|    | DIN<br>(GERMANY)                         | EN-GJN-HV350;<br>EN-GJN-HB340;<br>EN-JN2019 | EN-GJN-HB400;<br>EN-JN2059 | EN-GJN-HB500 | EN-GJS-HB400         | EN-GJS-HB450                                                                                                                            | G-X 250<br>CrMoV 25 |         |       |         |        |        |
|  | Werkstoff<br>(GERMANY)                   | 0.9610;<br>5.5600                           | 5.5601                     | 5.560        | 5.3406               | 5.3407                                                                                                                                  | 1.4192              |         |       |         |        |        |
|  | EN<br>(EUROPE)                           | EN-GJN-HB340;<br>EN-JN2019                  | EN-GJN-HB400;<br>EN-JN2059 | EN-GJN-HB500 | EN-GJS-HB400         | EN-GJS-HB450                                                                                                                            |                     |         |       |         |        |        |
|  | GOST<br>(RUSSIA)                         |                                             |                            |              |                      |                                                                                                                                         |                     | ChS15M4 | ChS17 | ChS17M3 | ChKh16 | ChKh22 |
|  | JIS<br>(JAPAN)                           |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|  | SS<br>(SWEDEN)                           |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|  | UNE<br>(SPAIN)                           |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|  | UNI<br>(ITALY)                           |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|  | IS<br>(INDIA)                            |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|  | KS<br>(REP. OF<br>KOREA)                 |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                             |                            |              |                      |                                                                                                                                         |                     |         |       |         |        |        |



## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No. |         |        |             |                                                                                     |                                                                       |                                                     |                                              |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------|---------|--------|-------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------|
| Standards                                                                           |                                          | 40                 | 40      | 40     | 40          | 41                                                                                  | 41                                                                    | 41                                                  | 41                                           |
|    | NF/AFNOR<br>(FRANCE)                     |                    |         |        |             |                                                                                     |                                                                       |                                                     |                                              |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) |                    |         |        |             | A532 IID 20% CrMo-LC;<br>A532 Class II Type D;<br>F45007                            | A532 IIC 15% CrMo-HC;<br>A532 Class II Type C;<br>15% CrMo;<br>F45005 | A532 IIIA 25% Cr;<br>A532 Class III Type A          | A532 ID;<br>Ni-Hard 4;<br>Ni-HiCr;<br>F45003 |
|    | BS<br>(UK)                               |                    |         |        |             | Grade 3 C                                                                           | Grade 3 A;<br>Grade 3 B                                               | Grade 3 D                                           | Grade 2 C;<br>Grade 2 D;<br>Grade 2 E        |
|    | DIN<br>(GERMANY)                         |                    |         |        |             | G-X 260 CrMoNi 20 2 1;<br>EN-GJN-HV600(XCr23);<br>EN-GJN-HB555(XCr18);<br>EN-JN3039 | G-X 300 CrMo 15 3;<br>G-X 300 CrMoNi 15 2 1;<br>EN-GJN-HV600(XCr14)   | G-X 260 Cr 27;<br>EN-GJN-HB555(XCr23);<br>EN-JN3049 | G-X 300 CrNiSi 9 5 2;<br>EN-GJN-HV600;       |
|    | Werkstoff<br>(GERMANY)                   |                    |         |        |             | 0.9645;<br>5.5609                                                                   | 0.9635;<br>0.9640;<br>5.5608                                          | 0.9650;<br>5.5610                                   | 0.9630;<br>5.5605                            |
|   | EN<br>(EUROPE)                           |                    |         |        |             | EN-GJN-HB555(XCr18);<br>EN-JN3039                                                   | EN-GJN-HB555(XCr14)                                                   | EN-GJN-HB555(XCr23);<br>EN-JN3049                   | EN-GJN-HB555;<br>EN-JN2049                   |
|  | GOST<br>(RUSSIA)                         | ChKh28D2           | ChG7Kh4 | ChYu30 | ChN3KhMDSHa |                                                                                     |                                                                       | ChWG                                                |                                              |
|  | JIS<br>(JAPAN)                           |                    |         |        |             |                                                                                     |                                                                       |                                                     |                                              |
|  | SS<br>(SWEDEN)                           |                    |         |        |             |                                                                                     |                                                                       | 0466-00                                             | 0457-00                                      |
|  | UNE<br>(SPAIN)                           |                    |         |        |             |                                                                                     |                                                                       |                                                     |                                              |
|  | UNI<br>(ITALY)                           |                    |         |        |             |                                                                                     |                                                                       |                                                     |                                              |
|  | IS<br>(INDIA)                            |                    |         |        |             |                                                                                     |                                                                       |                                                     |                                              |
|  | KS<br>(REP. OF<br>KOREA)                 |                    |         |        |             |                                                                                     |                                                                       |                                                     |                                              |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                    |         |        |             |                                                                                     |                                                                       |                                                     |                                              |

## Material Designation in Accordance with Selected Standards

|                                                                                     |                                          | Material Group No.                                               |                                           |                  |         |          |        |          |        |             |
|-------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------|-------------------------------------------|------------------|---------|----------|--------|----------|--------|-------------|
| Standards                                                                           |                                          | 41                                                               | 41                                        | 41               | 41      | 41       | 41     | 41       | 41     | 41          |
|    | NF/AFNOR<br>(FRANCE)                     |                                                                  |                                           |                  |         |          |        |          |        |             |
|    | AISI/ASM/<br>ASTM/SAE/<br>UNS/AA<br>(US) | A532 IA;<br>Ni-Hard;<br>F45000;<br>Ni-Cr-Hc                      | A532 IIIA 25% Cr                          |                  |         |          |        |          |        |             |
|    | BS<br>(UK)                               | Grade 2 B                                                        | Grade 3 E                                 |                  |         |          |        |          |        |             |
|    | DIN<br>(GERMANY)                         | G-X 330 NiCr 4 2;<br>EN-GJN-HV550;<br>EN-GJN-HB510;<br>EN-JN2039 | G-X 300 CrMo 27 1;<br>EN-GJN-HB555(XCr23) | G-X 250 CrMoV 25 |         |          |        |          |        |             |
|    | Werkstoff<br>(GERMANY)                   | 0.9625;<br>5.5604                                                | 0.9655;<br>5.5610                         | 1.419            |         |          |        |          |        |             |
|   | EN<br>(EUROPE)                           | EN-GJN-HB510;<br>EN-JN2039                                       | EN-GJN-HB555(XCr23)                       |                  |         |          |        |          |        |             |
|  | GOST<br>(RUSSIA)                         |                                                                  | 20Ch25N20S2                               |                  | ChKh9N5 | ChKh16M2 | ChKh22 | ChKh28D2 | ChYu30 | ChN3KhMDSHa |
|  | JIS<br>(JAPAN)                           |                                                                  |                                           |                  |         |          |        |          |        |             |
|  | SS<br>(SWEDEN)                           | 0513-00                                                          |                                           |                  |         |          |        |          |        |             |
|  | UNE<br>(SPAIN)                           |                                                                  |                                           |                  |         |          |        |          |        |             |
|  | UNI<br>(ITALY)                           |                                                                  |                                           |                  |         |          |        |          |        |             |
|  | IS<br>(INDIA)                            |                                                                  |                                           |                  |         |          |        |          |        |             |
|  | KS<br>(REP. OF<br>KOREA)                 |                                                                  |                                           |                  |         |          |        |          |        |             |
|  | GB/YB/JB/<br>SY/NB<br>(PRC)              |                                                                  |                                           |                  |         |          |        |          |        |             |

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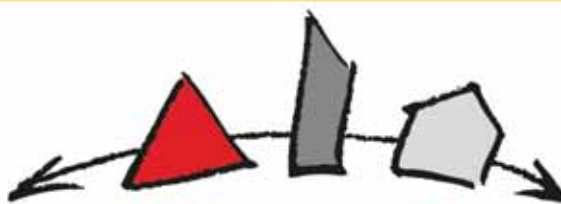
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