

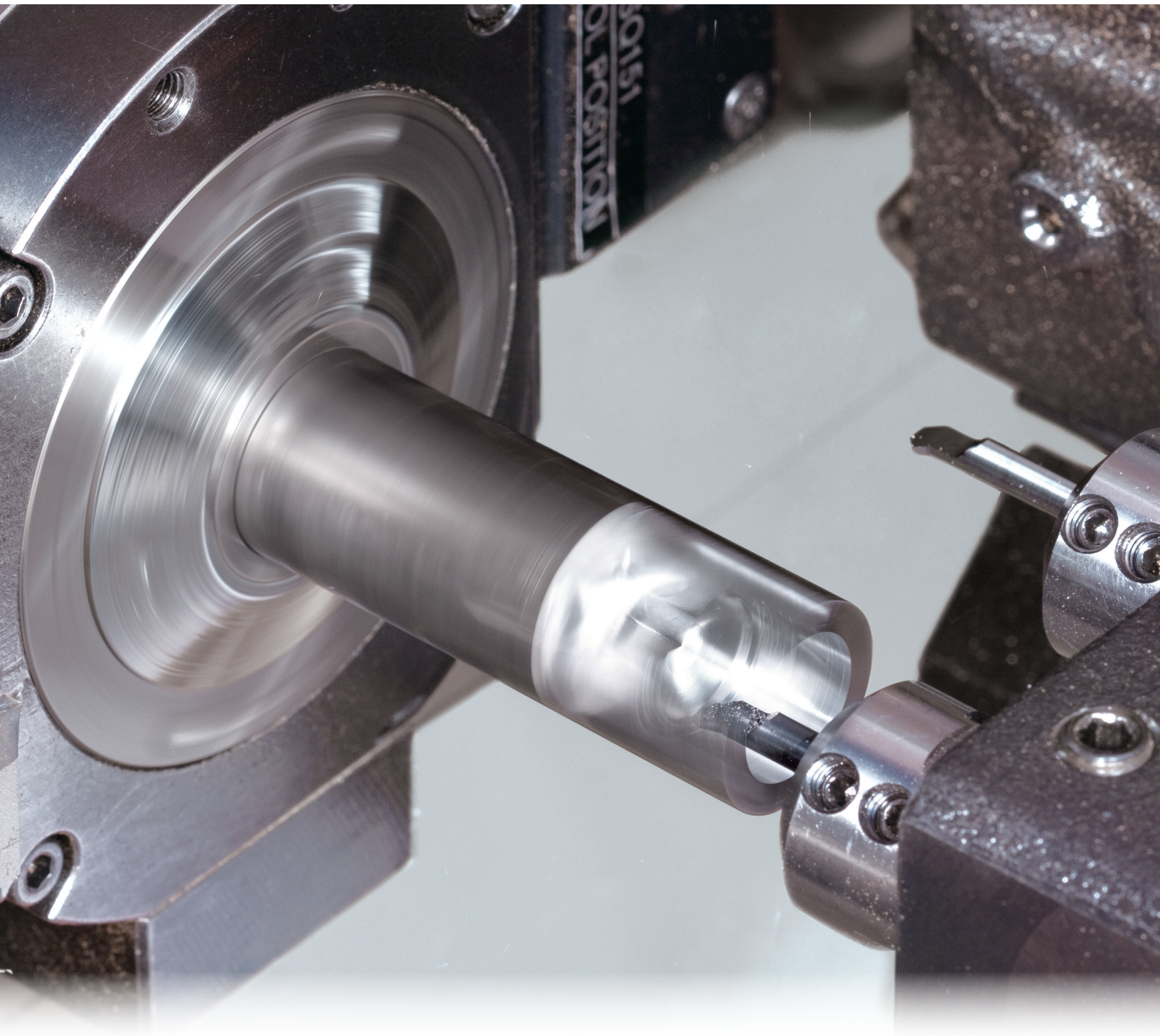
**NEW!**

## **Collet-chuck sleeves**

enabling quick tool changeover and precise repeatability!

**Solid threading, grooving  
and boring tools**  
for 0.6 mm (0.023")  
minimum bore!





ACCELERATED MACHINING



## New Collet-Chuck sleeves!

For easy tool changeover and precise repeatability!

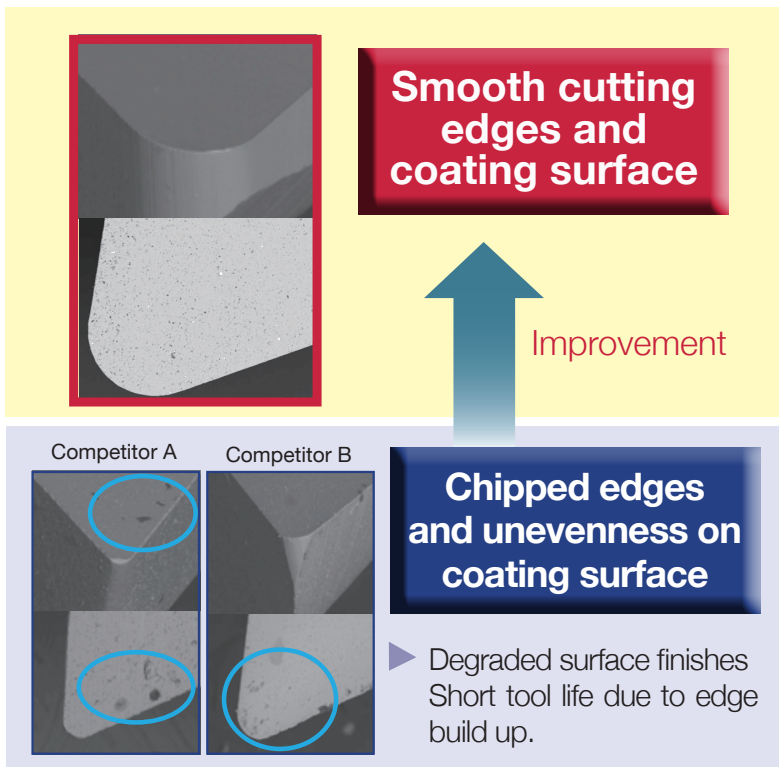


# Precision machining with exceptional surface finish for internal turning on small parts!



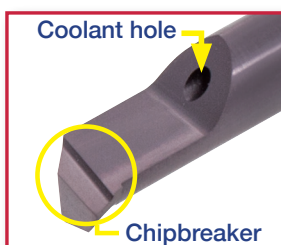
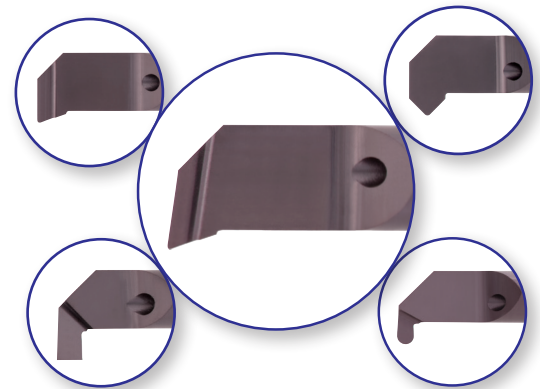
Engineered for precision machining with **Durable cutting edges!**

Comparison of tool surface and cutting edge



**Enhanced cutting edge integrity over the competition**

- Generates fine surface finishes and prevents edge chipping.
- Smooth cutting edge yields high precision products.



## Coolant hole

- Supplies coolant directly to the cutting edge.
- Offers exceptional chip evacuation.

**ECO**

## Economy style for cost-effective solutions!

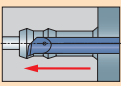
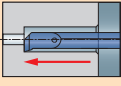
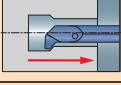
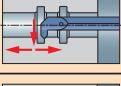
- All economy products contain an "E" in the nomenclature (ie. TFE**E**TR, TFE**E**PR, etc.)
- All economy products are without coolant holes for cost savings!



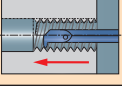
## Expanded selection of tools for a wide range of internal operations

- 146 solid bar items in a wide range of geometries
- Minimum boring diameter: **DMIN = 0.6 mm**

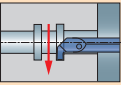
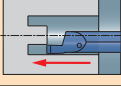
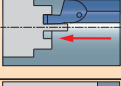
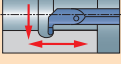
### Boring, profiling, chamfering

| Type                                            | Application                                                                       | Shank diameter<br>DCONMS<br>(mm) | Min. bore dia. DMIN (mm) |      |      |      |   |    |  |
|-------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|--------------------------|------|------|------|---|----|--|
|                                                 |                                                                                   |                                  | 0                        | 2    | 4    | 6    | 8 | 10 |  |
| <b>TFT</b><br>(P. 11)<br><b>TFET</b><br>(P. 12) |  | Boring, profiling,<br>chamfering | ø4, ø7                   | ø0.6 | ø7.0 |      |   |    |  |
| <b>TFP</b><br><b>TFEP</b><br>(P. 13)            |  | Boring,<br>chamfering            | ø4, ø7                   | ø2.8 |      | ø5.0 |   |    |  |
| <b>TFU</b><br><b>TFEU</b><br>(P. 14)            |  | Back boring,<br>chamfering       | ø7                       | ø5.0 |      |      |   |    |  |
| <b>TFC</b><br><b>TFEC</b><br>(P. 15)            |  | Boring,<br>45° chamfering        | ø7                       | ø5.0 |      | ø6.8 |   |    |  |
| <b>TFB</b><br><b>TFEB</b><br>(P. 16)            |  | Back boring                      | ø4, ø7                   | ø3.0 |      | ø7.0 |   |    |  |

### Threading

| Type                                 | Application                                                                                                   | Shank diameter<br>DCONMS<br>(mm) | Min. bore dia. DMIN (mm) |   |      |      |   |    |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------|---|------|------|---|----|
|                                      |                                                                                                               |                                  | 0                        | 2 | 4    | 6    | 8 | 10 |
| <b>TFI</b><br><b>TFEI</b><br>(P. 17) |  Threading (Metric thread) | ø4, ø7                           |                          |   | ø4.0 | ø7.0 |   |    |

### Grooving

| Type                                            | Application                                                                         | Shank diameter<br>DCONMS<br>(mm)           | Groove width<br>CW<br>(mm) | Min. bore dia. DMIN (mm) |      |      |      |   |       |      |    |    |  |
|-------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|----------------------------|--------------------------|------|------|------|---|-------|------|----|----|--|
|                                                 |                                                                                     |                                            |                            | 0                        | 2    | 4    | 6    | 8 | 10    | 12   | 14 | 15 |  |
| <b>TFG</b><br>(P. 18)<br><b>TFEG</b><br>(P. 19) |  | Grooving                                   | ø4, ø7                     | 0.5 - 2.0                | ø2.0 |      |      |   |       | ø6.8 |    |    |  |
| <b>TFF</b><br><b>TFEF</b><br>(P. 21)            |  | Face<br>grooving                           | ø7                         | 1.0 - 3.0                |      |      | ø6.0 |   | ø15.0 |      |    |    |  |
| <b>TFS</b><br><b>TFES</b><br>(P. 22)            |  | Face<br>grooving<br>(for shaft)            | ø7                         | 2.0                      |      |      | ø6.0 |   |       |      |    |    |  |
| <b>TFR</b><br><b>TFER</b><br>(P. 20)            |  | Boring,<br>profiling<br>(full radius type) | ø7                         | 1.0                      |      | ø5.0 |      |   |       | ø6.8 |    |    |  |

**Refined edge design and an expanded range of tools to maximize productivity in machining of small parts!**



## High precision collet-chuck sleeves for easy operation

### Exceptional repeatability of solid bars

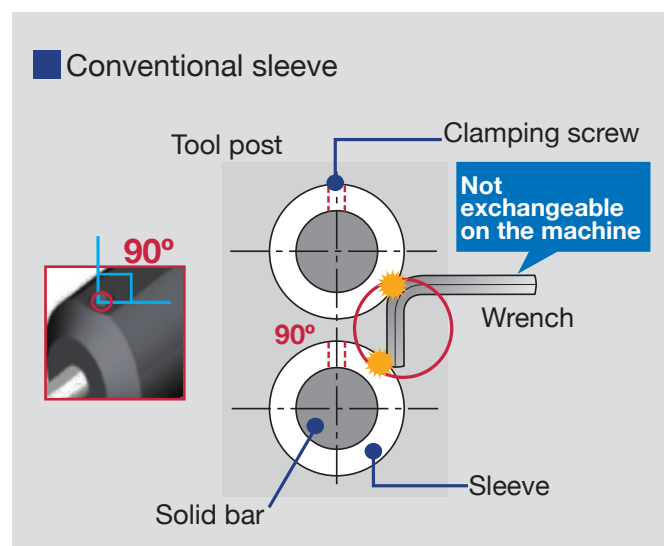
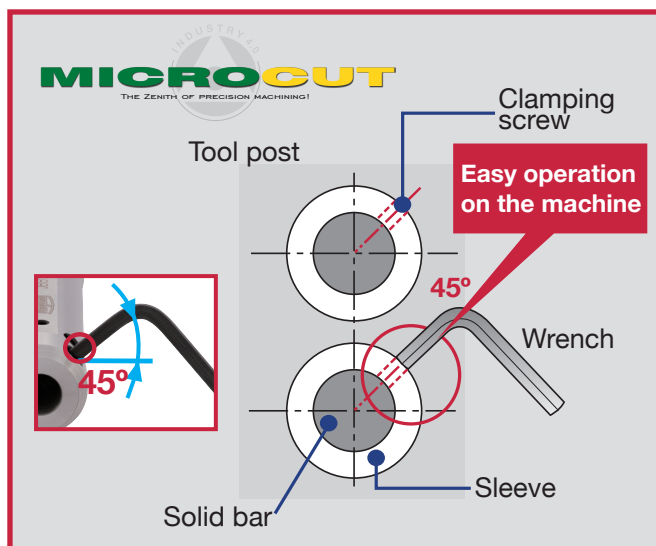
Innovative chucking system ensures exceptional repeatability for precision machining

### Double ended design for 2 different shank sizes

One sleeve can accommodate both  $\varnothing 4$  mm and  $\varnothing 7$  mm shank boring bars

### Easy tool changeovers

Insert clamping screw can be accessed at a  $45^\circ$  angle, making tool changeover easy with the sleeve in the machine



**Highly functional sleeves provide exceptional stability when boring small diameter holes!**

## Sleeve designed for through-coolant supply

### Easy connection to the coolant tube

Rc1/8 threads are provided at the end of the sleeve for coolant tube connection

### Designed for optimal overhang lengths

Sleeve and flat lengths are designed to provide optimal overhang lengths

### Precise and efficient tool changes

Engineered to deliver consistent accuracy and enable faster and more efficient tool changes without the need to remove the sleeve from the tool post



## Collet-chuck sleeve **NEW!** (see page 25)

### Easy tool changeovers

Allows for quick and easy tool changeovers

1. Place the tool in the sleeve
2. Tighten the cap with the special wrench

### High accuracy indexing

The innovative collet chucking system guarantees superior repeatability for precise machining

### Easy connection to coolant tube

Rc1/8 fitting are provided at the end of the sleeve. No additional connection is required for internal coolant supply



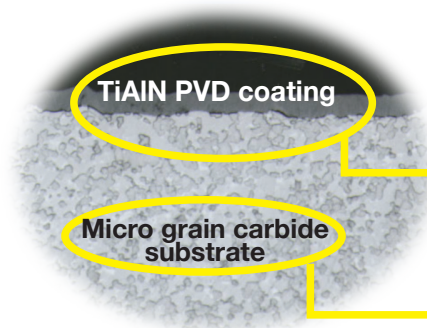
## Sleeve selections

| Sleeve type                    | <br><b>TFBS</b> | <br><b>TFBS-C</b> | <b>NEW!</b><br><br>(see page 25)<br><b>TFBSA-C</b> | <br><b>TFBS-4N</b> |
|--------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Clamping system                | Screw                                                                                              | Screw                                                                                                | Built-in collet                                                                                                                        | Screw                                                                                                   |
| Through-coolant                | No                                                                                                 | No                                                                                                   | Yes                                                                                                                                    | Yes                                                                                                     |
| Adaptable shank size           | Both $\varnothing 4$ and $\varnothing 7$ mm can be assembled on the same sleeve                    | Separate sleeves for $\varnothing 4$ mm and $\varnothing 7$ mm                                       | Separate sleeves for $\varnothing 4$ mm and $\varnothing 7$ mm                                                                         | Separate sleeves for $\varnothing 4$ mm and $\varnothing 7$ mm                                          |
| Available sleeve diameters     | 10 sizes, $\varnothing 12.0$ mm - $\varnothing 25$ mm                                              | 7 sizes, $\varnothing 15.875$ mm - $\varnothing 25.4$ mm                                             | 10 sizes, $\varnothing 12.0$ mm - $\varnothing 25$ mm                                                                                  | 10 sizes, $\varnothing 12.0$ mm - $\varnothing 25$ mm                                                   |
| Tool changeover in the machine | Efficient                                                                                          | Efficient                                                                                            | Very Efficient                                                                                                                         | Efficient                                                                                               |



## Grades

### AC22 PVD coated grade



Optimized combination of (TiAlN) coating and extremely tough carbide substrate ensures longer tool life and cutting edge integrity

#### Excellent chipping & welding resistance

Thin TiAlN coated layer is deposited evenly without sacrificing the cutting edge sharpness.

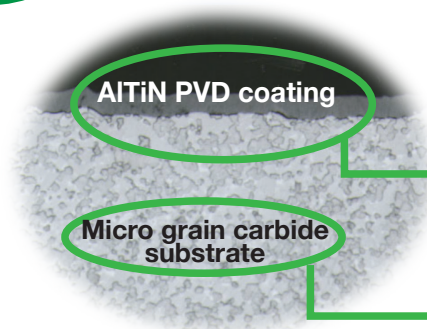
#### Tough carbide substrate ensures resistance to plastic deformation

| Application          | Application code | Grade | Substrate        |                |              | Coating layer    |                | Features                                                                   |
|----------------------|------------------|-------|------------------|----------------|--------------|------------------|----------------|----------------------------------------------------------------------------|
|                      |                  |       | Specific gravity | Hardness (HRA) | T.R.S. (GPa) | Main Composition | Thickness (μm) |                                                                            |
| <b>P</b> Steel       | P20 - P30        | AC22  | 14.4             | 91.5           | 3.0          | TiAlN            | 1.0            | Versatile PVD coated grade for a wide range of materials and applications. |
| <b>M</b> Stainless   | M20 - M30        | AC22  | 14.4             | 91.5           | 3.0          | TiAlN            | 1.0            |                                                                            |
| <b>K</b> Cast iron   | K20 - K30        | AC22  | 14.4             | 91.5           | 3.0          | TiAlN            | 1.0            |                                                                            |
| <b>N</b> Non-ferrous | N20 - N30        | AC22  | 14.4             | 91.5           | 3.0          | TiAlN            | 1.0            |                                                                            |
| <b>S</b> Superalloys | S20 - S30        | AC22  | 14.4             | 91.5           | 3.0          | TiAlN            | 1.0            |                                                                            |

**Expanded cost effective solution for a wider application coverage!**

### AC22S PVD coated grade

**ECO**



Excellent wear and chipping resistance yields longer and predictable tool life combined with stable machining on solid bars without coolant ports.

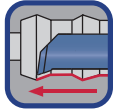
#### Excellent resistance to wear & chip welding

Smooth coating surface of the cutting edge prevents coating from peeling off, while its superior wear resistance provides longer tool life than existing grades.

#### High resistance to plastic deformation

Tough carbide substrate offers stable and longer tool life.

## STANDARD CUTTING CONDITIONS - BORING/THREADING



Boring, profiling, chamfering, back boring

| ISO      | Workpiece materials                               | Grade      | Cutting speed<br>Vc (m/min) | Cutting speed<br>Vc (sfm) | Feed<br>f (mm/rev) | Feed<br>f (ipr) |
|----------|---------------------------------------------------|------------|-----------------------------|---------------------------|--------------------|-----------------|
| <b>P</b> | Low carbon steels<br>(1015, 1025, etc.)           | AC22/AC22S | 40 - 140                    | 131 - 459                 | 0.01 - 0.08*       | 0.0004 - 0.003* |
|          | Carbon steels, Alloy steels<br>(1055, 4140, etc.) | AC22/AC22S | 40 - 140                    | 131 - 459                 | 0.01 - 0.08*       | 0.0004 - 0.003* |
|          | Prehardened steels<br>(NAK80, PX5 etc.)           | AC22/AC22S | 40 - 140                    | 131 - 459                 | 0.01 - 0.08*       | 0.0004 - 0.003* |
| <b>M</b> | Stainless steels<br>(304, 316, etc)               | AC22/AC22S | 40 - 140                    | 131 - 459                 | 0.01 - 0.08*       | 0.0004 - 0.003* |
| <b>K</b> | Grey cast irons<br>(No.250B, 300B, etc.)          | AC22/AC22S | 30 - 100                    | 98 - 328                  | 0.01 - 0.08*       | 0.0004 - 0.003* |
|          | Ductile cast irons<br>(65-45-12, 80-55-06, etc.)  | AC22/AC22S | 30 - 100                    | 98 - 328                  | 0.01 - 0.08*       | 0.0004 - 0.003* |
| <b>N</b> | Aluminium alloys, copper alloys<br>(Si < 12%)     | AC22/AC22S | 90 - 200                    | 295 - 656                 | 0.01 - 0.08*       | 0.0004 - 0.003* |
| <b>S</b> | Titanium alloys<br>(Ti-6Al-4V, etc.)              | AC22/AC22S | 30 - 100                    | 98 - 328                  | 0.01 - 0.08*       | 0.0004 - 0.003* |
|          | Superalloys<br>(Inconel718, etc.)                 | AC22/AC22S | 30 - 100                    | 98 - 328                  | 0.01 - 0.08*       | 0.0004 - 0.003* |

\* TFTR/L04020004-D006,  
TFTR/L04030004-D006  
mm/rev 0.01 = Max. f

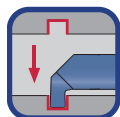


Threading (metric thread)

| ISO      | Workpiece materials                               | Grade      | Cutting speed<br>Vc (m/min) | Cutting speed<br>Vc (sfm) | Number of passes<br>Pitch mm (in) |                  |               |                  |                 |
|----------|---------------------------------------------------|------------|-----------------------------|---------------------------|-----------------------------------|------------------|---------------|------------------|-----------------|
|          |                                                   |            |                             |                           | 0.5<br>(0.020")                   | 0.75<br>(0.030") | 1<br>(0.039") | 1.25<br>(0.049") | 1.5<br>(0.059") |
| <b>P</b> | Low carbon steels<br>(1015, 1025, etc.)           | AC22/AC22S | 40 - 140                    | 131 - 459                 | 6 - 8                             | 8 - 10           | 10 - 12       | 12 - 15          | 15 - 18         |
|          | Carbon steels, Alloy steels<br>(1055, 4140, etc.) | AC22/AC22S | 40 - 140                    | 131 - 459                 | 6 - 8                             | 8 - 10           | 10 - 12       | 12 - 15          | 15 - 18         |
|          | Prehardened steels<br>(NAK80, PX5 etc.)           | AC22/AC22S | 40 - 140                    | 131 - 459                 | 6 - 8                             | 8 - 10           | 10 - 12       | 12 - 15          | 15 - 18         |
| <b>M</b> | Stainless steels<br>(304, 316, etc)               | AC22/AC22S | 40 - 140                    | 131 - 459                 | 8                                 | 10               | 12            | 15               | 18              |
| <b>K</b> | Grey cast irons<br>(No.250B, 300B, etc.)          | AC22/AC22S | 30 - 100                    | 98 - 328                  | 7                                 | 9                | 12            | 14               | 17              |
|          | Ductile cast irons<br>(465-45-12, 80-55-06, etc.) | AC22/AC22S | 30 - 100                    | 98 - 328                  | 7                                 | 9                | 12            | 14               | 17              |
| <b>N</b> | Aluminium alloys, copper alloys<br>(Si < 12%)     | AC22/AC22S | 90 - 200                    | 295 - 656                 | 6                                 | 8                | 10            | 12               | 15              |

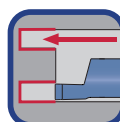


## STANDARD CUTTING CONDITIONS - GROOVING



Internal grooving

| ISO      | Workpiece materials                                    | Grade      | Cutting speed |           | Feed<br>f (mm/rev) | Feed<br>f (ipr) |
|----------|--------------------------------------------------------|------------|---------------|-----------|--------------------|-----------------|
|          |                                                        |            | Vc (m/min)    | Vc (sfm)  |                    |                 |
| <b>P</b> | Low carbon steels<br>(C15, C20 etc.)                   | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.03        | 0.0004 - 0.001  |
|          | Carbon steels, Alloy steels<br>(C55, 42CrMoS4 etc.)    | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.03        | 0.0004 - 0.001  |
|          | Prehardened steels<br>(NAK80, PX5 etc.)                | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.03        | 0.0004 - 0.001  |
| <b>M</b> | Stainless steels<br>(X5CrNi18-9, X5CrNiMo17-12-2 etc.) | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.03        | 0.0004 - 0.001  |
| <b>K</b> | Grey cast irons<br>(250, 300 etc.)                     | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.03        | 0.0004 - 0.001  |
|          | Ductile cast irons<br>(400-15, 600-3 etc.)             | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.03        | 0.0004 - 0.001  |
| <b>N</b> | Aluminium alloys, copper alloys<br>Si < 12%            | AC22S/AC22 | 90 - 200      | 295 - 656 | 0.01 - 0.03        | 0.0004 - 0.001  |
| <b>S</b> | Titanium alloys<br>Ti-6Al-4V etc.                      | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.03        | 0.0004 - 0.001  |
|          | Superalloys (Inconel718, etc.)                         | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.03        | 0.0004 - 0.001  |



Face grooving

| ISO      | Workpiece materials                                    | Grade      | Cutting speed |           | Feed<br>f (mm/rev) | Feed<br>f (ipr) |
|----------|--------------------------------------------------------|------------|---------------|-----------|--------------------|-----------------|
|          |                                                        |            | Vc (m/min)    | Vc (sfm)  |                    |                 |
| <b>P</b> | Low carbon steels<br>(C15, C20 etc.)                   | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.05        | 0.0004 - 0.002  |
|          | Carbon steels, Alloy steels<br>(C55, 42CrMoS4 etc.)    | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.05        | 0.0004 - 0.002  |
|          | Prehardened steels<br>(NAK80, PX5 etc.)                | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.05        | 0.0004 - 0.002  |
| <b>M</b> | Stainless steels<br>(X5CrNi18-9, X5CrNiMo17-12-2 etc.) | AC22S/AC22 | 40 - 140      | 131 - 459 | 0.01 - 0.05        | 0.0004 - 0.002  |
| <b>K</b> | Grey cast irons<br>(250, 300 etc.)                     | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.05        | 0.0004 - 0.002  |
|          | Ductile cast irons<br>(400-15, 600-3 etc.)             | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.05        | 0.0004 - 0.002  |
| <b>N</b> | Aluminium alloys, copper alloys<br>Si < 12%            | AC22S/AC22 | 90 - 200      | 295 - 656 | 0.01 - 0.05        | 0.0004 - 0.002  |
| <b>S</b> | Titanium alloys<br>Ti-6Al-4V etc.                      | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.05        | 0.0004 - 0.002  |
|          | Superalloys (Inconel718, etc.)                         | AC22S/AC22 | 30 - 100      | 98 - 328  | 0.01 - 0.05        | 0.0004 - 0.002  |

Solid boring bars, inserts, tools and sleeves

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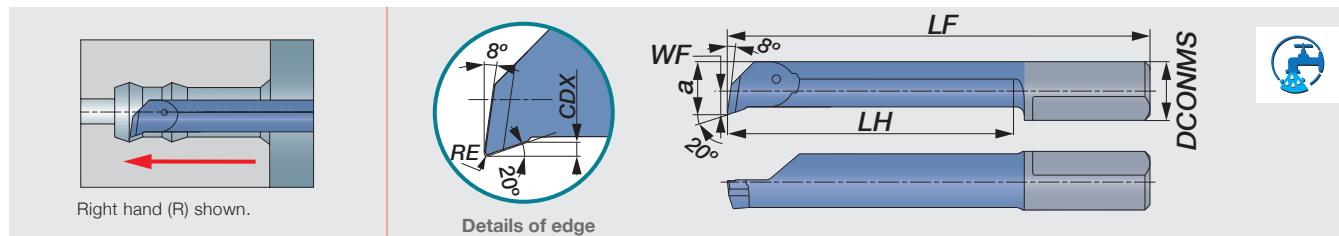
|          |    |          |    |       |    |
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| BBC      | 39 | FSBI     | 33 | TFESR | 23 |
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## Solid boring bars

# BORING, PROFILING, CHAMFERING

TFTR/L with coolant hole



| Designation         | Grade AC22 |    | DMIN       | DCONMS   | WF         | a          | LF          | LH         | CDX          | RE + <sup>0.05</sup> <sub>0</sub> |
|---------------------|------------|----|------------|----------|------------|------------|-------------|------------|--------------|-----------------------------------|
|                     | RH         | LH |            |          |            |            |             |            |              |                                   |
| TFTR04020004-D006   | ✓          |    | 0.6 (0.02) | 4 (0.16) | -          | 0.5 (0.02) | 18.5 (0.72) | 2 (0.08)   | 0.08 (0.003) | 0.04 (0.002)                      |
| TFTR04030004-D006   | ✓          |    | 0.6 (0.02) | 4 (0.16) | -          | 0.5 (0.02) | 19.5 (0.77) | 3 (0.12)   | 0.08 (0.003) | 0.04 (0.002)                      |
| TFTR04045005-D010   | ✓          |    | 1 (0.04)   | 4 (0.16) | -          | 0.9 (0.03) | 21 (0.83)   | 4.5 (0.18) | 0.1 (0.004)  | 0.05 (0.002)                      |
| TFTR04065005-D010   | ✓          |    | 1 (0.04)   | 4 (0.16) | -          | 0.9 (0.03) | 23 (0.91)   | 6.5 (0.26) | 0.1 (0.004)  | 0.05 (0.002)                      |
| TFTR04040005-D020   | ✓          |    | 2 (0.08)   | 4 (0.16) | -          | 1.7 (0.07) | 20.5 (0.81) | 4 (0.16)   | 0.1 (0.004)  | 0.05 (0.002)                      |
| TFTR04090005-D020   | ✓          |    | 2 (0.08)   | 4 (0.16) | -          | 1.7 (0.07) | 25.5 (1.00) | 9 (0.35)   | 0.1 (0.004)  | 0.05 (0.002)                      |
| TFTR04140005-D020   | ✓          |    | 2 (0.08)   | 4 (0.16) | -          | 1.7 (0.07) | 30.5 (1.20) | 14 (0.55)  | 0.1 (0.004)  | 0.05 (0.002)                      |
| TFTR/L04090010-D028 | ✓          | ✓  | 2.8 (0.11) | 4 (0.16) | 0.6 (0.02) | 2.6 (0.10) | 25.5 (1.00) | 9 (0.35)   | 0.2 (0.007)  | 0.10 (0.004)                      |
| TFTR/L04150010-D028 | ✓          | ✓  | 2.8 (0.11) | 4 (0.16) | 0.6 (0.02) | 2.6 (0.10) | 31.5 (1.24) | 15 (0.59)  | 0.2 (0.007)  | 0.10 (0.004)                      |
| TFTR/L04190010-D028 | ✓          | ✓  | 2.8 (0.11) | 4 (0.16) | 0.6 (0.02) | 2.6 (0.10) | 35.5 (1.40) | 19 (0.75)  | 0.2 (0.007)  | 0.10 (0.004)                      |
| TFTR/L04090010-D040 | ✓          | ✓  | 4 (0.16)   | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 25.5 (1.00) | 9 (0.35)   | 0.3 (0.012)  | 0.10 (0.004)                      |
| TFTR/L04150010-D040 | ✓          | ✓  | 4 (0.16)   | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 31.5 (1.24) | 15 (0.59)  | 0.3 (0.012)  | 0.10 (0.004)                      |
| TFTR/L04190010-D040 | ✓          | ✓  | 4 (0.16)   | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 35.5 (1.40) | 19 (0.75)  | 0.3 (0.012)  | 0.10 (0.004)                      |
| TFTR04230010-D040   | ✓          |    | 4 (0.16)   | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 39.5 (1.56) | 23 (0.91)  | 0.3 (0.012)  | 0.10 (0.004)                      |
| TFTR04270010-D040   | ✓          |    | 4 (0.16)   | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 43.5 (1.71) | 27 (1.06)  | 0.3 (0.012)  | 0.10 (0.004)                      |
| TFTR/L07090015-D050 | ✓          | ✓  | 5 (0.20)   | 7 (0.28) | 0.9 (0.03) | 4.4 (0.17) | 25 (0.98)   | 9 (0.35)   | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07140015-D050 | ✓          | ✓  | 5 (0.20)   | 7 (0.28) | 0.9 (0.03) | 4.4 (0.17) | 30 (1.18)   | 14 (0.55)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07190015-D050 | ✓          | ✓  | 5 (0.20)   | 7 (0.28) | 0.9 (0.03) | 4.4 (0.17) | 35 (1.38)   | 19 (0.75)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07240015-D050 | ✓          | ✓  | 5 (0.20)   | 7 (0.28) | 0.9 (0.03) | 4.4 (0.17) | 40 (1.57)   | 24 (0.94)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07290015-D050 | ✓          | ✓  | 5 (0.20)   | 7 (0.28) | 0.9 (0.03) | 4.4 (0.17) | 45 (1.77)   | 29 (1.14)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR07340015-D050   | ✓          |    | 5 (0.20)   | 7 (0.28) | 0.9 (0.03) | 4.4 (0.17) | 50 (1.97)   | 34 (1.34)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07140015-D060 | ✓          | ✓  | 6 (0.24)   | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 30 (1.18)   | 14 (0.55)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07210015-D060 | ✓          | ✓  | 6 (0.24)   | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 37 (1.46)   | 21 (0.83)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07240015-D060 | ✓          | ✓  | 6 (0.24)   | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 40 (1.57)   | 24 (0.94)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07290015-D060 | ✓          | ✓  | 6 (0.24)   | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 45 (1.77)   | 29 (1.14)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR07340015-D060   | ✓          |    | 6 (0.24)   | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 50 (1.97)   | 34 (1.34)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR07410015-D060   | ✓          |    | 6 (0.24)   | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 57 (2.24)   | 41 (1.61)  | 0.5 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07190015-D068 | ✓          | ✓  | 6.8 (0.27) | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 35 (1.38)   | 19 (0.75)  | 0.6 (0.019)  | 0.15 (0.006)                      |
| TFTR07240015-D068   | ✓          |    | 6.8 (0.27) | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 40 (1.57)   | 24 (0.94)  | 0.6 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07290015-D068 | ✓          | ✓  | 6.8 (0.27) | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 45 (1.77)   | 29 (1.14)  | 0.6 (0.019)  | 0.15 (0.006)                      |
| TFTR/L07340015-D070 | ✓          | ✓  | 7 (0.28)   | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 50 (1.97)   | 34 (1.34)  | 0.6 (0.019)  | 0.15 (0.006)                      |
| TFTR07390015-D070   | ✓          |    | 7 (0.28)   | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 55 (2.17)   | 39 (1.54)  | 0.6 (0.019)  | 0.15 (0.006)                      |
| TFTR07440015-D070   | ✓          |    | 7 (0.28)   | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 60 (2.36)   | 44 (1.73)  | 0.6 (0.019)  | 0.15 (0.006)                      |
| TFTR07490015-D070   | ✓          |    | 7 (0.28)   | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 65 (2.56)   | 49 (1.93)  | 0.6 (0.019)  | 0.15 (0.006)                      |

Unit: mm (inch)  
✓: Stocked items

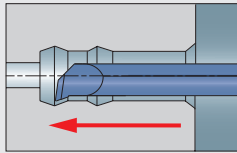


## Solid boring bars

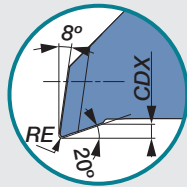
## BORING, PROFILING, CHAMFERING

TFETR/L (without coolant hole)

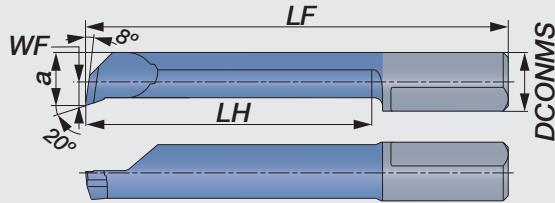
ECO



Right hand (R) shown.



Details of edge



| Designation          | Grade<br>AC22S |    | DMIN       | DCONMS    | WF          | a           | LF           | LH          | CDX         | RE <sup>+0.05<br/>0</sup> |
|----------------------|----------------|----|------------|-----------|-------------|-------------|--------------|-------------|-------------|---------------------------|
|                      | RH             | LH |            |           |             |             |              |             |             |                           |
| TFETR04045005-D010   | ✓              |    | 1 (0.039)  | 4 (0.157) | -           | 0.9 (0.035) | 21 (0.827)   | 4.5 (0.177) | 0.1 (0.004) | 0.05 (0.002)              |
| TFETR04065005-D010   | ✓              |    | 1 (0.039)  | 4 (0.157) | -           | 0.9 (0.035) | 23 (0.906)   | 6.5 (0.256) | 0.1 (0.004) | 0.05 (0.002)              |
| TFETR04040005-D020   | ✓              |    | 2 (0.079)  | 4 (0.157) | -           | 1.7 (0.067) | 20.5 (0.807) | 4 (0.157)   | 0.1 (0.004) | 0.05 (0.002)              |
| TFETR04090005-D020   | ✓              |    | 2 (0.079)  | 4 (0.157) | -           | 1.7 (0.067) | 25.5 (1.00)  | 9 (0.354)   | 0.1 (0.004) | 0.05 (0.002)              |
| TFETR04140005-D020   | ✓              |    | 2 (0.079)  | 4 (0.157) | -           | 1.7 (0.067) | 30.5 (1.201) | 14 (0.551)  | 0.1 (0.004) | 0.05 (0.002)              |
| TFETR/L04090010-D028 | ✓              | ✓  | 2.8 (0.11) | 4 (0.157) | 0.6 (0.024) | 2.6 (0.102) | 25.5 (1.004) | 9 (0.354)   | 0.2 (0.008) | 0.10 (0.004)              |
| TFETR04150010-D028   | ✓              |    | 2.8 (0.11) | 4 (0.157) | 0.6 (0.024) | 2.6 (0.102) | 31.5 (1.240) | 15 (0.591)  | 0.2 (0.008) | 0.10 (0.004)              |
| TFETR04190010-D028   | ✓              |    | 2.8 (0.11) | 4 (0.157) | 0.6 (0.024) | 2.6 (0.102) | 35.5 (1.398) | 19 (0.748)  | 0.2 (0.008) | 0.10 (0.004)              |
| TFETR04090010-D040   | ✓              |    | 4 (0.16)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.138) | 25.5 (1.004) | 9 (0.354)   | 0.3 (0.012) | 0.10 (0.004)              |
| TFETR04150010-D040   | ✓              |    | 4 (0.16)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.138) | 31.5 (1.240) | 15 (0.591)  | 0.3 (0.012) | 0.10 (0.004)              |
| TFETR04190010-D040   | ✓              |    | 4 (0.16)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.138) | 35.5 (1.398) | 19 (0.748)  | 0.3 (0.012) | 0.10 (0.004)              |
| TFETR04230010-D040   | ✓              |    | 4 (0.16)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.138) | 39.5 (1.555) | 23 (0.906)  | 0.3 (0.012) | 0.10 (0.004)              |
| TFETR04270010-D040   | ✓              |    | 4 (0.16)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.138) | 43.5 (1.713) | 27 (1.063)  | 0.3 (0.012) | 0.10 (0.004)              |
| TFETR07090015-D050   | ✓              |    | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 25 (0.984)   | 9 (0.354)   | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07140015-D050   | ✓              |    | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 30 (1.181)   | 14 (0.551)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07190015-D050   | ✓              |    | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 35 (1.378)   | 19 (0.748)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07240015-D050   | ✓              |    | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 40 (1.575)   | 24 (0.945)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07290015-D050   | ✓              |    | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 45 (1.772)   | 29 (1.142)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07340015-D050   | ✓              |    | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 50 (1.968)   | 34 (1.339)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07140015-D060   | ✓              |    | 6 (0.23)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.209) | 30 (1.181)   | 14 (0.551)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR/L07210015-D060 | ✓              | ✓  | 6 (0.23)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.209) | 37 (1.457)   | 21 (0.827)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07240015-D060   | ✓              |    | 6 (0.23)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.209) | 40 (1.575)   | 24 (0.945)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07290015-D060   | ✓              |    | 6 (0.23)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.209) | 45 (1.772)   | 29 (1.142)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07340015-D060   | ✓              |    | 6 (0.23)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.209) | 50 (1.968)   | 34 (1.339)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07410015-D060   | ✓              |    | 6 (0.23)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.209) | 57 (2.244)   | 41 (1.614)  | 0.5 (0.020) | 0.15 (0.006)              |
| TFETR07190015-D068   | ✓              |    | 6.8 (0.27) | 7 (0.276) | 2.8 (0.110) | 6.3 (0.250) | 35 (1.378)   | 19 (0.748)  | 0.6 (0.020) | 0.15 (0.006)              |
| TFETR07240015-D068   | ✓              |    | 6.8 (0.27) | 7 (0.276) | 2.8 (0.110) | 6.3 (0.250) | 40 (1.575)   | 24 (0.945)  | 0.6 (0.020) | 0.15 (0.006)              |
| TFETR07290015-D068   | ✓              |    | 6.8 (0.27) | 7 (0.276) | 2.8 (0.110) | 6.3 (0.250) | 45 (1.772)   | 29 (1.142)  | 0.6 (0.020) | 0.15 (0.006)              |
| TFETR07340015-D070   | ✓              |    | 7 (0.28)   | 7 (0.276) | 2.8 (0.110) | 6.3 (0.250) | 50 (1.968)   | 34 (1.339)  | 0.6 (0.020) | 0.15 (0.006)              |
| TFETR07390015-D070   | ✓              |    | 7 (0.28)   | 7 (0.276) | 2.8 (0.110) | 6.3 (0.250) | 55 (2.165)   | 39 (1.535)  | 0.6 (0.020) | 0.15 (0.006)              |
| TFETR07440015-D070   | ✓              |    | 7 (0.28)   | 7 (0.276) | 2.8 (0.110) | 6.3 (0.250) | 60 (2.362)   | 44 (1.732)  | 0.6 (0.020) | 0.15 (0.006)              |
| TFETR07490015-D070   | ✓              |    | 7 (0.28)   | 7 (0.276) | 2.8 (0.110) | 6.3 (0.250) | 65 (2.559)   | 49 (1.929)  | 0.6 (0.020) | 0.15 (0.006)              |

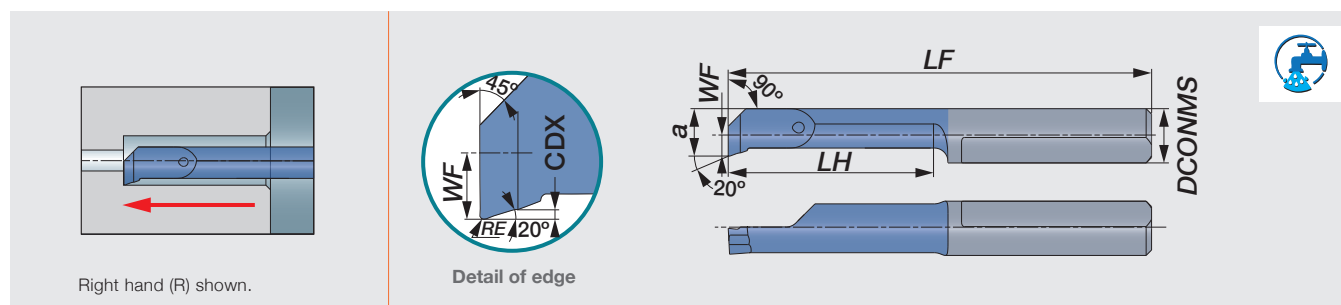
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

# BORING, CHAMFERING

TFPR with coolant hole



| Designation       | Grade<br>AC22 | DMIN       | DCONMS   | WF         | a          | LF           | LH         | CDX         | RE <sup>ε</sup> |
|-------------------|---------------|------------|----------|------------|------------|--------------|------------|-------------|-----------------|
|                   | RH            |            |          |            |            |              |            |             |                 |
| TFPR04090010-D028 | ✓             | 2.8 (0.11) | 4 (0.16) | 0.9 (0.04) | 2.6 (0.10) | 25.5 (1.004) | 9 (0.354)  | 0.2 (0.007) | 0.10 (0.004)    |
| TFPR04150010-D028 | ✓             | 2.8 (0.11) | 4 (0.16) | 0.9 (0.04) | 2.6 (0.10) | 31.5 (1.240) | 15 (0.591) | 0.2 (0.007) | 0.10 (0.004)    |
| TFPR04090010-D040 | ✓             | 4 (0.16)   | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 25.5 (1.004) | 9 (0.354)  | 0.3 (0.012) | 0.10 (0.004)    |
| TFPR04150010-D040 | ✓             | 4 (0.16)   | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 31.5 (1.240) | 15 (0.591) | 0.3 (0.012) | 0.10 (0.004)    |
| TFPR07140015-D050 | ✓             | 5 (0.20)   | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 30 (1.181)   | 14 (0.551) | 0.5 (0.019) | 0.15 (0.006)    |
| TFPR07190015-D050 | ✓             | 5 (0.20)   | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 35 (1.389)   | 19 (0.748) | 0.5 (0.019) | 0.15 (0.006)    |

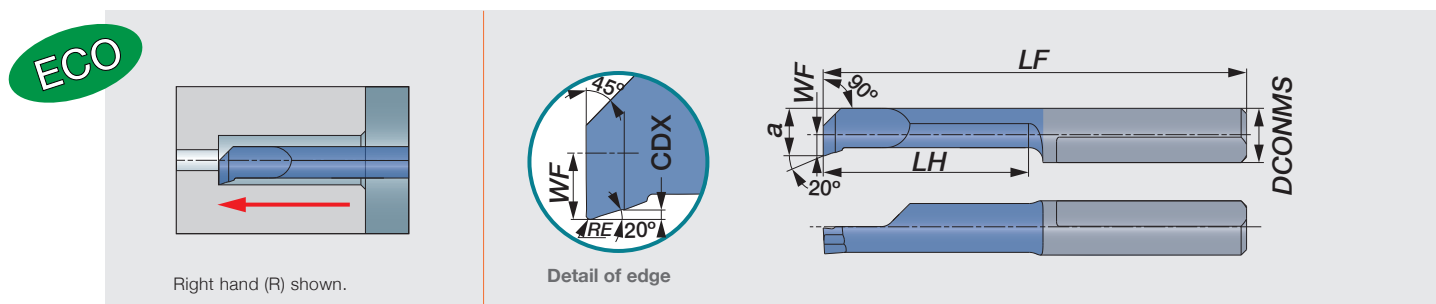
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

# BORING, CHAMFERING

TFEPR (without coolant hole)



| Designation        | Grade<br>AC22S | DMIN       | DCONMS    | WF          | a          | LF           | LH         | CDX         | RE <sup>ε</sup> |
|--------------------|----------------|------------|-----------|-------------|------------|--------------|------------|-------------|-----------------|
|                    | RH             |            |           |             |            |              |            |             |                 |
| TFEPR04090010-D028 | ✓              | 2.8 (0.11) | 4 (0.157) | 0.9 (0.035) | 2.6 (0.10) | 25.5 (1.004) | 9 (0.354)  | 0.2 (0.008) | 0.10 (0.0039)   |
| TFEPR04150010-D040 | ✓              | 4 (0.16)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.14) | 31.5 (1.240) | 15 (0.591) | 0.3 (0.012) | 0.10 (0.0039)   |
| TFEPR07140015-D050 | ✓              | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.181)   | 14 (0.551) | 0.5 (0.019) | 0.15 (0.0059)   |
| TFEPR07190015-D050 | ✓              | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 35 (1.378)   | 19 (0.748) | 0.5 (0.019) | 0.15 (0.0059)   |

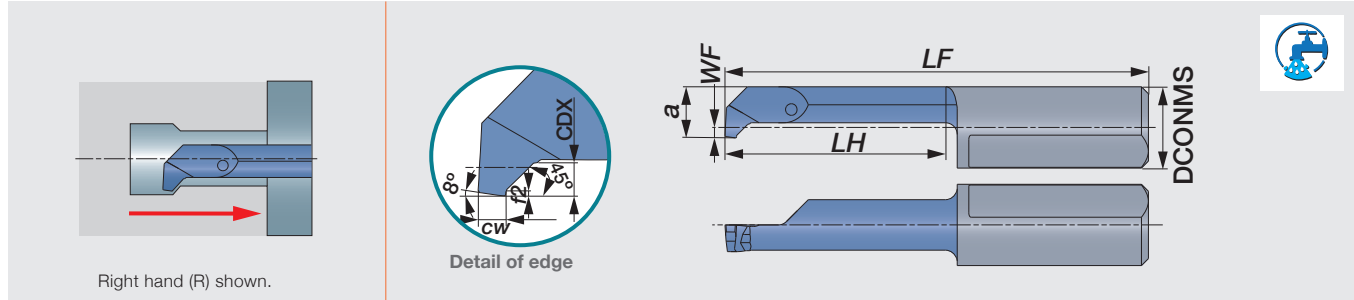
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

## BACK BORING, CHAMFERING

TFUR with coolant hole



| Designation       | Grade<br>AC22 | DMIN     | DCONMS    | WF          | a          | LF         | LH         | f2          | CDX       | CW        | + 0.05<br>0 |
|-------------------|---------------|----------|-----------|-------------|------------|------------|------------|-------------|-----------|-----------|-------------|
|                   | RH            |          |           |             |            |            |            |             |           |           |             |
| TFUR07140010-D050 | ✓             | 5 (0.20) | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.181) | 14 (0.551) | 0.2 (0.008) | 1 (0.039) | 1 (0.039) |             |
| TFUR07190010-D050 | ✓             | 5 (0.20) | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 35 (1.378) | 19 (0.748) | 0.2 (0.008) | 1 (0.039) | 1 (0.039) |             |

Unit: mm (inch)

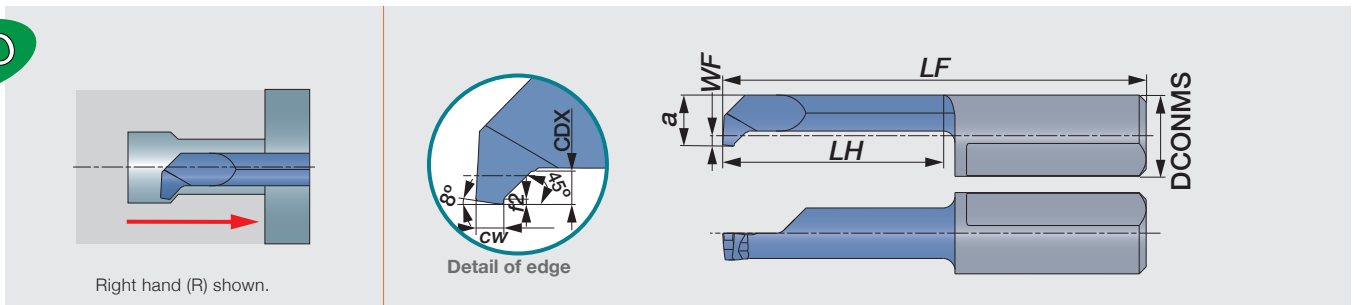
✓: Stocked items

## Solid boring bars

## BACK BORING, CHAMFERING

TFEUR (without coolant hole)

ECO



| Designation        | Grade<br>AC22S | DMIN     | DCONMS    | WF          | a           | LF         | LH         | f2          | CDX       | CW        | + 0.05<br>0 |
|--------------------|----------------|----------|-----------|-------------|-------------|------------|------------|-------------|-----------|-----------|-------------|
|                    | RH             |          |           |             |             |            |            |             |           |           |             |
| TFEUR07140010-D050 | ✓              | 5 (0.20) | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 30 (1.181) | 14 (0.551) | 0.2 (0.008) | 1 (0.039) | 1 (0.039) |             |
| TFEUR07190010-D050 | ✓              | 5 (0.20) | 7 (0.276) | 0.9 (0.035) | 4.4 (0.173) | 35 (1.378) | 19 (0.748) | 0.2 (0.008) | 1 (0.039) | 1 (0.039) |             |

Unit: mm (inch)

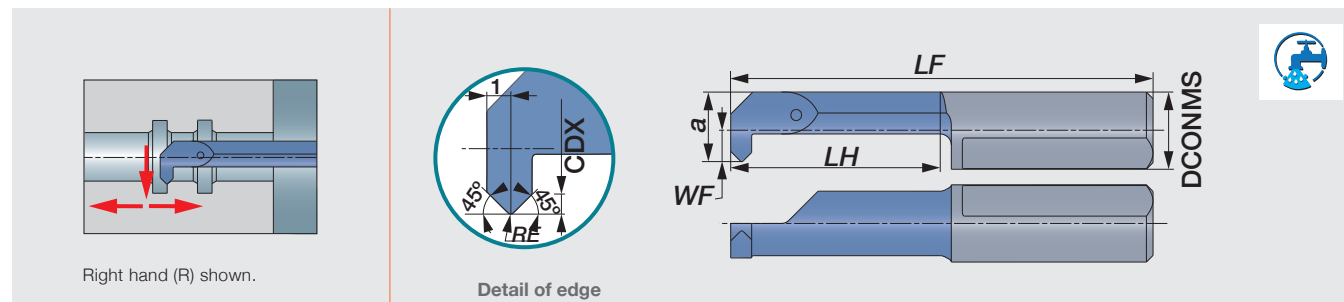
✓: Stocked items



## Solid boring bars

# 45° CHAMFERING

TFCR with coolant hole



| Designation       | Grade<br>AC22 | DMIN       | DCONMS   | WF         | a          | LF        | LH        | CDX        | RE          | ± 0.05 |
|-------------------|---------------|------------|----------|------------|------------|-----------|-----------|------------|-------------|--------|
|                   | RH            |            |          |            |            |           |           |            |             |        |
| TFCR07140020-D050 | ✓             | 5 (0.20)   | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 30 (1.18) | 14 (0.55) | 0.7 (0.03) | 0.2 (0.008) |        |
| TFCR07190020-D050 | ✓             | 5 (0.20)   | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 35 (1.38) | 19 (0.75) | 0.7 (0.03) | 0.2 (0.008) |        |
| TFCR07190020-D068 | ✓             | 6.8 (0.27) | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 35 (1.38) | 19 (0.75) | 0.7 (0.03) | 0.2 (0.008) |        |

Unit: mm (inch)

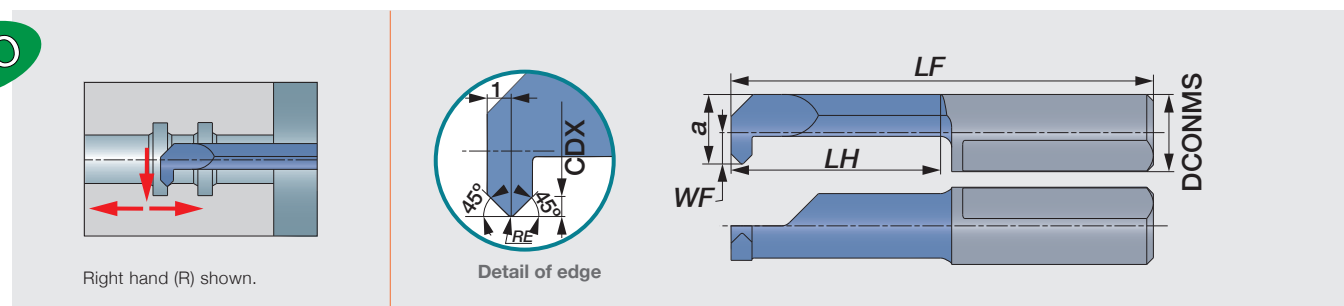
✓: Stocked items

## Solid boring bars

# 45° CHAMFERING

TFECR (without coolant hole)

ECO



| Designation        | Grade<br>AC22S | DMIN       | DCONMS    | WF          | a          | LF         | LH         | CDX         | RE           | ± 0.05 |
|--------------------|----------------|------------|-----------|-------------|------------|------------|------------|-------------|--------------|--------|
|                    | RH             |            |           |             |            |            |            |             |              |        |
| TFECR07140020-D050 | ✓              | 5 (0.20)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.181) | 14 (0.551) | 0.7 (0.028) | 0.2 (0.0079) |        |
| TFECR07190020-D068 | ✓              | 6.8 (0.27) | 7 (0.276) | 2.8 (0.110) | 6.3 (0.25) | 35 (1.378) | 19 (0.748) | 0.7 (0.028) | 0.2 (0.0079) |        |

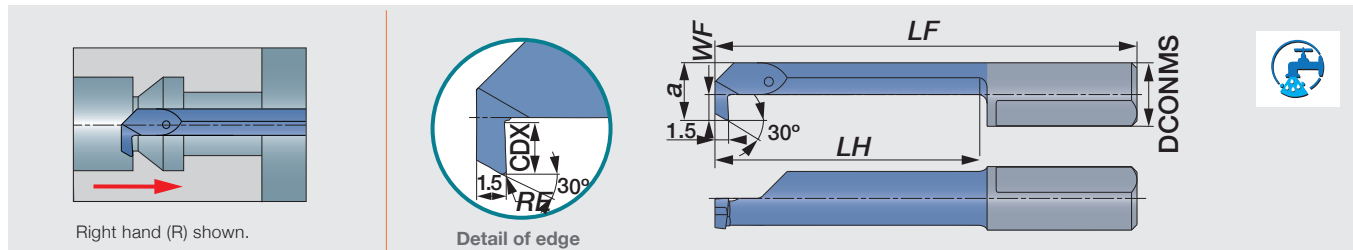
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

## BACK BORING

TFBR with coolant hole



| Designation       | Grade<br>AC22 | DMIN     | DCONMS   | WF         | a          | LF        | LH        | CDX        | RE           | ± 0.05 |
|-------------------|---------------|----------|----------|------------|------------|-----------|-----------|------------|--------------|--------|
|                   | RH            |          |          |            |            |           |           |            |              |        |
| TFBR04140020-D030 | ✓             | 3 (0.12) | 4 (0.16) | 0.6 (0.02) | 2.6 (0.10) | 30 (1.18) | 14 (0.55) | 0.5 (0.02) | 0.2 (0.007)  |        |
| TFBR04190020-D030 | ✓             | 3 (0.12) | 4 (0.16) | 0.6 (0.02) | 2.6 (0.10) | 35 (1.38) | 19 (0.75) | 0.5 (0.02) | 0.2 (0.007)  |        |
| TFBR04140015-D040 | ✓             | 4 (0.16) | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 30 (1.18) | 14 (0.55) | 0.8 (0.03) | 0.15 (0.006) |        |
| TFBR04240015-D040 | ✓             | 4 (0.16) | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 40 (1.57) | 24 (0.94) | 0.8 (0.03) | 0.15 (0.006) |        |
| TFBR07190020-D050 | ✓             | 5 (0.20) | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 35 (1.38) | 19 (0.75) | 1 (0.04)   | 0.2 (0.007)  |        |
| TFBR07290020-D050 | ✓             | 5 (0.20) | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 45 (1.77) | 29 (1.14) | 1 (0.04)   | 0.2 (0.007)  |        |
| TFBR07190020-D060 | ✓             | 6 (0.24) | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 35 (1.38) | 19 (0.75) | 1.8 (0.07) | 0.2 (0.007)  |        |
| TFBR07290020-D060 | ✓             | 6 (0.24) | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 45 (1.77) | 29 (1.14) | 1.8 (0.07) | 0.2 (0.007)  |        |
| TFBR07190020-D070 | ✓             | 7 (0.28) | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 35 (1.38) | 19 (0.75) | 2.5 (0.10) | 0.2 (0.007)  |        |
| TFBR07290020-D070 | ✓             | 7 (0.28) | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 45 (1.77) | 29 (1.14) | 2.5 (0.10) | 0.2 (0.007)  |        |

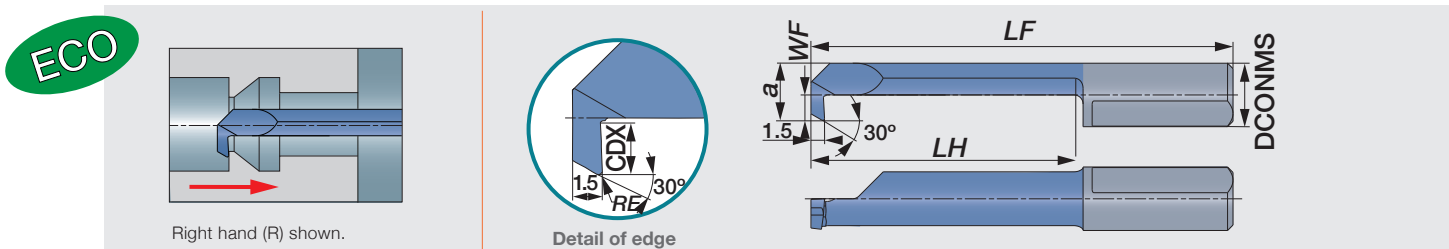
## Solid boring bars

## BACK BORING

Unit: mm (inch)

✓: Stocked items

TFEBR (without coolant hole)



| Designation        | Grade<br>AC22S | DMIN     | DCONMS    | WF         | a          | LF        | LH        | CDX        | RE           | ± 0.05 |
|--------------------|----------------|----------|-----------|------------|------------|-----------|-----------|------------|--------------|--------|
|                    | RH             |          |           |            |            |           |           |            |              |        |
| TFEBR04140020-D030 | ✓              | 3 (0.12) | 4 (0.157) | 0.6 (0.02) | 2.6 (0.10) | 30 (1.18) | 14 (0.55) | 0.5 (0.02) | 0.2 (0.008)  |        |
| TFEBR04140015-D040 | ✓              | 4 (0.16) | 4 (0.157) | 1.5 (0.06) | 3.5 (0.14) | 30 (1.18) | 14 (0.55) | 0.8 (0.03) | 0.15 (0.006) |        |
| TFEBR07190020-D050 | ✓              | 5 (0.20) | 7 (0.276) | 0.9 (0.04) | 4.4 (0.17) | 35 (1.38) | 19 (0.75) | 1 (0.04)   | 0.2 (0.008)  |        |

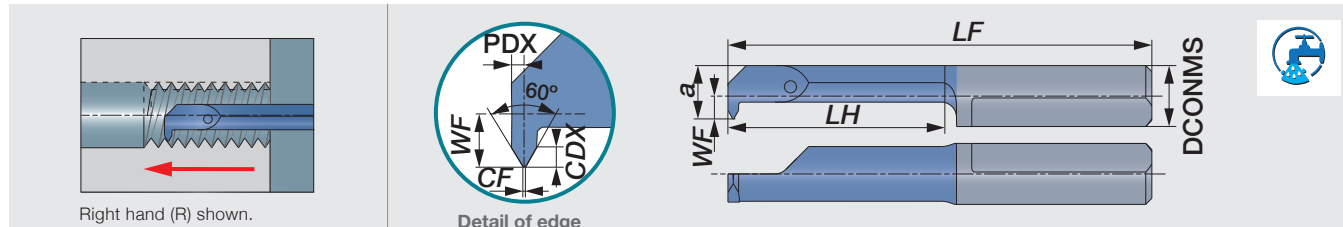
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

# THREADING (METRIC)

TFIR with coolant hole



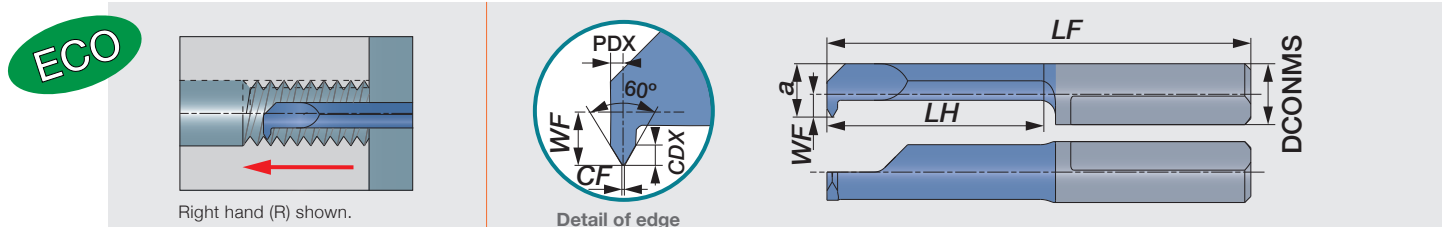
| Designation       | Grade<br>AC22 | Pitch | DMIN       | <sup>0</sup> <sub>-0.02</sub><br>CF | DCONMS   | WF         | a          | LF        | LH        | CDX         | PDX          |
|-------------------|---------------|-------|------------|-------------------------------------|----------|------------|------------|-----------|-----------|-------------|--------------|
|                   | RH            |       |            |                                     |          |            |            |           |           |             |              |
| TFIR04140050-D040 | ✓             | 0.5   | 4 (0.16)   | 0.06 (0.002)                        | 4 (0.16) | 1.5 (0.06) | 3.5 (0.14) | 30 (1.18) | 14 (0.55) | 0.3 (0.012) | 0.35 (0.014) |
| TFIR07140050-D050 | ✓             | 1.0   | 5 (0.20)   | 0.06 (0.002)                        | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 30 (1.18) | 14 (0.55) | 0.3 (0.012) | 0.35 (0.014) |
| TFIR07140075-D050 | ✓             | 0.75  | 5 (0.20)   | 0.09 (0.004)                        | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 30 (1.18) | 14 (0.55) | 0.4 (0.015) | 0.45 (0.017) |
| TFIR07140100-D048 | ✓             | 1.0   | 4.8 (0.19) | 0.12 (0.005)                        | 7 (0.28) | 0.9 (0.04) | 4.4 (0.17) | 30 (1.18) | 14 (0.55) | 0.6 (0.024) | 0.55 (0.022) |
| TFIR07140100-D060 | ✓             | 1.5   | 6 (0.24)   | 0.12 (0.005)                        | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 30 (1.18) | 14 (0.55) | 0.6 (0.024) | 0.55 (0.022) |
| TFIR07140125-D060 | ✓             | 1.25  | 6 (0.24)   | 0.15 (0.006)                        | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 30 (1.18) | 14 (0.55) | 0.7 (0.028) | 0.65 (0.026) |
| TFIR07140150-D060 | ✓             | 1.5   | 6 (0.24)   | 0.18 (0.007)                        | 7 (0.28) | 1.8 (0.07) | 5.3 (0.21) | 30 (1.18) | 14 (0.55) | 0.8 (0.032) | 0.75 (0.029) |
| TFIR07140150-D070 | ✓             | 1.5   | 7 (0.28)   | 0.18 (0.007)                        | 7 (0.28) | 2.8 (0.11) | 6.3 (0.25) | 30 (1.18) | 14 (0.55) | 0.8 (0.032) | 0.75 (0.029) |

Unit: mm (inch)  
✓: Stocked items

## Solid boring bars

# THREADING (METRIC)

TFEIR (without coolant hole)



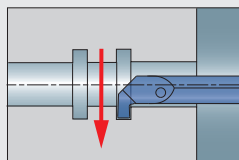
| Designation        | Grade<br>AC22S | Pitch | DMIN       | <sup>0</sup> <sub>-0.02</sub><br>CF | DCOMNS    | WF          | a          | LF         | LH         | CDX         | PDX          |
|--------------------|----------------|-------|------------|-------------------------------------|-----------|-------------|------------|------------|------------|-------------|--------------|
|                    | RH             |       |            |                                     |           |             |            |            |            |             |              |
| TFEIR04140050-D040 | ✓              | 0.5   | 4 (0.16)   | 0.06 (0.002)                        | 4 (0.157) | 1.5 (0.059) | 3.5 (0.14) | 30 (1.181) | 14 (0.551) | 0.3 (0.012) | 0.35 (0.014) |
| TFEIR07140050-D050 | ✓              | 0.5   | 5 (0.20)   | 0.06 (0.002)                        | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.181) | 14 (0.551) | 0.3 (0.012) | 0.35 (0.014) |
| TFEIR07140075-D050 | ✓              | 0.75  | 5 (0.20)   | 0.09 (0.004)                        | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.181) | 14 (0.551) | 0.4 (0.016) | 0.45 (0.018) |
| TFEIR07140100-D048 | ✓              | 1.0   | 4.8 (0.19) | 0.12 (0.005)                        | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.181) | 14 (0.551) | 0.6 (0.024) | 0.55 (0.022) |
| TFEIR07140100-D060 | ✓              | 1.0   | 6 (0.24)   | 0.12 (0.005)                        | 7 (0.276) | 1.8 (0.071) | 5.3 (0.21) | 30 (1.181) | 14 (0.551) | 0.6 (0.024) | 0.55 (0.022) |
| TFEIR07140150-D060 | ✓              | 1.5   | 6 (0.24)   | 0.18 (0.007)                        | 7 (0.276) | 1.8 (0.071) | 5.3 (0.21) | 30 (1.181) | 14 (0.551) | 0.8 (0.032) | 0.75 (0.029) |

Unit: mm (inch)  
✓: Stocked items

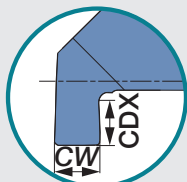
## Solid boring bars

## INTERNAL GROOVING

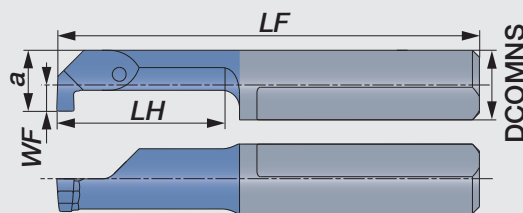
TFGR/L with coolant hole



Right hand (R) shown.



Detail of edge



| Designation         | Grade<br>AC22 |   | CW <sup>+0.05<br/>0</sup> | DMIN        | DCONMS   | WF          | a          | LF          | LH        | CDX         |
|---------------------|---------------|---|---------------------------|-------------|----------|-------------|------------|-------------|-----------|-------------|
|                     | R             | L |                           |             |          |             |            |             |           |             |
| TFGR04050050-D020   | ✓             |   | 0.5 (0.019)               | 2 (0.008)   | 4 (0.16) | 0.2 (0.008) | 1.8 (0.07) | 21 (0.83)   | 5 (0.20)  | 0.4 (0.016) |
| TFGR04100050-D020   | ✓             |   | 0.5 (0.019)               | 2 (0.008)   | 4 (0.16) | 0.2 (0.008) | 1.8 (0.07) | 26 (1.02)   | 10 (0.39) | 0.4 (0.016) |
| TFGR04050070-D030   | ✓             |   | 0.7 (0.028)               | 3 (0.118)   | 4 (0.16) | 0.7 (0.028) | 2.7 (0.11) | 21 (0.83)   | 5 (0.20)  | 0.6 (0.024) |
| TFGR04100070-D030   | ✓             |   | 0.7 (0.028)               | 3 (0.118)   | 4 (0.16) | 0.7 (0.028) | 2.7 (0.11) | 26 (1.02)   | 10 (0.39) | 0.6 (0.024) |
| TFGR04090100-D040   | ✓             |   | 1 (0.039)                 | 4 (0.157)   | 4 (0.16) | 1.5 (0.059) | 3.5 (0.14) | 25.5 (1.00) | 9 (0.35)  | 0.8 (0.031) |
| TFGR04150100-D040   | ✓             |   | 1 (0.039)                 | 4 (0.157)   | 4 (0.16) | 1.5 (0.059) | 3.5 (0.14) | 31.5 (1.24) | 15 (0.59) | 0.8 (0.031) |
| TFGR07090100-D050   | ✓             |   | 1 (0.039)                 | 5 (0.197)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 25 (0.98)   | 9 (0.35)  | 1 (0.039)   |
| TFGR07140100-D050   | ✓             |   | 1 (0.039)                 | 5 (0.197)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.18)   | 14 (0.55) | 1 (0.039)   |
| TFGR07090150-D050   | ✓             |   | 1.5 (0.059)               | 5 (0.197)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 25 (0.98)   | 9 (0.35)  | 1 (0.039)   |
| TFGR07140150-D050   | ✓             |   | 1.5 (0.059)               | 5 (0.197)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 30 (1.18)   | 14 (0.55) | 1 (0.039)   |
| TFGR07090200-D050   | ✓             |   | 2 (0.079)                 | 5 (0.197)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 25 (0.98)   | 9 (0.35)  | 1 (0.039)   |
| TFGR07190200-D050   | ✓             |   | 2 (0.079)                 | 5 (0.197)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 35 (1.38)   | 19 (0.75) | 1 (0.039)   |
| TFGR/L07090100-D060 | ✓             | ✓ | 1 (0.039)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 25 (0.98)   | 9 (0.35)  | 1.8 (0.070) |
| TFGR07140100-D060   | ✓             |   | 1 (0.039)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 30 (1.18)   | 14 (0.55) | 1.8 (0.070) |
| TFGR07210100-D060   | ✓             |   | 1 (0.039)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 37 (1.46)   | 21 (0.83) | 1.8 (0.070) |
| TFGR07290100-D060   | ✓             |   | 1 (0.039)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 45 (1.77)   | 29 (1.14) | 1.8 (0.070) |
| TFGR/L07090150-D060 | ✓             | ✓ | 1.5 (0.059)               | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 25 (0.98)   | 9 (0.35)  | 1.8 (0.070) |
| TFGR07140150-D060   | ✓             |   | 1.5 (0.059)               | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 30 (1.18)   | 14 (0.55) | 1.8 (0.070) |
| TFGR07210150-D060   | ✓             |   | 1.5 (0.059)               | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 37 (1.46)   | 21 (0.83) | 1.8 (0.070) |
| TFGR07240150-D060   | ✓             |   | 1.5 (0.059)               | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 40 (1.57)   | 24 (0.94) | 1.8 (0.070) |
| TFGR07290150-D060   | ✓             |   | 1.5 (0.059)               | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 45 (1.77)   | 29 (1.14) | 1.8 (0.070) |
| TFGR07090200-D060   | ✓             |   | 2 (0.079)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 25 (0.98)   | 9 (0.35)  | 1.8 (0.070) |
| TFGR07140200-D060   | ✓             |   | 2 (0.079)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 30 (1.18)   | 14 (0.55) | 1.8 (0.070) |
| TFGR07210200-D060   | ✓             |   | 2 (0.079)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 37 (1.46)   | 21 (0.83) | 1.8 (0.070) |
| TFGR07240200-D060   | ✓             |   | 2 (0.079)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 40 (1.57)   | 24 (0.94) | 1.8 (0.070) |
| TFGR07290200-D060   | ✓             |   | 2 (0.079)                 | 6 (0.236)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 45 (1.77)   | 29 (1.14) | 1.8 (0.070) |
| TFGR07090100-D068   | ✓             |   | 1 (0.039)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 25 (0.98)   | 9 (0.35)  | 2.5 (0.098) |
| TFGR07140100-D068   | ✓             |   | 1 (0.039)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 30 (1.18)   | 14 (0.55) | 2.5 (0.098) |
| TFGR07210100-D068   | ✓             |   | 1 (0.039)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 37 (1.46)   | 21 (0.83) | 2.5 (0.098) |
| TFGR07090150-D068   | ✓             |   | 1.5 (0.059)               | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 25 (0.98)   | 9 (0.35)  | 2.5 (0.098) |
| TFGR07140150-D068   | ✓             |   | 1.5 (0.059)               | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 30 (1.18)   | 14 (0.55) | 2.5 (0.098) |
| TFGR07210150-D068   | ✓             |   | 1.5 (0.059)               | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 37 (1.46)   | 21 (0.83) | 2.5 (0.098) |
| TFGR07290150-D068   | ✓             |   | 1.5 (0.059)               | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 45 (1.77)   | 29 (1.14) | 2.5 (0.098) |
| TFGR07090200-D068   | ✓             |   | 2 (0.079)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 25 (0.98)   | 9 (0.35)  | 2.5 (0.098) |
| TFGR/L07140200-D068 | ✓             | ✓ | 2 (0.079)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 30 (1.18)   | 14 (0.55) | 2.5 (0.098) |
| TFGR07210200-D068   | ✓             |   | 2 (0.079)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 37 (1.46)   | 21 (0.83) | 2.5 (0.098) |
| TFGR07250200-D068   | ✓             |   | 2 (0.079)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 40 (1.57)   | 25 (0.98) | 2.5 (0.098) |
| TFGR07290200-D068   | ✓             |   | 2 (0.079)                 | 6.8 (0.268) | 7 (0.28) | 2.7 (0.106) | 6.2 (0.24) | 45 (1.77)   | 29 (1.14) | 2.5 (0.098) |

- Corner radius : less than 0.01 mm.

Unit: mm (inch)

✓: Stocked items

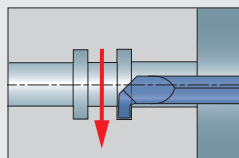


## Solid boring bars

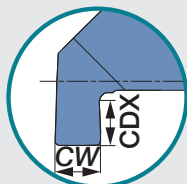
# INTERNAL GROOVING

TFEGR/L (without coolant hole)

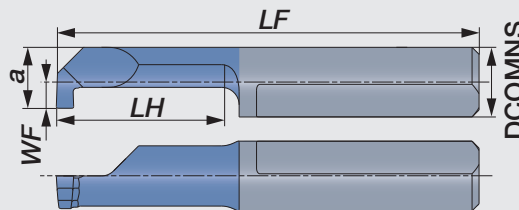
ECO



Right hand (R) shown.



Detail of edge



| Designation        | Grade<br>AC22S | $^{+0.05}_{0}$<br>CW | DMIN        | DCONMS    | WF          | a          | LF           | LH         | CDX         |
|--------------------|----------------|----------------------|-------------|-----------|-------------|------------|--------------|------------|-------------|
|                    | R              |                      |             |           |             |            |              |            |             |
| TFEGR04100050-D020 | ✓              | 0.5 (0.019)          | 2 (0.008)   | 4 (0.157) | 0.2 (0.008) | 1.8 (0.07) | 26 (1.024)   | 10 (0.394) | 0.4 (0.016) |
| TFEGR04090100-D040 | ✓              | 1 (0.039)            | 4 (0.157)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.14) | 25.5 (1.004) | 9 (0.354)  | 0.8 (0.032) |
| TFEGR04150100-D040 | ✓              | 1 (0.039)            | 4 (0.157)   | 4 (0.157) | 1.5 (0.059) | 3.5 (0.14) | 31.5 (1.24)  | 15 (0.591) | 0.8 (0.032) |
| TFEGR07090200-D050 | ✓              | 2 (0.076)            | 5 (0.197)   | 7 (0.276) | 0.9 (0.035) | 4.4 (0.17) | 25 (0.984)   | 9 (0.354)  | 1 (0.039)   |
| TFEGR07090100-D060 | ✓              | 1 (0.039)            | 6 (0.236)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.21) | 25 (0.984)   | 9 (0.354)  | 1.8 (0.071) |
| TFEGR07140100-D060 | ✓              | 1 (0.039)            | 6 (0.236)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.21) | 30 (1.181)   | 14 (0.551) | 1.8 (0.071) |
| TFEGR07090150-D060 | ✓              | 1.5 (0.059)          | 6 (0.236)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.21) | 25 (0.984)   | 9 (0.354)  | 1.8 (0.071) |
| TFEGR07090200-D060 | ✓              | 2 (0.079)            | 6 (0.236)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.21) | 25 (0.984)   | 9 (0.354)  | 1.8 (0.071) |
| TFEGR07140200-D060 | ✓              | 2 (0.079)            | 6 (0.236)   | 7 (0.276) | 1.8 (0.071) | 5.3 (0.21) | 30 (1.181)   | 14 (0.551) | 1.8 (0.071) |
| TFEGR07090100-D068 | ✓              | 1 (0.039)            | 6.8 (0.268) | 7 (0.276) | 2.7 (0.106) | 6.2 (0.24) | 25 (0.984)   | 9 (0.354)  | 2.5 (0.098) |
| TFEGR07090150-D068 | ✓              | 1.5 (0.059)          | 6.8 (0.268) | 7 (0.276) | 2.7 (0.106) | 6.2 (0.24) | 25 (0.984)   | 9 (0.354)  | 2.5 (0.098) |
| TFEGR07140150-D068 | ✓              | 1.5 (0.059)          | 6.8 (0.268) | 7 (0.276) | 2.7 (0.106) | 6.2 (0.24) | 30 (1.181)   | 14 (0.551) | 2.5 (0.098) |
| TFEGR07090200-D068 | ✓              | 2 (0.079)            | 6.8 (0.268) | 7 (0.276) | 2.7 (0.106) | 6.2 (0.24) | 25 (0.984)   | 9 (0.354)  | 2.5 (0.098) |
| TFEGR07140200-D068 | ✓              | 2 (0.079)            | 6.8 (0.268) | 7 (0.276) | 2.7 (0.106) | 6.2 (0.24) | 30 (1.181)   | 14 (0.551) | 2.5 (0.098) |
| TFEGR07210200-D068 | ✓              | 2 (0.079)            | 6.8 (0.268) | 7 (0.276) | 2.7 (0.106) | 6.2 (0.24) | 37 (1.457)   | 21 (0.827) | 2.5 (0.098) |
| TFEGR07290200-D068 | ✓              | 2 (0.079)            | 6.8 (0.268) | 7 (0.276) | 2.7 (0.106) | 6.2 (0.24) | 45 (1.772)   | 29 (1.142) | 2.5 (0.098) |

- Corner radius : less than 0.01 mm.

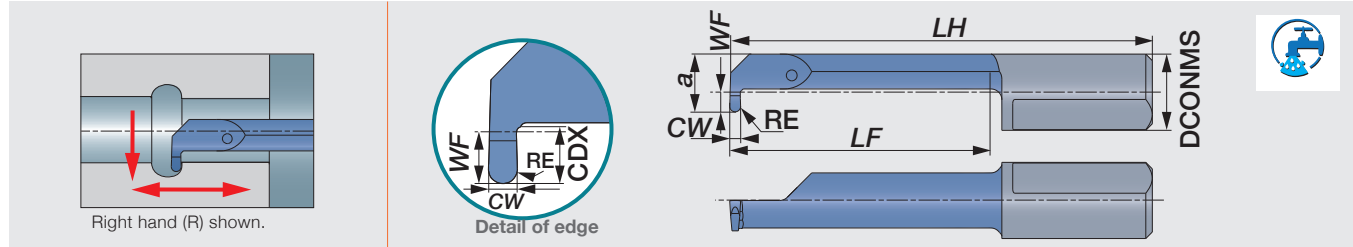
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

## GROOVING, PROFILING (FULL RADIUS TYPE)

TFRR with coolant hole



| Designation       | Grade<br>AC22 | $\begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$<br>CW | DMIN       | DCONMS   | WF          | a          | LF        | LH        | CDX        | RE         |
|-------------------|---------------|----------------------------------------------------------|------------|----------|-------------|------------|-----------|-----------|------------|------------|
|                   | RH            |                                                          |            |          |             |            |           |           |            |            |
| TFRR07190050-D050 | ✓             | 1 (0.04)                                                 | 5 (0.20)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 35 (1.38) | 19 (0.75) | 1 (0.04)   | 0.5 (0.02) |
| TFRR07240050-D060 | ✓             | 1 (0.04)                                                 | 6 (0.24)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 40 (1.57) | 24 (0.94) | 1.8 (0.07) | 0.5 (0.02) |
| TFRR07290050-D068 | ✓             | 1 (0.04)                                                 | 6.8 (0.27) | 7 (0.28) | 2.8 (0.110) | 6.3 (0.25) | 45 (1.77) | 29 (1.14) | 2.5 (0.10) | 0.5 (0.02) |

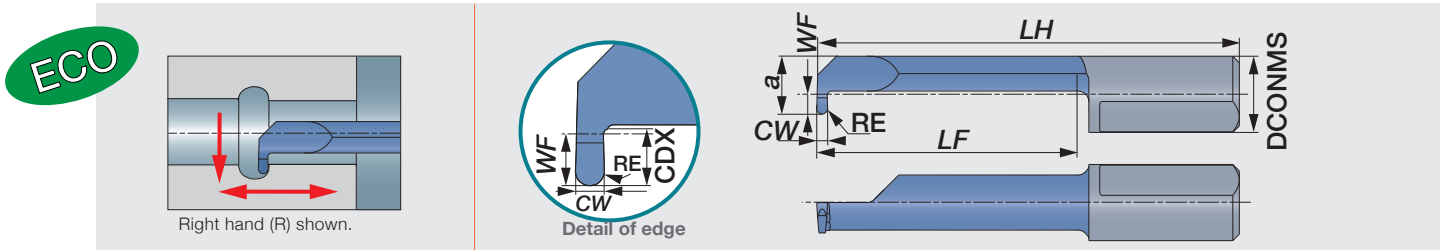
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

## GROOVING, PROFILING (FULL RADIUS TYPE)

TFERR (without coolant hole)



| Designation        | Grade<br>AC22S | $\begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$<br>CW | DMIN       | DCONMS   | WF          | a          | LF        | LH        | CDX        | RE         |
|--------------------|----------------|----------------------------------------------------------|------------|----------|-------------|------------|-----------|-----------|------------|------------|
|                    | RH             |                                                          |            |          |             |            |           |           |            |            |
| TFERR07190050-D050 | ✓              | 1 (0.04)                                                 | 5 (0.20)   | 7 (0.28) | 0.9 (0.035) | 4.4 (0.17) | 35 (1.38) | 19 (0.75) | 1 (0.04)   | 0.5 (0.02) |
| TFERR07240050-D060 | ✓              | 1 (0.04)                                                 | 6 (0.24)   | 7 (0.28) | 1.8 (0.071) | 5.3 (0.21) | 40 (1.57) | 24 (0.94) | 1.8 (0.07) | 0.5 (0.02) |
| TFERR07290050-D068 | ✓              | 1 (0.04)                                                 | 6.8 (0.27) | 7 (0.28) | 2.8 (0.110) | 6.3 (0.25) | 45 (1.77) | 29 (1.14) | 2.5 (0.10) | 0.5 (0.02) |

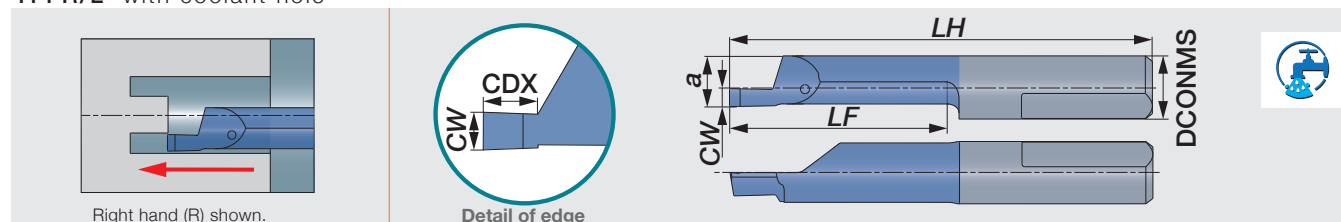
Unit: mm (inch)

✓: Stocked items

## Solid boring bars

# FACE GROOVING

TFFR/L with coolant hole

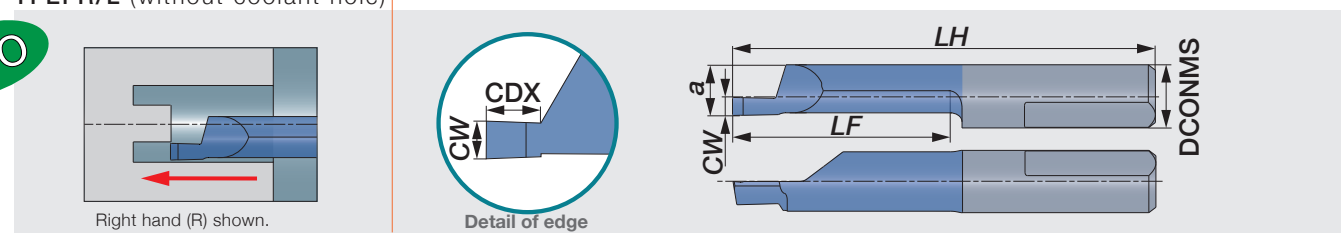


| Designation         | Grade<br>AC22 |   | CW<br>$+0.05$<br>0 | DMIN      | DCONMS   | a          | LH        | LF        | CDX        |
|---------------------|---------------|---|--------------------|-----------|----------|------------|-----------|-----------|------------|
|                     | R             | L |                    |           |          |            |           |           |            |
| TFFR07110100-D060   | ✓             |   | 1 (0.04)           | 6 (0.24)  | 7 (0.28) | 5.2 (0.20) | 26 (1.02) | 10 (0.39) | 1.5 (0.06) |
| TFFR07110150-D060   | ✓             |   | 1.5 (0.06)         | 6 (0.24)  | 7 (0.28) | 5.2 (0.20) | 26 (1.02) | 10 (0.39) | 2 (0.08)   |
| TFFR07110200-D060   | ✓             |   | 2 (0.08)           | 6 (0.24)  | 7 (0.28) | 5.2 (0.20) | 26 (1.02) | 10 (0.39) | 3 (0.12)   |
| TFFR07110100-D080   | ✓             |   | 1 (0.04)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 27 (1.06) | 11 (0.43) | 1.5 (0.06) |
| TFFR07110150-D080   | ✓             |   | 1.5 (0.06)         | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 27 (1.06) | 11 (0.43) | 2.5 (0.10) |
| TFFR07110200-D080   | ✓             |   | 2 (0.08)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 27 (1.06) | 11 (0.43) | 3 (0.12)   |
| TFFR07110250-D080   | ✓             |   | 2.5 (0.10)         | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 27 (1.06) | 11 (0.43) | 3.5 (0.14) |
| TFFR07110300-D080   | ✓             |   | 3 (0.12)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 27 (1.06) | 11 (0.43) | 3.5 (0.14) |
| TFFR07200200-D080   | ✓             |   | 2 (0.08)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 36 (1.42) | 20 (0.79) | 3 (0.12)   |
| TFFR/L07210150-D080 | ✓             | ✓ | 1.5 (0.06)         | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 36 (1.42) | 21 (0.83) | 2.5 (0.10) |
| TFFR07210200-D080   | ✓             |   | 2 (0.08)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 36 (1.42) | 21 (0.83) | 3 (0.12)   |
| TFFR07210250-D080   | ✓             |   | 2.5 (0.10)         | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 36 (1.42) | 21 (0.83) | 3.5 (0.14) |
| TFFR07210300-D080   | ✓             |   | 3 (0.12)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 36 (1.42) | 21 (0.83) | 3.5 (0.14) |
| TFFR/L07300200-D080 | ✓             | ✓ | 2 (0.08)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 46 (1.81) | 30 (1.18) | 3 (0.12)   |
| TFFR07300300-D080   | ✓             |   | 3 (0.12)           | 8 (0.31)  | 7 (0.28) | 5.9 (0.23) | 46 (1.81) | 30 (1.18) | 3.5 (0.14) |
| TFFR07200250-D150   | ✓             |   | 2.5 (0.10)         | 15 (0.59) | 7 (0.28) | 5.9 (0.23) | 36 (1.42) | 20 (0.79) | 20 (0.79)  |
| TFFR07200300-D150   | ✓             |   | 3 (0.12)           | 15 (0.59) | 7 (0.28) | 5.9 (0.23) | 36 (1.42) | 20 (0.79) | 20 (0.79)  |
| TFFR07300300-D150   | ✓             |   | 3 (0.12)           | 15 (0.59) | 7 (0.28) | 5.9 (0.23) | 46 (1.81) | 30 (1.18) | 30 (1.18)  |

## Solid boring bars

# FACE GROOVING

TFEFR/L (without coolant hole)



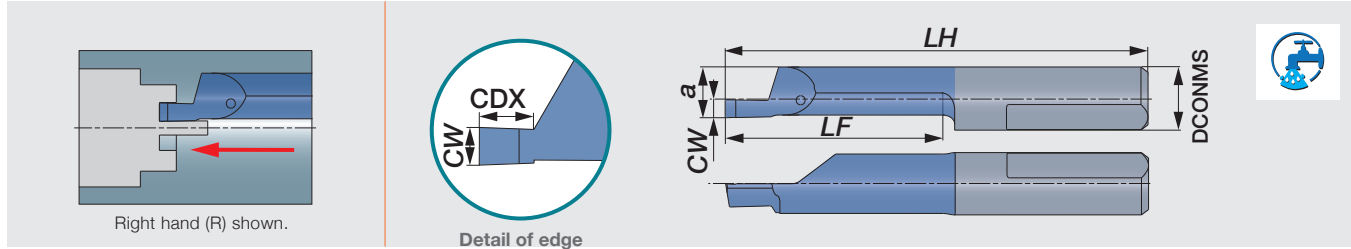
| Designation        | Grade<br>AC22S |   | CW<br>$+0.05$<br>0 | DMIN       | DCONMS    | a           | LH         | LF         | CDX         |
|--------------------|----------------|---|--------------------|------------|-----------|-------------|------------|------------|-------------|
|                    | R              | L |                    |            |           |             |            |            |             |
| TFEFR07110100-D060 | ✓              |   | 1 (0.039)          | 6 (0.236)  | 7 (0.276) | 5.2 (0.205) | 26 (1.024) | 10 (0.394) | 1.5 (0.059) |
| TFEFR07110200-D060 | ✓              |   | 2 (0.079)          | 6 (0.236)  | 7 (0.276) | 5.2 (0.205) | 26 (1.024) | 10 (0.394) | 3 (0.118)   |
| TFEFR07110100-D080 | ✓              |   | 1 (0.039)          | 8 (0.315)  | 7 (0.276) | 5.9 (0.232) | 27 (1.063) | 11 (0.433) | 1.5 (0.059) |
| TFEFR07110250-D080 | ✓              |   | 2.5 (0.098)        | 8 (0.315)  | 7 (0.276) | 5.9 (0.232) | 27 (1.063) | 11 (0.433) | 3.5 (0.138) |
| TFEFR07300300-D080 | ✓              |   | 3 (0.118)          | 8 (0.315)  | 7 (0.276) | 5.9 (0.232) | 46 (1.811) | 30 (1.181) | 3.5 (0.138) |
| TFEFR07200250-D150 | ✓              |   | 2.5 (0.098)        | 15 (0.591) | 7 (0.276) | 5.9 (0.232) | 36 (1.417) | 20 (0.787) | 20 (0.787)  |
| TFEFR07200300-D150 | ✓              |   | 3 (0.118)          | 15 (0.591) | 7 (0.276) | 5.9 (0.232) | 36 (1.417) | 20 (0.787) | 20 (0.787)  |
| TFEFR07300300-D150 | ✓              |   | 3 (0.118)          | 15 (0.591) | 7 (0.276) | 5.9 (0.232) | 46 (1.811) | 30 (1.181) | 30 (1.181)  |

Unit: mm (inch)  
✓: Stocked items

## Solid boring barst

## FACE GROOVING (FOR MACHINING SHAFT)

TFSR with coolant hole



| Designation       | Grade<br>AC22<br><br>RH | $\begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$<br>CW | DMIN     | DCONMS   | a          | LH        | LF        | CDX      |
|-------------------|-------------------------|----------------------------------------------------------|----------|----------|------------|-----------|-----------|----------|
| TFSR07200200-D060 | ✓                       | 2 (0.08)                                                 | 6 (0.24) | 7 (0.28) | 5.2 (0.20) | 36 (1.42) | 20 (0.79) | 4 (0.16) |

Unit: mm (inch)

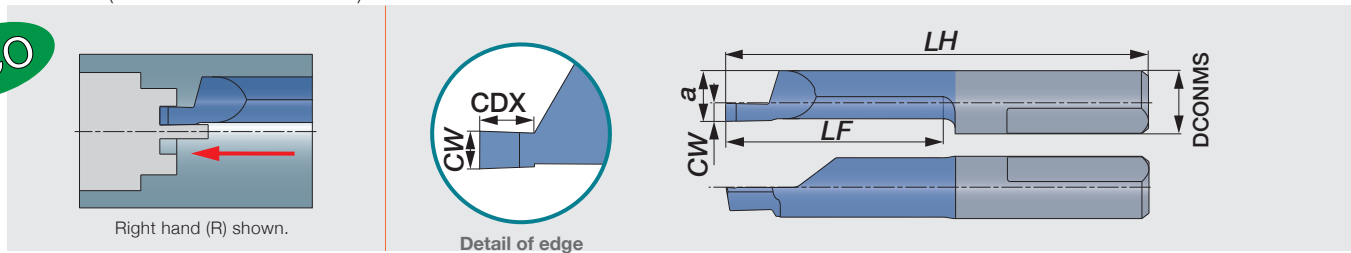
✓: Stocked items

## Solid boring bars

## FACE GROOVING (FOR MACHINING SHAFT)

TFESR (without coolant hole)

ECO



| Designation        | Grade<br>AC22S<br><br>RH | $\begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$<br>CW | DMIN     | DCONMS   | a          | LH        | LF        | CDX      |
|--------------------|--------------------------|----------------------------------------------------------|----------|----------|------------|-----------|-----------|----------|
| TFESR07200200-D060 | ✓                        | 2 (0.08)                                                 | 6 (0.24) | 7 (0.28) | 5.2 (0.20) | 36 (1.42) | 20 (0.79) | 4 (0.16) |

Unit: mm (inch)

✓: Stocked items



## SLEEVES

**NEW!**

(see page 25)



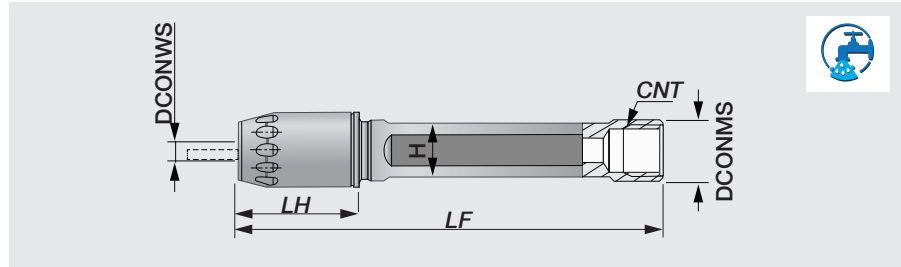
Excellent cutting edge offers high precision machining for a wide range of internal applications!

Collet chuck sleeve for solid carbide bars

## SLEEVE WITH INTERNAL COOLANT SUPPLY

TFBSA-C

NEW!



| Description      | DCONMS        | DCONWS    | LF          | LH         | H            | CNT   | CSP            |
|------------------|---------------|-----------|-------------|------------|--------------|-------|----------------|
| TFBSA12-4-L80C   | 12 (0.472)    | 4 (0.157) | 80 (3.149)  | 23 (0.906) | 10.3 (0.406) | Rc1/8 | w/coolant hole |
| TFBSA127-4-L80C  | 12.7 (0.499)  | 4 (0.157) | 80 (3.149)  | 23 (0.906) | 11.6 (0.457) | Rc1/8 | w/coolant hole |
| TFBSA14-4-L80C   | 14 (0.551)    | 4 (0.157) | 80 (3.149)  | 23 (0.906) | 12 (0.472)   | Rc1/8 | w/coolant hole |
| TFBSA159-4-L100C | 15.88 (0.625) | 4 (0.157) | 100 (3.937) | 23 (0.906) | 14 (0.551)   | Rc1/8 | w/coolant hole |
| TFBSA159-7-L100C | 15.88 (0.625) | 7 (0.276) | 100 (3.937) | 23 (0.906) | 14 (0.551)   | Rc1/8 | w/coolant hole |
| TFBSA16-4-L100C  | 16 (0.629)    | 4 (0.157) | 100 (3.937) | 23 (0.906) | 14 (0.551)   | Rc1/8 | w/coolant hole |
| TFBSA16-7-L100C  | 16 (0.629)    | 7 (0.276) | 100 (3.937) | 23 (0.906) | 14 (0.551)   | Rc1/8 | w/coolant hole |
| TFBSA19-4-L120C  | 19 (0.754)    | 4 (0.157) | 120 (4.724) | 23 (0.906) | 17.2 (0.677) | Rc1/8 | w/coolant hole |
| TFBSA19-7-L120C  | 19 (0.754)    | 7 (0.276) | 120 (4.724) | 23 (0.906) | 17.2 (0.677) | Rc1/8 | w/coolant hole |
| TFBSA20-4-L120C  | 20 (0.787)    | 4 (0.157) | 120 (4.724) | 23 (0.906) | 18 (0.709)   | Rc1/8 | w/coolant hole |
| TFBSA20-7-L120C  | 20 (0.787)    | 7 (0.276) | 120 (4.724) | 23 (0.906) | 18 (0.709)   | Rc1/8 | w/coolant hole |
| TFBSA22-4-L135C  | 22 (0.866)    | 4 (0.157) | 135 (5.315) | 23 (0.906) | 20 (0.787)   | Rc1/8 | w/coolant hole |
| TFBSA22-7-L135C  | 22 (0.866)    | 7 (0.276) | 135 (5.315) | 23 (0.906) | 20 (0.787)   | Rc1/8 | w/coolant hole |
| TFBSA25-4-L135C  | 25.4 (0.984)  | 4 (0.157) | 120 (4.724) | 23 (0.906) | 23 (0.906)   | Rc1/8 | w/coolant hole |
| TFBSA25-7-L135C  | 25.4 (0.984)  | 7 (0.276) | 120 (4.724) | 23 (0.906) | 23 (0.906)   | Rc1/8 | w/coolant hole |
| TFBSA254-4-L120C | 25 (1.000)    | 4 (0.157) | 120 (4.724) | 23 (0.906) | 23.4 (0.921) | Rc1/8 | w/coolant hole |
| TFBSA254-7-L120C | 25 (1.000)    | 7 (0.276) | 120 (4.724) | 23 (0.906) | 23.4 (0.921) | Rc1/8 | w/coolant hole |

Unit: mm (inch)

## SPARE PARTS

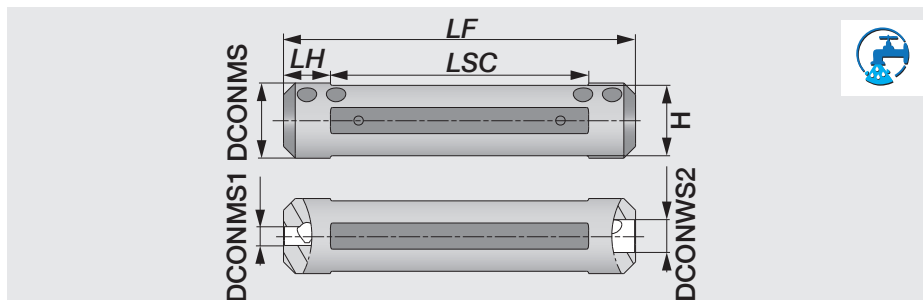


| Designation     | Clamping screw | Wrench     |
|-----------------|----------------|------------|
| TFBSA**-4-L100C | CAP-A-4        | WRENCH-A-4 |
| TFBSA**-7-L100C | CAP-A-7        | WRENCH-A-7 |

Sleeve with double-ended clamping and coolant supply

## SLEEVE FOR CLAMPING TWO DIFFERENT SHANK SIZES

TFBS



| Designation | DCONMS        | DCONMS1  | DCONWS2  | LF          | LH        | LSC         | H           |
|-------------|---------------|----------|----------|-------------|-----------|-------------|-------------|
| TFBS12-4-4  | 12 (0.47)     | 4 (0.16) | 4 (0.16) | 75 (2.95)   | 10 (0.39) | 55 (2.17)   | 10.3 (0.41) |
| TFBS127-4-4 | 12.7 (0.50)   | 4 (0.16) | 4 (0.16) | 76.2 (3.00) | 10 (0.39) | 56.2 (2.21) | 11.6 (0.46) |
| TFBS14-4-4  | 14 (0.55)     | 4 (0.16) | 4 (0.16) | 75 (2.95)   | 10 (0.39) | 55 (2.17)   | 12 (0.47)   |
| TFBS159-4-7 | 15.875 (0.62) | 4 (0.16) | 7 (0.28) | 76.2 (3.00) | 10 (0.39) | 56.2 (2.21) | 14 (0.55)   |
| TFBS16-4-7  | 16 (0.63)     | 4 (0.16) | 7 (0.28) | 75 (2.95)   | 10 (0.39) | 55 (2.17)   | 15 (0.59)   |
| TFBS19-4-7  | 19.05 (0.75)  | 4 (0.16) | 7 (0.28) | 89 (3.50)   | 10 (0.39) | 69 (2.72)   | 17.2 (0.68) |
| TFBS20-4-7  | 20 (0.79)     | 4 (0.16) | 7 (0.28) | 90 (3.54)   | 10 (0.39) | 70 (2.76)   | 18 (0.71)   |
| TFBS22-4-7  | 22 (0.87)     | 4 (0.16) | 7 (0.28) | 90 (3.54)   | 10 (0.39) | 70 (2.76)   | 20 (0.79)   |
| TFBS25-4-7  | 25 (0.98)     | 4 (0.16) | 7 (0.28) | 100 (3.94)  | 10 (0.39) | 80 (3.15)   | 23 (0.91)   |
| TFBS254-4-7 | 25.4 (1.00)   | 4 (0.16) | 7 (0.28) | 90 (3.54)   | 10 (0.39) | 70 (2.76)   | 23.4 (0.92) |

Unit: mm (inch)

### SPARE PARTS

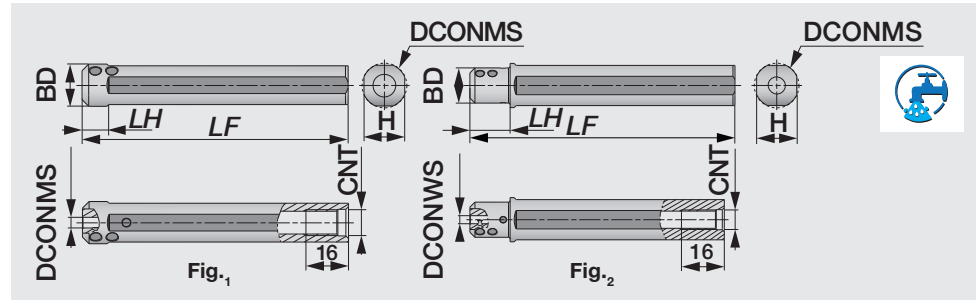


| Designation | Clamping screw | Wrench |
|-------------|----------------|--------|
| TFBS12-4-4  | SSHM5-4PF-S    | P-2.5  |
| TFBS14-4-4  | SSHM5-4PF-S    | P-2.5  |
| TFBS127-4-4 | SSHM5-6PF-S    | P-2.5  |
| TFBS...-4-7 | SSHM5-6PF-S    | P-2.5  |

## Single-ended sleeve

## SLEEVE WITH INTERNAL COOLANT SUPPLY

## TFBS-C



| Description     | DCONMS        | BD            | DCONWS   | LF         | LH        | H           | CNT   | CSP            | Fig |
|-----------------|---------------|---------------|----------|------------|-----------|-------------|-------|----------------|-----|
| TFBS159-4-L100C | 15.875 (0.62) | 15.875 (0.62) | 4 (0.16) | 100 (3.94) | 10 (0.39) | 14.6 (0.57) | Rc1/8 | w/coolant hole | 1   |
| TFBS159-7-L100C | 15.875 (0.62) | 15.875 (0.62) | 7 (0.28) | 100 (3.94) | 10 (0.39) | 14.6 (0.57) | Rc1/8 | w/coolant hole | 1   |
| TFBS16-4-L100C  | 16 (0.63)     | 16 (0.63)     | 4 (0.16) | 100 (3.94) | 10 (0.39) | 15 (0.59)   | Rc1/8 | w/coolant hole | 1   |
| TFBS16-7-L100C  | 16 (0.63)     | 16 (0.63)     | 7 (0.28) | 100 (3.94) | 10 (0.39) | 15 (0.59)   | Rc1/8 | w/coolant hole | 1   |
| TFBS19-4-L100C  | 19.05 (0.75)  | 17.5 (0.69)   | 4 (0.16) | 100 (3.94) | 20 (0.79) | 17.2 (0.68) | Rc1/8 | w/coolant hole | 2   |
| TFBS19-7-L100C  | 19.05 (0.75)  | 17.5 (0.69)   | 7 (0.28) | 100 (3.94) | 20 (0.79) | 17.2 (0.68) | Rc1/8 | w/coolant hole | 2   |
| TFBS20-4-L100C  | 20 (0.79)     | 17.5 (0.69)   | 4 (0.16) | 100 (3.94) | 20 (0.79) | 18 (0.71)   | Rc1/8 | w/coolant hole | 2   |
| TFBS20-7-L100C  | 20 (0.79)     | 17.5 (0.69)   | 7 (0.28) | 100 (3.94) | 20 (0.79) | 18 (0.71)   | Rc1/8 | w/coolant hole | 2   |
| TFBS22-4-L100C  | 22 (0.87)     | 17.5 (0.69)   | 4 (0.16) | 100 (3.94) | 20 (0.79) | 20 (0.79)   | Rc1/8 | w/coolant hole | 2   |
| TFBS22-7-L100C  | 22 (0.87)     | 17.5 (0.69)   | 7 (0.28) | 100 (3.94) | 20 (0.79) | 20 (0.79)   | Rc1/8 | w/coolant hole | 2   |
| TFBS25-4-L100C  | 25 (0.98)     | 18 (0.71)     | 4 (0.16) | 100 (3.94) | 23 (0.91) | 23 (0.91)   | Rc1/8 | w/coolant hole | 2   |
| TFBS25-7-L100C  | 25 (0.98)     | 18 (0.71)     | 7 (0.28) | 100 (3.94) | 23 (0.91) | 23 (0.91)   | Rc1/8 | w/coolant hole | 2   |
| TFBS254-4-L100C | 25.4 (1.00)   | 18 (0.71)     | 4 (0.16) | 100 (3.94) | 23 (0.91) | 23.4 (0.92) | Rc1/8 | w/coolant hole | 2   |
| TFBS254-7-L100C | 25.4 (1.00)   | 18 (0.71)     | 7 (0.28) | 100 (3.94) | 23 (0.91) | 23.4 (0.92) | Rc1/8 | w/coolant hole | 2   |

Unit: mm (inch)

## SPARE PARTS

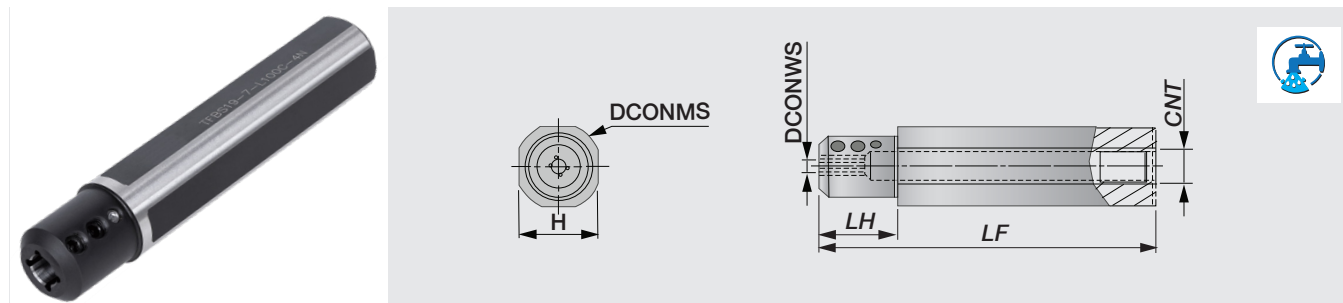


| Designation     | Clamping screw | Wrench |
|-----------------|----------------|--------|
| TFBS...-4-L100C | SSHM5-6PF-S    | P-2.5  |
| TFBS...-7-L100C | SSHM5-4PF-S    | P-2.5  |

## Single-ended sleeve

# SLEEVE FOR INTERNAL COOLANT WITH 4 COOLANT HOLES

## TFBS-4N



| Description        | DCONMS       | DCONWS    | LF          | LH         | H            | CNT    | CSP            |
|--------------------|--------------|-----------|-------------|------------|--------------|--------|----------------|
| TFBS12-4-L80C-4N   | 12 (0.472)   | 4 (0.157) | 80 (3.149)  | 10 (0.394) | 10.3 (0.406) | Rc1/16 | w/coolant hole |
| TFBS127-4-L80C-4N  | 12.7 (0.499) | 4 (0.157) | 80 (3.149)  | 10 (0.394) | 11.6 (0.457) | Rc1/16 | w/coolant hole |
| TFBS14-4-L80C-4N   | 14 (0.551)   | 4 (0.157) | 80 (3.149)  | 10 (0.394) | 12 (0.472)   | Rc1/8  | w/coolant hole |
| TFBS159-4-L100C-4N | 15.9 (0.625) | 4 (0.157) | 100 (3.937) | 10 (0.394) | 14.6 (0.575) | Rc1/8  | w/coolant hole |
| TFBS159-7-L100C-4N | 15.9 (0.625) | 7 (0.276) | 100 (3.937) | 10 (0.394) | 14.6 (0.575) | Rc1/8  | w/coolant hole |
| TFBS16-4-L100C-4N  | 16 (0.629)   | 4 (0.157) | 100 (3.937) | 10 (0.394) | 15 (0.591)   | Rc1/8  | w/coolant hole |
| TFBS16-7-L100C-4N  | 16 (0.629)   | 7 (0.276) | 100 (3.937) | 10 (0.394) | 15 (0.591)   | Rc1/8  | w/coolant hole |
| TFBS19-4-L100C-4N  | 19 (0.748)   | 4 (0.157) | 100 (3.937) | 20 (0.787) | 17.2 (0.677) | Rc1/8  | w/coolant hole |
| TFBS19-7-L100C-4N  | 19 (0.748)   | 7 (0.276) | 100 (3.937) | 20 (0.787) | 17.2 (0.677) | Rc1/8  | w/coolant hole |
| TFBS20-4-L100C-4N  | 20 (0.787)   | 4 (0.157) | 100 (3.937) | 20 (0.787) | 18 (0.709)   | Rc1/8  | w/coolant hole |
| TFBS20-7-L100C-4N  | 20 (0.787)   | 7 (0.276) | 100 (3.937) | 20 (0.787) | 18 (0.709)   | Rc1/8  | w/coolant hole |
| TFBS22-4-L100C-4N  | 22 (0.866)   | 4 (0.157) | 100 (3.937) | 20 (0.787) | 20 (0.787)   | Rc1/8  | w/coolant hole |
| TFBS22-7-L100C-4N  | 22 (0.866)   | 7 (0.276) | 100 (3.937) | 20 (0.787) | 20 (0.787)   | Rc1/8  | w/coolant hole |
| TFBS25-4-L100C-4N  | 25 (0.984)   | 4 (0.157) | 100 (3.937) | 23 (0.906) | 23 (0.906)   | Rc1/8  | w/coolant hole |
| TFBS25-7-L100C-4N  | 25 (0.984)   | 7 (0.276) | 100 (3.937) | 23 (0.906) | 23 (0.906)   | Rc1/8  | w/coolant hole |
| TFBS254-4-L100C-4N | 25.4 (1.000) | 4 (0.157) | 100 (3.937) | 23 (0.906) | 23.4 (0.921) | Rc1/8  | w/coolant hole |
| TFBS254-7-L100C-4N | 25.4 (1.000) | 7 (0.276) | 100 (3.937) | 23 (0.906) | 23.4 (0.921) | Rc1/8  | w/coolant hole |

Unit: mm (inch)

## SPARE PARTS

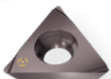
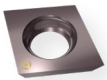
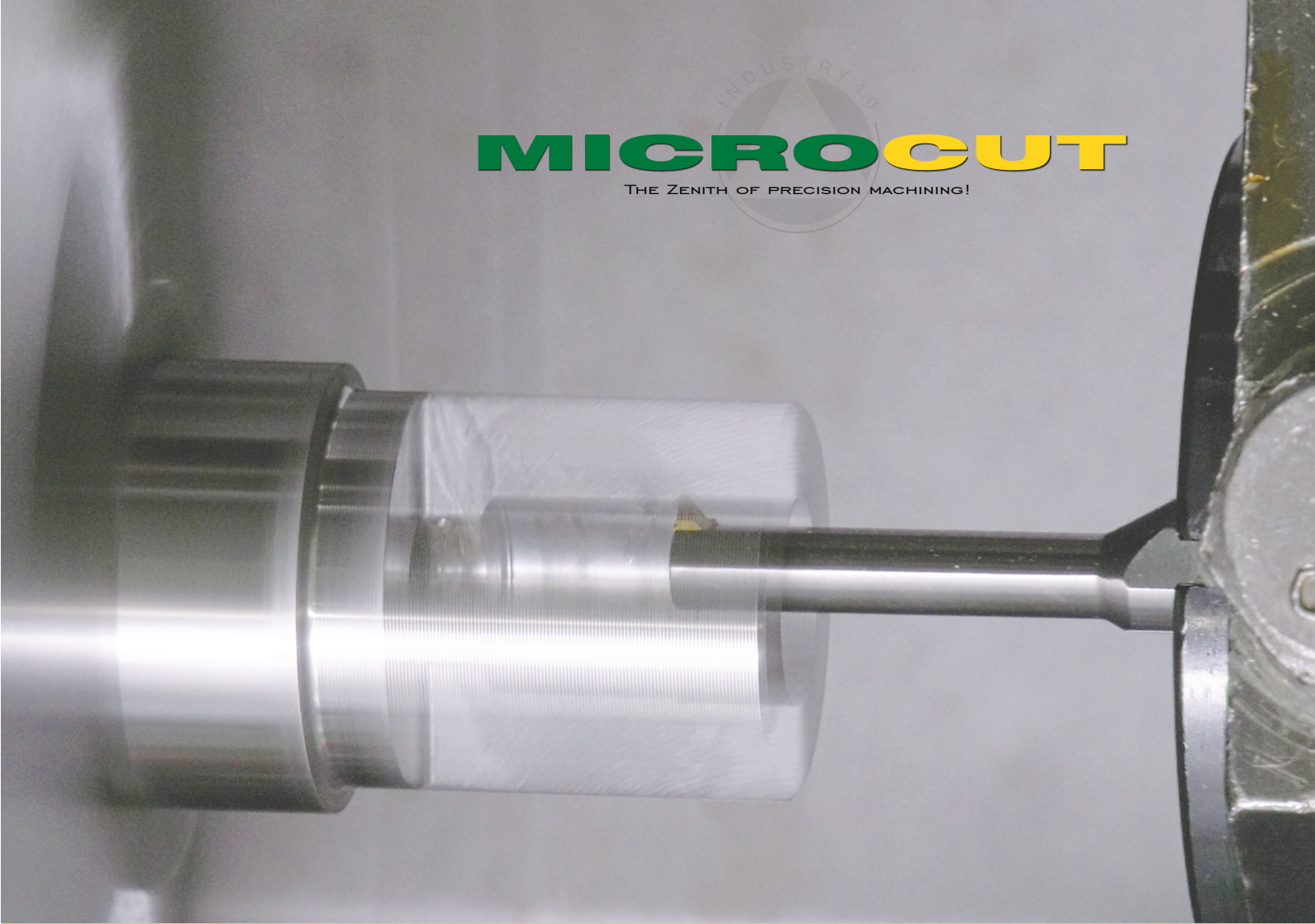


| Designation     | Clamping screw | Wrench |
|-----------------|----------------|--------|
| TFBS...-4-L100C | SSHM5-6PF-S    | P-2.5  |
| TFBS...-7-L100C | SSHM5-4PF-S    | P-2.5  |



# MICROCUT

THE ZENITH OF PRECISION MACHINING!



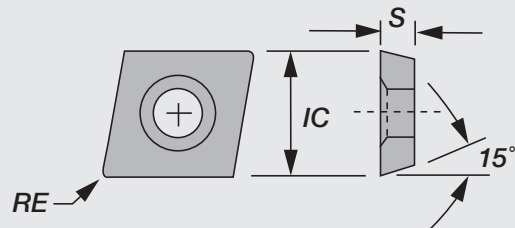
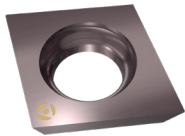
# BANTAM

THE ZENITH OF PRECISION MACHINING!

## Bantam Series indexable carbide inserts

### BORING

#### CDCD



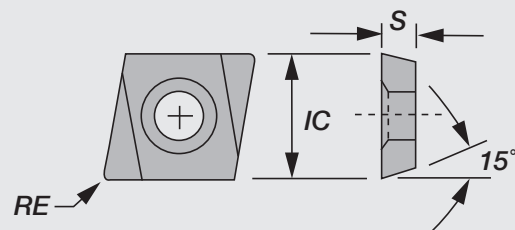
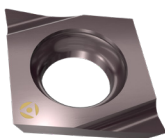
| Designation | IC           | RE            | S           | Grades |     |
|-------------|--------------|---------------|-------------|--------|-----|
|             |              |               |             | GP22   | GP4 |
| CDCD-500    | 3.96 (0.156) | 0.051 (0.002) | 1.02 (0.09) | √      | √   |
| CDCD-505    | 3.96 (0.156) | 0.177 (0.007) | 1.02 (0.09) | √      | √   |
| CDCD-51     | 3.96 (0.156) | 0.381 (0.015) | 1.02 (0.09) | √      | √   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable carbide inserts

### BORING

#### CDCG with chipbreaker



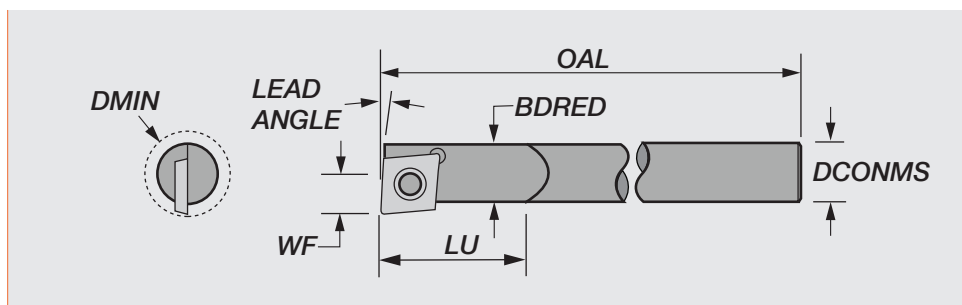
| Designation | IC           | RE            | S           | Grades |     |
|-------------|--------------|---------------|-------------|--------|-----|
|             |              |               |             | GP22   | GP4 |
| CDCG-500L   | 3.96 (0.156) | 0.051 (0.002) | 1.02 (0.09) | √      | √   |
| CDCG-505L   | 3.96 (0.156) | 0.177 (0.007) | 1.02 (0.09) | √      | √   |
| CDCG-51L    | 3.96 (0.156) | 0.381 (0.015) | 1.02 (0.09) | √      | √   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable internal tools

## BORING

## CCBI/CSBI



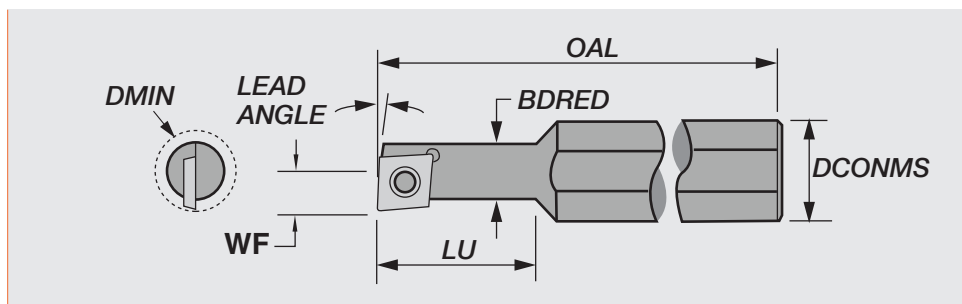
| Designation           | Material | MIID   | Lead Angle | BDRED        | DCONMS       | OAL          | LU           | WF           | DMIN         | SCREW |
|-----------------------|----------|--------|------------|--------------|--------------|--------------|--------------|--------------|--------------|-------|
| CSBI-165/187-1/2-7R   | Steel    | CDGD/G | 7°         | 4.19 (0.165) | 4.75 (0.187) | 63.5 (2.50)  | 12.7 (0.500) | 2.39 (0.094) | 4.57 (0.180) | TS1   |
| CCBI-165/156-6-7R     | Carbide  | CDGD/G | 7°         | 4.19 (0.165) | 3.96 (0.156) | 152.4 (6.00) | –            | 2.39 (0.094) | 4.57 (0.180) | TS1   |
| CSBI-180/187-2 1/2-5R | Steel    | CDGD/G | 5°         | 4.57 (0.180) | 4.75 (0.187) | 63.5 (2.50)  | 12.7 (0.500) | 2.64 (0.104) | 5.28 (0.208) | TS1   |
| CCBI-180/187-4-5R     | Carbide  | CDGD/G | 5°         | 4.80 (0.189) | 4.75 (0.187) | 101.6 (4.00) | –            | 2.64 (0.104) | 5.28 (0.208) | TS1   |
| CSBI-250-3-5R         | Steel    | CDGD/G | 5°         | 6.60 (0.260) | 6.35 (0.250) | 76.2 (3.00)  | –            | 3.68 (0.145) | 7.24 (0.285) | TS1   |
| CCBI-250-4-5R         | Carbide  | CDGD/G | 5°         | 6.55 (0.258) | 6.35 (0.250) | 101.6 (4.00) | –            | 3.68 (0.145) | 7.24 (0.285) | TS1   |
| CSBI-250-3-0R         | Steel    | CDGD/G | 0°         | 6.60 (0.260) | 6.35 (0.250) | 76.2 (3.00)  | –            | 3.86 (0.152) | 7.42 (0.292) | TS1   |
| CCBI-250-4-0R         | Carbide  | CDGD/G | 0°         | 6.55 (0.258) | 6.35 (0.250) | 101.6 (4.00) | –            | 3.86 (0.152) | 7.42 (0.292) | TS1   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable internal tools

## BORING

## CCBI/CSBI



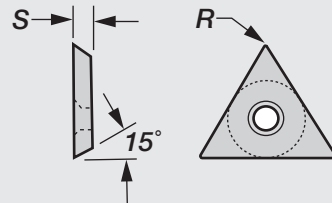
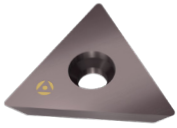
| Designation           | Material | MIID   | Lead Angle | BDRED        | DCONMS       | OAL         | LU           | WF           | DMIN         | SCREW |
|-----------------------|----------|--------|------------|--------------|--------------|-------------|--------------|--------------|--------------|-------|
| CSBI-180/500-1/2-5R   | Steel    | CDGD/G | 5°         | 4.57 (0.180) | 12.7 (0.500) | 69.9 (2.75) | 12.7 (0.500) | 2.64 (0.104) | 5.28 (0.208) | TS1   |
| CCBI-180/500-7/8-5R   | Carbide  | CDGD/G | 5°         | 4.80 (0.189) | 12.7 (0.500) | 60.2 (2.37) | 22.2 (0.875) | 2.64 (0.104) | 5.28 (0.208) | TS1   |
| CSBI-250/500-3/4-5R   | Steel    | CDGD/G | 5°         | 6.60 (0.260) | 12.7 (0.500) | 69.9 (2.75) | 19.1 (0.750) | 3.68 (0.145) | 7.24 (0.285) | TS1   |
| CCBI-250/500-1 1/4-5R | Carbide  | CDGD/G | 5°         | 6.55 (0.258) | 12.7 (0.500) | 69.9 (2.75) | 31.8 (1.250) | 3.68 (0.145) | 7.24 (0.285) | TS1   |
| CSBI-250/500-3/4-0R   | Steel    | CDGD/G | 0°         | 6.60 (0.260) | 12.7 (0.500) | 69.9 (2.75) | 19.1 (0.750) | 3.86 (0.152) | 7.42 (0.292) | TS1   |
| CCBI-250/500-1 1/4-0R | Carbide  | CDGD/G | 0°         | 6.55 (0.258) | 12.7 (0.500) | 69.9 (2.75) | 31.8 (1.250) | 3.68 (0.145) | 7.24 (0.285) | TS1   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable carbide inserts

### BORING

#### TDAB



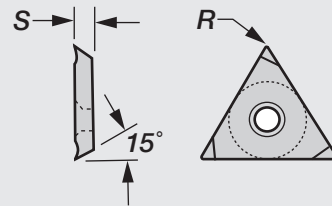
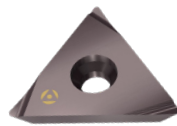
| Designation | IC           | RE            | S            | Grades |     |
|-------------|--------------|---------------|--------------|--------|-----|
|             |              |               |              | GP22   | GP4 |
| TDAB-505    | 4.06 (0.160) | 0.177 (0.007) | 1.19 (0.047) | ✓      | ✓   |
| TDAB-51     | 4.06 (0.160) | 0.381 (0.015) | 1.19 (0.047) | ✓      | ✓   |

Unit: mm (inch)  
 ✓: Stocked items

## Bantam Series indexable carbide inserts

### BORING

#### TDCG with chipbreaker



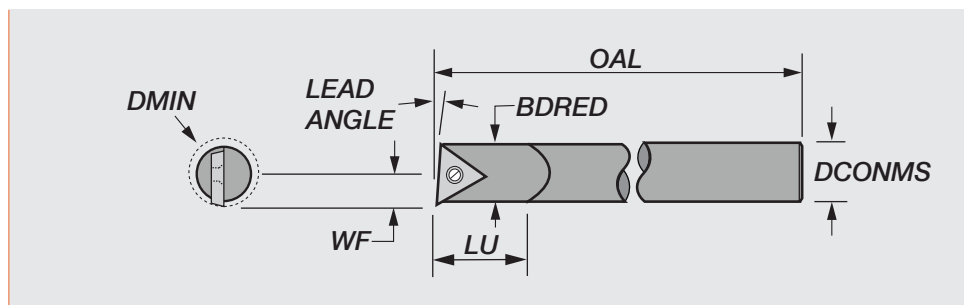
| Designation | IC           | RE            | S            | Grades |     |
|-------------|--------------|---------------|--------------|--------|-----|
|             |              |               |              | GP22   | GP4 |
| TDCG-500L   | 4.06 (0.160) | 0.177 (0.007) | 1.19 (0.047) | ✓      | ✓   |
| TDCG-51L    | 4.06 (0.160) | 0.381 (0.015) | 1.19 (0.047) | ✓      | ✓   |

Unit: mm (inch)  
 ✓: Stocked items

## Bantam Series indexable internal tools

## BORING

FCBI/FSBI



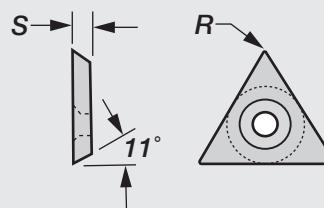
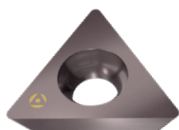
| Designation   | Material | MIID    | Lead Angle | BDRED        | DCONMS       | OAL          | WF           | DMIN         | SCREW |
|---------------|----------|---------|------------|--------------|--------------|--------------|--------------|--------------|-------|
| FCBI-187-4-5R | Carbide  | TDAB/CG | 5°         | 5.16 (0.203) | 4.75 (0.187) | 101.6 (4.00) | 3.20 (0.126) | 6.99 (0.275) | TS3   |
| FCBI-250-4-5R | Carbide  | TDAB/CG | 5°         | 6.35 (0.250) | 6.35 (0.250) | 101.6 (4.00) | 3.96 (0.156) | 7.62 (0.300) | TS3   |
| FSBI-250-4-5R | Steel    | TDAB/CG | 5°         | 6.35 (0.250) | 6.35 (0.250) | 101.6 (4.00) | 3.96 (0.156) | 7.62 (0.300) | TS3   |
| FCBI-312-4-5R | Carbide  | TDAB/CG | 5°         | 7.92 (0.312) | 7.92 (0.312) | 101.6 (4.00) | 4.75 (0.187) | 9.14 (0.360) | TS3   |
| FSBI-312-4-5R | Steel    | TDAB/CG | 5°         | 7.92 (0.312) | 7.92 (0.312) | 101.6 (4.00) | 4.75 (0.187) | 9.14 (0.360) | TS3   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable carbide inserts

## BORING

TPCB



| Designation | IC           | RE            | S            | Grades |     |
|-------------|--------------|---------------|--------------|--------|-----|
|             |              |               |              | GP22   | GP4 |
| TPCB-2205   | 6.35 (0.250) | 0.177 (0.007) | 2.44 (0.096) | √      | √   |
| TPCB-221    | 6.35 (0.250) | 0.381 (0.015) | 2.44 (0.096) | √      | √   |

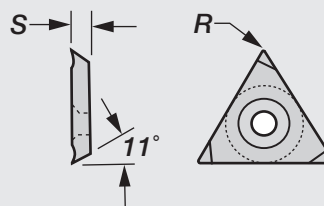
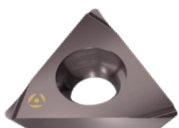
Unit: mm (inch)  
√: Stocked items



## Bantam Series indexable carbide inserts

### BORING

TPCG with chipbreaker



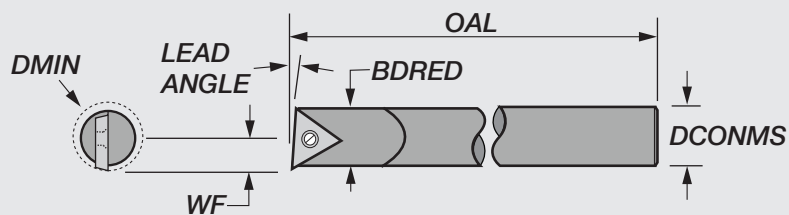
| Designation | IC           | RE            | S            | Grades |     |
|-------------|--------------|---------------|--------------|--------|-----|
|             |              |               |              | GP22   | GP4 |
| TPCG-2205L  | 6.35 (0.250) | 0.177 (0.007) | 2.44 (0.096) | ✓      | ✓   |
| TPCG-221L   | 6.35 (0.250) | 0.381 (0.015) | 2.44 (0.096) | ✓      | ✓   |

Unit: mm (inch)  
✓: Stocked items

## Bantam Series indexable internal tools

### BORING

QCBI/QSBI



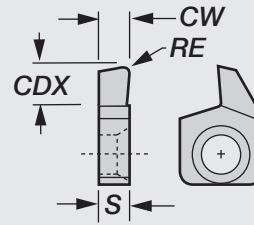
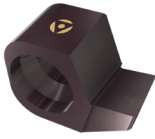
| Designation   | Material | MIID   | Lead Angle | BDRED        | DCONMS       | OAL          | WF           | DMIN         | SCREW |
|---------------|----------|--------|------------|--------------|--------------|--------------|--------------|--------------|-------|
| QSBI-375-5-5R | Steel    | TPCB/G | 5°         | 9.78 (0.385) | 9.53 (0.375) | 127.0 (5.00) | 2.39 (0.094) | 11.1 (0.438) | TS6   |
| QCBI-375-6-5R | Carbide  | TPCB/G | 5°         | 9.91 (0.390) | 9.53 (0.375) | 152.4 (6.00) | 2.39 (0.094) | 11.1 (0.438) | TS61  |
| QSBI-500-6-5R | Steel    | TPCB/G | 5°         | 4.57 (0.180) | 12.7 (0.500) | 152.4 (6.00) | 2.64 (0.104) | 5.28 (0.208) | TS6   |
| QCBI-500-8-5R | Carbide  | TPCB/G | 5°         | 12.9 (0.510) | 12.7 (0.500) | 203.2 (8.00) | 2.64 (0.104) | 14.3 (0.563) | TS6   |
| QSBI-500-8-5R | Steel    | TPCB/G | 5°         | 12.9 (0.510) | 12.7 (0.500) | 203.2 (8.00) | 3.68 (0.145) | 14.3 (0.563) | TS6   |

Unit: mm (inch)  
✓: Stocked items

## Bantam Series indexable carbide inserts

## BORING

## BNBR



| Designation | R | L | CW            | RE                        | CDX          | S            | Grades |      |
|-------------|---|---|---------------|---------------------------|--------------|--------------|--------|------|
|             |   |   |               |                           |              |              | GP22   | GP4* |
| BNBR/L-125W | √ | √ | 3.175 (0.125) | 0.127/0.254 (0.005/0.010) | 2.03 (0.080) | 3.48 (0.137) | √      | √    |

Unit: mm (inch)

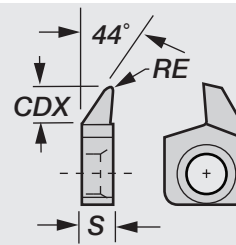
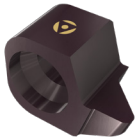
√: Stocked items

\*Available in right hand only

## Bantam Series indexable carbide inserts

## PROFILING

## BNPR



| Designation | RE            | CDX          | S            | GP22 | Grades |     |
|-------------|---------------|--------------|--------------|------|--------|-----|
|             |               |              |              |      | GP22   | GP4 |
| BNPR-015R   | 0.381 (0.015) | 1.78 (0.070) | 3.48 (0.137) | √    | √      | √   |

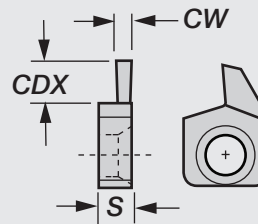
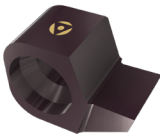
Unit: mm (inch)

√: Stocked items

## Bantam Series indexable carbide inserts

## GROOVING

## BNGR



| Designation | R | L | CW            | CDX          | S            | GP22 | Grades |      |
|-------------|---|---|---------------|--------------|--------------|------|--------|------|
|             |   |   |               |              |              |      | GP22   | GP4* |
| BNGR-031W   | √ |   | 0.787 (0.031) | 1.27 (0.050) | 3.48 (0.137) | √    | √      | √    |
| BNGR-047W   | √ |   | 1.194 (0.047) | 1.78 (0.070) | 3.48 (0.137) | √    | √      | √    |
| BNGR/L-062W | √ | √ | 1.575 (0.062) | 1.78 (0.070) | 3.48 (0.137) | √    | √      | √    |
| BNGR/L-094W | √ | √ | 2.388 (0.094) | 1.78 (0.070) | 3.48 (0.137) | √    | √      | √    |
| BNGR-125W   | √ |   | 3.175 (0.125) | 1.78 (0.070) | 3.48 (0.137) | √    | √      | √    |

Unit: mm (inch)

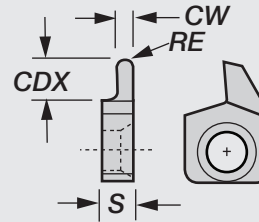
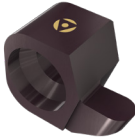
√: Stocked items

\*Available in right hand only

## Bantam Series indexable carbide inserts

### GROOVING

#### BNRR - Full nose radius



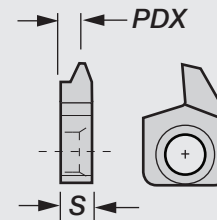
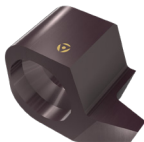
| Designation | CW            | CDX          | RE             | S            | Grades |     |
|-------------|---------------|--------------|----------------|--------------|--------|-----|
|             |               |              |                |              | GP22   | GP4 |
| BNRR-031W   | 0.787 (0.031) | 1.27 (0.050) | 0.393 (0.0155) | 3.48 (0.137) | √      | √   |
| BNRR-047W   | 1.194 (0.047) | 1.78 (0.070) | 0.597 (0.0235) | 3.48 (0.137) | √      | √   |
| BNRR-062W   | 1.575 (0.062) | 1.78 (0.070) | 0.787 (0.0310) | 3.48 (0.137) | √      | √   |
| BNRR-094W   | 2.388 (0.094) | 1.78 (0.070) | 1.194 (0.0470) | 3.48 (0.137) | √      | √   |
| BNRR-125W   | 3.175 (0.125) | 1.78 (0.070) | 1.588 (0.0625) | 3.48 (0.137) | √      | √   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable carbide inserts

### THREADING - ACME

#### BNAR



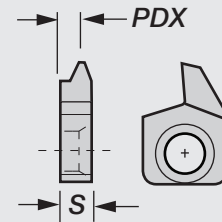
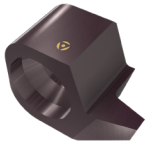
| Designation | TPI | PDX          | S            | Grades |     |
|-------------|-----|--------------|--------------|--------|-----|
|             |     |              |              | GP22   | GP4 |
| BNAR-10ACME | 10  | 2.54 (0.100) | 3.48 (0.137) | √      |     |
| BNAR-12ACME | 12  | 2.44 (0.096) | 3.48 (0.137) | √      |     |
| BNAR-16ACME | 16  | 2.54 (0.100) | 3.48 (0.137) | √      | √   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable carbide inserts

## THREADING - STUB ACME

## BNAR



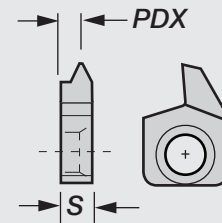
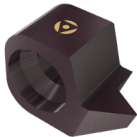
| Designation   | TPI | PDX          | S            | Grades<br>GP22 |
|---------------|-----|--------------|--------------|----------------|
| BNAR-10STACME | 10  | 2.54 (0.100) | 3.48 (0.137) | √              |
| BNAR-12STACME | 12  | 2.44 (0.096) | 3.48 (0.137) | √              |
| BNAR-16STACME | 16  | 2.54 (0.100) | 3.48 (0.137) | √              |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable carbide inserts

## THREADING - NPT

## BNVR



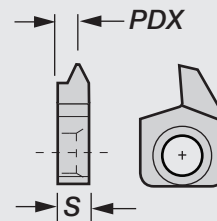
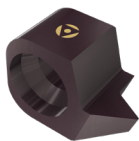
| Designation | TPI | PDX          | S            | Grades<br>GP22 | GP4 |
|-------------|-----|--------------|--------------|----------------|-----|
| BNVR-14NPT  | 14  | 2.54 (0.100) | 3.48 (0.137) | √              | √   |
| BNVR-18NPT  | 18  | 2.44 (0.096) | 3.48 (0.137) | √              | √   |
| BNVR-27NPT  | 27  | 2.54 (0.100) | 3.48 (0.137) | √              | √   |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable carbide inserts

### THREADING - UN

BNVR



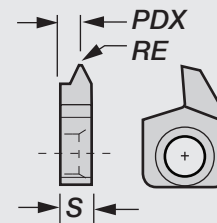
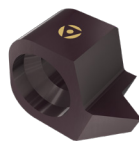
| Designation | TPI | PDX          | S            | Grades |     |
|-------------|-----|--------------|--------------|--------|-----|
|             |     |              |              | GP22   | GP4 |
| BNVR-12UN   | 12  | 2.54 (0.100) | 3.48 (0.137) | ✓      | ✓   |
| BNVR-16UN   | 16  | 2.69 (0.106) | 3.48 (0.137) | ✓      | ✓   |
| BNVR-18UN   | 18  | 2.69 (0.106) | 3.48 (0.137) | ✓      | ✓   |
| BNVR-20UN   | 20  | 2.72 (0.107) | 3.48 (0.137) | ✓      | ✓   |
| BNVR-24UN   | 24  | 2.92 (0.115) | 3.48 (0.137) | ✓      | ✓   |
| BNVR-28UN   | 28  | 2.72 (0.107) | 3.48 (0.137) | ✓      | ✓   |
| BNVR-32UN   | 32  | 2.97 (0.117) | 3.48 (0.137) | ✓      | ✓   |

Unit: mm (inch)  
✓: Stocked items

## Bantam Series indexable carbide inserts

### THREADING - 60° V

BNVR



| Designation | R | L | TPIN | TPIX | RE             | PDX          | S            | Grades |      |
|-------------|---|---|------|------|----------------|--------------|--------------|--------|------|
|             |   |   |      |      |                |              |              | GP22   | GP4* |
| BNVR/L-60   | ✓ | ✓ | 18   | 40   | 0.080 (0.003)F | 2.41 (0.095) | 3.48 (0.137) | ✓      | ✓    |

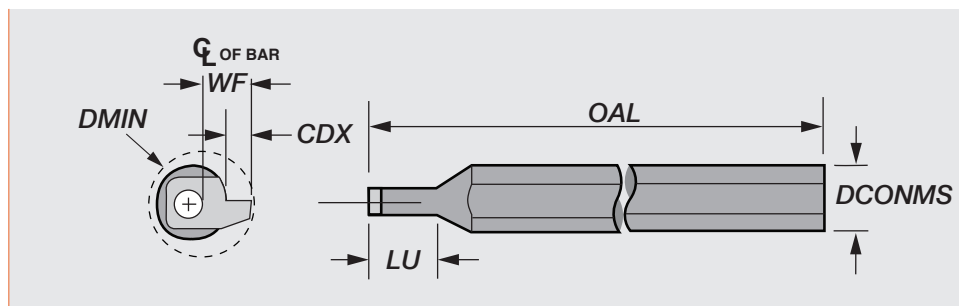
Unit: mm (inch)  
✓: Stocked items  
\*Available in right hand only



## Bantam Series indexable internal tools

## BORING, PROFILING, GROOVING AND THREADING

BB



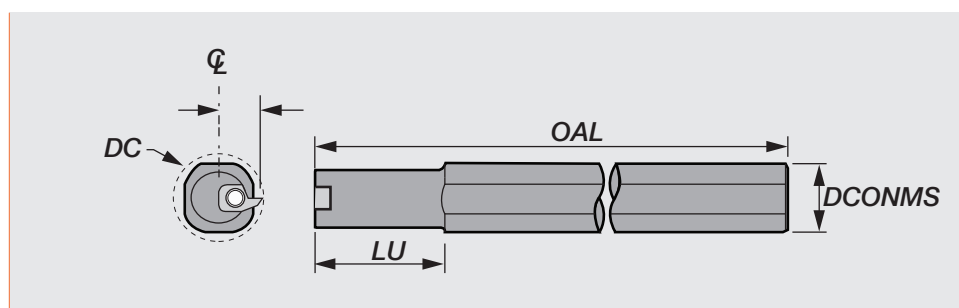
| Designation | Material    | MIID | DCONMS       | OAL        | LU            | WF            | CDX          | DMIN          | SCREW |
|-------------|-------------|------|--------------|------------|---------------|---------------|--------------|---------------|-------|
| BB-312S     | Steel       | BN_R | 12.7 (0.500) | 127 (5.00) | 19.05 (0.750) | 3.91 (0.154)  | 1.78 (0.070) | 7.92 (0.312)  | TS25  |
| BB-344S     | Steel       | BN_R | 12.7 (0.500) | 127 (5.00) | 19.05 (0.750) | 3.61 (0.142)  | 1.78 (0.070) | 8.74 (0.344)  | TS25  |
| BB-375S     | Steel       | BN_R | 12.7 (0.500) | 127 (5.00) | 19.05 (0.750) | 4.14 (0.163)  | 1.78 (0.070) | 9.53 (0.375)  | TS25  |
| BB-440S     | Steel       | BN_R | 12.7 (0.500) | 127 (5.00) | 25.4 (1.000)  | 4.57 (0.180)  | 1.78 (0.070) | 5.28 (0.440)  | TS25  |
| BB-312HM    | Heavy Metal | BN_R | 12.7 (0.500) | 127 (5.00) | 25.4 (1.000)  | 3.96 (0.156)  | 1.78 (0.070) | 7.92 (0.312)  | TS25  |
| BB-344HM    | Heavy Metal | BN_R | 12.7 (0.500) | 127 (5.00) | 25.4 (1.000)  | 3.61 (0.142)  | 1.78 (0.070) | 8.74 (0.344)  | TS25  |
| BB-375HM    | Heavy Metal | BN_R | 12.7 (0.500) | 127 (5.00) | 28.58 (1.125) | 4.14 (0.163)  | 1.78 (0.070) | 9.53 (0.375)  | TS25  |
| BB-440HM    | Heavy Metal | BN_R | 12.7 (0.500) | 127 (5.00) | 38.1 (1.500)  | 4.57 (0.180)  | 1.78 (0.070) | 11.18 (0.440) | TS25  |
| BB-312C     | Carbide     | BN_R | 12.7 (0.500) | 127 (5.00) | 31.75 (1.250) | 3.91 (0.154)  | 1.78 (0.070) | 7.92 (0.312)  | TS25  |
| BB-440C     | Carbide     | BN_R | 12.7 (0.500) | 127 (5.00) | 38.1 (1.500)  | 4.57 (0.180)) | 1.78 (0.070) | 11.18 (0.440) | TS25  |

Unit: mm (inch)  
√: Stocked items

## Bantam Series indexable internal tools

## THREADMILLING/MILL GROOVING

BBC - Circular Interpolating



| Designation | Material    | MIID | DCONMS       | OAL        | LU           | DC           | SCREW |
|-------------|-------------|------|--------------|------------|--------------|--------------|-------|
| BBC-516S    | Steel       | BN_R | 12.7 (0.500) | 127 (5.00) | 25.4 (1.000) | 13.1 (0.516) | TS25  |
| BBC-516HM   | Heavy Metal | BN_R | 12.7 (0.500) | 127 (5.00) | 25.4 (1.000) | 13.1 (0.516) | TS25  |

Unit: mm (inch)  
√: Stocked items

# Tool-Flo Manufacturing, Inc.

14745 Kirby Dr, Houston, TX 77047, U.S.A.  
Inside Sales: (713) 941-1080, (800) 345-2815  
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