

# TB



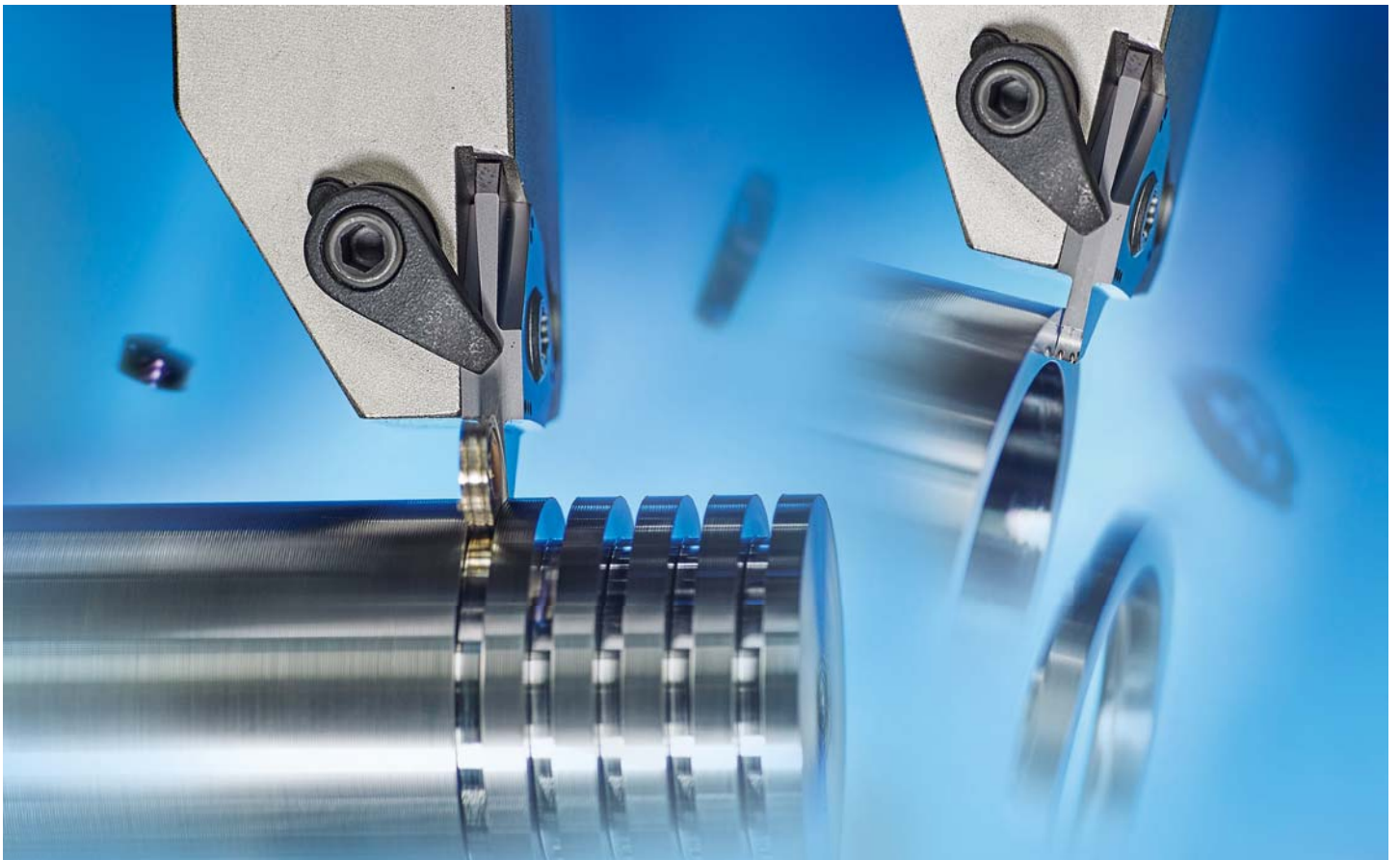
## 3-Corner Grooving & Parting Tools for High Speed, High Feed and Interrupted Machining

### ▣ Machining Stability

Strong clamping prevents tool vibration to produce high quality finishes and longer tool life

### ▣ Chip Control

Stable chip control boosts productivity at high speeds and high feeds



## 3-Corner Grooving & Parting Tools for High Efficiency

# TB



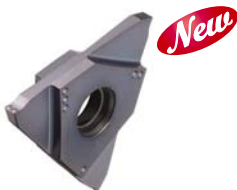
**TB3, TB4**

Ground chip breaker



**TB4-M**

M-class chip breaker



**TB5-M**

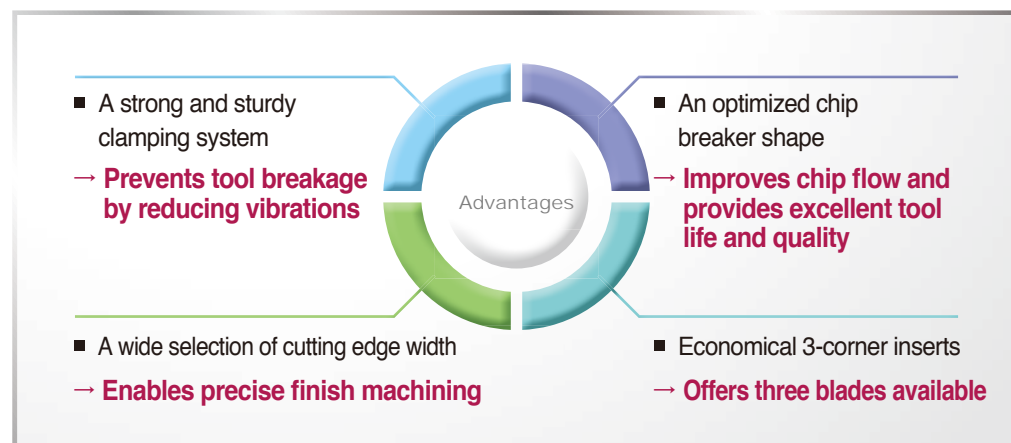
M-class chip breaker

Machining small components requires high productivity tools that are capable of high speed and high feed work. These tough cutting conditions often involve high spindle speeds over 2,000 RPM. These high speeds cause vibrations of the spindle, and the cutting tools are negatively affected by the vibrations.

Grooving and parting inserts normally have thin and narrow cutting edges, which leads to tool vibration at high speeds and feeds. Such vibrations can cause decreased level of surface finish, dimensional changes, and shortened tool life. Clamping stability and improved rigidity of the cutting edges are essential to cutting performance.

**TB** was designed to have wide supporting areas along the outer edge of the equilateral triangle-shaped insert, to maximize clamping stability. A double clamping system, using both a clamp and screw, also enables stable machining at high speeds, high feeds, and high interruptions. Additionally, its specialized chip breakers help to minimize cutting force and improve chip evacuation, which results in excellent surface finish.

TB is a combination of grooving and parting tools that can boost your productivity with its high stability at high speeds, high feeds, and high interruptions.



## Code System

[ Insert ]

|                       |   |                           |   |   |               |   |                     |
|-----------------------|---|---------------------------|---|---|---------------|---|---------------------|
| <b>TB</b>             | <b>5</b>                                  | <b>150</b>                | <b>N</b>  | - | <b>010</b>    | - | <b>M</b>            |
| <b>Triangle Blade</b> | <b>Inscribed circle</b>                   | <b>Cutting edge width</b> | <b>Hand</b>                                     |   | <b>Nose R</b> |   | <b>Chip breaker</b> |
|                       | 3: 9.525 mm<br>4: 12.7 mm<br>5: 15.875 mm | 0.5~4.5 mm                | N: Neutral<br>R: Right-handed<br>L: Left-handed |   | 0.00~0.40mm   |   | None<br>M           |

[ Holder ]

|                              |  |                   |                                   |
|------------------------------|--|-------------------|-----------------------------------|
| <b>TBH</b>                   | <b>5</b>                               | <b>25</b>         | <b>R</b>                          |
| <b>Triangle Blade Holder</b> | <b>Inscribed circle</b>                | <b>Shank size</b> | <b>Hand</b>                       |
|                              | 3: 9.525mm<br>4: 12.7mm<br>5: 15.875mm | 10~25mm           | R: Right-handed<br>L: Left-handed |

## Common Problems When Grooving and Parting Off

- Vibrations and impacts are caused by low clamping stability in interrupted machining  
→ **Burr creation, reduced surface quality and tool breakage**
- When chip flow is not smooth in high speed and high feed machining, chips are caught inside each groove and rough cutting edges  
→ **Increased cutting force leads to inferior surface quality and shortened tool life**

## Development of the TB

### Higher clamping stability

| Type     | TB3, TB4, TB4-M   | TB5-M  |
|----------|---|--|
| Shape    | <p>Clamp an insert</p> <p>Clamping area of 60°</p>  | <p>First, screw an insert</p> <p>Second, clamp it</p> <p>Clamping area of 60°</p>  |
| Features | <ul style="list-style-type: none"> <li>• Stable clamping system with an internal angle of 60°</li> <li>• Clamp use</li> </ul> | <ul style="list-style-type: none"> <li>• Stable clamping system with an internal angle of 60°</li> <li>• Double clamping using both a screw and a clamp</li> </ul> |

• Cutting conditions:  
vc (m/min) = 150  
ap (mm) = 3, wet

### Improved chip control (M chip breaker)

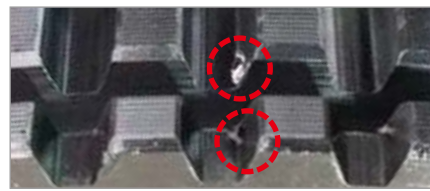
| Type                         | Competitor  |      | TB4-M, TB5-M   |      |
|------------------------------|---|------|--|------|
| Feed, fn (mm/rev)            | 0.12  | 0.18 | 0.12   | 0.18 |
| C45 (Carbon steel)           |   |      |  |      |
| X5CrNi18-9 (Stainless steel) |   |      |  |      |
| Result                       | Decreased machining quality owing to unstable chip evacuation |      | <b>Improved machining quality thanks to stable chip evacuation</b> |      |

## Development Effect

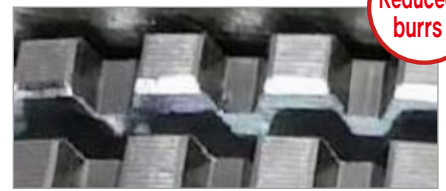


- Workpiece: 18CrMo4
- Cutting conditions :  
vc (m/min) = 120  
fn (mm/rev) = 0.1  
ap (mm) = 4.5, wet

### Interrupted machining availability



Burrs, created by vibrations in interrupted cutting  
[ Competitor ]



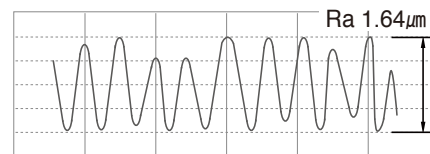
Reduced burr creation thanks to higher clamping stability  
[ TB5-M ]

Reduced burrs

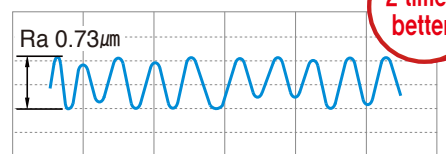


- Workpiece: C45
- Cutting conditions :  
vc (m/min) = 180  
fn (mm/rev) = 0.18  
ap (mm) = 5.0, wet

### High speed and high feed machining availability



Decreased level of surface finish owing to poor chip flow  
[ Competitor ]

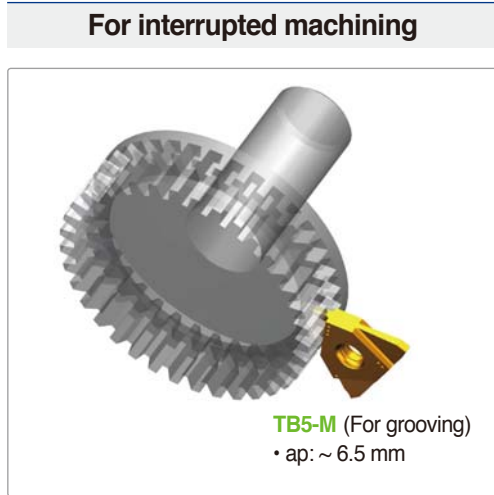


Improved surface finish thanks to smooth chip flow  
[ TB5-M ]

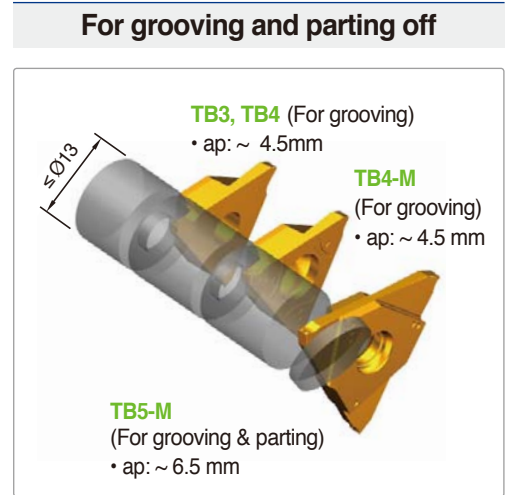
2 times better

## ⇒ TB Features

- **TB3, TB4, TB4-M**  
(For grooving)  
→ Recommended for continuous cutting
- **TB5-M** (For grooving)  
→ Recommended for both continuous and interrupted cutting



→ **TB5-M is recommended for interrupted machining**



→ **TB5-M is capable of cutting off a steel bar with external diameter  $\leq \text{Ø}13$**

| Specification      | TB3000R/L<br>TB4000R/L  | TB4000R-M  | TB5000N-000-M <i>New</i>   |             |
|--------------------|---|--|--|-------------|
| Designation        | TB3125R/L~TB3430R/L<br>(Inscribed circle of 9.525 mm)<br>TB4125R/L~TB4430R/L<br>(Inscribed circle of 12.7 mm) | TB4150R-M<br>~TB4450R-M<br>(Inscribed circle of 12.7 mm) | TB5050N-000-M<br>~TB5318N-020-M<br>(Inscribed circle of 15.875 mm) |             |
| Insert shape       |   |  |  |             |
| Features           | Chip breaker  | Ground chip breaker                                      | Pressed chip breaker   |             |
|                    | Hand  | Right/Left-handed  | Right-handed   | Neutral     |
|                    | Cutting edge width (b)  | TB3000: 1.25~4.3 mm<br>TB4000: 1.25~4.5 mm               | 1.5~4.5 mm   | 0.5~3.18 mm |
|                    | Depth of cut (T-MAX)  | TB3000: ~3.5 mm<br>TB4000: ~5.0 mm                       | ~5.0 mm  | ~6.5 mm     |
| Specialized        | Shape   | ○  | X  | X           |
|                    | Cutting edge width  | ○  | ○  | ○           |
| Chip breaker shape |   |  |  |             |
| Application range  | P   | P, M, K  | P, M, K  |             |
| Grade              | CN2000, PC5300  | CN2000, PC5300   | PC5300   |             |

## Guide for TB

(mm)

### [ Recommended machining method ]

• TB3, TB4



For grooving

• TB4-M



For grooving For turning

• TB5-M



For parting off For grooving For turning

| Cutting edge width W | TB                 |       |       | Recommended feed rate (mm/rev) | TB3, TB4 | TB4-M | TB5-M |
|----------------------|--------------------|-------|-------|--------------------------------|----------|-------|-------|
|                      | Depth of cut T-MAX |       |       |                                |          |       |       |
|                      | TB3, TB4           | TB4-M | TB5-M |                                |          |       |       |
| 0.50                 | -                  | -     | 2.5   | 0.05<br>(0.03~0.1)             | -        | -     | ●     |
| 0.80                 | -                  | -     | 1.6   |                                | -        | -     | ●     |
| 1.00                 | -                  | -     | 3.5   |                                | -        | -     | ●     |
| 1.04                 | -                  | -     | 2.0   |                                | -        | -     | ●     |
| 1.20                 | -                  | -     | 2.0   |                                | -        | -     | ●     |
| 1.25                 | 2.0                | -     | 2.0   |                                | ●        | -     | -     |
| 1.40                 | 2.0                | -     | 6.5   | ●                              | -        | ●     |       |
| 1.45                 | 2.0                | -     | -     | ●                              | -        | -     |       |
| 1.47                 | -                  | -     | 6.5   | -                              | -        | ●     |       |
| 1.50                 | 3.5                | 3.5   | 6.5   | ●                              | ●        | ●     |       |
| 1.57                 | -                  | -     | 6.5   | -                              | -        | ●     |       |
| 1.70                 | -                  | -     | 6.5   | 0.1<br>(0.03~0.15)             | -        | -     | ●     |
| 1.75                 | 3.5                | 3.5   | -     |                                | ●        | ●     | -     |
| 1.78                 | -                  | -     | 6.5   |                                | -        | -     | ●     |
| 1.85                 | 3.5                | 3.5   | -     |                                | ●        | ●     | -     |
| 1.96                 | -                  | -     | 6.5   |                                | -        | -     | ●     |
| 2.00                 | 3.5                | 3.5   | 6.5   |                                | ●        | ●     | ●     |
| 2.15                 | 3.5                | 3.5   | -     | ●                              | ●        | -     |       |
| 2.22                 | 6.5                | -     | 6.5   | -                              | -        | ●     |       |
| 2.30                 | 3.5                | 3.5   | 6.5   | ●                              | ●        | ●     |       |
| 2.39                 | -                  | -     | 6.5   | -                              | -        | ●     |       |
| 2.47                 | -                  | -     | 6.5   | -                              | -        | ●     |       |
| 2.50                 | 4.0                | 4.0   | 6.5   | 0.12<br>(0.03~0.2)             | ●        | ●     | ●     |
| 2.65                 | 4.0                | 4.0   | 6.5   |                                | ●        | ●     | -     |
| 2.70                 | -                  | -     | 6.5   |                                | -        | -     | ●     |
| 2.80                 | 4.0                | 4.0   | -     |                                | ●        | ●     | -     |
| 2.87                 | -                  | -     | 6.5   |                                | -        | -     | ●     |
| 3.00                 | 4.0                | 4.0   | 6.5   |                                | ●        | ●     | ●     |
| 3.15                 | -                  | -     | 6.5   | -                              | -        | ●     |       |
| 3.18                 | -                  | -     | 6.5   | -                              | -        | ●     |       |
| 3.30                 | 4.0                | -     | -     | 0.15<br>(0.05~0.2)             | ●        | -     | -     |
| 3.50                 | 5.0                | 5.0   | -     |                                | ●        | ●     | -     |
| 4.00                 | 5.0                | 5.0   | -     |                                | ●        | ●     | -     |
| 4.30                 | 5.0                | 5.0   | -     |                                | ●        | ●     | -     |
| 4.50                 | 5.0                | 5.0   | -     |                                | ●        | ●     | -     |

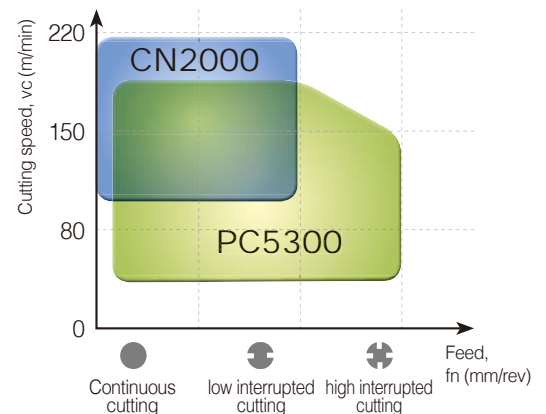
● : Managed item

## Recommended Cutting Conditions

Recommended cutting speed, vc (m/min)

| Workpiece |              | CN2000<br>(Cermet) |             |      | PC5300<br>(Coated) |             |      |
|-----------|--------------|--------------------|-------------|------|--------------------|-------------|------|
|           |              | Min.               | Recommended | Max. | Min.               | Recommended | Max. |
| P         | SMOOC type   | 100                | 160         | 220  | 80                 | 140         | 200  |
|           | SCM type     | 100                | 150         | 200  | 80                 | 130         | 180  |
| M         | STS type     | -                  | -           | -    | 40                 | 80          | 150  |
| K         | GC, GCD type | -                  | -           | -    | 80                 | 130         | 180  |

## Recommended Cutting Range

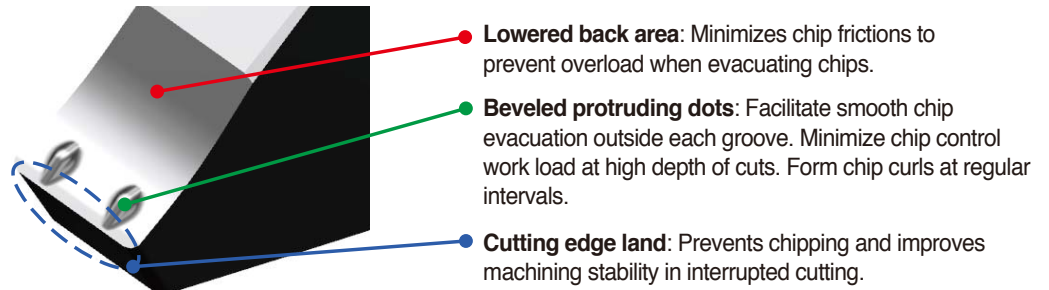


## TB-M Chip Breaker

- Minimized cutting force at high speed and high feed → **Smooth chip evacuation outside each groove**
- High precision cutting performance → **Exceptional surface finish and accurate dimensions**
- Excellent chip flow and cutting results → **Ideal for automated and unmanned production**

• Purpose: Grooving, parting off and interrupted cutting ≤ 6.5 mm with T-MAX

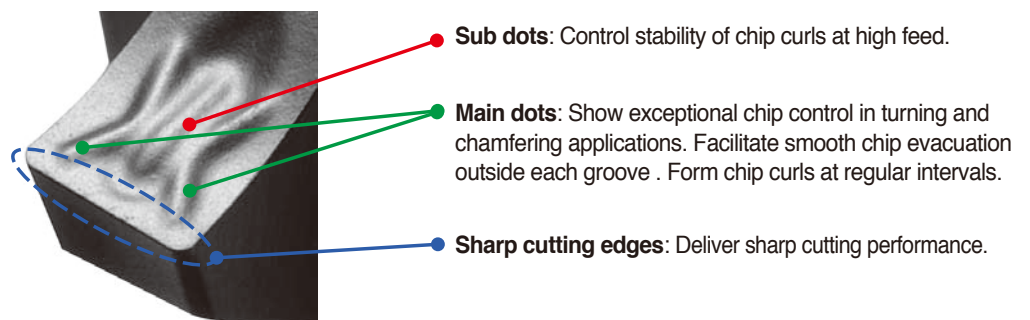
### TB5-M Chip breaker



| Designation            | TB5050N-M<br>~TB5120N-M | TB5140N-M<br>~TB5178N-M | TB5196N-M<br>~TB5239N-M | TB5247N-M<br>~TB5287N-M | TB5300N-M<br>~TB5318N-M |
|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Shape                  |                         |                         |                         |                         |                         |
| Cutting edge width (b) | 0.5~1.2 mm              | 1.40~1.78 mm            | 1.96~2.39 mm            | 2.47~2.87 mm            | 3.0~3.18 mm             |

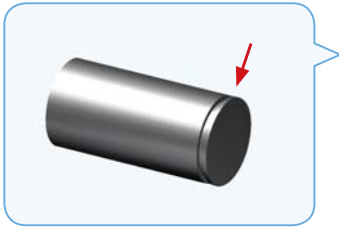
• Purpose: Grooving and turning ≤ 4.5 mm with T-MAX

### TB4-M Chip breaker



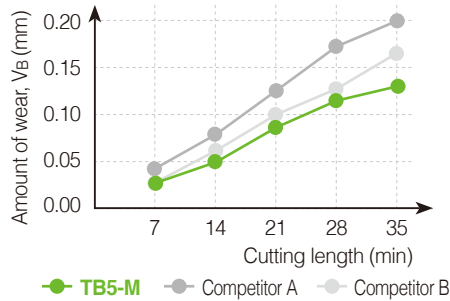
| Designation            | TB4150R-M<br>~TB4185R-M | TB4200R-M<br>~TB4228R-M | TB4300R-M<br>~TB4350R-M | TB4400R-M<br>~TB4450R-M |
|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Shape                  |                         |                         |                         |                         |
| Cutting edge width (b) | 1.5~1.85 mm             | 2.0~2.8 mm              | 3.0~3.5 mm              | 4.0~4.5 mm              |

## ➔ Wear Resistance Test



### 35 min. long machining

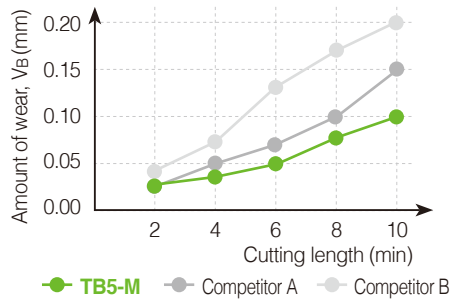
- **Workpiece** C45 (Carbon steel), External turning and grooving
- **Cutting conditions**  $vc$  (m/min) = 200,  $ap$  (mm) = 3,  $fn$  (mm/rev) = 0.12, wet
- **Tools** TB5200N-020-M (PC5300)



| Type                 | TB5200N-020-M (PC5300) | Competitor A (Universal grade) | Competitor B (Universal grade) |
|----------------------|------------------------|--------------------------------|--------------------------------|
| Picture of wear      |                        |                                |                                |
| Tool life comparison | 100%                   | 70%                            | 40%                            |

### 10 min. long machining

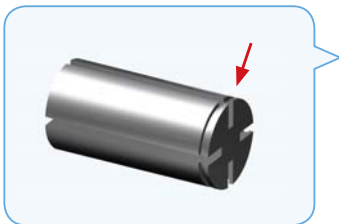
- **Workpiece** X5CrNi18-9 (Stainless steel), External turning and grooving
- **Cutting conditions**  $vc$  (m/min) = 120,  $ap$  (mm) = 3,  $fn$  (mm/rev) = 0.1, wet
- **Tools** TB5200N-020-M (PC5300)



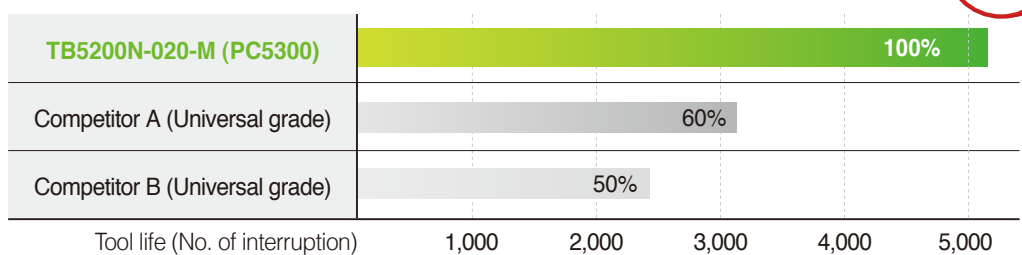
| Type                 | TB5200N-020-M (PC5300) | Competitor A (Universal grade) | Competitor B (Universal grade) |
|----------------------|------------------------|--------------------------------|--------------------------------|
| Picture of wear      |                        |                                |                                |
| Tool life comparison | 100%                   | 70%                            | 40%                            |

## ➔ Evaluation of Wear

- **Workpiece** C45 (Carbon steel), Grooving with four times of interruption
- **Cutting conditions**  $vc$  (m/min) = 100,  $ap$  (mm) = 3,  $fn$  (mm/rev) = 0.1, wet
- **Tools** TB5200N-020-M (PC5300)



### Feed rate (0.1 mm/rev)

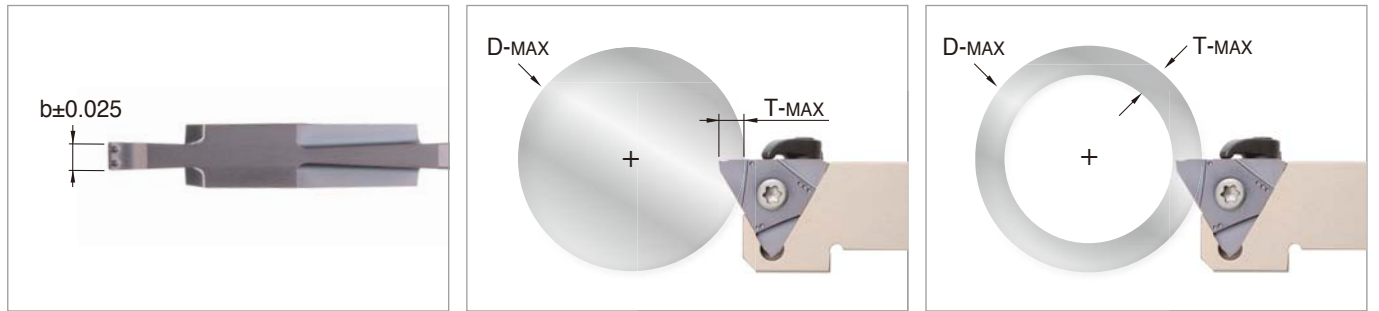


40%  
longer  
tool life

## ⇒ TB5-M Machining Range

\* There is a limit to cutting diameters of TB5-M when depth of cuts are over 5 mm.  
(e.g. When cutting with a TB5200N-020-M insert at the depth of 6.2 mm, Ø60 D-MAX is available.)

\* N.L = No limit



(mm)

| Designation           | b    | g(T-MAX) | r    | ØD-MAX  |         |         |         |         |         |         |         |         |   |
|-----------------------|------|----------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|
|                       |      |          |      | T ≤ 3.0 | T ≤ 3.5 | T ≤ 4.0 | T ≤ 4.5 | T ≤ 5.0 | T ≤ 5.5 | T ≤ 6.0 | T ≤ 6.4 | T ≤ 6.5 |   |
| <b>TB</b> 5050N-000-M | 0.50 | 1.0      | 0.00 | -       | -       | -       | -       | -       | -       | -       | -       | -       | - |
| 5050N-004-M           | 0.50 | 2.5      | 0.04 | -       | -       | -       | -       | -       | -       | -       | -       | -       | - |
| 5080N-000-M           | 0.80 | 1.6      | 0.00 | -       | -       | -       | -       | -       | -       | -       | -       | -       | - |
| 5100N-006-M           | 1.00 | 3.5      | 0.06 | -       | -       | -       | -       | -       | -       | -       | -       | -       | - |
| 5104N-000-M           | 1.04 | 2.0      | 0.00 | -       | -       | -       | -       | -       | -       | -       | -       | -       | - |
| 5120N-000-M           | 1.20 | 2.0      | 0.00 | -       | -       | -       | -       | -       | -       | -       | -       | -       | - |
| 5140N-000-M           | 1.40 | 6.5      | 0.00 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5147N-000-M           | 1.47 | 6.5      | 0.00 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5150N-010-M           | 1.50 | 6.5      | 0.10 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5150N-015-M           | 1.50 | 6.5      | 0.15 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5157N-015-M           | 1.57 | 6.5      | 0.15 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5170N-010-M           | 1.70 | 6.5      | 0.10 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5178N-018-M           | 1.78 | 6.5      | 0.18 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5196N-015-M           | 1.96 | 6.5      | 0.15 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5200N-020-M           | 2.00 | 6.5      | 0.20 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5222N-015-M           | 2.22 | 6.5      | 0.15 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5230N-020-M           | 2.30 | 6.5      | 0.20 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5239N-015-M           | 2.39 | 6.5      | 0.15 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5247N-020-M           | 2.47 | 6.5      | 0.20 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5250N-020-M           | 2.50 | 6.5      | 0.20 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5270N-010-M           | 2.70 | 6.5      | 0.10 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5287N-020-M           | 2.87 | 6.5      | 0.20 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5300N-000-M           | 3.00 | 6.5      | 0.00 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5300N-020-M           | 3.00 | 6.5      | 0.20 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5300N-040-M           | 3.00 | 6.5      | 0.40 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5315N-015-M           | 3.15 | 6.5      | 0.15 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |
| 5318N-020-M           | 3.18 | 6.5      | 0.20 | N.L     | N.L     | N.L     | N.L     | N.L     | Ø300    | Ø170    | Ø60     | Ø40     |   |



## ⇒ Application Examples



### Servo piston

- Workpiece 18CrMo4
- Cutting conditions  $vc$  (m/min) = 120,  $ap$  (mm) = 2.0,  $fn$  (mm/rev) = 0.1, wet
- Tools TB4200R-M (PC5300)

**TB4-M**

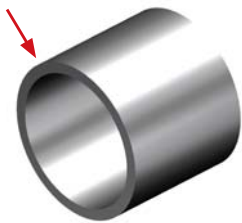
1000 ea/tooth

Competitor

820 ea/tooth

20%  
more

➔ 20% longer tool life than the competitor, thanks to improved chip flow



### Sleeve

- Workpiece C20
- Cutting conditions  $vc$  (m/min) = 200,  $ap$  (mm) = 2.0,  $fn$  (mm/rev) = 0.12, wet
- Tools TB5200N-020-M (PC5300)

**TB5-M**

600 ea/tooth

Competitor

460 ea/tooth

30%  
more

➔ Reduced burr creation and 30% longer than the competitor, tool life thanks to improved stability at high speed



### Clutch hub

- Workpiece 20Cr4
- Cutting conditions  $vc$  (m/min) = 150,  $ap$  (mm) = 4.5,  $fn$  (mm/rev) = 0.12, wet
- Tools TB5200N-020-M (PC5300)

**TB5-M**

110 ea/tooth

Competitor

100 ea/tooth

10%  
more

➔ 10% longer tool life than the competitor, thanks to excellent machining stability and quality results even at high feed



### Gate valve spindle

- Workpiece B1
- Cutting conditions  $vc$  (m/min) = 130,  $ap$  (mm) = 3.5,  $fn$  (mm/rev) = 0.1, wet
- Tools TB5200N-020-M (PC5300)

**TB5-M**


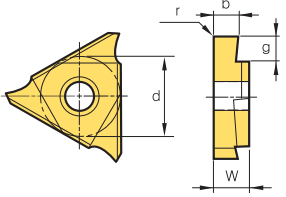

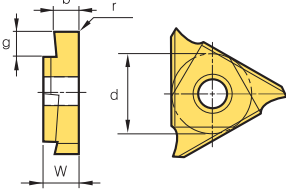
720 ea/tooth

Competitor


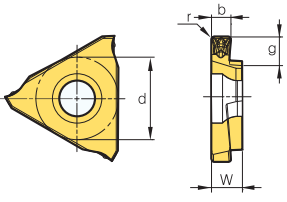
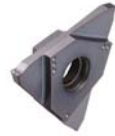
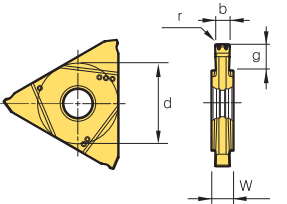
600 ea/tooth

20%  
more

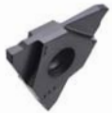
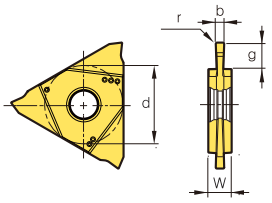
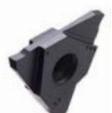
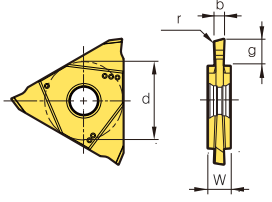
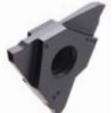
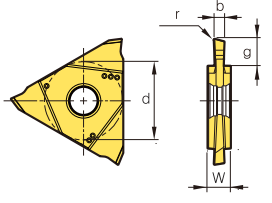

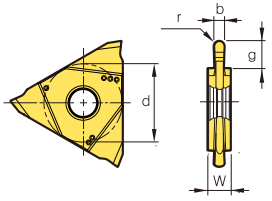
➔ 20% longer tool life than the competitor, thanks to excellent machining quality

| Shape   | Designation          |       | Cermet | Coated | Dimensions (mm) |              |      |      |       | Figure  |
|---|----------------------|-------|--------|--------|-----------------|--------------|------|------|-------|---|
|   |                      |       | CN2000 | PC5300 | b               | g<br>(T-MAX) | r    | w    | d     |   |
|    | TB<br>(Right-handed) | 3125R |        |        | 1.25            | 1.5          | 0.20 | 4.76 | 9.525 |    |
|   |                      | 3145R |        |        | 1.45            |              |      |      |       |   |
|   |                      | 3175R |        |        | 1.75            |              |      |      |       |   |
|   |                      | 3185R |        |        | 1.85            |              |      |      |       |   |
|   |                      | 3200R |        |        | 2.00            |              |      |      |       |   |
|   |                      | 3230R |        |        | 2.30            |              |      |      |       |   |
|   |                      | 3280R |        |        | 2.80            |              |      |      |       |   |
|   |                      | 3330R |        |        | 3.30            |              |      |      |       |   |
|   |                      | 3430R |        |        | 4.30            |              |      |      |       |   |
|   |                      | 4125R | ●      | ●      | 1.25            | 2.0          | 0.20 | 4.76 | 12.7  |   |
|   |                      | 4145R | ●      | ●      | 1.45            |              |      |      |       |   |
|   |                      | 4150R | ●      | ●      | 1.50            |              |      |      |       |   |
|   |                      | 4175R | ●      | ●      | 1.75            |              |      |      |       |   |
|   |                      | 4185R | ●      | ●      | 1.85            |              |      |      |       |   |
|   |                      | 4200R | ●      | ●      | 2.00            |              |      |      |       |   |
|   |                      | 4215R | ●      | ●      | 2.15            |              |      |      |       |   |
|   |                      | 4230R | ●      | ●      | 2.30            |              |      |      |       |   |
|   |                      | 4250R | ●      | ●      | 2.50            |              |      |      |       |   |
|   |                      | 4265R | ●      | ●      | 2.65            |              |      |      |       |   |
|   |                      | 4280R | ●      | ●      | 2.80            |              |      |      |       |   |
|   |                      | 4300R | ●      | ●      | 3.00            |              |      |      |       |   |
|   |                      | 4330R | ●      | ●      | 3.30            |              |      |      |       |   |
|   |                      | 4350R | ●      | ●      | 3.50            |              |      |      |       |   |
|   |                      | 4400R | ●      | ●      | 4.00            | 5.0          | 0.40 |      |       |   |
| 4430R   | ●                    | ●     | 4.30   |        |                 |              |      |      |       |   |
| 4450R   | ●                    | ●     | 4.50   |        |                 |              |      |      |       |   |
|  | TB<br>(Left-handed)  | 3125L |        |        | 1.25            | 1.5          | 0.20 | 4.76 | 9.525 |  |
|   |                      | 3145L |        |        | 1.45            |              |      |      |       |   |
|   |                      | 3175L |        |        | 1.75            |              |      |      |       |   |
|   |                      | 3185L |        |        | 1.85            |              |      |      |       |   |
|   |                      | 3200L |        |        | 2.00            |              |      |      |       |   |
|   |                      | 3230L |        |        | 2.30            |              |      |      |       |   |
|   |                      | 3280L |        |        | 2.80            |              |      |      |       |   |
|   |                      | 3330L |        |        | 3.30            |              |      |      |       |   |
|   |                      | 3430L |        |        | 4.30            |              |      |      |       |   |
|   |                      | 4125L |        |        | 1.25            | 2.0          | 0.20 | 4.76 | 12.7  |   |
|   |                      | 4145L |        |        | 1.45            |              |      |      |       |   |
|   |                      | 4150L |        |        | 1.50            |              |      |      |       |   |
|   |                      | 4175L |        |        | 1.75            |              |      |      |       |   |
|   |                      | 4185L |        |        | 1.85            |              |      |      |       |   |
|   |                      | 4200L |        |        | 2.00            |              |      |      |       |   |
|   |                      | 4215L |        |        | 2.15            |              |      |      |       |   |
|   |                      | 4230L |        |        | 2.30            |              |      |      |       |   |
|   |                      | 4250L |        |        | 2.50            |              |      |      |       |   |
|   |                      | 4265L |        |        | 2.65            |              |      |      |       |   |
|   |                      | 4280L |        |        | 2.80            |              |      |      |       |   |
|   |                      | 4300L |        |        | 3.00            |              |      |      |       |   |
|   |                      | 4330L |        |        | 3.30            |              |      |      |       |   |
|   |                      | 4350L |        |        | 3.50            |              |      |      |       |   |
|   |                      | 4400L |        |        | 4.00            | 5.0          | 0.40 |      |       |   |
| 4430L   |                      |       | 4.30   |        |                 |              |      |      |       |   |
| 4450L   |                      |       | 4.50   |        |                 |              |      |      |       |   |

● : Managed item

| Shape   | Designation                 |             | Cermet | Coated | Dimensions (mm) |              |      |      |        | Figure  |
|---|-----------------------------|-------------|--------|--------|-----------------|--------------|------|------|--------|---|
|   |                             |             | CN2000 | PC5300 | b               | g<br>(T-MAX) | r    | w    | d      |   |
|    | <b>TB</b><br>(Right-handed) | 4150R-M     | ●      | ●      | 1.50            | 3.5          | 0.20 | 4.76 | 12.7   |    |
|   |                             | 4175R-M     | ●      | ●      | 1.75            |              |      |      |        |   |
|   |                             | 4185R-M     | ●      | ●      | 1.85            |              |      |      |        |   |
|   |                             | 4200R-M     | ●      | ●      | 2.00            |              |      |      |        |   |
|   |                             | 4215R-M     | ●      | ●      | 2.15            |              |      |      |        |   |
|   |                             | 4230R-M     | ●      | ●      | 2.30            |              |      |      |        |   |
|   |                             | 4250R-M     | ●      | ●      | 2.50            | 4.0          | 0.30 |      |        |   |
|   |                             | 4265R-M     | ●      | ●      | 2.65            |              |      |      |        |   |
|   |                             | 4280R-M     | ●      | ●      | 2.80            |              |      |      |        |   |
|   |                             | 4300R-M     | ●      | ●      | 3.00            |              |      |      |        |   |
|   |                             | 4330R-M     | ●      | ●      | 3.30            | 5.0          | 0.40 |      |        |   |
|   |                             | 4350R-M     | ●      | ●      | 3.50            |              |      |      |        |   |
|   |                             | 4400R-M     | ●      | ●      | 4.00            |              |      |      |        |   |
|   |                             | 4430R-M     | ●      | ●      | 4.30            |              |      |      |        |   |
| 4450R-M   | ●                           | ●           | 4.50   |        |                 |              |      |      |        |   |
|  | <b>TB</b><br>(Neutral)      | 5050N-000-M |        | ●      | 0.50            | 1.0          | 0.00 | 4.50 | 15.875 |  |
|   |                             | 5050N-004-M |        | ●      |                 | 2.5          | 0.04 |      |        |   |
|   |                             | 5080N-000-M |        | ●      | 0.80            | 1.6          | 0.00 |      |        |   |
|   |                             | 5100N-006-M |        | ●      | 1.00            | 3.5          | 0.06 |      |        |   |
|   |                             | 5104N-000-M |        | ●      | 1.04            | 2.0          | 0.00 |      |        |   |
|   |                             | 5120N-000-M |        | ●      | 1.20            |              |      |      |        |   |
|   |                             | 5140N-000-M |        | ●      | 1.40            | 6.5          | 0.10 |      |        |   |
|   |                             | 5147N-000-M |        | ●      | 1.47            |              |      |      |        |   |
|   |                             | 5150N-010-M |        | ●      | 1.50            | 0.15         |      |      |        |   |
|   |                             | 5150N-015-M |        | ●      |                 |              |      |      |        |   |
|   |                             | 5157N-015-M |        | ●      | 1.57            | 0.10         |      |      |        |   |
|   |                             | 5170N-010-M |        | ●      | 1.70            |              |      |      |        |   |
|   |                             | 5178N-018-M |        | ●      | 1.78            | 0.18         |      |      |        |   |
|   |                             | 5196N-015-M |        | ●      | 1.96            | 0.15         |      |      |        |   |
|   |                             | 5200N-020-M |        | ●      | 2.00            | 0.20         |      |      |        |   |
|   |                             | 5222N-015-M |        | ●      | 2.22            | 0.15         |      |      |        |   |
|   |                             | 5230N-020-M |        | ●      | 2.30            |              |      |      |        |   |
|   |                             | 5239N-015-M |        | ●      | 2.39            | 0.20         |      |      |        |   |
|   |                             | 5247N-020-M |        | ●      | 2.47            |              |      |      |        |   |
|   |                             | 5250N-020-M |        | ●      | 2.50            | 0.10         |      |      |        |   |
|   |                             | 5270N-010-M |        | ●      | 2.70            |              |      |      |        |   |
|   |                             | 5287N-020-M |        | ●      | 2.87            | 0.20         |      |      |        |   |
|   |                             | 5300N-000-M |        | ●      | 3.00            | 0.00         |      |      |        |   |
|   |                             | 5300N-020-M |        | ●      |                 | 0.20         |      |      |        |   |
|   |                             | 5300N-040-M |        | ●      |                 | 0.40         |      |      |        |   |
|   |                             | 5315N-015-M |        | ●      | 3.15            | 0.15         |      |      |        |   |
| 5318N-020-M   |                             | ●           | 3.18   | 0.20   |                 |              |      |      |        |   |

● : Managed item

| Shape   | Designation                          |             | Cermet | Coated | Dimensions (mm) |              |      |      |        |   | Figure  |
|---|--------------------------------------|-------------|--------|--------|-----------------|--------------|------|------|--------|---|---|
|   |                                      |             | CN2000 | PC5300 | b               | g<br>(T-MAX) | r    | a°   | w      | d   |   |
|    | TB<br>(Neutral)                      | 5050N-004-P |        |        | 0.50            | 1.0          | 0.04 | -    | 4.50   | 15.875  |  |
|   |                                      | 5100N-010-P |        |        | 1.00            | 3.5          | 0.10 |      |        |   |   |
|   |                                      | 5150N-010-P |        |        | 1.50            | 6.5          | 0.20 |      |        |   |   |
|   |                                      | 5150N-020-P |        |        |                 |              | 0.10 |      |        |   |   |
|   |                                      | 5200N-010-P |        |        | 2.00            | 6.5          | 0.20 |      |        |   |   |
|   |                                      | 5200N-020-P |        |        |                 |              | 0.15 |      |        |   |   |
|   |                                      | 5239N-015-P |        |        | 2.39            | 6.5          | 0.20 |      |        |   |   |
|   |                                      | 5250N-020-P |        |        | 2.50            | 6.5          | 0.20 |      |        |   |   |
|   |                                      | 5300N-020-P |        |        | 3.00            | 6.5          | 0.20 |      |        |   |   |
|    | TB<br>(Neutral,<br>Right<br>cutting) | 5100R-6D-P  |        |        | 1.00            | 3.5          | 6    | 4.50 | 15.875 |   |   |
|   |                                      | 5100R-15D-P |        |        |                 |              | 15   |      |        |   |   |
|   |                                      | 5150R-6D-P  |        |        | 1.50            | 6.5          | 6    |      |        |   |   |
|   |                                      | 5150R-15D-P |        |        |                 |              | 15   |      |        |   |   |
|   |                                      | 5200R-6D-P  |        |        | 2.00            | 6.5          | 6    |      |        |   |   |
|   |                                      | 5200R-15D-P |        |        |                 |              | 15   |      |        |   |   |
|  | TB<br>(Neutral,<br>Left<br>cutting)  | 5100L-6D-P  |        |        | 1.00            | 3.5          | 6    | 4.50 | 15.875 |  |   |
|   |                                      | 5100L-15D-P |        |        |                 |              | 15   |      |        |   |   |
|   |                                      | 5150L-6D-P  |        |        | 1.50            | 6.5          | 6    |      |        |   |   |
|   |                                      | 5150L-15D-P |        |        |                 |              | 15   |      |        |   |   |
|   |                                      | 5200L-6D-P  |        |        | 2.00            | 6.5          | 6    |      |        |   |   |
|   |                                      | 5200L-15D-P |        |        |                 |              | 15   |      |        |   |   |
|  | TB<br>(Neutral,<br>Round<br>shape)   | 5157N-079-P |        |        | 1.57            | 6.5          | 0.79 | 4.50 | 15.875 |  |   |
|   |                                      | 5200N-100-P |        |        |                 |              | 1.00 |      |        |   |   |
|   |                                      | 5239N-120-P |        |        |                 |              | 1.20 |      |        |   |   |
|   |                                      | 5300N-150-P |        |        |                 |              | 1.50 |      |        |   |   |

● : Managed item



TB3000R/L  
TB4000R-M

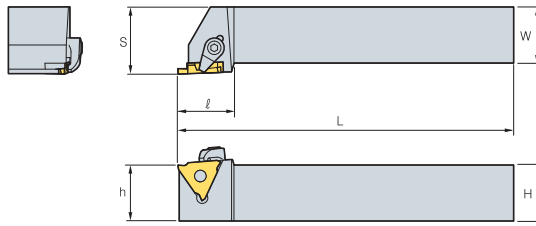
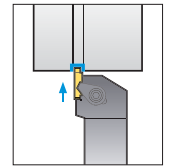
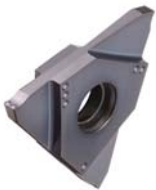


Fig. 1



This figure applies to right-hand



TB5000N-000-M

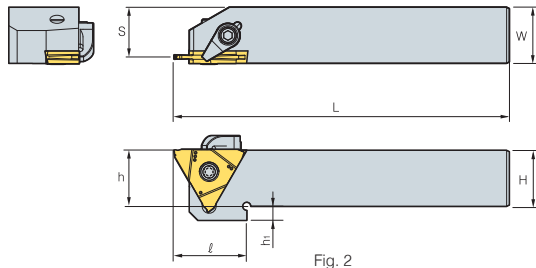


Fig. 2

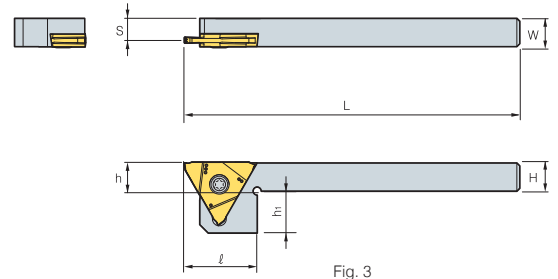


Fig. 3

(mm)

| Designation |           | H = (h) | W  | L   | ℓ    | h <sub>1</sub> | S    | Applicable insert | Clamp | Clamp screw | Screw    | Wrench         | Fig. |
|-------------|-----------|---------|----|-----|------|----------------|------|-------------------|-------|-------------|----------|----------------|------|
| TBH         | 320R/L-23 | 20      | 20 | 125 | 25.5 | -              | 25   | TB3125~3230R/L    |       |             |          |                | 1    |
|             | 320R/L-33 | 20      | 20 | 125 | 25.5 | -              | 25   | TB3280~3330R/L    |       |             |          |                |      |
|             | 320R/L-45 | 20      | 20 | 125 | 25.5 | -              | 25   | TB3430R/L         |       |             |          |                |      |
|             | 325R/L-23 | 25      | 25 | 150 | 25.5 | -              | 30   | TB3125~3230R/L    |       |             |          |                |      |
|             | 325R/L-33 | 25      | 25 | 150 | 25.5 | -              | 30   | TB3280~3330R/L    |       |             |          |                |      |
|             | 325R/L-45 | 25      | 25 | 150 | 25.5 | -              | 30   | TB3430R/L         |       |             |          |                |      |
|             | 420R/L-23 | 20      | 20 | 125 | 25.5 | -              | 25   | TB4125~4230R/L    |       |             |          |                |      |
|             | 420R/L-33 | 20      | 20 | 125 | 25.5 | -              | 25   | TB4250~4330R/L    |       |             |          |                |      |
|             | 420R/L-45 | 20      | 20 | 125 | 25.5 | -              | 25   | TB4350~4450R/L    |       |             |          |                |      |
|             | 425R/L-23 | 25      | 25 | 150 | 25.5 | -              | 30   | TB4125~4230R/L    |       |             |          |                |      |
|             | 425R/L-33 | 25      | 25 | 150 | 25.5 | -              | 30   | TB4250~4330R/L    |       |             |          |                |      |
|             | 425R/L-45 | 25      | 25 | 150 | 25.5 | -              | 30   | TB4350~4450R/L    |       |             |          |                |      |
| TBH         | 510R/L    | 10      | 10 | 125 | 25   | 15             | 7.8  | TB5050~5318N      | -     | -           | FTNA0512 | TW20L          | 3    |
|             | 512R/L    | 12      | 12 | 125 | 25   | 13             | 9.8  |                   |       |             |          |                |      |
|             | 516R/L    | 16      | 16 | 125 | 26   | 9              | 13.8 |                   |       |             |          |                |      |
|             | 520R/L    | 20      | 20 | 125 | 26   | 5              | 17.8 |                   |       |             |          |                |      |
|             | 525R/L    | 25      | 25 | 150 | -    | -              | 22.8 |                   |       |             |          |                |      |
|             |           |         |    |     |      |                |      |                   | CS6R1 | DHA0617     | FTNA0516 | HW30L<br>TW20L | 2    |



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