Large inserts for medium to heavy turning

THS & TUS Chipbreaker

The ultimate chipbreakers for medium to heavy steel turning!
Remarkable reliability in medium to heavy turning of steels!

For medium to heavy turning

THS chipbreaker
(Double sided)

Features

Exceptional chip control under a wide range of cutting conditions!!

Newly designed dimples on the insert corner

- Excellent chip control even when machining with a small depth of cut
- Suitable for machining with a fluctuating depth of cut

Optimum and tough cutting edge

- Improved fracture resistance
- Provides high strength and low cutting forces

Cutting performance

Heavy interrupted machining test

<table>
<thead>
<tr>
<th>Insert</th>
<th>CNMG190616-THS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work material</td>
<td>SCM440 / 42CrMo4</td>
</tr>
<tr>
<td>Diameter</td>
<td>ø250 mm x L480 mm with 4 slots</td>
</tr>
<tr>
<td>Cutting speed</td>
<td>Vc = 100 m/min</td>
</tr>
<tr>
<td>Depth of cut</td>
<td>ap = 4 mm</td>
</tr>
<tr>
<td>Feed</td>
<td>f = 0.5 mm/rev</td>
</tr>
<tr>
<td>Machining</td>
<td>Facing, heavy interrupted</td>
</tr>
<tr>
<td>Coolant</td>
<td>Dry</td>
</tr>
<tr>
<td>Machine</td>
<td>NC lathe</td>
</tr>
</tbody>
</table>

Chip control

<table>
<thead>
<tr>
<th>Depth of cut: ap (mm)</th>
<th>Feed: f (mm/rev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>0.3 0.4 0.6 0.8 1.0</td>
</tr>
</tbody>
</table>

Application range

<table>
<thead>
<tr>
<th>Depth of cut: ap (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 12 15 18 21 25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feed: f (mm/rev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 0.6 0.9 1.2 1.5</td>
</tr>
</tbody>
</table>
For heavy turning of steels

**TUS chipbreaker**
(Single sided)

**Features**

Extremely strong cutting edges prevent fractures!

Newly developed chipbreaker for heavy turning
- Uniquely designed protrusions
- Reduction of contact area with chips when machining large depths of cut

Optimum cutting edge design with incredible toughness
- Improved fracture resistance and reduced notch wear

**Cutting performance**

- **Heavy interrupted machining test**

  ![Graph showing heavy interrupted machining test results]

  **Chip control**

  - **Input**: CNMM190616-TUS
  - **Work material**: SCM440 / 42CrMo4 (250HB)
  - **Cutting speed**: Vc = 100 m/min
  - **Coolant**: Dry

**Application range**

- **Size**: 25 size
- **Feed**: f (mm/rev)

**Features**

- **For heavy turning of steels**
- **TUS chipbreaker** (Single sided)
- **Extremely strong cutting edges prevent fractures!**
- **Newly developed chipbreaker for heavy turning**
  - Uniquely designed protrusions
  - Reduction of contact area with chips when machining large depths of cut
- **Optimum cutting edge design with incredible toughness**
  - Improved fracture resistance and reduced notch wear

**Cutting performance**

- **Heavy interrupted machining test**

  ![Graph showing heavy interrupted machining test results]

  **Chip control**

  - **Input**: CNMM190616-TUS
  - **Work material**: SCM440 / 42CrMo4 (250HB)
  - **Cutting speed**: Vc = 100 m/min
  - **Coolant**: Dry

**Application range**

- **Size**: 25 size
- **Feed**: f (mm/rev)
Grade

T9115 and T9125

Extremely stable tool life!

Provides a high level of reliability with its excellent fracture resistance!

Special Surface Technology

- Smooth insert surface prevents chip adhesion and improves chip flow.
- Prevents randomly developed cracks, providing exceptional fracture resistance.
- This specialized treatment enhances the bond between the coating and the substrate.

<table>
<thead>
<tr>
<th>Application</th>
<th>Grade</th>
<th>Substrate</th>
<th>Coating layer</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application code</td>
<td>Specific gravity</td>
<td>Hardness (HRA)</td>
<td>Transverse rupture strength (GPa)</td>
<td>Main Composition</td>
</tr>
<tr>
<td>PREMIUMTEC</td>
<td>P10 - P20</td>
<td>13.9</td>
<td>91.0</td>
<td>2.5</td>
</tr>
<tr>
<td>PREMIUMTEC</td>
<td>P20 - P30</td>
<td>13.7</td>
<td>90.0</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Highly stable grade for steel turning
Special Surface Technology PremiumTec applied

T9115 demonstrates a good balance of wear and impact resistance. Applicable for continuous to light interrupted cutting.

T9125 demonstrates excellent chipping resistance. Applicable for medium to heavy cutting.

Standard cutting conditions

19 size

<table>
<thead>
<tr>
<th>Work materials</th>
<th>Chip-breaker</th>
<th>Grades</th>
<th>Cutting speed Vc (m/min)</th>
<th>Depth of cut ap (mm)</th>
<th>Feed: f (mm/rev)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.8  1.2  1.6  2.4  3.2</td>
<td></td>
</tr>
<tr>
<td>Steels S45C, SCM415 / C45, 15CrMo5 etc</td>
<td></td>
<td>T9115</td>
<td>220 (150 - 300)</td>
<td>5.0 (1.5 - 8.0)</td>
<td>0.35 (0.3 - 0.4) 0.5 (0.3 - 0.6) 0.6 (0.4 - 0.8) 0.7 (0.5 - 1.0) –</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9125</td>
<td>150 (80 - 200)</td>
<td>5.0 (0.3 - 0.6) 0.5 (0.3 - 0.6) 0.6 (0.4 - 0.8) 0.7 (0.5 - 1.0) –</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9115</td>
<td>220 (150 - 300)</td>
<td>6.0 (3.0 - 9.0)</td>
<td>0.5 (0.45 - 0.6) 0.6 (0.45 - 0.8) 0.8 (0.5 - 1.0) 1.0 (0.6 - 1.4) 1.1 (0.65 - 1.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9125</td>
<td>150 (80 - 200)</td>
<td>6.0 (0.45 - 0.6) 0.6 (0.45 - 0.8) 0.8 (0.5 - 1.0) 1.0 (0.6 - 1.4) 1.1 (0.65 - 1.5)</td>
<td></td>
</tr>
</tbody>
</table>

25 size

<table>
<thead>
<tr>
<th>Work materials</th>
<th>Chip-breaker</th>
<th>Grades</th>
<th>Cutting speed Vc (m/min)</th>
<th>Depth of cut ap (mm)</th>
<th>Feed: f (mm/rev)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6  2.4  3.2</td>
<td></td>
</tr>
<tr>
<td>Steels S45C, SCM415 / C45, 15CrMo5 etc</td>
<td></td>
<td>T9115</td>
<td>220 (150 - 300)</td>
<td>6.0 (1.5 - 11.0)</td>
<td>0.6 (0.4 - 0.8) 0.7 (0.5 - 1.0) –</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9125</td>
<td>150 (80 - 200)</td>
<td>6.0 (0.4 - 0.8) 0.7 (0.5 - 1.0) –</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9115</td>
<td>220 (150 - 300)</td>
<td>8.0 (3.0 - 12.0)</td>
<td>0.8 (0.55 - 1.1) 1.0 (0.6 - 1.4) 1.1 (0.65 - 1.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T9125</td>
<td>150 (80 - 200)</td>
<td>0.8 (0.55 - 1.1) 1.0 (0.6 - 1.4) 1.1 (0.65 - 1.5)</td>
<td></td>
</tr>
</tbody>
</table>
## Inserts Negative type

### Rhombic, 80°

<table>
<thead>
<tr>
<th>Application</th>
<th>Chipbreaker</th>
<th>$f - a_p$</th>
<th>Cat. No.</th>
<th>Stocked grades</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THS</strong></td>
<td><strong>Medium to heavy cutting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TUS</strong></td>
<td><strong>Heavy cutting (Single sided)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Square, 90°

<table>
<thead>
<tr>
<th>Application</th>
<th>Chipbreaker</th>
<th>$f - a_p$</th>
<th>Cat. No.</th>
<th>Stocked grades</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THS</strong></td>
<td><strong>Medium to heavy cutting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TUS</strong></td>
<td><strong>Heavy cutting (Single sided)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Chipbreaker cross sections are of the inserts marked *.  

•: Stocked items
## Practical examples

<table>
<thead>
<tr>
<th>Work piece type</th>
<th>Turbine disk (raw material)</th>
<th>Crankshaft (for marine engine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolholder</td>
<td>SNMG190616-THS</td>
<td>SNMM190616-TUS</td>
</tr>
<tr>
<td>Insert</td>
<td>T9125</td>
<td>T9125</td>
</tr>
<tr>
<td>Work material</td>
<td>SCM440 / 42CrMo4</td>
<td>SCM440 / 42CrMo4</td>
</tr>
<tr>
<td>Cutting speed: (V_c) (m/min)</td>
<td>60</td>
<td>160</td>
</tr>
<tr>
<td>Feed: (f) (mm/rev)</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Depth of cut: (a_p) (mm)</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Machining</td>
<td>External turning &amp; facing</td>
<td>Total 8 places (heavy interrupted)</td>
</tr>
<tr>
<td>Coolant</td>
<td>Wet</td>
<td>Wet</td>
</tr>
<tr>
<td>Results</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tungaloy Corporation</th>
</tr>
</thead>
</table>

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