Turning Insert Selection Guide

**Grades**

- **Fine Finishing to Finishing**
- **Finishing to Rough Cutting**

**Main Chipbreakers**

**Negative Type**

**Positive Type**

**Sub-Chipbreakers**

**Negative Type**

**Strong Edge Chipbreakers**

**Chipbreakers for Small Depths**

**Wiper Inserts**

**Chipbreakers for Heavy Cutting**
Representative Chipbreakers/Recommended Cutting Conditions

<table>
<thead>
<tr>
<th>Work Materials</th>
<th>Cutting Process</th>
<th>Chipbreakers</th>
<th>Grades</th>
<th>Cutting Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Depth of Cut $a_p$ (mm)</td>
</tr>
<tr>
<td>Soft Steel</td>
<td>Fine Finishing</td>
<td>FL</td>
<td>T1500Z</td>
<td>0.2 - 0.6</td>
</tr>
<tr>
<td></td>
<td>Finishing</td>
<td>LU</td>
<td>AC810P</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>GU</td>
<td>AC8025P</td>
<td>1.0 - 2.5</td>
</tr>
<tr>
<td></td>
<td>Rough</td>
<td>MU</td>
<td>AC830P</td>
<td>2.0 - 4.0</td>
</tr>
<tr>
<td>Medium Carbon Steel</td>
<td>Fine Finishing</td>
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</tr>
</tbody>
</table>

**GE Type for General Purpose**
Achieves high efficiency and longer tool life with reduced rake face wear.
Delivers stable chip control performance from shallow cutting depths onwards.

**GE Type Chip Control**
Work Material: SCM415 Cutting Conditions: $v_c=200$ m/min Dry

**Wear Resistance**
Work Material: SCM435 Cutting Conditions: $v_c=250$ m/min $f=0.4$ mm/rev $a_p=2.0$ mm

**Features of the High Efficiency Chipbreaker Series**

**Application Range**

**Characteristics**

Rake face profile relieves stress concentration with smooth chip evacuation.

Localised chip contact causes rake face/chipbreaker wear to progress.

Wide guide face ensures smooth chip flow to relieve stress concentration and reduce damage.
Representative Grades / Performance

**Grades**

<table>
<thead>
<tr>
<th>Grades</th>
<th>High Speed Cutting</th>
<th>General Purpose Cutting</th>
<th>Interrupted Cutting</th>
<th>Small Product Machining</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC810P</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AC8025P</td>
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<tr>
<td>AC830P</td>
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<tr>
<td>AC1030U</td>
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</tbody>
</table>

Covers a range of machining applications from high speed to interrupted cutting and small product machining.

**AC810P**

In addition to FF-TiCN, which has excellent peel-off and wear resistance, this grade features a tough, thick Alumina coating enhanced by newly developed grain growth control technology, excellent wear resistance and long tool life in high-speed, high-feed cutting.

**AC8025P**

Employs Absotech Platinum, a new CVD coating. This grade has excellent adhesion and chipping resistance thanks to a smooth surface treatment and reduction in tensile stress within the coating layer to achieve a stable, and long tool life.

**AC830P**

In addition to FF-TiCN, which has excellent peel-off and wear resistance, this grade features a strengthened FF-Al2O3 layer using new stress control technology, and moreover provides excellent reliability and wear resistance in heavy interrupted cutting to achieve long tool life.

**AC1030U**

Employs Absotech Bronze, a new PVD coating, and exclusive tough carbide substrate. This grade reduces adhesion and microchipping with a high-quality cutting edge to achieve excellent machined surface quality.

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**AC8025P Cutting Performance**

- **Wear Resistance (Medium-Speed \(v_c=200\text{m/min}\))**

  - **Excellent wear resistance in medium-speed cutting**

  ![Image of wear resistance](image1)

  **Work Material**: SCM435  
  **Insert**: CNMG120408N-SE  
  **Toolholder**: PCLNR2525M12  
  **Cutting Conditions**: \(v_c=200\text{m/min}\), \(f=0.2\text{mm/rev}\), \(a_p=1.5\text{mm}\), **Wet**

- **Adhesion and Chipping Resistance**

  - **Greatly improved adhesion and chipping resistance with an advanced coating and smooth surface treatment**

  ![Image of adhesion and chipping resistance](image2)

  **Work Material**: SCM415  
  **Insert**: CNMG120408N-GU  
  **Toolholder**: PCLNR2525M12  
  **Cutting Conditions**: \(v_c=200\text{m/min}\), \(f=0.3\text{mm/rev}\), \(a_p=1.5\text{mm}\), **Wet**
Representative Grades / Performance
Recommended Cutting Conditions

### Grades

**T1000A / T1500A / T1500Z**
- **T1000A**: A high hardness cermet that combines excellent wear resistance and toughness. Achieves high accuracy in continuous cutting of steel and finishing of powder metal and cast iron.
- **T1500A**: A general purpose cermet made from hard grains with different sizes and functions that provide good surface finish and a good balance of wear resistance and toughness.
- **T1500Z**: Employs the “Brilliant Coat” PVD coating with excellent lubricity to provide better wear resistance and stable surface finish in low-cutting-speed applications such as small product or low carbon steel machining.

### Performance

#### T1000A Performance

**Wear Resistance**
![Graph showing wear resistance performance for T1000A compared to Competitor’s Cermet.]

- Exhibits excellent wear resistance.

**Fracture Resistance**
![Graph showing fracture resistance performance for T1000A compared to Competitor’s Cermet.]

- Provides excellent fracture resistance.

#### T1500A Performance

**Wear Resistance**
![Graph showing wear resistance performance for T1500A compared to Competitor’s Cermet.]

- 1.5 times better wear resistance!

**Machined Surface Finish**
![Graph showing machined surface finish performance for T1500A compared to Competitor’s Cermet.]

- Beautiful glossy finished surfaces.

#### T1500Z Performance

**Wear Resistance**
![Graph showing wear resistance performance for T1500Z compared to Competitor’s Cermet.]

- Reduces cloudy finish.

**Machined Surface Finish**
![Graph showing machined surface finish performance for T1500Z compared to Competitor’s Cermet.]

- Beautiful finished surfaces even at lower cutting speeds.

### Recommended Cutting Conditions

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Soft Steel (SS41 and others)</td>
<td>Fine Finishing</td>
<td>FA/FL</td>
<td>T1500Z</td>
<td>Depth of Cut (a_{p}(\text{mm})): 0.2 - 0.5</td>
<td>100 - 200 - 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T3000Z</td>
<td>Feed Rate (f) (\text{mm/rev}) 0.05 - 0.15</td>
<td>150 - 200 - 400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LU</td>
<td></td>
<td>Cutting Speed (v_c) (m/min): 150 - 300</td>
<td></td>
</tr>
<tr>
<td>Alloy Steel Carbon Steel (S45C, SCM435, and others)</td>
<td>Fine Finishing</td>
<td>FA/FL</td>
<td>T1500A</td>
<td>Depth of Cut (a_{p}(\text{mm})): 0.2 - 0.5</td>
<td>100 - 200 - 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T1500A</td>
<td>Feed Rate (f) (\text{mm/rev}) 0.05 - 0.15</td>
<td>150 - 200 - 400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SU/SE</td>
<td></td>
<td>Cutting Speed (v_c) (m/min): 150 - 300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>GU</td>
<td>T1500Z</td>
<td>Depth of Cut (a_{p}(\text{mm})): 0.8 - 2.2</td>
<td>50 - 150 - 250</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>GU</td>
<td>T1500Z</td>
<td>Feed Rate (f) (\text{mm/rev}) 0.15 - 0.25</td>
<td>50 - 150 - 250</td>
</tr>
</tbody>
</table>

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**Note:** A11