<table>
<thead>
<tr>
<th>Insert Cat. No.</th>
<th>TME4400</th>
<th>TGD4400-A</th>
<th>AEME4400</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMD4400I</td>
<td></td>
<td>AEMD4303RI-S</td>
<td></td>
</tr>
<tr>
<td>ASMT170508PDPR-MJ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EGTD4000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMD4400I</td>
<td></td>
<td>AEMD4303RI-S</td>
<td></td>
</tr>
<tr>
<td>ASMT170508PDPR-MJ</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**New Highly Tough Cermet for Milling**

**NS740**

Highly Impact Resistant Grade for Excellent Surface Finish

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**Tungaloy Klongtonnue**, Watthana Bangkok 10110, Thailand
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New Highly Tough Cermet for Milling

**NS740**

Applicable for a Wide Range of Work Materials from General Steels to Die Steels.

**Skeleton-Reinforced Cermet**

Improved bonding between ceramic grains which form the skeleton of cermet

- High toughness
- Improved impact resistance
- Stable machining
- Can increase feed per tooth
- Full lineup of corner-reinforced (CR-type) inserts
- Increased machining efficiency

**Reduced machining costs**

**The secret of high toughness of skeleton-reinforced cermet NS740**

- Improved bonding between ceramic grains which form the skeleton of cermet
- High toughness
- Improved impact resistance
- Reduced machining costs
- Improved tool life
- Increased machining efficiency

**Conventional cermet NS740**

- Improved bonding between ceramic grains which form the skeleton of cermet
- High toughness
- Improved impact resistance
- Reduced machining costs
- Improved tool life
- Increased machining efficiency

**Comparison of finished surfaces**

<table>
<thead>
<tr>
<th>Machined length before breakage L (m)</th>
<th>Conventional cermet</th>
<th>NS740</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>0.67</td>
<td>2.58</td>
</tr>
<tr>
<td>1.5</td>
<td>1.08</td>
<td>2.58</td>
</tr>
<tr>
<td>2.0</td>
<td>1.51</td>
<td>2.58</td>
</tr>
<tr>
<td>2.5</td>
<td>1.93</td>
<td>2.58</td>
</tr>
<tr>
<td>3.0</td>
<td>2.35</td>
<td>2.58</td>
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<tr>
<td>3.5</td>
<td>2.77</td>
<td>2.58</td>
</tr>
<tr>
<td>4.0</td>
<td>3.19</td>
<td>2.58</td>
</tr>
<tr>
<td>4.5</td>
<td>3.61</td>
<td>2.58</td>
</tr>
<tr>
<td>5.0</td>
<td>4.03</td>
<td>2.58</td>
</tr>
</tbody>
</table>

**Comparison of tool failure**

<table>
<thead>
<tr>
<th>Machined length before breakage L (m)</th>
<th>Conventional cermet</th>
<th>NS740</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Broken</td>
<td></td>
</tr>
<tr>
<td>900</td>
<td>Broken</td>
<td></td>
</tr>
</tbody>
</table>

**Results**

Although the workpiece has many holes on the surface, NS740 insert produced superior surface finish without insert breakage compared with competitor's cermet.

Compared with conventional coated grades, NS740 insert produced improved surface finish and reduced cutting forces.

**NS740 Practical example**

- **Work material:** Carbon steel (JIS S45C)
- **Tool:** EPS11025RS (3 teeth)
- **Insert:** ASMT11T304PDPR-MJ (NS740)
- **Cutting conditions:**
  - Cutting speed $V_c = 120$ m/min
  - Depth of cut $ap = 3$ mm
  - Cutting width $ae = 5$ mm
  - Feed per tooth $f_z = 0.15$ mm/t
- **Cutting fluid:** Dry

**Results**

Reduced machining costs and improved tool life compared with competitor's cermet.
New Highly Tough Cermet for Milling

NS740

Applicable for a Wide Range of Work Materials from General Steels to Die Steels.

**Skeleton-Reinforced Cermet**

- Improved bonding between ceramic grains which form the skeleton of cermet
- High toughness & Improved impact resistance
- Stable machining
- Can increase feed per tooth
- Full lineup of corner-reinforced (CR-type) inserts
- Improved tool life
- Increased machining efficiency
- Reduced machining costs

**The secret of high toughness of skeleton-reinforced cermet NS740**

**Comparison of tool failure**

- Reduced machining costs
- Improved tool life
- Increased machining efficiency

**NS740 Practical example**

- Work material: Carbon steel (JIS S45C)
- Tool: EPS11025RS (3 teeth)
- Insert: ASMT11T304PDPR-MJ (NS740)
- Cutting conditions:
  - Cutting speed: $V_c = 120$ m/min
  - Depth of cut: $a_p = 3$ mm
  - Cutting width: $a_e = 5$ mm
  - Feed per tooth: $f_z = 0.15$ mm/t
- Cutting fluid: Dry

**Results**

- Compared with conventional coated grades, NS740 insert produced improved surface finish and reduced cutting forces.
New Highly Tough Cermet for Milling

**NS740**

Applicable for a Wide Range of Work Materials from General Steels to Die Steels.

**Skeleton-Reinforced Cermet**

- Improved bonding between ceramic grains which form the skeleton of cermet
- Stable machining
- Increased tool life
- Improved toughness
- Improved impact resistance
- Can increase feed per tooth
- Full lineup of corner-reinforced (CR-type) inserts

**Reduced machining costs**

**The secret of high toughness of skeleton-reinforced cermet NS740**

- Improved bonding between ceramic grains and Co, Ni phase
- Stable machining
- Increased tool life
- Improved impact resistance
- Reduced machining costs
- Can increase feed per tooth
- Improved tool life
- Increased machining efficiency

**Comparison of finished surfaces**

<table>
<thead>
<tr>
<th>Workpiece</th>
<th>Surface Roughness Rz (μm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS740</td>
<td>0.67</td>
</tr>
<tr>
<td>Conventional Tungsten grade</td>
<td>2.58</td>
</tr>
<tr>
<td>Competitor A</td>
<td>3.5</td>
</tr>
<tr>
<td>Competitor B</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Machined length before breakage**

<table>
<thead>
<tr>
<th>Workpiece</th>
<th>Length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS740</td>
<td>105</td>
</tr>
<tr>
<td>Conventional cermet</td>
<td>160</td>
</tr>
</tbody>
</table>

**NS740 Practical example**

- **Work material**: Mild steel (JIS SS400)
- **Tool**: TME4410RI (12 teeth)
- **Insert**: SEEN1203AGTNCR-14
- **Cutting conditions**:
  - Cutting speed: \( V_c = 200 \text{ m/min} \)
  - Depth of cut: \( a_p = 1.5 \text{ mm} \)
  - Feed per tooth: \( f_z = 0.15 \text{ mm/t} \)
- **Cutting fluid**: Dry

**Results**

Although the workpiece has many holes on the surface, NS740 insert produced superior surface finish without insert breakage compared with competitor's cermet.

Compared with conventional coated grades, NS740 insert produced improved surface finish and reduced cutting forces.

**NS740 Practical example**

- **Work material**: Carbon steel (JIS S45C)
- **Tool**: EPS11025RS (3 teeth)
- **Insert**: ASMT11T304PDPR-MJ (NS740)
- **Cutting conditions**:
  - Cutting speed: \( V_c = 120 \text{ m/min} \)
  - Depth of cut: \( a_p = 3 \text{ mm} \)
  - Cutting width: \( a_e = 5 \text{ mm} \)
  - Feed per tooth: \( f_z = 0.15 \text{ mm/t} \)
- **Cutting fluid**: Dry

**Results**

NS740 coated cemented carbide grade is applicable for a wide range of work materials from general steels to die steels.
<table>
<thead>
<tr>
<th>Stocked Grade</th>
<th>NS740</th>
</tr>
</thead>
</table>

**Highly Impact-Resistant Grade for Excellent Surface Finish**

**New Highly Tough Cermet for Milling**

Keeping the Customer First
Keeping the Customer First

New Highly Tough Cermet for Milling

NS740

Highly Impact Resistant Grade for Excellent Surface Finish

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Tungaloy, a global company operating in 40 different countries and regions, is the leading supplier of precision carbide and high performance tooling. Tungaloy Europe, established in 1954, has been providing cutting tools with cutting edge technology and solutions to the European market. Tungaloy America, Inc. was established in 1969 and has been leading the American market with new technology and solutions. Tungaloy Singapore (Pte.), Ltd. was established in 1990 and has been providing cutting tools to the Asian market.

Tungaloy’s new highly tough cermet for milling, NS740, is designed for demanding applications where high toughness and excellent surface finish are required. NS740 features a highly impact resistant grade that allows it to withstand tough cutting conditions while maintaining a smooth surface finish. It is ISO 9001 certified and is suitable for use in the automotive, aerospace, and heavy machinery industries.

Specifications:
- Name: NS740
- Description: Highly tough cermet for milling
- Features:
  - Highly impact resistant grade
  - Excellent surface finish
- Applications:
  - Automotive
  - Aerospace
  - Heavy machinery
- Industry: Machining tools
- Certification: ISO 9001
- Manufacturer: Tungaloy Corporation

For more information, please contact Tungaloy Europe or Tungaloy America, Inc.