BALINIT HARD CARBON
For a sharp cut
Highly productive machining in non-ferrous metals
When machining nonferrous metals, this formula applies: The sharper the edge and the smoother the surface, the more efficient and successful the manufacturing process. You can reliably attain this goal with BALINIT® HARD CARBON by Oerlikon Balzers, a technology leader in hard coatings. BALINIT® HARD CARBON lets you tap into unique advantages that make the difference.

### OPTIMIZED PERFORMANCE

<table>
<thead>
<tr>
<th>High coating hardness</th>
<th>Protection against abrasive wear results in longer tool lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smooth coating surface with consistently sharp tool edges, for micro tools as well</td>
<td>Protection against adhesive wear and improved tool surface quality lead to reduced tooling costs</td>
</tr>
<tr>
<td>High thermal stability with a maximum application temperature of 500 °C</td>
<td>MQL and dry machining possible</td>
</tr>
<tr>
<td>Low coefficient of friction due to reduced roughness</td>
<td>Improved capacity utilisation</td>
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<tr>
<td></td>
<td>Reduced production costs</td>
</tr>
<tr>
<td></td>
<td>Low torques</td>
</tr>
<tr>
<td></td>
<td>Low tendency to adhesion</td>
</tr>
</tbody>
</table>

### BALINIT® HARD CARBON

Increased productivity, reliability and process stability

### Application recommendations

**Drilling, milling, countersinking**

- Aluminium and aluminium alloys with up to 12% Si
- Copper, bronze, silver, gold, platinum
- Composites such as CFRP and GFRP
- Organic materials such as wood, paper
Considerable performance gain when milling non-ferrous metals

**BALINIT® HARD CARBON for carbide end mills**

<table>
<thead>
<tr>
<th>Tool</th>
<th>Carbide end mill</th>
<th>Carbide end mill Ø 8 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workpiece</td>
<td>HDD aluminium alloy baseplate (ADC12) (AlSi 12Cu)</td>
<td>AI-ABS-Pc GF 20 Sandwich</td>
</tr>
<tr>
<td>Cutting data</td>
<td>$v_c = 5,000$ rpm Cooling</td>
<td>$n = 40,000$ U/min $v_f = 2.4$ m/min</td>
</tr>
<tr>
<td>Challenge</td>
<td>Untreated: Premature abrasive wear</td>
<td>Untreated: Premature abrasive wear</td>
</tr>
<tr>
<td>The solution</td>
<td>BALINIT® HARD CARBON</td>
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<tr>
<td></td>
<td>- Less abrasive wear</td>
<td>- Less abrasive and adhesive wear</td>
</tr>
<tr>
<td></td>
<td>- 95% more parts produced</td>
<td>- Tool costs over 85% lower versus PCD</td>
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<td></td>
<td>- Production costs 55% lower</td>
<td>- 85% lower tool costs compared to PCD</td>
</tr>
<tr>
<td>Source</td>
<td>End-user Malaysia</td>
<td>Tool manufacturer Germany</td>
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**Tool**
- Carbide end mill
  - Ø 8 mm

**Workpiece**
- HDD aluminium alloy baseplate (ADC12) (AlSi 12Cu)
- AI-ABS-Pc GF 20 Sandwich

**Cutting data**
- $v_c = 5,000$ rpm Cooling
- $n = 40,000$ U/min $v_f = 2.4$ m/min

**Challenge**
- Untreated: Premature abrasive wear
- Untreated: Premature abrasive wear with additional edge build-up

**The solution**
- BALINIT® HARD CARBON
  - Less abrasive wear
  - 95% more parts produced
  - Production costs 55% lower
- BALINIT® HARD CARBON
  - Less abrasive and adhesive wear
  - Tool costs over 85% lower versus PCD

**Source**
- End-user Malaysia
- Tool manufacturer Germany

**BALINIT® HARD CARBON for carbide contour mills**

<table>
<thead>
<tr>
<th>Tool</th>
<th>Carbide end mill 10 x 12</th>
</tr>
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<tbody>
<tr>
<td>Workpiece</td>
<td>Brass 2.0321 (CuZn37)</td>
</tr>
<tr>
<td>Cutting data</td>
<td>Dry machining</td>
</tr>
<tr>
<td></td>
<td>$v_c = 150$ m/min $f = 0.2$ mm/rev</td>
</tr>
<tr>
<td>Challenge</td>
<td>Untreated: Premature abrasive wear with additional edge build-up</td>
</tr>
<tr>
<td>The solution</td>
<td>BALINIT® HARD CARBON</td>
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<tr>
<td></td>
<td>- Less abrasive and adhesive wear</td>
</tr>
<tr>
<td></td>
<td>- Longer tool service life in dry machining</td>
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<td></td>
<td>- 100% more parts produced</td>
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<tr>
<td>Source</td>
<td>End-user</td>
</tr>
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**Tool**
- Carbide end mill 10 x 12

**Workpiece**
- Brass 2.0321 (CuZn37)

**Cutting data**
- Dry machining
- $v_c = 150$ m/min $f = 0.2$ mm/rev

**Challenge**
- Untreated: Premature abrasive wear with additional edge build-up

**The solution**
- BALINIT® HARD CARBON
  - Less abrasive and adhesive wear
  - Longer tool service life in dry machining
  - 100% more parts produced

**Source**
- End-user
Counter sinking of sandwich material, CFRP/Thermoplastics

**BALINIT® HARD CARBON** for counter sinks

<table>
<thead>
<tr>
<th>No. of parts produced [pieces]</th>
<th>Tool</th>
<th>Counter sink 11 x 22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncoated</td>
<td>Workpiece</td>
<td>CFRP + Thermoplastics</td>
</tr>
<tr>
<td></td>
<td>Cutting data</td>
<td>Dry machining</td>
</tr>
<tr>
<td></td>
<td>Challenge</td>
<td>- Build-up edges due to thermoplastics - Abrasive wear and delamination of CFRP</td>
</tr>
<tr>
<td></td>
<td>The solution</td>
<td>BALINIT® HARD CARBON - Less abrasive and adhesive wear - Longer tool life</td>
</tr>
</tbody>
</table>

180% more parts produced

When machining nonferrous metals, take advantage of BALINIT HARD CARBON
Contact us now!

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