BALINIT TURBINE PRO
Coatings that protect your turbine components to improve flight safety and fuel efficiency
Serious damages to turbine components caused by corrosion and erosion generates substantial high repair costs and costly downtime. BALINIT® TURBINE PRO provides excellent surface protection against solid particle erosion (SPE) and liquid drop erosion (LDE) without affecting your components’ fatigue life.

This hard, dense PVD coating offers maximum lifetime erosion resistance using Oerlikon Balzers’ latest technology. BALINIT® TURBINE PRO uses dense ceramic nitride structures; this results in an optimal relation of the highest hardness to residual compressive stress. Tests have shown that BALINIT® TURBINE PRO exceeds other tested coatings for erosion resistance.

At Oerlikon Balzers, we have the expertise and knowledge that allows our coatings to be fully tailor-made to meet our customers’ requirements for erosion, oxidation and not corrosion protection. With over a 110 coating centres worldwide in 36 countries, Oerlikon Balzers surface solutions are designed to bring our coating performance closer to you.

The advantages of using BALINIT TURBINE PRO

- BALINIT® TURBINE PRO provides:  
  - Minimal fatigue debit of original finished component material  
  - A low surface roughness to improve gas flow efficiency  
  - PVD coatings are especially suitable for flight critical components due to the coating uniformity and the repeatability of the process  
  - Surface finishes achievable < 0.1 Ra µm  
  - Coating thickness can be optimised to keep uniformity of your part  
  - Oerlikon Balzers’ solutions offer environmentally friendly coating technologies that reduce operating costs, extend service intervals and protect valuable components from all types of wear  
  - BALINIT® TURBINE PRO is:  
    - 40 x more erosion resistant than steel  
    - 5 x more erosion resistant than other PVD coating solutions

<table>
<thead>
<tr>
<th>Coating material</th>
<th>BALINIT TURBINE PRO</th>
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<tbody>
<tr>
<td>MeAlN</td>
<td>MeAlN</td>
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<tr>
<td>Coating hardness</td>
<td>H, 32 ± 2 GPa</td>
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<tr>
<td>Typical coating</td>
<td>thickness (µm)</td>
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<tr>
<td>Friction against</td>
<td>steel, dry running</td>
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<tr>
<td>Coating temperature</td>
<td>&lt; 500° C / &lt; 932° F</td>
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<tr>
<td>Long term temperature stability</td>
<td>700°C / 1282°F</td>
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<tr>
<td>Typical substrates</td>
<td>Inconel, titanium and steels</td>
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<tr>
<td>Colour</td>
<td>Violet-grey</td>
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</tbody>
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Applications of BALINIT TURBINE PRO

BALINIT TURBINE PRO is used on aircraft low pressure and high pressure compressors as well as on helicopter axial compressors and impellers.

The BALINIT® TURBINE PRO family of coatings can be applied to large sized blades and produces excellent mirror surface finishes down to < 0.1 Ra µm (< 4 Ra µin).

The below test results demonstrate that BALINIT® TURBINE PRO coated material does not decrease the fatigue life using a rotating beam fatigue test.

Test parameters

- Rotating beam bending test
  - Temperature: Ambient temperature
  - Frequency: 100 Hz
  - Reverse stress cycle: R = -1

Results (Figure 1)

- Mass Loss (mg/g sand)
- 1.4313 Stainless Steel Ti6Al4IN718
- Uncoated 20°
- Uncoated 90°
- Typical Aluminum Slurry coating 20°
- BALINIT TURBINE PRO 20°
- BALINIT TURBINE PRO 90°

High cycle fatigue test specimen

BALINIT TURBINE PRO demonstrates minimal erosion in tough conditions

Figure 1 shows the erosion resistance for BALINIT® TURBINE PRO compared to other materials and coatings, at different angles of incidence.
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Benefit from the BALINIT TURBINE PRO coating solutions
Contact us now!

You can find a full listing of our locations at:
www.oerlikon.com/balzers