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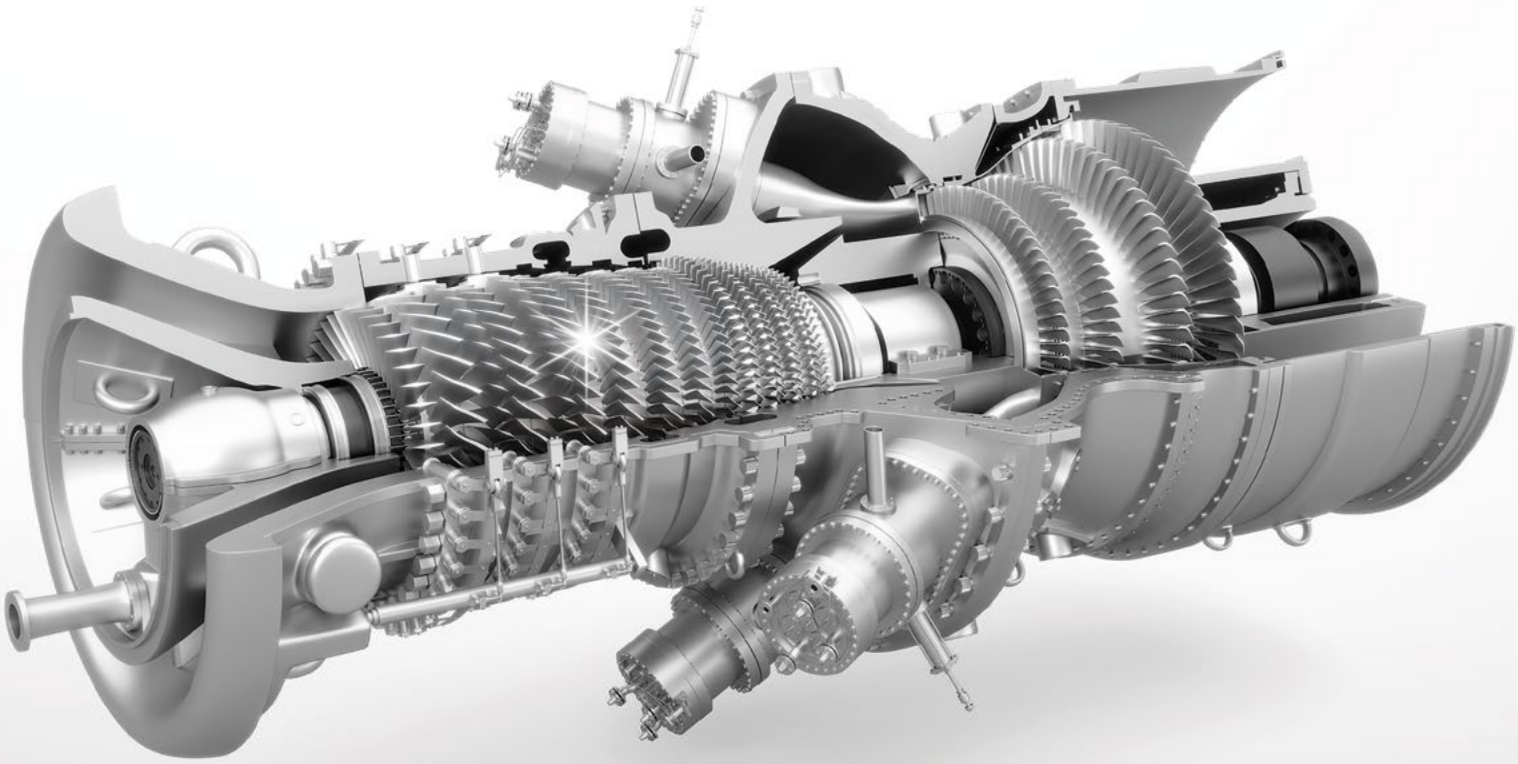
BALINIT PROTEC

REACH-compliant coating for enhanced protection on industrial gas turbine compressors



Power Generation

BALINIT PROTEC – an enhanced REACH-compliant corrosion protection coating

Solid Particle Erosion (SPE), Water Droplet Erosion (WDE) and corrosion are key challenges that considerably influence the performance of industrial gas turbine compressors. The resulting deficiencies in material degradation should not be underestimated, as with the decreasing of efficiency of the industrial gas turbine, performance is compromised.

BALINIT® PROTEC by Oerlikon Balzers is a REACH-compliant coating, especially developed to protect industrial gas turbine compressors from corrosion and erosion. Moreover, this new revolutionary PVD coating can substantially improve the efficiency of compressors.

Corrosion resistance and efficiency improvements based on a REACH-compliant coating solution

As a global leader of surface solutions with nearly 75 years of experience through close partnership with our customers, Oerlikon Balzers turns your costly asset into a long-term investment with the right REACH-compliant PVD coating solution perfectly tailored to your needs – BALINIT® PROTEC.

OPTIMISED PERFORMANCE

EU REACH-compliant REACH compliant	**BALINIT® PROTEC does not use the toxic and hazardous hexavalent Cr-VI**
Reduction of cavitation from Water Droplet Erosion (WDE) caused by fogging and wet compression systems	**Increased asset life and compressor protection**
Enhanced protection from Solid Particle Erosion (SPE)	**Outperforms the current industry standard galvanic sacrificial coatings**
Superior surface finish	**Improved efficiency with standard surface smoothness of Ra < 0.8 µm** **Surface finish can be further enhanced by post polishing**
Increased corrosion protection on gas turbine compressors	**Has passed the ASTM B117 salt fog and OEM sulphur tests**

BALINIT PROTEC
Advanced REACH-compliant protection with a NEW PVD corrosion resistant coating

Coating properties at a glance

	Coating colour	Coating hardness H_{IT} (GPa)	Indentation modulus E_{IT} (GPa)	Typical coating thickness (µm)	Coating application temperature (°C)	Max. service temperature (°C)
BALINIT® PROTEC	grey	20 +/-1	262 +/- 9	5 – 25	< 500*	1000

* Coating application temperature tailored to meet substrate material requirements
All given data are approximate values and dependent on application, environment and test conditions.

BALINIT PROTEC in comparison with other solutions

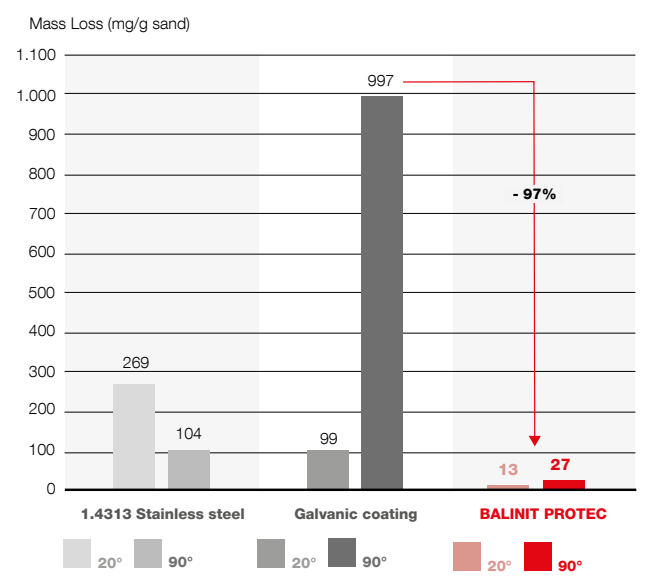
BALINIT PROTEC demonstrates minimal Solid Particle Erosion (SPE) mass loss

Figure 1 shows the mass loss for BALINIT® PROTEC at 20° and 90° angles when compared to uncoated stainless steel and standard galvanic coatings.

Test parameters

Solid Particle Erosion (SPE)	Parameters
Impingement angle	20° and 90°
Abrasive material	White Corundum Al_2O_3
Distance nozzle-sample	90 mm (3.5 in)
Particle size	F 240 (~50 µm)
Estimated particle speed	90 m/s
Abrasive feed rate	~350 g/min (ASTM G76 standard only ~2 g/min)
Test duration	300 sec
Benefit	**Extended coating life**

Results (Figure 1)



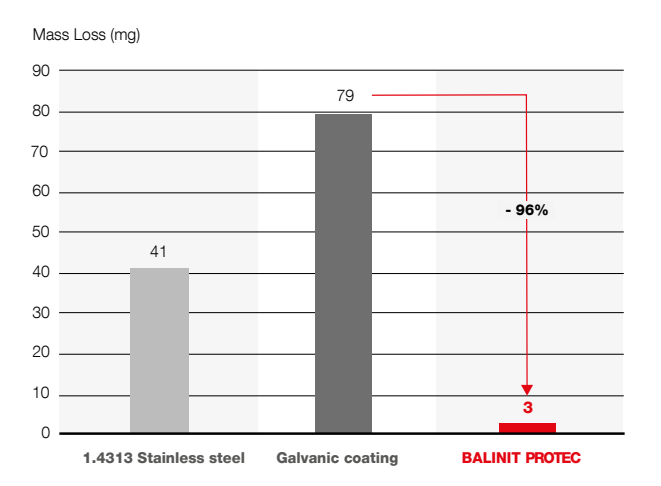
BALINIT PROTEC demonstrates minimal Water Droplet Erosion (WDE) mass loss

Figure 2 shows mass loss for BALINIT® PROTEC when compared to uncoated stainless steel and galvanic coatings.

Test parameters

Water Droplet Erosion (WDE)	Parameters
Water temperature	~25°C
Frequency	20 kHz
Peak-to-peak amplitude	50 µm
Test duration	20 hrs
Benefit	**Advanced protection for power augmentation systems**

Results (Figure 2)



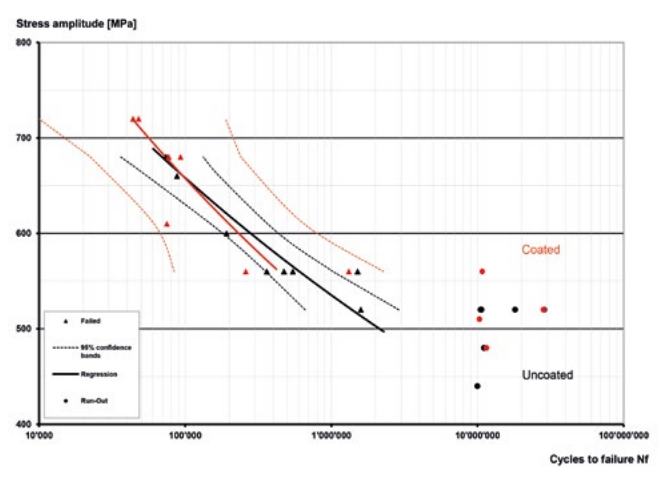
BALINIT PROTEC does not degradate High Cycle Fatigue (HCF) life

Figure 3 shows that BALINIT® PROTEC coated substrates compared with uncoated stainless steel substrates do not decrease the fatigue life using a rotating beam fatigue test.

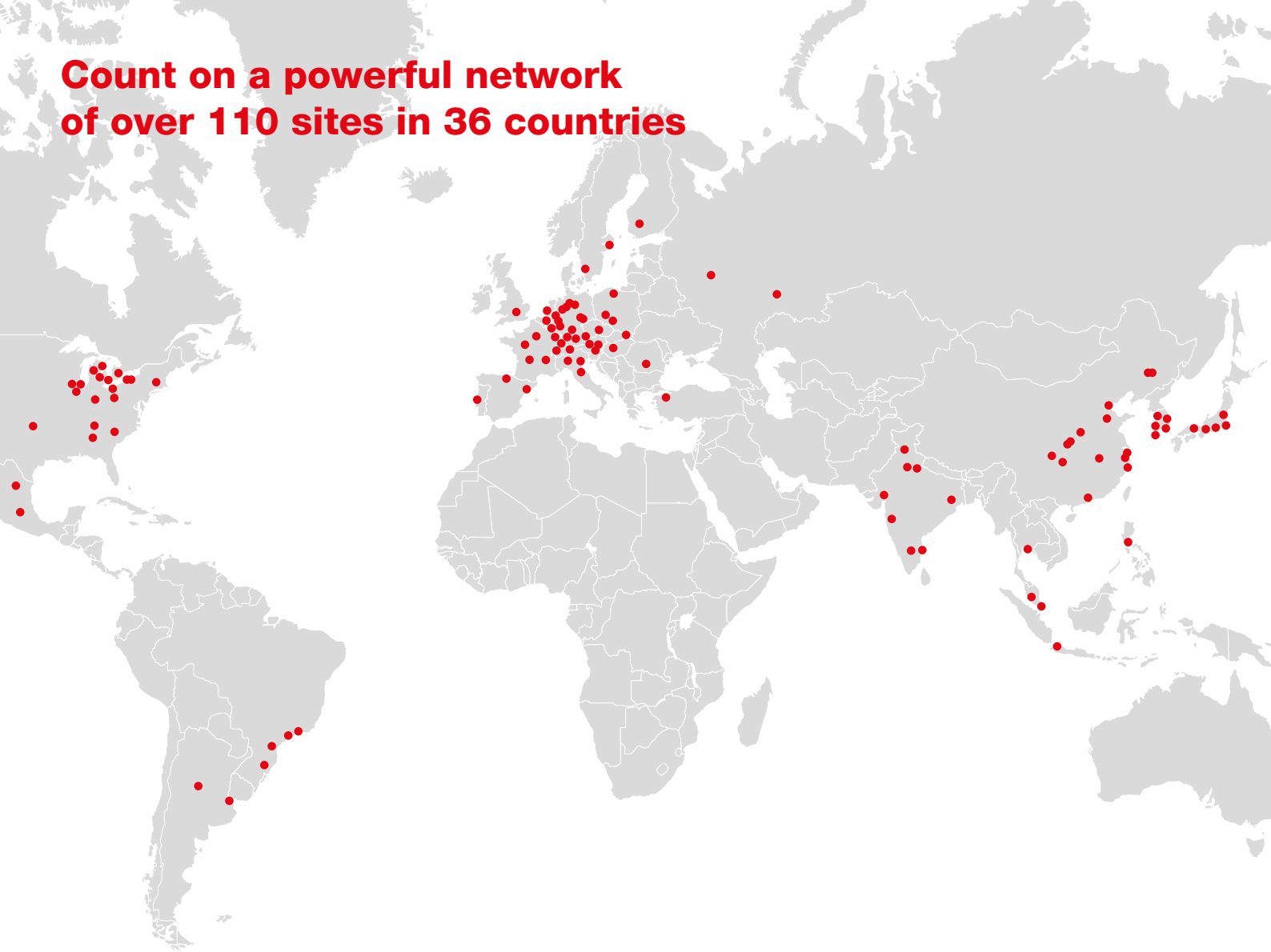
Test parameters

Rotating beam bending test	Parameters
Temperature	Ambient temperature
Frequency	100 Hz
Reverse stress cycle	R = -1
Benefit	**Asset life extension**

Results (Figure 3)



Count on a powerful network of over 110 sites in 36 countries



Open a new world of possibilities with BALINIT PROTEC
Get in touch with us today!

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