

# **BALINIT TISAFLEX**

## **Machining difficult-to-cut materials at the highest level**

Tailored coating properties for demanding machining applications



**Cutting Tools**



# BALINIT TISAFLEX: superior thermal stability and resistance to oxidation and wear

Machining difficult-to-cut materials such as titanium, nickel-based alloys and stainless and hardened steel, which are being used more and more in the aerospace, 3C (Computers, Communications and Consumer electronics) and mould-making industries, pushes

cutting tools to the limits of their performance. BALINIT® TISAFLEX from Oerlikon Balzers is a high-end coating solution that offers superior oxidation resistance, high thermal stability and exceptional wear resistance, making it perfect for machining these challenging materials.

## Top coating properties lead to excellent results

### OPTIMISED PERFORMANCE

Optimised layer structure with tailored mechanical properties of each layer



**AlTiN based layer offers high degree of ductility**  
**TiSiXN layer makes BALINIT® TISAFLEX hard and resistant to oxidation and wear**

Defined stress profile



**Reduced crack formation and improved resistance to chipping**

Superior heat resistance of BALINIT® TISAFLEX



**The coated tool can sustain high temperatures at the cutting edge**

Tailored combination of the coating structure and properties



**Significant reduction of adhesive wear resulting in extended tool life**

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## Application recommendations

### ■ Operations such as

- Finishing with end mills
- Roughing with end mills
- Finishing using inserts
- Drills

### ■ Materials

Materials leading to the formation of the built-up edge effect causing adhesive wear:

- Stainless steel
- Nickel-based alloys
- Titanium-based alloys
- Hardened steel

The superior properties of BALINIT® TISAFLEX make it the best coating solution for ambitious machining applications in:

#### Aerospace



#### 3C Industry



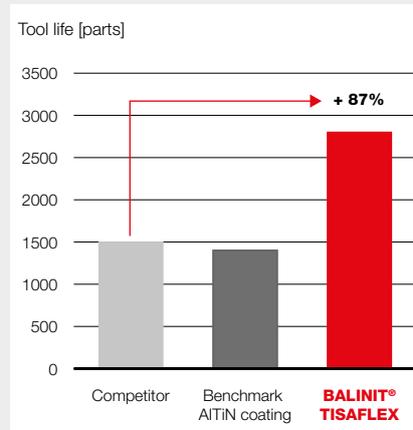
#### Mold making



# BALINIT TISAFLEX: maximum performance for machining difficult-to-cut materials



## Milling stainless steel



### Tool

End mill Ø 4mm

### Workpiece

Steel 1.4401, X2CrNiMo1712 (AISI 316L, SUS 316L)

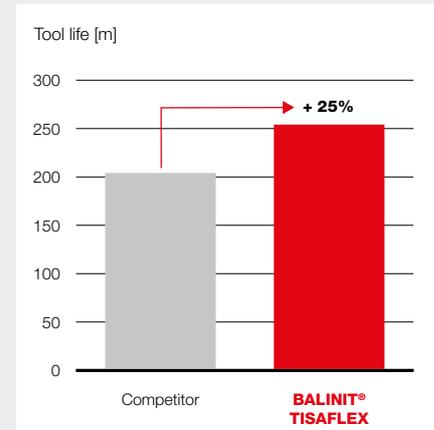
### Cutting parameters

$v_c = 125$  m/min  
 $f_t = 0.05$  mm  
 $a_p = 0.15$  mm  
 $a_e = 0.03$  mm  
 Oil cooling

### Source/ Customer

Tool manufacturer

## Milling hardened steel



End mill Ø 10 mm

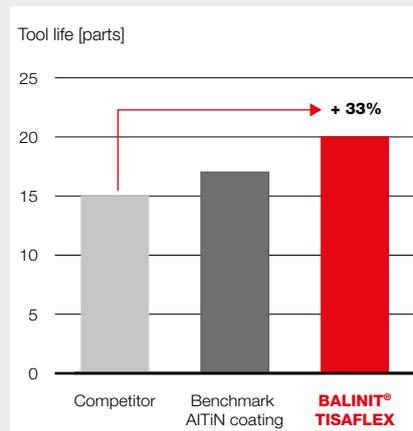
Steel 1.2344, X40CrMoV5-1 (AISI H13, JIS SKD61) 45 HRC

$v_c = 220$  m/min  
 $f_t = 0.10$  mm/tooth  
 $a_p = 10.0$  mm  
 $a_e = 0.5$  mm  
 Wet

Oerlikon Balzers cutting laboratory



## Machining aerospace components



### Tool

Chamfer cutter Ø 12 mm

### Workpiece

Nickel alloy 2.4650, NiCo20Cr20MoT (UNS N07263, NIMONIC® C-263)

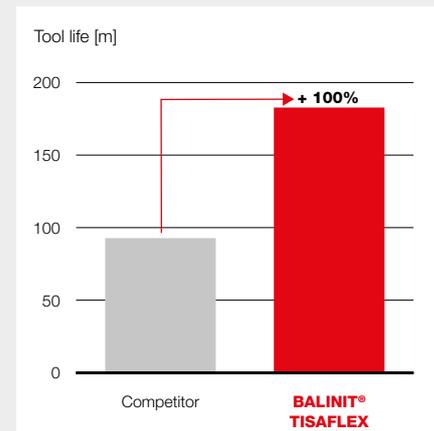
### Cutting parameters

$v_c = 64$  m/min  
 $f_t = 0.05$  mm/tooth

### Source/ Customer

Manufacturer of aerospace components

## Milling nickel-based alloy



End mill Ø 16 mm

Nickel alloy 2.4650, NiCo20Cr20MoT (UNS N07263, NIMONIC® C-263)

$v_c = 45$  m/min  
 $f_t = 0.09$  mm/tooth  
 $a_p = 0.50$  mm  
 $a_e =$  variable

Tool manufacturer

**Benefit from the BALINIT TISAFLEX high-performance coating  
Contact us now!**

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