

Coating solutions and services for cutting tools

Your guide to higher machining productivity and lower production costs

Cutting Tools

Sustainable coating solutions and services for your cutting tools

Coatings and services from Oerlikon Balzers give you high-performance cutting tools that are ready to meet the increasing demands of modern manufacturing. A wide range of coating technologies is available for

almost unlimited applications and various materials. Working in close collaboration with our customers around the world, our specialists are continuously opening up new applications. Customised coatings are available on request.

BALINIT coatings BALINIT

High productivity, manufacturing reliability, production costs - the demands made on cutting tools are enormous. You can rely on the innovative BALINIT® coatings from Oerlikon Balzers, one of the world's leading suppliers of surface technologies.







Serving a wide range of markets

BALINIT® coatings offer the properties you need for your application, including extreme hardness and high wear resistance - whatever your challenge in machining, you'll see a wide range of benefits.





BALIQ

The BALIQ[®] coating family from Oerlikon Balzers represents a major technological breakthrough. It is based on our S3p® technology (Scalable Pulsed Power Plasma) that intelligently combines the benefits of arc evaporation and magnetron sputtering.

BALIQ® coatings offer revolutionary properties for a unique range of applications. You benefit from new opportunities that go beyond anything seen before with coatings tailored precisely to your needs.



Revolutionary smoothness

BALIQ[®] enables smooth chip removal and eliminates the need for mechanical posttreatment. Adhesion and built-up edges are avoided even with difficult-to-machine materials.





20

200

Pulse duration (ms) 0.2

Exceptional precision

High precision in coating thickness distribution

guarantees extremely sharp edges. Outstanding

results are achieved especially with tools that have ultra-small diameters.

BALIQ®

BALDIA

BALDIA coatings

The diamond coatings from the BALDIA® portfolio are the best choice for machining highly abrasive base materials. They improve cutting performance and allow parts to be manufactured with tightest tolerances to produce the best possible finishing accuracy.





The Oerlikon Balzers diamond coating portfolio is divided into two groups of different base materials. In both groups the ending "DC" represents maximum coating quality with consistently high tool performance and the tightest possible tolerances for tool diameter and coating thickness.

BALINIT coatings Coating properties at a glance

BALINIT®	Coating material	Coating hardness Η _π [GPa]	Compressive stress [GPa]	Max. service temperature [°C]	Coating temperature [°C]	Coating colour
A	TiN	30 +/- 3	-2 +/- 1	600	< 500	golden yellow
ALCRONA EVO	AlCrN-based	44 +/- 4	-3.5 +/- 1	1,100	< 500	bright grey
ALNOVA	AlCrN-based	38 +/- 3	-3.5 +/- 1	1,100	< 500	light grey
ALTENSA	AlCrN-based	40 +/- 3	-2 +/- 1	1,100	< 500	light grey
В	TiCN	37 +/- 3	-3 +/- 1	400	< 500	blue grey
DURANA	AITiN/TiSiXN	37 +/- 3	-3.5 +/- 1	1,000	< 500	bronze
LATUMA	AITiN-based	35 +/- 3	-3 +/- 1	1,000	< 500	grey
MAYURA	ta-C	> 65	-	> 500	< 150	rainbow / rainbow black*
PERTURA	AITiN-based	35 +/- 3	-4 +/- 1	1,000	< 600	aubergine grey
TISAFLEX	AITiN/TiSiXN	38 +/- 5	-5 +/- 1	1,100	< 600	bronze

BALDIA

BALIQ coatings Coating properties at a glance

BALIQ®	Coating material	Coating hardness Η _π [GPa]	Compressive stress [GPa]	Max. service temperature [°C]	Coating temperature [°C]	Coating colour
ALCRONOS	AlCrN-based	37 +/- 3	-3.5 +/- 1	1,100	< 500	bright grey
ALTINOS	AITiN-based	36 +/- 3	-3.3 +/- 1	1,000	< 500	anthracite
ANTOS	AlCrN + WC/C	35 +/- 2 18 +/- 1	-2.5 +/- 1	1,100 (AlCrN)	< 500	dark grey
AUROS	AlCrTiN- based	30 +/- 3	-2.5 +/- 1	600	< 500	rose gold
TISINOS PRO	AITiSiN-based	38 +/- 1	-3.1 +/- 1	1,000	< 500	bronze

BALDIA coatings **Coating properties at a glance**

BALDIA®	Coating material	Coating hardness Η _π ([GPa]	Available coating thicknesses [µm]*	Max. service temperature [°C]	Coating temperature [°C]	Coating colour
COMPACT	C-based (sp3)	80 – 100	6 – 12	600	< 900	grey
COMPACT DC	C-based (sp3)	80 – 100	4 – 15	600	< 900	grey
NANO	C-based (sp3)	80 – 100	6 – 12	600	< 900	grey
COMPOSITE DC	C-based (sp3)	80 - 100	4 – 15	600	< 900	grey

*Additional coating thicknesses on request. All given data are approximate values and dependent on application, environment and test conditions.

* Variations in colour depend on tool dimensions, applications and geometry. All given data are approximate values and dependent on application, environment and test conditions.

Recommended coatings for gear cutting, milling, drilling and reaming

	GEAR CUTTING				MILLING	DRILLING / REAMING	
Material	Hobs	Stick blades	Shaper cutters	Skiving tools	End mills	Drills	Reamers
Unalloyed steel	AT / AV	DR / AT / AV	AT / AV	AT / AV	AV	PT / AV / LM	ALC / PT / AV
Steel < 1,000 N/mm ²	AT / AV	DR / AT / AV	AT / AV	AT / AV	AV	PT / LM / AV	ALC / PT / AV
Steel > 1,000 N/mm ²	AT / AV	DR / AT / AV	AT / AV	AT / AV	AV / LM / DR	PT / DR / LM	ALC / DR / AV
Steel 45 – 56 HRC	AT / AV	DR / AT / AV	AT / AV	AT / AV	DR / AN / LM	PT / DR / LM	ALC / DR / LM
Steel 56 – 72 HRC	AT / AV / LM	DR / AT / AV	AT / AV / LM	AT / AV / LM	TSP / DR / LM	PT / DR / LM	TSP / DR / PT
Stainless steel					TF / AN / LM	PT / DR / LM	ALC / DR / PT
Cast iron (GG, GGG)	AT / AV	DR / AT / AV	AT / AV	AT / AV	AN / LM / AV	PT / DR / LM	ALC / PT / AV
Wrought Al / Al alloys < 12% Si					MY	MY	MY
Al alloys > 12% Si					DIA CS DC / DIA N / MY	DIA CS DC / DIA N / MY	
Nickel alloys					TF / TSP / LM	TF / PT / LM	TSP / LM
Titanium, titanium alloys					TSP / TF / AN	TF / PT / LM	TSP / LM
Brass, copper, bronze					MY	MY	MY
Graphite					DIA CT DC / DIA CT	DIA CT DC / DIA CT	DIA CT DC / DIA CT
CFRP / GFRP / Sandwich					DIA CS DC /	DIA CS DC /	DIA CS DC /
materials / Stacks					DIA N	DIA N / MY	DIA N / MY
Green ceramics					DIA CT / DIA CT DC	DIA CT DC / DIA CT	DIA CT / DIA CT DC
Sintered ceramics					DIA CT DC / DIA CT	DIA CT DC / DIA CT	
Organic fibres					MY	MY	
(e.g. wood, paper)							

Recommended coatings for machining with inserts, micromachining, threading and broaching

MACHINING WITH INSERTS		MICROMACHI	INING	THREADING			BROACHING
Turning	Milling	End mills	Drills	Taps	Thread formers	Thread mills	Broaches
LM / ALT	LM / AV	ALC / TSP	ALC / TSP	AUR / ANT / B	ALC / AUR / A	ALC / AV	AV
LM / ALT	LM / AV	ALC / TSP	ALC / TSP	AUR / ANT / B	ALC / AUR / A	ALC / AV	AV
LM / ALT	LM / AN	ALC / TSP	ALC / TSP	AUR / ANT / B	ALC / AUR / A	ALC / AV	AV
LM / ALT	LM / AN	TSP / ALC	TSP / ALC	AUR / ALC / B		ALC / LM	AV
TSP / ALT / LM	ALT / LM	TSP / ALC	TSP / ALC			TSP / TF / LM	AV / LM
LM / ALT	LM / AN / ALT	TSP / ALC	TSP / ALC	ANT / AUR / B	AUR / ALC / A	ALC / LM	AV
LM / ALT	LM	ALC / TSP	ALC / TSP	AUR / ALC / B		ALC / AV	AV
MY	MY	MY	MY	MY / B	MY / A	MY / B	MY / AV
DIA CS DC / DIA N / MY	MY	MY	MY	MY / AV			
TSP / ALT / LM	LM / AN	TSP / ALC	TSP / ALC	ANT / AUR / B		TSP / LM	AV
TSP / ALT / LM	TSP / AN / LM	TSP / ALC	TSP / ALC	ANT / AUR / B	ALC	TSP / LM	AV
MY	MY	MY	MY	MY		MY / B	MY / AV
DIA CT / DIA CT DC	DIA CT / DIA CT DC	DIA CT / DIA CT DC	DIA CT DC / DIA CT				
DIA CS DC / DIA N							
DIA CT / DIA CT DC							
DIA CT / DIA CT DC	DIA CT DC / DIA CT	DIA CT DC / DIA CT	DIA CT DC / DIA CT				
MY	MY						

DIA CT = BALDIA® COMPACT DIA CT DC = BALDIA® COMPACT DC DIA N = BALDIA® NANO DIA CS DC = BALDIA® COMPOSITE DC

Reconditioning by Oerlikon Balzers – the fast, all-inclusive solution for your round tools

Cutting tools can be reconditioned several times, producing a quality and service life comparable to new tools. As well as reducing costs, reconditioning makes a substantial contribution to sustainability and environmental protection

by saving valuable resources. Our complete reconditioning service follows a globally defined standard process including incoming inspection, de-coating, regrinding, pre-treatment, re-coating and express delivery service on demand.

Amount of machined material, 100%

Cutting tools can be reground and recoated in selected coating centres. Even after three reconditioning cycles, you save more than 50% compared to purchasing a new coated tool while simultaneously benefitting from the same high performance.

Europe

Austria: Stainz

Turkev: Bursa

Romania: Maracineni (Piteşti)

Argentina: Buenos Aires Mexico: Querétaro, Saltillo

India: Ahmedabad, Aurangabad, Bangalore, Chandigarh, Chennai, Jamshedpur, Manesar, Pune Korea: Pyeongtaek, Busan Thailand: Chonburi Philippines: Calamba City Vietnam: Bac Ninh (Hanoi)

primeGear – a customised service that gives you unmatched gear cutting tool performance

primeGear gives you higher process reliability, reduced tool wear, extended tool life, shorter cycle times and lower production costs. We'll work alongside you to eliminate the weak links in your tool service life by analysing all phases of the tool life cycle:

Example of tool cost reduction

The results of a customer test show a higher process stability, improved tool wear and reduced regrinding stock removal. Reducing the resharpening variations in two steps and an optimum tool coating enabled longer reconditioning cycles, resulting in total tool cost savings of 90% per year.

Direct effect:

- Step 1: Tool costs reduced by 47%
- Step 2: Tool costs reduced by additional 45%

Indirect effects:

- Predictability in tool service life increased milling machine uptime
- Quality of machined gears improved (the difference) between the first and last gear was reduced)

- Surface treatment
- Cutting process
- Tool handling
- Resharpening

Close to our customers – worldwide

Argentina Brazil Canada Mexico USA

Americas

more than **25** customer centres in

- Austria Belgium Czech Republic Finland France Germany Hungary Italy Liechtenstein Luxembourg
- Poland Portugal Romania Slovakia Spain Sweden Switzerland Turkey United Kingdom

Europe

more than **45** customer centres in

China India Indonesia Japan Malaysia Philippines Singapore South Korea Thailand Vietnam

Asia

more than **35** customer centres in

Contact us now!

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