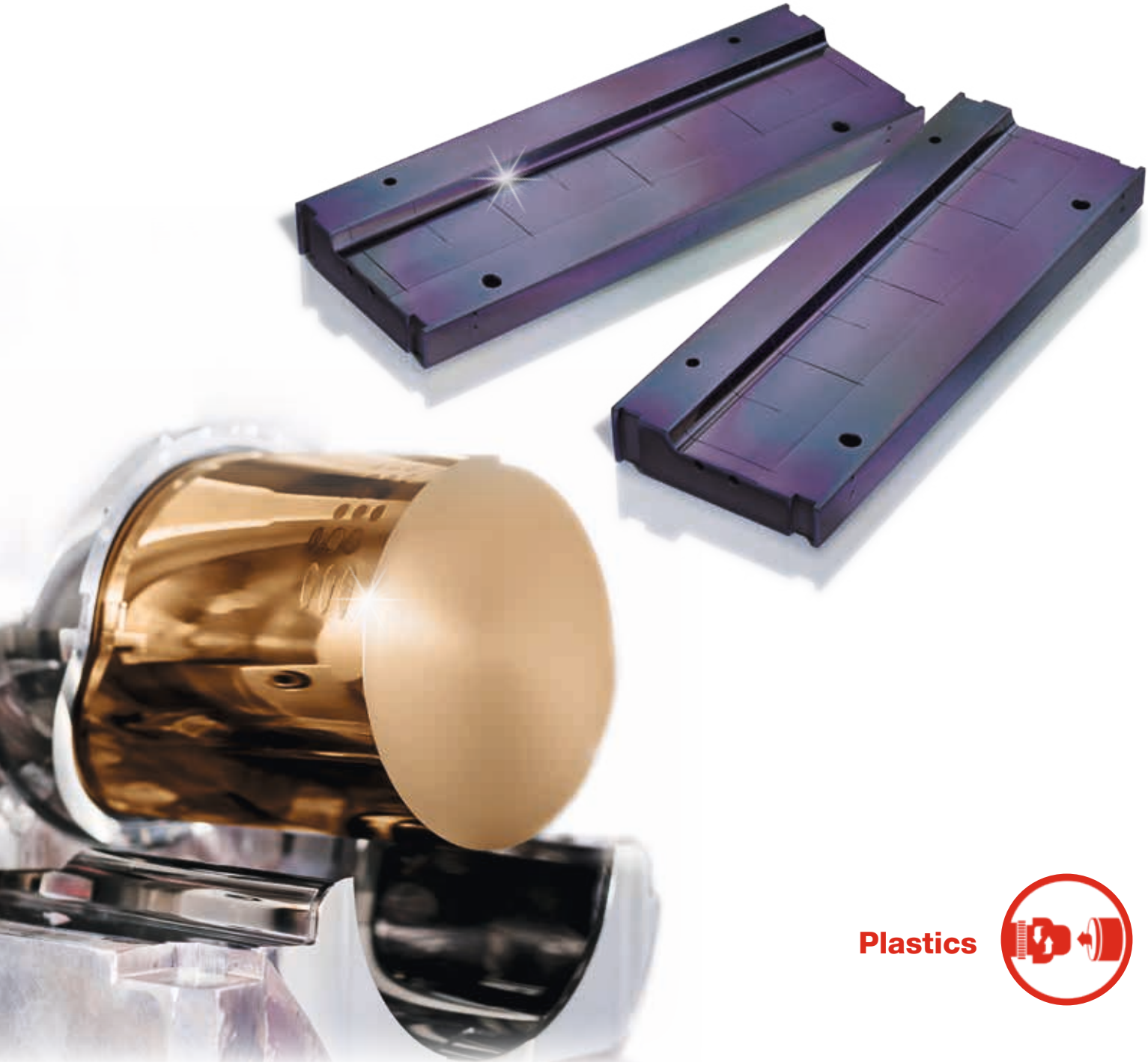
oerlikon
balzers

Greater productivity and efficiency in plastics processing

Our wear-reducing surface solutions in injection molding and extrusion



Plastics

Injection molding and extrusion at its best – with BALINIT and BALIQ coatings from Oerlikon Balzers

The mold surface plays a crucial role in injection molding and extrusion: The better its quality, the greater the productivity and efficiency of the manufacturing process. You can reliably achieve this objective with innovative BALINIT® and BALIQ® wear protection solutions from Oerlikon Balzers – a technology leader in hard coatings. Oerlikon coatings push your molds to peak performance and give you numerous advantages in plastics processing.

BALINIT and BALIQ boost productivity, process reliability and cost-effectiveness

Extreme coating hardness

– Offers superb protection against abrasive wear

– Protects mold against discoloration when using aggressive masterbatches

Reduction of tool costs through longer tool life with less scrap and shorter cycle times

Ceramic material – low coefficient of friction

– Prevents adhesion, e.g. sticking of melt

– Protects against seizure of moving mold parts – even when operated dry

– Inert surface technology reduces sticking

Reduction of production and unit costs with reduced machine downtimes and better-quality products

Brilliant surface quality

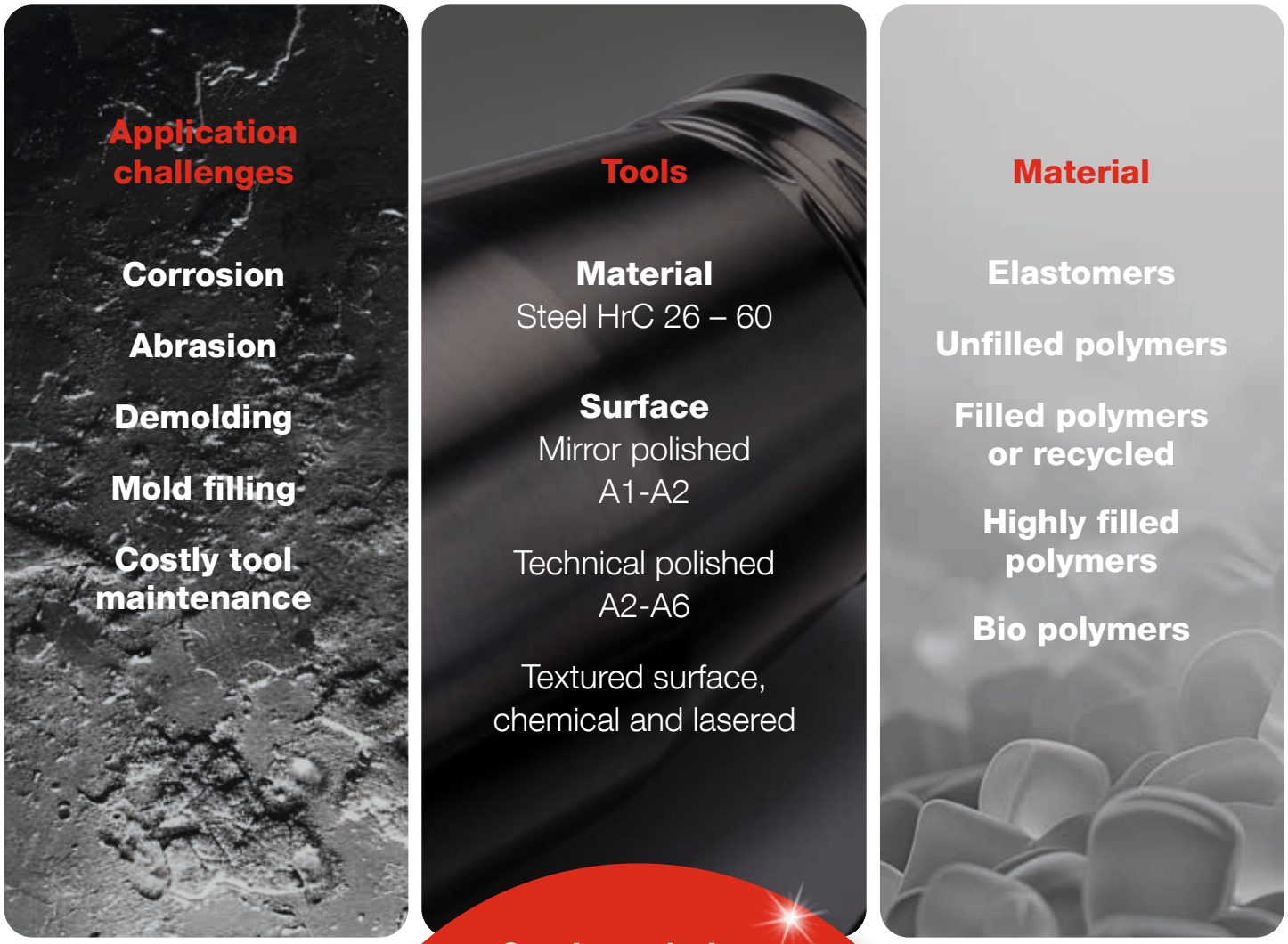
– Improves mold filling and demolding

– BALINIT® and BALIQ® coatings provide longer-lasting protection against surface deposits

– Improves corrosion resistance of amorphous carbon coatings

Reduction of maintenance costs by minimizing the amount of maintenance and cleaning required

Boost productivity with our innovative surface solutions



Application challenges

Corrosion

Abrasion

Demolding

Mold filling

Costly tool maintenance

Tools

Material
Steel HrC 26 – 60

Surface
Mirror polished
A1-A2

Technical polished
A2-A6

Textured surface,
chemical and lasered

Material

Elastomers

Unfilled polymers

Filled polymers or recycled

Highly filled polymers

Bio polymers

Coating solutions

BALINIT® MOLDENA
BALINIT® DYLYN
BALINIT® MAYURA

BALIQ® CRONOS
BALIQ® TINOS

BALITHERM®
PRIMEFORM

The right coating depends on the wear pattern, tool material and surface condition, as well as the plastic material being processed.

Coating properties at a glance

	Carbon-based coatings for injection molding		
	BALINIT® DYLYN	**BALINIT® TRITON**	**BALINIT® C**
Coating material	a-C:H:Si	a-C:H	Me-C:H
Microhardness [HV 0.05]	2,500	2,500	1,500
Coefficient of friction (dry against steel)	0.1 – 0.2	0.1 – 0.2	0.1 – 0.2
Coating thickness [µm]	1 – 3	1 – 3	1 – 4
Residual stress [Gpa]			-1.0
Max. service temperature [°C]	300	300	300
Coating temperature [°C]	180 – 220	180 – 250	180 – 250
Coating color	black	black	charcoal
Coating structure	multilayer	monolayer	lamellar
Abrasion	++	++	+
Adhesion (seizure)	++	+++	+++
Corrosion	+++	++	+
Demolding	+++	++	+
Mold filling	+++	++	+
Available as STAR version*	x (Ti)	x (CrN)	x (CrN)
Available in BALINIT® DUPLEX Series Nitriding in combination with BALINIT® coating	x	x	x

*The STAR versions deliver better load-bearing capabilities paired with high surface pressures.

The following materials can be coated: High-speed steels, plastic mold steels, cold- and hot-working steels, stainless steels, heat-treatable steels, cemented carbides,

Recommended applications

	Carbon-based coatings for injection molding		
	BALINIT® DYLYN	**BALINIT® TRITON**	**BALINIT® C**
Thermoplastics			
PE, PP, PB	+++		
PS, SB, SAN, ABS, ASA	+		
PVC	+		
PTFE, SPTFE, PVDF	+		
POM	++	For moving tool elements / dry operation (slides/ejectors)	For moving tool elements / dry operation (slides/ejectors)
PA	++		
PC, PBT (B), PET (P)	+++		
PPE, PEEK, PAEK / PPS, PSU, PES	+		
PI	+		
CA, CP, CAP	+		
PMMA	++		
TPU	++		
Thermosets			
PF	++		
EP	+		
UP	+		
MF, UF, MP	++		
Elastomers			
PUR	++		
NBR, EPDM, Si	++		
Multipolymer TPE, FPM	+		

+ = Conditionally suited + + = Well suited + + + = Excellently suited

All BALINIT® coatings intended for manufacturing food industry packaging have been classified by the FDA as safe for this application.
All data provided herein is for reference purposes only. Definitive values depend on the respective substrate, geometry, and surface finish.

BALINIT® MOLDENA	BALINIT® MAYURA	BALIQ® TINOS	BALIQ® CRONOS	BALITHERM® PRIMEFORM
CrON	ta-C	TiN S3p	CrN	
2,800	6,500	3,000	2,150	up to 1,400
0.3 – 0.5	< 0.10	0.6	0.5	0
~7	0.3	2 – 4	2 – 4	
-0.4	-4.0	-2.7 +/- 1	- 2.1 +/- 1	
700	500	700	700	400
350	< 150	200 – < 500	200 – < 500	380/480
dark rainbow	rainbow / rainbow black	golden yellow	silver	
multilayer	multilayer	monolayer	monolayer	
+++	++	++	++	++
+++	++	++	++	+
+++	+	++	++	++
+++	++	+++	+++	+
++	++	++	++	+
x	x			

suitable CuBe alloys.

BALINIT® MOLDENA	BALINIT® MAYURA	BALIQ® TINOS	BALIQ® CRONOS	BALITHERM® PRIMEFORM
+++	++	+++	+++	+++
+++	++	++	++	+++
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IPC demolding tests have shown that BALITHERM® PRIMEFORM is a vast improvement over hard chrome.

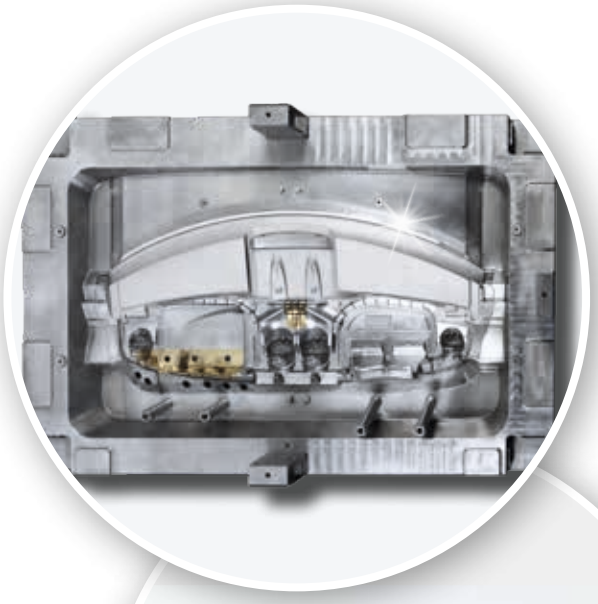
Outstanding performance in injection molding

BALIQ® TINOS for waste containers

Tool: 1.2343 ESU
Polymer: PC / ABS
Challenge:
Sensivity of mirror-polished cavitities to scratching, residues

The solution: BALIQ® TINOS
– Improved demolding
– Significantly less maintenance
– Fewer residues
– Better cleaning
– No scratches

10 ×
longer maintenance intervals



BALITHERM® PRIMEFORM treatment for instrument panels (automotive)

Tool: cavity, steel: 1.2738 HH
Processed polymer: PA6.6 GF30
Challenge without treatment:
Tool wear due to fiberglass-reinforced material with flame retardant (V0), scratch-sensitive, flashing, corrosion

The solution: BALITHERM® PRIMEFORM
For noticeably improved demolding, optimized processability, enhanced component quality.
– Greater production efficiency and reliability
– Reduced scrap costs
– Reduced maintenance costs
– Reduced flashing at parting line

30%
productivity gain

Outstanding performance in extrusion

BALINIT® MOLDENA for PVC profiles for windows

Tool: Vacuum calibration unit
Processed polymer: Wood-reinforced PVC
Challenge:
Glass fibers and TiO_2 cause wear at the edges of the vacuum grooves and on the flat sliding surface, resulting in scratches on the profile and stick-slip effects

The solution: BALINIT® MOLDENA
– Reduction of pressure by 20%
– Wear and scratch protection
– Increased service life of coating up to 6,000 miles/9,600 km
– Oxide layer improves material flow by 30%
– Reduction of sticking
– Increased corrosion resistance
– Greater production efficiency and reliability

Material flow increased by 30%

BALINIT® DYLYN

One of the most popular carbon-based coatings on the market.
BALINIT® DYLYN gives you stable, high-volume production and helps increase sustainability, improve quality and reduce maintenance costs.

How you benefit from BALINIT® DYLYN
– High chemical corrosion resistance
– Easy to switch from normal to bio & recycled polymers
– Low surface energy
– Excellent release capability
– Prevents residue build-up
– Increased productivity

Downtime reduced by 50%

Close to our customers – worldwide

Argentina
Brazil
Canada
Mexico
USA

Americas

more than **25** customer centers in the

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 centers in

China
India
Indonesia
Japan
Malaysia
Philippines
Singapore
South Korea
Thailand
Vietnam

Asia

more than **35** customer centers in

Contact us now!

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