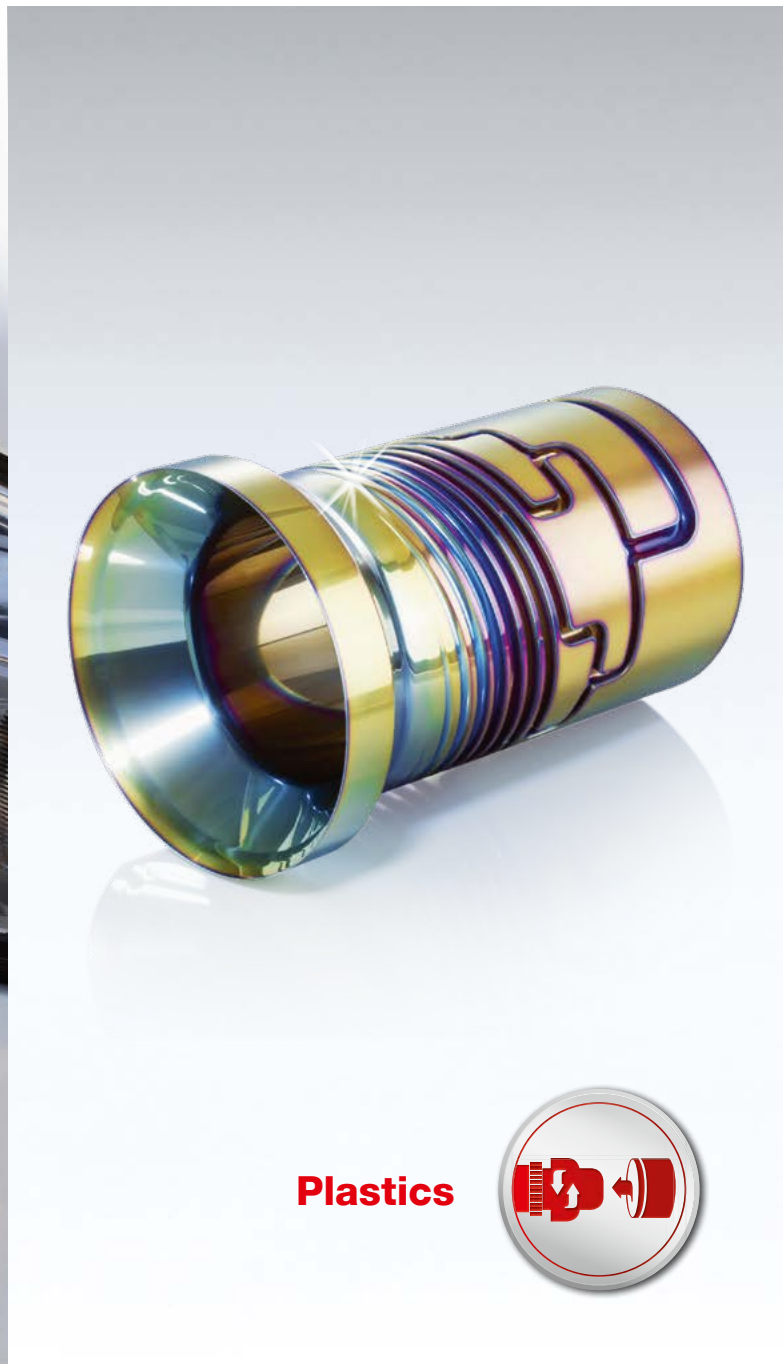


The benchmark in plastics processing

Our wear-reduction solutions for greater productivity and efficiency in injection molding and extrusion



Plastics



Injection molding and extrusion at its best – With BALINIT by 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 attain this objective with innovative BALINIT® wear protection

solutions by Oerlikon Balzers – a technology leader in hard coatings. BALINIT® coatings push your molds to peak performance and offer you numerous advantages in plastics processing.

Extreme coating hardness

Superb protection against abrasive wear

Protection of mold against discoloration when using aggressive masterbatches

Ceramic material – low coefficient of friction

Prevents adhesion, e.g. sticking of melt

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

Reduction of sticking due to inert surface technology

Brilliant surface quality

Improved mold filling and demolding

BALINIT® coatings afford longer protection against surface deposits

Improved corrosion resistance of amorphous carbon coatings

Reduction of tool costs due to longer tool life, less scrap, and shorter cycle times

Reduction of production and unit costs due to less machine downtime and improved part quality

Reduction of maintenance costs due to fewer servicing and cleaning intervals

**BALINIT® for injection molding and extrusion:
Boost productivity, cost-effectiveness, and process reliability**



Convincing performance in injection molding



BALITHERM® PRIMEFORM and BALIQ® TINOS for waste containers

Tool: 1.2343 ESU

Polymer: PC / ABS

Challenge:

Sensitivity of mirror-polished cavities to scratching, residues

**The solution: BALITHERM® PRIMEFORM
and BALIQ® TINOS**

- Improved demolding
- Significant decrease in maintenance
- Less residues
- Better cleaning
- No scratches

10x
increase of the
maintenance
interval



BALITHERM® PRIMEFORM treatment for instrument panels (automotive)

Tool: cavity, steel: 1.2738 HH

Processed polymer: PA6.6 GF30

No-treatment challenge:

Tool wear due to fibreglass-reinforced material with flame retardant (V0), scratch-sensitive, flashing, corrosion

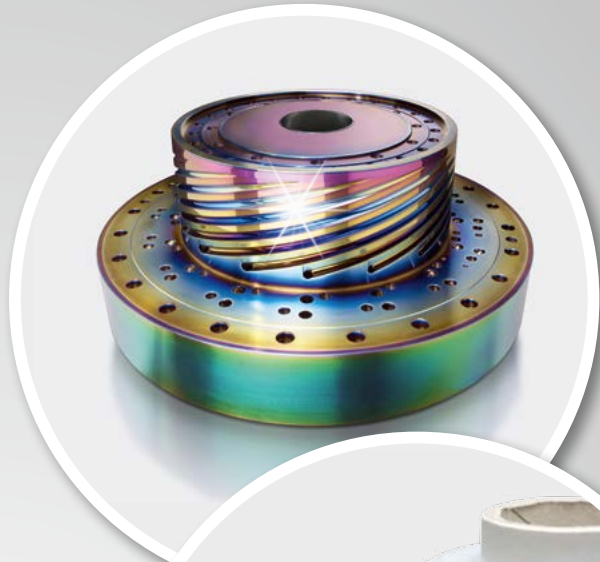
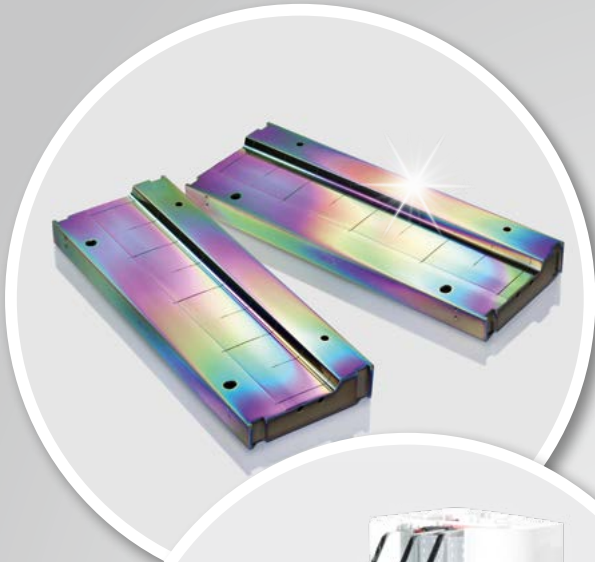
The solution: BALITHERM® PRIMEFORM

For noticeably improved demolding, optimised processability, enhanced component quality.

- Greater production efficiency and reliability
- Reduced scrap costs
- Reduced maintenance costs
- Reduced flashing at parting line

Productivity
gain
30%

Convincing performance in extrusion



BALINIT® CROMA PLUS for PVC profiles for windows

Tool: Vacuum calibration unit

Processed polymer: PVC

Challenge:

Glass fibres and TiO₂ cause wear at the edges of the vacuum grooves and on the flat sliding surface, this results in scratches on the profile and stick-slips effects

The solution: BALINIT® CROMA PLUS

- Wear and scratch protection
- Increase lifetime of coating up to 6,000 miles / 9.600 km
- Oxyd-Layer improves flow by 30 %
- Reduction of sticking
- Greater production efficiency and reliability

Material flow
increase by
30 %

BALINIT® CROMA PLUS for plastics films

Tool: Spiral mandrel distributor/dies

Processed polymer: HDPE

Challenge:

Quality issues in the films due to local plastic spots sticking to the surface, abrasive cleaning causing wear and scratches, surface gets dull and rougher after ~1 year process

The solution: BALINIT® CROMA PLUS

- Significantly reduced or even eliminated sticking
- Excellent scratch protection
- No chemical interaction – no visual change of BALINIT® CROMA PLUS

Reduction
of downtime
for cleaning by
60 %

For injection molding, coating properties at a glance

	Carbon-based coatings		
	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 colour	Black	Black	Charcoal
Coating structure	Multilayer	Monolayer	Lamellar
Abrasion	++	++	+
Adhesion (seizure)	++	+++	+++
Corrosion	+++	++	+
Demolding			
Mold filling			
Available as BALINIT® ARCTIC low-temperature coating (max. 200°C)			
Available as STAR version*	x (Ti)	x (CrN)	x (CrN)
Available in BALINIT® DUPLEX Series**	x	x	x
Available in BALINIT® ADVANCED Series***			

*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, suitable CuBe alloys.

Application recommendations

	Carbon-based coatings		
	BALINIT® DYLYN	BALINIT® TRITON	BALINIT® C
Thermoplastics			
PE, PP, PB			
PS, SB, SAN, ABS, ASA			
PVC			
PTFE, SPTFE, PVDF			
POM			
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			
Elastomere			
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.

Coating properties at a glance

	BALIQ® CRONOS	BALINIT® CROMA
Coating material	CrN	CrN
Microhardness (HV 0.05)	2,150	2,500
Coefficient of friction (dry against steel)	0.5	0.3 – 0.5
Coating thickness (µm)	2 – 4	4 – 10
Residual stress (Gpa)	-1.6/-2.1	-1.5/-2.0
Max. service temperature (°C)	700	700
Coating temperature (°C)	< 500	250 – 450
Coating colour	Silver	Silver grey
Coating structure	Monolayer	Multilayer
Abrasion	++	++
Adhesion (seizure)	++	++
Corrosion	++	++
Demolding	+++	++
Mold filling	++	+
Available as BALINIT® ARCTIC low-temperature coating (max. 200 °C)		
Available as STAR version*		
Available in BALINIT® DUPLEX Series Nitriding in combination with BALINIT® coating		x
Available in BALINIT® ADVANCED Series (enhanced support effect of the tool surface)		

*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,

Application recommendations

	BALIQ® CRONOS	BALINIT® CROMA
Thermoplastics		
PE, PP, PB	+++	++
PS, SB, SAN, ABS, ASA	++	++
PVC	+++	++
PTFE, SPTFE, PVDF	++	++
POM	+++	++
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	++	++
Elastomere		
PUR	+	+
NBR, EPDM, Si	++	++
Multipolymer TPE, FPM	++	++

- + = Conditionally suited
- ++ = Well suited
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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® CROMA PLUS	BALINIT® ALCRONA PRO	BALINIT® LUMENA
CrN+OX	AlCrN	TiAlN
2,500	3,200	3,400
0.3 – 0.5	0.35	0.3 – 0.35
4 – 10	2 – 4	8 – 12
-1.5/-2.0	-3.0	-1.1
700	1100	900
250 – 450	470	450
Rainbow	Blue-grey	Violet-grey
Multilayer	Monolayer	nanostructured
++	+++	+++
+++	+	+
++	++	++
++	++	+
+	+	+++
x	x	x
	x	x

BALITHERM® PRIMEFORM
up to 1,400
0
400
380/480
++
+
++
+
+

suitable CuBe alloys.

BALINIT® CROMA PLUS	BALINIT® ALCRONA PRO	BALINIT® LUMENA
+++	+++	+++
+++	++	+++
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BALITHERM® PRIMEFORM
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Benefit from high-end wear protection solutions for your plastics processing applications. Contact us now!

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