

oerlikon
balzers

BALINIT® LUMENA

Productivity in forming



BALINIT® LUMENA: Fulfils the toughest requirements in forming

Challenges

Today, high-strength to ultra-high-strength sheet steel has become the standard in crash-relevant automotive structural parts. When such components are processed, the high-strength characteristics of the metal result in significant stresses on the tool surface, particularly in highly loaded radius zones. In many cases, this causes premature tool failure. Similar problems are encountered in cold solid forming operations. With high degrees of metal deformation, the fatigue load of the base material is often exceeded, and this too, can lead to tool failure. Additionally, cold welding on the tool is often a problem. The consequences are increased maintenance and a deterioration of the surface quality of the part.

The solution

These problems can be solved with BALINIT® LUMENA. The TiAlN coating with minimised residual stress significantly reduces abrasive wear in forming tools. The cold welding problem is largely deminished by the chemical composition of the coating. Cleaning intervals are extended and at the same time, product quality is improved.

The BALINIT® LUMENA coating has the following features:

- High hardness
- An optimised hardness to residual compressive stress ratio
- High abrasive wear resistance
- Improved chemical and thermal resistance
- Reduced coefficient of friction
- High achievable coating thicknesses (comparable with CVD)



Properties of BALINIT® LUMENA

Coating material	TiAlN
Microhardness (HV 0,05)	3,400
Coefficient of friction against steel (dry)	0.30 - 0.35
Max. service temperature (°C)	900
Coating colour	violet-grey

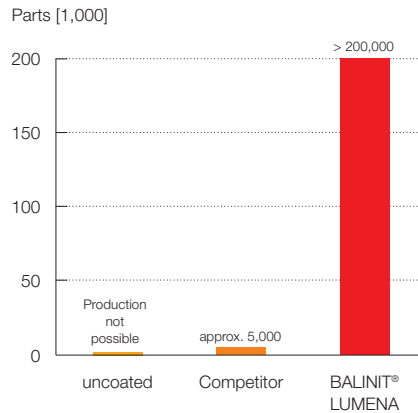
BALINIT® LUMENA: Cost-effective, optimised forming processes

A comparison of our environmentally friendly PVD coatings with the CVD or TD coatings used so far in forming applications reveals that BALINIT® LUMENA delivers better or equivalent results – without the risk of tool distortion that can occur due to the high process temperatures involved in the application of CVD and TD coatings.

Applications:

- Forming of high-strength sheet steel in the automotive industry (for instance bumpers, longitudinal members, side-impact protectors)
- Cold solid forming of steering and drive elements, transmission parts, etc.
- Sheet metal forming (clutches, etc.)
- Hydroforming
- Aluminium profile extrusion

Sizing

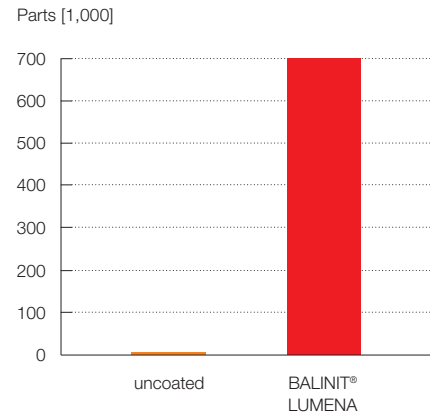


Tool: Mandrel, Ø 120 x 250 mm
Steel DIN 1.3343 (~AISI M2)
62 HRC

Workpiece: Material DIN 1.0511 (~AISI 1040)
thickness 10 mm
6 strokes/min
Lubrication MQL oil mist

Failure criterion: Cold welding

Deep drawing

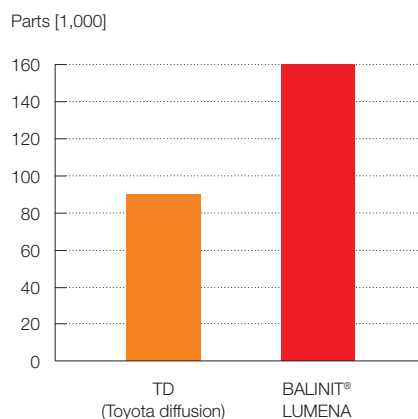


Tool: Die, DIN 1.2379 (~AISI D2)
61 HRC

Workpiece: Material DIN 1.0489
(H280LA/H300)
sheet thickness 5 mm

Benefit: Without coating, only 50 parts could be produced.

Bending

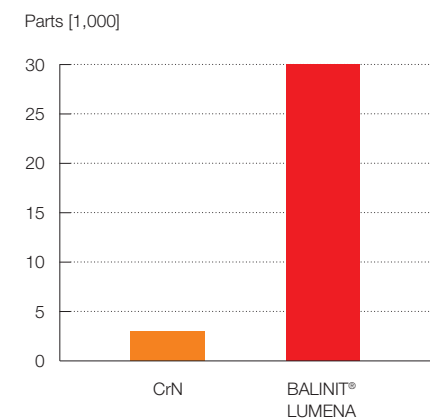


Tool: Bending tool
DIN 1.2379 (~AISI D2), 61 HRC

Workpiece: Structural part
material JIS SAPH 370, 3.2 mm

Benefit: Reduced cold welding
significantly improved part quality.

Bending



Tool: Bending mandrel
DIN 1.2379 (~AISI D2), 61 HRC

Workpiece: Tubes, DIN 1.4401 (~AISI 316)
thickness 1.5 – 1.75 mm

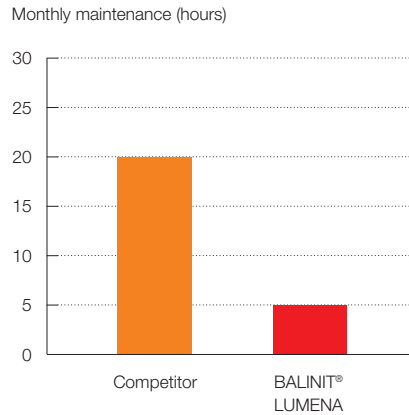
Benefit: The BALINIT® LUMENA coating dramatically reduces cold welding.



BALINIT® LUMENA: Enhances the reliability and life of your tools



Sheet metal forming

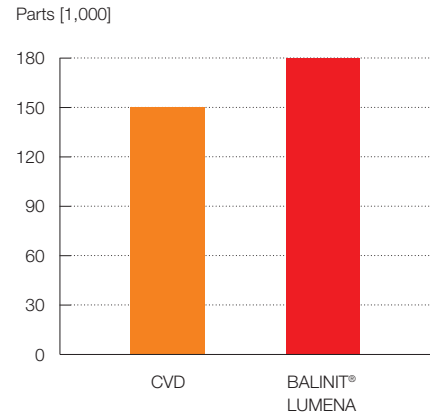


Tool: Forming die
DIN 1.2379 (~AISI D2), 60 HRC

Workpiece: Bumper, DIN 1.8998
(S680MC/CP-W 800)
sheet thickness 2.8 mm

Benefit: Monthly maintenance effort was reduced by 75 %.

Sheet metal forming



Tool: Forming die
DIN 1.2379 (~AISI D2), 62 HRC

Workpiece: Bumper DIN 1.0965
(S900MC/MS-W 1200)
sheet thickness 3.0 mm

Benefit: PVD coatings are much more cost-effective than CVD coatings.

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Japan, Korea, Liechtenstein, Mexico,
Poland, Portugal, Romania, Spain,
Switzerland, Turkey

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