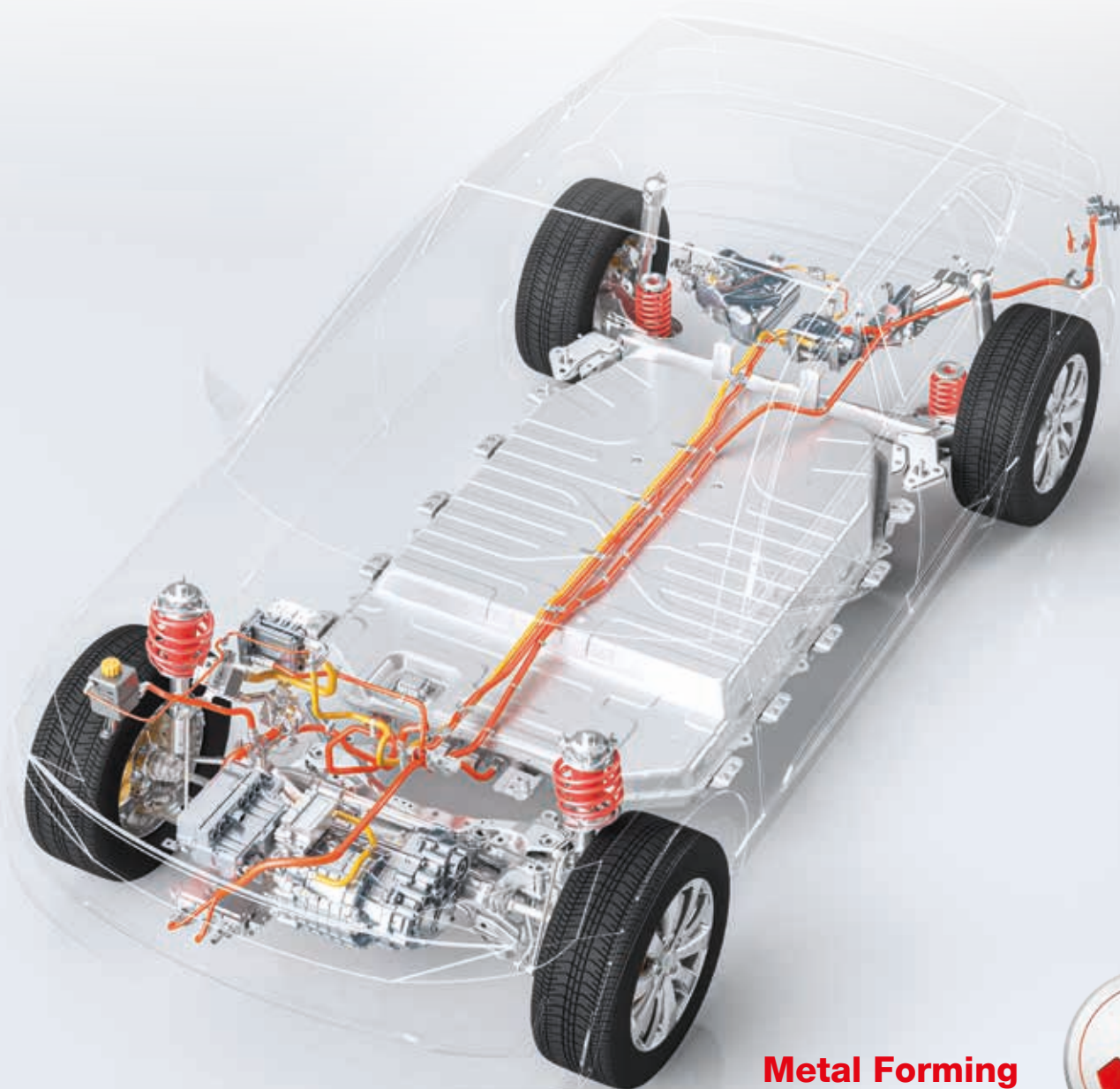


# **eMobility – lower costs and improved productivity**

Oerlikon Balzers' surface solutions  
and application experience give you  
the tool performance you need



**Metal Forming**



# eMobility – new product designs can pose new challenges in manufacturing processes and tools

With over 75 years of coating experience, Oerlikon Balzers understand the challenges you face in metal and plastic forming. BALINIT® and BALITHERM® solutions can minimise abrasive and adhesive wear, maximise tool performance and reduce down time and maintenance costs.

From aluminium die casting to aluminium sheet trimming to aluminium foil slitting, Oerlikon Balzers can help you optimise your forming tools. Lightweight and compact product designs require higher precision in manufacturing using unfamiliar new materials. Our advanced coatings can give you the product quality and tool performance you need.

## PLASTIC BATTERY CASE MOULDING

### Compression moulding

Oerlikon Balzers can minimise your mould maintenance and reduce costs. BALINIT® and BALITHERM® can protect moulds, preserve polished surfaces, protect against harmful gases and improve mould release.

## BATTERY TAB WELDING AND CELL-TO-BUSBAR / CELL-TO-CELL WELDING

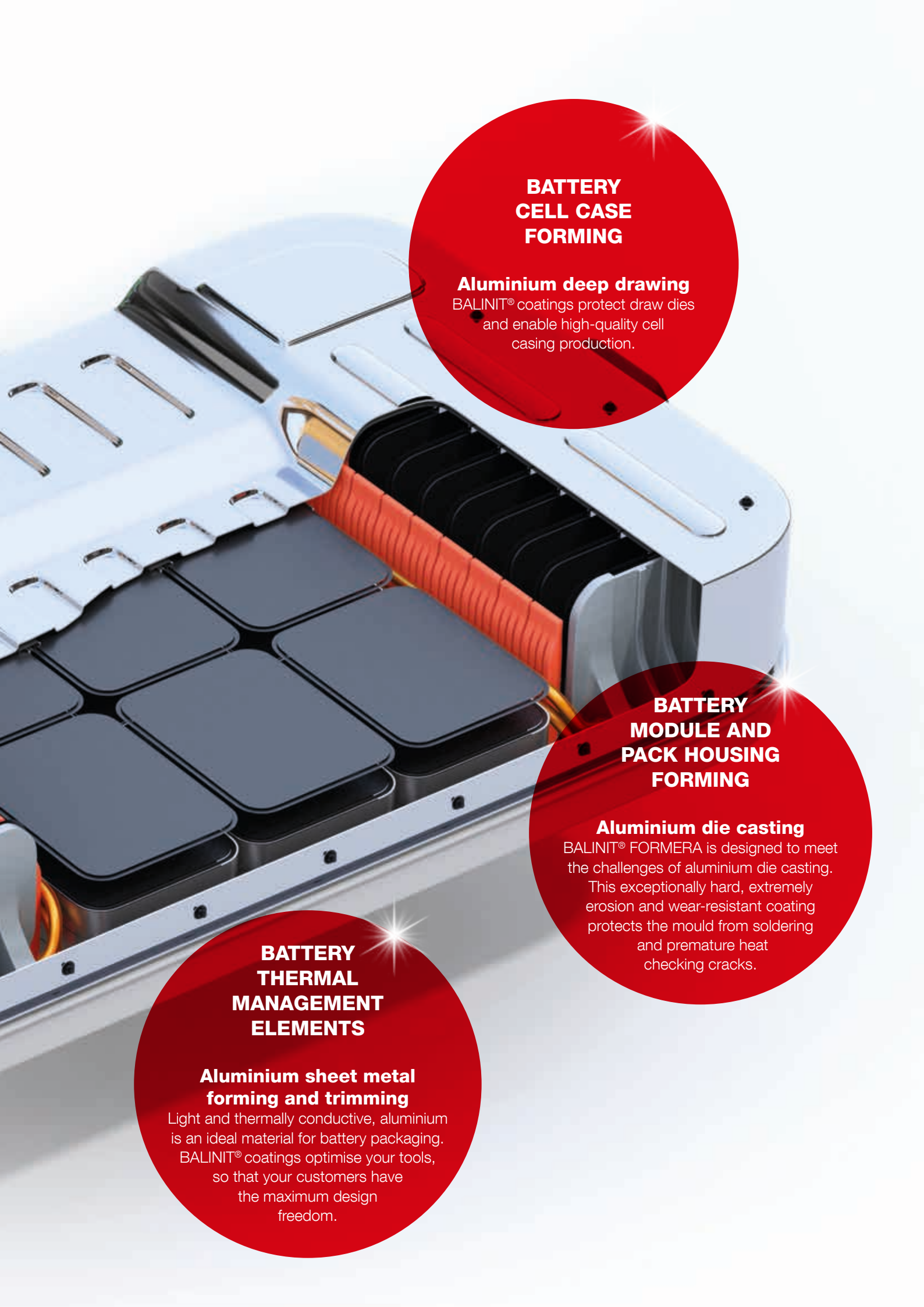
### Ultrasonic welding tools

BALINIT® coatings can prevent tool wear and aluminium adhesion, improving weld quality. Whatever the cell design, our precision 1 µm coating ensures ultrasonic welding tools perform for longer.

## BATTERY ELECTRODE SHAPING

### Electrode foil slitting blades

BALINIT® MAYURA protects the blade cutting edge and ensures a burr-free smooth cuts for thin aluminium and copper foils.



### **BATTERY CELL CASE FORMING**

**Aluminium deep drawing**  
BALINIT® coatings protect draw dies  
and enable high-quality cell  
casing production.

### **BATTERY MODULE AND PACK HOUSING FORMING**

**Aluminium die casting**  
BALINIT® FORMERA is designed to meet  
the challenges of aluminium die casting.  
This exceptionally hard, extremely  
erosion and wear-resistant coating  
protects the mould from soldering  
and premature heat  
checking cracks.

### **BATTERY THERMAL MANAGEMENT ELEMENTS**

**Aluminium sheet metal  
forming and trimming**  
Light and thermally conductive, aluminium  
is an ideal material for battery packaging.  
BALINIT® coatings optimise your tools,  
so that your customers have  
the maximum design  
freedom.



# High-precision forming tools are key elements in successful eMobility product manufacturing

Optimised tools and production processes keep production costs under control, thanks to surface solutions from Oerlikon Balzers.

- Reduce scrap rate
- Minimise down time by reducing maintenance frequency
- Uniform coating thickness on the functional area to meet tight tool tolerances
- Maintain scratch-free polished surfaces for longer

## Aluminium trimming, flanging, punching and forming

Aluminium is an essential material for the electrification of the automotive industry. From battery electrodes to battery thermal management systems to lightweight car body panels, Oerlikon Balzers has solutions to give you the tool performance you need.

- Reduce aluminium sticking
- Protect the tools' functional areas against wear and increase service life
- Improve part quality by eliminating burrs and keeping the press lines free of aluminium dust

Solution for battery cell manufacturing tools:

**BALINIT® MAYURA**

Solution for aluminium die casting and forming of thick materials:

**BALINIT® FORMERA**

Solution for aluminium trimming and flanging:

**BALINIT® TRITON STAR**

Solutions for large panel dies:

**PPD**

**Laser hardening**



# For battery modules and packs, whether aluminium, steel or plastic, Oerlikon Balzers has surface solutions for your forming technologies

To reduce weight and increase functionality:

- Battery and electric motor housing by HPDC
- Battery housing tray
- Battery frame
- Battery lower protection cover

## eMobility coating solutions at a glance

How do you achieve efficient production processes and keep production costs under control?  
By optimising your tools with surface solutions from Oerlikon Balzers.

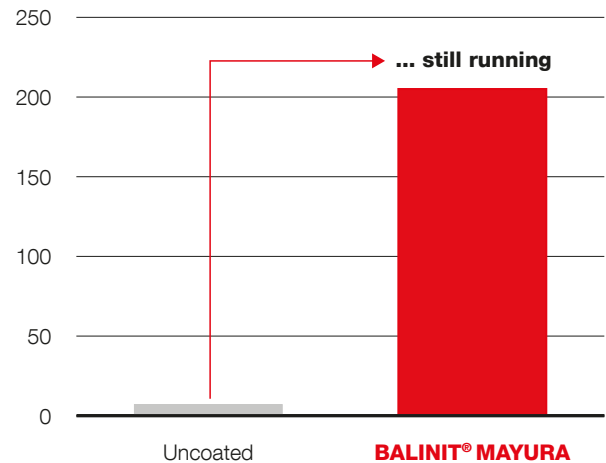
Application	Large panel dies		Alu sheet forming, trimming, flanging, punching, stamping		Alu die casting, tough structural parts
Solution	BALITHEM PPD	BALITHEM PRIMEFORM	BALINIT MAYURA	BALINIT TRITON STAR	BALINIT FORMERA
Description	Diffusion process	Diffusion process	ta-C multilayer	Multilayer	CrAlN-based nanolayer/multilayer
Thickness [µm]	50 – 150	50 – 100	0.3 – 1.5	4 – 6	6 – 12
Process temperature [°C]	500 – 530	380/470	< 150	200 – 250	480
Max. service temperature [°C]	N/A	400	> 500	350	900
Coating hardness H <sub>IT</sub> [GPa]	1,200 HV compound layer	up to 1,400 HV	> 65	~15 – 25	28 +/- 2
Colour	N/A	N/A	rainbow / rainbow black	black	silver / light grey

The data given are approximate values, they depend on application, environment and test condition.

## BALINIT MAYURA – trimming aluminium

<b>Tool</b>	Trimming dies and punches 1.2379 / D2
<b>Workpiece</b>	Hood
<b>Challenge</b>	Aluminium starting to stick to cutting edges
<b>Solution</b> <b>BALINIT® MAYURA</b>	Aluminium build-up over time reduced

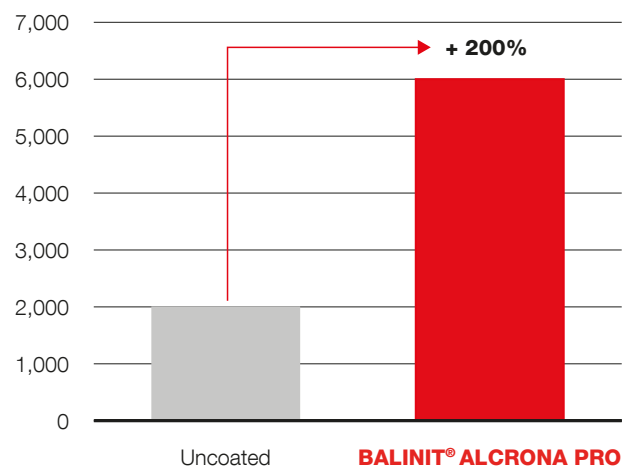
Parts produced with minimal maintenance [1,000 parts]  
[Cleaning trim edges with a cloth after every 5,000 parts]



## BALINIT ALCRONA PRO – slot die coating for battery electrode foil

<b>Tool</b>	Slot die SUS 304 / 1.4301
<b>Workpiece</b>	Li-ion battery electrode foil (cathode)
<b>Challenge</b>	Highly polishing surface is prone to scratches and requires careful handling
<b>Solution</b> <b>BALINIT® ALCRONA PRO</b>	<ul style="list-style-type: none"> <li>- Maintenance-friendly, wear-resistant surface</li> <li>- Longer service life</li> </ul>

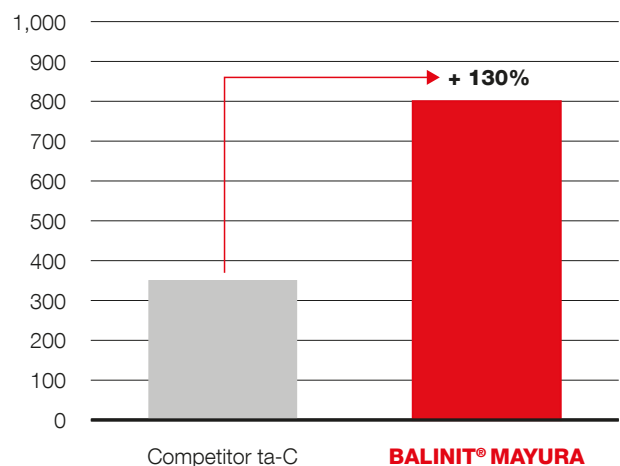
Service life [kilometer]



## BALINIT MAYURA – electrode foil slitting

<b>Tool</b>	Carbide blade
<b>Workpiece</b>	Aluminium foil
<b>Challenge</b>	Aluminium sticking due to material burrs and high scrap rate
<b>Solution</b> <b>BALINIT® MAYURA</b>	Sharp cutting edges protected

Maintenance-free production [1,000 parts]



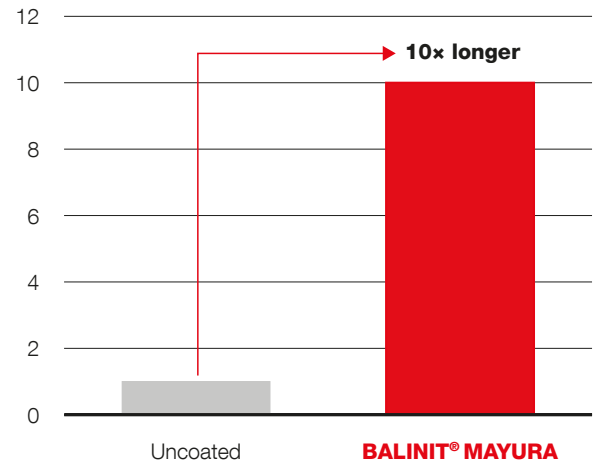
## BALINIT MAYURA – ultrasonic welding tool

<b>Tool</b>	Tool steel or titanium
<b>Workpiece</b>	Aluminium foil or wire
<b>Challenge</b>	Adhesive wear

**Solution**  
**BALINIT® MAYURA**

- Aluminium sticking significantly decreased
- Wear reduced

Relative tool service life



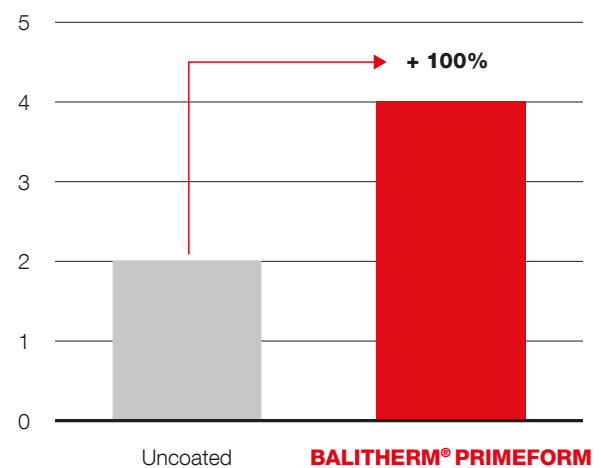
## BALITHERM PRIMEFORM – SMC moulds

<b>Tool</b>	1.2738
<b>Workpiece</b>	Glass-fibre reinforced polyester resin
<b>Challenge</b>	Service life – replacement of Cr plating

**Solution**  
**BALITHERM® PRIMEFORM**

- Easy repair
- Less cleaning
- 10 times less maintenance

Tool service life [500 pieces]



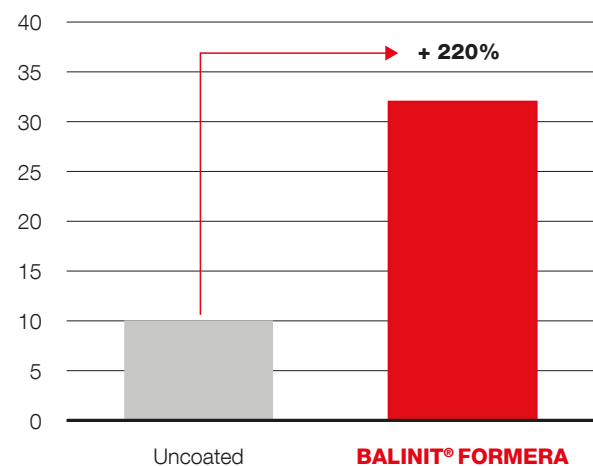
## BALINIT FORMERA – aluminium die casting

<b>Tool</b>	1.2344 (44+2 HRc)
<b>Workpiece</b>	AlSi9MG, battery box
<b>Challenge</b>	Thermal cracks, frequent maintenance

**Solution**  
**BALINIT® FORMERA**

- Aluminium sticking significantly decreased
- Maintenance reduced and tool service life extended

Shots without welding [1,000 parts]



**Close to our customers – worldwide**



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Canada  
Mexico  
USA

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Czech Republic  
Finland  
France  
Germany  
Hungary  
Italy  
Liechtenstein  
Luxembourg

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Portugal  
Romania  
Slovakia  
Spain  
Sweden  
Switzerland  
Turkey  
United Kingdom

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more than **45** customer centres in



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Indonesia  
Japan  
Malaysia  
Philippines  
Singapore

South Korea  
Thailand  
Vietnam

## Asia

more than **35** customer centres in

**Contact us now!**

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