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ePD & INUBIA I

CHROME LOOKING PLASTIC
METALLISATION ON A NEW LEVEL



 REACH conform

ePD

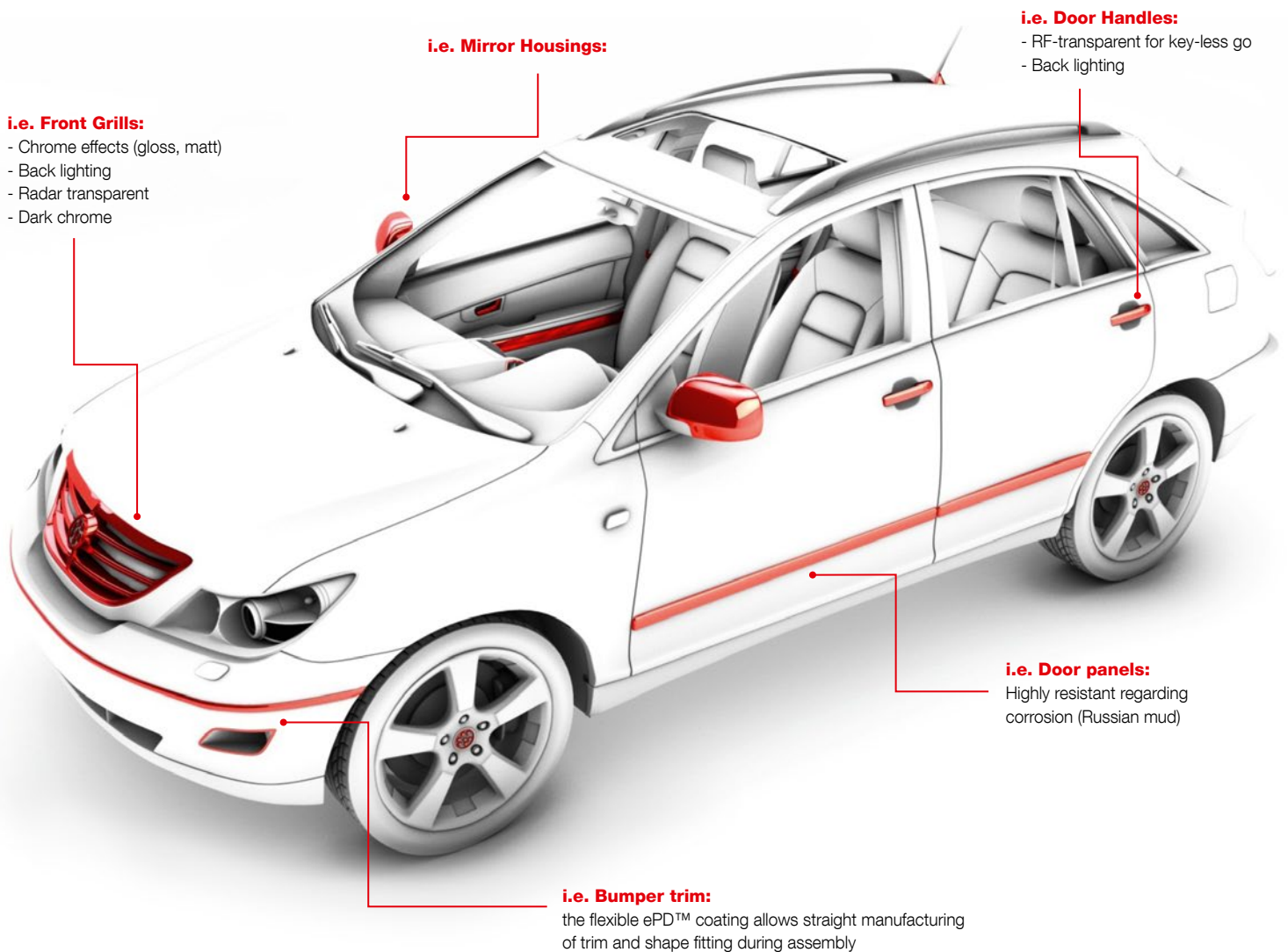
CHROME LOOKING PLASTIC METALLISATION ON A NEW LEVEL

Plastics metallisation is a technology that has been attracting the interest of designers and major industry sectors for many years now. Consumer products which bear components with an attractive metallic look are fashionable and raise the perceived value of these end products.

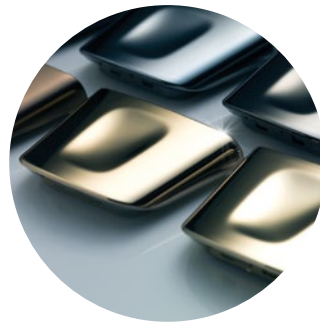
Environmental necessity has led scientists and developers to thrive for new surface technologies and to develop alternatives that provide new coatings with comparable visual and protective properties - but with less or no environmental impact.

Consequently, Oerlikon Balzers has developed ePD™ technology, a surface technology that not only provides the glossy look of metal – the most popular being chromium – but also satisfies the high protective requirements that a coating needs to offer. With ePD™ and INUBIA I Oerlikon Balzers offers a fully integrated solution for plastic metallisation which fulfils this high technological level. INUBIA I supports high volume production through fast process cycles. A phenomenal throughput can thus be achieved, which translates to a cost-effective production.

ePD for automotive exterior design



ePD for automotive interior design



Push-buttons



Capacitive sensing



Decorative trims



Gear shifter

ePD for other application designs



Home appliances



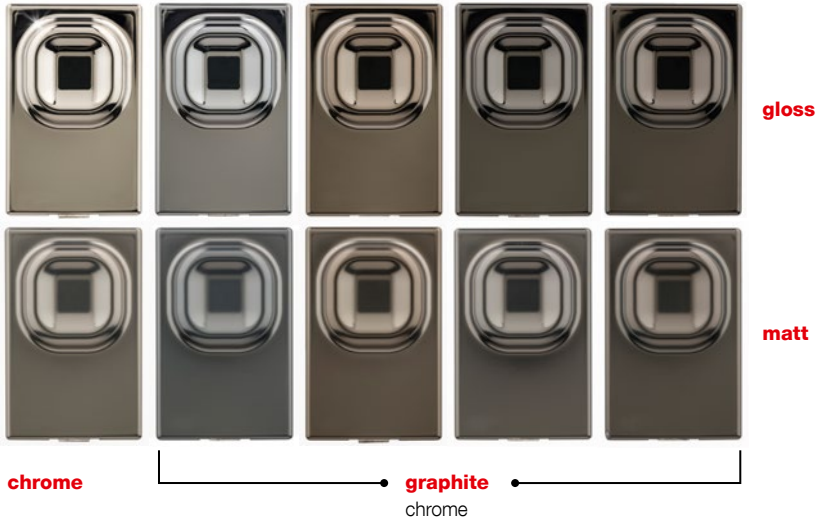
Consumer electronics



Sanitary equipment

ePD

FOR CHROME LOOKING METALLISATION OF DESIGN PARTS



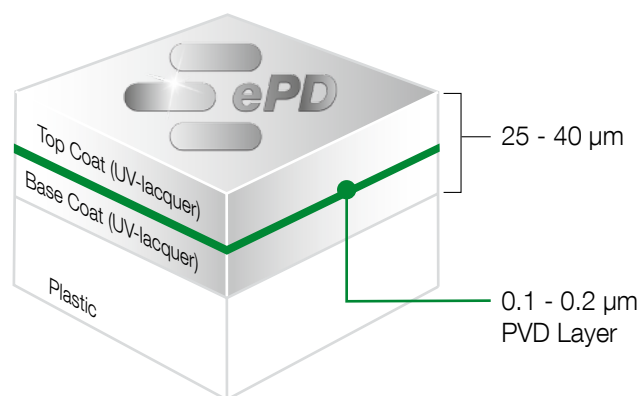
COATING SYSTEMS

GOOD TO KNOW!

INUBIA I 6 and I 12 equipment can not only produce coatings with the popular chrome appearance. With the combination of metals used as plasma target material and a variation of reactive gases, a variety of appealing colours can be created with the PVD process.

Inspiring coatings

ePD™ is the short form for “embedded PVD for Design parts” and represents an environment-friendly and future-oriented coating procedure. Whenever high-end metallic surfaces on plastic parts are required, ePD™ is the sustainable alternative to today’s conventional production technologies. No environmentally harmful chrome derivatives are used in the process.



What is ePD?

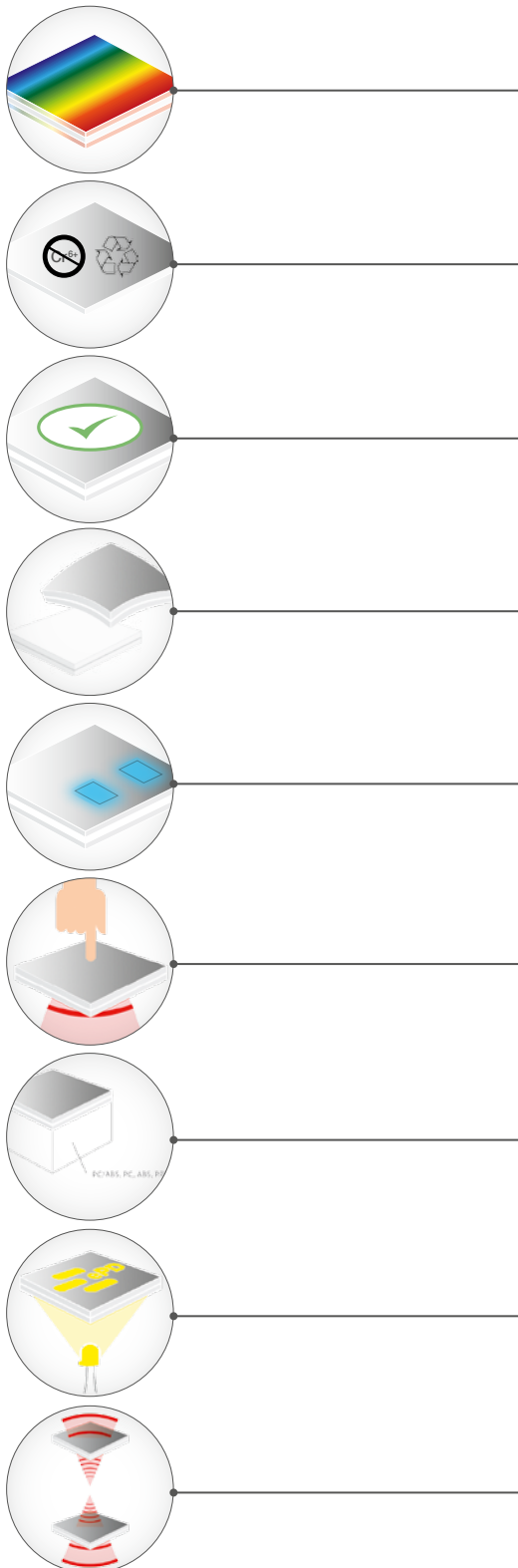
ePD™ based coatings consist of three layers: a lacquer base coat, a thin metallic decorative film, and a protective lacquer top coat. The base coat serves to equalize irregularities of the injection moulded plastic substrate. On top of the base coat, a thin metallic film is deposited using PVD vacuum sputter technology.

On top of the thin metallic film, another lacquer coating is applied. The top coat is extremely fast drying, and is durable, stable and protective. The ePD™ process is environmentally friendly due to low energy consumption and the avoidance of special waste. ePD™ coated parts are fully recyclable.

ePD TECHNOLOGY – UNPRECEDENTED FEATURES AND ADVANTAGES

ePD™ technology offers a large number of desirable surface properties. The nanotechnology in fact offers far more desirable properties than conventional metal platings. A broad scope of new features for new applications can be utilised

that raise the value of the end product by combining design with functionality. Useful new functions can be integrated into ePD™ coated parts, and therefore are attractive to designers, manufacturers and end users.



Colour flexibility

Beyond the classic chrome colour, ePD™ offers a large variety of colour options, from mirror chrome to graphite chrome and many other colour shades.

Environmental-friendly

ePD™ is the environmental-friendly alternative to today's conventional production. No environmentally harmful chrome derivatives are used in the process. ePD™ coated parts are fully recyclable.



Corrosion resistance (Russian mud test):

ePD™ coatings provide enhanced corrosion resistance – including against Russian mud, which contains highly corrosive salts, typically used to thaw ice on roads in Russia and Canada. ePD™ coated parts withstand Russian mud tests, a very important feature for automotive exterior plastic metallisation.

Safety features

Coatings applied using ePD™ technology on soft and flexible base materials reduce or eliminate sharp breaking edges that are found with other metallic coatings. ePD™ coated parts qualify for safety-relevant parts in car interiors and open up new horizons in automotive exterior parts design.

TRANSLUX® - Light-transparency

The thin ePD™ coatings can be made translucent for light sources beneath the coated part. At night and when dark, coated parts - that look metallic during the day - can provide signal lighting or back lighting.

Capacitive sensing

The integration of capacity sensing technologies in metallised plastic components offer attractive design solutions, such as for any kind of electronic devices.

Large variety of substrate materials

ePD™ is not limited to PC/ABS and ABS substrate material and therefore gives you more design flexibility. With ePD™, many other polymers such as PC, TPE, PA and ASA may also be metallised. For example, a polymer with a flexible structure can be metallised and bent or stretched to a certain degree without fracturing.

Day/Night design

Laser etching allows controlled coating removal for day/night design or, for example, for light emitting buttons which can have letters or icons laser etched into them.

Radar-transparency

The inbound and outbound radar transparency of metallised plastic parts is now possible. For example, for safety distance control solutions integrated into the front grills of cars or lane departure warning sensors in the exterior trim.

INUBIA I6 & I12

THE FULLY INTEGRATED AND AUTOMATED SOLUTION FOR HIGH-VOLUME PLASTIC METALLISATION



INUBIA I6 and I12 are fully automated and user friendly systems that provide ePD™ based coatings. The integrated system, completely developed by Oerlikon Balzers, enables high-volume mass production in accordance with automotive specifications.

Full machine control: Process parameters and recipes are provided by Oerlikon Balzers, and can be saved and reproduced automatically at any time. Remote service can access the equipment controls and exchange and upload parameters. History profiles can be run and process events are recorded and can be retrieved at any time.

INUBIA I6	INUBIA I12
Spindle length = Maximum workpiece length	Spindle length = Maximum workpiece length
600 mm	1200 mm
Spindle diameter:	Spindle diameter:
220 mm	360 mm
Spindles per carrier:	Spindles per carrier:
2	2
Spindle orientation:	Spindle orientation:
horizontal	horizontal
Spindle cycle time:	
< 45 sec	

COATING SYSTEMS

GOOD TO KNOW!

Oerlikon Balzers' INUBIA I6 and I12 enable customers to efficiently apply ePD™: plastic metallisation for injection moulded 2D and 3D Design Parts on a high volume scale.

The combination of fast UV-paint processes and vacuum metallisation by rapid-cycling PVD sputtering leads to a fully integrated and innovative machine solution. Oerlikon Balzers is again setting a new industrial standard.

Depending on the parts' geometry, metallisation throughput up to 60 m²/h can be achieved.

INUBIA I (Integrated) – the solution consists of a fully automated process sequence:

- Load** ① Manual or automatic spindle load
- Cleaning** ② CO₂ cleaning
- UV Base Coat** ③ Application of the base coat through a spray painting process
- PVD Metallisation** ④ Magnetron sputtering of the metallic or metal-ceramic thin PVD film
- UV Top Coat** ⑤ Application of lacquer top coat to protect the metal or metal-ceramic film
- Unload** ⑥ Manual or automatic spindle unload

PVD:

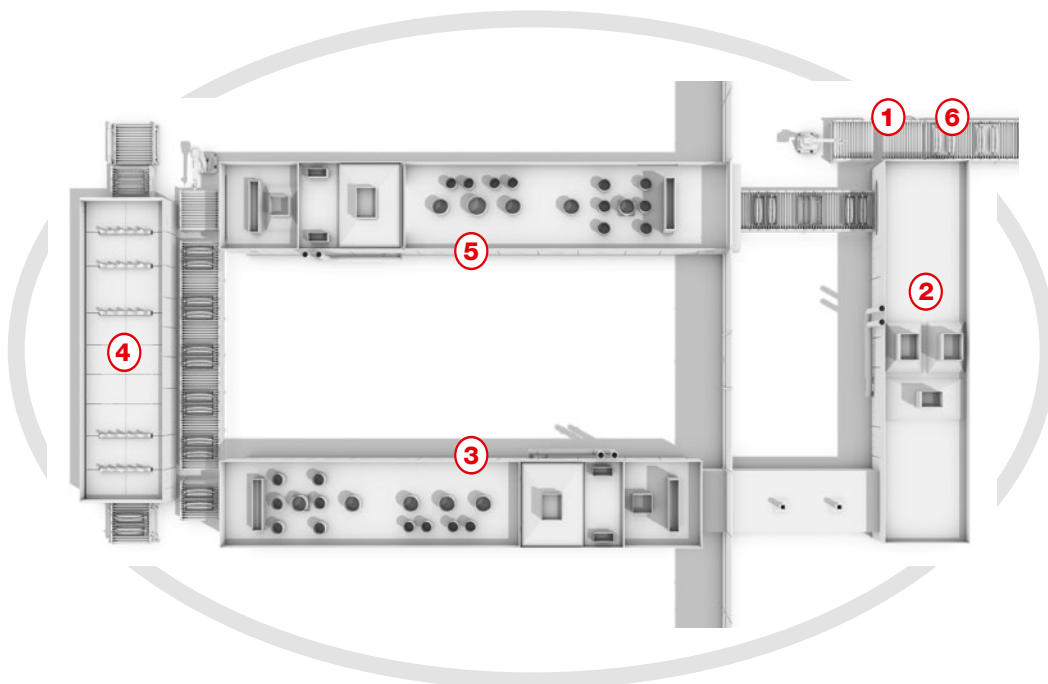
Physical vapour deposition (PVD) is a vacuum deposition method, used to deposit thin films via the condensation of a vaporised form of the desired film material.

Inline PVD process:

Multi-chamber short-cycle system

Recommended substrate materials:

Plastics: ABS, PC/ABS, PC, PC/PBT, PC/PET, selected blends of PA (fibre glass and mineral enforced), other plastics on request





Customer service

Service and engineering teams provide customer support on site and remote.



Green technology

The ePD™ process is REACH conform and does not use Cr⁶⁺ in the production process. Recycling and waste management of metallised parts is simplified.

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