

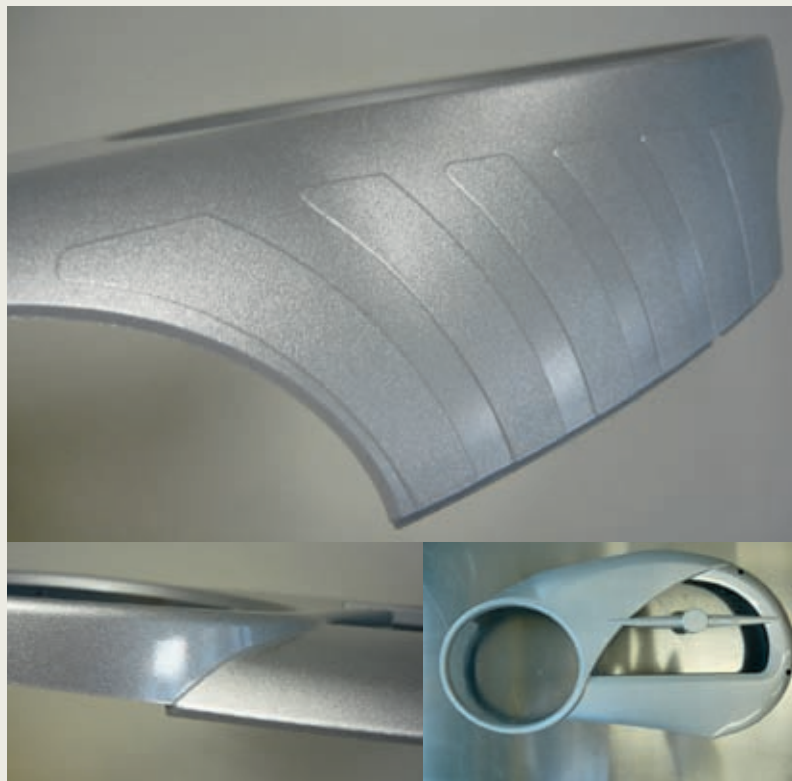
## WATERBORNE TWO-COMPONENT POLYURETHANE COATINGS FOR PLASTICS

# New high-gloss coating for ABS

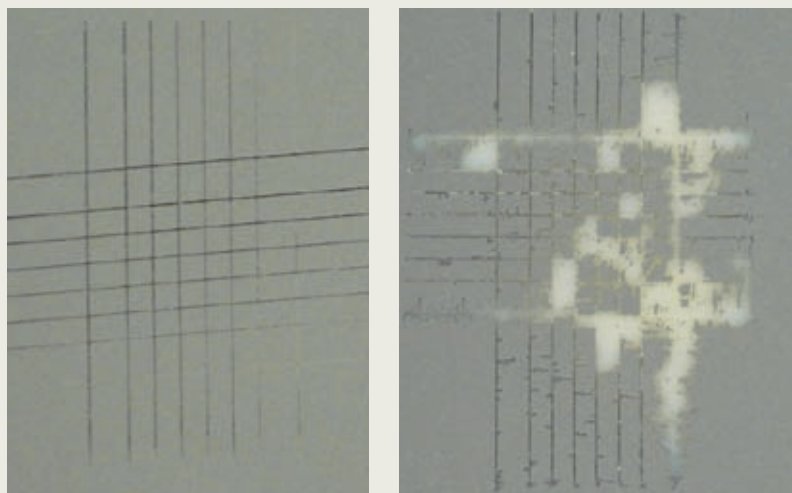
In industrial applications, coatings frequently have to be applied to plastic substrates, such as ABS. These plastics are used for a wide variety of purposes and have significant advantages over metals. However, specific problems can arise when coating ABS.

Acrylonitrile butadiene styrene, or ABS, is one of the most common plastics on the market. Its applications range from add-on vehicle parts (interior and exterior), electronic products, housings and covers through to leisure items and products for the toy industry. ABS is a mix of acrylonitrile (15 to 35%), butadiene (5 to 30%) and styrene (40 to 60%). It is available either as a copolymer or as a blend (a mix of the finished polymers). Depending on the proportions of the three components, plastics with different properties, such as density, hardness or tensile strength, can be produced. One property which is crucial for the coating manufacturer Freilacke is the coatability of the plastic. A coating which adheres to one type of ABS may under certain circumstances completely fail to adhere to another type.

Therefore, it is always advisable for coating developers to test their products on the original substrates. When coating manufacturers order new original parts from their customers, they are not trying to cause difficulties. In fact, they want to guarantee in advance that the coating they are developing meets all the adhesion and durability requirements on this specific substrate.



Coated original substrate made of ABS.



Different ABS substrates coated with the same paint: on the left showing good adhesion and on the right poor adhesion.

Why are coatings applied to plastics such as ABS in the first place? One reason is that the styrene component of ABS can cause the plastic to degrade if is exposed to the UV radiation in sunlight over a long period of time. In the worst case, the plastic becomes brittle, stress cracks form and the component may no longer be able to perform the required function. In addition, a suitable coating can to a certain extent protect the relatively sensitive plastic from scratching and harmful chemicals. As a result, the coating can significantly extend the service life of a component. Finally, coatings can enhance the appearance or feel of the component.

The core competence of FreiLacke has traditionally been the production of high-quality coatings for metal substrates. In order to add to its already comprehensive range of products, two years ago the company systematically

began to develop high-quality, environmentally friendly coating systems specifically for industrial plastic applications. The project produced successful results last year, following close cooperation with the customer. A high-gloss, single-coat, waterborne, two-component polyurethane metallic paint was developed specifically for ABS substrates.

The product had to fulfil the following customer criteria:

- Single coat with very good adhesion to ABS
- High-gloss even in thin layers (>75 E at an angle of 60°)
- Resistance to a wide range of chemicals
- Ready for packaging and stacking immediately after cooling
- Good coverage of edges and vertical surfaces, and no sinking of the effect pigment
- Excellent overall coverage

The paint is applied using a large-scale spray coating machine and cured at 70 °C after flash-off.

The decisive factors in producing a high-quality, decorative coating include not only the paint itself, but also the substrate, in particular when this is made of plastic. Single-coat paints make any faults in the plastic very obvious. However, if the substrate has been properly cast and has no air bubbles or flow lines, in many cases a primer is not needed, as in the case described above. Of course, there are other plastics which require priming for reasons of adhesion. In order to increase the painting capacity and make use of advantages such as high levels of scratch resistance, FreiLacke has begun developing UV-curable coating systems. —|

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