

A Coater with a Clear Perspective

KRD Sicherheitstechnik Cures Makrolon with Polysiloxane Lacquers

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KRD Sicherheitstechnik, Geesthacht/Germany, specialises in non-scratch sealing of plasticised plastics. Since 1988, for instance, it has been producing high-impact glazing for police vehicles. Another example is to be found on a catamaran currently sailing the oceans of the world. Its external glazing panels are composed of a coated polycarbonate (grade: Makrolon, manufacturer: Bayer). The catamaran is a

Despite their thermoformability, untreated crystal-clear polycarbonates make poor glass substitutes because they are not hard enough. However, applying speciality, non-scratch polysiloxane coatings by the appropriate method can rectify this deficiency.

KingcatM270, made by the French company KingcatSA (title picture; photo: KingcatSA). This luxury model, which has a top-speed of 46 knots, is the first vessel to defy the hostile, salty sea climate using plastic glazing of this kind. In both of these examples, the requisite surface hardness and hydrolytic resistance are provided by polysiloxane-based KASI coating systems made by KRD Sicherheitstechnik.

"The Kingcat has now been sailing the high seas these last two years. And so far, the KASI coating has been an unqual-

ified success. We hope that this application will catch on, because it would open up a whole new market for the material", says Gerd Brammer, who founded KRD in Hamburg in 1975. Initially a vehicle-repair shop, it has evolved over the years into a specialist coating company employing some 60 staff with annual sales of DM 10 million and annual growth of around 10%. The catamaran's coated windows measure 1000×1800 mm, but Gerd Brammer and Korinna Poillon, his daughter and designated successor, are actually capable of shaping and coating PC and

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PMMA slabs measuring up to 3000 mm × 7000 mm in their factory shops.

High-Impact Plastics Save on Repair Costs

“It’s simply not true that plastics such as polycarbonate are no match for glass”, says Brammer. “The abrasion resistance of glass is not the be-all and end-all. The glazing’s impact strength is just as important, if not more so”. This is why, for instance, the front panes of the German Intercity Express trains are made of polycarbonate coated with KASI. These have to be replaced less frequently after collisions with foreign bodies and, according to KRD, this has led to major savings for German Railways.

The essential thing is to get the right balance of coating. Thus, the polysiloxane film, which confers a kind of glassy surface on the plastic, must not be too thick as otherwise it will become brittle and crack. When just the right level of thinness is struck, it is highly elastic and small abrasive particles bounce off it. KRD has found that coating thicknesses less than 8 µm are ideal. They are applied

in special cleanrooms or by spin coating. An elaborate quality control system – cross-hatch test, Florida weathering, interferometry – ensure that they are of uniform thickness.

Coating Experience is Crucial

The coating process is the outcome of a great deal of know-how, because Gerd Brammer and Korinna Poillon take great pains to ensure that their products offer maximum optical quality. “Lacquers can enhance the quality of plastics in many ways. But few people have the experience that you need to carry out coating successfully in practice”, says Brammer. KRD has acquired this experience through years of responding to changing customer specifications. For years now, Bayer AG, Leverkusen/Germany, has been sending its test polycarbonate parts to KRD for coating. Prototype automotive glazing, under consideration by all major automotive manufacturers, is also produced by KRD.

Every year, around 300t polycarbonate and 1000t PMMA pass through the KRD

factory. The company deliberately avoids mass production: typical series coated in Geesthacht run to just several thousand parts and include partition walls for trams and safety glazing. But KRD also makes one-off parts, such as stage decorations for TV productions. “We concentrate on speciality applications – high-quality coatings at fair prices”.

That this strategy is paying off is evidenced by closer co-operation with a Japanese coating company planned for the near future. Meter-high PMMA noise-protection walls will soon be made in Japan. These are still being coated in Geesthacht for now. The coating comprises a KASI polysiloxane lacquer and a photocatalytically auto-curing TiO₂ layer that would not adhere otherwise to plastic. In securing this order, the coating specialist KRD prides itself on beating off world-wide competition.

The Author of this Article

Dr. Stefan Albus, born in 1966, is a freelance technical journalist and reports mainly about topics dealing with plastics.