Case Study

Conductive polyamide 6 for powder coating

Perfect color match for plastic and metal components in a single step

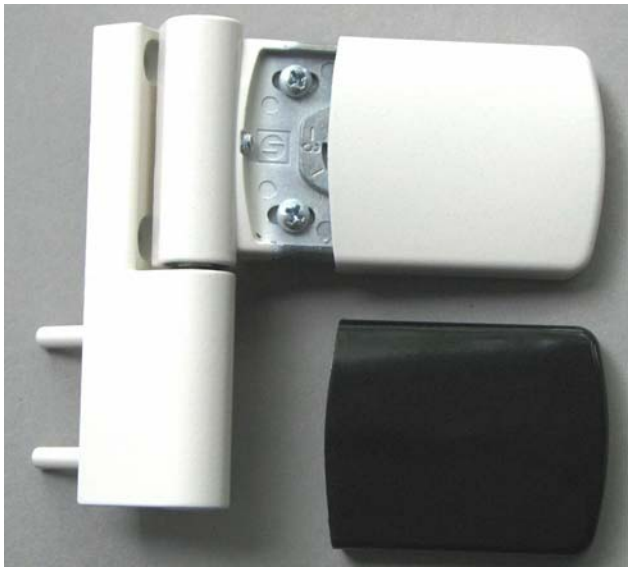

Figure 1 Door strips

Manufacturer: Schüring GmbH & Co. Fenster-Technologie KG

Grade: Durethan® BCF 30 X H2.0

The conductive polyamide 6 Durethan BCF 30 X H2.0 from LANXESS, which is already used in the production of conductive vehicle fuel filter housings and anti-static components for potentially explosive areas in coating lines, is also ideal for use in powder coating applications. This was confirmed by tests performed on a cap cover for door and window strips made of die-cast zinc.

Exhibiting a specific surface resistance of around 102 Ohm, the material is sufficiently conductive to allow an even layer of powder coating to be applied to the cover cap. There is thereby no need to pretreat the component with a conductive primer. What's more, the material is capable of withstanding temperatures of around 180 to 200 °C for several minutes when the coating is baked. Thanks to its high heat resistance, the cap displays no noticeable distortion.

The caps are usually made of dyed polycarbonate, while the door and window strips are powder-coated separately. The problem is that the shades of the cap and strips do not match exactly. The idea was therefore to use a plastic that could also be powder-coated. In this way, the metal strips and plastic cap could be assembled first before being coated electrostatically in a single step. In contrast to the standard solution, with Durethan BCF 30 X H2.0 just one coating step is required, thus ensuring a perfect color match for the metal and plastic components. The uniform look of the paint and surface is not affected by weathering either, because only one coating system is used.

Durethan BCF 30 X H2.0 is reinforced by weight with a 30 percent mixture of glass and carbon fiber. This contributes to the material's excellent conductivity and unlike conductivity additives based on carbon black, which usually impair the mechanical properties and surface quality of polyamide 6, it has a negligible impact on the mechanical properties of the thermoplastic. With this material, users can benefit from virtually all of the advantages of standard polyamide 6 grades with 30 percent glass fiber reinforcement, such as Durethan BKV 30 H2.0, when designing complex technical components.

Following successful tests on the cover cap, LANXESS expects that the new material will be used in the series production of components for powder coating. Processors benefit from all the strengths that powder coating offers over wet coating. This means that functional or decorative coatings, such as a metallic look, could be applied to suitable components.

Possible applications include polyamide chair bases and arm rests with a metallic surface in the furniture-making industry or coated window frames and modules in the construction industry. There is also considerable scope for applications that call for metal and plastic components to be combined and coated in a single shade of color. With powder coating, this can be achieved cost-effectively in a single step.