

Case Study

USB connector housings

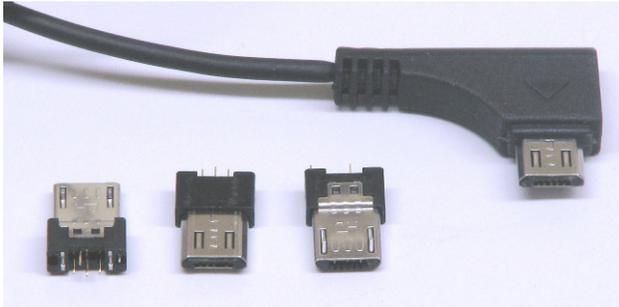


Figure 1 USB connector housings

A new polyamide 66 resin from LANXESS, Durethan DP AKV 30 FN00, is proving to be a successful material for consumer electronics applications which require flame-retardant properties.

Recently, the electronics industry has been voluntarily moving away from materials with flame-retardants based on halogen. This material not only fits this trend but is also free of red phosphorus, an ingredient in many flame-retardant plastics which may cause cosmetic issues in the finished part.

In addition, this material achieves excellent ratings in flame retardancy tests, has a wide processing window for injection molding and is perfect for components with very thin walls such as plug connectors, coil formers and tiny USB plugs.

Many manufacturers of consumer electronics have stopped using halogenated flame-retardant plastics in an effort to become more eco-friendly. Their goal is to improve their image with consumers by improving the sustainability of their operations. More and more companies are also opting for plastics that contain no red phosphorus. This is due to its inherently dark color, which prevents production of light-colored components. Color is a crucial design element and a safety feature in many applications. Red phosphorus can

Grade: Durethan® DP AKV 30 FN00

Manufacturer: Hyupjin INC, Korea

also cause corrosion when it comes in contact with metals in warm or moist conditions.

Tests conducted in accordance with standard UL 94 confirm the high flame retardancy of Durethan DP AKV 30 FN00. Test pieces between 0.4 and 3 millimeters thick passed the test and were awarded the classification V-0. Moreover, the thermoplastic is difficult to ignite and has a short flame time. At 960 °C, it achieved the best possible GWFI (Glow Wire Flammability Index) value for plastics in the glow wire test according to IEC 60695-2-12 based on test piece thicknesses of between 0.8 and 3 millimeters. In the HWI (Hot Wire Ignition) and HAI (High Amp Arc Ignition) tests, the material was classified in the best performance level category (PLC 0), even at a test piece thickness of 0.4 millimeters. This makes it highly suitable as an insulating material in line with UL standard 508.

The electrical properties of polyamide 66 are also rated very highly. For instance, its CTI A (Comparative Tracking Index, IEC 60112) value of 600 volts means it is very tracking resistant and therefore earns the best possible classification (PLC 0) on the UL Yellow Card. The risk of short circuits and equipment faults resulting from leakage currents in applications is thus greatly reduced.

Even in air, this material, which is reinforced with 30 percent glass fibers, has high heat resistance in continuous use. Tests to assess compliance with UL 746 B are currently underway and excellent Yellow Card values are expected for the Relative Thermal Index (RTI) with respect to all three load types specified in the standard. The material also has impressive mechanical properties. The high Izod impact strength

(ISO 180-1U) of 55 kJ/m² is just one noteworthy example.

The new polyamide 66 was designed to have a broad processing window for injection molding. This material can easily cope with wall thicknesses of well under one millimeter – for instance in plug connectors. The material is used instead of flame-retardant PBT, polyamide 46 and polyphthalamide in many applications.

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Typical Properties

Property data is provided as general information only. Property values are approximate and are not part of the product specifications.

Flammability

Flammability results are based on small-scale laboratory tests for purposes of relative comparison and are not intended to reflect the hazards presented by this or any other material under actual fire conditions.

Health and Safety

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling LANXESS products mentioned in this publication. Before working with these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets (MSDS) and product labels. Consult your LANXESS Corporation representative or contact the Product Safety and Regulatory Affairs Department at LANXESS. For materials that are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturer(s) must be followed.

Regulatory Compliance

Some of the end uses of the products described in this brochure must comply with applicable regulations, such as the FDA, NSF, USDA and CPSC. If you have any questions on the regulatory status of any LANXESS engineering thermoplastic, consult your LANXESS Corporation representative or contact the LANXESS Regulatory Affairs Manager.

Regrind

Where end-use requirements permit, regrind may be used with virgin material in quantities specified in individual product information bulletins, provided that the material is kept free of contamination and is properly dried (see maximum permissible quantities and drying conditions in product information bulletins). Any regrind used must be generated from properly molded/extruded parts, sprues, runners, trimmings and/or film. All regrind used must be clean, uncontaminated, and thoroughly blended with virgin resin prior to drying and processing. Under no circumstances should degraded, discolored, or contaminated material be used for regrind. Materials of this type should be discarded. Improperly mixed and/or dried regrind may diminish the desired properties of a particular LANXESS product. It is critical that you test finished parts produced with any amount of regrind to ensure that your end-use performance requirements are fully met. Regulatory or testing organizations (e.g., UL) may have specific requirements limiting the allowable amount of regrind. Because third party regrind generally does not have a traceable heat history or offer any assurance that proper temperatures, conditions, and/or materials were used in processing, extreme caution must be exercised in buying and using regrind from third parties. The use of regrind material should be avoided entirely in those applications where resin properties equivalent to virgin material are required, including but not limited to color quality, impact strength, resin purity, and/or load-bearing performance.

Color and visual effects

Type and quantity of pigments or additives used to obtain certain colors and special visual effects can affect mechanical properties.

Note:

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