

## Case Study

### Monitor frame



Fig. 1 Monitor frame

**Philips** is represented in more than 60 countries and has production sites all over the world. Among the products it produces are monitors for use in hospitals: these are used for patient monitoring in the operating room or in intensive care medicine, as emergency monitors in ambulances or as fetal monitors for screening women and their unborn babies. The monitor frame shown in Fig. 1 is used in the 19-inch IntelliVue MX800 patient monitor. This flatscreen device combines an integrated PC and a patient monitor.

Due to their use in hospitals and operation via touch-screen, these types of panels need frequent cleaning. Germs that are becoming ever more resistant require the use of increasingly aggressive disinfectants. Philips was therefore on the lookout for materials that have better resistance to a range of disinfectants than conventional unreinforced housing materials based on PC+ABS blends.

**OEM:** Philips Medizinsysteme GmbH, Germany

**Grade:** Durethan® BKV 20 FN00

**Manufacturer:** Gebr. Schwarz GmbH, Germany

The requirement profile for a material to solve this problem was as follows:

- Halogen-free flame retardant package
- UL94V-0 rating at 1.5 mm thickness
- Minimal warpage
- Very high chemical resistance
- Optimal surface quality and aesthetics

To meet these requirements in the next generation of devices, LANXESS offers Durethan BKV 20 FN 00, a glass-fiber reinforced and halogen-free flame-retardant polyamide. Reinforced polyamide has a higher tendency to warp than unreinforced PC+ABS blends. However, with the help of in-depth mold filling simulations, warpage calculations and geometry optimization in collaboration with LANXESS, it was possible to solve this issue and bring the parts to production.

Snap-fit latches and screw bosses for self-tapping screws can be integrated very easily (see Fig. 2).



Fig. 2 Snap-fit latches and screw bosses

Also, due to its good chemical resistance, Durethan BKV 20 FN00 polyamide is not prone to environmental stress cracking.

In this application it was also possible for the first time to combine a printed disinfectant-resistant film with Durethan resin by means of film insert molding (FIM), which leads to a high-gloss surface. The FIM technology is used for the visible surface of the patient monitors. For other areas, the good surface appearance achievable with Durethan BKV 20 FN00 polyamide is sufficient.

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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:

The information contained in this publication is current as of March, 2012. Please contact LANXESS Corporation to determine if this publication has been revised.