Case Study

Steering wheel control switch in Pocan® DP T 7140 LDS

Grade: Pocan® DP T 7140 LDS

Manufacturer: TRW, Germany

Fig. 1 Steering wheel with right and left steering wheel control switch

TRW Automotive Safety Systems GmbH, based in Aschaffenburg, is one of the world's leading companies for integrated vehicle control systems on the automotive market. One of its focuses is the production of steering wheels. TRW is the first company to use the laser direct structuring process (LDS) for the production of a steering wheel control switch. The injection molded circuit substrates, also known as MIDs (Molded Interconnect Devices) for short, are made of Pocan® DP T 7140 LDS, a thermoplastic polyester specially formulated by LANXESS to work with the LDS process. The steering wheel is used on the BMW Z4 Roadster.

The LPKF-LDS® process (developed by LPKF Laser & Electronics AG) is a particularly innovative method for the production of MIDs. It allows circuit tracks to be applied to plastic parts both simply and cost-effectively, offering flexibility in the event of changed layouts.

The steering wheel control switches are the first automotive applications of the laser direct structuring process to be mass-produced on a large scale. This part demonstrates many of the advantages of the LDS process, namely its reduced space requirements and high level of functional integration. Separate printed circuit boards and cables are no longer required, simplifying the assembly and reducing costs.

A key characteristic of Pocan® DP T 7140 LDS resin is its very high heat distortion temperature HDT (Bf) of 250 °C. It is therefore particularly suitable for lead-free soldering in the "vapor phase". Different transistors, resistors, capacitors and SMD connectors are applied to the two control switches through vapor phase soldering at 235 °C.

TRW Automotive Systems GmbH has been awarded the "MID Industry Prize 2009" by the "Research Association Molded Interconnect Devices 3D-MID e. V." for its innovative development of this steering wheel control switch.

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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.

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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.

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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 October, 2010. Please contact LANXESS Corporation to determine if this publication has been revised.

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