News Release

Infotainment carrier in the Audi A6 based on thermoplastic composite technology

Reduces weight by nearly 50 percent

Lightweight construction with continuous fiber-reinforced polyamide composites

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Cologne – An infotainment carrier of hybrid design, made from a continuous fiber-reinforced polyamide composite and a polyamide 6 overmolding material, is being used for the first time in the Audi A6. Fabricated with Tepex and Durethan from LANXESS, this mass-produced component weighs only just over half as much as its steel counterpart. “This application underlines the enormous weight-saving potential of hybrid technology and continuous fiber-reinforced polyamide composites for the lightweight design of structural components. We are confident that this hybrid design also is suitable for other support components in motor vehicles, such as carriers for pre-installed electrical and electronic modules,” says Martin Klocke, lightweight design specialist at LANXESS.

The series component was preceded by a production-ready prototype developed through close cooperation between Audi's Control Device Package Development and Fiber Reinforced Plastics Technology Development departments, LANXESS, KraussMaffei Technologies GmbH and Christian Karl Siebenwurst GmbH & Co. KG Modellbau und Formenbau. For the manufacture of the prototype, KraussMaffei developed a fully automated manufacturing cell with a specially adjusted handling system and a heating unit directly positioned above the mold platen.

Cost-efficient, one-shot process with short cycle times
Based on this work, Reinert Kunststofftechnik GmbH und Co. KG built an optimized manufacturing cell for the fully automated and reproducible series production of the infotainment carrier.
The process involves the use of two inserts made of

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Tepex dynalite 102-RG600(2)/47%, a polyamide 6 composite from LANXESS subsidiary Bond-Laminates reinforced with continuous glass fibers. They are gradually heated by an infrared heating system from KRELUS AG, formed in the injection mold and then directly overmolded with the easy-flow polyamide 6 Durethan BKV 30 EF H2.0 from LANXESS. Ribs on the side of the component far from the gate are filled by injecting Durethan through the Tepex inserts. The one-shot process enables production of the composite part in a cycle time of less than 50 seconds without requiring any re-working. Special grippers rapidly transfer the heated composite inserts to the mold, where they are set in place by special positioning pins. The holes for the screw connections are not stamped afterwards in a separate processing step, but rather formed by mandrels inside the injection mold when it is closed. This way, the fibers are pushed around the bore hole with virtually no damage at all, which ensures optimal load transfer when the component is exposed to stress. This positive effect has been confirmed by corresponding testing. The handling system and production mold were developed and manufactured by Maier Formenbau GmbH.

High composite strength and stiffness

The infotainment carrier holds a premium-brand amplifier and an optional TV tuner. It must not only display high stiffness, but also be resistant to fatigue at the points where it is connected to the body and add-on parts, because the weight of the installed devices leads to vibrations during driving, which causes high dynamic stresses. These areas therefore are reinforced with Tepex and designed such that forces flow mainly via the continuous fibers.

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