Cost-effective manufacturing of three-dimensional foam cores for the series production of carbon-fiber composites

Evonik is presenting ROHACELL® Triple F—a new structural foam for large-quantity series production—at the JEC in Paris.

Sandwich cores for fiber-composite components are currently mainly designed in flat structures. As part of its LiteCon joint venture, Evonik Industries, Germany, is now producing ready-foamed, complex three-dimensional structural cores for CFRP sandwich components in industrial series production. ROHACELL® Triple F will make it possible to produce complex 3D components in commercial quantities. Thanks to its excellent mechanical properties, even at higher temperatures, this foam can be used in high-pressure RTM or wet-pressing processes for the quick and efficient production of sandwich components with light foam cores for the automotive industry, for example in car bodies, chassis and mounted parts.

The material in the core has a strong impact on the performance of sandwich constructions. Aside from the mechanical performance, the sandwich core and the entire sandwich component should be able to be produced economically. Until now, polymer hard foams for sandwich components were predominantly manufactured in blocks and then formed into the desired shape in a further processing step, usually by CNC milling. The high degree of manual forming and the relatively high wastage mean that manufacturing costs for large-scale production are too high.

This is what led Evonik to develop a new in-mold foaming process (IMF) for its rigid foam for manufacturing complex geometries. For ROHACELL® Triple F, PMI granules in the desired density are foamed into a finished foam core in a mold. Metallic parts, for example threaded inserts, can be directly integrated during the foaming process. ROHACELL® Triple F is compatible with conventional resins such as epoxy resin. Thermoplastic materials can also be set directly in the mold as a cover layer.

Sandwich components with an in-mold foamed core made from ROHACELL® Triple F are offered by LiteCon Advanced Composite Product GmbH, a joint venture between Evonik Industries AG and SECAR Technology GmbH established in 2013. LiteCon combines the materials competency of Evonik with SECAR’s process know-how for manufacturing components for the composites industry.
For further information on ROHACELL® please visit www.rohacell.com

Image caption:
With ROHACELL® Triple F, it is possible to produce complex geometries with integrated inserts and the specific required density. By way of an example, the demonstration component includes two different inserts.

About Evonik
Evonik, the creative industrial group from Germany, is one of the world leaders in specialty chemicals. Profitable growth and a sustained increase in the value of the company form the heart of Evonik’s corporate strategy. Its activities focus on the key megatrends health, nutrition, resource efficiency and globalization. Evonik benefits specifically from its innovative prowess and integrated technology platforms.

Evonik is active in over 100 countries around the world. In fiscal 2014 more than 33,000 employees generated sales of around €12.9 billion and an operating profit (adjusted EBITDA) of about €1.9 billion.

Disclaimer
In so far as forecasts or expectations are expressed in this press release or where our statements concern the future, these forecasts, expectations or statements may involve known or unknown risks and uncertainties. Actual results or developments may vary, depending on changes in the operating environment. Neither Evonik Industries AG nor its group companies assume an obligation to update the forecasts, expectations or statements contained in this release.