

BMW 7 Series dashboard carrier

The case

At the forefront of automotive development BMW is continuously engaged in exploring new ways to make its vehicles safer, lighter and more fuel efficient, and more environmentally friendly. In tandem with those objectives, but no less important, it aims through its developmental work to improve component and vehicle performance and decrease production costs without any compromises in its very high standards of engineering.

The latest contribution to these vehicle enhancements involved the innovative reengineering of the dashboard carrier in the BMW 7 Series.

The challenge

The pre-existing dashboard carrier in the BMW 7 Series model was a construction using PUR-LFI materials. The key objective of the redesign was to create a single-material solution for the dashboard carrier module that would lower system cost and simplify the manufacturing process. Essential was that the material selected was compatible with BMW's integral foam injection technology. Known as SGI, this process enables BMW to produce a lightweight part, which exhibits the same performance profile as compact material and much heavier parts.

For this project BMW was both the OEM and also, through its Landshut Innovation and Technology Centre, the project's Tier 1 supplier. In addition to OEM objectives the Tier 1 requested technical support from the raw material supplier, which included assistance with:

- Customized material development
- Fine-tuning of the injection moulding process
- CAED support for filling and cooling analyses, performance simulation and structural optimisation.



The solution

The material selected by BMW to meet the dashboard carrier specifications was Borealis' Nepol™ GB215HP, a high performance 20% long glass fibre (LGF) reinforced polypropylene. Due to its outstanding mechanical properties Nepol GB215HP can replace other engineering plastics or metal alloys in a broad range of applications. Moreover, it is particularly well suited for processing in combination with special foaming technologies such as BMW's SGI process.

Successfully replacing the previous PUR-LIF composition, Nepol GB215HP delivered:

- The same mechanical performance using less material
- Lower systems costs through improved processing conditions
- Potential weight reduction by up to 20%

An additional benefit was gained through the use of a recyclable, more environmentally friendly material, as well as a contribution to vehicle weight saving and, ultimately, lower fuel consumption.

The product

Nepol GB215HP is a 20% long glass fibre reinforced polypropylene grade. The long glass fibres, which are chemically coupled to the polypropylene matrix, provide for outstanding mechanical properties that include high strength and stiffness, and excellent impact behaviour.

Nepol™ GB215HP	Physical properties (Typical values)
Tensile modulus [MPa]	5300
Tensile strength [MPa]	105
Charpy impact +23 (-20)°C [kJ/m²]	57 (32)
Mould shrinkage [%]	0,2/0,5 (longitudinal and cross flow)
HDT-A [°C]	130



Borealis is the only supplier offering a high performance LGF-PP for the SGI technology processing.

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