



Thermoplastic oil sump helps reduce both engine weight and noise

New Euro 6 truck engines from Scania feature oil sump made from DuPont™ Zytel® nylon

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Geneva, March 2012. An oil sump moulded from DuPont™ Zytel® nylon resin, one of the first to be produced in thermoplastic for the truck sector, is helping the Swedish commercial vehicle manufacturer Scania meet new challenges with regard to noise emissions and weight. The lightweight yet equally robust oil sump is amongst the host of innovative technical solutions incorporated by Scania in its new Euro 6 engines.

The ground-breaking application was produced in Sweden by the Plastal Group AB, a leading supplier of engineered plastics to the automotive industry, with the material, design and processing support of DuPont representatives in the country and across Europe and the input of prototype specialists Idé-Pro of Skive, Denmark. Innovative plastic applications, such as the Scania oil sump, that can help the automotive industry successfully meet the challenges of the future, will be on show at the international VDI Conference "Plastics in Automobile Manufacture" in Mannheim, Germany on March 21 and 22, 2012, where DuPont will also be an exhibitor.

Amongst the range of technological highlights contained within the new 440 and 480 hp (324 and 353 kW) 13-litre Euro 6-compliant engines, unveiled by Scania in spring 2011, is the premiere of an oil sump moulded from a heat-stabilized, glass-fibre reinforced grade of Zytel® 66 nylon. The adoption of the DuPont material for this application - a first for the truck market and only the second development for commercial production vehicles worldwide following the launch of the Daimler oil pan module in 2008 - has enabled a reduction in the weight of the component by over 50 percent versus its aluminium predecessor. Perhaps just as significantly, with regard to the environmental impact of the noise emitted by trucks, the use of a thermoplastic for the oil sump also helps reduce noise footprint of the engines.

The particular grade of Zytel[®] used for the Scania oil sump, Zytel[®] 70G35HSLX, is a 35% glass fibre reinforced, heat stabilized and lubricated polyamide 66 that is considered a material of choice for harsh, under-the-hood applications involving high temperatures and oil. Thanks to its low melt viscosity it readily fills thin section moulds, which, in combination with fast set up times, contributes to very fast moulding cycles. According to the development team at Scania, their main reasons for choosing Zytel[®] 70G35HSLX were that it meets technical requirements when used in oxidised oil and still provides the necessary level of impact performance.

Having settled on the initial design and material, Scania contacted Idé-Pro to undertake the first steps in the parts' development. Idé-Pro not only produces tools and moulds parts, but also offers the development tools and expertise needed during the prototype stage.. In such a way the design of the mould could be optimized to minimize warpage.

Beyond material selection, DuPont also assisted Scania in refining the sump's design and the production process, particularly with regard to achieving a consistently tight seal between the sump and the engine. This required very precise tolerance control of a large component, measuring 847mm (length) x 467mm (width) x 203mm (height), achieved by comprehensive mould flow analyses, prototype testing and ongoing optimisation of processing parameters. Ribbing on the underside of the sump also plays a key role in remaining within the permitted tolerances for the part, as well as performing a secondary function as a defensive shield against stone impacts. "Although it is assumed that an external acoustic cover will form the first line of defence against stones or debris thrown up from the road surface, Scania considers the ribbing on the underside of the sump as a second line of protection," confirms Murray Smith development specialist at DuPont Performance Polymers in Sweden.

Its effectiveness in this role was tested at DuPont's European Technical Centre in Geneva, where a high-speed impact compressed air cannon was used to fire steel balls at an angle of 45 degrees and at a speed of 80 kph (50 mph) at the sump. These tests confirmed that the ribs effectively dissipate the impact energy, becoming damaged in the process, whilst the structural integrity of the sump remains preserved.

DuPont Performance Polymers is committed to working with customers throughout the world to develop new products, components and systems that help reduce dependence on fossil fuels and protect people and the

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