

## Case Study

### Electronic junction box made of Pocan® T 7391



<b>Material:</b>	Pocan® T 7391
<b>Injection molder:</b>	Mecaplast Group, France
<b>OEM:</b>	Volvo Trucks, Renault Trucks
<b>Industry:</b>	Automotive

The main activities of the Mecaplast Group include the design, development and production of innovative automotive equipment for the European market. In fact, Mecaplast is one of the leading manufacturers in this field. The company supplies plastic components for automotive interiors and exteriors to a range of car manufacturers as well as Volvo Trucks and Renault Trucks.

The illustration above shows a new application for trucks – the electronic junction box. This is installed between the driver's cab and the engine compartment and is the interface to the central electronics, located behind it. Electronic components, some of which can also be mounted on the box, can weigh up to 3 kg. This box, which is manufactured by Mecaplast in France, was originally made of welded sheet metal. It is now made of Pocan T 7391, an engineering thermoplastic reinforced with 45 % glass fibers from LANXESS.

The electronic junction box is subject to particularly demanding technical requirements. As the interface

between the driver's cab and the engine compartment, it is subject to strong vibrations but must still remain extremely stiff. The conditions are made more difficult by the fact that the box must withstand temperatures up to 70 °C. Compared with steel, which involves a complicated design, it is both easier and more cost-effective to manufacture the box out of Pocan T 7391.

Pocan T 7391 has been used for the junction box of the new Premium truck from Renault Trucks since the start of 2006. The box is to be installed in other truck models, such as the Midlum from Renault Trucks and the Volvo FL and FM from Volvo Trucks, from the end of 2006.

The electronic junction box is the biggest and heaviest PBT application to be made from a LANXESS plastic for the automotive industry to date. It is 580 mm high and weighs 1.7 kg. In view of the demands made on this product and the weight and size that result from this, the low tendency to creep



and high dimensional stability of Pocan are crucial properties.

The high stiffness of Pocan T 7391 is impressive. The shear modulus curve (see Diagram 1) provides information on the linear elastic deformation. The torsion pendulum test shows very good values due to the high glass fiber content.

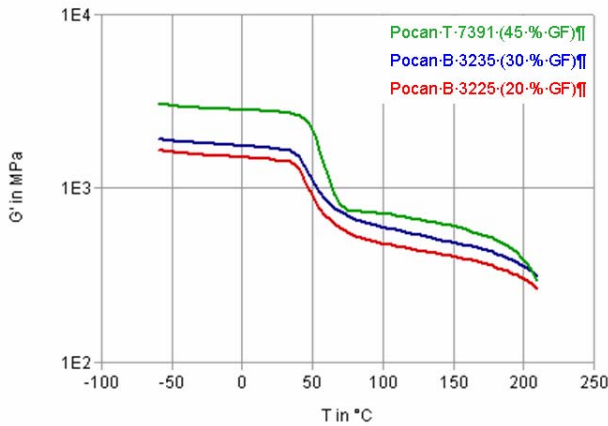


Diagram 1 Shear modulus curves

Diagram 1 shows shear modulus curves for three products with different glass fiber contents – Pocan T 7391 (45 %), Pocan B 3235 (30 %) and Pocan B 3225 (20 %).

The exceptional stiffness can also be seen clearly in the following diagrams.

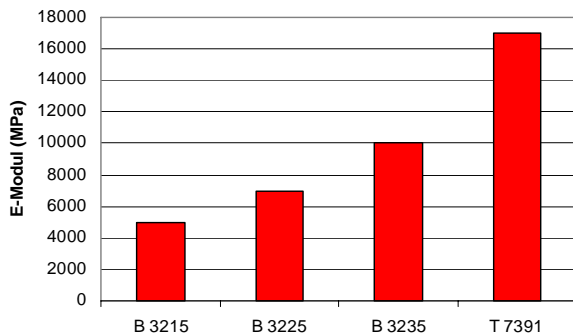


Diagram 2 Relationship between E-modulus and GF content

Diagram 2 shows an above-average increase in the elasticity modulus compared with other glass fiber-reinforced Pocan grades.

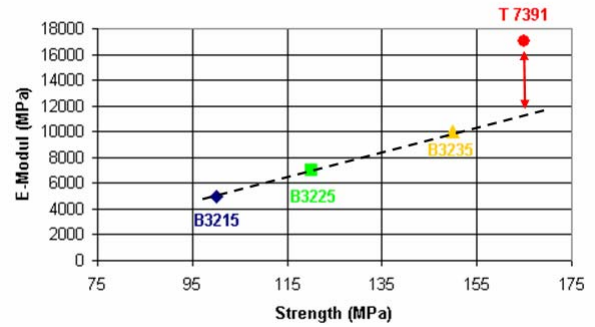


Diagram 3 Relationship between E-modulus and strength

Diagram 3 confirms the exceptional qualities of Pocan T 7391. Comparing these products reveals a dependency between the E-modulus and the glass fiber content – the higher the glass fiber content, the greater the stiffness and strength. Pocan T 7391 has outstanding qualities. If the values were connected linearly, the strength of Pocan T 7391 ought to be lower. However the result is significantly higher than expected.

In addition to its high stiffness and strength, Pocan T 7391 has other impressive features, such as...

- Good surface quality
- Low tendency to creep – results in high dimensional stability
- Reduced tendency to warpage
- High level of toughness
- High stability at temperature peaks



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Unless specified to the contrary, the values given have been established on standardized test specimens at room temperature. The figures should be regarded as guide values only and not as binding minimum values. Kindly note that, under certain conditions, the properties can be affected to a considerable extent by the design of the mold/die, the processing conditions and the coloring.

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