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PRESS INFORMATION

Press release, K2013 preview

Consistent performance – even at elevated temperatures

The ever increasing requirements in the engine compartment will bring materials based on aliphatic polyamides to their limits in the medium term. EMS-GRIVORY has developed a new, high heat-stabilised polyamide: Grivory HT2VS-HH. This means the right product for tomorrow's high-temperature applications is already available today.

Downsizing is one of the megatrends in current automotive development. Statutory regulations oblige car manufacturers to drastically reduce fuel consumption and thus the CO₂ emissions of their vehicles. At the same time, customers' demands for convenience and driving dynamics remain unchanged. To achieve this balancing act, OEMs are relying increasingly on engines with a smaller cylinder capacity and more powerful turbocharging. For the materials used in the charge air system, this chiefly means extreme stresses due to higher charge air pressures and temperatures. Added to this is a general rise in engine compartment temperatures as a result of increasingly dense packaging.

Increasing requirements in the engine compartment

Whereas charge air pressures of about 1.5 bar and charge air temperatures of up to a maximum of 200°C were the norm ten years ago, maximum pressures are currently in the region of 3.3 bar and continuous and peak temperatures are around 210°C to 230°C. EMS-GRIVORY has introduced two excellent materials for this range of temperature and pressure: the proven heat-stabilised triple-six polyamides Grilon TSG-W and Grilon TSG-W2. However, requirements will increase still further as power units are adapted to the forthcoming Euro 6 standard, with the result that peak temperatures of up to 250°C will be the rule rather than the exception. With this temperature rise to near the melting point of aliphatic polyamides, materials based on PA66 and PA6 will reach the limits of their performance capability.

The hotter the better

EMS-GRIVORY addressed this problem area at an early stage. During a detailed research programme, a series of construction materials was developed that fulfilled the increased requirements without any problems – the new Grivory HT2VS-HH products. These products are based on Grivory HT2, which has successfully been

in the market for many years. The new modified polyphthalamides are designed specifically for long-term use under extreme continuous temperatures. They have outstanding resistance to heat ageing over a wide temperature range from 180°C to 250°C. Grivory HT2VS-HH has no stabiliser gaps of the kind often commonly known from other heat-stabilised products. Another noteworthy feature of the new EMS material is the fact that its resistance to ageing actually increases with rising temperatures! The products have an unusually high retention of properties in the uppermost range from 230 to 250°C. For example, Grivory HT2VS-HH shows an almost constant breaking stress over 3,000 hours at 250°C.

Excellent retention of properties

Grivory HT2VS-HH impresses when compared with other high-performance plastics: its stress-strain behaviour is on a par with a similarly reinforced PPS, and Grivory HT2VS-HH has a higher elongation at break. When the heat-ageing resistance of the two materials is compared after 1,000 hours at 250°C, Grivory HT2VS-HH has far greater resistance. Starting from mechanical properties that are already higher in the un-aged state, the property retention of Grivory HT2VS-HH with regard to breaking stress is more than 60% greater, and with regard to elongation at break is up to more than 100% higher than for a corresponding PPS type.

Grivory HT2VS-HH has already been validated by numerous OEMs and TIER 1 companies, with extremely positive feedback. For example, as previously with GRILON TSG-30/4 W2, the products achieved approval testing in Volkswagen's Central Laboratory with a laboratory mark of 1 for 230°C and also for 250°C. This means EMS-GRIVORY is already equipped today for tomorrow's challenges.

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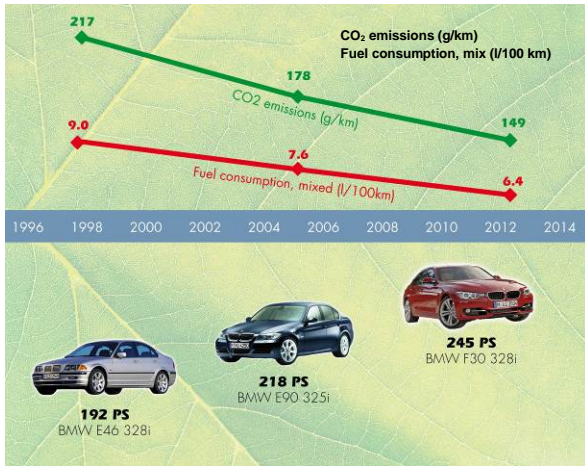
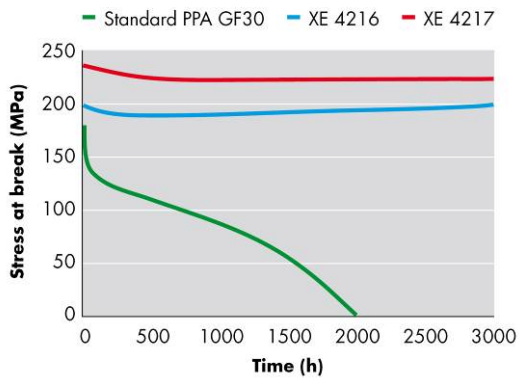


Illustration of the reduction in fuel consumption and CO₂ emissions with increased performance, exemplified by BMW.



Heat test at 250°C: the test was carried out on the breakage stress property with a 30% glass fibre-reinforced grade of Grivory HT2VS-HH (XE 4216) and a 45%-reinforced (XE 4217) grade compared to a standard PPA with 30% glass-fibre reinforcement.



EMS-GRIVORY offers two excellent materials for the temperature range from 210 to 230°C and air pressures up to 3.3 bar: the proven heat-stabilised triple-six polyamides Grilon TSG-W and Grilon TSG-W2. Photo: the charge air cooler of the VW Amarok made from Grilon TSG-W2.



Contact for technical inquiries

Michael Kipperer
Automotive Applications Development
EMS-GRIVORY Europe
Tel.: +41 81 632 62 27
E-mail: michael.kipperer@emsgrivory.com



Contact for the press

Andreas Müller
Head of Communication
Tel.: +41 81 632 72 50
E-mail: andi.mueller@emsgrivory.com

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