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PRESSE INFORMATION

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EMS polyamide specialty products with high hydrolysis resistance and flame protection for electro-mobility applications

Reliability in the new E-mobility

The drive technology in electric vehicles is significantly more challenging than for cars with conventional drive systems. This is why the demands made of the materials used are also higher. EMS-GRIVORY provides a wide range of hydrolysis-resistant and flame-protected specialty polyamides to ensure reliable operation in electric vehicles.

Hydrolysis resistance required

Thermal management is particularly important for efficient operation of electric vehicles. This means that the high-voltage battery, performance electronics and electric drive system must all be maintained at correct temperature levels. To achieve this, liquid-cooled systems based on water for example are used.
Grivory HT1VA has been developed for applications in the field of cooling systems. The outstanding long-term resistance to hydrolysis and high temperatures of this product make uninterrupted permanent operation possible. After around 8000 hours storage in a water-glycol mixture based on ethylene glycol in a 1:1 mixing ratio at 110 °C, Grivory HT1VA shows a 3.4 higher tensile stress at break compared to a hydrolysis stabilised PA 66 **(Fig. 1)**.

A further advantage of Grivory HT1VA for E-mobility applications is its electrically compatible heat stabilisation which allows electronic components to be installed without problem, as no ion-migration takes place in connection with electrical conductors and no corrosion occurs under warm and moist conditions. With this property profile, Grivory HT1VA is perfectly suited for use in challenging applications such as cooling systems of electric vehicles, auxiliary water pumps or thermal management modules

Flame protected and with good mechanical properties

The success of E-mobility lies in the drive system and the components of the highly efficient battery system. The requirements for each component inside the high-voltage onboard network of the electric vehicle must be completely met during operation and even after damage in the case of an accident. These demands are significantly higher than in the traditional 12-V/24-V systems used in vehicles with internal combustion engines.
For this reason, every material must be carefully evaluated with regard to the criteria of flame protection, insulation and cooling compatibility. EMS-GRIVORY provides a wide range of flame-protected specialty polyamides ranging from unreinforced polyamide 6 to glass-fiber reinforced PA66+6 grades and polyphthalamides (PPAs) which can be soldered at temperatures around 260°C. The flame-protected polyamides contain no halogens or red phosphor and are impact and creep resistant as well as insulating. They are durable and maintain constant colour fastness even at high temperatures. Newly developed materials, such as Grilon XE 16079, a polyamide with 30% glass-fiber content, that is optimally designed for components with long flow paths, such as battery holders, complete the assortment satisfying all application requirements.

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A further field of E-mobility is the charging infrastructure where EMS-GRIVORY also provides fitting solutions for highly-stressed components. As a rule, mineral-based flame protection systems have a negative effect on the strength and toughness of a material. To compensate this effect, flame-protected products have been developed with high-performance long glass-fiber reinforcement. These products show an excellent mechanical performance and good dimensional stability at high temperatures and are therefore well suited for challenging applications such as rapid charging plugs for electric vehicles. **(Fig. 2)**

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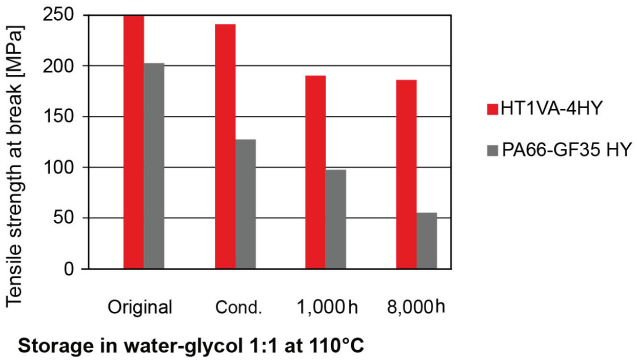

Fig. 1: After 8000 hours storage of storing in a 1:1 water-glycol mixture at 110°C, the tensile strength at break of Grivory HT1VA-4 HY is 186 MPa - 3.4 times higher than PA66-GF-30HY with 55 MPa.

Fig. 2: Charging plug made of Grivory GVL-4H V0.

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