

PRESS INFORMATION

High-performance polyamides for electric vehicles

High-performance polyamides from EMS-GRIVORY are not only predestined for use in vehicles with classic internal combustion engines, they are also excellently suited for use in electromobility applications, as classic lightweight design materials, for thermal management or components in high-voltage on-board network systems.

Lightweight design is a focus topic for electric cars. Reduction in vehicle weight contributes towards a reduction in the energy requirements of the car, especially during acceleration. This makes lightweight design measures an important factor in the development of electric vehicles.

Long fibers for lightweight construction

Long fiber reinforced high-performance polyamides from EMS-GRIVORY provide an alternative to heavy die-cast alloys. These polyamides are high quality and proven products for components such as battery brackets and housings in electric vehicles. Their partially aromatic matrix enables them to remain stiff and strong, even after water absorption. The special long glass-fiber reinforcement (LFT) leads to a sustainable improvement of thermomechanical properties at high temperatures so that these LFT products still exhibit high mechanical property values even at temperatures in the region of the glass transition point. In addition, the fiber skeleton makes high energy absorption possible under crash loading.

For the simulation of highly dynamic processes, EMS-GRIVORY provides elongation rate dependent material data sets, taking into account anisotropy and kind of load, to enable optimal design of structural components in the field of electric car construction.

Hydrolysis and temperature resistance requirements

Thermal management is very important for efficient running of electric vehicles; in particular to maintain the high voltage battery, power electronics and electric motor at the correct temperature level. Here, for example, liquid-cooled, water-based systems are used. EMS-GRIVORY has developed the new product Grivory HT1VA for cooling system applications. This material has outstanding resistance to hydrolysis

and cooling agents and can withstand long-term use at moderate cooling agent temperatures. After around 12,000 hours in water at 95°C, Grivory HT1VA exhibits 30% higher strength values compared to a traditional PPA under the same conditions.

A further advantage of this product when used in electric vehicle applications is that it is equipped with electro-compatible stabilisation. This makes it extremely suitable for production of electronic components as in combination with electrical conductors, no ionic migration and in warm climates, no corrosive effects are created. This property profile makes Grivory HT1VA extremely well suited for challenging applications in cooling systems of electric vehicles, such as auxiliary water pumps or thermal management modules.

Flame protection with good mechanical properties

For components of the high-voltage on-board power systems in electric vehicles, EMS-GRIVORY offers a wide assortment of flame-protected polyamides, ranging from non-reinforced polyamide 6 and glass-fiber reinforced PA66 and PA6 grades up to polyphthalamides solderable at temperatures up to 260°C. These flame-protected polyamides contain no halogens or red phosphor, have high impact and tracking resistance as well as insulating properties.

EMS-GRIVORY also provides the right solution for highly-stressed components. As a rule, mineral-based flame-proofing systems have a negative effect on the strength and toughness of a material. To compensate this influence, flameproof products have been developed which are modified with high-performance long glass-fiber reinforcement. This long glass-fiber reinforcement ensures that the mechanical properties remain at a high level making these special products suitable for challenging applications such as rapid charging connectors for electric vehicles.

Whether with regard to lightweight design, hydrolysis resistance or flame protection; the comprehensive product portfolio from EMS-GRIVORY is excellently positioned to master the challenges of electromobility.

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