

News Release



Where electricity and cars meet

- **Tailor-made engineering plastics for safe and reliable high-voltage plug-in connectors in electric and hybrid vehicles**
- **Used as standard by many car makers: universal connectors from TE Connectivity made of Ultramid® from BASF**

BASF is expanding its range of engineering plastics for the dynamic market of electric and hybrid vehicles. Tailor-made Ultramid® and Ultradur® materials are now available globally for equipping vehicle-interior and -exterior high-voltage plug-in connectors with precisely fitting characteristics. The special polyamide and polybutylene terephthalate grades meet the demands on flame retardancy, color stability, mechanics, and electrical isolation. They therefore allow automotive manufacturers to save on weight and installation space around the battery and at the same time help to improve safety in e-mobility.

One example is the connectors for hybrid and electric vehicles which TE Connectivity, Schaffhausen (Switzerland) has developed from various Ultramid® grades for numerous automotive companies in close collaboration with BASF. "Components for battery-powered vehicles are evolving all the time, and each automotive manufacturer has special requirements", says Wolfgang Balles, responsible at TE Connectivity for product development hybrid and electric mobility. Franz Janson, head of Global Resin Material Platform at TE, adds: "That is why for us, as a company that operates globally, it is vital to have a cooperation partner like BASF with which we can find the ideal combination of material and part. This is the only way that we can

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deliver safe and reliable components to the mass market.”

The high-voltage connectors can be identified by their typical orange color (color batch from BASF Color Solutions). The light-colorable BASF polyamide used is color stable and resistant to thermal aging. Particularly in the sensitive range of high voltages the color coding of the individual components is safety-relevant: It needs to remain highly visible for at least ten years. BASF optimized the connector locks using its simulation tool Ultrasim®: Ultrasim® precisely predicted the lock-in behavior of the component in processing and in use, enabling savings in production time and costs.

The globally available Ultramid® and Ultradur® grades pass the test according to the tighter IEC standard 62196-1 and the glow wire test according to IEC 60695-2-11 - at 850°C for parts made from isolating matter which holds conducting parts, and at 650°C for all other parts made from isolating matter. The materials for plug-in connectors close to the battery are resistant to high temperatures as well as coolants and equipped with flame retardant if necessary. They make for low-warpage, tight and creep-resistant parts. The materials used for plug-in connectors in the charging system are noted among other things for their flame retardance, impact strength and creep resistance as well as excellent isolation properties. The portfolio also includes plastics which contain halogen-free flame retardant and comply with the Restriction of Hazardous Substances Directive (RoHS).

Further technical information at the Ultraplaste Infopoint: ultraplaste.infopoint@basf.com, +49 621 60-78780.

About BASF's Performance Materials Division

BASF's Performance Materials division encompasses the entire materials' know-how of BASF regarding innovative, customized plastics under one roof. Globally active in four major industry sectors - transportation, construction, industrial applications and consumer goods – the division has a strong portfolio of products and services combined with a deep understanding of application-oriented system solutions. Key drivers of profitability and growth are our close collaboration with

customers and a clear focus on solutions. Strong capabilities in R&D provide the basis to develop innovative products and applications. In 2014, the Performance Materials division achieved global sales of € 6.5 bn. More information online: www.performance-materials.basf.com.

About BASF

At BASF, we create chemistry – and have been doing so for 150 years. Our portfolio ranges from chemicals, plastics, performance products and crop protection products to oil and gas. As the world's leading chemical company, we combine economic success with environmental protection and social responsibility. Through science and innovation, we enable our customers in nearly every industry to meet the current and future needs of society. Our products and solutions contribute to conserving resources, ensuring nutrition and improving quality of life. We have summed up this contribution in our corporate purpose: We create chemistry for a sustainable future. BASF had sales of over €74 billion in 2014 and around 113,000 employees as of the end of the year. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information on BASF is available on the Internet at www.basf.com.