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News Release

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Less electro-corrosion, more color: New Ultramid® Advanced N for high-voltage connectors in electric cars

- Ultramid® Advanced N3U42G6 with non-halogenated flame retardant increases safety and durability of E&E applications
- Excellent colorability and long-term color stability with pre-colored compound or UL-certified masterbatches
- Automotive supplier KOSTAL Kontakt Systeme uses new BASF polyphthalamide (PPA) in connector for high-current modules
- Meet BASF at Battery Show, Stuttgart, booth 10-E110

BASF is now complementing its polyphthalamide (PPA) portfolio by Ultramid® Advanced N3U42G6, a polyamide 9T with non-halogenated flame-retardant, which minimizes electro-corrosion of metal contacts in electric and electronics (E&E) parts for e-mobility. The PPA increases the safety and durability of high-voltage (HV) connectors in e.g. inverters, DC-DC converters and batteries of electric cars. Due to its high strength and stiffness over a broad temperature range, its outstanding chemical resistance and dimensional stability, the Ultramid® Advanced N grade enhances the robustness and reliability of thin-walled HV connectors meeting growing industry needs for halide-free E&E components used in warm and humid conditions. The new Ultramid® Advanced N3U42G6 is available in uncolored with UL-certified masterbatches but also as pre-colored version with high color stability for easy processing and excellent color retention after heat ageing.

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As one of the first E&E expert companies, the automotive supplier KOSTAL Kontakt Systeme, Lüdenscheid, Germany, now uses the new Ultramid® Advanced N in several components in its high-voltage connector KS22 Class 4 for high-current modules. The HV-connector, the smallest in its performance class, benefits from the BASF PPA in several ways: It enables miniaturization and saves installation space as it shows good flowability at thin wall thickness. Ultramid® Advanced N3U42G6 provides the connector with very high electrical insulation which beats aliphatic polyamides, especially at elevated temperatures. In addition, it has a high elongation at break so that there is no stress whitening when the different components are mounted. In this way, automotive customers can rely on the safe, long-term performance of KOSTAL's HV-connector with the best combination of electrical insulation and mechanical properties.

The flame-retardant Ultramid® Advanced N3U42G6 extends the lifetime of E&E components as it is halide-free according to EN 50642. It thus prevents contact corrosion and subsequent failure of sensitive electrical parts exposed to heat and moisture. The PPA achieves fire protection class UL94 with V-0 at 0.25 mm. It also enables long-lasting color coding which is safety-relevant in areas with high voltages: It meets all the criteria of color stability and heat aging resistance. In in-house tests, the color stability was confirmed after 1,000 hours at up to 150°C. Pre-colored variants like the e-mobility standard orange RAL 2003 are available directly from BASF. For self-coloring, more than 50 inorganic and organic colorants, which are approved for coloring PPAs and show a heat stability up to 350°C, can be used.

„Our new non-halogenated grade combines the excellent properties of our superhero Ultramid® Advanced N with better colorability, long color stability and outstanding anti-corrosion effect", says Volker Zeiher from technical development engineering plastics at BASF. "With this optimized PA9T, our customers can develop innovative, best-in-class E&E components supported by BASF's proven flame-retardant expertise and material know-how for electronics manufacturing. Ultramid® Advanced N3U42G6 is part of BASF's tailored flame-retardant PPA portfolio for the E&E industry that advances the development of challenging parts in consumer electronics, automotive battery systems and electric powertrains."

Due to its low moisture uptake and high heat distortion temperature of 265°C, Ultramid® Advanced N3U42G6 is especially suited for connectors post-processed

with surface mount technology (SMT): It guarantees a high dimensional stability and avoids blistering or changes in dimensions of the processed part during the SMT process. The new PPA grade is especially suited for SMT as it can withstand higher temperatures while maintaining its mechanical strength. This increases the quality of the post-processed E&E components and helps to reduce waste and costs.

About Ultramid® Advanced

BASF's polyphthalamide portfolio is based on the six polymers Ultramid® Advanced N (PA9T), Ultramid® Advanced T1000 (PA6T/6I), Ultramid® Advanced T2000 (PA6T/66), Ultramid® T KR (PA6T/6), Ultramid® T6000 (PA66/6T) and Ultramid® T7000 (PA/PPA). They open the door to the next generation of lightweight, high-performance plastic components in many different sectors including the automotive industry, electronics and electric devices, mechanical engineering and consumer goods. The PPA portfolio is available globally and complemented by BASF's Ultrasim® simulation tool and extensive experience in application development. It includes more than 50 compounded grades for injection molding and extrusion, products with or without flame retardants. The compounds are available in different colors, from colorless to laser-markable black, with short-glass or mineral fiber reinforcement, and with various heat stabilizers.

More information:
www.ppa.basf.com and www.ultramid-advanced-n.basf.com

About BASF's Performance Materials division

BASF's Performance Materials division leads the transformation of the plastics industry by merging sustainability with a competitive edge. Our broad material competencies and product portfolio, backed by deep industry understanding, make us the ideal one-stop-shop. With dedicated material-focused teams and strong R&D power, we deliver industry-leading technologies and expertise to our customers worldwide. Our global network ensures a competitive advantage through superior innovations, regional proximity, and tailor-made solutions that meet local market demands. We are committed to enhancing performance and efficiency across sectors such as automotive, consumer goods, industrial applications, and construction. With BASF, our partners embark on #OurPlasticsJourney towards a more circular and sustainable future. In 2024, the Performance Materials division achieved global sales of €6.8 billion. Join #OurPlasticsJourney on LinkedIn https://on.basf.com/PM_LinkedIn and in our newsletter https://on.basf.com/PM_Newsletter.
Further information at https://www.performance-materials.basf.com.

About BASF

At BASF, we create chemistry for a sustainable future. Our ambition: We want to be the preferred chemical company to enable our customers' green transformation. We combine economic success with environmental protection and social responsibility. Around 112,000 employees in the BASF Group contribute to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio comprises, as core businesses, the segments Chemicals, Materials, Industrial Solutions, and Nutrition & Care; our standalone businesses are bundled in the segments Surface Technologies and Agricultural Solutions. BASF generated sales of €65.3 billion in 2024. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the United States. Further information at www.basf.com.