News Release

BASF strengthens collaboration with HP to develop production-ready 3D printing materials

- **Accelerating materials development for HP Multi Jet Fusion technology**
- **Based on its unparalleled portfolio, BASF develops new materials for the 3D printing market**

FLORHAM PARK, NJ, November 2, 2016 -- BASF is teaming up with HP to offer new 3D printing materials to customers through the HP Multi Jet Fusion Open Platform. The HP Open Platform approach allows customers to select a material supplier, such as BASF, and engage with them directly to develop materials for specific 3D production applications. BASF and HP are now strengthening the collaboration to accelerate the learning cycle on requirements and specifications necessary to develop materials for large-scale production. BASF is committed to integrating the ideas generated from this exchange to speed the development of a variety of new materials for enhanced 3D printing products. On an even broader scope, the company is increasing its activities in developing new material solutions for the 3D printing industry.

Materials for large-scale production

In the chemical industry, BASF has the broadest product portfolio of materials that can be developed for 3D printing. Among them are an extensive range of engineering thermoplastics, polyurethanes, acrylate systems (e.g., photo-polymers), photoinitiators, functional additives, stabilizers, pigments, as well as metal systems. This range of products serves as the basis for ready-for-use formulations for 3D printing.

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“BASF brings tremendous expertise in materials for mass production to the 3D printing industry,” explains Tim Weber, Global Head, 3D Materials & Advanced Applications, HP. “By partnering with companies that have a long history in developing new materials with customers in the manufacturing industry, we want to bring 3D printing from small batch series to industrial large-scale production.”

BASF has broad experience in the development of plastics. Its portfolio includes high-performance engineering plastics such as Ultramid® based on polyamide, Ultradur® based on polybutylene terephthalate, Ultrason® based on polysulfones and Ultraform® based on polyoxymethylene. Another important product group is polyurethane solutions, which are used for improved insulation of buildings and the lightweight design of cars. Producers of shoes, household goods as well as sports equipment use the unique advantages of polyurethanes. This product group is composed of thermoplastic elastomers (e.g., Elastollan® (TPU)) and microcellular elastomers. These existing businesses and strong capabilities are the backbone for the development of materials specific for industrial 3D printing applications.

“In collaboration with HP, we combine our understanding of customer needs and applications along with expertise in materials,” said Dietmar Geiser, responsible for BASF’s 3D printing strategy at BASF New Business. “The HP Open Platform is driving the advancement of materials for large-scale industrial use of 3D printing in production, and BASF will play an integral role in materials development”.

HP’s Multi Jet Fusion technology is similar to 2D printing, in that a print-head applies agents in the envisioned shape on a polymer powder. The agents and powder are then exposed to energy to enable fusing. Due to the specific thermal conductivity of the agents, the polymer powder melts only in areas where the print head has applied the fusing agent and does not melt where the detailing agent has been applied. This process differs from the widely used laser sintering, in which the powder is applied and then melted bit by bit with a moving laser. Compared to other 3D printing technologies, HP’s Multi Jet Fusion technology is set to accelerate large-scale production by a factor of up to ten while halving the costs.

Overall, BASF develops various materials and ready-for-use formulations for all established 3D printing technologies for fabrication of plastics, ceramics or metals parts. An example of BASF's material development capabilities is the recently launched Ultrasint PA6 X028, a polyamide-6 powder for sintering which provides superior mechanical stability and higher heat resistance compared to component parts fabricated with other polyamides currently used in the 3D industry. "We are working to develop durable materials that can be used for goods such as automobiles, electronics, sports articles or materials for the machining industry," Geiser said.

To coordinate its 3D printing market development activities and innovation strategy, BASF has established a new dedicated business unit in BASF New Business GmbH (BNB) and created an Application Technology Center for 3D printing in Heidelberg, Germany. This center is dedicated to developing customized material solutions and downstream applications for customers.

About BASF

BASF Corporation, headquartered in Florham Park, New Jersey, is the North American affiliate of BASF SE, Ludwigshafen, Germany. BASF has nearly 17,500 employees in North America, and had sales of $17.4 billion in 2015. For more information about BASF's North American operations, visit www.basf.us.

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 112,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into five segments: Chemicals, Performance Products, Functional Materials & Solutions, Agricultural Solutions and Oil & Gas. BASF generated sales of more than €70 billion in 2015. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information at www.basf.com.