

## From chess pieces to industrial series production: What's beyond the hype for 3D printing?

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- “Evonik meets Science” forum in Hangzhou focuses on 3D printing
- With polyamide 12, Evonik is one of the leading global suppliers of materials for 3D printing
- Additional capacity for polyamide 12 powder will be available at the end of 2017

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Whether it was chess pieces with a difference or the facility to easily print yourself as a miniature model at home, it's hard to tell what triggered the hype around 3D printing. One thing is certain, however: The technology has made great strides. 3D printing is now used to manufacture replacement parts for airplanes and the construction industry uses the technology in China, for example, to build entire houses in less than 24 hours. But in the enthusiasm for this new way of producing highly functional building components, might we lose sight of the fact that there are more important issues than simply the time factor? At the “Evonik meets Science” forum in Hangzhou, experts from the specialty chemicals group discussed the topic with scientists from China. Because this topic is closely related to industrial application, several local 3D printing machine producers were also involved in this forum. All participants among the value chain of this emerging technology could get an overview of technological development and industrial application potential in China.

Evonik, in any case, has been making preparations – for the hype beyond the hype: The further development of its innovative synthetic materials now enables the use of additive processes not only for the manufacture of prototypes, but also in series production. If additive procedures are to become competitive and, most importantly, cost-effective, the reproducibility of the properties and established standards for material and machines will play a key role.

Evonik has been developing plastic powders for additive manufacturing for almost 20 years. With polyamide 12 (PA12), the specialty chemicals group is already one of the world's leading

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suppliers of materials in this area. As a special powder for tool-free 3D printing processes, PA12 enables almost total freedom of design, especially for applications with high mechanical, thermal, and chemical requirements. This makes complex forms and customized objects feasible in series production.

An example here is the highly innovative market for wearable technology – smart electronic devices that can be worn on the body, to which Evonik now has access through its investment in the start-up company Wiivv Wearables Inc. Wiivv is among the pioneers in using additive procedures for individualized mass production – in its case for biomechanically optimized insoles made of PA12. The principle behind it is simple: A software program uses photographs to create a 3D shape of the foot. This is then converted to data and processed directly by a suitable printer. In the future, electronic sensors could also be incorporated into the soles to enable movement profiles to be recorded, for example, in professional sport.

“Materials, which enable tailored functionality for sustainable solutions – and which are suitable for mass production – are a promising growth driver for our business,” says Sylvia Monsheimer, head of the “New 3D printing technologies” market segment at Evonik. Against this background, Evonik has not only declared the additive manufacturing sector a core strategic growth area, the Group is currently expanding its capacities. As of the end of 2017, a new production line in Marl is to increase the annual capacity for special VESTOSINT® powder by 50 percent. “The demand for technical substances, which require the highest level of performance and are therefore resource efficient, is very high. This is immediately evident when we look at the market for our innovative synthetic materials for 3D printing.”



*Image caption: With consistent further development of its plastic powders for additive manufacturing, Evonik is preparing for the hype after the 3D printing hype: Series production.*

#### **Company information**

Evonik, the creative industrial group from Germany, is one of the world leaders in specialty chemicals. Profitable growth and a sustained increase in the value of the company form the heart of Evonik's corporate strategy. Its activities focus on the key megatrends health, nutrition, resource efficiency and globalization. Evonik benefits specifically from its innovative prowess and integrated technology platforms. Evonik is active in over 100 countries around the world with more than 35,000 employees. In fiscal 2016 the enterprise generated sales of around €12.7 billion and an operating profit (adjusted EBITDA) of about €2.165 billion.

Evonik Industries has been producing specialty chemical products in the Greater China region (Mainland China, Hong Kong and Taiwan) since the late 1970's; with wide-ranging trading relations already in place prior to this in the region. Evonik regards Greater China as one of the driving forces of the global economy and we consequently endeavor to grow our business in the region. The company now has around 3,200 employees in the Greater China region, the regional sales reached about €1.3 billion in 2016.

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