

Optimized synthetic thermoplastics for 3D printing

04.09.2018

Brightlands Materials Center and Fraunhofer IMWS work together

Advanced 3D printing with thermoplastic composites: To achieve that goal, the Fraunhofer Institute for Microstructure of Materials and Systems IMWS in Halle (Saale) and Brightlands Materials Center – an initiative of the Province of Limburg and TNO – in the Netherlands are going to collaborate. Together, the partners want to optimize fiber-reinforced thermoplastics to make them ideally suited for 3D printing on an industrial scale.

In 3D printing or additive manufacturing as it is also called, various materials are used, such as metals, synthetic resins and polymers, ceramics or carbon materials. The 3D printing of polymeric materials offers special advantages due to the low weight of the resulting products, very flexible design possibilities or the opportunity to integrate sensors. In the German-Dutch joint project, Fraunhofer IMWS and Brightlands Materials Center want to combine the advantages of individual production by means of 3D printing and the attractive properties of fiber-reinforced thermoplastic materials.

First of all, the partners will develop a better understanding of the manufacturing process in 3D printing, for example, the question of how the reinforcing fibers are embedded in the matrix and how this affects the properties of the printed composite part, such as stiffness or tensile strength. In the next step, the partners intend to develop materials and technologies that enable manufacturing of highly resilient and tailor-made components such as spare parts for automotive, aerospace and construction industries.

“The success story of 3D printing so far shows the great potential of this technology. However, many parameters can still be significantly improved, such as the speed of production and the mechanical stability of components. The competences of Brightlands Materials Center with respect to polymeric material properties and processing, especially with regard to different methods of 3D printing, are an excellent addition to our profile. I am sure that together we can achieve great progress on these issues,” says Dr. Ralf Schlimper, head of group “Assessment of Composite Systems” at the Fraunhofer IMWS, who coordinates the cooperation in Halle (Saale).

“We are excited to start this partnership with Fraunhofer IMWS, which has an excellent track record in the field of thermoplastic composites, including non-destructive diagnostics of product quality. This collaboration gives us access to great skills and facilities to support our own ambitions in the field of continuous fiber reinforced 3D printing,” says Marnix van Gorp, Managing Director of Brightlands Materials Center.

The cooperation between the state of Saxony-Anhalt and the province of Limburg is a long-term intensive cooperation between the two regions. “We have a lot of similarities, such as a strong chemical and plastics industry, which is characteristic of the region, the commitment to the use of renewable resources in this area and the interest in boosting the cooperation of companies and Research institutions,” says Dr. Jürgen Ude, State Secretary at the Ministry of Economics, Science and Digitalization of Saxony-Anhalt.

“In many collaborative projects, such as »European chemical Regions Network (ECRN)«, »ChemSME«, »ChemClust« and »S3Chem«, we have seen how enriching cooperation is and how much both regions can benefit from it. I am optimistic that the cooperation in the field of 3D printing will continue this success story,” says Joost van den Akker, Minister of Economic Affairs of the province of Limburg.

Source: www.imws.fraunhofer.de

04.09.2018

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