Friedrichshafen, October 12th, 2021

**A shared goal: Expanding the fields of application for 3D printing in industrial manufacturing**

Working as a team with new ideas to achieve increased strength, larger volumes and more options for composites in additive manufacturing

Parts and components needed by many industries are currently trapped in bottlenecks. Additive manufacturing can offer new solutions here and its areas of application are far from being exhausted, particularly in industrial manufacturing.

“3D printing of large-scale, high-load components is becoming increasingly important,” said Michael Rieck, Business Development Manager at AKRO-PLASTIC GmbH. According to the compounder, the screw extrusion additive manufacturing (SEAM) process constitutes an especially interesting method in this context. This process uses standard granules and features high throughputs of 5 kg/h and more. In addition, very high alignment of the fibers (anisotropy) can then be achieved when printing fiber-reinforced plastics. Results have demonstrated that under optimal conditions, strengths greater than those of injection-molded geometries can be achieved.

“The achievable throughputs and material properties, combined with a suitable component design, make quantities beyond 10,000 units possible in additive manufacturing and offer an alternative to injection molding. Depending on the geometry and system, this limit can also be set significantly higher,” explained Dr. Nicolai Lammert, Head of Business Unit Additive Manufacturing at Yizumi Germany. “Scaling up through the number of systems or the number of extruders and nozzles within a manufacturing cell multiplies the number of pieces per hour with low investment costs.”

The flexibility of the process enables new designs in 3D spatial structures that cannot be mapped in injection molding. By using a 3D honeycomb structure, for example, extreme compressive loads can be supported despite a low component weight. However, amorphous plastics are often used in 3D printing because they shrink much less, and therefore warp less, than semi-crystalline ones. Adhesion to the build platform is significantly improved due to less contraction, but amorphous plastics often exhibit poor adhesion properties per se.

Creation of a strong bond between normally incompatible materials such as, in this example, a high-strength, sustainable plastic and a stainless steel sheet, will be demonstrated at FAKUMA using the example of the pen holder. This is where Plasmatreat’s PlasmaPlus technology comes into play. A nanolayer is deposited onto the sheet using the special PT-Bond process from PlasmaPlus, which causes the melt to adhere to the metal.

“PT-Bond is a special nanolayer created with our PlasmaPlus technology to achieve functionalized surfaces. When PT-Bond is used, a gaseous precursor is injected into the plasma beam that is generated under atmospheric pressure. The substrate is coated with an ultra-thin, transparent plasma-polymer protective layer. This layer then acts to promote adhesion,” said Lukas Buske, Head of Plasma Applications at Plasmatreat GmbH, explaining the process. “This allows us to bond materials with long-term stability and to flexibly expand the fields of application for 3D printed components in industrial manufacturing.”

The process can be seen live at the Yizumi Germany booth in Hall B2 – Booth B2-2108.

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**About Plasmatreat**

Plasmatreat is an international leader in the development and manufacture of atmospheric plasma systems for the pretreatment of substrate surfaces.

Whether plastic, metal, glass or paper - the industrial use of plasma technology modifies the properties of the surface in favor of the process requirements.

Openair-Plasma® technology is used in automated and continuous manufacturing processes in almost every industrial sector. Examples include the automotive, electronics, transportation, packaging, consumer goods and textile industry, but the technology, cost and environmental advantages of the plasma technology are used in medical technology and in the renewable energy sector as well.

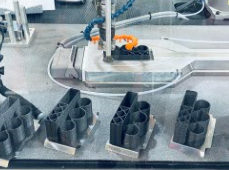
The Plasmatreat Group has technology centers in Germany, USA, Canada, China, and Japan. With its worldwide sales and service network, the company is represented in more than 30 countries by subsidiaries and sales partners.

For more information, please visit: [www.plasmatreat.com](http://www.plasmatreat.de)

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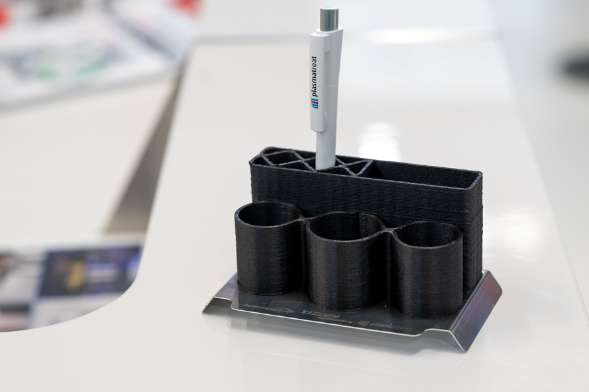
**Images:**

[[Picture of a pen holder machine]]



At Yizumi Germany's booth B2-2108, the component, the pen holder, will be manufactured live. (Image: Akro-Plastik)

[[Picture Pen Holder]]



The manufactured component, developed in a collaborative effort by Plasmatreat, Akro-Plastik and Yizumi, is aimed at giving visitors from the fields of design and technology food for thought for new structures in future projects. (Image: Plasmatreat)