PRESS RELEASE

January 9th, 2023

DUPLEX 3D GmbH is a German startup company headquartered at the Technologiezentrum in Augsburg Innovationspark! The company was formed to develop, manufacture and distribute new technology based industrial 3D printers, focusing on their patented MAP™ technology that enables two-directional 3D printing.

The birth of the patented MAP™ technology

Multi-Directional Additive Production (MAP™) addresses the long-unchanged process of building 3D objects layer by layer, one on top of the other, that results in an utterly slow process.

MAP™ technology introduces a completely new way of creating physical objects, establishing a new standard in additive manufacturing resulting in higher productivity and ROI. Using multiple build directions MAP™ technology can achieve unparalleled print speeds without any limitations on the 3D geometry being built. It is thus a completely new approach, enabling extremely fast printing speed. It can be applied to various additive manufacturing technologies (e.g. FDM, SLS, SLA, DLMS) and its core principles allow printing with different types of materials including solid and liquid. Although MAP™ is not restricted to filament based 3D printing, the first 3D printer utilizing MAP™ is an FDM, named DUPLEX F2.

DUPLEX F2: the first two-directional 3D printer in the world

The new DUPLEX F2 3D printer is designed for heavy, industrial application, built from quality parts and assembled with precision to assure the long-lasting quality and reliability this new technology truly deserves.

Thanks to the multi-directional part growing, the DUPLEX F2 is up to 15-times faster than similar FDM printers due to the combination of its unique features: two extruders working simultaneously on the same object; no, or minimal need of support printing necessary; significantly reduced time of post-processing due to minimal supporting.

What are the key innovations that makes two-directional printing possible?

The R&D team has been working on the development of the first printer for 3 years to make sure that the commercial-ready machine is fit for industrial, 24/7 use. DUPLEX F2 was equipped with several new innovations necessary for high-precision and efficient two-directional printing. The AutoPlane System (APS) automatically removes the base plate, allowing the bottom extruder to access the object for parallel printing from top and bottom at the same time. The Mesh auto-calibration is necessary for perfect part orientation, enabling maximum precision on the vertical extremes of the built object. The proprietary DUPLEX software is needed to handle unique MAP™ slicing.

What are the main benefits of the two-directional printing?

The main benefit of this new method of 3D printing is that the object being printed is held at the mid-section, making the supporting unnecessary for most geometries. The elimination or minimization of support printing creates a lot more efficient 3D printing process: it saves time, as the support does not need to be printed, saves material, saves energy and also, saves significant labor cost making post processing virtually unnecessary.

As a result of the supportless printing method, several complex, elongated shapes can be efficiently printed on DUPLEX F2, that were not possible to be printed before, using the traditional one-directional technology.

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What are the most important industry applications for the new DUPLEX F2 3D printer?

There are several industrial application areas where the benefits of the DUPLEX F2 3D printer can be maximized:

1. End-part production from fast PLA PRO up to glass/carbon reinforced PA and PPS
2. Rapid functional prototyping for R&D labs especially of the Transportation and Technical Sports Industry.
3. Ready-to-use high performance composite Molds and Patterns for the Manufacturing sector
4. Jigs and Fixture printing next to the production line
5. Visualization and Display for the Medical sector (complex anatomical models), Design and Film Production Studios

What strategic collaborations did DUPLEX 3D rely on to ensure high quality development?

BASF – Forward AM: the German chemical company was one of the first industry stakeholders to realize the novelty and the huge potential of the new technology that DUPLEX developed. As part of the strategic cooperation between the two companies, BASF provided high-quality filaments and continuous technical support to aid the tedious development process needed to maximize layer adhesion and part precision. The DUPLEX F2 printer is optimized for the BASF produced DUPLEX filaments to guarantee fast and high-quality printing at all times.

Budapest Technical University (BTU): DUPLEX turned to BTU in order to get continuous and objective measurements regarding the two most important must-haves that the two-directional printing needed to achieve: 1. as good layer adhesion as one-directional printing, 2. high-quality precision at the vertical extremes of the 1m build chamber. As part of the cooperation, BTU provided on-going measurements regarding the mechanical properties and the accuracy of the two-directional prints.

Why did the DUPLEX 3D start-up chose Augsburg Innnovationspark for their HQ?

The Technologiezentrum (TZA) at Augsburg Innovationspark is the perfect location for a German start-up aiming at revolutionizing FDM 3D printing. As with all game-changing innovations the newcomer needs to have a thorough understanding of the entered industry and its ecosystem. TZA hosts a great mix of experienced, innovation focused and new technology-based smaller companies and actively generates knowledge sharing among them to speed up their innovation process. The atmosphere at TZA, its interconnectivity among all industry stakeholders provides the best soil for the DUPLEX 3D to speed up the successful commercial launch of the new F2 printer.

External references:

- AdditiveManufacturingMedia "Top10 Developments on Formnext 2022"
- 3D Adept Media: "Formnext 2022: the killjoys, the elders and the kids of the “fAMily” reunion"
- 3DNatives: "Printers that amazed us the most at Formnext 2022"
- AdditiveManufacturingMedia> LinkedIn editorial coverage on DUPLEX F2 printer, Formnext 2022
- 3D Printing Industry's detailed editorial

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