PRESS RELEASE

High-Resolution 3D-Printing:

Breakthrough by Material Characterization According to ISO

Technology leader UpNano succeeds in manufacturing cm-sized bending and tensile test specimens using a technology that allows nm-resolution 3D-printing.

Vienna (Austria), 27th May 2020 – Manufacturing of cm-sized test specimens for material characterization according to ISO standards has now been achieved for the first time with a technology that allows 3D-printing a feature size of 200 nanometers. The innovation leader for high precision 2-Photon Polymerization (2PP) 3D-Printing, UpNano GmbH, succeeded in printing test specimens from their specific photopolymer on their state-of-the-art NanoOne-printer in sizes and shapes necessary for ISO tests. This achievement is the result of a productive collaboration with the TU Wien (Austria). Previously it was considered impossible to print specimens at the (large) size necessary for ISO tests with a photopolymer and a 2PP 3D-printer that at the same time is able to achieve a resolution in the sub-micrometer range. The proprietary adaptive resolution technology of UpNano in combination with a powerful laser makes this now possible and thus 3D-printing of nm-sized parts using materials characterized according to ISO for industry and academia.

High-resolution 3D-printing allows the production of smaller and more precise parts than any traditional manufacturing processes. However, as the potential of this technology becomes more and more apparent, industries as well as research institutions throughout the world demand for reliable information on the qualities of the large number of different materials used for the various printing technologies. This often proves difficult as most standard test methods for material specifications require specimens much larger than high-resolution 3D-printers are able to produce. Now the technology leader for 2-Photon Polymerization (2PP) 3D-printing, UpNano GmbH (Vienna, Austria) succeeded in manufacturing test specimens in the required cm-range with its NanoOne-printer that allows nm-resolution as well.

One Printer Fits All

“Our proprietary adaptive resolution technology adapts the laser spot size in accordance with the required geometry and resolution. It enables users of the NanoOne-printer to manufacture specimens with a nanometer resolution – or in sizes up to centimeters”, explains Peter Gruber, head of technology and co-founder of UpNano. “We now used the latter capability of the system to produce bending test specimens measuring 2 cm length in size and tensile test specimens with length of 3,5 cm.” Using the universal performance material UpPhoto, the company was able to produce 30 bending test specimens in less than 10 hours and 12 tensile test specimens with a more complex structure in less than 9 hours. This speed demonstrates the performance of the NanoOne-system considered to be the

fastest high-resolution 3D-printing system on the market. Furthermore, this number of test specimens will allow test series with statistically sound results leading to material specification in compliance with ISO standards.

“The lack of standardized material specifications is a serious obstacle for using high-performance 3D-printing in an industrial setting. Decentralized production processes of global industries and warranty legislations are based on standards and norms. If your material or device does not fit in this finely honed system, it might be good for prototypes – but not for series production”, emphasizes Bernhard Küenburg, CEO, the importance of the progress made by UpNano. By addressing this requirement of the technical industry, the company strengthens its position as innovation leader in the emerging market for high-performance 3D-printing – a position gained by selling the fastest 2PP 3D-printing system that offers up to a hundred times faster throughput for short production cycles than other systems.

Printing Living Cells

The capabilities of the NanOne-system do not only meet requirements of technical industry but of research institutions, too. Just recently UpNano sold a complete system to the MedUni Vienna (Austria). Here the system will be used for various purposes in research. The possibility of printing delicate structures needed by biomedical research such as scaffolds, membranes or microchannels is facilitated by the so called UpBio photopolymer. This special resin permits 2 PP 3D-printing in the presence of living embedded cells and thus is ideal for biomedical research.

By attending to the needs of industry and research alike, UpNano continues to push the possibilities and capabilities of 2PP 3D printing further and further. Focused in-house research in cooperation with the TU Wien as well as listening closely to the needs of industry will further strengthen the position of the innovation leader in the market.

Images available upon request or Image available: https://web.tresorit.com/l/YxjM1#VC_NtQgwKV9YOoRYGqsc6Q

About UpNano (May 2020)
Founded in September 2018 as a spin out of the TU Wien, UpNano is a Vienna-based high-tech company with the focus on development, manufacturing and commercialization of high-resolution 3D printing systems based on 2-photon polymerization. With the first commercial product, the printing system NanoOne, microparts with structure details down to 200 nm can be printed. Due to the very fast printing process, also meso scale parts up to several centimeters in height can be realized.

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