



Press Release

TRUMPF takes a robust and digitalized approach to 3D printing

New “TruTops Print” software makes machines much easier to operate // Partnership with Module Works ensures successful software development // High-speed sensors monitor melt pool // New gas flow concept increases reproducibility of part properties

Ditzingen, November 16, 2021 – High-technology company TRUMPF is constantly striving to make its 3D printing systems even smarter and more productive. The company recently took the opportunity of the Formnext trade fair in Frankfurt to present a series of new software, sensor and automation solutions designed to improve the efficiency of 3D printing. For example, its new “TruTops Print” software now combines several data preparation and planning steps that previously required multiple different software tools. “Z-segmentation” is one of the most exciting features of the new software. This feature boosts the productivity of the system by dividing parts into different segments and assigning different parameters to each segment based on the required part quality. This enables the 3D printer to generate thicker or thinner layers for each part depending on the importance of the respective segment. This flexible approach to printing increases the productivity of the system without diminishing part quality.

TRUMPF teamed up with technology provider Module Works to develop the new software. As part of their strategic partnership, development engineers from the two companies joined forces to adapt the TruTops Print software to the specific requirements of TRUMPF 3D printing systems and kit it out with an intuitive user interface.

“This new software allows us to offer our customers a more tailored approach to operating our TruPrint 3D printers,” says René Kreissl, who is responsible for the additive manufacturing business at TRUMPF. “We’re making it far, far easier for customers to make the journey from an initial idea for a part to the final product – and that’s a great way to improve the overall appeal of additive technologies. Module Works is highly experienced in digital manufacturing, so they were the perfect choice of partner to help us develop the new software.”



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New gas flow concept ensures reproducible results

As part of its efforts to make its machines even more robust and improve part reproducibility, TRUMPF has spent recent months developing a new gas flow concept. This optimizes the flow of shielding gas through the build chamber, which is a particularly important aspect of the system, especially during the printing process. The new concept ensures homogeneous flow conditions to ensure the efficient removal of smoke from the build chamber; this creates the kind of consistently good process conditions that allow the laser to perform its work undisturbed. All the latest-generation TruPrint 3D printers come with this new gas flow concept. TRUMPF has systematically examined how the flow concept affects the robustness of the process and has validated it on all its new-generation machines.

Automatic monitoring of the printing process

Another key focal point at the TRUMPF Formnext stand was the new TruPrint 3000 medium-format machine. Equipped with two 500-watt lasers, the TruPrint 3000 uses powder-bed-based laser melting to produce parts up to 400 millimeters tall and up to 300 millimeters in diameter. It also comes with a standout quality-assurance feature in the form of melt pool monitoring. This relies on special high-speed sensors in the machine optics that automatically monitor the melt pool during the printing process. Intelligent analysis software determines if the melt pool is too cold or hot and presents a graphical display of any deviations from a reference build job, thereby giving operators the information they need to detect, analyze and rectify errors. The machine also incorporates a powder-bed monitoring feature which uses a high-resolution camera and automatic image processing to monitor the powder bed in the build chamber and automatically detect problems such as defective powder layers.

The TRUMPF digitalization solutions for 3D printing also include a standard condition monitoring module that delivers the relevant KPIs, as well as an option for customers to control their machines via remote access through interfaces such as the industry-standard OPC UA interface.

Higher productivity thanks to automation

TRUMPF continues to incorporate a range of automation solutions in its 3D printing technologies. For example, the TruPrint 5000 medium-format machine can be set to start the manufacturing process automatically. As soon as the build cylinder is placed in the system, it moves automatically to its set-up and working position. The integrated zero-point clamping system is the basis for downstream process steps such as EDM, milling and turning. It connects the substrate plate automatically with the piston in the cylinder, eliminating the need for manual work steps, such as tightening screws.

Next, a transport system in the process chamber sets the build and cylinder covers to a rest position, and the manufacturing process starts autonomously. In the next step, the lasers calibrate themselves and the build process starts automatically. Thanks to the principle of interchangeable cylinders, the build cylinder can exit the machine with the finished parts while the build chamber maintains an inert environment using a shielding gas and is able to start immediately on the next job. This reduces downtime and non-productive time and increases the productivity of the 3D printer.

Another useful feature is the automated monitoring of the scan field, which is the area in which the laser works in the build chamber. This improves the reliability of the process by measuring the position of the laser beams, checking them against the software and re-aligning the beams where necessary.

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René Kreissl, head of the Additive Manufacturing business unit

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TruPrint 3000

The new TruPrint 3000 medium-format machine drew plenty of attention at Formnext. It uses powder-bed-based laser melting to fabricate parts up to 400 millimeters tall and up to 300 millimeters in diameter.



Starts the process automatically

Automation is a key focus at TRUMPF. For example, the TruPrint 5000 large-format machine can be set to start the manufacturing process automatically.



Versatile monitoring

TRUMPF equips its 3D printers with cameras and sensors to record a variety of process and condition data.



About TRUMPF

TRUMPF is a high-tech company offering manufacturing solutions in the fields of machine tools and laser technology. The Company drives digital connectivity in the manufacturing through consulting, platform products and software. TRUMPF is a technology and market leader in highly versatile machine tools for sheet metal processing and in the field of industrial lasers.

In 2020/21, the company employed some 14,800 people and generated sales of about 3.5 billion euros. With over 80 subsidiaries, the TRUMPF Group is represented in nearly every European country as well as in North America, South America and Asia. The company has production facilities in Germany, France, the United Kingdom, Italy, Austria, Switzerland, Poland, the Czech Republic, the United States, Mexico and China.

Find out more about TRUMPF at www.trumpf.com

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