TRUMPF presents process chain for industrial 3D printing

Powerful medium format machines with tool change cylinder concept for industrial-scale LMF production – industry-ready periphery for external part and powder management – TruConnect solution range and monitoring for connected manufacturing includes additive manufacturing as well

Ditzingen, November 15, 2016 – TRUMPF, the laser systems manufacturer and Industry 4.0 pioneer, is at the Formnext trade fair in Frankfurt to present its new 3D printers – TruPrint 3000 and TruPrint 5000. These medium format machines are based on laser metal fusion (LMF) technology, using lasers to generate complete parts layer by layer in a powder bed. These parts can measure up to 300 millimeters in diameter and 400 millimeters in height. With an ingenious tool change cylinder concept, which allows the construction chamber and supply cylinders to be switched out quickly, and an industry-ready periphery, these new machines are geared towards the large-scale production of complex metal parts. What's more, with the TruPrint 3000, TRUMPF is putting the spotlight on the complete process chain for additive manufacturing.

The first link in the process chain is preparing the data for the 3D design and production program. With its "TruTops Print with NX" software package, TRUMPF is offering the first comprehensive software solution with a standardized user interface across systems. By doing so, TRUMPF now has industry-ready solutions that cover every aspect of additive manufacturing – from a practical powder feed that supplies the large internal powder container and additive manufacturing technology itself, to downstream tasks such as the unpacking and cleaning of the newly minted part. And the laser pioneer's approach to additive manufacturing also addresses Industry 4.0 in a move to optimize business processes across the board. For instance, users can apply any of a variety of solutions to monitor, analyze and remotely adjust a wide range of condition parameters during the manufacturing process. Industry 4.0 solutions by TRUMPF are brought together under TruConnect; the name references connected manufacturing, which links machines, people and information.

High productivity thanks to minimum downtime

Both the TruPrint 3000 and TruPrint 5000 systems can be used to manufacture complex metal parts out of powder. Depending on the part in question, it may be made from any weldable material – such as various forms of steel, nickel-based alloys, titanium or aluminum – in powder form. Since the TruPrint 3000 is equipped with two supply cylinders, up to 75 liters of powder are available for each job, which is around two and a half times the construction volume – enough powder, in other words, to complete the entire manufacturing process without having to stop for refilling. And even if the powder were to run low, the ingenious tool change cylinder feature kicks in: the TruPrint 3000 is designed so that the supply and overflow cylinders can be changed out without interrupting the manufacturing process. This reduces downtimes while also increasing the 3D printer's productivity.

Industrial powder and parts management

Among the decisive factors in any industry-ready, large-scale production process are system periphery and powder management. The automated sieve station by TRUMPF refines several hundred kilograms of powder every hour, thereby ensuring consistent powder quality. When it comes to powder, TRUMPF leaves nothing to chance: no matter whether it's a question of grain size, grain-size distribution or flowability, developers working in a special lab determine the optimum parameters and test what laser output and process speed will maximize powder performance. Before the powder is delivered, TRUMPF performs an internal check to ensure it meets the customer's quality requirements.

Once the manufacturing process is complete, the new parts then have to be removed from the machine, cleaned and detached from the substrate plate. This is why TRUMPF added an unpacking station to the production program, seamlessly integrated into the process chain. The covered construction chamber can be fitted directly into this station. Customers benefit from the higher machine availability that results from the external unpacking. Thanks to the station's safety gloves and sight protection, users don't come into direct contact with the powder during unpacking and cleaning. Excess material ends up back in the sieve station, ensuring a safe and sealed powder cycle.

New machine concept leads to enhanced productivity

And what about the next generation of 3D printers? TRUMPF is working on machine concepts to make additive processes still more productive. The TruPrint 5000 demonstrator on show at formnext is based on the multi-laser principle. It features three 500-watt TRUMPF lasers, which are simultaneously active at multiple points in the process chamber. This means they can generate parts in the construction cylinder faster and more efficiently.

Regardless of the number and geometry of the parts, they can be exposed to all three lasers in the construction chamber at the same time. The lasers are not limited to predefined areas, leading to faster build-up rates. Smart exposure strategies automatically determine the ideal laser paths so that all three lasers can always expose multiple parts. In addition, the lasers can be easily assigned to specific parts – the advantage being that the outer contours are produced, literally seamlessly, by a single laser. Thanks to its integrated preheating function that can go up to 500 degrees Celsius, the TruPrint 5000 also offers high part quality and meets the stringent manufacturing requirements for large-scale industrial production.

Market launch for the multi-laser system is scheduled for late 2017.

The TruPrint 3000 can be used to generate metal parts measuring up to 300 millimeters in diameter and 400 millimeters in height. The system features a 500-watt laser.

The TRUMPF unpacking station features safety gloves and sight protection so that users don't come into contact with the powder when unpacking and cleaning parts.

Complex interior structures can be generated using the LMF technique. The laser melts the powder in the powder bed to create the desired part contour layer by layer.

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About TRUMPF

The high-technology company TRUMPF offers production solutions in the machine tool, laser and electronics sectors. We are driving digital connectivity in manufacturing industry through consulting, platform and software offers.TRUMPF is the world technological and market leader for machine tools used in flexible sheet metal processing, and also for industrial lasers.
In 2015/16 the company – which has more than 11,000 employees – achieved sales of 2.81 billion euros. With over 70 subsidiaries, the TRUMPF Group is represented in nearly all the countries of Europe, North and South America, and Asia. It has production facilities in Germany, France, Great Britain, Italy, Austria, Switzerland, Poland, the Czech Republic, the USA, Mexico, China and Japan.

For more information about TRUMPF go to www.trumpf.com

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