

LIGHTNING FAST 3D PRINTING

SLM SOLUTIONS PRINTS E-DRIVE HOUSING FROM PORSCHE ON NXG XII 600

Has metal 3D printing arrived in the manufacturing industry and is the technology ready to enter serial production? What does it take to make the leap to industrialization? With its recently launched innovative SLM® machine NXG XII 600, SLM Solutions provided an answer to these questions. The machine sets new milestones in terms of productivity, size, reliability and safety and paves the way to the future of manufacturing. Now, SLM Solutions presents application examples, produced on the NXG XII 600, which impressively illustrate the speed and productivity of the machine to reduce part costs.

The NXG XII 600 is equipped with twelve overlapping 1 kW lasers and a build envelope of 600x600x600 mm, enabling the production of large-volume square parts with up to 120 µm layer thickness and even more. Productivity is further enhanced through variable beam spot, bi-directional recoating, laser balance and an optimized gas flow while a closed environment maximizes operator safety.

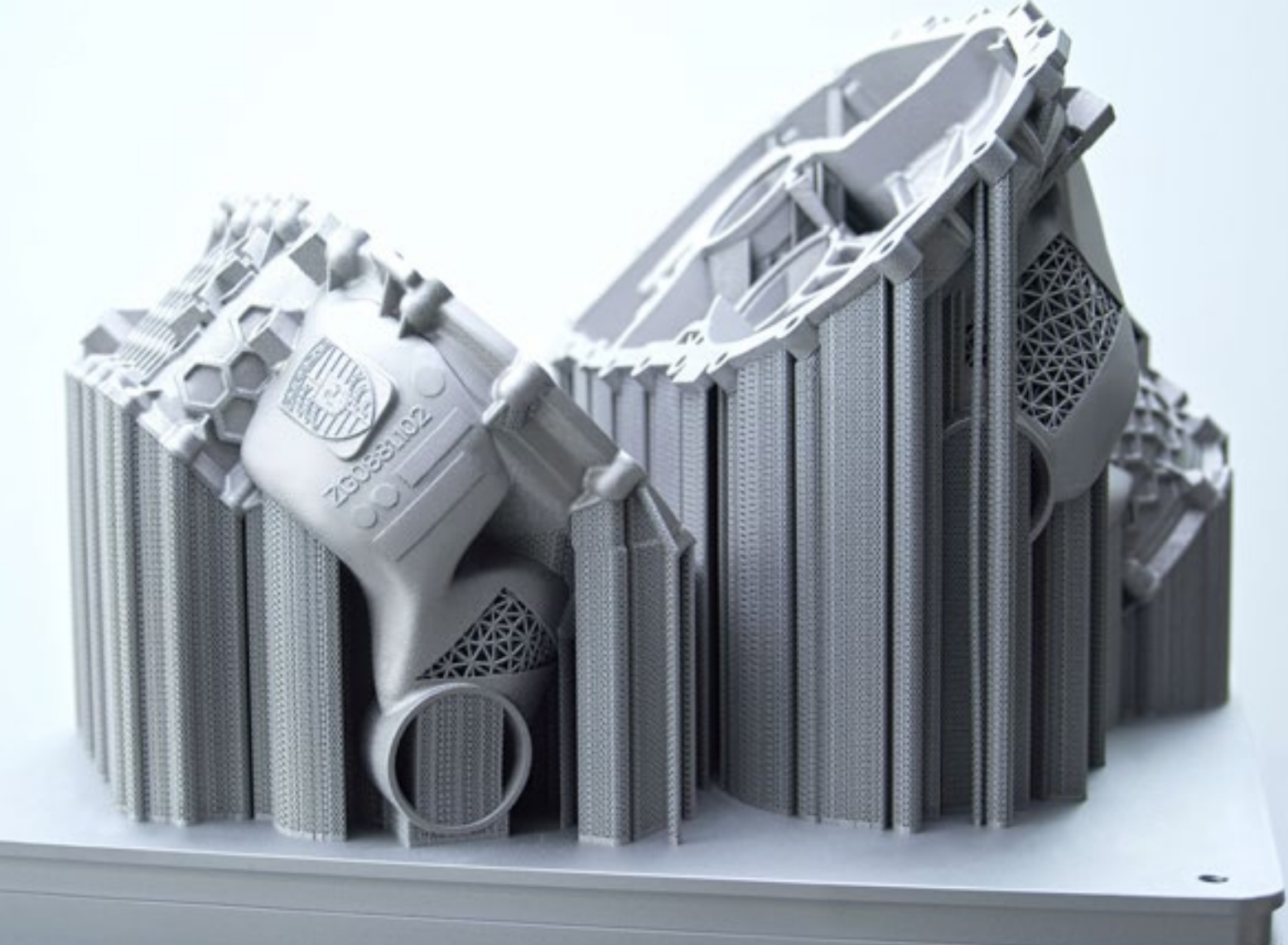
One company that has already tested the productivity of the NXG XII 600 is Porsche. The Porsche advanced powertrain engineering department also focuses on large powertrain applications, such as E-drive housings, cylinder blocks, cylinder heads etc. in additive manufacturing. In a proof of concept with the SLM® machine NXG XII 600 a complete E-drive

housing with an innovative AM Design was successfully printed. Porsche thereby sets high quality demands on the part: A permanent magnet motor with 800 volt operating voltage delivers up to 205 kW (280 hp). The downstream two-stage transmission is integrated in the same housing and drives the wheels with up to 2,100 Newton meters of torque. This highly integrated approach is designed for use on the front axle of a sports car.

All the advantages of additive manufacturing have been implemented in this housing such as topology optimization with lattice structures to reduce the weight, functional integration of cooling channels, higher stiffness and reduced assembly time by the integration of parts as well as improvements in part quality.

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– Falk Heilfort



“This new manufacturing technology is technically and economically interesting for us. Possible use cases are especially prototypes in the development phase, special and small series production as well as for motor sport and classic spare parts.” The E-drive unit measures 590 x 560 x 367 mm and was built in only 21 hours on the NXG XII 600.

Ralf Frohwerk, Global Head of Business Development of SLM Solutions, is delighted with the excellent results of the Porsche part: “We are glad and proud to cooperate with highly innovative companies like Porsche. The NXG XII 600 achieves unmatched levels of performance and functional improvements of key automotive parts while delivering cost productivity that enables broad use of additive manufacturing technology for true series production. We are thrilled to take this big step towards full industrialization of metal additive manufacturing for Porsche applications.”

SLM® technology is most concisely described as an iterative process that uses high powered lasers

to melt metal powder along pre-defined pathways. Selective Laser Melting technology enables the simple yet rapid creation of intricately shaped parts that were previously deemed impossible with traditional subtractive techniques as casting, drilling or milling. This effectively eliminates the constraints of traditional manufacturing, enabling unprecedented design freedom.

