Company Profile

FastForm Technology Co., Ltd (short for "FastForm") was established by Dr. Shuai Li (Nanyang Technological University, Singapore), Dr. Zhichao Chen (Loughborough University, U.K.) and Weidong Li (former engineer from Nokia) on Apr 2nd, 2016.

FastForm is specialized in the cutting-edge research and development of 3D printing technology and equipment. Currently, the leading product of FastForm is a SLM 3D printer, FF-M500, which is mainly for industrial application. As a large device, FF-M500 is characterized by customized workbench with dual-laser melting. Most of all, due to totally independent intellectual property rights, FastForm succeeded in breaking up the monopoly of commercial SLM 3D printers from developed countries, thus arousing widespread attention.

Product Introduction

The First SLM Metal 3D Printer With Dual-Laser In China

Based on SLM (selective laser melting, a popular technique for 3D printing of metals), FF-M500 utilizes the high energy from dual-laser to melt powdered metals layer by layer to form 3D complex products with large dimension, high precision (≤ 0.1mm) and excellent performance, which are particularly attractive and advantageous in, especially aerospace, moulding, medical and automotive applications.

>>Highlights<<

1.Hardware

① Super-large Work Dimension

Thanks to the coordination of dual-laser, the largest available work dimension can be up to 500×400×300mm3, which can absolutely satisfy the most demand in manufacturing fields, e.g. aerospace, moulding etc.

③ Efficient Production

The advanced technologies such as simultaneous work of dual lasers, doubling powdering with variable speed, can greatly improve the printing efficiency (> 50%).

⑤ Protective Gas System

Automatic control of oxygen / pressure, effective protection of dust, intelligent detection of service life of filter and smart renewal of exhausted filter.

② Extremely High Precision

Closed-loop control with grating feedback and accurate positioning (2μm) is right for the harsh requirement of SLM.

④ Flexible and Following Supply System

The unique flexible and following supply system enhances the efficiency a nd quality of powder rolling, and meanwhile buffers the formation of complex and gridding parts.

2. Self-developed Software / Control System

① Totally self-developed with independent intellectual property rights. Abundant functions for pre-processing: 3D transformation, category layout, auto generation of supports, fault-tolerant and multi-core accelerated slicing algorithm, and so on.

② Intelligent detection: up to 40 smart sensors in service, for intelligent detection of temperature, oxygen content, pressure and powder amount.
Automatic control: 24h unattended printing, available for auto circulation of powder.

③ Real-time monitoring: photograph for each layer to automatically recognize defects in printing.

④ Estimation of workload: total consumption of time, metal, gas and electricity.

3.Safety Protection

① Auto power-off after printing，
Emergency stop in case of fault，
Protection against laser beam: laser is disabled when door is open.

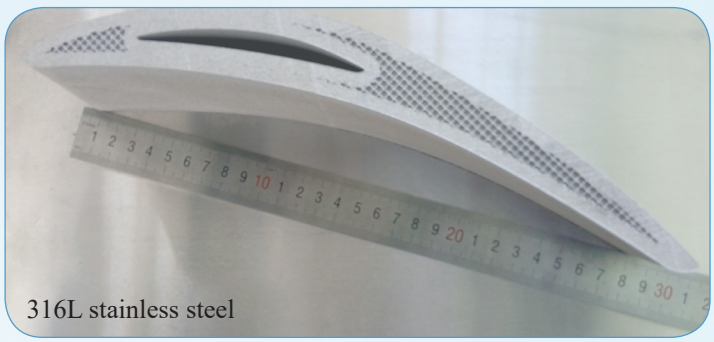
② Prevention of collision: adjustable torque limit for all motors,Pressure control in chamber to avoid overpressure.

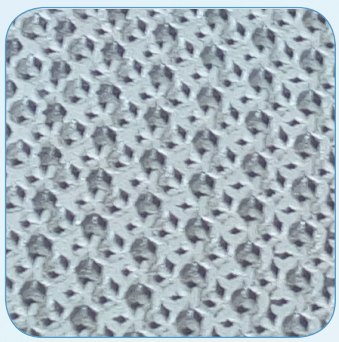
Higher precision; Smarter control; More security !

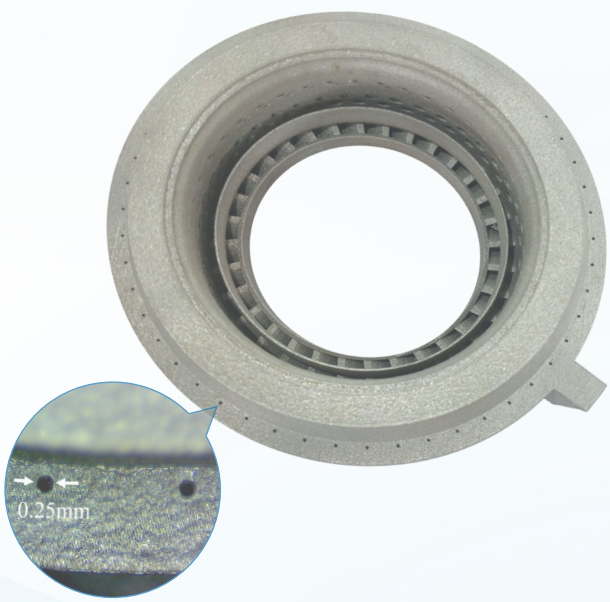
4.Specification

Specification of FF-M500 -- Dual-Laser / Galvanometer	
LASER SYSTEM	BUILD VAT
• Laser type：Fiber Laser • Wave length：1064nm • Laser power：2x500W • Video monitoring: Real-time	• Work dimension: 500mm(X)×300mm(Y)×410mm(Z) Recommended thickness of substrate is 25mm • Highest heating temperature : 250°C • Protective gas: Nitrogen, Argon • Gas consumption<3.5L/min • Content of oxygen<100ppm
OPTICAL & SCANNING	ELEVATOR
• Laser spot(diameter@1/e^2)：0.05~0.15mm • Mark speed：Recommended 2.0m/s • Jump speed：Recommended 10.0m/s • Dual-laser: simultaneous scan (independently or cooperatively)	• Z resolution: 0.001mm • Positioning accuracy：±0.002mm
RECOATING SYSTEM	SOFTWARE
• Recoating: top-to-bottom, flexible and following method • Normal mode：0.04mm • Fast mode ：0.04~0.1mm • Precise mode：0.02~0.04mm	• Operation System：Windows 7 • Operation Application：KSLMpro • CAD Interfac：STL File Formate
WARRANTY	MATERIALS
• Laser: 5,000h or 12 months (maximum warranty) • Machine: 12 months including assembly	• Inconel 625 high-temperature alloy • GH4169 alloy • 316L stainless steel • Ti6Al4V Titanium alloy and pure titanium • AlSi12Mg aluminum alloy ,etc.

Print Samples


316L stainless steel

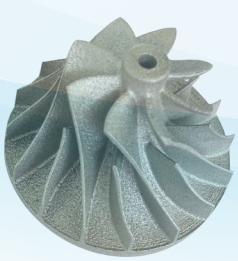


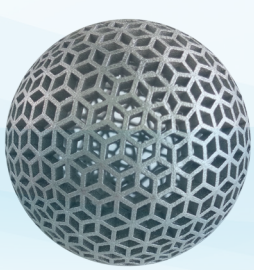


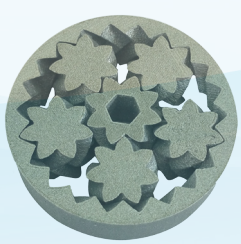
Ni625


316L stainless steel


Ti6Al4V


316L stainless steel


316L stainles steel


aluminum alloy

Mechanical Properties Of Materials For SLM GBT228-2002 Sheet

	Ti6Al4V	316L Stainless Steel	Inconel718[1]	AlSi12Mg
Tensile strength(MPa)	1275±47	642±23	1404±20	390±10
Yield strength（MPa）	1120±41	525±22	1167±25	217±11
Maximum elongation(%)	8±2	30±5	17±3	6±1
Elastic modulus(GPa)	113±4	189±15	330±5	62±9
Hardness(HV10)	386±5	212±2	468±10	116±1

1. After standard heat treatment.
2. The result is merely applicable to this sheet, so there may be some difference if powder, different parameters or test direction were used.

Core Members

CEO & Chief Engineer

Shuai Li : He was once a joint Ph.D. of HUST (Huazhong University of Science and Technology) and NTU (Nanyang Technological University). He received his bachelor and doctoral degree from HUST, and dual bachelor degree (Business Administration) from Wuhan University. Currently, Li is devoting himself to additive manufacturing.

Vice - Chief Engineer

Pengju Xue : He received his doctoral degree (Material Processing) from HUST, Specialized in hybrid rapid prototyping (3D printing) of complex products applied in aerospace and weaponry, he was involved in major science and technology programs (973 / 863).

Technical Director

Zhichao Chen : He was a joint Ph.D. of HUST and LU (Loughborough University). He received dual doctoral degree from HUST and LU due to his outstanding research in 3D printing. He was once in charge of the development of 3D printing devices for many NSFC projects, accumulating rich experience in electromechanical control and software design.

Development Manager

Weidong Li : He graduated from People's Liberation Army Information Engineering University, Recently, he has participated in the development and mass production of various 3D printers, such as FDM, SLA, DLP, and SLM etc.