



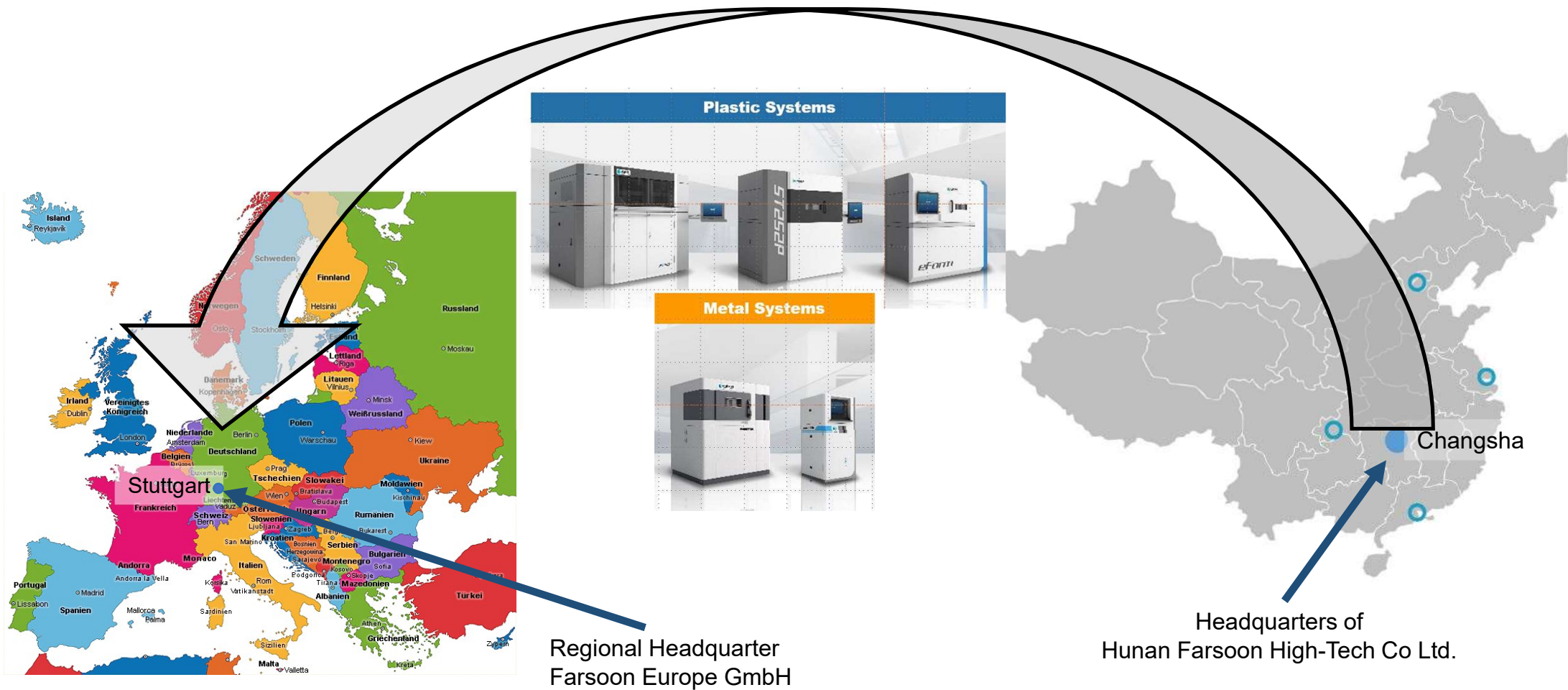
FARSOON
TECHNOLOGIES

Open for Industry Laser Sintering:

**Our Contributions for the Industrialization
of Additive Manufacturing**

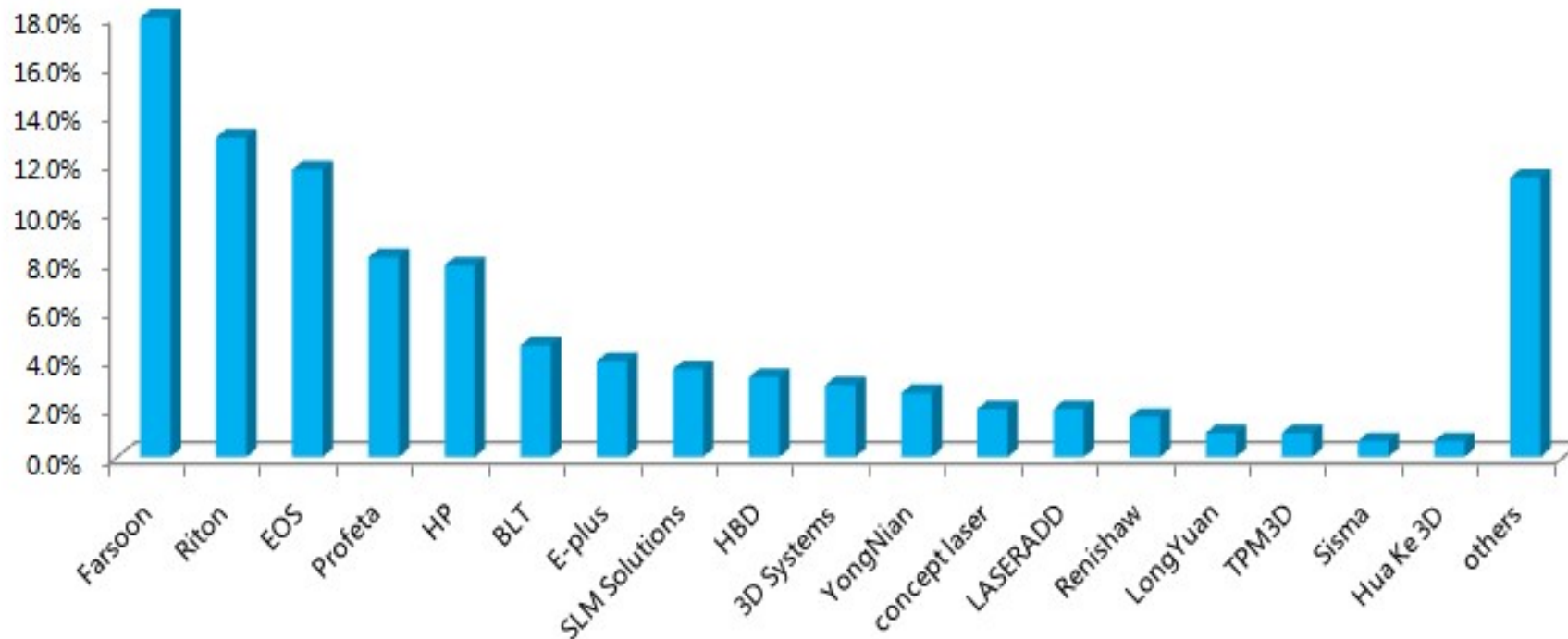
FARSOON Europe GmbH
Dr. Dirk Simon

We sell laser sintering machines *Made in China*



We are No 1 in sintering systems in China

2018 China Market Share of Powder Bed Fusion Machines (unit)



source: Data by Farsoon marketing Dept. (main OEM only)

Since 2017 we are expanding in a global scale



Established laser machines portfolio

Plastic Systems

Metal Systems



403P

40x40x45 cm³



252P

25x25x32 cm³



eForm

25x25x32 cm³



FS271M

27x27x32 cm³



FS121M

12x12x10 cm³

Auxiliary equipment



Breakout Station



Breakout Station with integrated cylinder control unit



Independent cylinder control unit



Fork lift (metal)



Fork lift (Plastic)



Nitrogen generator

Air compressor



Wet Vacuum



Water Chiller



Powder mixer



Sand Blast unit



Metal Powder Sieve



Farsoon invites material companies to jointly innovate for better parts

Both use its main core competences to offer the optimal solutions for the customers



Chemical & Materials Companies



AM Parts Producers

Auto-motive

Aero-space

Industrial / Energy

Medical / Dental

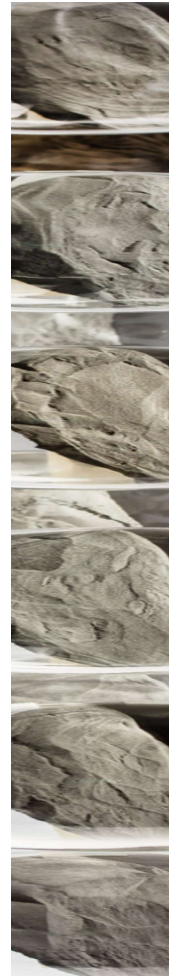
Sports & Leisure

Others



Excellence in metal parts with Oerlikon powders

oerlikon



AM Metal Powders

We offer AM tested metal powders with the technical support required for successful implementation. Reference mechanical properties, heat treatment and microstructure from our materials printed in relevant AM equipment give a foundation ready to be built upon. Our global sales and logistics network means we are ready to help you select the perfect materials for your specific application.

| | | |
|----------|------------------------------------|------------------------------------|
| Ni-based | 718 Nickel Alloy (2.4668) | download datasheet |
| | 625 Nickel Alloy (2.4856) | download datasheet |
| | Nickel Alloy X (2.4665) | download datasheet |
| | Nickel Alloy 230 | download datasheet |
| Co-based | Cobalt Chrome Molybdenum (F75) | download datasheet |
| Fe-based | 316L Stainless Steel (1.4404) | download datasheet |
| | 17-4PH Stainless Steel (1.4542) | download datasheet |
| | 15-5PH Stainless Steel (1.4545) | download datasheet |
| | 18 Ni Maraging Steel (1.2709) | download datasheet |
| | H13 Hot Work Tool Steel (1.2344) | download datasheet |
| Ti-based | Ti-6Al-4V ELI Grade 23 and Grade 5 | download datasheet |

Source: <https://www.oerlikon.com/am/en/offerings/metal-powders/>

LEHVOSS powders for Farsoon machines



CUSTOMIZED
POLYMER MATERIALS

LEHVOSS
Group



Our Competences



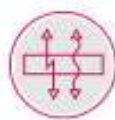
STRUCTURAL



RESISTANT



TRIBOLOGICAL



CONDUCTIVE



WEIGHT



PROTECTION



SURFACE



CUSTOMIZED
POLYMER MATERIALS

LUVOSINT TPU X92A

Elastic parts with high strength

LUVOSINT PP 9703 WT

Parts with high chemical resistance

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USA
Tel +1-855-661-3226
Fax +1-860-495-2047
Email: info@lehvoss.com

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Unit 4805 Maxco Centre
8 Xinyi Road, Changning District
Shanghai 200336
China
Tel +86 21 6278 5181
Email: info@lehvoss.cn

We are members of:



Any recommendations made for use of Seller's materials are made to the best of Seller's knowledge and are based upon prior tests and experience of the Seller believed to be reliable; however, Seller does not guarantee the results to be obtained and all such recommendations are non-binding – also with regard to the protection of third party's rights –, do not constitute any representation and do not affect in any way Buyer's obligation to examine and/or test the Seller's goods with regard to their suitability for his Buyer's purposes. No information given by the Seller is to be construed in any way as a guarantee regarding characteristics or duration of use, unless such information has been explicitly given as a guarantee.



Farsoon produces PA1212 based powders

for sale in Europe (incl. Israel)

| | | FS3300PA | FS3401GB | FS3250MF |
|---------------------|-----|----------|--------------|----------------|
| | | Neat | Glass filled | Mineral filled |
| Modulus | MPa | 1600 | 3500 | 6100 |
| Tensile strength | MPa | 46 | 44 | 51 |
| Elongation at break | % | 35 | 5 | 5 |

Total Materia Database helps you to find materials suitable for Farsoon machines

 **Total Materia** The world's most comprehensive materials database

Web: www.totalmateria.com

Contact: custservice@keytometals.com

Our Components:



Total Metals



PolyPLUS



Extended Range



DataPLUS



Enviro



Compliance



Suppliers



SmartComp



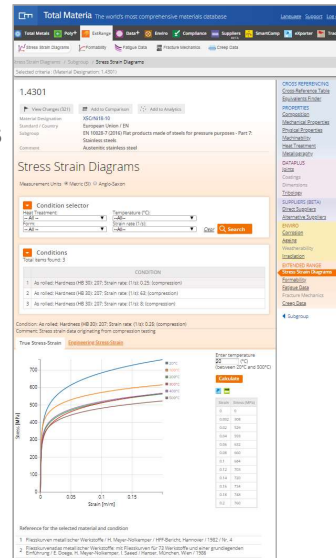
eXporter



Tracker

What's Inside

- ✓ Properties for 450,000+ Materials
- ✓ Metals, Polymers, Ceramics, Composites
- ✓ 74 Standard Development Organizations
- ✓ 3,000+ Sources for Advanced Data
- ✓ 150,000+ Stress-Strain Curves
- ✓ 35,000+ Materials with Cyclic Properties
- ✓ International Cross-Reference Tables
- ✓ Chemical Composition
- ✓ Mechanical and Physical Properties
- ✓ Multiple Material Comparison Options
- ✓ Property Estimation and Interpolation
- ✓ Data Export to CAE Software
- ✓ Identification of Unknown Materials



3D Materials

- 1000's of 3D materials
- >100 3D material producers
- Exposure, curing, manufacturing processes and much more

| Properties | | | | |
|--|-------|-------|---------------------------------------|--|
| Condition: 3D Printed; Infill density: 100%; Machine: Ultimaker 2+; 3D Printed specimen test | | | | |
| Property | Value | Unit | Note | |
| Impact Strength | 14.2 | kJ/m² | Charpy: Normal Test Method: ISO 179 | |
| | ± 0.7 | | | |
| | 13.1 | | | |
| Flexural Strength | ± 0.7 | MPa | Charpy: Parallel Test Method: ISO 179 | |
| | <65.7 | | | |
| | ± 5.3 | | | |
| Flexural Strain | ± 3.2 | MPa | Parallel Test Method: ISO 178 | |
| | <86.2 | | | |
| | ± 0.2 | | | |
| | 3.8 | % | Parallel Test Method: ISO 178 | |
| | ± 0.2 | | | |
| | ± 0.2 | | | |

Innofil3D PLA

View Changes (0)

Add to Comparison

Add to Analytics

Standard / Country

Producer

Group of Materials

Polymer family

Form

Dimension

Processing

Application

Comment

PROPRIETARY

Innofil3D BV

Polymers

Poly(lactic acid)

Filament

Diameter (mm): 1.75 ± 0.05 or 2.85 ± 0.1

3D printing (Additive manufacturing) - Fused Deposition Modeling (FDM)/Fused Filament Fabrication (FFF)

Machine: Ultimaker 2+

Suitable for all commercially available leading brands 3D FDM/FFF printers

Polylactic acid (PLA), unreinforced, FDA compliant

Manufacturing Processes

Use condition selector

View data for all conditions

Conditions

CONDITION

3D printed specimen production; Machine: Ultimaker 2+

3D printing machine settings, based on 0.4 mm nozzle

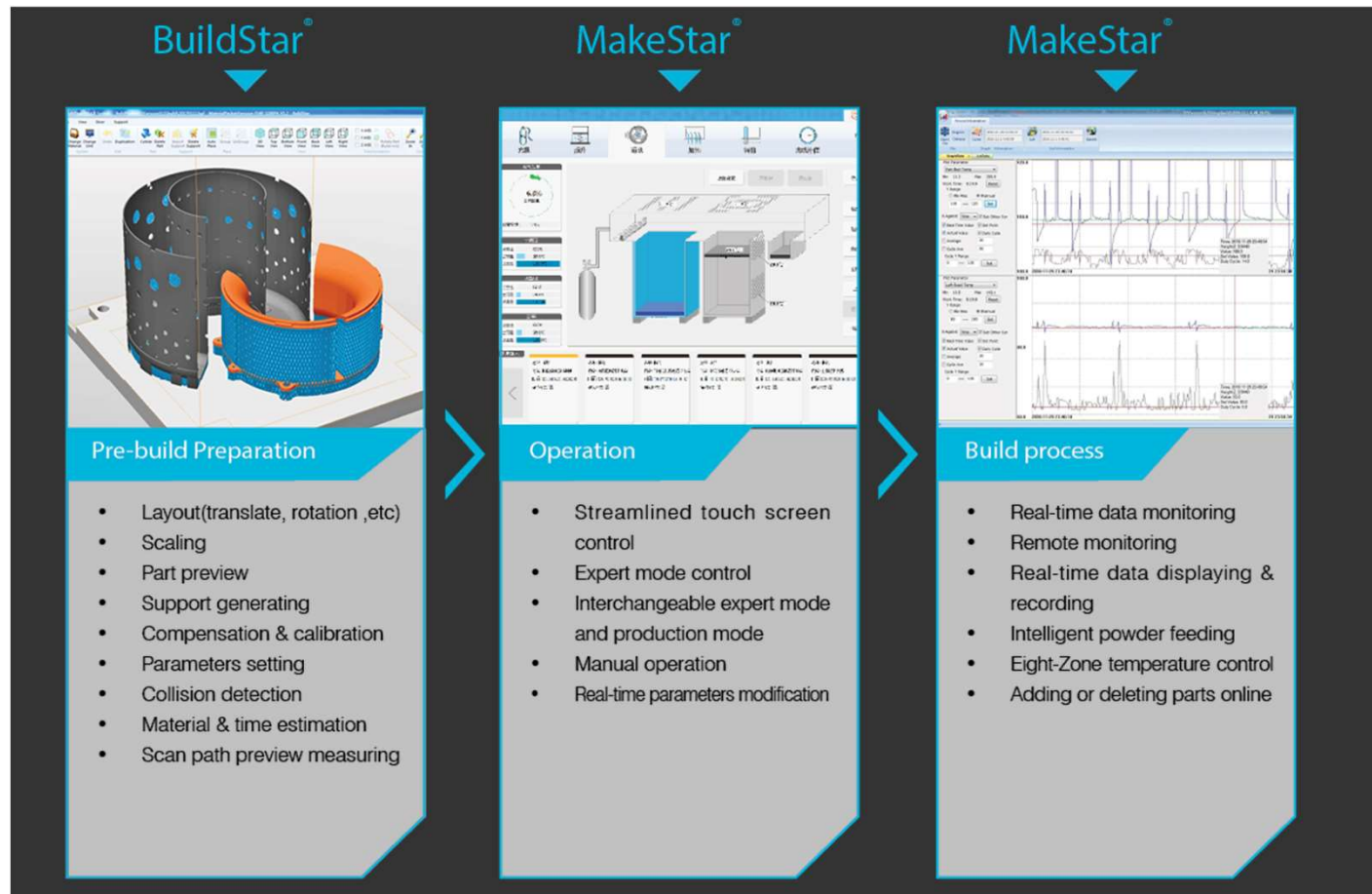
Properties

Condition: 3D printed specimen production; Machine: Ultimaker 2+

| Property | Value | Unit | Note |
|------------------------|------------|------|------|
| Heated Bed Temperature | 60 | °C | |
| Printing Speed | 40 | mm/s | |
| Printing Temperature | 210 | °C | |
| Shells Number | 2 | - | |
| Infill Orientation | 45 | ° | |
| Infill Density | 50, or 100 | % | |

Farsoon software has open parameters

- Fully in-house developed software solution
- Build preparation software
- Machine control software
- Open for customizing interfaces



MakeStar/BuildStar™: User friendly software: *switch between manufacturing and advanced user interface*

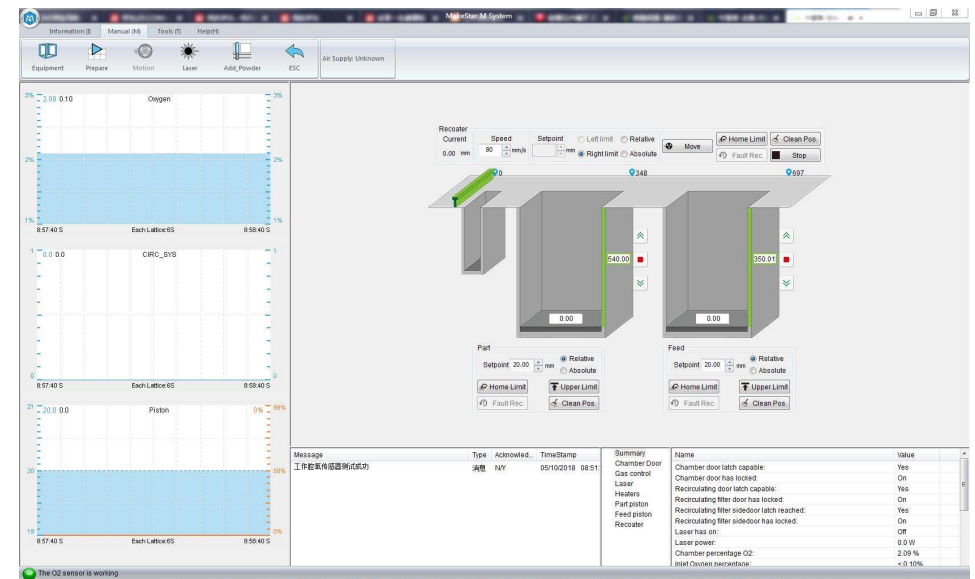
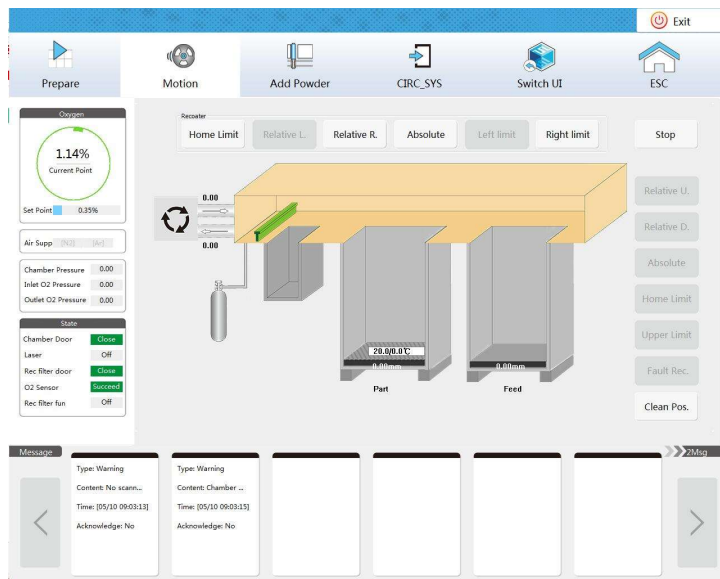
Manufacturing Interface

- Touch screen interface
- Streamlined operations
- for ease of everyday operations

Flexible
of Switch

Advanced User Interface

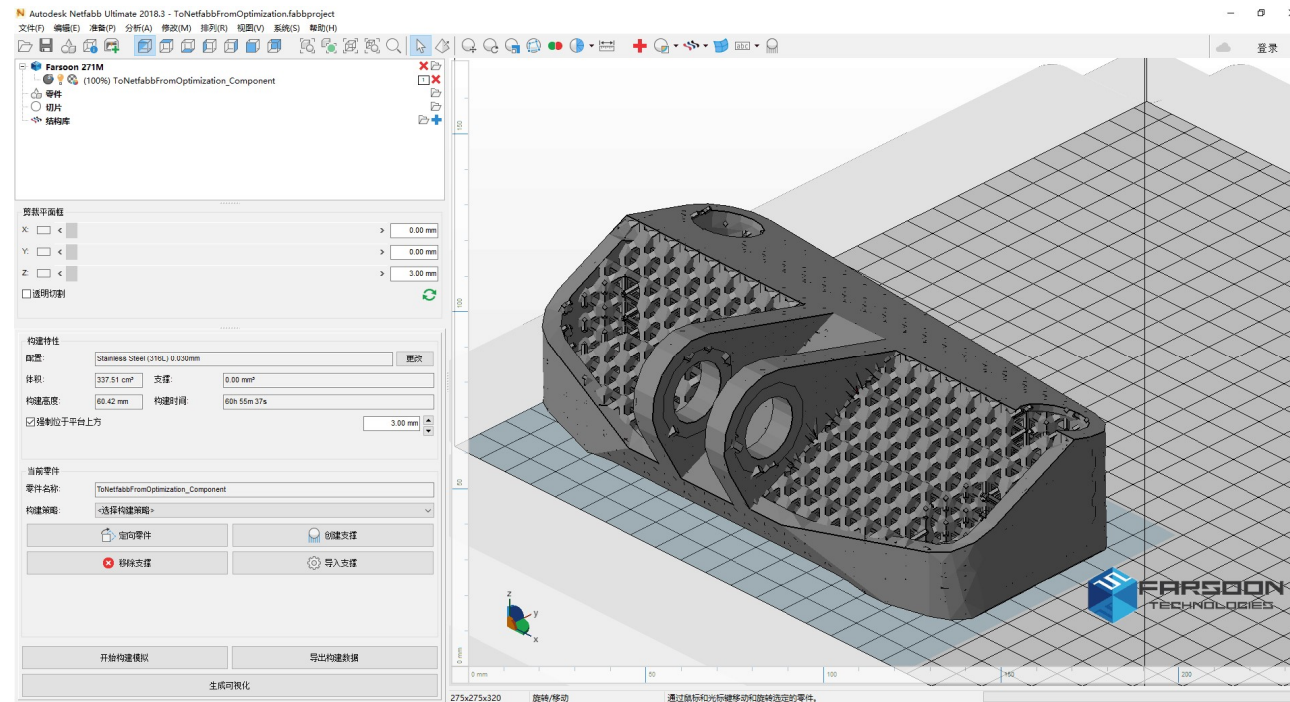
- Full access to machine parameters and information
- Powerful tool for optimizing build process



Software - Partnership with Autodesk Netfabb

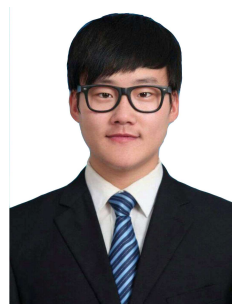
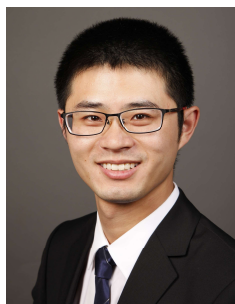


- efficient build preparation
- tools for optimizing designs
- simulating metal additive processes and hybrid manufacturing
- planning for CNC post-processing



The team behind wehelpyou@farsoon-eu.com

... and strongly supported by >250 people in our Headquarters



| | | | | | | | | |
|--|---|---|---|--|---|---|---|------------------|
| Dirk Simon | Michael Kock | Bjoern Bjoernstroem | Jan-Peter Derrer (as of April 01) | Yan Hao | Simone Riegler | Johnny Zhu | Mourad Mountassir | N.N. |
| Managing Director | Senior Sales Manager | Senior Sales Manager | Senior Business Development Manager | Business Operations Manager | Procurement & Accounting Officer | Service Engineer | Service Engineer | Service Engineer |
| +49 711 6740 0306 +49 160 9052 9582 dirk.simon@farsoon-eu.com | +49 151 4006 2826 michael.kock@farsoon-eu.com | +49 151 6126 2560 bjoern.bjoernstroem@farsoon-eu.com | +49 711 6740 03xx Jan-peter.derrer@farsoon-eu.com | +49 711 6740 0307 +49 152 5161 6423 yan.hao@farsoon-eu.com | +49 711 6740 0308 Simone.riegler@farsoon-eu.com | +49 151 1816 8702 johnny.zhu@farsoon-eu.com | +49 160 9498 6055 mourad.mountassir@farsoon-eu.com | |

We establish representation by Agents regionally

- We systematically search agents qualified in additive manufacturing
- Tender process starting for
 - Poland & Baltic
 - Spain & Portugal
 - Benelux
 - UK & Ireland

→ We take the responsibility to serve the customers

Italy:
Dr. Diego Grasso, In-Tech srl



We offer services with highly qualified Engineers

Qualification of Service Engineer:

Farsoon continuously invests into the qualification of its Service Engineers. Level of education must be at least Bachelor's degree in Engineering. The Service Engineers are extensively trained in Farsoon Headquarters and must pass examinations before receiving the certification. Farsoon differentiates following 4 levels of certification:

| Level 1 | Level 2 | Level 3 | Level 4 |
|--|--|--|---|
| <ul style="list-style-type: none">• Operators' training• Software training• Standard safety training• Basic phone & e-mail support• Mechanical checks of machine | <ul style="list-style-type: none">• Exchange of wear parts• Basic troubleshooting of mechanical issues• Apprentice machine repair• Installing software upgrades• Laser power calibration | <ul style="list-style-type: none">• Troubleshooting of mechanical, thermal & electro-optical issues• All aspects of preventive maintenance• Electro-optical & thermal machine calibrations• Machine repairs• Application support | <ul style="list-style-type: none">• Expert level machine installations & repairs• Technical services on beta-machines• Advanced application support & joint developments• Advanced safety training |

Farsoon sends Service Engineers of at least Level 3 to customers.

You can select from 3 service levels

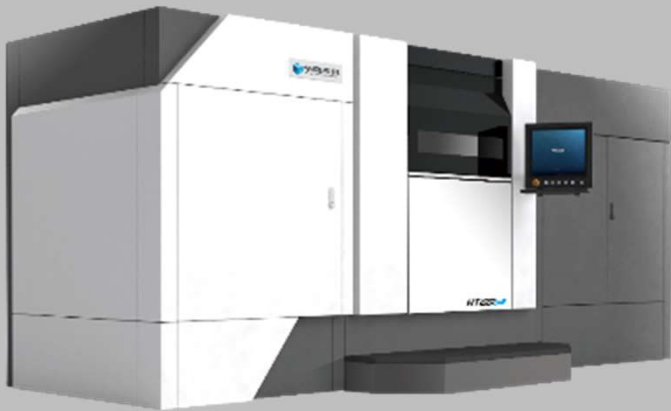
| | On-demand Services | Silver Level Services | Gold Level Services |
|--|--|---|---|
| Labor costs | Invoiced per day | Included | Included |
| Preventive Maintenance (as specified below) | On-request, invoiced according to expenses | 2 visits of 5 days each included | Up to 3 visits of 5 days each included |
| Software & hardware upgrades | Invoiced according to expenses | Included in PM | Included in PM |
| Remote trouble-shooting | Excluded | Qualified response within 72h* included | Qualified response within 36h* included |
| Application support (incl. material config files) | Excluded | Included | Included |
| Costs of wear parts | Invoiced according to expenses | Included | Included |
| Costs of spare parts | Invoiced according to expenses | Invoiced according to expenses | Included [#] |
| Travelling | Invoiced according to expenses | Included | Included |
| Accommodation | To be paid by customer directly | Included | Included |

Farsoon innovates for AM series production

➔ *Continuous Additive Manufacturing Systems (CAMS)*

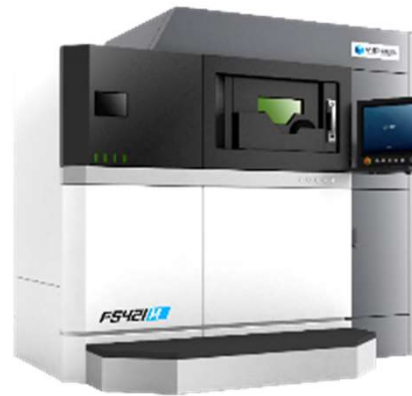
Plastic Laser Sintering

beta-HT1001P



Metal Laser Sintering

beta-FS421M

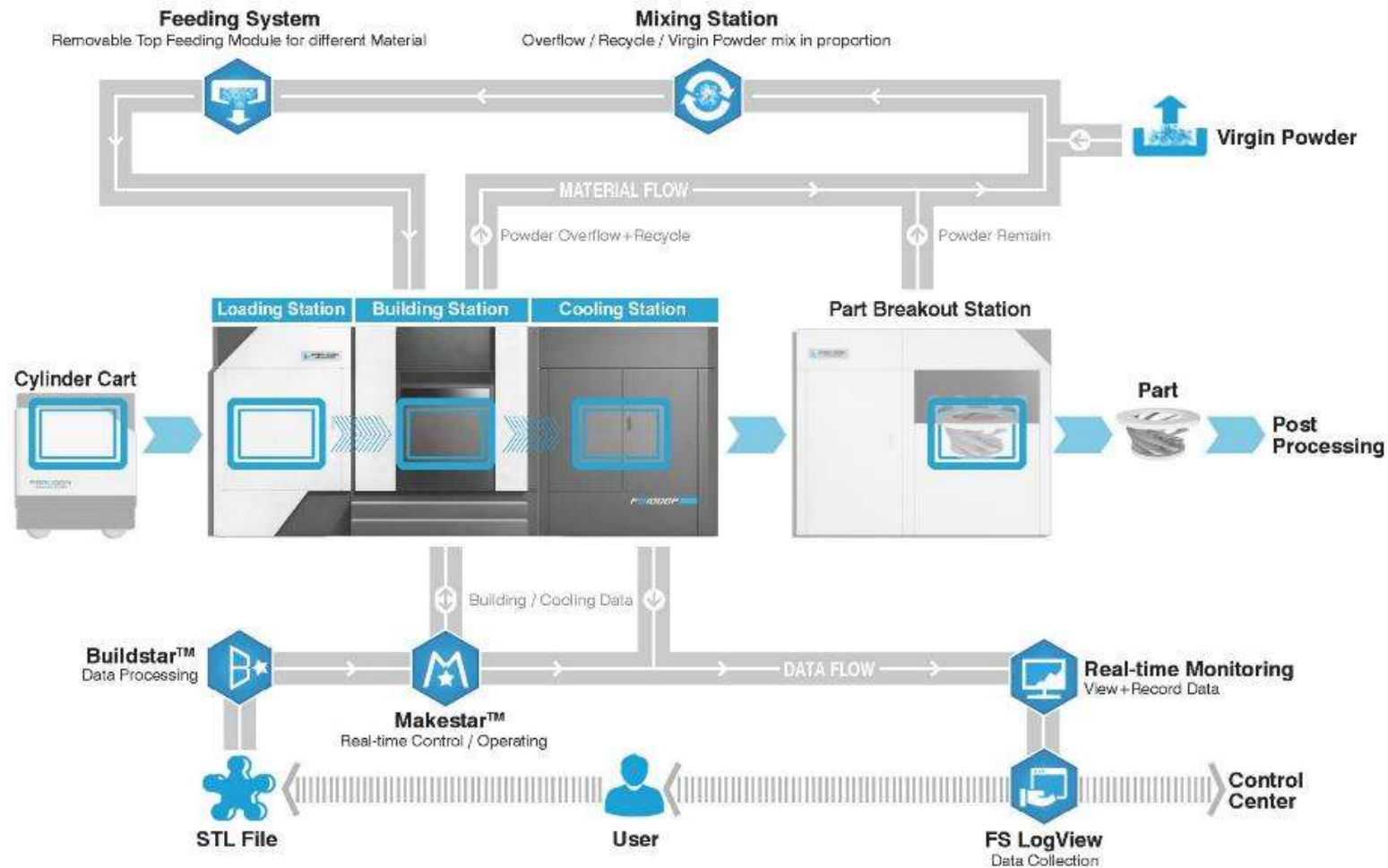


FS721M

Coming Soon



Workflow for integration into manufacturing



Higher productivity than competitive systems

higher scanning speed, higher laser power, dynamic focusing

Farsoon HT1001P

1

Dynamic focusing, dual-beam

- contour building with small beam
- filling with big beam

2

Higher Laser power: 2*100W

3

Faster scanning speed: 2*15.2m/s

+52%

scanning speed

EOS P500*

F-theta-Lens with same size beam

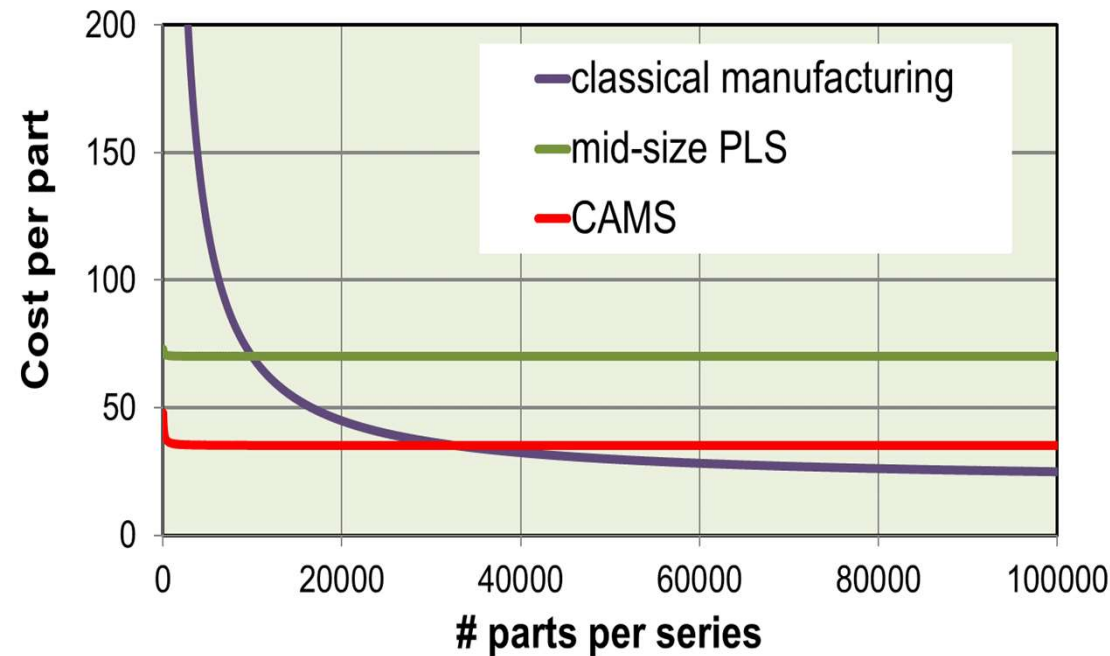
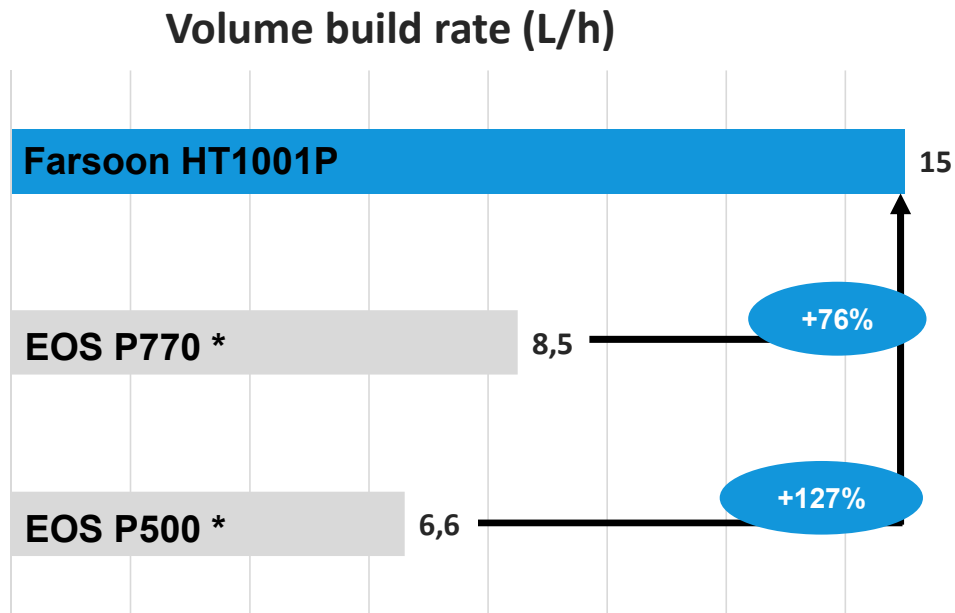
Laser power: 2*70W

2*10m/s

Fully digital, dynamic focusing ensure the high accuracy

* source: https://www.eos.info/systeme_loesungen/eos-p-500

Farsoon HT1001P increases your competitiveness versus classical manufacturing



* source: https://www.eos.info/systeme_loesungen/eos-p-500
https://cdn.eos.info/70a35a17f13f2106/ceb16c7556e3/EOS_System_Data_Sheet_EOS_P_770_DE_V6_Web.pdf

Jabil (Florida) benchmarked Farsoon HT1001P

P40 Aircraft Replica



In 1941, a group of 100 US volunteer aviators in cooperation with the Chinese Air Force became part the infamous „Flying Tigers“ squadron. The P40 aircraft (pictured above) and these aviators distinguished themselves in the defense of the Asia Pacific region until 1942.



Fabricating this aircraft replica was a challenging task related to the required accuracy and large size. Working with Jabil engineers, Farsoon succeeded in fabricating the replica with their HT1001P polymer laser sintering system using FS3300PA nylon powder.

JABIL
Jabil.com/additive

FARSOON
TECHNOLOGIES



John Dulchinos
Vice President
Global Automation
and 3D Printing
Jabil Circuit, Inc.

“The platform’s footprint and performance throughput could add yet another level of productivity to Jabil’s growing portfolio of solutions (...) well suited for meeting our customers’ requirements, especially in the aerospace and transportation industries.”

JABIL

Modellbau Kurz signed Joint Development for beta-testing HT1001P in Gerlingen (Stuttgart)



KURZ



Goals of Collaboration:

- Readiness level for full commercialization
- Highly productive fabrication of functional parts
- Industrially relevant parts made of engineering plastics, such as reinforced PA6
- Production of many parts at lower costs

Farsoon FLIGHT™: Do you want to beta-test now?

Fiber Laser

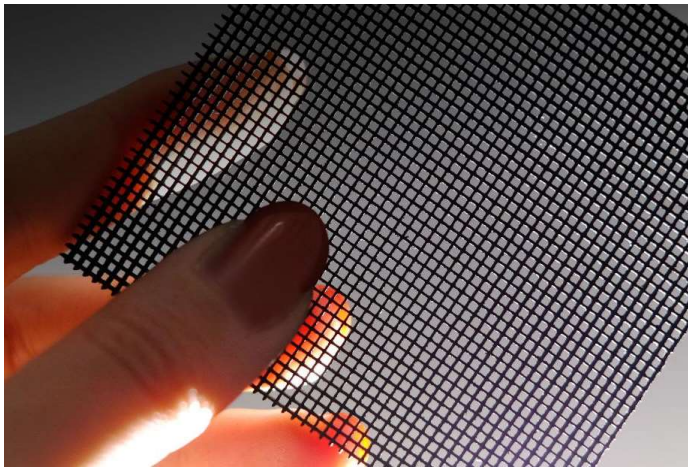
- 500W laser
- Longer laser life span
- Black plastic powders

Fast

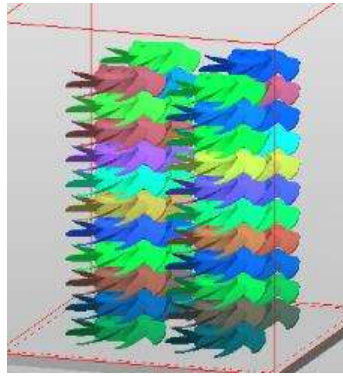
- Faster scanning speed
- Dynamic focusing
- 3x higher productivity compared to HSS/MJF

Fine

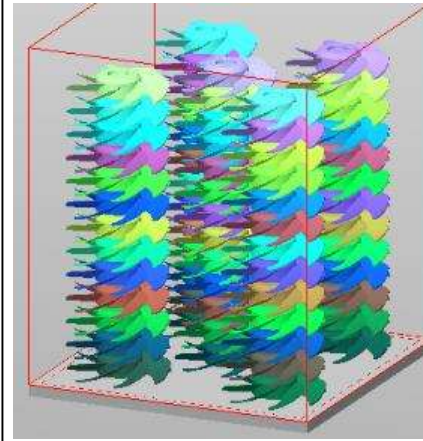
- Smaller laser spot size
- Improved surface quality
- fine detail as small as 0.3mm



HSS
380*284*380mm
14.3h/44 parts



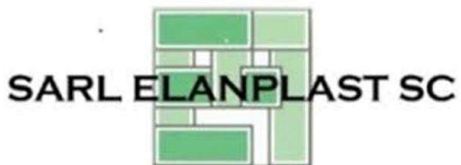
Flight
375*375*430 mm
7.8h/65 parts



We encourage you to talk with our customers

Part production

End application



Your benefits in working with Farsoon

Open for Your Objectives

Open for Your Challenges

OPEN FOR INDUSTRY

Open for Diversity

Open for Your Sovereignty

Our supply chain provides lead-times of 3 months

- Please place your request for quotations and orders to FARSOON Europe GmbH for ship-to in geography of Europe
 - Sales contract under European trade laws
 - Accounting in Euro
 - Regional contacts
 - Shorter response times
- Machines are made-to-order
 - Customization according to your specific needs
 - Full quality control with test builds in China
 - Typical lead-time ~3 months incl. delivery from China to Europe
- Warehouse in Europe ensure few days delivery times (as of 2019)
 - PA1212 based plastic powders
 - Spare parts & wearing parts