AM SOLUTIONS

CATALOGUE 2019

3D PRINTERS & POST-PROCESSING SOLUTIONS

Published by 3DA Solutions

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Editorial

Choose the way you want to start

Although additive manufacturing is hundreds of years old, the last five years have been marked by the rise of a number of industrial revolutions and awareness on the technology potential by professionals.

The only thing is that, once you've decided that Additive Manufacturing/3D Printing is right for your project/business, the next step might be quite intimidating. Indeed, as a media, we've covered various industry shows where hundreds of manufacturers and distributors were showcasing a comprehensive range of 3D printing systems.

At Formnext 2018 and at 3D Print Lyon 2019 for instance, we saw various 3D printers that integrate the most well-known technologies (FDM, SLA & SLS), a wide range of metal AM technologies and other types of 3D Printing technologies that deserve to be known and leveraged. However, what struck us most was the lack of tangible resources and guidelines, potential users we met at these shows wanted to have, in order to know in which train to board for their 3D Printing/AM journey.

This International Catalogue of Additive Manufacturing (AM) Solutions aims to be the first step in providing the industry the guidelines they deserve. More importantly, an important focus for us was to enable potential users to leverage the latest developments in Additive Manufacturing. Therefore, companies that spoke in this issue have only been able to highlight their latest developments, new and upgraded solutions.

Whether you are in Europe, in the USA or in Asia, this International Catalogue of AM Solutions should act like a brochure advising on 3D printers per technology, material choices and post-processing solutions.

3D ADEPT Media is committed to supporting the integration of 3D Printing & AM technologies in all industries. Therefore, we strongly encourage you to make the most of this Catalogue.

So, welcome to the International Catalogue of Additive Manufacturing Solutions. Made by 3D ADEPT Media.

3DA SOLUTIONS

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What About it ?

Metal Additive Manufacturing

MetalONE

LASERTEC 12 SLM

Selective laser melting

Selective Laser Melting is an additive manufacturing process that enables the production of metal parts using high-power lasers. These lasers fuse metal powder particles gradually and locally, in a full melting process and a controlled atmosphere.

This technology allows the manufacture of functional components with high structural integrity at a low cost. It is compatible with various materials, including biocompatible titanium alloys.

SLM is very similar to SLS, and both processes are covered under the powder bed fusion umbrella. The significant difference between both processes is the type of feedstock or powder required. While SLS mainly relies on nylon (PA) polymer materials, SLM is specially designed for metals. Besides, SLM technology leverages various metal powders including titanium, cobalt-chromium, steel, stainless steel, copper or aluminium, to name a few of them.

Furthermore, with SLM, a high-power fiber laser scans the powder surface. Thereafter, the generated heat melts the powder particles and creates a molten pool. Once the layer is scanned, the platform drops down by a single-layer thickness in the z-axis, and the fresh layer of powder is deposited. The process is repeated until the end of the entire part. Loose powders are removed once the full component is produced.

SLM parts must be fabricated in an inert gas atmosphere such as argon to remove oxygen from the building chamber. The substrate is removed from the build chamber once the process completes, and the supports are removed carefully.

SLM is one of the AM technologies that is gaining momentum today. The technology enables a wide range of applications for rapid prototyping and mass production. The end parts produced via SLM integrate properties that are similar to those manufactured via traditional manufacturing processes.

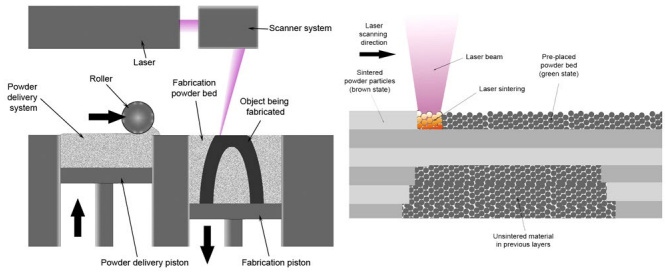

Diagram of the selective laser melting (laser sintering) process

LASERTEC 12 SLM

Mathias Wolpiansky, Managing Director of REALIZER GmbH at DMG MORI

In six years, **DMG MORI** has built up extensive experience in Selective Laser Melting.

"We bring decades of experience in CNC Machining to the industry, but we will not replace CNC technologies by AM technologies. As a matter of fact, AM also relies on CNC. The fact is, clients are always waiting for the next step. Our aim therefore is to combine our expertise in CNC & AM to address crucial challenges they are facing when it comes to productivity, industrialization for AM and safe working conditions." **Mathias Wolpiansky**, Managing Director of REALIZER GmbH at DMG MORI.

With the launch of the industrial 3D Printing system LASERTEC 12 SLM, the company continues to provide products that are reliable, highly-functional and worthy of investment to meet each and every customer's needs.

The metal AM System uses the powder bed technology where an individual layer of metal powder materials is built up and irradiated with laser to create the shape. It achieves high-precision molding of complex-shaped parts like a lattice using a laser with the smallest spot diameter of 35 µm. Lastly, the system integrates linear scale with a positioning accuracy of less than 1 µm for high-precision metal additive manufacturing.

Technical specifications

Build Volume	125 x 125 x 200 mm
Layer thickness (µm)	20 to 100
Laser spot diameter (µm)	Min. 35
Laser type	Fiber type
Laser output (depending on specification) (W)	200 to 400
Compatible resins	Daylight Magna resins
Printing Software	Photocentric Studio
Connectivity	USB, Ethernet, WiFi

DMG MORI

www.dmgmori.com

SLM Solutions: Holistic Solutions Provider and Partner for Metal Additive Manufacturing

One of the most important current trends in 3D printing is the advancement of functional parts into series production, aided by consistently improved machines with increased productivity, robustness and stability. SLM Solutions is a leading supplier of metal additive manufacturing systems that partners with customers to utilize selective laser melting for qualified production processes. Headquartered in Germany with global representation, SLM Solutions holds the base patent as the inventor of the selective laser melting process and to this day, only focuses on the advancement of this production process.

SLM Solutions was the first to develop and introduce multi-laser systems to the market, with the twin-laser SLM®280 in 2011 and the quad-laser SLM®500 debuting in 2015. As the innovation leader in the industry, SLM Solutions also offers patented bi-directional recoating to reduce laser-off times, overlap stitching to ensure part quality and ensures operator safety and process integrity through closed-loop handling. This unique approach isolates operators from metal powder during powder fill process and unpacking after a build. Qualified SLM® systems are used worldwide by customers in a wide range of industries, including aerospace, automotive, tooling, energy and healthcare. In the research field the open parameter nature of all SLM® machines help further advance process and material development.

SLM Solutions offers selective laser melting systems in four sizes, the SLM®125, SLM®280, SLM®500 and extended z-axis SLM®800, which all offer the same cutting edge technological process, differing mainly in the size of the build envelope as well as the number and power of the lasers processing the build.

All machines enable qualified production in a variety of materials and almost any weldable alloy can be processed. SLM® machines are available with 400W or 700W lasers and fully automated powder sieving and supply systems that ensure safe and reliable powder supply without manual refilling during the build.

As a complete partner in developing additive manufacturing processes, SLM Solutions also offers software solutions to ease the path to successful selective laser melting builds, track melt pool and laser data outputs and streamline plant production. Consulting offerings further lower the learning curve and assist customers in developing their production processes.

For more information visit us at Booth E03, Hall 12 at formnext.

Machine Name	Machine Size in (mm; w x d x h)	Build Envelope reduced by substrate plate thickness (mm³; w x d x h)	Build Materials	Layer Thickness
SLM®125	1400 x 900 x 2460	125 x 125 x 125	Titanium, Aluminum, Tool Steel and Stainless Steel, Cobalt-Chrome, Copper and IN. Parameters for other alloys available on request.	20 µm - 75 µm
SLM®280	4150 x 1200 x 2525 (incl. PSV)	280 x 280 x 365		20 µm - 90 µm
SLM®500	8600 x 4500 x 2700 (incl. permanent filter module, chamber removal station, powder sieve and operating space for all peripheral equipment)	500 x 280 x 365		20 µm - 90 µm
SLM®800	Varies depending on machine setup and automation options	500 x 280 x 850		20 µm - 90 µm

TECHGINE 探真

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TS 500

The technical team has made a breakthrough in the idea of existing single beam selective laser melting and is the first to propose four beams scanning in the world, which is a new method of additive manufacturing. It is able to achieve large size, high deposition efficiency and high precision while guaranteeing the quality of parts.

TS500 is in the front ranking the world for is dimensions and efficiency of manufactured parts by SLM process. The machine owns the full set of intellectual property rights.

Technical specifications

Machine size : 6700 x 2500 x 4600 mm
Build size : 500 x 500 x 1000 mm
Laser power : 4 x 500 W or 4 x 1000 W fiber laser
Recoating mechanism : Bidirectional recoating
Build rate : 80-200 cm3/h
Precision optics : ± 0.05 mm
Focus diameter : 100 µm
Oxygen level : ≤ 100 ppm
Substrate pre-heating : 200°C
Materials : Titanium / Aluminium / Stainless steel / High-strength steel

TS 120

The TS120 is a cost-effective and compact industrial grade metal 3D printing solution.

Compact and flexible, the product exceeds the requirements of conventional equipment in

the market. The user-friendly control console simplifies the operation. It is a new generation

of equipment specific to medical, digital education and digital design.

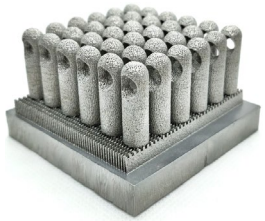
Technical specifications

Machine size : 950 x 1350 x 2000 mm
Build size : Ø 120 x 100 mm (D x h)
Laser power : 200 W or 500 W fiber laser
Recoating mechanism : Uplifting powder
Build rate : 1-35 cm3/h
Precision optics : ± 0.05 mm
Focus diameter : 40-120 µm
Oxygen level : ≤ 100 ppm
Materials : Titanium / Aluminium / Stainless steel / High-strength steel, ...

TS 300

The product is the result of design iteration. It is reliable and wide applicable, alowing to achieve very complex and precise structures on a large scale. The control software has a mature database of multi
materials and can be used to developped the own process parameters of the customers.

MetalONE



"It's probably the smallest, most affordable and easy to use metal 3D printer on the market". **Arturo Donghi** CEO of Sharebot srl.

Known for providing a comprehensive range of Additive Manufacturing technologies, Sharebot debuts firs metal 3D Printing this year.

The company enters this new frontier of the industry with metalONE, a metal 3D printer that integrates SLM (Selective Laser Melting) technology. With a 1070 nm fiber Laser at 250W power and a working area of 6,5x6,5x10cm, the movement speed of the 3D printer reaches 5 mt/s. metalONE can use nitrogen or argon gas to establish a modified atmosphere inside the printing chamber, it's managed by a 10" touch screen monitor and can be remotely accessed through the web interface from any browser.

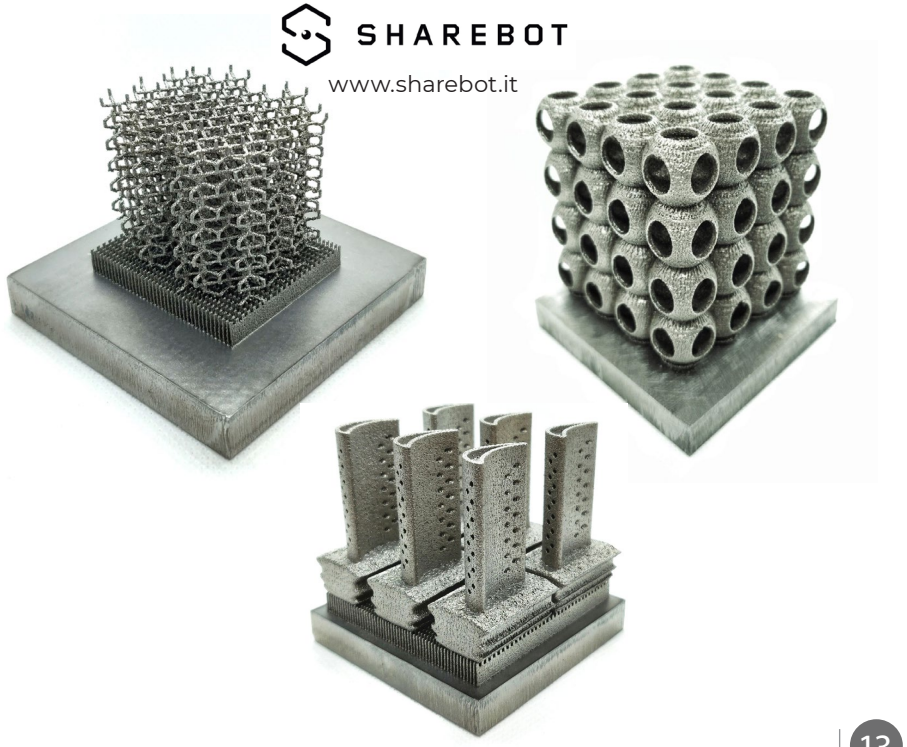
The user can easily modify the process parameters and double check in the log files after printing.

"Easy to use, in 10 minutes you can start a new print, and in less than 30 minutes you can clean the printer and change powder. Affordable, completely open parameters with a lot of info inside the log files in order to fully understand the process layer by layer. There are also some photos of each layer in order to implement AI solutions. The ideal metal 3D printer for all those who want to test new materials and thanks to its printing area and the standard DMLS printing process, it allows the creation of objects and prototypes using only a minimum of 800gr of metal powder", said **Arturo Donghi** CEO of Sharebot srl.

Arturo Donghi CEO of Sharebot srl.

Ideal for Research & Development of new powders and University R&D Departments, Sharebot is now collaborating with 5 universities in the USA, Asia and Europe that already started to use metalONE for the testing of various powders and solutions.

Already, ready for commercialization, the system can be shipped anywhere across the world within 30 working days. First deliveries will be shipped right after the Formnext 2019 event.



AMPRO SP330

AmPro Innovations

The SP-330 is a metal additive manufacturing machine specially developed for the aerospace industry. AmPro Innovations provides a range of equipment that spans the entire production chain from powder handling to the final part.

The SP-330 has a build volume of 320x250x250 mm and is dedicated to the production of metal parts for the aerospace industry.

It is delivered with already certified powder parameters and particle sizes, allowing easy handling. In addition, it is open and the manufacturing parameters used can be completely modified.

One of the strengths of the latter is the ability to remove the manufacturing chamber and replace it with a blank chamber so as not to waste time between two productions (cooling, dusting, ...). This system makes it possible to have a machine downtime between two minimum productions. The withdrawn manufacturing chamber is cooled and then the powdering can be done in a controlled atmosphere system.

TECHNICAL SPECIFICATION

- Build volume: 330 x 250 x 250 mm
- powder layer thickness: 20-100 µm
- Dimensional precision : ± 0.05 mm
- Substrate preheating : up to 300 °C
- Powder dispensing : Silo powder feed with bi-directional re-coater
- Laser type : 1 Lasers – IPG fiber – Yb 500W
- Production rate: 5-50 cm3 / h
- Scan speed : Up to 7 m / s
- Optical System : F-Theta Lenses
- Shielding gas : Nitrogen / Argon
- Filter system : H13
- Metal powders: Titanium / Aluminum / Steel 316L / Hx
- Time for material change: 10 minutes

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SPEE3Dcell

SPEE3D officially made its entry into the market at Formnext 2017, showcasing its Supersonic 3D Deposition (SP3D) process which uses cold spray techniques to inject metal particles which deform and stick to the surface as a result of the kinetic energy generated as air is accelerated at 1,000 metres a second. This year at **Formnext 2019 (Hall 12.0, E02)**, Aussie Metal 3D Printing Company unveils a new technology: SPEE3Dcell.

"Our world-first technology leverages cold spray technology and allows the 3D printing of industrial quality metal parts in just minutes, rather than days or weeks, at production costs", says Co-founder & CEO **Byron Kennedy**.

Co-founders Byron Kennedy (CEO) and Steven Camilleri (CTO)

Description of the process

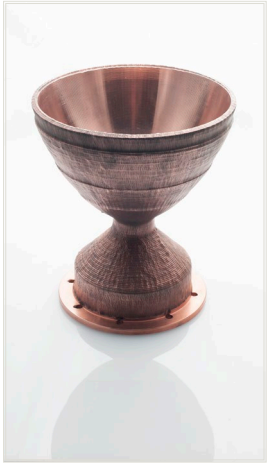
The metal cold spray technology harnesses the power of kinetic energy, rather than relying on high-power lasers and expensive gasses, and allows 3D metal printing at affordable production costs, offering a genuinely better alternative to casting.

"The SPEE3D process works by shooting metal powder through a jet engine nozzle at speeds up to Mach 3. The metal powder is deposited layer by layer upon a substrate intelligently controlled by a robotic arm. The sheer kinetic energy of the process causes the powder to bind together, forming a high-density part without the need for heat to "melt" the metal. As a result, printed parts can safely be handled immediately after the build", continues Co-founder & CEO **Byron Kennedy**.

SPEE3Dcell is a full package that includes a LightSPEE3D or WarpSPEE3D metal printer, together with a heat treatment oven and a CNC 3 axis milling machine. According to the company, the operator will no need to leverage any foundry.

"SPEE3Dcell is being launched at Formnext 2019. It is perfect for OEM's and manufacturers that currently rely on casting for production of metal parts and are looking for a technology that offers more flexibility without the cost penalty of other additive manufacturing processes", adds the Co-founder & CTO **Steven Camilleri**.

SPEE3D operates globally and supplies its metal AM technology to various geographical markets including USA, Europe, Japan, Singapore Australia and New Zealand.



www.spee3d.com

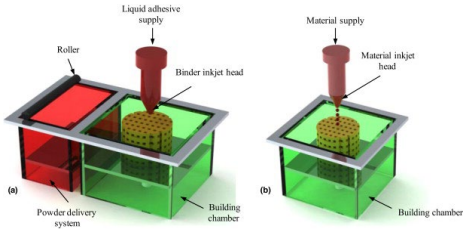
What About it ?

Inkjet Printing Processes

Inkjet Printing Processes

Inkjet printing technology comprises two main configurations:

- the binder jetting method or bonding method,
- the material jetting method or buildup method.



Inkjet printing processes: binder jetting (a) and material jetting (b) methods.

Binder Jetting

Binder jetting aka binder jet printing (BJP), is an additive manufacturing process in which powder is deposited layer by layer and selectively joined in each layer with a liquid binder. It's different than material jetting where the binder jetting printed component is self-supported within the removable powder bed. However, 3D printed parts have limited mechanical properties and sometimes, require further infiltration, sintering, or casting to be reinforced.

In addition to metals, binder jetting can work with a range of other materials, like sand and ceramics.

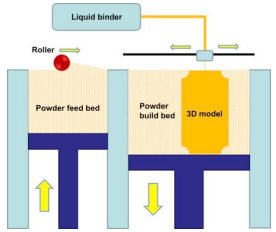
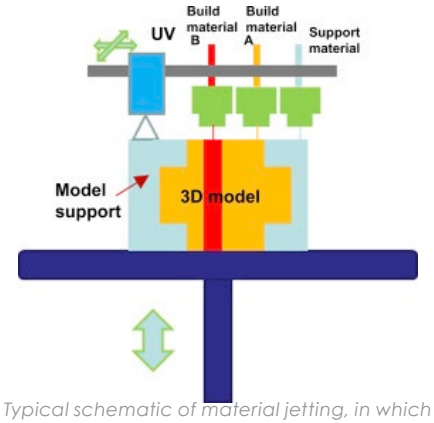


Figure. Typical schematic of binder jetting, in which powders are adhered layer by layer with liquid binder.

Material jetting

Material jetting produces 3D printed components of the highest dimensional accuracy with a very smooth surface finish. This AM process is leveraged for both visual prototypes and tools manufacturing. In the «layer by layer» printing process, wax-like melted materials are jetted through inkjet print heads, which then cure and solidify. Material jetting allows for different materials to be printed in the same object, making it one of the rare 3D printing technologies to deliver the production of parts from multiple materials and in full colour. However, as part of this process, support material may be required and jetted. Also, note that support material is usually built from a different material and removed during the postprocessing stage.

Lastly, technologies such as photopolymer jetting, drop on demand (DoD), thermojet printing, inkjet printing, and multijet modeling/printing all belong to the family of material jetting.



Typical schematic of material jetting, in which printer jets both build and support material on a platform using either a continuous or droplet approach.

PartPro350 xBC

The PartPro350 xBC offers cutting edge printhead technology that delivers industry-leading colour part production. With speeds up to 18mm per hour for a fully loaded build volume, the PartPro350 xBC is 150% faster than other colour binder technologies. The printer offers full-colour printing in one process by integrating all steps and curing, colouring and 3D stacking at once, with CMY three-colour ink and transparent binders.

XYZ PRINTING

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Printing Properties

Technology	Binder Jetting
Build Volume (W x D x H)	222 x 350 x 200 mm
Product Dimensions (W x D x H)	1380 x 770 x 1300 mm
Product Weight	233 kgs (513.7 lbs)
Resolution	1600 x 1600 dpi
Layer Thickness	0.1 mm (100 microns)
Build Speed	Up to 18 mm/hour
Material Compatibility	BuiltPro Powder DurajetPro Binder, CynidePlus,Color cartridges, FlashYellow,Color cartridges, IperMagenta, Color cartridges

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Massivit 1800 Pro

www.massivit3d.com

Massivit 3D large format 3D printing technology is the result of the combined expertise of experts from both the wide format printing and 3D printing industries.

Traditionally, 3D printers have been based on one of two key technologies: solid materials or photopolymer liquids. Both these technologies have been rendered impractical for commercial production needs due to limitations in speed.

Massivit 3D's co-founder and serial entrepreneur, Gershon Miller, developed an entirely new patented technology, Gel Dispensing Printing (GDP), that enables production at radical speed. The gel can be polymerized, and therefore cures 'on-the-fly'. This was the birth of the company's 1st Generation product line and a growing range of more than a hundred applications for a range of industries.

Launched in Q1 2019 and already available in the market, the Massivit 1800 Pro is a large format 3D printer for visual communication and entertainment. It offers unprecedented printing speed and is designed to empower wide format print businesses to expand their services, enter new niche markets, and overcome fierce market competition.

Key specifications:

Printing Speed	300 mm/sec linear speed 35cm/13.7" vertical speed on Z axis per hour (Printing speed for 1-meter diameter cylinder)
Printing Modes	• Normal (1.3 mm) • Quality (1 mm) • High Resolution (0.8 mm) • Mega-Quality (Rapid, high quality printing of large objects allowing for gel cost efficiency) • Variable Resolution (Flexible, pre-defined switching between resolutions for a single model without changing the tip)
Scalability of printing heads	1 or 2
Maximum Printing Volume	145cm x 111cm x 180cm / 57" x 44" x 70"
Supported Printing Materials:	• Dimengel 100 (Proprietary) • Dimengel 20 FR – (Proprietary, Fire-Re-tardant)

The Massivit team has been working on key areas for improvements in Q1, 2019. A new version of the software and a new material have been made available to the public. Named **Massivit Smart V4.5 software**, in addition to its user-friendly interface, the new software enables full automation, and can produce concrete molds for the production of street furniture, restoration, interior design pieces, and museum models.

What About it ?

Selective laser sintering (SLS)

MfgPro230 xS

Sintratec S2

Selective laser sintering (SLS)

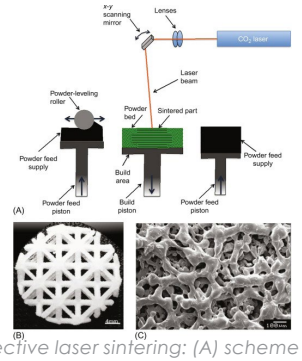
Selective Laser Sintering is a layer manufacturing process that enables the manufacturing of complex 3D parts through the successive addition of powder layers.

Selective laser sintering/melting is a powder- and laser-based additive manufacturing technology that can process many types of materials such as polymer, metal, ceramic, and composite. Its industrial applications include the production of components for the automotive, aerospace, tooling, biomedical, and architecture sectors.

SLS is a type of Powder Bed Fusion (PBF) technology wherein a bed of powder polymer, resin or metal is partially (sintering) or fully (melting) targeted by a powerful directional heating source such as a laser that results in a solidified layer of fused powder.

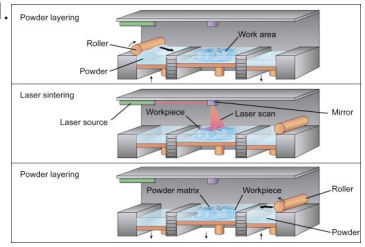
Such a process requires the use of a high-energy laser beam to fuse particle granules directly into complex, net-shaped 3D components. Parts are produced in a layer-by-layer way by repeating a scanning of the laser beam over a single layer of the powder granules, thereby consolidating them via full or partial melting. CAD and CAM software establish the process scheme. These manufacturing conditions lead to advantages such as high geometrical design freedom, high flexibility, and near net shape production. Those advantages have also enabled specialists of the field to develop the technology further.

SLS is often seen as the sister of metal SLM technologies. Like SLM technologies, the plastic printed part is produced layer-by-layer with SLS technology. However, both technologies do not require the same sintering temperature. A polyamide material (e.g., Nylon, PA12) for instance, must be sintered at 160–200°C, using a high-wattage laser whereas metal laser 3D printing technologies withstand a much higher temperature.



Selective laser sintering: (A) scheme of the process; (B) macrostructure of the sintered object; and (C) SEM image of sintered polymeric powder. Scale bar: (B) 4 mm; (C) 100 µm (Yeong et al., 2010)

During the manufacturing process, the SLS 3D printer preheats the bulk powder material in the powder bed below its melting point, allowing the laser to raise the temperature of the selected regions to the melting point. A roller applies a layer of fresh polymer powder. Once the sintered powder is obtained, the build plate lowers before applying a new layer of powder on the printing area. The process is repeated until the desired part is created.



Basic selective laser sintering procedure

Once the printing process is over, the powder bed and the manufactured parts (often referred to as a «partial cake») must cool down before being removed from the build chamber. Depending on the type of polymer used, it is possible to reuse the non-sintered powder. The manufactured parts are ready to use or can be refined according to the requirements.

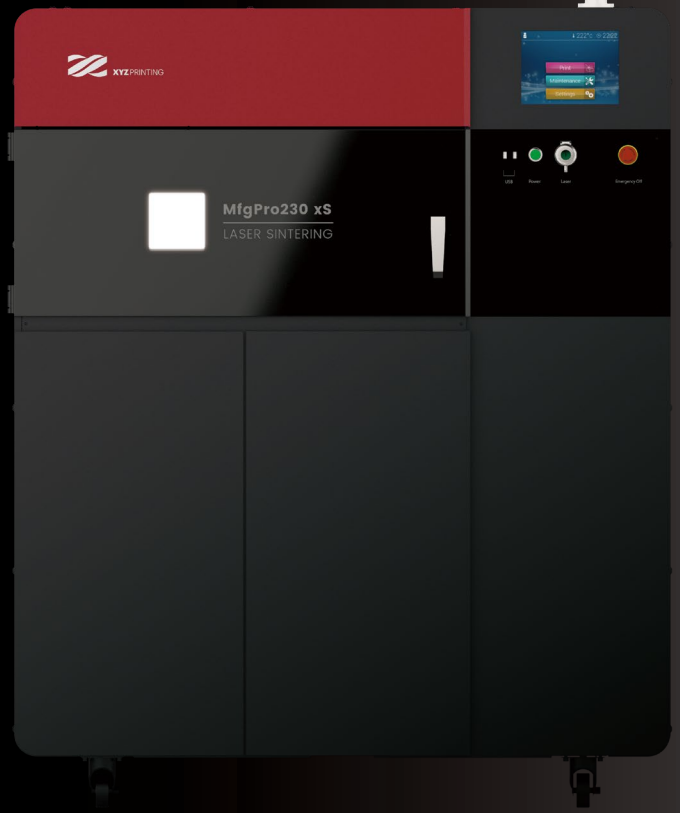
Several process parameters of a 3D printer can be modified. They include laser parameters (e. g. laser power and scanning speed) and construction parameters (e. g. layer thickness). Settings that are usually modified, are described as below:

Parameters	Description
Laser power	Applied power of the laser as it scans the surface of each layer
Scanning speed	The speed at which the laser beam moves when it passes through a scanning vector
Scanning spacing	Separation between two consecutive laser beams.
Number of scans	Number of times the laser beam passes through a scanning vector per layer
Laser scanning strategy	Any scan pattern or exposure method that is used to influence a dependent variable during the SLS process
Layer thickness	A measure of the layer height of each successive addition of material in the additive manufacturing or 3D printing process in which layers are stacked.
Build plate temperature	Heated chamber or bed temperature during the printing process.

Operators can produce several parts at the same time during the printing process. In this case, each powder layer can contain cross-sectional layers of several parts.

MfgPro230 xS

The MfgPro230 xS is one of largest SLS printers in market with a print volume of 230x230x230mm. It allows you to create prints with no support material due to its SLS technology, resulting in less material being used and fewer breakages due to the isotropic mechanical properties of the technology, ensuring every print job counts. The printer can print up to one litre per hour making it one of the fastest printers on the market.



XYZ PRINTING

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SLS (Selective Laser Sintering)

Printing Properties

Technology	SLS (Selective Laser Sintering)
Build Volume (W x D x H)	230 x 230 x 230 mm
Product Dimensions (W x D x H)	1480 x 850 x 2040 mm
Product Weight	360Kg (792lbs)
Laser Type	30W CO2
N2 System	Inner Gas Control System
Layer Thickness	0.08 mm / 0.1 mm / 0.15 mm / 0.2 mm
Build Speed	Up to 20 mm / hour (Geometry dependent)
Material Compatibility	sPro12w , TPU
Power Requirement	220V / 32A. Max 7 KW

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SINTRATEC S2

Dominik Solenicki
CEO and founder of SINTRATEC AG

Up until now in the SLS field consumers had to choose between expensive high-end machines and semi-professional printers. With the Sintratec S2 there is an attractive alternative in the market, that is perfectly positioned in-between those categories. The affordable end-to-end solution includes not only a powerful 3D printing system but also an efficient powder-handling and post-processing. Thanks to the flexible material core unit system, users can reduce downtimes significantly. Material swaps are not only faster but happen without any contamination of other printing materials. The Sintratec S2 is a fully-integrated system that is monitored and controlled via touchscreen and therefore easy to use. All these aspects make the SLS solution a great offer for the industrial market. Thanks to its modular design the Sintratec S2 can be expanded by adding additional modules. This represents a great opportunity for companies to scale their production according to their needs. By that, the Sintratec S2 bridges the gap between professional prototyping of functional objects and the manufacturing of small series as well. It is especially designed for engineers, designers, inventors but also professors and researchers working in different industries or academic institutions. In short: There is no other professional SLS system available with such a high price-performance ratio.

DESCRIPTION	TECHNICAL SPECIFICATIONS
Print, de-powder and prepare in one solution: The Sintratec S2 is a brand-new compact system for industrial additive manufacturing. The modular system is based on selective laser sintering technology. New and unique in the SLS field are the all-in-one integrated and semi-automated processes of laser sintering, de-powdering, material preparation and post processing. Thanks to this end-to-end solution users benefit not only from precise printed objects with an exceptionally high degree in freedom of form, but also from an economic operation with reduced down times.	• X-Y laser scanning system for fast printing. • High-resolution camera for real-time evaluation. • Touchscreen for direct operation. • Network connection for remote control and monitoring. • Contactless point measurement for powder surface temperature control. • Multi-zone heating • Height×Width×Depth: **1500×1000×750 m** • Power supply : **230 V | 2 kW max** • Air filtration system • Integrated screening function • Integrated mixing function

Contact details:
Address : Sintratec AG - Badenerstrasse 13, 5200 Brugg, Switzerland
site : www.sintratec.com
Tel : +41 56 552 00 22
email : info@sintratec.com

What About it ?

Post - Processing Solutions

Post - Processing Solutions

Post-processing plays a vital role in enabling AM technologies to move from a prototyping tool to a final part production tool.

Parts produced via AM technologies usually require a post-processing stage. This crucial step in the 3D Printing/AM production refers to any process that must be performed on a printed part or any technique used to further improve the part. This finishing step enables to refine parts at the end of the printing process.

Post-processing options for 3D printed parts include the removal of the support material or the excess materials, washing and heat treatment, sanding or polishing a model to paint or stain it. The choice for one option depends on the printing process used and varies from one user to another.

For FDM and Material Jetting technologies, for example, the cleaning stage consists of removing the support material from the printed part. The duration of this task depends on the type of material used to support the part. Indeed, there are two types of support material: soluble and insoluble. An insoluble support material is usually made of the same material used for the printed model.

As far as SLS & SLM technologies are concerned, the cleaning step consists of removing excess reusable powder for future production. Powder residues can stick on the component or can be found in holes or more complex internal channels within the model.

The post-processing stage is a challenging and time-consuming process. The duration of this process might be even longer when it is performed manually. However, with the advancement of technologies, specialists of this intimidating stage have developed automated solutions that enable AM operators to save time and costs during the AM process.

Post-processing has, therefore, become an integral part of the 3D printing process and the development of dedicated solutions make it more scalable than before.

TraXer

"Having a perfect 3D printed part is good, enabling workers to produce this part in a healthy environment is much better." **Bernd Hackemann**, CEO & Co-founder of TraXer.

3DWASH reflects the continued pursuit of safety in 3D Printing environments. Developed by TraXer, a specialist in 3D printing technology, 3DWASH is a special cleaning agent for the removal of all common alkali-soluble support materials.

Bernd Hackemann, CEO & Co-founder of TraXer

TRAXER 3D-Printing Technology

formnext Halle 12.1 - Stand F125
Frankfurt, 19. - 22.11.2019

3DWASH
EINE MARKE DER TRAXER GMBH

formnext Halle 12.1 - Stand F125
Frankfurt, 19. - 22.11.2019

"With a low PH value, our soluble support material has some special additive for polymers and protects the model structures of the print". The eco-friendly solution does not need any additional dilution or neutralization and is perfectly compatible with soluble polymers.

"For professional use, special soluble polymers are used as support material together with e.g. ABS or PC-ABS model materials. These soluble thermoplastics polymers are unique: although they are insoluble in water, they can be transformed from a solid to a dissolved state in an aqueous alkali solution. Dangerous or toxic organic solvents are not required. But to avoid high pH levels 3DWash has been developed."

AMPRO G2 : POWDER REMOVAL SYSTEM

The AMPRO G2 is a simple, fast and efficient solution for all parts and manufacturing plates up to 350×350 mm. This solution allows you to evacuate the powder from your parts in a safe way, avoiding any risk of contamination of the working environment.

The machine allows a 360° rotation along two axes allowing the powder majority to be removed by gravity. In parallel, it is also equipped with a manual hand nozzle to carry out a meticulous work and to evacuate the powder trapped in complex channels. The machine is controlled with a pedal and a glovebox systems.

The transparent machine housing allows a complete view of the part, simplifying the operator work.

During the cleaning process, the production chamber may be immersed in an inert atmosphere (Argon or Nitrogen) in order to treat any type of powder including reactive powders. The powder evacuated is stored in a recovery tank for a future utilisation after sieving.

RAPID POWDER REMOVAL SYSTEM

Machine size : 980 x 1570 x 1050 mm

360° rotation of part along 2 axes

3 gazes atmosphere (Ar, N2, Air)

Operator controlled

Slow rotation speed (<3 rpm) for an effective work

Contamination – free powder recovery

Solution for every kind of powder – Titanium alloys, Aluminium Alloys, Hx alloys, Stainless steel, …

Complete visibility of the machine thanks to a transparent machine housing

Suitable for a large size of build plate (EOS M280, M290 / Concept Laser M2 / SLM 280 / FSM 271M / BLT 320 / Trueprint 3000 / ≤350×350 mm)

AmPro Innovations
www.amprogroup.com.au

What About it ?

Fused Deposition Modeling

Method x

Qu3

Fused Deposition Modeling

Fused Deposition Modeling (FDM) is a 3D Printing process in which a physical component is directly fabricated from a computer-aided design (CAD) file using layer-by-layer deposition of a feedstock plastic filament material extruded through a nozzle.

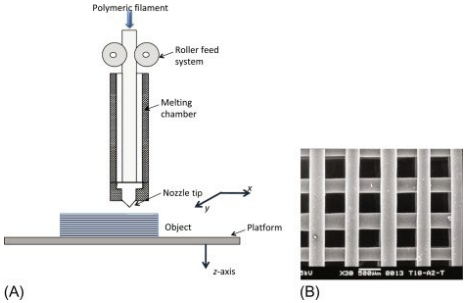
Fused Deposition Modeling (FDM)/ Fused Filament Fabrication (FFF) is one of the most widely used additive manufacturing processes. The technology is often leveraged for the manufacturing of prototypes and functional parts in engineering plastics. Due to their ability to produce complex geometrical shapes without tooling in office-environment, FDM 3D Printers are often the first choice of most users.

The easy-to-use process, its reliability and affordability have made the success of AM and have fostered the adoption of technology in industries, academia and among consumers. It is often the first choice of beginners in the 3D Printing industry. R&D institutions still leverage this technology for the development of new materials and processes.

The most widely used materials are thermoplastic polymers (e.g., PLA, ABS, polyurethane). They appear in the form of a pre-extruded filament.

In the process below, a coil of thermoplastic filament is first loaded into the system. Once the nozzle has reached the ideal temperature, the filament is fed to the extrusion head, then in the nozzle where it melts. The extrusion head is attached to a two-axis system that facilitates its move in x-y directions.

The melted material is extruded in thin strands and deposited layer-by-layer in preselected areas, as described in the STL file. Sometimes, the cooling of the filament on the platform is accelerated through the use of cooling fans attached on the extrusion head. When a layer is finished, the build platform moves down in z-direction, and a new layer is deposited. This process is repeated until the part is complete.



Fused deposition modeling: (A) scheme of the process; (B) example of PCL structure obtained by FDM, scale bar 500 µm (Zeina et al., 2002).

The FDM process was first developed and commercialized by Stratasys in 1992. Over the years, the development of the process allowed new companies into this segment.

MakerBot

MANUFACTURE COMPLEX & DURABLE ABS PARTS AT 1/4 THE COST OF AN INDUSTRIAL 3D PRINTER.

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A MANUFACTURING WORKSTATION.
Print Real ABS with a 100ºC Heated Chamber.

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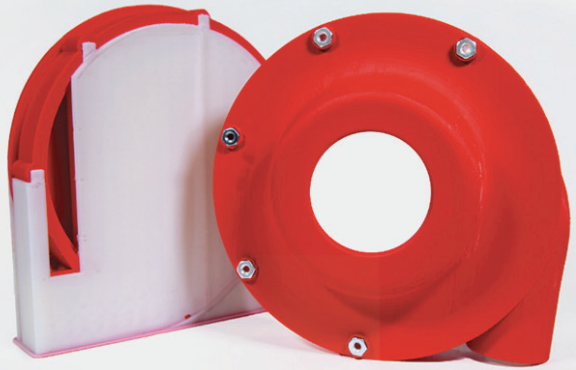

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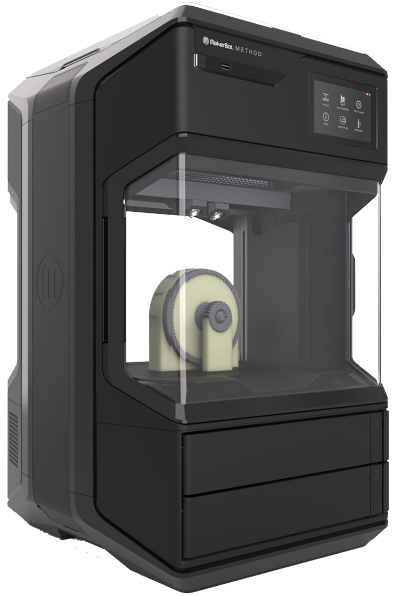


The MakerBot Method, the first performance 3D printer, bridges the gap between desktop and industrial 3D printers by bringing features that were previously only available on industrial 3D printers to professionals at a significantly lower cost. Method provides a breakthrough in 3D printing that enables design engineers to innovate faster than before. Method leverages 30 years of expertise in industrial FDM additive manufacturing from its parent company, Stratasys, and combines it with the accessibility and ease-of-use for which MakerBot is known.

Main technical specifications

The MakerBot Method 3D Printer features industrial-grade technology, such as a Circulating Heated Chamber, Dual Performance Extruders, Precision PVA Water Soluble Supports, Dry-Sealed Material Bays, and an Ultra-Rigid Metal Frame. The printer's industrial features tightly control the 3D printing process to deliver a high level of precision, reliability, and dimensional accuracy previously only achievable on industrial machines. The dual extrusion system found in Method, combined with water-soluble PVA provides a superior surface finish, and enables unlimited design freedom and unrestricted geometries.Method allows users to turn their CAD files to parts faster by providing a seamless and reliable workflow without tinkering, up to 2x faster print speeds that desktop 3D printers. Method offers out-of-the-box deployment and a hassle-free guided setup, making it easy to install and use. The printer also includes built-in sensors, automated maintenance procedures, and support to ensure a smooth and seamless user experience. All of these features come at an accessible price.

Method is the first performance 3D printer and bridges the gap between desktop and industrial solutions by bringing features that were previously only accessible on industrial level machines. Desktop 3D printers derive their DNA from hobbyist 3D printers and are insufficient for many applications in the professional segment. Industrial 3D printers offer significant benefits, such as larger build size, greater dimensional accuracy, advanced materials and repeatability. However, they often come at a price point that is inaccessible to smaller organizations. At MakerBot, we sought to bridge this gap and bring industrial quality results at an accessible and disruptive price point.

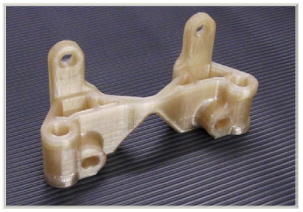
We believe that Method is the next step in helping organizations adopt 3D printing at a larger scale. Method provides a breakthrough in 3D printing that enables industrial designers and mechanical engineers to innovate faster and become more agile. It is built for professionals who need immediate access to a 3D printer that can deliver industrial performance to accelerate their design cycles. Method is developed to bring industrial technologies into an accessible platform, breaking the price-performance barrier and redefining rapid prototyping in the process.

Qu3

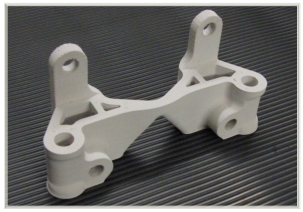
QUALUP SAS started this 3D Printing adventure by designing and developing the 3D printers' brand SpiderBot. The company's expertise in professional-grade 3D printers led to the development of industrial 3D Printing systems tailor-made for research and a wide range of industries.

Following the first launch at 3D Print Lyon 2019, QUALUP SAS is now making its official entry into the global Additive Manufacturing market at **Formnext 2019 – Hall 11.0, F34.**

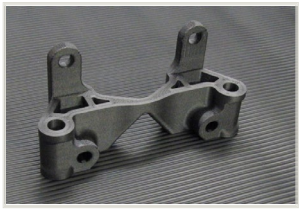
"We have been produced systems with heated chamber for 7 years. The «Qu3» is the result of 4 years of R&D in high temperature materials printing", said Philippe BOICHUT from the company. It is designed for applications that require high temperatures and high resistant materials: Aeronautic, Transport, Sport equipment.



PEKK printed part



PEKK CF10 printed part



PEI 9085 printed part

PEI 1010 printed part

Main Specifications of the Qu3

The advanced 3D printer integrates several exclusive features such as the ability to print large parts in a very high-temperature chamber. The system functions with liquid cooled heads, and integrates a 20" screen (zoom on nozzles) to monitor the printing process as well as head calibration workbench. Additional options include infrared camera (Flir sensor) and internet monitoring camera, a spool box heated up to 110°C and a Dyze design Pellet extruder.

Bed up to 250°C (or at chamber temperature)	Bed up to 250°C (or at chamber temperature)
AutoCalibration of the printer with 3D mapping of the Bed	Dual Head 500°C Liquid cooled (with escape of unused head).
300Mhz 32 bits motherboard with the latest CAN FD Bus (simplified wiring)	Adaptative Chamber up to 275°C (Fast heat: less than 15mn to heat up to 275°C)
Trinamic drivers including collision detection	Optimized ventilation
Compatible with materials PEI (1010 & 9085), PEEK, Metal, Glass Bed fixed by vacuum	

Availability & Commercialization

For now, the French company only operates on the European market. The 3D Printing system is already available for commercialization. However, given the limited production capacities, the current deadline for a new order is 5 months.

"Four 3D printers are in manufacturing and we are looking for investors for the creation of a production line.

We are a small team of passionate people, we are constantly looking to improve our products, better serve our customers and push the limits of the technology. We use the best CAD and digital simulation tools on a daily basis to simplify and reduce design times.

Our machines are manufactured in Burgundy by a network of subcontractors equipped with state-of-the-art machines and are assembled, wired, tested and controlled in our facilities", concludes BOICHUT.

www.spiderbot.eu

Ultimaker S3

This year has been a pivotal year for Ultimaker that has added two new products to its portfolio. The first one is the Ultimaker S3.

Paul Heiden
SVP Product Management at Ultimaker.

"Ultimaker S3 is the latest printer we've developed for our S line. The Ultimaker S3 was designed so that anyone could achieve high-quality results. It is an affordable entry to professional 3D printing, making the ROI of 3D printing easy and fast to achieve, allowing even more professionals to create exactly what they need, where they need it and when they need it.
The Ultimaker S3 has all of our S5 printer capabilities, but with a smaller footprint. It carries an award-winning touch interface, and predefined print settings that facilitate 3D printing as part of any workflow. Its advanced active levelling, stiffer build platform, heated build plate and more accurate stepper drivers result in the highest print quality for a machine this size. Also, dual filament flow sensors notify you if you run out of material by pausing the printer and prompting you to add more before resuming the printing process. Thanks to its smaller size, the Ultimaker S3 fits easily on any desktop. Its internal design allows both nozzles to reach the whole build plate, meaning that no space is wasted, thus offering an increased build-volume-to-size ratio. The Ultimaker S3 is compatible with almost any 2.85 mm filament allowing 3D printing with third-party materials as easily as Ultimaker filament. All of that is made possible by predefined print settings available on Ultimaker Marketplace, including carbon fibre reinforced composites for high-strength parts", explains Paul Heiden, SVP Product Management at Ultimaker.

Designed for smaller businesses to start disruptive 3D printing, the Ultimaker S3 offers the same general specs as the Ultimaker S5, but is more affordable, and with a smaller build volume.

The Ultimaker 3 and the Ultimaker S3 have a similar build volume, and both offer dual extrusion. However, the newest family member includes additional features such as:

- Composite printing that enables the user to achieve more and more demanding applications

- Filament flow sensor for a print that never runs out of material

- Advanced active levelling increases reliability by ensuring a near-to-perfect initial layer, and build plate adhesion

- Touchscreen: the Ultimaker S3 is easily set up, controlled, and maintained via its intuitive 4.7-inch color touchscreen

- Enclosed front: The glass door on the front enables a more controlled environment inside the printer, resulting in a higher print reliability.

The Ultimaker S3 is already available through the company's network of global partners.

"The biggest breakthrough we had was with material adoption. It might seem hard to believe now but a 6-month period to learn printing with a specific material wasn't exceptional at the time. Then we introduced the concept of print profiles, first for Ultimaker Materials and quickly widening this concept to a now prominent Ultimaker Material Alliance Program with virtually all material suppliers in the world. By making print profiles available on Ultimaker Cura's Marketplace, we've tremendously extended the application range of Ultimaker", concludes Paul Heiden, SVP Product Management at Ultimaker.

AM Solutions CATALOGUE 2019

The Ultimaker S5 Pro Bundle

Last year, the FDM 3D Printer Ultimaker S5 made a gigantic entry into the industrial 3D Printing market. This year, the system has been upgraded to the Ultimaker S5 Pro Bundle, which includes the Ultimaker S5 printer, the Ultimaker S5 Material Station and Ultimaker S5 Air Manager.

Paul Heiden
SVP Product Management at Ultimaker.

Ultimaker

"Disruptive 3D printing is more than just a 3D printer. Only a deeply integrated 3D printing platform will deliver the biggest and fastest ROI. Only a seamless product portfolio that works hassle-free will really boost production efficiency and deploy 3D printing as a serious alternative manufacturing method. Ultimaker's Integrated platform solution supported by solid infrastructure results in a dominant market position. Ultimaker's competitive advantage is our 360-degree platform solution consisting of hardware, software, materials and our global sales and support infrastructure. Deep knowledge of materials, strong alliances with leading material companies combined to Ultimaker Cura allow us to assert that almost any industrial filament is compatible with our Ultimaker printers, ensuring unrivaled levels of quality and reliability that meet the need of a demanding customer base in all industries", **Paul Heiden,** SVP Product Management at Ultimaker.

Dealing with the Ultimaker S5 Air Manager, compared to third-party covers, Ultimaker provides a solution for which the ultrafine particle filtering has been thoroughly tested and approved. Many competitors communicate on what they filter without displaying any evidence of it. Another advantage of the Air Manager is the software integration that allows optimized airflow per material. This not only leads to efficient filtering, but also ensures the print quality is not affected.

The Ultimaker S5 Air Manager leads to a better controlled environment inside the printer and filters out up to 95 percent of all ultrafine particles created while printing, creating a safe barrier around the build chamber.

The Ultimaker S5 Material Station allows you to load Ultimaker spools in any bay. It can hold 6 spools and together with the Ultimaker Material Alliance Program, it allows users to make endless material combinations. Main features include uninterrupted printing, humidity control easy setup and monitoring as well as composite materials ready to print.

The Ultimaker S5 Pro Bundle is already available through the company's network of global partners. The main target remains the same: Professional/Enterprise Market. The company also aims to target universities/research institutions with solutions that allow university teachers and students for printing functional prototypes, customized tools and final parts that require customization, repeatability, full geometrical freedom capabilities and an open yet reliable hardware, software and material platform.

PartPro300 xT

The PartPro300 xT is the most advanced FDM printer in the brand portfolio. The heated chamber ensures a constant temperature, offering excellent performance for complex geometrics and advanced materials. It can print with multiple material types including ABS, PLA, Tough PLA, PETG, Water-soluble BVOH, Carbon Fibre and Metallic PLA. Its dual extrusion module allows the use of two different colours or materials to create more diverse product designs and strengthens the physical 3D models by combining two materials in one single print.

XYZ PRINTING

Published by 3D ADEPT MEDIA

Fused Filament Fabrication (FFF)

Printing Properties

Technology	Fused Filament Fabrication (FFF)
Max. Build Area (WxDxH)	Dual: (195 x 270 x 300 mm) Single: (295 x 300 x 300 mm)
Layer Resolution	0.4mm single nozzle: 50-400 micron 0.4mm dual nozzle: 200-400 micron 0.8mm nozzle: 400-700 micron
XY Positioning Precision	12.5 micron
Printing Software	XYZmaker Suite
Supported File Formats	.stl, .obj, .ply ,.3cp,.nkg, .igs, .stp, .3w, .3mf

Material

Material Compatibility	ABS / PLA / Water-soluble BVOH / PETG / *XYZ Carbon Fiber/ *Metallic PLA (*Need to use with Harden Steel Nozzle)
Support 3rd Party Material	No
Filament Diameter	1.75 mm

For more information visit us at formnext
Booth C11 , Hall 12.1

Contact us: www.pro.xyzprinting.com / Email: Info_Pro@xyzprinting.com

Silicone 3D printing

German RepRap

The **L320** 3D printer from the Liquid Additive Manufacturing (LAM) series by German RepRap is a real „Game Changer". For the first time it is possible to 3D print with injection moulding silicone

German RepRap prides itself on being part of the companies that pave the way to the world of Silicone 3D Printing. The L320 3D printer is the first available Silicone 3D Printer from the Liquid Additive Manufacturing (LAM) series.

"With the Liquid Additive Manufacturing (LAM) 3D printer from German RepRap, a true „Game Changer" enters the market. For the first time it is possible use liquid material such as liquid silicone rubber (LSR) for additive manufacturing. The same material is already used for many products and different applications. This brings new possibilities in terms of shapes and geometries, which are not processable with other traditional manufacturing methods. Bionic shapes or other complex objects can be manufactured, in quantities of 1 as well as in mass production - with almost identical and sometimes even better properties compared to injection molding. The build platform of the L320 is suitable for the printing of small and large objects, as well as for small series", **Lena Wietfeld** Head of Marketing.

Compatible with the liquid silicone rubber (LSR), this material is a real silicone that does not contain any acrylic hardener, does not become UV-crosslinked and is almost identical to injection molding in all properties.

Main technical specifications

Print Technology	LAM (Liquid Additive Manufacturing)
Max. Build Area (WxDxH)	250 x 320 x 150 mm
Print speed	10 - 150 mm/s
Travel speed	10 - 300 mm/s
Position accuracy	+/- 0,2 mm
Layer height (min.)	0,22 - 0,9 mm
Material	SILASTIC™ 3D 3335 Liquid Silicone Rubber (LSR)
Nozzle options	0,23 | 0,4 | 0,8 mm
Extruder	Lift and sunk system, volumetric extrusion
Software	Simplify3D Software

"Our LAM technology (...) is a very interesting 3D printing process, because it works with a material that is not - as with the FFF printer - melted and solidified again, but is liquid, and vulcanized under heat exposure. One speaks also of a thermal full network. This means that the individual layers that the printer deposits firmly connect to each other. In this way, it is possible to produce components that have almost the same properties as injection-molded parts – a clear advantage because insights from the 3D-printed prototype can be transferred directly to injection-molded serial parts. In addition, this is also very interesting for the development of new customer groups, since the process, even without an investment in tools or moulds, makes lot sizes of n = 1 possible or economical."

Major sectors that might need Silicone 3D printing include the construction, medical, automotive electrical & electronics industries.

Lena Wietfeld Head of Marketing

German RepRap

www.germanreprap.com

What About it ?

Resin 3D Printing

Asiga PRO 4K

Carbon M2

Stereolithography

Stereolithography is among the first rapid prototyping technologies. The AM technique leverages a layer by layer structure fabrication. In this process, a laser beam targets a free surface of a photosensitive liquid to enable polymerization of the liquid on that area and transform it into a polymerized solid.

Two processes are crucial to enable the production of an object via SLA: curing and recoating. As far as curing is concerned, it should be noted that SLA harnesses UV-assisted photopolymerization of liquid monomers. A UV laser is scanned over a layer of the liquid monomer to cure the monomer in selected surfaces as determined by the tool paths. Once a layer is complete, another layer of resin is coated on top of the cured layer. This technique is called recoating. Both recoating and curing processes are repeated until the end of the manufacturing.

3D Systems developed this AM process in 1988 based on the work of Charles Hull. Over time, other companies have developed the technology further and expand the utilization of SLA-based 3D printers. SLA delivers components with high accuracy and a wide range of materials compatible with this process are becoming available.

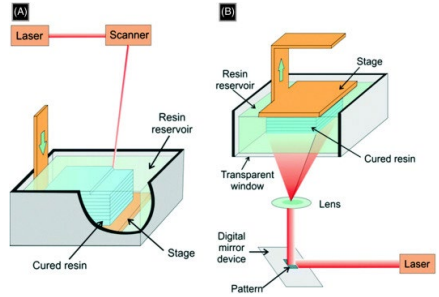


Fig. shows two different types of SLA process, which is commercially available now.

Two types of stereolithography techniques for rapid prototoyping of ceramics.

(A) Top-down system with scanning laser on top, (B) bottom-up systems with digital light projection.

A) A top-down system with scanning laser on top

Top-down SLA systems use low-power, highly focused UV laser beam to scan successive cross-sections of a 3D Printed part in a vat of liquid photosensitive polymer.

As the laser traces the layer, the polymer solidifies, and the excess areas are left as a liquid.

«After the platform sank down for the next layer, a blade is moved across the surface to smooth it before scanning. The platform is lowered by a distance equal to the layer thickness (25 to 50 µm), and a subsequent layer is formed on top of the previously completed layers. This process continues until it completes the buildup. The part is drained above the vat. The excess polymer is swabbed or washed away from the surfaces.»

(Additive Manufacturing: Materials, Processes, Quantifications and Applications. By Jing Zhang, Yeon-Gil Jung)

In most cases, the operator achieves a final cure while placing the part in a UV oven. At the end, supports are removed from the object and surfaces are polished, sanded, or otherwise finished.

B) A Bottom-up system with digital light projection (DLP)

Bottom-up systems have become trendy for several applications.

A light source (an LED lamp) combined with a deformable mirror device (DMD) presents an entire layer of photopolymer. An SLA-based system displays the photopolymer from below through a transparent window, therefore facilitates the part removal from the vat. By integrating new features in SLA 3D Printers, manufacturers have been able to improve the speed of the process —without any need at all to stop the operations between layers for recoating.

In addition to avoiding the use of expensive lasers, SLA delivers a wide range of benefits:

• It does not require a large vat of photopolymer which means that the material can be provided as it is used. Researches show that, «a large vat of photopolymer as in conventional stereolithography can cost thousands of dollars and the unused material is subject to contamination and degradation.»

• It delivers excellent resolution and fast operation.

Kings 3D printers has its advantages not only in producing high-precision, small complex parts efficiently, but also in printing large objects with its large-size 3D printers. Kings has invested a lot in R&D of printing materials specialized for automotive industry. With a printing size of 1700x800x500mm, the KINGS 1700 was customized for large size prototypes, such as automobiles. The dual lasers save half the printing time compared to ordinary printers.

Alex Mayer
Sales

Kings has developed its own printing materials to meet the needs of different industies while keeping the best price - performance ratio in the market.

As an exclusive partner, Omnitec GmbH takes over the entire sales and service for the German market.

Description	Technical Specifications
KINGS SLA 3d Printer is an additive manufacturing Machine that works by focusing ultraviolet laser onto a vat of Photopolymer resin. The Resin is photo-chemically solidified and a single layer of desired 3D object is formed. This process will be repeated for each layer until the model is completed. The advantages of SLA 3D printing lie in higher accuracy rate, faster speed and better surface smoothness (compared to CNC and FDM).	• Nd: YV04 Solid Laser • 355nm Wave Length • Minimum Power to Liquid ≥ 300mW • Layer thickness with normal construction: 0.1mm • Layer thickness with fast construction: 0.15mm • Layer Thickness with exact structure: 0.05mm • Scanner: Galvanometer-Scanner • Power Supply: 230V - max. 2kW

Contact details:

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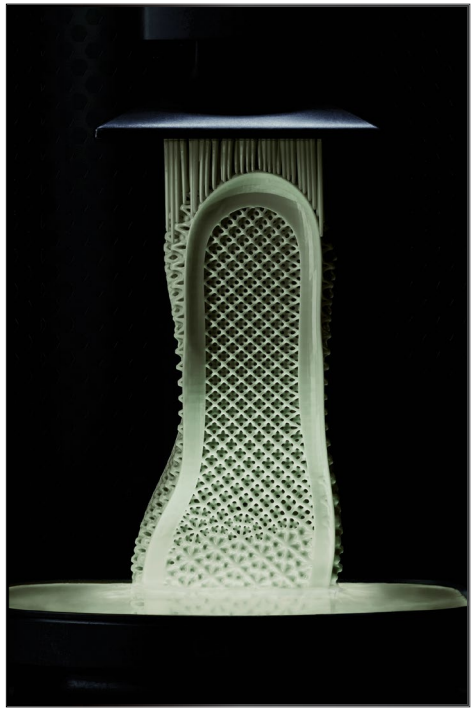
info@myomnitec.de
www.myomnitec.de

formnext
discover3Dprinting
Hall: 11.0
Stand: A19

Carbon M2



The M2 printer

The M2 enables product designers and engineers to design on the same means of production, which eliminates the prototyping and tooling stages of the product design and production process, and also allows for digital manufacturing at scale.

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www.carbon3d.com

Main technical specifications

Build volume of 7.4" x 4.6" x 12.8" (189mm x 118mm x326mm)
Manufacturing-ready features include: o Locked printing parameters for validated production runs, encrypted models, and fleet management o Parts can be serialized to ensure part production quality and traceability throughout a part's lifecycle, supporting robust post-market surveillance for tightly regulated markets such as medical products o Coming soon are dashboards for monitoring / optimizing operational efficiency and multi- role user interface enables "operators" and "engineers"
Production extensibility: o Compatible with a robotic interface to enable automated part removal after it's done printing o Includes three "Carbon Connector" data and power expansion ports for expansion of production capabilities, which are to be determined, but could include automated resin dispensing, temperature-controlled resin cassettes, and several other additional future production operations.

"Carbon's mission is to reinvent how polymer products are designed, engineered, manufactured, and delivered, toward a digital and sustainable future. The company uniquely combines innovations in software, hardware (the M2 printer) and materials to deliver industry-leading digital manufacturing solutions.

With Carbon's ground-breaking, proprietary Digital Light Synthesis™ technology, broad family of programmable liquid resins, and M2 printers, manufacturers can unlock new business opportunities such as mass customization, on-demand inventory, and previously impossible product designs.

Phil DeSimone
Carbon's VP of Business Development

Carbon's success is tied directly to the success of its customers through the subscription-pricing model. The subscription model helps future-proof customers from the obsolescence of traditional capital equipment purchases and enables them to reap the many benefits of Carbon's technology without having to outright purchase expensive machines. With a Carbon subscription, each printer of a customer is paired with industry-leading setup and service, compatibility with all of Carbon's innovative materials, continual over-the-air software updates, ongoing training and education, and one-to-one customer support."

SystemX 601

Affordable Industrial SLA 3D Printer

With its 300-watt laser source, the SystemX-601 3D SLA printer is a solid machine for printing detailed parts with high precision. Fast and easy to use, it is equipped with software and hardware technologies to guarantee the best repeatability and productivity.

Main technical specifications

Print Technology	SLA
Max. Build Area (WxDxH)	600 x 600 x 400 mm
Exposure Technology	Overhead type LCD
Laser Source	Triple Frequency solid laser Nd:YVO4
Wave Length	355 µm
Scanning Speed	6 to 10 m/s
Beam Diameter	0,12 up-to 0,8 mm
XY Precision	±0,1 mm on 100 mm
Z Precision	±18 µm
File Format	STL - SLC

MAIN BENEFITS

HIGH PRODUCTION SLA 3D PRINTER

The SLA 3D printers SystemX are built to run 24/7. With their strong steel and marble structure, they're loaded with advanced SLA technology to deliver small & large-scale high-quality parts.

RESIN SAVER : With SLA machines, resin tanks must be full before starting to 3D print. The SystemX machines come with a feature that requires only few liters of resins to print, and still being able to print large parts.

PRODUCTIVITY : With its fast scanning speed and its adjustable beam spot diameter, the SystemX machines can achieve complex and intense production in a short amount of time.

3RD PARTY RESINS : The SystemX machine print resistant and detailed 3D models with its wide range of resins. As an open-source technology, it can also print with 355 Nm third-party resins.

OTHER BENEFITS : The SystemX machines print very precise parts, in a large range of materials, offering a wide range of opportunities. Bonus: they can be monitored with a mobile-app.

SystemX 600

For more information contact us :
+33 7 81 10 93 36
contact@x3d-systems.com
www.x3d-systems.com

PartPro150 xP

With a build area up to 150 × 150 x 200 mm and the X/Y resolution at 130 microns, the PartPro150 xP is ideal for producing small to medium sized parts which require smooth surface finishes. The enlarged build area is ideal for more applications. Also, thanks to the reliable mechanism, the PartPro150 xP provides long-life tank and auto calibration.

XYZ PRINTING

For more information visit us at formnext Booth C11 , Hall 12.1

PartPro100 xP

The PartPro100 xP is a high-resolution DLP printer for those small parts where accuracy and details are critical. It uses professional grade plastic resin and features the tough surface quality that is perfect for prototyping small parts. It is the most affordable high-resolution 3D printer based on DLP technology.

Print Technology	DLP Technology
Max. Build Area (WxDxH)	64 x 40 x 120 mm
Layer Resolution	25 / 50 / 100 microns
X-Y Resolution	50 microns
Light Source	UV LED λ 405nm
Printing Software	XYZware VPD
Supported File Formats	.stl / .3ws / .3wn)

MultiCure180

Both the Eeezcure180 and MultiCure180 are designed to optimise the mechanical properties of resin-printed models, improving the strength and performance of printed parts. The LEDs embedded in to the MultiCure180 have a wider range of UV wavelengths meaning that it is able to cure a wider range of resin materials with increased efficiency.

UV Curing

Wavelength	UV LED λ 355~425nm
Max. Curing Size (Ø x H)	180 x 200 mm
Cure Time	1 – 60 minutes (Timer included)
Turntable Payload	1.5 kg
Material Compatibility	Photopolymer Resin

Contact us: www.pro.xyzprinting.com / Email: Info_Pro@xyzprinting.com

ASIGA PRO 4K

The Asiga PRO 4K is the world's most advanced lab 3D printer offering exceptional productivity in a small footprint.

Featuring flexible precision, the PRO 4K is Asiga's highest resolution production system with available X&Y resolutions of 65 or 80 microns.

The PRO line integrates the cutting-edge Smart Positioning System to create parts with incredible precision.

The Asiga PRO 4K is optimized for a variety of precision uses in dental and audiology lab production, engineering prototyping, and other small part manufacturing where precision is essential.

For more information
Visit us at formnext
Booth 12.1 - G09

ASIGA

Product specification	PRO 4K65	PRO 4K80
Build Volume X, Y, Z	176 × 99 × 200mm	217 × 122 × 200mm
Pixel Resolution	65µm	80µm
LED Wavelength	385nm (high power UV LED) or 405nm	385nm (high power UV LED) or 405nm
Material Compatibility	Asiga materials, 100% Open Material System — use any suitable third party material	
Software	Asiga Composer software. Lifetime updates included	
File Inputs	STL, SLC, PLY, STM (Asiga Stomp file format)	
Network Compatibility	Wifi, Wireless Direct, Ethernet	

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Edited by
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AM Solutions CATALOGUE 2019

2019

ADDITIVE MANUFACTURING EVENTS IN 2020

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TCT Japan - January 29-31st - JAPAN
3D Medical Printing Conference & EXPO - February 04-05th - The Netherlands
Prototyping 2020 + Machineering Network event. - February 05-06th - BELGIUM
Additive Manufacturing for Aerospace & Space (TBC*) - February 25-27th - UK
Japan largest 2nd Additive Manufacturing Expo- February 26-28th - JAPAN
JEC World (TBC*) - March 03-05th - FRANCE
RapidPro 2020 - 4-5 March - Veldhoven, The Netherlands
APS MEETINGS - 10-11 March- Lyon , France
Metav 2020 - March 10-13th - GERMANY
Additive Manufacturing Forum - 11-12 March 2020-Berlin, Germany
GLOBAL INDUSTRIE- 31 March - 03 April 2020 - Lyon, France
Manufacturing World Nagoya - April 15th -17th - JAPAN
3D Printing Value Chain Event - April 21-22 - The Netherlands
3D PRINTING EUROPE- 13 -14 April 2020 - Berlin, Germany
Hannover Messe - April 20-24, 2020- Hannovre, Germany
Rapid Tech- May 5-7, 2020 -Erfurt, Germany
Spar3DExpo - 21 - 23 May - Anaheim, Los Angeles - USA
Advances in 3D Printing & Modelling - May 2020 - Amsterdam, The Netherlands
Advanced Engineering May 2020 - Ghent, Belgium
3D PRINT Exhibition 2020 / 16 - 18 June - Lyon, France
ROSMOULD 2020 -8-10 June - Moscou, Russia
Experience AM - September 22-24, 2020 - Messe Augsburg, Germany
TCT Show 2020 - September 29 – October 1st , Birmingham, UK
Euro PM2020 Congress & Exhibition - 4- 8 October - Bilbao, Spain
Metal Madrid 2020 - November - Madrid, Spain
FORMNEXT 2020 - November - Frankfurt, Germany
Metal Additive Manufacturing Conference - Vienna

3D ADEPT MEDIA

3D Adept is a Communication Company dedicated to the 3D printing industry. Our Media provide the latest trends and analysis in the 3D printing industry in English & French. 3D Adept Media includes an online media and a bimonthly magazine, 3D Adept Mag. All issues of 3D Adept Mag are available to download free of charge.

Our mission is to help any company develop its services and activities in the 3D printing industry.

3D Adept Mag

All about additive Manufacturing

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