

Versatile Selective Laser Melting

High Power Laser in a Compact Footprint
for Flexible Manufacturing



SLM[®] 125

Selective Laser Melting Machine

Adaptable and robust for a wide range of users

Highest power in its class
with a 400W laser

Material Development Module
to edit over 200 process parameters

Top quality features of larger SLM® machines
in a compact footprint

The highest, safest performance available in its class at a low investment

Offering a larger build plate and higher-powered laser than other similar-sized machines, the SLM®125 is a flexible manufacturing system to fit users' specific needs. Metal additive manufacturing beginners can develop processes that scale to larger SLM® systems, research institutes benefit from a material development toolkit and production facilities can run prototype, small series and qualified production components. All selective laser melting powders, including reactive materials, can be processed on the SLM®125.

Open system architecture puts selective laser melting users in control

All machines from SLM Solutions allow the use of materials from any supplier. This gives users the freedom to source qualified metal powder from SLM Solutions' powder division or from their own supplier, as well as the flexibility to develop new alloys. The integrated SLM® Build Processor and open software architecture offer the choice of running standard parameters supplied by SLM Solutions or to customize and optimize parameters to meet their production needs and gain a competitive advantage.

Small Machine, Big Results

SLM[®] 125

Selective Laser Melting Machine

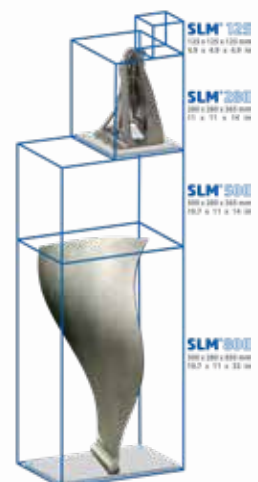


Technical Specifications

Build Envelope (L x W x H)	125 x 125 x 125 mm reduced by substrate plate thickness
Build Volume Reduction (L x W x H)	50 x 50 x 50 mm reduced by substrate plate thickness
3D Optics Configuration	Single (1x 400 W) IPG fiber laser
Real Build Rate	up to 25 cm ³ /h
Variable Layer Thickness	20 µm - 75 µm, more available on request
Minimum Feature Size	140 µm
Beam Focus Diameter	70 µm - 100 µm
Maximum Scan Speed	10 m/s
Average Inert Gas Consumption in Process	0.6 l/min (Argon)
Average Inert Gas Consumption in Purging	70 l/min (Argon)
E-Connection / Power Input	400 Volt 3NPE, 32 A, 50/60 Hz, 3 kW
Compressed Air Requirement	ISO 8573-1:2010 [1:4:1] 7 bar
Machine Dimensions (L x W x H)	1400 mm x 900 mm x 2460 mm

*depending on material and build part geometry

Build Chamber Sizes



1 Compact, Powerful Machine for Metal Part Production

The SLM®125 build envelope is up to 160% larger than other machines in its class and is designed for cost-efficient process development and small to medium manufacturing of high-quality, fully dense metal parts.

The smallest machine in the SLM Solutions' lineup, the SLM®125 includes many of the top-quality features of our larger platforms in a compact footprint. The substrate plate can pre-heat to up to 200°C and the standard 400W fiber laser is the highest power offered on small machines to replicate production settings with up to 80% less metal powder than other systems. The machine utilizes an optimized gas filtration process with an adjustable gas flow that allows for optimal process properties and minimized gas consumption.

2 Efficient, Methodical Parameter Development Software

The material development module is an easy, intuitive software tool for a systematic analysis of parameter variation. Users gain the power of developing in-house material know-how and utilizing custom process settings. Automated parameter alignment through rule definition and the replication and positioning of parts on the build plate create time savings in alloy development and parameter optimization.

3 High-Quality Metal Powders and Reliable Powder Management Process

Stainless steel, cobalt-chrome, nickel alloys, aluminum and titanium, to name a few, can all be processed in top quality on all SLM Solutions selective laser melting systems. Both reactive and non-reactive metals can be processed in the standard SLM®125 configuration.

Thanks to the machine's compact design with a reduced number of powder-transporting components, materials can be changed quickly and easily. The Powder Sieving Machine (PSM) is a perfect complement to the SLM®125. During the sieving process, rough or oversized particles are sorted out and separated from the process-ready materials under inert atmosphere conditions. The reusable metal powder, defined by grain size, is transported to a storage container for direct loading into the gravity powder feed on the machine.

4 Customer-Oriented System for Additive Manufacturing Success

The SLM®125 can be adapted to customers' requirements and allows the user to scale their selective laser melting strategy. A variety of components and options make the SLM®125 an optimal system for all users, from research institutes working on new materials and process development to first-time users looking to gain best-in-class metal AM experience, as well as prototype manufacturers or, of course, those running qualified series production processes.



Quality Assurance of the Selective Laser Melting Process

Comprehensive monitoring and quality assurance enable a high degree of process documentation and verification. Chamber temperature, oxygen, gas flow and other variables are constantly monitored and logged. This level of process control results in consistent, high quality builds.

Layer Control System (LCS)

To ensure repeatable and reliable build quality, the LCS continuously checks the accuracy of each layer by monitoring the powder bed and detecting possible coating irregularities.

Melt Pool Monitoring (MPM)

Melt Pool Monitoring (MPM) is an available on-axis tool for visualizing the melt pool in the SLM® process. Data from MPM can be used as a resource for efficiently developing and evaluating the process parameters. In the production of safety-critical parts, the data collected serves as documentation for quality assurance.

Laser Power Monitoring (LPM)

Laser Power Monitoring (LPM) is an available on-axis monitoring system that continuously measures and documents target and actual emitted laser output throughout the production process.

Innovation Comes Standard

SLM Solutions is known as the innovation leader in selective laser melting, being the first to introduce both twin- and quad-laser production systems. Features such as bi-directional powder recoating to reduce manufacturing time, open powder architecture allowing use material from any supplier and full process parameter access for custom development come standard on every selective laser melting machine.

Qualified Material Solutions

SLM Solutions offers expert know-how that drives unique specifications to assure mechanical properties through the combination of machine, parameters and powder audited for composition, quality and flowability. Our material experts are always collaborating with customers to develop and source new alloys optimized for selective laser melting.

Consultative Development and Expert Knowledge-Sharing

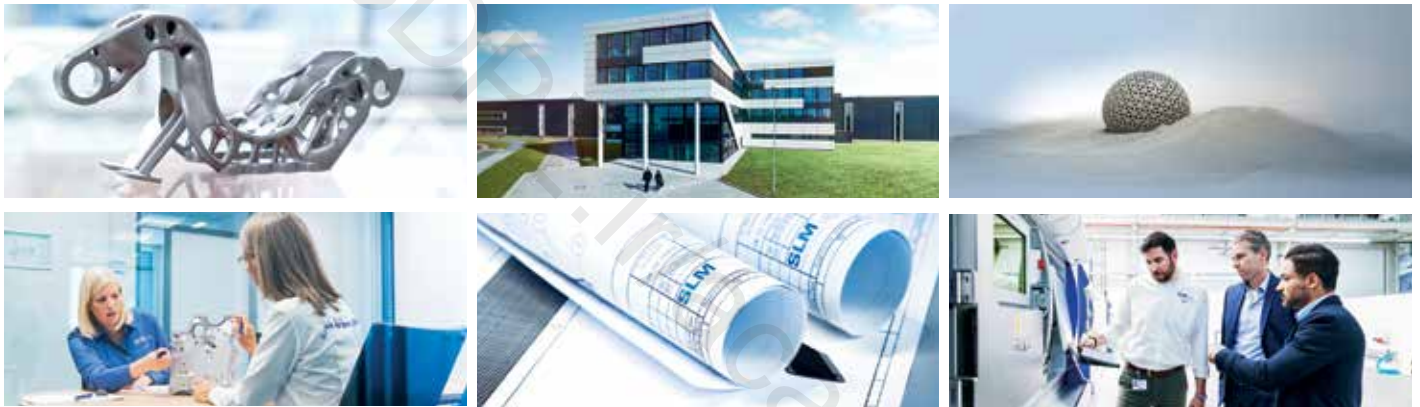
SLM Solutions' consulting, applications, training and service teams put customer success first to ensure their return on investment is maximized. Our experts work with customers every step of their additive journey, from application identification and development to full serial production ramp-up.



SLM Solutions - Technology Pioneers, Innovation Leaders

SLM Solutions helped invent the laser powder bed fusion process, was the first to offer multi-laser systems and all selective laser melting machines offer patented quality, safety and productivity features. Taking a vested interest in customers' long-term success in metal additive manufacturing, SLM Solutions' experts work with customers at each stage of the process to provide support and knowledge-sharing that elevate use of the technology and ensure customers' return on investment is maximized. Optimal paired with SLM Solutions' software, powder and quality assurance products, the SLM® technology opens new geometric freedoms that can enable lightweight construction, integrate internal cooling channels or decrease time to market.

A publicly traded company, SLM Solutions Group AG focuses exclusively on metal additive manufacturing and is headquartered in Germany with offices in China, France, India, Italy, Russia, Singapore and the United States and a network of global sales partners.



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Production Ready Selective Laser Melting

Optimized for Faster Multi-Laser, Cost-Efficient
Builds for High Volume Projects



SLM[®] 500

Selective Laser Melting Machine

Metal Additive Manufacturing Industrialization

Quad-laser productivity

from the multi-laser technology pioneer

Operational cost efficiency

with automated features

Safe powder handling

keeping material in an inert atmosphere

The highest, safest performance available in its class with cost reduction

The SLM[®]500 is built to ensure operator safety and lower overall operational costs. Material and operator are separated through a closed-loop powder handling strategy that includes an automated powder sieve and supply. Machine downtime is minimized through exchangeable build cylinders to maximize productivity and reduce cost per part. As the first quad-laser metal system on the market, the SLM[®]500 serves as the flagship machine for high volume metal additive manufacturing.

Patented multi-laser overlap strategy for consistent material quality

As the innovation leader in the selective laser melting field, SLM Solutions focuses on both productivity increases and material characteristics. SLM[®] patents include a scan strategy to minimize soot interference with lasers and a laser overlap strategy for efficient processing. Testing proves comparable density and mechanical property results in overlap and single-laser scan areas. The exact laser overlap is altered layer by layer to avoid a visible seam or mechanical weak point in the finished component.

Efficient, Reliable, Repeatable

SLM[®] 500

Selective Laser Melting Machine

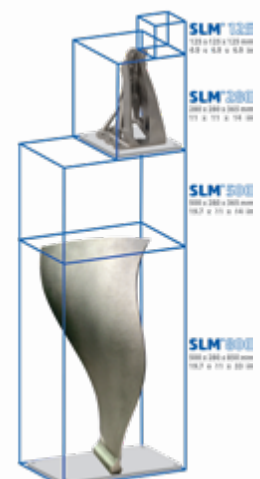


Technical Specifications

Build Envelope (L x W x H)	500 x 280 x 365 mm reduced by substrate plate thickness
3D Optics Configuration	Twin (2x 400W or 2x 700W) Quad (4x 400W or 4x 700W) IPG fiber laser
Real Build Rate	up to 171 cm ³ /h*
Variable Layer Thickness	20 µm - 90 µm, more available on request
Minimum Feature Size	150 µm
Beam Focus Diameter	80 - 115 µm
Maximum Scan Speed	10 m/s
Average Inert Gas Consumption in Process	16 l/min (Argon)
Average Inert Gas Consumption in Purging	250 l/min (Argon)
E-Connection / Power Input	400 Volt 3NPE, 63 A, 50/60 Hz, 8 - 10 kW
Compressed Air Requirement	ISO 8573-1:2010 [1:4:1] 7 bar
Machine Dimensions (L x W x H)	6080 x 2530 x 2620 mm

*depending on material and build part geometry

Build Chamber Sizes



1 SLM®500 Selective Laser Melting for Serial Production Solutions

The SLM®500 is optimized for top-quality components with a focus on both repeatability and machine uptime. Optimized gas flow through a patented sintered wall prevents soot disruption of the lasers to ensure consistent quality results.

Increased productivity is crucial for production-oriented machines, and the SLM®500 is available with two or four lasers operating independently or in parallel. With 400W and 700W lasers available, users have the choice of laser power matched to their material, with the option of increased power to build in thicker layers for further productivity gains.

2 Permanent Filter Module Improves Machine Uptime and Reduces Costs

The permanent filter module traps process soot in a sintered plate filter that is purged with gas. The waste material is coated with an inhibitor and stored in a bin for dry disposal, while clean gas returns to the process chamber, stabilizing gas flow to ensure part quality throughout long builds without interruption.

The elimination of consumable filter cartridges increases safety while improving machine uptime and reducing costs. Operators no longer need to flood filters and waste management is simplified as controlled diffusion renders a standard dry material for disposal.

3 PSV Closed-Loop Powder Handling Increases Safety and Material Quality

Paired with the Powder Supply Vacuum (PSV), the SLM®500 protects the operator from exposed powder and keeps material under an inert gas atmosphere throughout the powder-handling process.

The PSV features a 90l tank for pre-loading and storage of metal powder. The automatic system sieves material before transportation to the machine for the build process, collects overflow powder to be returned to the sieve during the build, and also connects to the PRS unpacking station for powder removal after completion of a build.

4 Part Removal Station for Efficient Unpacking and Downtime Reduction

The Part Removal Station (PRS) reduces machine downtime by allowing one completed job to be unpacked while the next can begin on the machine. Build cylinders with completed jobs are transported out of the SLM®500 for cooling and powder removal in an inert atmosphere.

Integrated gloves offer full access to remove material without exposing operators to metal powder. A vacuum hose, located directly in the PRS chamber, feeds unused powder directly back to the PSV for sieving and use in the next production build.



Quality Assurance of the Selective Laser Melting Process

Comprehensive monitoring and quality assurance enable a high degree of process documentation and verification. Chamber temperature, oxygen, gas flow and other variables are constantly monitored and logged. This level of process control results in consistent, high quality builds.

Layer Control System (LCS)

Layer Control System (LCS) is a testing and documentation system that examines the performance of each powder layer by monitoring the powder bed and detecting possible coating irregularities.

Melt Pool Monitoring (MPM)

Melt Pool Monitoring (MPM) is an available on-axis tool for visualizing the melt pool in the SLM® process. Data from MPM can be used as a resource for efficiently developing and evaluating the process parameters. In the production of safety-critical parts, the data collected serves as documentation for quality assurance.

Laser Power Monitoring (LPM)

Laser Power Monitoring (LPM) is an available on-axis monitoring system that continuously measures and documents target and actual emitted laser output throughout the production process.

Innovation Comes Standard

SLM Solutions is known as the innovation leader in selective laser melting, being the first to introduce both twin- and quad-laser production systems. Features such as bi-directional powder recoating to reduce manufacturing time, open powder architecture allowing use material from any supplier and full process parameter access for custom development come standard on every selective laser melting machine.

Qualified Material Solutions

SLM Solutions offers expert know-how that drives unique specifications to assure mechanical properties through the combination of machine, parameters and powder audited for composition, quality and flowability. Our material experts are always collaborating with customers to develop and source new alloys optimized for selective laser melting.

Consultative Development and Expert Knowledge-Sharing

SLM Solutions' consulting, applications, training and service teams put customer success first to ensure their return on investment is maximized. Our experts works with customers every step of their additive journey, from application identification and development to factory layout and full serial production ramp-up.



SLM Solutions - Technology Pioneers, Innovation Leaders

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Large Format Selective Laser Melting

Fully Automated Series Production with
a Scalable Multi-Machine Setup



SLM[®] 800

Selective Laser Melting Machine

New Possibilities for Large Production Parts



Build parts 850mm tall
with extended z-axis height

Quad-laser efficiency
from the multi-laser pioneer

Multi-machine setup
for production environments

Selective laser melting with an expanded build envelope and integrated automation

Offering the tallest powder bed fusion chamber on the market, the SLM®800 efficiently builds large components and opens new production possibilities. All SLM Solutions' patented innovations have been scaled up and partnered with features such as a metal recoating brush, permanent filter module and centralized powder supply to enable successful large builds. The SLM®HUB and optional Build Cylinder Magazine create an automated, multi-machine production manufacturing cell.

Patented multi-laser overlap strategy for consistent material quality

As the innovation leader in the selective laser melting field, SLM Solutions focuses on both productivity increases and material characteristics. SLM® patents include a scan strategy to minimize soot interference with lasers and a laser overlap strategy for efficient processing. Testing proves comparable density and mechanical property results in overlap and single-laser scan areas. The exact laser overlap is altered layer by layer to avoid a visible seam or mechanical weak point in the finished component.

Modular, Automated Production

SLM[®] 800

Selective Laser Melting Machine

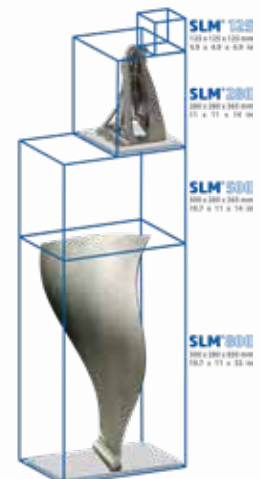


Technical Specifications

Build Envelope (L x W x H)	500 x 280 x 875 mm reduced by substrate plate thickness
3D Optics Configuration	Quad (4x 400W or 4x 700W) IPG fiber laser
Real Build Rate	up to 171 cm ³ /h*
Variable Layer Thickness	20 µm - 90 µm, more available on request
Minimum Feature Size	150 µm
Beam Focus Diameter	80 - 115 µm
Maximum Scan Speed	10 m/s
Average Inert Gas Consumption in Process	Dependent on machine setup
Average Inert Gas Consumption in Purging	Dependent on machine setup
E-Connection / Power Input	400 Volt 3NPE, 63 A, 50/60 Hz, 8-10 kW
Compressed Air Requirement	ISO 8573-1:2010 [1:4:1] 7 bar
Machine Dimensions (L x W x H)	Dependent on machine setup

*depending on material and build part geometry

Build Chamber Sizes



1 SLM®800 Selective Laser Melting for Serial Production Solutions

The SLM®800 utilizes the proven quad-laser technology of the SLM®500 with an extended z-axis for larger production builds. SLM Solutions' patented sintered wall gas flow prevents disruption of the laser for consistent quality and the durable metal recoating brush ensures stable powder recoating while enabling error correction during the build.

Vertically extending the build envelope reduces exposure per layer and internal stresses with a higher surface quality for long components. Decreased supports through vertical orientation also reduces material usage and post-processing.

2 Permanent Filter Module Improves Machine Uptime and Reduces Costs

The permanent filter module traps process soot in a sintered plate filter that is purged with gas. The waste material is coated with an inhibitor and stored in a bin for dry disposal, while clean gas returns to the process chamber, stabilizing gas flow to ensure part quality throughout long builds without interruption.

The elimination of consumable filter cartridges increases safety while improving machine uptime and reducing costs. Operators no longer need to flood filters and waste management is simplified as controlled diffusion renders a standard dry material for disposal.

3 Fully Automatic Powder Handling Increases Safety and Material Quality

Each SLM®800 features an integrated powder tank to supply the machine with a direct source of material. The additional central powder supply unit (CPS) features two 220l tanks, one fixed for delivery to the machine and one portable for powder refill. Sieves are located both in between the two CPS tanks and on the machine directly before use to ensure powder quality throughout the process.

4 SLM®HUB for Fully Automated Build Cylinder Handling

The SLM®HUB utilizes a linear axis to drive build cylinders between three integrated stations and directly into or out of the SLM®800 machine. Setup of new substrate plates and removal of finished parts takes place in the handling position while dedicated locations in the parking chamber allow for pre-heating of cylinders before or controlled cooling after a build.

The integrated powder removal chamber separates the build cylinder from the substrate plate and rotates the build with vibration motions. A specially designed gas flow ensures safe depowdering within an inert atmosphere. All powder can be recovered and returned to the centralized powder supply.

Up to five SLM®800 machines can link to one SLM®HUB to optimize utilization with full automation to minimize costs.



Up to five machines can be connected to one SLM®HUB in a multi-machine setup

Quality Assurance of the Selective Laser Melting Process

Comprehensive monitoring and quality assurance enable a high degree of process documentation and verification. Chamber temperature, oxygen, gas flow and other variables are constantly monitored and logged. This level of process control results in consistent, high quality builds.

Layer Control System (LCS)

Layer Control System (LCS) is a testing and documentation system that examines the performance of each powder layer by monitoring the powder bed and detecting possible coating irregularities.

Melt Pool Monitoring (MPM)

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Laser Power Monitoring (LPM)

Laser Power Monitoring (LPM) is an available on-axis monitoring system that continuously measures and documents target and actual emitted laser output throughout the production process.

Innovation Comes Standard

SLM Solutions is known as the innovation leader in selective laser melting, being the first to introduce both twin- and quad-laser production systems. Features such as bi-directional powder recoating to reduce manufacturing time, open powder architecture allowing use material from any supplier and full process parameter access for custom development come standard on every selective laser melting machine.

Qualified Material Solutions

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Consultative Development and Expert Knowledge-Sharing

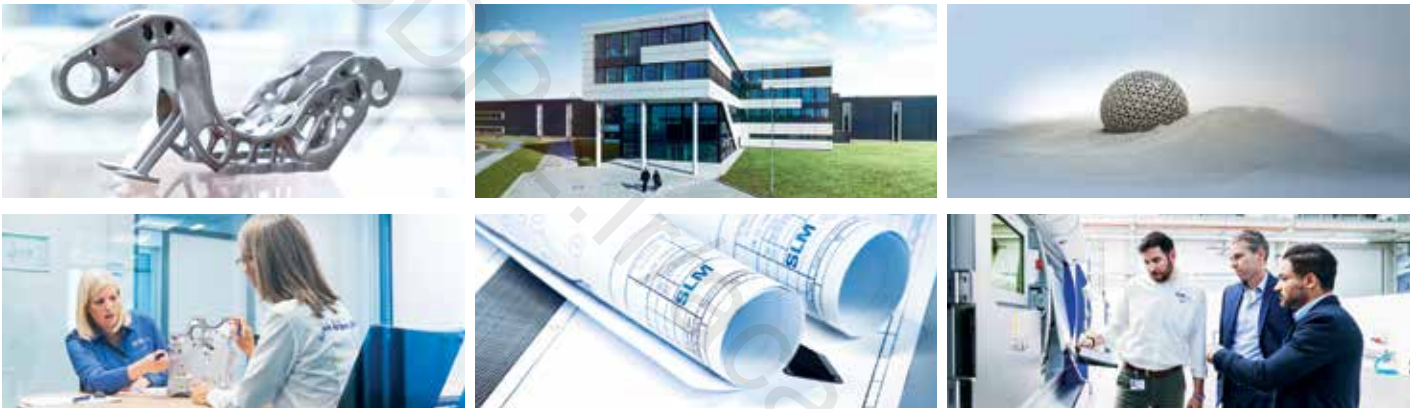
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SLM[®]

PRODUCTION READY

SELECTIVE LASER MELTING

280 2.0

MULTIPLE LASERS AND PROCESS STABILITY

FOR DEMANDING APPLICATIONS

PREMIUM QUALITY **AND THE HIGHEST PRODUCTIVITY**

Larger build chamber and multiple lasers increase productivity without sacrificing build quality

With a build plate 25% larger than standard mid-sized machines to fit more parts per build, high-power and multi-laser machines further promote production-oriented additive manufacturing. The leader in multilaser systems, SLM Solutions offers a patented multilaser scan strategy to minimize soot interference, alter layer stitching and deliver results with the same density and mechanical properties as single-laser builds.

Open system architecture puts selective laser melting users in control; your powder, your parameters

All SLM® systems allow the use of materials from any supplier. The integrated SLM® Build Processor and open software architecture offer the freedom to run standard parameters or optimize them to meet specific production needs and gain a competitive advantage. In addition, refined parameters and an identical optical bench allow processes to be directly transferred to other machines, such as scaling up to the SLM®500.

*INDUSTRY-LEADING
GAS FLOW DELIVERS
CONSISTENT QUALITY*

UP TO TWO
700
WATT LASERS

SLM[®]280

2.0



TECHNICAL SPECIFICATIONS

Build Envelope (L x W x H)	280 x 280 x 365 mm reduced by substrate plate thickness
3D Optics Configuration	Single (1x 400W or 1x 700W), Twin (2x 400 W or 2x 700W) Dual: 1x700W and 1x1000W IPG fiber laser
Real Build Rate	up to 113 cm ³ /h*
Variable Layer Thickness	20µm - 90µm, more available on request
Minimum Feature Size	150 µm
Beam Focus Diameter	80 - 115 µm
Maximum Scan Speed	10 m/s
Average Inert Gas Consumption in Process	8 l/min (Argon)
Average Inert Gas Consumption in Purging	110 l/min (Argon)
E-Connection / Power Input	400 Volt 3NPE, 63 A, 50/60 Hz, 3.5-5.5 kW
Compressed Air Requirement	ISO 8573-1:2010 [1:4:1] 7 bar
Machine Dimensions (L x W x H)	3150 mm x 1280 mm x 2470 mm

*depending on material and build part geometry

POWERFUL **AND COMPACT**

1

Multi-laser technology was pioneered by SLM Solutions, who remain the market-leaders in multilaser installations. The SLM@280 can be equipped with up to two 700W fiber lasers to accelerate the printing process of many metal additive powders.

2

Patented bi-directional powder recoating helps reduce manufacturing time by depositing a new layer of powder in both directions without having to return to a “home” position.

3

Paired with a Powder Sieving Machine (PSM), the SLM@280 offers material flexibility. Manual sieves allow efficient material changeover for adaptable production while maintaining safety and quality.

Overflow powder is collected into a sealed bottle, transferred to the PSM for sieving and returned to the build process while maintaining an inert environment and offering traceability.

3DPrinterAcademy

INNOVATION **BECOMES STANDARD**

INNOVATION COMES STANDARD

SLM Solutions is known as the innovation leader in selective laser melting. Features such as bi-directional powder recoating to reduce manufacturing time, open powder architecture allowing use material from any supplier, and full process parameter access for custom development come standard on every selective laser melting machine.

POWDER HANDLING OPTIONS

SLM Solutions closed-loop systems utilize a holistic powderhandling approach with the complete separation of operator and exposed powder. Door-integrated glove boxes on all machines eliminate direct contact of powder by operators and the minimization of powder handling outside an inert atmosphere maintains powder quality.

The second generation SLM@280 system offers the same high-quality process technology as the third generation, but with a manual powder sieve for flexibility with material changeover.

QUALIFIED MATERIAL SOLUTIONS

SLM Solutions offers expert know-how that drives unique specifications to assure mechanical properties through the combination of machine, parameters and powder audited for composition, quality, and flowability. Our material experts are always collaborating with customers to develop and source new alloys optimized for selective laser melting.

QUALITY ASSURANCE OF THE SELECTIVE LASER MELTING PROCESS

Comprehensive monitoring and quality assurance enable a high degree of process documentation and verification. Chamber temperature, oxygen, gas flow, and other variables are constantly monitored and logged to ensure consistent, high quality builds. Layer Control System (LCS), Melt Pool Monitoring (MPM), and Laser Power Monitoring (LPM) monitor various systems to detect possible irregularities.

CONSULTATIVE DEVELOPMENT AND EXPERT KNOWLEDGE-SHARING

SLM Solutions' consulting, applications, training and service teams put customer success first to ensure their return on investment is maximized. Our experts works with customers every step of their additive journey, from application identification and development to full serial production ramp-up.

SLM[®]

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SELECTIVE LASER MELTING

280 2.0

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GAS FLOW DELIVERS
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Maximum Scan Speed	10 m/s
Average Inert Gas Consumption in Process	8 l/min (Argon)
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The second generation SLM@280 system offers the same high-quality process technology as the third generation, but with a manual powder sieve for flexibility with material changeover.

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SLM Solutions offers expert know-how that drives unique specifications to assure mechanical properties through the combination of machine, parameters and powder audited for composition, quality, and flowability. Our material experts are always collaborating with customers to develop and source new alloys optimized for selective laser melting.

QUALITY ASSURANCE OF THE SELECTIVE LASER MELTING PROCESS

Comprehensive monitoring and quality assurance enable a high degree of process documentation and verification. Chamber temperature, oxygen, gas flow, and other variables are constantly monitored and logged to ensure consistent, high quality builds. Layer Control System (LCS), Melt Pool Monitoring (MPM), and Laser Power Monitoring (LPM) monitor various systems to detect possible irregularities.

CONSULTATIVE DEVELOPMENT AND EXPERT KNOWLEDGE-SHARING

SLM Solutions' consulting, applications, training and service teams put customer success first to ensure their return on investment is maximized. Our experts works with customers every step of their additive journey, from application identification and development to full serial production ramp-up.