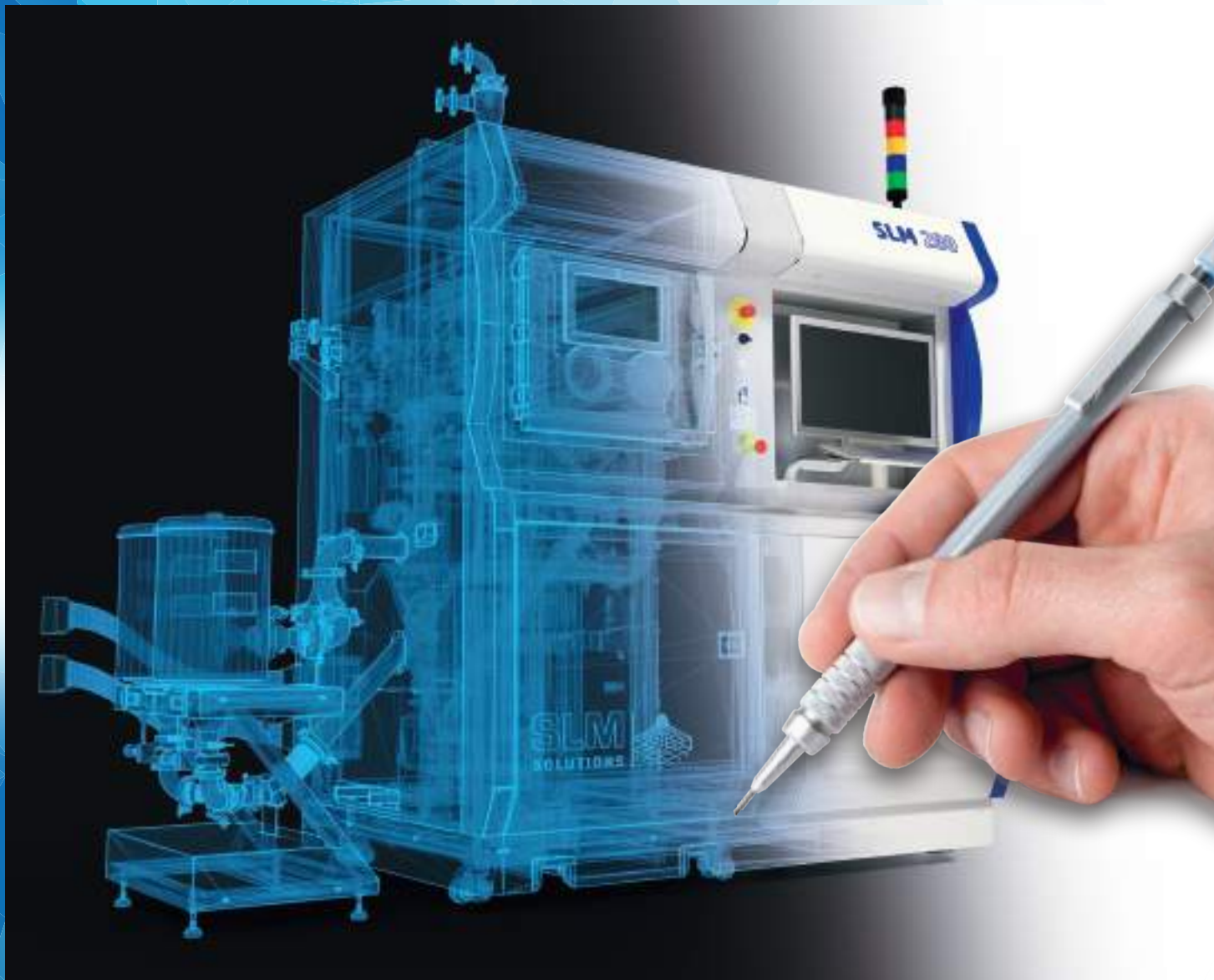# SLM 280 2.0
Selective Laser Melting Machine

**High-performance machine with
highest productivity for series production
and one-off production with individual parameters**

Selective Laser Melting Machine SLM 280 2.0

The Selective Laser Melting Machine SLM 280 2.0 provides a **280 x 280 x 365 mm³** build envelope and a **patented multi-beam technology**. During the build process up to two fiber lasers expose the build field via a 3D scan optic.

The **high-performance machine** is available in several configurations, providing single optics (1x 400W or 1x 700W), dual optics (1x 700W and 1x 1000W) and twin optics (2x 400W or 2x 700W). Depending on how the components are arranged, a 80 % higher build rate can be achieved. In addition, the **patented bidirectional powder coating** helps to reduce the manufacturing time of individually manufactured metal build parts.

The SLM 280 2.0 as an **open system** offers many options for optimizing the production processes as required with individually set process parameters and for carrying out material developments. The machine enables the manufacture of individual metal components based on CAD data for **series production and one-off production with individual parameters**.

Technical Specifications

Build Envelope (L x W x H)	280 x 280 x 365 mm³ reduced by substrate plate thickness
3D Optics Configuration Dual Configuration: with switching unit	Single (1x 400 W), Twin (2x 400 W), Single (1x 700 W), Twin (2x 700 W), Dual (1x 700 W and 1x 1000 W) IPG fiber laser
Build Rate (Twin 400 W)	up to 88 cm³/h*
Variable Layer Thickness	20 µm - 75 µm
Min. Feature Size	150 µm
Beam Focus Diameter	80 - 115 µm
Max. Scan Speed	10 m/s
Average Inert Gas Consumption in Process	2,5 l/min (argon)
Average Inert Gas Consumption Purging	70 l /min (argon)
E-Connection / Power Input	400 Volt 3NPE, 63 A, 50/60 Hz, 3,5 - 5,5 kW
Compressed Air Requirement / Consumption	ISO 8573-1:2010 [1:4:1], 50 l/min @ 6 bar
Dimensions (L x W x H)	2600 mm x 1200 mm x 2700 mm
Weight (without / incl. powder)	approx. 1300 kg / approx. 1800 kg

Machine configuration for all types of metal powders /
Technical changes reserved   *depending on material and build part geometry

SLM 280

The SLM 280 2.0 is equipped with a 2+1 filter solution that increases the filter lifetime. The additional second stage fine filter ensures an extremely low particle concentration.

In addition, the SLM 280 2.0 provides a **build volume reduction** of 100 x 100 x 160 mm³ thus decreasing the amount of powder.

Another option available is the **high temperature substrate-plate heating**, that enables temperatures up to 550°C on the substrate-plate and the production of build parts up to a height of 100 mm and a diameter of 90 mm. The modular design concept of this option does enable a quick mounting similar to the installation of a reduced build-plate in the SLM 280 machine. Potential applications are production of Titanium parts without internal stress or cracks.

The use of a large **powder tank** (40l) with two bottles (each 5l) enables the execution of a complete production process in full height with a 1.6-way overdose. The size of the overflows has also been modified accordingly to enable **simple handling**, the powder bottles of the overflows are easily accessible from outside. The complete process is carried out in an inert gas atmosphere. With efficient inert gas circulation, a reduced gas consumption is achieved in a secure and efficient operation. A **new inert gas flow** is used for optimum process conditions, whereby an efficient removal of soot from the process chamber is achieved. In addition to the attainment of constant conditions on the work surface, the beam entry glasses are also effectively protected from contamination.

Optionally, a modular powder supply unit (PSV) can be connected to the machine to ensure a reliable powder supply to the SLM 280 2.0 throughout the entire production process.

Powder Supply Unit PSV

The PSV uses a 90-liter powder tank which is sufficient for any production process**. Manual filling of powder via individual powder bottles is not necessary.** An ultrasonic sieve, which is integrated in the PSV, sieves the available powder just before it is fed into the process so that no oversized particles or foreign objects can find their way into the SLM process. The transport of powder between the PSV and the SLM machine is **fully automatic** and carried out **via vacuum technology**.

The PSV uses **three independent conveying routes.** In addition to supplying the freshly sieved metal powder to the SLM machine, a second conveying route returns the excess metal powder from the overflows back to the PSV whereat the powder supply to the SLM machine is then prioritized. The third conveying route uses a manual suction device to remove the excess metal powder from the process chamber which is then conveyed directly back to the PSV.

SLM
SOLUTIONS

Fresh powder is either supplied through the direct connection of powder containers to the powder tank from the PSV or through the emptying of the powder container in the process chamber via a suction device.

Powder transport, powder sieving and the storage of the powder take place in a **closed system with inert gas atmosphere. Contactless powder handling** ensures maximum safety at work.

Quality assurance of the production process

A comprehensive monitoring and quality assurance system enables a **high degree of process control** in the machine.

Melt Pool Monitoring (MPM) is an optionally 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. It also provides important insights about **optimizing the process parameters** of individual component parts. In the production of safety-critical parts, the data collected serves as documentation for quality assurance in the production process. The recorded data enables conclusions to be drawn regarding irregularities during fusion, which can lead to anomalies in the components.

Laser Power Monitoring (LPM) is an optionally available on-axis monitoring system that continuously measures and documents TARGET and ACTUAL emitted laser output throughout the production process. On the one hand, the module can be used as an early warning system for preventing machine downtime with targeted measures when irregularities occur. On the other hand, it makes an important contribution to quality assurance thanks to its **process documentation**.

Both quality modules are available **for single and multi laser operations.**

About SLM Solutions

The Lübeck-based SLM Solutions Group AG is a leading provider of metal-based additive manufacturing technology. SLM Solutions focuses on the development, assembly and sale of machines and integrated system solutions in the field of selective laser melting (SLM).

SLM technology offers diverse options in the metal-based generative manufacturing of build parts, such as a new design and geometric freedom, lightweight construction through the reduction of build part weight, significant advantages in terms of production speed and the manufacturing of internal undercut build parts in low quantities.

Our products are utilized globally by customers from the most varied sectors, particularly in the aerospace, automotive, tooling, energy and healthcare industries, as well as in research and education.

They particularly value the following advantages of our technology partnership:

- Highest **productivity** using patented multi-laser technology

- Highest material density and **build part quality** through our innovative gas stream management

- Completely closed **powder management** in an inert gas atmosphere

- Cutting-edge process monitoring using various **quality control modules**

- Multilingual open **software architecture** with customer adaptability

- Ultracompact **modular design**

- Long-term and **confidential customer relationships**

- **A technological leader and pioneer** in metal-based additive manufacturing with decades of market experience

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