

# SLM<sup>®</sup> 500

SELECTIVE  
LASER MELTING



**PRODUCTION-FOCUSED  
MULTI-LASER VERSATILITY**



**4x 700W**



**280MM**  
X-AXIS

**500MM**  
Y-AXIS

**365MM**  
Z-AXIS



# METAL ADDITIVE MANUFACTURING INDUSTRIALIZATION

The safest, most productive, established, large platform metal AM production system: the SLM®500. Double the build envelope of the SLM®280 family (500 x 280 x 365 mm<sup>3</sup>, to be precise), double the lasers - and yet still many similarities that allow for an easy scale-up across the SLM® product family. With innovative features such as the exchangeable build cylinder and a fully inert, sealed powder cycle realize an unprecedented <60(!) minutes preparation time between two builds. Ready for series production?

## **THE HIGHEST, SAFEST PERFORMANCE AVAILABLE IN ITS CLASS AT A LOW INVESTMENT**

The SLM®500 is a built to ensure operator safety and lower overall operational costs. Material and powder handling strategy that 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 a versatile machine for high volume metal additive manufacturing.

## **PATENTED MULTI-LASER OVERLAP STRATEGY FOR CONSISTENT MATERIAL QUALITY**

As a leader in selective laser melting innovation, Nikon SLM Solutions prioritizes both productivity and material characteristics. Our SLM® patents include a specialized scan strategy that ensures efficient processing. Rigorous testing has demonstrated that by altering the overlap layer by layer, we achieve comparable density and mechanical properties without creating visible seams or mechanical weak points in the finished component.

## **POWDER MANAGEMENT**

PSV is our automated powder management solution designed for continuous production. It stores, sieves, and transports powder to and from the machine using an efficient vacuum-based conveying system. The entire process operates under fully inert conditions, preventing powder oxidation, ensuring the best part quality, and maintaining the highest level of safety. The reservoir tank holds up to 90 liters of powder, sufficient for full-height build jobs. Integrated scales provide the operator with current fill levels, and dew point sensors monitor and log relative humidity. Specifically for the SLM®500, PSV also functions as an integrated depowdering solution, enabling fast and safe powder removal after a build job using the separate PRS.

**QUAD-LASER  
PRODUCTIVITY FROM  
THE MULTI-LASER  
TECHNOLOGY  
PIONEER**

**POWDER SUPPLY  
WITH  
90L  
POWDER  
TANK**





# POWERFUL AND COMPACT

## TECHNICAL SPECIFICATIONS



<b>BUILD ENVELOPE (L × W × H)</b>	500 x 280 x 365 mm <sup>3</sup> , reduced by substrate plate thickness
<b>3D OPTICS CONFIGURATION</b>	Quad (4x 700W)
<b>THEORETICAL SYSTEM BUILD RATE</b>	up to 345 cm <sup>3</sup> /h
<b>VARIABLE LAYER THICKNESS</b>	20 – 90 µm, more available on request
<b>MINIMUM FEATURE SIZE</b>	150 µm
<b>BEAM FOCUS DIAMETER</b>	80 – 115 µm
<b>MAXIMUM SCAN SPEED</b>	10 m/s
<b>AVERAGE INERT GAS CONSUMPTION IN PROCESS</b>	16 L/min (Argon)
<b>AVERAGE INERT GAS CONSUMPTION IN PURGING</b>	250 L/min (Argon)
<b>E-CONNECTION / POWER INPUT</b>	400 Volt 3NPE, 63 A, 50/60 Hz, 8-5.5 kW
<b>COMPRESSED AIR REQUIREMENT</b>	ISO 8573-1:2010 [1:4:1] 7 bar
<b>MACHINE DIMENSIONS (L × W × H)</b>	6080 x 2530 x 2620 mm <sup>3</sup>
<b>GAS FILTRATION</b>	PFM (Permanent Filter Module)



# SLM®500

## FAST AND POWERFUL

1

### SLM®500 SELECTIVE LASER MELTING FOR SERIAL PRODUCTION

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. As we see the market responding well to high-powered production machines, we offer SLM®500 only in a four-laser variant equipped with 700W lasers. 2800 Watts of power equipped with removable build cylinders are perfect ingredients for serial production. With 700W, 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.

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 an inert gas atmosphere throughout the process. The PSV features a 90L tank for metal powder. The 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.

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 the next can begin on the machine. Build cylinders with completed jobs are transported 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, feeds powder directly back to PSV for sieving and use in the next production build.

2

The permanent filter module traps soot in a sintered plate filter and coats the waste material with an inhibitor for dry disposal. Machine uptime is increased, gas flow is stabilized, and consumable costs are reduced while increasing safety.





# INNOVATION BECOMES STANDARD

## **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**

Layer Control System (LCS), standard with any SLM®500, is a testing and documentation system that examines the performance of each powder layer by monitoring the powder bed and detecting possible coating irregularities.

## **INNOVATION COMES STANDARD**

Nikon 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**

Nikon 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**

Nikon 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 factory layout and full serial production ramp-up.

# TECHNOLOGY PIONEERS INNOVATION LEADERS



**2000+ LASERS  
INSTALLED GLOBALLY**



**9 CENTERS**

Country	City	Type
Germany	Lübeck	Management, Engineering, Production, Application
USA	Long Beach, CA	Application
USA	Greenville, SC	Production
Japan	Tokyo	Application, Sales
China	Shanghai	Sales
Singapore	Singapore	Sales
India	Bangalore	Sales
South Korea	Seoul	Sales
Italy	Bologna	Engineering

## NIKON SLM SOLUTIONS

The laser powder bed fusion process was the first to offer multi-laser systems, and all its selective laser melting machines offer patented quality, safety and productivity features. Taking a vested interest in customers' long-term success in metal additive manufacturing, Nikon 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. Optimally paired with Nikon 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.

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



GO **FASTER.**  
GO **MULTI-LASER.**  
GO **END-TO-END.**  
GO **SUPPORT-FREE.**  
GO **INDUSTRIAL SCALE.**  
GO **BOLDER.**  
GO **FOR GOLD.**  
GO **NIKON SLM SOLUTIONS.**



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