



GE Additive

Repeatability at scale

Concept Laser M2 Series 5



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Enabling repeatability at scale

Designed for high-quality builds at scale

The M2 Series 5 can unlock your company's manufacturing potential. The system provides an elevated level of productivity and repeatability by minimizing the effects of process variations. The result: fast builds that help lower your company's cost.

The powerful dual-laser system—available in both 400 W and 1kW—combined with 3D optics enables 100% coverage per laser, meaning that both optical systems have full build-field overlap. A dedicated thermal control of the optics leads to improved thermal and optical stability, accuracy, and best-in-class stitching.

The flow-optimized build chamber allows for a more constant gas flow. Additionally, the optimized gas flow design eliminates recirculation and reduces variation by 25% over the entire build field.

New part vectorization allows for additional flexibility to part parameter design, enabling new geometries

and ensuring part quality, especially with increased part complexity. The pre-calculation helps to save time and boost productivity. In combination with multiple internal sensors, this ensures a more tightly controlled build environment, resulting in significantly better part quality and consistency. These are the key drivers for success in safety-relevant industries like aerospace and medical and other industries looking at scaled production.

Machine highlights

- Bigger build volume: 245 x 245 x 350 mm
- 400W or 1kW dual-laser system with full overlap
- Improved gas flow system
- 3D optics with 70 – 500 µm spot size
- Inert sieving and powder exchange
- Pre-calculation software, saving time when building complex parts

ACHIEVING QUALIFICATION

Scaling additive production requires qualification. In regulated industries, such as orthopedics and aerospace, rigor is even more important. Our additive experts have experience qualifying hardware in highly regulated markets and can help you reduce the learning curve so you can get your product to market faster. In the end, you will qualify the machine, the material, and the process. We follow industry-wide processes to establish robust and repeatable production outcomes.

Installation Qualification (IQ)

The purpose of the IQ protocol is to provide documented evidence that the machine is installed according to documented and pre-approved specifications.

Operational Qualification (OQ)

The purpose of OQ is to demonstrate that a system operates according to written pre-approved specifications throughout a specified operating range.

Performance Qualification (PQ)

The purpose of PQ is to demonstrate that the additive process, under anticipated manufacturing



MACHINE MANAGEMENT

Software features like pre-calculation enable an off-machine scan path generation. This eliminates calculation delays between layers for complex parts. A new dose profile also helps to further reduce powder consumption for builds with changing geometries.

The additional optical sensors help to monitor the optics temperature to ensure a more stable process and better part quality.

Furthermore, part segmentation and vector tool path support optimized exposure strategies, while the thin wall segmentation enables ultra-fine feature resolution within the part.

CL WRX Parameter 2.x

CL WRX Parameter 2.x is a software application which allows users to create and optimize parameters for their materials. The software enables users to access the full parameter definition (open parameter). The starting point is typically a GE Additive parameter that can be tailored to meet the needs of the application requirements. Additionally, this software can be used to create parameter sets for user developed materials.



CL WRX Control 2.x

The CL WRX Control 2.x software is supplied with all our DMLM machines. It is installed on the machine industrial PC to provide control of the machine axes and tool path. WRX Control allows for a complete calculation of the exposure vectors.

MONITORING AND ANALYTICS

Build Explorer

Build Explorer is a process-monitoring software from GE Additive that enables a user to understand the layer-by-layer performance of a build job as the build is happening. It is a machine health and process-monitoring software solution that provides a common user experience. It offers operators and process engineers layer-wise machine sensor and quality information for use real-time during the printing process and for post-build analysis.

Build Explorer gives users the ability to detect real-time machine health trends that can affect build part quality before the quality of a part is affected. Users will then have information that will allow them to take immediate action to minimize cost of poor quality

QM Meltpool 3D

QM Meltpool 3D[®] is an optional quality management system which is integrated into the optical path of the M2 system. It provides tracking of the ongoing build process via two optical sensors per scanner unit. These sensors are directed at the local emissions of the melt pool to provide high frequency raw intensity and area meltpool data. The system allows analysis of relevant data of the melting path, including full documentation and high resolution mapping (35 µm/Pixel) the melting pool data. GE Additive is taking active steps to develop future real time fault detection and control, reducing downstream testing procedures and qualification of part parameters.

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Technical Data

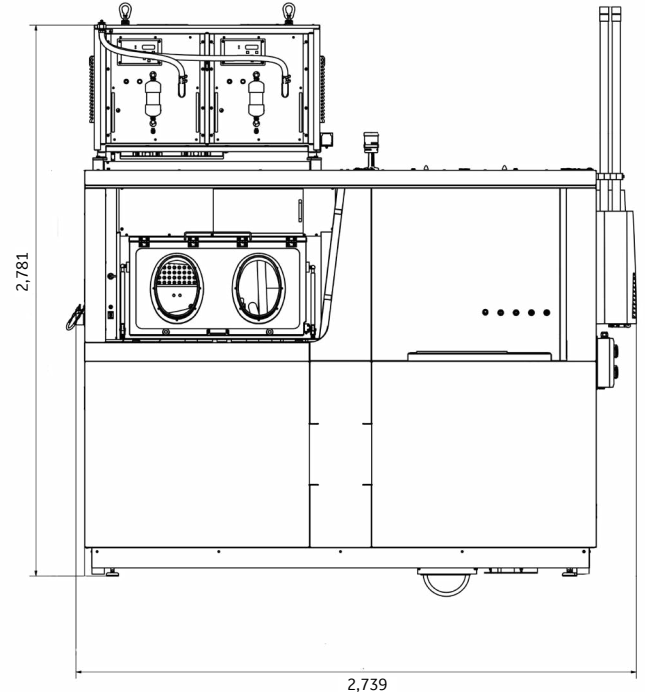
Build envelope	245 x 245 x max 405* mm (x, y, z)
Layer thickness	25 - 120 µm
Production speed	Productivity rates and material portfolio available on website
Laser system options	Fibre Laser 2x1kW (cw), Fibre Laser 2 x 400 W (cw), optional 1 x 400 W (cw)
Scanning speed	Max 4.5 m/s with variable focus adjustment
Focus diameter	61 - 72 µm
Spot Size range	70-500 µm
Heating System	Available
Reference clamping system (optional)	EROWA, others on request
Connected loads	Approx. power consumption 28A Power supply 3/N/PE AC 400V, 32A connector, compressed air 6-10bar 2 gas connections provided N2 generator external (optional)
Inert gas supply	5l / min < 1 m ³ /h
Inert gas consumption	Integrated, with a 20 m ² filter surface
Filtering system	2,739 x 2,050 x 2,781 mm (W x D x H)
Dimensions	
Weight	Approx. 2,500 kg
Operating conditions	18 - 25°C

Materials available**

- Stainless Steel 316L
- Stainless Steel 17-4PH
- Maraging Steel M300
- Tool Steel H13
- Aluminium AlSi10Mg
- Aluminium A205
- Aluminium AlSi7Mg
- Nickel 718
- Nickel 625
- Nickel X
- Titanium Ti6Al4V ELI Grade 23
- Titanium cp-Ti
- Titanium Ti6242
- Cobalt CoCrMo
- Cobalt CoCrW

*Build height dependent on build plate configuration and platform thickness (actual range is 405-313 mm)

**Most parameters, data sheets and productivity rates can be found on the [M2 Series 5 website](#)



CAPABILITY PACKAGES

The Concept Laser M2 Series 5 was designed to meet the most critical requirements by the highly regulated aerospace industry. But, we believe that everyone, regardless of industry, region or where you are on your additive journey, should have access to these capabilities. As such, we now offer four capability packages to meet the needs of more customers and help more users adopt additive technology. All models are built upon the Series 5 foundations of uniformity, accuracy, repeatability and reliability.

Standard: Ideal for entry-level users, standalone prototyping, or low volume production (available in 400W or 1000W)

Production: Ideal for full production applications (available in 400W or 1000W). Incorporating quality process monitoring add-ons and productivity tools.

✓ Included in machine price + Can be purchased separately

Capability Packages	S STANDARD		P PRODUCTION	
	2 x 400W	2 x 1000W	2 x 400W	2 x 1kW
Laser Power	2 x 400W	2 x 1000W	2 x 400W	2 x 1kW
3D Optics	✓	✓	✓	✓
Build Plate Heating	✓	✓	✓	✓
QM Liveview	✓	✓	✓	✓
Filter Life Extension Package (New!)	✓	✓	✓	✓
Fast Powder Re-fill (New!)	✓	✓	✓	✓
Build to Build Variability Analyzer (New!)	3-month Trial	3-month Trial	6-month Trial	6-month Trial
QM Coating	+	+	✓	✓
Build Explorer	+	+	✓	✓
Vacuum Port	+	+	✓	✓
Offline Recoater Setup	+	+	✓	✓
QM Meltpool 3D			✓	✓
IQ – OQ – PQ Protocol	+	+	+	+
Installation Qualification (IQ)	+	+	+	