

Sapphire and Sapphire 1MZ Printer

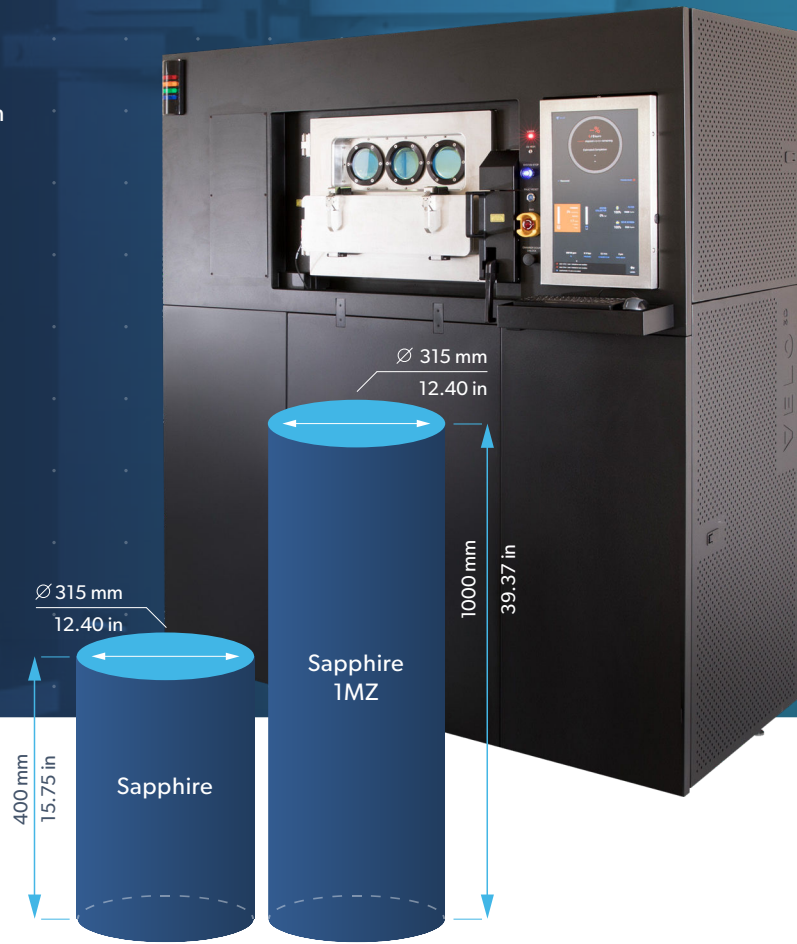
Velo3D provides a fully integrated metal additive manufacturing solution that lets engineers build the parts they need without design or quality compromises. Velo3D's intelligent solution is not just a printer, it is a highly integrated production system driven by our Intelligent Fusion manufacturing process. The solution includes Velo3D's Flow print preparation software, your choice of a Sapphire printer, and Assure quality monitoring and control software.

The Sapphire family of printers are capable of printing complex geometries including low angle prints down to zero degrees, high aspect ratio structures, large inner diameters, and many other features that traditional manufacturing technologies and conventional AM printers struggle to produce.

Sapphire Printer Family Configurations

The **Sapphire** and the **Sapphire 1MZ**

For higher volume production parts see our Sapphire XC printer



Development & Production-Level Additive Manufacturing

Print Without Compromise

Sapphire printers utilize two 1kW lasers and a proprietary non-contact recoater that eliminates the risk of part collision while enabling thinner walls and more accurate builds.

Standardized and controlled parameter sets, along with automated calibrations, ensure consistent geometric accuracy, surface finish, and validated material properties. This enables Sapphire printers to provide exceptional supply chain scalability with one print file per part that works on any Sapphire worldwide.

Made for Production

The standard build cylindrical chamber of 315 mm diameter by 400 mm height is now available in a 1000 mm height configuration for taller parts. Both feature dual 1kW lasers for faster printing and our proprietary non-contact recoater to reduce the risk of part collisions.

In-situ metrology sensors enable visibility into the quality of every layer of the build. Calibration requires no external instrumentation, enabling runtime and one-click optics calibration. Continuous powder handling and inert powder unpacking are included.

Sapphire and Sapphire 1MZ Printer

VELO^{3D}

US Production Facilities
2710 Lakeview Court
Fremont, CA 94538

Laser and Optics Fidelity

- Automated pre-build and run-time optics calibrations
- Self-cleaning laser windows

Powder Bed Uniformity

- Non-contact recoater
- Per-layer 3D powder bed height mapping
- Full-height printing without interruption for powder addition or filter changes

Environmental Control

- Low ppm O₂ during normal operation
- Active humidity monitoring
- Ambient temperature and pressure operation
- Highly regulated chamber gas flows
- High efficiency spatter removal

1MZ Features

- 1000 mm tall build volume
- Same capabilities with identical build parameters as standard Sapphire model

System Features

	Standard	1MZ
Build Volume ¹	315 mm Ø 400 mm Z	315 mm Ø 1000 mm Z
Size (L x W x H)	2.1 x 2.1 x 2.5 m (82.5 x 82.5 x 98 in)	2.1 x 2.1 x 2.5 m plus 1.37 m (54 in) pit
Weight	2,875 kg (6,325 lbs)	3,150 kg (6,930 lbs)
Lasers	Dual 1 kW lasers	
Throughput	Up to 100 cc/hr	
Surface finish	5-15 µm S _a (typical)	

¹ Build height will vary depending upon build plate thickness. Actual build height will be 550 mm with 25+50 mm two-piece build plate, 500 mm with 25+100mm plate.

Qualified Materials

Nickel	Inconel® 718, Inconel 625®, Hastelloy® C-22, Hastelloy® X, for AM® Haynes® 282 ^{®2} , Haynes® 214 [®]
Copper	GRCop-42, C18150
Titanium	Ti-6Al-4V
Aluminum	F357, Scalmalloy®, Ahead® CP1
Steel	M300 Steel

² Powder is produced by Höganäs under license from Haynes, International, Inc.

Metal 3D Printing Without Compromise

Velo3D separates itself from existing powder bed fusion solutions with its unique ability to print low angles and overhangs down to zero degrees, as well as large diameter circular holes and inner tubes up to 100 mm all the way down to 500 microns without the need for supports.

This not only reduces the need for post-processing, but it overcomes the “45 degree rule” for conventional AM which recommends supports for most surfaces less than 45 degrees. Velo3D frees designers to build the impossible – unlocking a wealth of designs that can now be produced with additive technology.



**Build the Part You Need
Without Design or Quality Compromise**

For more capability details visit Velo3D.com