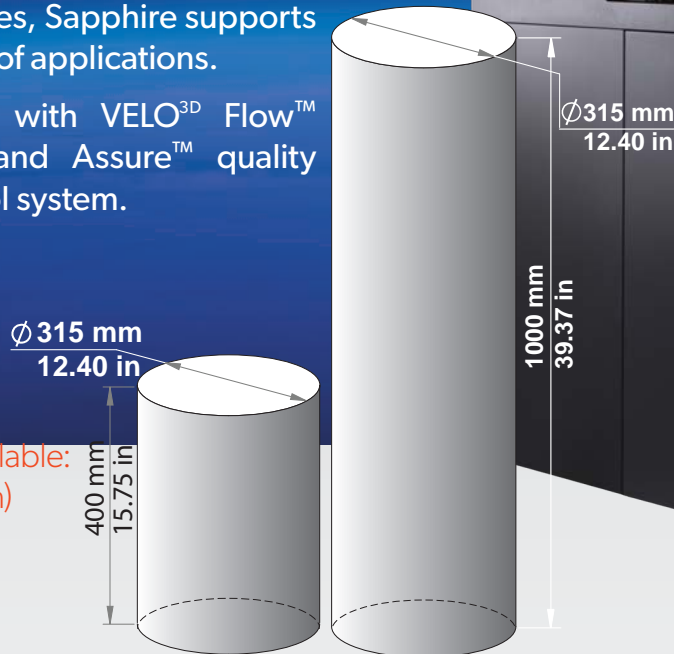


Sapphire[®] Printer

The VELO^{3D} Sapphire is the next generation in metal laser powder bed fusion. While conventional systems often require supports for any surface below 45 degrees, Sapphire uniquely enables designs with overhangs down to zero degrees.

Sapphire is designed from the ground up with production in mind. Offering the same SupportFree capability and quality control in two different build volumes, Sapphire supports a comprehensive list of applications.

Sapphire integrates with VELO^{3D} Flow[™] pre-print software and Assure[™] quality assurance and control system.



Configurations Available:
 Standard (400 mm)
 1MZ (1000 mm)

Production-Level Additive Manufacturing

Enabling SupportFree[™] Geometries

Low angles down to zero degrees (vs 45 degrees with conventional AM) enables impossible geometries and significantly less post processing

Large inner diameters up to 100 mm (vs 10 mm with conventional AM) enables manifolds, volutes and crossovers

High aspect ratios up to 3000:1 (vs 8:1 with conventional AM) enables high performance heat exchangers and assemblies

Made for Production

Our cylindrical 315 mm diameter build chamber is now available in 400 mm and 1000 mm configurations

Both feature dual kW 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 included

Sapphire Printer

Laser and Optics Fidelity

- Run-time and one-click 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

- Sub-10 ppm O₂ during normal operation
- Active humidity monitoring
- Ambient temperature and pressure operation
- Highly regulated chamber gas flows
- High efficiency spatter removal

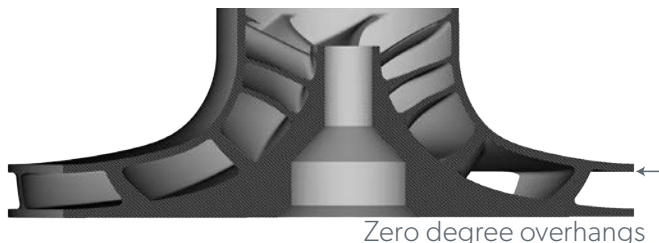
1MZ Features

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

SupportFree Metal 3D Printing

VELO^{3D} 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 diameters and inner tubes up to 100 mm 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 any any surface less than 45 degrees. VELO^{3D} frees designers to build the impossible – unlocking a wealth of designs that can now be produced with additive technology.



System Features

Lasers:	Dual 1 kW laser
Laser class:	Class 1
Materials:	IN718, Ti6Al4V, Al357
Typ. throughput:	Up to 60 cc/hr
Typ. surface finish:	5-15 μm Sa
Size (L x W x H)	2.1 by 2.1 by 2.5 m (82.5 by 82.5 by 98 in)
Size (1MZ)	2.1 by 2.1 by 2.5 plus 1.37 m (54 in) pit
Weight	5700 kg (12,560 lbs)
Weight (1MZ)	5900 kg (12,980 lbs)



**Unlock SupportFree Capabilities
for your company**

info@velo3D.com