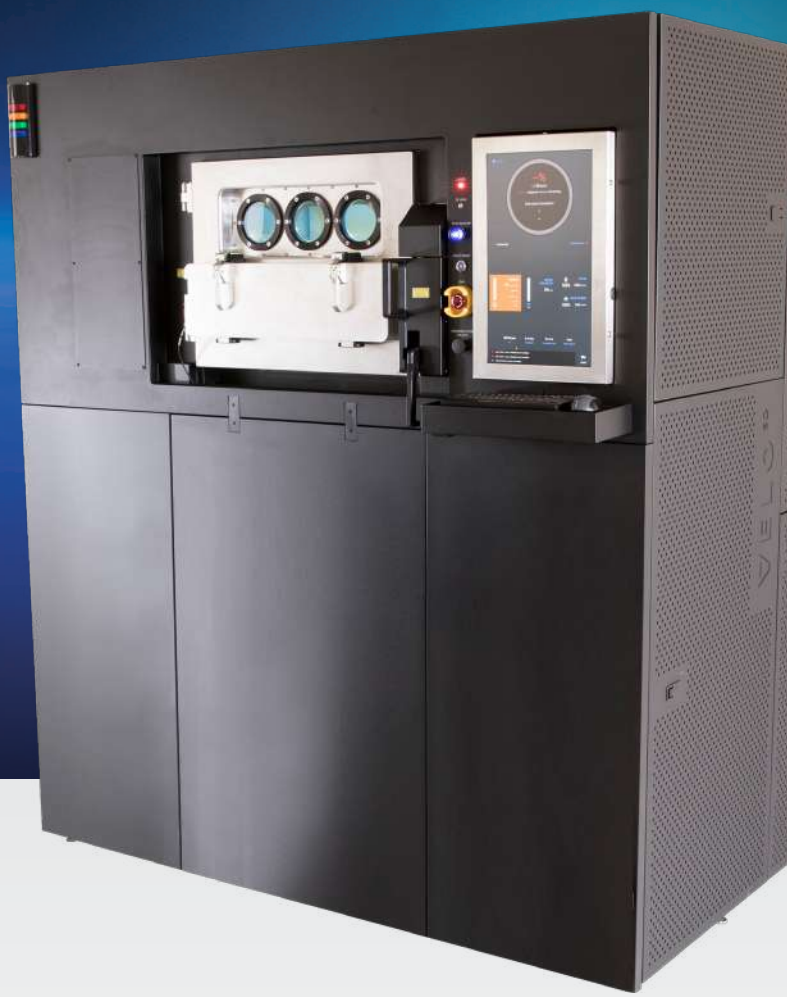
PRODUCT BRIEF

Sapphire® Printer

Product Overview

The VELO[3D] Sapphire represents the next generation in metal laser powder bed fusion for additive manufacturing. While conventional systems often require supports for any surface below 45 degrees, Sapphire uniquely enables manufacturers to realize designs with overhangs lower than 10 degrees. Sapphire is designed from the ground up with high volume manufacturing in mind and features an integrated in-situ process metrology that enables the first and only closed loop melt pool control.



Production-Level Additive Manufacturing

Enabling SupportFree Geometries

- Low angles down to 10 degrees (vs 45 degrees with conventional AM) enables impossible geometries and significantly less post processing
- Large inner diameters up to 40 mm (vs 10 mm with conventional AM) enables manifolds, volutes and crossovers
- High aspect ratios up to 500:1 (vs 8:1 with conventional AM) enables high performance heat exchangers and assemblies

Made for Production

- In-situ metrology sensors reduce variances between builds, parts, and machines
- Non-contact recoater eliminates risk of part collision protecting both the build and the recoater
- Complete documentation and traceability of system calibration and build performance
- Unique closed loop melt pool control enables low angle skins and improves process stability

VELO 3D

Sapphire Printer

Laser and Optics Fidelity

- In-situ, automatic optics metrology and calibration
- Non-fouling laser window (no cleaning required)

Powder Bed Uniformity

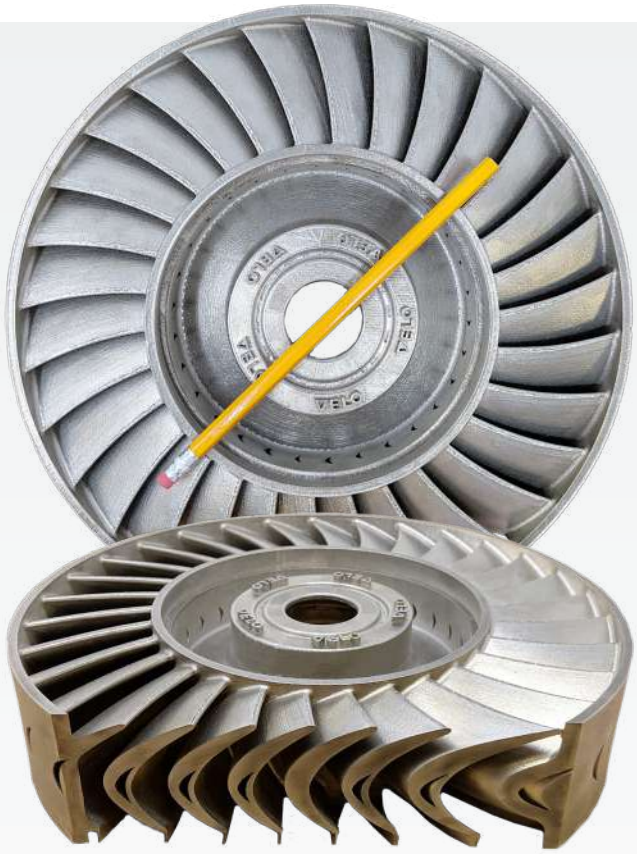
- Non-contact recoater
- Per-layer 3D powder bed height mapping
- Powder reservoir sufficient for two full builds

Environmental Control

- Sub-10 ppm O_2 during normal operation
- Active humidity monitoring
- Ambient temp and pressure operation
- Chamber gas flows highly regulated
- High efficiency spatter removal during recoat
- Moisture dried from powder continuously

System Features

Build volume:	315 mm diameter x 400 mm
Lasers:	Dual 1 kW laser operation
Laser class:	Class 1 Laser Product
Available materials:	IN718, Ti6Al4V
Typical throughput:	Up to 60 cc/hr
Typical surface finish:	5-15 µm Sa



SupportFree Metal 3D Printing

VELO[3D] separates itself from existing powder bed fusion solutions with its unique ability to print low angles and overhangs below 10 degrees, as well as large diameters and inner tubes up to 40 mm without the need for supports.

This not only reduces the need for post-processing, but it overcomes the "45 degree rule" – any surface less than 45 degrees requires supports. VELO[3D] frees designers to build the impossible – unlocking a wealth of designs that can be produced with additive technology.

Industry standard 45-degree minimum. Supports required.

Sapphire 10-degree minimum. No supports required.

Continue the Conversation

Do you have a part that you struggle to manufacture? Connect with our sales directors to see how we can help.

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To learn more visit:
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