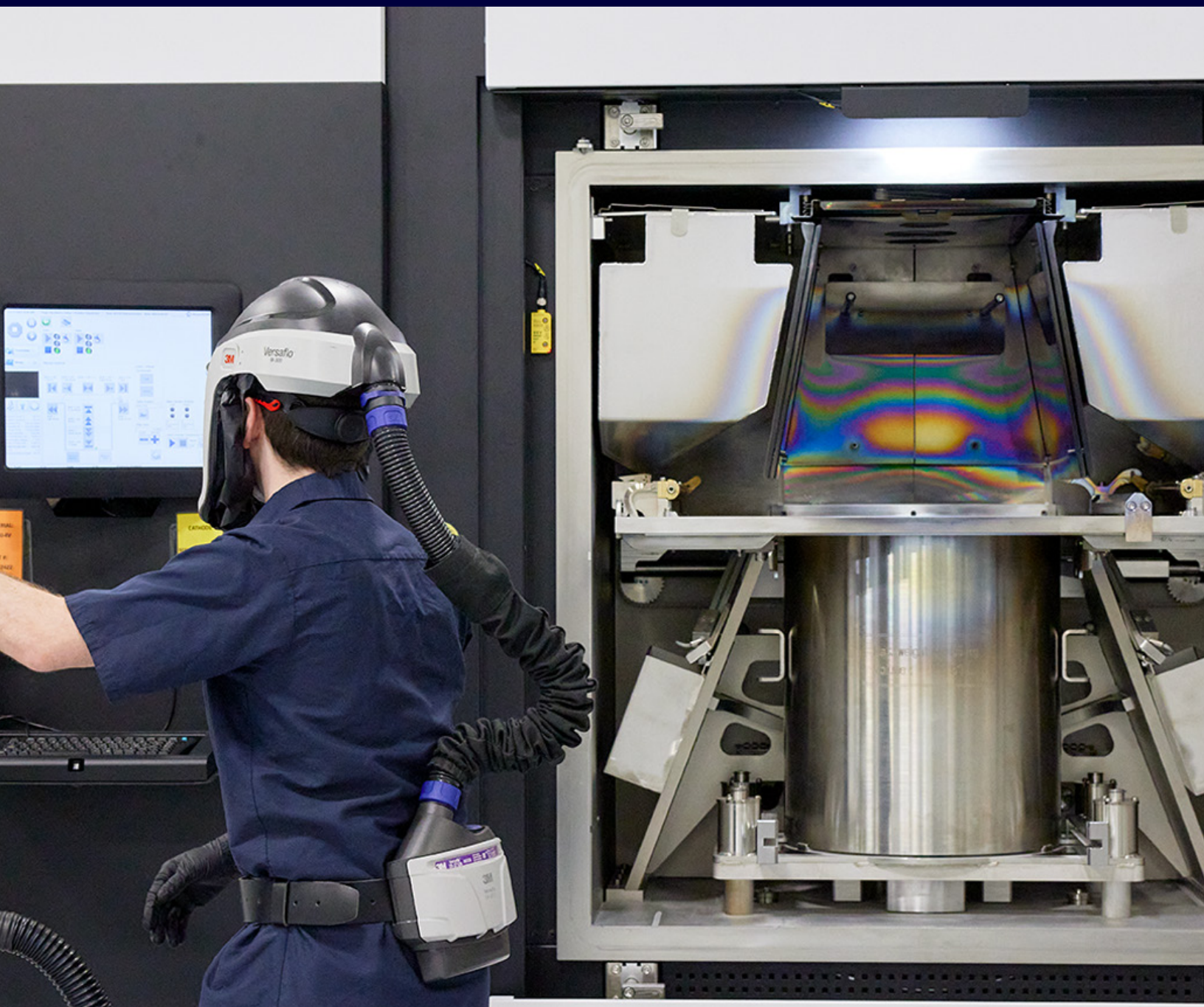


**COLIBRIUM
ADDITIVE**
a GE Aerospace company

With Point Melt technology

Spectra L

The largest EBM build volume available



The key to high productivity

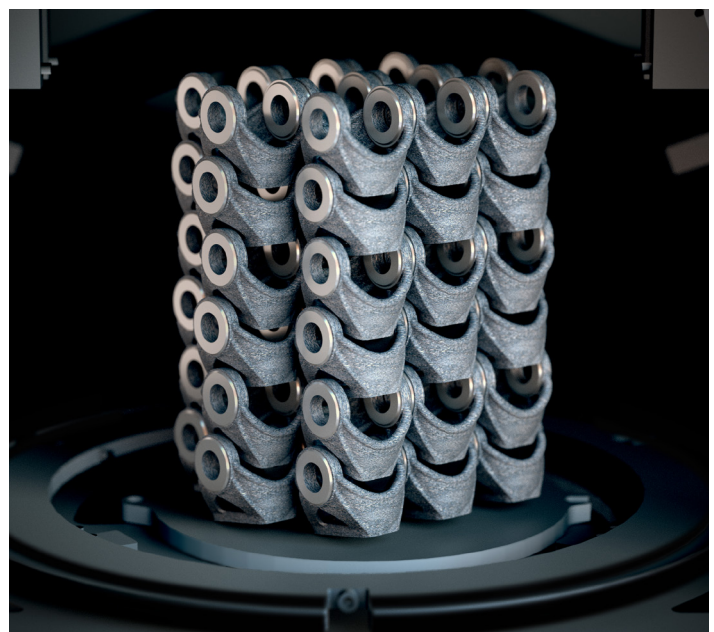
We've opened the door for a new level of productivity in additive manufacturing, with the new Spectra L. Our latest innovation offers increased productivity and reduces cost per part by up to 20%. Due to an increased beam power to 4.5kW and enhancements in the beam control, the build speed is increased by up to 30%, compared to previous EBM machines.

The Spectra L allows for mass production of parts by providing the feature to tightly stack parts without compromising on quality. Electron Beam Melting (EBM) technology provides you with freedom in design and allows you to build free floating parts in sintered powder. The supports are primarily used for heat equalization and are easily removed when the build is finished.

The improved melt process results in consistent material properties for thin and bulky geometries. This provides the freedom to design parts without limiting your imagination. In addition, the Spectra L offers the largest build volume of our EBM machines, allowing enhanced capacity to produce high-integrity parts larger, and faster, than ever before.

Spectra L Benefits

- Reduced cost per part thanks to increased build speed, the largest EBM build volume and the ability to tightly stack parts
- Excellent part quality, with improved surface finish and improved material properties for thin wall geometries.
- Integrated system architecture, with standardized IoT interface, data analytics for machine health monitoring and our new Powder Recovery Station, PRS 30.



Integrated approach for best results

The Spectra L features a powerful, integrated hardware and software system for efficient operation of your EBM machine and better build analysis.

- The Spectra L includes xQam™ technology for high-precision beam autocalibration, a powerful software platform, and electronics for efficient and accurate beam control.
- LayerQam™, a camera-based monitoring system, provides for inline part quality verification and comprehensive defect diagnosis. Detailed reports are generated from the data collected by the software after the build is completed. The user is then informed of any defect present and location within the build.

Powder handling equipment

A complete powder handling system to support the additive process, both pre- and post-build:

Powder Recovery Station (PRS)

Recovers unused powder in a closed environment

Vacuum cleaners

Clean the finished build

Sieving station

Filters unused powder to rid of oversized particles

Hopper filling station

Loads sieved powder from barrels into machine hopper

Trolleys

Transport build tank, powder hoppers, and barrels

Closed-loop powder-handling system maintains powder integrity

The Spectra L machine is supported by a closed powder handling system that maintains the powder batch integrity. The system is automated and includes a Powder Recovery Station (PRS), an auto dosing sieve and a hopper filler station.

When a built part is cleaned in the PRS, excess powder is recovered and smaller particles are removed in a cyclone separator. Powder also passes through a magnetic sieve to remove any metallic satellites picked up in the cleaning process. The recovered powder is then returned to the hoppers via the hopper filler station. And because Spectra L operates within a closed-loop system that creates a dust-tight environment, powders are completely contained and never cross-contaminated or exposed to external elements.





Point Melt Technology for EBM

Point Melt, available on Colibrium Additive's Spectra EBM printers, is a process during which metal powder is melted through small "points" instead of lines as commonly done. This technology enables a more accurate temperature control, reducing temperature gradients and sintering needs. As result, metal parts produced using Point Melt can benefit from elimination of supports needed to build overhangs and an improved surface quality. Point Melt also enables additional strategies such as multiple passes on the same area allowing melt pool control and the resulting microstructure.

Advantages of Point Melt

- 39% larger build volume than previous generation EBM machines
- Point Melt helps control the microstructure and influences the mechanical properties at macro level. The accurate control temperature and solidification process enables:
 - Isotropic solidification, with small and nearly equally distributed grains.
 - Directional Solidification (DS), with grains oriented in the build direction.
 - Hybrid solidification, with different heights of the part having different solidification strategies.

This will enable material properties tailored to the different functions of the part, for example, printing turbine blades using isotropic solidification for the blade root and directional solidification for the main blade body.

Spectra L

Technical Data

Max. build size	350 × 430 mm (Ø x H)
Max. beam power	4.5kW
Cathode type	Single crystalline
Vacuum base pressure	5 × 10 ⁻⁴ mbar
Typical build atmosphere	4 × 10 ⁻³ mbar (partial pressure of He)
Power supply	3 × 400 V, 32A, 13kVA
He consumption, build process	5 liter/h
He consumption, ventilation	150-200l/build
Typical process temperature	700°C
Size	1,328 × 2,344 × 2,858mm (D x W x H)
Weight	2,915kg
CAD interface	Standard STL



Materials Available

- Ti6Al4V Grade 5, P-Mtrl
- Ti6Al4V Grade 23, P-Mtrl

