

Spectra H

High heat for expanded capabilities



Advanced thinking that's growing capabilities

The acceleration of new developments in additive manufacturing continues to deliver on the promise of this transformative technology. Colibrium Additive continues to be at the forefront of additive technology as we enable a new phase of high-volume industrial production.

Setting the pace is Colibrium Additive's Spectra H. With an extended build platform and capability to produce parts at temperatures exceeding 1,000 °C, the machine's enhanced capacity is opening up new opportunities to produce high-integrity parts larger, and faster, than ever before. As part of a system that simplifies operation and maximizes output, Spectra H is the EBM evolution that's helping the industry take the next step forward.

Designed to produce high heat for crack prone materials

The expanded build chamber, 39% larger than the previous generation EBM machine, allows Spectra H to deliver market-leading, high-temperature production. Movable heat shields create improved insulation, forming the ideal environment for exceptional part production. An auto-calibrated, 6 kW beam provides a 100% increase in power to provide up to 50% faster builds, allowing manufacturers to begin transitioning into high-volume outputs.

With this extended platform, it's possible to print larger parts than ever before, and produce more parts at one time. And with Spectra H's high-heat capability, users can incorporate new alloys into production to expand their offerings, including high-temperature, crack-prone materials.

Spectra H Benefits

- 39% larger build volume than previous generation EBM machines
- Capable of working with high-temperatures and crack-prone materials such as TiAl
- Movable heat shields for improved temperature management
- Auto-calibrated beam for precise part production
- Closed-loop system to maintain powder integrity
- Powder distribution system delivers even layer of powder for optimal part production



Integrated approach for best results

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

- The Spectra H 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 H 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 H 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 H

Technical Data

Max. build size	250 × 430 mm (D,H)
Max. beam power	6kW
Cathode type	Single crystalline
Minimum chamber 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 range	600-1,100°C
Size	1,328 × 2,344 × 2,858 mm (D,W,H)
Weight	2,915kg
CAD interface	Standard STL

Materials Available

- TiAl D-Mtrl
- Nickel Alloy 718 D-Mtrl
- Highly Alloyed Tool SteelD-Mtrl
- Ti6Al4V Grade 5 P-Mtrl
- Cobalt Chrome CoCr

