LENS® 500 HYBRID CONTROLLED ATMOSPHERE SYSTEM

Affordable Hybrid Machine for the Fabrication and Restoration of High Value Metal Components.

LENS 500 HY CA System. An additive only controlled atmosphere model, LENS 500 AM CA, is also available.

The LENS 500 Hybrid Controlled Atmosphere System sets a new standard in affordability and performance for titanium and aluminum metal additive manufacturing applications. The system incorporates an Optomec proprietary hermetically sealed Class 1 enclosure and an integrated gas purification system that maintains oxygen and moisture levels to below 40 ppm.

Built on a rugged cast iron CNC platform, the system features high precision ball screws, spindle, and ATC for precision machining operations. Additive functionality is enabled with integrated Optomec LENS Print Engine technology including Steadyflow™ powder feeders, water-cooled LENS processing head, and SmartAM™ closed loop controls. A high power fiber laser and advanced Siemens controls complete the system. Powerful Optomec software enables multi-axis build strategies that combine additive and subtractive operations in a single tool path. Optional material starter recipes and unparalleled customer service and support round out the LENS 500 Hybrid Controlled Atmosphere System.

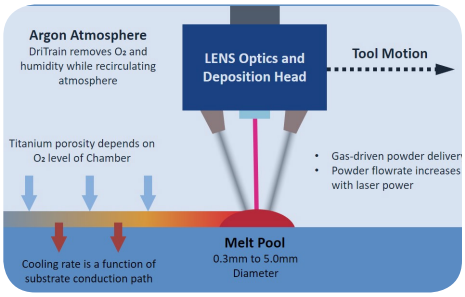
LENS 500 HY CA FEATURES

- Full Atmosphere Control – superior metal quality
- Cast Iron CNC Platform – affordable rugged base
- Full CNC Machining Capability – finished parts in one set-up
- Full LENS Additive Capability – industry proven technology
- Up to 5 Axis Motion – for complex parts/repairs
- Fiber Laser – high performance/reliability
- Closed Loop Controls – part to part consistency
- Common materials: Inconel Alloys, Stainless Steels, Titanium alloys

LENS APPLICATIONS

- Hybrid Manufacturing
- Finished Functional Prototypes
- Repair damaged/worn parts
- Restore mis-machined components
- Remanufacturing of legacy parts

Laser Engineered Net Shaping



How the LENS Process works:

The LENS process is housed in a chamber which is purged with argon such that oxygen and moisture levels stay below 40 parts per million for LENS Hybrid CA Systems and 10 parts per million for LENS Additive CA Systems. This ensures there is no impurity pickup during deposition.

The LENS Deposition head delivers the laser and powder to the deposition zone. Metal powder is conveyed through nozzles to the focal point of the laser creating a melt pool. Argon gas is used to deliver the powder and protect the melt pool from contamination.

Toolpaths are generated from a CAD model and instruct the LENS system to build or machine the part using standard G & M commands. Material starter recipes provide pre-qualified LENS processing parameters to print a variety of commonly used powders including Titanium, Inconel, and Steels.The part is built layer by layer under the control of software that monitors a variety of parameters to ensure geometric and mechanical integrity. When complete, the part is removed and can be heat-treated, Hot-Isostatic Pressed, machined or finished in any other manner.

LENS 500 Hybrid CA System

	SPECIFICATIONS	LENS 500 HYBRID CA SYSTEM	LENS 500 AM CA SYSTEM
AUTOMATION PLATFORM	Additive Mode XYZ Travel (mm)	350x350x500	500x350x500
	Subtractive Mode XYZ Travel (mm)	500x350x500	NA
	Table Size XY (mm) / Payload (kg)	600x300 / 200	600x300 / 200
	Positional Accuracy (mm)	± 0.005	± 0.005
	Positional Repeatability (mm)	± 0.0025	± 0.0025
	Rotary Table A Axis (Optional)	Removable	Removable
	Additive Mode XYZ Travel (mm)	200x350x500	350x350x500
	Subtractive Mode XYZ Travel (mm)	350x350x500	NA
	Table Ø (mm) / Payload (kg)	170 / 100 with Tailstock	170 /100
	Trunnion (Optional)	Removable	Permanent
	Additive Mode XYZ Travel (mm)	350x350x300	500x350x450
	Subtractive Mode XYZ Travel (mm)	500x350x300	NA
	Maximum workpiece size Ø, H (mm)	120x300	120x300
	Maximum workpiece weight (kg)	35	35
	Rotary axis "C "(degrees)	360	360
	Tilt range "A" axis (+/- degrees)	± 110	± 110
	CNC Controller	Siemens 828	Siemens 828
	Touch Probe	Option	Option
	System Approx Weight (kg)	2500	2500
	System Dimensions (mm)	1650x2050x2050	1650x2050x2050
LENS DEPOSITION	CDRH Class 1 / Airtight Enclosure	Standard	Standard
	Antechamber Ø (mm)	375	375
	Pneuma Seal Door with Glove Access	Standard / 2 Glove Ports	Standard / 2 Glove Ports
	Oxygen/Moisture Level (ppm)	< 40	< 10
	Powder Feeders	Up to 4	Up to 4
	Laser Power Range (W)	500 -2000	500 -2000
	Closed Loop Process Control	Option	Option
	2.5D Tool Path Software	Option	Option
	5 Axis Tool Path Software	Option	Option
MACHINING	Tool Changer	8 Tool Umbrella Type	NA
	Tool Taper	CAT 40	NA
	Spindle (rpm)	8,000	NA
	Spindle Center Distance to Column Surface (mm)	381	NA
	Spindle Nose to Table Surface (mm)	76 - 584	NA
	Spindle Motor Peak (W)	5600	NA
	Spindle Torque (Nm)	47.4	NA

ABOUT OPTOMEC

Optomec® is a privately-held, rapidly growing supplier of Additive Manufacturing systems. Optomec's patented Aerosol Jet Systems for printed electronics and LENS 3D Printers for metal components are used by industry to reduce product cost and improve performance. Together, these unique printing solutions work with the broadest spectrum of functional materials, ranging from electronic inks to structural metals and even biological matter. Optomec has more than 300 marquee customers around the world, targeting production applications in the Electronics, Energy, Life Sciences and Aerospace industries. For more information about Optomec, visit http://www.optomec.com.

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Production Grade 3D Printers... with a Material Difference

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