LENS® MACHINE TOOL SERIES

LENS 3D Hybrid 20 Open Atmosphere System

Value Leading Machine Tool for Hybrid Additive and Subtractive Metal Processing.

LENS 3D HY 20 OA System. An Additive only model, LENS 3D AM 20 is also available.

The LENS 3D Hybrid 20 Open Atmosphere System sets a new price to performance standard for combining additive and subtractive manufacturing in a single machine tool. The system utilizes Optomec industry proven LENS Print Engine technology seamlessly integrated into Class 1 Laser Safe CNC platform. The system is ideally suited for processing stainless and tool steels, nickel based alloys, cobalt, tungsten and other non-reactive metals.

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 technology including Steadyflow™ powder feeders, water-cooled LENS processing head with interchangeable powder delivery nozzles, and SmartAM™ closed loop controls. A high power fiber laser and advanced Siemens controls complete the system.

LENS FEATURES

- 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: Tool and Stainless Steels, Inconels, Hastelloy, Stellite,
- Tungsten Carbide

LENS APPLICATIONS

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

OPTOMEC®
Production Grade 3D Printers... with a Material Difference
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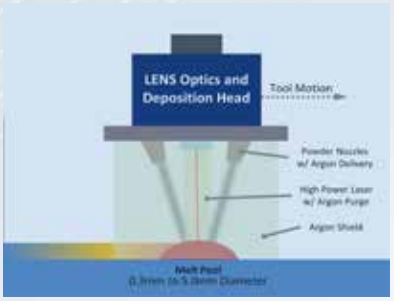
Laser Engineered Net Shaping

LENS Open Atmosphere Deposition Process



How the LENS process works

The Optomec Machine Tool Series Open Atmosphere system is housed in a Class 1 chamber so that all laser hazards are contained within the enclosure. 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. A curtain of argon gas provides additional shielding for the local build area. Tool-paths created from standard G & M codes or from a CAD model instruct the LENS machine how to build the part. 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 3D Hybrid 20 0A

	FEATURE	DESCRIPTION
MACHINE TOOL PLATFORM	Lower Base	Rugged cast iron construction, precision linear ways.
	Upper Enclosure	Class I Laser Enclosure
	Door/Glove Ports	Door and glove ports which are interlocked to prevent possible exposure to laser beam during normal operation.
	Hybrid Sys. Work Envelope	Machining Mode = 20x12x20" (500x300x500 mm) Additive Mode = 14x12x20" (350x300x500 mm)
	Additive Only Sys Work Envelope	20x12x20" (500x300x500 mm)
	Table Size/Load	12"x24"/450 lbs. (300x600 mm/200 kg.) evenly distributed
	Ball Screw Size	Precision ground 1.00" (25 mm) ball screws
	Motion	3 Axis Standard; X, Y Linear Table, Z Gantry Optional 4th Axis Rotary Table, Reduces X axis stroke by 6" (150 mm) Optional 4th/5th Axis Tilt/Rotate Table, Reduces Z axis stroke by 7" (175 mm) for Hybrid model
	Positional Accuracy	+/- 0.0002" (5 microns)
	Positional Repeatability	+/- 0.0001" (2.5 microns)
	Linear Resolution	0.0001" (2.5 microns)
	Machine Control	Siemens 828 Controller with additive/subtractive HMI. Conversational mode, G&M programming and Optional Wizards for easy additive tool path generation.
	Machine Dimensions	65x80x80" (1650x 2050x2050 mm)
MACHINING	Motor HP (Peak)	7.5 HP
	Spindle Speed	Standard: 60 - 8,000 RPM, Optional: 30,000 RPM
	Spindle Torque (Max)	35 ft.-lbs. @ 350 RPM (4.8m-kgs)
	Cutting Feed rate	0.001- 400 IPM (0.025 - 10160 MPM)
	Tool Type/Taper	CAT 40 (BT-optional)
LENS LASER DEPOSITION	LENS Processing Head	Water tight, water cooled assembly with adjustable laser spot sizes. Application specific powder deliver nozzles.
	Laser	500 W to 2 kW Fiber Laser with chiller.
	Powder Feeder	SteadyFlow™ Powder Feeder with capacity to hold up to 2 liters of powder. Optionally up to 2 Powder Feeders for alloys and functional gradients.
	Deposition rate	0.25 lbs. (0.1 kgs)/hr.@ 500 W, 0.5 lbs.(0.2kgs)/hr. @ 1 kW, ,1 lbs (0,4kgs)/hr. @ 2kW
	Deposition Process Controls	Optional SmartAM™ coaxial closed loop control
	2.5 D Tool Path Software	Optional PartPrep for 2.5D tool path generation
	3D Tool Path Software	Optional MasterCAM with Additive Plug-in for 5 axis coordinated tool path generation

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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