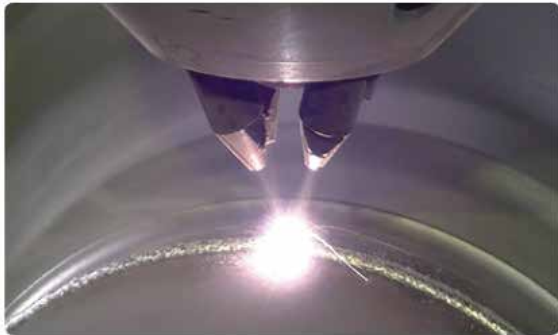


LENS[®] 450

The LENS[®] 450 brings industrial-strength metal 3D Printing technology to the laboratory and classroom

Additive Manufacturing, also known as 3D Printing, has recently emerged as the first manufacturing revolution of the 21st Century. Industrial applications are growing rapidly and processes are being qualified in numerous industries. In the area of metal Additive Manufacturing, applications such as repair, rework, coating and low volume manufacturing are being implemented across a wide range of industries, including oil and gas, aerospace, mining, power generation and medical.



LENS in Action Repairing a Casing



LENS 450 System

The all-new LENS 450 system offers a low cost entry to metal Additive Manufacturing. With a 100mm cubed working volume, 400W fiber laser and full LENS control software, the LENS 450 gives the user the same process as the industry-proven LENS 850R and MR-7, but with a smaller footprint and at a lower cost.

KEY FEATURES

- ▶ Blown Powder Deposition – visible, teachable process
- ▶ Industry-proven LENS process
- ▶ Rapid set-up – make a new material in ten minutes!
- ▶ High brightness solid-state Fiber Laser
- ▶ Rapid solidification rates (>1000C) – Novel microstructures
- ▶ Complete Atmosphere Control – full protection for highest quality
- ▶ Create mixtures - rapid alloy discovery

LENS 450 APPLICATION

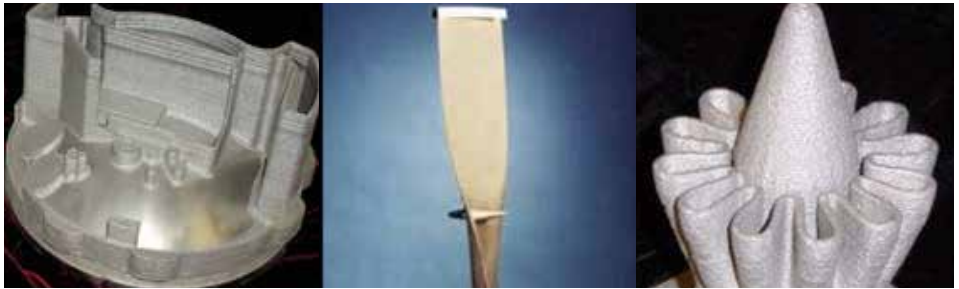
- ▶ Teaching and research on metal 3D Printing
- ▶ Rapid Manufacturing
- ▶ Rapid Prototyping
- ▶ Hybrid Manufacturing
- ▶ Rapid Alloy Screening
- ▶ Repair & Remanufacture

Laser Engineered Net Shaping



How the LENS system works:

LENS systems utilize a high-power laser together with powdered metals to build fully dense structures directly from a 3-dimensional CAD solid model. The CAD model is automatically sliced into a tool-path, which instructs the LENS machine how to build the part. The part is constructed layer by layer under the control of software that monitors a variety of parameters to ensure geometric and mechanical integrity. The LENS process is housed in a chamber which is purged with argon such that the oxygen level stays below 10 parts per million to ensure there is no impurity pick-up during deposition. The metal powder is fed to the process by Optomec's proprietary powder-feed system, which is able to flow small quantities of powder very precisely. When complete, the part is removed and can be heat-treated, Hot-Isostatic Pressed, machined, or finished in any other manner.



Defense Housing
Fabricated by LENS System

Compressor Blade
Repaired by LENS System

Exhaust Duct
Fabricated by LENS System

LENS®450 Typical Performance Parameters

Process Work Envelope	Standard 450 : 100 x 100 x 100 mm Optional 450 XL: 150 x 150 x 150 mm
Enclosure	Class I Laser Enclosure, Hermetically sealed to maintain process environment and safety
Motion Control	3-axes standard: XY linear table motion Z Gantry motion
Positional Accuracy	± .25mm
Linear Resolution	± .025 mm
Motion Velocity	60 mm/s
Deposition Rate	Up to 0.5 kg/hr
Gas Purification System	Direct purge system to achieve low oxygen levels
Powder Feeder	Standard 450 :One integrated feeder (option to add one more) 450 XL: powder feeder cart with one feeder (option to add one more)
Lasers	400W IPG Fiber Laser
Software	Workstation Control; STL Editing; PartPrep slicing
Enclosure Dimensions	1 x 1 x 1.5 m, standalone unit

ABOUT OPTOMECC

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 200 marquee customers around the world, targeting production applications in the Electronics, Energy, Life Sciences and Aerospace industries. For more information on Optomec Additive Manufacturing solutions, [click here](#)