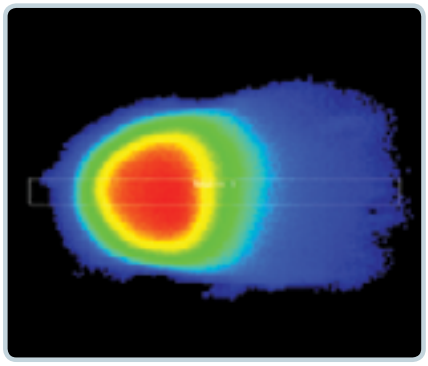
PROCESS MONITORING AND CONTROLS

LENS® systems are used in the repair and rapid manufacturing of metal components in state-of-the-art materials such as titanium, stainless steel and Inconel®. LENS users demand the highest quality, repeatability and reproducibility, and the latest LENS system options and accessories provide the process monitoring and control tools they need.

Thermal Imager

Stratonic's ThermaViz system uses an innovative two-wavelength imaging pyrometer with sophisticated image acquisition and analysis software to provide real-time, true temperature images and measurements. By providing a highly magnified image of the melt-pool, the ThermaViz software can provide the user with high-resolution, high accuracy temperature information.



FEATURES AND BENEFITS:

- Record temperature movies - verify process consistency
- Measure cooling rates – correlate to microstructure
- Visualize the melt-pool – shortcut process development

NEW FOR 2013

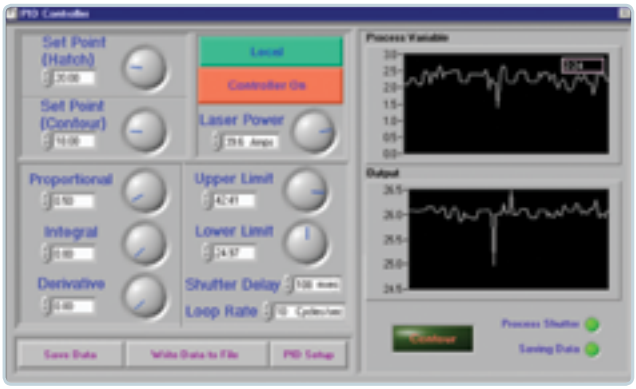
- Optional capability to measure as low as 600C – perfect for bulk metallic glasses and solid-state phase transformations
- Increased frame rate – 8 images per second
- Simplified alignment and calibration software tools
- New user-friendly calibration system
- Now also available for the 850-R

Melt-Pool Sensor

In use for over ten years, the LENS Melt-Pool Sensor provides a closed-loop option for users looking to control the heat input and microstructure of the LENS process. This sensor measures the size of the melt-pool and keeps it constant by continuously adjusting the laser power.

FEATURES AND BENEFITS:

- Control heat input – from part to part, and throughout a build
- Reduce burn-back – attenuate heat input on sensitive repairs
- Constant cooling rate throughout build – for constant microstructure
- Rapid response – up to 100Hz adjustments



OPTOMEC®
Additive Manufacturing Systems—from NANO to MACRO™

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Laser, Powder and Thermal Imager Calibration Systems

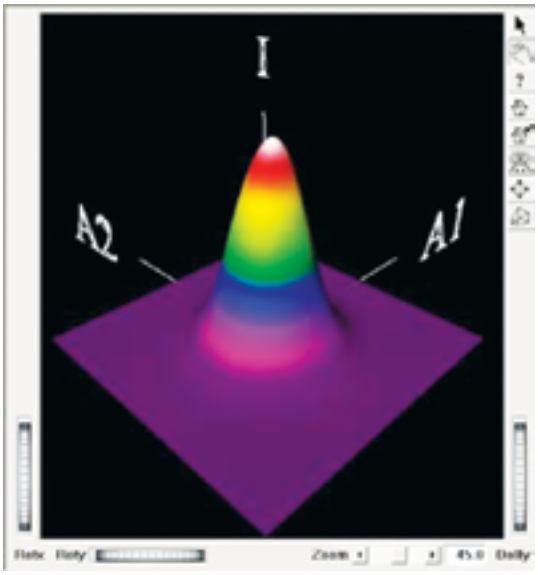
With these new LENS system accessories, the LENS user can monitor, adjust and calibrate the laser spot, powder flow, and Thermal Imager. Production users will benefit from process traceability. Researchers will enjoy the ability to quickly generate gradient material recipes.

Laser Calibration System

Ophir-Spiricon, a global leader in laser beam measurement, has packaged the Nanoscan beam profiler, a 5000W thermal sensor, and the Nanoscan software to provide an integrated package for calibrating the LENS system laser at the workpiece.

The unit can provide the following key information:

- Laser power at the workpiece
- Beam width and profile
- Beam position



Powder Calibration System

Smart Tech is a start-up specializing in accessories for laser powder deposition systems. Their first product, the Alloy Discovery System, has been extensively tested and used at MUT in Poland, and is now available to all LENS users.

This unit measures the rate of powder flow at the workpiece, and can provide the following key information:

- Powder flow rate
- Powder flow rate through each powder nozzle
- Powder flow rate through a 3mm orifice
- Powder flow rate vs. position of the orifice

Thermal Imager Calibrator

To accompany the Thermal Imager, Stratonics has now released a calibration system that can be operated by the user to verify the calibration of the Thermal Imager on a regular basis. Bulbs are calibrated by Stratonics and shipped to the user, and can be recalibrated by Stratonics to NIST-traceable standards.

ABOUT OPTOMEC

Optomec® is the world leading provider of additive manufacturing systems for high-performance applications in the Electronics, Biomedical, Photovoltaic, and Aerospace & Defense markets. These systems utilize Optomec's patented Aerosol Jet Printed Electronics technology and LENS powder-metal fabrication technology.

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