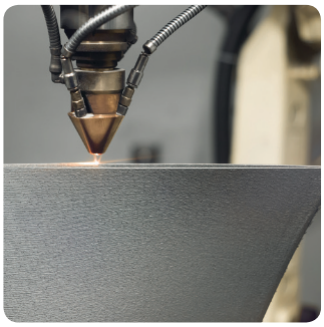
CLAMIR

NIT
New Infrared Technologies

Closed-loop laser power control system for Cladding and Laser Metal Deposition processes / Direct Energy Deposition (DED).

Continuous monitoring measuring the melt pool geometry.

- ✓ Ensures quality and repeability.
- ✓ Compatible with most of laser heads and powders.
- ✓ Easy mechanical integration.
- ✓ Quick configuration.
- ✓ Helps to reduce C02 emissions

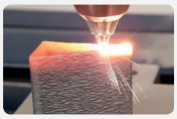


CLAMIR: LMD/DED processes

Continuous control of the laser
avoids overheating of the part under process and allows a continuous and high quality manufacturing process.

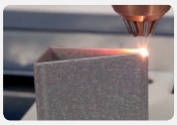
Use of CLAMIR
Reduces rates of defective parts, material reduction cost up to 60% and saves 50% more energy than uncontrolled processes.

NO CONTROL



Constant laser power causes overheating and lack of adherence to the base material.

CLAMIR **ON**



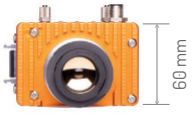
Laser power is controlled in close-loop mode in real time using the infrared image of the melt pool.

CLAMIR: Cladding processes

Reduces damage
to the base material due to excess of laser power application (average reduction of dilution: >40%)

Allows continuous processing
increasing productivity.

Water block with inlet/outlet connectors
Multipurpose I/O connector
Lens with locking counterthread
C-mount thread
GigE connector



Multiple optical configurations

MAIN SPECIFICATIONS

SYSTEM OPERATION	Continuous melt pool measurement Accurate closed-loop control of the laser power	Configuration S/W friendly user interface Easy set up	Process compatibility Tracks Continuous	S/W Indicators Melt pool width Laser power Infrared image Laser status
MECHANICAL INTEGRATION	On-axis optical system monitoring melt pool geometry	Laser head optical path needs IR transmission (> 1.1 um)	Compact system – Embedded IR camera, processor and control	Integration in the laser head using an existing optical port

COMPONENTS	Sensor head with embedded real-time processing electronics and connectors Imaging lens Software for system configuration Infrared emmiter for initial focus and optical calibration
PROCESS COMPATIBILITY	LMD process (Laser Metal Deposition) / Laser Cladding Processes
OPTICAL COMPATIBILITY	Transmission of infrared radiation (above 1.1 um) from the process area to the optical port is required. *
MATERIAL COMPATIBILITY	Steel powder, Stain steel powder, Stelite powder, Inconel, others.
LASER POWER CONTROL	Analog signal control, 0 VDC - 10 VDC
DIMENSIONS (mm) / WEIGHT	88 mm x 60 mm x 92 mm / 0.5 kg
POWER SUPPLY	24 VDC, 6W
IMAGING LENS	According clients specifications and needs. Several optical configurations available.
MECHANICAL ENCLOSURE	IP67 rated mechanical enclosure with embedded heatsink Embedded waterblock for air / water cooling
MECHANICAL INTERFACE	C-mount thread with counterthread for tight adjustment
INFRARED CAMERA	VPD PbSe camera, 64x64 pixels (pixel size: 50 microns) MWIR response (1 -5 um), frame rate 1000 images per second
COMMUNICATION INTERFACE	Gigabit Ethernet (RJ-45)
SOFTWARE	CLAMIR control SW v.1.0 (Windows 10, 32 and 64 bits compatible)
MINIMUM REQUIREMENTS	PC with processor i5, RAM memory: 8 GB Hard disk available: 1 GB, O.S.: Windows 10 or later (32/64 bits)
PROCESS CONTROL	Selectable modes: Automatic, Manual
PROCESS CONFIGURATION	Selectable process configuration: Tracks, Continuous Initial laser power Track length (Tracks mode)
OTHER FEATURES	2x digital input, 2x digital output (multiple functionalities) Process data logging

* The performance of the system may be limited if additional optical components are installed in the optical path.

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What is not measured cannot be controlled, and what is not controlled, cannot be improved.