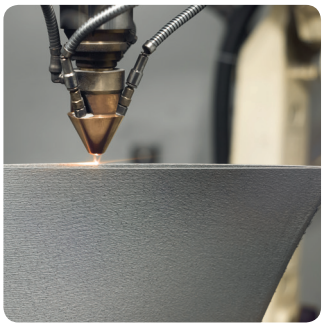
CLAMIR

NIT
New Infrared Technologies

Closed-loop laser power control system for cladding and laser metal meposition (LMD) processes/Direct Energy Deposition (DED).

Continuous monitoring and control measuring the melt pool geometry.

- ✓ Ensures quality and repeability.
- ✓ Compatible with most laser heads and powders.
- ✓ Easy mechanical integration.
- ✓ Quick configuration.
- ✓ Helps to reduce CO_2 emissions.

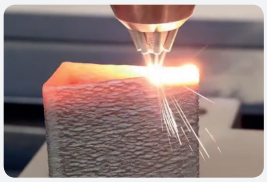


CLAMIR: LMD/DED processes

Continuous control of the laser
Prevents overheating of the part during processing and enables a continuous, high-quality manufacturing process.

Usage of CLAMIR
Reduces defective part rate, saves material up to 60%, and cuts energy consumption by half.

NO CONTROL



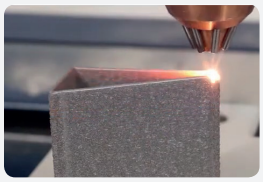
Constant laser power causes overheating and lack of adherence to the base material.

CLAMIR: Cladding processes

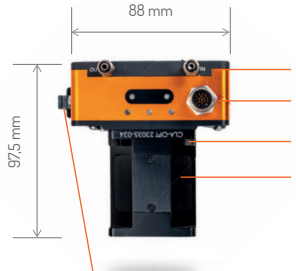
Reduces damage
to the base material due to excess of laser power application.
(Average reduction of dilution: >40%)

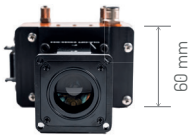
Allows continuous processing
increasing productivity.

CLAMIR **ON**



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





Multiple optical configurations

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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. Track or 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 µm).	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 emitter for initial focus and optical calibration.
PROCESS COMPATIBILITY	Laser Metal Deposition / Laser Cladding.
OPTICAL COMPATIBILITY	Transmission of infrared radiation (above 1.1 µm) from the process area to the optical port is required. *
MATERIAL COMPATIBILITY	Steel powder, stainless steel powder, Stellite powder, Inconel, and others.
LASER POWER CONTROL	Analog signal control, 0 VDC - 10 VDC.
DIMENSIONS (mm) / WEIGHT	88 mm x 60 mm x 42.5 mm / 0.5 kg. (without connection box)
POWER SUPPLY	24 VDC, 6W.
IMAGING LENS	According to client's specifications and needs. Several optical configurations available.
MECHANICAL ENCLOSURE	IP65 rated mechanical enclosure with embedded heatsink. Embedded waterblock for air / water cooling.
MECHANICAL INTERFACE	Multiple Adapters.
INFRARED CAMERA	VPD PbSe camera, 64x64 pixels (pixel size: 50 microns). MWIR response (1 -5 µm), frame rate 1000 images per second.
COMMUNICATION INTERFACE	Gigabit Ethernet (RJ-45).
SOFTWARE	CLAMIR control SW v2.3.1 (Windows 10, 32 and 64 bits compatible). Includes both CLAMIR Acquisition and Configuration SW v2.3.1 and NIT Visualization software v2.3.0.
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.

CE

* 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.