

IANUS

Laser Reconfigurable Multi-Process Cell

Open platform with robotic arm equipped with different technology solutions



Precise, Flexible, Multi process

Can perform different integrated processes:

DED Powder, DED wire, Laser Welding, Laser Heat Treatment

Also available with REAL_DED head

Dimensions (LxWxH)

3552 x 2751 x 2425 mm

Weight

2000 kg

Power supply

400 V / 50 Hz / 20 kW

Working Volume (LxWxH)

1600 x 1200 x 700 mm*

Number of integrated axes

6 to 8

Axes speed

200°/s (acceleration 300°/s²)

CAM Software (optional)

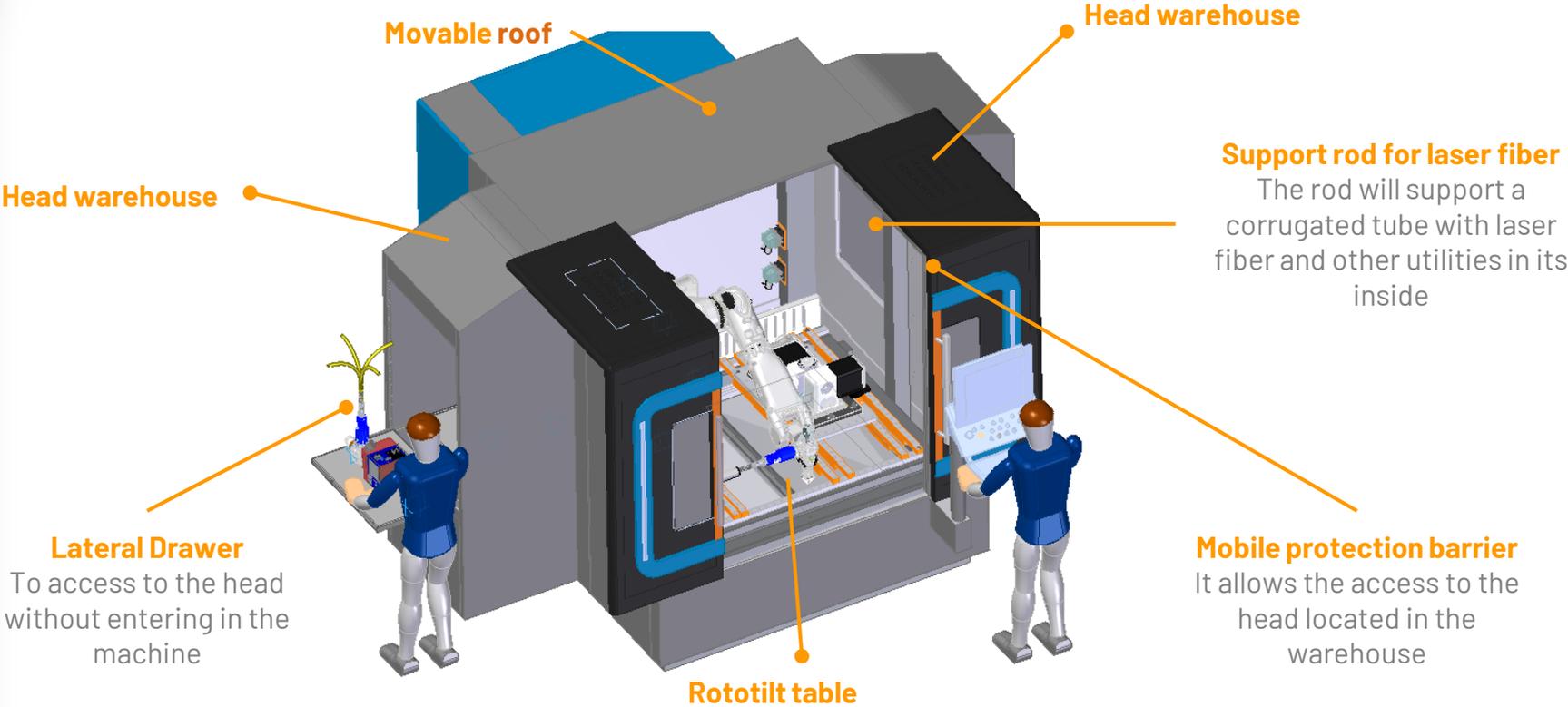
NX Siemens

CNC Software

SINUMERIK ONE Siemens

Automation possible by installing a conveyor belt and buffer

Open platform and automation



Direct Energy Deposition (DED) - Powder

DED process is based on the interaction between two elements: **laser** and **powder**.

Thermal energy from a laser source fuses metal powder sprayed and focused on the substrate.

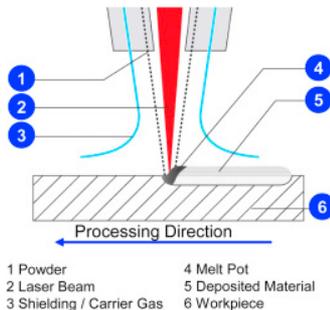
Applications: repairing of damaged parts, re-coating of surfaces, free-form depositions

→ Laser source: fiber/direct diode, power <2kW

→ Powder: metallic, granulometry 45 – 150 μm



Example for repairing of damaged blade.



Scheme of DED process.



DED - POWDER SOLUTION	
ELEMENT	CHARACTERISTICS
DED - powder head	Additive standard head - 4 beam nozzle
Delivery fiber	Dedicated fiber for the process (generally 100 μm)
Powder feeder	PF 2/2 (standard 2 hoppers)
Starting kit	10 kg of metallic powder for the start-up of the machine: AISI 316L

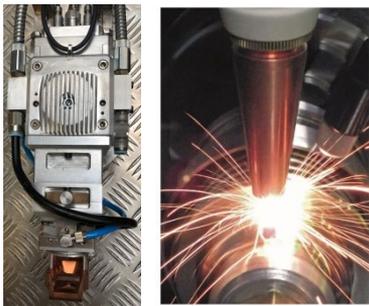
Laser Welding (LW)

LW process uses the thermal energy to fuse and to join together two pieces of metals.

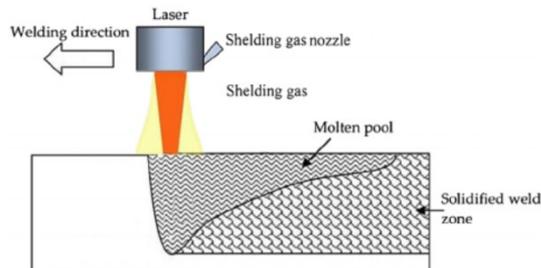
Different configurations of welding: proximity welding, remote welding (scanner head). Necessary addition of protective gas to cover the melt pool.

Applications: welding in industrial sectors (automotive, oil & gas, exc...)

→ Laser source: fiber/direct diode, power >2kW



PRIMA's head and example of welding application



Scheme of LW process

LW SOLUTION	
ELEMENT	CHARACTERISTICS
LW head	Dedicated to proximity welding
LW scanner head	Dedicated to remote welding
Delivery fiber	Dedicated to LW applications
Necessary an upgrade of the laser source (higher power >2 kW)	

Direct Energy Deposition (DED) - Wire

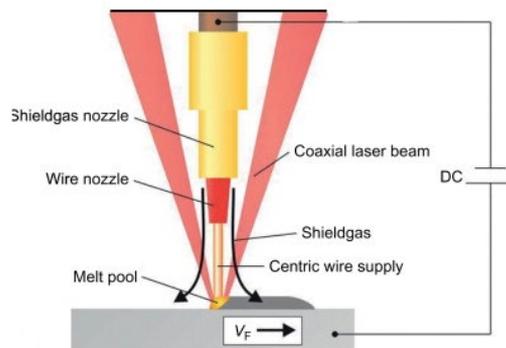
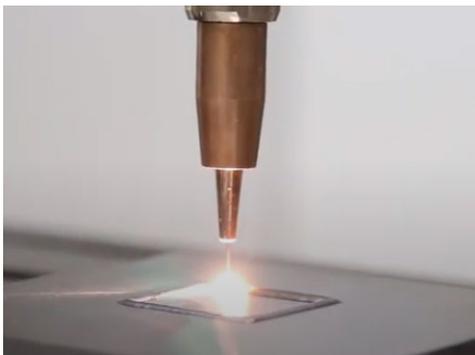
DED process is based on the interaction between two elements: **laser** and **metal**, in form of wire.

Thermal energy from a laser source fuses metal powder sprayed and focused on the substrate.

Applications: repairing of damaged parts, re-coating of surfaces, free-form depositions

→ Laser source: fiber/direct diode, power <2kW

→ Powder: metallic, granulometry 45 – 150 μm



DED - WIRE SOLUTION	
ELEMENT	CHARACTERISTICS
DED wire head	Standard wire DED hed
Delivery fiber	Dedicated fiber for the process (generally 100 μm)
Wire feeder	Standard wire feeder
Starting kit	Set of selected wire materials

Heat treatment

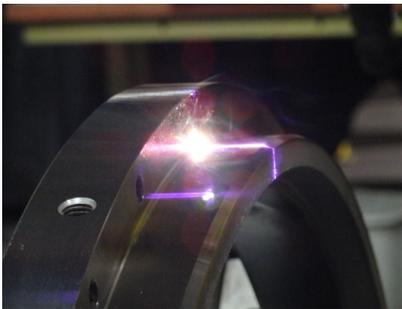
LHT process is based on the interaction between two elements: **laser** and **the base material**, no other metallic elements are involved.

Thermal energy from a laser source interacts and affects the substrates characteristics. Specific laser spot is required in order to maximize the interaction between the two elements (large laser spot and high laser power).

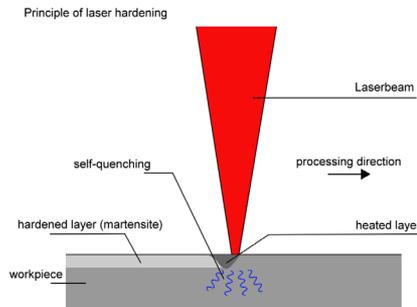
Applications: depending on the machine configuration different applications (laser hardening, ...)

→ Laser source: fiber/direct diode, power >2kW

→ Dedicated scanner head



Example of LHT process with large laser spot.



Scheme for LHT process.

HEAT TREATMENT	
ELEMENT	CHARACTERISTICS
LHT scanner head	Different head with integrated scanner and dedicated optics
Delivery fiber	Dedicated fiber for the process (generally 100 μm)
Laser source	Possible integration of a laser source with larger maximal power

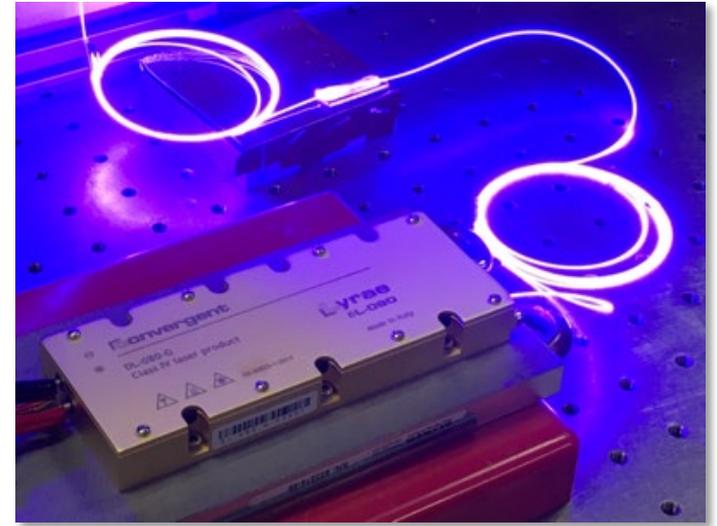
Different wavelengths for DED

In the Direct Energy Deposition process, material absorption, laser power, and high brightness are crucial factors in order to guarantee quality and repeatability.

Prima Additive invests in the development and integration of lasers with different wavelengths, according to the specific needs of the different additive manufacturing processes.

Among the developments currently ongoing there is the development of Blue or Green Laser Sources. These laser sources allow, for example, copper to be clad to stainless steel. The industrial blue laser can even clad copper on copper, something that can't be done with infrared.

Furthermore, the advantages of blue lasers are a key factor in the development of the Direct Energy Deposition process, because these sources can speed the process up to 10x compared to the IR for reflective materials such as gold, copper, aluminum...



The system is available in various laser configurations. Also available with multiple lasers at the same time.

Types of lasers available and powers

- IR (multi mode 1-6 kW)
- Blue Laser (multi mode 0.5 - 1.5 kW)
- IR (single mode 500 w)



www.primaadditive.com