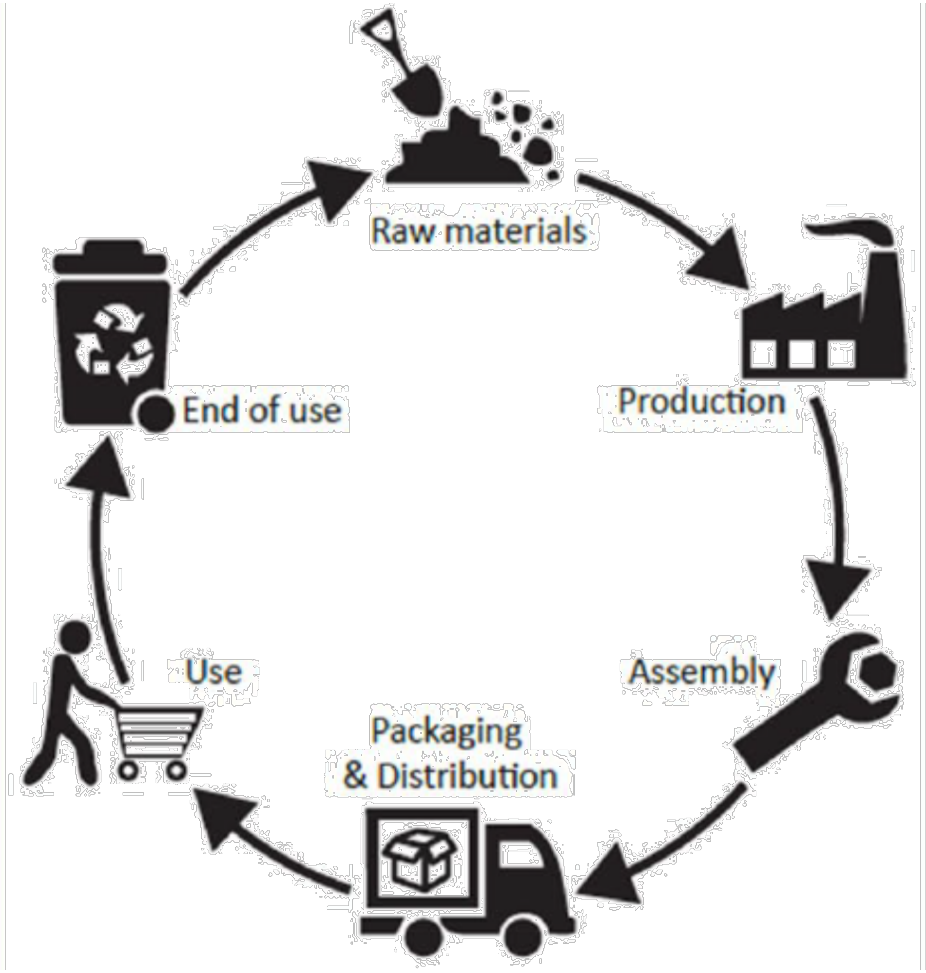
DRIVING INNOVATION
IN PHOTONICS FOR A BETTER WORLD

LASEA
LASER SOLUTIONS

LASER AND CIRCULAR ECONOMY

PRODUCT LIFE CYCLE



Before the year 2000

Moving away from the linear model—extract, produce, discard

CIRCULAR ECONOMY AND THEORY OF 4R

1. Reduce

➔ *raw material/ energy - production of machine or laser process*

➔ *Local production – Europe*

➔ *Miniaturisation of systems*

2. Re-use

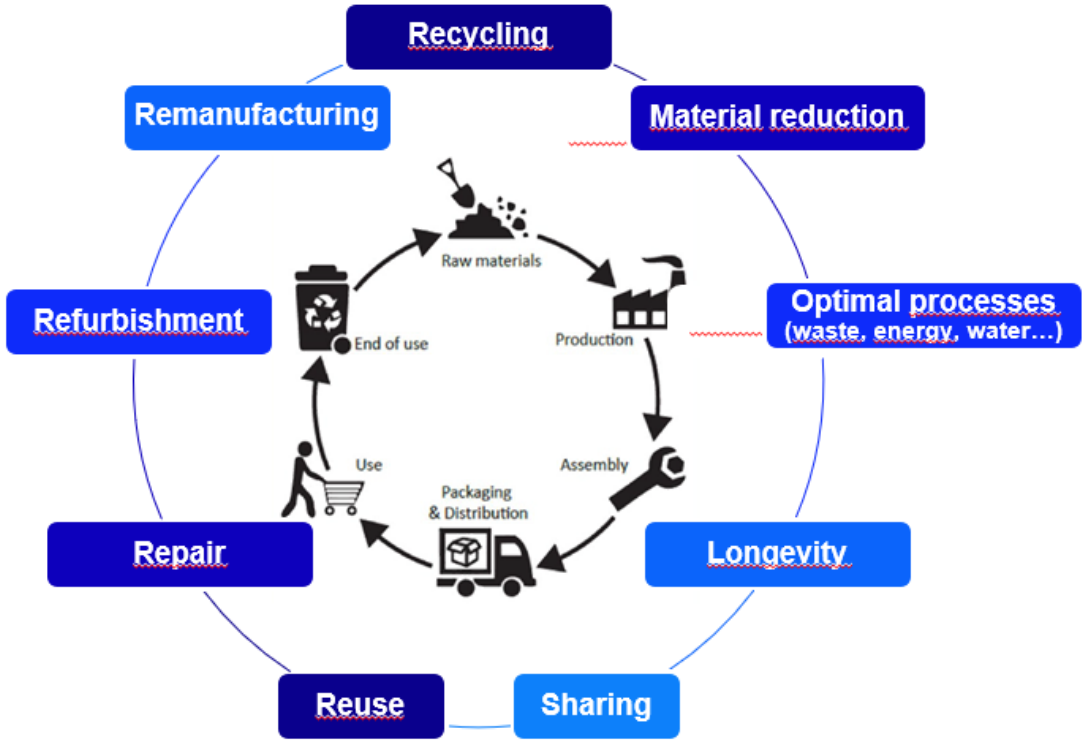
➔ *machines refurbishment – processing support*

3. Repair

➔ *Efficient after sales service*

4. Recycle

➔ *As much as possible!*



LASEA MACHINES ARE DESIGNED TO BE UPGRADED

Breaking away from planned obsolescence:

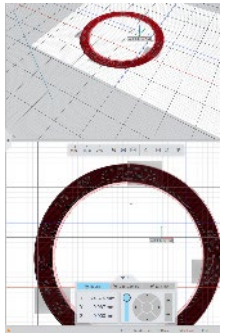
➔ **Vertical integration puts the entire value chain in our hands: quality, lead times, margins and technological ownership**

1 **Design**

2 **Mechanics**

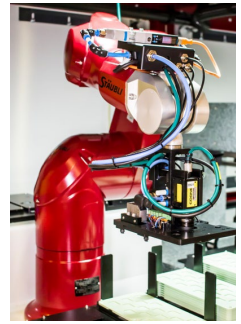
3 **Optics**

4 **Software**



5 **Integration**

6 **Automation**

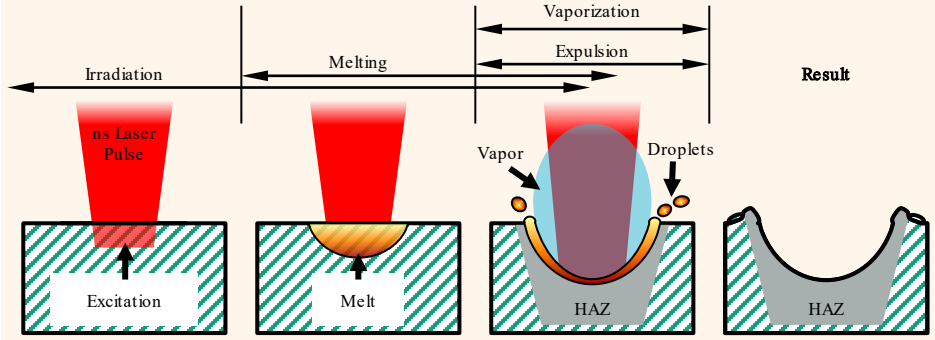


OLD MICROMACHINING

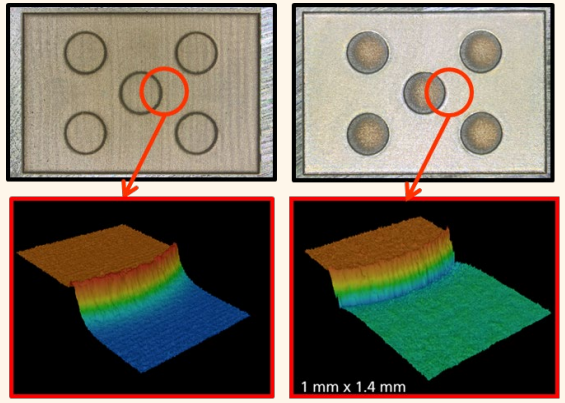
- A series of mechanical and (electro-) chemical operations, e.g.
  - Polishing, milling, drilling, cutting (CNC)
  - Electrical discharge machining (EDM)
  - Electro-chemical machining (ECM)
  - Wet chemical etching
- These methods provide excellent results, BUT!
  - Lack of flexibility
  - Cannot be easily adapted
  - Negative environmental impact
    - Harmful process chemicals
    - Waste products
    - High energy consumption
    - Minimal remanufacturing options.

NEW MICROMACHINING: LASER PROCESS

Nanosecond pulse duration

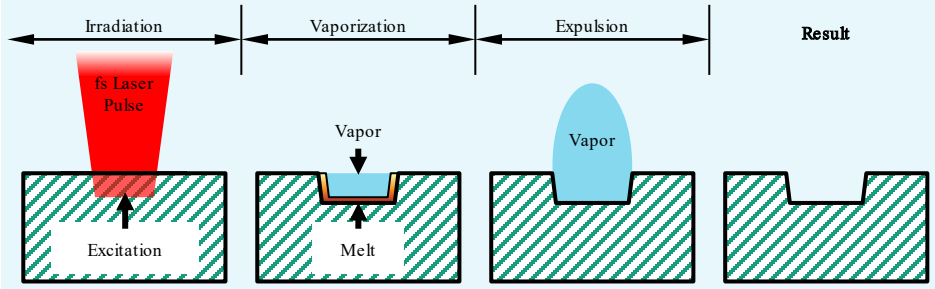


- High removal rate
- Low precision due to melt-dominated ablation
- Debris and burrs
- Pronounced heat affected zone

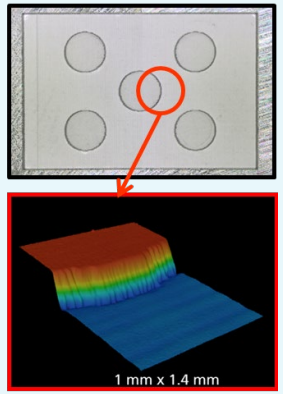


τ = 150 ns τ = 10 ns

Pulse duration < 1 ps



- High precision due to sublimation-dominated ablation
- Minimal thermal impact
- Processing of practically all materials due to non-linear absorption
- Relatively low removal rate



τ = 1.5 ps

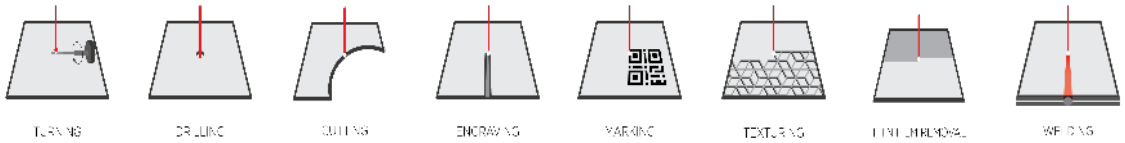
What our laser machines are able to do…

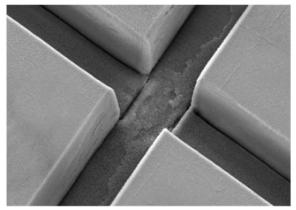
LUXURY

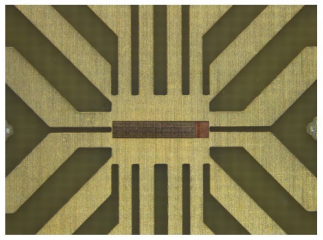
MEDICAL

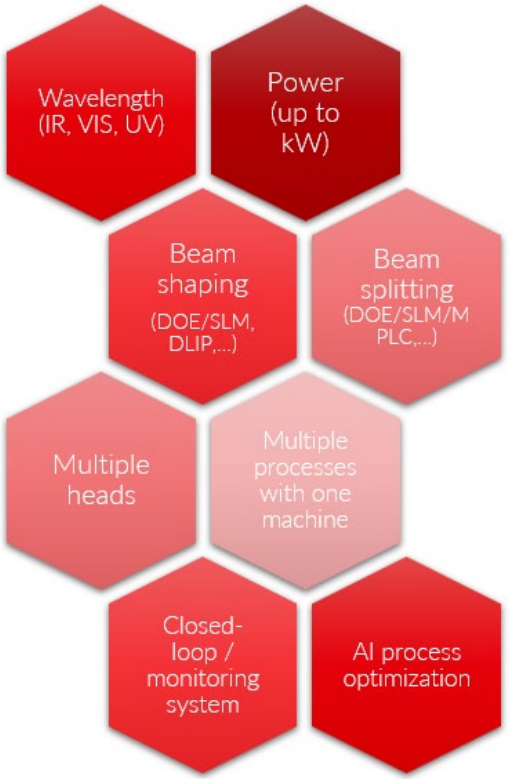
ELECTRONICS

RESEARCH









FROM THE TEXTURING OF AN AIRPLANE WING

TO THE LS LAB FOR THE LABORATORY

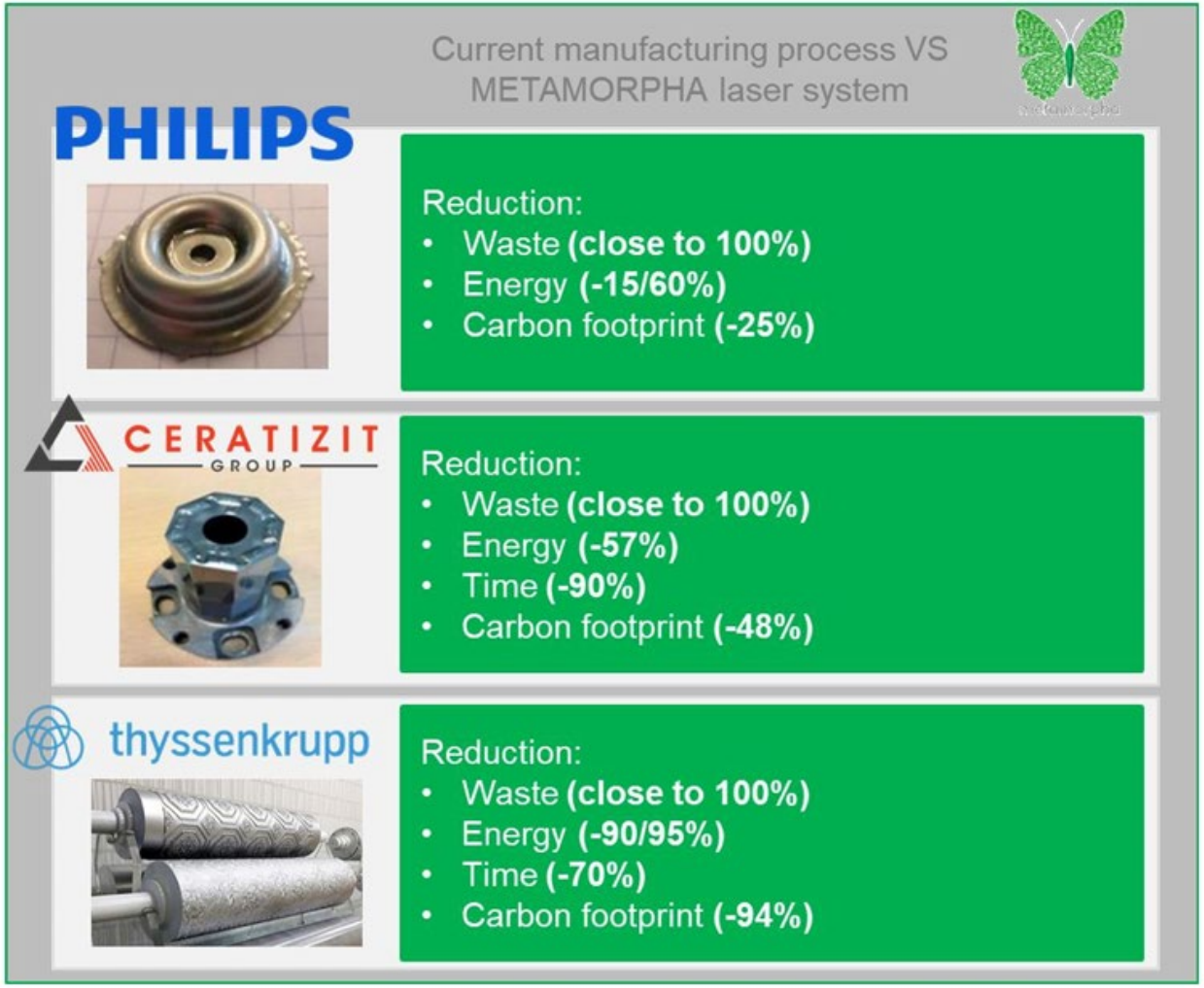
GREEN MANUFACTURING

Replacement

Wet cutting/ ECM → Laser technology

Electrical Discharge Machining → Laser technology

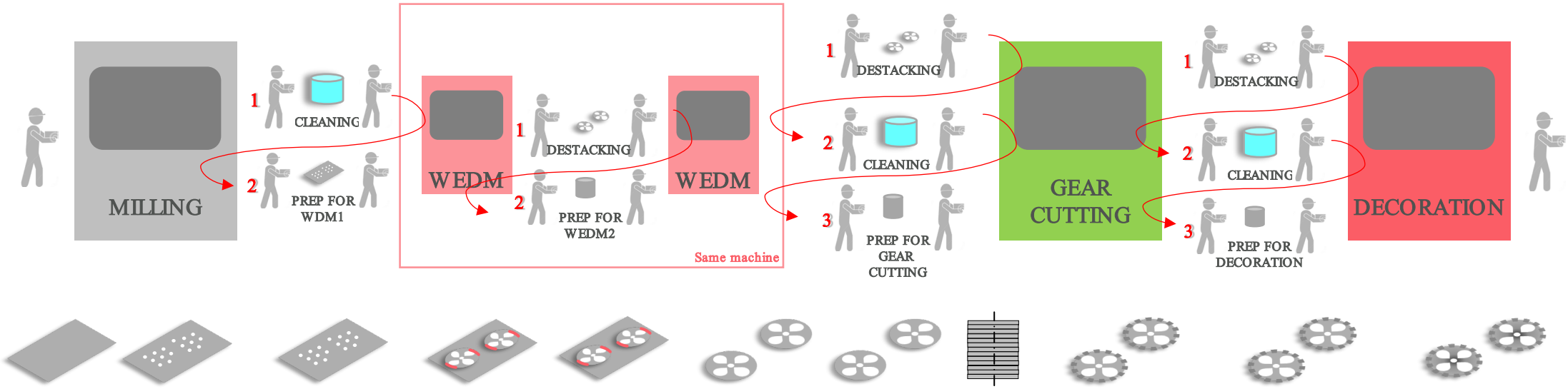
Electrical Discharge Texturing → Laser technology



The METAMORPHA project has received funding from Horizon Europe, the European Union's Framework Programme for Research and Innovation, under grant agreement 101057457.

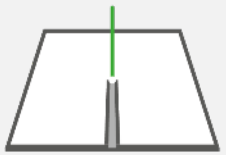
Funded by the European Union

CONVENTIONAL WAY TO PRODUCE A WATCH MOVEMENT PART



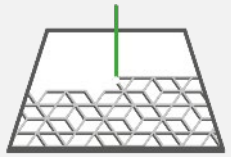
- **Many manual operations**
  - Loading/unloading
  - Stacking/destacking
  - Slug removal (WEDM)
  - Cleaning before next operation
  - Preparation for next machine
  - …
- **Many machine operations**
  - Milling of the start holes (before WEDM)
  - WEDM
  - Chamfering
  - Gear cutting
  - Decoration
  - …

2. NEW WAY TO PRODUCE A WATCH MOVEMENT PART

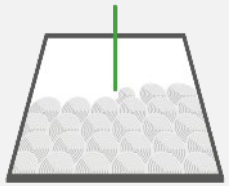


ENGRAVING

CHAMFERING

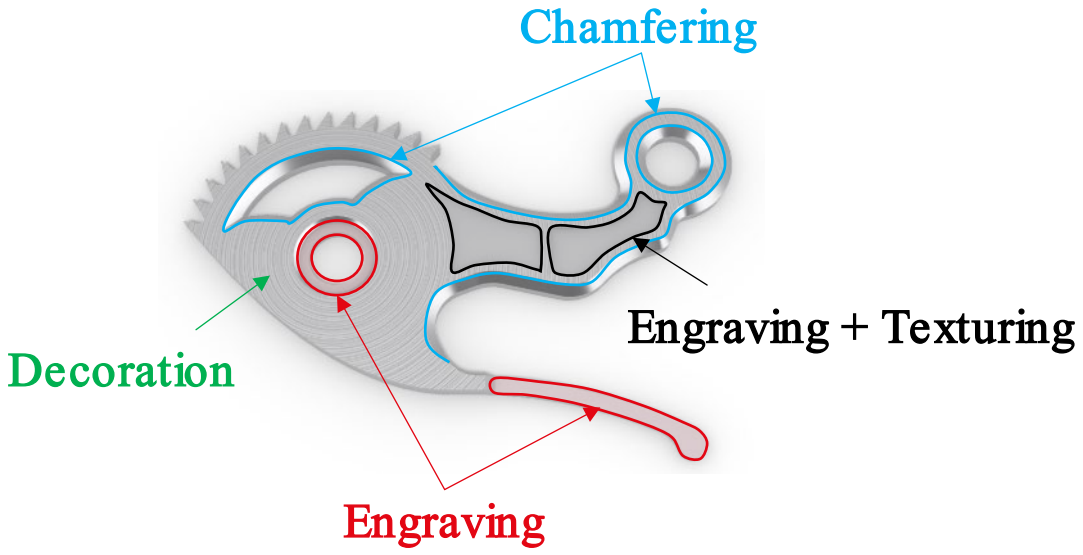


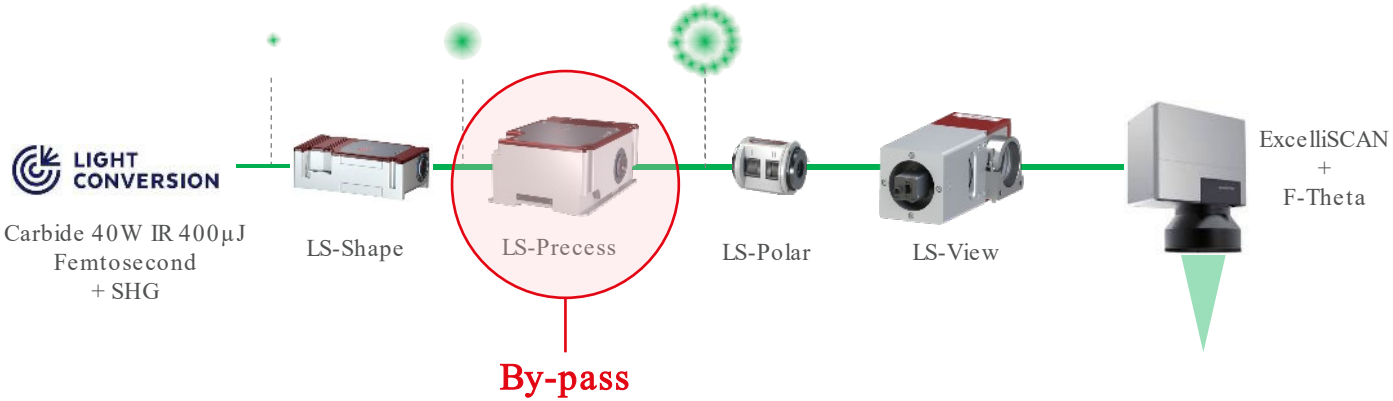
TEXTURING

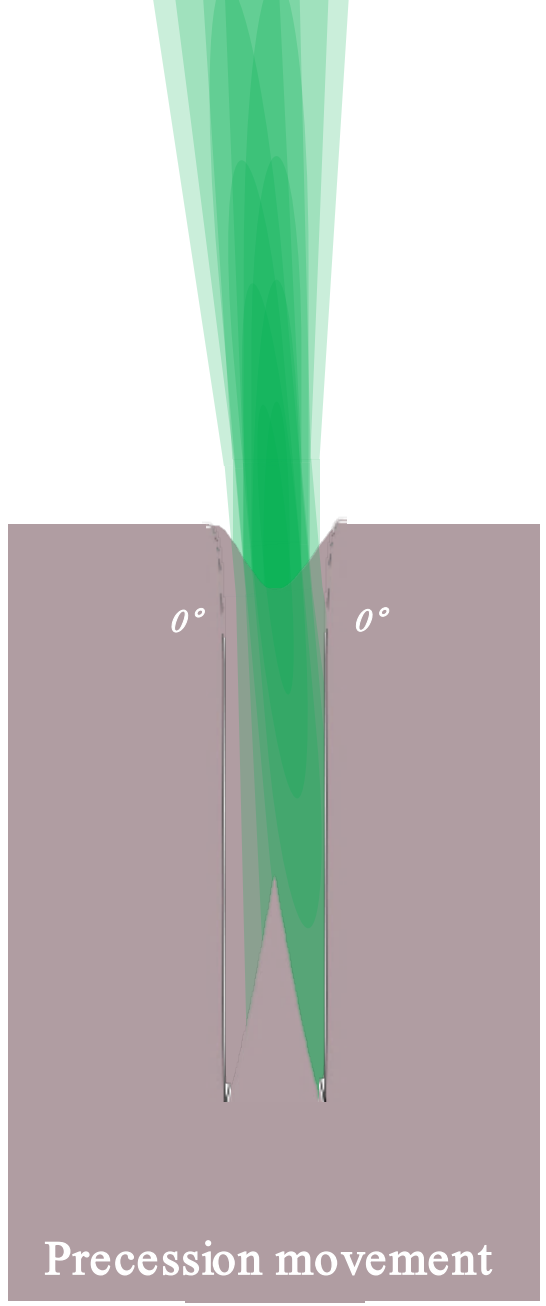


DECORATION

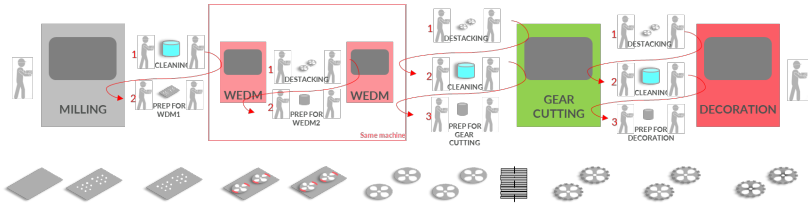
THIN FILM REMOVAL

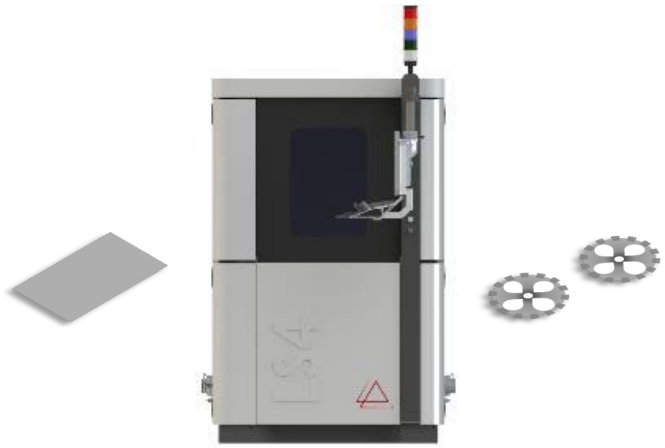






THE MOVEMENT PART PRODUCED WITH LASER, IN « ONE OP »





- **Only 2 manual operations**
  - Loading
  - Unloading
- **One operation (One OP)**
  - Laser
- **Advantages**
  - ✓ Time saving
  - ✓ Increased flexibility
  - ✓ Reduced footprint of the production line
  - ✓ Reduced overall investment
  - ✓ Reduced energy consumption
  - ✓ Reduced consumables costs
  - ✓ Reduce level of invertory (pull production production)

OUR VISION

"Driving Innovation In Photonics For A Better World"

LASEA OPTICAL SYSTEMS

LASER CHEVAL

OPTEC LASEA GROUP

LASEA LASER SOLUTIONS

LASEA
LASER SOLUTIONS

LASEA. MAKING THE SMALLEST BIG DIFFERENCE EN

LASEA - LS-Lab

LS-Lab

The right setup for micromachining process development. Like a high-end micromachining machine, this compact lab set-up, combined with LASEA's beam management modules, allows high-precision laser processes

Flexibility
Simplicity
Precision

Discover the potential of the LS-Lab on lasea.eu/applications

www.lasea.com / info@lasea.com

Version 1.0

LASEA
LASER SOLUTIONS

LASEA. MAKING THE SMALLEST BIG DIFFERENCE EN

LASEA - LS-Lab

LS-Lab

HIGHLIGHTS

The 3 available LS-Lab micromachining stations, combined with the LASEA beam management modules,enable high precision laser micro-processing processes.

This modular and upgradeable concept of machining stations and optical modules makes it possible to bettercompose your equipment according to your needs.

Designed to provide access to cutting, drilling, texturing, marking, engraving, thin-film removal and 2-photon polymerization applications, these stations are pre-assembled and aligned with the chosen optical configuration. It is placed on an optical table next to the laser. This gives you access to the best setup for developing your process.

Standard configurations :

Laser type	Femtosecond Laser 5 to 100 W
Wavelength	515/1030 nm or 343 nm
Modules	LS-Shape, LS-View, LS-Scan
Software	Kyla basic
Power supply	100-240VAC – 16 A max

Options :

- Spot size adjustment
- Polarisation control
- 0° Taper
- Optical Z axis
- Synchronise motion 1D or 2D
- Fume extractor

LS-Lab Access

600 x 1.000 x 700 mm
200 kg
Manual axis : 50x50x20 mm

LS-Lab Flex

600 x 700 x 1.056 mm
400 kg
Motorized axis : 160x160x300 mm

LS-Lab Max

900 x 1.100 x 1.100 mm
700 kg
Motorized axis : 300x300x300 mm

Discover the potential of the LS-Lab on lasea.eu/applications

www.lasea.com / info@lasea.com

Version 1.0

LASEA TEAM

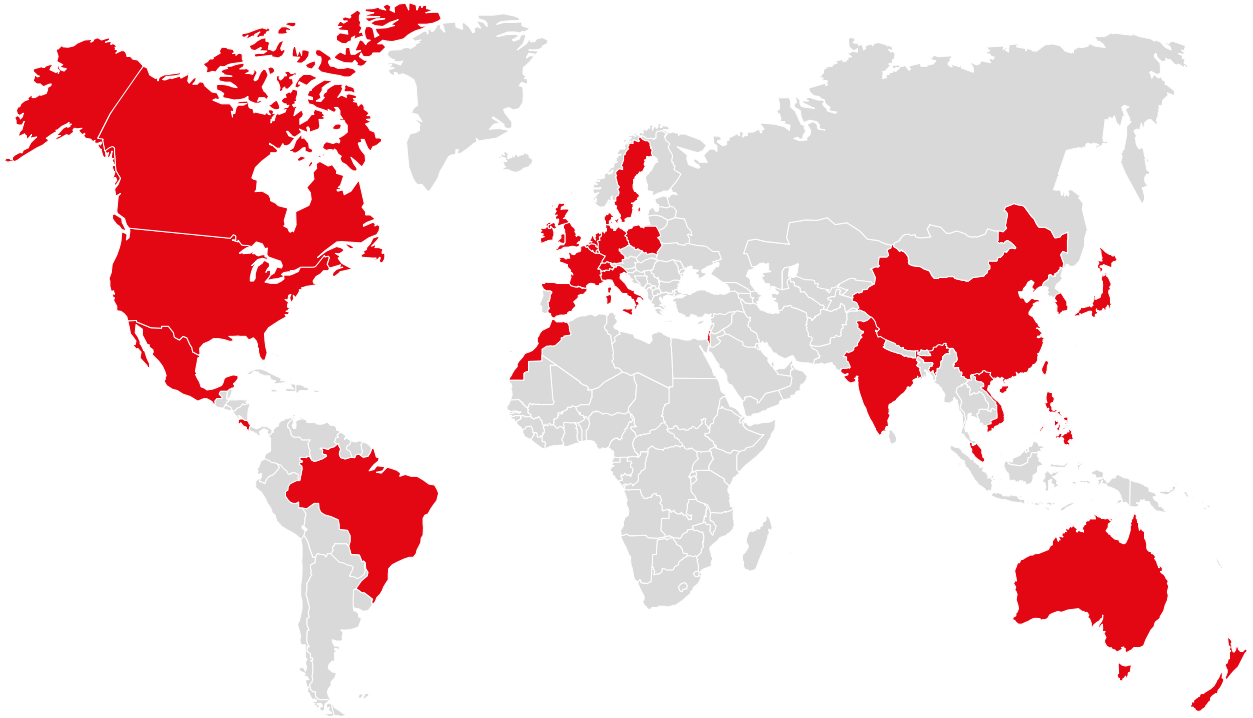
LET'S STAY IN TOUCH…

LASEA Groupe

Christophe SEURET
CEO LASEA Suisse

Thomas RAI
Product Line Manager

LOCATIONS



Countries where we have installed machines

Let's stay connected!
www.lasea.com

LASEA Belgium
Liège (HQ)

OPTEC Belgium
Mons

LASEA France
Bordeaux

LASER Cheval
Marnay

LASEA Switzerland
Biel

LASEA Inc.
San Diego

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