



Pulsate

Funded by



PHOTONICS PUBLIC PRIVATE PARTNERSHIP

In partnership with



Pulsate project: empowering SMEs competences in Laser-Based Advanced and Additive Manufacturing

Pablo M. Romero, Project Coordinator

7th - May 2024, Manufacturing Partnership Day





About Pulsate Project

Lasers in Manufacturing

Large potential benefits

- Quality
- Productivity
- Flexibility
- Inherently digital & automated tool

Critical barriers in SMEs

- Large investments with difficult to evaluate risks
- Lack of awareness: success cases and implementations
- Main developments towards large OEMs
- Different set of skills needed for operators, engineers, designers...
- Impact of the technology on the whole workshop





Pulsate

I4MS



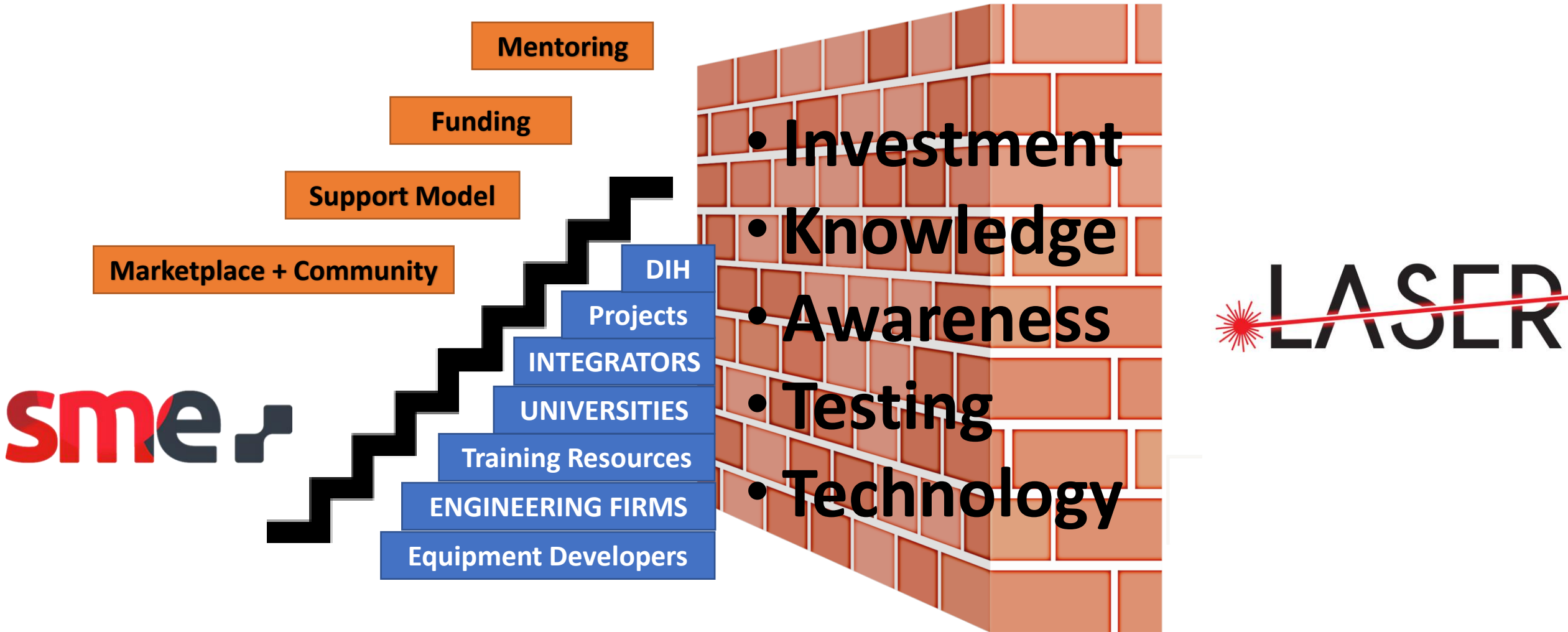
PHOTONICS²¹
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- Investment
- Knowledge
- Awareness
- Testing
- Technology

 **LASER**

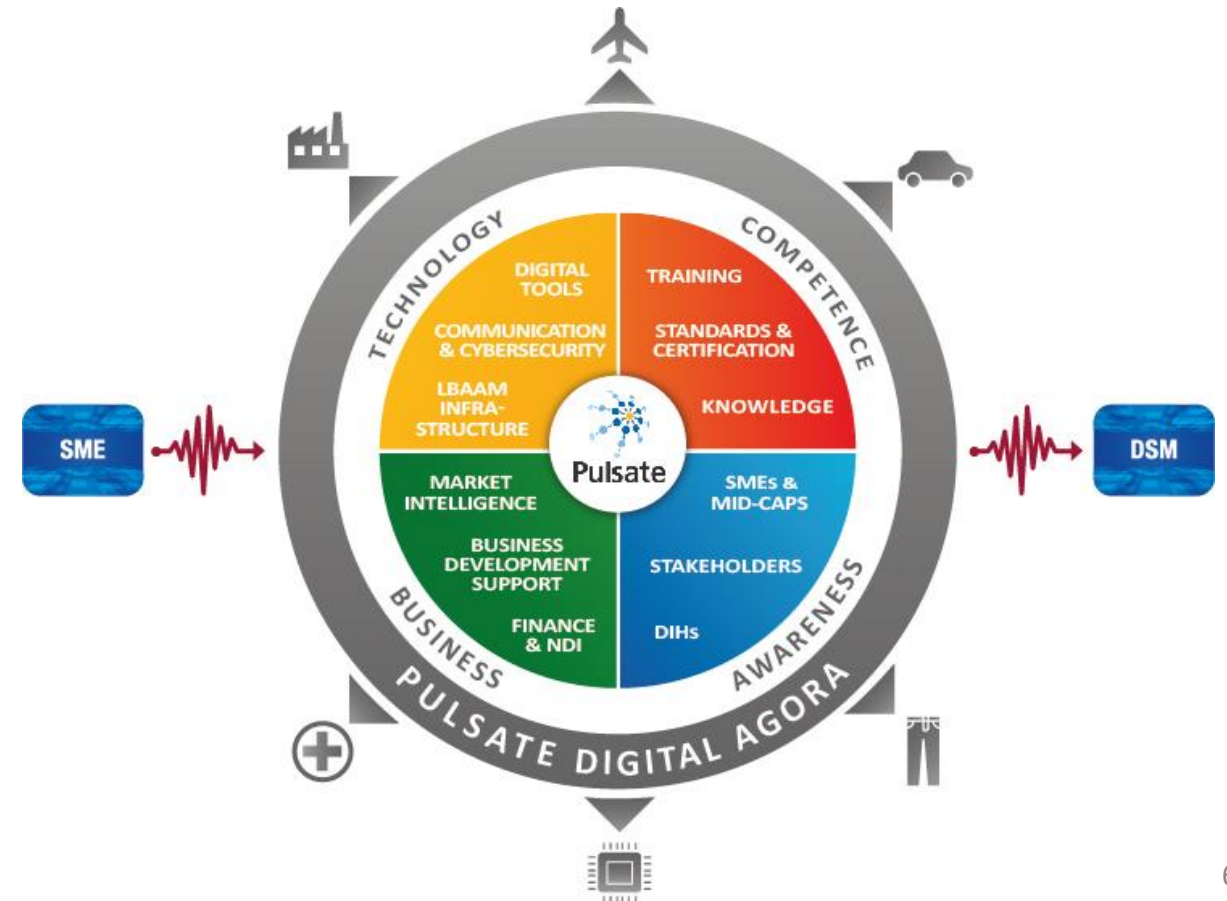


About PULSATE

PAN-European Network for Laser-Based Advanced and Additive Manufacturing

The main objective of PULSATE is to set up and consolidate a robust and open PAN European Network, sustainable beyond the project timeframe, to promote and facilitate the adoption of Laser-Based Advanced Additive Manufacturing (LBAAM) technologies by SMEs and Mid Caps.

The network will connect DIHs, top class Competence Centres, Public Institutions, Standardization Organizations, Financing and Business Development entities through a Single Entry Point.

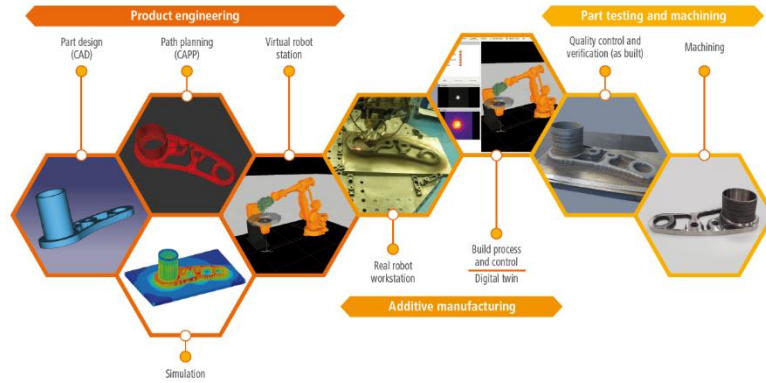


About us

We are a strong consortium to support you with any need for implementing LBAAM technologies

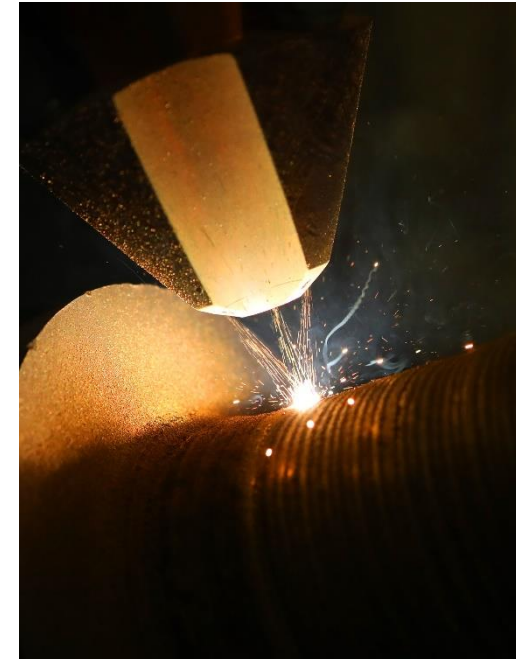
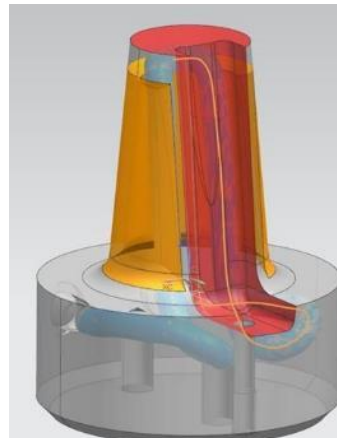


Exemple of capacities: hybridization of AM processes

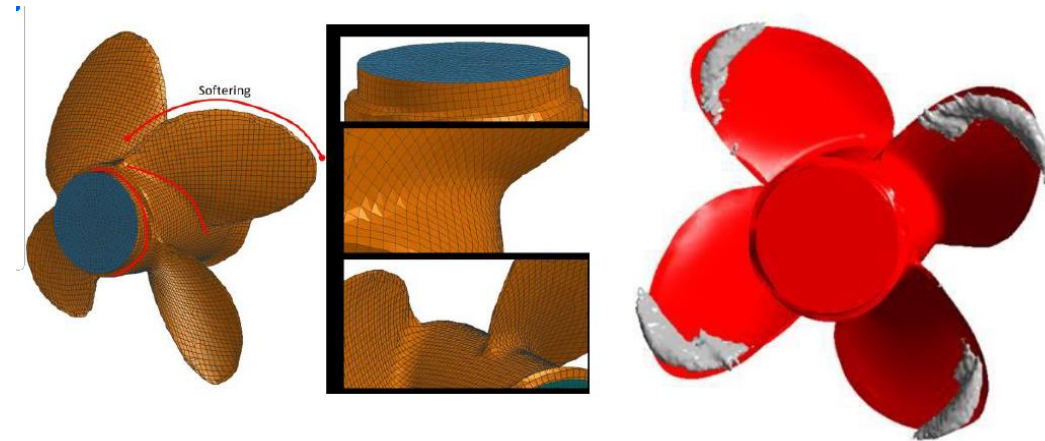
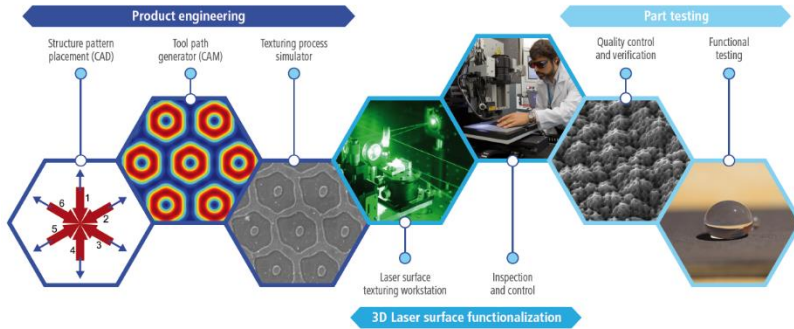


Designed to test the collaboration between us:

- Designed at MTC
- Simulated at FhG IWS
- PBF at MTC
- DED at AIMEN
- Inspected at CEA

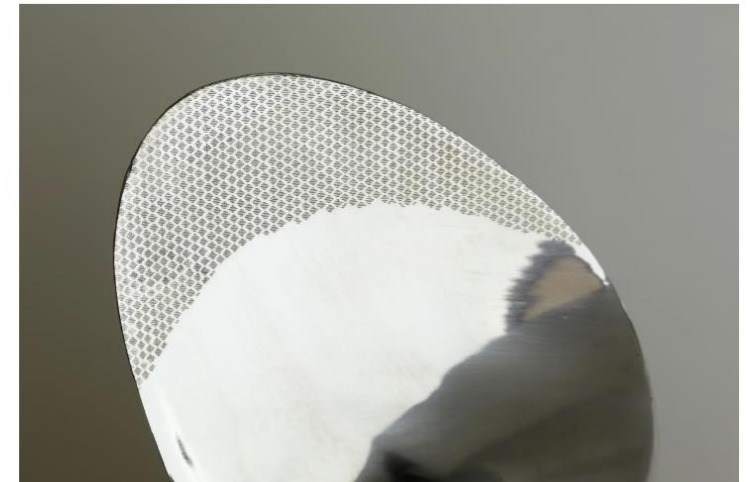
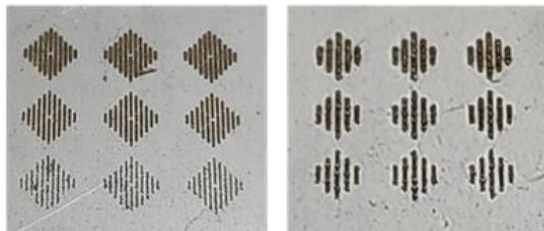


Exemple of capacities: 3D Surface functionalization



Designed to test the collaboration between us:

- Different structuring strategies at 4 laser institutes
 - FhG IWS: DLIP
 - MTC: cross hatch and dimples
 - FTMC: riblets
 - AIMEN: micro cladding
- Simulated at AIMEN



Implementing Services

Through our PAN-European Network for Laser-Based Advanced and Additive Manufacturing PULSATE aims to support the industry by:

- Financing and supporting SMEs' projects through open calls:
 - 2 Open calls to develop Technology and test it into manufacturing environment called Transfer Experiments (TTEs): **22 experiments** were funded involving **48 companies** from **15 countries**. (up to 150k€ funding / project)
 - 2 Open calls focused on technical and/or economic feasibility assessment for the implementation of lasers called Adopters Use Cases (AUCs): **38 experiments** were funded involving **38 companies** from **18 countries**. (up to 25k€ funding / project) and results of the second OC to be published in a few days (around 20 additional experiments)
 - In total: > 4 M€ of cascade funding. All open calls highly successful. **60 experiments in total**. **83 distinct companies** involved. Very high success rate in experiment completion and objective attainment (>90%). High satisfaction markings in post-project surveying (>4/5 overall markings) and measurable TRL advance in most cases (5->6-7)
- Organization of technical webinars, brokerage and matchmaking events, Open house event in laser labs.
- Dedicated online community members to share info, experience, questions...



Success stories

Success stories: SUBAR - Scale up of biomimetic antireflective surface laser structuring

- **Aim:** The assessment of Biomimetic's Tettix AR glass treatments in real imaging applications related to optical microscopy.
- **Technology:** An anti-reflective or anti-reflection coating is an optical coating applied to the surface of optical elements to reduce reflection and improve quality. Usually, developing anti-reflective coatings for new materials is a long and challenging process with many iterations to reach the desired properties.
- **Results:** Automated and sustainable AR treatment of curved optical elements with direct laser nano-texturing, which can reduce the reflectivity <math><1\%</math> for broad spectra of the visible and the NIR.

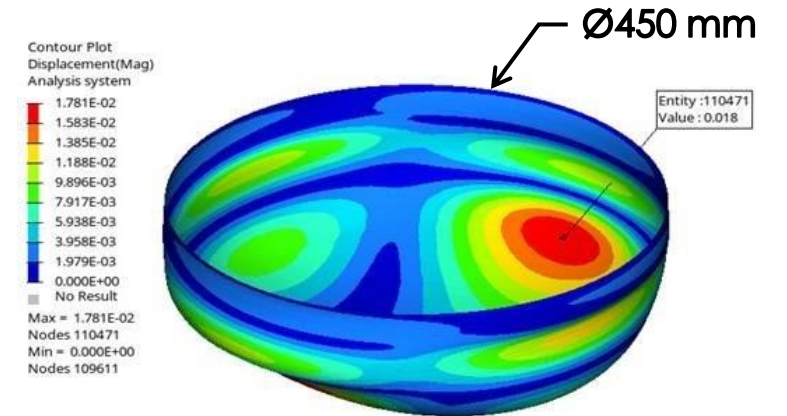


Success stories: SUPER MAM

SimUlation of DED ProcEss foR the Additive Manufacturing of lArge and coMplex parts

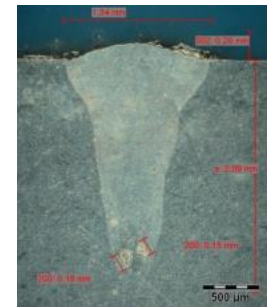
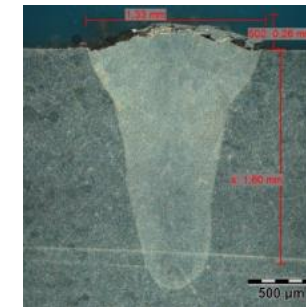
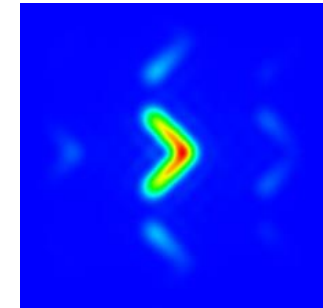
Aim :

- 1) Development of an **industrial simulation tool** to estimate the residual stresses and deformations of a part produced by DED additive manufacturing. The analysis of the results will be used to optimize the design and the manufacturing parameters.
- 2) The project's ambition is to **produce a first-time-right part** thanks to the identification of distortions ahead of the manufacturing process which will allow :
 - To control production costs,
 - To make the DED process even more competitive,
 - To accelerate the industrialization phase for DED AM parts.



Success stories: WELDSHAPE - Laser welding of hard to weld aluminum alloys

- **Aim:** The development of a unique and innovative remote welding machine that operates using a special single-mode fiber laser.
- **Technology:** In conventional laser welding processes, high-power fiber laser sources are commonly used as light sources along with heavy laser welding head that restricts the processing speed, and hence the productivity. The remote laser material processing is proposed as the technology to solve this problem, where a longer focal length than a conventional related process is used. This enables a high possible welding speed and beam shaping possibility (wobbling).
- **Results:** BBW started to weld hard-to-weld materials, like crack-sensitive aluminum alloys, in a special machine integrating both Smart Move scanner and Civan laser.



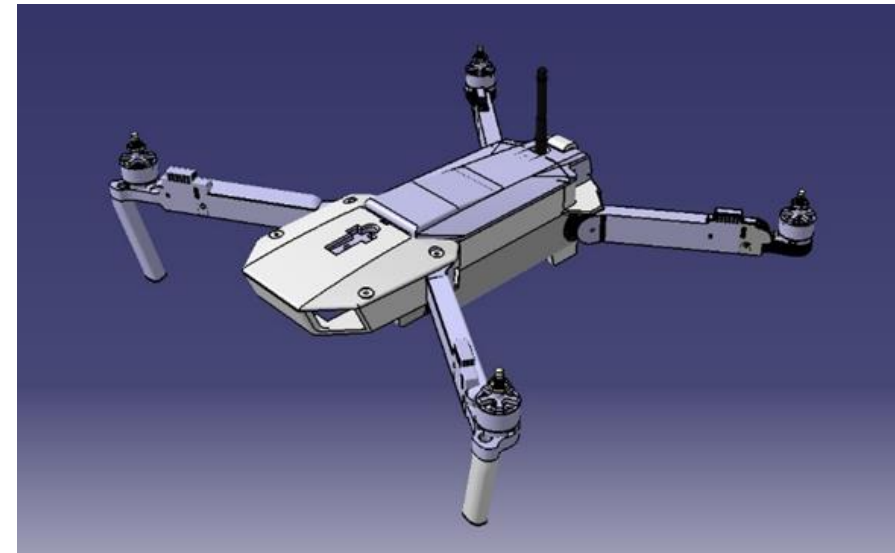
Success stories: Loom-State

- **Aim:** A technical feasibility study using Laser-based Advanced and Additive manufacturing technology to improve the zero-waste design capability of Weffan's 3D woven trousers using laser cutting.
- **Technology:** The project focused on a new area of research into LBAAM technology applied to 3D woven garment finishing. The aim is to create a sustainable, competitive, and resilient alternative to wasteful cut & sew garment production at an industrial scale using laser technology to finish garments off the loom.
- **Results:** An accessible, near zero-waste, localized clothing manufacturing alternative that integrates laser technology for a lower carbon footprint, lower waste, and resilient nearshore production.



Success stories: QUADLAM

- **Aim:** Design production of a customized quadcopter (drone) with key parameters: low weight (flight time, power-to-weight); low drag coefficient; good finish
- **Technology:** For the construction of the structural parts of the drone, it was deemed appropriate to use AM methods beyond FDM (Fused Deposition Modeling) and consider more advanced AM methods such as Laser-PBF methods.





The Digital Agora, and PULSATE beyond the EU Project

Become part of PULSATE network

Join Digital agora

Becoming a partner of PULSATE network will enable you to participate in the adoption of laser-based advanced and additive manufacturing, either as an adopter or a provider (of services, equipment, or knowledge), and benefit from the largest European community of the whole value chain in Laser Manufacturing.

Members

- Learn more about LBAAM with our courses, consulting and apps, filtered by categories
- Didn't find what you looking for – request tailor-made solution through our matchmaking system

Sellers

- Offer your services through your courses, consultings and apps.

Everyone

- Engage in community by subscribing to those discussion panels matching your interests or create your own panel



ABOUT ▾ MARKETPLACE ▾ ENTERPRISE ▾ COMMUNITY ▾ GET FUNDED ▾ EVENTS ▾ ACCOUNT (Ambrose) ▾



Participate in the *Expression of Interest* - for service vouchers

New tool working on a “first come –first served” basis

CURRENTLY OPEN

This EoI will enable any company to use PULSATE partners’ services through the Agora. It will be based on a voucher principle, giving services at no cost, and the companies will not receive direct funding.

Estimation of 10-12 services / companies to be supported.

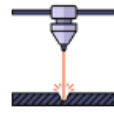
Very fast process, and even simpler than the previous Open Calls.

Not limited to SMEs. Any industrial company

Participate in the *Expression of Interest* - for service vouchers

New tool working on a “first come –first served” basis

CURRENTLY OPEN



Laser welding



Laser cladding and repair



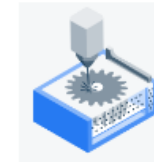
Analysis of data acquired during a
Laser-based process



Access to Infrastructure



Development of in-process
monitoring



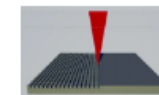
Powder Bed Fusion process and
geometry optimization



Direct Energy Deposition process
development



Development of Laser-based
additive manufacturing application



Laser surface Texturing and
Functionalization

Expression of Interest

Submission of requests started: 26- March- 2024 at 00:00 CET (Brussels Time).

Cut-off date 1: 26-Apr-2024 at 17:00 CEST (Brussels Time).

Cut-off date 2: 17-May-2024 at 17:00 CEST (Brussels Time).

Cut-off date 3: 7-June-2024 at 17:00 CEST (Brussels Time).

Cut-off date 4: 28-June-2024 at 17:00 CEST (Brussels Time).

FINAL EVENT - DATE: 18th – 19th June

SQUARE
BRUSSELS CONVENTION CENTRE

Mont des Arts, 1000 Brussels, Belgium



Open and Free Registration

Focused on networking and future support

Participation of supported companies

Cross-cutting topics:

- AI in laser manufacturing
- Beam Shaping for process improvement
- Complex 3D surface processing
- Sustainability in advanced manufacturing
- Standardization of Laser equipment/processes

Roundtable with our Board of Stakeholders
(COHERENT, TRUMPF, IPG, ROLLS-ROYCE,
DAETWYLER, General Electric, THALES, ATOS...)

Success Stories



Pulsate

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www.pulsate.eu

www.linkedin.com/company/pulsateEU

www.twitter.com/pulsateEU



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