



dilapro

DIGITAL LASER PRODUCTION

Project n° 101138859

DIGITAL TWINS OF LASER PROCESSING FOR MULTI-CAPABILITY MANUFACTURING OF COMPLEX COMPONENTS AND DIGITAL CERTIFICATION

Newsletter #6

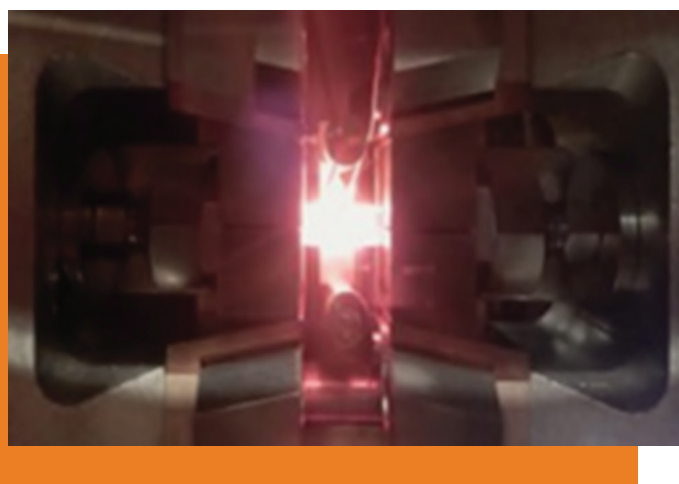
01. A Breakthrough in Laser Digital Production

The DILAPRO project is pleased to share a significant leap forward in its mission to advance laser-based manufacturing.

The team has successfully developed new methodologies for the physical simulation of additive manufacturing (AM) processes and conducted an in-depth review of laser-surface interaction modelling. This achievement provides valuable tools that will help drive innovation in the industry.

The first part of this work focuses on a new manual for the physical simulation of the AM process. This tool allows for the experimental analysis of how a material's microstructure evolves at different stages of production. This kind of fundamental understanding is crucial for improving the quality and reliability of digitally manufactured products. For the laser community, these new simulation tools mean more precise control and a better ability to predict outcomes.

The project's initial plan to create a physical simulation tool for laser surface texturing (LST) was found to be unfeasible due to current experimental limitations. To address this, the team pivoted to a new strategy, conducting a thorough review of existing modelling tools and techniques for LST using ultrafast lasers. This in-depth report will now form the basis for future modelling work within DILAPRO, with the goal of integrating these insights into the DILAFACT and DILACERT software solutions.



Furthermore, DILAPRO is exploring the effect of LST on the high cycle fatigue resistance of AM materials which remains a gap in the current state of the art.

This achievement reinforces DILAPRO's commitment to pushing the boundaries of digital production. The methodologies developed will benefit the entire laser and manufacturing community by enabling faster, more effective, and more reliable production. The project is confident that this work will contribute to a more advanced and sustainable future for the industry.

02. DILAPRO's New Inspection System Advances Quality Control

The DILAPRO project has reached an advancement in its work to improve quality control in laser manufacturing, with the successful development and integration of a customised eddy current inspection system.

This innovative system uses advanced eddy current sensors for real-time, in-situ inspection directly within the machines of the project's partners. This is crucial for the qualification and certification of manufactured parts, ensuring they meet the highest quality standards. The work has focused on integrating the original W1 AMiquam sensors into key partner systems, including those from DCU, FIELDMADE, and PRIMA.

Throughout DILAPRO, focus has been on expanding the sensor array to encompass the entire build plate in the new W2 sensor system. This provides a point cloud of the entire build job, highlighting defects and abnormalities while it is being printed. This sensor is under integration into the SLM280 system at DTI.



This development is important because it provides a new way to monitor and assess the manufacturing process as it happens. For the wider manufacturing community, this means improved quality control and process reliability, helping to produce better, more consistent products with fewer defects.

This work demonstrates DILAPRO's commitment to delivering advanced, practical solutions that contribute to a more efficient and reliable future for laser-based manufacturing.

Events



DILAPRO, FLASH, AND OPERATIC Host Successful Joint Workshop at the NOLAMP20 Conference

On 27 August, the DILAPRO team, along with the FLASH and OPERATIC projects, hosted a successful workshop at the NOLAMP20 conference.

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DILAPRO Reached Halfway Milestone at Third Physical Meeting in Lisbon

The DILAPRO project reached a significant milestone, officially completing its first 18 months. To mark this occasion and align on the project's future, the team gathered for its third physical meeting on 2 and 3 June 2025 in Oeiras, Lisbon, proudly hosted by the European Federation for Welding, Joining and Cutting (EFW).

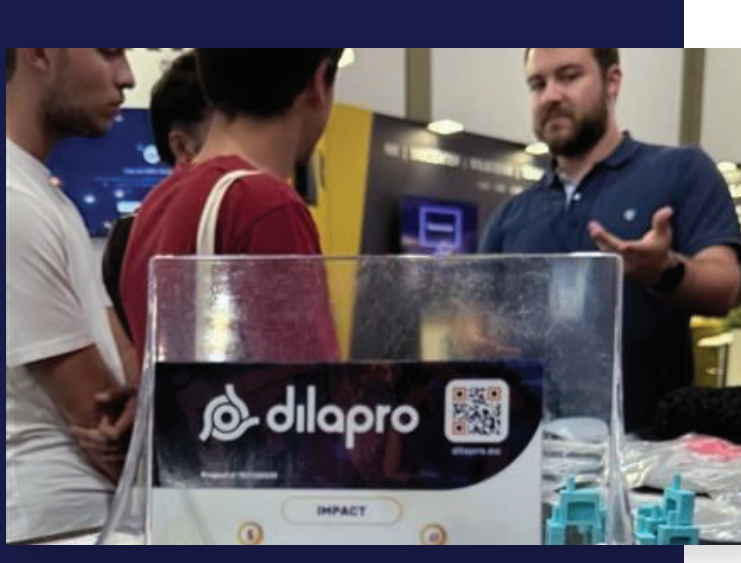
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DILAPRO Project Showcased at IIW International Conference

The DILAPRO team was pleased to participate in the IIW International Conference and National Welding Days, which took place in Genoa. The event brought together over 2,000 attendees and served as a prime opportunity for discovery and collaboration.

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DILAPRO Showcases Innovation at EMAF 2025

The DILAPRO project was a featured participant at EMAF 2025, the International Fair of Machinery, Equipment and Services for Industry. Held from 27 to 30 May at Exponor in Porto, EMAF is Portugal's largest industrial event.

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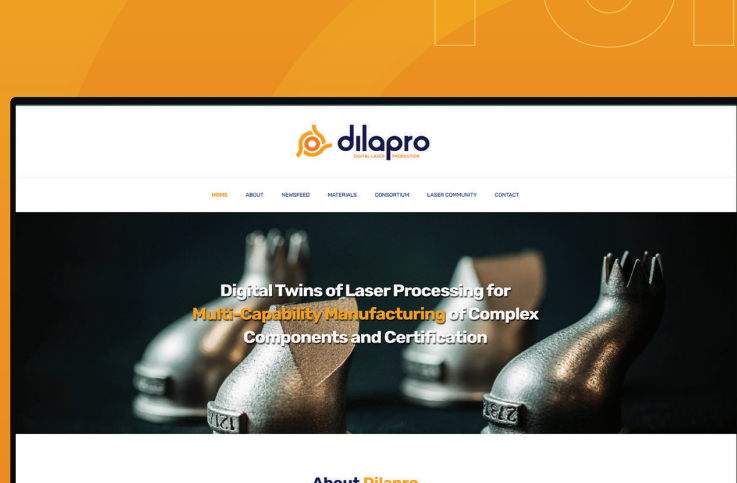


DILAPRO Project and GEAR-UP Project Announce Strategic Partnership

The DILAPRO project is thrilled to announce an exciting new collaboration with the GEAR-UP project. This partnership marks a significant step forward in its shared commitment to advancing sustainable manufacturing and driving the Green and Digital transitions across Europe

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