

FLASH

Flexible Laser-Based Manufacturing

FLEXIBLE LASER-BASED MANUFACTURING THROUGH PRECISION PHOTON DISTRIBUTION

Porto Salvo, September, 2024- Nine months into the FLASH project, significant progress has been made toward developing a versatile laser platform that integrates four key laser processing technologies: cutting, drilling, welding, and surface treatment.

During this initial phase, the input, output data, and expected outcomes for the Machine Learning (ML) component within the system's infrastructure have been clearly defined. As development and testing proceed, all data will undergo rigorous validation checks to ensure the model's consistency and quality.

The primary objective of the ML algorithm is to optimize production by identifying and recommending the optimal processing regimes across the platform. These regimes represent the specific operational conditions and parameters under which the laser machine operates to achieve desired manufacturing outcomes across various laser machining types.

A secondary objective is to provide a comprehensive cost-benefit analysis (CBA). This analysis will leverage the recommended machine settings, life cycle analysis (LCA) data, and other key performance indicators (KPIs) to offer operators clear, quantifiable insights into the financial, operational, and environmental impacts of different processing configurations. By achieving these goals, the FLASH project aims to enable businesses to reduce waste, defects, and energy consumption, while producing high-quality results and enhancing overall operational efficiency.

The benefits of the FLASH system will be demonstrated through four distinct industrial application case studies across three critical industries: automation/automotive (ATOP and TOFAS), medical (DePuy Synthes), and high-value tooling (Diamoutils).

In addition to technological advancements, the FLASH Consortium has prioritized internal skills development. The Manufacturing Technology Centre (MTC) has delivered an introductory laser processing training course, while 3 Drivers has offered a course on life cycle assessment. The University of Huddersfield has contributed with training on precision metrology.

Looking ahead, a deeper understanding of the system requirements will be developed, with a focus on options for integrating the laser platform with higher-level data management systems. This integration is crucial to ensure compatibility and efficiency throughout the project. Additionally, LCA and Artificial Intelligence (AI) will be evaluated as deployment options to identify the most effective software solutions.

Additionally, a preliminary exploitation plan for the FLASH project results has been developed. This plan includes an initial assessment of the key exploitable results and outlines the strategies and methods the consortium intends to use to create impact and ensure a lasting legacy. The current exploitation process encompasses market analysis with segmentation and a significant value proposition, along with the definition of IP strategies and the refinement of suitable business models.

The FLASH project is prepared to revolutionize laser-based manufacturing by delivering a flexible, efficient, and sustainable solution for industries worldwide.