



OPeraTIC is a project funded through the European Union's Horizon Europe programme to boost the adoption of high-power ultra-short-pulsed lasers, bringing all the benefits of high-power ultrafast lasers into large scale industrial applications.



Mission

Four pillars support our development, being the backbone of our research: the machine architecture (optics and mechatronics), the digital architecture (electronics and data), the Machine Intelligence (AI), and the adaptive processing of complex 3D parts.

Vision



We envisage the development of a platform, which can be useful for a wide range of industrial applications up to several square meters of surface to be treated, able to cope with freeform shapes, based on all the technological components developed in the project (optics, mechatronics, control and AI) seamlessly integrated into a single ultrafast laser-powered machine with unprecedented productivity and capabilities.



Solutions

OPeRaTIC will develop all the technological components required to allow high-power (>200 W), ultrashort pulse (< 30ps) lasers to become fully industrial tools for 3D surface treatment, bringing their advantages in terms of quality, efficiency, emissions (avoidance of chemicals and waste), flexibility and functionality.

Modular Laser System

We will develop all the components to take maximum advantage of high power ultrafast lasers and make them work together, as plug-and-play elements, thanks to a new machine architecture.

Data driven pipeline

We will enable the real time transmission of critical information within the system to allow closed loop control.

Zero Defect Manufacturing

Using AI and real time signals, we will enable the reduction of deviations and target a zero defect operation, even in complex pieces with dimensional inaccuracies.

Demonstrate the approach

On the basis of four very different and demanding use cases from real industry, the project will demonstrate the effectiveness of the results and the benefits against competing technologies.



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