

About ADALAM Project

ADALAM aims to develop a sensor based adaptive micromachining system using ultrashort pulsed lasers for zero failure manufacturing. The technology developed will generate completely new solutions for manufacturing of high-quality and innovative products, enabled by the ability of adaptive laser micromachining.

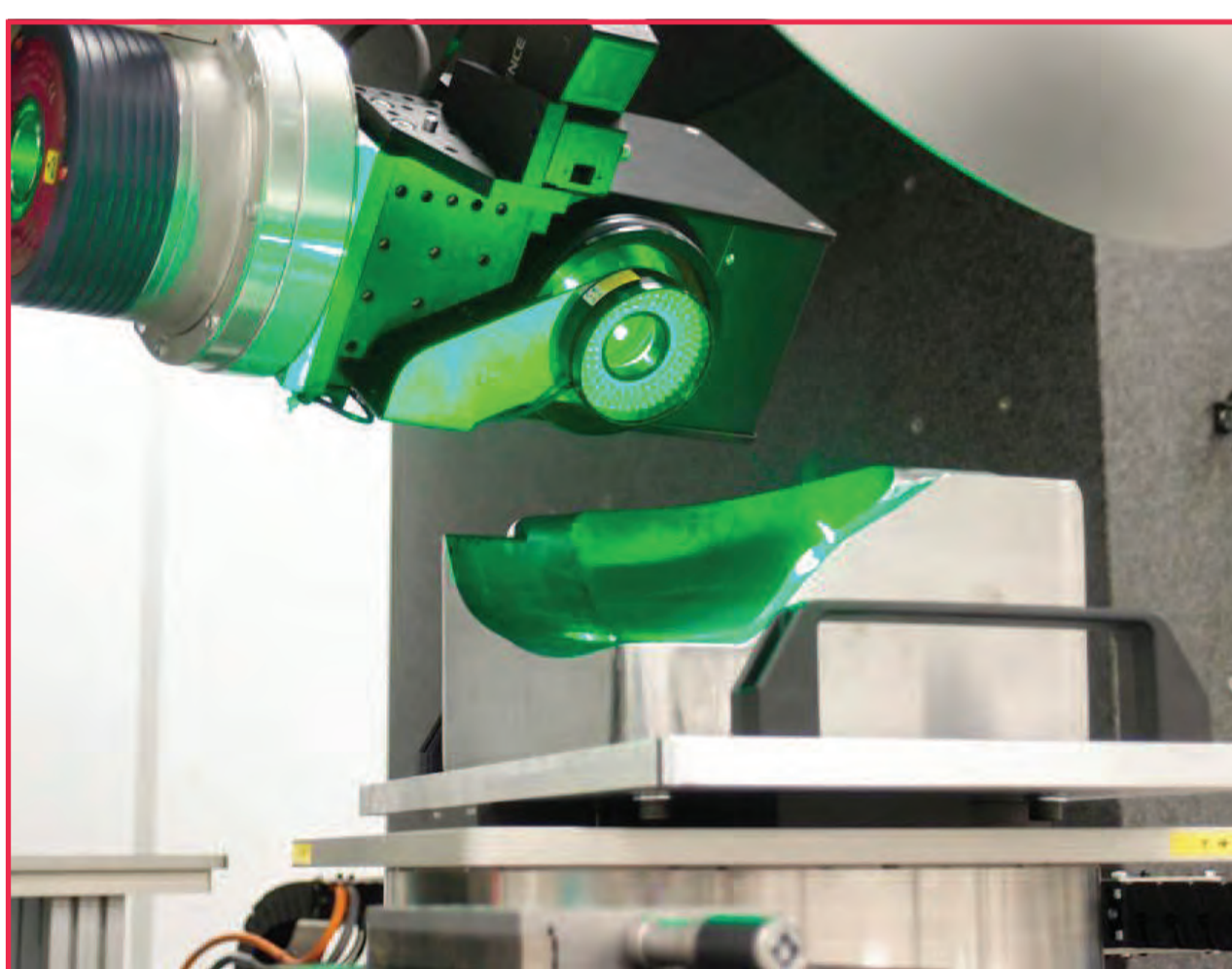
Objectives

The developed solution will be divided in three main components:

- **In line topography measurement** and pointcloud analysis software for monitoring.
- Laser machine **architecture and adaptive control** for micromachining.
- **Calibration** of the system to include traceability and certification.

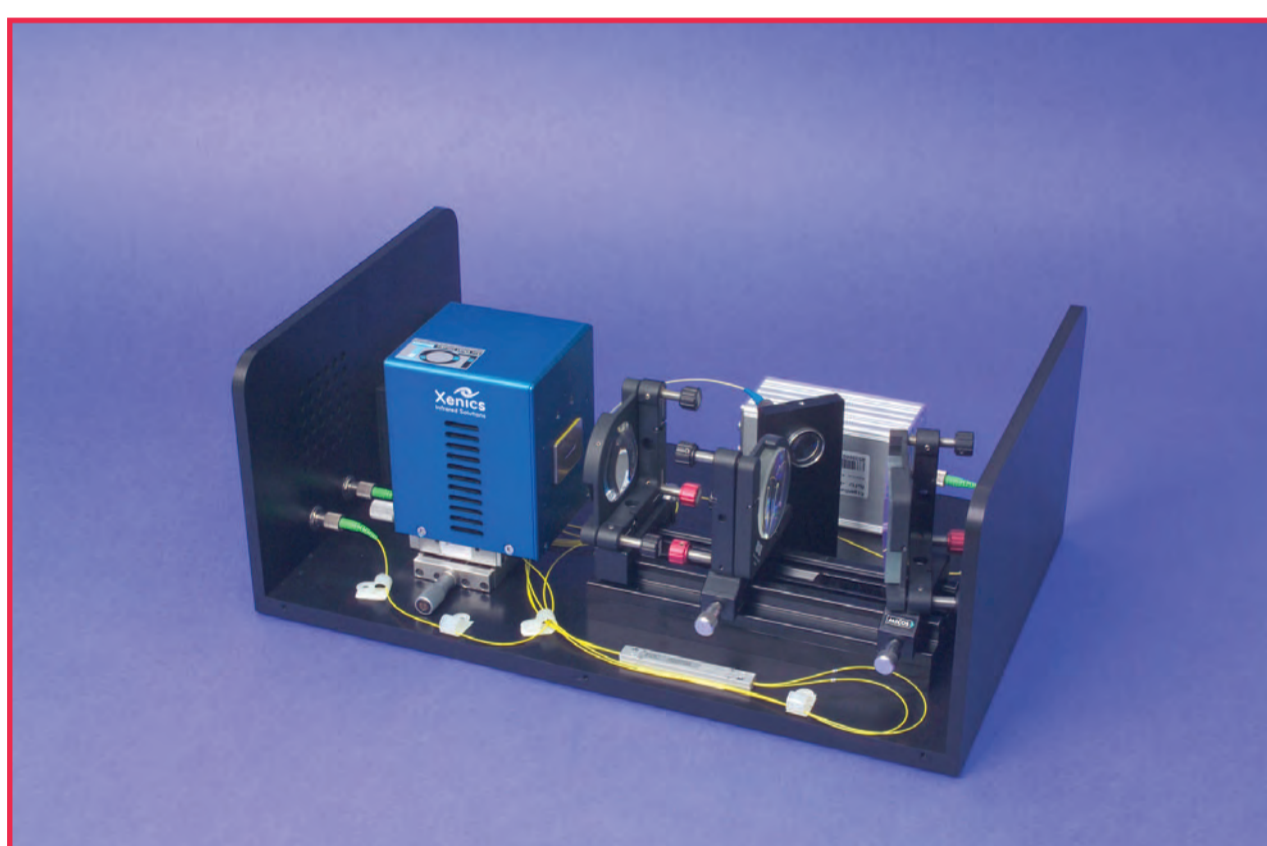
These objectives will be then evaluated in **three industrial end-user applications**.

Laser Based Machine



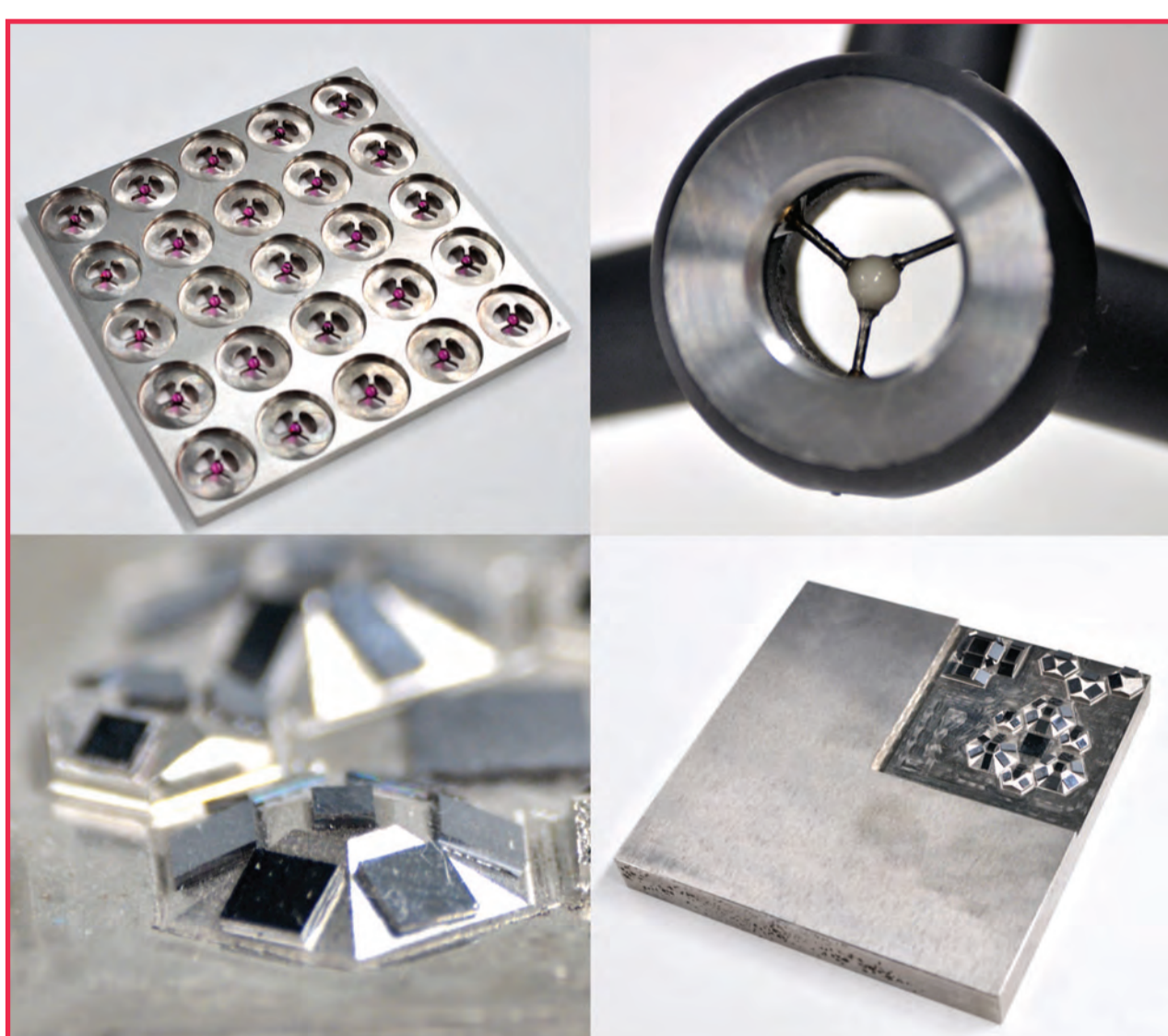
Adaptive laser micromachining system based in ultrashort pulsed laser ablation. The synchronization with inline measuring system and data analysis software will allow the zero-failure manufacturing.

In-line Measuring System



Topography measuring system based on low coherence interferometry. PointCloud will be analysed by certified software, providing feedback about micromanufacturing quality.

Calibration



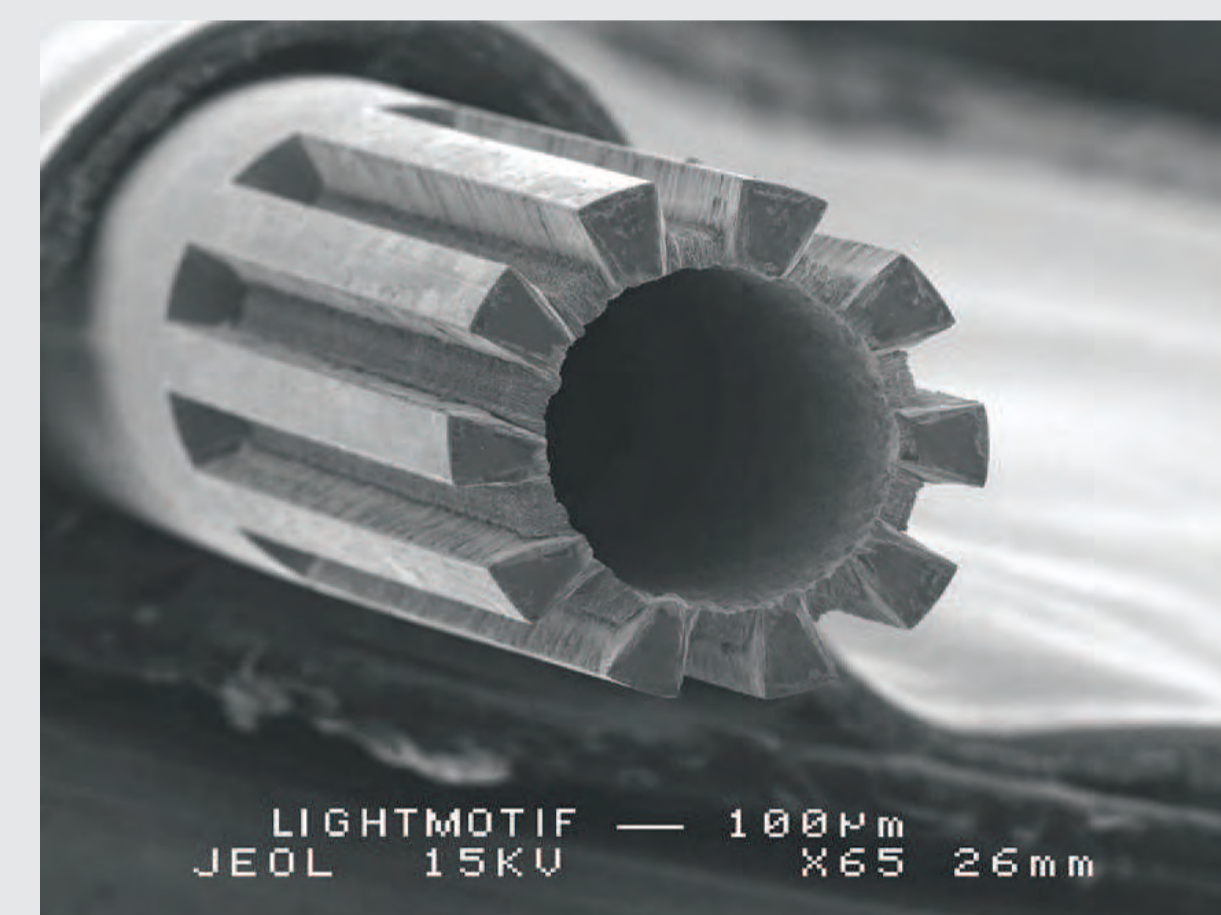
The evaluation and quantification of the error sources by exploitation of new artifacts will enable the definition of a methodology for the complete calibration of the system: measuring system and laser machine.

The Impact

ADALAM project is designed to deliver convincing evidence to SMEs of the benefits of the use of adaptive ultrashort pulsed laser based manufacturing systems and its monitoring and control with in-line dimensional metrology as well as final quality assurance for a considerably enhancement of the exploitation and usage of material and resources and the consequent generation of high quality final products.

Applications

ADAPATIVE MICRO-MILLING



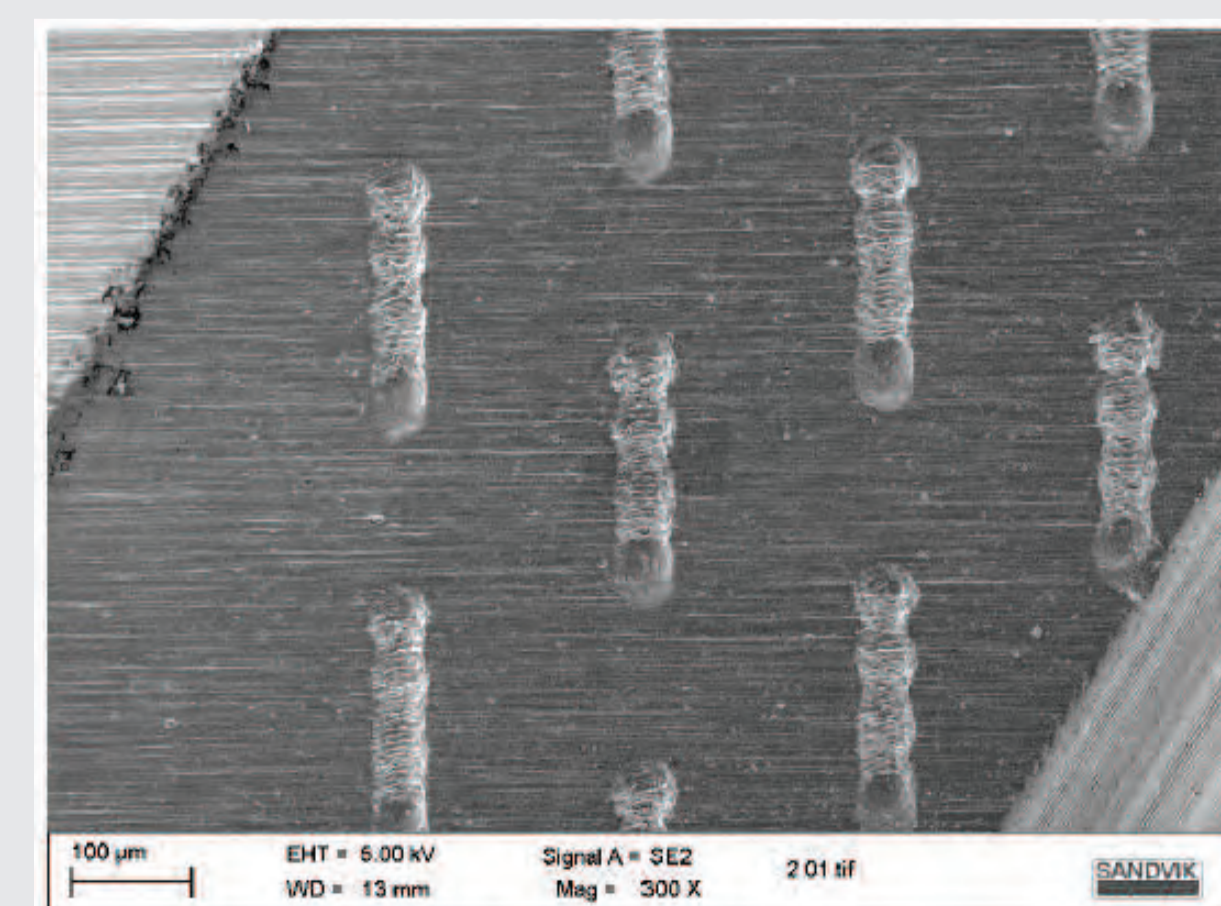
Micromilling by ultrashort pulse laser will be used to machine precise 2,5D structures into any material. Apart from applications 2 and 3, it may be exploited for the production of micro-moulds, precision stamps and other toolings.

DEFECT DETECTION AND REMOVAL



Surface defects such as high spots (pillar like protrusions) cause surface unevenness. A typical high spot show a semi-spherical shape is an example is given here.

SHAPE RECOGNITION AND TEXTURING



Micro laser textures for solid round tools using the ADALAM process to improve friction properties, wear resistance and chip break abilities. In the case of machining tools the texturization of contact surfaces as the tool's face and flank lead also to a tribological optimization and consequently to an optimization of the production process.

Project Coordinator

UNIMETRIK
METROLOGY AND CALIBRATION

Project Partners

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