

PROJECT PARTNERS

• Coordinator:

ITA INNOVA

- Spain
- www.ita-innova.es

• Partners:

FORTH

- Greece
- www.forth.gr

FUNDITEC

- Spain
- www.funditec.es

GOTTFRIED WILHELM LEIBNIZ
UNIVERSITÄT HANNOVER

- Germany
- www.ids.uni-hannover.de

ML ENGRAVING

- Italy
- www.mlengraving.com

OPTIMAL OPTIK

- Hungary
- www.optimal-optik.hu

ORP STAMPI

- Italy
- www.orpstampi.it

PLASTIPOLIS

- France
- www.plastipolis.fr

SKM AERONAUTICS

- Israel
- www.skm.co.il

Instituto Tecnológico de Aragón (ITA INNOVA) is a non profit technology centre whose main objective is to promote competitiveness.



FORTH is the largest and most successful Research Institution in Greece (1200 personnel) incorporating 6 Institutes.



Funditec is a foundation that identifies market needs and offers the technological solutions in advanced materials



Leibniz Universität Hannover (LUH) is a member university of the TU9 group. LUH is dedicated to research and education.



ML Engraving is the leader in laser engraving of 2D and 3D functional and/or aesthetic textures on moulds.



Optimal Optik is an engineering company specialising in the design and development of optical instruments.



ORP Stampi is a leader in the design and manufacture of moulds for technical rubber parts.



Plastipolis is the only competitiveness cluster for plastics and composites industry in France.



SKM Aeronautics Ltd. develops and produces precision rubber sealing solutions according to aerospace standard AS9100.



Contact details

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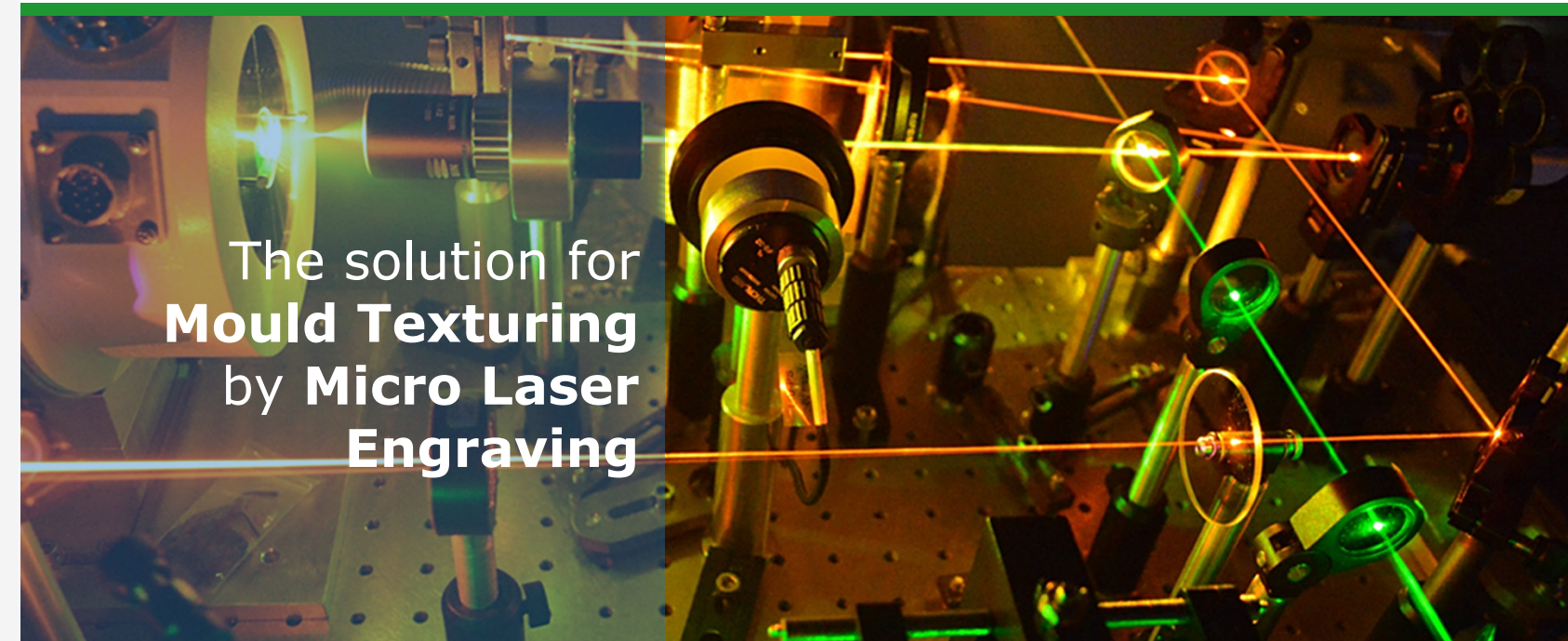


MouldTex
3D mould surface texturing



MouldTex

3D mould surface texturing



The solution for
Mould Texturing
by **Micro Laser**
Engraving

TECHNOLOGIES

Friction & Wear Simulation

Reduced Order Modelling

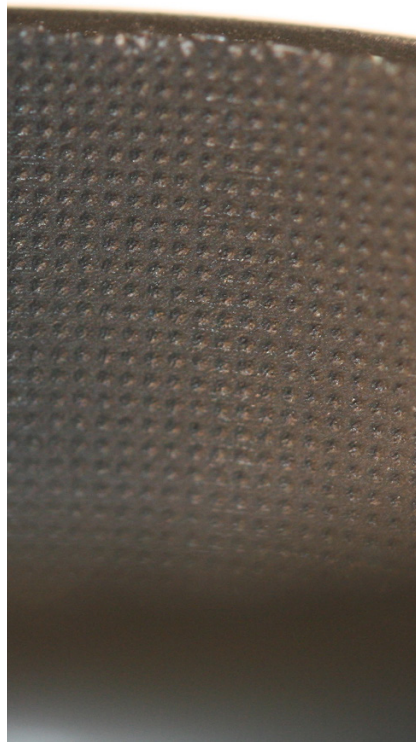
Laser Micro-texturing

Optical Technologies for Surface Inspection

Inline quality and process control

PARTNERS





Context of the project

REDUCE THE FRICTION TO OPTIMIZE SEALS

Friction is intrinsically related to seal performance. Surface texturing is a proven technique for reducing friction.

Within recent years this technique has been applied and demonstrated for polymeric and elastomeric materials at laboratory level.

MouldTex will develop and demonstrate a novel methodology for the design and high volume manufacture of surface textured polymeric components.

The novel methodology combines:

- advanced modelling software for the identification of sur-

face texture patterns that lead to significant friction reduction for target rubber and plastic seals and applications

- software for the design of mould tools that enable the reliable transfer of texture patterns onto the seal surface

- novel automated laser system for the application of hierarchical laser induced micro- texture patterns to the mould tool surface

- best practice for moulding and de-moulding using surface textured moulds

- inline optical inspection for surface texture pattern quality control.

New solution for your needs

OBJECTIVES:

To develop a :

- **friction modelling and optimisation software**
- **mould surface texturing method**
- **release agents for easy demoulding**
- **mould design tool**

To validate the results in demo pilot lines for the manufacturing of :

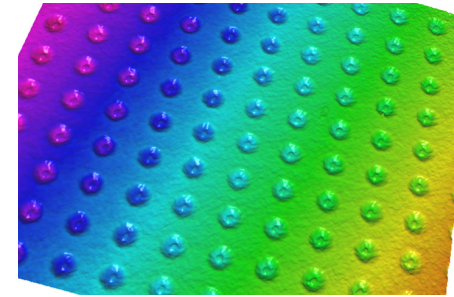
- **mould tools**
- **rotational seals for engines**
- **piston seals**

MouldTex, a project to improve rubber seals manufacturing

BENEFIT OF THE PROJECT

Affordable technologies for mould micro and nano structurations, to provide specific properties:

- **Cost-efficient**
- **Up-scalable**
- **Adaptable**



Accessible technologies to mass production:

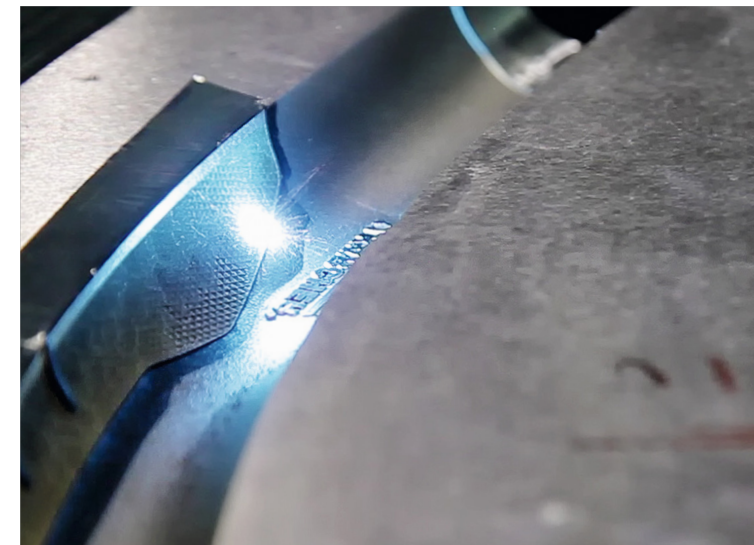
- **Design and implantation of specific methods**
- **From labs to real scale**

Accessible modelling tools:

- **Select process parameters**
- **Target specific surface textures**
- **Ease the transfer to other application**
- **Cost-efficient**
- **Sustainable**
- **Environment friendly**

Reach quality requirements:

- **In-process inspection**
- **monitoring**



EXAMPLE OF TECHNOLOGY DEVELOPPED

Laser modelling and optics for surface texturing:

Ultrashort (less than few picoseconds) laser pulses constitute a powerful tool for large scale precision manufacturing at both the micro and the nano scales.

The Ultrafast Laser Micro and Nano Processing Group (ULNMP) of the Institute of Electronic Structure and Laser (IESL-FORTH) is a, world-wide, pioneering team focusing on the development of advanced laser texturing and modeling tools for the biomimetic structuring of materials.

In this project, studies will be undertaken to better understand :

- the underlying mechanisms defining the laser-matter interactions between the picosecond-laser system and the target mould tool materials;
- the formation of laser-induced hierarchical surface texture features.

