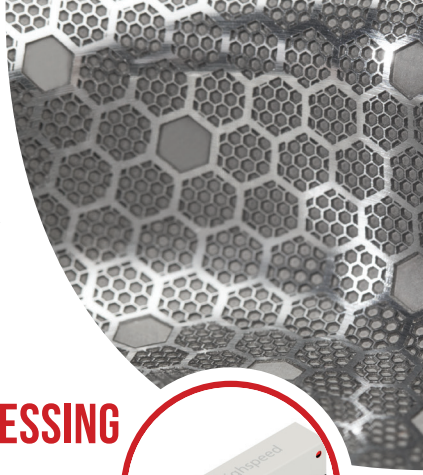
PROMETHEUS

RAPID ULTRA-SHORT PULSE LASER SURFACE TEXTURING TECHNOLOGY

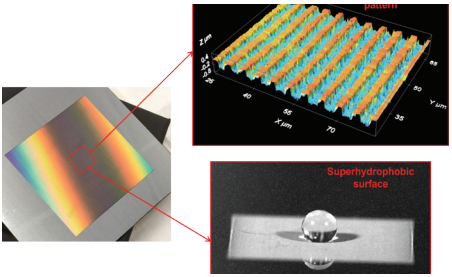


THE NEXT GENERATION IN HIGH POWER ULTRA-SHORT PULSE LASER SURFACE PROCESSING

Develop high power ultra-short pulse lasers and the associated optics to enable the precise periodic texturing of surfaces to impart a range of surface functionalities at unprecedented processing speeds.

OBJECTIVES

- Manufacture textured functional surfaces utilising fewer raw materials
- Improve accuracy, power, and control over existing technologies
- Achieve fast materials processing with processing speeds 2-5 m^2/min.
- Increase achievable precision
- Minimize heat impact on sensitive materials
- Increase productivity
- Increase achievable flexibility and product customization
- Significantly reduce processing costs



BENEFITS OF THE PROJECT

- More than 1000 jobs will be created
- An increase of the investment in innovation
- Reduction of harmful chemical usage
- High-throughput efficient material removal at up to 5 m^2/min.

PHOTONICS21

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825503 – PROMETHEUS and from the "Photonics Public Private Partnership"
www.photonics21.org

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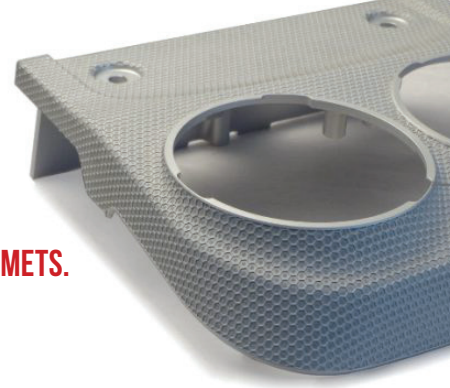


TECHNOLOGY THAT CAN BE USED ON A RANGE OF DIVERSE MATERIALS: METALS/POLYMERS/CERAMICS AND CERMETS.

EXPECTED RESULTS OF END USER CASE STUDIES

MEDICAL DEVICE PRODUCTS

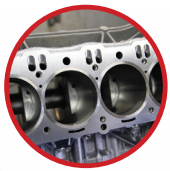
- Reduce the number of revision surgeries by Surface functionalization of polymer surface
- Improve bond strength for orthopaedic implants
- Increase health benefits for the patients

DISHWASHER

- Surface texturing applied to the dishwasher for improved drying
- Saving of electrical power and tonnes of CO2

TUMBLEDRYER

- Next generation of energy efficient heat pump
- Enabled dryers of power saving



AUTOMOTIVE CYLINDER PISTON LINER

- Increase fuel economy due to reduced surface friction
- Potential to deliver savings of CO2

AUTOMOTIVE HIGH STRENGTH ALUMINIUM PRESSING

- Laser textured mould tools have the capability to deliver step change improvements
- Weight saving of litres of fuel and tonnes of CO2 r

AESTHETIC CHROME COMPONENTS FOR AUTOMOTION

- Obtain super-hydrophobic textured surfaces
- Improve the easy-clean capability

Partners:

EWF · Prima Power · TWI · Arçelik · mtc Manufacturing Technology Centre · Johnson & Johnson VISION CARE, INC. · HOLO/OR · FCA · Fraunhofer IWS · PHOTONICS21 · THE PHOTONICS BRETAGNE Photonics Innovation Hub · aimen · MAIER · VISUM · IRIS TECHNOLOGY GROUP · edgewave

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