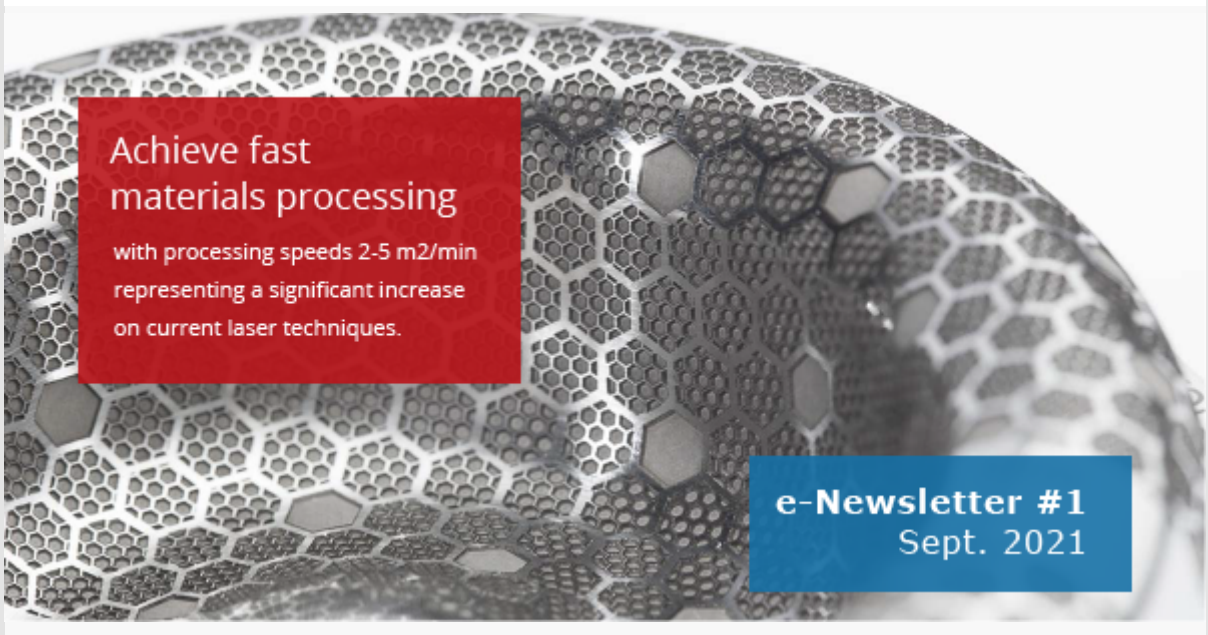
PROMETHEUS

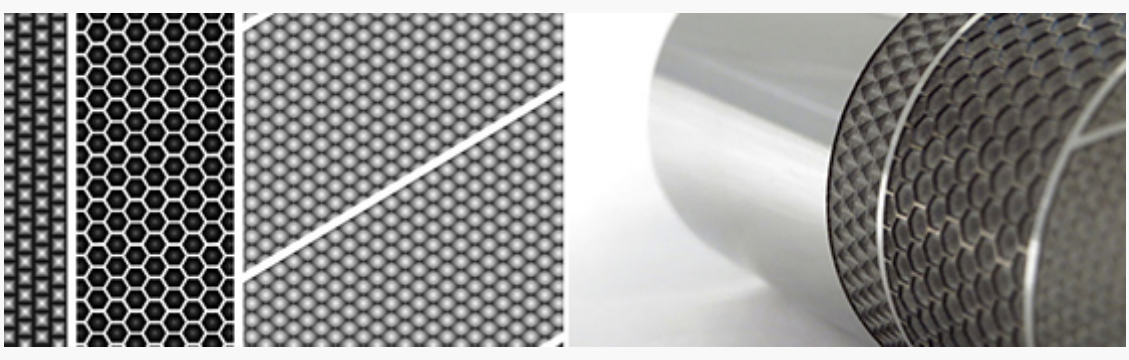
RAPID ULTRA-SHORT PULSE LASER SURFACE TEXTURING TECHNOLOGY



PROMETHEUS aims to deliver the next generation in high power ultra-short pulse laser surface processing solu-tion.

The innovative laser solution is being combined with laser optics (diffractive optic element beam splitting and M2 transformations), optical fibre delivery and in-process inspection and control to enable high throughput, high spatial resolution Direct Laser Interference Patterning (DLIP) surface processing.

The PROMETHEUS integrated system will be demonstrated to deliver unprecedented surface texturing speeds of up to 5 m2/ min, enabling high resolution features down to1 µm to be produced with minimal heat impact on workpieces. This demonstrator system will be capable of delivering a broad range of surface functionalities onto metals, polymers and ceramics.



PROMETHEUS is a pan-European EU consortium of world leading industrial and research partners with 4 multi-national end-user representatives, **Maier**, **Johnson and Johnson**, **Fiat Chrysler Automobile group** and **Arcelik** will critically assess the project's outputs against current industrial processes. These major end-users represent the automotive, white goods and fast-moving consumer

goods markets and will test both the process and the re-sultant surfaces against current production for a range of applications, including non-stick, low wear/friction, oleophobic and hydrophobic properties. By demonstrating high-speed processing and commercial application of the technology, PROMETHEUS will overcome the main limitations currently preventing large scale commercialisa-tion.

DLIP System

We are developing the fastest laser Microtexturing system of the world, but how does it work? It is based on a method called **Direct Laser Interference Patterning**, or short **DLIP**, in which two laser beams are superimposed and create an interference pattern. This pattern illuminates the substrate and, when the laser intensity is high enough, this can be treated directly, creating surface features in the range of a few micrometer or smaller as the maximum feature size DLIP can do is a few micrometer and it can go down to tens of nanometer.

PROMETHEUS' system uses a *13 mm thin laser line* in order to process the substrate faster, still keeping the size of the feature small enough for producing surface functions like self-cleaning, decoration and friction reduction or increase.

Fraunhofer IWS is in charge of developing and constructing the main functional component of the PROMETHEUS system, which is a compact module for DLIP. This module is made compact by using special, custom designed Diffractive Optical Elements (DOE) from Holo/Or. These DOE split the input beam, shape it into 2 lines, then overlap and focus the lines to exactly the same spot on the workpiece, all with absolute angular accuracy.

The module has been assembled and is currently under testing.

Events

A Public day will be organised where the leading organisations and persons of the manufacturing industry will be invited, and the PROMETHEUS presented and discussed with experts, at an online event.

It is scheduled for 23rd of November and the main technical innovation will be presented and explained in detail.

See this link for the registration on the event!

Social Media

PROMETHEUS has a website with all information summarized: Website

Besides the website, PROMETHEUS has a Facebook , LinkedIn and Twitter page where you can obtain new information about the project!

There are already some dissemination materials created for the project available on the website.

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