NANO PATTERNS
FOR INDUSTRIAL APPLICATIONS
This EU-funded H2020 project aims to bring LIPSS to mass production. This will be achieved by developing an easy to handle all in one machine that comprises a laser texturing device, an in-line monitoring system and simulation tools. Three use cases will demonstrate increased product performance:

1) MEDICAL COMPONENTS

Antibacterial properties against mouth infections along with a surface enabling a good biological response by the surrounding tissues will deliver the new generation of dental implants.

2) ADVANCED BATTERIES

Enhanced adhesion and roughening of the current collector will allow controlled changes in the current collector surface in a very cost-effective and fast way (0.1 min/cm²). It will also improve the electrochemical properties of battery current collectors.

3) LINEAR ENCODERS

Tuning the reflection properties on the scale will make the encoder less prone to misalignments.

Applying a specific type of pattern or roughness onto the surface in order to change its properties using laser technology offers a significant commercial potential. This is because it allows improved product performance without altering the surface’s chemical composition or adding any coatings. Femtosecond LIPSS will enable high resolution features (<1μm) in very precise locations with cost-effective process times.

WHAT ARE LIPSS?

Laser Induced Periodic Surface Structures (LIPSS) are naturally created by the interaction of ultrashort pulse laser beams with a surface. High resolution features (in the range of 100 nm - 1 μm) can be defined in precise locations of the component.

DUP - Direct Laser Interference Patterning
- Nano pattern possible
- Patterning on precise location possible

DLA - Direct Laser Ablation
- Low processing

LIPSS - Laser Induced Periodic Surface Structures
- Higher resolution
- Much faster processing than DLA
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