

Advancements in precise micro and nanostructuring using UV to IR 1-picosecond laser system

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The advancement of micro and nanostructuring technologies is pivotal for the industrial production of functional surfaces with innovative properties. This study focuses on the application of productive micro and nanostructuring in the UV to IR spectra using a 1-picosecond laser system. By shortening the wavelengths towards the UV range the absorption characteristics are improved as well as the ability to create highly detailed structures, which are essential for various high-precision applications.

A primary objective of this research is to enhance the productivity of these processes. We achieve this through the implementation of advanced direct laser interference patterning (DLIP) and beam shaping techniques facilitated by spatial light modulators (SLMs). DLIP allows for the creation of periodic surface patterns with high precision, while SLMs enable dynamic beam shaping, enhancing the versatility and efficiency of the structuring process.

The integration of these technologies significantly boosts the productivity, achieving structuring rates that meet and surpass industry standards.