

Laser Surface Texturing of Stainless Steel ? Effect of Pulse Duration on Texture's Morphology and Frictional Response

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© 2018 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim Laser surface texturing is a powerful tool to fabricate functional surface textures, whereby their morphology and cross-sectional profile greatly depend on laser parameters such as pulse duration and fluence. In this work, the authors fabricate well-defined groove-like textures on stainless steel by laser surface texturing using different pulse durations ranging from nano- to femtoseconds, while keeping structural parameters such as depth and periodicity fairly constant. By doing so, the influence of the pulse duration on the resulting cross-sectional profile of the textures and its subsequent impact on the tribological response are assessed. Reciprocating ball-on-disk tests and computational fluid dynamic simulations with Abaqus are used to evaluate the tribological performance of the as-fabricated textures. Their results demonstrate that the use of laser pulses with different pulse durations induce changes in the resulting cross-secti