Designing surface textures for EHL point-contacts - Transient 3D simulations, meta-modeling and experimental validation

Marian, Max

Grützmacher, Philipp

Rosenkranz, Andreas

Tremmel, Stephan

Mücklich, Frank

Wartzack, Sandro

Micro-textures applied on rubbing surfaces have gained tremendous attention in the tribological community. Numerous studies deal with the deduction and testing of beneficial micro-textures. Nevertheless, not all questions have been answered yet. Will texturing really deliver as good effects as frequently claimed? Are there optimum texture designs? Are there occasions where texturing could enhance the tribological performance but is questionable from other perspectives? Therefore, ball-on-disc experiments are carried out with a special emphasis on the relative position of micro-texture and counter body. Furthermore, transient EHL simulations are performed, addressing the effects of structural parameters and relative texture's position on the tribological performance. Finally, meta-modeling with subsequent optimization is applied to predict numerically derived optima and robust texture designs.