

Hydrodynamic effects of texture geometries on journal bearing surfaces

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Abstract: Lately, the expanding range of tribological applications to the microscopic levels has revived interest in this field. Actually, little is understood about the subtle effects of variations of a journal bearing's profile upon its performance. The surface texturing is expected to make an important contribution to future technologies of bearing. Numerical study based on finite difference methods is used to find the tendency of important tribological properties of a journal bearing such as minimum film thickness, maximum pressure, axial oil flow and friction torque. The present work is a comparative study of the hydrodynamic effects of a few deterministic texture shapes in a journal bearing application. The geometry and the size of textures affect load capacity and friction torque. The parallelepipedic textures show advantages compared to the other geometries for the improvement of the performances of the bearing. In general, the impact of shapes is more visible for higher asperity area in accordance with the geometrical differences.

Keywords : texture, lubrication, hydrodynamic, journal bearing