Comparative analysis of surface texturing effect on the performance of hydrodynamic journal bearings

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Abstract : Understanding the influence of surface texturation on journal bearing performances inevitably involves experimental investigations pending being followed by a numerical modeling of the problem. This work consists to model and to understand the evolution of journal bearing characteristics with and without presence of textures on the bearing surface. The numerical approach based on the finite difference method is used in this analysis. Improving performance of textured bearing with spherical dimples suggest that contact characteristics such as minimum film thickness, maximum pressure, and friction torque may be improved through an appropriate surface texture geometry and appropriate texture distribution on the contact surface. The results of our simulations are in good agreement with those obtained experimentally [1].

Keywords : Journal bearings, Reynolds equation, Hydrodynamic lubrication, Stribeck curve, texture