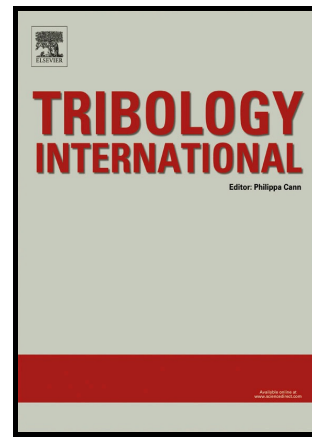


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Analysis of Novel Hybrid Bump–Metal Mesh Foil Bearings

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Abstract

Hybrid bump–metal mesh foil bearings (HB-MFBs) are novel gas foil bearings which comprise bump foil and metal mesh blocks in bearing substructure. *HB-MFBs have the advantages of both bump-type foil bearings and metal mesh foil bearings in terms of assembly accuracy, stability and can work at high temperatures.* This paper proposes a theoretical model by assembling the models of the bump foil and metal mesh blocks. A prototype bearing was manufactured to measure the lift-off speed, drag torque and temperature. The bearing performance with respect to mesh density, journal speed and applied load were predicted and analysed. The influence of Coulomb friction and mesh density on bearing stability with respect to friction coefficient and applied load was also discussed.

Keywords: Gas foil bearing; Theoretical model; Bearing stability

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