World Academy of Science, Engineering and Technology
International Journal of Mechanical and Materials Engineering
Vol:8, No:11, 2014

Study of TiO2 Nanoparticles as Lubricant Additive in Two-Axial Groove Journal Bearing

Authors : K. Yathish, K. G. Binu, B. S. Shenoy, D. S. Rao, R. Pai

Abstract : Load carrying capacity of an oil lubricated two-axial groove journal bearing is simulated by taking into account the viscosity variations in lubricant due to the addition of TiO2 nanoparticles as lubricant additive. Shear viscosities of TiO2 nanoparticle dispersions in oil are measured for various nanoparticle additive concentrations. The viscosity model derived from the experimental viscosities is employed in a modified Reynolds equation to obtain the pressure profiles and load carrying capacity of two-axial groove journal bearing. Results reveal an increase in load carrying capacity of bearings operating on nanoparticle dispersions as compared to plain oil

Keywords : journal bearing, TiO2 nanoparticles, viscosity model, Reynold's equation, load carrying capacity
Conference Title : ICCEM 2014 : International Conference on Computational and Experimental Mechanics
Conference Location : Venice, Italy
Conference Dates : November 13-14, 2014