

## Study of TiO<sub>2</sub> Nanoparticles as Lubricant Additive in Two-Axial Groove Journal Bearing

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**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 TiO<sub>2</sub> nanoparticles as lubricant additive. Shear viscosities of TiO<sub>2</sub> 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, TiO<sub>2</sub> nanoparticles, viscosity model, Reynold's equation, load carrying capacity

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