

AN EFFECT OF PAD SUPPORT POSITION ON THE DYNAMIC CHARACTERISTICS OF TILTING 4-PAD JOURNAL BEARING

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ABSTRACT

The journal bearing systems of high speed rotating machinery can be designed as the system with the radial tilting-pad journal bearings. High speed operation of these bearings at the journal peripheral speed reaching 220 m/s, the determination of both static and dynamic characteristics of system rotor-bearings, critical speeds, response of system on the dynamic load as well as stability of rotor is very important.

The paper introduces the results of theoretical calculations of dynamic characteristics of tilting-4 pad journal bearing. The Reynolds', energy, viscosity and geometry equations were solved simultaneously under assumption of adiabatic laminar oil flow in the bearing gap. The resulting force, static equilibrium position angle, stiffness and damping coefficients have been computed for two different values of aspect ratio, different values of pad relative clearance and different support position of pads.

Keywords: tilting-pad journal bearings, dynamic characteristics