

Increase of Energy Efficiency by Means of Application of Active Bearings

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Abstract : In the present paper, increasing of energy efficiency of a thrust hybrid bearing with a central feeding chamber is considered. The mathematical model was developed to determine the pressure distribution and the reaction forces, based on the Reynolds equation and static characteristics' equations. The boundary problem of pressure distribution calculation was solved using the method of finite differences. For various types of lubricants, geometry and operational characteristics, axial gaps can be determined, where the minimal friction coefficient is provided. The next part of the study considers the application of servovalves in order to maintain the desired position of the rotor. The report features the calculation results and the analysis of the influence of the operational and geometric parameters on the energy efficiency of mechatronic fluid-film bearings.

Keywords : active bearings, energy efficiency, mathematical model, mechatronics, thrust multipad bearing

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