Thesis Title	Optimum Design of Jounal Bearings with Non-Newtonian Lubricants.
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Abstract

Modern machinery is operated under survere condition at a very high speed and high temperature. An additive specially high molecular weight polymer mixed in lubricating oil will result as a Non-Newtonian lubricant which will improve viscosity index. This thesis emphasises on the behavior of journal bearings with Non-Newtonian lubricants starting from the analytical solution of modified Reynolds equation. Numerical calculation is performed by using Finite difference method to obtained pressure (P), flow rate (Q), and temperature distribution (T). These parameters are employed in an optimum program to find the optimum clearance (C) and the diameter-length ratio (λ) under the defined objective function and constrains where the flow rate and the change in temperature are minimized. An Area Elimination by Grid Search is the Optimum method used in this study. An optimum size of the bearing is obtained by a Grid Search method.

A set of optimized clearance and Diameter-length ratio with various loading capacities establishes characteristic diagrams which are useful for design.