

A THERMOHYDRODYNAMIC ANALYSIS FOR DYNAMICALLY LOADED JOURNAL BEARINGS

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ABSTRACT

A comprehensive transient thermohydrodynamic analysis for dynamically loaded journal bearings such engine crankshaft or shaft line bearings has been developed. A key element in this analysis is the consideration of different time scales for the oil film, journal and bushing. Another important element of this analysis is the consideration of moving grids in the oil film. Mass conserving cavitation is included via the Elrod cavitation algorithm. The 3-D energy equation is solved without any simplification in the oil film or the bushing. The journal is treated as a lumped thermal element.

REFERENCES

1. Cameron, A., *Basic Lubrication Theory*, Longman Group Limited, Great Britain, 1970.
2. Elrod, H.G., *A Cavitation Algorithm*, ASME Journal of Lubrication Technology, vol.103, Nr.3, 1981.
3. Khonsari, M.M., *A Review of Thermal Effects in Hydrodynamic Bearings*, ASLE Transactions, vol.30, 1987.
4. Simionov, M. *The Naval Propulsion Power Plants. The Shaft Lines*, Evrika Publishing House, ISBN 973-8052-90-4, Braila, 2001.