STUDIES ON TRANSITION TEMPERATURE, FRICTION AND SCUFFING IN BOUNDARY LUBRICATION

by

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CERTIFICATE

This is to certify that the thesis entitled 'Studies on Transition Temperature, Friction and Scuffing in Boundary Lubrication' being submitted by Mohanlal V. Khemchandani to the Indian Institute of Technology, Delhi, for the award of Doctor of Philosophy is a record of bonafide research work he has done during September 1974 to September 1977 under my guidance and supervision. He has fulfilled the requirements for the submission of this thesis, which to my knowledge, has reached the required standard.

The results obtained in this thesis have not been submitted to any other university or institute for the award of any degree or diploma.

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ABSTRACT

The thesis describes the theoretical and experimental investigation of the frictional characteristics of boundary lubrication and the effect of temperature on the stability of adsorbed lubricant layer. The scuffing temperature, that is, the temperature at which the reversibility of friction is completely absent, is identified on the basis of percentage reversibility of friction.

A simple formulation has been developed for prediction of 'Coefficient of Friction' and 'Zone of Influence' for boundary lubricated systems. The effectiveness of boundary lubricants is related to the forces which hold them on solid surfaces as a continuous film. The domain of these attractive forces is represented by zone of influence.

The friction analysis is basically an extension of junction growth model. An attempt is made to correlate the factor k, introduced by Bowden and Tabor, with the properties of interacting surfaces, operational parameters and physico-chemical nature of lubricant, so as to get better understanding of lubricant film failure.

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