

Documents

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Squeeze film behavior in porous transversely circular stepped plates with a couple stress fluid

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Abstract

Purpose - The purpose of this paper is to carry out a study of the effect of surface roughness on squeeze film behavior between two transversely circular stepped plates with couple stress lubricant when the upper circular stepped plate has porous facing which approaches the lower plate with uniform velocity.

Design/methodology/approach - The modified Stochastic Reynolds equation is derived for Christensen Stochastic theory for the rough surfaces. Closed form solution of the Stochastic Reynolds equation is obtained in terms of Fourier-Bessel series. Findings - It is found that the effect of couple stress fluid and surface roughness is more pronounced compared to classical case. Originality/value - The problem is original that it consider a couple stress fluid in this type of applications.

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