عنوان مقاله:

An Overview of Internal Incompressible Viscous Flow and itsApplication in Lubrication

محل انتشار:

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خلاصه مقاله:

The purpose of this article is to review the basic principles of incompressible viscous flow inlubrication theory to reduce friction and wear between solid surfaces. To this end, theReynolds lubrication pressure equation is discussed, which can be solved in the boundaryconditions and the surface profile about the geometry of various problems to obtain thepressure distribution relation, which determines the maximum pressure preventing thesurfaces from coming into contact. On the other hand, depending on the bearing parameter,the lubrication zones are divided into two categories: stable (hydrodynamic) and unstable(combined and boundary); in the stable zone, the changes are self-correcting. Furthermore,the theory of lubrication is divided into different categories: hydrodynamic lubrication,hydrostatic lubrication, elastohydrodynamic lubrication (EHL), boundary lubrication (BL),hydromagnetic lubrication, and thermodynamic lubrication; which have been investigatedthroughout the article. A number of internal viscous applications such as squeeze film, themovement of particles along with the fluid and near the boundaries, the passage of the liquidflow through a microchannel of known geometry, etc. that have been studied in recent yearswere reviewed, and the contents of lubrication theory as a part of tribology were brieflydiscussed.

کلمات کلیدی:

Internal Flow, External Flow, Creeping Motion, Hydrodynamic Lubrication,Boundary Lubrication, Tribology.