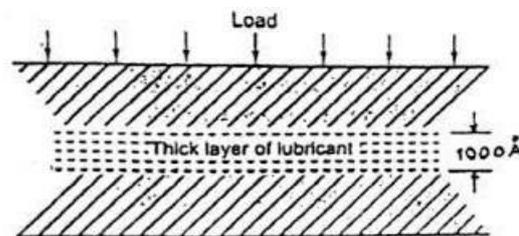




Mechanism of Lubrication

Thick Film or Fluid Film or Hydrodynamic Lubrication

It is carried out with the help of liquid lubricants. In this mechanism, two moving and sliding surfaces are separated by thick film of lubricant fluid of about 1000\AA , applied to prevent direct surface to surface contact and consequently reduce wearing and tearing of metals. Therefore it is known as thick film or fluid film lubrication or hydrodynamic (hydro meaning liquid and dynamic meaning relative motion) lubrication. In this case fluid is formed by mixing of hydrocarbon oils and anti-oxidants with long chain polymer so as to maintain viscosity. Fluid film lubrication is useful in delicate and light machines like watches, clocks, guns, scientific equipments.

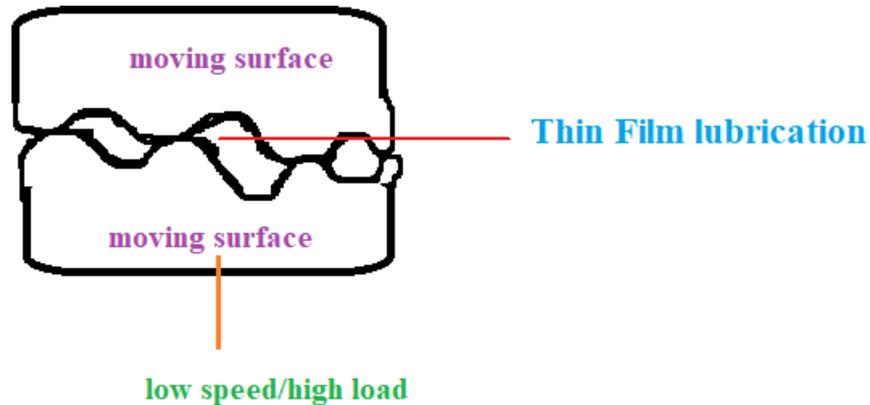


Thin Film or Boundary Lubrication

It is carried out with semi-solid (grease) and solid (graphite and molybdenum disulphide) lubricants. Boundary lubrication is a condition in which the lubricant film becomes too thin to provide total separation. In this type of lubrication a thin film of lubricant is adsorbed on the surface by weak Vander Waals forces. Thin film lubrication is operating at relatively low speed and



heavy loading (pressure).



Extreme Pressure (or Temperature) Lubrication

In this mechanism, moving or sliding surfaces are under high pressure and speed, therefore this is known as extreme pressure lubrication. In such a case high temperatures generated due to friction, under these condition liquid lubricants are fail to stick and decompose or vaporize. These problems are minimized by special additives are added to mineral oils. These additives form durable films on metal surfaces which can withstand high loads and high temperatures. Important additives are organic compound having group like chloride, sulphur, phosphorus etc. They react with metallic surface to form metallic compound (possess high melting points and serve as good lubricants under extreme temperatures and pressures) like chlorides, sulphides, phosphate as more durable film