



Limits of Lubrication: films - how thin? surfaces - how soft? lubricants - how wet?

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Ultra Thin Film Lubrication. The potential for ultra low friction is obviously there, but there are also numerous practical manufacturing challenges. Looking at the work that the nano groups have done with applying Reynolds equation to single layers of water, it is easy to ask when engineers will try to access such a thin film and over what areas it is possible.

Soft Biological Lubrication. The future will be to perform modeling on surfaces that have a considerable deformability and permeability. This will fundamentally change the nature of the equations and introduce a number of extremely interesting phenomena to the hydrodynamics. .

Water is really wet. Can we engineer systems to be lubricated without oil? There is no pressure viscosity effect, and there are numerous technological challenges. There is also a very obvious temperature limit to this problem, so one may be able to derive a simple phase diagram with shear rate and frictional heating to illustrate the limits.