thickness or the load capacity can change as much as by a factor more than 1.5 and 1.1 with a change in roughness by a factor of 2 for cases when $h/o$ rungs between 1.5 and 3 and between 3 and 6, respectively. This helps in developing manufacturing specifications for surface roughness.

6 Acknowledgments

The first author (BB) was partially supported by the Royal Norwegian Council for Scientific and Industrial Research, Oslo, Norway, under their Senior Visiting Scientist Program.

References


C. M. Ettles

The inclusion of surface texture effects in fluid film lubrication is one of the most difficult and exacting areas in Tribology and the authors are to be congratulated in developing their work for the compressible case.

In the model, surface texture is characterized by the aspect ratio of the asperities, based on the correlation lengths across and perpendicular to sliding. To what extent does the actual shape of the asperities affect the lubrication? For example are the truncated shapes produced during the finishing processes of discs beneficial? In the grinding of steel it is possible to produce widely differing textures of the same roughness. Cogdell et al. have investigated the effect of many surface parameters in thin film with oil. Some features were found to be beneficial. Would the authors expect similar effects as found by Cogdell? If so, could production techniques be modified to improve the lubrication?


Authors’ Closure

The authors wish to thank Professor Ettles for his comments.

What we have pointed out in our model is that shear effects cannot account for the observed behavior of the head/recording medium interface. We have further shown that isolated peaks can explain the observations. The presence of such peaks has been established experimentally.

In general, roughness shape will affect both shear- and squeeze-terms, and in lubrication situations where the film thickness and the roughness excursions are of the same order of magnitude, roughness shape is very important.

However, for the head/medium interface we believe that shape effects are rather unimportant. The reason is primarily the fact that the flying height is quite large compared with the $a$-value. Further, the isolated asperities are found, experimentally, not to affect this quantity, and, therefore, not the roughness factors.

Accordingly, although the geometry of the peak tips will probably have a local effect in the contact or near-contact region, the roughness shape should be of limited importance.