Effect of carbon-based thin-film coating on frictional behavior under boundary lubrication regime

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Lubricants are usually formulated with different chemical additives to impart some desirable properties, such as friction and wear reduction. The current set of lubricant additives are formulated to interact with ferrous surfaces. Since carbon-based thin-film coatings are being used for tribological components, better understanding of the effect of such coatings on friction behavior in lubricated contacts is needed. This paper presents our experimental study of friction behavior of three variants of carbon-based coatings under boundary lubrication regime with four different lubricants. Results showed that the frictional behaviors of the three carbon coatings are similar to one another in the four lubricants, and the presence of carbon coating substantially reduced the wear on the uncoated steel sliding counterface.