Recent development of Dymon-iC and MoST coatings

X. Zhang*, D. G. Teer

Teer Coatings Ltd, West Stone House, Berry Hill Industrial Estate, Droitwich, Worcestershire, WR9 9AS UK

Abstract:™

Dymon-iC™ and MoST™ coatings, have been successfully used in a wide range of applications, for example as solid lubricant coatings in vacuum or ambient conditions, in dry machining, dry forming etc. Both coatings show low friction, high hardness, very low wear and high load bearing capacity. Both coatings provide protection for both the coated surface and uncoated surface of the counter bodies.

It has been noticed that the coefficient of friction of both Dymon-iC™ and MoST™ coatings increases from about 0.03 to 0.15 as the normal load is decreased from 80N to 10N, in pin-on-disc un-lubricated tests. This higher friction coefficient is a disadvantage for many applications of these coatings, such as for automobile or MEMs industries.

This paper describes methods that have proved successful in reducing the low load friction coefficients for both coatings.

A range of dopants for Dymon-iC™ coatings have been studied. It has been found that additions of Si can reduce the low load friction to less than 0.05 whilst retaining the excellent wear properties.

MoST™ coatings have been successfully modified by depositing them as a multi layer structure with TiB2 interlayers. Such coatings have a friction coefficient of less than 0.05 under a 10N load. Further it is found that the addition of the TiB2 allows an increase in total coating thickness from 1 micron to about 4 microns. The specific wear rate of the MoST™ is retained and therefore the thicker coatings have a 4 times increase in wear life.

Keywords*:* MoS2, coatings, DLC, solid lubricant, friction, wear