Department of Mechanical Engineering
Massachusetts Institute of Technology
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Fall 2003

2.800 Tribology

Homework (Due November 11, 2003)

1. In Homework #5, you were asked to determine the volume fraction of TiB_2 we should add to minimize the wear of dispersion hardened Cu/TiB_2 alloys.

   Determine the wear coefficient of Alloy B (i.e., dispersion hardened alloy with one micron diameter TiB_2 particles).

2. Fretting wear occurs when the interface between two surfaces undergoes a small, relative oscillatory displacement under load. This kind of wear may occur when a ball bearing mounted on a shaft has a small relative displacement. The wear mechanism is similar to delamination wear, except that the maximum sliding distance is less than 100 microns in each direction. Develop a model for fretting wear.

3. Indicate how you would design a disk brake for automobiles.