A comparison of frictional characteristics of various metallic and plastic materials is given in **Figure 3-1**. In some plastic materials, the coefficient of friction decreases with load, thereby greatly reducing or eliminating the stick-slip in the start-up of machinery.

In recent years, the properties of plastic bearing materials have been materially enhanced by the addition of fillers (such as fiber, powder, graphite and molybdenum disulfide) and composites (metal or other backings). If the cost is warranted, the mechanical properties of such bearings can be dramatically improved.

**3.5 Example**

A shaft of 1/2" in diameter is supported by two plastic bearings. The force equals 10 lbs. The bearing length is 3/4". The shaft rotates at 750 rpm.

$$PV = \frac{0.262 \cdot F \cdot rpm}{l} = \frac{0.262 \times 10 \times 750}{0.75} = 2619 \text{ fpm} \cdot \text{psi}$$

From the tables showing the maximum PV values, the proper material can be chosen. If the computed value exceeds the value in the table for the chosen material, the dimensions of the shaft and of the bearing should be changed.

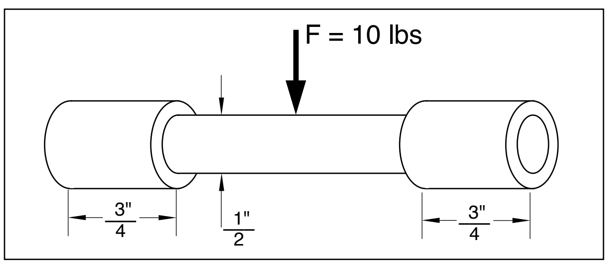

**Fig. 3-2**

**3.6 Lubrication**

Lubricants reduce the static and dynamic coefficients of friction and permit materials to operate at higher PV's than without lubrication. While most plastics do not require lubrication, some type of lubricant will generally enhance bearing performance. In many cases, water will provide sufficient lubrication and cooling during bearing operation. At the time a plastic bearing is installed, it is a good idea to apply a light film of grease on the ID of the bearing prior to mounting on the shaft.

The effect of lubrication on the factor of a particular material (in this case, Oilon PV–80) is shown on the following graph: