

### 1. Dry Friction

Dry friction resists relative lateral motion of two solid surfaces in contact. The two regimes of dry friction are 'static friction' between non-moving surfaces, and kinetic friction (sometimes called sliding friction or dynamic friction) between moving surfaces.

The Coulomb friction may take any value from zero up to one, and the direction of the frictional force against a surface is opposite to the motion that surface would experience in the absence of friction. Thus, in the static case, the frictional force is exactly what it must be in order to prevent motion between the surfaces; it balances the net force tending to cause such motion. In this case, rather than providing an estimate of the actual frictional force, the Coulomb approximation provides a threshold value for this force, above which motion would commence. This maximum force is known as traction.

A practical example

Dry sliding of different components over each other results in changes of interfaces. During the running-in procedure a surface accommodation takes place. There is transfer of material from the softer to the harder component. At the surface of a composite a friction layer is formed, which has a different chemistry than the matrix. Type of friction layer and transfer layer govern the tribological performance of a dry sliding system. In order to arrive at desired frictional properties various additives are added to composites.

### b. Fluid Friction

Fluid friction occurs between fluid layers that are moving relative to each other. This internal resistance to flow is named viscosity. The viscosity of a fluid is described as its "thickness". Thus, water is "thin", having a lower viscosity, while honey is "thick", having a higher viscosity. The less viscous the fluid, the greater its ease of deformation or movement.

All real fluids (except superfluids) offer some resistance to shearing and therefore are viscous.

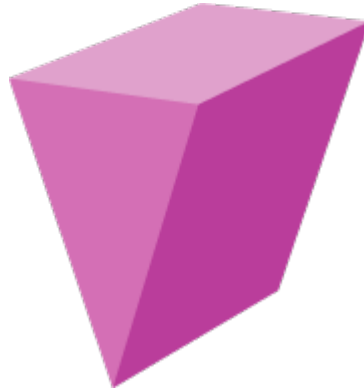
A practical example of fluid friction

- If there is a wet surface between two thin glass plates, you will notice that plates get stuck and the bottom plate doesn't fall when you hold only the top one.
- When any object is dropped in a fluid, the extent of splash is depended on the fluid friction of that particular fluid.

### 2. Wedge

A wedge is a simple machine that almost looks like a ramp or an inclined plane. It is actually made up of two inclined planes joined together. It can be made of wood, metal, stone, or plastic. It is thick on one end and usually thins

out to a sharp edge on the other end. They come in all sizes and usually have handles attached to them.



Examples of wedges

Wedges can be used in many ways: for cutting, splitting, tightening or to hold back, to hold together, or for scraping, such as a snowplow or farm grader.

#### **SQUARE THREADED SCREW**

The square thread screw is a common screw threadform, used in high load applications such as leadscrews and jackscre. It gets its name from the square cross-section of the thread. It is the lowest friction and most efficient thread form, but it is difficult to fabricate.

#### **JOURNAL BEARING**

Journal or plain bearings consist of a shaft or journal which rotates freely in a supporting metal sleeve or shell. There are no rolling elements in these bearings. Their design and construction may be relatively simple, but the theory and operation of these bearings can be complex.

