

Fluid Mechanics

fluid :

is the liquid and the gas

Fluid mechanics:

is the science studies the fluid statics and fluid dynamics

-fluid statics study the fluid at rest

-fluid dynamics study the fluid at motion

Density:

is the mass of the fluid divided by its volume

$$\rho = M/V$$

it measured by kg/m³

Specific density:

is the ratio of the density of a substance to the density of a given reference material.

$$\rho_s = \rho / \rho_r$$

$$\rho_d = \frac{\text{weight of specific volume of substance}}{\text{weight of the same volume of water}}$$

Fluid pressure:

is the force exerted on a surface by a fluid

$$P = \rho h g + p_a$$

it measured by Pascal

Blood pressure (BP):

is the pressure [force per unit area] exerted by circulating blood on the walls of blood vessels.

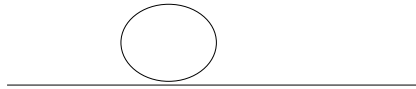
Surface tension:

The cohesive forces between liquid molecules are responsible for the phenomenon known as surface tension.

The molecules at the surface do not have other like molecules on all sides of them and consequently they cohere more strongly to those directly associated with them on the surface.

This forms a surface "film" which makes it more difficult to move an object through the surface than to move it when it is completely submersed.

If the Cohesive Forces > adhesive forces then the surface tension is large



if the Cohesive Forces < adhesive forces then the surface tension is small



Surface tension force measured by N/m

the surface tension force $\gamma = F/L$