

CHAPTER-10

MECHANICAL PROPERTIES OF FLUIDS

GLOSSARY :

▲ **Compressible flow** : The density changes with position time.

▲ **Dynamic Lift** : Force that acts on a body.

▲ **Density** : The ratio of the mass to the volume of an object.

$$\text{Density} : \frac{\text{Mass } M}{\text{Volume } V}$$

▲ **Fluid statics** : The branch of fluid mechanics in which the forces and pressures acting on a stationary fluid are studied.

▲ **Fluid dynamics** : Branch of fluid mechanics in which motion of fluid and properties related to it as a result of forces acting on the fluid are studied.

▲ **Gauge pressure** : The excess of pressure, $P - P_a$ at depth h .

▲ **Irrotational flow** : The element of a fluid at each point has no net angular velocity about the point.

- ▲ **Incompressible flow** : The density of a fluid remains constant with time.
- ▲ **Non – viscous flow** : The flow of a fluid having small co – efficient of viscosity time.
- ▲ **Pressure** : The area on which the force acts.
- ▲ **Rotational flow** : The element of a fluid at each point has net angular velocity about that point.
- ▲ **Stream line** : The path taken by a fluid particle under a steady flow.
- ▲ **Surface Tension** : A force per unit length acting in the plane of the interface between the plane of the liquid and any other substance.
- ▲ **Steady flow** : Velocity of the fluid at each point remains constant with time.
- ▲ **Turbulent flow** : The velocity of the fluid changes erratically from point to point as well as from time to time.

- ▲ **Unsteady flow** : The velocity of the fluid at a given point keeps on changing with time.
- ▲ **Viscous flow** : The flow of a fluid which has large coefficient of viscosity.
- ▲ **Viscosity** : The resistance to fluid motion is like internal friction analogous to friction when a solid moves on a surface.
- ▲ **Velocity gradient** : The difference in velocity between two layers of liquid per unit perpendicular distance, in the direction perpendicular to the direction of flow.