FLUID STATICS

Fluid Mechanics

Mukhtiar Ali Talpur

Study of fluid at rest

Study of fluid in rigid body motion

FLUID STATICS

Fluid at rest

$U \neq f(x,y,z,t)$

$du/dx = 0$

$du/dy = 0$

$du/dz = 0$

$du/dt = 0$

Shear stress in any direction will be zeero

Shear stress in all directions will be zeero

$$\tau_x = \mu \frac{du}{dx} = 0$$

$$\tau_y = \mu \frac{du}{dy} = 0$$

$$\tau_z = \mu \frac{du}{dz} = 0$$

Only pressure acting normal to the fluid that is the atmospheric pressure and pull due to gravitational force

Pressure is the normal component of force per unit area

$$P = \frac{F\perp}{A}\ N / m^2 \qquad \text{(Pascal)}$$

Dyne / Cm^2

1 bar = 10^5 Pascal

Torr = I mm Hg

1 Atm = 760 mm Hg = 101.3 k Pa

Psi (FPS) = 6894.76 pa

- Absolute pressure
- Gauge pressure
- Vacuum pressure

PASCALs LAW

Pressure at a point in a fluid at rest is same in all directions