

# A description of fluid mechanics

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Any thing whose particles can move easily from one place to another that means shape can be easily changed upon the application of negligible force.

MECHANICS: Study of response of bodies upon the application of force. FLUID

MECHANICS : Fluid mechanics may be defined as the branch of engineering science which deal with behavior of fluids under the condition of rest and motion. FLUID MECHANICS DIVIDED IN 3 PARTS 1 STATICS 2

KINAMETICS 3 DYNAMICS STATICS: Study of incompressible fluids under static conditions is called hydrostatic and that branch dealing compressible static gasses is termed as aero-statics.

KINAMETICS: It deal with velocities acceleration and the pattern of flow only

forces or energy, velocity and acceleration . DYNAMICS: It deals with the relation b/w velocities acceleration of fluid with the force or energy causing them.

WRITE DOWN THE PROPERTIES OF FLUID? The matter can be

classified on the basis of spacing b/w the molecules of matter as 1 SOLID

STATE: 2 FLUID STATE. 1 LIQUID STATE i GASES STATE In solid molecules

are very closed spaced where as liquids. The spacing b/w the different molecules is relatively large and in gases the spacing b/w molecules is still

large Its means the intermolecular cohesive forces are large in solids,

smaller in liquids and extremely small in gases and on account of this fact

solids posses compact and regional form, liquids molecules can move freely

with in the liquids mass and the molecules of gases have greater freedom of movement so that the gases fill the container completely in which they are

placed. A solid can resist tensile compressive and shear stresses up to a

certain limit where a fluid has no tensile strength or very little of it and it can

resist the compressive forces only when it kept in a container. When a fluid is subjected to a shearing it deforms continuously as long as forces apply.

The amount of shearing stress in a depends on the magnitude of state of deformation of the fluid element. Liquid and gases in habit different characteristics. The liquid under ordinary condition are quite different to compress where as gases can be compressed much widely under the action of external pressure. WRITE DOWN THE CHARACTER OF FLUIDS: Fluid is a substance which is capable of following. 1. It has no definite shape but confirms the shape of container vessels 2. Even a smaller amount of shear force exerted on a fluid will cause it to undergo a deformation which continuous as long as the force continuous to applied.

CLASSIFICATION OF FLUID: 1) LIQUID 2) GAS 3) VAPOUR 1) IDEAL FLUIDS -

2) REAL FLUIDS 1 LIQUIDS: Liquid Is Type Of Fluid Having Definite volume which varies only slightly with temp and pressure Liquid have bulk elastic modulus when under compression and will store up energy in same manner as solids. As the contraction of volume of liquids under contraction is extremely it is usually ignored and liquid is assumed as incompressible. All known liquids evaporated at narrow pressure above zero depending on the temp. LIQUID AND THERE PROPERTIES: A liquid can be easily distinguished, solid or gas. A solid as a definite shape which a liquid takes the shape of vessel into which it is poured. A gas completely fills the vessel which contain it. 2 GAS: It possesses not definite volume and will be compressible.

3 VAPOUR: It is a gas whose temp and pressure are such that it is very near the liquid state for example steam IDEAL FLUID An ideal fluid is one which

has no viscosity and surface tension and it is incompressible. In true sense no such fluid exist in the nature however fluid which have low viscosity such as water and air can be treated as ideal fluid under certain conditions. REAL

FLUID A real fluid is one which has viscosity , surface tension, and compresablity in addition to the density. The real fluid are actually available.

PROP OF WATER DENSITY There are two types of density. 1-Mass density 2-Weight density 1-Mass density : The density (also known as mass density)of liquid may be defined as the mass per unit volume . Mass density=  $m/v$  It is usually denoted by  $\rho = m/v$  Its unit is  $kg/m^3$ .

2-Weight density: The weight density (also known as specific weidht)is defined as the weight per unit volume ( $w/v$ ) at standard temp and pressure. It is usually denoted by  $w = \rho g$  Its unit is  $KN/M^3$ . SPECIFIC VOLUME It is defined as volume per mass of fluid. It is denoted by  $v = V/m = 1/\rho$  SPECIAL GRAVITY Special gravity is the ratio of the specific weight of liquid to the specific weight ofstandard fluid. It is dimension less has no unit. It is denoted by  $S$   $S = \text{specific weight of liquid} / \text{specific weight of pure water}$   $S = W? /W_{water}$