

Answer on Question #51109-Physics-Mechanics-Kinematics-Dynamics

Why does a single particle of fluid at rest do not accelerate due to gravitational force?

Answer

If a single particle of fluid is at rest (do not move due to gravitational force), then it is situated on some object and the reaction force by object acting on particle of fluid is

$$\vec{N} = -\vec{W} = -m\vec{g},$$

where \vec{W} is the weight of a single particle of fluid.

The acceleration of a single particle of fluid is

$$\vec{a} = \frac{\vec{F}}{m} = \frac{\vec{N} + \vec{W}}{m} = \frac{-\vec{W} + \vec{W}}{m} = 0.$$

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