Answer on Question #50881-Physics-Mechanics-Kinematics Dynamics

Does the velocity of the particles of fluid at rest changes in downward direction due to gravitational force? If so, why does it change? For finding pressure for fluid at rest the formula is $p = hdg$. Why don't we take the average of two accelerations, the acceleration of particles of fluid instead of acceleration due to gravity?

Answer

If fluid at rest the average velocity of its particles is zero! But particles of fluid can have nonzero velocity, which depend on temperature. The gravitational force acts on particles, but in the fluid the interaction forces between molecules are very important and can compensate gravitational force.

If fluid at rest the average acceleration of its particles is zero! It is because the average velocity of its particles is zero.