

The Effect of Inlet Baffle Position in Improving the Efficiency of Oil and Water Gravity Separator Tanks

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Abstract : The gravitational effect has been extensively applied to separate oil from water in water and wastewater treatment systems. The maximum oil globules removal efficiency is improved by obtaining the best flow uniformity in separator tanks. This study used 2D computational fluid dynamics (CFD) to investigate the effect of different inlet baffle positions inside the separator tank. Laboratory experiment has been conducted, and the measured velocity fields which were by Nortek Acoustic Doppler Velocimeter (ADV) are used to verify the CFD model. Computational investigation results indicated that the construction of an inlet baffle in a suitable location provides the minimum recirculation zone volume, creates the best flow uniformity, and dissipates kinetic energy in the oil and water separator tank. Useful formulas were predicted to design the oil and water separator tanks geometry based on an experimental model.

Keywords : oil/water separator tanks, inlet baffles, CFD, VOF

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