

## Investigation of Droplet Size Produced in Two-Phase Gravity Separators

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**Abstract :** Determining droplet size and distribution is essential when determining the separation efficiency of a two/three-phase separator. This paper investigates the effect of liquid flow and oil pad thickness on the droplet size at the lab scale. The findings show that increasing the inlet flow rates of the oil and water results in size reduction of the droplets and increasing the thickness of the oil pad increases the size of the droplets. The data were fitted with a simple Gaussian model, and the parameters of mean, standard deviation, and amplitude were determined. Trends have been obtained for the fitted parameters as a function of the Reynolds number, which suggest a way forward to better predict the starting parameters for population models when simulating separation using CFD packages. The key parameter to predict to fix the position of the Gaussian distribution was found to be the mean droplet size.

**Keywords :** two-phase separator, average bubble droplet, bubble size distribution, liquid-liquid phase

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