

Gas-Liquid Two Phase Flow Phenomenon in Near Horizontal Upward and Downward Inclined Pipe Orientations

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Abstract : The main purpose of this work is to experimentally investigate the effect of pipe orientation on two phase flow phenomenon. Flow pattern, void fraction and two phase pressure drop is measured in a polycarbonate pipe with an inside diameter of 12.7mm for inclination angles ranging from -20° to $+20^\circ$ using air-water fluid combination. The experimental data covers all flow patterns and the entire range of void fraction typically observed in two phase flow. The effect of pipe orientation on void fraction and two phase pressure drop is justified with reference to the change in flow structure and two phase flow behavior. In addition to this, the top performing void fraction and two phase pressure drop correlations available in the literature are presented and their performance is assessed against the experimental data in the present study and that available in the literature.

Keywords : flow patterns, inclined two phase flow, pressure drop, void fraction

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