**Experimental Study Of Three Phase**

**Flow In Horizontal Pipes**

**ABSTRACT:**

Experiments on three phase air-water-oil flow has been carried out to study the flow regimes, heat transfer co-efficient and pressure gradient. A horizontal pipe of 16mm ID and 6 m long, jacketed with another pipe of 30mm ID pipe. The jacketed and insulated pipe is used to supply heating fluid to heat the test pipe section at different flow conditions. The effects of water cuts, liquid and gas velocities on flow patterns, heat transfer coefficient and pressure gradients have been studied. The experimental have been conducted using three different liquids like Kerosene, Engine oil, Gear oil, tap water and air. The testing pipe was maintained at 80*°C.* Superficial water and oil velocity varied from 0.5 m/s to 4m/s and air velocity varied from 0.3m/s to 40m/s to cover wide range of flow patterns. The experimental were performed for 10% to 90% water cuts. The flow patterns were observed and recorded using high speed video camera while the pressure drops were measured using pressure transducers. The flow patterns show strong dependence on water fraction, gas velocities and liquid velocities. The observed flow patterns are stratified (smooth and wavy) elongated bubble, slug, dispersed bubble, and annular flow patterns. The pressure gradients have been found to increase with the increase in gas flow rates. Also, for a given superficial gas velocity, the pressure gradients increased with the increase in the superficial liquid velocity. The pressure gradient first increase and then decreases with increasing water cut. In general, phase inversion was observed with increase in the water cut. The general, phase inversion was observed with increase in the water cut. The experimental results have been compared with the existing unified model and good agreement has been noticed.

**INTRODUCTION:**