

## **Flow Patterns, Void Fraction and Convective Heat Transfer in Gas-Liquid Two Phase Flow at Various Pipe Inclinations**

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Two component two phase flow consists of the two phases of two chemically different species such as air-water. The two component two phase flow is often referred to as non-boiling two phase flow. Two phase flow literature reports a plethora of correlations/models for determination of void fraction and non-boiling heat transfer. The void fraction and heat transfer in gas-liquid two phase flow are found to be a function of flow patterns, pipe diameter, pipe orientation, and fluid properties. Consequently, it is quite a challenging task for the end user to select an appropriate correlation/model for the type of two phase flow under consideration. Selection of a correct correlation also requires some fundamental understanding of the two phase flow physics and the underlying principles/assumptions/limitations associated with these correlations. Thus, it is of significant interest for a design engineer to have knowledge of the flow patterns and their transitions and their influence on two phase flow variables. To address some of these issues and facilitate selection of appropriate two phase flow models, this lecture presents a succinct review of the flow patterns, void fraction, and non-boiling heat transfer phenomenon and recommend some of the well scrutinized correlations.