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A NEW PRESSURE DROP CORRELATION FOR TWO-PHASE FLOW UNDER MICROGRAVITY ENVIRONMENT OF SPACE MISSIONS

Abstract

The crucial establishments about the design of every two-phase flow system used for space requests is whether the system will work reliably and can the response to changes in the setpoints such as heat load, flow rates and pressures. Numerical computations of gas-liquid flows on earth are not done using "exact" equations but depend on empirical models. Consequently, prediction of behavior in space is not a matter of turning off the gravity term in the calculations. Once the effect of gravity on fluid behavior is diminished or removed, other forces, otherwise of small significance, can assume principal roles." The pressure drop is needed for sizing system working under microgravity environment. However, there is no proper two-phase friction pressure drop correlation. Scientists must use a TPFPD correlation for normal gravity to estimate TPFPD under microgravity. This work is aimed at developing a TPFPD correlation for microgravity using multiple data sources. The comparison shows that for microgravity applications it is far better than any existing model.