



FLOW BOILING HEAT TRANSFER IN NARROW VERTICAL CHANNELS

By Jianyun Shuai

Cuvillier Verlag Okt 2004, 2004. Taschenbuch. Book Condition: Neu. 208x147x12 mm. Neuware - Saturated flow boiling heat transfer and flow visualization experiments were carried out in three vertical rectangular channels with dimensions (width×height) 2.0×4.0, 0.86×2.0 and 0.54×1.60 mm (corresponding to hydraulic diameters 2.67, 1.20 and 0.81 mm, respectively). The channels were heated from three sides. Deionized water was used as the working fluid. The channel exit was at atmospheric pressure. Benchmark experiments of single-phase flow were also conducted for pressure drop and heat transfer. Experimental results show that for the 0.54×1.60 mm channel, the singlephase friction factor is higher than predicted by well-accepted correlations, while for the other two channels it can be well correlated. The heat transfer performance for both laminar and turbulent regimes under asymmetric heating conditions is different from that under uniform heating conditions on which the existing correlations are based. Therefore single-phase heat transfer correlations were modified so that they could be incorporated into the two-phase heat transfer correlations employed for asymmetric heating conditions. For flow boiling, three basic flow patterns are observed for all the channels, viz., bubbly, slug and annular flow. However, based on the developed flow pattern maps, the transition from slug to...



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