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Flow Boiling of Water in Square Cross Section Microchannel at Different Inlet Subcooling Conditions

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Abstract **-** The effect of inlet subcooling on flow boiling heat transfer of deionised water in a horizontal single-microchannel of square cross section 1.0 mm by 1.0 mm and 75 mm long was studied. Three inlet sub-cooling conditions of 50, 15 and 5 K were studied for the mass fluxes of 200, 400 and 600 kg/m^{2}s with increasing base heat fluxes in the range of 105- 455 kW/m^2. Flow boiling patterns were related to corresponding local heat transfer coefficient along the microchannel and pressure drop characteristics for each inlet sub-cooling condition. This study demonstrates that, inlet sub-cooling has a significant effect on the two-phase heat transfer rates, pressure drop and flow patterns in the range studied.

Keywords**:** Flow boiling, Square Microchannel, Flow patterns, Heat transfer, Pressure Drop