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PRESSURE DROP DURING FLOW BOILING INSIDE PARALLEL MICROCHANNELS

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Highlights

- Flow boiling of R134a occurred inside nine parallel microchannels.
- The effect of the inlet pressure on pressure drop was investigated.
- The test section was symmetrically heated and the leakage effect between closing channels was not present.

ABSTRACT

Pressure drop is experimentally investigated inside parallel microchannels during subcooled flow boiling of R134a in horizontal orientation. The test conditions included the inlet pressure, the inlet subcooled degree, the heat flux, the vapour quality, and the mass velocity, ranging from 600 to 900 kPa, 1 to 20 K, 5 to 220 kW m⁻², 0 to 95% and 250 to 1000 kg m⁻²s⁻¹, respectively. The effect of the mass velocity and the inlet pressure were investigated. The relative weight of the pressure drop due to two-phase flow acceleration and the friction pressure drop for single phase and two-phase flows were considered. The experimental results for the pressure drop were compared with those predicted by the homogenous model and five other semi-empirical models.

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