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Nota di contenuto	List of contributors. Foreword by G.F. Hewitt. Foreword by Cees W.M. van der Geld. Critical review by Masahiro Kawaji. Critical review by Lounes Tadrist. Editorial by Sujoy Kumar Saha. 1 Introduction / Sujoy K. Saha, Gian P. Celata -- References. 2 Onset of nucleate boiling, void fraction, and liquid film thickness / Durga P. Ghosh, Rishi Raj, Diptimoy Mohanty, Sandip K. Saha : Onset of nucleate boiling -- Void fraction in microchannels -- Liquid film thickness measurement -- References. 3 Flow patterns and bubble growth in microchannels / Lixin Cheng : Introduction -- Criteria for distinction of macro and microchannels -- Fundamentals of flow patterns in macro and microchannels -- Flow patterns and flow pattern maps in microchannels -- Current research progress on bubble growth in microchannels -- Concluding remarks -- References 4 Flow boiling heat transfer with models in microchannels / Lixin Cheng : Introduction -- Flow boiling heat transfer in microchannels -- Correlations and models of flow boiling heat transfer in microchannels -- Models of flow boiling heat transfer for specific flow patterns in microchannels -- Concluding remarks -- Nomenclature -- References. 5 Pressure drop / Sujoy K. Saha, Gian P. Celata : Introduction -- Studies on flow characteristics of water in microtubes -- Effect of header shapes on fluid flow characteristics --

Pressure loss investigation in rectangular channels with large aspect ratio -- Effect of shape and geometrical parameters on pressure drop closure -- Nomenclature -- References. 6 Critical heat flux for boiling in microchannels / P.K. Das, A.K. Das : Introduction -- CHF in pool boiling and flow boiling in microchannels: present state of understanding -- Some general observations on boiling in microchannels and associated CHF -- Experimental investigations of CHF -- Prediction of CHF through correlations -- Physical mechanism and mechanistic models -- Present state of understanding and prediction of CHF in microchannels -- Gray areas and research needs -- Nomenclature -- References. 7 Instability in flow boiling through microchannels / P.K. Das, A.K. Das : Introduction -- Instability: a general overview -- Experimental investigations -- Analysis of instability in flow boiling through microchannels -- Efforts to suppress the instability in flow boiling through microchannels -- Reduction of instability in flow boiling through microchannels: achievements and challenges -- Nomenclature -- References. 8 Condensation in microchannels / Gherhardt Ribatski, Jaqueline D. Da Silva : Introduction -- Convective condensation -- Condensation inside small diameter channels -- Methods for prediction of heat transfer coefficient and pressure drop for condensation inside small-diameter channels -- Nomenclature -- References. 9 Conclusions / Sujoy K. Saha, Gian P. Celata. Index.

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#### Sommario/riassunto

This book offers the latest research and recommended models on the microsized cooling system, which not only significantly reduces the weight load but also enhances the capability to remove a much greater amount of heat than any large-scale cooling systems. A detailed reference to microchannel phase change (boiling and condensation) includes recommended models and correlations for various requirements such as pressure loss and heat transfer coefficient. Researchers, engineers, designers, and students will benefit from the collated, state-of-the-art research that is found in this book and its systematic addressing of the relevant issues and provision of a good reference for solving problems of critical analysis.

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