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To facilitate the "learning" and "reference" experience here, Prof. Thome has developed a highly innovative new addition to these two sets: all of the authors have been invited to make video lectures from their volumes and chapters to put online for free viewing by the public! This is currently in the development phase and the website will be announced in 2015. Thus, interested readers will be able to click on the interactive table of contents of the two sets to see lectures by the experts! This will be an excellent tool to cut the time gap between research and practice AND also let the readers "meet" the authors.

Readership: Graduate students, researchers and professional in the fields of mechanical, refrigeration, chemical, nuclear and electronics engineering on the important topics of two-phase heat transfer and two-phase flow.



Encyclopedia of Two-Phase Heat Transfer and Flow I
Fundamentals and Methods
(A 4-Volume Set)



Encyclopedia of Two-Phase Heat Transfer and Flow II
Special Topics and Applications
(A 4-Volume Set)



Encyclopedia of Two-Phase Heat Transfer and Flow III
Macro and Micro Flow Boiling and Numerical Modeling Fundamentals (A 4-Volume Set)



Encyclopedia of Two-Phase Heat Transfer and Flow IV
Modeling Methodologies, Boiling of CO₂, and Micro-Two-Phase Cooling (A 4-Volume Set)

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for more details.*

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for more details.*



Encyclopedia of Two-Phase Heat Transfer and Flow I Fundamentals and Methods (A 4-Volume Set)

Edited by **John R Thome** (*Laboratory of Heat and Mass Transfer (LTCM), Switzerland & Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland*)

The aim of the two-set series is to present a very detailed and up-to-date reference for researchers and practicing engineers in the fields of mechanical, refrigeration, chemical, nuclear and electronics engineering on the important topic of two-phase heat transfer and two-phase flow. The scope of the first set of 4 volumes presents the fundamentals of the two-phase flows and heat transfer mechanisms, and describes in detail the most important prediction methods, while the scope of the second set of 4 volumes presents numerous special topics and numerous applications, also including numerical simulation methods.

Practicing engineers will find extensive coverage to applications involving: multi-microchannel evaporator cold plates for electronics cooling, boiling on enhanced tubes and tube bundles, flow pattern based methods for predicting boiling and condensation inside horizontal tubes, pressure drop methods for singularities (U-bends and contractions), boiling in multiport tubes, and boiling and condensation in plate heat exchangers. All of these chapters include the latest methods for predicting not only local heat transfer coefficients but also pressure drops.

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Contents: Volume 1: Modeling of Gas Liquid Flow in Pipes (Yehuda Taitel and Dvora Barnea): Introduction; Basic Definitions of Two Phase Flow Parameters; Simplified Methods; Hydrodynamic Models Based on Flow Patterns; Flow Pattern Transition; The Two Fluid Model; The Drift Flux Model; Flow in Parallel Pipes; Flooding and Flow Reversal; **Volume 2: Condensation Heat Transfer (Srinivas Garimella and Brian M Fronk):** Introduction to Condensation Heat Transfer; Direct-Contact Condensation; Dropwise Condensation; External Film Condensation; Internal Flow Condensation; Mini- and Microchannel Condensation; Condensation of Mixtures with Condensable and Non-Condensable Constituents; Enhancement of Condensation Heat Transfer; **Volume 3: Flow Boiling in Macro and Microchannels (John R Thome and Andrea Cioncolini):** Introduction to Two-Phase Flow and Boiling in Channels; Two-Phase Flow Pattern Maps for Macrochannels; Two-Phase Flow Pattern Maps for Microchannels; Void Fraction; Entrained Liquid Fraction in Annular Two-Phase Flow; Two-Phase Pressure Drop; Forced Convective Boiling; Critical Heat Flux in Convective Boiling; Unified Modeling Suite for Annular Flow; **Volume 4: Special Topics in Pool and Flow Boiling (ME Poniewski, S Hozejowska, R Kaniowski, B Maciejewska, R Pastuszko, M Piasecka and TM Wójcik):** Introduction; Enhanced Pool Boiling Heat Transfer on Novel Combined Micro-Structured Surfaces; Hysteresis Phenomena in Pool Boiling on Micro-Structured Surfaces; Flow Boiling in Minichannels; Heat Transfer and Pressure Drop in Minichannels with a Microstructured Surface and Various Spatial Orientations; Numerical Analysis of Boiling Two-Phase Flow in Mini- and Microchannels.

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Edited by **John R Thome** (*Laboratory of Heat and Mass Transfer (LTCM), Switzerland & Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland*) & **Jungho Kim** (*University of Maryland, USA*)

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