

Preface

Heat exchangers constitute a multi-billion dollar industry, and their design is well established. This book presents new and innovative equipment design for heat transfer apparatus. The reader should be familiar with the basic concepts of heat transfer, although the fundamentals can be found in all the chapters throughout this book. Different approaches for innovative heat exchanger design are covered, when starting with polymeric heat exchangers based on polymeric films in Chapter “[Polymer Film Heat Exchangers](#)” and based on polymer composites in Chapter “[Polymer Composite Heat Exchangers](#)”. Innovative micro-structured plate-and-frame heat exchangers are presented in Chapter “[Innovative Design of Micro-Structured Plate-and-Frame Heat Exchangers](#)”, while Chapter “[Heat Transfer in Evaporation on Micro- and MacroStructured Tubes](#)” is dedicated to micro- and macro-structured tubes. In Chapter “[Multi-stream Plate-and-Frame Heat Exchangers for Condensation and Evaporation](#)”, the reader finds multi-stream plate-and-frame heat exchangers and low-finned tubes in Chapter “[Low-Finned Tubes For Condensation](#)”. A strong focus is on pillow plate heat exchangers with their fundamentals covered in Chapter “[Pillow Plate Heat Exchangers: Fundamental Characteristics](#)”, condensation application in Chapter “[Single-Phase Flow and Condensation in Pillow-Plate Condensers](#)” and two types of evaporator design in Chapter “[Pillow Plate Heat Exchangers as Falling Film Evaporator or Thermosiphon Reboiler](#)”. Chapter “[hiTRAN[®] Thermal Systems in Tubular Heat Exchanger Design](#)” deals with the use of turbulence promoters on the tube side, while Chapter “[Embaffle[®] Heat Exchange Technology](#)” presents an approach to increase shell-side turbulence and hence heat transfer. Finally, in Chapter “[Innovative Adsorbent Heat Exchangers: Design and Evaluation](#)”, adsorbent heat exchangers, an absolute niche technique, complete the script.

The different contributions provide up-to-date information and case studies in single- and two-phase applications with evaporation and condensation, viscous liquids and fouling problems. Although it is not a handbook, it provides detailed information on heat exchangers with great potential and high innovative capacity.

Kaiserslautern, Germany
Braunschweig, Germany

Hans-Jörg Bart
Stephan Scholl

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Bart, H.-J.; Scholl, S. (Eds.)

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