

1. Record Nr.	UNINA9910458110003321
Autore	Serth R. W
Titolo	Process heat transfer [[electronic resource]] : principles and applications / / R.W. Serth
Pubbl/distr/stampa	Amsterdam ; ; London, : Elsevier Academic Press, c2007
ISBN	1-281-02506-2 9786611025069 0-08-054441-X
Descrizione fisica	1 online resource (770 p.)
Disciplina	621.4022
Soggetti	Heat - Transmission Heat exchangers Heat exchangers - Design Heat - Transmission - Computer programs Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Front Cover; Process Heat Transfer Principles and Applications; Copyright Page; Contents; Preface; Conversion Factors; Physical Constants; Acknowledgements; Chapter 1: Heat Conduction; 1.1 Introduction; 1.2 Fourier's Law of Heat Conduction; 1.3 The Heat Conduction Equation; 1.4 Thermal Resistance; 1.5 The Conduction Shape Factor; 1.6 Unsteady-State Conduction; 1.7 Mechanisms of Heat Conduction; Chapter 2: Convective Heat Transfer; 2.1 Introduction; 2.2 Combined Conduction and Convection; 2.3 Extended Surfaces; 2.4 Forced Convection in Pipes and Ducts; 2.5 Forced Convection in External Flow 2.6 Free Convection Chapter 3: Heat Exchangers; 3.1 Introduction; 3.2 Double-Pipe Equipment; 3.3 Shell-and-Tube Equipment; 3.4 The Overall Heat-Transfer Coefficient; 3.5 The LMTD Correction Factor; 3.6 Analysis of Double-Pipe Exchangers; 3.7 Preliminary Design of Shell-and-Tube Exchangers; 3.8 Rating a Shell-and-Tube Exchanger; 3.9 Heat-Exchanger Effectiveness; Chapter 4: Design of Double-Pipe Heat Exchangers; 4.1 Introduction; 4.2 Heat-Transfer Coefficients for

Exchangers without Fins; 4.3 Hydraulic Calculations for Exchangers without Fins; 4.4 Series/Parallel Configurations of Hairpins 4.5 Multi-tube Exchangers 4.6 Over-Surface and Over-Design; 4.7 Finned-Pipe Exchangers; 4.8 Heat-Transfer Coefficients and Friction Factors for Finned Annuli; 4.9 Wall Temperature for Finned Pipes; 4.10 Computer Software; Chapter 5: Design of Shell-and-Tube Heat Exchangers; 5.1 Introduction; 5.2 Heat-Transfer Coefficients; 5.3 Hydraulic Calculations; 5.4 Finned Tubing; 5.5 Tube-Count Tables; 5.6 Factors Affecting Pressure Drop; 5.7 Design Guidelines; 5.8 Design Strategy; 5.9 Computer Software; Chapter 6: The Delaware Method; 6.1 Introduction; 6.2 Ideal Tube Bank Correlations 6.3 Shell-Side Heat-Transfer Coefficient 6.4 Shell-Side Pressure Drop; 6.5 The Flow Areas; 6.6 Correlations for the Correction Factors; 6.7 Estimation of Clearances; Chapter 7: The Stream Analysis Method; 7.1 Introduction; 7.2 The Equivalent Hydraulic Network; 7.3 The Hydraulic Equations; 7.4 Shell-Side Pressure Drop; 7.5 Shell-Side Heat-Transfer Coefficient; 7.6 Temperature Profile Distortion; 7.7 The Wills-Johnston Method; 7.8 Computer Software; Chapter 8: Heat-Exchanger Networks; 8.1 Introduction; 8.2 An Example: TC3; 8.3 Design Targets; 8.4 The Problem Table; 8.5 Composite Curves 8.6 The Grand Composite Curve 8.7 Significance of the Pinch; 8.8 Threshold Problems and Utility Pinches; 8.9 Feasibility Criteria at the Pinch; 8.10 Design Strategy; 8.11 Minimum-Utility Design for TC3; 8.12 Network Simplification; 8.13 Number of Shells; 8.14 Targeting for Number of Shells; 8.15 Area Targets; 8.16 The Driving Force Plot; 8.17 Super Targeting; 8.18 Targeting by Linear Programming; 8.19 Computer Software; Chapter 9: Boiling Heat Transfer; 9.1 Introduction; 9.2 Pool Boiling; 9.3 Correlations for Nucleate Boiling on Horizontal Tubes; 9.4 Two-Phase Flow 9.5 Convective Boiling in Tubes

---

#### Sommario/riassunto

The First Law of Thermodynamics states that energy can neither be created nor destroyed. Heat exchangers are devices built for efficient heat transfer from one fluid to another. They are widely used in engineering processes and include examples such as intercoolers, preheaters, boilers and condensers in power plants. Heat exchangers are becoming more and more important to manufacturers striving to control energy costs. Process Heat Transfer Rules of Thumb investigates the design and implementation of industrial heat exchangers. It provides the background needed to unde

---