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Newtonian fluid flow in a cylindrical channel (tube or pipe); 2.2.4.2 Turbulent fluid flow around immersed particles; 2.3 Flow properties of fluids; 2.3.1 Types of fluid flow behavior; 2.3.2 Non-Newtonian fluid flow in pipes; 2.4 Transportation of fluids; 2.4.1 Energy relations: The Bernoulli equation; 2.4.2 Pumps: Types and operation; Kinetic pumps; Positive displacement pumps; 2.4.3 Pump selection; 2.4.4 Ejectors; 2.4.5 Piping
2.5 Flow of particulate solids (powder flow)2.5.1 Introduction; 2.5.2 Flow properties of particulate solids; 2.5.3 Fluidization; 2.5.4 Pneumatic transport; 2.5.5 Flow of powders in storage bins; 2.5.6 Caking; References; 3 Heat and Mass Transfer: Basic Principles; 3.1 Introduction; 3.2 Basic relations in transport phenomena; 3.2.1 Basic laws of transport; 3.2.2 Mechanisms of heat and mass transfer; 3.3 Conductive heat and mass transfer; 3.3.1 The Fourier and Fick laws; 3.3.2 Integration of Fourier's and Fick's laws for steady state conductive transport
3.3.3 Thermal conductivity, thermal diffusivity and molecular diffusivity3.3.3.1 Thermal conductivity and thermal diffusivity; 3.3.3.2 Molecular (mass) diffusivity, diffusion coefficient; 3.3.4 Examples of steady-state conductive heat and mass transfer processes; 3.3.4.1 Steady-state conduction through a single slab; 3.3.4.2 Steady-state conduction through a multi-layer slab; total resistance of resistances in series; 3.3.4.3 Steady-state transfer through varying area; 3.3.4.4 Steady-state mass transfer of gas through a film; 3.4 Convective heat and mass transfer
3.4.1 Film (or surface) heat and mass transfer coefficients

Sommario/riassunto

The past 30 years have seen the establishment of food engineering both as an academic discipline and as a profession. Combining scientific depth with practical usefulness, this book serves as a tool for graduate students as well as practicing food engineers, technologists and researchers looking for the latest information on transformation and preservation processes as well as process control and plant hygiene topics.*Strong emphasis on the relationship between engineering and product quality/safety*Links theory and practice*Considers topics in light of factors such as cost an