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Nota di contenuto	Front Cover; Food Process Engineering and Technology; Copyright Page; Contents; Introduction - Food is Life; Chapter 1 Physical properties of food materials; 1.1 Introduction; 1.2 Mechanical properties; 1.2.1 Definitions; 1.2.2 Rheological models; 1.3 Thermal properties; 1.4 Electrical properties; 1.5 Structure; 1.6 Water activity; 1.6.1 The importance of water in foods; 1.6.2 Water activity, definition and determination; 1.6.3 Water activity: prediction; 1.6.4 Water vapor sorption isotherms; 1.6.5 Water activity: effect on food quality and stability; 1.7 Phase transition phenomena in foods 1.7.1 The glassy state in foods 1.7.2 Glass transition temperature; Chapter 2 Fluid flow; 2.1 Introduction; 2.2 Elements of fluid dynamics; 2.2.1 Viscosity; 2.2.2 Fluid flow regimes; 2.2.3 Typical applications of Newtonian laminar flow; 2.2.3a Laminar flow in a cylindrical channel (pipe or tube); 2.2.3b Laminar fluid flow on flat surfaces and channels; 2.2.3c Laminar fluid flow around immersed particles; 2.2.3d Fluid flow through porous media; 2.2.4 Turbulent fluid flow; 2.2.4a Turbulent Newtonian fluid flow in a cylindrical channel (tube or pipe) 2.2.4b 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; 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; Chapter 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 diffusivity; 3.3.4 Examples of steady-state conductive heat and mass transfer processes; 3.4 Convective heat and mass transfer; 3.4.1 Film (or surface) heat and mass transfer coefficients; 3.4.2 Empirical correlations for convection heat and mass transfer; 3.4.3 Steady-state interphase mass transfer
3.5 Unsteady state heat and mass transfer
3.5.1 The 2nd Fourier and Fick laws; 3.5.2 Solution of Fourier's second law equation for an infinite slab; 3.5.3 Transient conduction transfer in finite solids; 3.5.4 Transient convective transfer in a semi-infinite body; 3.5.5 Unsteady state convective transfer; 3.6 Heat transfer by radiation; 3.6.1 Interaction between matter and thermal radiation; 3.6.2 Radiation heat exchange between surfaces; 3.6.3 Radiation combined with convection; 3.7 Heat exchangers; 3.7.1 Overall coefficient of heat transfer; 3.7.2 Heat exchange between flowing fluids
3.7.3 Fouling

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
