

1. Record Nr.	UNINA9910139293503321
Titolo	Energy savings // edited by Evangelos Tsotsas and Arun S. Mujumdar
Pubbl/distr/stampa	Weinheim, Germany, : Wiley-VCH, 2012
ISBN	3-527-64401-6 1-283-41404-X 9786613414045 3-527-63168-2 3-527-63169-0
Edizione	[1st ed.]
Descrizione fisica	1 online resource (378 p.)
Collana	Modern drying technology ; ; v. 4
Altri autori (Persone)	TsotsasEvangelos MujumdarA. S
Disciplina	660.28 660.28426
Soggetti	Drying Drying agents Drying equipment industry - Energy conservation Energy conservation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Modern Drying Technology: Energy Savings; Contents; Series Preface; Preface of Volume 4; List of Contributors; Recommended Notation; EFCE Working Party on Drying; Address List; 1 Fundamentals of Energy Analysis of Dryers; 1.1 Introduction; 1.2 Energy in Industrial Drying; 1.3 Fundamentals of Dryer Energy Usage; 1.3.1 Evaporation Load; 1.3.2 Dryer Energy Supply; 1.3.3 Evaluation of Energy Inefficiencies and Losses: Example; 1.3.3.1 Dryer Thermal Inefficiencies; 1.3.3.2 Inefficiencies in the Utility (Heat Supply) System; 1.3.3.3 Other Energy Demands; 1.3.4 Energy Cost and Environmental Impact 1.3.4.1 Primary Energy Use 1.3.4.2 Energy Costs; 1.3.4.3 Carbon Dioxide Emissions and Carbon Footprint; 1.4 Setting Targets for Energy Reduction; 1.4.1 Energy Targets; 1.4.2 Pinch Analysis; 1.4.2.1 Basic Principles; 1.4.2.2 Application of Pinch Analysis to Dryers; 1.4.2.3 The Appropriate Placement Principle Applied to Dryers; 1.4.2.4 Pinch

Analysis and Utility Systems; 1.4.3 Drying in the Context of the Overall Process; 1.5 Classification of Energy Reduction Methods; 1.5.1 Reducing the Heater Duty of a Convective Dryer; 1.5.2 Direct Reduction of Dryer Heat Duty  
1.5.2.1 Reducing the Inherent Heat Requirement for Drying 1.5.2.2 Altering Operating Conditions to Improve Dryer Efficiency; 1.5.3 Heat Recovery and Heat Exchange; 1.5.3.1 Heat Exchange Within the Dryer; 1.5.3.2 Heat Exchange with Other Processes; 1.5.4 Alternative Utility Supply Systems; 1.5.4.1 Low Cost utilities; 1.5.4.2 Improving Energy Supply System Efficiency; 1.5.4.3 Combined Heat and Power; 1.5.4.4 Heat Pumps; 1.6 Case Study; 1.6.1 Process Description and Dryer Options; 1.6.2 Analysis of Dryer Energy Consumption; 1.6.3 Utility Systems and CHP; 1.7 Conclusions; References  
2 Mechanical Solid-Liquid Separation Processes and Techniques 2.1 Introduction and Overview; 2.2 Density Separation Processes; 2.2.1 Froth Flotation; 2.2.2 Sedimentation; 2.3 Filtration; 2.3.1 Cake Filtration; 2.3.2 Sieving and Blocking Filtration; 2.3.3 Crossflow Micro- and Ultra-Filtration; 2.3.4 Depth and Precoat Filtration; 2.4 Enhancement of Separation Processes by Additional Electric or Magnetic Forces; 2.5 Mechanical/Thermal Hybrid Processes; 2.6 Important Aspects of Efficient Solid-Liquid Separation Processes; 2.6.1 Mode of Apparatus Operation  
2.6.2 Combination of Separation Apparatuses 2.6.3 Suspension Pre-Treatment Methods to Improve Separation Conditions; 2.7 Conclusions; References; 3 Energy Considerations in Osmotic Dehydration; 3.1 Scope; 3.2 Introduction; 3.3 Mass Transfer Kinetics; 3.3.1 Pretreatments; 3.3.2 Product; 3.3.3 Osmotic Solution; 3.3.4 Treatment Conditions; 3.4 Modeling of Osmotic Dehydration; 3.5 Osmotic Dehydration - Two Major Issues; 3.5.1 Quality Issues; 3.5.2 Energy Issues; 3.5.2.1 Osmo-Convective Drying; 3.5.2.2 Osmo-Freeze Drying; 3.5.2.3 Osmo-Microwave Drying; 3.5.2.4 Osmotic-Vacuum Drying; 3.6 Conclusions  
References

---

Sommario/riassunto

This multivolume work covers drying, a key industrial processes that accounts for about 10-percent of total energy consumption in industry. It guides engineers towards achieving energy savings through such approaches as improved apparatus design, optimization, and heat recovery. In so doing, it points the way to success for both researchers and practitioners in mastering this multiphase and multiscale process.

---