Handbook of Research on Advances and Applications in Refrigeration Systems and Technologies (2 Vols.)

Part of the Advances in Mechatronics and Mechanical Engineering (AMME) Book Series

Pedro Dinis Gaspar (University of Beira Interior, Portugal) and Pedro Dinho da Silva (University of Beira Interior, Portugal)

Description:
In recent years, the sustainability and safety of perishable foods has become a major consumer concern, and refrigeration systems play an important role in the processing, distribution, and storage of such foods. To improve the efficiency of food preservation technologies, it is necessary to explore new technological and scientific advances both in materials and processes.

The Handbook of Research on Advances and Applications in Refrigeration Systems and Technologies gathers state-of-the-art research related to thermal performance and energy-efficiency. This book covers a diverse array of subjects from the challenges of surface-area frost-formation on evaporators to the carbon footprint of refrigerant chemicals.

Readers:
This publication provides a broad insight into the optimization of cold-supply chains and serves as an essential reference text for undergraduate students, practicing engineers, researchers, educators, and policymakers.


Topics Covered:
- Cold-Supply Chains
- Commercial vs. Domestic Refrigeration
- Ejector Refrigeration
- Evaporator Design
- Exergetic Analysis
- Refrigeration Systems
- Renewable Energy and Food Storage
- Thermal Performance
- Transcritical Refrigeration Cycles

Hardcover + Free E-Access: $545.00
E-Access Only: $515.00
1 Year Online Subscription: $255.00
2 Year Online Subscription: $430.00
Chapter 1
Ejector Refrigeration Cycles: Classification of Thermodynamic Cycles with Ejectors
Mark Bergander, University of Hartford, USA

Chapter 2
The Diffusion Absorption Refrigerator Operation and Performance
Lorenzo De Pascale, University of Salento, Italy
Giuseppe Starace, University of Salento, Italy
Federica Carlucci, University of Salento, Italy

Chapter 3
Advanced Exergetic Analysis is a Modern Tool for Evaluation and Optimization of Refrigeration Systems
Tatiana Morosuk, Technical University of Berlin, Germany
George Tsatsaronis, Technical University of Berlin, Germany

Chapter 4
New Mechanisms for Cryogenic Solid-Gas Sublimation Refrigeration: Basic Principles and System Designs
Lin Chen, Peking University, China

Chapter 5
Ejection Refrigeration Cycles
Durajcz Josef Batrynowicz, Bialystok University of Technology, Poland
Kamil Leszek Smierciec, Bialystok University of Technology, Poland
Jerzy Gagan, Bialystok University of Technology, Poland
Jaroslaw Lech Karwacki, Institute of Fluid-Flow Machinery, Poland

Chapter 6
Current and Future Trends of Refrigerants Development
Miguel Duarte, University of Beira Interior, Portugal
Luís Carvalho Pires, University of Beira Interior, Portugal
Pedro Dinis da Silva, University of Beira Interior, Portugal
Pedro Dinis Gaspar, University of Beira Interior, Portugal

Chapter 7
Retrofitting of R404a Commercial Refrigeration Systems with R410a and R407F HFCs Refrigerants
Marco Bortolini, University of Bologna, Italy
Mauro Gamberi, University of Padova, Italy
Alessandro Graziani, University of Padova, Italy
Riccardo Manzini, University of Bologna, Italy

Chapter 8
Transcritical Carbon Dioxide Refrigeration as an Alternative to Subcritical Plants: An Experimental Study
Adriana Greco, University of Naples Federico II, Italy
Ciro Aprea, University of Salerno, Italy
Angelo Maiorino, University of Salerno, Italy

Chapter 9
Capillary Tube as an Expansion Device in a CO2 (R744) Transcritical Heat Pump System
Neeraj Agrawal, Dr. Babasaheb Ambedkar Technological University, India
Sovik Bhattacharyya, Indian Institute of Technology Kharagpur, India

Chapter 10
Transcritical CO2 Refrigeration System in Tropical Region: Challenges and Opportunities
Mani Sankar Dasgupta, Birla Institute of Technology and Science, India
Dileep Kumar Gupta, Birla Institute of Technology and Science, India

Chapter 11
Processes and Technological Systems for Freezing of Foodstuff
Vladimir Stefanovskiy, All-Russia Scientific Research Institute of Refrigerating Industry, Russia

Chapter 12
Study of Thermal and Microbiological Behavior of Foods Submitted to Evaporative Cooling Process
Paulo Ricardo Santos da Silva, University of Vale do Rio dos Sinos, Brazil

Chapter 13
Refrigeration in Fruit Storage: ‘Rocha’ Pear as a Case Study
Teresa Deuchande, Catholic University of Portugal, Portugal
Susana Carvalho, Catholic University of Portugal, Portugal
Christian Larrigaudiere, Research Institute of the Government of Catalonia, Spain
Marta Vasconcelos, Catholic University of Portugal, Portugal

Chapter 14
Guiding Principles for Hygienic Design of Evaporators to Mitigate Contamination-Related Risks in Air Blast Freezing Systems
Frank Moerman, Catholic University of Leuven, Belgium
Kostadin Fikiin, Technical University of Sofia, Bulgaria

Chapter 15
Aerodynamic Isolation of Open Refrigerated Vertical Display Cases using Air Curtains
Mazyar Navaz, Kettering University, USA
Dana Dabiri, University of Washington, USA
Homayun Navaz, Kettering University, USA

Chapter 16
Experimental Analysis to Optimize the Performance of Air Curtains and Heat Exchangers: Application to Refrigerated Display Cases
Samuel Nascimento, University of Beira Interior, Portugal
Gustavo Heidinger, University of Beira Interior, Portugal
Pedro Dinis Gaspar, University of Beira Interior, Portugal
Pedro Dinis da Silva, University of Beira Interior, Portugal

Chapter 17
Implementation of Thermal and Energy Improvements in Domestic Refrigeration. Case Studies
Juan Manuel Belman-Flores, University of Guanajuato, Mexico
Armando Gallegos-Muñoz, University of Guanajuato, Mexico

Chapter 18
Effect of Hygienic Design and Operational Parameters on Frosting and Defrosting of Evaporators in Refrigerated Food Processing and Storage Facilities
Frank Moerman, Catholic University of Leuven, Belgium
Kostadin Fikiin, Technical University of Sofia, Bulgaria

Chapter 19
Expansion Power Recovery in Refrigeration Systems
Alison Subiantoro, TUM CREATE, Singapore
Ooi Kim Tiow, Nanyang Technological University, Singapore

Chapter 20
Cold Thermal Energy Storage
Franc Kosi, University of Belgrade, Serbia
Branimir Zivkovic, University of Belgrade, Serbia
Mirko Komatina, University of Belgrade, Serbia
Dragi Antonijevic, University of Belgrade, Serbia
Mohamed Abdul Galil, University of Belgrade, Serbia
Uros Milovanovic, University of Belgrade, Serbia

Chapter 21
Development of Heat Pump System using Thermobank and Ejector for Heating Room and Cold Storage
Jong-Teak Oh, Chonnam National University, Republic of Korea
Chapter 22
Integration of Renewable Energy in Refrigerated Warehouses
Kostadin Fikiin, Technical University of Sofia, Bulgaria
Borislav Stankov, Technical University of Sofia, Bulgaria

Chapter 23
Optimization of Natural Gas Liquefaction Process
Mohd Shariq Khan, Yeungnam University, Republic of Korea
Moonyong Lee, Yeungnam University, Republic of Korea

Chapter 24
Use of Hydrogen and Fuel Cells for Refrigerated Transport
Raquel Garde, National Renewable Energy Centre, Spain
Sindia Casado, National Renewable Energy Centre, Spain
Fernando Jimenez, National Renewable Energy Centre, Spain
Gabriel Garcia, National Renewable Energy Centre, Spain
Monica Aguado, National Renewable Energy Centre, Spain