

## Book Review

*Modern Drying Technology (Third edition)*, edited by Xiangdong Liu and Zhanyong Li, Chemical Industry Press: Beijing, China; 2022; ISBN:9787122391186, 2346pp. In Chinese.

*Modern Drying Technology* is a Chinese technical manual which introduces wide ranging knowledge about drying, including drying theories, drying methods, product drying, dryer control, energy savings, etc. Its first edition can be traced back to 1990s and in that year, Prof Yongkang Pan planned to translate the *Handbook of Industrial Drying* (1<sup>st</sup> edition, CRC Press, New York, USA) edited by Professor Arun S. Mujumdar. While, Professor Mujumdar suggested him to edit a Chinese handbook rather than translating the book. After more than 3-year efforts from 38 Chinese drying experts and several international contributors such as Prof Arun S. Mujumdar, C. Strumillo, Dr. Kudra, et al., the first edition was published in 1998. The book was widely welcomed by graduate students, researchers, and industry personnel who found this to be a good source for acquiring drying knowledge, operation and design of new dryers. Since it enjoyed high reputation in industry, the first edition of the book won the prestigious scientific and technological progress award of China Petroleum and Chemical Association.

*Modern Drying Technology* was updated in 2007 as its enhanced second edition, which was co-edited by Professors Yongkang Pan, Xizhong Wang and Xiangdong Liu. Now, the third edition of *Modern Drying Technology* has been published in significantly expanded and updated version, covering much more area and recent developments in drying technologies. The new edition is published in 2 volumes, 53 chapters and 2346 pages. Compared with the previous second edition, the number of words in the third edition has increased by nearly 50% and 7 new chapters have been added to it. It has truly become a unique "Encyclopedia" of Chinese drying technology.

The contents of *Modern Drying Technology* can be divided into four main sections:

Part 1: Drying fundamentals and theories.

Part 2: Drying method and dryers.

Part 3: Drying in various industries

Part 4: Auxiliary technologies and devices in drying.

Beside the four sections, the book has a preface which gives a concise historical account of drying, development of drying technology in China, selection of dryers and

innovations in drying technology; and an appendix which lists key representative books on drying in Chinese, English, Japanese, etc. Thus, the coverage of this book is truly global. With reference to this book, the reader can directly carry out selection of drying methods and equipment, drying testing and simulation, the design and operation of dryer, and comprehensively understand the development trend of the drying technology. There is no other drying book in Chinese which is so comprehensive with such broad coverage useful for industry as well as academia.

For the convenience of the readers, the following gives a brief listing and contents of the main four sections in this book.

**In Part I**, there are 4 chapters which introduce the psychometric characteristics of humid air and the wet feed, calculations of drying process and dryer design, the experimental and measurement methods for drying R&D, as well as various drying modeling and simulation techniques. New experimental and measurement methods are included such as the determination of drying kinetics of single particles (liquid droplets), which is important in design of spraying drying processes.

**Part II** is dedicated to detailed description of different drying methods and dryers, including various novel drying methods, typical traditional dryers and new hybrid dryers. It contains 23 chapters and each chapter introduces one typical type of dryer. The types of the dryers and drying systems cover tunnel and chamber drying, drum drying, belt drying, rotary drying, pneumatic and flash drying, fluidized bed drying (including its variants), spray drying, impingement and through drying, impinging stream drying, solar drying, infrared drying, microwave and dielectric drying, heat pump drying, superheated steam drying, supercritical drying, contact-sorption drying, pulse combustion drying, freeze drying, etc. Most chapters show physical modeling, performance evaluation, design calculation, industrial applications of the drying systems. It is fascinating to find that the book covers a wide range of dryers that have been used across various fields to dry diverse types of materials. There is no other book that presents such a diverse range of dryers and their comprehensive applications in several industrial sectors.

**Part III** constitutes 19 chapters focusing on the drying process and dryers of specific materials. The materials considered are food, fruits and vegetables, grain, dairy products and sugar, plant extracts, tea, cotton, tobacco, pasture, wood, Chinese medicinal tablets, biotechnological products, polymers, nanomaterials, wood, paper, coal and minerals, sludge, ceramic products, etc. The dryer types described in this section are used to treat the above materials. Thus, this section is very useful for researchers and industries to identify the suitable dryer types for the drying of a variety of materials.

**In Part IV**, the main auxiliary systems and technologies related to the drying process are introduced in 7 chapters. It concludes heating system, ventilation and dust

collection system, feeding and discharging devices, dryer control, life cycle assessment, as well as energy-saving and safe operation.

"Smart dryers" is a development trend for industrial drying with low operation cost and high product quality. In this revised edition, special attention is paid to tracking the latest research progress about smart dryer. For example, application of intelligent control technology in freeze dryers, intelligent process control and artificial neural network technology in drying of fresh food, automatic control of grain drying equipment, as well as model-based control based on the single droplet drying experimental and measurement techniques.

This book is prepared with the participation of nearly 100 drying experts from 33 universities, 21 scientific research institutes and enterprises in China. It is a result of top expertise and knowledge from technologists and researchers in Chinese drying community. The two editors-in-chief are internationally well recognized researchers, who both graduated from Tianjin Institute of Light Industry (now Tianjin University of Science and Technology) and received their doctorates from Lodz Technical University, Poland and Nagoya University, Japan, respectively.

*Modern Drying Technology* is recommended to every industry sector that is associated with drying, such as teaching, research, product development and production, design, and manufacturing of dryers. Readers may find book reviews of the first two editions which have also appeared in this journal which can available at the following links.

<https://www.tandfonline.com/doi/full/10.1080/07373930701729271>

<https://www.tandfonline.com/doi/abs/10.1080/07373939908917590>

The editors are congratulated for their outstanding effort in editing such a comprehensive powerhouse of current knowledge about industrial drying science, technology and engineering.

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