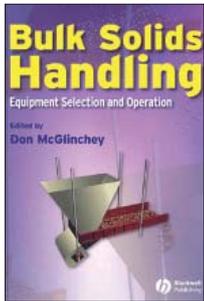


## **BULK SOLIDS HANDLING: EQUIPMENT SELECTION AND OPERATION**

**Edited by Don McGlinchey, Wiley-Blackwell, Hoboken, NJ, 290 pages, \$170, May 2008, ISBN-13: 978-1-4051-5825-1**



Powders and bulk solids are central to a wide spectrum of industries, from minerals processing and bulk and fine chemicals to food and pharmaceuticals. This book provides an overview of the major technologies involved in the storage and handling of particulate materials, from large grains to fine cohesive materials.

Eight international experts in the field contributed to the text, which positions the reader to diagnose solids handling and processing problems in industry and to deal with experts and equipment vendors from an informed position. Readers will receive guidance on equipment choices, applications, and the limitations of current bulk solids handling technologies.

The book establishes a grounding in the technology through an introductory discussion of bulk powder properties and the instrumentation and techniques for determining them. The introduction chapter covers topics such as: flow properties, particle and powder densities, protocol for determining bulk density, and instrumentation for the measurement of tensile strength and cohesion.

The book next moves into a detailed examination of the design of hoppers and bins from a flowability perspective. This chapter covers flow patterns, flowrate, particle segregation, vessel outlets, aerated versus nonaerated discharge, bin and hopper selection criteria, and operational considerations, including flowrate problems, structural and process problems, abrasive wear and attrition, and feeder problems.

Chapter 3 deals with the design and construction of silos and hoppers. Here, readers will develop an understanding of pressure changes in silos and their consequences (including pressure changes during emptying), structural damage and its causes, structural safety, and special design situations. The chapter refers extensively to the provisions of the recently developed European standards for silo pressures and for structural design of metal silos.

Extensive chapters are devoted to several conveying systems, although belt conveying is not included in the book. Pneumatic conveying systems and their design are covered in detail, including types of conveying systems, system components, factors that affect conveying capability, conveying system design criteria, and troubleshooting. The discussion of screw conveyors covers classes of screw equipment, stan-

dard screw conveyor features, the operational benefits and limitations of screw conveyors, power requirements, screw feeders, dispensing screws, and special screw conveyors. A succinct, informative review of trough conveying, including chutes, vibratory conveyors, air slides, and chain and flight conveyors, is provided. A useful table summarizes conveyor technologies, with guidance on their key functions, materials handled, conveying length, and capacity.

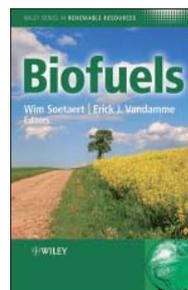
A final chapter reviews the equipment available for small-scale bulk-handling operations.

This book will be a useful source of information for both neophytes and experienced engineers who are responsible for handling, storage, processing, or production involving particulate materials. In subsequent editions, I hope that the editor will include a chapter on the hazards associated with powder and bulk solids storage and handling — as many of these materials are combustible or pose health hazards, and can cause explosions or adversely affect the health of persons handling them. For readers interested in these hazards and methods to minimize or eliminate them, the Center for Chemical Process Safety's (CCPS) book, "Guidelines for Safe Handling of Powders and Bulk Solids," is recommended.

*Stanley S. Grossel,  
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## **BIOFUELS**

**Edited by Wim Soetaert and Erick J. Vandamme, John E. Wiley & Sons, Ltd., West Sussex, U.K., 256 pages, \$130, Mar. 2009, ISBN-13: 978-0-470-02674-8**



The use of biofuels is gaining momentum, and, with the gradual depletion of fossil fuel reserves, is expected to have an increasing impact on the world's energy and agricultural sectors.

This latest entry in Wiley's Series in Renewable Resources covers the use and conversion technologies of biomass as a renewable resource to produce bioenergy in sustainable ways. The book starts by comparing renewable energy sources with fossil fuels. It then provides a broad overview of the economics and technology of biofuels development, and the integration of biofuels into industry. Production technologies for biofuels are assessed in detail. The book also discusses the interaction of renewable fuels technologies with global market factors and ecological considerations.

The book will be useful to chemists, biologists and engineers working in the biofuels industry, as well as for researchers, teachers, policy-makers, and those involved in convention fuel companies.