



Multiphase Flow and Fluidization: Continuum and Kinetic Theory Descriptions

By Dimitri Gidaspow

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Useful as a reference for engineers in industry and as an advanced level text for graduate engineering students, *Multiphase Flow and Fluidization* takes the reader beyond the theoretical to demonstrate how multiphase flow equations can be used to provide applied, practical, predictive solutions to industrial fluidization problems. Written to help advance progress in the emerging science of multiphase flow, this book begins with the development of the conservation laws and moves on through kinetic theory, clarifying many physical concepts (such as particulate viscosity and solids pressure) and introducing the new dependent variable—the volume fraction of the dispersed phase. Exercises at the end of each chapter are provided for further study and lead into applications not covered in the text itself.

- Treats fluidization as a branch of transport phenomena
- Demonstrates how to do transient, multidimensional simulation of multiphase processes
- The first book to apply kinetic theory to flow of particulates
- Is the only book to discuss numerical stability of multiphase equations and whether or not such equations are well-posed
- Explains the origin of bubbles and the concept of critical granular flow
- Presents clearly written exercises at the end of each chapter to facilitate understanding and further study

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Editorial Review

Review

"Overall, I recommend this book to people who are serious about fundamental modeling of multiphase flows. It is representative of the latest efforts in this field; namely it is the first to focus on the kinetic theory as applied to multiphase systems involving particles." **--POWDER TECHNOLOGY**

From the Back Cover

As a reference tool for engineers and as an advanced level text for graduate students, Multiphase Flow and Fluidization takes the reader beyond the theoretical to show how multiphase flow equations provide practical solutions to industrial fluidization problems. Written to advance progress in the emerging science of multiphase flow, this book begins with the development of basic conservation laws and moves on through kinetic theory. It clarifies many physical concepts (such as particulate viscosity and solids pressure) and introduces the new dependent variable--the volume fraction of the dispersed phase. Exercises are provided for further study, and lead into applications not covered in the text itself.

This book is the first to apply kinetic theory to flow particulates. It treats fluidization as a branch of transport phenomena and shows how to do transient, multidimensional simulation of multiphase processes. There is much new material here, from such theoretical matters as well-posedness and numerical stability of multiphase equations, to such practical ones as the origin of bubbles and the concept of critical granular flow.

Users Review

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