



Modeling of Steelmaking Processes

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From the prediction of complex weather patterns to the design of swimsuits, modeling has, over the years, quietly but steadily become an essential part of almost every field and industry—and steelmaking is no exception. Factors such as visual opacity, high operating temperature, and the relatively large size of industrial reactors often preclude direct experimental observation in steel manufacturing. Therefore the industry is overwhelmingly dependent on modeling to quickly and cost-effectively provide insight into analysis, design, optimization, and control of processing. However, few, if any, books offer the adequate coverage of modeling.

Addresses Fundamental Principles of Physical and Mathematical Modeling in Steelmaking Processes

Modeling of Steelmaking Processes meets that ever-present demand and provides a solid knowledge base on which to build. With content designed to serve professionals and students, this book starts with an overview of steelmaking and develops into a focused description of underlying scientific fundamentals and applications.

This powerful learning tool:

- Presents an overview of steelmaking, the relevance of modeling and measurements, the evolution of steelmaking, and modern technology
- Discusses emerging issues, such as environmental emissions, recycling, and product development and quality
- Analyzes mechanistic, AI-based, and macroscopic models, to provide a holistic view of steelmaking process modeling
- Provides useful questions and problems, as well as a practice session on modeling, to reinforce understanding

Developed as a self-tutorial, this text explores thermodynamic principles, analysis of metallurgical kinetics and transport phenomena, and key numerical methods, helping readers easily navigate a generally complex subject.

Catalog no. 62433, August 2009, c. 500 pp.
ISBN: 978-1-4200-6243-4, \$139.95 / £89.00

Features

- Describes modern steelmaking technology including types of models and their applications
- Presents elements of physical and mathematical modeling with illustrative examples
- Discusses computational fluid dynamics (CFD) software
- Features worked examples, homework problems, and a solutions manual

About the Authors

Professor Mazumdar has been teaching process modeling and steelmaking at the Indian Institute of Technology, Kanpur, India, for more than two decades. He has coauthored a book, and has written book chapters and numerous articles in peer-reviewed journals. He is well known for numerous original contributions in the area of ladle metallurgy, steelmaking, and continuous casting. Professor Mazumdar is a fellow of the Indian National Academy of Engineering and works as a consultant to several Indian steel plants.

Professor Evans holds the P. Malozemoff chair in the Department of Materials Science and Engineering at the University of California, Berkeley. During his four-decade-long career in metals and materials research, he has made numerous original contributions, and has authored and coauthored several books and monographs. Professor Evans is well known for his contributions to modeling in process metallurgy and aluminum metallurgy. He has to his credit more than 300 publications and has won several awards and honors including the Brimacombe Award, the Berkeley Citation, and the Douglas Gold Medal of Advances in Mechanical Engineering.

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FLAT-ROLLED STEEL PROCESSES

Advanced Technologies

Vladimir B. Ginsburg

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Considered one of the major innovators in the flat-rolling of steel, Vladimir B. Ginsburg holds more than two dozen patents in the industry. In this volume, Ginsburg brings together other industry pioneers to define the latest developments in flat-rolled processes. This includes the revolutionary introduction of computer-based technology in both new and existing conventional rolling mills. Each section provides a brief topic summary and then goes on to describe the latest advances specific to that area. Main subjects include advanced hot rolling mills, advanced cold rolling mills, control systems, and the production of advanced flat-rolled steel products.

Catalog no. 72927, May 2009, 384 pp.

ISBN: 978-1-4200-7292-1, \$169.95 / £103.00

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