



## ASM Handbook Volume 22A: Fundamentals of Modeling for Metals Processing (ASM Handbooks)

By David Furrer

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This Handbook provides an overview of the development of models of metallic materials and how the materials are affected by processing. This knowledge is central to understanding of the behavior of existing alloys and the development of new materials that affect nearly every manufacturing industry. Background on fundamental modeling methods provides the user with a solid foundation of the underlying physics that support the mechanistic method of many industrial simulation software packages. The phenomenological method is given equal coverage.

The substantial efforts of the past 25 years to develop and implement computer-based models to simulate manufacturing processes, the evolution of microstructures, and the effects on the mechanical properties within component materials are detailed. The rate of change within this area of engineering has continued to increase with increasing industrial benefits from the use of such engineering tools, and the reduced cost and increased speed of computing systems required to perform the extensive model calculations. This book serves as a reference to these developments and the governing principles on which they are based.

Leading experts from ten countries have contributed to this effort to provide a comprehensive reference for the modeling practitioner as well as those needing to learn modeling methods.

This Volume will be joined by a companion, Volume 22B, Metals Process Simulation, that will provide details on integrating these models into software tools to allow simulation of manufacturing processes.

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