



# Science and Engineering of Casting Solidification, Second Edition

By Doru Stefanescu

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**Science and Engineering of Casting Solidification, Second Edition** By Doru Stefanescu

Stefanescu here attempts to describe solidification theory through the complex mathematical apparatus required for a fundamental treatment of the problem. The mathematics is however restricted to the elements essential to attain a working knowledge in the field. This is in line with the main goal of the book, which is to educate the reader in the fast moving area of computational modeling of solidification of castings. A special effort has been made to introduce the reader to the latest developments in solidification theory including, in this second edition, a new chapter on semi-solid casting.

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## **Science and Engineering of Casting Solidification, Second Edition By Doru Stefanescu Bibliography**

- Sales Rank: #3525674 in Books
- Published on: 2008-11-06
- Original language: English
- Number of items: 1
- Dimensions: 9.21" h x .94" w x 6.14" l, 1.55 pounds
- Binding: Hardcover
- 380 pages



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## **Editorial Review**

From the Back Cover

*Science and Engineering of Casting Solidification, Second Edition* covers the essentials of solidification science of metals and alloys at macro- and micro-length scales at cooling rates specific to commercial castings and rapid solidification processing. The mathematical fundamentals necessary to build a working knowledge in the field, specifically partial differential equations and numerical analysis, are introduced. Each topic begins with the description of the underlying physics, followed by the mathematics required to build analytical and numerical models. Wherever possible, a detailed description of the architecture of the numerical model is provided, followed by examples of models built on the Excel spreadsheet.

Features of this new edition include:

- Expanded sections on peritectic solidification and shrinkage porosity mechanisms and modeling,
- A new chapter addressing rapid solidification and bulk metallic glasses,
- Additional solved problems,
- Revised and simplified derivations of several models.

*Science and Engineering of Casting Solidification, Second Edition* will prove useful to senior undergraduate and graduate students, as well as to industrial researchers that work in the field of solidification in general and casting modeling in particular. The detailed coverage of casting defects will also make it useful to industrial practitioners of metal casting. Additional course materials are available upon faculty request.

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