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Descrizione fisica	1 online resource (XIX, 544 p. 210 illus., 156 illus. in color.)
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Soggetti	Solidification Metals - Transport properties
Lingua di pubblicazione	Inglese
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Note generali	Includes index.
Nota di contenuto	Chapter 1. Crystallography -- Chapter 2. Surface Reconstruction -- Chapter 3. Mass Transport by Diffusion -- Chapter 4. Solidification -- Chapter 5. Planar Metal Solidification -- Chapter 6. Contour Metal Solidification -- Chapter 7. Alloy Solidification I -- Chapter 8. Alloy Solidification II -- Chapter 9. Solid-State Phase Change -- Chapter 10. Solidification Defects.
Sommario/riassunto	This textbook explains the physics of phase transformation and associated constraints from a metallurgical or materials science point of view, based on many topics including crystallography, mass transport by diffusion, thermodynamics, heat transfer and related temperature gradients, thermal deformation, and even fracture mechanics. The work presented emphasizes solidification and related analytical models based on heat transfer. This corresponds with the most fundamental physical event of continuous evolution of latent heat of fusion for directional or non-directional liquid-to-solid phase transformation at a specific interface with a certain geometrical shape, such as planar or curved front. Dr. Perez introduces mathematical and engineering approximation schemes for describing the phase transformation, mainly during solidification of pure metals and alloys. Giving clear definitions and explanations of theoretical concepts and full detail of derivation of formulae, this interdisciplinary volume is ideal for graduate and upper-level undergraduate students in applied

science, and professionals in the metal making and surface reconstruction industries. Reinforces concepts with example problems illustrating the application of thermodynamics and heat transfer techniques for solving complex solidification problems Adopts an easy and succinct manner narrative style Elucidates solidification shrinkage and gas porosity in casting defects Describes analysis of cracks around a pore using linear elastic fracture mechanics (LEFM) .
