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Autore	Singh Ramesh
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Nota di contenuto	Front Cover; Applied Welding Engineering: Processes, Codes and Standards; Copyright Page; Acknowledgment; 1. Introduction to Basic Metallurgy; 1. Introduction; Pure Metals and Alloys; Smelting; Iron; Sponge Iron; 2. Alloys; Alloys; Effects of Alloying Elements; Carbon Steels; Sulfur; Manganese; Phosphorus; Silicon; Alloy Steels; The Effect of Alloying Elements on Ferrite; Effects of Alloying Elements on Carbide; 3. Physical Metallurgy; Crystal Lattices; Crystal Structure Nomenclature; Solidification; Lever Rule of Solidification; Constitutional Supercooling; Elementary Theory of Nucleation AllotropyCrystal Imperfections; Grain Size; 4. Structure of Materials; Phase Diagrams; Different Types of Phase Diagrams; Iron-Iron Carbide Phase Diagram; Explanation of the Iron-Carbon Phase Diagram; Rationale for Letter Designations in the Iron-Iron Carbide Phase Diagram; 5. Production of Steel; The Electric Arc Furnace (EAF) Process; Furnace Charging; Melting; Refining; Phosphorus Removal; Sulfur Removal; Nitrogen and Hydrogen Control; De-Slagging; Tapping; Basic Oxygen Furnace (BOF); Refining Reactions; Carbon; Silicon; Manganese; Phosphorus; Sulfur Removal; Deoxidation of Steel

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White Heart Cast IronBlack Heart Cast Iron; Pearlite Malleable Cast Iron; Martensitic Malleable Iron; Gray Cast Iron; Castability of Gray Cast Iron; Chilled Cast Iron; Nodular (Spheroidal Graphite) Cast Iron; Castability, Solidification and Shrinkage; Alloy Cast Irons; 8. Stainless Steels; Stainless Steel Production; Forming; Heat Treatment; Cutting Stainless Steel; Finishing; Fabrication of Stainless Steel; Welding and Joining; Types of Stainless Steels; Classification of Stainless Steel; Martensitic Stainless Steels; Ferritic Stainless Steels; Pitting Resistance Equivalent (PRE)
Austenitic Stainless SteelsDuplex Stainless Steels; Precipitation-Hardening (PH) Stainless Steels; 9. Non-Ferrous Materials; Copper and Copper Alloys; Aluminum and Aluminum Alloys; Physical Metallurgy of Aluminum; Effect of Alloying Elements on Aluminum; Effect of Iron; Effect of Silicon; Effect of Manganese; Effect of Magnesium; Effect of Copper; Effect of Zinc; Effect of Chromium; Effect of Zirconium; Effect of Lithium; Age Hardenable Alloys; Nickel and Nickel Alloys; Titanium and Titanium Alloys; 10. Working With Metals; Elastic Limit; Plastic Deformation; Fracture
Polycrystalline Materials

Sommario/riassunto

While there are several books on market that are designed to serve a company's daily shop-floor needs. Their focus is mainly on the physically making specific types of welds on specific types of materials with specific welding processes. There is nearly zero focus on the design, maintenance and troubleshooting of the welding systems and equipment. Applied Welding Engineering: Processes, Codes and Standards is designed to provide a practical in-depth instruction for the selection of the materials incorporated in the joint, joint inspection, and the quality control for the final product. Weld