Hardenability Concepts With Applications To Steel

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Fatigue and Corrosion in Metals
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Principles of heat treatment of steels
Comprehensive Materials Processing
Residual Stress and Stress Relaxation
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Hot Stamping Advanced Manufacturing Technology of Lightweight Car Body
Encyclopedia of Iron, Steel, and Their Alloys (Online Version)
Tool Steels, 5th Edition
International Conference on Martensitic Transformations (ICOMAT) 2008
Handbook of Metallurgical Process Design
Conceptual Density Functional Theory and Its Application in the Chemical Domain
Advances in Neural Networks
Hardenability Concepts with Applications to Steel
Trends in Welding Research 2012: Proceedings of the 9th International Conference
NBSIR.
Computational Welding Mechanics

MCKENZIE BRENNAN

Hardenability Concepts with Applications to Steel Elsevier
Reviewing an extensive array of procedures in hot and cold forming, casting, heat treatment, machining, and surface engineering of steel and aluminum, this comprehensive reference explores a vast range of processes relating to metallurgical component design-enhancing the production and the properties of engineered components while reducing manufacturing costs. It surveys the role of computer simulation in alloy design and its impact on material structure and mechanical properties such as fatigue and wear. It also discusses alloy design for various materials, including steel, iron, aluminum, magnesium, titanium, super alloy compositions and copper.
Fatigue and Corrosion in Metals CRC Press
Having a good understanding of a construction material's performance under different conditions is essential for helping engineers in selecting the right type of material for a job and for setting design specifications. Keeping abreast of the latest research is an important part of this.The deformation and processing of structural materials is divided into eight chapters, each one exploring a material's processing and deformation behaviour. They also consider how the microstructural composition of materials is affected by processing and what influence this has on its subsequent in situ performance. The materials and behaviours looked at in the chapters include: aluminium and its alloys; magnesium alloys; ferrous alloys; superalloys (Ni-based alloys); semisolid metal (SSM) processing of metallic alloys; plastic deformation of intermetallic alloys; metal matrix composites (MMCs); and fine grain superplasticity in SP materials.The first of its kind to give comprehensive coverage to the subject, The deformation and processing of structural materials is a valuable resource for engineers, researchers in mechanical, civil and structural engineering. - Contains research on the preformance of materials - Valuable resource for researchers in mechanical, civil and structural engineering - Comprehensive coverage to the deformation and processing of all types of structural materials
Computational Welding Mechanics BoD – Books on Demand
George Krauss, University Emeritus Professor, Colorado School of Mines and author of the best-selling ASM book Steels: Processing, Structure, and Performance, discusses some of the important additions and updates to the new second edition.
Principles of heat treatment of steels Springer
The first of many important works featured in CRC Press' Metals and Alloys Encyclopedia Collection, the Encyclopedia of Iron, Steel, and Their Alloys covers all the fundamental, theoretical, and application-related aspects of the metallurgical science, engineering, and technology of iron, steel, and their alloys. This Five-Volume Set addresses topics such as extractive metallurgy, powder metallurgy and processing, physical metallurgy, production engineering, corrosion engineering, thermal processing, metalworking, welding, iron- and steelmaking, heat treating, rolling, casting, hot and cold forming, surface finishing and coating, crystallography, metallography, computational metallurgy, metal-matrix composites, intermetallics, nano- and micro-structured metals and alloys, nano- and micro-alloying effects, special steels, and mining. A valuable reference for materials scientists and engineers, chemists, manufacturers, miners, researchers, and students, this must-have encyclopedia: Provides extensive coverage of properties and recommended practices Includes a wealth of helpful charts, nomograms, and figures Contains cross referencing for quick and easy search Each entry is written by a subject-matter expert and reviewed by an international panel of renowned researchers from academia, government, and industry. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-mail) online.sales@tandf.co.uk
Comprehensive Materials Processing Springer Science & Business Media
This carefully edited book is putting emphasis on computational and artificial intelligent methods for learning and their relative applications in robotics, embedded systems, and ICT interfaces for psychological and neurological diseases. The book is a follow-up of the scientific workshop on Neural Networks (WIRN 2015) held in Vietri sul Mare, Italy, from the 20th to the 22nd of May 2015. The workshop, at its 27th edition became a traditional scientific event that brought together scientists from many countries, and several scientific disciplines. Each chapter is an extended version of the original contribution presented at the workshop, and together with the reviewers' peer revisions it also benefits from the live discussion during the presentation. The content of book is organized in the following sections. 1. Introduction, 2. Machine Learning, 3. Artificial Neural Networks: Algorithms and models, 4. Intelligent Cyberphysical and Embedded System, 5. Computational Intelligence Methods for Biomedical ICT in Neurological Diseases, 6. Neural Networks-Based Approaches to Industrial Processes, 7. Reconfigurable Modular Adaptive Smart Robotic Systems for Optoelectronics Industry: The White'R Instantiation This book is unique in proposing a holistic and multidisciplinary approach to implement autonomous, and complex Human Computer Interfaces.
Residual Stress and Stress Relaxation ASM International
Drawing on state-of-the-art research results, Resistance Welding: Fundamentals and Applications, Second Edition systematically presents fundamental aspects of important processes in resistance welding and discusses their implications on real-world welding applications. This updated edition describes progress made in resistance welding research and practice since the publication of the first edition. New to the Second Edition: Significant addition of the metallurgical aspects of materials involved in resistance welding, such as steels, aluminum and magnesium alloys, zinc, and copper Electric current waveforms commonly used in resistance welding, including single-phase AC, single-phase DC, three-phase DC, and MFDC Magnesium welding in terms of cracking and expulsion The effect of individual welding parameters 2-D and 3-D lobe diagrams New materials for the ultrasonic evaluation of welds, including A-scan, B-scan, and in-line A-scan The book begins with chapters on the metallurgical processes in resistance spot welding, the basics of welding schedule selection, and cracking in the nugget and heat-affected zone of alloys. The next several chapters discuss commonly conducted mechanical tests, the monitoring and control of a welding process, and the destructive and nondestructive evaluation of weld quality. The authors then analyze the mechanisms of expulsion—a process largely responsible for defect formation and other unwanted features—and explore an often overlooked topic in resistance welding-related research: the influence of mechanical aspects of welding machines. The final chapters explain how to numerically simulate a resistance welding process and apply statistical design and analysis approaches to welding research. To obtain a broad understanding of this area, readers previously had to scour large quantities of research on resistance welding and essential related subjects, such as statistical analysis. This book collects the necessary information in one source for students, researchers, and practitioners in the sheet metal industry. It thoroughly reviews state-of-the-art results in resistance welding research and gives you a solid foundation for solving practical problems in a scientific and systematic manner.
Phase Transformations in Steels CRC Press
Comprehensive Materials Processing, Thirteen Volume Set

provides students and professionals with a one-stop resource consolidating and enhancing the literature of the materials processing and manufacturing universe. It provides authoritative analysis of all processes, technologies, and techniques for converting industrial materials from a raw state into finished parts or products. Assisting scientists and engineers in the selection, design, and use of materials, whether in the lab or in industry, it matches the adaptive complexity of emergent materials and processing technologies. Extensive traditional article-level academic discussion of core theories and applications is supplemented by applied case studies and advanced multimedia features. Coverage encompasses the general categories of solidification, powder, deposition, and deformation processing, and includes discussion on plant and tool design, analysis and characterization of processing techniques, high-temperatures studies, and the influence of process scale on component characteristics and behavior. Authored and reviewed by world-class academic and industrial specialists in each subject field Practical tools such as integrated case studies, user-defined process schemata, and multimedia modeling and functionality Maximizes research efficiency by collating the most important and established information in one place with integrated applets linking to relevant outside sources

Heat Treatment of Gears CRC Press

Computational welding mechanics (CWM) provides an important technique for modelling welding processes. Welding simulations are a key tool in improving the design and control of welding processes and the performance of welded components or structures. CWM can be used to model phenomena such as heat generation, thermal stresses and large plastic deformations of components or structures. It also has a wider application in modelling thermomechanical and microstructural phenomena in metals. This important book reviews the principles, methods and applications of CWM.The book begins by discussing the physics of welding before going on to review modelling methods and options as well as validation techniques. It also reviews applications in areas such as fatigue, buckling and deformation, improved service life of components and process optimisation. Some of the numerical methods described in the book are illustrated using software available from the author which allows readers to explore CWM in more depth.Computational welding mechanics is a standard work for welding engineers and all those researching welding processes and wider thermomechanical and microstructural phenomena in metals. - Highlights the principles, methods and applications of CWM - Discusses the physics of welding - Assesses modelling methods and validation techniques

Bainite in Steels Elsevier

This book comprises select proceedings of the International Conference on Future Learning Aspects of Mechanical Engineering (FLAME 2018). The book discusses different topics of industrial and production engineering such as sustainable manufacturing systems, computer-aided engineering, rapid prototyping, manufacturing management and automation, metrology, manufacturing process optimization, casting, welding, machining, and machine tools. The contents of this book will be useful for researchers as well as professionals.

Resistance Welding ASM International

The Trends conference attracts the world's leading welding researchers. Topics covered in this volume include friction stir welding, sensing, control and automation, microstructure and properties, welding processes, procedures and consumables, weldability, modeling, phase transformations, residual stress and distortion, physical processes in welding, and properties and structural integrity of weldments.

SSC. Springer Science & Business Media

Heat Treatment Of Steels As An Art To Improve Their Service Performance Has Been Practised Ever Since It Started To Be Used As Tools And Weapons.However, The Scientific Basis Of Heat Treatment Of Steels Became More Apparent Only In The First Half Of This Century And Still Some Gaps Remain In Its Complete Understanding.Earlier Books On Heat Treatment Of Steels Mainly Emphasised The Art And The Empirically Arrived Principles Of Heat Treatment. In The Last Few Decades, Our Understanding Of Phase Transformations And Mechanical Behaviour Of Steels, And Consequently Of Heat Treatment Of Steels, Has Considerably Increased.In This Book On Principles Of Heat Treatment Of Steels The Emphasis Is On The Scientific Principles Behind The Various Heat Treatment Processes Of Steels. Though It Is Expected That The Reader Has Sufficient Background In Phase Transformations And Mechanical Behaviour Of Materials, First Few Chapters Review These Topics With Specific Reference To Steels. Basic Principles Of Various Heat Treatment Processes Of Steels Including Surface Hardening Processes, Are Then Covered In Sufficient Detail To Give A Good Overall Understanding Of These Processes. The Detail Engineering Aspects Are, However, Omitted. These Are Easily Available In Various Handbooks On Heat Treatment. The Book Also Covers Heat Treatment Of Tool Steels And Cast Irons.The Book Has Been Well Written And Can Be Used A Textbook On Heat Treatment For Undergraduate Students. It Is Also A Good Reference Book For Teachers And Researchers In This Area And Engineers In The Industry.

CALPHAD (Calculation of Phase Diagrams): A Comprehensive Guide CRC Press

The completely revised Second Edition of Metallurgy for the Non-Metallurgist provides a solid understanding of the basic principles and current practices of metallurgy. This major new edition is for anyone who uses, makes, buys or tests metal products. For both beginners and others seeking a basic refresher, the new Second Edition of the popular Metallurgy for the Non-Metallurgist gives an all-new modern view on the basic principles and practices of metallurgy. This new edition is extensively updated with broader coverage of topics, new and improved illustrations, and more explanation of basic concepts. Why are cast irons so suitable for casting? Do some nonferrous alloys respond to heat treatment like steels? Why is corrosion so pernicious? These are questions that can be answered in this updated reference with many new illustrations, examples, and descriptions of basic metallurgy.

Steels: Processing, Structure, and Performance, Second Edition ASM International

Offering one of the field's most thorough treatments of material design principles, including a concise overview of fastener design, the Handbook of Mechanical Alloy Design provides an extensive overview of the effects of alloy compositional design on expected mechanical properties. This reference highlights the design elements that must be considered in risk-based metallurgical design and covers alloy design for a broad range of materials, including the increasingly important powder metal and metal matrix alloys. It discusses the design issues associated with carbon, alloy, and tool steels, microalloyed steels, and more. The Handbook of Mechanical Alloy Design is a must-have reference.

The Deformation and Processing of Structural Materials Springer

This reference presents the classical perspectives that form the basis of heat treatment processes while incorporating descriptions of the latest advances to impact this enduring technology. The second edition of the bestselling Steel Heat Treatment Handbook now offers abundantly updated and extended coverage in two self-contained volumes:

Principles of the Heat Treatment of Plain Carbon and Low Alloy Steels ASM International

The processing-microstructure-property relationships in steels continue to present challenges to researchers because of the complexity of phase transformation reactions and the wide spectrum of microstructures and properties achievable. This major two-volume work summarises the current state of research on phase transformations in steels and its implications for the emergence of new steels with enhanced engineering properties.Volume 1 reviews fundamentals and diffusion-controlled phase transformations. After a historical overview, chapters in part one discuss fundamental principles of thermodynamics, diffusion and kinetics as well as phase boundary interfaces. Chapters in part two go on to consider ferrite formation, proeutectoid ferrite and cementite transformations, pearlite formation and massive austenite-ferrite phase transformations. Part three discusses the mechanisms of bainite transformations, including carbide-containing and carbide-free bainite. The final part of the book considers additional driving forces for transformation including nucleation and growth during austenite-to-ferrite phase transformations, dynamic strain-induced ferrite transformations (DIST) as well as the effects of magnetic fields and heating rates.With its distinguished editors and distinguished international team of contributors, the two volumes of Phase transformations in steels is a standard reference for all those researching the properties of steel and developing new steels in such areas as automotive engineering, oil and gas and energy production. - Discusses the fundamental principles of thermodynamics, diffusion and kinetics - Considers various transformations, including ferrite formation, proeutectoid ferrite and cementite transformations - Considers additional driving forces for transformation including nucleation and growth during austenite-to-ferrite phase transformations

Steel Heat Treatment Handbook - 2 Volume Set Elsevier

During the week of June 29 - July 5, 2008, over 300 scientists and engineers from 30 countries spanning five continents converged at the historic La Fonda Hotel in the city of Santa Fe, New Mexico, USA to participate in the 12th International Conference on Martensitic Transformations (ICOMAT-08) to fathom the peculiar world of certain crystalline materials that undergo structural change when cooled or stressed. Many of these materials can restore their original shape when reheated, thus the name "Shape Memory Alloys". In the spirit of Santa Fe, a central theme of ICOMAT-08 was INTEGRATION across many dimensions.

Technical Aspects of Critical Materials Use by the Steel Industry ASM International

This monograph acts as a benchmark to current achievements in the field of Computer Coupling of Phase Diagrams and Thermochemistry, often called CALPHAD which is an acronym for Computer CALculation of PHAse Diagrams. It also acts as a guide to both the basic background of the subject area and the cutting edge of the topic, combining comprehensive discussions of the underlying physical principles of the CALPHAD method with detailed descriptions of their application to real complex multi-component materials.Approaches which combine both thermodynamic and kinetic models to interpret non-equilibrium phase transformations are also reviewed.

Welding in Energy-Related Projects CRC Press

Welding in Energy-Related Projects contains the proceedings of the Welding Institute of Canada's Second International Conference held in Toronto, 20-21 September 1983, on the theme ""Welding in Energy-Related Projects."" The contributions to the conference offer a unique overview of many areas of technology from research and development studies to construction and operation, and as such provide a comprehensive reference source. This volume contains 44 papers organized into eight sections. Section I contains studies on materials and weldability of steels for energy structures. Section II covers welding techniques such as flux-cored arc welding, root pass welding, and automatic welding. Section III on welding control systems includes studies on such as integrated robotic welding and microprocessor technology in automatic integrated welding systems. Sections IV and V presents studies on welding of high-alloy systems and welding procedure optimization, respectively. Section VI covers quality assurance and inspection of piping systems. Section VII takes up the properties of welds. Section VIII presents stress and strain analyses of welds.

Technical Aspects of Critical Materials Use by the Steel Industry: B. Proceedings of a public workshop "Trends in critical materials requirements for steels of the future; conservation and substitution technology for chromium." Newnes

This book is dedicated to intelligent systems of broad-spectrum application, such as personal and social biosafety or use of intelligent sensory micro-nanosystems such as "e-nose", "e-tongue" and "e-eye". In addition to that, effective acquiring information, knowledge management and improved knowledge transfer in any media, as well as modeling its information content using meta-and hyper heuristics and semantic reasoning all benefit from the systems covered in this book. Intelligent systems can also be applied in education and generating the intelligent distributed eLearning architecture, as well as in a large number of technical fields, such as industrial design, manufacturing and utilization, e.g., in precision agriculture, cartography, electric power distribution systems, intelligent building management systems, drilling operations etc. Furthermore, decision making using fuzzy logic models, computational recognition of comprehension uncertainty and the joint synthesis of goals and means of intelligent behavior biosystems, as well as diagnostic and human support in the healthcare environment have also been made easier.

Intelligent Systems New Age International

Selected papers from the 2011 International Conference on Advanced Design and Manufacturing Engineering (ADME 2011), 16-18 September 2011, Guangzhou, China

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