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Fatigue and Fracture of Ordered Intermetallic Materials I - W. O. Soboyejo 1994

Fatigue Design (ESIS 16) - J. Solin 1993-03-02

A compilation of research in fatigue design, prediction, and assessment Fatigue Design is a collection of research presented at the 1993 International Symposium on Fatigue Design. Detailing the latest findings and most current research, this book features papers on a variety of pertinent topics, including the quantification of service load for fatigue life predictions, identification of stress states and failure modes, assessment of residual life in damaged components, and more. Special attention is paid to the need for simple and reliable prediction tools to help better ensure adequate strength at the design stage.

Aluminum and Aluminum Alloys - Joseph R. Davis 1993-01-01

This one-stop reference is a tremendous value and time saver for engineers, designers and researchers. Emerging technologies, including aluminum metal-matrix composites, are combined with all the essential aluminum information from the ASM Handbook series (with updated statistical information).

Mechanical Behavior of Materials - Marc André Meyers 2008-11-06

A balanced mechanics-materials approach and coverage of the latest developments in biomaterials and electronic materials, the new edition of this popular text is the most thorough and modern book available for upper-level undergraduate courses on the mechanical behavior of materials. To ensure that the student gains a thorough understanding the authors present the fundamental mechanisms that operate at micro- and nano-meter level across a wide-range of materials, in a way that is mathematically simple and requires no extensive knowledge of materials. This integrated approach provides a conceptual presentation that shows how the microstructure of a material controls its mechanical behavior, and this is reinforced through extensive use of micrographs and illustrations. New worked examples and exercises help the student test their understanding. Further resources for this title, including lecture slides of select illustrations and solutions for exercises, are available online at www.cambridge.org/97800521866758.

Metal Fatigue in Engineering - Henry O. Fuchs 1980-06-20

Applied Optimal Design Mechanical and Structural Systems Edward J. Haug & Jasbir S. Arora This computer-aided design text presents and illustrates techniques for optimizing the design of a wide variety of mechanical and structural systems through the use of nonlinear programming and optimal control theory. A state space method is adopted that incorporates the system model as an integral part of the design formulations. Step-by-step numerical algorithms are given for each method of optimal design. Basic properties of the equations of mechanics are used to carry out design sensitivity analysis and optimization, with numerical efficiency and generality that is in most cases an order of magnitude faster in digital computation than applications using standard nonlinear programming methods. 1979 Optimum Design of Mechanical Elements, 2nd Ed. Ray C. Johnson The two basic optimization techniques, the method of optimal design (MOD) and automated optimal design (AOD), discussed in this valuable work can be applied to the optimal design of mechanical elements commonly found in machinery, mechanisms, mechanical assemblages, products, and structures. The many illustrative examples used to explicate these techniques include such topics as tensile bars, torsion bars, shafts in combined loading, helical and spur gears, helical springs, and hydrostatic journal bearings. The author covers curve fitting, equation simplification, material properties, and failure theories, as well as the effects of manufacturing errors on product performance and the need for a factor of safety in design work. 1980 Globally Optimal Design Douglass J. Wilde Here are

new analytic optimization procedures effective where numerical methods either take too long or do not provide correct answers. This book uses mathematics sparingly, proving only results generated by examples. It defines simple design methods guaranteed to give the global, rather than any local, optimum through computations easy enough to be done on a manual calculator. The author confronts realistic situations: determining critical constraints; dealing with negative contributions; handling power function; tackling logarithmic and exponential nonlinearities; coping with standard sizes and indivisible components; and resolving conflicting objectives and logical restrictions. Special mathematical structures are exposed and used to solve design problems. 1978

Properties of Aluminum Alloys - John Gilbert Kaufman 2008-01-01

A compilation of data collected and maintained for many years as the property of a large aluminum company, which decided in 1997 to make it available to other engineers and materials specialists. In tabular form, presents data on the tensile and creep properties of eight species of wrought alloys and five species of cast alloys in the various shapes used in applications. Then looks at the fatigue data for several alloys under a range of conditions and loads. The data represent the typical or average findings, and though some were developed years ago, the collection is the largest and most detailed available. There is no index.

Atlas of Fatigue Curves - Howard E. Boyer 1985-12-31

Contains more than 500 fatigue curves for industrial ferrous and nonferrous alloys. Also includes an explanation of fatigue testing and interpretation of test results. Each curve is presented independently and includes an explanation of its particular importance.

Properties of Aluminum Alloys - John Gilbert Kaufman 1999-01-01

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Metal Matrix Composites - Nikhilesh Chawla 2006-01-16

In the last few years, a significant increase in applications of MMCs has taken place, particularly in the areas of automotive, aerospace, electronics, and recreation. These include continuous fiber reinforced MMCs for cables in power transmission, high temperature superconducting wires, particulate MMCs in civilian aircraft and automotive applications, and high volume fraction, high thermal conductivity substrates for electronic packaging. Nevertheless, as with any novel material systems, there is a lack of fundamental understanding on the part of practicing engineers and designers. This book would seek to address these issues, in a thorough and cohesive manner, as well as to provide students and scientists with a basic understanding of MMCs. This book will emphasize the synergistic relationships among processing, structure, and properties of metal matrix composites.

High Cycle Fatigue of Structural Materials - W. O. Soboyejo 1997

Examining underlying mechanisms governing the high-cycle fatigue behavior of structural materials, this book from Materials Week '97 focuses on the high-cycle fatigue behavior of existing aluminum, nickel, and titanium-base alloys. Mechanical and empirical approaches to the assessment of environment and temperature effects are examined, along with probable approaches for the prediction of high-cycle fatigue

behavior under both uniaxial and multiaxial stresses.

Weld Integrity and Performance - Steve Lampman 1997-01-01

Key articles from over 10 separate ASM publications are brought together as a practical reference on weld integrity crack prevention. This book thoroughly covers the essentials of weld solidification and cracking, weldability and material selection, process control and heat treatment, failure analysis, and fatigue and fracture mechanics weldments. Contents also include an appendix for quick reference of tabular data on weldability of alloys, process selection, recommended interpass and heat treatment temperatures, and qualification codes and standards.

Gear Materials, Properties, and Manufacture - Joseph R. Davis 2005

All of the critical technical aspects of gear materials technology are addressed in this new reference work. Gear Materials, Properties, and Manufacture is intended for gear metallurgists and materials specialists, manufacturing engineers, lubrication technologists, and analysts concerned with gear failures who seek a better understanding of gear performance and gear life. This volume complements other gear texts that emphasize the design, geometry, and theory of gears. The coverage begins with an overview of the various types of gears used, important gear terminology, applied stresses and strength requirements associated with gears, and lubrication and wear. This is followed by in-depth treatment of metallic (ferrous and nonferrous alloys) and plastic gear materials. Emphasis is on the properties of carburized steels, the material of choice for high-performance power transmission gearing.

Proceedings of the 7th International Conference on Fracture Fatigue and Wear - Magd Abdel Wahab 2018-07-14

These proceedings gather a selection of peer-reviewed papers presented at the 7th International Conference on Fracture Fatigue and Wear (FFW 2018), held at Ghent University, Belgium on 9-10 July 2018. The contributions, prepared by international scientists and engineers, cover the latest advances in and innovative applications of fracture mechanics, fatigue of materials, tribology and wear of materials. The book is intended for academics, including graduate students and researchers, as well as industrial practitioners working in the areas of fracture fatigue and wear.

Aluminum Alloy Castings - John Gilbert Kaufman 2004-01-01

J. G. (Gil) Kaufman is currently president of his consulting company, Kaufman Associates.

Fatigue and Durability of Metals at High Temperatures - S. S. Manson 2009

From concept to application, this book describes the method of strain-range partitioning for analyzing time-dependent fatigue. Creep (time-dependent) deformation is first introduced for monotonic and cyclic loading. Multiple chapters then discuss strain-range partitioning in details for multi-axial loading conditions and how different loading permutations can lead to different micro-mechanistic effects. Notably, the total-strain method of strain-range partitioning (SRP) is described, which is a methodology that sees use in several industries. Examples from aerospace illustrate applications, and methods for predicting time-dependent metal fatigue are critiqued.

Atlas of Stress-strain Curves - ASM International 2002-01-01

Contains more than 1400 curves, almost three times as many as in the 1987 edition. The curves are normalized in appearance to aid making comparisons among materials. All diagrams include metric units, and many also include U.S. customary units

Fatigue Data Book - Scott D. Henry 1994-12-31

A compilation of information and tables of fatigue data for light structural alloys, useful as a supplement to the publisher's Atlas of Fatigue Curves. Contains sections on aluminum, magnesium, and titanium alloys, with information on the chemistry and identity of various forms of the alloys, corro

Fatigue and Durability of Structural Materials - Gary R. Halford 2006

Fatigue and Durability of Structural Materials explains how mechanical material behavior relates to the design of structural machine components. The major emphasis is on fatigue and failure behavior using engineering models that have been developed to predict, in advance of service, acceptable fatigue and other durability-related lifetimes. The book covers broad classes of materials used for high-performance structural applications such as aerospace components, automobiles, and power generation systems. Coverage focuses on metallic materials but also addresses unique capabilities of important nonmetals. The

concepts are applied to behavior at room or ambient temperatures; a planned second volume will address behavior at higher-temperatures. The volume is a repository of the most significant contributions by the authors to the art and science of material and structural durability over the past half century. During their careers, including 40 years of direct collaboration, they have developed a host of durability models that are based on sound physical and engineering principles. Yet, the models and interpretation of behavior have a unique simplicity that is appreciated by the practicing engineer as well as the beginning student. In addition to their own pioneering work, the authors also present the work of numerous others who have provided useful results that have moved progress in these fields. This book will be of immense value to practicing mechanical and materials engineers and designers charged with producing structural components with adequate durability. The coverage is appropriate for a range of technical levels from undergraduate engineering students through material behavior researchers and model developers. It will be of interest to personnel in the automotive and off-highway vehicle manufacturing industry, the aeronautical industry, space propulsion and the power generation/conversion industry, the electric power industry, the machine tool industry, and any industry associated with the design and manufacturing of mechanical equipment subject to cyclic loads.

Atlas of Stress-corrosion and Corrosion Fatigue Curves - A. J. McEvily 1990

A reference for materials scientists that can be used to find the effects of various corrosive media and processing variables on the stress-corrosion cracking and corrosion fatigue characteristics of ferrous and nonferrous alloys. There are more than 500 stress/cracking-time curves, S/N curves, and

Mechanics and Mechanisms of Fracture - Alan F. Liu 2005

Elements of Metallurgy and Engineering Alloys - Flake C. Campbell 2008

This practical reference provides thorough and systematic coverage on both basic metallurgy and the practical engineering aspects of metallic material selection and application.

Fatigue of Structures and Materials - J. Schijve 2008-12-16

Fatigue of structures and materials covers a wide scope of different topics. The purpose of the present book is to explain these topics, to indicate how they can be analyzed, and how this can contribute to the designing of fatigue resistant structures and to prevent structural fatigue problems in service. Chapter 1 gives a general survey of the topic with brief comments on the significance of the aspects involved. This serves as a kind of a program for the following chapters. The central issues in this book are predictions of fatigue properties and designing against fatigue. These objectives cannot be realized without a physical and mechanical understanding of all relevant conditions. In Chapter 2 the book starts with basic concepts of what happens in the material of a structure under cyclic loads. It illustrates the large number of variables which can affect fatigue properties and it provides the essential background knowledge for subsequent chapters. Different subjects are presented in the following main parts: • Basic chapters on fatigue properties and predictions (Chapters 2-8) • Load spectra and fatigue under variable-amplitude loading (Chapters 9-11) • Fatigue tests and scatter (Chapters 12 and 13) • Special fatigue conditions (Chapters 14-17) • Fatigue of joints and structures (Chapters 18-20) • Fiber-metal laminates (Chapter 21) Each chapter presents a discussion of a specific subject.

Handbook of Residual Stress and Deformation of Steel - George E. Totten 2002

Annotation Examines the factors that contribute to overall steel deformation problems. The 27 articles address the effect of materials and processing, the measurement and prediction of residual stress and distortion, and residual stress formation in the shaping of materials, during hardening processes, and during manufacturing processes. Some of the topics are the stability and relaxation behavior of macro and micro residual stresses, stress determination in coatings, the effects of process equipment design, the application of metallo- thermo-mechanic to quenching, inducing compressive stresses through controlled shot peening, and the origin and assessment of residual stresses during welding and brazing. Annotation c. Book News, Inc., Portland, OR (booknews.com)

Mechanical Behavior of Materials - Norman E. Dowling 2007

Comprehensive in scope and readable, this book explores the methods used by engineers to analyze and predict the mechanical behavior of materials. Author Norman E. Dowling provides thorough coverage of

materials testing and practical methods for forecasting the strength and life of mechanical parts and structural members.

Understanding How Components Fail, 3rd Edition - Donald J. Wulpi 2013-10-01

One of the first books new engineers and technicians should read. This new edition of the perennial best seller preserves the core of the previous editions, focusing on the metallurgical and materials evaluation for failure mode identification. Comprehensive information covering the basic principles and practices are clearly explained.

ASM Handbook - ASM International 2003

Non-Crimp Fabric Composites - Stepan V Lomov 2011-04-19

Non-crimp fabric (NCF) composites are reinforced with mats of straight (non-crimped) fibres, giving them such advantages as strength, ease of handling and low manufacturing costs. Non-crimp fabric composites provides a comprehensive review of the use of NCF composites, their manufacture and applications in engineering. Part one covers the manufacture of non-crimp fabrics, including also topics such as structural stitching and automated defect analysis. Part two goes on to discuss the manufacture of non-crimp fabric composites, with chapters covering such topics as deformability and permeability of NCF. Part three focuses on the properties of NCF composites, with chapters on stiffness and strength, damage progression and fatigue. Finally, part four covers the applications of NCF composites, including chapters on the aerospace and automotive industries as well as wind turbines and helicopter applications. The book concludes with a discussion of cost analysis of NCF composites in engineering applications. With its distinguished editor and international team of expert contributors, Non-crimp fabric composites is an essential reference for composite manufacturers and structural and mechanical engineers in industries using NCF composites, as well as academics with a research interest in the field. Provides a comprehensive review of the use of NCF composites, their manufacture and applications in engineering Reviews the manufacture of non-crimp fabrics, including also topics such as structural stitching and automated defect analysis Examines the properties of NCF composites considering stiffness and strength, damage progression and fatigue

Structural Life Assessment Methods - A. F. Liu 1998-07-01

Nickel, Cobalt, and Their Alloys - Joseph R. Davis 2000-01-01

This book is a comprehensive guide to the compositions, properties, processing, performance, and applications of nickel, cobalt, and their alloys. It includes all of the essential information contained in the ASM Handbook series, as well as new or updated coverage in many areas in the nickel, cobalt, and related industries.

Fatigue and Durability of Structural Materials - S. S. Manson 2006

Fatigue and Durability of Structural Materials explains how mechanical material behavior relates to the design of structural machine components. The major emphasis is on fatigue and failure behavior using engineering models that have been developed to predict, in advance of service, acceptable fatigue and other durability-related lifetimes. The book covers broad classes of materials used for high-performance structural applications such as aerospace components, automobiles, and power generation systems.

ASM Handbook: Fatigue and fracture - ASM International. Handbook Committee 1990

These volumes cover the properties, processing, and applications of metals and nonmetallic engineering materials. They are designed to provide the authoritative information and data necessary for the appropriate selection of materials to meet critical design and performance criteria.

Fatigue Data Book - ASM International 1994-12-31

A compilation of information and tables of fatigue data for light structural alloys, useful as a supplement to the publisher's Atlas of Fatigue Curves . Contains sections on aluminum, magnesium, and titanium alloys, with information on the chemistry and identity of various forms of the alloys, corro

Ask a Manager - Alison Green 2018-05-01

From the creator of the popular website Ask a Manager and New York's work-advice columnist comes a witty, practical guide to 200 difficult professional conversations—featuring all-new advice! There's a reason

Alison Green has been called “the Dear Abby of the work world.” Ten years as a workplace-advice columnist have taught her that people avoid awkward conversations in the office because they simply don't know what to say. Thankfully, Green does—and in this incredibly helpful book, she tackles the tough discussions you may need to have during your career. You'll learn what to say when • coworkers push their work on you—then take credit for it • you accidentally trash-talk someone in an email then hit “reply all” • you're being micromanaged—or not being managed at all • you catch a colleague in a lie • your boss seems unhappy with your work • your cubemate's loud speakerphone is making you homicidal • you got drunk at the holiday party Praise for Ask a Manager “A must-read for anyone who works . . . [Alison Green's] advice boils down to the idea that you should be professional (even when others are not) and that communicating in a straightforward manner with candor and kindness will get you far, no matter where you work.”—Booklist (starred review) “The author's friendly, warm, no-nonsense writing is a pleasure to read, and her advice can be widely applied to relationships in all areas of readers' lives. Ideal for anyone new to the job market or new to management, or anyone hoping to improve their work experience.”—Library Journal (starred review) “I am a huge fan of Alison Green's Ask a Manager column. This book is even better. It teaches us how to deal with many of the most vexing big and little problems in our workplaces—and to do so with grace, confidence, and a sense of humor.”—Robert Sutton, Stanford professor and author of The No Asshole Rule and The Asshole Survival Guide “Ask a Manager is the ultimate playbook for navigating the traditional workforce in a diplomatic but firm way.”—Erin Lowry, author of Broke Millennial: Stop Scraping By and Get Your Financial Life Together

ASM Handbook - 1990

These volumes cover the properties, processing, and applications of metals and nonmetallic engineering materials. They are designed to provide the authoritative information and data necessary for the appropriate selection of materials to meet critical design and performance criteria.

Fatigue and Fracture - F. C. Campbell 2012

"This book emphasizes the physical and practical aspects of fatigue and fracture. It covers mechanical properties of materials, differences between ductile and brittle fractures, fracture mechanics, the basics of fatigue, structural joints, high temperature failures, wear, environmentally-induced failures, and steps in the failure analysis process."--publishers website.

Materials Properties Handbook - Gerhard Welsch 1993-12-31

Comprehensive datasheets on more than 60 titanium alloys More than 200 pages on metallurgy and fabrication procedures Input from more than 50 contributors from several countries Careful editorial review for accuracy and usefulness. Materials Properties Handbook: Titanium Alloys provides a data base for information on titanium and its alloys, and the selection of specific alloys for specific applications. The most comprehensive titanium data package ever assembled provides extensive information on applications, physical properties, corrosion, mechanical properties (including design allowances where available), fatigue, fracture properties, and elevated temperature properties. The appropriate specifications for each alloy are included. This international effort has provided a broad information base that has been compiled and reviewed by leading experts within the titanium industry, from several countries, encompassing numerous technology areas. Inputs have been obtained from the titanium industry, fabricators, users, government and academia. This up-to-date package covers information from almost the inception of the titanium industry, in the 1950s, to mid-1992. The information, organized by alloy, makes this exhaustive collection an easy-to-use data base at your fingertips, which generally includes all the product forms for each alloy. The 60-plus data sheets supply not only extensive graphical and tabular information on properties, but the datasheets also describe or illustrate important factors which would aid in the selection of the proper alloy or heat treatment. The datasheets are further supplemented with back-ground information on the metallurgy and fabrication characteristics of titanium alloys. An especially extensive coverage of properties, processing and metallurgy is provided in the datasheet for the workhorse of the titanium industry, Ti-6Al-4V. This compendium includes the newest alloys made public. even those still under development. In many cases, key references are included for further information on a given subject. Comprehensive datasheets provide extensive information on: Applications, Specifications, Corrosion, Mechanical Design Properties, Fatigue and Fracture

ASM Handbook Metals Handbook V. 18 - ASM International. Handbook Committee 1990

Advanced Fracture Mechanics and Structural Integrity - Ashok Saxena 2019-02-06

Advanced Fracture Mechanics and Structural Integrity is organized to cover quantitative descriptions of crack growth and fracture phenomena. The mechanics of fracture are explained, emphasizing elastic-plastic and time-dependent fracture mechanics. Applications are presented, using examples from power generation, aerospace, marine, and chemical industries, with focus on predicting the remaining life of structural components and advanced testing methods for structural materials. Numerous examples and end-of-chapter problems are provided, along with references to encourage further study. The book is written for use in an advanced graduate course on fracture mechanics or structural integrity.

Impurities in Engineering Materials - Clyde Briant 2017-09-29

Provides a state-of-the-art account of the various effects of impurities on the properties of engineering alloys. Outlines a wide range of methods for producing cleaner alloys. Traces the technological advances

that allow the economical manufacture of purer materials.

Characterization and Failure Analysis of Plastics - ASM International 2003

The selection and application of engineered materials is an integrated process that requires an understanding of the interaction between materials properties, manufacturing characteristics, design considerations, and the total life cycle of the product. This reference book on engineering plastics provides practical and comprehensive coverage on how the performance of plastics is characterized during design, property testing, and failure analysis. The fundamental structure and properties of plastics are reviewed for general reference, and detailed articles describe the important design factors, properties, and failure mechanisms of plastics. The effects of composition, processing, and structure are detailed in articles on the physical, chemical, thermal, and mechanical properties. Other articles cover failure mechanisms such as: crazing and fracture; impact loading; fatigue failure; wear failures, moisture related failure; organic chemical related failure; photolytic degradation; and microbial degradation. Characterization of plastics in failure analysis is described with additional articles on analysis of structure, surface analysis, and fractography.