

Deformation Fracture Mechanics Of Engineering Materials

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*Failure of Materials in
Mechanical Design* - Jack A.
Collins 1993-10-06
Failure of Materials in
Mechanical Design
**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.

Mechanics of Finite Deformation and Fracture -

Majid Aleyaasin 2016-01-05

This important work covers the fundamentals of finite deformation in solids and constitutive relations for different types of stresses in large deformation of solids. In addition, the book covers the fracture phenomena in brittle or quasi-brittle materials in which large deformation does not occur. The book provides a thorough understanding of fracture mechanics as well.

Since mathematical proof with full derivation is demonstrated throughout the book, readers will gain the skills to understand and derive the basic concepts on their own, enabling them to put forward new ideas and solutions. Finite deformations in material can occur with change of geometry such that the deformed shape may not resemble the initial shape. Analyzing these types of deformations needs a

particular mathematical tool that is always associated with tensor notations. In general the geometry may be non-orthogonal, and the use of covariant and contra-variant tensor concepts to express the finite deformations and the associated mechanical strains are needed. In addition, it is obvious that in large deformations, there are several definitions for stress, each depending on the frame of the stress definitions. The constitutive equations in material also depends on the type of stress that is introduced. In simulation of the material deformation, components of the deformation tensor will be transformed from one frame to another either in orthogonal or in non-orthogonal coordinate of geometry. This informative book covers all this in detail.

Deformation and Fracture Behaviour of Polymer

Materials - Wolfgang Grellmann 2017-07-12

This book covers the most recent advances in the deformation and fracture

behaviour of polymer material. It provides deeper insight into related morphology–property correlations of thermoplastics, elastomers and polymer resins. Each chapter of this book gives a comprehensive review of state-of-the-art methods of materials testing and diagnostics, tailored for plastic pipes, films and adhesive systems as well as elastomeric components and others. The investigation of deformation and fracture behaviour using the experimental methods of fracture mechanics has been the subject of intense research during the last decade. In a systematic manner, modern aspects of fracture mechanics in the industrial application of polymers for bridging basic research and industrial development are illustrated by multifarious examples of innovative materials usage. This book will be of value to scientists, engineers and in polymer materials science.

Mechanisms of Deformation and Fracture - K. E. Easterling 1979

Fracture Mechanics of Electromagnetic Materials - Xiaohong Chen 2012

Fracture Mechanics of Electromagnetic Materials provides a comprehensive overview of fracture mechanics of conservative and dissipative materials, as well as a general formulation of nonlinear field theory of fracture mechanics and a rigorous treatment of dynamic crack problems involving coupled magnetic, electric, thermal and mechanical field quantities. Thorough emphasis is placed on the physical interpretation of fundamental concepts, development of theoretical models and exploration of their applications to fracture characterization in the presence of magneto-electro-thermo-mechanical coupling and dissipative effects. Mechanical, aeronautical, civil, biomedical, electrical and electronic engineers interested in application of the principles of fracture mechanics to design analysis and durability evaluation of smart structures and devices will find this book

an invaluable resource.

Transport Phenomena in Materials Processing - David R. Poirier 2016-12-06

This text provides a teachable and readable approach to transport phenomena (momentum, heat, and mass transport) by providing numerous examples and applications, which are particularly important to metallurgical, ceramic, and materials engineers. Because the authors feel that it is important for students and practicing engineers to visualize the physical situations, they have attempted to lead the reader through the development and solution of the relevant differential equations by applying the familiar principles of conservation to numerous situations and by including many worked examples in each chapter. The book is organized in a manner characteristic of other texts in transport phenomena. Section I deals with the properties and mechanics of fluid motion; Section II with thermal

properties and heat transfer; and Section III with diffusion and mass transfer. The authors depart from tradition by building on a presumed understanding of the relationships between the structure and properties of matter, particularly in the chapters devoted to the transport properties (viscosity, thermal conductivity, and the diffusion coefficients). In addition, generous portions of the text, numerous examples, and many problems at the ends of the chapters apply transport phenomena to materials processing.

Deformation and Failure in Metallic Materials -

Kolumban Hutter 2013-11-11

This book is devoted to the deformation and failure in metallic materials, summarizing the results of a research programme financed by the "Deutsche Forschungsgemeinschaft". It presents the recent engineering as well as mathematical key aspects of this field for a broad community. Its main focus is on

the constitutive behaviour as well as the damage and fracture of metallic materials, covering their mathematical foundation, modelling and numerics, but also relevant experiments and their verification.

Dynamic Deformation, Damage and Fracture in Composite Materials and Structures - Vadim V.

Silberschmidt 2016-01-23

Composite materials, with their higher exposure to dynamic loads, have increasingly been used in aerospace, naval, automotive, sports and other sectors over the last few decades. Dynamic

Deformation, Damage and Fracture in Composite

Materials and Structures

reviews various aspects of dynamic deformation, damage and fracture, mostly in composite laminates and sandwich structures, in a broad range of application fields including aerospace, automotive, defense and sports engineering. As the mechanical behavior and performance of composites varies under

different dynamic loading regimes and velocities, the book is divided into sections that examine the different loading regimes and velocities.

Part one examine low-velocity loading and part two looks at high-velocity loading. Part three then assesses shock and blast (i.e. contactless) events and the final part focuses on impact (contact) events. As sports applications of

composites are linked to a specific subset of dynamic loading regimes, these applications are reviewed in the final part. Examines dynamic deformation and fracture of composite materials

Covers experimental, analytical and numerical aspects

Addresses important

application areas such as aerospace, automotive, wind energy and defence, with a special section on sport applications

Mechanical Behavior of Materials - Zainul Huda

2022-01-02

This textbook supports a range of core courses in undergraduate materials and

mechanical engineering curricula given at leading universities globally. It presents fundamentals and quantitative analysis of mechanical behavior of materials covering engineering mechanics and materials, deformation behavior, fracture mechanics, and failure design. This book provides a holistic understanding of mechanical behavior of materials, and enables critical thinking through mathematical modeling and problem solving. Each of the 15 chapters first introduces readers to the technologic importance of the topic and provides basic concepts with diagrammatic illustrations; and then its engineering analysis/mathematical modelling along with calculations are presented. Featuring 200 end-of-chapter calculations/worked examples, 120 diagrams, 260 equations on mechanics and materials, the text is ideal for students of mechanical, materials, structural, civil, and aerospace engineering.

Mechanics and Mechanisms of Fracture - Alan F. Liu 2005

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.

Fundamentals of Fracture Mechanics - John Frederick Knott 1973

Failure Analysis of Engineering Materials - Charles R. Brooks 2002

This text introduces the important aspects associated with the failure analysis of engineering components; and provides a treatment of both macroscopic and microscopic observations of fracture surfaces. --

Advances in Research on the Strength and Fracture of Materials - D.M.R. Taplin
2013-10-22

Advances in Research on the Strength and Fracture of Materials: Volume 1s—An Overview contains the proceedings of the Fourth International Conference on Fracture held at the University of Waterloo, Canada, in June 1977. The papers review the state of the art with respect to fracture in a wide range of materials such as metals and alloys, polymers, ceramics, and composites. This volume is comprised of 40 chapters and opens with a discussion on progress in the development of elementary fracture mechanism maps and their application to metal deformation processes, along with micro-mechanisms of fracture and the fracture toughness of engineering alloys. The next section is devoted to the fracture of large-scale structures such as steel structures, aircraft, cargo containment systems, nuclear reactors, and pressure vessels.

Fracture at high temperatures and in sensitive environments is then explored, paying particular attention to creep failure by cavitation under non-steady conditions; the effects of hydrogen and impurities on brittle fracture in steel; and mechanism of embrittlement and brittle fracture in liquid metal environments. The remaining chapters consider the fracture of non-metallic materials as well as developments and concepts in the application of fracture mechanics. This book will be of interest to metallurgists, materials scientists, and structural and mechanical engineers.

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.

Thermodynamics in Materials Science - Robert DeHoff 2006-03-13
Thermodynamics in Materials Science, Second Edition is a

clear presentation of how thermodynamic data is used to predict the behavior of a wide range of materials, a crucial component in the decision-making process for many materials science and engineering applications. This primary textbook accentuates the integration of principles, strategies, a

Fracture Mechanics - E.E. Gdoutos 2006-03-30

New developments in the applications of fracture mechanics to engineering problems have taken place in the last years. Composite materials have extensively been used in engineering problems. Quasi-brittle materials including concrete, cement pastes, rock, soil, etc. all benefit from these developments. Layered materials and especially thin film/substrate systems are becoming important in small volume systems used in micro and nanoelectromechanical systems (MEMS and NEMS). Nanostructured materials are being introduced in our every day life. In all these problems

fracture mechanics plays a major role for the prediction of failure and safe design of materials and structures. These new challenges motivated the author to proceed with the second edition of the book. The second edition of the book contains four new chapters in addition to the ten chapters of the first edition. The fourteen chapters of the book cover the basic principles and traditional applications, as well as the latest developments of fracture mechanics as applied to problems of composite materials, thin films, nanoindentation and cementitious materials. Thus the book provides an introductory coverage of the traditional and contemporary applications of fracture mechanics in problems of utmost technological importance. With the addition of the four new chapters the book presents a comprehensive treatment of fracture mechanics. It includes the basic principles and traditional applications as well as the new frontiers of research of

fracture mechanics during the last three decades in topics of contemporary importance, like composites, thin films, nanoindentation and cementitious materials. The book contains fifty example problems and more than two hundred unsolved problems. A "Solutions Manual" is available upon request for course instructors from the author.

Damage and Fracture Mechanics - Taoufik

Boukharouba 2009-08-09

The First African

InterQuadrennial ICF

Conference "AIQ-ICF2008" on

Damage and Fracture

Mechanics - Failure Analysis of

Engineering Materials and

Structures", Algiers, Algeria,

June 1-5, 2008 is the first in

the series of InterQuadrennial

Conferences on Fracture to be

held in the continent of Africa.

During the conference, African

researchers have shown that

they merit a strong reputation

in international circles and

continue to make substantial

contributions to the field of

fracture mechanics. As in most

countries, the research effort

in Africa is undertaken at the industrial, academic, private sector and governmental levels, and covers the whole spectrum of fracture and fatigue. The AIQ-ICF2008 has brought together researchers and engineers to review and discuss advances in the development of methods and approaches on Damage and Fracture Mechanics. By bringing together the leading international experts in the field, AIQ-ICF promotes technology transfer and provides a forum for industry and researchers of the host nation to present their accomplishments and to develop new ideas at the highest level. International Conferences have an important role to play in the technology transfer process, especially in terms of the relationships to be established between the participants and the informal exchange of ideas that this ICF offers.

Topics in Fracture and

Fatigue - A.S. Argon

2012-12-06

Fracture in structural materials

remains a vital consideration in engineering systems, affecting the reliability of machines throughout their lives.

Impressive advances in both the theoretical understanding of fracture mechanisms and practical developments that offer possibilities of control have re-shaped the subject over the past four decades. The contributors to this volume, including some of the most prominent researchers in the field, give their long-range perspectives of the research on the fracture of solids and its achievements. The subjects covered in this volume include: statistics of brittle fracture, transition of fracture from brittle to ductile, mechanics and mechanisms of ductile separation of heterogeneous solids, the crack tip environment in ductile fracture, and mechanisms and mechanics of fatigue. Materials considered range from the usual structural solids to composites. The chapters include both theoretical points of view and discussions of key experiments. Contributors

include: from MIT, A.S. Argon, D.M. Parks; from Cambridge, M.F. Ashby; from U.C. Santa Barbara, A.G. Evans, R. McMeeking; from Glasgow, J. Hancock; from Harvard, J.W. Hutchinson, J.R. Rice; from Sheffield, K.J. Miller; from Brown, A. Needleman; from the Ecole des Mines, A. Pineau; from U.C. Berkeley, R. O. Ritchie; and from Copenhagen, V. Tvergaard.

Deformation and Fracture Mechanics of Engineering Materials - Richard W.

Hertzberg 1989-01-17

This Third Edition of the well-received engineering materials book has been completely updated, and now contains over 1,100 citations. Thorough enough to serve as a text, and up-to-date enough to serve as a reference. There is a new chapter on strengthening mechanisms in metals, new sections on composites and on superlattice dislocations, expanded treatment of cast and powder-produced conventional alloys, plastics, quantitative fractography, JIC and KIEAC test procedures, fatigue, and

failure analysis. Includes examples and case histories. Mechanical Behavior of Materials - Norman E. Dowling 1993

Covers stress-strain equations, mechanical testing, yielding and fracture under stress, fracture of cracked members, and fatigue of materials.

Mechanical Properties of Ceramics - John B. Wachtman 2009-08-13

A Comprehensive and Self-Contained Treatment of the Theory and Practical Applications of Ceramic Materials When failure occurs in ceramic materials, it is often catastrophic, instantaneous, and total. Now in its Second Edition, this important book arms readers with a thorough and accurate understanding of the causes of these failures and how to design ceramics for failure avoidance. It systematically covers: Stress and strain Types of mechanical behavior Strength of defect-free solids Linear elastic fracture mechanics Measurements of elasticity, strength, and fracture

toughness Subcritical crack propagation Toughening mechanisms in ceramics Effects of microstructure on toughness and strength Cyclic fatigue of ceramics Thermal stress and thermal shock in ceramics Fractography Dislocation and plastic deformation in ceramics Creep and superplasticity of ceramics Creep rupture at high temperatures and safe life design Hardness and wear And more While maintaining the first edition's reputation for being an indispensable professional resource, this new edition has been updated with sketches, explanations, figures, tables, summaries, and problem sets to make it more student-friendly as a textbook in undergraduate and graduate courses on the mechanical properties of ceramics.

Outlines and Highlights for Deformation and Fracture Mechanics of Engineering Materials by Hertzberg, ISBN

- Cram101 Textbook Reviews
2011-05-01

Never HIGHLIGHT a Book Again! Virtually all of the

testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific.

Accompanys: 9780471012146 .

Mechanical Behaviour of Engineering Materials -

Joachim Roesler 2007-10-16

How do engineering materials deform when bearing mechanical loads? To answer this crucial question, the book bridges the gap between continuum mechanics and materials science. The different kinds of material deformation are explained in detail. The book also discusses the physical processes occurring during the deformation of all classes of engineering materials and shows how these materials can be strengthened to meet the design requirements. It provides the knowledge needed in selecting the appropriate engineering material for a certain design

problem. This book is both a valuable textbook and a useful reference for graduate students and practising engineers.

Mechanical Behavior of Materials - William F. Hosford 2010

This is a textbook on the mechanical behavior of materials for mechanical and materials engineering. It emphasizes quantitative problem solving. This new edition includes treatment of the effects of texture on properties and microstructure in Chapter 7, a new chapter (12) on discontinuous and inhomogeneous deformation, and treatment of foams in Chapter 21.

Deformation and Fracture Mechanics of Engineering

Materials - Richard W. Hertzberg 2020-07-08

Deformation and Fracture Mechanics of Engineering Materials, Sixth Edition, provides a detailed examination of the mechanical behavior of metals, ceramics, polymers, and their composites. Offering an

integrated macroscopic/microscopic approach to the subject, this comprehensive textbook features in-depth explanations, plentiful figures and illustrations, and a full array of student and instructor resources. Divided into two sections, the text first introduces the principles of elastic and plastic deformation, including the plastic deformation response of solids and concepts of stress, strain, and stiffness. The following section demonstrates the application of fracture mechanics and materials science principles in solids, including determining material stiffness, strength, toughness, and time-dependent mechanical response. Now offered as an interactive eBook, this fully-revised edition features a wealth of digital assets. More than three hours of high-quality video footage helps students understand the practical applications of key topics, supported by hundreds of PowerPoint slides highlighting important

information while strengthening student comprehension. Numerous real-world examples and case studies of actual service failures illustrate the importance of applying fracture mechanics principles in failure analysis. Ideal for college-level courses in metallurgy and materials, mechanical engineering, and civil engineering, this popular is equally valuable for engineers looking to increase their knowledge of the mechanical properties of solids.

Mechanical Behavior and Fracture of Engineering Materials - Jorge Luis González-Velázquez
2019-08-29

This book presents the theoretical concepts of stress and strain, as well as the strengthening and fracture mechanisms of engineering materials in an accessible level for non-expert readers, but without losing scientific rigor. This volume fills the gap between the specialized books on mechanical behavior,

physical metallurgy and material science and engineering books on strength of materials, structural design and materials failure. Therefore it is intended for college students and practicing engineers that are learning for the first time the mechanical behavior and failure of engineering materials or wish to deepen their understanding on these topics. The book includes specific topics seldom covered in other books, such as: how to determine a state of stress, the relation between stress definition and mechanical design, or the theory behind the methods included in industrial standards to assess defects or to determine fatigue life. The emphasis is put into the link between scientific knowledge and practical applications, including solved problems of the main topics, such as stress and strain calculation. Mohr's Circle, yield criteria, fracture mechanics, fatigue and creep life prediction. The volume covers both the original findings in the field of

mechanical behavior of engineering materials, and the most recent and widely accepted theories and techniques applied to this topic. At the beginning of some selected topics that by the author's judgement are transcendental for this field of study, the prime references are given, as well as a brief biographical semblance of those who were the pioneers or original contributors. Finally, the intention of this book is to be a textbook for undergraduate and graduate courses on Mechanical Behavior, Mechanical Metallurgy and Materials Science, as well as a consulting and/or training material for practicing engineers in industry that deal with mechanical design, materials selection, material processing, structural integrity assessment, and for researchers that incursion for the first time in the topics covered in this book.

Fatigue of Materials - S.

Suresh 1998-10-29

Second edition of successful materials science text for final

year undergraduate and graduate students.

Deformation and Fracture Mechanics of Engineering Materials - Deepak Gupta 2015

Fracture Mechanics - Dietmar Gross 2011-07-03
- self-contained and well illustrated - complete and comprehensive derivation of mechanical/mathematical results with emphasis on issues of practical importance - combines classical subjects of fracture mechanics with modern topics such as microheterogeneous materials, piezoelectric materials, thin films, damage - mechanically and mathematically clear and complete derivations of results

Deformation and Fracture Mechanics of Engineering Materials - Richard W. Hertzberg 1996

This edition comprehensively updates the field of fracture mechanics by including details of the latest research programmes. It contains new material on non-metals, design issues and statistical aspects.

The application of fracture mechanics to different types of materials is stressed.

Deformation and Fracture Behaviour of Polymers -

Wolfgang Grellmann

2001-06-20

This book gives an overview of recent advances in the fracture mechanics of polymers, morphology property correlations, hybrid methods for polymer testing and polymer diagnostics, and biocompatible materials and medical prostheses, as well as application examples and limits.

High Temperature Deformation and Fracture of Materials - Jun-Shan Zhang 2010-09-01

The energy, petrochemical, aerospace and other industries all require materials able to withstand high temperatures. High temperature strength is defined as the resistance of a material to high temperature deformation and fracture. This important book provides a valuable reference to the main theories of high temperature deformation and fracture and the ways they can be used to

predict failure and service life. Analyses creep behaviour of materials, the evolution of dislocation substructures during creep, dislocation motion at elevated temperatures and importantly, recovery-creep theories of pure metals Examines high temperature fracture, including nucleation of creep cavity, diffusional growth and constrained growth of creep cavities A valuable reference to the main theories of high temperature deformation and fracture and the ways they can be used to predict failure and service life

Micromechanisms of Fracture and Fatigue -

Jaroslav Pokluda 2010-05-27

Micromechanisms of Fracture and Fatigue forms the culmination of 20 years of research in the field of fatigue and fracture. It discusses a range of topics and comments on the state of the art for each. The first part is devoted to models of deformation and fracture of perfect crystals. Using various atomistic methods, the theoretical

strength of solids under simple and complex loading is calculated for a wide range of elements and compounds, and compared with experimental data. The connection between the onset of local plasticity in nanoindentation tests and the ideal shear strength is analysed using a multi-scale approach. Moreover, the nature of intrinsic brittleness or ductility of perfect crystal lattices is demonstrated by the coupling of atomistic and mesoscopic approaches, and compared with brittle/ductile behaviour of engineering materials. The second part addresses extrinsic sources of fracture toughness of engineering materials, related to their microstructure and microstructurally-induced crack tortuosity. Micromechanisms of ductile fracture are also described, in relation to the fracture strain of materials. Results of multilevel modelling, including statistical aspects of microstructure, are used to explain remarkable phenomena discovered in experiments. In the third part of the book, basic

micromechanisms of fatigue cracks propagation under uniaxial and multiaxial loading are discussed on the basis of the unified mesoscopic model of crack tip shielding and closure, taking both microstructure and statistical effects into account. Applications to failure analysis are also outlined, and an attempt is made to distinguish intrinsic and extrinsic sources of materials resistance to fracture. Micromechanisms of Fracture and Fatigue provides scientists, researchers and postgraduate students with not only a deep insight into basic micromechanisms of fracture behaviour of materials, but also a number of engineering applications.

Fracture Mechanics - Chin-Teh Sun 2011-10-14

Most design engineers are tasked to design against failure, and one of the biggest causes of product failure is failure of the material due to fatigue/fracture. From leading experts in fracture mechanics, this new text provides new approaches and new

applications to advance the understanding of crack initiation and propagation. With applications in composite materials, layered structures, and microelectronic packaging, among others, this timely coverage is an important resource for anyone studying or applying concepts of fracture mechanics. Concise and easily understood mathematical treatment of crack tip fields (chapter 3) provides the basis for applying fracture mechanics in solving practical problems. Unique coverage of bi-material interfacial cracks (chapter 8), with applications to commercially important areas of composite materials, layered structures, and microelectronic packaging. A full chapter (chapter 9) on the cohesive zone model approach, which has been extensively used in recent years to simulate crack propagation. A unified discussion of fracture criteria involving nonlinear/plastic deformations

Fracture Mechanics - Alan T. Zehnder 2012-01-03

Fracture mechanics is a vast and growing field. This book develops the basic elements needed for both fracture research and engineering practice. The emphasis is on continuum mechanics models for energy flows and crack-tip stress- and deformation fields in elastic and elastic-plastic materials. In addition to a brief discussion of computational fracture methods, the text includes practical sections on fracture criteria, fracture toughness testing, and methods for measuring stress intensity factors and energy release rates. Class-tested at Cornell, this book is designed for students, researchers and practitioners interested in understanding and contributing to a diverse and vital field of knowledge.

Physics of Strength and Fracture Control - Anatoly A. Komarovskiy 2002-09-17

Still passive and for the most part uncontrollable, current systems intended to ensure the reliability and durability of engineering structures are still in their developmental infancy.

They cannot make corrections or recondition materials, and most material and structural failures cannot be predicted. Accidents-and catastrophes-result. Physics of Strength and Fracture Control: Adaptation of Engineering Materials and Structures introduces a new physical concept in the science of the resistance of materials to external effects, a concept that opens completely new avenues for improving the strength and safety of engineered objects. Based on a thermodynamic equation of state of solids derived by the author, the approach provides a general methodology for treating all the physical and mechanical properties of materials, regardless of their nature and physical state. The author shows that this approach enables the control of the stressed-deformed state both to prevent failures and fractures and to promote them for easier shaping of materials. He uses this methodology to present and discuss non-traditional but practical ways of solving real-world problems.

Of enormous theoretical and practical significance, this groundbreaking work ushers in a new stage in the science of material strength. It opens the door to systematic ways to design materials, control their operating properties, and predict their behavior under specific operating conditions.

Mechanical Properties of Engineered Materials - Wole Soboyejo 2002-11-20

Featuring in-depth discussions on tensile and compressive properties, shear properties, strength, hardness, environmental effects, and creep crack growth, "Mechanical Properties of Engineered Materials" considers computation of principal stresses and strains, mechanical testing, plasticity in ceramics, metals, intermetallics, and polymers, materials selection for thermal shock resistance, the analysis of failure mechanisms such as fatigue, fracture, and creep, and fatigue life prediction. It is a top-shelf reference for professionals and students in materials, chemical,

mechanical, corrosion, industrial, civil, and maintenance engineering; and surface chemistry.

Deformation and Fracture Behaviour of Polymers -

Wolfgang Grellmann

2013-03-09

This book gives an overview of recent advances in the fracture

mechanics of polymers, morphology property correlations, hybrid methods for polymer testing and polymer diagnostics, and biocompatible materials and medical prostheses, as well as application examples and limits.