

Deformation And Fracture Mechanics Of Engineering Materials Solution Manual

Over forty years of teaching experience are distilled into this text. The guiding principle is the wide use of the concept of intermediate asymptotics, which enables the natural introduction of the modeling of real bodies by continua. Beginning with a detailed explanation of the continuum approximation for the mathematical modeling of the motion and equilibrium of real bodies, the author continues with a general survey of the necessary methods and tools for analyzing models. Next, specific idealized approximations are presented, including ideal incompressible fluids, elastic bodies and Newtonian viscous fluids. The author not only presents general concepts but also devotes chapters to examining significant problems, including turbulence, wave-propagation, defects and cracks, fatigue and fracture. Each of these applications reveals essential information about the particular approximation. The author's tried and tested approach reveals insights that will be valued by every teacher and student of mechanics.

Modern Solid Mechanics considers phenomena at many levels, ranging from nano size at atomic scale through the continuum level at millimeter size to large structures at the tens of meter scale. The deformation and fracture behavior at these various scales are inextricably related to interdisciplinary methods derived from applied mathematics, physics, chemistry, and engineering mechanics. This book, in honor of James R. Rice, contains articles from his colleagues and former students that bring these sophisticated methods to bear on a wide range of problems. Articles discussing problems of deformation include topics of dislocation mechanics, second particle effects, plastic yield criterion on porous materials, hydrogen embrittlement, solid state sintering, nanophases at surfaces, adhesion and contact mechanics, diffuse instability in geomaterials, and percolation in metal deformation. In the fracture area, the topics include: elastic-plastic crack growth, dynamic fracture, stress intensity and J-Integral analysis, stress-corrosion cracking, and fracture in single crystal, piezoelectric, composite and cementitious materials. The book will be a valuable resource for researchers in modern solid mechanics and can be used as reference or supplementary text in mechanical and civil engineering, applied mechanics, materials science, and engineering graduate courses on fracture mechanics, elasticity, plasticity, mechanics of materials or the application of solid mechanics to processing, and reliability of life predictions.

Introduction to Fracture Mechanics presents an introduction to the origins, formulation and application of fracture mechanics for the design, safe operation and life prediction in structural materials and components. The book introduces and informs the reader on how fracture mechanics works and how it is so different from other forms of analysis that are used to characterize mechanical properties. Chapters cover foundational topics and the use of linear-elastic fracture mechanics, involving both K-based characterizing parameter and G-based energy approaches, and how to characterize the fracture toughness of materials under plane-strain and non plane-strain conditions using the notion of crack-resistance or R-curves. Other sections cover far more complex nonlinear-elastic fracture mechanics based on the use of the J-integral and the crack-tip opening displacement. These topics largely involve continuum mechanics descriptions of crack initiation, slow crack growth, eventual instability by overload fracture, and subcritical cracking. Presents how, for a given material, a fracture toughness value can be measured on a small laboratory sample and then used directly to predict the failure (by fracture, fatigue, creep, etc.) of a much larger structure in service Covers the rudiments of fracture mechanics from the perspective of the philosophy underlying the few principles and the many assumptions that form the basis of the discipline Provides readers with a "working knowledge" of fracture mechanics, describing its potency for damage-tolerant design, for preventing failures through appropriate life-prediction strategies, and for quantitative failure analysis (fracture diagnostics)

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 Fundamentals, High-Temperature Deformation, Damage, and Design

Deformation and Fracture Behaviour of Polymers

Fracture Mechanics and Statistical Mechanics of Reinforced Elastomeric Blends

Flow, Deformation and Fracture

Porous Rock Fracture Mechanics

The analysis of crack problems through fracture mechanics has been applied to the study of materials such as glass, metals and ceramics because relatively simple fracture criteria describe the failure of these materials. The increased attention paid to experimental rock fracture mechanics has led to major contributions to the solving of geophysical problems. The text presents a concise treatment of the physics and mathematics of a representative selection of problems from areas such as earthquake mechanics and prediction, hydraulic fracturing, hot dry rock geothermal energy, fault mechanics, and dynamic fragmentation.

Intended for engineers from a variety of disciplines dealing with structural materials, this text describes the current state of knowledge. It begins by describing the fracture process at the two extremes of scale: first in the context of atomic structures, then in terms of a continuous elastic medium. Treating the fracture process in increasingly sophisticated ways, the book then considers plastic corrections and the procedures for measuring the toughness of materials. Practical considerations are then discussed, including crack propagation, geometry dependence, flaw density, mechanisms of failure by cleavage, the ductile-brittle transition, and continuum damage mechanics. The whole is rounded off with discussions of generalised plasticity and the link between the microscopic and macroscopic aspects, and problems are provided at the end of each chapter. See previous entry. Annotation copyright Book News, Inc. Portland, Or.

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 und- taken 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.

Time-Dependent Fracture Mechanics

Fracture Mechanics

Failure Analysis of Engineering Materials and Structures

Micromechanisms of Fracture and Fatigue

Mechanisms of Deformation and Fracture

Porous Rock Failure Mechanics: Hydraulic Fracturing, Drilling and Structural Engineering focuses on the fracture mechanics of porous rocks and modern simulation techniques for progressive quasi-static and dynamic fractures. The topics covered in this volume include a wide range of academic and industrial applications, including petroleum, mining, and civil engineering. Chapters focus on advanced topics in the field of rock's fracture mechanics and address theoretical concepts, experimental characterization, numerical simulation techniques, and their applications as appropriate. Each chapter reflects the current state-of-the-art in terms of the modern use of fracture simulation in industrial and academic sectors. Some of the major contributions in this volume include, but are not limited to: anisotropic elasto-plastic deformation mechanisms in fluid saturated porous rocks, dynamics of fluids transport in fractured rocks and simulation techniques, fracture mechanics and simulation techniques in porous rocks, fluid-structure interaction in hydraulic driven fractures, advanced numerical techniques for simulation of progressive fracture, including multiscale modeling, and micromechanical approaches for porous rocks, and quasi-static versus dynamic fractures in porous rocks. This book will serve as an important resource for petroleum, geomechanics, drilling and structural engineers, R&D managers in industry and academia. Includes a strong editorial team and quality experts as chapter authors Presents topics identified for individual chapters are current, relevant, and interesting Focuses on advanced topics, such as fluid coupled fractures, rock's continuum damage mechanics, and multiscale modeling Provides a 'one-stop' advanced-level reference for a graduate course focusing on rock's mechanics

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.

Areas addressed include: Fracture and damage mechanics; modelling of damage and fracture phenomena; failure mechanisms; fatigue; viscoelastic effects; interfacial morphology; impact; toughness and toughening mechanisms, and weathering effects; stress corrosion crack growth mechanisms, and weathering effects; test methods; effects of stacking sequence on properties; mechanical, welded and adhesive jointing; analytical methods; structure-property relationships; and micromechanical studies. 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.

Outlines and Highlights For Deformation and Fracture Mechanics of Engineering Materials by Hertzberg, Isbn

with Application to Hydraulic Fracturing, Drilling and Structural Engineering

Deformation and Fracture Behaviour of Polymer Materials

The James R. Rice 60th Anniversary Volume

Multiscale Deformation and Fracture in Materials and Structures

A physical, mechanism-based presentation of the plasticity and fracture of polymers, covering industrial scale applications through to nanoscale biofluidic devices.

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.

Mechanisms of Deformation and Fracture contains the proceedings of the Interdisciplinary Conference on the Mechanisms of Deformation and Fracture held at the University of Luleå in Sweden on September 20-22, 1978. The papers explore the mechanisms underlying deformation and fracture of materials such as pearlite, metals, quartz, soils, and rocks. Results of theoretical and experimental studies on topics ranging from electromagnetic detection of low-cycle fatigue to stress and strain distribution in two-phase systems are presented. This book is comprised of 37 chapters and begins with a discussion on the interrelationships among solid mechanics, earth sciences, and material sciences. Subsequent chapters focus on the low-cycle behavior of case hardened steel; deformation and shear of normally consolidated flocculated kaolin; analytical modeling in inelasticity; creep mechanisms in clay; and initiation of crack growth at full plasticity. Plastic flow mechanisms and the rheological properties of the Earth's mantle are also examined, along with the fracture of glassy thermoplastics. The final chapter presents a thermodynamic model of consolidation in cohesive soils. This monograph will be a valuable resource for students and practitioners of mechanical engineering, metallurgy, materials science, and earth sciences.

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 drive 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.

Twenty-fourth Volume

Proceedings of the Thirteenth National Symposium on Fracture Mechanics : a Symposium

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Fracture Mechanics of Ceramics

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, stress and strain, and fracture mechanics. 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 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 metal 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 fundamental 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 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.

Deformation and Fracture Mechanics of Engineering Materials

This 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 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 to predict failure and service life

- 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

High Temperature Deformation and Fracture of Materials

Mechanical Properties of Materials

In a Multi-scale Context

Mechanical Behavior and Fracture of Engineering Materials

INSTRUCTOR'S MANUAL T/A DEFORMATION 4ED HERTZBERG

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 aspects 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.

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 .

Intended for engineers, researchers, and graduate students dealing with materials science, structural design, and nondestructive testing and evaluation, this book represents a continuation of the author's "Fracture Mechanics" (1997). It will appeal to a variety of audiences: The discussion of design codes and procedures will be of use to practicing engineers, particularly in the nuclear, aerospace and pipeline industries; the extensive bibliography and discussion of recent results will make it a useful reference for academic researchers; and graduate students will find the clear explanations and worked examples useful for learning the field. The book begins with a general treatment of fracture mechanics in terms of material properties and loading and provides up-to-date reviews of the ductile-brittle transition in steels and of methods for analyzing the risk of fracture. It then discusses the dynamics of fracture and creep in homogeneous and isotropic media, including discussions of high-loading-rate characteristics, the behavior of stationary cracks in elastic media under stress, and the propagation of cracks in elastic media. This is followed by an analysis of creep and crack initiation or propagation, describing, for example, the morphology and incubation times of crack initiation and growth and the effects of high temperatures. The book concludes with treatments of cycling deformation and fatigue, creep-fatigue fractures, and crack initiation and propagation. Problems at the end of each chapter serve to reinforce and test the student's knowledge and to extend some of the discussions in the text. Solutions to half of the problems are provided.

Solutions Manual

Geologic Fracture Mechanics

Based on Deformation and Fracture Mechanics of Engineering Materials by Richard W. Hertzberg, 4th Ed: MS4011

Deformation and Fracture Mechanics of Engineering Materials

Introduction to Fracture Mechanics

Elastomers are found in many applications ranging from technology to daily life applications for example in tires, drive systems, sealings and print rollers. Dynamical operation conditions put extremely high demands on the performance and stability of these materials and their elastic and flow properties can be easily adjusted by simple manipulations on their elastic and viscous properties. However, the required service life suffers often from material damage as a result of wear processes such as abrasion and wear fatigue, mostly caused by crack formation and propagation. This book covers interdisciplinary research between physics, physical chemistry, material sciences and engineering of elastomers within the range from nanometres to millimetres and connects these aspects with the constitutive material properties. The different chapters describe reliable lifetime and durability predictions based on new fracture mechanical testing concepts and advanced material-theoretical methods which are finally implemented in the finite element method for structural simulations. The use of this approach allows a realistic description of complex geometrical and loading conditions which includes the peculiarities of the mechanical behaviour of elastomeric materials in detail. Furthermore, this approach demonstrates how multi-scale research concepts provide an ambitious interdisciplinary challenge at the interface between engineering and natural sciences. This book covers the interests of academic researchers, graduate students and professionals working in polymer science, rubber and tire technology and in materials science at the interface of academic and industrial research.

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 the 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.

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.

These volumes, 9 and 10, of Fracture Mechanics of Ceramics constitute the proceedings of an international symposium on the fracture mechanics of ceramic materials held at the Japan Fine Ceramics Center, Nagoya, Japan on July 15, 16, 17, 1991. These proceedings constitute the fifth pair of volumes of a continuing series of conferences. Volumes 1 and 2 were from the 1973 symposium, volumes 3 and 4 from a 1977 symposium, and volumes 5 and 6 from a 1981 symposium all of which were held at The Pennsylvania State University. Volumes 7 and 8 are from the 1985 symposium which was held at the Virginia Polytechnic Institute and State University. The theme of this conference, as for the previous four, focused on the mechanical behavior of ceramic materials in terms of the characteristics of cracks, particularly the roles which they assume in the fracture processes and mechanisms. The 82 contributed papers by over 150 authors and co-authors represent the current state of that field. They address many of the theoretical and practical problems of interest to those scientists and engineers concerned with brittle fracture.

Proceedings of the Interdisciplinary Conference Held at the University of Luleå, Luleå, Sweden, September 20-22, 1978

Nanoscale Deformation and Fracture Mechanics of Polycrystalline Silicon and Diamond-like Carbon for MEMS by the AFM/DIC Method

Mechanics and Mechanisms of Fracture

Damage and Fracture Mechanics

With an Introduction to Micromechanics

In the preliminary stage of designing new structural hardware to perform a given mission in a fluctuating load environment, there are several factors that the designer should consider. Trade studies for different design configurations should be performed and, based on strength and weight considerations, among others, an optimum configuration selected. The selected design must withstand the environment in question without failure. Therefore, a comprehensive structural analysis that consists of static, dynamic, fatigue, and fracture is necessary to ensure the integrity of the structure. Engineers must also consider the feasibility of fabricating the structural hardware in the material selection process. During the past few decades, fracture mechanics has become a necessary discipline for the solution of many structural problems in which the survivability of structure containing pre-existing flaws is of great interest. These problems include structural failures resulting from cracks that are inherent in the material, or defects that are introduced in the part due to improper handling or rough machining, that must be assessed through fracture mechanics concepts.

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.

"The sixth edition provides supplemental materials to enhance both the learning and teaching experiences of students and faculty. A number of video recordings have been added to the text to flesh out certain topics; these recordings have been well received in both Lehigh University classrooms and industrial short courses given throughout the world. Special attention is given to discussions and their interpretation of fatigue fracture surface markings in metals and engineering plastics. A new video recording has been created expressly for this edition that eerily connects works of fiction with real events; in one case, a 1949 novel describes a fictional account of the fatigue failure of an imagined commercial airliner that predated the 1954 catastrophic fatigue failure of the de Havilland Comet commercial airliner. Then again, an 1896 novel described the sinking of an imagined cruise liner, named Titan, 14-years before the sinking of the R.M.S. Titanic. The similarities in the sinking of both Titan and Titanic vessels are mesmerizing"

The effective elastic modulus and Poisson's ratio of polysilicon and ta-C from the Sandia National Laboratories (SUMMIT) were 155 +/- 6 GPa and 0.22 +/- 0.02, and 759 +/- 22 GPa and 0.17 +/- 0.03, respectively. Similarly, the elastic modulus and Poisson's ratio of polysilicon fabricated at MCHC via the Multi-User MEMS Processes (MUMPS) with 110 texture were 164 +/- 7 GPa and 0.22 +/- 0.02, respectively.

An Introduction

Fracture Mechanics of Rock

Fracture Fundamental High-Temperature Deformation, Damage, and Design

Mechanics of Finite Deformation and Fracture

The Physics of Deformation and Fracture of Polymers