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KEY=BY - MARISA FOLEY

MODERN CERAMIC ENGINEERING

PROPERTIES, PROCESSING AND USE IN DESIGN

MODERN CERAMIC ENGINEERING

PROPERTIES, PROCESSING, AND USE IN DESIGN, THIRD EDITION

CRC Press Ceramic materials have proven increasingly important in industry and in the fields of electronics, communications, optics, transportation, medicine, energy conversion and pollution control, aerospace, construction, and recreation. Professionals in these fields often require an improved understanding of the specific ceramics materials they are using

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CRC Press Ceramic materials have proven increasingly important in industry and in the fields of electronics, communications, optics, transportation, medicine, energy conversion and pollution control, aerospace, construction, and recreation. Professionals in these fields often require an improved understanding of the specific ceramics materials they are using. Modern Ceramic Engineering, Third Edition helps provide this by introducing the interrelationships between the structure, properties, processing, design concepts, and applications of advanced ceramics. This student-friendly textbook effectively links fundamentals and fabrication requirements to a wide range of interesting engineering application examples. A follow-up to our best-selling second edition, the new edition now includes the latest and most important technological advances in the field. The author emphasizes how ceramics differ from metals and organics and encourages the application of this knowledge for optimal materials selection and design. New topics discuss the definition of ceramics, the combinations of properties fulfilled by ceramics, the evolution of ceramics applications, and their importance in modern civilization. A new chapter provides a well-illustrated review of the latest applications using ceramics and discusses the design requirements that the ceramics must satisfy for each application. The book also updates its chapter on ceramic matrix composites and adds a new section on statistical process control to the chapter on quality assurance. Modern Ceramic Engineering, Third Edition offers a complete and authoritative introduction and reference to the definition, history, structure, processing, and design of ceramics for students and engineers using ceramics in a wide array of industries.

ENGINEERING CERAMICS

Springer Science & Business Media A handy reference for technicians who want to understand the nature, properties and applications, of engineering ceramics. The book meets the needs of those working in the ceramics industry, as well as of technicians and engineers involved in the application of ceramic materials.

THE MAGIC OF CERAMICS

John Wiley & Sons Most people would be surprised at how ceramics are used, from creating cellular phones, radio, television, and lasers to its role in medicine for cancer treatments and restoring hearing. The Magic of Ceramics introduces the nontechnical reader to the many exciting applications of ceramics, describing how ceramic material functions, while teaching key scientific concepts like atomic structure, color, and the electromagnetic spectrum. With many illustrations from corporations on the ways in which ceramics make advanced products possible, the Second Edition also addresses the newest areas in ceramics, such as nanotechnology.

INTRODUCTION TO ENGINEERING MATERIALS

BEHAVIOR: PROPERTIES, AND SELECTION

CRC Press Presents the fundamental science needed to understand the classification of materials and the limits of their properties in terms of temperature, strength, ductility, corrosion and physical behaviour, while emphasizing materials processing, selection and property measurement methods.

SOLUTIONS MANUAL FOR MODERN CERAMIC ENGINEERING

CRC Press| Lic

CERAMIC AND GLASS MATERIALS

STRUCTURE, PROPERTIES AND PROCESSING

Springer Science & Business Media This is a concise, up-to-date book that covers a wide range of important ceramic materials used in modern technology. Chapters provide essential information on the nature of these key ceramic raw materials including their structure, properties, processing methods and applications in engineering and technology. Treatment is provided on materials such as alumina, aluminates, Andalusite, kyanite, and sillimanite. The chapter authors are leading experts in the field of ceramic materials. An ideal text for graduate students and practising engineers in ceramic engineering, metallurgy, and materials science and engineering.

FUNDAMENTALS OF MODERN MANUFACTURING

MATERIALS, PROCESSES, AND SYSTEMS

JOHN WILEY & SONS, INC.

MODERN CERAMIC ENGINEERING

PROPERTIES, PROCESSING, AND USE IN DESIGN, FOURTH EDITION

CRC Press Since the publication of its Third Edition, there have been many notable advances in ceramic engineering. Modern Ceramic Engineering, Fourth Edition serves as an authoritative text and reference for both professionals and students seeking to understand key concepts of ceramics engineering by introducing the interrelationships among the structure, properties, processing, design concepts, and applications of advanced ceramics. Written in the same clear manner that made the previous editions so accessible, this latest edition has been expanded to include new information in almost every chapter, as well as two new chapters that present a variety of relevant case studies. The new edition now includes updated content on nanotechnology, the use of ceramics in integrated circuits, flash drives, and digital cameras, and the role of miniaturization that has made our modern digital devices possible, as well as information on electrochemical ceramics, updated discussions on LEDs, lasers and optical applications, and the role of ceramics in energy and pollution control technologies. It also highlights the increasing importance of modeling and simulation.

HANDBOOK OF MATERIALS SELECTION FOR ENGINEERING APPLICATIONS

CRC Press Reflecting the rapid advances in new materials development, this work offers up-to-date information on the properties and applications of various classes of metals, polymers, ceramics and composites. It aims to simplify the materials selection process and show how to lower materials and manufacturing costs, drawing on such sources as vendor supplied and quality control test data.

FUNDAMENTOS DE MANUFACTURA MODE

Pearson Educación CONTENIDO: Automatización programable - Control de calidad - Deformación volumétrica (masiva) en el trabajo de metales - Ensamble mecánico - Ensamble y encapsulado de dispositivos electrónico - Esmerilado y otros procesos abrasivos - Fundamentos de la fundición de los metales - Fundamentos de soldadura - Fundamentos del formado de metales - Ingeniería de manufactura - Limpieza y tratamiento de superficies - Líneas de producción - Maquinado no tradicional y procesos de corte térmico - Materiales cerámico - Materiales compuestos - Materiales de ingeniería - Medición e inspección - Metalurgia de polvos - Operaciones de maquinado y maquinas herramienta - Plantación y control de la producción - Polímeros - Procesamiento de circuitos integrados - Procesamiento de productos cerámicos y cermets - Procesos de conformado para plásticos - Procesos de formado para materiales compuestos en matriz polimérica - Procesos de recubrimiento y deposición - Procesos de soldadura - Propiedades de los mate ...

CALLISTER'S MATERIALS SCIENCE AND ENGINEERING

John Wiley & Sons Callister's Materials Science and Engineering: An Introduction promotes student understanding of the three primary types of materials (metals, ceramics, and polymers) and composites, as well as the relationships that exist between the structural elements of materials and their properties. The 10th edition provides new or updated coverage on a number of topics, including: the Materials Paradigm and Materials Selection Charts, 3D printing and additive manufacturing, biomaterials, recycling issues and the Hall effect.

FUNDAMENTALS OF MATERIALS SCIENCE AND ENGINEERING

AN INTEGRATED APPROACH

John Wiley & Sons Fundamentals of Materials Science and Engineering provides a comprehensive coverage of the three primary types of materials (metals, ceramics, and polymers) and composites. Adopting an integrated approach to the sequence of topics, the book focuses on the relationships that exist between the structural elements of materials and their properties. This presentation permits the early introduction of non-metals and supports the engineer's role in choosing materials based upon their characteristics. Using clear, concise terminology that is familiar to students, the book presents material at an appropriate level for student comprehension. This International Adaptation has been thoroughly updated to use SI units. This edition enhances the coverage of failure mechanism by adding new sections on Griffith theory of brittle fracture, Goodman diagram, and fatigue crack propagation rate. It further strengthens the coverage by including new sections on peritectoid and monotectic reactions, spinodal decomposition, and various hardening processes such as surface, and vacuum and plasma hardening. In addition, all homework problems requiring computations have been refreshed.

THE HANDBOOK OF ADVANCED MATERIALS

ENABLING NEW DESIGNS

John Wiley & Sons Written to educate readers about recent advances in the area of new materials used in making products. Materials and their properties usually limit the component designer. * Presents information about all of these advanced materials that enable products to be designed in a new way * Provides a cost effective way for the design engineer to become acquainted with new materials * The material expert benefits by being aware of the latest development in all these areas so he/she can focus on further improvements

3RD EUROPEAN SYMPOSIUM ON ENGINEERING CERAMICS

Springer Science & Business Media This volume is the proceedings of the 3rd European Symposium on Engineering Ceramics, held in London, 28-29 November 1989, under the auspices of IBC Technical Services Ltd. The Symposium sessions were chaired by Eric Briscoe, who also introduced the Symposium with the very appropriate review 'Ceramics in Europe'. The term 'engineering ceramics' is commonly taken to mean a group of special high-strength and heat-resistant ceramic materials developed almost exclusively for the advanced internal combustion engine of the next century. It is not always fully appreciated that high grade fine microstructure ceramics both of the oxide and of the non-oxide classes, whether they be termed engineering, fine, special, advanced, structural or technical, have been supporting a large number of diverse and profitable industries over many decades. Indeed, in some respects these materials can be regarded as natural developments from the long established refractories field, and the distinction between an engineering ceramic and a refractory can become blurred, as the contribution in this volume on 'Nitride Bonded Carbide Engineered Ceramics' shows. It is of significance that in Japan, for example, much development work in the engineering ceramics field was initiated by the refractories industries, seeking to diversify possibly but doing so on the basis of long experience in the refractories area. The main objective of this Symposium was to help engineers and designers to assess the present state of the field of engineering ceramics.

LIGHTWEIGHT MATERIALS

UNDERSTANDING THE BASICS

ASM International

CERAMIC MATERIALS

SCIENCE AND ENGINEERING

Springer Science & Business Media Ceramic Materials: Science and Engineering is an up-to-date treatment of ceramic science, engineering, and applications in a single, comprehensive text. Building on a foundation of crystal structures, phase equilibria, defects, and the mechanical properties of ceramic materials, students are shown how these materials are processed for a wide diversity of applications in today's society. Concepts such as how and why ions move, how ceramics interact with light and magnetic fields, and how they respond to temperature changes are discussed in the context of their applications. References to the art and history of ceramics are included throughout the text, and a chapter is devoted to ceramics as gemstones. This course-tested text now includes expanded chapters on the role of ceramics in industry and their impact on the environment as well as a chapter devoted to applications of ceramic materials in clean energy technologies. Also new are expanded sets of text-specific homework problems and other resources for instructors. The revised and updated Second Edition is further enhanced with color illustrations throughout the text.

ADVANCED STRUCTURAL MATERIALS

PROPERTIES, DESIGN OPTIMIZATION, AND APPLICATIONS

CRC Press A snapshot of the central ideas used to control fracture properties of engineered structural metallic materials, Advanced Structural Materials: Properties, Design Optimization, and Applications illustrates the critical role that advanced structural metallic materials play in aerospace, biomedical, automotive, sporting goods, and other industries in the twenty-first century. The book presents an overview of the structure, properties, and applications of these materials, including the basic ideas behind their design. It contains examples and accessible language, elucidating the basic concepts that guide the development of new alloys and composite materials. With in-depth reviews from leading contributors, the text develops an understanding of the breadth and depth of advances in the field. It begins with a broad introduction to advanced structural materials, then examines materials at the frontiers of emerging applications such as biomaterials, MEMS, amorphous materials, and nanotechnology. The chapter authors are experts in their own right and they assume no prior knowledge of a given material system, delineating the fundamental concepts and applications of advanced structural materials. The rich array of carefully selected topics provides useful insights into the structure, properties, and applications of advanced structural materials.

ENGINEERING CERAMICS '96: HIGHER RELIABILITY THROUGH PROCESSING

Springer Science & Business Media Despite the significant progress, which has been made in developing of ceramic materials desired for engineering applications, their mass production is still not on expected level. Among the key factors hindering higher exploitation of these materials the problems in processing were identified. The processing comprises powder production, mixing techniques, forming, and sintering. All of them are equally important and all of them can introduce defects into the material. Besides improvement in processing, the properties of ceramic materials can be considerably improved by the creation of composites. Composites formed at micro or macro level are able to form more flaw-tolerant material. Considerable research activities, working on above mentioned phenomena are in progress at industrial laboratories as well as other research centres. This volume presents the contributions to the Advanced Research Workshop "Engineering Ceramics '96" with 65 participants from 21 countries held on 12th - 15th May 1996 at Smolenice Castle, Slovakia, the conference site of Slovak Academy of Sciences. The book covers research activities on engineering ceramic materials and gives an overview with respect to recent developments.

MATERIALS SELECTION IN MECHANICAL DESIGN

Elsevier Understanding materials, their properties and behavior is fundamental to engineering design, and a key application of materials science. Written for all students of engineering, materials science and design, this book describes the procedures for material selection in mechanical design in order to ensure that the most suitable materials for a given application are identified from the full range of materials and section shapes available. Fully revised and expanded for this third edition, Materials Selection in Mechanical Design is recognized as one of the leading texts, and provides a unique and genuinely innovative resource. Features new to this edition • New chapters on topics including process selection, material and shape selection, design of hybrid materials, environmental factors and industrial design. • Reader-friendly approach and attractive, easy to use two-color presentation. • The methods developed in the book are implemented in Granta Design's widely used CES Educational software. Materials are introduced through their properties; materials selection charts (now available on line) capture the important features of all materials, allowing rapid retrieval of information and application of selection techniques. Merit indices, combined with charts, allow optimization of the materials selection process. Sources of material property data are reviewed and approaches to their use are given. Material processing and its influence on the design are discussed. New chapters on environmental issues, industrial engineering and materials design are included, as are new worked examples, and exercise materials. New case studies have been developed to further illustrate procedures and to add to the practical implementation of the text. The new edition of the leading materials selection text Expanded and fully revised throughout, with new material on key emerging topics, an even more student-friendly approach, and attractive, easy to use two-color presentation

MECHANICAL ENGINEERS' HANDBOOK, MATERIALS AND ENGINEERING MECHANICS

John Wiley & Sons Full coverage of electronics, MEMS, and instrumentation and control in mechanical engineering This second volume of Mechanical Engineers' Handbook covers electronics, MEMS, and instrumentation and control, giving you accessible and in-depth access to the topics you'll encounter in the discipline: computer-aided design, product design for manufacturing and assembly, design optimization, total quality management in mechanical system design, reliability in the mechanical design process for sustainability, life-cycle design, design for remanufacturing processes, signal processing, data acquisition and display systems, and much more. The book provides a quick guide to specialized areas you may encounter in your work, giving you access to the basics of each and pointing you toward trusted resources for further reading, if needed. The accessible information inside offers discussions, examples, and analyses of the topics covered, rather than the straight data, formulas, and calculations you'll find in other handbooks. Presents the most comprehensive coverage of the entire discipline of Mechanical Engineering anywhere in four interrelated books Offers the option of being purchased as a four-book set or as single books Comes in a subscription format through the Wiley Online Library and in electronic and custom formats Engineers at all levels will find Mechanical Engineers' Handbook, Volume 2 an excellent resource they can turn to for the basics of electronics, MEMS, and instrumentation and control.

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CERAMIC MICROSTRUCTURES

PROPERTY CONTROL BY PROCESSING

Springer Science & Business Media This text deals with the effect of processing on the microstructure and properties of advanced structural and electroceramic materials. It fulfils the need for a well illustrated book explaining the relation between microstructure and

properties in structural ceramics, featuring high quality micrographs and characterization techniques.

WHAT EVERY ENGINEER SHOULD KNOW ABOUT CERAMICS

CRC Press

ENGINEERING MATERIALS

POLYMERS, CERAMICS AND COMPOSITES

PHI Learning Pvt. Ltd. This text, now in its second edition, continues to provide a balanced practical treatment of polymers, ceramics, and composites, covering all their physical properties as well as applications in industry. The text puts emphasis on developing an understanding of properties, characteristics and specifications of non-metallic engineering materials and focusing on the techniques for controlling their properties during processing. It provides students with the knowledge they need to make optimal selection and use of these materials in a variety of manufacturing applications. The book focuses on structure-properties correlation of materials as it forms the basis for predicting their behaviour during processing and service conditions. The text also discusses the recently developed advanced materials. Each chapter includes the questions of fundamental importance and industrial significance, along with their answers. This book is especially designed for Metallurgical and Materials Science students for a course in non-metallic engineering materials. Besides it should prove useful for the students of other engineering disciplines where materials science/materials engineering is offered as a compulsory course. **NEW TO THIS EDITION** : Addition of a new chapter on Ceramics—A Material for Biomedical Applications (Chapter 5) Inclusion of a number of questions and their answers in Chapters 2, 3 and 4, modifications of existing figures and the inclusion of new ones. Incorporation of plenty of numerical problem related to polymers, ceramics and composites.

SYNTHESIS AND PROPERTIES OF ADVANCED MATERIALS

Springer Science & Business Media Synthesis and Properties of Advanced Materials provides an overview of some of the most exciting developments in advanced materials. The book contains review papers based on tutorial lectures given at The First Pan American Advanced Study Institute held in Merida, Mexico, 1995. Each paper serves as a comprehensive introduction and review to the topic covered. Topics included: diamond and related materials, nanocrystalline metals and ceramics, Co-based alloys for biomedical applications, high-temperature superconductivity materials, composite materials, cement-based materials, ion-implanted ceramics and structural ceramics. Each chapter emphasizes the relationships among processing parameters, micro-structure and properties. Synthesis and Properties of Advanced Materials provides an excellent review of the state of the art in advanced materials for the working engineer or researcher. Students will also find this text an accessible introduction to the field.

MATERIALS FOR HIGH TEMPERATURE ENGINEERING APPLICATIONS

Springer Science & Business Media This concise survey describes the requirements on materials operating in high-temperature environments and the processes that increase the temperature capability of metals, ceramics, and composites. The major part deals with the applicable materials and their specific properties, with one entire chapter devoted to coatings. Written for engineering and science students, researchers, and managers in industry.

DEGARMO'S MATERIALS AND PROCESSES IN MANUFACTURING

John Wiley & Sons Now in its eleventh edition, DeGarmo's Materials and Processes in Manufacturing has been a market-leading text on manufacturing and manufacturing processes courses for more than fifty years. Authors J T. Black and Ron Kohser have continued this book's long and distinguished tradition of exceedingly clear presentation and highly practical approach to materials and processes, presenting mathematical models and analytical equations only when they enhance the basic understanding of the material. Completely revised and updated to reflect all current practices, standards, and materials, the eleventh edition has new coverage of additive manufacturing, lean engineering, and processes related to ceramics, polymers, and plastics.

CHEMICAL PROCESSING OF CERAMICS, SECOND EDITION

CRC Press Many believe that the silicon/information age is heading to the Age of Biology and that the next frontier in ceramics will most likely require molecular level or nanoscale control. What, then, is the role of ceramics in the age of biology? As we change from an energy-rich society to an energy-declining society, how can ceramic materials appease the problem? This new edition of Chemical Processing of Ceramics offers a scientific and technological framework for achieving creative solutions to these questions. Edited by experts and containing chapters by leading researchers in the field, the book uses an interdisciplinary approach to cover topics ranging from starting materials to device applications. The book begins with a discussion of starting material, highlighting how to prepare and modify them in the nanoscale range. The chapter authors discuss the synthesis, characterization, and behavior of ceramic powders, the processing of ceramic films via sol-gel technique, and the fabrication of nonoxide ceramics. They also present coverage of several specific thin films, membranes, ferroelectrics, bioceramics, dielectrics, batteries, and superconductors. Although the book is edited, it is organized to reflect the chemical sequence of ceramic processing and the coherent theme of chemical processing for advanced ceramic materials. The coverage of molecular/nanoprocessing techniques that result in new materials will enable researchers and engineers to meet the challenge of producing inorganic materials for use in the applications of the future.

28TH INTERNATIONAL CONFERENCE ON ADVANCED CERAMICS AND COMPOSITES A

John Wiley & Sons A collection of Papers Presented at the 28th International Conference and Exposition on Advanced Ceramics and Composites held in conjunction with the 8th International Symposium on Ceramics in Energy Storage and Power Conversion Systems.

CERAMIC MATERIALS AND PROCESSING - PHASE EQUILIBRIA - PHYSICAL MODELLING IN ELECTRON MICROSCOPY

EXAMINATION QUESTIONS AND ANSWERS FOR METALLURGY AND MATERIALS ENGINEERING

YALIN YAYINCILIK There were two main driving forces in my decision for preparing a question- answer book covering all the courses given by myself during the past 10 years in my academic career: first argument is that there exists a good amount of original questions in the exams and their corresponding answers, next , my expectation is that probably fewer time would be spent in preparing such a book where the questions and answers are all-ready prepared thereupon.... In this country, most of the undergraduate students do not necessarily work on the course they attend in the same day; instead they prefer to start preparing their exams 2 or 3 days before.. In these circumstances, last minute students may usually prefer working on the passed questions for the tomorrow's exam. However this method of preparation may lead unwanted consequences such that students mostly do not find same questions 'unconsciously' learnt by heart in the exams. In order to increase working efficiency and consequently reach to the maximum performance in exams will only be possible if students do not miss any lectures given by staff; in addition to be an active participant during the lecture and daily work on the given homeproblems are the basic requirements for a full success. In concluding, this book will give a chance to the well prepared students to make a quick rehearsal before the exams for obtaining best results after the exams.

A CONCISE INTRODUCTION TO CERAMICS

Springer Science & Business Media To Ceramics by George C. Phillips ~ VAN NOSTRAND REINHOLD ~ ~ ___ New York Copyright ('> 1991 by Van Nostrand Reinhold Softcover reprint of the hardcover 1 st edition 1991 Library of CONGRESS Catalog Card Number 91-19587 ISBN-13: 978-94-011--6975-2 All rights reserved. No part of this work covered by the copyright hereon may be reproduced or used in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems-without written permission of the publisher. Manufactured in the United States of America Published by Van Nostrand Reinhold 115 Fifth Avenue New York, New York 10003 Chapman and Hall 2-6 Boundary Row London, SE1 5HN, England Thomas Nelson Australia 102 Dodds Street South Melbourne 3205 Victoria, Australia Nelson Canada 1120 Birchmount Road Scarborough, Ontario M1K 5G4, Canada 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 Library or Congress Cataloging-in-Publication Data Phillips, George C . 1937- A concise introduction to ceramics/by George C. Phillips. p. cm. Includes bibliographical references and index. ISBN-13: 978-94-011--6975-2 e-ISBN-13: 978-94-011--6973-8 001:10: 1007/978-94-011--6973-8 I. Ceramics. I. Title.

POROSITY OF CERAMICS

PROPERTIES AND APPLICATIONS

CRC Press Focuses on the effects of porosity and microcracking on the physical properties of ceramics, particularly nominally single phase ceramics. The book elucidates the fundamental interrelationships determining the development and use of materials for actual and potential engineering needs. It aims to help in the understanding of porosity effects on other materials, from ceramic composites, cements and plasters to rocks, metals and polymers.;College or university bookshops may order five or more copies at a special student price, available on request.

HANDBOOK OF ADVANCED CERAMICS

MATERIALS, APPLICATIONS, PROCESSING, AND PROPERTIES

Academic Press This new handbook will be an essential resource for ceramicists. It includes contributions from leading researchers around the world and includes sections on Basic Science of Advanced Ceramics, Functional Ceramics (electro-ceramics and optoelectro-ceramics) and engineering ceramics. Contributions from more than 50 leading researchers from around the world Covers basic science of advanced ceramics, functional ceramics (electro-ceramics and optoelectro-ceramics), and engineering ceramics Approximately 750 illustrations

ENCYCLOPEDIA OF CHEMICAL PHYSICS AND PHYSICAL CHEMISTRY: APPLICATIONS

Taylor & Francis

FRICITION AND WEAR OF CERAMICS

CRC Press Provides comprehensive information on the tribological aspects of advanced ceramic materials for all uses that require controlled friction and wear resistance. The text is a guide to altering the microstructure of ceramics to create optimum performance in sliding and rolling contact applications.

INTEGRATING ELECTRICAL HEATING ELEMENTS IN PRODUCT DESIGN

CRC Press Offers details on the utilization of electrical heating elements in consumer appliance design and industrial processes. The text includes basic theory, metallurgy and production advice for developing more reliable and cost-effective heaters. It provides tables comparing resistivity and surface resistance of different materials, and listing the resistance and weight per metre as well as surface per ohm of whole and half B&S wire and ribbon sizes for common standard resistance heating alloys. The book also contains calculation equations suitable for use in BASIC programs.

MECHANICAL PROPERTIES OF CERAMICS

John Wiley & Sons 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.

CELLULAR SOLIDS

STRUCTURE AND PROPERTIES

Cambridge University Press In this new edition of their classic work on Cellular Solids, the authors have brought the book completely up to date, including new work on processing of metallic and ceramic foams and on the mechanical, electrical and acoustic properties of cellular solids. Data for commercially available foams are presented on material property charts; two new case studies show how the charts are used for selection of foams in engineering design. Over 150 references appearing in the literature since the publication of the first edition are cited. The text summarises current understanding of the structure and mechanical behaviour of cellular materials, and the ways in which they can be exploited in engineering design. Cellular solids include engineering honeycombs and foams (which can now be made from polymers, metals, ceramics and composites) as well as natural materials, such as wood, cork and cancellous bone.