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Tribology for Scientists and Engineers
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Designing Small Weapons

KEENAN SYDNEE

Materials for the Hydrogen Economy John Wiley & Sons
This book focuses on developing small weapons, following the lifecycle of a firearm from design to manufacture. It demonstrates how modern technologies can be used at every stage of the process, such as design methodologies, CAD/CAE/CAM software, rapid prototyping, test benches, materials, heat and surface treatments, and manufacturing processes. Several case studies are presented to provide detailed considerations on developing specific topics. Small weapons are designed to be carried by one person; examples are pistols, revolvers, rifles, carbines, shotguns, and submachine guns. Beginning with a review of the history of weapons from ancient to modern times, this book builds on this by mapping out recent innovations and state-of-the-art technologies that have advanced small weapon design. Presenting a comprehensive guide to computer design tools used by weapon engineers, this book demonstrates the capabilities of modern software at all stages of the process, looking at the computer-aided design, engineering, and manufacturing. It also details the materials used to create small weapons, notably steels, engineering polymers, composites, and emerging materials. Manufacturing processes, both conventional and unconventional, are discussed, for example, casting, powder metallurgy, additive manufacturing, and heat and surface treatments. This book is essential reading to those in the field of weapons, such as designers, workers in research and development, engineering and design students, students at military colleges, sportsmen, hunters, and those interested in firearms. Dr. Jose Martin Herrera-Ramirez is a military engineer with experience in the field of weapon and ammunition development. After receiving his PhD in Materials Science and Engineering from the Paris School of Mines in France, he was the head of the Applied Research Center and Technology Development for the Mexican Military Industry (CIADTIM). He now researches the development of metallic alloys and composites at the Research Center for Advanced Materials (CIMAV) in Chihuahua, Mexico. Dr. Luis Adrian Zuñiga-Aviles is a military engineer with wide experience in the field of weapon and ammunition development. He was head of the prototypes and simulation departments at the Applied Research Center and Technology Development for the Mexican Military Industry (CIADTIM) and head of engineering of the Production directorate. He received his PhD in Science and Technology on Mechatronics from the Center for Engineering and Industrial Development (CIDESI) in Queretaro, Mexico. He now researches the new product design and development for military application, machinery, robotics, and medical devices in the Faculty of Medicine at the Autonomous University of Mexico State (UAEMex) and the Faculty of Engineering at UAEMex as part of the Researchers for Mexico program CONACYT.
From Basics to Advanced Concepts Springer
This textbook, suitable for students, researchers and engineers, gathers the experience of more than 20 years of teaching fracture mechanics, fatigue and corrosion to professional engineers and running experimental tests and verifications to solve practical problems in engineering applications. As such, it is a comprehensive blend of fundamental knowledge and technical tools to address the issues of fatigue and corrosion. The book initiates with a systematic description of fatigue from a phenomenological point of view, since the early signs of submicroscopic damage in few surface grains and continues describing, step by step, how these precursors develop to become mechanically small cracks and, eventually, macrocracks whose growth is governed by fracture mechanics. But fracture mechanics is also introduced to analyze stress corrosion and corrosion assisted fatigue in a rather advanced fashion. The author dedicates a particular attention to corrosion starting with an electrochemical treatment that mechanical engineers with a rather limited knowledge of electrochemistry will well digest without any pain. The electrochemical introduction is considered an essential requirement to the full understanding of corrosion that is essentially an electrochemical process. All stress corrosion aspects are treated, from the generalized film rupture-anodic dissolution process that is the base of any corrosion mechanism to the aggression occurring in either mechanically or thermally sensitized alloys up to the universe of hydrogen embrittlement, which is described in all its possible modes of appearance. Multiaxial fatigue and out-of-phase loading conditions are treated in a rather comprehensive manner together with damage progression and accumulation that are not linear processes. Load spectra are analyzed also in the frequency domain using the Fourier transform in a rather elegant fashion full of applications that are generally not considered at all in fatigue textbooks, yet they deserve a special place and attention. The issue of fatigue cannot be treated without a probabilistic approach unless the designer accepts the shame of one-out-of-two pieces failure. The reader is fully introduced to the most promising and advanced analytical tools that do not require a normal or lognormal distribution of the experimental data, which is the most common case in fatigue. But the probabilistic approach is also used to introduce the fundamental issue of process volume that is the base of any engineering application of fatigue, from the probability of failure to the notch effect, from the metallurgical variability and size effect to the load type effect. Fractography plays a fundamental role in the post mortem analysis of fatigue and corrosion failures since it can unveil the mystery encrypted in any failure.
Inco Nickel Topics CRC Press
Hydrogen offers a promising alternative for supplying clean and sustainable energy to meet increasing demands worldwide. However, materials are key to transforming the technology into a viable industry. Materials for the Hydrogen Economy describes the technical challenges and the current efforts in developing materials possessing the properties required for handling each stage of the hydrogen fuel chain. Thorough coverage offers newcomers as well as experienced engineers and researchers a reliable and fully scalable foundation in this field. This book covers all seven of the current hydrogen production methods, as well as distribution, storage, and utilization technologies, particularly fuel cells. It details the chemical reactions, processes, types of feedstock, and commercial equipment involved in hydrogen production. It also covers methods, membranes, liners, and sensors used for separating, sealing, and purifying hydrogen. Several chapters examine corrosion effects in pipeline steels and other storage and transportation vessels, leading to discussions of hydrogen permeation barriers, barrier coatings, and hydrides for on-board hydrogen storage. The final chapters focus on electrolytes and component materials for solid-oxide fuel cells (SOFCs) and H2/O2 PEM fuel cells. Materials for the Hydrogen Economy provides a broad review of material requirements for handling hydrogen from production to market. It explores the development of these materials alongside essential considerations and issues associated with their deployment.
CRC Press
This book reports on topics at the interface between manufacturing, mechanical and chemical engineering. It gives a special emphasis to CAD/CAE systems, information management systems, advanced numerical simulation methods and computational modeling techniques, and their use in product design, industrial process optimization and in the study of the properties of solids, structures and fluids. Control theory, ICT for engineering education as well as ecological design and food technologies are also among the topics discussed in the book. Based on the International Conference on Design, Simulation, Manufacturing: The Innovation Exchange (DSMIE-2018), held on June 12-15, 2018, in Sumy, Ukraine, the book provides academics and professionals with a timely overview and extensive information on trends and technologies behind current and future developments of Industry 4.0, innovative design and renewable energy generation.
Commerce Business Daily CRC Press

The Handbook of Environmental Degradation of Materials, Third Edition, explains how to measure, analyze and control environmental degradation for a wide range of industrial materials, including metals, polymers, ceramics, concrete, wood and textiles exposed to environmental factors, such as weather, seawater, and fire. This updated edition divides the material into four new sections, Analysis and Testing, Types of Degradation, Protective Measures and Surface Engineering, then concluding with Case Studies. New chapters include topics on Hydrogen Permeation and Hydrogen Induced Cracking, Weathering of Plastics, the Environmental Degradation of Ceramics and Advanced Materials, Antimicrobial Layers, Coatings, and the Corrosion of Pipes in Drinking Water Systems. Expert contributors to this book provide a wealth of insider knowledge and engineering expertise that complements their explanations and advice. Case Studies from areas such as pipelines, tankers, packaging and chemical processing equipment ensure that the reader understands the practical measures that can be put in place to save money, lives and the environment. Introduces the reader to the effects of environmental degradation on a wide range of materials, including metals, plastics, concrete, wood and textiles Describes the kind of degradation that effects each material and how best to protect it Includes case studies that show how organizations, from small consulting firms, to corporate giants design and manufacture products that are more resistant to environmental effects

Proceedings of the International Conference on Design, Simulation, Manufacturing: The Innovation Exchange, DSMIE-2018, June 12-15, 2018, Sumy, Ukraine Malaysian Tribology Society

Reviews the mineral and material industries of the United States and foreign countries. Contains statistical data on materials and minerals and includes information on economic and technical trends and development. Includes chapters on approximately 90 commodities and over 175 countries.

Handbook of Environmental Degradation of Materials ASTM International

Coverage of the most recent advancements and applications in laser materials processing This book provides state-of-the-art coverage of the field of laser materials processing, from fundamentals to applications to the latest research topics. The content is divided into three succinct parts: Principles of laser engineering-an introduction to the basic concepts and characteristics of lasers, design of their components, and beam delivery Engineering background&-a review of engineering concepts needed to analyze different processes: thermal analysis and fluid flow; solidification of molten metal; and residual stresses that evolve during processes Laser materials processing-a rigorous and detailed treatment of laser materials processing and its principle applications, including laser cutting and drilling, welding, surface modification, laser forming, and rapid prototyping Each chapter includes an outline, summary, and example sets to help readers reinforce their understanding of the material. This book is designed to prepare graduate students who will be entering industry; researchers interested in initiating a research program; and practicing engineers who need to stay abreast of the latest developments in this rapidly evolving field.

Advances in Design, Simulation and Manufacturing William Andrew

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

Technical Abstract Bulletin Titanium for the Chemical EngineerLectures Given at A.I. Ch. E. Materials Conference, Philadelphia, Pennsylvania, April 1, 1968Western Machinery and Steel World ...National Educators' Workshop, Update 92Standard Experiments in Engineering Materials Science and Technology : Proceedings of a Workshop Sponsored Jointly by the United States Department of Energy, Oak Ridge, Tennessee; Norfolk State University, Norfolk, Virginia; and the National Institute of Standards and Technology, Washington, D.C., and Held in Oak Ridge, Tennessee November 11-13, 1992Energy Research AbstractsU.S. Government Research ReportsInco Nickel TopicsAn Introductory Guide to EC Competition Law and PracticeHandbook of Environmental Degradation of Materials

The first of many important works featured in CRC Press’ Metals and Alloys Encyclopedia Collection, the Encyclopedia of Iron, Steel, and Their Alloys covers all the fundamental, theoretical, and application-related aspects of the metallurgical science, engineering, and technology of iron, steel, and their alloys. This Five-Volume Set addresses topics such as extractive metallurgy, powder metallurgy and processing, physical metallurgy, production engineering, corrosion engineering, thermal processing, metalworking, welding, iron- and steelmaking, heat treating, rolling, casting, hot and cold forming, surface finishing and coating, crystallography, metallography, computational metallurgy, metal-matrix composites, intermetallics, nano- and micro-structured metals and alloys, nano- and micro-alloying effects, special steels, and mining. A valuable reference for materials scientists and engineers, chemists, manufacturers, miners, researchers, and students, this must-have encyclopedia: Provides extensive coverage of properties and recommended practices Includes a wealth of helpful charts, nomograms, and figures Contains cross referencing for quick and easy search Each entry is written by a subject-matter expert and reviewed by an international panel of renowned researchers from academia, government, and industry. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-mail) online.sales@tandf.co.uk

Report of NRL Progress ASTM International

This book is a compilation of papers presented at the Regional Tribology Conference 2011 (RTC2011) - Langkawi, Malaysia on 22 ~ 24 November 2011.

RTC2011 Springer

This book describes available tribology technologies and introdces a comprehensive overview of tribology. General, up-to-date knowledge on how tribology is approached in various related areas of research, both experimental and computational is provided.

Fatigue and Corrosion in Metals Springer

As fatigue and fracture mechanics approaches are used more often for determining the useful life and/or inspection intervals for complex structures, realization sets-in that all factors are not well known or characterized. Indeed, inherent scatter exists in initial material quality and in material performance. Furthermore, projections of component usage in determination of applied stresses are inexact at best and are subject to much discrepancy between projected and actual usage. Even the models for predicting life contain inherent sources of error based on assumptions and/or empirically fitted parameters. All of these factors need to be accounted for to determine a distribution of potential lives based on combination of the aforementioned variables, as well as other factors. The purpose of this symposium was to create a forum for assessment of the state-of-the-art in incorporating these uncertainties and inherent scatter into systematic probabilistic methods for conducting life assessment.

Standard Experiments in Engineering Materials Science and Technology : Proceedings of a Workshop Sponsored Jointly by the United States Department of Energy, Oak Ridge, Tennessee; Norfolk State University, Norfolk, Virginia; and the National Institute of Standards and Technology, Washington, D.C., and Held in Oak Ridge, Tennessee November 11-13, 1992 Springer Science & Business Media

Titanium for the Chemical EngineerLectures Given at A.I. Ch. E. Materials Conference, Philadelphia, Pennsylvania, April 1, 1968Western Machinery and Steel World ...National Educators' Workshop, Update 92Standard Experiments in Engineering Materials Science and Technology : Proceedings of a Workshop Sponsored Jointly by the United States Department of Energy, Oak Ridge, Tennessee; Norfolk State University, Norfolk, Virginia; and the National Institute of Standards and Technology, Washington, D.C., and Held in Oak Ridge, Tennessee November 11-13, 1992Energy Research AbstractsU.S. Government Research ReportsInco Nickel TopicsAn Introductory Guide to EC Competition Law and PracticeHandbook of Environmental Degradation of MaterialsWilliam Andrew

Proceedings of Regional Tribology Conference 2011 Springer Science & Business Media

This volume contains the proceedings of the XIX International Colloquium on Mechanical Fatigue of Metals, held at the Faculty of Engineering of the University of Porto, Portugal, 5-7 September 2018. This International Colloquium facilitated and encouraged the exchange of knowledge and experiences among the different communities involved in both basic and applied research in the field of the fatigue of metals, looking at the problem of fatigue exploring analytical and numerical simulative approaches. Fatigue damage represents one of the most important types of damage to which structural materials are subjected in normal industrial services that can finally result in a sudden and unexpected abrupt fracture. Since metal alloys are still today the most used materials in designing the majority of components and structures able to carry the highest service loads, the study of the different aspects of metals fatigue attracts permanent attention of scientists, engineers and designers.

Corrosion Abstracts ASTM International

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

U.S. Government Research Reports ASTM International

Alloys Index

Experimental and Simulation Perspectives

Probabilistic Aspects of Life Prediction

Technical Translations