

Fibre Science And Technology By S Mishra

Produced for unit SEFI01 (Introduction to fibre science and textile technology) offered by the Faculty of Science and Technology's School of Engineering and Technology in Deakin University's Open Campus Program.

Fiber composites, like metals, exhibit a form of degradation in service described as fatigue. Engineers must understand composite fatigue because it is a causative agent of design and structural failures. Engineers need to increase their knowledge of the mechanisms which result in degradation in order to predict the life of a composite under specified conditions and produce composites with greater durability. This book provides an extensive account of contemporary research on fatigue from a selection of international recognized researchers. Part one introduces the concept, delivering a historical review of the fatigue behavior of fiber-reinforced plastics and illustrating fatigue test methods and fatigue under multiaxial stress systems. The second part reviews current research on micromechanical aspects, emphasizing long-term behavior, interface performance, delamination, and damage accumulation. The next two sections cover the analysis and testing of fatigue behavior and detail physical, micromechanical, computational, statistical, and life-prediction models for constant and variable stress. The final parts offer an overview of the wide range of composite fatigue-related problems experienced by engineers in aerospace, marine, and structural engineering.

Manufactured Fibre Technology provides an accessible and comprehensive treatment of the chemical, physical and mechanical processes involved in the production of all important commodity manufactured fibres and most of the industrial fibres. The emphasis is on the fundamental principles and industrial aspects of production. Latest developments in manufactured fibres in terms of manufacturing processes, characteristics and their applications are also covered. Manufactured Fibre Technology is designed around two chapters with a balance of basic principles and production of specific fibre types. Newer and industrially relevant areas such as high speed spinning, production of specialty fibres (including microfibres), computer simulation of spinning, high performance fibres, spun-bonding and melt-blowing, and re-use of fibre waste are included. The structure, property and application areas of each fibre type are also discussed, thus providing a broad understanding of the subject. In addition, various aspects related to the testing and characterisation of fibres and polymers are reviewed. This book is an invaluable resource to students, lecturers, industrial technologists and researchers in this subject area.

Handbook of Fibre Rope Technology

Fundamentals and Applications

Fatigue in Composites

Experiments in Textile and Fibre Chemistry

Some of the most interesting developments of the last few decades in the field of fiber production have been the result of intensive study in Japanese industry and research institutes. This book was originally published in Japanese by the Society of Fiber Science and Technology, Japan, in order to present a thorough scientific and technological review of advances in fiber production, and is now published in English. In addition to providing an extensive review of recent breakthroughs in fiber spinning technology, this popular book illustrates how R&D can pay off in terms of commercial success in the textiles marketplace.

Sustainable Fibres and Textiles provides a whole-lifecycle approach to the subject of sustainable textiles, from fiber production, through manufacturing and low-energy care and recycling. The scientific, industrial, regulatory and social aspects of this lifecycle are explored by an expert author team who bring global perspectives to this important subject. The first part of the book provides detailed coverage of the sustainable production of textiles, with chapters devoted to each of the main fiber types, including new biosynthetic fibers, such as textiles produced from Poly(lactic Acid (PLA). The second part examines sustainable production methods, focusing on low carbon production technologies and sustainable, low-pollution methods of processing and dyeing fabrics. The final sections explore the benefits of textiles designed to enable low-energy fabric care via both finishes used to treat the fabric and better care labelling. Re-use and recycling options are also covered, as are ethical aspects, such as fair trade fabrics. Presents an integrated understanding of sustainability through the whole supply-chain – from agriculture, through manufacturing and fabric care, to recycling
Teachers users how to make optimal choices of fiber and manufacturing technologies to achieve the sustainable production of high-quality apparel and other textile products
Provides a wider understanding of emerging regulatory frameworks that will shape the future of sustainable textiles

Fiber Technology for Fiber-Reinforced Composites provides a detailed introduction to fiber reinforced composites, explaining the mechanics of fiber reinforced composites, along with information on the various fiber types, including manufacturing of fibers (starting from monomers and precursors), fiber spinning techniques, testing of fibers, and surface modification of fibers. As material technologies develop, composite materials are becoming more and more important in transportation, construction, electronics, sporting goods, the defense industry, and other areas of research. Many engineers working in industry and academics at universities are trying to manufacture composite materials using a limited number of fiber types with almost no information on fiber technology, fiber morphology, fiber properties, and fiber sizing agents. This book fills that gap in knowledge. Unique in that it focuses on a broad range of different fiber types used in composites manufacturing
Contains contributions from leading experts working in both industry and academia
Provides comprehensive coverage on both natural and nanofibers

Advanced Fiber Spinning Technology

An International Journal : Back Issues, Contents, Availability, Prices

Chemical Processing of Fibers and Fabrics - Fundamentals and Preparation

Study guide and readings

Handbook of Fiber Science and Technology

The Handbook of Fiber Chemistry, Third Edition provides complete coverage of scientific and technological principles for all major natural and synthetic fibers. Incorporating new scientific techniques, instruments, characterization, and processing methods, the book features important technological advances from the past decade, particularly in fiber production and novel applications. It contains the latest data and insight into the chemistry and structural properties made possible by these advances. Authored by leading experts in the field of fiber science, most chapters in this third edition of a bestseller are either new or extensively updated. Chapters on synthetic fibers detail their formation from monomers, while those on natural fibers cover extraction and purification methods. Each chapter encompasses definitions, morphology, and fine structure; properties, testing, processing methods, and equipment; and the conversion into marketable products. Taking into account the recent expansion and diversification of markets for various fibers, this book also offers a solid foundation in the principles used for developing new fibers, including biologically and electronically active fibers. The Handbook of Fiber Chemistry, Third Edition offers a better understanding of the structure-property relationships of fibers and fiber-related phenomena. It is an ideal volume for scientists, technologists, and engineers working to develop novel and innovative products and technologies using natural and synthetic fibers.

Despite the increased variety of manufactured fibres available to the textile industry, demand for cotton remains high because of its suitability on the basis of price, quality and comfort across a wide range of textile products. Cotton producing nations are also embracing sustainable production practices to meet growing consumer demand for sustainable resource production. This important book provides a comprehensive analysis of the key scientific and technological advances that ensure the quality of cotton is maintained from the field to fabric. The first part of the book discusses the fundamental chemical and physical structure of cotton and its various properties. Advice is offered on measuring and ensuring the quality of cotton fibre. Building on these basics, Part two analyses various means for producing cotton such as genetic modification and organic production. Chapters focus on spinning, knitting and weaving technologies as well as techniques in dyeing. The final section of the book concludes with chapters concerned with practical aspects within the industry such as health and safety issues and recycling methods for used cotton. Written by an array of international experts within the field, Cotton: science and technology is an essential reference for all those concerned with the manufacture and quality control of cotton. Summarises key scientific and technological issues in ensuring cotton quality

Discusses the fundamental chemical and physical structure of cotton Individual chapters focus on spinning, knitting and weaving technologies

A Text Book of Fibre Science and TechnologyNew Age International

Manufactured Fibre Technology

Types, Properties and Factors Affecting Breeding and Cultivation

Science and Technology

An Internat. Journal / Publ. Quarterly

Sustainable Fibres and Textiles

Experiments in Textile and Fiber Chemistry focuses on selected experiments in the chemistry of fibrous polymers and ancillary materials designed primarily for undergraduate students in technical colleges, polytechnics, and universities. The book first reviews the determination of 'available' chlorine in sodium hypochlorite solution, hardness of water, and estimation of iron in water. The text also ponders on the determination of the saponification and iodine values of oils, use of the pH meter, and use of pH indicators and acid-base titrations. The publication examines the determination of the nitrogen content of organic substances by the Kjeldahl method; separation of amino acids by paper chromatography and paper electrophoresis; and thin layer chromatography. Identification of N-terminal amino acids by the 'Dansyl' method; supercontraction of wool; rendering wool resistant to acid dyeing; effect of breaking disulfide cross-links in wool; and the formation of lanthionine linkages in wool are discussed. The text is a valuable reference for textile and fiber experts interested in the chemistry of fibrous polymers and ancillary materials.

Advanced research into wool science and technology is leading to a better understanding of the properties of wool. Wool is increasingly being seen as a high performance fibre, with new modifications and applications. Advances in wool technology presents a comprehensive overview of these developments and innovations. Part one includes advances that have occurred in the production and processing of wool. Topics range from the progress in wool spinning, weaving and colouration, to environmental supply chain management and to the role of genetic engineering in improved wool production. Part two reviews new wool products and applications. Chapters include the production of brighter and whiter wool, high performance wool blends and wool for apparel. With its two distinguished editors and array of international contributors, this book is a valuable reference for producers, manufacturers, retailers and all those wishing to improve and understand developments in wool technology. It will also be suitable for researchers in industry or academia. Presents a comprehensive account of recent developments and innovation surrounding the high performance fibre
Examines advances in wool production and processing from wool spinning to genetic engineering in improved production
Considers environmental supply chain management

Based on over 25 years of research at the University of Manchester Institute of Science & Technology, this book contains more than 1,500 scanning electron micrographs and other pictures, offering a unique collection of documentary information. The explanatory text presents fiber and polymer scientists an explanation of fracture mechanisms and outlines way to maximize textile life span, enabling textile technologists and design engineers to manufacture improved textile products, and helping forensic scientists to identify cause of failure.

Materials, Design and Technology

Handbook of Natural Fibres

Fundamentals of Yarn Technology

Textile Institute. Technology and Tomorrow's Fibres. Textile Institute Fibre Science Conference, Held 7-8 December 1988

Science and Technology of the Fatigue Response of Fibre-Reinforced Plastics

Even though the fibre or textile technology is nearly as old as human civilization itself, the process of meaningful unfolding and proper understanding of the fibre science as one of the major branches of polymer science is only of very recent origin and development. This book has been designed with the idea of combining the science and technology of natural and man-made fibres and integrating the vast subject area from the view point of material science and technology with special reference to fibres and textiles constituting a major class of polymeric materials of every-day use.

This important book provides a guide to the fundamentals and latest developments in smart technology for textiles and clothing. The contributors represent a distinguished international panel of experts and the book covers many aspects of cutting edge research and development. Smart fibres, fabrics and clothing starts with a review of the background to smart technology and goes on to cover a wide range of the material science and fibre science aspects of the technology including: Electrically active polymeric materials and the applications of ionic/polymer gel and elastomers for artificial muscles; Thermally sensitive fibres and fabrics; Cross-linked polyol fibrous substrates stimuli-responsive interpenetrating polymer network hydrogel; Permeation control through stimuli-responsive polymer membranes; optical fibre sensors, hollow fibre membranes for gas separation; Wearable electronic and photonic technologies; Adaptive and responsive textile structures (ARTS); Biomedical applications including the applications of scaffolds in tissue engineering It is essential reading for academics in textile and materials science departments, researchers, designers and engineers in the textiles and clothing product design field. Product managers and senior executives within textile and clothing manufacturing will also find the latest insights into technological developments in the field valuable and fascinating.

The remarkable properties of silk fibres have gained them a prominent place in the field of technical textiles. Advances in Silk Science and Technology explores recent developments in silk processing, properties and applications. Techniques for manufacturing spider silk are also discussed and the current and future applications of this fibre are reviewed. Part One focuses on the properties and processing of silk from both silkworms and spiders. It addresses recent advances in our understanding of the properties of silk and offers systematic coverage of the processing of silk from spinning through to finishing, as well as an analysis of quality testing for silk fibres, yarns and fabrics. Part Two then addresses important applications of silk from silkworms and spiders, and includes chapters on the use of silk in polymer matrix composites and in different kinds of biomaterial. The book concludes with a chapter on developments in the use of silk waste. Reviews the properties of silk from both silkworms and spiders Offers systematic coverage of the processing of silk from spinning through to finishing Cover a range of applications, including on the use of silk in polymer matrix composites and in different kinds of biomaterial

Atlas of Fibre Fracture and Damage to Textiles

From Science to Market

Textile Fibres

Man-made Fibres

From Fibre Science to Apparel Engineering

The field of fibre rope technology has witnessed incredible change and technological advance over the last few decades. At the forefront of this change has been the development of synthetic fibres and modern types of rope construction. This handbook updates the history and structural mechanics of fibre rope technology and describes the types and properties of modern rope-making materials and constructions. Following an introduction to fibre ropes, the Handbook of fibre rope technology takes a comprehensive look at rope-making materials, rope structures, properties and mechanics and covers rope production, focusing on laid strand, braided, low-twist and parallel yarn ropes. Terminations are also introduced and the many uses of rope are illustrated. The key issues surrounding the inspection and retirement of rope are identified and rope testing is thoroughly examined. The final two chapters review rope markets, distribution and liability and provide case studies from the many environments in which fibre rope is used. The Handbook of fibre rope technology is an essential reference for everyone assisting in the design, selection, use, inspection and testing of fibre rope. A comprehensive look at rope-making materials and structures, properties and mechanics
Covers rope production including laid strand, braided, low-twist and parallel yarn ropes and rope terminations
Rope testing is examined in depth, as well as the key issues surrounding rope retirement

This major textbook is designed for students studying textiles and fashion at higher and undergraduate level, as well as those needing a comprehensive and authoritative overview of textile materials and processes. The first part of the book reviews the main types of natural and synthetic fibres and their properties. Part two provides a systematic review of the key processes involved first in converting fibres into yarns and then transforming yarns into fabrics. Part three discusses the range of range of finishing techniques for fabrics. The final part of the book looks specifically at the transformation of fabric into apparel, from design and manufacture to marketing. With contributions from leading experts in their fields, this major book provides the definitive one-volume guide to textile manufacture. Provides comprehensive coverage of the types and properties of textile fibres to yarn and fabric manufacture, fabric finishing, apparel production and fashion
Focused on the needs of college and undergraduate students studying textiles or fashion courses
Each chapter ends with a summary to emphasise key points, a comprehensive self-review section, and project ideas are also provided

Textiles are ubiquitous materials that many of us take for granted in our everyday lives. We rely on our clothes to protect us from the environment and use them to enhance our appearance. Textiles also find applications in transport, healthcare, construction, and many other industries. The revised and updated 2nd Edition of The Chemistry of Textile Fibres highlights the trend towards the synthesis, from renewable resources, of monomers for making synthetic fibres. It contains new information on the influence of legislation and the concerns of environmental organisations on the use of chemicals in the textile industry. New sections on genetically modified cotton, anti-microbial materials and spider silk have been added as well as a new chapter covering functional fibres and fabrics. This book provides a comprehensive overview of the various types of textile fibres that are available today, ranging from natural fibres to the high-performance fibres that are very technologically advanced. Readers will gain an appreciation of why particular types of fibre are used for certain applications through understanding the chemistry behind their properties. Students following ‘A’ level courses or equivalent and first-year undergraduate students reading textile technology subjects at university will find this book a valuable source of information.

Fiber Technology for Fiber-Reinforced Composites

Fibre Science and Technology in the Development of New Countries

Study guide

Fabric Technology

Fibre science and textile technology. Part 1

This book collects selected high quality articles submitted to the 2nd International Conference on Natural Fibers (ICNF2015). A wide range of topics is covered related to various aspects of natural fibres such as agriculture, extraction and processing, surface modification and functionalization, advanced structures, nano fibres, composites and nanocomposites, design and product development, applications, market potential, and environmental impact. Divided into separate sections on these various topics, the book presents the latest high quality research work addressing different approaches and techniques to improve processing, performance, functionalities and cost-effectiveness of natural fibre and natural based products, in order to promote their applications in various advanced technical sectors. This book is a useful source of information for materials scientists, teachers and students from various disciplines as well as for R& D staff in industries using natural fibre based materials.

Focusing On The Fundamentals Of Natural And Manmade Fibres, This Book Systematically Explains Fibre Extraction/Production, Structure, Properties And Uses.Recent Developments Like Different Aliphatic And Aromatic Polyamides, Ployimides, Novoloids, Polycarbonates, Carbon, High Performance Polyethylenes, Etc. Have Also Been Explained In A Simplified Manner. Diverse Applications Of Fibres Have Been Included To Illustrate Their Use And Utility.This Book Will Serve As A Basic Text For Both Diploma And Degree Students Of All Textile Disciplines. It Would Also Serve As A Useful Reference For Researchers And Professionals Engaged In This Area.

Fibre Science and Technology is one of six titles in a coherent and definitive series of volumes dedicated to advanced composite materials research, development and usage in the former Soviet Union. Much of the information presented has been classified until recently. Thus each volume provides a unique insight into hitherto unknown research and development data. This volume deals with the basic components of a composite material, namely the reinforcement and the encasing matrix material. Beginning with a specification of a range of reinforcing fibres (glass, carbon, organic, inorganic, ceramic), the book then considers in detail the development of such fibres and the significant range of properties achieved. An extensive test methodology used to evaluate the physical and mechanical properties of each type of fibre matrix combination is presented, and the production method employed for each constituent part is described. This book will be of interest to anyone involved in research or development in composite materials science and technology, both in industry and universities.

Fibre Science

Smart Fibres, Fabrics and Clothing

Technology of Textile Materials

Handbook of Fiber Chemistry, Third Edition

Wool

Growing awareness of environmental issues has led to increasing demand for goods produced from natural products, including natural fibres. The two-volume Handbook of natural fibres is an indispensable tool in understanding the diverse properties and applications of these important materials. Volume 1: Types, properties and factors affecting breeding and cultivation is an essential guide to a wide range of natural fibres, and highlights key techniques for their improvement. Part one reviews key types and fundamental properties of natural textile fibres. The production, identification and testing of a range of cotton, bast, silk and wool fibres are discussed, alongside bioengineered natural textile fibres. Part two goes on to explore the improvement of natural fibre properties and production through breeding and cultivation, beginning with a discussion of fibrous flax and cotton. Improved natural fibre production through the prevention of fungal growth is explored, along with the use of genetic engineering and biotechnology to enhance desirable characteristics. Finally, the wider impact of natural textile production is discussed, using wild silk enterprise programs as an example. With its distinguished editor and international team of expert contributors, the two volumes of the Handbook of natural fibres are essential texts for professionals and academics in textile science and technology. Provides an essential guide to a wide range of natural fibres and highlights key techniques for their improvement

Reviews key types and fundamental properties of natural textile fibres, addressing the production, identification and testing of a range of cotton, bast, silk and wool fibres

Explores the improvement of natural fibre properties and production through breeding and cultivation, beginning with a discussion of fibrous flax and cotton

Discusses the fundamental chemical and physical structure of cotton Individual chapters focus on spinning, knitting and weaving technologies

Fibre, one of the most used of commodities, has one of the most elaborate and long development processes. The emergence of new varieties, along with new technologies in manufacturing and new terminology, mean that it may be difficult to stay abreast - this book aims to fulfil that need. In this book leading experts within the industry come together to give the first comprehensive treatments of the science and technology of wool to be published in over 20 years. The wool industry has been through a period of substantial change, with a major overhaul of trading methods, exciting innovations in wool-scouring and wool processing methods, and the development of modern technology reflecting a strong emphasis on environmental concerns and energy conservation. Research into wool science has continued to grow, and the technologist now has a better understanding of both the chemical and the physical properties of wool. Modern instruments can determine the structural differences between several types of wool proteins and how they interact, and this knowledge is leading to a deeper understanding of what can be done to create better products and more effective processes. Wool: Science and technology is an essential reference resource for anyone involved in the worldwide wool industry whether as processor, manufacturer, or user for the garment and carpets trades. First new comprehensive treatment of wool for over 20 years

Covers all aspects of processing, treatment and manufacture

Contributions from distinguished experts worldwide