Composite Nonwoven Materials Structure Properties And Applications

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Poly(Ethylene Terephthalate) Based Blends, Composites and Nanocomposites - P. M. Visakh 2015-08-24
Poly(Ethylene Terephthalate) (PET) is an industrially important material which is not treated specifically in any other book. Poly(Ethylene Terephthalate) Based Blends, Composites and Nanocomposites fills this gap and systematically guides the reader through all aspects of PET and its blends, composites and nanocomposites. It covers theoretical fundamentals, nanocomposites preparation, modification techniques, structure-property relationships, characterisation of the different blends and composites, and material choice for specific applications. Consisting of contributions from experts in the field this book is a useful reference for the researchers and engineers working on the development and characterization of PET materials as well as on implementing them in real-world products. It can also be used as a standard reference for deeper insight in the mechanical, thermal, thermo-mechanical and visco-elastic aspects in product design decisions. Provides a systematic overview on all types of poly(ethylene) terephthalate (PET) based blends, composites and nanocomposites Informs about characterization, structure-property relationships and types of modifications Links material properties to specific applications, enabling engineers to make the best material choice to increase product performance and cost efficiency, in industries ranging from aerospace to energy

Cellulose Fibre Reinforced Composites - R Arun Ramnath 2022-10-29
Cellulose Fibre Reinforced Composites: Interface Engineering, Processing and Performance provides an up-to-date review of current research in cellulose fiber reinforced polymer composites. Key emphasis is placed on interface engineering, modern technologies needed for processing and materials performance in industrial applications. Novel techniques for interfacial adhesion, characterization and assessment of cellulose fiber reinforced composites are also discussed, along with current trends and future directions. With contributions from leading researchers in industry, academic, government and private research institutions from across the globe, the book will be an essential reference resource for all those

working in the field of cellulose fibers and their composites. Reviews advances in recent research towards enhancing the mechanical properties of cellulose fiber composites Discusses interface engineering and modern technologies needed for processing cellulose fiber composites Includes case studies of problems with interfaces and practical industrial applications

Sustainability in the Textile and Apparel Industries - Subramanian Senthilkannan Muthu 2020-03-31

This book is part of a five-volume set that explores sustainability in textile industry practices globally. Case studies are provided that cover the theoretical and practical implications of sustainable textile issues, including environmental footprints of textile manufacturing, consumer behavior, eco-design in clothing and apparels, supply chain sustainability, the chemistry of textile manufacturing, waste management and textile economics. The set will be of interest to researchers, engineers, industrialists, R&D managers and students working in textile chemistry, economics, materials science, and sustainable consumption and production. This volume explores some alternative synthetic raw materials resulting from the recycling and regeneration of renewable textile fibers, and how these sustainable green-based composites can contribute to improved ecological and human health. The book offers insights into the impacts of human-made fibers and microfiber pollution, and how biodegradable material sourcing can help to curb harmful environmental impacts from these practices and achieve clothing and apparel sustainability.

High-Performance Apparel - John McLoughlin 2017-09-18

High-Performance Apparel: Materials, Development, and Applications covers the materials and techniques used in creating high-performance apparel, the technical aspects of developing high-performance garments, and an array of applications for high-performance clothing and wearable technology. Part One covers fabric construction for high-performance garments, from fiber types and spinning methods, to weaving, knitting, finishing, and joining techniques. Development of high-performance apparel is covered in Part Two, with particular emphasis on design and product development for function and wearer comfort. Part Three covers a range of applications and wearable technology that make use of high-performance apparel, including chapters on sportswear, protective clothing, and medical, military, and intelligent textiles. The book provides an excellent resource for all those engaged in garment development and production, and for academics engaged in research into apparel technology and textile science. Offers a range of perspectives on high-performance apparel from an international team of authors with diverse expertise Provides systematic and comprehensive coverage of the topic from fabric construction, through apparel design and development, to the range of current and potential applications Presents an excellent resource for all those engaged in garment development and production, and for academics engaged in research

Polyolefin Fibres - S C O Ugbolue 2017-06-09

Polyolefin Fibres: Structure, Properties and Industrial Applications, Second Edition, explores one of the most widely used commercial polymers, with a focus on the most important polyolefins, namely polyethylene, polypropylene, and polyolefin bicomponent fibres.

These versatile fibres are durable, chemically resistant, lightweight, economical, and functional. This new edition has been updated and expanded to include cutting-edge research on a broad range of advanced applications. Part I covers the structure and properties of polyolefin fibres, incorporating a new chapter on the environmental aspects of polyolefin use. Part II examines the methods for improving the functionality of polyolefins, providing essential information for those engaged in developing high-performance materials. A final group of chapters addresses how polyolefin fibres can be incorporated into specific textile applications, such as automotive, geotextile, biomedical, and hygiene products, and explores potential future development. This book is an essential reference for textile technologists and manufacturers, polymer and fibre scientists, yarn and fabric manufacturers, biomedical and device engineers, and industrialists and researchers. Introduces the types, properties and structure of polyolefin fibers for readers new to the polyolefins field Examines methods to improve the functionality of polyolefin fibers, providing essential information for textile technologists and research and development managers engaged in developing high-performance materials Presents existing and potential applications of polyolefin fibers, exploring how they can expand the range of commercial polyolefin-based products

Fibrous and Textile Materials for Composite Applications - Sohel Rana 2016-01-22

This book focuses on the fibers and textiles used in composite materials. It presents both existing technologies currently used in commercial applications and the latest advanced research and developments. It also discusses the different fiber forms and architectures, such as short fibers, unidirectional tows, directionally oriented structures or advanced 2D- and 3D-textile structures that are used in composite materials. In addition, it examines various synthetic, natural and metallic fibers that are used to reinforce polymeric, cementitious and metallic matrices, as well as fiber properties, special functionalities, manufacturing processes, and composite processing and properties. Two entire chapters are dedicated to advanced nanofiber and nanotube reinforced composite materials. The book goes on to highlight different surface treatments and finishes that are applied to improve fiber/matrix interfaces and other essential composite properties. Although a great deal of information about fibers and textile structures used for composite applications is already available, this is the only book currently available that discusses all types of fibers and structures used to reinforce polymers, cement, metal or soil to improve their general performance and multi-functional behaviors. As such, it fills an important gap in the available literature and provides a valuable resource for a wide range of students and researchers from academia and industry.

Electrochemical Energy - Pei Kang Shen 2018-10-08

Electrochemical Energy: Advanced Materials and Technologies covers the development of advanced materials and technologies for electrochemical energy conversion and storage. The book was created by participants of the International Conference on Electrochemical Materials and Technologies for Clean Sustainable Energy (ICES-2013) held in Guangzhou, China, and incorporates select papers

presented at the conference. More than 300 attendees from across the globe participated in ICES-2013 and gave presentations in six major themes: Fuel cells and hydrogen energy Lithium batteries and advanced secondary batteries Green energy for a clean environment Photo-Electrocatalysis Supercapacitors Electrochemical clean energy applications and markets Comprised of eight sections, this book includes 25 chapters featuring highlights from the conference and covering every facet of synthesis, characterization, and performance evaluation of the advanced materials for electrochemical energy. It thoroughly describes electrochemical energy conversion and storage technologies such as batteries, fuel cells, supercapacitors, hydrogen generation, and their associated materials. The book contains a number of topics that include electrochemical processes, materials, components, assembly and manufacturing, and degradation mechanisms. It also addresses challenges related to cost and performance, provides varying perspectives, and emphasizes existing and emerging solutions. The result of a conference encouraging enhanced research collaboration among members of the electrochemical energy community, Electrochemical Energy: Advanced Materials and Technologies is dedicated to the development of advanced materials and technologies for electrochemical energy conversion and storage and details the technologies, current achievements, and future directions in the field.

Handbook of Nonwovens - S. J. Russell 2022-06-03

Handbook of Nonwovens, Second Edition updates and expands its popular interdisciplinary treatment of the properties, processing, and applications of nonwovens. Initial chapters review the development of the industry and the different classes of nonwoven material. The book then discusses methods of manufacture such as dry-laid, wet-laid, and polymer-laid web formation. Other techniques analyzed include mechanical, thermal, and chemical bonding, as well as chemical and mechanical finishing systems. The book concludes by assessing the characterization, testing, and modeling of nonwoven materials. Covering an unmatched range of materials with a variety of compositions and manufacturing routes, this remains the indispensable reference to nonwovens for designers, engineers, materials scientists, and researchers, particularly those interested in the manufacturing of automotive, aerospace, and medical products. Nonwovens are a unique class of textile material formed from fibers that are bonded together through various means to form a coherent structure. The range of properties they can embody make them an important part of a range of innovative products and solutions, which continues to attract interest from industry as well as academia. Describes in detail the manufacturing processes of a range of nonwoven materials Provides detailed coverage of the mechanical and thermal properties of non-woven fabrics Includes extensive updates throughout on the characterization and testing of nonwovens Explains how to model nonwoven structures

Advanced Knitting Technology - Subhankar Maity 2021-08-22

Advanced Knitting Technology provides complete coverage of the latest innovations and developments in knitting technology, including emerging methods as well as the latest best practice for classical processes. Many technologies can be used for the production of cloth such

as weaving, knitting, nonwoven, and braiding. Knitting methods are being selected for a growing range of applications due to the spectacular properties of knitted fabric, such as softer tactile quality, higher stretchability, bulkiness, and functional properties that compare favorably with other woven fabrics. Beyond the well-known apparel applications, specially designed knitted structures are uniquely suitable for high performance applications like reinforcement for composites, medical implants, and geotextiles. This book presents recent advances in knitting technology, including structures, properties and applications of knitted fabrics in modern apparel, activewear, composites, medical textiles, and geotextiles. With reference to the latest industry practice, testing, quality and process control methods for knitting technologies are discussed. Advanced Knitting Technology covers recent advances in knitting technology, properties and performance of knitted structures, their applications in apparel and technical fields. Provides detailed and practical instructions for the sustainable production of knitted textiles, including sustainable chemical processing natural dyeing processes, and sustainability analysis methods Draws on the latest research to discuss the future of knitted apparels and high-tech applications of knitted structures as technical textiles Explores the latest applications of AI and machine learning to the knitting process

Textile and Clothing Design Technology - Tom Cassidy 2017-11-15

In the textile industry, there is a pressing need for people who can facilitate the translation of creative solutions from designers into manufacturing language and data. The design technologist has to understand the elements and principles employed by designers and how these change for various textile media. One must also have a good understanding of the processes, materials and products for which the textile designer is required to produce creative solutions. This book will be for designers wishing to improve their technological knowledge, technologists wishing to understand the design process, and anyone else who seeks to work at this design-technology interface. Key Features: • Provides a comprehensive information about textile production, apparel production and the design aspects of both textile and apparel production. • Fills the traditional gap between design and manufacture changing with advanced technologies. • Includes brief summary of spinning, weaving, chemical processing and garmenting. • Facilitates translation of creative solutions from designers into manufacturing language and data. • Covers set of workshop activities.

Encyclopedia of Renewable and Sustainable Materials - 2020-01-09

Encyclopedia of Renewable and Sustainable Materials provides a comprehensive overview, covering research and development on all aspects of renewable, recyclable and sustainable materials. The use of renewable and sustainable materials in building construction, the automotive sector, energy, textiles and others can create markets for agricultural products and additional revenue streams for farmers, as well as significantly reduce carbon dioxide (CO_2) emissions, manufacturing energy requirements, manufacturing costs and waste. This book provides researchers, students and professionals in materials science and engineering with tactics and information as they face increasingly complex challenges

around the development, selection and use of construction and manufacturing materials. Covers a broad range of topics not available elsewhere in one resource Arranged thematically for ease of navigation Discusses key features on processing, use, application and the environmental benefits of renewable and sustainable materials Contains a special focus on sustainability that will lead to the reduction of carbon emissions and enhance protection of the natural environment with regard to sustainable materials

Fibrous Filter Media - Philip Brown 2017-06-16

Fibrous Filter Media comprehensively covers the types, manufacture, applications, performance, and modeling of fibrous filter media. Part I introduces the principles of gas and liquid filtration, while Part II presents an overview of the types of fibrous filters, including details of fiber types, fabric construction, and applications. Part III covers a variety of filtration applications in which fibrous assemblies are used, with examples ranging from filtration for improving air quality, to medical filters, to industrial waste-water filtration. Finally, Part III covers the properties and performance of fibrous filters, including chapters on filter performance and simulation. With its expert editors and international team of contributors, this important book provides information on fibrous filters relevant to fiber and textile scientists, and is also ideal for academics and industry professionals working in the field of filtration. Dr. Philip Brown is Sweetenburg Professor of polymer and textile engineering at Clemson University, USA. Dr. Christopher Cox is Professor of mathematical sciences at Clemson University, USA. Systematic and comprehensive coverage of the trends and new technologies being developed in the field of fibrous filter media Focused on the needs of the textiles and filtration industries, with a clear emphasis on applied technology Contains contributions from an international team of authors edited by an expert in the field

Engineered Fabrics - Mukesh Kumar Singh 2019-02-13

Engineered fabrics have gained special attention from all quarters due to their adaptability for unconventional applications. Engineered fabrics are used in a range of technical products such as seatbelt fabrics, automotive textiles, geotextiles, and other industrial textiles. This book provides a comprehensive review and case studies of engineered fabrics used in civil engineering as geotextiles. Engineered fabrics cover a huge area from textiles used for deep-sea applications to reinforcing materials for lightweight composite materials used to construct various aircraft panels. This book gives an insight into soil conservation using engineered fabrics along with woven denim fabrics with dual core-spun yarns. The editor has included one introductory chapter on engineered fabrics that covers all aspects of fabric engineering required to cater for the needs of technical and industrial textiles.

Biodegradable Matrices and Composites - Alessandro Pegoretti 2020-09-23

This eBook is a collection of articles from a Frontiers Research Topic. Frontiers Research Topics are very popular trademarks of the Frontiers Journals Series: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest

key findings and historical advances in a hot research area! Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers Editorial Office: frontiersin.org/about/contact.

Theory and Design of Wood and Fiber Composite Materials - Benjamin A. Jayne 1972-08-01

Good,No Highlights,No Markup,all pages are intact, Slight Shelfwear,may have the corners slightly dented, may have slight color changes/slightly damaged spine.

Concise Encyclopedia of Composite Materials - Andreas Mortensen 2006-12-08

Concise Encyclopedia of Composite Materials draws its material from the award-winning Encyclopedia of Materials: Science and Technology, and includes updates and revisions not available in the original set. This customized collection of articles provides a handy reference for materials scientists and engineers with an interest in composite materials made from polymers, metals, ceramics, carbon, biocomposites, nanocomposites, wood, cement, fibers, etc. Brings together articles from the Encyclopedia of Materials: Science & Technology that focus on the essentials of composite materials, including recent updates Every article has been commissioned and written by an internationally recognized expert and provides a concise overview of a particular aspect of the field Enables rapid reference; extensive bibliographies, cross-referencing and indexes guide the user to the most relevant reading in the primary literature Covers areas of active research, such as biomaterials and porous materials

Antimicrobial Textiles from Natural Resources - Md. Ibrahim H. Mondal 2021-03-20

The textile industry is focused in its search for alternative green fibres with the aim of providing high-quality products which are fully recyclable and biodegradable. Natural textile materials from renewable sources play an increasingly important role in the industry due to their unique properties and functionality over synthetic fibres, as well as their sustainability. Antimicrobial Textiles from Natural Resources is an in-depth guide to the latest methods and applications of natural antimicrobial materials. A broad range of applications are addressed, from common to specialized applications, including many in the biomedical sector. This world-class collection of contributors write from a range of disciplinary backgrounds, providing important insights from textile science and technology, materials science, chemical engineering, and biomedical engineering. Advice and proposed solutions are presented in a rigorous and practical way, drawing on results and case studies obtained from academic and industrial laboratories worldwide. Examines how natural fibres can be used in the place of less renewable or sustainable choices, thus helping designers improve the sustainability of their products Provides unique coverage of the biofunctionality of biopolymers in textiles Explains how antimicrobial properties can reduce odour, extend the life of textiles, and provide numerous medical benefits

Nonwovens - T. Karthik 2017-11-22

Nonwovens: Process, Structure, Properties and Applications outlines the concept and principle of entire nonwoven manufacturing process starting from raw material selection, web formation techniques, web bonding methods and finishing. Further, characterization and testing of non-woven fabrics, application of non-woven fabrics in different areas such

as apparel, aggrotech, geotech, medical and hygiene, automotive textiles, filtration products, home textiles, roofing and construction and packaging were also discussed in detail. The advancements in non-woven manufacturing known as composite non-woven, their properties and applications were discussed in detail. The application of natural fibers in non-woven manufacturing with their advantages and limitations were also discussed in brief. This book is primarily a text book intended for textile technology students in universities and colleges, researchers, industrialists and academicians, as well as professionals in the apparel and textile industry.

Advances in Technical Nonwovens - George Kellie 2016-05-17

Advances in Technical Nonwovens presents the latest information on the nonwovens industry, a dynamic and fast-growing industry with recent technological innovations that are leading to the development of novel end-use applications. The book reviews key developments in technical nonwoven manufacturing, specialist materials, and applications, with Part One covering important developments in materials and manufacturing technologies, including chapters devoted to fibers for technical nonwovens, the use of green recycled and biopolymer materials, and the application of nanofibres. The testing of nonwoven properties and the specialist area of composite nonwovens are also reviewed, with Part Two offering a detailed and wide-ranging overview of the many applications of technical nonwovens that includes chapters on automotive textiles, filtration, energy applications, geo- and agrotextiles, construction, furnishing, packaging and medical and hygiene products. Provides systematic coverage of trends, developments, and new technology in the field of technical nonwovens Focuses on the needs of the nonwovens industry with a clear emphasis on applied technology Contains contributions from an international team of authors edited by an expert in the field Offers a detailed and wide-ranging overview of the many applications of technical nonwovens that includes chapters on automotive textiles, filtration, energy applications, geo- and agrotextiles, and more

Medical Textiles from Natural Resources - Md. Ibrahim H. Mondal 2022-06-23

Medical Textiles from Natural Resources provides systematic and comprehensive coverage of the fundamentals, production methods, processing techniques, characterization techniques, properties and applications of medical textile materials from natural resources. Medical textiles offer a variety of technical and functional properties valued in medical and healthcare sectors, often relating to hygiene. As medical textile products remain in close contact with the human body, the fibre must have characteristics such as biological compatibility, biological degradability, permeability and nontoxicity. Only materials from natural renewable sources have such characteristics. This book provides the latest information on a wide range of medical applications, from single suture and wound dressings, to implants and tissue scaffolds. It also offers a systematic review of the manufacture, properties and applications of technical textiles for medical use. Explains the latest technologies related to fibre extraction from natural sources, chemical treatments, weave constructions, fabric finishes and

coatings. Describes innovative applications of nanomaterials in the treatment of textile fabric and the utilization of carbohydrate polymers in the preparation of nanoparticles deposited in nonwoven fabrics. Helps product designers to find appropriate materials from natural resources with the characteristics of biodegradability, renewability, biocompatibility and nontoxicity.

ECO-COMPASS - Xiaosu Yi 2019-04-25
Today, mainly man-made materials, such as carbon and glass fibers, are used to produce composite parts in aviation. Renewable materials, such as natural fibers or bio-sourced resin systems, have not yet found their way into aviation. The project ECO-COMPASS aims to evaluate the potential applications of ecologically improved composite materials in the aviation sector in an international collaboration of Chinese and European partners. Natural fibers such as flax and ramie will be used for different types of reinforcements and sandwich cores. Furthermore, bio-based epoxy resins to substitute bisphenol-A based epoxy resins in secondary structures are under investigation. Adapted material protection technologies to reduce environmental influence and to improve fire resistance are needed to fulfil the demanding safety requirements in aviation. Modelling and simulation of chosen eco-composites aims for an optimized use of materials while a Life Cycle Assessment aims to prove the ecological advantages compared to synthetic state-of-the-art materials. This Special Issue provides selected papers from the project consortium partners.

Coir Fiber and its Composites - Mohammad Jawaid 2022-08-30
Coir Fiber and its Composites: Processing, Properties and Applications presents unified knowledge on eco-friendly coir fiber composites, covering their characterization, design, manufacture and applications. The properties of coir fiber and its extraction and processing are explored in-depth, thus helping researchers, scientists and those working in various industries understand the need of coir fiber composites in the development of green, biodegradable and sustainable components that have potential in real-world applications. The book elaborates on the basic characterization of coir fibers and its composite properties such, including its physical, mechanical, morphological, thermal, structural and chemical properties. Users will find sound knowledge on coir fiber and its composites, including modern design and manufacture engineering with numerous example illustrations, methods and results that will be valuable for graduate students, researchers and industrialists working in the development of plant-based composite materials. Covers all aspects of coir fibers and their composites, such as cultivation, extraction, processing, modification, composite design, properties and applications Provides an overview of all types of natural fibers and their composites to give an insight on which fiber is suitable for a specific application Presents a comparison in terms of properties, costs, production processes and availability of different fibers Covers lifecycle assessment, case studies on industrial product development, manufacturing and design as well as numerical problems and solutions

Scientific and Technical Aerospace Reports - 1994

Handbook of Natural Fibres - Ryszard M. Kozlowski 2020-01-28
The Handbook of Natural Fibres,

Second Edition, Volume One: Types, Properties and Factors Affecting Breeding and Cultivation covers every aspect of natural fibers, their breeding, cultivation, processing and applications. This volume features fundamental discussions of each fiber, covering different stages of breeding and cultivation. Natural fibrous resources, both lignocellulosic and protein ones, are renewable, biodegradable, and nontoxic, making them an important source of sustainable textile solutions. A broad range of natural fibers are covered in this book, including cotton, jute, kenaf, flax, hemp, sisal, ramie, curaua, pineapple, bamboo, coir, sheep wool, and more. Provides detailed instructions for how to carry out the latest scientific methods for identifying natural fibers Explains properties of natural fibers that will be of interest to readers in growth fields like biocomposites and nanofibers Includes a rare overview of emerging natural fibers and their uses, along with sources of further information

Sustainable Fibres and Textiles - Subramanian Senthilkannan Muthu 2017-05-29

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 Polylactic 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

Materials, Structures and Manufacturing for Aircraft - Melih Cemal Kuşhan 2022-05-27

This book offers a comprehensive look at materials science topics in aerospace, air vehicle structures and manufacturing methods for aerospace products, examining recent trends and new technological developments. Coverage includes additive manufacturing, advanced material removal operations, novel wing systems, design of landing gear, eco-friendly aero-engines, and light alloys, advanced polymers, composite materials and smart materials for structural components. Case studies and coverage of practical applications demonstrate how these technologies are being successfully deployed. Materials, Structures & Manufacturing for Aircraft will appeal to a broad readership in the aviation community, including students, engineers, scientists, and

researchers, as a reference source for material science and modern production techniques.

Handbook of Fibrous Materials, 2 Volumes - Jinlian Hu 2020-06-22

Edited by a leading expert in the field with contributions from experienced researchers in fibers and textiles, this handbook reviews the current state of fibrous materials and provides a broad overview of their use in research and development. Volume One focuses on the classes of fibers, their production and characterization, while the second volume concentrates on their applications, including emerging ones in the areas of energy, environmental science and healthcare. Unparalleled knowledge of high relevance to academia and industry.

Textiles and Fashion - Rose Sinclair 2014-11-08

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

Human Body - Karen L. LaBat 2019-02-18

Human Body: A Wearable Product Designer's Guide, unlike other anatomy books, is divided into sections pertinent to wearable product designers. Two introductory chapters include many definitions, an introduction to anatomical terminology, and brief discussions of the body's systems, setting the stage for the remaining chapters. The book is extensively referenced and has a large glossary with both anatomical and design terms making it maximally useful for interdisciplinary collaborative work. The book includes 200 original illustrations and many product examples to demonstrate relationships between wearable product components and anatomy. Exercises introduce useful anatomical, physiological, and biomechanical concepts and include design challenges. Features Includes body region chapters on head and neck, upper torso and arms, lower torso and legs, the mid-torso, hands, feet, and a chapter on the body as a whole Contains short sections on growth and development, pregnancy, and aging as well as sections on posture, gait, and designing total body garments Describes important regional muscles and their actions as well as joint range of motion (ROM) definitions and data with applications to designing motion into wearable products Presents appendices correlating to each body region’s anatomy with instructions for landmarking and measuring the body, a valuable resource for a lifetime of

designing
Natural Fibers, Plastics and Composites - Frederick T. Wallenberger 2011-06-28

Handbook of Technical Textiles - A. Richard Horrocks 2015-12-01
The second edition of Handbook of Technical Textiles, Volume 1: Technical Textile Processes provides readers with a comprehensive understanding of the latest advancements in technical textiles. With revised and updated coverage, including several new chapters, this volume reviews recent developments and technologies in the field, beginning with an overview of the technical textiles industry that includes coverage of technical fibers and yarns, weaving, spinning, knitting, and nonwoven production. Subsequent sections include discussions on finishing, coating, and the coloration of technical textiles. Provides a comprehensive handbook for all aspects of technical textiles Presents updated, detailed coverage of processes, fabric structure, and applications An ideal resource for those interested in high-performance textiles, textile processes, textile processing, and textile applications Contains contributions from many of the original, recognized experts from the first edition who update their respective chapters

Functional Nanofibers and their Applications - Q Wei 2012-05-24
Nanofibers are a flexible material with a huge range of potential applications in such areas as technical textiles. Functional nanofibers and their applications summarises key trends in the processing and applications of these exciting materials. Part one focuses on the types and processing of nanofibers. Beginning with an overview of the principles and techniques involved in their production, it goes on to review core-shell, aligned, porous and gradient nanofibers. The processing and application of composite functional nanofibers, carbon and polymer nanofiber reinforcements in polymer matrix composites, and inorganic functional nanofibers are then explored in detail, before part one concludes with a consideration of surface functionalization. A wide variety of functional nanofiber applications are then reviewed in part two. Following consideration of their use in filtration, drug delivery and tissue engineering applications, the role of functional nanofibers in lithium-ion batteries, sensor applications, protective clothing, food processing and water purification is explored. Discussion of their use in sound absorption, electromagnetic wave attenuation and biomedical and microelectronic applications follows, before a final discussion of future trends. With its distinguished editor and international team of expert contributors, Functional nanofibers and applications is a key text for all those working in the fields of technical textiles, as well as areas using nanofibers such as composites, biomaterials and microelectronics. Summarises key trends in the processing and applications of functional nanofibres in areas such as technical textiles Provides an overview of the principles and techniques involved in the production of nanofibres and reviews core-shell, aligned, porous and gradient nanofibres Considers the use of nanofibres in filtration, drug delivery and tissue engineering applications and the role of functional nanofibres in lithium-ion batteries, sensor applications, protective clothing, food processing and water purification

Composite Nonwoven Materials - Dipayan Das 2014-03-14
Composite nonwoven materials are versatile materials with a variety of applications, including hygiene, medicine and filtration. This important book provides a technical resource for professionals and academics in the field. It explores these materials in terms of fiber types used, manufacturing processes, structure, and physical properties. The first part of the book focuses on the use of natural and synthetic fibers in composite nonwovens, discusses their structure in terms of fiber packing and alignment, and their physical properties. Further chapters deal with the practical applications of composite nonwoven materials. Hygiene applications, such as diapers, female sanitary products, incontinence pads, and wipes are covered, as well as composite nonwoven-based medical products and filters. Composite Nonwoven Materials is an ideal reference for R&D managers in the textile industry and academic researchers in textile science. Systematic and comprehensive information on composite nonwovens Critical review of progress in research and development on composite nonwovens Comment on future research direction and ideas for product development

Modelling and Predicting Textile Behaviour - Xiaogang Chen 2009-11-30
The textile industry can experience a vast array of problems. Modelling represents a group of techniques that have been widely used to explore the nature of these problems, it can highlight the mechanisms involved and lead to predictions of the textile behaviour. This book provides an overview of how textile modelling techniques can be used successfully within the textile industry for solving various problems. The first group of chapters reviews the different types of models and methods available for predicting textile structures and behaviour. Chapters include modelling of yarn, woven and nonwoven materials. The second group of chapters presents a selection of case studies, expressing the strengths and limitations and how various models are applied in specific applications. Case studies such as modelling colour properties for textiles and modelling, simulation and control of textile dyeing are discussed. With its distinguished editor and international range of contributors, Modelling and predicting textile behaviour is essential reading material for textile technologists, fibre scientists and textile engineers. It will also be beneficial for academics researching this important area. Provides an overview of the different types of models and methods that can be used successfully within the textile industry Reviews the structural hierarchy in textile materials fundamental to the modelling of textile fibrous structures Assesses the strengths and weaknesses of different textile models and how specific models are applied in different situations

Biodegradable and Biocompatible Polymer Composites - Navinchandra Gopal Shimpi 2017-09-18
Biodegradable and Biocompatible Polymer Composites: Processing, Properties and Applications begins by discussing the current state-of-the-art, new challenges and opportunities for various biodegradable and biocompatible polymer composite systems. Interfacial characterization of composites and the structure-property relationships in various composite systems are explained in detail via a theoretical model. Processing techniques for various macro and nanocomposite systems and the influence of processing

parameters on properties of the composite are also reviewed in detail. The characterization of microstructure, elastic, visco-elastic, static and dynamic mechanical, thermal, rheological, optical, and electrical properties are highlighted, as are a broad range of applications. The book is a useful reference resource for both researchers and engineers working in composites materials science, biotechnology and nanotechnology, and is also useful for students attending chemistry, physics, and materials science and engineering courses. Presents recent outcomes and highlights the going importance of biodegradable and biocompatible polymer composites and their impact on the environment Analyzes all the main processing techniques, characterization and applications of biodegradable composites Written by leading international experts working in the field of biodegradable and biocompatible polymer composites Covers a broad range of application fields, including medical and pharmaceutical, agricultural, packaging and transport

Toughened Composites - Sri Bandyopadhyay 2022-12-09

This book covers micro and macro aspects of toughened composites covering polymer matrix, metal matrix, ceramic matrix and nanomatrix. It gives the reader understanding of composite fabrication, construction, and lightweight yet high crack resistance performance, macroscopic testing supported by microscopic bonding and debonding features, models of stress transfer, and commercial features of developing cheaper yet high-quality materials. Features: Focuses on micro and macro aspects of toughening methods and principles of composite materials. Includes all types of composites including polymer matrix, metal matrix, ceramic matrix and nanomatrix. Covers corrosion resistance and oxidation resistance as well as solubility resistance. Discusses the use of recycled materials. Provides a good balance of long fibre, short fibre, nanoparticle and particulate modifiers. This book aims at researchers and professionals in materials science, composite materials, fracture mechanics, materials characterization and testing, properties and mechanics, nanomaterials, aerospace and automotive engineering and structural engineering.

Encyclopedia of Polymer Science and Technology, Concise - Herman F. Mark 2013-10-16

The compact, affordable reference, revised and updated The Encyclopedia of Polymer Science and Technology, Concise Third Edition provides the key information from the complete, twelve-volume Mark's Encyclopedia in an affordable, condensed format. Completely revised and updated, this user-friendly desk reference offers quick access to all areas of polymer science, including important advances in nanotechnology, imaging and analytical techniques, controlled polymer architecture, biomimetics, and more, all in one volume. Like the twelve-volume full edition, the Encyclopedia of Polymer Science and Technology, Concise Third Edition provides both SI and common units, carefully selected key references for each article, and hundreds of tables, charts, figures, and graphs.

Encyclopedia and Handbook of Materials, Parts and Finishes - Mel Schwartz 2016-07-06

A great deal of progress has been made in the development of materials, their application to structures, and their adaptation to a variety of systems and integrated across a wide range of industrial applications. This encyclopedia serves the rapidly

expanding demand for information on technological developments. In addition to providing information

Thermosets - Qipeng Guo 2017-11-14

In this new edition, Thermosets: Structure, Properties, and Applications builds on and updates the existing review of mechanical and thermal properties, as well as rheology and curing processes of thermosets, and the role of nanostructures in thermoset toughening. All chapters have been updated or re-written, and new chapters have been added to reflect ongoing changes and developments in the field of thermosetting materials and the applications of these materials. Applications of thermosets are the focus of the second part of the book, including the use of thermosets in the building and construction industry, aerospace technology and as insulation materials. Thermoset adhesives and coatings, including epoxy resins, acrylates and polyurethanes are also discussed, followed by a review of thermosets for electrical applications. New chapters include coverage of thermoset nanocomposites, recycling issues, and applications such as consumer goods, transportation, energy and defence. With its distinguished editor and international team of expert contributors, the second edition of Thermosets: Structure, Properties, and Applications is an essential guide for engineers, chemists, physicists and polymer scientists involved in the development, production and application of thermosets, as well as providing a useful review for academic researchers in the field. Links structure, properties, and applications, making this book relevant to both academia and engineers in industry Includes entirely new chapters on the use of thermosets in aerospace, transport, defense, and a range of consumer applications Enables practitioners to stay current on the latest developments in recycling of thermosets and their composites

Properties and Applications of Polymer Nanocomposites - Deba Kumar Tripathy 2017-05-07

The aim of the present edited book is to furnish scientific information about manufacturing, properties, and application of clay and carbon based polymer nanocomposites. It can be used as handbook for undergraduate and post graduate courses (for example material science and engineering, polymer science and engineering, rubber technology, manufacturing engineering, etc.) as well as as reference book for research fellows and professionals. Polymer nanocomposites have received outstanding importance in the present decade because of their broad range of high-performance applications in various areas of engineering and technology due to their special material properties. A great interest is dedicated to nanofiller based polymeric materials, which exhibit excellent enhancement in macroscopic material properties (mechanical, thermal, dynamic mechanical, electrical and many more) at very low filler contents and can therefore be used for the development of next-generation composite materials.