

Woven And Nonwoven Technical Textiles Don Low

This book summarizes all different fields of cotton fiber, including genetics, fiber chemistry, soft materials, textile, and fashion engineering. It also contains some new applications such as biomaterials, nanocoated smart fabrics, and functional textiles. Moreover, the significant improvement recently in gene modification and gene technology is introduced. This book discusses all these aspects in a more straightforward way, and new illustrations will help readers to understand the contents. It is intended for undergraduate and graduate students who are interested in cotton science and processing technologies, researchers investigating the updated applications of cotton in various fields as well as industrialists who want to have a quick review of the cotton and its different stages.

The production of textile materials comprises a very large and complex global industry that utilises a diverse range of fibre types and creates a variety of textile products. As the great majority of such products are coloured, predominantly using aqueous dyeing processes, the coloration of textiles is a large-scale global business in which complex procedures are used to apply different types of dye to the various types of textile material. The development of such dyeing processes is the result of substantial research activity, undertaken over many decades, into the physico-chemical aspects of dye adsorption and the establishment of 'dyeing theory', which seeks to describe the mechanism by which dyes interact with textile fibres. Physico-Chemical Aspects of Textile Coloration provides a comprehensive treatment of the physical chemistry involved in the dyeing of the major types of natural, man-made and synthetic fibres with the principal types of dye. The book covers: fundamental aspects of the physical and chemical structure of both fibres and dyes, together with the structure and properties of water, in relation to dyeing; dyeing as an area of study as well as the terminology employed in dyeing technology and science; contemporary views of intermolecular forces and the nature of the interactions that can occur between dyes and fibres at a molecular level; fundamental principles involved in dyeing theory, as represented by the thermodynamics and kinetics of dye sorption; detailed accounts of the mechanism of dyeing that applies to cotton (and other cellulosic fibres), polyester, polyamide, wool, polyacrylonitrile and silk fibres; non-aqueous dyeing, as represented by the use of air, organic solvents and supercritical CO₂ fluid as alternatives to water as application medium. The up-to-date text is supported by a large number of tables, figures and illustrations as well as footnotes and widespread use of references to published work. The book is essential reading for students, teachers, researchers and professionals involved in textile coloration.

This Standard specifies the terms and definitions, product classification, technical requirements, test methods, inspection rules, packaging, marking, storage and transportation of protective nonwoven fabrics for surgical use. This Standard

applies to single-layer non-woven fabrics, composite non-woven fabrics, film-coated non-woven fabrics that are used in surgical gowns, clean air suits and surgical drapes.

The 2002 Workshop on Frontiers in Electronics was the third in the series of WOFE workshops. Over 70 leading experts from academia, industry, and government agencies reported on the most recent developments in their fields and exchanged views on future trends and directions of the electronics and photonics industry. The issues they addressed ranged from system-on-chip to DNA doping, from ultrathin SOI to electrot textiles, from photonics integration on the ULSI platform to wide band gap semiconductor devices and solid state lighting. The rapid pace of electronic technology evolution compels a merger of different technical areas, and WOFE-02 provided a unique opportunity for cross-fertilization of the emerging fields of microelectronics, photonics, and nanoelectronics. The workshop was informal and stimulated provocative views, visionary outlooks, and discussions on controversial issues.

The surface of textiles offers an important platform for functional modifications in order to meet special requirements for a variety of applications. The surface modification of textiles may be achieved by various techniques ranging from traditional solution treatment to biological approaches. This book reviews fundamental issues relating to textile surfaces and their characterisation and explores the exciting opportunities for surface modification of a range of different textiles. Introductory chapters review some important surface modification techniques employed for improved functional behaviour of textiles and the various surface characterisation methods available. Further chapters examine the different types of surface modification suitable for textiles, ranging from the use of plasma treatments and physical vapour deposition to the use of nanoparticles. Concluding chapters discuss surface modification strategies for various applications of textiles. Surface modification of textiles is a valuable resource for chemists, surface scientists, textile technologists, fibre scientists, textile engineers and textile students. Reviews fundamental issues relating to textiles surfaces and their characterisation Examines various types of surface modification suitable for textiles, including plasma treatments and nanoparticles Discusses surface modification strategies for textile applications such as expansion into technical textile applications

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.

An evolution is currently underway in the textile industry and Textile for Industrial Applications is the guidebook for its growth. This industry can be classified into three categories-clothing, home textile, and industrial textile. Industrial textiles, also known as technical textiles, are a part of the industry that is thriving and showing great

Nonwovens have been one of the fastest growing and most exciting sectors of the textiles market. Such fabrics have a broad spectrum of end uses, ranging from medical products to interior textiles. This book focuses on the variety of technical nonwoven applications available.

Opening chapters in part one briefly discuss the fundamental principles of nonwoven fabrics, topics such as the formation of nonwovens and the influence of fibre and fabric properties on nonwoven performance are covered. Part two provides valuable examples of how nonwoven materials can be used in a variety of textile products for apparel, filtration and personal hygiene. With a collection of international contributors, this book is an important reference for professionals involved in the production, technology and use of nonwoven materials, extending from industries such as the medical textile industry to the apparel sector. It will also be suitable for researchers in academia with an interest in nonwoven fabrics. Focuses on the variety of technical nonwoven applications available and provides a comprehensive overview of current developments and likely future trends Reviews the formulation of various types of nonwovens and examines the influence of fibre and fabric properties on nonwoven performance Provides a broad overview of nonwoven applications in a variety of different areas from apparel to automotive interiors

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

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applied in different situations

Applications of Nonwovens in Technical Textiles Elsevier

This book provides basic knowledge about the principles, roles, types and evaluation methods of antistatic and conductive textile materials, which are used for protection against charge dissipation, incendiary discharge, intense electrostatic fields and electromagnetic interference (EMI). It also discusses the basic properties of different types of conductive fibers and filaments and the manufacturing processes of conductive textile products. Although such materials are typically produced as shields against charge dissipation and EMI, they are also used in other special applications, such as sensors, antennas, flexible heaters, and specialized apparel. The book will be useful for students, pedagogues and other academics. It will also be of interest to the general reader who wants to expand their knowledge of the applications and properties of conductive textiles.

Advanced Materials Source Book 1994-1995 presents the developments in the field of advanced materials. This book provides information regarding materials and products, legislation, patents, advances in processing and equipment, standards, and testing procedures. Organized into four chapters, this book begins with an overview of the international market trends, specific materials, or materials groups and appliances. This text then examines the applications and makes market projections on a wide range of specialty materials, including ceramics, biomaterials, electronic materials, and optical materials. Other chapters consider the healthy nature of predictions concerning Japan and parts of Europe, stating that Germany and Japan will lead the advanced structural ceramics market. This book discusses as well the developments concerning various materials. The final chapter presents a list of contact details for the organizations listed in the main text to allow the readers to make new contacts or to follow-up items of particular interest. This book is a valuable resource for private consumers. Provides an overview of the family of polyester polymers which comprise an important group of plastics that span the range of commodity polymers to engineering resins. It describes the preparation, properties and applications of polyesters. Readers will also find details on polyester-based elastomers, biodegradable aliphatic polyester, liquid crystal polyesters and unsaturated polyesters for glass-reinforced composites. Presents an overview of the most recent developments. Explores synthesis, catalysts, processes, properties and applications. Looks at emerging polyester materials as well as existing ones. Written by foremost experts from both academia and industry, ensuring that both fundamentals and practical applications are covered.

Plasma technologies present an environmentally-friendly and versatile way of treating textile materials in order to enhance a variety of properties such as wettability, liquid repellency, dyeability and coating adhesion. Recent advances made in commercially viable plasma systems have greatly increased the potential of using plasma technology in industrial textile finishing. This pioneering book provides an essential guide to both the technology and science related to plasmas and its practical applications in the textile industry. The first part of the book discusses the science and technology behind plasmas. Chapters give detailed and comprehensive descriptions on the characteristics of plasmas and methods of control and treatment in the processing of textiles. Both low pressure cold plasma and atmospheric pressure cold plasma processes are described as well as the diagnosis and control of plasma parameters in plasma generating reactors. A chapter is devoted to the use of plasma technology to achieve nanoscale treatment of textile surfaces. The second part of the book concentrates on specific applications of plasma technologies. Chapters cover treatments for water and oil repellency of textiles, engineering of biomedical textiles and woollen finishing techniques through the use of plasma technologies. Further chapters cover the modification of fibres for use in composites and the potential use of plasma technologies for the finishing of fabrics made of man made fibres. The final chapter in the book

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gives a comprehensive analysis of the surface chemical and physical characterisation of plasma treated fabrics. Written by a distinguished international team of experts, Plasma technologies for textiles is an invaluable reference for researchers, scientists and technologists alike. Summarises both the science and technology of plasma processing, and its practical applications Discusses how plasma technology improves textile properties such as wettability and liquid repelling An invaluable reference for researchers, scientists and technologists Fibre2Fashion magazine—the print venture of Fibre2Fashion.com since 2011—is circulated among a carefully-chosen target audience globally, and reaches the desks of top management and decision-makers in the textiles, apparel and fashion industry. As one of India's leading industry magazines for the entire textile value chain, Fibre2Fashion Magazine takes the reader beyond the mundane headlines, and analyses issues in-depth.

This important book provides a comprehensive account of the advances that have occurred in fire science in relation to a broad range of materials. The manufacture of fire retardant materials is an active area of research, the understanding of which can improve safety as well as the marketability of a product. The first part of the book reviews the advances that have occurred in improving the fire retardancy of specific materials, ranging from developments in phosphorus and halogen-free flame retardants to the use of nanocomposites as novel flame retardant systems. Key environmental issues are also addressed. The second group of chapters examines fire testing issues and regulations. A final group of chapters addresses the application of fire retardant materials in such areas as composites, automotive materials, military fabrics and aviation materials. With its distinguished editors and array of international contributors, this book is an essential reference for producers, manufacturers, retailers and all those wishing to improve fire retardancy in materials. It is also suitable for researchers in industry or academia. Reviews advances in improving the retardancy of materials Addresses key environmental issues Examines fire testing issues and regulations and the challenges involved

This book offers an insider's view of how industrial problems are translated into mathematics and how solving the mathematics leads to convincing industrial solutions as well. In 6 technical chapters, a wide range of industrial problems is modeled, simulated, and optimized; 4 others describe the modeling, computing, optimization, and data analysis concepts shaping the work of the Fraunhofer ITWM. Each technical chapter illustrates how the relevant mathematics has been adapted or extended for the specific application and details the underlying practical problem and resulting software. The final chapter shows how the use of mathematical modeling in the classroom can change the image of this subject, making it exciting and fun.

This major handbook provides comprehensive coverage of the manufacture, processing and applications of high tech textiles for a huge range of applications including: heat and flame protection; waterproof and breathable fabrics; textiles in filtration; geotextiles; medical textiles; textiles in transport engineering and textiles for extreme environments. Handbook of technical textiles is an essential guide for textile yarn and fibre manufacturers; producers of woven, knitted and non-woven fabrics; textile finishers; designers and specifiers of textiles for new or novel applications as well as lecturers and graduate students on university textile courses. Comprehensive handbook for all aspects of technical textiles Detailed coverage of processes, fabric structure and applications Contributions from recognised experts world-wide

Today's China is governed by a new economic model that marks a radical break from the Mao and Deng eras; it departs fundamentally from both the East Asian developmental state and its own Communist past. It has not, however, adopted a liberal economic model. China has retained elements of statist control even though it has liberalized foreign direct investment more than

any other developing country in recent years. This mode of global economic integration reveals much about China's state capacity and development strategy, which is based on retaining government control over critical sectors while meeting commitments made to the World Trade Organization. In *China's Regulatory State*, Roselyn Hsueh demonstrates that China only appears to be a more liberal state; even as it introduces competition and devolves economic decisionmaking, the state has selectively imposed new regulations at the sectoral level, asserting and even tightening control over industry and market development, to achieve state goals. By investigating in depth how China implemented its economic policies between 1978 and 2010, Hsueh gives the most complete picture yet of China's regulatory state, particularly as it has shaped the telecommunications and textiles industries. Hsueh contends that a logic of strategic value explains how the state, with its different levels of authority and maze of bureaucracies, interacts with new economic stakeholders to enhance its control in certain economic sectors while relinquishing control in others. Sectoral characteristics determine policy specifics although the organization of institutions and boom-bust cycles influence how the state reformulates old rules and creates new ones to maximize benefits and minimize costs after an initial phase of liberalization. This pathbreaking analysis of state goals, government-business relations, and methods of governance across industries in China also considers Japan's, South Korea's, and Taiwan's manifestly different approaches to globalization. This book highlights the manufacturing and applications of acoustic textiles in various industries. It also includes examples from different industries in which acoustic textiles can be used to absorb noise and help reduce the impact of noise at the workplace. Given the importance of noise reduction in the working environment in several industries, the book offers a valuable guide for companies, educators and researchers involved with acoustic materials.

Geotextiles extend the service life of roads increase their load carrying capacity and reduce rutting and other distresses. The effectiveness of geotextiles in stabilization and separation roles with flexible pavements has been extensively researched. Recognizing the vast potentiality of this developed Bituminized Jute Paving Fabric (BJPF) as overlay on existing pavements to reinforce and partially substitute the bitumen mastic, a strong desire of sharing the findings stimulated by the author to write this comprehensive technical handbook.

Non-woven Fabrics is differentiated text which covers overall stream from raw fibers to final products and includes features of manufacturing and finish process with specialized application end use. Application range of non-woven fabrics is extended to all the industrial fields needless to say apparel, such as ICT (information and communication technology), bio- and medicals, automobiles, architectures, construction and environmental. Every chapter is related to the important and convergent fields with the technical application purpose from downstream to upstream fields. Also, applicability of non-woven fabrics is introduced to be based on the structural analysis of dimensional concept and various non-woven fabrics as a state-of-art embedded convergent material are emphasized in all industry fields by using nanofibers and carbon fibers.

This book provides a comprehensive overview of the field of functional finishing of textiles, describing the state-of-the-art research and well-established techniques applied in the textile industry, and covering all areas of textile dyeing and finishing. It is intended

for academic researchers and professionals in related scientific and engineering fields, including textile engineering, chemistry, nanotechnology, material science, biotechnology and environmental science. The book also provides reference material for stakeholders looking for innovative technologies and insights into the environmental and sustainability issues in the development of functional textiles and related products.

This is an easily-accessible two-volume encyclopedia summarizing all the articles in the main volumes Kirk-Othmer Encyclopedia of Chemical Technology, Fifth Edition organized alphabetically. Written by prominent scholars from industry, academia, and research institutions, the Encyclopedia presents a wide scope of articles on chemical substances, properties, manufacturing, and uses; on industrial processes, unit operations in chemical engineering; and on fundamentals and scientific subjects related to the field.

The use of composite materials has grown exponentially in the last decades and has affected many engineering fields due to their enhanced mechanical properties and improved features with respect to conventional materials. For instance, they are employed in civil engineering (seismic isolators, long-span bridges, vaults), mechanical engineering (turbines, machine components), aerospace and naval engineering (fuselages, boat hulls and sails), automotive engineering (car bodies, tires), and biomechanical engineering (prostheses). Nevertheless, the greater use of composites requires a rapid progress in gaining the needed knowledge to design and manufacture composite structures. Thus, researchers and designers devote their own efforts to develop new analysis techniques, design methodologies, manufacturing procedures, micromechanics approaches, theoretical models, and numerical methods. For these purpose, it is extremely easy to find many recent journal papers, books, and technical notes, focused on the mechanics of composites. In particular, several studies are presented to take advantage of their superior features by varying some typical structural parameters (such as geometry, fiber orientations, volume fraction, structural stiffness, weight, lamination scheme). Therefore, this Conference aims to collect contributions from every part of the globe that can increase the knowledge of composite materials and their applications, by engaging researches and professional engineers and designers from different sectors. The same aims and scopes have been reached by the previous editions of Mechanics of Composites International Conferences (MECHCOMP), which occurred in 2014 at Stony Brook University (USA) and in 2016 at University of Porto (Portugal).

This volume is a scientific introduction to the study, engineering and applications of medical textiles. It moves systematically from the fundamentals of textile materials and their fabrication through biocompatibility and biodegradability to the applications of textiles in healthcare, ranging from hygiene to wound care, grafts and implantables. The book analyzes how the internal structures of various types of textiles, wovens, knits and nonwovens, are related to

specific medical/biomedical end uses. While carefully explaining the basics, the book aims to show the connection between textile properties and the design and development of medical and healthcare textile products. This text is designed for advanced students and industry-based textile researchers, engineers, and product developers.

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

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