Life Cycle Assessment Lca Of Light Weight Eco Composites Springer Theses

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Advances in Processing of Lightweight Metal Alloys and Composites - R. Vaira Vignesh 2022-11-18
This book covers the most important aspects of lightweight metal alloys including history, physical metallurgy, overview of production technologies, alloy development, compositing, post-processing (heat

treatment, surface engineering, bulk-deformation), and joining methodologies. It discusses the microstructural evolution, fractography, morphology of corroded and worn surface to enable easy understanding of the mechanism. The topics covered in this book include lightweight metallic materials, instrumental characterization of light weight metal alloys and composites, severe plastic deformation processing of aluminum alloys, solid-state welding of aluminum alloys, aluminum metal matrix composite for automotive and aircraft applications, and heat treatment of aluminum metal matrix composites. The book is highly useful for students, researchers, academicians, scientists, and engineers working on lightweight materials.

New Materials in Civil Engineering - Pijush Samui 2020-07-07

New Materials in Civil Engineering provides engineers and scientists with the tools and methods needed to meet the challenge of designing and constructing more resilient and sustainable infrastructures. This book is a valuable guide to the properties, selection criteria, products, applications, lifecycle and recyclability of advanced materials. It presents an A-to-Z approach to all types of materials, highlighting their key performance properties, principal characteristics and applications. Traditional materials covered include concrete, soil, steel, timber, fly ash, geosynthetic, fiber-reinforced concrete, smart materials, carbon fiber and reinforced polymers. In addition, the book covers nanotechnology and biotechnology in the development of new materials. Covers a variety of materials, including fly ash, geosynthetic, fiber-reinforced concrete, smart materials, carbon fiber reinforced polymer and waste materials Provides a “one-stop resource of information for the latest materials and practical applications Includes a variety of different use case studies

Materials, Design and Manufacturing for Lightweight Vehicles - P.K. Mallick 2020-09-26
Materials, Design and Manufacturing for Lightweight Vehicles, Second Edition, features the requirements for processing each material type, explains the manufacture of different categories of components, and analyzes different component joining techniques. The properties of all materials, metals, polymers and composites currently used are included along with how each one influences structural design. The new edition also contains refinements to manufacturing processes in particular hot stamping of boron steel and aluminum alloy, and new chapters on designing lightweight automotive structures & lightweight materials for powertrains and electric vehicles. With its distinguished editor and renowned team of contributors, this is a standard reference for practicing engineers involved in the design and material selection for motor vehicle bodies and components as well as material scientists, environmental scientists, policy makers, car companies and automotive component manufacturers. Fully updated including emphasis on optimized production methods for steels, aluminum alloys, polymers and polymer composite Covers aspects related to the production of environmentally acceptable leading-edge automobiles Explores the manufacturing process for light alloys including metal forming processes for automotive applications as well as new developments in steel technology that are making advanced high strength steels more attractive for lightweight vehicles

The Multi Material Lightweight Vehicle (MMLV) Project - David Wagner 2015-06-05
The desire for greater fuel efficiency and reduced emissions have accelerated a shift from traditional materials to design solutions that more closely match materials and

their properties with key applications. The Multi-Material Lightweight Vehicle (MMLV) Project presents cutting edge engineering that meets future challenges in a concept vehicle with weight and life-cycle assessment savings. These results significantly contribute to achieving fuel reduction and to meeting future Corporate Average Fuel Economy (CAFÉ) regulations without compromising vehicle performance or occupant safety. The MMLV Project presents: • Lightweight materials applications. • Body in white design and computer aided engineering • Engine and transmission design and lightweighting. • Full vehicle test results that are specific to the MMLV subsystems including crash, corrosion, durability and Noise Vibration and Harshness (NVH). • The Life Cycle Analysis (LCA) for the MMLV The aluminum-intensive structure, combined with carbon fiber, magnesium, and titanium results in full vehicle mass reduction of a C/D class family sedan to that of a subcompact B-car (two vehicle segments lighter). The MMLV Project presents engineering solutions that frame materials selection and applications for the future.

Lightweight and Sustainable Materials for Automotive Applications - Omar Faruk 2017-06-01

Automotive manufacturers are required to decrease CO2 emissions and increase fuel economy while assuring driver comfort and safety. In recent years, there has been rapid development in the application of lightweight and sustainable materials in the automotive industry to help meet these criteria. This book provides critical reviews and the latest research results of various lightweight and sustainable materials in automotive applications. It discusses current applications and future trends of lightweight materials in the automotive area. While there are a few books published mainly focusing on automotive applications of metallic lightweight materials,

to date there is no available book focusing on a broad spectrum of lightweight materials, including metal, plastic, composites, bio-fiber, bio-polymer, carbon fiber, glass fiber, nanomaterials, rubber materials, and foaming materials, as this work does. The book also includes case studies of commercial lightweight automotive parts from sustainable lightweight materials, providing an invaluable resource to those involved in this in-demand research and commercialization area.

Magnesium Technology 2014 - Martyn Alderman 2016-12-06

The Magnesium Technology Symposium, the event on which this collection is based, is one of the largest yearly gatherings of magnesium specialists in the world. Papers in this collection represent all aspects of the field, ranging from primary production to applications to recycling. Moreover, papers explore everything from basic research findings to industrialization. This volume covers a broad spectrum of current topics, including alloys and their properties; cast products and processing; wrought products and processing; forming, joining, and machining; corrosion and surface finishing; ecology; and structural applications. In addition, there is coverage of new and emerging applications in such areas as hydrogen storage.

Re-engineering Manufacturing for Sustainability - Andrew Y. C. Nee 2013-04-08

This edited volume presents the proceedings of the 20th CIRP LCE Conference, which cover various areas in life cycle engineering such as life cycle design, end-of-life management, manufacturing processes, manufacturing systems, methods and tools for sustainability, social sustainability, supply chain management, remanufacturing, etc.

ACI213R-14 Guide for Structural Lightweight Aggregate Concrete - ACI Committee 213 2014

Materials Experience - Elvin

Karana 2013-10-24
There currently exists an abundance of materials selection advice for designers suited to solving technical product requirements. In contrast, a stark gap can be found in current literature that articulates the very real personal, social, cultural and economic connections between materials and the design of the material world. In Materials Experience: fundamentals of materials and design, thirty-four of the leading academicians and experts, alongside 8 professional designers, have come together for the first time to offer their expertise and insights on a number of topics common to materials and product design. The result is a very readable and varied panorama on the world of materials and product design as it currently stands. Contributions by many of the most prominent materials experts and designers in the field today, with a foreword by Mike Ashby The book is organized into 4 main themes: sustainability, user interaction, technology and selection Between chapters, you will find the results of interviews conducted with internationally known designers. These 'designer perspectives' will provide a 'time out' from the academic articles, with emphasis placed on fascinating insights, product examples and visuals

Biocomposite and Synthetic Composites for Automotive Applications - S.M. Sapuan Sapuan 2020-11-24
Biocomposite and Synthetic Composites for Automotive Applications provides a detailed review of advanced macro and nanocomposite materials and structures, and discusses their use in the transport industry, specifically for automotive applications. This book covers materials selection, properties and performance, design solutions, and manufacturing techniques. A broad range of different material classes are reviewed with emphasis on advanced materials and new research pathways where composites can be derived from

agricultural waste in the future, as well as the development and performance of hybrid composites. The book is an essential reference resource for those researching materials development and industrial design engineers who need a detailed understanding of materials usage in transport structures. Life Cycle Assessment (LCA) analysis of composite products in automotive applications is also discussed, and the effect of different fiber orientation on crash performance. Synthetic/natural fiber composites for aircraft engine fire-designated zones are linked to automotive applications. Additional chapters include the application and use of magnesium composites compared to biocomposites in the automotive industry; autonomous inspection and repair of aircraft composite structures via vortex robot technology and its application in automotive applications; composites in a three-wheeler (tuk tuk); and thermal properties of composites in automotive applications. Covers advanced macro and nanocomposites used in automotive structures Emphasizes materials selection, properties and performance, design solutions, and manufacturing techniques Features case studies of successful applications of biocomposites in automotive structures

Principles of Cement and Concrete Composites - Natt Makul 2021

This book presents an introduction, a discussion of the concept of the design and the concrete development, and the properties and testing of the concrete in fresh and hardened stages. After an introduction to the principles of cement and concrete composites, the reader will find information on the principles of quantum-scaled cement, low-carbon cement, fiber-reinforced concrete, reactive powder concrete, and tailor-made recycled aggregate concrete.

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 (CO2) 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
Green Design, Materials and Manufacturing Processes - Helena Bartolo 2013-06-06
The rise of manufacturing intelligence is fuelling innovation in processes and products concerning a low environmental impact over the product's lifecycle. Sustainable intelligent manufacturing is regarded as a manufacturing paradigm for the 21st century, in the move towards the next generation of manufacturing and processing technologies. The manufacturing industry has reached a turning point in its evolution and new business opportunities are emerging. With sustainable development arises the immense challenge of combining innovative ideas

regarding design, materials and products with non-polluting processes and technologies, conserving energy and other natural resources. On the other hand, sustainability has become a key concern for government policies, businesses and the general public. Model cities are embracing novel ecosystems, combining environmental, social and economic issues in more inclusive and integrated frameworks. Green Design, Materials and Manufacturing Processes includes essential research in the field of sustainable intelligent manufacturing and related topics, making a significant contribution to further development of these fields. The volume contains reviewed papers presented at the 2nd International Conference on Sustainable Intelligent Manufacturing, conjointly organized by the Centre for Rapid and Sustainable Product Development, Polytechnic Institute of Leiria, and the Faculty of Architecture, Technical University of Lisbon, both in Portugal. This event was held at the facilities of the Faculty of Architecture, Lisbon, from June 26 to June 29, 2013. A wide range of topics is covered, such as Eco Design and Innovation, Energy Efficiency, Green and Smart Manufacturing, Green Transportation, Life-Cycle Engineering, Renewable Energy Technologies, Reuse and Recycling Techniques, Smart Design, Smart Materials, Sustainable Business Models and Sustainable Construction. Green Design, Materials and Manufacturing Processes is intended for engineers, architects, designers, economists and manufacturers who are actively engaged in the advancement of science and technology regarding key sustainability issues, leading to more suitable, efficient and sustainable products, materials and processes.

Engineering Solutions for Sustainability - Jeffrey Fergus 2016-12-01

With impending and burgeoning societal issues affecting both developed and

emerging nations, the global engineering community has a responsibility and an opportunity to truly make a difference and contribute. The papers in this collection address what materials and resources are integral to meeting basic societal sustainability needs in critical areas of energy, transportation, housing, and recycling. Contributions focus on the engineering answers for cost-effective, sustainable pathways; the strategies for effective use of engineering solutions; and the role of the global engineering community. Authors share perspectives on the major engineering challenges that face our world today; identify, discuss, and prioritize engineering solution needs; and establish how these fit into developing global-demand pressures for materials and human resources.

Life Cycle Assessment (LCA) of Light-Weight Eco-composites - Miao Guo 2013-01-11

Miao Guo's PhD thesis provides scientific insights into the environmental issues related to biocomposites based on starch-polyvinyl alcohol (PVOH) blends. The author contributes significantly to the methodological issues underlying the Life Cycle Assessment (LCA) modelling approach. As well as presenting complete LCA inventories using primary data from a variety of sources, Guo develops a new modelling approach incorporating the process-oriented biogeochemistry model Denitrification-Decomposition (DNDC) into site-specific LCA studies to simulate carbon and nitrogen dynamics in the wheat agro-ecosystem. This thesis addresses important LCA data quality issues by using comprehensive sensitivity and uncertainty analyses and has resulted in a large number of publications in internationally renowned journals.

Polymeric Nanocomposites with Carbonaceous Nanofillers for Aerospace Applications - Ayesha Kausar 2022-10-14

Polymeric Nanocomposites with Carbonaceous Nanofillers

for Aerospace Applications offers a comprehensive paperback on the aerospace relevance of polymer/carbonaceous nanofiller-based nanocomposite. This manuscript summarizes all specific information on the design, fabrication and application areas of aerospace industry that employ polymer/carbonaceous nanofiller-based nanocomposites. In addition, it points to the potential of aeronautical nanocomposites towards lightning strike, radiation shielding, anti-corrosion, electronic/optical features, thermal management, antistatic application, self-healing aptitude, and green nanocomposites. The modeling of mechanical and essential properties of aerospace nanocomposites is also discussed, along with challenges and future forecasts of polymer/carbonaceous nanofiller nanocomposites. Focuses on essential aerospace composites, carbonaceous nanofillers, and ensuing polymer/carbonaceous nanofiller-based nanocomposites Explores indispensable properties of aeronautical nanocomposites, modeling of physical properties, and combined influence of carbonaceous nanofillers and carbon fibers on space material properties Includes up-to-date technical applications of polymer/carbonaceous nanofiller-based nanocomposites in design, mechanical robustness, heat resistance, non-flammability, anti-corrosion, radiation shielding, lightning strike prevention, electronic/optical features, antistatic application, self-healing, thermal management, and green nanocomposites for aeronautical relevance

Lightweight Composite Structures in Transport - James Njuguna 2016-01-22 Lightweight Composite Structures in Transport: Design, Manufacturing, Analysis and Performance provides a detailed review of lightweight composite

materials and structures and discusses their use in the transport industry, specifically surface and air transport. The book covers materials selection, the properties and performance of materials, and structures, design solutions, and manufacturing techniques. A broad range of different material classes is reviewed with emphasis on advanced materials. Chapters in the first two parts of the book consider the lightweight philosophy and current developments in manufacturing techniques for lightweight composite structures in the transport industry, with subsequent chapters in parts three to five discussing structural optimization and analysis, properties, and performance of lightweight composite structures, durability, damage tolerance and structural integrity. Final chapters present case studies on lightweight composite design for transport structures. Comprehensively covers materials selection, design solutions, manufacturing techniques, structural analysis, and performance of lightweight composite structures in the transport industry Includes commentary from leading industrial and academic experts in the field who present cutting-edge research on advanced lightweight materials for the transport industry Includes case studies on lightweight composite design for transport structures

Technologies for economic and functional lightweight design - Klaus Dröder 2021-03-10

This book comprises the proceedings of the conference “Future Production of Hybrid Structures 2020”, which took place in Wolfsburg. The conference focused on hybrid lightweight design, which is characterized by the combination of different materials with the aim of improving properties and reducing weight. In particular, production technologies for hybrid lightweight design were discussed, new evaluation methods for the ecological assessment of hybrid

components were presented and future-oriented approaches motivated by nature for the development of components, assemblies and systems were introduced. Lightweight design is a key technology for the development of sustainable and resource-efficient mobility concepts. Vehicle manufacturers operate in an area of conflict between customer requirements, competition and legislation. Material hybrid structures, which combine the advantages of different materials, have a high potential for reducing weight, while simultaneously expanding component functionality. The future, efficient use of function-integrated hybrid structures in vehicle design requires innovations and constant developments in vehicle and production technology. There is a great demand, especially with regard to new methods and technologies, for "affordable" lightweight construction in large-scale production, taking into account the increasing requirements with regard to variant diversity, safety and quality.

Environmental Assessment of Lightweight Electric Vehicles - Patricia Egede 2016-07-25

This monograph adresses the challenge of the environmental assessment of leightweight electric vehicles. It poses the question whether the use of lightweight materials in electric vehicles can reduce the vehicles' environmental impact and compares the environmental performance of a lightweight electric vehicle (LEV) to other types of vehicles. The topical approach focuses on methods from life cycle assessment (LCA), and the book concludes with a comprehensive concept on the environmental assessment of LEVs. The target audience primarily comprises LCA practitioners from research institutes and industry, but it may also be beneficial for graduate students specializing in the field of environmental assessment.

Porous lightweight composites reinforced with fibrous structures - Yiqi Yang

2017-07-30
This book will be a one-stop-shop for readers seeking information on lightweight composites made from multiple materials via diverse processing technologies. The lightweight composites are featured for their potential to be basic construction units in a variety of areas, especially automotive, civil engineering, aerospace engineering, etc. Emphasis will be on how fibers or fibrous structures reinforce the composites. The subject of the book is to provide a comprehensive understanding on the raw materials, processing technologies, performance properties, and end uses of lightweight composites.

Advanced High-Strength Steels - Mahmoud Y. Demeri 2013-08-01
Examines the types, microstructures and attributes of AHSSAlso reviews the current and future applications, the benefits, trends and environmental and sustainability issues.

Life Cycle Assessment (Lca) of Light-Weight Eco-Composites - Miao Guo 2016-05-01
This book reviews environmental issues related to biocomposites, and offers a new modeling method incorporating process-oriented Denitrification-Decomposition into site-specific LCA studies, to simulate carbon and nitrogen dynamics in the wheat agro-ecosystem.

Magnesium Technology 2015 - Michele Manuel 2016-12-26
The Magnesium Technology Symposium, the event on which this collection is based, is one of the largest yearly gatherings of magnesium specialists in the world. Papers represent all aspects of the field, ranging from primary production to applications to recycling. Moreover, papers explore everything from basic research findings to industrialization. Magnesium Technology 2015 covers a broad spectrum of current topics, including alloys and their properties; cast products and processing; wrought products and processing; forming, joining,

and machining; corrosion and surface finishing; ecology; and structural applications. In addition, there is coverage of new and emerging applications.

Composites Innovation - Probir Guha 2021-11-14

Composites Innovation: Perspectives on Advancing the Industry provides a panoramic view of innovations in the composites industry, including discussions from business leaders and the university research community on advanced applications in North America, advances in recycling of composites, the use of artificial intelligence, nanocomposites, and emerging smart composites technology. The book is arranged in five key segments including: how composites fit into our world; the basics of the technology; customer insights; pushing the boundaries with concepts from outside the world of composites and emerging composites technologies; and paths forward to find competitive and effective solutions in a timely manner. Key Features Considers sustainability and innovation as driving forces for the growth of composites Explores materials and process development, including chopped and continuous fiber systems Provides a landscape of the status of intellectual property and patents Discusses use of artificial intelligence to improve business systems with case studies and a new disciplined approach to ideation and innovation Features chapters by an accomplished group of global business and technology leaders With contributing authors spanning 15 time zones to pioneer new solutions with composite materials, this book provides an excellent resource for composites business leaders, researchers and educators, and industry professionals, as well as new entrants to this vibrant community.

Life Cycle Design & Engineering of Lightweight Multi-Material Automotive Body Parts - Thomas Vietor 2022-10-19

This book presents the final

report of the collaborative research project "MultiMaK2": MultiMaK2 contributed to the development of multi-material component concepts in large-scale automotive production. Whithin the project new methods in conceptual design of lightweight components were developed at the example of roof cross member and transmission tunnels. A concurrent Life Cycle Design & Engineering approach led to identifying eco- and cost efficient component alternatives. This includes evaluation tools for the concepts' full life cycle. Further, methods to integrate that knowledge into automotive engineering processes have been established based on principles of visual analytics. That brings forward a tight integration of data, engineering models and results visualization towards an informed knowledge building across disciplines. MultiMaK2 also compiled and structured design guidelines within a knowledge management system. All methods and tools have been embedded within the Life Cycle Design & Engineering Lab in the Open Hybrid LabFactory.

Lightweight Energy - Alessandra Zanelli 2022-11-30 This book explores membrane materials as a means of translating natural and renewable resources into a more flexible, dynamic, and reactive architectural skin. It represents the first time that energy-saving design has been addressed systematically in relation to lightweight building systems and tensile membranes. Understanding of the energetic behavior of membranes and foils used as a building envelope is a fundamental theme, as it is the integration of flexible photovoltaics in membranes, as well as the exploitation of water and wind resources. A theoretical, methodological framework for consciously designing the membrane life cycle is presented. The authors cross-cut and combine exploration of climate-based design methodology and life cycle thinking strategies. Both

active and passive systems are investigated, referring to alternative productive resources like sun, wind, and water. Case studies are brought forward in the book's second half, highlighting energy lightness for an increasingly dematerialized architecture and addressing inherent issues. Four main research and development paths are presented, the first two focusing on advancements in façade materials and Photovoltaic systems applicable to membrane architecture, the third referring to fog and dew harvesting and the fourth dealing with the future frontier of flexible transparency and designs for well-being through a passive solar system.

Lightweight Polymer Composite Structures - Sanjay Mavinkere Rangappa 2020-09-01

This book provides a comprehensive account of developments in the area of lightweight polymer composites. It encompasses design and manufacturing methods for the lightweight polymer structures, various techniques, and a broad spectrum of applications. The book highlights fundamental research in lightweight polymer structures and integrates various aspects from synthesis to applications of these materials. Features Serves as a one stop reference with contributions from leading researchers from industry, academy, government, and private research institutions across the globe Explores all important aspects of lightweight polymer composite structures Offers an update of concepts, advancements, challenges, and application of lightweight structures Current status, trends, future directions, and opportunities are discussed, making it friendly for both new and experienced researchers.

Life Cycle Assessment - Aiduan Borrion 2021-03-19

Life cycle assessment (LCA) is an established methodology used to quantify the environmental impacts of products, processes and

services. Circular economy (CE) thinking is conceptual way of considering the impacts of consuming resources. By taking a closed loop approach, CE provides a framework for influencing behaviours and practices to minimise this impact. Development of the circular economy is a crucial component in the progression towards future sustainability. This book provides a robust systematic approach to the circular economy concept, using the established methodology of LCA. Including chapters on circular economic thinking, the use of LCA as a metric and linking LCA to the wider circular economy, this book utilises case studies to illustrate the approaches to LCA. With contributions from researchers worldwide, Life Cycle Assessment provides a practical, global guide for those who wish to use LCA as a research tool or to inform policy, process, and product improvement.

Magnesium - Karl U. Kainer 2006-03-06

The need for light-weight materials, especially in the automobile industry, created renewed interest in innovative applications of magnesium materials. This demand has resulted in increased research and development activity in companies and research institutes in order to achieve an improved property profile and better choice of alloy systems. Here, development trends and application potential in different fields like the automotive industry and communication technology are discussed in an interdisciplinary framework.

Construction Materials - Marios Soutsos 2017-10-10

This established textbook provides an understanding of materials' behaviour through knowledge of their chemical and physical structure. It covers the main classes of construction materials: metals, concrete, other ceramics (including bricks and masonry), polymers, fibre composites, bituminous materials, timber, and glass. It provides a clear and comprehensive perspective on the whole range of materials

used in modern construction, to form a must-have for civil and structural engineering students, and those on courses such as architecture, surveying and construction. It begins with a Fundamentals section followed by a section on each of the major groups of materials. In this new edition: - The section on fibre composites FRP and FRC has been completely restructured and updated. - Typical questions with answers to any numerical examples are given at the end of each section, as well as an instructor's manual with further questions and answers. - The links in all parts have also been updated and extended, including links to free reports from The Concrete Centre, as well as other online resources and material suppliers' websites. - and now with solutions manual and resources for adopting instructors on https://www.crcpress.com/9781498741101

Materials for Lightweight Constructions - S. Thirumalai Kumaran 2022-09-13

This book presents the key concepts and methods involved in the development of a variety of materials for lightweight constructions, including metals, alloys, polymers and composites. It provides case studies and examples to explain strategies adapted for specific applications of the materials and covers traditional to advanced manufacturing concepts of lightweight materials, including 3D printing. It also illustrates the fundamentals and usability of biodegradable materials for achieving a greener environment, as well as possibilities of green manufacturing. Covers the fundamentals of a range of materials used for lightweight constructions Discusses fabrication and testing of materials Addresses relevant concepts of 3D printing and biodegradable materials Explores analysis of the failure mechanism of materials used in various applications Identifies the applicability of materials to a variety of situations Materials for Lightweight Constructions will suit researchers and

graduate students in materials science, mechanical engineering, construction and composites.

Issues in Ecological Research and Application: 2011 Edition - 2012-01-09

Issues in Ecological Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Ecological Research and Application. The editors have built Issues in Ecological Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Ecological Research and Application in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Ecological Research and Application: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Life Cycle Management - Guido Sonnemann 2015-07-16

This book provides insight into the Life Cycle Management (LCM) concept and the progress in its implementation. LCM is a management concept applied in industrial and service sectors to improve products and services, while enhancing the overall sustainability performance of business and its value chains. In this regard, LCM is an opportunity to differentiate through sustainability performance on the market place, working with all departments of a company such as research and development, procurement and marketing, and to enhance the

collaboration with stakeholders along a company's value chain. LCM is used beyond short-term business success and aims at long-term achievements by minimizing environmental and socio-economic burden, while maximizing economic and social value.

Environmental Assessment of Lightweight Electric Vehicles - Patricia Egede 2016-08-08

This monograph adresses the challenge of the environmental assessment of leightweight electric vehicles. It poses the question whether the use of lightweight materials in electric vehicles can reduce the vehicles' environmental impact and compares the environmental performance of a lightweight electric vehicle (LEV) to other types of vehicles. The topical approach focuses on methods from life cycle assessment (LCA), and the book concludes with a comprehensive concept on the environmental assessment of LEVs. The target audience primarily comprises LCA practitioners from research institutes and industry, but it may also be beneficial for graduate students specializing in the field of environmental assessment.

Handbook of Life Cycle Assessment (LCA) of Textiles and Clothing - Subramanian Senthilkannan Muthu 2015-07-25

Life cycle assessment (LCA) is used to evaluate the environmental impacts of textile products, from raw material extraction, through fibre processing, textile manufacture, distribution and use, to disposal or recycling. LCA is an important tool for the research and development process, product and process design, and labelling of textiles and clothing. Handbook of Life Cycle Assessment (LCA) of Textiles and Clothing systematically covers the LCA process with comprehensive examples and case studies. Part one of the book covers key indicators and processes in LCA, from carbon and ecological footprints to disposal, re-use and recycling. Part two then discusses a broad range of LCA

applications in the textiles and clothing industry. Covers the LCA process and its key indicators, including carbon and ecological footprints, disposal, re-use and recycling Examines the key developments of LCA in the textile and clothing industries Provides a wide range of case studies and examples of LCA applications in the textile and clothing industries

Plastics Application Technology for Lightweight Automobiles - Sudhakar Marur 2013-08-06

This book is focused on the use of plastics in automobiles for traditional applications, as well as for more advanced uses such as under-the-hood components. Engineering thermoplastics offer the ability to tailor-make components from polymers, and to design parts for enhanced performance, new functionality, part integration, and elimination of secondary operations. Parts made from engineering thermoplastics can be manufactured within specified cost constraints, and using manufacturing methods that offer a wide range of production flexibility. A decade of research and real-world applications is presented by the authors on application technology development for various aspects of automotive design – concept design, CAD modeling, predictive engineering methods through CAE, manufacturing method simulation, and prototype and tool making. Additional advantages of plastics are covered and include greater styling, improved energy absorption, and enhanced performance over traditional materials, all while fostering environmental sustainability and reducing overall vehicle weight for next generation automobiles.

Sustainable Composites for Lightweight Applications - Hom Dhakal 2020-11-22

Carbon and glass fibre reinforced composite materials have been used for many years in several different types of applications. However, these conventional composites are derived from non-renewable

reinforcements and they pose a significant threat to the environment. Government legislation and consumer behaviour have recently forced many industries to adapt sustainable composites. Industries such as automotive, marine and aerospace are now seeking sustainable lightweight composites with the aim to reduce the overall weight of the components with enhanced materials and design aspects. Therefore, there is high demand on research for the development of sustainable lightweight composites. This book presents a comprehensive review of lightweight composites with the central aim to increase their use in key industrial sectors such as automotive, marine and aerospace. There is no such book currently available that is dedicated to sustainable lightweight applications covering important topics such as key drivers for lightweight composites, mechanical properties, damage characterisation, durability and environmental aspects. Key topics that are addressed include: The roles of reinforcements and matrices in composite materials Sustainable natural fibre reinforcements and their morphological structures Lightweight applications and properties requirements Design, manufacturing processes and their effects on properties Testing and damage characterisation of composite materials Sustainable composites and techniques for property enhancement Future trends and challenges for sustainable composites in lightweight applications It will be a valuable reference resource for those working in material Science, polymer science, materials engineering, and industries involved in the manufacture of automotive and aerospace components from lightweight composite materials. Provides a comprehensive review of sustainable lightweight composites looking at key industrial applications such as automotive, marine, and aerospace and construction

Important relationships between structure and properties are analysed in detail Enhancement of properties through hybrid systems, are also explored with emphasis on design, materials selection and manufacturing techniques

Product Design and Life Cycle Assessment - Ireneusz Zbicinski 2006

Nanotechnology in Eco-efficient Construction - Fernando Pacheco-Torgal 2018-11-22

Covering the latest technologies, Nanotechnology in eco-efficient construction provides an authoritative guide to the role of nanotechnology in the development of eco-efficient construction materials and sustainable construction. The book contains a special focus on applications concerning concrete and cement, as nanotechnology is driving significant development in concrete technologies. The new edition has 14 new chapters, including 3 new parts: Mortars and concrete related applications; Applications for pavements and other structural materials; and Toxicity, safety handling and environmental impacts. Civil engineers requiring an understanding of eco-efficient construction materials, as well as researchers and architects within any field of nanotechnology, eco-efficient materials or the construction industry will find this updated reference to be highly valuable. Addresses issues such as toxicity and LCA aspects New chapters covering safety handling on occupational exposure of nanoparticles and the assessment of personal exposure to airborne nanomaterials Discusses the effects of adding nano-particles on the durability and on the properties of geopolymers

Nonconventional and Vernacular Construction Materials - Kent A. Harries 2019-11-18

Nonconventional and Vernacular Construction Materials: Characterisation, Properties and Applications, Second Edition covers the topic

by taking into account sustainability, the conservation movement, and current interests in cultural identity and its preservation. This updated edition presents case studies, information on relevant codes and regulations, and how they apply (or do not apply) to nocmats. Leading international experts contribute chapters on current applications and the engineering of these construction materials. Sections review vernacular construction, provide future directions for nonconventional and vernacular materials research, focus on natural fibers, and cover the use of industrial byproducts and natural ashes in cement mortar and concrete. Takes a scientifically rigorous approach to vernacular and non-conventional building materials and their applications Includes a series of case studies and new material on codes and regulations, thus providing an invaluable compendium of practical knowhow Presents the wider context of materials science and its applications in the sustainability agenda