

KEY PRINCIPLES OF SUSTAINABLE MANUFACTURING



DESIGN FOR SUSTAINABILITY

Products built to last, repair, and recycle



ENERGY EFFICIENCY

Less energy, greener manufacturing.



RESOURCE CONVERSATION

Waste reduction, material recycling



ECO-FRIENDLY MATERIALS

Renewable resources, reduced impact



WORKER WELL-BEING

Safety first, healthy workforce



CONTINUOS IMPROVEMENT

Always better, always greener

Design And Manufacture For Sustainable Development

Tianran Wang, Yi Zhang, Haibin Yu, Fei-Yue Wang

Design And Manufacture For Sustainable Development:

Design and Manufacture for Sustainable Development Bernard Hon, 2002-04-22 Design and Manufacture for Sustainable Development brings together a collection of papers from a conference held at the University of Liverpool in June 2002 that inspire the interchange of ideas on the theory technology tools and methodology for the entire product life cycle within the framework of sustainable development It also embraces key subjects including strategy design materials manufacturing packaging distribution disposal recycling and auditing TOPICS COVERED INCLUDE Philosophy of and strategy for sustainable technologies Design principles for sustainable development Sustainable manufacturing technologies Use of recycling bio degradable materials Re use and recycling design and technologies Tools for sustainable product design Measurement and auditing Best practices and case studies Impact of emerging legislation International trends and future development Sustainable development will have a fundamental impact on the engineering community since through design and manufacture we are responsible for the use of energy materials and processes for the complete product life cycle This is an essential volume for the bookshelves of those wanting to be well informed about this evolving technology Manufacture for Sustainable Development (2003) Bernard Hon, 2004-01-16 The increasing demand for energy raw materials and goods arising from world population growth the emerging concept of sustainable development is concerned with meeting such challenges The widely accepted Brundtland definition of sustainable development states that it is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs The papers in this volume are from a conference organised by the University of Liverpool in September 2003 and are dedicated to the holistic study and interchange of ideas on the theory technology tools methodology for the entire product life cycle within the framework of sustainable development Design and Manufacture for Sustainable Development 2003 brings together industry leaders and the cutting edge of academic research in this critical area and includes Life cycle engineering from methodology to enterprise culture teaching mechanical engineering course relating to the environment Biodegradable plastics for hygenic disposable products Assessment for product sustainability An exploration of the role values play in designer decision making and how this effects ecodesign outcomes Laser technology applied to sustainable demolition and high energy re usable bricks Sustainability principles for product design Public perceptions of sustainability energy efficiency and recycling how these can inform the design process Design and Manufacture for Sustainable Development 2004 Tracy Bhamra, Bernard Hon, 2004-10-29 Sustainable development is now becoming a matter that must be addressed at both strategic and operational level whether driven by legislation the greening of the marketplace supply chain requirements or the pressure of events associated with climate change Design and Manufacture for Sustainable Development 2004 is an international volume including papers by distinguished authors for academia and industry These international papers encompass the holistic study and interchange of ideas on the theory practice tools and methodology for the entire product

life cycle within the framework of sustainable development Sustainable Product Development Daizhong Su,2020-05-12 This book offers a comprehensive review of sustainability and product design providing useful information on the relevant regulations and standards for industries to meet increasing market demands for eco products while reducing their impact on the environment The examples and methods presented allow readers to gain insights into sustainable products The authors also explain how to develop products with sustainability features by applying tools and methods for sustainable design and manufacture These tools methods include Regulations directives related to sustainable product development Popular lifecycle analysis software packages Environmental and social lifecycle impact assessment methods Lifecycle inventory databases Eco point and eco accounting infrastructure ICT and traceability technologies for sustainable product development Sustainable design and manufacture Integrated approach for sustainable product development A description of each sustainability tool is accompanied by easy to understand guidelines as well as sustainable product development methods Five different case studies are also presented to illustrate how to apply the tools and methods into the development of real sustainable products In view of the increasing pressure on industries to meet the sometimes conflicting demands of the market and environment this book is a valuable resource for engineers and managers in manufacturing companies wishing to update their knowledge of sustainable product development It is also suitable for researchers and consultants who are involved or interested in sustainable product development as well as for students studying sustainable development production and engineering management Sustainable Design and Manufacturing 2016 Rossi Setchi, Robert J. Howlett, Ying Liu, Peter Theobald, 2016-04-02 This volumes consists of 59 peer reviewed papers presented at the International Conference on Sustainable Design and Manufacturing SDM 16 held in Chania Crete Greece in April 2016 Leading edge research into sustainable design and manufacturing aims to enable the manufacturing industry to grow by adopting more advanced technologies and at the same time improve its sustainability by reducing its environmental impact SDM 16 covers a wide range of topics from sustainable product design and service innovation sustainable process and technology for the manufacturing of sustainable products sustainable manufacturing systems and enterprises decision support for sustainability and the study of societal impact of sustainability including research for circular economy Application areas are wide and varied The book will provide an excellent overview of the latest research and development in the area of Sustainable Design and Manufacturing Advanced Design and Manufacturing for Sustainable Development Volume 3 Xiangwei(ed) Chen Zhang (Xin(ed)),2006 Advanced Design and Manufacturing for Sustainable Development Volume 2 Xiangwei(ed) Chen Zhang (Xin(ed)),2006 Advanced Design and Manufacturing for Sustainable Development **Volume 1** Xiangwei(ed) Chen Zhang (Xin(ed)),2006 **Advanced Design and Manufacturing for Sustainable Development** Xiangwei Zhang, Xin Chen, 2006-05-01 Sustainable Product Design and Development Anoop Desai, Anil Mital, 2020-12-03 This book outlines the process of sustainable product design and development It presents design guidelines

that help prolong the life of a product and minimize its environmental impact These guidelines specifically enable product design for end of life EoL objectives such as reuse recycling and remanufacturing Sustainable Product Design and Development also presents mathematical models that will help the designer determine the cost of designing sustainable products This cost can be computed early during the design stage of a product Sustainable Product Design and Development presents different ways and means by which a product can address all three pillars of sustainability environmental conservation social sustainability and economic sustainability Various case studies are incorporated in different chapters Case studies on designing products for assembly disassembly and remanufacturing have been presented in their respective chapters The book also provides an overview of global environmental legislation to help the reader grasp the importance of waste management and sustainable product design This book is aimed at professionals engineering students environmental scientists and those in the business environment Advanced Designs and Researches for Manufacturing Peng Cheng Wang, Xiang Dong Liu, Yong Quan Han, 2012-12-13 Selected papers from the 2nd International Conference on Materials and Products Manufacturing Technology ICMPMT 2012 September 22 23 2012 Guangzhou China EcoDesign and Sustainability I Yusuke Kishita, Mitsutaka Matsumoto, Masato Inoue, Shinichi Fukushiqe, 2020-11-02 This book highlights cutting edge ecodesign research covering product and service design smart manufacturing and social perspectives in ecodesign Featuring selected papers presented at EcoDesign 2019 11th International Symposium on Environmentally Conscious Design and Inverse Manufacturing it also includes diverse interdisciplinary approaches to foster ecodesign research and activities In the context of Sustainable Development Goals SDGs it addresses the need for the manufacturing industry to design innovations for sustainable value creation taking into account technological developments legislation and consumer lifestyles Further the book discusses the concept of circular economy which originated in Europe and aims to increase resource efficiency by shifting away from the linear economy Focusing on product life cycle design and management smart manufacturing circular economy and business strategies and providing useful approaches and solutions to these emerging concepts this book is intended for both researchers and practitioners working in the broad field of ecodesign and Design for Sustainability Tracy Bhamra, Vicky Lofthouse, 2016-04-22 Design for Sustainability is a practical sustainability approach to design which focuses on the challenges and issues faced by those designing consumer products in the 21st Century It is written from a design perspective and aimed at both professional and student industrial and product designers and those involved in managing design The book begins by summarising the historical and current issues of the environmental debate in the context of sustainable product development highlighting the benefits gained from considering the impact on the environment and issues of sustainability when designing The authors answer the questions What is sustainable product development and why is it important What are the main drivers of sustainable product development They explain how design can help to control human impact on the environment by not only minimising pollution waste energy use

and use of scarce resources but also by thinking outside the box to create systems and services that can reduce the number of products manufactured The aim is to put sustainable development within a commercial context and introduce a new focus for design Design for Sustainability outlines and assesses the methods tools and techniques available to designers both for design innovation and design improvement A wide range of case studies are presented across a number of product sectors including electrical goods IT and furniture Initially they demonstrate product improvement and redesign examples include those that reduce waste pollution and energy consumption designing for recycling and reuse of parts Further examples are then provided exemplifying the more radical approach of system and service design The final section takes the reader through a whole sustainable design project from start to finish from brief to manufacture References and sources of information are also included Design for Environment as a Tool for the Development of a Sustainable Supply Chain Maurizio Bevilacqua, Filippo Emanuele Ciarapica, Giancarlo Giacchetta, 2012-01-05 Environmental Design is becoming an increasingly significant agenda for many manufacturing companies and yet there is no standard to their approaches strategies or their levels of execution Applying Design for Environment DfE methodologies to develop a more sustainable supply chain has formed procedures and techniques which allow designers to integrate these methods with environmental supply chain management Design for Environment as a Tool for the Development of a Sustainable Supply Chain aims to define relevant target specifications for a product throughout its life cycle from conception and design to the end of its operating life Be considering this new approach to the supply chain environmental responsiveness can work in tandem with sounds business management The usual focus on suppliers manufacturers and customers is expanded in Design for Environment as a Tool for the Development of a Sustainable Supply Chain to include stakeholders such as government bodies and recycling companies The influence of these additional groups is analyzed alongside concepts such as Product life cycle development aimed at environmental impact minimization Supplier selection and management based on environmental criteria and Marketing and communication choices which increase the value of environmentally sensitive products By including several case studies alongside theoretical topics Design for Environment as a Tool for the Development of a Sustainable Supply Chains acts as a foundation for professionals across the supply chain from industrial designers to marketing and sales departments who are involved in environmental issues **Engineering for Sustainability Gerald** Jonker, Jan Harmsen, 2012-05-01 This book provides engineers with the necessary information to design sustainable processes products and value chains It describes the current consensus on sustainable development for four context levels Planet Society Business and Engineers It also presents all required design steps from problem definition via synthesis of potential solutions analysis of solutions improvements to the final solution evaluation For each design step methods and guidelines are provided in relation to the goal of obtaining a sustainable solution a solution that meets both the needs of people and all specific context constraints with regard to the planet and prosperity Provides information on the current consensus on

sustainable development for four context levels Planet Society Business and Engineers Offers guidelines for analyzing problems and identifying the best solution for each problem as applicable to a specific situation Provides clear design procedures for implementation of a particular solution Helps engineers to come up with profitable designs which meet environmental constraints Presents the information that engineers need to meet energy water food health and other basic Advances in Additive Manufacturing, Modeling Systems and 3D Prototyping Massimo Di Nicolantonio, Emilio Rossi, Thomas Alexander, 2019-06-04 This book discusses the latest advances in digital modeling systems DMSs and additive manufacturing AM technologies It covers applications of networked technologies ubiquitous computing new materials and hybrid production systems discussing how they are changing the processes of conception modeling and production of products and systems of product The book emphasizes ergonomic and sustainability issues as well as timely topics such as DMSs and AM in Industry 4 0 DMSs and AM in developing countries DMSs and AM in extreme environments thus highlighting future trends and promising scenarios for further developing those technologies Based on the AHFE 2019 International Conference on Additive Manufacturing Modeling Systems and 3D Prototyping held on July 24 28 2019 in Washington D C USA the book is intended as source of inspiration for researchers engineers and stakeholders and to foster interdisciplinary and international collaborations between them Re-engineering Manufacturing for Sustainability Andrew Y. C. Nee, Bin Song, Soh-Khim Ong, 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 Design for Sustainable Change Anne Chick, Paul Micklethwaite, 2011-06-20 Design for Sustainable Change explores how design thinking and design led entrepreneurship can address the issue of sustainability It discusses the ways in which design thinking is evolving and being applied to a much wider spectrum of social and environmental issues beyond its traditional professional territory. The result is designers themselves evolving and developing greater design mindfulness in relation to what they do and how they do it This book looks at design thinking as a methodology which by its nature considers issues of sustainability but which does not necessarily seek to define itself in those terms It explores the gradual extension of this methodology into the larger marketplace and the commercial and social implications of such an extension **Design for Environmental Sustainability** Carlo Arnaldo Vezzoli, Ezio Manzini, 2008-06-17 This volume is a technical and operative contribution to the United Nations Decade on Education for Sustainable Development 2005 2014 aiding the development of a new generation of designers responsible and able in the task of designing environmentally sustainable products The book provides a comprehensive framework and a practical tool to support the design process This is an important text for those interested in the product development processes

Advanced Manufacturing Technology in China: A Roadmap to 2050 Tianran Wang, Yi Zhang, Haibin Yu, Fei-Yue

Wang, 2012-03-02 As one of the eighteen field specific reports comprising the comprehensive scope of the strategic general report of the Chinese Academy of Sciences this sub report addresses long range planning for developing science and technology in the field of advanced manufacturing technology. They each craft a roadmap for their sphere of development to 2050 In their entirety the general and sub group reports analyze the evolution and laws governing the development of science and technology describe the decisive impact of science and technology on the modernization process predict that the world is on the eve of an impending S T revolution and call for China to be fully prepared for this new round of S T advancement Based on the detailed study of the demands on S T innovation in China's modernization the reports draw a framework for eight basic and strategic systems of socio economic development with the support of science and technology work out China's S T roadmaps for the relevant eight basic and strategic systems in line with China's reality further detail S T initiatives of strategic importance to China's modernization and provide S T decision makers with comprehensive consultations for the development of S T innovation consistent with China's reality Supported by illustrations and tables of data the reports provide researchers government officials and entrepreneurs with guidance concerning research directions the planning process and investment Founded in 1949 the Chinese Academy of Sciences is the nation s highest academic institution in natural sciences Its major responsibilities are to conduct research in basic and technological sciences to undertake nationwide integrated surveys on natural resources and ecological environment to provide the country with scientific data and consultations for government s decision making to undertake government assigned projects with regard to key S T problems in the process of socio economic development to initiate personnel training and to promote China s high tech enterprises through its active engagement in these areas

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