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 Design and Manufacturing of Plastics Products

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YATES LAWRENCE

Design for Recycling CRC Press

Waste pickers are an integral part of the informal South African waste management system. Their trade contributes to recycling by reducing the circulation of waste from the formal municipal waste management system.. Evictions of waste picker communities that live on privately owned land in Centurion (Tshwane region 4) have been a cause of distress for these individuals for years. They continuously face inappropriate living and spatial conditions to support their livelihood, having no other option. Ongoing evictions force the waste pickers to areas distant from residential domestic waste collection. This results in exhaustive travel to collect enough recyclable items, sold for a small fee to buy-back centres. The collection and reclaim site where the transaction occurs is dependent on the collection company. This leaves little room for negotiating collection areas closer to the suburban and urban communities. The project argues that a facilitative space may contribute the economic empowerment of the waste pickers through access to plastic waste pickers through access to plastic waste recycling equipment, training, and access to new markets which can yield a greater opportunity for improved livelihoods. This study will identify an appropriate site through mapping and analysis of the waste picker community to propose a new plastic waste processing centre to address economic and social challenges. This study also looks at the collection and sorting of recyclable waste plastic and the production of new materials or products to sell. The study will also employ published research papers and quantitative methods to investigate considerable economic opportunities and approaches. Components within the centre such as training and possible access to new markets will also be provided to the waste pickers. The design and placement of an appropriate recycling centre could provide economic opportunities, improve quality of life and provide identity and ownership within the waste management system. The study found that access to a centralised building improves the accessibility to a higher in come for the community of waste pickers compared to having no centralised space. The study also found that a higher revenue generation can be possible, although the initial cost to set up typical plastic processing equipment is costly. Alternative solutions can be explored further. Access to train ing for operating processing machinery may open opportunity to build waste picker skills and can be incorporated in the building programme.

Design Unbound Publishing

Design and Optimization of Thermal Systems, Third Edition: with MATLAB® Applications provides systematic and efficient approaches to the design of thermal systems, which are of interest in a wide range of applications. It presents basic concepts and procedures for conceptual design, problem formulation, modeling, simulation, design evaluation, achieving feasible design, and optimization. Emphasizing modeling and simulation, with experimentation for physical insight and model validation, the third edition covers the areas of material selection, manufacturability, economic aspects, sensitivity, genetic and gradient search methods, knowledge-based design methodology, uncertainty, and other aspects that arise in practical situations. This edition features many new and revised examples and problems from diverse application areas and more extensive coverage of analysis and simulation with MATLAB®.

Polymers Elsevier

Global material crises are imminent. In the very near future, recycling will no longer be a choice made by those concerned about the environment, but a necessity for all. This means a paradigm shift in domestic behavior, manufacturing, construction, and design is inevitable. *The Architecture of Waste* provides a hopeful outlook through examining current recycling practices, rethinking initial manufacturing techniques, and proposing design solutions for second lives of material-objects. The book touches on a variety of inescapable issues beyond our global waste crisis including cultural

psyches, politics, economics, manufacturing, marketing, and material science. A series of crucial perspectives from experts cover these topics and frames the research by providing a past, present, and future look at how we got here and where we go next: the historical, the material, and the design. Twelve design proposals look beyond the simple application of recycled and waste materials in architecture—an admirable endeavor but one that does not engage the urgent reality of a circular economy—by aiming to transform familiar, yet flawed, material-objects into closed-loop resources. Complete with over 150 color images and written for both professionals and students, *The Architecture of Waste* is a necessary reference for rethinking the traditional role of the architect and challenging the discipline to address urgent material issues within the larger design process. *Advances on Mechanics, Design Engineering and Manufacturing IV* DIANE Publishing
 The book introduces the reader to the concepts of Scientific Molding and Scientific Processing for Injection Molding, geared towards developing a robust, repeatable, and reproducible (3Rs) molding process. The effects of polymer morphology, thermal transitions, drying, and rheology on the injection molding process are explained in detail. The development of a robust molding process is broken down into two sections and is described as the Cosmetic Process and the Dimensional Process. Scientific molding procedures to establish a 3R process are provided. The concept of Design of Experiments (DOEs) for and in injection molding is explained, providing an insight into the cosmetic and dimensional process windows. A plan to release qualified molds into production with troubleshooting tips is also provided. Topics that impact a robust process such as the use of regrind, mold cooling, and venting are also described. Readers will be able to utilize the knowledge gained from the book in their day-to-day operations immediately. The second edition includes a completely new chapter on Quality Concepts, as well as much additional material throughout the book, covering fountain flow, factors affecting post mold shrinkage, and factor selections for DOEs. There are also further explanations on several topics, such as in-mold rheology curves, cavity imbalances, intensification ratios, gate seal studies, holding time optimization of hot runner molds, valve gated molds, and parts with large gates. A troubleshooting guide for common molded defects is also provided.

Biodegradable Waste Processing for Sustainable Developments Springer

The globalisation of markets and the expansion of product responsibility into the entire product life cycle lead to an increasing competitive situation for nationally and internationally operating companies. Therefore, to win this competition the use of the most effective and efficient resources regarding the whole product life cycle is necessary. Since these resources are globally distributed the different tasks both within a phase of product life cycle and those spread over different phases are distributed as well. The global interference of these tasks requires a close multilateral co-operation of the companies concerned. Current information- and communication technologies and modern management concepts offer high potentials to meet these requirements. The international seminar of CIRP on Life Cycle Engineering titled "Life Cycle Networks" was a forum for the presentation and discussion of current research work and recent advancements on these strategic issues for current and future engineering. Complex requirements and innovative solutions to support and realise Life Cycle Networks has been revealed and summarised. The employment of information technology to support both specific phases of product life cycle and holistic approaches will be the main focus. This volume contains the papers presented at the seminar which provide opportunities to identify the state-of-the-art and address future needs. The parts in this volume correspond to the sessions of the seminar and are presented under the following headings: Life Cycle Management; Life Cycle Design; Design for Environment; Design for Recycling; Life Cycle Assessment; Disassembly; IT-Networks.

Enhancing Future Skills and Entrepreneurship William Andrew

This book contains the papers presented at the XXXI International Congress INGEGRAP "Graphic Expression: reunion, reflection, representation," held on June 29–30 and July 1, 2021, in Málaga,

Spain. It reports on cutting-edge topics in product design and manufacturing, such as industrial methods for integrated product and process design, innovative design and computer-aided design. Further topics covered include virtual simulation and reverse engineering, additive manufacturing, product manufacturing, engineering methods in medicine and education, representation techniques and nautical, engineering and construction, aeronautics and aerospace design and modeling. The book is divided into six main sections, reflecting the focus and primary themes of the conference. The contributions presented here provide researchers, engineers and experts in a range of industrial engineering subfields with extensive information to support their daily work; but also they are intended to stimulate new research directions, advanced applications of the methods discussed and future interdisciplinary collaborations.

Designing for the Circular Economy BoD – Books on Demand

Thermal systems play an increasingly symbiotic role alongside mechanical systems in varied applications spanning materials processing, energy conversion, pollution, aerospace, and automobiles. Responding to the need for a flexible, yet systematic approach to designing thermal systems across such diverse fields, *Design and Optimization of Thermal*

Improving Economic Opportunities Springer Nature

The text comprehensively highlights the key issues surrounding the implementation of waste-to-energy systems, such as site selection, regulatory aspects and financial, and economic implications. It further discusses environmental aspects of food waste to energy conversion, microbial fuel cells (MFCs) for waste recycling and energy production, and valorization of algal blooms and their residues into renewable energy. This book: Discusses the environmental impact of waste-to-energy and sustainable waste-to-energy technologies in a comprehensive manner. Presents life cycle assessment studies and perspective solutions in waste-to-energy sectors. Covers applications of smart materials in thermal energy storage systems. Explains thermo-chemical technologies for recycling plastic waste for energy production and recovery of valuable products. Illustrates biorefineries and case studies for sustainable waste valorization. It is primarily written for senior undergraduate and graduate students, and academic researchers in the fields of mechanical engineering, environmental engineering, energy studies, production engineering, industrial engineering, and manufacturing engineering.

Design, User Experience, and Usability CRC Press

This volume includes papers presented at the 4th International Conference on Sustainable Design and Manufacturing (SDM-17) held in Bologna, Italy, in April 2017. The conference covered a wide range of topics from cutting-edge sustainable product design and service innovation, sustainable processes and technology for the manufacturing of sustainable products, sustainable manufacturing systems and enterprises, decision support for sustainability, and the study of the societal impact of sustainability including research for circular economy. Application areas are wide and varied, and the book provides an excellent overview of the latest research and development in the area of Sustainable Design and Manufacturing.

Sustainable Design and Manufacturing 2017 Springer Nature

A study of how recycling collection programs operate and generate a supply of discarded material for scrap-based manufacturers. Will be of interest to people in many sectors: recycling coordinators can identify potential markets for their recovered materials; manufacturers will see improved feedstock quality from better educated suppliers; entrepreneurs can gain insight into successful operations; and economic developers can weigh the benefits a community might reap from such facilities. The 24 case studies contained here represent a sample of state-of-the-art scrap-based manufacturers. Tables.

Additive Manufacturing for Plastic Recycling Routledge

This open access book presents the proceedings of the 3rd Indo-German Conference on Sustainability in Engineering held at Birla Institute of Technology and Science, Pilani, India, on September 16-17, 2019. Intended to foster the synergies between research and education, the conference is one of the joint activities of the BITS Pilani and TU Braunschweig conducted under the auspices of Indo-German Center for Sustainable Manufacturing, established in 2009. The book is divided into three sections: engineering, education and entrepreneurship, covering a range of topics, such as renewable energy forecasting, design & simulation, Industry 4.0, and soft & intelligent sensors for energy efficiency. It also includes case studies on lean and green manufacturing, and life cycle analysis of ceramic products, as well as papers on teaching/learning methods based on the use of learning factories to improve students' problem-solving and personal skills. Moreover, the book discusses high-tech ideas to help the large number of unemployed engineering graduates looking for jobs become tech entrepreneurs. Given its broad scope, it will appeal to academics and industry professionals alike.

Plastic Waste Markets European Alliance for Innovation

Recycling von Kunststoffen, Gummi und anderen Polymeren: Wie beeinflussen solche Prozesse unsere Umwelt? Dieser Frage geht der vorliegende Band nach, wobei sich der Autor auf die neue Gesetzgebung in den USA, Japan und der EU bezieht, die Polymerhersteller zum Recycling zwingt. Vor- und Nachteile der Recyclingkreisläufe werden einander gegenübergestellt. Alle Kapitel enthalten Beispielfragen und -antworten.

Design Guidelines for Plastic Bottle Recycling William Andrew

The circular economy describes a world in which reuse through repair, reconditioning and refurbishment is the prevailing social and economic model. The business opportunities are huge but developing product and service offerings and achieving competitive advantage means rethinking your business model from early creativity and design processes, through marketing and communication to pricing and supply. Designing for the Circular Economy highlights and explores 'state of the art' research and industrial practice, highlighting CE as a source of: new business opportunities; radical business change; disruptive innovation; social change; and new consumer attitudes. The thirty-four chapters provide a comprehensive overview of issues related to product circularity from policy through to design and development. Chapters are designed to be easy to digest and include numerous examples. An important feature of the book is the case studies section that covers a diverse range of topics related to CE, business models and design and development in sectors ranging from construction to retail, clothing, technology and manufacturing. Designing for the Circular Economy will inform and educate any companies seeking to move their business models towards these emerging models of sustainability; organizations already working in the circular economy can benchmark their current activities and draw inspiration from new applications and an understanding of the changing social and political context. This book will appeal to both academia

and business with an interest in CE issues related to products, innovation and new business models.

Robust Process Development and Scientific Molding Springer Nature

Two large international conferences on Advances in Engineering Sciences were held in Hong Kong, March 13-15, 2013, under the International MultiConference of Engineers and Computer Scientists (IMECS 2013), and in London, U.K., 3-5 July, 2013, under the World Congress on Engineering 2013 (WCE 2013) respectively. IMECS 2013 and WCE 2013 were organized

Plastic Waste and Recycling CRC Press

Recycling of Flexible Plastic Packaging presents thorough and detailed information on the management and recycling of flexible plastic packaging, focusing on the latest actual/potential methods and techniques and offering actionable solutions that minimize waste and increase product efficiency and sustainability. Sections cover flexible plastic packaging and its benefits, applications and challenges. This is followed by in-depth coverage of the materials, types and forms of flexible packaging. Other key discussions cover collection and pre-treatment, volume reduction, separation from other materials, chemical recycling, post-processing and reuse, current regulations and policies, economic aspects and immediate trends. This information will be highly valuable to engineers, scientists and R&D professionals across industry. In addition, it will also be of great interest to researchers in academia, those in government, or anyone with an interest in recycling who is looking to further advance and implement recycling methods for flexible plastic packaging. Presents state-of-the-art methods and technologies regarding the processing of flexible plastic packaging waste Addresses the challenges currently associated with both waste management and available recycling methods Opens the door to innovation, supporting improved recycling methods, manufacturing efficiency and industrial sustainability

Manufacturing from Recyclables Carl Hanser Verlag GmbH Co KG

In this study, we develop a framework for the multicriteria design of plastic recycling based on quality information and environmental impacts for the purpose of supporting collaborative decision making among consumers, municipalities, and recyclers. The subject of this article is the mechanical recycling of postconsumer polyethylene terephthalate (PET) bottles. We present a "quality conversion matrix", which links the quality of recycled PET resin to the quality of waste PET bottles and operational conditions, described in terms of the functions of modules constituting the entire recycling process. We estimate the quality of recycled PET resin and simulate the applicability to the intended products as the primary criterion by confirming whether the estimated quality of recycled resin satisfies the quality demands of PET resin users. The amounts of carbon dioxide (CO) emissions and fossil resource consumption are also estimated as the secondary criteria. An approach to collaborative decision making utilizing mixed-integer linear programming (MILP) and Monte Carlo simulation is proposed on the premise of different objectives of various stakeholders, where all the feasible optimal solutions for achieving the quality demands are obtained. The quality requirements of waste bottles, along with the CO emissions and fossil resource consumption estimated for each solution, contribute to the collaborative multicriteria design of plastic recycling.

2021 IEEE 7th International Conference on Computing, Engineering and Design (ICCED) Bloomsbury Publishing

Plastic bottles, cardboard boxes, aluminium cans... we all get through a lot of rubbish, but do you really know what happens after you put it in the bin? Are you even sure which bin it goes in?

Recycling has never been more important - but it has also never been more complicated. Where do you put bottle lids? Why can't black plastic be recycled? What do you do with labels? The Rubbish Book answers all these questions and many more, providing you with all the information you need to become a true recycling expert, so you can help protect the planet with confidence. Written by an award-winning sustainability expert, it includes an A-Z of household items and whether they can be recycled; an in-depth look at the collection and sorting processes; a break-down of what the recycling symbols on our packaging actually mean; and an insight into the future of recycling and the new materials that will change the way we look at rubbish for ever.

After Plastic Waste Springer

Intelligent Human Systems Integration 2024 Proceedings of the 7th International Conference on Intelligent Human Systems Integration: Integrating People and Intelligent Systems, Università degli Studi di Palermo, Palermo, Italy, February 22- 24, 2024

IAENG Transactions on Engineering Sciences Routledge

In order to limit plastic waste to a controllable range, I try to reduce the cost of recycled plastics and increase the value of recycled plastics. After research and experimentation, I created a method of turning plastic bottles into plastic cloth through cutting and knitting. This method and material provide a new direction for the reuse of plastics. For the creation of new reuse methods, it is not only necessary to look to the future, but also to see the past. I found inspiration from human industrial history to deal with plastic pollution. This project aims to make people aware of the value of recycled plastics." - abstract

Ergonomics In Design Nordic Council of Ministers

Design and Manufacturing of Plastics Products: Integrating Conventional Methods and Innovative Technologies brings together detailed information on design, materials selection, properties, manufacturing, and the performance of plastic products, incorporating the utilization of the latest novel techniques and additive manufacturing technologies. The book integrates the design of molded products and conventional manufacturing and molding techniques with recent additive manufacturing techniques to produce performant products and cost-effective tools. Key areas of innovation are explained in detail, including hybrid molds, the integration of processing options with product properties and performance, and sustainability factors such as eco-design strategies, recycling, and lifecycle assessment. Other sections cover the development of plastics products, including design methodologies, design solutions specific to plastics, and design for re-use, as well as manufacturing and performance, with an emphasis on thermoplastic molding techniques, recent advances on plastics tooling, and the appraisal of the influence of processing options on product performance. This is a valuable resource to plastics engineers, design engineers, mold makers, and product or part designers across industries. It will also be of interest to researchers and advanced students in plastics engineering, polymer science, additive manufacturing and mechanical engineering. Offers a thorough grounding in plastics part design, thermoplastic material selection, properties, manufacture and performance of plastic parts Presents the latest advances, including the integration of additive manufacturing in the plastics product development cycle, hybrid molds, and lifecycle and recycling considerations Enables the reader to utilize traditional methods alongside cutting-edge technologies in the production of performant plastic products and parts

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