

Standard Plastic Extrusion Design Guide

A hands-on guide to choosing and using old and new technologies for joining plastics and elastomers. Includes detailed discussions of over 25 techniques used to join plastics to themselves and to other materials. Advantages and disadvantages of each technique along with detailed discussions of applications are presented. A second section is organized by material and provides details of using different processes with over 50 generic families of plastics and how different techniques and operating parameters affect weld strength and other criteria. This book is an excellent reference and an invaluable resource for novice and expert alike in determining the best joining technique for their application and providing guidance in how to design and prepare for production.

This book introduces readers to additive technology and its application in different business sectors. It explores the fundamental impact additive has on technology, particularly on operations, innovation, supply chains, the environment and customer relations. Subsequently, on the basis of a broad survey of the best technology adopters, it offers advice on how to enhance business value by implementing the technology in different industrial and commercial environments. Additive manufacturing (AM) is a new area of manufacturing that has already brought about phenomenal changes to industry and business models. It affects nearly all aspects of the managerial and organizational thinking that was applied to conventional manufacturing. Currently, the technology is being adopted in manufacturing areas that involve high-value products with complex geometries, and small to medium production volumes. It boosts the productivity of new product development processes by slashing costs, reducing time and promoting creativity and innovativeness. Further, it shrinks supply chains by bringing firms closer to their customers. This unique book offers abundant empirical and practical evidence confirming the value of this new technology. Dynamic Mechanical Analysis (DMA) is a powerful technique for understanding the viscoelastic properties of materials. It has become a powerful tool for chemists, polymer and material scientists, and engineers. Despite this, it often remains underutilized in the modern laboratory. Because of its high sensitivity to the presence of the glass transition, many users limit it to detecting glass transitions that can't be seen by differential scanning calorimetry (DSC). This book presents a practical and straightforward approach to understanding how DMA works and what it measures. Starting with the concepts of stress and strain, the text takes the reader through stress-strain, creep, and thermomechanical analysis. DMA is discussed as both the instrument and fixtures as well as the techniques for measuring both thermoplastic and thermosetting behavior. This edition offers expanded chapters on these areas as well as frequency scanning and other application areas. To help the reader grasp the material, study questions have also been added. Endnotes have been expanded and updated. Features Reflects the latest DMA research and technical advances Includes case studies to demonstrate the use of DMA over a range of industrial problems Includes numerous references to help those with limited materials engineering background Demonstrates the power of DMA as a laboratory tool for analysis and testing

A practical reference for all plastics engineers who are seeking to answer a question, solve a problem, reduce a cost, improve a design or fabrication process, or even venture into a new market. Applied Plastics Engineering Handbook covers both polymer basics – helpful to bring readers quickly up to speed if they are not familiar with a particular area of plastics processing – and recent developments – enabling practitioners to discover which options best fit their requirements. Each chapter is an authoritative source of practical advice for engineers, providing authoritative guidance from experts that will lead to cost savings and process improvements. Throughout the book, the focus is on the engineering aspects of producing and using plastics. The properties of plastics are explained along with techniques for testing, measuring, enhancing and analyzing them. Practical introductions to both core topics and new developments make this work equally valuable for newly qualified plastics engineers seeking the practical rules-of-thumb they don't teach you in school, and experienced practitioners evaluating new technologies or getting up to speed on a new field. The depth and detail of the coverage of new developments enables engineers and managers to gain knowledge of, and evaluate, new technologies and materials in key growth areas such as biomaterials and nanotechnology. This highly practical handbook is set apart from other references in the field, being written by engineers for an audience of engineers and providing a wealth of real-world examples, best practice guidance and rules-of-thumb.

Additive manufacturing (AM) is a fast-growing sector with the ability to evoke a revolution in manufacturing due to its almost unlimited design freedom and its capability to produce personalised parts locally and with efficient material use. AM companies, however, still face technological challenges such as limited precision due to shrinkage, built-in stresses and limited process stability and robustness. Moreover, often post-processing is needed due to high roughness and remaining porosity. Qualified, trained personnel are also in short supply. In recent years, there have been dramatic improvements in AM design methods, process control, post-processing, material properties and material range. However, if AM is going to gain a significant market share, it must be developed into a true precision manufacturing method. The production of precision parts relies on three principles: Production is robust (i.e. all sensitive parameters can be controlled). Production is predictable (for example, the shrinkage that occurs is acceptable because it can be predicted and compensated in the design). Parts are measurable (as without metrology, accuracy, repeatability and quality assurance cannot be known). AM of metals is inherently a high-energy process with many sensitive and inter-related process parameters, making it susceptible to thermal distortions, defects and process drift. The complete modelling of these processes is beyond current computational power, and novel methods are needed to practicably predict performance and inform design. In addition, metal AM produces highly textured surfaces and complex surface features that stretch the limits of contemporary metrology. With so many factors to consider, there is a significant

shortage of background material on how to inject precision into AM processes. Shortage in such material is an important barrier for a wider uptake of advanced manufacturing technologies, and a comprehensive book is thus needed. This book aims to inform the reader how to improve the precision of metal AM processes by tackling the three principles of robustness, predictability and metrology, and by developing computer-aided engineering methods that empower rather than limit AM design. Richard Leach is a professor in metrology at the University of Nottingham and heads up the Manufacturing Metrology Team. Prior to this position, he was at the National Physical Laboratory from 1990 to 2014. His primary love is instrument building, from concept to final installation, and his current interests are the dimensional measurement of precision and additive manufactured structures. His research themes include the measurement of surface topography, the development of methods for measuring 3D structures, the development of methods for controlling large surfaces to high resolution in industrial applications and the traceability of X-ray computed tomography. He is a leader of several professional societies and a visiting professor at Loughborough University and the Harbin Institute of Technology. Simone Carmignato is a professor in manufacturing engineering at the University of Padua. His main research activities are in the areas of precision manufacturing, dimensional metrology and industrial computed tomography. He is the author of books and hundreds of scientific papers, and he is an active member of leading technical and scientific societies. He has been chairman, organiser and keynote speaker for several international conferences, and received national and international awards, including the Taylor Medal from CIRP, the International Academy for Production Engineering.

Includes Part 1, Number 2: Books and Pamphlets, Including Serials and Contributions to Periodicals July - December)

Design Engineering Manual offers a practical guide to the key principles of design engineering. It features a compilation of extracts from several books within the range of Design Engineering books in the Elsevier collection. The book is organized into 11 sections. Beginning with a review of the processes of product development and design, the book goes on to describe systematic ways of choosing materials and processes. It details the properties of modern metallic alloys including commercial steels, cast irons, superalloys, titanium alloys, structural intermetallic compounds, and aluminum alloys. The book explains the human/system interface; procedures to assess the risks associated with job and task characteristics; and environmental factors that may be encountered at work and affect behavior. Product liability and safety rules are discussed. The final section on design techniques introduces the design process from an inventor's perspective to a more formal model called total design. It also deals with the behavior of plastics that influence the application of practical and complex engineering equations and analysis in the design of products. Provides a single-source of critical information to the design engineer, saving time and therefore money on a particular design project Presents both the fundamentals and advanced topics and also the latest information in key aspects of the design process Examines all aspects of the design process in one concise and accessible volume

This book describes industrial applications of polyolefins from the researchers' perspective. Polyolefins constitute today arguably the most important class of polymers and polymeric materials for widespread industrial applications. This book summarizes the present state of the art. Starting from fundamental aspects, such as the polymerization techniques to synthesize polyolefins, the book introduces the topic. Basic knowledge about polyolefin composites and blends is explained, before applications aspects in different industry sectors are discussed. The spectrum comprises a wide range of applications and industry sectors, such as the packaging and food industry, the textile industry, automotive and buildings, and even biomedical applications. Topics, which are addressed in the various chapters, comprise synthesis and processing of the materials; their classification; mechanical, physical and technical requirements and properties; their characterization; and many more. In the end of the book, even the disposal, degradation and recycling of polyolefins are addressed, and light is shed on their commercial significance and economic value. In this way, the book follows the entire 'lifetime' of polyolefin compounds and materials: from their synthesis and processing, over applications, to the recycling and reuse of disposed or degraded polyolefin substrates.

APPLIED STRENGTH OF MATERIALS 6/e, SI Units Version provides coverage of basic strength of materials for students in Engineering Technology (4-yr and 2-yr) and uses only SI units. Emphasizing applications, problem solving, design of structural members, mechanical devices and systems, the book has been updated to include coverage of the latest tools, trends, and techniques. Color graphics support visual learning, and illustrate concepts and applications. Numerous instructor resources are offered, including a Solutions Manual, PowerPoint slides, Figure Slides of book figures, and extra problems. With SI units used exclusively, this text is ideal for all Technology programs outside the USA.

Standards, Quality Control and Measurement Sciences in 3D Printing and Additive Manufacturing addresses the critical elements of the standards and measurement sciences in 3D printing to help readers design and create safe, reliable products of high quality. With 3D printing revolutionizing the process of manufacturing in a wide range of products, the book takes key features into account, such as design and fabrication and the current state and future potentials and opportunities in the field. In addition, the book provides an in-depth analysis on the importance of standards and measurement sciences. With self-test exercises at the end of each chapter, readers can improve their ability to take up challenges and become proficient in a number of topics related to 3D printing, including software usage, materials specification and benchmarking. Helps the reader understand the quality framework tailored for 3D printing processes Explains data format and process control in 3D printing Provides an overview of different materials and characterization methods Covers benchmarking and metrology for 3D printing

The second edition of Extrusion is designed to aid operators, engineers, and managers in extrusion processing in quickly answering practical day-to-day questions. The first part of the book provides the fundamental principles, for operators and engineers, of polymeric materials extrusion processing in single and twin screw extruders. The next section covers advanced topics including troubleshooting, auxiliary equipment, and coextrusion for operators, engineers, and managers. The final part provides applications case studies in key areas for engineers such as compounding, blown film, extrusion blow molding, coating, foam, and reprocessing. This practical guide to extrusion brings together both equipment and materials processing aspects. It covers basic and advanced topics, for reference and training, in thermoplastics processing in the extruder. Detailed reference data are provided on such important operating conditions as temperatures, start-up procedures, shear rates, pressure drops, and safety. A practical guide to the selection, design and optimization of extrusion processes and equipment Designed to improve production efficiency and product quality Focuses on practical fault analysis and troubleshooting techniques

This is a summary of my over 15 years work as a mechanical design engineer in electronics industry. The contents include: · The task, design considerations, developing steps of mechanical design for electronics product. · The frequent using mechanical components design guideline. · Specific function design, such as seal, EMC, screw torque definition and calculation. · Tolerance analysis. · Preliminary thermal distribution design. · Other topics such as DFM, failure root cause analysis, etc. Components design guideline is the major part of this book. The components are categorized according manufacturing method, such as sheet metal, plastic injection, die casting, Aluminium extrusion, over mold, rubber keypad and standards components selection. In each individual guideline, the typical structure is used to include the main items of: · Characters about advantages and disadvantages. · Brief description of typical manufacturing process and related equipment. · Frequent using material. · Structure design considerations. · Typical features. · Tolerance. · Frequent defects and analysis. The aim of this book is to provide guide and support to the junior mechanical design engineers in electronics industry, and I assume the readers have mechanical knowledge and reasonable design practise. So I excluded the massive basics that can be found from popular manuals or standards to make the book brief and wish could bring the readers practical help.

El diseño de las piezas de plástico reúne una serie de aspectos diferenciales en relación con el diseño de piezas con materiales convencionales. En este libro se pretenden exponer los principios que hacen que un diseñador industrial tenga criterio y pueda analizar y juzgar la bondad de un diseño. El objetivo es proporcionar los modelos generales de comportamiento mecánico resistente, así como los de algunos componentes específicos comúnmente utilizados y que forman parte tanto de los bienes de consumo como de manufactura. El libro pretende tener como lector al estudiante de últimos cursos de las ramas de Ingeniería que le son sensibles, fundamentalmente Ingeniería Industrial, Mecánica o Diseño, y a los técnicos de las empresas implicados en el proceso de diseño de piezas o componentes de plástico.

Plastics Institute of America Plastics Engineering, Manufacturing & Data Handbook Springer Science & Business Media

This volume focuses on the practical application of processes for manufacturing plastic products. It includes information on design for manufacturability (DFM), material selection, process selection, dies, molds, and tooling, extrusion, injection molding, blow molding, thermoforming, lamination, rotational molding, casting, foam processing, compression and transfer molding, fiber reinforced processing, assembly and fabrication, quality, plant engineering and maintenance, management.

Whether it be as translucent sheets, broadly stretched membranes, and inflated foil cushions or in graceful, organic curves, architecture today is utilizing plastics in the most disparate forms and for a wide variety of purposes. Innovative technical developments are constantly improving its material properties; at the same time, there is a growing new awareness of its potential as a construction material. While plastics used to be employed primarily as an inexpensive variant on traditional building materials, they are increasingly regarded in the construction world today as a serious and viable alternative, be it as supporting structures, roofs, facades, or elements of interior design and decoration. Thanks in large part to this inherent self-sufficiency, plastics are currently enjoying an unprecedented surge in popularity, even among the international architectural avant-garde – as multiwall sheets or corrugated, fiber-reinforced panels, or as filling between glass panes. And the new generation of ecological bioplastics also pays tribute to the debate on sustainability, ridding plastics of their lingering reputation as environmental offenders. From the history of plastics and membranes in architecture to their material properties and requirements in construction and design, the Plastics and Membranes Construction Manual cuts to the chase, providing the kind of solid and comprehensive overview of the subject that readers have come to expect from the Im DETAIL series. Selected project examples round off the reference work and make it indispensable for the day-to-day life of the professional planner and for every architecture library.

Provides a bibliography of more than three thousand handbooks in various aspects of science and technology, from abrasives and band structures to yield strength and zero defects

This book gathers the proceedings of the 5th International Conference on the Industry 4.0 Model for Advanced Manufacturing (AMP 2020), held in Belgrade, Serbia, on 1–4 June 2020. The event marks the latest in a series of high-level conferences that bring together experts from academia and industry to exchange knowledge, ideas, experiences, research findings, and information in the field of manufacturing. The book addresses a wide range of topics, including: design of smart and intelligent products, developments in CAD/CAM technologies, rapid prototyping and reverse engineering, multistage manufacturing processes, manufacturing automation in the Industry 4.0 model, cloud-based products, and cyber-physical and reconfigurable manufacturing systems. By providing updates on key issues and highlighting recent advances in manufacturing engineering and technologies, the book supports the transfer of vital knowledge to the next generation of academics and practitioners. Further, it will appeal to anyone working or conducting research in this rapidly evolving field.

This book provides a simplified, practical, and innovative approach to understanding the design and manufacture of plastic products in the World of Plastics. The concise and comprehensive information defines and focuses on past, current, and future technical trends. The handbook reviews over 20,000 different subjects; and contains over 1,000 figures and more than 400 tables. Various plastic materials and their behavior patterns are reviewed. Examples are provided of different plastic products and relating to them critical factors that range from meeting performance requirements in different environments to reducing costs and targeting for zero defects. This book provides the reader with useful pertinent information readily available as summarized in the Table of Contents, List of References and the Index.

General DFMA principles, considerations. Failure analysis method and possible cause frequent problems.

The explosion of plastic material development continues to generate a proliferation of conversion processes and variants of these methods. Unfortunately, most books on plastics conversion focus on a single process, such as injection molding, limiting their usefulness to readers without prior knowledge of the field. Few, if any, single-source texts

