

injection mould design handbook pdf

injection mould design handbook pdf is a critical resource for engineers, designers, and manufacturers involved in the plastic injection molding industry. This comprehensive guide offers in-depth knowledge on the principles, techniques, and best practices for designing molds that ensure efficient production and high-quality plastic components. The handbook typically covers essential topics such as mold materials, cooling systems, gating methods, and troubleshooting common molding issues. With the digital availability of the injection mould design handbook pdf, professionals can conveniently access detailed illustrations, calculations, and case studies to enhance their understanding and application of molding concepts. This article explores the contents and benefits of the injection mould design handbook pdf, highlighting its significance in modern manufacturing processes. The following sections will delve into the fundamental aspects of injection mold design, key design considerations, and practical tips for optimizing mold performance.

- Overview of Injection Mould Design Handbook PDF
- Key Components of Injection Mold Design
- Design Considerations and Best Practices
- Material Selection and Mold Construction
- Cooling and Ejection Systems
- Troubleshooting and Maintenance

Overview of Injection Mould Design Handbook PDF

The injection mould design handbook pdf serves as a comprehensive reference manual that consolidates the theoretical and practical knowledge required for designing injection molds. It provides detailed explanations of molding principles, step-by-step design procedures, and technical guidelines that aid in creating efficient molds. The handbook is essential for both novice and experienced professionals, helping them reduce trial-and-error during mold fabrication and improving overall product quality. This digital format allows easy navigation through various chapters, enabling users to quickly find information on specific design elements such as runner systems, mold flow analysis, and parting lines. Additionally, many versions feature downloadable content, including templates and calculation tools, which streamline the design process.

Key Components of Injection Mold Design

Understanding the key components involved in injection mold design is crucial for developing molds that meet production and quality requirements. The injection mould design handbook pdf typically breaks down these components into several main sections, each addressing different aspects of the mold structure.

Mold Base and Cavities

The mold base provides the foundation and support for the mold cavities, which form the actual shape of the plastic part. The handbook emphasizes the importance of precision machining and proper alignment of these components to ensure consistent part quality and mold longevity.

Runner and Gate Systems

Runners and gates control the flow of molten plastic into the mold cavities. The injection mould design handbook pdf covers various runner types—hot, cold, and semi-hot—and gate designs, helping designers select the most suitable configuration based on part geometry and cycle time requirements.

Cooling Channels

Effective cooling is vital to reduce cycle time and maintain dimensional stability. The handbook provides detailed guidance on the optimal layout of cooling channels to achieve uniform temperature distribution across the mold.

Ejection Mechanisms

Ejection systems are responsible for removing the finished part from the mold without damage. The handbook describes different ejection methods such as ejector pins, sleeves, and air blasts, outlining their appropriate applications and design considerations.

Design Considerations and Best Practices

The injection mould design handbook pdf outlines essential design considerations that influence mold performance, part quality, and manufacturing efficiency. Adhering to these best practices reduces defects, extends mold life, and optimizes production costs.

Part Design Compatibility

Designing the plastic part with moldability in mind is a key focus of the handbook. It stresses the importance of avoiding undercuts, sharp corners, and uniform wall thickness to facilitate easier molding and reduce scrap rates.

Tolerances and Shrinkage

Accounting for material shrinkage and setting appropriate tolerances are critical steps detailed in the handbook. These factors ensure that the final parts meet dimensional specifications and functional requirements.

Ventilation and Gas Escape

Proper venting prevents defects caused by trapped air and gases. The injection mould design handbook pdf discusses vent placement and sizing techniques to allow efficient gas escape during the injection process.

Cost Efficiency and Sustainability

The handbook encourages design strategies that minimize material waste, reduce cycle times, and enable mold reuse. Sustainable practices such as using recyclable mold materials and energy-efficient cooling systems are also covered.

Material Selection and Mold Construction

Selecting the right materials for mold construction is a vital aspect addressed by the injection mould design handbook pdf. It highlights the strengths and weaknesses of common mold steels, aluminum, and other alloys used in mold manufacturing.

Mold Steel Types

The handbook details various steel grades, such as P20, H13, and S7, explaining their suitability based on hardness, wear resistance, and thermal conductivity. Choosing the appropriate steel ensures mold durability and performance under high-pressure injection conditions.

Surface Treatments and Coatings

Surface treatments like nitriding and coatings such as chrome plating are

discussed for enhancing mold resistance to corrosion, abrasion, and sticking of plastic parts. These treatments extend mold life and improve part release characteristics.

Fabrication Techniques

The handbook covers advanced fabrication methods including CNC machining, EDM (Electrical Discharge Machining), and additive manufacturing technologies. These processes contribute to achieving complex mold geometries and fine details.

Cooling and Ejection Systems

Efficient cooling and reliable ejection mechanisms are essential for optimal mold operation. The injection mould design handbook pdf provides engineering insights and design formulas that assist in developing these systems effectively.

Cooling Channel Design

Optimal cooling channel design reduces cycle times and prevents warping or internal stresses. The handbook describes channel layouts—straight, conformal, and baffle types—and explains how to calculate flow rates and heat transfer coefficients.

Ejector Pin Placement

Proper positioning and sizing of ejector pins minimize part deformation and ensure smooth ejection. The handbook also discusses alternatives like stripper plates and sleeve ejectors for complex part geometries.

Automation Integration

Modern molds often incorporate automated ejection systems synchronized with injection machines. The handbook details considerations for integrating pneumatic and hydraulic actuators to enhance production efficiency.

Troubleshooting and Maintenance

The injection mould design handbook pdf includes sections dedicated to identifying and resolving common molding issues, as well as guidelines for routine mold maintenance to prolong service life.

Common Defects and Solutions

Problems such as flash, sink marks, warpage, and short shots are analyzed with their root causes and corrective actions. This knowledge helps maintain consistent product quality and reduces downtime.

Preventive Maintenance Practices

The handbook stresses regular inspection, cleaning, and lubrication schedules to prevent mold wear and damage. Proper storage and handling procedures are also recommended to safeguard mold integrity.

Repair Techniques

When molds incur damage, the handbook outlines repair methods including welding, polishing, and surface rebuilding. These techniques restore mold functionality and delay costly replacements.

- Comprehensive theoretical and practical knowledge
- Detailed design components and systems
- Material and fabrication guidance
- Cooling and ejection optimization
- Maintenance and troubleshooting strategies

Frequently Asked Questions

Where can I find a free PDF of the Injection Mould Design Handbook?

Free PDFs of the Injection Mould Design Handbook can sometimes be found on academic websites, libraries, or platforms like ResearchGate. However, ensure you access them through legal and authorized sources to respect copyright.

What topics are covered in the Injection Mould Design Handbook PDF?

The Injection Mould Design Handbook PDF typically covers topics such as mould design principles, materials selection, cooling system design, gating and

runner systems, ejector mechanisms, and troubleshooting common defects.

Is the Injection Mould Design Handbook PDF suitable for beginners?

Yes, the Injection Mould Design Handbook PDF is generally structured to cater to both beginners and experienced professionals by explaining fundamental concepts as well as advanced design techniques.

How can the Injection Mould Design Handbook PDF help improve mould design efficiency?

The handbook provides detailed design guidelines, best practices, and case studies that help engineers optimize mould design for better cycle times, material usage, and product quality, ultimately improving efficiency.

Are there updated editions of the Injection Mould Design Handbook PDF available?

Yes, updated editions of the Injection Mould Design Handbook are periodically released to include the latest advancements in mould design technology, materials, and manufacturing processes. Check the publisher's website for the latest version.

Can I use the Injection Mould Design Handbook PDF for designing molds for new materials?

Absolutely. The handbook often includes information on designing molds for a variety of materials, including newer polymers and composites, with guidance on how material properties affect mould design.

What software tools are recommended alongside the Injection Mould Design Handbook PDF?

Software tools like Moldflow, SolidWorks, AutoCAD, and CATIA are commonly used in conjunction with the Injection Mould Design Handbook to simulate, model, and optimize injection mould designs.

Additional Resources

1. Injection Molding Handbook

This comprehensive handbook covers the essentials of injection molding, including machine types, materials, and process parameters. It provides detailed insights into mold design principles and troubleshooting techniques. Ideal for both beginners and experienced engineers, it serves as a practical guide for improving product quality and manufacturing efficiency.

2. Injection Mold Design Engineering

Focused on the engineering aspects of mold design, this book explores the integration of CAD/CAM technologies in creating efficient molds. Readers will find valuable information on mold flow analysis, cooling system design, and gating methods. The book emphasizes design optimization to reduce cycle times and enhance part quality.

3. Plastic Injection Molding: Manufacturing Process Fundamentals

This text offers a thorough introduction to the plastic injection molding process, covering material selection, machine operation, and mold construction. It includes case studies and practical examples to illustrate common challenges and solutions in mold design. The book is essential for understanding how to achieve consistent and defect-free molded parts.

4. Fundamentals of Injection Molding Design

Aimed at students and professionals, this book breaks down the core principles of injection mold design. It discusses cavity and core design, runner systems, and ejector mechanisms in detail. The clear explanations and diagrams make complex concepts accessible for readers new to the field.

5. Injection Molding Advanced Troubleshooting Guide

This guide addresses common issues encountered during the injection molding process and provides systematic approaches to resolving them. It covers defects related to mold design, such as warpage, sink marks, and flash. Mold designers and process engineers can benefit from its practical troubleshooting techniques.

6. Designing Plastic Parts for Assembly

While focusing broadly on plastic part design, this book includes critical sections on how mold design impacts assembly processes. It explains design for manufacturability (DFM) principles that reduce production costs and improve part functionality. Mold designers will find it useful for aligning part and mold design considerations.

7. Injection Mold Design and Construction

This resource details the step-by-step process of designing and building injection molds, from initial concept to finished tool. It highlights various mold types, materials selection, and machining techniques. The inclusion of real-world examples helps readers understand the complexities of mold construction.

8. Plastic Part Design for Injection Molding

Focusing on the interface between part and mold design, this book guides readers through designing plastic parts that are easy to mold and produce high-quality results. It covers draft angles, wall thickness, and rib design, all crucial for successful injection molding. The book supports mold designers in creating parts that minimize defects and optimize cycle times.

9. Injection Molding Process, Technology, and Fundamentals

Offering a broad overview of injection molding, this book details the technological advancements and fundamental concepts of the process. It

includes chapters on mold design, machine operation, and process control. The text is well-suited for engineers seeking to deepen their understanding of injection molding from design to production.

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Injection Mold Design Handbook: A Comprehensive Guide to Mastering Plastic Part Creation

This ebook delves into the intricacies of injection mold design, a critical process in manufacturing countless plastic products. Understanding injection mold design is paramount for achieving optimal part quality, minimizing production costs, and ensuring efficient manufacturing processes. This handbook serves as a practical guide for engineers, designers, and manufacturers seeking to improve their understanding and expertise in this vital field.

"The Ultimate Injection Mold Design Handbook: From Concept to Production"

Contents:

Introduction: The Importance of Injection Mold Design.

Chapter 1: Fundamentals of Plastics and Polymer Science: Material Selection, Properties, and Behavior.

Chapter 2: Injection Molding Process: A Detailed Overview of the Stages Involved.

Chapter 3: Design Considerations for Injection Molds: Part Design, Gate Locations, Runner Systems, and Cooling Systems.

Chapter 4: CAD Software and Simulation Tools: Utilizing Modern Technologies for Design and Analysis.

Chapter 5: Mold Manufacturing Processes: Machining, EDM, and other fabrication techniques.

Chapter 6: Molding Parameters and Process Optimization: Adjusting variables for optimal part quality.

Chapter 7: Troubleshooting Common Injection Molding Defects: Identifying and resolving issues.

Chapter 8: Advanced Mold Design Techniques: Overmolding, Insert Molding, and Multi-Component Molding.

Conclusion: Future Trends and Best Practices in Injection Mold Design.

Introduction: The Importance of Injection Mold Design: This section establishes the significance of injection mold design in the manufacturing landscape, highlighting its impact on product quality, cost-effectiveness, and production efficiency. It will discuss the role of the injection mold designer

and their contribution to successful product launches.

Chapter 1: Fundamentals of Plastics and Polymer Science: This chapter provides a thorough understanding of the properties and behaviors of various plastics, covering their chemical structures, mechanical properties, thermal characteristics, and the factors influencing their selection for specific applications. It will also introduce relevant testing standards.

Chapter 2: Injection Molding Process: This chapter presents a detailed step-by-step explanation of the injection molding process, from material feeding and melting to injection, cooling, and ejection. Each stage is explained with diagrams and illustrations, providing a clear understanding of the process flow and critical control parameters.

Chapter 3: Design Considerations for Injection Molds: This is the core of the handbook, focusing on crucial design elements. It will cover part design principles (draft angles, wall thickness, ribs, etc.), gate location strategies for optimal filling and minimizing defects, runner system design for efficient material flow, and cooling system design for effective part solidification and cycle time reduction. Recent research on optimized cooling channel designs will be incorporated.

Chapter 4: CAD Software and Simulation Tools: This chapter introduces readers to the essential CAD software and simulation tools used in injection mold design. It covers the use of software for 3D modeling, mold flow analysis, and other relevant simulations. Specific software examples and tutorials will be included, demonstrating practical applications and workflow. The importance of validating designs virtually before physical manufacturing will be stressed.

Chapter 5: Mold Manufacturing Processes: This chapter details the various manufacturing processes used in creating injection molds. It will cover techniques like CNC machining, Electrical Discharge Machining (EDM), and other relevant fabrication methods, explaining their applications and advantages/disadvantages. Surface finishing techniques will also be included.

Chapter 6: Molding Parameters and Process Optimization: This chapter examines the key parameters influencing the injection molding process, such as injection pressure, melt temperature, holding pressure, and cooling time. It will detail the optimization process to achieve consistent part quality, minimize defects, and maximize production efficiency. Statistical process control (SPC) techniques will be discussed.

Chapter 7: Troubleshooting Common Injection Molding Defects: This practical chapter focuses on identifying and resolving common injection molding defects, such as short shots, sink marks, warping, and flash. Detailed explanations, troubleshooting diagrams, and suggested corrective actions will guide users in problem-solving. Root cause analysis techniques will be featured.

Chapter 8: Advanced Mold Design Techniques: This chapter explores advanced techniques in injection mold design. It covers overmolding (combining different materials), insert molding (embedding components), and multi-component molding (creating parts from multiple materials simultaneously). Case studies showcasing successful implementations will be included.

Conclusion: Future Trends and Best Practices in Injection Mold Design: This concluding section summarizes key takeaways, highlights best practices in injection mold design, and discusses emerging trends such as additive manufacturing and automation in mold production. The importance of continuous improvement and staying up-to-date with technological advancements will be emphasized.

Keywords: Injection mold design, injection molding, plastic injection molding, mold design handbook, CAD software for mold design, mold flow analysis, injection molding defects, plastic part design, polymer science, mold manufacturing, process optimization, overmolding, insert molding, multi-component molding, design for manufacturing (DFM), rapid prototyping, tooling design, CNC machining, EDM, injection molding parameters, quality control, statistical process control (SPC).

FAQs:

1. What is the difference between a hot runner and a cold runner system? Hot runner systems keep the plastic molten within the runner system, reducing material waste, while cold runner systems solidify the plastic in the runner, requiring removal after molding.
2. How do I choose the right material for my injection molded part? Material selection depends on factors like part function, required mechanical properties, cost, and environmental considerations. Consulting material property charts and engaging with material suppliers is crucial.
3. What is the importance of draft angles in injection mold design? Draft angles allow for easy part ejection from the mold cavity, preventing damage to the part or the mold.
4. What are some common injection molding defects and how can they be avoided? Common defects include short shots (incomplete filling), sink marks (indentation), warping (deformation), and flash (excess material). Proper mold design, process parameters, and material selection can minimize these defects.
5. What CAD software is commonly used for injection mold design? Popular software includes Autodesk Inventor, SolidWorks, and Creo Parametric.
6. What is mold flow analysis and why is it important? Mold flow analysis simulates the plastic flow within the mold cavity, allowing designers to identify potential defects before manufacturing.
7. How can I optimize the cooling system in my injection mold? Optimizing cooling involves careful placement of cooling channels to ensure even cooling and reduced cycle times. Simulation software can greatly assist in this process.
8. What are the latest trends in injection mold design? Trends include the use of additive manufacturing for mold creation, automation of mold manufacturing processes, and the development of more sustainable materials.
9. Where can I find resources for further learning about injection mold design? Numerous online courses, textbooks, and professional organizations offer training and resources.

Related Articles:

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2. Advanced Techniques in Injection Mold Cooling System Design: A deep dive into optimizing cooling for complex molds.
3. Understanding and Preventing Warping in Injection Molded Parts: A comprehensive guide to identifying and solving warping issues.

4. Material Selection for Injection Molding: A Practical Guide: An in-depth look at choosing the right material for your application.
5. The Role of Simulation in Optimizing Injection Mold Design: The importance and application of mold flow analysis.
6. Cost-Effective Strategies for Injection Mold Design: Techniques to reduce the cost of mold design and manufacturing.
7. Introduction to Hot Runner Molding Systems: A guide to the advantages and disadvantages of hot runner technology.
8. Troubleshooting Common Injection Molding Defects: A Practical Handbook: A detailed guide on resolving common injection molding problems.
9. Sustainable Materials and Practices in Injection Molding: Exploring eco-friendly options and practices in injection molding.

injection mould design handbook pdf: Injection Molding Handbook D.V. Rosato, Marlene G. Rosato, 2012-12-06 This third edition has been written to thoroughly update the coverage of injection molding in the World of Plastics. There have been changes, including extensive additions, to over 50% of the content of the second edition. Many examples are provided of processing different plastics and relating the results to critical factors, which range from product design to meeting performance requirements to reducing costs to zero-defect targets. Changes have not been made that concern what is basic to injection molding. However, more basic information has been added concerning present and future developments, resulting in the book being more useful for a long time to come. Detailed explanations and interpretation of individual subjects (more than 1500) are provided, using a total of 914 figures and 209 tables. Throughout the book there is extensive information on problems and solutions as well as extensive cross referencing on its many different subjects. This book represents the ENCYCLOPEDIA on IM, as is evident from its extensive and detailed text that follows from its lengthy Table of CONTENTS and INDEX with over 5200 entries. The worldwide industry encompasses many hundreds of useful plastic-related computer programs. This book lists these programs (ranging from operational training to product design to molding to marketing) and explains them briefly, but no program or series of programs can provide the details obtained and the extent of information contained in this single sourcebook.

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injection mould design handbook pdf: ARBURG Practical Guide to Injection Moulding Vannessa Goodship, 2017-02-27 This book details the factors involved in the injection moulding process, from material properties and selection to troubleshooting faults, and includes the equipment types currently in use and machine settings for different types of plastics. Material flow is

a critical parameter in moulding and there are sections covering rheology and viscosity. High temperature is also discussed as it can lead to poor quality mouldings due to material degradation. The text is supported by 74 tables, many of which list key properties and processing parameters, and 233 figures; there are also many photographs of machinery and mouldings to illustrate key points. Troubleshooting flow charts are also included to indicate what should be changed to resolve common problems. Injection moulding in the Western World is becoming increasingly competitive as the manufacturing base for many plastic materials has moved to the East. Thus, Western manufacturers have moved into more technically difficult products and mouldings to provide enhanced added value and maintain market share. Technology is becoming more critical, together with innovation and quality control. There is a chapter on advanced processing in injection moulding covering multimaterial and assisted moulding technologies. This guide will help develop good technical skills and appropriate processing techniques for the range of plastics and products in the marketplace. Every injection moulder will find useful information in this text, in addition, this book will be of use to experts looking to fill gaps in their knowledge base as well as those new to the industry. ARBURG has been manufacturing injection moulding machines since 1954 and is one of the major global players. The company prides itself on the support offered to clients, which is exemplified in its training courses. This book is based on some of the training material and hence is based on years of experience.

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applications Discusses the fundamentals of the metal injection molding processes and covers topics such as component design, important powder characteristics, compound manufacture, tooling design, molding optimization, debinding, and sintering Comprehensively examines quality issues such as feedstock characterization, modeling and simulation, common defects and carbon content control

injection mould design handbook pdf: The Complete Part Design Handbook E. Alfredo Campo, 2013-03-18 This handbook was written for the injection molding product designer who has a limited knowledge of engineering polymers. It is a guide for the designer to decide which resin and design geometries to use for the design of plastic parts. It can also offer knowledgeable advice for resin and machine selection and processing parameters. Manufacturer and end user satisfaction is the ultimate goal. This book is an indispensable, all inclusive, reference guide. New illustrations, graphs and equations have been included to provide additional clarity for complex ideas. Contents: - Plastic Materials Selection Guide - Engineering Product Design - Structural Design for Thermoplastics - Thermoplastic Gearing Design - Plastic Journal Bearing Design - Thermoplastic Spring Design - Thermoplastic Pressure Vessel Design - Thermoplastic Assembly Methods - Thermoplastic Effects on Design - Thermoplastic Injection Mold Design - Performance Testing of Thermoplastics - Thermoplastic Product Cost Analysis

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injection mould design handbook pdf: Moldflow Design Guide Jay Shoemaker, 2006-01-01

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injection mould design handbook pdf: Molding Simulation: Theory and Practice Maw-Ling Wang, Rong-Yeu Chang, Chia-Hsiang (David) Hsu, 2018-06-11 This practical introductory guide to injection molding simulation is aimed at both practicing engineers and students. It will help the reader to innovate and improve part design and molding processes, essential for efficient manufacturing. A user-friendly, case-study-based approach is applied, enhanced by many illustrations in full color. The book is conceptually divided into three parts: Chapters 1-5 introduce the fundamentals of injection molding, focusing the factors governing molding quality and how molding simulation methodology is developed. As they are essential to molding quality, the rheological, thermodynamic, thermal, mechanical, kinetic properties of plastics are fully elaborated in this part, as well as curing kinetics for thermoset plastics. Chapters 6-11 introduce CAE verification of design, a valuable tool for both part and mold designers toward avoiding molding problems in the design stage and to solve issues encountered in injection molding. This part covers design guidelines of part, gating, runner, and cooling channel systems. Temperature control in hot runner systems, prediction and control of warpage, and fiber orientation are also discussed. Chapters 12-17 introduce research and development in innovative molding, illustrating how CAE is applied to advanced molding techniques, including co-/bi-Injection molding, gas-/water-assisted injection molding, foam injection molding, powder injection molding, resin transfer molding, and integrated circuit packaging. The authors come from the creative simulation team at CoreTech System (Moldex3D), winner of the PPS James L. White Innovation Award 2015. Several CAE case study exercises for execution in the Moldex3D software are included to allow readers to practice what they have learned and test their understanding.

injection mould design handbook pdf: Practical Injection Molding Bernie A. Olmsted, Martin Davis, 2001-03-14 This work focuses on the factors critical to successful injection moulding, including knowledge of plastic materials and how they melt, the importance of mould design, the role of the screw, and the correct use of the controls of an injection moulding machine. It seeks to provide operating personnel with a clear understanding of the basics of injection molding.

injection mould design handbook pdf: *Engineering Design Handbook* United States. Army Materiel Command, 1975

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obscured. For many years, toolmakers and tool users have had to rely on the small number of specialist welders who do understand exactly what welding repair involves and have the skills to carry it out. Understanding the technical side of tool steels is frequently a problem for welders and understanding the practical side of welding can be a problem for machinists. This book has been written so that specialists from both sides can get to grips with the techniques and procedures involved. The Handbook of mould, tool and die repair welding is designed to save companies time and money by: - Acting as a training aid so that repairs can be carried out in-house - Reducing the need to send work out and the costs involved - Reducing the production time lost when repairs are required - Providing clear diagrams and a user-friendly style to make the techniques easily understood. It is an essential resource for Tool Room Managers and Foremen as well as maintenance and repair welding specialists. - Comprehensive tool metal welder's reference work - Written for the shop floor, by the shop floor - Practical, easy to understand techniques designed to save time and money

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injection mould design handbook pdf: Some Critical Issues for Injection Molding Jian Wang, 2012-03-23 This book is composed of different chapters which are related to the subject of injection molding and written by leading international academic experts in the field. It contains introduction on polymer PVT measurements and two main application areas of polymer PVT data in injection molding, optimization for injection molding process, Powder Injection Molding which comprises Ceramic Injection Molding and Metal Injection Molding, and some special techniques or applications in injection molding. It provides some clear presentation of injection molding process and equipment to direct people in plastics manufacturing to solve problems and avoid costly errors. With useful, fundamental information for knowing and optimizing the injection molding operation, the readers could gain some working knowledge of the injection molding.

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