

# INJECTION MOLDING TROUBLESHOOTING REFERENCE GUIDE

| Problem / Effect          | Injection Pressure | Cycle Time | Injection Hold Time | Recirculation Gate Size | Gate Last Length | Nozzle Opening | Adjust Feet | Clamp Pressure | Back Temp | Heat Temp | Injection Speed | Injection Time | Gate Pressure | Gate Temp | Nozzle Heating Band | Control Action |
|---------------------------|--------------------|------------|---------------------|-------------------------|------------------|----------------|-------------|----------------|-----------|-----------|-----------------|----------------|---------------|-----------|---------------------|----------------|
| Block at Gate             | ▲                  |            |                     | ▲                       |                  |                |             |                | ◆         | ▲         | ▼               |                |               |           |                     |                |
| Brittleness               |                    |            |                     |                         |                  |                |             |                | ▼         | ▲         | ▼               | ▼              | ▼             | ▲         |                     | ⊗              |
| Color Streaks             |                    |            |                     | ▲                       | ▼                |                |             |                | ◆         | ▲         | ▼               | ▼              | ▲             |           | ⊗                   | ⊗              |
| Flash                     | ▼                  |            | ▼                   |                         |                  |                |             | ▲              | ▼         | ▼         | ▼               | ▼              | ▼             |           |                     |                |
| Jacking                   |                    |            |                     | ▲                       | ▼                | ▲              |             |                | ◆         | ▲         | ▼               |                |               |           | ⊗                   |                |
| Overcontamination         | ▼                  |            |                     |                         | ▼                | ▲              |             |                | ▲         | ▲         | ▼               |                |               |           |                     | ⊗              |
| Part Shrinkage, Stability | ▲                  |            | ▲                   | ▲                       |                  |                |             |                | ◆         | ◆         |                 |                |               |           |                     |                |
| Part Surface Finish       | ▲                  |            |                     | ▲                       |                  |                |             |                | ▼         | ▲         |                 |                |               |           |                     |                |
| Short Shots               | ▲                  | ▲          |                     | ▲                       | ▼                |                | ◆           |                | ▲         | ▲         | ▲               |                |               |           |                     |                |
| Sink Marks                | ▲                  |            | ▲                   | ▲                       | ▼                |                | ◆           |                | ▼         | ▼         |                 |                | ▲             | ▲         |                     |                |
| Spoke Binding             | ▼                  | ▲          | ▼                   |                         |                  |                |             |                |           | ▼         |                 |                |               |           | ⊗                   | ⊗              |
| Striving to Cavity        | ▼                  | ▲          | ▼                   |                         |                  |                | ◆           |                | ▼         | ▼         |                 |                |               |           |                     |                |
| Warpage                   | ▼                  | ▲          |                     |                         |                  |                |             |                | ▼         | ▼         | ▼               |                | ▼             |           |                     |                |
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| Weld Mark                 | ▲                  |            | ▲                   | ▲                       |                  |                |             |                | ▲         | ▲         | ▲               |                |               | ▲         |                     |                |
| Weld Marks                | ▼                  |            |                     | ▲                       |                  | ▲              |             |                | ◆         |           | ▼               | ▼              | ▼             | ▲         |                     |                |

Check the key variables in the order indicated by the numbers.



# Plastic Injection Molding Troubleshooting Guide

**Daniela Niemeyer**



## **Plastic Injection Molding Troubleshooting Guide:**

**Injection Molding Advanced Troubleshooting Guide** Randy Kerkstra, Steve Brammer, 2021-04-06 This highly practical troubleshooting guide solves injection molding problems systematically and quickly. The rigorous but user friendly approach employs the authors proven STOP methodology considering molding process, mold, machine and material 4M's as possible sources of part defects. Importantly, the interaction between tooling, processing and material is emphasized, allowing successful resolution of difficult problems where by the books approaches fail. Starting from troubleshooting methodology and tools, there is a focused discussion of key areas impacting troubleshooting, in particular the 4M's followed by an in depth troubleshooting guide for various molding defects structured logically by type of problem solution. Insightful case studies throughout show the strengths of the STOP method to get real processes to run smoothly and reliably producing quality parts with optimal cycle time and cost. Drawing on a wealth of hands on experience, this book serves as an ideal reference to be consulted at the machine or as a learning and training manual suitable for both beginners and experienced molders. With valuable information on robust process windows, cycle time evaluations, scrap savings and runners/gates with no existing standard in the industry, no other book provides the unique insights found here. The 2nd edition is updated with new discussion and case studies on topics including additive manufactured inserts, unmelts, buildup, burns, cycle time gloss variation and read through.

**Injection Molding Advanced Troubleshooting Guide** Randy Kerkstra, Steve Brammer, 2018 This highly practical troubleshooting guide solves problems at the machine systematically and quickly. Drawing on a wealth of hands on experience from the authors who have built strong reputations in the field, the book is structured by type of problem solution. Thus it is an ideal reference to be consulted at the machine. Included is valuable information on robust process windows, cycle time evaluations, scrap savings and runners/gates with no existing standard in the industry. No other book provides the unique insights found here. *Injection Molding Troubleshooting Guide, 3rd Ed.* Jay W. Carender, 2011-11-04 The IM Troubleshooting Guide was originally prepared in 1996 as a 48 page convenient pocket sized resource for use in Injection Molding. This information is most useful by personnel who work in the injection molding field including press operators, technicians, engineers etc. This 3rd ED is at 104 pages and includes selected extra pages from other APEBOOKS that are helpful in process set up and troubleshooting. This book includes many useful definitions and tips for troubleshooting molding problems both process and tooling related. The book was written based on many years of process engineering. The solutions for correcting process problems are listed in the best order to solve the problem based on factors such as ease, timeliness to perform versus cost to implement and always considering effectiveness to solve problem. It is also useful to identify a common set of definitions for each department to use when discussing these common molding defects. Tips are often provided as to which defects may be process correctable versus those requiring product or mold changes. An introduction to DOE and dimensional nominalization is made but discussed in greater detail in some of the other booklets.

written by this author for injection molding these are listed later in this book a total of six books have been written for injection molding

*Troubleshooting Injection Moulding* Vanessa Goodship, 2004 Annotation Injection moulding is one of the most commonly used processing technologies for plastics materials Proper machine set up part and mould design and material selection can lead to high quality production This review outlines common factors to check when preparing to injection mould components so that costly mistakes can be avoided This review examines the different types of surface defects that can be identified in plastics parts and looks at ways of solving these problems Useful flow charts to illustrate possible ways forward are included Case studies and a large b257 of figures make this a very useful report

**Handbook of Plastic Processes** Charles A. Harper, 2006-08-28 An outstanding and thorough presentation of the complete field of plastics processing Handbook of Plastic Processes is the only comprehensive reference covering not just one but all major processes used to produce plastic products helping designers and manufacturers in selecting the best process for a given product while enabling users to better understand the performance characteristics of each process The authors all experts in their fields explain in clear concise and practical terms the advantages uses and limitations of each process as well as the most modern and up to date technologies available in their application Coverage includes chapters on Injection molding Compression and transfer molding Sheet extrusion Blow molding Calendering Foam processing Reinforced plastics processing Liquid resin processing Rotational molding Thermoforming Reaction injection molding Compounding mixing and blending Machining and mechanical fabrication Assembly finishing and decorating Each chapter details a particular process its variations the equipment used the range of materials utilized in the process and its advantages and limitations Because of its increasing impact on the industry the editor has also added a chapter on nanotechnology in plastics processing

Injection Molding Troubleshooting Guide, 1996

*Handbook of Troubleshooting Plastics Processes* John R. Wagner, Jr., 2012-09-19 This handbook provides a framework for understanding how to characterize plastic manufacturing processes for use in troubleshooting problems The 21 chapters are authored by well known and experienced engineers who have specialized knowledge about the processes covered in this practical guide From the Preface In every chapter the process is described and the most common problems are discussed along with the root causes and potential technical solutions Numerous case studies are provided that illustrate the troubleshooting process Mark A Spalding The Dow Chemical Company

*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 **Plastics**

**Institute of America Plastics Engineering, Manufacturing & Data Handbook** D.V. Rosato,Nick R. Schott,Marlene G. Rosato,2001-11-30 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 Handbook of

Molded Part Shrinkage and Warpage Jerry Fischer,2012-12-31 How easy life would be if only moldings were the same size and shape as the mold But they never are as molders toolmakers designers and end users know only too well Shrinkage means that the size is always different warpage often changes the shape too The effects are worse for some plastics than others Why is that What can you do about it The Handbook of Molded Part Shrinkage and Warpage is the first and only book to deal specifically with this fundamental problem Jerry Fischer s Handbook explains in plain terms why moldings shrink and warp shows how additives and reinforcements change the picture sets out the effect of molding process conditions and explains why you never can have a single correct shrinkage value It goes on to demonstrate how to alleviate the problem through careful design of the molded part and the mold and by proper material selection It also examines computer aided methods of forecasting shrinkage and warpage And most important of all the Handbook gives you the data you need to work with Authoritative and rooted in extensive industrial experience the expert guidance contained in this handbook offers practical understanding to novices and new insights to readers already skilled in the art of injection molding and mold making Contains the answers to common problems and detailed advice on how to control mold and post mold shrinkage and warpage Case Studies illustrate and enrich the text Data tables provide the empirical data that is essential for success but hard to come by **Machining of Plastics: A Guide to Cutting-Edge Processes and Techniques** Pasquale De Marco,

Immerse Yourself in the World of Plastic Machining A Comprehensive Guide for Professionals and Enthusiasts In the realm of

manufacturing plastic machining stands as a versatile and indispensable process transforming plastic materials into intricate shapes and components that serve a multitude of industries From automotive and aerospace to medical and consumer electronics plastic machining plays a pivotal role in shaping our modern world This comprehensive guidebook delves into the depths of plastic machining providing a thorough understanding of its principles techniques and applications Whether you are a seasoned machinist seeking to expand your expertise or a novice eager to explore the possibilities of plastic machining this book will equip you with invaluable knowledge and insights Within these pages you will embark on a journey through the diverse world of plastics gaining familiarity with their unique properties and machinability characteristics You will discover the intricacies of various machining processes from traditional cutting and drilling to advanced methods like laser cutting and ultrasonic welding Delve into the chapters dedicated to specific plastic machining techniques where you will learn about the selection of appropriate cutting tools optimization of process parameters and troubleshooting common problems Master the art of machining thermoplastics thermosets and reinforced plastics unlocking the full potential of these versatile materials Explore the fascinating realm of advanced topics in plastic machining including automation sustainable practices and emerging technologies Gain insights into the latest innovations that are revolutionizing the industry such as robotic machining cells eco friendly machining techniques and 3D printing of plastic parts Written in a clear and engaging style this book is accessible to readers of all experience levels It is enriched with informative diagrams charts and photographs that enhance understanding and provide practical guidance With its comprehensive coverage of the subject matter this book is an indispensable resource for anyone involved in the field of plastic machining Unleash the Power of Plastic Machining Transform Your Manufacturing Capabilities With this comprehensive guide as your trusted companion you will gain the knowledge and skills necessary to navigate the world of plastic machining with confidence Optimize your processes enhance product quality and unlock new possibilities for innovation Whether you are a student a machinist an engineer or a manufacturer this book will empower you to harness the full potential of plastic machining and drive your manufacturing operations to new heights of success If you like this book write a review

**Injection Molding: A Comprehensive Guide to Processing, Materials, and Troubleshooting** Pasquale De Marco, 2025-04-24 Injection Molding A Comprehensive Guide to Processing Materials and Troubleshooting provides a comprehensive guide to injection molding covering all aspects of the process from material selection and mold design to process optimization and troubleshooting It offers a valuable resource for engineers technicians and professionals in the manufacturing industry who seek to deepen their understanding of injection molding and improve their skills in this field This book stands out with its focus on troubleshooting injection molding problems It provides a systematic approach to identifying and resolving common issues including material related mold related and process related defects Real world case studies are included to illustrate the troubleshooting process and help readers apply the concepts to practical scenarios In addition to the core injection molding process the book explores

advanced techniques such as multi component injection molding insert molding gas assisted injection molding water assisted injection molding and in mold labeling These techniques are gaining popularity due to their ability to produce complex parts with high quality and efficiency One of the key strengths of this book is its focus on the latest developments and trends in injection molding It discusses Industry 4 0 and its impact on the injection molding industry as well as sustainable practices and emerging research areas This information helps readers stay up to date with the latest advancements and challenges in the field With its comprehensive coverage practical insights and focus on troubleshooting and advanced techniques Injection Molding A Comprehensive Guide to Processing Materials and Troubleshooting is an essential resource for anyone involved in injection molding It is a valuable addition to the libraries of engineers technicians and professionals seeking to improve their knowledge and skills in this dynamic and ever evolving industry If you like this book write a review on google books

Applied Plastics Engineering Handbook Myer Kutz,2011-07-20 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 **Automotive Plastics and Composites** Joseph P. Greene,2021-06-23 Automotive Plastics and Composites Materials and Processing is an essential guide to the use of plastic and polymer composites in automotive applications whether in the exterior interior under the hood or powertrain with a focus on materials properties and processing The book begins by introducing plastics and polymers for the automotive industry discussing polymer materials and structures mechanical chemical and physical properties rheology and flow analysis In the second part of the book each chapter is dedicated to a category of material and considers the manufacture processing properties shrinkage and possible applications in each case Two chapters on polymer processing provide detailed information on both closed mold and open mold processing The final chapters explain other key aspects such

as recycling and sustainability design principles tooling and future trends This book is an ideal reference for plastics engineers product designers technicians scientists and R D professionals who are looking to develop materials components or products for automotive applications The book also intends to guide researchers scientists and advanced students in plastics engineering polymer processing and materials science and engineering Analyzes mechanical chemical physical and thermal properties enabling the reader to select the appropriate material for specific applications Explains polymer processing with thorough coverage of operations across both closed mold and open mold processing Provides systematic coverage of materials including commodity and engineering thermoplastics bio based plastics thermosets composites elastomeric polymers and 3D printed plastics

Concise Encyclopedia of Plastics Marlene G. Rosato,D.V. Rosato,2012-12-06 After over a century of worldwide production of all kinds of plastic products, the plastics industry is now the fourth largest and others industry in the United States This brief concise and practical The bulk of the book is the alphabetical listing of entries at the to past and future trends end of the encyclopedia seven appendices provide background information comprehensive updates continually are on the horizon and the examples of these developments that are discussed in the book provide guides plastics Following the alphabetical listing of entries at the to past and future trends end of the encyclopedia seven appendices provide background information comprehensive updates continually are on the horizon and the examples of these developments that are discussed in the book provide guides plastics Following the alphabetical listing of entries at the to past and future trends end of the encyclopedia seven appendices provide background information comprehensive updates continually are on the horizon and the examples of these developments that are discussed in the book provide guides plastics

*Search of Excellence, ANTEC 91* Society of Plastic Engineers,1991-05-01

**Polymer Gears** Sabu Thomas,Miroslav Huskić,Hanna J. Maria,Jože Tavčar,2024-11-16 Polymer Gears discusses polymer gear design and their efficient mechanical properties light weight and low noise during operation As plastic gears are replacing metallic gears in traditional and new applications there is still lack of material characterization and complex relations between different geometric and operating parameters Thus polymer gear design remains an open challenge This book serves as a comprehensive and professional guide on the topic providing readers with current developments carried out in the field of plastic gears production characterization and applications This will include material development tribological properties simulations and processing methods Current developments carried out in the field of plastic gear production Presents the characterization of plastic gear production Includes applications of plastic gear production and development Provides updates on tribological properties simulations and processing methods

**Plastic Processes** Mr. Rohit Manglik,2024-01-23

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### **Plastic Injection Molding Troubleshooting Guide Introduction**

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