

# 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
Wash at Gate	▲			▲					◆	▲	▼					
Wrinkles									▼	▲	▼	▼	▼	▲		⊗
Gate Sticking				▲	▼				◆	▲	▼	▼	▲		⊗	⊗
Flash	▼		▼					▲	▼	▼	▼	▼	▼			
Jacking				▲	▼	▲			◆	▲	▼				⊗	
Distortion	▼				▼	▲			▲	▲	▼					⊗
Part Shrink, Stability	▲		▲	▲					◆	◆						
Part Surface Finish	▲			▲					▼	▲						
Short Shot	▲	▲		▲	▼		◆		▲	▲	▲					
Sink Marks	▲		▲	▲	▼		◆		▼	▼			▲	▲		
Spoke Sticking	▼	▲	▼							▼					⊗	⊗
Shrink in Cavity	▼	▲	▼				◆		▼	▼						
Warpage	▼	▲							▼	▼	▼		▼			
Weld Marks	▲		▲				◆		▼	▼				▲		
Weld Mark	▲		▲	▲					▲	▲	▲			▲		
Weld Marks	▼			▲		▲			◆		▼	▼	▼	▲		

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



# Injection Moulding Troubleshooting Guide

**K Payea**



## **Injection Moulding Troubleshooting Guide:**

*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

**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 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     Injection Molding Advanced Troubleshooting Guide Randy Kerkstra,2018     Injection Molding Troubleshooting Guide ,1996     **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     **Meat & Potatoes of Plastic Injection Moulding** Danny Kerridge,2019-07-18 At Last a ready reference guide to troubleshooting Plastic Injection Moulding with the reasons WHY we make those adjustments and what the adjustments affect As with my other books this is a simple step by step list of remedies to any injection moulding issue These step by step instructions have a cross reference to a section in the book that describes in detail exactly what you are doing and WHY     **Practical Guide to Injection Moulding** Vannessa Goodship,2004 This Practical Guide to Injection Moulding is based on course material used by ARBURG in training operators of injection moulding machines It comes from many years of experience in this field and has been edited by an expert injection moulder at Warwick University It will be of use to experts looking to fill gaps in their knowledge base and to those new to the industry The factors involved in injection moulding from material properties and selection to troubleshooting faults are all examined in this book It covers the equipment types in use and machine settings for different types of plastics Material flow is critical in moulding and there are sections covering rheology and viscosity High temperature can lead to poor quality mouldings due to material degradation and this is discussed There are an exceptional number of figures in this text with many photographs of machinery and mouldings to illustrate key points There are also numerous tables listing key properties and processing parameters Flow charts are included in the chapter on troubleshooting to indicate what can be changed to resolve common problems Injection moulding in the Western World is becoming increasingly competitive as the manufacturing base for many

plastics materials has moved to the East Thus Western manufacturers have moved into more technically difficult products and mouldings to provide more 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 multi material and assisted moulding technologies This Guide will assist progress in developing good technical skills and appropriate processing techniques for the range of plastics and products in the marketplace

### **Troubleshooting Manufacturing Processes**

LaRoux K. Gillespie,1988      **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

ARBURG Practical Guide to Injection Moulding Vanessa 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      **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      *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      **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

**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

**Gas Assisted Moulding** T. C. Pearson, 1997 This review examines the current state of the art in GAM technology and applications It outlines the fundamental principles and discusses the benefits and limitations of the process It describes the choice of equipment including aspects such as nitrogen gas preparation and the position and timing of gas injection The report also provides design guidelines for thin and thick section mouldings and the cost and location of gas channels External gas moulding is also briefly described An additional indexed section containing several hundred abstracts from the Rapra Polymer Library database provides useful references for further reading

**Handbook of Polymer Degradation** S. Halim Hamid, 2000-06-30 Covers recent advances in polymer degradation and stabilization Focuses on the basics of photo and bio degradability Delineates special and general environmental parameters such as solar irradiation temperature and agrochemical exposure Surveys plastic waste disposal strategies such as recycling incineration chemical recovery by pyrolysis and source reduction

**Proceedings of the 2022 Annual Technology, Applied Science and Engineering Conference (ATASEC 2022)** Rosa Andrie Asmara, Arie Rachmad Syulistyo, Muhammad Shulhan Khairiy, Vivi Nur Wijayaningrum, Indrazno Siradjuddin, Septian Enggar Sukmana, 2023-02-10 This is an open access book The 4th Annual Technology Applied Science and Engineering Conference ATASEC 2022 is an annual reputable event organized with a motivation to provide an excellent international platform for the academicians researchers engineers industrial participants

and research students around the world to share their research findings ATASEC 2022 was performed online using Zoom platform on September 15th 16th 2022 ATASEC 2022 theme is Science Technology Innovative Academic and Vocational Research Towards Product Development Through Industrial and Educational Cooperation It addresses researchers and industries from all areas of advanced technology and science It provides an international forum to present advances in the state of the art identify emerging research topics and together define the future of these exciting research domains The conference will be enriched with renowned keynote speakers SPE/ANTEC 1998 Proceedings Spe,1998-03-31 Annotation More than 700 presentations at ANTEC 98 the Annual Technical Conference of the Society of Plastics Engineers comprise an encyclopedic compilation of the newest plastics technology available This is the single most comprehensive annual presentation of new plastics technology **Handbook of Polyester Molding Compounds and Molding Technology** Raymond W. Meyer,2012-12-06



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