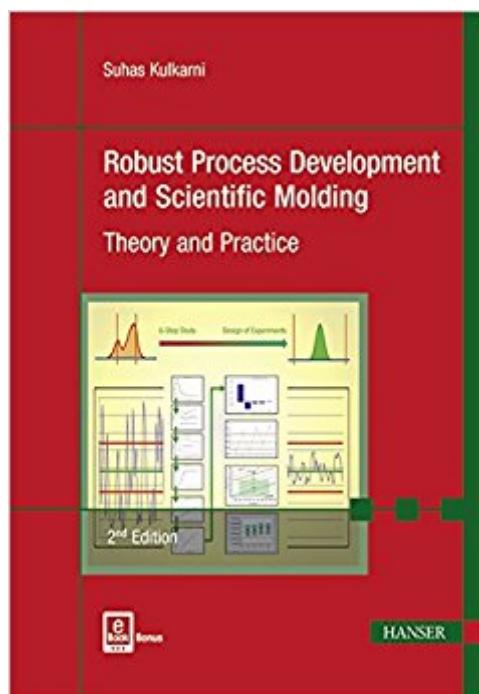


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# Robust Process Development And Scientific Molding: Theory And Practice



## Synopsis

This book introduces the concepts of Scientific Molding and Scientific Processing for Injection Molding, geared toward developing a robust, repeatable, and reproducible (3Rs) molding process. It explains the underlying principles of polymer science: the properties that are important to injection molding and their application to molding process development. The effects of polymer morphology, thermal transitions, drying, and rheology on the injection molding process are explained in detail. The development of a robust molding process is broken down into two sections: the Cosmetic Process and the Dimensional Process. Scientific molding procedures to establish a 3R process are provided. The concept of Design of Experiments (DOEs) for and in injection molding is explained, giving insight into the cosmetic and dimensional process windows. A plan to release qualified molds into production with troubleshooting tips is also provided. Topics that impact a robust process such as the use of regind, mold cooling, and venting are also described. Readers will be able to utilize the knowledge gained from the book in their day-to-day operations immediately. This second edition includes a completely new chapter on Quality Concepts, as well as much additional material throughout, covering fountain flow, factors affecting post mold shrinkage, and factor selections for DOEs. There are also further explanations on several topics, such as in-mold rheology curves, cavity imbalances, intensification ratios, gate seal studies, holding time optimization of hot runner molds, valve gated molds, and parts with large gates. A troubleshooting guide for common molded defects is also provided.

## Book Information

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## Customer Reviews

Suhas Kulkarni is the President of FIMMTECH, a consulting firm that specializes in services related to injection molding. He earned his Masters in Plastics Engineering from the University of Massachusetts, Lowell and a Bachelors in Polymer Engineering from the University of Poona, India. He has 24+ years of experience as a process engineer. His main area of expertise is Scientific Processing for Injection Molding. Based on his experience, he has developed a custom software called Nautilus, that aids the complete process development routine to production release. He has given numerous presentations on Injection Molding related topics and written several articles. He also teaches a plastics and molding course at the University of California, San Diego and is a contract faculty at the University of Massachusetts at Lowell.

As a NEW Production/Lean Manufacturing engineer this was my go. Helped me out perform 2 of my coworkers that wouldn't do any research. Definitely wasn't my only research tool though. Now 1 of them reports to me.  :)

This is an amazing book that takes you from the basics all the way to advanced process development. The author dwells on the basics, explains them clearly and then introduces the reader to the concepts of Process Development. A very simple read to a thoroughly written book. A friend recommended this and now I carry it everywhere I go as a reference. Waiting for a second edition ?  
:)

this book is well suited for anyone with a genuine interest in understanding the steps and effort necessary to develop, identify and maintain a consistent process and outcome for injection molding.

This book contributes nothing new to advance my understanding of plastics processing, I was disappointed to see some sections shorted when a more detailed discussion could have been provided. Some topics I feel are important were skimmed over in a paragraph or so. This book would be good for a new student (less than 3 years experience) that wants an 'overview' to plastic processing.

A very practical book, bought as an ongoing learning tool for a graduating polymer diplomate. It will

become a standard presentation gift for all my future students. Succinct, devoid of waffle and padding, lessons for the learning from page one.

We contract our molding out and after having trouble with parts not consistently meeting specifications we became frustrated as with the "shoot from the hip" approach our molder was using. With some molding experience, I decided to educate myself and staff about scientific molding. This book gives you the right amount of information to be able to understand the reasons and steps that should be taken when developing a robust molding process. Using this information (and starting at the beginning of the development steps), we were able to effectively communicate and direct our molder in determining the root cause of the issues we were encountering. We uncovered some pretty basic issues (like the molding machine barrel volume was way too big for our shot volume). We fixed those issues, set up a robust process, and haven't had a problem since. The molder would not have gotten there without the knowledge we imparted on them from this book. By the way, the molder produces parts for highly regulated industries and claims to use scientific molding, so it pays to know what that means by educating yourself. I recommend it not only for molders, but for engineers and materials management professionals that contract their molding out - at minimum you can communicate your expectations (and know what you are talking about) that they must use scientific molding when developing the process for your part and show you what they have done. Thanks to the author - Great book!

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