

Analyzing and Troubleshooting Single Screw Extruder

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Prior extrusion books are based on barrel rotation physics — this is the first book that focuses on the actual physics of the process-screw rotation physics. In the first nine chapters, theories and math models are developed. Then, these models are used to solve actual commercial problems in the remainder of the book. Realistic case studies are presented that are unique in that they describe the problem as viewed by a typical plant engineer and provide the actual dimensions of the screws. Hypotheses are then formed and experiments are developed to test the hypotheses. Once the root cause of the problem is known, several technical solutions to eliminate the root cause are presented. Typically, the machine owner will select the best technical solution for their equipment and market situation. Overall, there is not a book on the market with this level of detail and disclosure. The new knowledge in this book will be highly useful for production engineers, technical service engineers working with customers, consultants specializing in troubleshooting and process design, and process researchers and designers that are responsible for processes that running at maximum rates and maximum profitability.

Contents:

- Introduction & Troubleshooting
- Polymer Materials
- Introduction to Polymer Rheology for Extrusion
- Resin Physical Properties Related to Processing
- Solids Conveying
- The Melting Process
- Fluid Flow in Metering Channels
- Mixing Processes for Single-Screw Extruders
- Scaling of Single-Screw Extrusion Processes
- Introduction to Troubleshooting the Extrusion Process
- Contaminations in the Finished Product
- Flow Surging
- Rate-Limited Extrusion Processes
- Barrier and High-Performance Screws
- Melt-Fed Extruders