

The SPE Guide on Extrusion Technology and Troubleshooting

The SPE Guide on Extrusion Technology and Troubleshooting

This recently published guide on extrusion technology is the most in-depth, comprehensive writing of the various extrusion processes to date. Sponsored by the Society of Plastics Engineers, under the guidance of Mr. John Wagner and Dr. John Vlachopoulos as technical editors, enlisted twenty-nine authors to cover extrusion technology in its entirety.

The fundamental factors of various extrusion technologies to full presentations of many unique and previously unwritten subjects are presented here. The book is divided into three parts. Part I consists of chapters, 1-8 on extrusion technology. Part II, chapters 9-16 discusses downstream processes and applications. Part III, chapters 17-20, covers common technologies used in the extrusion process. The Introduction, by Russ Gould, covers the basics of extrusion troubleshooting techniques.

- Chapter 1, written by William Kramer and Ed Stewart, describes single screw extrusion process.
- Chapter 2 covers twin-screw systems written by Charlie Martin.
- Allan Griff and John R. Wagner present alternate extrusion systems in chapter 3.
- Chapter 4 is a unique, well-written section on Extrusion Control written by Tim Fisher.
- Chapter 5, Dan Smith, Pete Stoughton, Chuck Morgan and Gary Hovis team up to describe auxiliary systems. Dan Smith discusses melt pumps and filtration, polymer drying by Pete Stoughton, resin conveying by Chuck Morgan and volumetric/gravimetric blending by Gary Hovis.
- Mark Spalding, Kyun Hyun and Dr. John Vlachopolos write chapter 6 on resin properties, covering additives, physical properties and rheology. This chapter is very unique in the way the authors describe resins and what is important for understanding the resin hardware interaction.
- Chapter 7, written by technical editor John Wagner, describes Performance Characterization followed by John Vlachopolos, of McMaster University and David Strutt of PolyDynamics, Inc. that describe the power of Computer Aided Analysis and Design in chapter 8.

Part II is about downstream processes and applications.

- Chapter 9 starts on extrusion compounding with Chan Chung providing an introduction to mixing and single screw compounding. David Todd describes twin-screw compounding and its process benefits. Finally, Chris case rounds out the subject on pelletizing equipment.

- Chapter 10, Paul Hendess discusses die design, materials and construction methods for pipe and tubing as well as a comprehensive troubleshooting section on the same. The subject of downstream sizing is written by Robert Bessemer and the affect on tubing extrusion. An excellent section on puller, cutters, and cutter knife design fills out this chapter.
- Chapter 11 concentrates on the Blown Film Extrusion process, written by Tom Butler. It is well written, easy to read with many illustrations that describe the process. The Troubleshooting Guide will help technicians and engineers alike.
- Chapter 12 concentrates on Cast Film and sheet extrusion. Written by Jan Ivey, it covers these two processes in depth.
- Chapter 13 by Jim Cooper addresses extrusion coating and extrusion laminations.
- Chapter 14 by Christine Ronaghan outlines the Wire & Cable Processes.
- Monofilament Extrusion written by Dr. John Hagewood covers applications as well as processing characteristics of that process.
- Profile Extrusion by Daniel Cykana speaks to a relatively unspoken subject in the extrusion processes. Unique equipment requirements are listed along with basic processing procedures is listed.
- Gary Oliver writes Chapter 17 on coextrusion with excellent illustrations of various feed block designs.
- Chapter 18 on Reactive Extrusion written by Carl Hagberg illustrates the various alloys and blends that can be accomplished through this process.
- Chapter 19 written by George Teddar talks to Scrap Reclaim in The Extrusion Process.
- The final Chapter (20) written by Allan Griff, gives the reader “The 10 Keys of Good Extrusion Practices.” Also listed are six appendices that provide: a thorough glossary of relevant terms, conversion factors, pertinent equations, useful websites, and a summary of typical resin properties.

This book is truly a worthwhile must for any extrusion engineer or technician that would benefit from this professional compilation of the industry’s best.

– Daniel Cykana, 8/6/02