STILL MAKING HISTORY

Plastics Books
New Publications

Released ................................. 4
Upcoming .................................. 10

Design

Product Design ............................ 12
Tool Design ................................ 14
Software ................................. 19

Processing & Manufacturing

General Overview .......................... 22
Injection Molding ......................... 24
Extrusion .................................. 34
Blow Molding ............................. 39
Thermoforming ........................... 40
Additive Manufacturing .................. 41
Mixing & Compounding ................. 42
Packaging ................................ 43
Other Processes ......................... 46

Materials

General Overview ......................... 50
Bioplastics ............................... 51
Composites & Nanocomposites ........ 52
Rubber & Elastomers ..................... 54
Thermoplastics ........................... 57
Additives & Foams ....................... 58

Polymer Science

Testing & Analytics ..................... 61
Physics & Chemistry ..................... 64
Rheology ................................. 65

Trade Fairs and Conferences ............. 21, 67

Magazines .................................. 68

Index ...................................... 70
Many technical books about plastics are too theoretical and difficult to read. The intention of this book is to offer something completely different: it is easy to read with many examples taken from everyday life. It is suitable for readers at secondary school and university levels, and can be used for training activities in industry as well as for self-studies. Included are nearly 600 color images to illustrate the wide variety of plastics and process workflows used today. The book also contains a number of computer-based tools that can be downloaded from the author’s website. This is probably the most versatile, comprehensive plastics handbook ever written!

New in the second edition are much-expanded content (new chapter) on extrusion, new color figures, a new layout, and corrections throughout.

T. A. Osswald, E. Baur, N. Rudolph
Plastics Handbook
The Resource for Plastics Engineers
5th edition
2019. 704 pages. E-Book Bonus Book 978-1-56990-559-3; € 129.00 E-Book 978-1-56990-560-9; € 99.99

The Plastics Handbook provides everything important there is to know about plastics, comprehensively compiled in a compact and well-organized format. From material properties to machines, processing, and applications, the user will find detailed information that allows the successful implementation of new materials and technologies. This concise, competent, modern reference not only explains the basic facts and interrelationships, but also serves as a practical guide for engineers to help them succeed in today’s challenging, global industrial world.

The 5th edition is comprehensively updated and now in full color with a modern, clearer layout.

C. Bonten
Plastics Technology
Introduction and Fundamentals
2019. 496 pages
Book 978-1-56990-767-2; € 99.99 E-Book 978-1-56990-768-9; € 79.99

This introductory book covers the entire spectrum of the plastics technology/engineering, from raw material to finished plastic products. It is intended not just for university/college students in plastics technology and other engineering disciplines but also for beginners to the field in general.

The interconnectivity between the different relevant knowledge areas of plastics technology, such as materials engineering, processing technology, and product development, is emphasized. A chapter »Plastics and the Environment« is also included, covering a topic (rightly) often of great concern to students and newcomers to the field.

Also includes numerous videos, conveniently linked via QR codes, to better demonstrate key processes visually.
Additive manufacturing (AM) is the term used for layer-oriented or generative manufacturing, which was introduced in the late 1980s as rapid prototyping. Over the last 20 years it has developed dramatically. Today it is not only a valuable tool for making models and prototypes but also a manufacturing method for final parts and mold inserts. AM is about to revolutionize manufacturing technology. This valuable quick guide provides support material for AM technology courses, updated content for traditional manufacturing lessons, and basic information to facilitate self studies.

Additive manufacturing (AM) is the term used for layer-oriented or generative manufacturing, which was introduced in the late 1980s as rapid prototyping. Over the last 20 years it has developed dramatically. Today it is not only a valuable tool for making models and prototypes but also a manufacturing method for final parts and mold inserts. AM is about to revolutionize manufacturing technology. This valuable quick guide provides support material for AM technology courses, updated content for traditional manufacturing lessons, and basic information to facilitate self studies.
The book provides a practical understanding of basic information on extrusion in a way useful to readers without an engineering degree as well as to those new to the field. It is primarily written for extruder operators, supervisors, technical service personnel, and process engineers. Designed for on-the-job use, it guides the reader step by step through material issues, machinery, processing, and troubleshooting.

This revised and extended third edition now also covers interpretation of extrusion process data, analysis of shrink void formation, dimensional variation by melt temperature fluctuations, efficient extrusion, grooved barrel extruder technology, and more.

From hardware and materials through processing and properties, this book presents a broad coverage of blown film extrusion and offers a balance of theory and practice. It explains certain effects in the blown film process so readers can troubleshoot and improve their operations. Also, current practices and equipment are emphasized to keep readers up to date with the most productive and efficient technology.

New in the 3rd edition is a chapter on polymer rheology, with an overview of the rheology of polymer melts and its effect on extruding blown film. Also additional improvements and corrections throughout.

Includes »Blown Film Extrusion Simulator« companion software, a learning tool to teach equipment operation and processing principles.
C. I. Chung

**Extrusion of Polymers**

*Theory & Practice*

3rd edition

E-Book 978-1-56990-738-2; € 119.99

The author presents single-screw extrusion technology together with the relevant polymer fundamentals, with an emphasis on screw design. The presentation begins on a physical level, providing an in-depth conceptual understanding, followed by an analytical level with mathematical models. Practical applications of the mathematical models are illustrated by numerous examples. A brief description of twin-screw extrusion technology is also presented.

New in the third edition: a novel patented barrier screw design that eliminates shortcomings of all previous barrier screw designs, more descriptive specific screw design guidelines, a scientifically designed pineapple mixing section, and general improvements and corrections.

S. Kenig, M. R. Kamal

**Processing of Polymer Nanocomposites**

2019. 520 pages. E-Book Bonus Book 978-1-56990-635-4; € 199.00
E-Book 978-1-56990-636-1; € 159.99

This book covers the fundamental unit operations involved in processing of thermoplastic and thermoset nanocomposites. The processing methods include extrusion, injection molding, blow molding, and thermoforming. Also covered are nanoparticle dispersion, distribution, and compatibilization, and applications of polymer nanocomposites.

Nanocomposites have been of high research interest in the past decades and a number of practical applications are now emerging, such as in the automotive sector. Although there have been previous works on nanocomposites, they are not as current as this one and they do not have the emphasis on processing found here.

T. Böhlke, F. Henning, A. N. Hrymak, L. Kärger, K. Weidenmann, J. T. Wood

**Continuous-Discontinuous Fiber-Reinforced Polymers**

*An Integrated Engineering Approach*

2019. 348 pages. E-Book Bonus Book 978-1-56990-692-7; € 169.00
E-Book 978-1-56990-693-4; € 139.99

This book addresses issues of continuous and discontinuous fiber processing strategies. Specific design strategies for advanced composite reinforcement are provided, with an integrated and holistic approach taken for composites material selection, product design, and mechanical properties. Characterization, simulation, technology, design, future research, and implementation directions are also included.
Evolved gas analysis (EGA) describes analysis of gases or volatile components evolved from a sample undergoing thermal analysis. This book focuses on the so-called »hyphenated techniques« (EGA-TGA, TGA-GC/MS, etc.), which allow a great deal of chemical information about a sample to be revealed quickly and conveniently.

The methods are highly applicable to polymer/plastics samples, but also to other materials including pharmaceuticals, biomass, and various organic and inorganic compounds. Examples of applications related to all these material types are provided.

This book provides practical help to anyone interested in the practical aspects of EGA-TGA, including those working in testing laboratories and their clients.
In setting up an injection molding machine, reliable initial processing data is necessary to optimize and stabilize the process, and guarantee excellent results. This powerful tool will provide you with the most important processing data, such as viscosity, thermal properties, mold temperatures, and suggested heater temperatures for the most commonly used materials in injection molding.

- Injection Technology
- The Injection Molding Cycle
- Useful Equations and Theory
- Examples of Calculations of Processing Variables
- Polymer Data

Pocket-sized and condensed – yet clear and comprehensive!

A. Naranjo, M. Noriega, J. D. Sierra, Sanz

Injection Molding Processing Data
2nd edition
2018. 128 pages
Book 978-1-56990-666-8; € 16.00

S-C. Chen, L-S. Turng

Advanced Injection Molding Technologies
2019. 448 pages. E-Book Bonus Book 978-1-56990-603-3; € 199.00
E-Book 978-1-56990-604-0; € 159.99

This international textbook covers the most recent and important developments in advanced injection molding technologies, such as intelligent process control, emerging special injection molding processes, process visualization, variable mold temperature technologies, computer-aided engineering (CAE), applications in optics, micromolding, and medical devices, and integrated knowledge guidance and management systems. It is intended to be used as a textbook for both introductory and advanced injection molding courses, as a must-have reference for professional engineers and engineering managers who want to keep abreast of the latest technological developments and applications, and in libraries to serve interested readers from both academic and industrial communities as well as the general public.

J. P. Beaumont

Runner and Gating Design Handbook
3rd edition
2019. 470 pages
Book 978-1-56990-590-6; € 179.99
E-Book 978-1-56990-591-3; € 149.99

The first book to shed light on the critical role the melt delivery system plays in successful injection molding has received a major update in its 3rd edition. This successful book will give you an immediate leg up by reducing mold commissioning times, increasing productivity, improving customer satisfaction, and achieving quality goals such as Six Sigma.

Highlights among the numerous new updates include coverage and analyses of critical shear induced melt variations that are developed in the runners of all injection molds, expanded content on hot runners, and a new subchapter on injection molding process development.
S. V. Canevarolo Jr.

**Polymer Science**

*A Textbook for Engineers and Technologists*

2019. 350 pages

Book 978-1-56990-725-2; € 89.99

E-Book 978-1-56990-726-9; € 69.99

This is an introductory textbook on polymer science aimed at lecturers/professors, undergraduate and graduate students of polymer science and technology courses as well as engineering (materials, chemical, civil, food, etc.), chemistry, and physics. It is also aimed at engineers and technologists.

Each chapter is written starting from simple concepts and progressively getting more complex towards its end, to help the reader decide how deep to go into each topic. Each chapter also presents the solution of many proposed problems, guiding the reader to solve numerically the everyday problems polymer technologists face, by applying theoretical concepts. Additionally, at every chapter’s end there is a list of problems for the reader to check his/her understanding of the topics.

U. Gandhi, S. Goris, T. A. Osswald, Y.-Y. Song

**Discontinuous Fiber Reinforced Composites**

*Fundamentals and Applications*

2020. 500 pages

Book 978-1-56990-694-1; € 179.99

E-Book 978-1-56990-695-8; € 149.99

This book provides the theoretical and practical background to design and use discontinuous fiber reinforced polymer materials, with an emphasis on structural parts for the automotive industry. Moreover, the product of years of collaborative work between industry and academia is presented in an easy-to-use, comprehensive manner.

The information provided makes it possible for someone with an engineering background to understand the micromechanics of discontinuous fiber reinforced materials and, hence, analyze the structural performance of components designed with such materials.
Upcoming

J. R. Lerma Valero

Plastics Injection Molding

Scientific Molding, Recommendations and Best Practices
E-Book 978-1-56990-690-3; € 89.99

»Plastics Injection Molding: Scientific Molding, Recommendations, and Best Practices« is a user-friendly reference book and training tool, with all the essentials to understand injection molding of plastics. It is a practical guide to refining and controlling the process, increasing robustness and consistency, increasing productivity and profitability, and reducing costs. This book contains structured information on process definitions and parameters, optimization methods, key points, interpretation of data sheets, among other useful recommendations regarding both technology and design. It also provides analysis of process deviation, defects, incidents, etc. as well as a section dedicated to material selection and comparison.

J. S. Dick

Rubber Technology
Compounding and Testing for Performance
3rd edition
2020. 600 pages
Book 978-1-56990-615-6; € 199.99
E-Book 978-1-56990-616-3; € 159.99

This book is a practical guide to cost-effective formulating of rubber compounds to achieve optimal processing and performance. It provides a thorough discussion of the principles of rubber compounding, rubber testing, and how various compound changes will effect different properties and test measurements.

New in this third edition: new and revised content on recycled rubber, precipitated silica and non-black fillers, and silicone elastomers.

K. Kohlgrüüber

Co-Rotating Twin-Screw Extruders: Fundamentals
2019. 432 pages
Book 978-1-56990-747-4; € 199.99
E-Book 978-1-56990-748-1; € 159.99

Co-rotating twin-screw extruders are extensively used for the preparation, compounding, mixing, and processing of plastics, but also in other industry branches, such as in rubber and food processing, and increasingly in the pharmaceutical industry too. Derived from the classic, bestselling work »Co-Rotating Twin Screw Extruders«, this book brings much of the content up to date, with an expanded focus on the fundamentals of co-rotating twin-screw extrusion, including functional zones in the extruder, screw elements, material behavior, flow properties, performance behavior, and application of computational fluid dynamics.
This book offers broad insight into the plastics industry, including tooling, molding, secondary operations, material selection, evaluation and testing, design, project management, costing, value engineering, and international supplier management and enhancement. It is unique in that it is the perspective of one who has been in the trenches – as opposed to an academician, scientist, or other professional in a field with very narrow scope, such as material science, tooling, or manufacturing.

P. A. Tres

**Designing Plastic Parts for Assembly**

8th edition

2017. 438 pages

Book 978-1-56990-668-2; € 150.00

E-Book 978-1-56990-669-9; € 119.99

This book provides an excellent tool for both seasoned part designers and novices to the field, facilitating cost-effective design decisions and ensuring that the plastic parts and products will stand up under use. The detailed, yet simplified discussion of material selection, manufacturing techniques, and assembly procedures enable the reader to evaluate plastic materials and to adequately design plastic parts for assembly. The book describes good joint design and implementation, the geometry and nature of the component parts, the types of load involved, and other basic information necessary in order to work successfully in this field.

P. R. Bonenberger

**The First Snap-Fit Handbook**

Creating and Managing Attachments for Plastics Parts

3rd edition

2016. 412 pages. E-Book Bonus

Book 978-1-56990-595-1; € 180.00

E-Book 978-1-56990-679-8; € 139.99

New designers of plastic parts wishing to use snap-fit had nowhere to turn unless they were fortunate enough to have access to an experienced snap-fit designer. This book organizes and presents all design aspects of snap-fits with an emphasis on the systems level thinking required to create world-class attachments. Beginning, as well as experienced, product designers will find the information they need to develop snap-fits more efficiently and avoid many common snap-fit problems. The third edition has been thoroughly revised to include new case histories and applications. The text has been extensively rewritten for clarity and user-friendliness and there are many new figures with expert explanations.
This completely updated handbook emphasizes the relationship between the assembly methods, the materials, and the plastics manufacturing processes, thus enabling the reader to identify the best design/assembly method for a given application. A new chapter on laser welding of plastics has been added. All principle fastening and joining methods used to assemble plastic parts today are described with their particular advantages and disadvantages. Assembly method limitations for a given material and/or a given molding process are discussed in great detail. This how-to book offers a wealth of hard-to-find, detailed information.

J. Rotheiser

**Joining of Plastics**

*Handbook for Designers and Engineers*

3rd edition

2009. 624 pages

Book 978-3-446-40786-2; € 129.99
E-Book 978-3-446-44595-6; € 109.99

Designing with Plastics is an indispensable tool for every engineer and designer working with plastic materials. It assists in the development of plastic parts that are not only functional and esthetically pleasing but also manufacturable while meeting ever increasing end-use requirements. The short but concise introduction into the specific properties of this material class focuses on the practical needs of the designer and lays the foundation for the following in depth discussion of part design suitable for production and the intended end-use application. Numerous detailed examples highlight practical tips and rules of thumb for successful part design.

G. Erhard

**Designing with Plastics**

2006. 530 pages

Book 978-3-446-22590-9; € 249.00
E-Book 978-3-446-41282-8; € 199.99

E. A. Campo

**The Complete Part Design Handbook**

*For Injection Molding of Thermoplastics*

2006. 891 pages

Book 978-3-446-40309-3; € 399.00
E-Book 978-3-446-41292-7; € 349.99

This indispensable, all-inclusive reference guide to plastic part design was compiled with the product designer in mind, who is looking for more detailed information on plastic resins, the rules and geometries underlying their use in product design, and the advantages and limitations of their use in industrial applications.

The designer will also find valuable advice on resin and tool selection and processing parameters that allow fast and successful product development and manufacture.
This overview of the design process for injection molded plastic parts describes an integrated approach to part design and material selection and will assist the designer in the development of parts that are functional, reliable, manufacturable, and aesthetically pleasing. The book covers not only concurrent engineering and design for manufacturability concepts, but in its new edition also addresses design for enhanced recyclability as well as the opportunities – and limitations – of implementing recycled material streams into the manufacturing process. The new and expanded version of this classic book will prove to be an essential tool to achieving economic and functional design goals.

This book is a step-by-step guide to die design for tubes and pipes. It offers unique coverage of the topic from a highly practical perspective. Written for plastics processing and design engineers, technical and manufacturing managers, die designers and manufacturers. This comprehensive guide includes worked examples to illustrate problem solving and detailed drawings of complete dies for various applications. It covers mono- and multilayers pipes, as well as important melt flow variables (e.g., pressure drop, shear stress, shear rate, temperature variations, and distribution variations, etc.) of key materials determined using FEM software.

This definitive book provides a comprehensive account of the full range of dies used for extrusion of plastics and elastomers. The distinctive features of the various types of dies are described in detail. Expert advice on the configuration of dies is given, and the possibilities and limitations of computer-aided design are demonstrated. Fundamentals and computational procedures are clearly explained so that no special prior knowledge of the subject is required. The book thus supports plastics engineers in their practical work as well as students preparing for their professional life. The 4th edition is brought up to date with several important additions, including coverage of multilayer (>15 layer) dies, melt encapsulation, and simulation tools.
This book provides a vision and structure to finally synergize all the engineering disciplines that converge in the mold design process. The topics are presented in a top-down manner, beginning with introductory definitions and the »big picture« before proceeding to layout and detailed design of molds. The book provides very pragmatic analysis with worked examples that can be readily adapted to »real world« mold design applications. It should help students and practitioners to understand the inner workings of injection molds and encourage them to think »outside the box« in developing innovative and highly functional mold designs.

G. Mennig, K. Stoeckhert

Mold-Making Handbook
3rd edition
2013. 732 pages
Book 978-1-56990-446-6; € 249.99
E-Book 978-1-56990-550-0; € 199.99

This new edition of Stoeckhert’s classic provides all fundamental and engineering aspects of mold construction and manufacturing. Completely revised, this edition includes the latest developments in technology, such as CAD and rapid prototyping.

R. Dangel

Injection Moulds for Beginners
2016. 326 pages. E-Book Bonus
Book 978-1-56990-631-6; € 90.00
E-Book 978-1-56990-632-3; € 69.99

This applications-oriented book describes the construction of an injection mold from the ground up. Included are explanations of the individual types of tools, components, and technical terms; design procedures; techniques, tips, and tricks in the construction of an injection mold; and pros and cons of various solutions. Based on a plastic part (»bowl with lid«) specially developed for this book, easily understandable text and many illustrative pictures and drawings provide the necessary knowledge for practical implementation. Step by step, the plastic part is modified and enhanced. The technologies and designs that are additionally needed for an injection mold are described by engineering drawings. Maintenance and repair, and essential manufacturing techniques are also discussed.
This book provides the reader with the ground rules for designing injection molds. It explains the basic mold principles regardless of what size and type of product is to be injection molded, whether the mold is small or large, has single or multiple cavities, and who designs or builds the mold.

G. Menges, W. Michaeli, P. Mohren
How to Make Injection Molds
3rd Edition
2001. 632 pages
Book 978-3-446-21256-5; € 249.00
E-Book 978-3-446-40180-8; € 199.99

This classic covers all aspects of injection mold design and manufacturing including material selection, general mold design, fabricating cavities and cores, dimensioning for mechanical and thermal design, and venting.

P. Unger
Gastrow Injection Molds
130 Proven Designs
4th Edition
2006. 345 pages
Book 978-3-446-40592-9; € 149.90
E-Book 978-3-446-41284-2; € 119.99

Designing the perfect mold is probably the most challenging task in plastics processing, especially in injection molding. The mold determines the quality, performance, and the profitability of a plastic part. Neither modern computer technology nor sophisticated CAE software can substitute the experience of the practicing mold engineer. This is why the »Gastrow« is so special to plastics engineers: 130 mold designs are presented in this extensively revised edition of the great classic in mold making. Each of the case studies was actually built, tested, and run successfully in production. The book is written by practitioners, describing problem solving in the design and the manufacture of injection molds. The wealth of information includes rules of thumb, design details, and practical tips invaluable for everyone involved in this field.
D. O. Kazmer

Injection Mold Design Engineering
2nd edition
2016. 553 pages. E-Book Bonus
Book 978-1-56990-570-8; € 129.99
E-Book 978-1-56990-665-1; € 109.99

This book offers a vision and structure to synergize all the engineering disciplines that converge in the mold design process. Topics are presented in a top-down manner, from introductory definitions and the »big picture« to layout and detailed design of molds. This book provides pragmatic analysis with worked examples that can be adapted to real-world mold design applications. It helps students and practitioners to understand the inner workings of injection molds and encourage them to think »outside the box« in developing innovative and highly functional mold designs.

H. Rees

Mold Engineering
2nd edition
2002. 712 pages
Book 978-3-446-21659-4; € 249.00

Injection molds for thermoplastic molding materials and their performance are covered in detail in this book for mold designers, molding machine technicians, and design engineers. Guidelines are supplied for the design of molds, from product drawing to complete mold assembly drawing, and more.

H. Rees, B. Catoen

Selecting Injection Molds
Weighing Cost versus Productivity
2006. 240 pages
Book 978-3-446-40308-6; € 129.90
E-Book 978-3-446-41302-3; € 109.99

This book explains to the mold designer the importance of knowing the expected productivity of the mold and how this information affects the cost of the planned mold and the cost of the molded product. It suggests many approaches to reduce mold cost and also to improve productivity by often just simple design changes. Above all, it emphasizes again and again that the ultimate goal is not to procure the lowest cost but to produce the lowest cost product.
Quality and profitability of injection molding operations can be influenced by the hot runner system. The many variations and design principles of hot runners are material-dependent and therefore not universally applicable. Knowing about and recognizing these limitations will make or break a molder’s success. This book provides a comprehensive overview of hot runner technology, advantageous design principles, and applications. It includes the necessary basics as well as many proven designs and application examples.
This practical introductory guide to injection molding simulation is aimed at both students and practicing engineers. It offers ways to innovate and improve part design and molding processes, which are essential for efficient manufacturing. This user-friendly book uses a case-study-based approach that is enhanced by many illustrations in full color. The book is divided into three parts. Part I introduces the fundamentals of injection molding, focusing on the factors governing molding quality and how molding simulation methodology is developed. Part II introduces CAE verification of design, a valuable tool for both part and mold designers. Part III introduces research and development in innovative molding, illustrating how CAE is applied to advanced molding techniques.

Given the importance of injection molding as a process as well as the simulation industry that supports it, there was a need for a book that deals solely with the modeling and simulation of injection molding. This book meets that need. The modeling and simulation details of filling, packing, residual stress, shrinkage, and warpage of amorphous, semicrystalline, and fiber-filled materials are described. This book is essential for simulation software users, as well as for graduate students and researchers who are interested in enhancing simulation. And for the specialist, numerous appendices provide detailed information on the topics discussed in the chapters.

The origins of this book not only include Moldflow Design Principles, but also includes Warpage Design Principles published by Moldflow, and C-Mold Design Guide. Collectively, these documents are based on years of experience in the research, theory and practice of injection molding. These documents are now combined into one book, the Moldflow Design Principles. This book is intended to help practicing engineers solve problems they encounter frequently in the design of parts and molds, as well as during production. This book can also be used as a reference for training purpose at industrial, as well as educational institutions.
This book provides the beginning engineer with the principles of rubber science and technology: what rubber is, how it behaves, and how to design engineering components with rubber. It introduces the reader to the principles on which successful use of rubber depends and offers solutions to the questions engineers in rubber processing face every day:

- How is an elastomer chosen and a formulation developed
- Why is rubber highly-elastic and relatively strong
- How to estimate the stiffness and the strength of a product
- How to guarantee high quality and durability
**Trade Fairs**

**KUTENO**
The trade fair in northern Germany where suppliers of plastic production meet with processors – the best overview to machines, materials and new processes.

www.kuteno.de

**KPA Rheda-Wiedenbrück**
Plastic manufacturers present their plastic product portfolio and services to the processing industry across all sectors in north Germany.

www.kpa-messe.de

**KPA Ulm**
Plastic manufacturers present their plastic product portfolio and services to the processing industry across all sectors in south Germany.

www.kpa-messe.de

**Trade fairs**

- **KUTENO**
  - 12 – 14 May 2020 in Rheda-Wiedenbrück

- **KPA Rheda-Wiedenbrück**
  - 15 – 16 September 2020 in Rheda-Wiedenbrück

- **KPA Ulm**
  - 10 – 11 March 2020 in Ulm

Be our guest: enjoy free entry, parking & food!

Save the Date

Don’t miss the most important plastic events in 2020!
U. Bruder  
**User’s Guide to Plastic**  
2nd Edition  
2019. 376 pages  
**Book** 978-1-56990-734-4; **€ 39.90**  
**E-Book** 978-1-56990-735-1; **€ 31.99**

Many technical books about plastics are too theoretical and difficult to read. The intention of this book is to offer something completely different: it is easy to read with many examples taken from everyday life. It is suitable for readers at secondary school and university levels, and can be used for training activities in industry as well as for self-studies. Included are nearly 600 color images to illustrate the wide variety of plastics and process workflows used today. The book also contains a number of computer-based tools that can be downloaded from the author’s website. This is probably the most versatile, comprehensive plastics handbook ever written!

New in the second edition are much-expanded content (new chapter) on extrusion, new color figures, a new layout, and corrections throughout.

T. A. Osswald, E. Baur, N. Rudolph  
**Plastics Handbook**  
The Resource for Plastics Engineers  
5th edition  
2019. 704 pages. **E-Book Bonus** 978-1-56990-559-3; **€ 129.00**  
**E-Book** 978-1-56990-560-9; **€ 99.99**

The Plastics Handbook provides everything important there is to know about plastics, comprehensively compiled in a compact and well-organized format. From material properties to machines, processing, and applications, the user will find detailed information that allows the successful implementation of new materials and technologies. This concise, competent, modern reference not only explains the basic facts and interrelationships, but also serves as a practical guide for engineers to help them succeed in today’s challenging, global industrial world.

The 5th edition is comprehensively updated and now in full color with a modern, clearer layout.

W. Michaeli, H. Greif, L. Wolters, F. Vossebürger  
**Training in Plastics Technology**  
2nd edition  
2001. 180 pages  
**Book** 978-3-446-21344-9; **€ 79.90**

Use this authoritative source book to guide newcomers in the plastics industry. Training in Plastics Technology is a text and workbook that provides an introduction to the world of plastics. This book is divided into educational units each of which covers a distinct subject area. Key questions at the beginning of each lesson help the reader approach the subject matter with certain questions in mind. Review questions at the end of each lesson test the knowledge acquired. The answers can be checked against the lists of correct answers at the end of the book. This comprehensive best-selling reference provides the fundamental information you’ll need to understand both processing and applications.
Polymer engineering is not an easy exercise. With evolving technology, it often involves complex concepts and processes. This book provides the theoretical essentials: understanding of processes, a basis for the use of design software, and much more.

The necessary physical concepts such as continuum mechanics, rheological behavior and measurement methods, and thermal science with its application to heating-cooling problems and implications for flow behavior are analyzed in detail. This knowledge is then applied to key processing methods, including single-screw extrusion and extrusion die flow, twin-screw extrusion and its applications, injection molding, calendering, and processes involving stretching.
D. O. Kazmer  
**Plastics Manufacturing Systems Engineering**  
2009. 520 pages  
**Book** 978-3-446-42014-4; € 129.90  
**E-Book** 978-3-446-43014-3; € 109.99

This book provides a vision and structure to finally synergize all the engineering disciplines that converge in the mold design process. The topics are presented in a top-down manner, beginning with introductory definitions and the »big picture« before proceeding to layout and detailed design of molds. The book provides very pragmatic analysis with worked examples that can be readily adapted to »real world« mold design applications. It should help students and practitioners to understand the inner workings of injection molds and encourage them to think »outside the box« in developing innovative and highly functional mold designs.

N. S. Rao, N. R. Schott  
**Understanding Plastics Engineering Calculations**  
**Hands-on Examples and Case Studies**  
2012. 206 pages  
**Book** 978-3-446-42278-0; € 89.90  
**E-Book** 978-3-446-43149-2; € 69.99

The plastics engineer working on the shop floor in a plastics manufacturing plant often needs quick answers to questions such as why the extruder output is low or whether he can expect better quality product by changing the resin or if the die pressure can be lowered. Applying state-of-the-art numerical software to address these issues is time-consuming and costly. Starting from practical design formulas which are easily applicable, this guide provides answers to these questions quickly and effectively by guiding the user step by step through the computational procedures on the basis of illustrative technical examples.

A. Naranjo, M. Noriega, J. D. Sierra, Sanz  
**Injection Molding Processing Data**  
2nd edition  
2018. 128 pages  
**Book** 978-1-56990-666-8; € 16.00  
**E-Book** 978-1-56990-667-5; € 12.99

In setting up an injection molding machine, reliable initial processing data is necessary to optimize and stabilize the process, and guarantee excellent results. This powerful tool will provide you with the most important processing data, such as viscosity, thermal properties, mold temperatures, and suggested heater temperatures for the most commonly used materials in injection molding.

- Injection Technology
- The Injection Molding Cycle
- Useful Equations and Theory
- Examples of Calculations of Processing Variables
- Polymer Data

Pocket-sized and condensed – yet clear and comprehensive!
This introduction provides an overview of the injection molding process and all its related aspects, such as material behavior, machine and mold design. Although the book is highly useful to advanced professionals, it is written in clear, simple language to enable beginners to understand the technology. In discussing the various operations related to the injection molding process, emphasis is placed on practical ways of processing and using plastics. The second edition is expanded to include all industrially relevant special injection molding techniques developed since the publication of the first edition.

Serving engineers, professionals, and others involved in the injection molding industry, this handbook thoroughly covers every detail of the machine and the process. This all-encompassing resource also includes the topics directly affecting the injection molding process, such as materials, process control, simulation, design, and troubleshooting. The handbook presents a well-rounded overview of the underlying theory and physics that control the common injection molding process variation, without losing the practical hands-on presentation used throughout.

This applications-oriented book describes the construction of an injection mold from the ground up. Included are explanations of the individual types of tools, components, and technical terms; design procedures; techniques, tips, and tricks in the construction of an injection mold; and pros and cons of various solutions. Based on a plastic part (»bowl with lid«) specially developed for this book, easily understandable text and many illustrative pictures and drawings provide the necessary knowledge for practical implementation. Step by step, the plastic part is modified and enhanced. The technologies and designs that are additionally needed for an injection mold are described by engineering drawings. Maintenance and repair, and essential manufacturing techniques are also discussed.
M. R. Kamal, A. I. Isayev, S.-J. Liu

Injection Molding
Technology and Fundamentals
2009. 954 pages
Book 978-3-446-41685-7; € 299.00
E-Book 978-3-446-43373-1; € 239.99

This book attempts to survey the state of the science and technology of the injection molding process. It represents a comprehensive, balanced mix of practical and theoretical aspects for a wide range of injection molding applications. The authors of the 21 chapters are experts and leaders in their respective areas of specialization in the injection molding field. While it is not possible to cover all aspects of such a dynamic growing field, we hope that the reader will find sufficient information and background to become acquainted, at various levels of depth, with key components of the science and technology of injection molding.

Y. Yang, X. Chen, N. Lu, F. Gao

Injection Molding Process Control, Monitoring, and Optimization
2017. 413 pages. E-Book Bonus
Book 978-1-56990-592-0; € 180.00
E-Book 978-1-56990-593-7; € 139.99

As a major polymer processing technology, injection molding has received a lot of research interest. This book introduces the analysis of the molding process from a system technology point of view. The book is divided into four parts: the first part serves as the general background to introduce injection molding process, the second is on the control of injection molding process, the third is on the monitoring technology, and the fourth is on the optimization of the process. Most the results of this book are from the real engineering implementation and experimental test results.
Since the publication of the 3rd edition of Injection Molding Machines, there has been considerable progress in certain process applications that make special demands on machinery and their control functions in particular. The book provides an elegant, succinct description of the injection molding process. By concentrating on a few key parameters, such as pressure, temperature, their rates, and their influence on the properties of moldings, it provides a clear insight into this technology. The subsequent comprehensive presentation of technical data relating to individual machine components and performance is unique and will be especially appreciated by practitioners.

This practical troubleshooting guide solves problems at the machine quickly and systematically. Drawing on a wealth of hands-on experience from the authors, this book is structured by type of problem and its solution. An ideal reference guide to be consulted at the machine, it includes valuable information on robust process windows, cycletime evaluations, scrap savings, and runners/gates with no existing standard in the industry. Written for students, engineers, process technicians, mold makers, researchers, and quality personnel, no other book provides the unique insights found here.
»Micro Injection Molding« meets the need for a dedicated book dealing exclusively with micro injection molding and overcoming the challenges of managing and processing polymer materials at ultra-small scales. Micro injection molding is the primary process for the mass production of polymer components with critical dimensions in the sub-millimeter range. This book provides all professionals involved in precision polymer processing and micro manufacturing with a comprehensive, up-to-date, and detailed treatment of the main topics related to micro molding, from material and process technology to tooling, to key-enabling technologies, and multimaterial process variations.

J. Greener, R. Wimberger-Friedl
Precision Injection Molding
Process, Materials, and Applications
2006. 344 pages
Book 978-3-446-21670-9; € 149.90

One of the key aspects of the production of high precision components is the need to meet extremely tight dimensional tolerances, typically in the submicron range, and maintain these tolerances over the practical lifetimes of the molded articles. In addition, as many of the precision components are utilized in various optoelectronic systems and devices, control of optical and electrical properties is often crucial. The strict control of dimensional and electro-optical properties requires a systematic reexamination of the conventional injection-molding process with special consideration of its impact on the dimensions and electro-optical characteristics of the molded article.

P. Unger
Hot Runner Technology
2006. 249 pages
Book 978-3-446-40584-4, € 129.90
E-Book 978-3-446-43063-1; € 109.99

Quality and profitability of injection molding operations can be influenced by the hot runner system. The many variations and design principles of hot runners are material-dependent and therefore not universally applicable. Knowing about and recognizing these limitations will make or break a molder’s success. This book provides a comprehensive overview of hot runner technology, advantageous design principles, and applications. It includes the necessary basics as well as many proven designs and application examples.
J. P. Beaumont

**Runner and Gating Design Handbook**

*Tools for Successful Injection Molding*

3rd edition

2019. 470 pages

Book 978-1-56990-590-6; € 179.99

E-Book 978-1-56990-591-3; € 149.99

The first book to shed light on the critical role the melt delivery system plays in successful injection molding has received a major update in its 3rd edition. This successful book will give you an immediate leg up by reducing mold commissioning times, increasing productivity, improving customer satisfaction, and achieving quality goals such as Six Sigma.

Highlights among the numerous new updates include coverage and analyses of critical shear induced melt variations that are developed in the runners of all injection molds, expanded content on hot runners, and a new subchapter on injection molding process development.

H. Pruner, W. Nesch

**Understanding Injection Molds**

2012. 160 pages

Book 978-1-56990-527-2; € 69.99

E-Book 978-1-56990-535-7; € 54.99

This book imparts the knowledge of injection mold tools. Instead of the mature designer, it targets the beginner and fabricator who want to learn the injection mold tool essentials quickly and comprehensively. It uses a compact style to describe all sub-assemblies of an injection mold tool and emphasizes the process technological aspects when choosing the tool.

The book is also written for the novice toolmaker and teaches all the possible combinations and their impact on a flawless production of molded parts. It describes injection tools for thermoplastic, thermoset, and elastomer processing.

H. Rees, B. Catoen

**Selecting Injection Molds**

*Weighing Cost versus Productivity*

2006. 240 pages

Book 978-3-446-40308-6; € 129.90

E-Book 978-3-446-41302-3; € 109.99

This book explains to the mold designer the importance of knowing the expected productivity of the mold and how this information affects the cost of the planned mold and the cost of the molded product. It suggests many approaches to reduce mold cost and also to improve productivity by often just simple design changes. Above all, it emphasizes again and again that the ultimate goal is not to procure the lowest cost but to produce the lowest cost product.
H. Rees  
**Understanding Injection Mold Design**  
2001. 127 pages  
**Book** 978-3-446-21587-0; € 59.90  
**E-Book** 978-3-446-40183-9; € 47.99  

This book provides the reader with the ground rules for designing injection molds. It explains the basic mold principles regardless of what size and type of product is to be injection molded, whether the mold is small or large, has single or multiple cavities, and who designs or builds the mold.

G. Menges, W. Michaeli, P. Mohren  
**How to Make Injection Molds**  
3rd Edition  
2001. 632 pages  
**Book** 978-3-446-21256-5; € 249.00  
**E-Book** 978-3-446-40180-8; € 199.99  

This classic covers all aspects of injection mold design and manufacturing including material selection, general mold design, fabricating cavities and cores, dimensioning for mechanical and thermal design, and venting.

G. Mennig, K. Stoeckhert  
**Mold-Making Handbook**  
3rd edition  
2013. 732 pages  
**Book** 978-1-56990-446-6; € 249.99  
**E-Book** 978-1-56990-550-0; € 199.99  

This new edition of Stoeckhert’s classic provides all fundamental and engineering aspects of mold construction and manufacturing. Completely revised, this edition includes the latest developments in technology, such as CAD and rapid prototyping.
Given the importance of injection molding as a process as well as the simulation industry that supports it, there was a need for a book that deals solely with the modeling and simulation of injection molding. This book meets that need. The modeling and simulation details of filling, packing, residual stress, shrinkage, and warpage of amorphous, semicrystalline, and fiber-filled materials are described. This book is essential for simulation software users, as well as for graduate students and researchers who are interested in enhancing simulation. And for the specialist, numerous appendices provide detailed information on the topics discussed in the chapters.

Contents:
Part 1 The Current State of Simulation:
  - Introduction
  - Stress and Strain in Fluid Mechanics
  - Material Properties of Polymers
  - Governing Equations
  - Approximations for Injection Molding
  - Numerical Methods for Solution
Part 2 Improving Molding Simulation:
  - Improved Fiber Orientation Modeling
  - Improved Mechanical Property Modeling
  - Long Fiber-Filled Materials
  - Crystallization
  - Effects of Crystallizations on Rheology and Thermal Properties
  - Colorant Effects
  - Prediction of Post-Molding Shrinkage and Warpage
  - Additional Issues of Injection-Molding Simulation
Epilogue
Appendices:
  - History of Injection-Molding Simulation
  - Tensor Notation
  - Derivation of Fiber Evolution Equations
  - Dimensional Analysis of Governing Equations
  - The Finite Difference Method
  - The Finite Element Method
  - Numerical Methods for the 2.5D Approximation
  - Three-Dimensional FEM for Mold Filling Analysis
  - Level Set Method
  - Full Form of Mori-Tanaka Model
Designing the perfect mold is probably the most challenging task in plastics processing, especially in injection molding. The mold determines the quality, performance, and the profitability of a plastic part. Neither modern computer technology nor sophisticated CAE software can substitute the experience of the practicing mold engineer. This is why the Gastrow is so special to plastics engineers: 130 mold designs are presented in this extensively revised edition of the great classic in mold making. Each of the case studies was actually built, tested, and run successfully in production. The book is written by practitioners, describing problem solving in the design and the manufacture of injection molds. The wealth of information includes rules of thumb, design details, and practical tips invaluable for everyone involved in this field.
S. Kulkarni
Robust Process Development and Scientific Molding
Theory and Practice
2nd edition
2017. 390 pages. E-Book Bonus Book 978-1-56990-586-9; € 130.00
E-Book 978-1-56990-691-0; € 99.99

The book introduces the reader to the concept of Scientific Processing for Injection Molding. It explains the underlying principles of polymer science, the properties that are important to injection molding and their application to the molding process development. Scientific molding procedures to establish a robust process are provided. The concept of Design of Experiments for injection molding is explained providing an insight to the cosmetic and dimensional process windows. A plan to release qualified molds into production with trouble shooting tips is also provided. Topics that impact a robust process such as the use of regrind, mold cooling and venting are also described.

G. F. Schiller
A Practical Approach to Scientific Molding
E-Book 978-1-56990-687-3; € 37.99

This easy-to-understand guide provides the necessary information to implement a scientific molding program. It is a hands-on reference for people on the molding floor, including those previously lacking theoretical background or formal education. The book covers how the injection molding machine prepares the plastic and understanding of plastic flow. The functions of the main machine components are explained and understanding of correct procedures and testing is developed. Each step of the process is clearly explained in a step-by-step manner, and simple examples of important calculations are provided. The practical approach is augmented by useful guides for trouble-shooting and machine set-up. Bonus Material: An Excel spreadsheet with a process test and a machine performance test.

J. R. Lerma Valero
Plastics Injection Molding
Scientific Molding, Recommendations, and Best Practices
E-Book 978-1-56990-690-3; € 89.99

»Plastics Injection Molding: Scientific Molding, Recommendations, and Best Practices« is a user-friendly reference book and training tool, with all the essentials to understand injection molding of plastics. It is a practical guide to refining and controlling the process, increasing robustness and consistency, increasing productivity and profitability, and reducing costs. This book contains structured information on process definitions and parameters, optimization methods, key points, interpretation of data sheets, among other useful recommendations regarding both technology and design. It also provides analysis of process deviation, defects, incidents, etc. as well as a section dedicated to material selection and comparison.
Initially published “to bridge the gap between theory and practice in extrusion,” this 5th edition of Polymer Extrusion continues to serve the practicing polymer engineer and chemist, providing the theoretical and the practical tools for successful extrusion operations. In its revised and expanded form, it also incorporates the many new developments in extrusion theory and machinery over the last years.

This revised and extended third edition now also covers interpretation of extrusion process data, analysis of shrink void formation, dimensional variation by melt temperature fluctuations, efficient extrusion, grooved barrel extruder technology, and more.

The author presents single-screw extrusion technology together with the relevant polymer fundamentals, with an emphasis on screw design. The presentation begins on a physical level, providing an in-depth conceptual understanding, followed by an analytical level with mathematical models. Practical applications of the mathematical models are illustrated by numerous examples. A brief description of twin-screw extrusion technology is also presented.

New in the third edition: a novel patented barrier screw design that eliminates shortcomings of all previous barrier screw designs, more descriptive specific screw design guidelines, a scientifically designed pineapple mixing section, and general improvements and corrections.
This book is a step-by-step guide to die design for tubes and pipes. It offers unique coverage of the topic from a highly practical perspective. Written for plastics processing and design engineers, technical and manufacturing managers, die designers and manufacturers. This comprehensive guide includes worked examples to illustrate problem solving and detailed drawings of complete dies for various applications. It covers mono- and multilayers pipes, as well as important melt flow variables (e.g., pressure drop, shear stress, shear rate, temperature variations, and distribution variations, etc.) of key materials determined using FEM software.

New in the 3rd edition is a chapter on polymer rheology, with an overview of the rheology of polymer melts and its effect on extruding blown film. Also additional improvements and corrections throughout.

Includes »Blown Film Extrusion Simulator« companion software, a learning tool to teach equipment operation and processing principles.
J. L. White, E. K. Kim
**Twin Screw Extrusion**
Technology and Principles
2nd edition
2010. 336 pages
Book 978-3-446-42272-8; € 149.90

As part of its comprehensive treatment of this complex technology, this volume distinguishes between the different types of commercially available twin screw extruders and clearly describes their capabilities. It examines the fundamentals, development, and technology of twin screw extruders widely used for compounding, blending, reactive extrusion, and devolatilization.

**Contents:**
- Non-Intermeshing Counter-Rotating Twin Screw Extruders
- Intermeshing Counter-Rotating Twin Screw Extruders
- Intermeshing Co-Rotating Twin Screw Extrusion

K. Kohlgrüber
**Co-Rotating Twin-Screw Extruders: Fundamentals**
2019. 432 pages
Book 978-1-56990-747-4; € 199.99
E-Book 978-1-56990-748-1; € 159.99

Co-rotating twin-screw extruders are extensively used for the preparation, compounding, mixing, and processing of plastics, but also in other industry branches, such as in rubber and food processing, and increasingly in the pharmaceutical industry too. Derived from the classic, bestselling work »Co-Rotating Twin Screw Extruders«, this book brings much of the content up to date, with an expanded focus on the fundamentals of co-rotating twin-screw extrusion, including functional zones in the extruder, screw elements, material behavior, flow properties, performance behavior, and application of computational fluid dynamics.
G. A. Campbell, M. A. Spalding

**Analyzing and Troubleshooting Single-Screw Extruders**

2013. 800 pages

*Book* 978-3-446-41371-9; **€ 249.99**

*E-Book* 978-3-446-43266-6; **€ 199.99**

The book is an excellent resource on the fundamentals of single-screw extrusion. These fundamentals are combined with the chemistry of polymers and the physical properties related to processing to efficiently troubleshoot and optimize extrusion processes. This book provides over 30 case studies for troubleshooting extrusion problems, describing the relationship between the process and the physical properties of the resin. A solution is described in detail for implementation.

Some of the physical properties related to single-screw processing that are presented in depth include rheology, heat capacity, dynamic friction, bulk density and pellet compaction, and melt density.

H. E. Harris

**Extrusion Control**

*Machine – Process – Product*

2004. 162 pages

*Book* 978-3-446-22167-3; **€ 89.90**

*E-Book* 978-3-446-43427-1; **€ 69.99**

In a very practical and down-to-earth way the author explains how quality in extrusion can be measured, controlled, and improved. In particular, he conveys an understanding of how extruders should be controlled and what good, closed-loop controls can accomplish. The author’s approach and style clearly conveys that he has been involved in this field for many years and that he knows from experience what kind of problems an extrusion operator faces and how to successfully tackle these problems.

This book is a helpful tool to improve and stabilize the extrusion process, thus facilitating a more profitable operation.

M. Noriega, C. Rauwendaal

**Troubleshooting the Extrusion Process**

*A Systematic Approach to Solving Plastic Extrusion Problems*

3rd edition

2019. 384 pages

*Book* 978-1-56990-775-7; **€ 149.99**

*E-Book* 978-1-56990-776-4; **€ 119.99**

This book addresses all issues crucial in extrusion troubleshooting. Additionally, it includes industrial case studies used to provide exemplary approaches to efficient problem analysis and problem solving. The interconnectivity between the different relevant knowledge areas is emphasized. This revised third edition comprises a very significant update, with a great deal of new content, especially focusing on additional case studies as well as new sections on collection and interpretation of extrusion process data, rotational rheometry, the smartphone, how screw design can affect extruder performance, melt temperature variation, recent research on automatic optimization of extruder barrel temperatures, process signal analysis using Fast Fourier Transform, among other topics.
C. Rauwendaal

**SPC**

Statistical Process Control in Injection Molding and Extrusion

2nd edition

2008. 264 pages

Book 978-3-446-40785-5; € 129.90

The intention of this book is to teach SPC and its application to specific processes in an integrated fashion. Many SPC training programs are taught by people that are very familiar with statistics but know little about plastics processing technology. However, successful implementation of SPC requires an understanding of SPC as well as process know-how. This book, therefore, aims to teach not only the principles of SPC but also basic injection molding and extrusion process technology.

J. L. Throne

**Thermoplastic Foam Extrusion**

An Introduction

2004. 150 pages

Book 978-3-446-22848-1; € 69.90

This unique introduction covers both low- and high-density thermoplastic foams in an easy-to-follow style that avoids excursions into the theoretical aspects of foam processing. The book provides information on materials and their properties and on all major foam extrusion processes. A considerable part of the volume is taken up by comprehensive troubleshooting guides, designed to help newcomers as well as seasoned practitioners navigate the pitfalls of foam extrusion.

N. Rao

**Diagnostics of Extrusion Processes**

Plastics Pocket Power

2014. 128 pages

Book 978-1-56990-568-5; € 9.99

E-Book 978-1-56990-569-2; € 7.99

Experience shows that troubleshooting of extrusion processes can usually be achieved quickly by applying proven, practical calculation procedures. Starting from polymer rheology and thermodynamics, this book shows how screw and die design are easily examined using simple formulas. Designed to be used on site, with many examples taken from the shop floor, this valuable diagnostic tool helps optimize screw and die geometry, leading to products of the highest quality.
Norman C. Lee

**Blow Molding Design Guide**
2nd edition
2008. 288 pages
Book 978-3-446-41264-4; € 129.90

The second edition of this widely accepted book provides a general understanding of the blow molding process. It offers a practical, hands-on approach, concentrating on real life, day-to-day problems faced by those working to create cost effective blow molded parts. The author used an integrated approach to plastic part design, considering material properties, process benefits and limitations, mold engineering, decoration, finishing, and assembly techniques, while always keeping a focus on manufacturability issues.

N. C. Lee

**Understanding Blow Molding**
2nd edition
2007. 194 pages
Book 978-3-446-41265-1; € 89.90

The focus of Understanding Blow Molding is on hands-on practical applications, which will benefit those new to the plastic blow molding industry, as well as those who are experienced but may not have been exposed to all facets of a blow molding plant. People from various disciplines such as product and manufacturing engineering, marketing, design, research and development, as well as operation personnel, will also gain insight into solving the everyday problems of a blow molding operation. This revised second edition is expanded by a comprehensive troubleshooting guide that will prove particularly helpful to any practitioner.

D. Rosato, A. Rosato, D. DiMattia

**Blow Molding Handbook**
2nd edition
2004. 642 pages
Book 978-3-446-22017-1; € 349.00

An industry standard, this book provides insight to critical areas such as product design, meeting performance requirements, reducing cost, and zero defect targets. The information presented is of value to fabricators, designers, and engineers and it also provides a firm basis for the beginner. The intent is to provide a complete review of the important aspect of the blow molding process that goes from the practical to the theoretical and from the elementary to the advanced.
Modern thermoforming practice is a balance of practical experience and the application of engineering principles. This very practical book introduces the process, its tools and machinery, and the commonly used materials to novices and practicing engineers alike.

Thermoforming is an area of plastics processing with especially high growth, applying to both production of technical parts as well as for packaging. In the area of plastics packaging, thermoforming is unrivaled as a processing method. This popular and unparalleled book has been substantially extended and revised in its second edition. New topics include thermoforming tools, decoration in thermo-forming, and energy usage in thermoforming. In addition to the thermoplastic materials, all procedural steps of thermo-forming as well as the essential machine types and fundamentals of making tools and molds are described comprehensively and illustrated with practical examples. This is a practical manual for both beginners and experienced professionals, based on a well-proven teaching program employed in training courses.

For more than 25 years International Polymer Processing, the journal of the Polymer Processing Society has, provided strictly peer-reviewed, high-quality articles and rapid communications from the leading experts around the world.
Laser Sintering with Plastics
Technology, Processes and Materials
E-Book 978-1-56990-684-2; € 69.99

Laser Sintering (LS) with plastics is one of the most promising additive manufacturing technologies. It is the process most likely to permanently cross the border between prototyping and the production of functional parts. This step is challenging because the technology must meet certain requirements that are also valid for traditional, established production processes. This book covers all levels of the LS process chain, including: current state of the machine technology; essential process steps both before and during sintering; specific demands of the materials, powder production methods, and evaluation of powder properties; and mechanical properties and density of the parts produced by LS. Examples of LS-produced parts are given, including those with special design features.

Additive Manufacturing
3D Printing for Prototyping and Manufacturing
2016. 611 pages. E-Book Bonus Book 978-1-56990-582-1; € 179.99
E-Book 978-1-56990-583-8; € 149.99

The use of additive manufacturing for the direct production of finished products is becoming increasingly important. The method not only reduces the demands on industrial infrastructure but also opens up new perspectives in terms of decentralized production and customer inclusive individualized production (customization, cyberproduction). Oriented toward the practitioner, this book presents the basics of additive manufacturing and discusses the properties and special aspects of industrially available machines. From the generation of data to the forming method, the complete process chain is shown in a practical light.

Additive Manufacturing (AM) is the term used for layer-oriented or generative manufacturing, which was introduced in the late 1980s as rapid prototyping. Over the last 20 years it has developed dramatically. Today it is not only a valuable tool for making models and prototypes but also a manufacturing method for final parts and mold inserts. AM is about to revolutionize manufacturing technology. This valuable quick guide provides support material for AM technology courses, updated content for traditional manufacturing lessons, and basic information to facilitate self studies.
C. Rauwendaal

Polymer Mixing
A Self-Study Guide

1998. 256 pages
Book 978-3-446-18784-9; € 89.90

This book covers the fundamental aspects of polymer mixing as well as modern mixing equipment. It emphasizes the basic mechanisms involved in the different mixing processes with a quantitative description of each process. This self-study guide features end of section questions so readers can evaluate their progress.

HANSER eLIBRARY.COM

The platform for professional digital information from HANSER has everything you could wish for. All needs can be met here for your particular activity.

- Custom-made or individual e-book packages in the areas building engineering, electrical engineering, computer sciences, construction engineering, plastics engineering, machine building mathematics and natural sciences, quality management, economics
- Currently over 1,700 e-books with an additional 200 every year
- E-journals in the areas of material sciences, nuclear technology, chemistry
- For higher education schools, institutions and companies through IP-connection
- Extensive user statistics
- Quick search results of relevant information with convenient search functions and detail-search options
- Storage possibility for search requests including an alert-function
- Mobile access available (e.g. Blackberry, iPhone or iPad)
- Unlimited printing and PDF-download

For further information just send us an e-mail at onlinesupport@hanser.de
A. Müller

**Coloring of Plastics**

Fundamentals – Colorants – Preparations

2003. 278 pages

*Book* 978-3-446-22346-2; € 129.90

*E-Book* 978-3-446-43415-8; € 109.99

This book describes the various aspects of coloring plastics, such as the construction of the processing machine, the processing technology, quality assurance of the raw materials and final products, toxicology of the raw materials, and the legal aspects from the handling of all ingredients during the production of a color preparation to the processing of plastic parts. It also includes the safe use of the plastic products in their specific application.

A. Limper

**Mixing of Rubber Compounds**

2012. 252 pages

*Book* 978-3-446-41743-4; € 129.90

*E-Book* 978-3-446-42865-2; € 109.99

The book covers the major aspects of rubber compounding. For the first time, the reader will find all relevant issues, whether it is machine design, process technology, or material parameters, covered in one comprehensive volume.

I. Manas-Zloczower

**Mixing and Compounding of Polymers**

Theory and Practice

2nd edition

2009. 1188 pages

*Book* 978-3-446-40773-2; € 299.00

*E-Book* 978-3-446-43371-7; € 239.99

Completely updated, the second edition of this classic handbook provides a representative state-of-the-art review of mixing and compounding technology in polymer processing. It covers all aspects of mixing, from the basic principles to the various practical applications, with due consideration to material properties and mixing devices.
Edited by Toshitaka Kanai and Gregory A. Campbell
FILM PROCESSING
Series Editor: Musa R. Kamal

T. Kanai, G. Campbell
Film Processing
2011. 452 pages
Book 978-3-446-43006-8; € 179.99
E-Book 978-3-446-40179-2; € 149.99

The manufacturing process for preparing very thin polymer products has developed into what is arguably the largest outlet for synthetic polymers. This book focuses on the developments in process hardware and operating techniques that permit increasingly high production rates, optimum property development, unusual degrees of molecular orientation, and the coextrusion of multilayer, multicomponent film and sheet. The strong relationships and the interdependence of these developments on the achievements in polymer design, such as rheology and mechanical and optical properties, are also discussed.

T. Kanai, G. Campbell
Film Processing Advances
2014. 400 pages
Book 978-1-56990-529-6; € 179.99
E-Book 978-1-56990-536-4; € 149.99

This book focuses on the latest developments of high-performance and multilayered films. The chapters, each written by leading experts in their fields, cover the current technologies of film extrusion, extruder screw design, die design, film structure, film temperature, crystallization dynamics, and film properties. It complements the classic Film Processing and is an ideal companion to that book.

S. Selke
Understanding Plastics Packaging Technology
1997. 220 pages
Book 978-3-446-18684-2; € 39.90

The manufacture and use of various packaging forms is explained in this book, including films and flexible packaging, thermoformed, injection and blow molded containers, and packaging foams. The text includes environmental perspectives with particular attention paid to energy use and recycling.
Plastics in Automotive Engineering
Exterior Applications

R. Stauber, L. Vollrath
2007. 423 pages
Book 978-3-446-41120-3; € 249.00
E-Book 978-1-56990-659-0; € 109.99

Today’s automotive industry is challenged by ever more stringent demands to reduce fuel consumption and exhaust emissions. Lightweight design and increased use of advanced plastic components will be crucial for the next generation of cars complying with legislation.

This unique and timely book provides theoretical as well as practical reviews of novel polymer applications for automotive engineering, covering material selection, simulation, prototyping and manufacturing.

Plastics Packaging
Properties, Processing, Applications, and Regulations
3rd edition
2016. 448 pages. E-Book Bonus Book 978-3-446-40790-9; € 129.99
E-Book 978-1-56990-659-0; € 109.99

Plastic materials continue to play a vital and growing role in packaging applications. This highly regarded book provides a basic understanding of the properties of the common packaging plastics. Comprehensive topics include material properties and how they relate to the chemical structure of the polymers, common processing methods for packaging applications, help with writing specifications, designing, fabricating, testing, and controlling the quality of the plastic material. The third edition introduces expanded discussion of PLA and other biobased plastics, and the coverage of tensile properties is enlarged. Further updates and enhancements throughout ensure Plastics Packaging remains an indispensable resource for both the packaging expert and the novice.

Technology of Polymer Packaging

A. Ghosh
2015. 136 pages
Book 978-1-56990-576-0; € 39.99
E-Book 978-1-56990-577-7; € 31.99

Aimed at engineering students, engineers, and technologists of the packaging industry, this book provides the essentials of polymer packaging. It provides the reader with the knowledge and skills to identify and solve problems in packaging processes, and thereby develop functional packaging. Sales and marketing people involved in the packaging industry will also find this a valuable resource. A short primer on polymeric materials and additives is followed by descriptions of the most important production processes for polymer packaging – both continuous and discontinuous. Further chapters cover technology of sealing and different converting processes of packaging webs. The clear, practical informational focus stems from the author’s extensive experience in the packaging industries and as an educator.
Electron beam curing technology for advanced composites has emerged as a credible and attractive alternative to thermal curing for most composite products. Technical advantages, e.g., for aerospace structures, include curing at room temperature, using low-cost tooling, and the ability to fabricate large integrated structures.

Here, both theoretical and practical aspects of electron beam curing of composites are comprehensively covered, with the intention to bridge the gap between academic knowledge and industrial applications.
All commercially available welding processes are reviewed and compared to help the reader select the best suited process for his/her application and to understand each process limitations and benefits. The focus on practical aspects such as weldability, optimizing part design, troubleshooting, and testing makes this book an indispensable tool for everyone involved in welding of plastics. At the same time, it also conveys the basic theoretical principles of plastics welding such as squeeze flow, molecular diffusion, and heat transfer mechanisms.

Composites have been acclaimed to be the »Materials of the Future«. Advanced polymer composites, once destined for stealth military aircraft or aerospace uses, are beginning to be used in down-to-earth structures such as bridges, building and highways. The objectives of this book are to provide a quick overview of the fundamental principles underlying composite processing and to summarize the most important processes for composite manufacturing. This book is particularly valuable for students as a graduate level textbook and practitioners who struggle to optimize these processes.

As a complete reference source for surface modification of polymers, this book reviews traditional and conventional methods for improving the adhesion of inks, coating adhesives, metals, and other adherends to polymers and introduces new methods for molecular engineering polymer surfaces to enhance their adhesion to a wide range of materials. In addition, this work serves to turn the vast amount of disparate information regarding plastics surface modification from wide ranging sources into practical application knowledge.
J. A. Avery  
**Gas-Assist Injection Molding**  
Principles and Applications  
2001. 215 pages  
Book 978-3-446-21289-3; € 99.90

This book provides in-depth coverage of all aspects of designing, developing, and manufacturing parts using gas-assist injection molding and comparing this relatively new technology to other possible manufacturing methods. The reader will gain an understanding of how to identify the specific version of this technology best suited for his/her application, as well as design and tooling details required to optimize cost and performance.

G. Beall  
**Rotational Molding**  
Design, Materials, Tooling, and Processing  
1998. 258 pages  
Book 978-3-446-18790-0; € 89.90

A highly versatile process, rotational molding allows for incredible design flexibility with the added benefit of low production costs. One of its advantages over other plastics processes is that one can mold more complex shapes with uniform wall thickness. This book provides an introduction to the design, materials, tooling, and process, and helps readers understand and apply the manufacturing techniques involved in rotational molding.

B. Davis, P. Gramann, T. A. Osswald, A. Rios  
**Compression Molding**  
2003. 208 pages  
Book 978-3-446-22166-6; € 79.90

The compression molding process is well known for its ability to produce highly complex, high-strength parts. This book not only covers the advantages and disadvantages of the molding operation with SMC/BMC (thermosetting) and GMT/LFT (thermoplastic) materials, it also provides the reader with relatively simple models for monitoring, troubleshooting, and quality control of their processes. Also covered is the important role of fiber reinforcement: how the quantity of fiber, the fiber length, and fiber orientation influence part strength and stiffness and how to calculate fiber breakage.
Understanding Plastics Recycling
Economic, Ecological, and Technical Aspects of Plastic Waste Handling
2017. 117 pages. E-Book Bonus Book 978-1-56990-676-7; € 70.00 E-Book 978-1-56990-677-4; € 54.99

This book shows the true market potential of plastics recycling, with analysis from economic, ecological, and technical perspectives. It is aimed at both technical and non-technical readers, including decision makers in material suppliers, plastic product manufacturers, governmental agencies, educators, and anyone with a general interest in plastics recycling. An overview of waste handling systems with a focus on the U.S. market is provided. Different methods of waste handling are compared from both economic and ecological perspectives. Common strategies and new approaches to both increase the recycling rate and improve recycling economically and technically are presented.
This book provides a comprehensive and very practical overview of the various plastic materials used in today’s industrial applications. It focuses on material properties and areas of application. All industrially significant plastic families and grades are introduced following the same approach: their chemical constitution, manufacturing, properties, processing, and end-use applications. This consistent presentation allows easy comparison of different materials and helps with the initial identification of suitable plastic materials for a given end use. Ample full-color illustrations are testimony to the fact that plastic materials are the ultimate tribute to man’s creativity and inventiveness.
A. V. Pocius
*Adhesion and Adhesives Technology*  
*An Introduction*  
3rd edition  
2012. 000 pages  
Book 978-3-446-42748-8; € 179.90  
E-Book 978-3-446-43177-5; € 149.99

This book describes, in clear understandable language, the three main disciplines of adhesion technology: 1) mechanics of the adhesive bond, 2) chemistry of adhesives, and 3) surface science. Some knowledge of physical and organic chemistry is assumed, but no familiarity with the science of adhesion is required. The emphasis is on understanding adhesion, how surfaces can be prepared and modified, and how adhesives can be formulated to perform a given task. Throughout the book, the author provides a broad view of the field, with a consistent style that leads the reader from one step to the next in gaining an understanding of the science.

H.-J. Endres, A. Siebert-Raths
*Engineering Biopolymers*  
*Markets, Manufacturing, Properties and Applications*  
2011. 692 pages  
Book 978-3-446-42403-6; € 299.00  
E-Book 978-3-446-43002-0; € 239.99

This book focuses on market-relevant bio/renewable materials and includes comparable data for biogenic polymers, biological macromolecules, and engineering materials. It offers valuable information regarding micro-structure, manufacturing, as well as processing, application, and recycling properties of biopolymers.

S. Fakirov, D. Bhattacharyya
*Engineering Biopolymers: Homopolymers, Blends, and Composites*  
2007. 901 pages  
Book 978-3-446-40591-2; € 299.00  
E-Book 978-3-446-44250-4; € 239.99

This volume presents the results of numerous worldwide studies focusing on the implementation of natural polymers as engineering plastics and the use of their inherent properties.

It discusses the processing and, more extensively, the application of natural materials (cellulose and protein-based) as reinforcements for polymer composites. The structural, morphological, and thermal characteristics, as well as the mechanical behavior of the obtained materials are covered comprehensively. In addition, the book includes case studies of commercial relevance.
This guide to plant design and machinery construction and operation is written by one of the pioneers in the field. It offers a comprehensive overview on processes, machines, and plant layouts for the production of synthetic (man-made) fibers from an engineering point of view. Detailed technical drawings, plus numerous formula and diagrams, illustrate the entire fiber-technical knowledge for the design of various production steps, from raw materials through polymerization, and spinning to textured and technical fabrics. This unique handbook is a treasury of knowledge for the expert, an indispensable adviser in solving dayto-day problems, and a must on the shelf for every library.
S. N. Bhattacharya, M. R. Kamal, R. K. Gupta

Polymeric Nanocomposites
Theory and Practice
2007. 398 pages
Book 978-3-446-40270-6; € 179.90
E-Book 978-3-446-41852-3; € 149.99

This comprehensive reference book incorporates the latest developments in the synthesis, production, characterization, and application of various types of polymeric nanocomposites. It outlines the various preparation techniques using different types of nanoparticles and polymer matrices with emphasis on clay nanoparticles.

L. M. Robeson

Polymer Blends
A Comprehensive Review
2007. 471 pages
Book 978-3-446-22569-5; € 249.00
E-Book 978-3-446-43650-3; € 199.99

Polymer blends offer a key option in solving emerging application requirements. The ability to combine existing polymers into new compositions with commercializable properties offers the advantage of reduced research and development expense compared to the development of new monomers and polymers to yield a similar property profile. An additional advantage is the much lower capital expense involved with scale-up and commercialization.

Another specific advantage of polymer blends versus new monomer/polymer compositions is that blends often offer property profile combinations not easily obtained with new polymeric structures. In the rapidly emerging technology landscape, polymer blend technology can quickly respond to developing needs.

G. H. Michler, F. J. Baltá-Calleja

Nano- and Micromechanics of Polymers
Structure Modification and Improvement of Properties
2012. 560 pages
Book 978-3-446-42767-9; € 299.00
E-Book 978-3-446-42844-7; € 239.99

The book brings together the detailed knowledge of structure and morphology of the main classes of polymers, including commodities as well as special polymers, with the explanation of the mechanical properties, processes and mechanisms on macroscopic, microscopic and nanoscopic scale. Description, explanation and theoretical interpretation of all of the micro- and nanoscopic processes and mechanisms in different polymers constitute the central part the book. Thus, it offers a key for a better understanding of structure-property-correlations of nearly all polymers of interest in industrial applications.
John S. Dick, C. P. Rader

**Raw Materials Supply Chain for Rubber Products**

2014. 600 pages
Book 978-1-56990-537-1; € 179.99
E-Book 978-1-56990-538-8; € 149.99

This book provides a current overview of the chemical supply chain for the global rubber industry. It also reviews the present and future international changes and their effects on this chemical supply chain for rubber producers, compounding ingredient manufacturers, custom mixers, rubber fabricators, molders, extruders and others.

The reader will be enabled to understand the chemical connectivity of rubber compounding materials to their chemical feedstocks.

J. S. Dick, C. P. Rader

**Rubber Processing**

*Technology – Materials – Principles*

1995. 608 pages
Book 978-3-446-16600-4; € 249.00

This book represents the first summary of rubber processing. It discusses the development of the technology and presents the theoretical and experimental aspects of rubber processing and engineering, including flow simulation.

J. L. White

**Engineered Rubber Products**

*Introduction to Design, Manufacture and Testing*

2009. 192 pages
Book 978-3-446-41731-1; € 99.90
E-Book 978-3-446-43344-1; € 79.99

The successful manufacture of engineered rubber products is complicated. It involves different disciplines, materials, and types and designs of equipment. Problems sometimes occur because of less-than-desirable communication among personnel involved in the development and manufacture of rubber products. This book’s intent is to improve communication among different disciplines. Using a systems approach, it is further intended to introduce chemists and engineers to the unique capabilities of rubber in a wide range of tire and non-tire products.
Many challenges confront the rubber technologist in the development, manufacture, and use of rubber products. These challenges include selecting and combining materials to form rubber compounds suitable for processing, successfully operating a range of manufacturing equipment, and meeting product performance in difficult and diverse environments. Case studies and literature references relate problem solutions to the everyday experience of the rubber technologist. From materials to processes to products, this book identifies many different rubber-related problems and suggests approaches to solve them.

This book is a practical guide to cost-effective formulating of rubber compounds to achieve optimal processing and performance. It provides a thorough discussion of the principles of rubber compounding, rubber testing, and how various compound changes will effect different properties and test measurements.

New in this third edition: new and revised content on recycled rubber, precipitated silica and non-black fillers, and silicone elastomers.

Rubber compounding is a very complex endeavor. There are many interactions and many ways to achieve the target properties and economic goals while maintaining an acceptable tradeoff for these characteristics. This book provides various experimental ideas to develop better compounds and solving technical problems. In a combined effort, 20 renowned industrial experts compiled a large number of diverse experimental suggestions for enhancing a specific compound property. By reviewing the suggestions in this book, the compounder may develop a better feel for how to best achieve a compromise or tradeoff with compound properties when developing new or improving tested rubber recipes.
J. T. Bauman

**Fatigue, Stress, and Strain of Rubber Components**

*Guide for Design Engineers*

2008. 225 pages
*Book* 978-3-446-41681-9; € 99.90
*E-Book* 978-3-446-43340-3; € 79.99

The book covers the fatigue testing of specimens, curve fitting of equations to the test data, and the use of such equations in life prediction. Stress-strain testing and behavior will be covered to the extent relevant to fatigue analysis. Also the text will cover the application of finite element analysis to components to determine high stress points which are vulnerable to fatigue failure. The book is aimed at design engineers with a bachelor’s degree, but with little or no knowledge of rubber behavior. It is aimed at aiding the design engineer in practical service life estimations and testing of rubber materials to that end.

G. Holden

**Understanding Thermoplastic Elastomers**

2000. 117 pages
*Book* 978-3-446-19332-1; € 59.90

One of the outstanding advantages of TPE’s can be summarized in a single phrase: They allow rubberlike articles to be produced using the rapid processing techniques developed by the thermoplastic industry. The commercial development of TPE’s enabled the rubber industry to utilize new processing techniques including blow molding, comolding and coextrusion, hot melt coating of pressure sensitive adhesives, and direct injection molding. New products, new processing techniques, new properties, and new applications have been experienced in the last decade. All this is reflected in this general introduction to the subject.

G. Holden, H. R. Kricheldorf, R. P. Quirk

**Thermoplastic Elastomers**

3rd edition
2004. 558 pages
*Book* 978-3-446-22375-2; € 299.00

Thermoplastic elastomers are one of the fastest growing material groups. They can be processed like thermoplastics but their properties are close to those of vulcanized elastomers. New products, new processing techniques, new properties, and new applications have developed since the publication of the 2nd edition. All these developments are reflected in the new edition of this well-established standard work. A unique and comprehensive, up-to-date guide to all scientific and technical aspects of thermoplastic elastomers – indispensable for everyone working in this field.
Polyolefins, the polymers synthesized from olefinic monomers, are the major commercial thermoplastics. They are also important elastomers and the components of major thermoplastic elastomers. Polyethylene and polypropylene in volume are the two largest thermoplastics and are fabricated into filaments, films, and moldings. For the first time, the reader will find a comprehensive description of the structuring of molten polyolefins in fiber, film and molding processes with correlation between structural order such as crystalline unit cell, polymorphic effect and orientation, and processing parameters.

Following the successful approach of the first edition, this book presents the current state of the PP industry. At its core is a detailed description of the polymerization, the catalysts, and the breakthroughs that occurred during the last two decades. Comprehensively covered are morphology, characterization, stabilization, properties, manufacturing, worldwide demand, environmental considerations, applications, and regulatory considerations. However, this update covers more than products, technology, and market, which undoubtedly are the most important dimensions of the PP industry.
Y. V. Kissin

**Polyethylene**

*End-Use Properties and their Physical Meaning*

2012. 152 pages

*Book* 978-1-56990-520-3; € 89.90

*E-Book* 978-1-56990-521-0; € 69.99

This book provides a necessary bridge between the values of engineering end-use parameters of polyethylene resins and their scientific molecular and structural characteristics. The main goal is to translate such common parameters, such as the melt index of a resin or the dart impact strength of a film sample, into the universal language of the polymer science. After this translation is completed, many facets of the resin properties became transparent and easily explainable.

E. D. Weil, S. V. Levchik

**Flame Retardants for Plastics and Textiles**

*Practical Applications*

2nd edition

2015. 398 pages

*Book* 978-1-56990-578-4; € 129.99

*E-Book* 978-1-56990-579-1; € 109.99

The book provides an overview of flame retardants that are either in actual commercial use or in advanced stages of market development. It reviews flame retardants polymer-by-polymer and offers insight to their modes of action and interaction. With this how-to approach, it offers suggestions for selecting between alternatives, provides formulations, and most importantly offers a starting point for the compounder or plastics fabricator to pass commercial flammability requirements.

J. Troitzsch

**Plastics Flammability Handbook**

*Principles, Regulations, Testing, and Approval*

3rd edition

2004. 774 pages

*Book* 978-3-446-21308-1; € 399.00

*E-Book* 978-3-446-43669-5; € 349.99

The completely revised and updated 3rd edition of this handbook covers all aspects of plastics flammability from fundamentals to the detailed description of national and international regulations, standards, test methods, and the approval procedures for plastics and plastic components in various fields of application. This unique and comprehensive handbook is a mandatory and essential reference for everyone concerned with plastics flammability.
Plastics without additives are not viable. Additives are essential to make plastics processable and to assure their end-use properties. The demands on additives have continued to evolve, not only because of changes in processing conditions and production techniques but also because plastics are being used in more demanding applications. This revised and updated edition, described earlier by one reviewer as the “bible” for anyone involved in the chemistry and technology of plastics additives, again provides an excellent overview of the complex science and technology of plastics additives and their industry. It offers guidance for all professionals involved in the development of new thermoplastic resin grades and novel end-use applications.

PVC differs in the stabilization of other commodity plastics. There are various metal compounds that are suitable for the stabilization of PVC, such as lead, tin, calcium, magnesium, zinc, rare earths, and also almost metal-free systems. These differences are described with their advantages, possibilities, and problems from the perspective of the chemist but processed for sales reps and technicians. Numerous tables and figures are useful for looking up structures and physico-chemical data. This book focuses on sustainability and shows that PVC has the best potential to develop into a fully sustainable material.

Since the previous edition of this book over a decade ago, many of the industry’s most pressing problems, which include environmentally acceptable blowing agents, combustibility, and solid waste disposal, have been addressed and significant progress has been made. The new edition reflects these developments as well as several new classes of foams brought to industrial application in recent years.
Welcome
...to HANSER open access!

Your benefits:
- increasing visibility, discoverability and citations for your work
- raising your profile
- expanding worldwide distribution

Your article

Are you an author? Get in touch:
Petra Dregger: +49 89 99830-113
petra.dregger@hanser.de
A polymeric material’s resistance to different environmental or processing related influences determines its suitability in any number of applications. Reliable information and performance predictions influence material selection. They take a variety of influences into consideration, among them resin manufacture, compounding, stabilization, processing, part design and end use.

Scanning electron microscopy (SEM) is often used in plastics failure analysis when light microscopy cannot provide images of high enough resolution. SEM images also provide higher contrast, in particular of surface textures. SEM is also advantageous with very dark surfaces and transparent materials. This book is an unrivaled comprehensive collection of SEM images covering topics such as surface properties, adhesion, joining, fracture, and other types of failure of plastic parts, which are of decisive importance for the economic success of plastics manufacturing operations.

Plastics failure, to a certain extent, is the result of a phenomenal increase in the number and variety of applications in relatively few years. The focus of this book is on actual field and product failures. The treatment is comprehensive, emphasizing cause and prevention. The concept of the interdependence of material, design, and processing is applied to all examples and cases. The »how to« of prevention is brought out as a logical extension of the cause of failure.
Thermal analysis has proven to be one of the most important and meaningful test methods in the plastics industry and in testing laboratories. Although thermal analysis is used for fundamental studies related to materials science of polymers, its power lies in understanding this behavior during manufacturing processes. This understanding aids in process optimization, reduction of manufacturing cycle times, failure analysis, and the overall improvement of the material properties of the finished product. In this book, the different test methods and their variations are described in detail, emphasizing the principles and their application in practice. Using practical examples, different approaches to problem solving are presented with a focus on the interpretation of the experimental results.

Thermal analysis comprises a group of techniques used to determine the physical or chemical properties of a substance as it is heated, cooled, or held at constant temperature. It is particularly important for polymer characterization, but also has major application in analysis of pharmaceuticals and foodstuffs. This comprehensive handbook presents practical and theoretical aspects of the key techniques of DSC, TGA, TMA, DMA, and related methods. It also includes separate chapters on the glass transition, polymers, polymorphism, purity determination, and method development. The large number of practical examples included should inspire readers toward new ideas for applications in their own fields of work.

This overview of plastics testing provides an understanding of how polymer structure and morphology affect properties that are important for plastics processing and how to test for these properties. The reader will get an overview of basic material testing, the specific properties tested, and why they are important. The book also provides insight into which tests are useful for predicting the behavior of plastics products after they have been produced and in end-use.
Testing of plastics provides an insight to the behavior of the material in response to applied loads or exposure to the environment and time. In order to determine the true performance of a plastic material, a comprehensive understanding of the broad range of plastics behavior, such as its mechanical, thermal, electrical, rheological, physical and chemical properties as well as environmental resistance is necessary. In industrial practice, fabricated parts are often tested as part of the design validation step to ensure that end use performance requirements are adequately met. This book provides a comprehensive discussion of test methods for various properties of plastics, related to different material types and forms, with reference to national, international and application/industry specific test methods in a practical, easy to understand manner.

With 588 images and associated analyses for avoidance of damage to plastics, this manual is aimed at both professionals and students. Many technical terms and colloquial descriptions, explanations, and interconnections with related areas, together with the images, facilitate the reader in determining and describing the exact type of damage of a given sample. The images, from microscopic quality and damage analysis of molding materials, semi-finished products, and molded parts, are divided into 74 subject areas of plastics processing and application, and contain over 2620 industry-standard technical terms. The analyses were performed with various light microscopes and a scanning electron microscope.

Processors and users of plastics often need to determine the chemical nature and classification of unknown plastic materials. This highly practical and useful manual enables you to determine the classification of plastics without lab equipment. This is a handy and effective tool for many practical situations.
This book provides a comprehensive introduction to the study of polymers. Special emphasis is given to the characteristics that set polymers apart from small molecules, as studied in classic chemistry courses. The various branches of polymer science are introduced and discussed in a systematic manner, starting from basic chemical structures, continuing through supramolecular organization and physical properties. Specific examples are used throughout to illustrate how end usage relates to the principles under discussion. A series of chapters is devoted to case studies describing the principal classes of synthetic polymers.

A. J. Peacock, A. Calhoun

**Polymer Chemistry**

Properties and Applications

2006. 418 pages

Book 978-3-446-22283-0; € 129.90

E-Book 978-3-446-43343-4; € 109.99

Structure and morphology determine the properties of polymeric materials. This atlas provides, with over 2000 high-quality micrographs, a comprehensive overview of the structural/morphological diversity of all classes of plastics. All microscopic techniques from light microscopy through scanning and transmission electron microscopy to atomic force microscopy are covered.

Another focus is on the changes in plastics morphology occurring under mechanical stress, i.e. the deformation and fracture structures. The extensive visual material will help professionals in research and application fields to determine structureproperty correlations of polymeric materials and also improve training and teaching in universities.

G. H. Michler

**Atlas of Polymer Structures**

Morphology, Deformation and Fracture Structures

2016. 612 pages

Book 978-1-56990-557-9; € 249.99

E-Book 978-1-56990-558-6; € 199.99

A. Naranjo, M. del Pilar Noriega, T. A. Osswald, A. Roldán-Alzate, J. D. Sierra

**Plastics Testing and Characterization**

Industrial Applications

2008. 376 pages

Book 978-3-446-41315-3; € 179.90

E-Book 978-3-446-41853-0; € 149.99

Combined with a solid engineering background, this book provides the information and industrial case studies an engineer needs to both make informed decisions about selecting appropriate testing techniques and effectively troubleshoot problems in the field of plastics manufacturing. The scope of this book also includes relevant and concise information for data interpretation using the most important characterization techniques.
This introduction to polymer materials science is divided into three major sections: Basic Principles, Influence of Processing on Properties, and Engineering Design Properties. The first edition of this textbook was praised for its vast number of graphs and data that can be used as reference. The new second edition further strengthens this attribute with a new appendix containing material property graphs for the commonly used polymers. However, the most important change implemented in this edition is the introduction of real-world examples and a variety of problems at the end of each chapter.
This book combines in one source an introduction to rheology, a discussion of quality management, and a presentation of the statistical tools required for the treatment of experimental data. These topics are well integrated, and special attention is given to the application of statistical analysis to rheological testing in the plastics industry. Numerous examples show how these methods can be used to solve production problems involving product quality. The compact disk that is included provides examples of the application of commercial statistical software to the use of rheology for quality control.

The rheology of polymer melts plays an important role today in industry and academia. Until now, textbooks on this subject mainly only covered homogeneous products. This book is unique in that it focuses on heterogeneous systems such as particle-filled materials and polymer blends, which are highly important in the world market. It deals with similarities and differences of the flow properties of these materials, providing both a fundamental and a practical understanding. Key points of the book are the viscous and elastic properties of engineering polymers filled with functional particles and the influence of nanoparticles on rheological properties.

Understanding the elastic properties of polymer melts is necessary for ensuring successful polymer processing and thus producing high-quality plastic parts. This unique book is the first to focus on this important topic.

Starting with the molecular origin of elastic behavior and an explanation of the physical quantities involved, experimental methods and the dependence of elastic behavior on experimental parameters are then presented. Elastic properties of filled and unfilled systems are compared directly, and polymer blends are also considered.

Elastic effects in various applications are included, such as in extrudate swell, internal stresses, and shrink films, to illustrate the importance of this field in the plastics processing industry.
Save the Date

Conferences

Don’t miss the most important plastic events in 2020!

Folien+Fahrzeug / Plastic Films in Automotive

This international conference presents to you the latest trends in interior and exterior applications regarding film technology and in-mould-decoration.

www.folien-fahrzeug.de

Praxisforum Kunststoffrezyklate / Plastics Recyclate Forum

Benefit from presentations and discussions on the topics of quality improvement, additives for recyclates, production, applications and upcycling for reliable components.

www.hanser-tagungen.de/recycling

Kunststoffe+Simulation / Plastics + Simulation

Look forward to interesting presentations on current developments and animated discussions with science and industry experts in the field of the simulation of processing procedures and the design of plastic components.

www.hanser-tagungen.de/simulation

04 – 05 February 2020 in Stuttgart-Böblingen

03 – 04 March 2020 in Darmstadt

12 – 13 May 2020 in Munich

All with simultaneous translation German/English
**Kunststoffe international**

**Magazine for Plastics**

In English  
Frequency: 10 issues per year

**Kunststoffe international**  
**Combined Annual Subscription**  
10 print editions + access to all contents at Kunststoffe-international.com and Kunststoffe.de + English E-Paper: € 448.00  
(€ 329.00 Print + € 119.00 Online)

**Kunststoffe international**  
**E-Paper Annual Subscription**  
10 E-Paper editions: € 329.00

**Kunststoffe international**  
**Print Annual Subscription**  
10 print editions: € 329.00

**Kunststoffe international**  
**Digital Annual Subscription**  
Access to all contents at Kunststoffe-international.com for 12 months (E-Paper not included): € 374.00

Print editions plus postage:  
In Germany: € 13.90  
Abroad: € 25.90  
Airmail: € 36.90

**International Polymer Processing**

**The Journal of the Polymer Processing Society**

In English  
Frequency: 5 issues per year

**Print + Online**  
5 print editions + access to all articles back to 1986: € 1,299.00  
(€ 1,108.00 Print + € 191.00 Online)

**Print + Online**  
5 print editions + access to all articles within subscription period: € 1,109.00  
(€ 1,108.00 Print + € 1.00 Online)

**Online Only**  
Access to all articles back to 1986: € 1,109.00

Print editions plus postage:  
In Germany: € 11.90  
Abroad: € 19.90  
Airmail: € 22.90

International Polymer Processing covers research and industrial application in the very specific areas of designing polymer products, processes, processing machinery, and equipment.
Tenside Surfactants Detergents

Cleaning Technology Journal
Articles in English, abstracts and news in both English and German
Frequency: bimonthly

Print + Online
6 print editions + access to all articles back to 2004: € 1,049.00
(€ 898.00 Print + € 151.00 Online)

Print + Online
6 print editions + access to all articles within subscription period: € 899.00
(€ 898.00 Print + € 1.00 Online)

Online Only
Access to all articles back to 2004: € 899.00

Print editions plus postage:
In Germany: € 11.90
Abroad: € 21.90
Airmail: € 24.90

Tenside Surfactants Detergents
provides you with the most recent results of research and development in all fields of surfactant chemistry.

HANSER eLIBRARY.com

The platform for professional digital information from HANSER has everything you could wish for.
All needs can be met here for your particular activity.

• Custom-made or individual e-book packages in the areas building engineering, electrical engineering, computer sciences, construction engineering, plastics engineering, machine building mathematics and natural sciences, quality management, economics
• Currently over 1,700 e-books with an additional 200 every year
• E-journals in the areas of material sciences, nuclear technology, chemistry
• For higher education schools, institutions and companies through IP-connection
• Extensive user statistics
• Quick search results of relevant information with convenient search functions and detail-search options
• Storage possibility for search requests including an alert-function
• Mobile access available (e.g. Blackberry, iPhone or iPad)
• Unlimited printing and PDF-download

For further information just send us an e-mail at onlinesupport@hanser.de
<table>
<thead>
<tr>
<th>Keyword</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollow plastic parts</td>
<td>18</td>
</tr>
<tr>
<td>Hot runners</td>
<td>18, 28</td>
</tr>
<tr>
<td>Identification</td>
<td>63</td>
</tr>
<tr>
<td>Industrial polymers</td>
<td>50</td>
</tr>
<tr>
<td>Industry 4.0</td>
<td>20</td>
</tr>
<tr>
<td>Injection mold</td>
<td>19</td>
</tr>
<tr>
<td>Injection molded circuit carriers</td>
<td>49</td>
</tr>
<tr>
<td>Injection molding</td>
<td>9, 13, 14, 18, 19, 23, 24, 29, 31, 38, 48, 50</td>
</tr>
<tr>
<td>Injection molding machine</td>
<td>25, 27, 33</td>
</tr>
<tr>
<td>Injection molds</td>
<td>15, 16, 17, 24, 25, 29, 30, 31, 32</td>
</tr>
<tr>
<td>Introduction to plastics</td>
<td>22</td>
</tr>
<tr>
<td>Joining</td>
<td>13</td>
</tr>
<tr>
<td>Laser sintering</td>
<td>41</td>
</tr>
<tr>
<td>Light microscopy</td>
<td>63, 64</td>
</tr>
<tr>
<td>Lightweight</td>
<td>45</td>
</tr>
<tr>
<td>Machine performance test</td>
<td>33</td>
</tr>
<tr>
<td>Manufacturing systems</td>
<td>15</td>
</tr>
<tr>
<td>Manufacturing systems engineering</td>
<td>24</td>
</tr>
<tr>
<td>Material behavior</td>
<td>11, 25, 36</td>
</tr>
<tr>
<td>Materials engineering</td>
<td>4</td>
</tr>
<tr>
<td>Material selection</td>
<td>11, 16, 30, 33, 45, 50</td>
</tr>
<tr>
<td>Materials science</td>
<td>65</td>
</tr>
<tr>
<td>Mechanical properties</td>
<td>63</td>
</tr>
<tr>
<td>Micro injection molding</td>
<td>28</td>
</tr>
<tr>
<td>Micro manufacturing</td>
<td>28</td>
</tr>
<tr>
<td>Micromechanics</td>
<td>10, 53</td>
</tr>
<tr>
<td>Mixing</td>
<td>42, 43</td>
</tr>
<tr>
<td>Modeling</td>
<td>19, 23, 31</td>
</tr>
<tr>
<td>Mold assembly</td>
<td>17, 32</td>
</tr>
<tr>
<td>Mold cooling</td>
<td>33</td>
</tr>
<tr>
<td>Mold design</td>
<td>9, 15, 16, 17, 18, 19, 24, 25, 29, 30, 31, 32</td>
</tr>
<tr>
<td>Mold engineering</td>
<td>17, 32, 39</td>
</tr>
<tr>
<td>Moldflow</td>
<td>19, 31</td>
</tr>
<tr>
<td>Molding simulation</td>
<td>19, 31</td>
</tr>
<tr>
<td>Mold making</td>
<td>15, 16, 25, 29, 30, 32</td>
</tr>
<tr>
<td>Monitoring</td>
<td>26, 48</td>
</tr>
<tr>
<td>Morphology</td>
<td>53, 57, 62, 64, 66</td>
</tr>
<tr>
<td>Multilayer</td>
<td>14, 35, 44</td>
</tr>
<tr>
<td>Nanocomposites</td>
<td>7, 46, 53</td>
</tr>
<tr>
<td>Nanomechanics</td>
<td>53</td>
</tr>
<tr>
<td>Nanoparticles</td>
<td>53, 66</td>
</tr>
<tr>
<td>NX</td>
<td>20</td>
</tr>
<tr>
<td>Packaging</td>
<td>5, 40, 44, 45</td>
</tr>
<tr>
<td>Part design</td>
<td>12, 13, 14, 19, 20, 31, 39</td>
</tr>
<tr>
<td>Physics</td>
<td>8, 64</td>
</tr>
<tr>
<td>Plasticizers</td>
<td>57</td>
</tr>
<tr>
<td>Plastics Handbook</td>
<td>4, 22</td>
</tr>
<tr>
<td>Plastics overview</td>
<td>4, 22</td>
</tr>
<tr>
<td>Plastics recycling</td>
<td>49</td>
</tr>
<tr>
<td>Plastics technology</td>
<td>4, 22</td>
</tr>
<tr>
<td>Polyethylene</td>
<td>57, 58</td>
</tr>
<tr>
<td>Polymer chemistry</td>
<td>64</td>
</tr>
<tr>
<td>Polymer data</td>
<td>9, 24</td>
</tr>
<tr>
<td>Polymer engineering</td>
<td>23</td>
</tr>
<tr>
<td>Polymeric materials</td>
<td>50</td>
</tr>
<tr>
<td>Polymer mixing</td>
<td>42</td>
</tr>
<tr>
<td>Polymer processing</td>
<td>23</td>
</tr>
<tr>
<td>Polymer structure</td>
<td>64, 65</td>
</tr>
<tr>
<td>Polymer science</td>
<td>10</td>
</tr>
<tr>
<td>Polyolefins</td>
<td>57</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>57</td>
</tr>
<tr>
<td>Precision injection molding</td>
<td>28</td>
</tr>
<tr>
<td>Prepregs</td>
<td>46</td>
</tr>
<tr>
<td>Process control</td>
<td>6, 9, 25, 26, 27, 34, 38</td>
</tr>
<tr>
<td>Process design</td>
<td>23</td>
</tr>
<tr>
<td>Process development</td>
<td>33</td>
</tr>
<tr>
<td>Processing data</td>
<td>6, 9, 24, 34</td>
</tr>
<tr>
<td>Process visualization</td>
<td>9, 27</td>
</tr>
<tr>
<td>Keyword</td>
<td>Page(s)</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Product design</td>
<td>12</td>
</tr>
<tr>
<td>Prototyping</td>
<td>41, 45</td>
</tr>
<tr>
<td>PVC</td>
<td>57, 59</td>
</tr>
<tr>
<td>Quality control</td>
<td>48, 66</td>
</tr>
<tr>
<td>Rapid prototyping</td>
<td>5, 15, 30, 41</td>
</tr>
<tr>
<td>Recycling</td>
<td>26, 44, 49</td>
</tr>
<tr>
<td>Regulations</td>
<td>58</td>
</tr>
<tr>
<td>Resistance</td>
<td>61, 63</td>
</tr>
<tr>
<td>Rheological behavior</td>
<td>23</td>
</tr>
<tr>
<td>Rheological properties</td>
<td>63, 65, 66</td>
</tr>
<tr>
<td>Rheology</td>
<td>8, 37, 44, 65, 66</td>
</tr>
<tr>
<td>Rotational molding</td>
<td>18, 48</td>
</tr>
<tr>
<td>Rubber</td>
<td>14, 20, 35, 54</td>
</tr>
<tr>
<td>Rubber components</td>
<td>56</td>
</tr>
<tr>
<td>Rubber compounding</td>
<td>43, 54</td>
</tr>
<tr>
<td>Rubber compounds</td>
<td>11, 55</td>
</tr>
<tr>
<td>Rubber processing</td>
<td>54</td>
</tr>
<tr>
<td>Rubber products</td>
<td>54, 55</td>
</tr>
<tr>
<td>Runners</td>
<td>9, 18, 27, 28, 29</td>
</tr>
<tr>
<td>Scanning electron microscopy</td>
<td>61, 63, 64</td>
</tr>
<tr>
<td>Scientific molding</td>
<td>11, 33</td>
</tr>
<tr>
<td>Screw design</td>
<td>7, 34, 38, 44</td>
</tr>
<tr>
<td>Simcenter 3D</td>
<td>20</td>
</tr>
<tr>
<td>Simulation</td>
<td>7, 19, 20, 23, 25, 31, 45</td>
</tr>
<tr>
<td>Single screw extrusion</td>
<td>37</td>
</tr>
<tr>
<td>SMC</td>
<td>48</td>
</tr>
<tr>
<td>Snap-Fit</td>
<td>12</td>
</tr>
<tr>
<td>Software</td>
<td>19, 23</td>
</tr>
<tr>
<td>SPC</td>
<td>38</td>
</tr>
<tr>
<td>Special injection molding processes</td>
<td>9, 27</td>
</tr>
<tr>
<td>Stability</td>
<td>61</td>
</tr>
<tr>
<td>Stabilization</td>
<td>59</td>
</tr>
<tr>
<td>Supply chain</td>
<td>54</td>
</tr>
<tr>
<td>Surface modification</td>
<td>47</td>
</tr>
<tr>
<td>Synthetic fibers</td>
<td>52</td>
</tr>
<tr>
<td>System technology</td>
<td>26</td>
</tr>
<tr>
<td>Testing</td>
<td>56, 65</td>
</tr>
<tr>
<td>Textile technology</td>
<td>49</td>
</tr>
<tr>
<td>TGA</td>
<td>8, 62</td>
</tr>
<tr>
<td>Thermal analysis</td>
<td>8, 62</td>
</tr>
<tr>
<td>Thermoforming</td>
<td>18, 40, 50</td>
</tr>
<tr>
<td>Thermoplastics</td>
<td>56, 57</td>
</tr>
<tr>
<td>Thermoplastic foam extrusion</td>
<td>38</td>
</tr>
<tr>
<td>Three-Dimensional molded interconnect devices</td>
<td>49</td>
</tr>
<tr>
<td>Tool design</td>
<td>14</td>
</tr>
<tr>
<td>Tolerances</td>
<td>28</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>6, 25, 27, 33, 34, 35, 37, 38, 39, 47, 48, 55, 64</td>
</tr>
<tr>
<td>Twin screw extrusion</td>
<td>7, 11, 34, 36</td>
</tr>
<tr>
<td>Venting</td>
<td>16, 30, 33</td>
</tr>
<tr>
<td>Videos</td>
<td>4</td>
</tr>
<tr>
<td>Viscosity</td>
<td>9, 24</td>
</tr>
<tr>
<td>Waste handling</td>
<td>49</td>
</tr>
<tr>
<td>Welding</td>
<td>13, 47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z88Aurora</td>
<td>20</td>
</tr>
</tbody>
</table>
Numbers
3D Printing
Understanding Additive Manufacturing ______ 5, 41

A
Additive Manufacturing
3D Printing for Prototyping and Manufacturing __ 41
Adhesion and Adhesives Technology
An Introduction ____________________________ 51
Advanced Injection Molding Technologies __ 9, 27
Analyzing and Troubleshooting Single-Screw Extruders 37
A Practical Approach to Scientific Molding____ 33
Atlas of Polymer Structures
Morphology, Deformation and Fracture Structures 64

B
Basic Polymer Engineering Data ______________ 50
Blow Molding Design Guide___________________ 39
Blow Molding Handbook _____________________ 39
Blown Film Extrusion________________________ 6, 35

C
Coloring of Plastics
Fundamentals – Colorants – Preparations ______ 43
Composite Technology
Prepregs and Monolithic Part Fabrication Technologies 46
Compression Molding_______________________ 48
Continuous-Discontinuous Fiber-Reinforced Polymers
An Integrated Engineering Approach __________ 7
Co-Rotating Twin-Screw Extruders: Fundamentals 11, 36

D
Designing Plastic Parts for Assembly _________ 12
Designing with Plastics _____________________ 13
Diagonistics of Extrusion Processes ___________ 38
Die Design for Extrusion of Plastic Tubes and Pipes
A Practical Guide ____________________________ 14, 35
Discontinuous Fiber Reinforced Composites
Fundamentals and Applications ________________ 10

E
Elastic Behavior of Polymer Melts
Rheology and Processing _____________________ 8, 66
Electron Beam Curing of Composites __________ 46
Engineered Rubber Products
Introduction to Design, Manufacture and Testing 54
Engineering Biopolymers
Markets, Manufacturing, Properties and Applications 51
Engineering Biopolymers:
Homopolymers, Blends, and Composites ______ 51
Engineering with Rubber
How to Design Rubber Components ____________ 20
Evolved Gas Analysis
Hyphenated Techniques _________________________ 8
Extrusion Control
Machine – Process – Product ____________________ 37
Extrusion Dies for Plastics and Rubber
Design and Engineering Computations ______ 14, 35
Extrusion of Polymers
Theory & Practice ____________________________ 7, 34

F
Fatigue, Stress, and Strain of Rubber Components
Guide for Design Engineers____________________ 56
Film Processing ______________________________ 44
Film Processing Advances ____________________ 44
Finite Element Analysis for Engineers
Basics and Practical Applications with Z88Aurora 20
Flame Retardants for Plastics and Textiles
Practical Applications __________________________ 58
Flow Analysis of Injection Molds ____________ 19, 31

G
Gas-Assist Injection Molding
Principles and Applications ____________________ 48
Gastrow Injection Molds ______________________ 16, 32

H
Handbook of Plastics Failure Analysis__________ 63
Hollow Plastic Parts
Design and Manufacture_______________________ 18
Hot Runner Technology ________________________ 18, 28
How to Improve Rubber Compounds
1800 Experimental Ideas for Problem Solving __ 55
How to Make Injection Molds ________________ 16, 30

I
Industrial Polymers _________________________ 50
Injection Mold Design Engineering___________ 17, 32
Injection Molding
An Introduction __________________________ 25
Technology and Fundamentals _______________ 26
Injection Molding Advanced Troubleshooting Guide
The 4M Approach __________________________ 27
Injection Molding Handbook_________________ 25
Injection Molding Machines
A User’s Guide ____________________________ 27
Injection Molding –
Process Control, Monitoring, and Optimization __ 26
Injection Molding Processing Data _______ 9, 24
Injection Moulds for Beginners__________ 15, 25

J
Joining of Plastics
Handbook for Designers and Engineers ______ 13

L
Laser Sintering with Plastics
Technology, Processes and Materials _______ 41

M
Materials Science of Polymers for Engineers___ 65
Micro Injection Molding ___________________ 28
Mixing and Compounding of Polymers
Theory and Practice ________________________ 43
Mixing of Rubber Compounds _____________ 43
Mold Engineering_________________________ 17, 32
Moldflow Design Guide _____________________ 19, 31
Molding Simulation
Theory and Practice ________________________ 19, 31
Mold-Making Handbook______________________ 15, 30

N
Nano- and Micromechanics of Polymers
Structure Modification and Improvement of Properties 53

P
Plastic Part Design for Injection Molding
An Introduction __________________________ 14
Plastics Additives Handbook________________ 59
Plastics and Composites Welding Handbook___ 47
Plastics Failure Guide
Cause and Prevention_______________________ 61
Plastics Flammability Handbook
Principles, Regulations, Testing, and Approval___ 58
Plastics Handbook
The Resource for Plastics Engineers _________ 4, 22
Plastics in Automotive Engineering
Exterior Applications ________________ 45
Plastics Injection Molding
Scientific Molding, Recommendations
and Best Practices _________________________ 11, 33
Plastics Manufacturing Systems Engineering 15, 24
Plastics Packaging
Properties, Processing, Applications, and Regulations 45
Plastics Technology
Introduction and Fundamentals _____________ 4
Plastics Testing and Characterization
Industrial Applications _____________________ 64
Plastic Surface Modification
Surface Treatment and Adhesion _____________ 47
Polyethylene
End-Use Properties and their Physical Meaning __ 58
Polymer Blends ___________________________ 53
Polymer Chemistry
Properties and Applications ______________ 64
Polymer Extrusion _______________________ 34
Polymeric Foams and Foam Technology ______ 59
Polymeric Materials
Structure – Properties – Applications ______ 50
Polymeric Nanocomposites
Theory and Practice _______________________ 53
Polymer Mixing
A Self-Study Guide ________________________ 42
Polymer Processing
Modeling and Simulation ________________ 23
Principles and Modeling ___________________ 23
Polymer Rheology
Fundamentals and Applications _____________ 65
Polymer Science
A Textbook for Engineers and Technologists____ 10
Polymer Testing __________________________ 63
Polyolefins
Processing, Structure Development, and Properties 57
Polypropylene Handbook___________________ 57
Precision Injection Molding
Process, Materials, and Applications ________ 28
Title Index

Processing of Composites __________________ 47
Processing of Polymer Nanocomposites _____ 7, 46
PVC Additives
Performance, Chemistry, Developments, and Sustainability ________________________ 59
PVC Handbook __________________________ 57

R
Raw Materials Supply Chain for Rubber Products 54
Resistance and Stability of Polymers _______ 61
Rheological and Morphological Properties of Dispersed Polymeric Materials
Filled Polymers and Polymer Blends__________ 66
Rheology in Plastics Quality Control__________ 66
Robust Plastic Product Design: A Holistic Approach 12
Robust Process Development and Scientific Molding
Theory and Practice _________________________ 33
Rotational Molding
Design, Materials, Tooling, and Processing____ 48
Rubber Processing
Technology – Materials – Principles __________ 54
Rubber Technology
Compounding and Testing for Performance __ 11, 55
Runner and Gating Design Handbook
Tools for Successful Injection Molding ____ 9, 18, 29

S
Scanning Electron Microscopy of Plastics Failure 61
Selecting Injection Molds
Weighing Cost versus Productivity ________ 17, 29
Simple Methods for Identification of Plastics___ 63
Simulations with NX/Simcenter 3D
Kinematics, FEA, CFD, EM and Data Management 20
SPC
Statistical Process Control in Injection Molding and Extrusion ________________________ 38
Structure and Rheology of Molten Polymers
From Structure to Flow Behavior and Back Again 65
Synthetic Fibers
Machines and Equipment Manufacture, Properties 52

T
Technology of Polymer Packaging___________ 45
Textile Technology
An Introduction __________________________ 49

The Complete Part Design Handbook
For Injection Molding of Thermoplastics _______ 13
The First Snap-Fit Handbook
Creating and Managing Attachments for Plastics Parts 12
The Physics of Polymer Interactions
Application to Rheology and Processing_______ 8
Thermal Analysis in Practice
Fundamental Aspects ______________________ 62
Thermal Analysis of Plastics
Theory and Practice _________________________ 62
Thermoforming ____________________________ 5, 40
Thermoplastic Elastomers _________________ 56
Thermoplastic Foam Extrusion
An Introduction ____________________________ 38
Three-Dimensional Molded Interconnect Devices
Materials, Manufacturing, Assembly, and Applications for Injection Molded Circuit Carriers_______ 49
Training in Injection Molding_______________ 26
Training in Plastics Technology______________ 22
Troubleshooting Rubber Problems___________ 55
Troubleshooting the Extrusion Process
A Systematic Approach to Solving Plastic Extrusion Problems ___________________________ 6, 37
Twin Screw Extrusion
Technology and Principles _________________ 36

U
Understanding Blow Molding _______________ 39
Understanding Extrusion___________________ 6, 34
Understanding Injection Mold Design_______ 16, 30
Understanding Injection Molds______________ 29
Understanding Plastics Engineering Calculations
Hands-on Examples and Case Studies___________ 24
Understanding Plastics Packaging Technology __ 44
Understanding Plastics Recycling
Economic, Ecological, and Technical Aspects of Plastic Waste Handling___________________ 49
Understanding Plastics Testing________________ 62
Understanding Polymer Processing
Processes and Governing Equations ___________ 23
Understanding Thermoforming ______________ 40
Understanding Thermoplastic Elastomers ______ 56
User’s Guide to Plastic____________________ 4, 22

75