From hardware and materials through processing and properties, a broad coverage of blown film extrusion is presented. A primary objective of this book is to ensure a useful balance of theory and practice. The reader will find the answers to "Why?" they encounter certain effects in the blown film process so that they are better able to troubleshoot and improve their operations. At the same time, current practices and equipment are emphasized to keep readers up-to-date with the most productive and efficient technology.

The companion CD-ROM, The Blown Film Extrusion Simulator, is provided to enhance the learning process. This software was developed specifically to teach blown film extrusion equipment operation and processing principles. The realistic graphic interface and intuitive operating techniques were designed to emulate actual processing methods so that learners can quickly move from the simulator to real production equipment. Throughout this book, exercises using the simulator are described to complement the methods and principles explained. Readers are encouraged to take a break from the book and spend a few minutes with the simulator to enhance their understanding of the content.

Contents:
- Materials for Blown Film
- Extrusion Overview
- Hardware for Blown Film
- Processing
- Co-extrusion
- Properties
- Troubleshooting
This book is unique in its focus on market-relevant bio/renewable materials. It is based on comprehensive research projects, during which these materials were systematically analyzed and characterized. For the first time the interested reader will find comparable data not only for biogenic polymers and biological macromolecules such as proteins, but also for engineering materials.

The reader will also find valuable information regarding micro-structure, manufacturing, and processing-, application-, and recycling properties of biopolymers.
Additive Manufacturing (AM) is the worldwide used term for layer oriented or generative manufacturing which originally was introduced at the end of the 1980s as Rapid Prototyping. Within the last 20 years it has developed dramatically. Today it is not just a valuable tool for making models and prototypes, but a manufacturing method for final parts as well as for mold inserts. It spreads throughout all disciplines and branches of industry, from art to medicine and from car manufacturing to aerospace engineering. AM is about to revolutionize the manufacturing technology in general.

This book is designed as a supporting material not only for special courses on advanced manufacturing technology, but for up-dating the content of traditional manufacturing lessons. It also provides basic information to facilitate self studies and is a valuable quick guide to AM.
Plastics fabrication and applications have seen significant growth; therefore testing of these materials requires viable measuring and evaluation processes. The classical methods of testing have been advanced in recent years and new methods established.

This book describes the correlation between the microstructure and macroscopic properties. Additionally, it introduces processes that allow the derivation of particular information about compromising factors and mechanisms.

A special feature of the book is the emphasis on the informative value of material specification for the appreciation of component properties.

Contents:
- Introduction into Testing Plastics and Composites
- Fabrication and Preparation of Test Samples
- Determination of Process Related Properties
- Mechanical Properties of Plastics
- Toughness Testing using Fracture Mechanical Tests
- Testing of Physical Properties
- Evaluation of Tension Fracture Resistance
- Non-destructive Tests
- Hybrid Methods for Material Diagnostics
- Testing Composite Materials
- Technological Tests
- Micro Test Technique

The authors:
Professor Wolfgang Grellmann teaches break mechanic of plastics and composites at the Martin-Luther University of Halle-Wittenberg.
Professor Sabine Seidler is vice dean of research and teaches about non-metallic materials at the Technical University of Vienna.
This book imparts the knowledge and understanding of the complex behavior of plastics. It works out the salient aspects for engineers in order to provide a basis for the development of mature products, appropriate design, and fabrication processes.

It has also been written for the practical by students and engineers. Text and structure of the book are compact, yet no essential information has been left out. The book offers easy-to-understand access to the nature of polymer materials. It intends to help the next generation of engineers to employ plastics in successful and sustainable ways.

The authors:
Professor emeritus Georg Menges at the RWTH Aachen.

Professor Edmund Haberstroh has taught at the RWTH Aachen about natural rubber since 1995.

Professor Walter Michaeli teaches at the RWTH Aachen. He has been the head of IKV since 1989.

Professor Ernst Schmachtenberg teaches about polymer technology at the RWTH, where he is also the dean.
This book presents structure, properties, and applications of polymers in an easy-to-understand yet scientifically sound form. It has been written for engineers and technicians, both students and practitioners.

The text starts with an introduction to the nature and structure of polymer materials as they pertain to understanding the behavior under physical, thermal, and chemical loads in the application. The author pays special attention to common mechanical properties, such as hardness and transformation behavior, aging, internal stress, and orientation. He also writes about the effects of fortifiers, toughness modifiers, and softening agents.

Contents:
- Economic Development
- Classification of Polymer Materials
- Design of Polymer Materials
- Structure of Polymer Materials (thermoplastics, thermosets, elastomers, blends, composite materials)
- Thermal-Mechanical Conditions
- Mechanical Behavior (deformation, orientation, internal stresses)
- Aging and Stabilization

The author:
Professor Gottfried Ehrenstein, retired, was head of the Department for Polymer Technologies at the University of Erlangen-Nürnberg.
Die Finite Elemente Methode ist heute ein Standardwerkzeug in der Produktentwicklung von Kunststoff- und Elastomerbauteilen. Ein Grundverständnis der rechnerischen Auslegung solcher Bauteile ist somit nicht nur beim Anwender von Simulationssoftware, sondern auch bei all denen, die sich mit den Ergebnissen von FEM-Simulationen auseinandersetzen müssen gefordert.

In viele Entscheidungsprozesse in der Produktentwicklung fließen Simulationsergebnisse ein, die es erforderlich machen, dass die Entscheidungsträger die gelieferten Ergebnisse richtig interpretieren und kritisch hinterfragen, um damit deren Zuverlässigkeit zu beurteilen. Zum einen muss also von den verantwortlichen Mitarbeitern ein Verständnis des spezifischen Werkstoffverhaltens dieser Materialien gefordert werden. Zum anderen kann dieses Werkstoffwissen nur erfolgreich in der FEM genutzt werden, wenn die grundlegenden Vorgehensweisen der Methode ausreichend verstanden sind.

Wer Kunststoffe, ihre Eigenschaften, Verarbeitung und Anwendungen von Grund auf verstehen möchte, muss sich mit ihrer Chemie befassen.

Dieses seit Jahren bewährte Fachbuch macht es Ingenieuren leicht, sich diese Thematik zu erschließen. Es ist anschaulich geschrieben, dabei fachlich fundiert und grundlegend.

Die hier vorliegende dritte Auflage ist aktualisiert, durchgehend überarbeitet und um Themen ergänzt wie z.B. Alterung und Alterungsschutz, chemische Reaktionen bei der Kunststoffverarbeitung, Nanotechnologie, Biopolymere.


Dieser anregende "Chemie-Cocktail" aus Theorie und Praxis eignet sich als Lehrbuch, als Nachschlagewerk oder als Hilfe bei der Werkstoffauswahl. Eben für alle, die Kunststoffe noch erfolgreicher anwenden wollen.

Inhalt

Grundlagen
Technologie der Verarbeitung von Kunststoffen
Polyolefine
Chlor-Kunststoffe
Polystyrol-Kunststoffe
Ester-Thermoplaste
Stickstoff-Thermoplaste
Acetal- und Ether-Thermoplaste
Fluor-Kunststoffe
Duroplaste
Hochleistungspolymere
Elastomere
Schaumstoffe
Kunststoffe als Sonderwerkstoffe
Arbeitssicherheit, Gesundheits- und Umweltschutz beim Umgang mit Kunststoffen
2012
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.

The author:
**Harry Pruner**, a degreed engineer, is the CEO of Pruner Marketing Services GmbH.

**Wolfgang Nesch** was a master toolmaker with the Ferromatik Milacron Company for more than 30 years. He worked in the application technology department for injection mold tools.
Goerg H. Michler, Francisco Baltà-Calleja

Nano- and Micromechanics of Polymers
Modification and property-improvement of polymers via nano and microstructural design
Approx: 500 pages
Hardcover
Publication date: March 2012

E-Book-Rights

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 of the book. Thus, it offers a key for a better understanding of structure-property-correlations of nearly all polymers of interest in industrial applications. A central aim of the book is to show, how by changing the morphology, microprocesses and, finally, the mechanical properties can be improved.

There is no other book available on the market, which is focused on micromechanical processes of polymers and their role to improve the properties of polymeric materials.

Kelvin Okamoto

Understanding Sustainability - Testing and Certification
Approx 175 pages
Hardcover, four-colour printing
Publication date: June 2012

E-Book-Rights

This book is to provide a basic overview of sustainability testing and certification for materials and products. Topics covered range from the three R’s (Reduce, Reuse and Recycle) to recycled content to renewably sourced to end-of-life options. Additionally, this book provides guidelines on how to set up a sustainability testing and certification program within a company. The intended audience is the new practitioners learning what needs to be done in their company and the accomplished practitioner needing a good summary of sustainability options possible for materials and products.
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

The authors describe current practices in rubber engineering. At the end of each chapter, sample questions and problems (together with solutions) are provided, allowing the reader to gauge how well he/she has mastered the material.

Contents:
- Materials and Compounds
- Elasticity
- Dynamic Mechanical Properties
- Strength
- Mechanical Fatigue
- Durability
- Design of Components
- Finite Element Analysis
- Test and Specifications
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, and yet take the resin rheology into account, 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.

Problems related to melt fracture, homogeneity of the melt, effect of screw geometry on the quality of the melt and the effect of die pressure on the pellet surface and their troubleshooting are only few of the topics among many that are dealt with in detail. All the calculations involved can be handled by pocket calculators and hence can be performed right on the site where the machines are running. This guide is a valuable tool not only to troubleshoot but also to estimate the effect of design and process parameters on the product quality in plastics processing.

Natti S. Rao did his B.Tech (Hons) in Mechanical and M.Tech in Chemical Engineering at the Indian Institute of Technology in India. He received his Ph.D. in Chemical Engineering from the University of Karlsruhe in Germany, and then joined BASF AG. He has developed software for designing polymer machinery which is being used by well-known companies in various countries. As proprietor of Plastics Solutions International, a consultant company, Dr.Rao is presently involved in consultant work in plastics and chemical engineering, and also holds seminars teaching the application of his software of designing polymer machinery. Dr.Rao authored four books on designing plastics machinery. He has approximately 60 publications in the fields of extrusion and injection molding and has worked as a visiting professor of Plastics Engineering at the Indian Institute of Technology, Chennai (Madras). Dr.Rao is a fellow of the Society of Plastics Engineering (SPE).
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.

The book consists of two parts. The first part deals with cross-sectoral matters, such as single-screw extruder, double-screw extruder, drive systems and controllers. These are important regardless of their specific application. The reader will learn basic process technological correlations that will help to solve practical problems.

The second part describes specific characteristics of the processes:
- Pipe extrusion
- Profile extrusion
- Flat-extrusion films
- Blow-extrusion films

The text strives to deliver quality descriptions to describe specific requirements of a given application. It also encourages discussions about new technologies.

The author:
Professor Andreas Limper taught plastics processing machines at the University Of Paderborn between 1995 and 2003. Since 2004 he has been the CEO of the Harburg Freudenberger Maschinenbau Company.

English translation title “Mixing of Rubber compounds” planned for spring 2012
Backlist
SEM of Plastic Failure
This comprehensive collection of SEM photographs of exemplary mechanical, thermal, chemical, and tribological failure cases and their detailed description is an invaluable tool for everyone involved in development, design, quality management, and manufacturing of plastic parts. The book provides the information necessary to assess failure and its causes and to identify corrective measures and preventive actions. More than 400 examples of failure cases are identified, explained in detail, and interpreted.

Content:
Structure - Processing - Properties; Material Inherent Defects; Surface Damage: Frictional, Rolling, Solid Particle Stream, Erosion, Cavitation, Chemicals, UV Radiation, Weathering; Elevated Temperature; Ductile and Brittle Overload Fractures; Dynamic Fatigue Fractures, Creep Fractures; Environmental Stress Cracking; Embrittlement; Properties and Characteristics of Plastics
Polymer surface modification is a topic that has been the object of a large number of investigations by academia and industry, but relatively little attention has been paid to surface activation technologies which, when appropriately utilized, make specific polymer-based surfaces receptive to value-adding interfaces such as inks, coating and adhesive formulations. Adhesion strength is generally determined by the properties of a base material and its interface. Optimizing adhesion strength can be accomplished by modifying these interfaces chemically and physically. As polymers are continually engineered to meet new product application requirements, optimizing the activation of these surfaces requires a fresh look at cost effective ways to etch, clean and functionalize them. These demands require detailed information on the surface treatment of classic materials, as well as an examination of the latest surface treatment machine designs available anywhere in the world today which are used to process these materials. There are four full chapters devoted specifically to corona, ozone, flame, and plasma discharge surface treatment technologies; and an interesting and useful identification of common adhesion maladies.

The aim of this book is to describe the primary polymer adhesion issues faced by manufacturers, processors and converters, to outline a variety of methods for attaining an appropriately activated surface, and to provide the diagnostics for various adhesion promotion issues which the reader seeks to trouble-shoot.
Twin Screw Extrusion has become an important part of polymer processing technology.

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.

Review: "The book is a tour-de-force..."
—Optimum Evaluation
This book presents basic information on extrusion technology and is accessible to professionals without an engineering degree. Written for extruder operators, supervisors, and technical service professionals, but also for newcomers to the industry and students, it introduces the process, the machinery and general information on process control, materials, and trouble shooting.

The second edition is extended to cover high-speed extrusion, how to reduce material cost, efficient extrusion, purging and product changeover, how to reduce energy consumption, new developments in extruder screw design, 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.

The second edition includes new chapters on die design, elastic effects in melt flow, and a new type of single-screw extruder with channeled barrel as well as improvements and corrections of the first edition.

The Content:
- Physical Description of Single Screw Extrusion
- Fundamentals of Polymers and Melt Rheology
- Theory of Single-Screw Extrusion and Scale-Up
- Screw Design and High Performance Screws
- Gear Pumps, Static Mixers, and Dynamic Mixers
- Physical Description of Twin-Screw Extruders
- Die Design
- Elastic Effects in Melt Flow
- Special Single-Screw Extruder with Channeled Barrel
Troubleshooting extrusion problems is one of the most challenging tasks for everyone involved in extrusion operations. It requires a good understanding of the extrusion process, knowledge of the material properties, good instrumentation, good analysis tools, and a systematic and logical approach.

This book addresses all issues crucial in extrusion troubleshooting. In addition, industrial case studies, richly illustrated with photographs and photomicrographs, are used to provide exemplary approaches to efficient problem analysis and problem solving.

Contents

- Requirements for Efficient Troubleshooting
- Tools for Troubleshooting
- Systematic Troubleshooting
- Case Studies: Film Coextrusion - Degradation in the Middle Layer
- Film Coextrusion with Interfacial Problems
- Lines in Extruded Film
- Color Variation in Fibers
- Film with Poor Transparency
- Wear Problem in Film Extrusion
- Multilayer Film with Appearance Problems
- Dispersion Problem in HDPE Bottles
- Polymer Degradation
- Heat Sealing Problems in Coextruded Film
- Output Problem in Blown Film Line
- Master Batch Selection
- Pipe Extrusion Problems
- Systematic Problem Solving
- Machine Troubleshooting and Maintenance
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 troubleshooting tips is also provided. Topics that impact a robust process such as the use of regrind, mold cooling and venting are also described.

1. Introduction to Scientific Processing for Injection Molding
2. Introduction to Polymers
3. Polymer Rheology
4. Plastic Drying
5. Plastic Materials, Fillers and Additives
6. Injection Molding
7. Scientific Processing and Scientific Molding
8. Design of Experiments for Injection Molding
9. Types of Process Windows and Alarm Limits
10. Quality Control Concepts
11. Production Release of the Molds
12. Miscellaneous Topics affecting the Molding Process
13. Related Topics, Technologies and Troubleshooting

Appendix

Suhas Kulkarni is the President of FIMMTECH, a consulting firm that specializes in services related to injection molding. He earned his Masters in Plastics Engineering from the University of Massachusetts, Lowell and a Bachelors in Polymer Engineering from the University of Poona, India. He has 18 years of experience as a process engineer. His main area of expertise is Scientific Processing for Injection Molding. Based on his experience, he has developed a custom software called Nautilus, that aids the complete process development routine to production release.

He has given numerous presentations on Injection Molding related topics and written several articles. He also teaches a plastics and molding course at the University of California, San Diego and is a contract faculty at the University of Massachusetts at Lowell.
The goal of the book is to assist the designer in the development of parts that are functional, reliable, manufacturable, and aesthetically pleasing. Since injection molding is the most widely used manufacturing process for the production of plastic parts, a full understanding of the integrated design process presented is essential to achieving economic and functional design goals. Features over 425 drawings and photographs.

Contents:
- Introduction to Materials
- Manufacturing Considerations for Injection Molded Parts
- The Design Process and Material Selection
- Structural Design Considerations
- Prototyping and Experimental Stress Analysis
- Assembly of Injection Molded Plastic Parts
- Conversion Constants
This book provides the background needed to understand not only the wide field of polymer processing, but also the emerging technologies associated with the plastics industry in the 21st Century. The book combines practical engineering concepts with modeling of realistic polymer processes. It is divided into three sections that provide the reader sufficient knowledge of polymer materials, polymer processing, and modeling. Understanding Polymer Processing is intended for the person who is entering the plastics manufacturing industry and as a textbook for students taking an introductory course in polymer processing. This three-part book also serves as a guide to the practicing engineer when choosing a process, determining important parameters and factors during the early stages of process design, and when optimizing such a process. Practical examples illustrating basic concepts are presented throughout the book.

Contents:

- Part I - Polymeric Materials
  This section gives a general introduction to polymers, including mechanical behavior of polymers and melt rheology
- Part II - Polymer Processing
  The major polymer processes are introduced in this section, including extrusion, mixing, injection molding, thermoforming, blow molding, film blowing, and many others.
- Part III - Modeling
  This last section delivers the tools to allow the engineer to solve back-of-the-envelop polymer processing models. It includes dimensional analysis and scaling, transport phenomena in polymer processing, and modeling polymer processes
M.Sc. Felipe Wolff-Fabris started his materials engineering studies at the Universidade Federal do Rio Grande do Sul, Brazil in 1999. In 2002, he was selected to participate in a double degree programme at the Ecole Centrale de Nantes in France. Under this programme, he had the opportunity to spend more than two years in France to pursue academic study and collaborative research. His diploma thesis was focused on thermoplastic composites and specifically looked into the functionalization of silane coupling agents for glass fibre reinforced polyethylene. In August 2005, he successfully earned his Master's degree (Diplôme d'Ingénieur). Subsequently, Mr. Wolff-Fabris joined the Department of Polymer Engineering at the University of Bayreuth, Germany, as scientific member, and in 2007, he became leader of the group "Thermosetting Polymers and Composites".

Prof Dr.-Ing. Volker Altstädt. After his university studies in physics and Dr.-Ing. in 1987 with Prof. Dr.-Ing. Ehrenstein at the department of Mechanical Engineering in Kassel, he worked as a group leader for 8 years in the Department of Polymer Physics under the Polymer Research Division of BASF AG in Ludwigshafen. Since 1995 he has been a full Professor for Polymers in Mechanical Engineering and head of the Department of Polymers and Polymer Composites at the Technical University Hamburg-Harburg, Germany. Since 2000, he has been the head of the Department of Polymer Engineering at the University of Bayreuth, Germany.

Dr. Ulrich Arnold studied chemistry at the University of Heidelberg, Germany and received his Ph.D. in 1998. After a postdoctoral stay at the State University of Campinas (Sao Paulo, Brazil) he moved to the Forschungszentrum Karlsruhe, in 2001. He is group leader at the Department of Technical Chemistry and his research activities focus on catalysis (development of catalyst systems based on organic polymers) and polymer.
The book provides
- Fundamental information about the aspects of curing reactions;
- Direct approach to material requirements and parameters affecting EB curing;
- Analysis of the use of current moulding technologies combined to EB curing;
- A description of research projects and main addressed topics;
- Examples of EB curing applications within the composite industry

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. The reader is introduced to fundamental information regarding curing reactions, to material requirements and parameters affecting EB curing, and the analysis of current molding technologies combined with EB curing. A description of research projects and the main topics they address as well as examples of EB curing applications within the composite industry are also presented.
Synthetische Polymerwerkstoffe stellen im Vergleich zu Metallen und Keramik zwar eine relativ junge Werkstoffklasse dar, haben aber aufgrund ihrer maßgeschneiderten Eigenschaften einen Spitzenplatz unter den Werkstoffen erobert.


"Kunststoffe - Eigenschaften, Verarbeitung und Prüfung"
2. Polymere Werkstoffe - Chemische Grundlagen, Polymerisation, Polyaddition, Polykondensation, Arten polymerer Werkstoffe
3. Thermoplaste - Herstellung, Einteilung, Standardkunststoffe: Eigenschaften, Charakteristik, Anwendungen, Technische Thermoplaste, Hochleistungsthermoplaste, Spezialkunststoffe
4. Kunststoffadditive - Füllstoffe, Faserwerkstoffe, Weichmacher, Flammschutzmittel, Stabilisatoren, Farbmittel, etc.
5. Verarbeitung von Thermoplasten - Aufbereiten, Urformen, Umformen, Fügen Veredelung
6. Kennwerte von Thermoplasten - Rheologische und mechanische Eigenschaften, Thermische Kennwerte, Brandverhalten, Elektrische Prüfungen, Sonstige Kennwerte
7. Kunststoffe und Umwelt
Anhang
A Übersichtstabellen
B Grundlegende Erläuterungen zu Kunststoffprüfungen
C Einführung in die Chemie
D Glossar
E Literaturverzeichnis
Make it successful - use color!

The book conveys the most important facts of dying plastics in an easy-to-understand form.

These are:

- The importance of color for plastic goods and products
- The most important basics of the perception of color
- The interrelationships of tests and the evaluation of the appearance of products
- The most important requirements and properties of coloring agents
- The aging of dyed plastics
- The principle methodology to design a color formula
- The most relevant correlations for distributive and dispersive mixing
- The principle possibilities of dying
- The effects of particular coloring matters
- The material and process specific influences on the tone
- The industrial equipment for dying plastics including possible compounding machines
Plastics – Properties, Processing, Standards
Up-to-date Information

The "Material Guide Plastics" is in the 10th printing since it first came out 35 years ago. This proves that the book serves the need of the market. Material properties and test procedures, processing options and application examples are comprehensively and clearly presented. They offer an excellent knowledge base for the professional in the field and the student in school and training.

The 10th edition has been thoroughly revised, updated, and amended. For instance, rheometric processes and PVT diagrams have been included and a new chapter has been devoted to biopolymers. All changes of important material and testing standards issued by the European (EN) and the International Standards Organizations (ISO) have been included. The authors paid particular attention to the detailed description of base materials, but also to new special materials such as biopolymers, composite systems, and polymer blends. The description of recycling efforts of plastics and possible environmental problems are up to the current state of technology.

The structural changes of the plastics industry are reflected in light of raw material producers and their brand names; the reader will find references to the online "material data center". If you are involved in construction, processing, applications, testing and recycling of plastics the Material Guide Plastics is right for you. It offers a quick and comprehensive overview of the composition and various kinds of plastics, including their properties, tests, and applications. Many diagrams and summaries compare possible applications of the different kinds of plastics.

- Easy-to-understand, practical presentation
- Many diagrams and summaries as a decision making aid for material selection
- Tables with well-arranged comparisons of properties of families of plastics
- The most important standards at a glance
Sustainability in PVC-Processing

- The subject of sustainability; a first in literature
- How PVC can be processed in an environmentally friendly manner
- Suggested formulation and test procedures for "starters"
- Troubleshooting tips for typical problems and mistakes during processing

PVC is distinguished from other plastic products because of the use of stabilizers. There are different metal compounds that are suitable to stabilize PVC such as lead, tin, calcium, magnesium, zinc, rare earths, and nearly all non-metal systems. In the introductory section of the book these differences are discussed from the chemist's point of view with their advantages, possibilities, and problems, but in a way the businessman and technician will understand.

Numerous tables and illustrations make this book a reference guide of structures and physico-chemical data. Job starters will find a section with suggested formulations and test procedures. A short chapter is devoted to trends in Europe. The subject of sustainability is discussed in depth and the author elaborates the great potential of PVC to become a completely sustainable material. Another chapter deals with the problems with PVC fabrication such as contamination, photo effects, and plate out. Plate out seems to be a normally occurring problem when processing PVC, but there are few publications about it. Before now the causes, influences, and mechanisms have been little understood. This section of the book offers many pieces of advice to the PVC-processor for the selection, dosage, and influencing factors of the ingredients. This has not been discussed before in technical literature.
Recognize the Problem - Prevent the Problem

This handbook is written for professionals and students and uses pictures and analysis to teach about problems with plastics and their prevention.

Many technical terms, also verbiage used by nonprofessionals, definitions, and references to other fields will help in damage analysis. The book uses 588 microscopic images derived from quality and damage analyses of form matter, semifinished and formed parts. The images are subdivided in 74 disciplines of plastics fabrication and applications. In addition, the contents include a glossary of 2620 quality and damage related terms in alphabetic order. The analyses were performed with various optical microscopes and a scanning electron microscope.

- Unique compendium of images and analyses for damage prevention
- References to related fields help in the damage assessment
- 588 color images from microscopic quality and damage analysis of molding materials, semifinished and molded parts
- Fast and easy access to information through systematic and encyclopedic structure

The author:

Friedrich Kurr was on the faculty of the University of Applied Science in Würzburg-Schweinfurt until 2008. He lectured about light microscopy (LIM) and scanning electron microscopy (SEM) for quality and damage analysis of plastic form parts, semifinished products and granulates.
Practical Quality Control

The importance of plastics as an engineering material continues to grow. Plastic materials often have a favorable cost/performance ratio and are well suited for the quick and precise fabrication of complicated, multifunctional components. Within the context of lowering prices and increasing performance, these materials will take center stage in industrial applications to substitute conventional materials or make new developments possible in the first place.

Successful products require appropriate materials for their fabrication and stringent quality control during fabrication. Quality problems during production must be recognized and analyzed with appropriate tools.

This is the first book of its kind; it is devoted to modern testing technology and strategy in a practical way.

- Praxis oriented textbook for the investigation of quality problems and the necessary metrology
- Helps to solve practical problems when testing of plastic materials
- Offers testing strategies and explains the applicable methods
From Idea to Product

This handbook is an encyclopedia for product developers who create plastic products according to functional and economical criteria. It deals with the construction principles, material selection, design rules, dimensioning, production simulation and prototype fabrication. The cost aspects are always considered.

**Author:** Professor Thomas Brinkman, PhD, is the CEO of IMPETUS Plastics Engineering GmbH and professor at the Technical College in Rosenheim, Germany.

**Selling points:**
- Practical guide for innovative product development with plastics
- Offers overview for many test methods and an introduction into testing design
- On CD: CAD example data, check lists, evaluation and calculation data

**Targeted audience:**
- Designers and product developers

**Content:**

1. Product Planning Phase
2. Concept Phase of a Product
3. Design Principles
4. Material Selection
5. Product Design
6. Tolerances of Plastic Products
7. Dimensioning of Products and Elements
8. Production Simulation for Validation of the Product Development
9. Cost Calculations
10. Prototypes
11. Test and Trials

Aus dem Inhalt:
Verfahrenstechnik , Treibmittel, Polypropylen , Physik des Schäumens im TSG, Aktuelle Anwendungsbeispiele, Verfahrensvergleich , Einfluss des Spritzgießwerkzeuges, Maßgeschneiderte Polymere , Sondertechnologien TSG

Mit dieser Einführung erhalten Sie einen leicht verständlichen, umfassenden Überblick über alle Kunststoffverarbeitungsprozesse, ihre Verfahrenstechnik sowie die zugehörigen maschinenbaulichen Grundlagen. Die sechste Auflage enthält neue Kapitel zu den Themen Biopolymere und Spaltimprägnierung und stellt ein neu entwickeltes Verfahren zur Herstellung von Leichtbauteilen vor, welches zukünftig vielleicht die industrielle Herstellung revolutionieren wird.