HANSER PLASTIC BOOKS

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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 trade-off for these characteristics. This book is dedicated to providing the reader with various experimental ideas which may guide him or her to developing better compounds and solving technical problems.

In a combined effort, 18 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 trade-off with compound properties when developing new or improving tested rubber recipes.

Contents:
- Introduction
- Optimizing Cured Physical Properties
- Improving Degradation Resistance for Cured Rubber Compounds
- Optimizing Measurable Processability Properties
- Minimizing Adverse Processing Attributes
- How to Obtain Better Property Trade-Offs
- Compatibility for Blends of Elastomers as Part of Vulcanizable Compounds
- Typical Cure Packages for Compounds Based on Different Elastomer Base
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.

Contents:
- TSE and TPE Materials, Compounds, Processes, and Products
- TSE Materials and Compounds
- TSE Processes and Equipment
- TSE Products
- TPE Materials and Compounds
- TPE Processes and Equipment
- TPE Products
Three-dimensional molded interconnect devices (MIDs) enable mechanical, electronic, optical, thermal and fluidic functions to be integrated into injection-molded components. Function integration on this scale goes hand in hand with a high level of geometrical design freedom and opportunities for miniaturization, plus the associated reduction in weight and savings on product costs. MIDs are made primarily of recyclable thermoplastics, so they are more environmentally compatible than alternatives produced using other available technologies.

MIDs are used in virtually every sector of electronics. The many standard applications for MIDs in the automotive industry in particular also drive for further development and research into MID technology. The significance of MID technology is also increasing in medical engineering, IT and telecommunications and in industrial automation, with numerous applications now successfully implemented in all these various fields.

This book offers a comprehensive insight into the state of the art in 3D-MID technology along the entire process chain. Individual chapters, moreover, deal with systematics of targeted development of MID parts and explore, with a dozen and more successful series-production applications as examples, the widely diverse fields of application for MID technology.

Sales to Foreign Countries:
Russia
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.

Contents:

• Different Types of Extruders
• Extruder Hardware
• Instrumentation and Control
• Fundamental Principles
• Important Polymer Properties
• Functional Process Analysis
• Extruder Screw Design
• Die Design
• Twin Screw Extruders
• Troubleshooting Extruders
• Modeling and Simulation of the Extrusion Process

Chris Rauwendaal, president of Rauwendaal Extrusion Engineering, Inc., (REE, Inc), has experience in a wide range of extrusion operations, including fiber spinning, film, sheet, tubing, medical tubing, pipe, and profile extrusion, co-extrusion, and reactive extrusion. Rauwendaal holds several patents in the field of polymer processing. He has worked on both practical and theoretical problems, such as screw-and-die design, trouble shooting, modeling and computer simulation, material analysis, and failure analysis.
The widespread use of large scale units for manufacturing blown film, blow-molded articles, flat film, and extruded pipes necessitates troubleshooting on site. This book provides practical computational tools which can be applied easily on the shop floor to obtain quick solutions in these and many other areas of polymer extrusion.

Contents:
- Rheological Properties of Molten Polymers
- Analytical Procedures for Troubleshooting Extrusion Screws
- Investigating Die Performance and Die Design by Computational Tools
- Parametrical Studies
- Design Software
- Thermal Properties of Solid and Molten Polymers
- Heat Transfer 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 consultancy company, Dr. Rao is presently involved in consultancy work in plastics and chemical engineering, and also holds seminars teaching the application of his software of designing polymer machinery. Dr. Rao has 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).
This volume deals with manufacturing processes for preparing very thin polymer products.

Many professionals working on polymer films have requested that a newer version of Film Processing be published that includes more recent technologies and addresses the latest literature. Film Processing Advances provides a timely response to these requests. This edition is still a technically oriented book to be used by film processing professionals, graduate students, and researchers and it covers recent technologies of film extrusion, extruder screw design, die design, film structure, film temperature, crystallization dynamics, and film properties. Furthermore, Film Processing Advances focuses on multilayered films and recent developments relating to high performance films. The chapters in this edition are all essentially new and were designed to complement the materials found in Film Processing, which remains a relevant and important information resource.

Contents:
- Extruder and Screw Design for Film Processing
- Kinematics, Dynamics, Crystallization, and Thermal Characteristics
- Multilayer Die Design and Film Structures
- Die Flow Analysis and Mathematical Modeling of Film Blowing
- T-Die Film Casting
- An Overview of Molten Polymer Drawing Instabilities
- Biaxially Oriented Tentering Film
- Structure Development in Uniaxial and Biaxial Film Stretching
- Double Bubble Tubular Film Extrusion
- Double Bubble Tubular Film Process, Polymer Design, and its Application
- Highly Transparent Polypropylene Sheets

**Toshitaka Kanai** is Principal Researcher at the Performance Materials Laboratories of Idemitsu Kosan Co., where he has worked since 1976. He is President of the Japan Society of Polymer Processing, International Representative of the Polymer Processing Society, and a Visiting Professor at Kanazawa University.

**Gregory A. Campbell** is Professor Emeritus at Clarkson University, NY. He formerly directed a research group at GM Research and managed polymer fabrication at Mobil Chemical Research.
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. The reader should also be able to directly link new commercial changes in 175 commonly used chemical feedstocks to hundreds of different rubber compounding ingredients and polymers.

Contents:

Introduction
Strategic Raw Materials
General Purpose Elastomers
Specialty Elastomers
Textile Reinforcing Materials and their Adhesive Systems
Thermoplastic Elastomers
Polyurethane
Carbon Black, Fillers, Reinforcing Agents and Coupling Agents
Process Oils, Synthetic Ester Plasticizers, and Processing Aids
Curatives
Antioxidants, Antiozonants, Tackifiers, Flame Retardants, and Blowing Agents
Intermediate Feedstocks (which includes the 30 vital intermediates, as well as 135 other critical chemical intermediates with detailed information regarding availability disruptions that occur when they are in short supply).
“Designing Plastic Parts for Assembly” 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 will 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. Throughout, the treatment is practice-oriented and focused on everyday problems and situations. The 7th edition introduces a completely new chapter on overmolding and in-mold assembly, as well as a new chapter on bonding, including accompanying examples. Laser molding and ultrasonics coverage are also brought up to date, with illustrative case histories.

Contents:
- Understanding Plastic Materials
- Understanding Safety Factors
- Strength of Materials for Plastics
- Nonlinear Considerations
- Assembly Techniques for Plastics
- Press Fitting
- Living Hinges
- Snap Fitting
- Bonding
- In-Mold Assembly

Paul A. Tres is a Senior Technical Consultant with ETS, Inc. of Bloomfield Hills, Michigan (www.ets-corp.com) serving the plastics and automotive industries. He is author of a variety of seminar manuals, technical and marketing papers, including the bestselling textbook Designing Plastic Parts for Assembly, 7th edition, published by Carl Hanser Verlag of Munich, Germany (2014) and computer software for automotive plastic part design. Speaker, educator, and lecturer at numerous national and international plastics seminars and conferences, with over 16,700 attendees in 12 countries, among them Canada, France, Germany, India, Korea, Malaysia, Mexico, and Thailand, Paul Tres is a Fellow of International Society of Plastics Engineers. He is also an active contributor to and member of the Plastics Academy, International Society of Automotive Engineers, and American Society of Mechanical Engineers.