

# **Permeability Properties of Plastics and Elastomers**

Third Edition

Laurence W. McKeen



# Permeability Properties Of Plastics And Elastomers

## Third Edition Plastics Design Library

**Myer Kutz**



## **Permeability Properties Of Plastics And Elastomers Third Edition Plastics Design Library:**

**Permeability Properties of Plastics and Elastomers** Laurence W. McKeen, 2011-09-08 Permeability properties are essential data for the selection of materials and design of products across a broad range of market sectors from food packaging to Automotive applications to Medical Devices This unique handbook brings together a wealth of permeability data in a form that enables quick like for like comparisons between materials The data is supported by a full explanation of its interpretation and an introduction to the engineering aspects of permeability in polymers The third edition includes expanded explanatory text which makes the book accessible to novices as well as experienced engineers written by industry insider and author Larry McKeen DuPont and 20% new data and major new explanatory text sections to aid in the interpretation and application of the data A unique collection of permeability data designed to enable quick like for like comparisons between different materials Third edition includes 20% new data and expanded explanatory text which makes the book accessible to novices as well as experienced engineers Essential reference for materials engineers design engineers and applications engineers across sectors including packaging automotive and medical devices [Permeability Properties of Plastics and Elastomers](#) Laurence W. McKeen, 2016-10-19 Permeability Properties of Plastics and Elastomers Fourth Edition provides a comprehensive collection of graphical multipoint and tabular data covering the permeation of liquids vapors and gases through plastic or polymeric materials such as films membranes and containers This updated edition includes an entirely new chapter on sustainable and biodegradable polymers and an extensive introductory section covering fatigue what it is how it is measured and the fundamentals of permeation and permeability properties Foundational information is also provided on the production of films containers membranes and the markets and applications for these materials Presents an essential reference tool part of the daily workflow of engineers and scientists involved in the plastics industry and product design with plastics Helps practitioners gain knowledge of exact permeation rates for liquids vapors or gases through a range of polymeric materials Enables engineers to improve performance of their products where permeability properties are important from where packages need to be near hermetically sealed to where a selectively permeable barrier is required

**Film Properties of Plastics and Elastomers** Laurence W. McKeen, 2012-04-25 Now in its 3e Film Properties of Plastics and Elastomers has been extensively revised This is the only data handbook available on the engineering properties of commercial polymeric films It details many physical mechanical optical electrical and permeation properties within the context of specific test parameters providing a ready reference for comparing materials in the same family as well as materials in different families Data is presented on the characteristics of 47 major plastic and elastomer packaging materials New to this edition the resin chapters each contain textual summary information including category general description processing methods applications and other facts as appropriate such as reliability weatherability and regulatory approval considerations for use in food and medical packaging Extensive references are provided Essential data and practical

guidance for engineers and scientists working with polymer films 3e expanded by nearly 50% to include new data sections and additional explanatory chapters to help readers utilize the data and work successfully with plastic films Written for engineers working across the key market sectors for polymer film applications semiconductor chemicals food beverage and pharmaceutical packaging energy medical devices etc **Handbook of Thermoplastic Elastomers** Jiri George

Drobny,2014-05-30 Handbook of Thermoplastic Elastomers Second Edition presents a comprehensive working knowledge of thermoplastic elastomers TPEs providing an essential introduction for those learning the basics but also detailed engineering data and best practice guidance for those already involved in polymerization processing and part manufacture TPEs use short cost effective production cycles with reduced energy consumption compared to other polymers and are used in a range of industries including automotive medical construction and many more This handbook provides all the practical information engineers need to successfully utilize this material group in their products as well as the required knowledge to thoroughly ground themselves in the fundamental chemistry of TPEs The data tables included in this book assist engineers and scientists in both selecting and processing the materials for a given product or application In the second edition of this handbook all chapters have been reviewed and updated New polymers and applications have been added particularly in the growing automotive and medical fields and changes in chemistry and processing technology are covered Provides essential knowledge of the chemistry processing properties and applications for both new and established technical professionals in any industry utilizing TPEs Datasheets provide at a glance processing and technical information for a wide range of commercial TPEs and compounds saving readers the need to contact suppliers Includes data on additional materials and applications particularly in automotive and medical industries **Introduction to Plastics Engineering** Anshuman Shrivastava,2018-05-15

Introduction to Plastics Engineering provides a single reference covering the basics of polymer and plastics materials and their properties design processing and applications in a practical way The book discusses materials engineering through properties formulation combining part design and processing to produce final products This book will be a beneficial guide to materials engineers developing new formulations processing engineers producing those formulations and design and product engineers seeking to understand the materials and methods for developing new applications The book incorporates material properties engineering processing design applications and sustainable and bio based solutions Ideal for those just entering the industry or transitioning between sectors this is a quick relevant and informative reference guide to plastics engineering and processing for engineers and plastics practitioners Provides a single unified reference covering plastics materials properties design processing and applications Offers end to end coverage of the industry from formulation to part design processing and the final product Serves as an ideal introductory book for new plastics engineers and students of plastics engineering Provides a convenient reference for more experienced practitioners **Handbook of Thermoset Plastics**

Hanna Dodiuk,2013-11-28 Thermosetting plastics are a distinct category of plastics whose high performance durability and

reliability at high temperatures makes them suitable for specialty applications ranging from automotive and aerospace through to electronic packaging and consumer products your melamine kitchen worktop is a thermoset resin Recent developments in thermoset plastics technology and processes has broadened their use exponentially over recent years and these developments continue in November 2011 French scientists created a new lightweight thermoset that is as strong and stable as previous materials yet can be easily reworked and reshaped when heated which makes it unique amongst thermosets and allows for repair and recycling The Handbook of Thermoset Plastics now in its Third edition provides a comprehensive survey of the chemical processes manufacturing techniques and design properties of each polymer along with their applications Written by a team of highly experienced practitioners the practical implications of using thermoset plastics are presented both their strengths and weaknesses The data and descriptions presented here enable engineers scientists and technicians to form judgments and take action on the basis of informed analysis The aim of the book is to help the reader to make the right decision and take the correct action avoiding the pitfalls the authors experience has uncovered The new edition has been updated throughout to reflect current practice in manufacturing and processing featuring Case Studies to demonstrate how particular properties make different polymers suitable for different applications as well as covering end use and safety considerations A new chapter on using nanoparticles to enhance thermal and mechanical properties A new chapter describing new materials based on renewable resources such as soy based thermoset plastics A new chapter covering recent developments and potential future technologies such as new catalysts for Controlled Radical Polymerization Goodman and Dodiuk Kenig provide a comprehensive reference guide to the chemistry manufacturing and applications of thermosets Updated to include recent developments in manufacturing from biopolymers to nanocomposites Case Studies illustrate applications of key thermoset plastics *Handbook of Biopolymers and Biodegradable Plastics* Sina

Ebnesajjad, 2012-12-31 Biopolymers and Biodegradable Plastics are a hot issue across the Plastics industry and for many of the industry sectors that use plastic from packaging to medical devices and from the construction industry to the automotive sector This book brings together a number of key biopolymer and biodegradable plastics topics in one place for a broad audience of engineers and scientists especially those designing with biopolymers and biodegradable plastics or evaluating the options for switching from traditional plastics to biopolymers Topics covered include preparation fabrication applications and recycling including biodegradability and compostability Applications in key areas such as films coatings controlled release and tissue engineering are discussed Dr Ebnesajjad provides readers with an in depth reference for the plastics industry material suppliers and processors bio polymer producers bio polymer processors and fabricators and for industry sectors utilizing biopolymers automotive packaging construction wind turbine manufacturers film manufacturers adhesive and coating industries medical device manufacturers biomedical engineers and the recycling industry Essential information and practical guidance for engineers and scientists working with bioplastics or evaluating a migration to bioplastics Includes

key published material on biopolymers updated specifically for this Handbook and new material including coverage of PLA and Tissue Engineering Scaffolds Coverage of materials and applications together in one handbook enables engineers and scientists to make informed design decisions      Handbook of Polymer Applications in Medicine and Medical Devices Kayvon Modjarad, Sina Ebnesajjad, 2013-12-05 While the prevalence of plastics and elastomers in medical devices is now quite well known there is less information available covering the use of medical devices and the applications of polymers beyond medical devices such as in hydrogels biopolymers and silicones beyond enhancement applications and few books in which these are combined into a single reference This book is a comprehensive reference source bringing together a number of key medical polymer topics in one place for a broad audience of engineers and scientists especially those currently developing new medical devices or seeking more information about current and future applications In addition to a broad range of applications the book also covers clinical outcomes and complications arising from the use of the polymers in the body giving engineers a vital insight into the real world implications of the devices they re creating Regulatory issues are also covered in detail The book also presents the latest developments on the use of polymers in medicine and development of nano scale devices Gathers discussions of a large number of applications of polymers in medicine in one place Provides an insight into both the legal and clinical implications of device design Relevant to industry academic and medical professionals Presents the latest developments in the field including medical devices on a nano scale      Plastics in Medical Devices Vinny R. Sastri, 2013-11-27 Plastics in Medical Devices is a comprehensive overview of the main types of plastics used in medical device applications It focuses on the applications and properties that are most important in medical device design such as chemical resistance sterilization capability and biocompatibility The roles of additives stabilizers and fillers as well as the synthesis and production of polymers are covered and backed up with a wealth of data tables Since the first edition the rate of advancement of materials technology has been constantly increasing In the new edition Dr Sastri not only provides a thorough update of the first edition chapters with new information regarding new plastic materials applications and new requirements but also adds two chapters one on market and regulatory aspects and supplier controls and one on process validation Both chapters meet an urgent need in the industry and make the book an all encompassing reference not found anywhere else Comprehensive coverage of uses of polymers for medical devices Unique coverage of medical device regulatory aspects supplier control and process validation Invaluable guide for engineers scientists and managers involved in the development and marketing of medical devices and materials for use in medical devices      **The Effect of Temperature and other Factors on Plastics and Elastomers** Laurence W. McKeen, 2014-04-15 This reference guide brings together a wide range of critical data on the effect of temperature on plastics and elastomers enabling engineers to make optimal material choices and design decisions The effects of humidity level and strain rate on mechanical and electrical properties are also covered The data are supported by explanations of how to make use of the data in real world engineering contexts

High and low temperatures can have a significant impact on plastics processing and applications particularly in industries such as automotive aerospace oil and gas packaging and medical devices where metals are increasingly being replaced by plastics Additional plastics have also been included for polyesters polyamides and others where available including polyolefins elastomers and fluoropolymers Entirely new sections on biodegradable polymers and thermosets have been added to the book The level of data included along with the large number of graphs and tables for easy comparison saves readers the need to contact suppliers and the selection guide has been fully updated giving assistance on the questions which engineers should be asking when specifying materials for any given application Trustworthy current thermal data and best practice guidance for engineers and materials scientists in the plastics industry More than 1 000 graphs and tables allow for easy comparison between plastics Entirely new sections added on biopolymers and thermosets

*The Effect of Sterilization on Plastics and Elastomers* Laurence W. McKeen, 2018-02-22 The Effect of Sterilization Methods on Plastics and Elastomers Fourth Edition brings together a wide range of essential data on the sterilization of plastics and elastomers thus enabling engineers to make optimal material choices and design decisions The data tables in this book enable engineers and scientists to select the right materials and sterilization method for a given product or application The book is a unique and essential reference for anybody working with plastic materials that are likely to be exposed to sterilization methods be it in medical device or packaging development food packaging or other applications Presents essential data and practical guidance for engineers and scientists working with plastics in applications that require sterile packaging and equipment Updated edition removes obsolete data updates manufacturers verifies data accuracy and adds new plastics materials for comparison Provides essential information and guidance for FDA submissions required for new medical devices

*Permeability Properties of Plastics and Elastomers, 2nd Ed.* Liesl K. Massey, 2003-01-14 This extensively revised and updated second edition of the only data handbook available on the properties of commercial polymeric films details the permeability characteristics of over 125 major plastic and elastomer packaging materials New to this edition are 92 resin chapters containing textual summary information including category general description processing methods applications and general permeability considerations for water vapor oxygen and other gases including aroma and flavor The product data is presented in graphical and tabular format retaining the familiar format of the first edition and allowing easy comparison between materials and test conditions

*Permeability Properties of Plastics and Elastomers* Liesl K. Massey, 2003-01-01 This extensively revised and updated second edition of the only data handbook available on the properties of commercial polymeric films details the permeability characteristics of over 125 major plastic and elastomer packaging materials New to this edition are 92 resin chapters containing textual summary information including category general description processing methods applications and general permeability considerations for water vapor oxygen and other gases including aroma and flavor The product data is presented in graphical and tabular format retaining the familiar format of the first edition and

allowing easy comparison between materials and test conditions      **Applied Plastics Engineering Handbook** Myer Kutz, 2011-07-26 A practical reference for all plastics engineers who are seeking to answer a question solve a problem reduce a cost improve a design or fabrication process or even venture into a new market Applied Plastics Engineering Handbook covers both polymer basics helpful to bring readers quickly up to speed if they are not familiar with a particular area of plastics processing and recent developments enabling practitioners to discover which options best fit their requirements Each chapter is an authoritative source of practical advice for engineers providing authoritative guidance from experts that will lead to cost savings and process improvements Throughout the book the focus is on the engineering aspects of producing and using plastics The properties of plastics are explained along with techniques for testing measuring enhancing and analyzing them Practical introductions to both core topics and new developments make this work equally valuable for newly qualified plastics engineers seeking the practical rules of thumb they don't teach you in school and experienced practitioners evaluating new technologies or getting up to speed on a new field The depth and detail of the coverage of new developments enables engineers and managers to gain knowledge of and evaluate new technologies and materials in key growth areas such as biomaterials and nanotechnology This highly practical handbook is set apart from other references in the field being written by engineers for an audience of engineers and providing a wealth of real world examples best practice guidance and rules of thumb      *Fatigue and Tribological Properties of Plastics and Elastomers* Laurence W. McKeen, 2016-03-31 Part of a series of data rich handbooks within the Plastics Design Library *Fatigue and Tribological Properties of Plastics and Elastomers* provides a comprehensive collection of graphical multipoint data and tabular data covering the fatigue and tribological performance of plastics The handbook is structured by grouping together plastics of similar polymer types into ten chapters Each of these chapters is split into two sections Fatigue Properties and Tribological Properties and together they provide a compendium of several hundred graphs and charts supplying the core data needed by engineers and scientists on a day to day basis The data for this third edition has been updated to cover upwards of five years since the previous edition was published and also includes an entirely new chapter covering sustainable and biodegradable polymers The book also includes an extensive introductory section covering fatigue what it is and how it is measured the fundamentals of tribology polymer chemistry and plastics composition These chapters also provide readers with a full understanding of the data section and how to put it to use as a hard working information tool      **The Effect of Long Term Thermal Exposure on Plastics and Elastomers** Laurence W. McKeen, 2013-11-20 This reference guide brings together a wide range of essential data on the effect of long term thermal exposure on plastics and elastomers enabling engineers to make optimal material choices and design decisions The data is supported by explanations of how to make use of the data in real world engineering contexts High heat environments are common in automotive oil and gas household appliances coatings space and aeronautics and many more end uses As a result thermal stability data are critically important to engineers designing



parts particularly that replace metals work that is common today as they look for ways to reduce weight The data tables in this book enable engineers and scientists to select the right materials for a given product or application across a wide range of sectors Several polymer classes are covered including polyolefins polyamides polyesters elastomers fluoropolymers biodegradable plastics and more saving readers the need to contact suppliers The book also includes introductory sections to provide background on plastic polymer chemistry and formulation and plastic testing methods providing the knowledge required to make best use of the data Essential data and practical guidance for engineers and scientists working with plastics for use in high temperature environments Includes introductory chapters on polymer chemistry and its effect on thermal stability providing the underpinning knowledge required to utilize the data Covers a wide range of commercial polymer classes saving readers the need to contact suppliers

**High Performance Polymers** Johannes Karl Fink, 2014-07-04 Approaching the material from a chemistry and engineering perspective High Performance Polymers presents the most reliable and current data available about state of the art polymerization fabrication and application methods of high performance industrial polymers Chapters are arranged according to the chemical constitution of the individual classes beginning with main chain carbon carbon polymers and leading to ether containing sulfur containing and so on Each chapter follows an easily readable template provides a brief overview and history of the polymer and continues on to such sub topics as monomers polymerization and fabrication properties fabrication methods special additives applications suppliers and commercial grades safety and environmental impact and recycling High Performance Polymers brings a wealth of up to date high performance polymer data to you library in a format that allows for either a fast fact check or more detailed study In this new edition the data has been fully updated to reflect all developments since 2008 particularly in the topics of monomers synthesis of polymers special polymer types and fields of application Presents the state of the art polymerization fabrication and application methods of high performance industrial polymers Provides fundamental information for practicing engineers working in industries that develop advanced applications including electronics automotive and medical Discusses environmental impact and recycling of polymers

**The Effect of UV Light and Weather on Plastics and Elastomers** Laurence W. McKeen, 2013-06-21 This reference guide brings together a wide range of essential data on the effects of weather and UV light exposure on plastics and elastomers enabling engineers to make optimal material choices and design decisions In both normal and extreme environments outdoor use has a variety of effects on different plastics and elastomers including discoloring and brittleness The data is supported by explanations of real world engineering applications The data tables in this book are supported by examples of real world applications enabling engineers and scientists to select the right materials for a given situation across a wide range of sectors including construction packaging signage consumer e g toys outdoor furniture automotive and aerospace defense etc The third edition includes new text chapters that provide the fundamental knowledge required to make best use of the data Author Larry McKeen has also added detailed descriptions of

the effect of weathering on the most common polymer classes such as polyolefins polyamides polyesters elastomers fluoropolymers biodegradable plastics etc making this book an invaluable design guide as well as an industry standard data source Essential data and practical guidance for engineers and scientists working with plastics in outdoor applications and products New introductory chapters on weathering processes and the effect of light and heat on plastics 25% new data

Introduction to Fluoropolymers Sina Ebnesajjad, 2013-05-11 Introduction to Fluoropolymers demystifies fluoropolymers for a wide audience of designers engineers sales staff and managers This important group of high performance polymers has applications across a wide range of market sectors including automotive aerospace medical devices high performance apparel oil gas renewable energy solar photovoltaics electronics semiconductor pharmaceuticals and chemical processing Dr Ebnesajjad covers the history and applications of a wide variety of materials including expanded polytetrafluoroethylene polyvinyl fluoride vinylidene fluoride polymers and fluoroelastomers just to name a few Properties and applications are illustrated by real world examples as diverse as waterproof clothing vascular grafts and coatings for aircraft interiors The different applications of fluoropolymers show the benefits of a group of materials that are highly water repellant and flame retardant with unrivalled lubrication properties and a high level of biocompatibility Health and safety and environmental aspects are also covered throughout the book Demystifies fluoropolymers for a broad audience of engineers in areas such as product design and manufacturing as well as for non engineers such as technical sales and management professionals Explains the potential of fluoropolymers for a wide range of applications across sectors such as aerospace energy and medical devices Ideal for both recently qualified engineers and engineers with limited experience of fluoropolymers

Biopolymers: Reuse, Recycling, and Disposal Michael Niaounakis, 2013-06-20 Biopolymers Reuse Recycling and Disposal is the first book covering all aspects of biopolymer waste management and post usage scenarios embracing existing technologies applications and the behavior of biopolymers in various waste streams The book investigates the benefits and weaknesses social economic and environmental impacts and regulatory aspects of each technology It covers different types of recycling and degradation as well as life cycle analysis all supported by case studies literature references and detailed information about global patents Patents in particular comprising 80% of published technical literature in this emerging field widely scattered and often available in Japanese only are a key source of information Dr Niaounakis draws on disciplines such as polymer science management biology and microbiology organic chemistry environmental chemistry and patent law to produce a reference guide for engineers scientists and other professionals involved in the development and production of biopolymers waste management and recycling This information is also valuable for regulators patent attorneys and academics working in this field Explores techniques and technologies involved in managing biopolymers in the waste stream including recycling and upcycling Provides waste management and recycling professionals the knowledge they need to plan for the exponential growth in biopolymer waste Helps engineers and product designers fully consider the end of life aspects

of their environmentally sustainable green products and solutions

## **Permeability Properties Of Plastics And Elastomers Third Edition Plastics Design Library** Book Review: Unveiling the Power of Words

In a global driven by information and connectivity, the energy of words has are more evident than ever. They have the capability to inspire, provoke, and ignite change. Such may be the essence of the book **Permeability Properties Of Plastics And Elastomers Third Edition Plastics Design Library**, a literary masterpiece that delves deep in to the significance of words and their effect on our lives. Compiled by a renowned author, this captivating work takes readers on a transformative journey, unraveling the secrets and potential behind every word. In this review, we will explore the book is key themes, examine its writing style, and analyze its overall impact on readers.

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