668.4 BRI

CONTENTS

PAR	RT I — MATERIALS	1
I.	THE SCIENCE OF PLACTICS Structure of Thermoplastics; Crystalline Melting Points; Glass Transition Point; Orienta Strength of Plastics; Effect of Temperature on Mechanical Properties; Time Dependence Mechanical Properties	5 tion; e of
II.	THERMOPLASTICS Polyolefins; Vinyl Plastics; Acrylics; Fluorocarbon Polymers; Non Ethenic Thermoplas	21 tics
III.	THERMOSETS	49
IV.	NATURAL POLYMERS AND THEIR DERIVATIVES Natural Polymers; Derivatives of Natural Polymers	63
V.	NONPLASTICS COMPONENTS Polymerisation Residues; Processing Aids; End-Use Additives; Conclusions	71
PART II — HEALTH AND QUALITY		97
VI.	FOOD HAZARDS—BACKGROUND AND BASIC ANALYSIS Spoilage in the Absence of Protection; Food Hazards Related to Plastics Basic Model; Interactions	99
VII.	TOXIC HAZARDS Base Lines; Toxic Hazard; Interactions; Conclusions	115
VIII.	MIGRATION Safety Evaluation Principles; Special Cases; Simplified Procedures; Frawley Approach Conclusions	129
IX.	FOOD QUALLITY—GENERAL Food Quality; Interactions; Preservation; Adulteration	181
X.	ORGANOLEPTIC EFFECTS Tainting; Origins of Food Tainting Involving Plastics; Practical Assessment of Tainting Identification of Source; Causes and Remedies; Masking; Conclusions	203

- XI. PLASTICS QUALITY Interactions; Summary
- XII. LAW AND REGULATIONS 251
 Historical; Food and Food Contact Law in Modern Times; Concepts of Common and
 Statute Law Relating to Food Contact; Principles; Legislation in Individual Areas or Nations;
 Legislation by Individual Country; Harmonisation of Legislation; EEC.

PART III - MANUFACTURING

XIII.	2 –D BASE MATERIALS Blow Extrusion of Film; Slit Die Extrusion of Film; Sheet Extrusion; Orientation of Film Laminates; Cross Ply Film	331 ;
XIV.	CONTAINERS FROM 2 –D MATERIALS—INTEGRAL PROCESSES Shrink Wrapping; Transwrap; Flowpak; Horizontal Sachet Machines; Vertical Sachet Machines; Skin Packaging; Curtain Coating; Thermoforming	349
XV.	CONTAINERS FROM 2-D BASE MATERIALS—INDIVIDUAL CONTAINERS Bags and Sacks; Thermoforming; Cold Forming Helically Wound Tanks; Scarp and Rec	359 ycle
XVI.	DIRECT MADE CONTAINERS Compression Moulding; Transfer Moulding; Lamination High Pressure Lamination; Low Pressure Lamination; Injection Moulding; Blow Moulding; Sinter Casting; Foam Process Which Method	367 ves;
XVII.	INTEGRATED PACKAGING Partly Integrated Systems; Fully Integrated Systems; Comparison of Systems; Applicatio	383 ns
XVIII	COMPOSITES Plastics Coated Materials; Laminates; Other Composite Applications; The Future	395
XIX.	CLOSURES AND OTHER ANCILLARIES Food Contact Hazards; General Requirements for A Closure; Cap Design	403
XX.	ORNAMENTATION 'Free' Ornamentation; Labelling; Printing; Silk Screen Printing; Dry Offset Printing; Flexographic Printing; Gravure Printing: Heat Transfer Labelling; In-Mould Decoration; Hot Foil Stamping; Electrostatic Printing; Printing Inks; Summary	411

Appendices

I.	GLOSSARY	429
II.	DIFFUSION AND PERMEABILITY	432
III.	PLASTICS AND THE ENVIRONMENT	439
IV.	PLASTICS DATA AND CHOICE CRITERIA	446
V.	SYMBOLS AND UNITS	454

Index