

# Contents

---

For a more detailed Table of Contents, see page iv.

<b>Introduction</b> .....	<b>1</b>
Engineering Plastics: An Introduction .....	3
Effects of Composition, Processing, and Structure on Properties of Engineering Plastics .....	28
<b>Materials Selection and Design of Engineering Plastics</b> .....	<b>49</b>
General Design Guidelines .....	51
Design with Plastics .....	55
Design and Selection of Plastics Processing Methods .....	64
<b>Physical, Chemical, and Thermal Analysis of Plastics</b> .....	<b>87</b>
Physical, Chemical, and Thermal Analysis of Thermoset Resins .....	89
Physical, Chemical, and Thermal Analysis of Thermoplastic Resins .....	105
Thermal Analysis and Thermal Properties .....	115
Environmental and Chemical Effects .....	146
Characterization of Weather Aging and Radiation Susceptibility .....	153
Flammability Testing .....	159
Electrical Testing and Characterization .....	164
Optical Testing and Characterization .....	177
<b>Mechanical Behavior and Wear</b> .....	<b>183</b>
Mechanical Testing and Properties of Plastics: An Introduction .....	185
Creep, Stress Relaxation, and Yielding .....	199
Crazing and Fracture .....	204

Fracture Resistance Testing .....	211
Impact Loading and Testing .....	216
Fatigue Testing and Behavior .....	238
Fatigue Failure Mechanisms .....	249
Friction and Wear Testing .....	259
Wear Failures of Plastics .....	267
Wear Failures of Reinforced Polymers .....	276
<b>Environmental Effects</b> .....	<b>293</b>
Thermal Stresses and Physical Aging .....	295
Environmental Stress Cracking .....	305
Moisture-Related Failure .....	315
Organic Chemical Related Failure .....	323
Photolytic Degradation .....	329
Microbial Degradation .....	336
<b>Failure Analysis of Plastics</b> .....	<b>341</b>
Analysis of Structure .....	343
Characterization of Plastics in Failure Analysis .....	359
Surface Analysis .....	383
Fracture and Fractography .....	404
Fractography of Composites .....	417
<b>Reference Information</b> .....	<b>431</b>
Abbreviations and Symbols .....	433
Index .....	436