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to Fatigue and Tribology of Plastics and Elastomers; 1.1 Introduction to Fatigue; 1.2 Types of Stress; 1.2.1 Tensile and Compressive Stress; 1.2.2 Shear Stress; 1.2.3 Torsional Stress; 1.2.4 Flexural or Bending Stress; 1.2.5 Hoop Stress; 1.3 Fatigue Testing; 1.3.1 Tensile Eccentric Fatigue Machine; 1.3.2 Flexural Eccentric Fatigue Machine; 1.3.3 Cantilevered Beam Eccentric Flexural Fatigue Machine
1.3.4 Servohydraulic, Electrohydraulic, or Pulsator Fatigue Testing Machines1.3.5 MIT Flex Life Machine; 1.3.6 Fatigue and Fracture Standards; 1.4 Understanding Fatigue Testing Data; 1.4.1 Monotonic Stress-Strain Behavior; 1.4.2 Cyclic Stress-Strain Behavior; 1.4.3 Strain-Life Behavior; 1.4.4 Stress-Life Behavior; 1.5 The Fatigue Process; 1.5.1 Crack Initiation; 1.5.2 Crack Growth or Propagation; 1.5.3 Failure; 1.6 Factors That Affect Fatigue Life; 1.7 Design Against Fatigue; 1.8 Summary; Chapter 2 Introduction to the Tribology of Plastics and Elastomers; 2.1 Friction; 2.2 Lubrication
2.3 Wear and Erosion2.3.1 Classification of Wear; 2.3.2 Characterizing Wear; 2.4 Tribology Testing; 2.4.1 Testing for Friction; 2.4.2 Wear and Abrasion Tests; 2.4.3 Erosion Tests; 2.4.4 Standard Tests; 2.5 Wear-Resistant Additives; 2.6 Summary; Chapter 3 Introduction to Plastics and Polymers; 3.1 Polymerization; 3.2 Copolymers; 3.3 Linear, Branched and Cross-linked Polymers; 3.4 Molecular Weight; 3.5 Thermosets versus Thermoplastics; 3.6 Crystalline versus Amorphous; 3.7 Blends; 3.8 Elastomers; 3.9 Additives; 3.9.1 Fillers, Reinforcement, Composites
3.9.2 Combustion Modifiers, Fire, Flame Retardants and Smoke Suppressants3.9.3 Release Agents and Antiblocking Agents; 3.9.4 Lubricants and Slip Agents, Tribology Additives; 3.9.5 Catalysts; 3.9.6 Impact Modifiers and Tougheners; 3.9.7 UV Stabilizers; 3.9.8 Antistatic Agents; 3.9.9 Plasticizers; 3.9.10 Pigments, Extenders, Dyes, Mica; 3.9.11 Coupling Agents; 3.9.12 Thermal Stabilizers; 3.10 Summary; Chapter 4 Styrenic Plastics; 4.1 Background; 4.1.1 Polystyrene; 4.1.2 Acrylonitrile Styrene Acrylate; 4.1.3 Styrene Acrylonitrile; 4.1.4 Acrylonitrile Butadiene Styrene
4.1.5 Methyl Methacrylate Acrylonitrile Butadiene Styrene4.1.6 Styrene Maleic Anhydride; 4.1.7 Styrenic Block Copolymers; 4.1.8 Styrenic Blends; 4.2 Polystyrene; 4.2.1 Fatigue Data; 4.3 Acrylonitrile Styrene Acrylate; 4.3.1 Fatigue Data; 4.4 Styrene Acrylonitrile; 4.4.1 Fatigue Data; 4.5 Acrylonitrile Butadiene Styrene; 4.5.1 Fatigue Data; 4.6 Styrenic Blends; 4.6.1 Fatigue Data; 4.6.2 Tribology Data; Chapter 5 Polyether Plastics; 5.1 Background; 5.1.1 Polyoxymethylene (or Acetal Homopolymer); 5.1.2 Polyoxymethylene Copolymer (POM-Co or Acetal Copolymer)
5.1.3 Modified Polyphenylene Ether/Polyphenylene Oxides

Sommario/riassunto

Part of a series of core databooks within the William Andrew Plastics Design Library, Fatigue and Tribological Properties of Plastics and Elastomers provides a comprehensive collection of graphical multipoint data and tabular data covering fatigue and tribology. The concept of fatigue is very straightforward: if an object is subjected to a stress or deformation, and it is repeated, the object becomes weaker. This weakening of plastic material is called fatigue. Tribology is the science and technology of surfaces in contact with each other and therefore covers friction, lubric