

Chapter 11

Materials

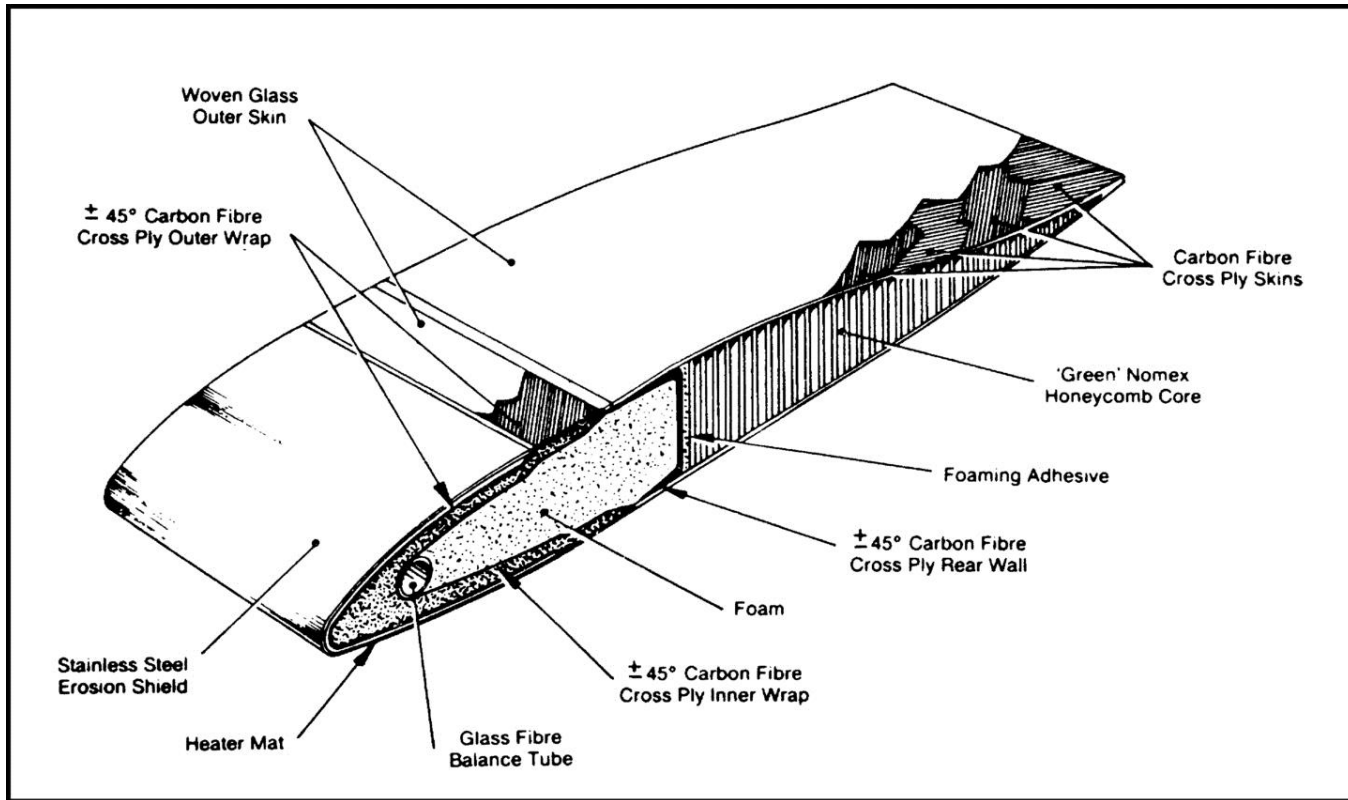


FIGURE 11.1 Sectional View of Helicopter Main Rotor Blade

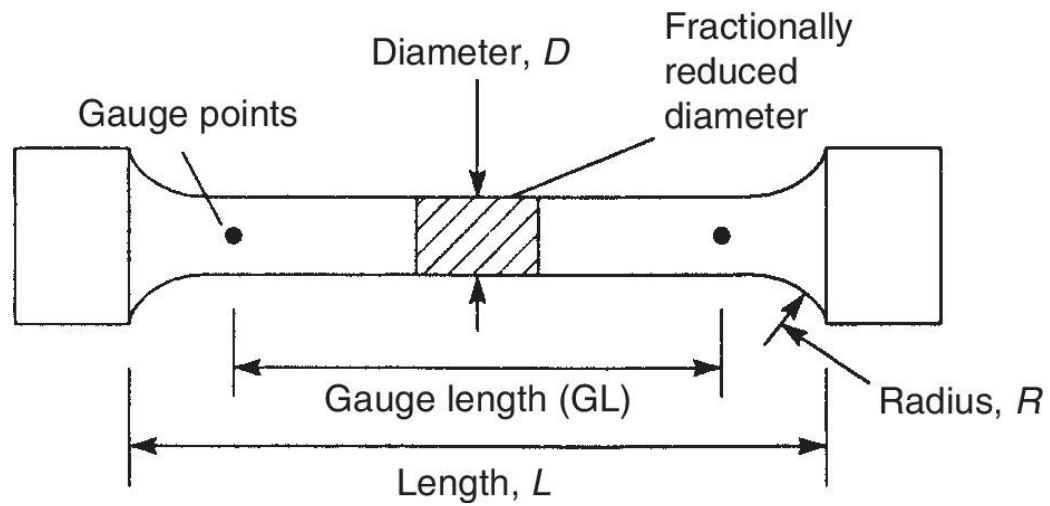


FIGURE 11.2 Standard Cylindrical Test Piece

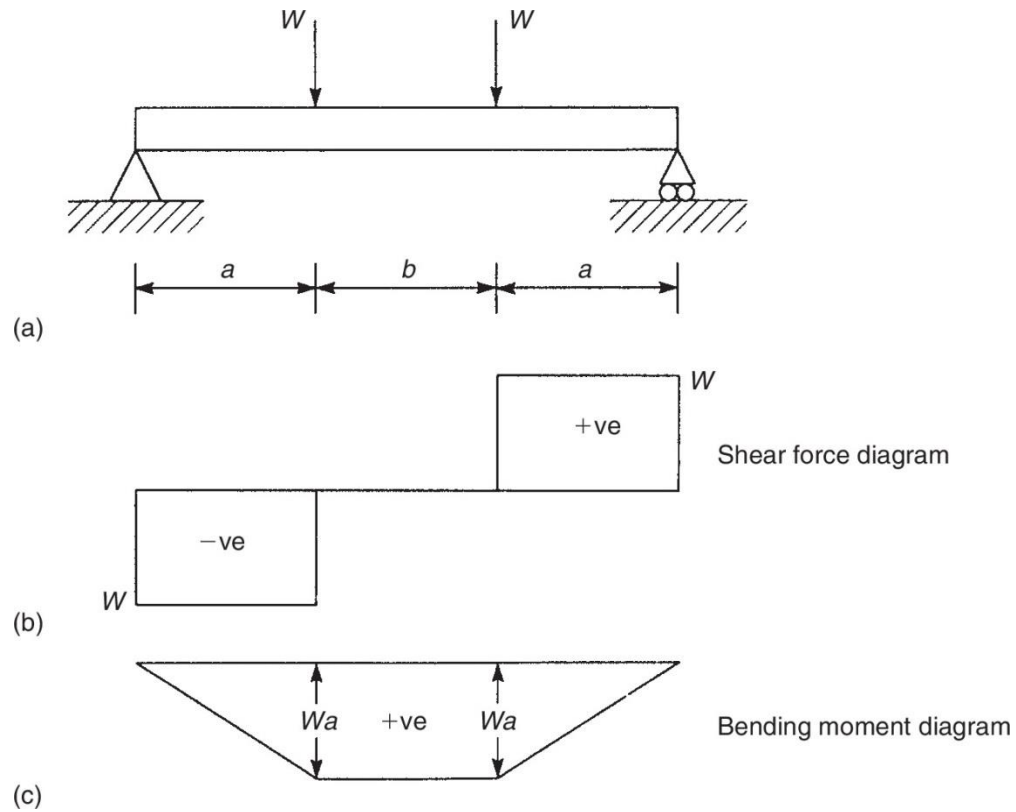


FIGURE 11.3 Bending Test on a Beam, “Two-Point” Load

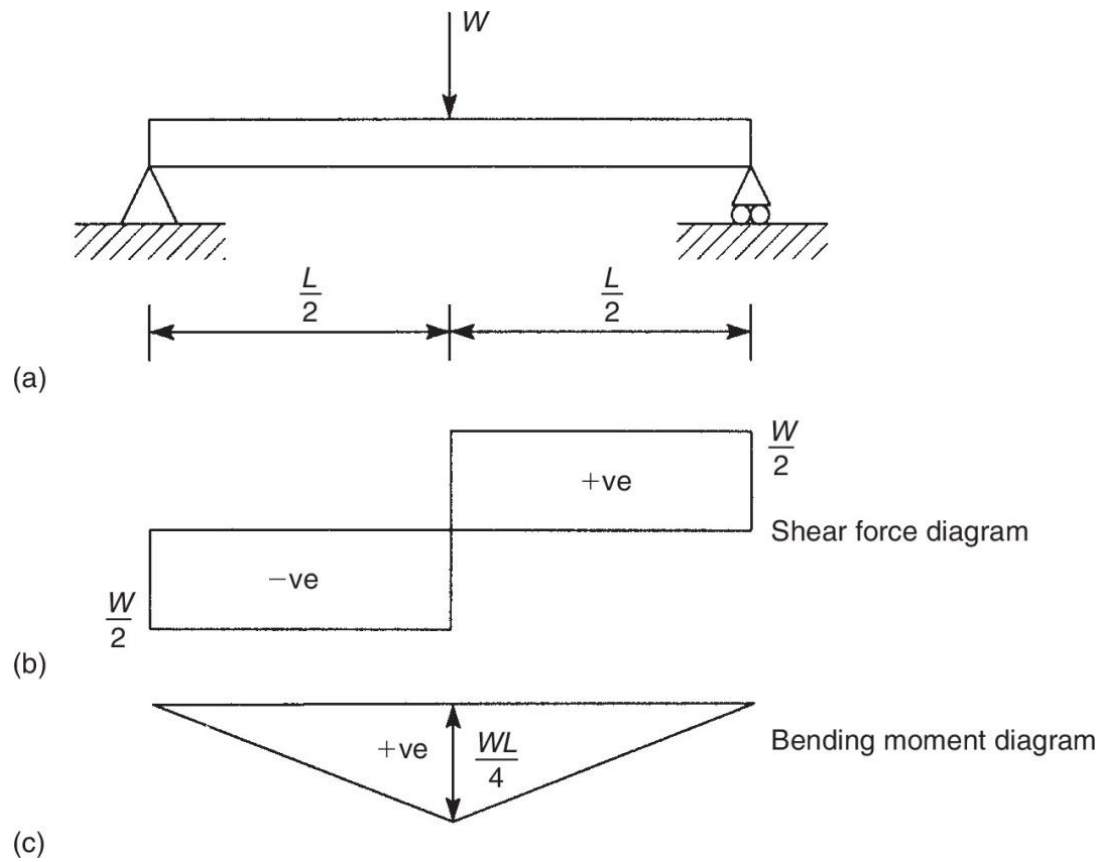


FIGURE 11.4 Bending Test on a Beam, Single Load

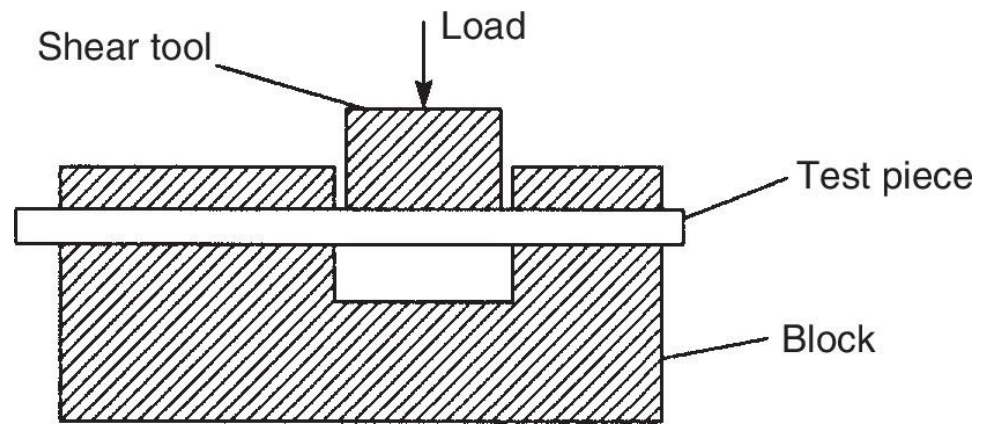


FIGURE 11.5 Shear Test

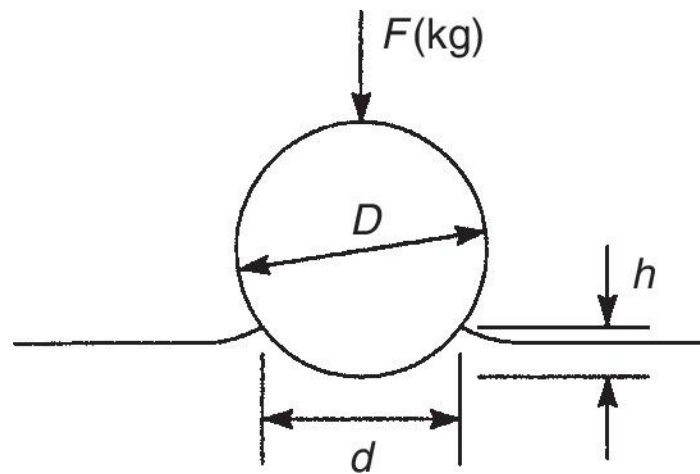


FIGURE 11.6 Brinell Hardness Test

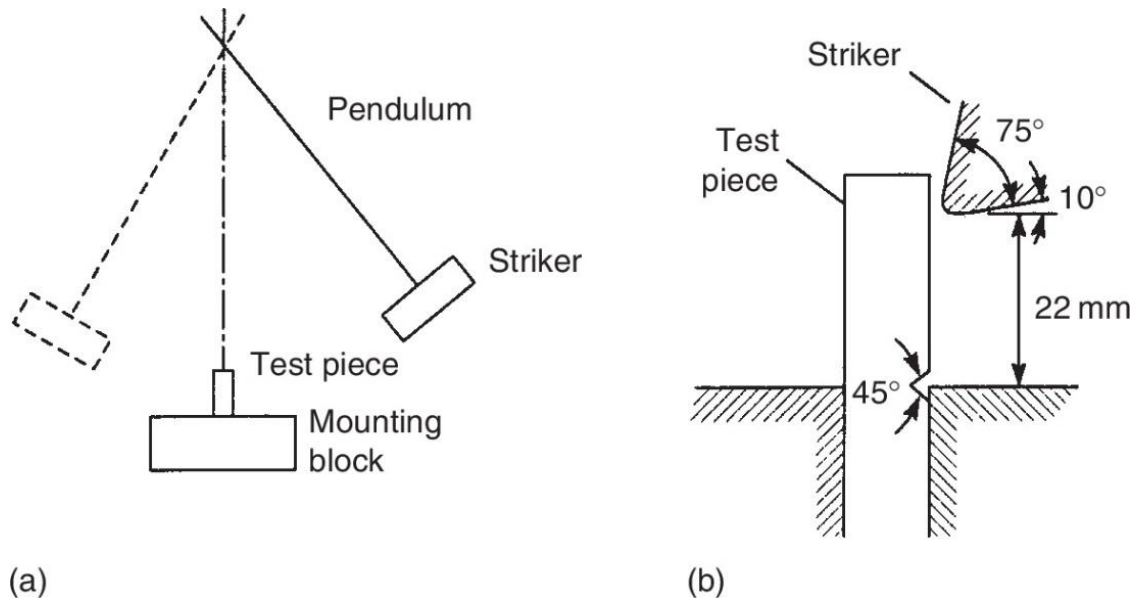


FIGURE 11.7 Izod Impact Test

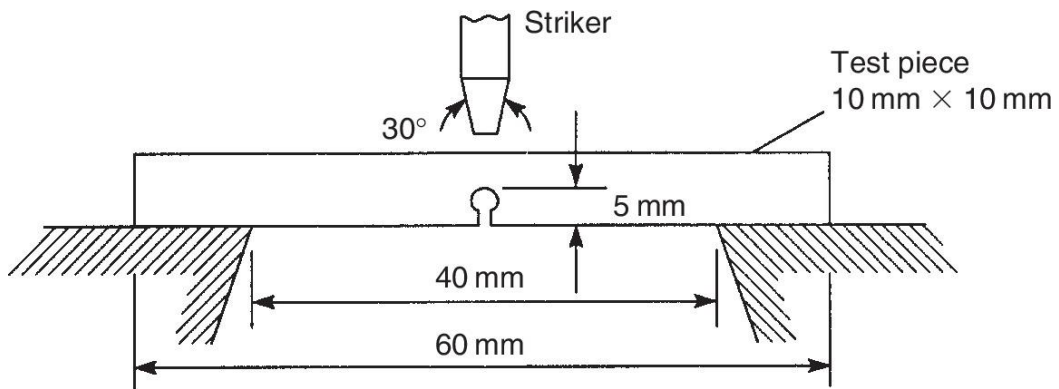


FIGURE 11.8 Charpy Impact Test

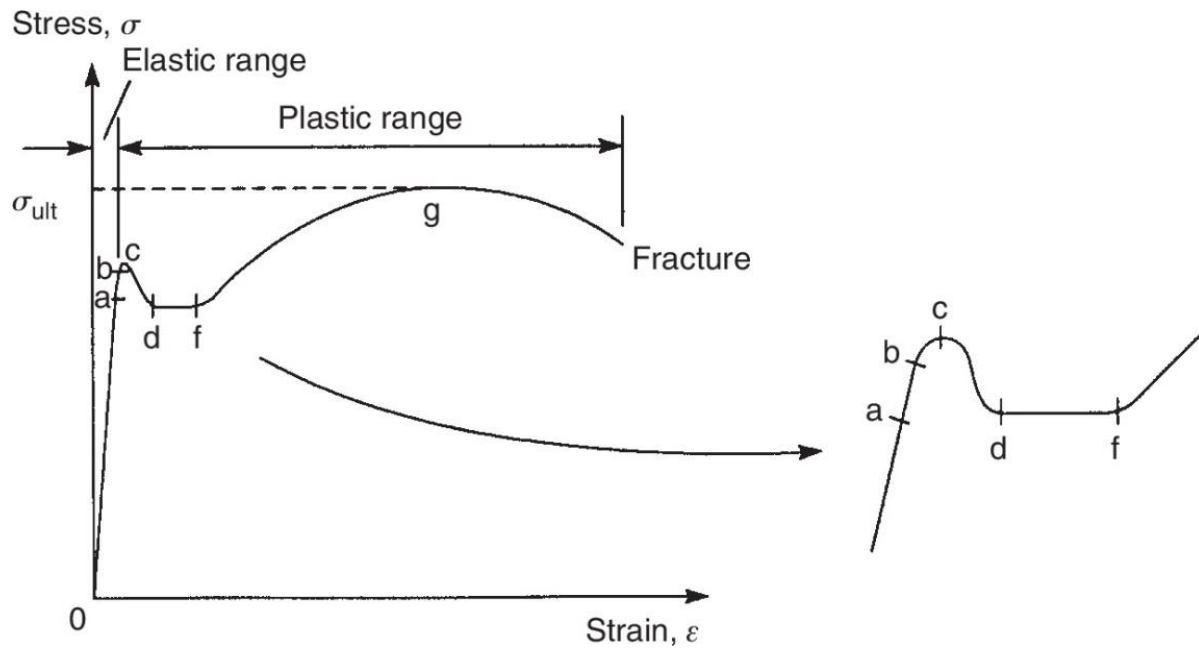


FIGURE 11.9 Stress–Strain Curve for Mild Steel

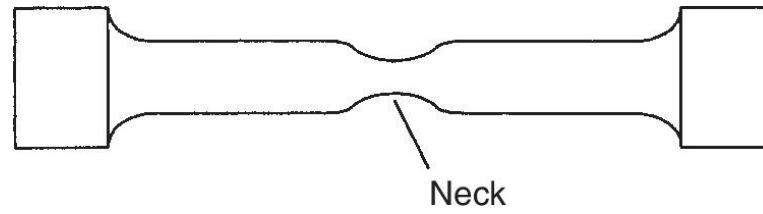


FIGURE 11.10 “Necking” of a Test Piece in the Plastic Range

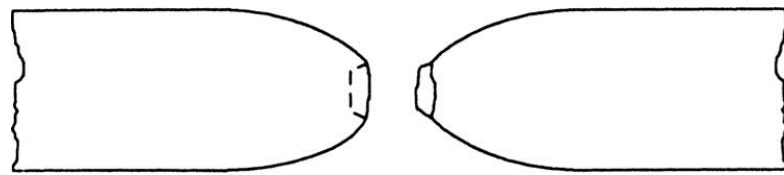


FIGURE 11.11 “Cup-and-Cone” Failure of a Mild Steel Test Piece

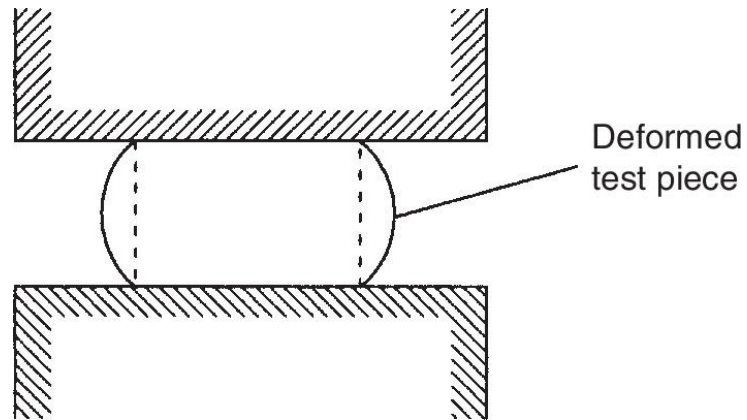


FIGURE 11.12 “Barrelling” of a Mild Steel Test Piece in Compression

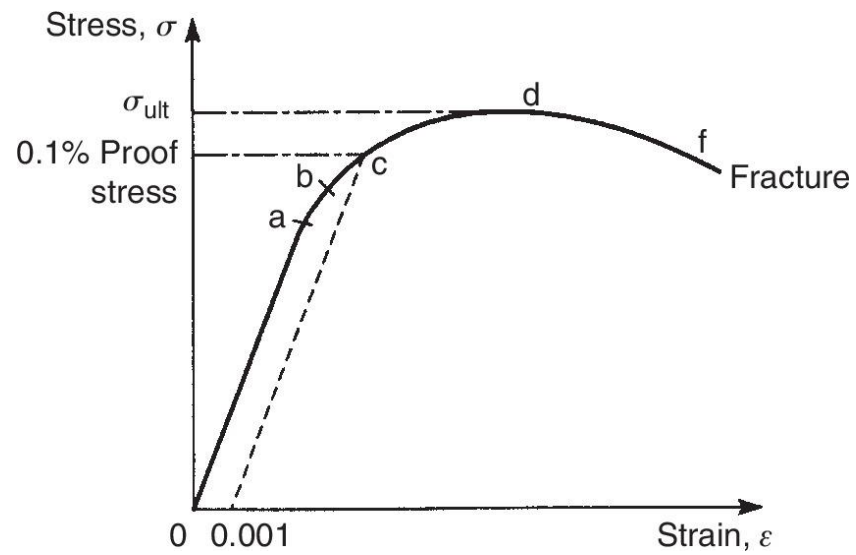


FIGURE 11.13 Stress–Strain Curve for Aluminum

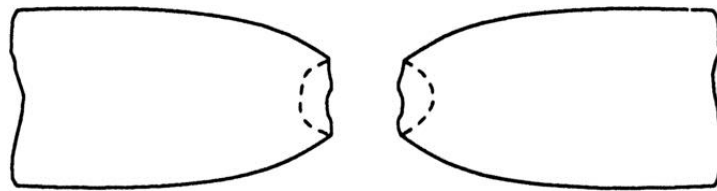


FIGURE 11.14 “Double-Cup” Failure of an Aluminum Alloy Test Piece

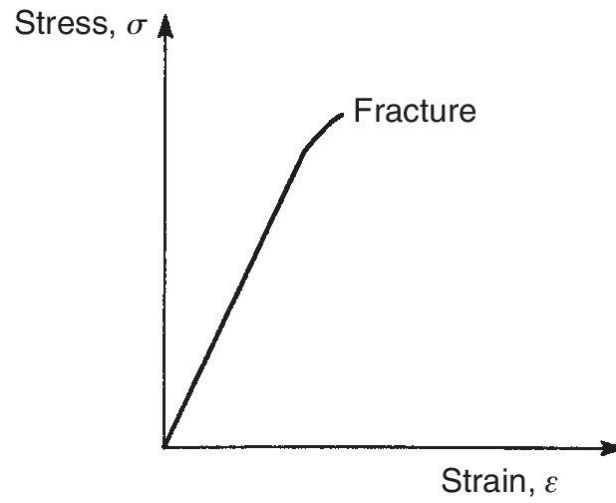


FIGURE 11.15 Stress–Strain Curve for a Brittle Material

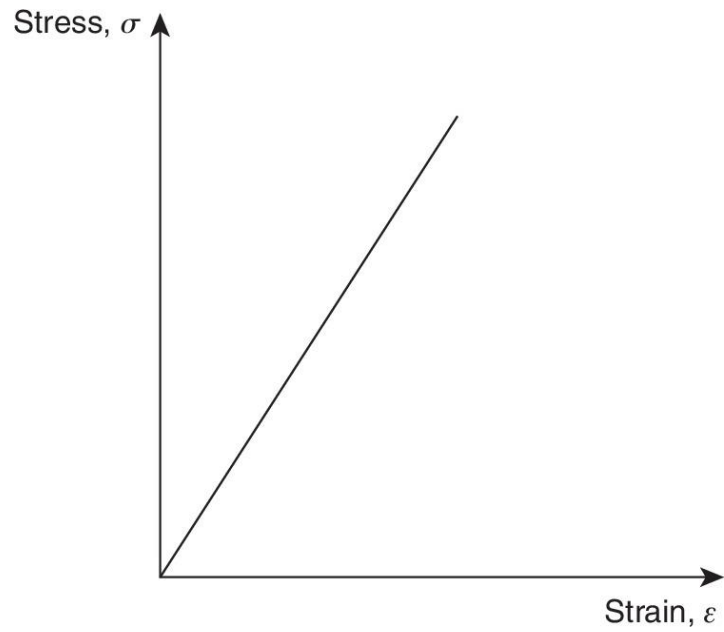


FIGURE 11.16 Stress–Strain Curve for a Fiber Composite

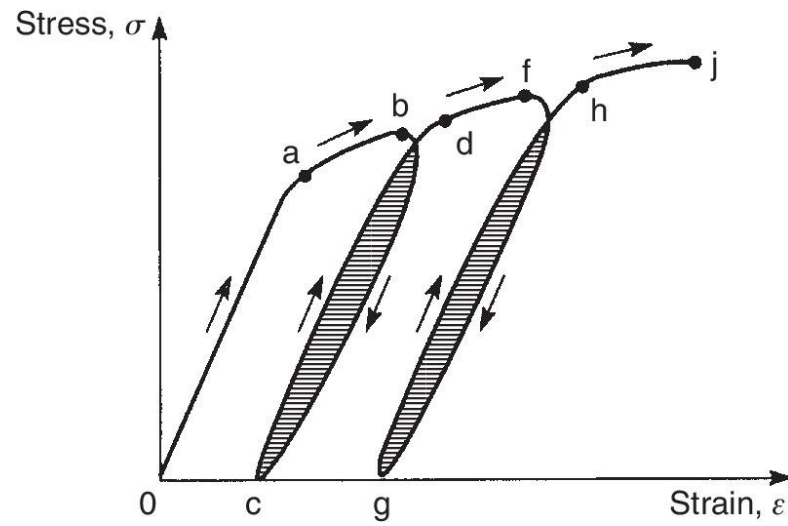


FIGURE 11.17 Strain Hardening of a Material

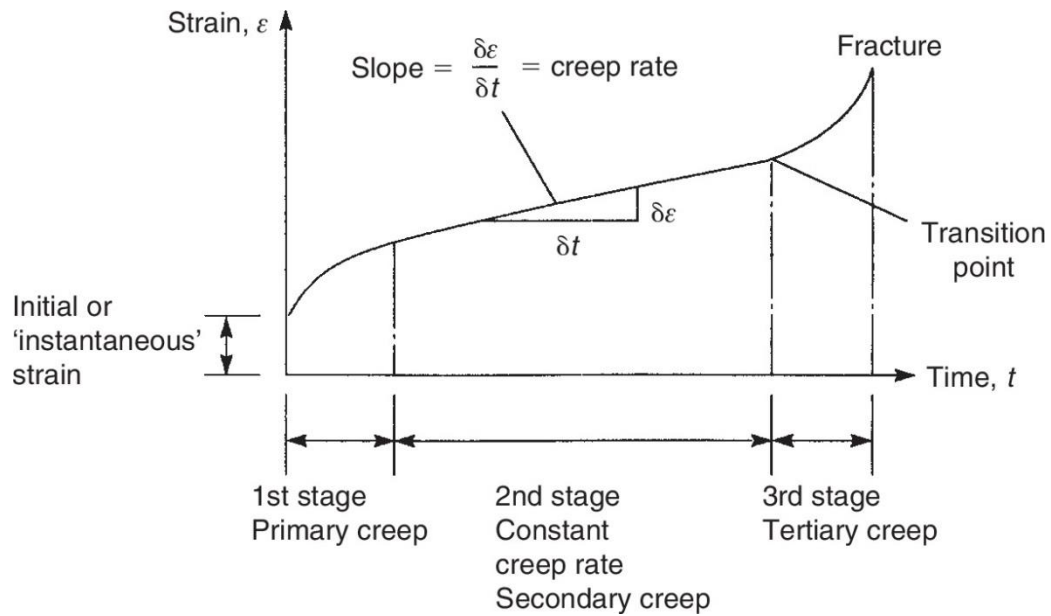


FIGURE 11.18 Typical Creep Curve

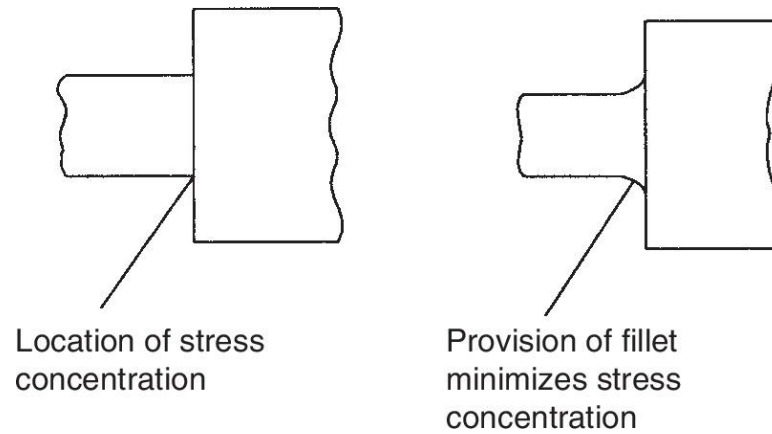


FIGURE 11.19 Stress Concentration Location

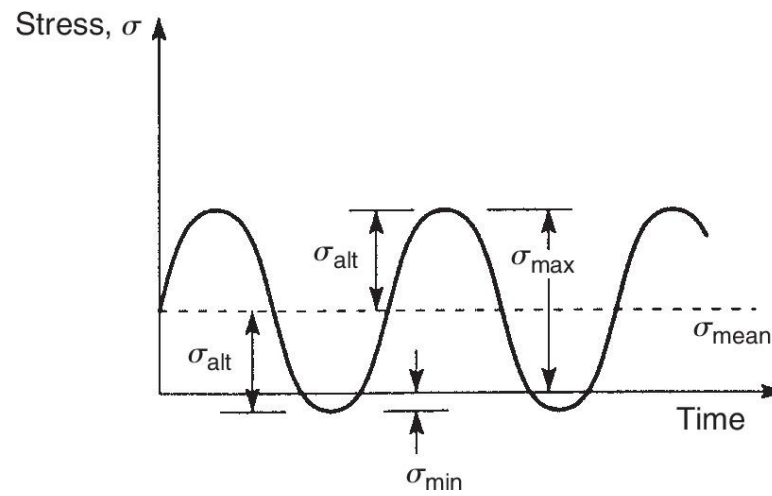


FIGURE 11.20 Alternating Stress in Fatigue Loading

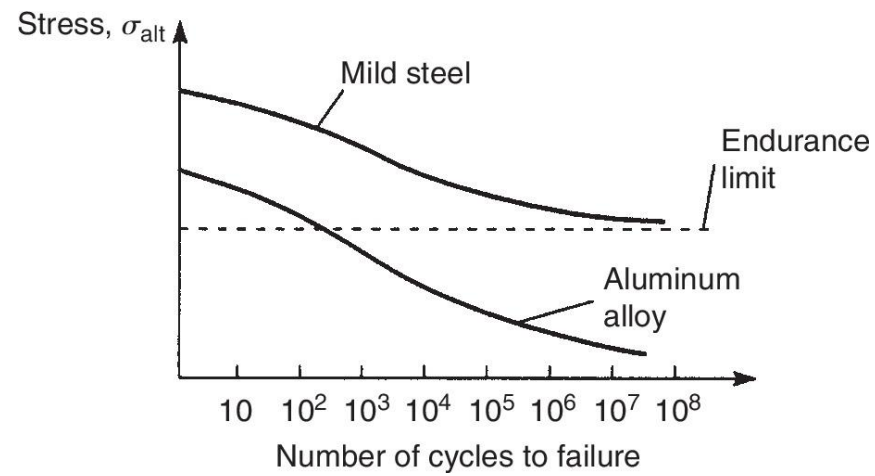


FIGURE 11.21 Stress–Endurance Curves