

## **Chapter 8**

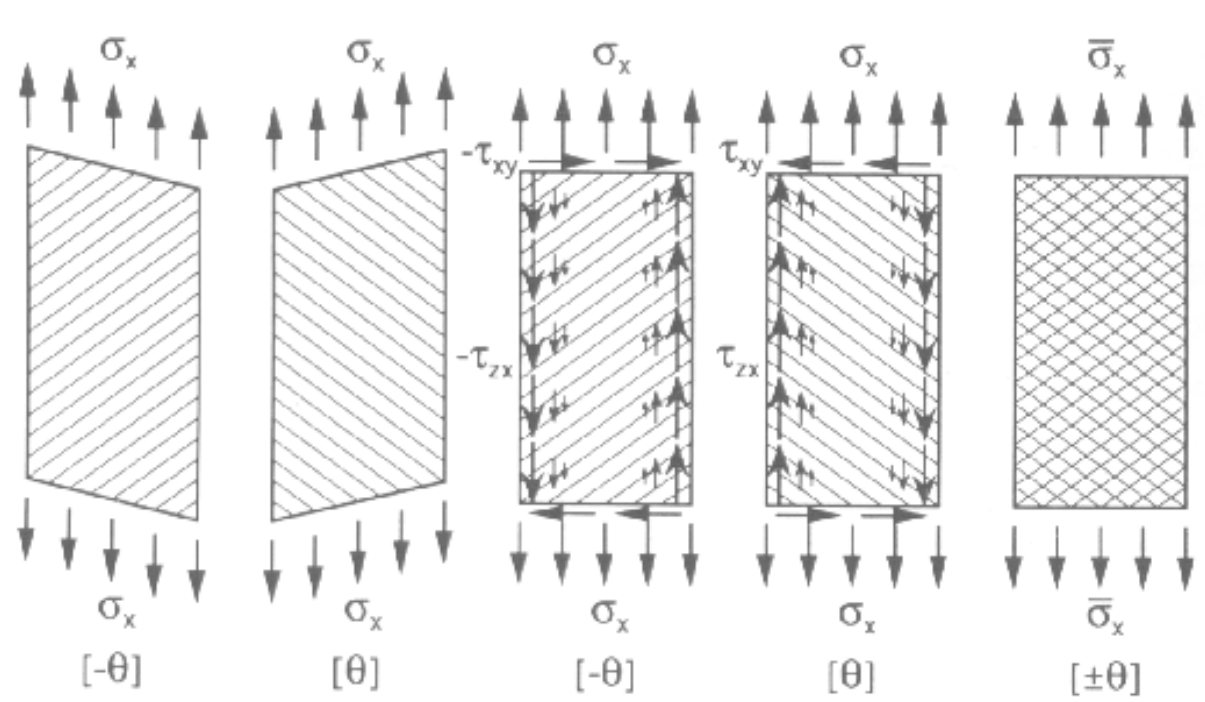
### **Interlaminar Stresses and Strength of Multidirectional laminates**

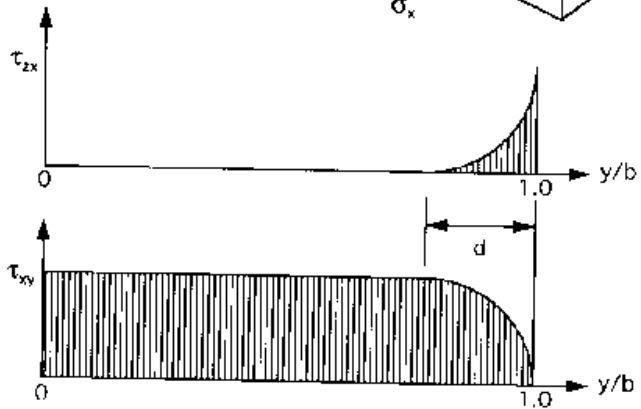
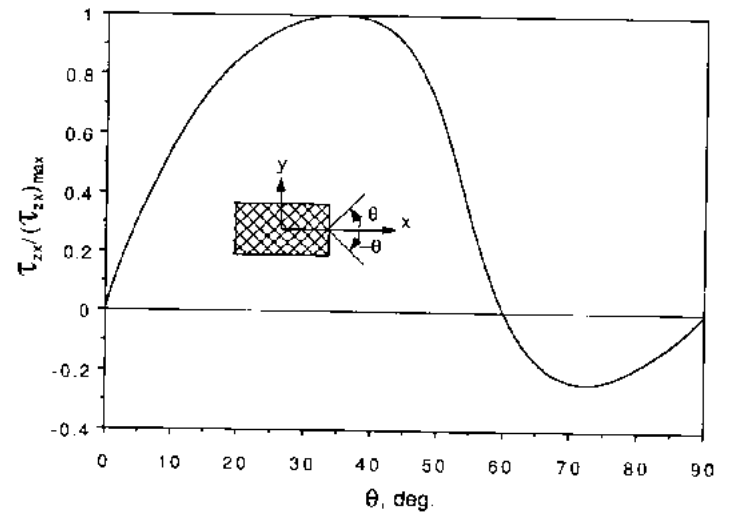
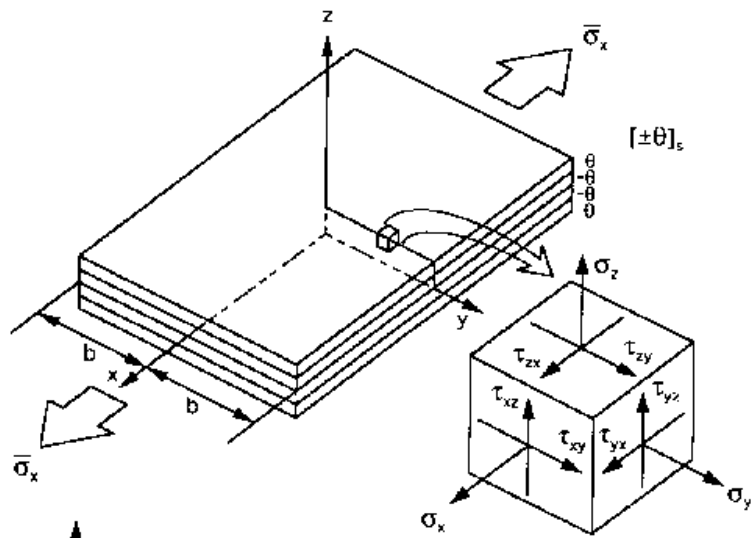
#### **8.0 Introduction**

Three types of interlaminar stress problems associated with three types of laminates:

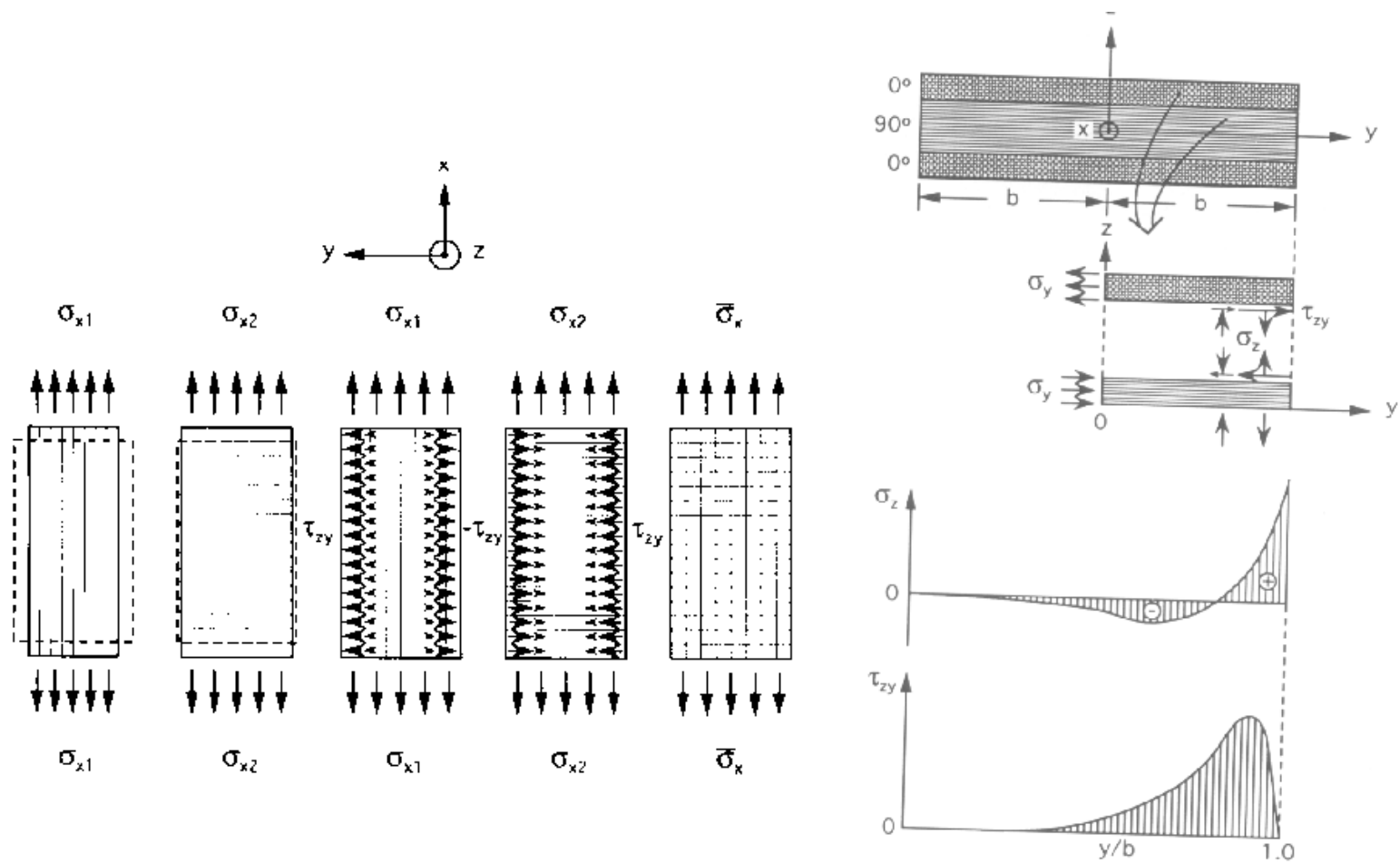
1.  $(\pm\theta)$  Angle-ply laminates
2. 0/90 Cross-ply laminates
3. Combination of angle-ply and cross-ply laminates.

## 8.1 Interlaminar Stresses in Angle-Ply Laminates

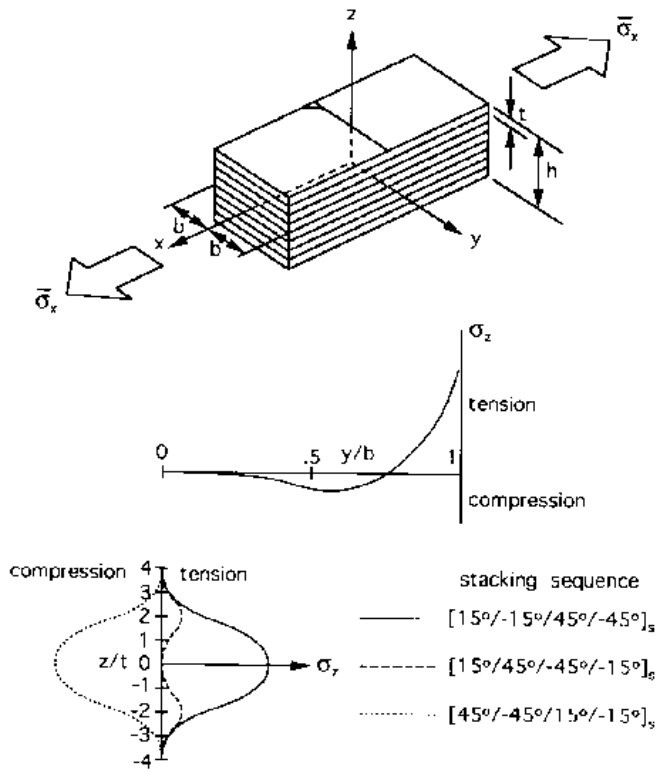




## 8.2 Interlaminar Stresses in Cross-ply Laminates

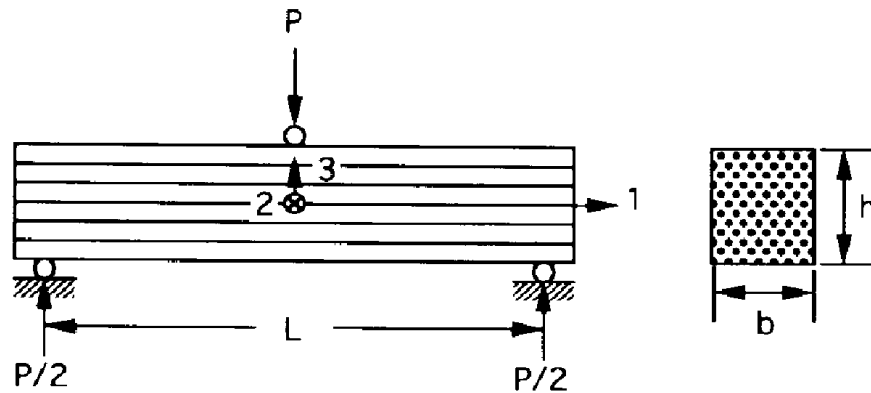


### 8.3 Interlaminar Stresses in Angle-Ply and Cross-ply Laminates



## 8.4 Interlaminar Strength

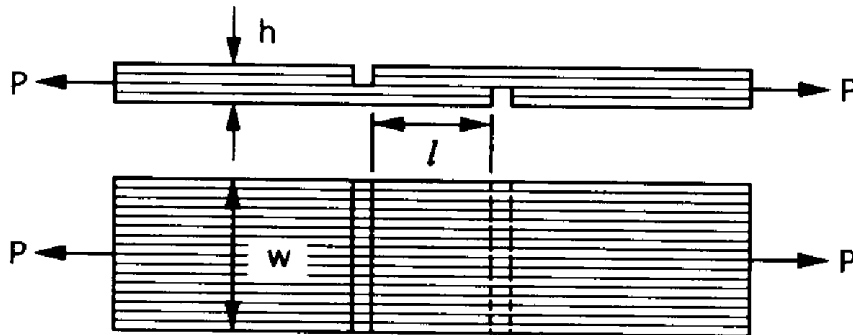
### 8.4.1 Interlaminar shear test (Short beam shear) (ASTM D2344)



$$F_{31} \cong \frac{3P}{4bh}$$

Note:  $\frac{2L}{h} < \frac{F_1}{F_{31}}$

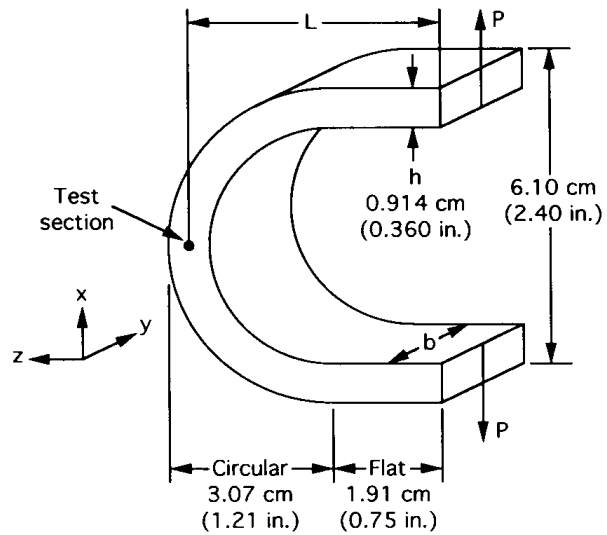
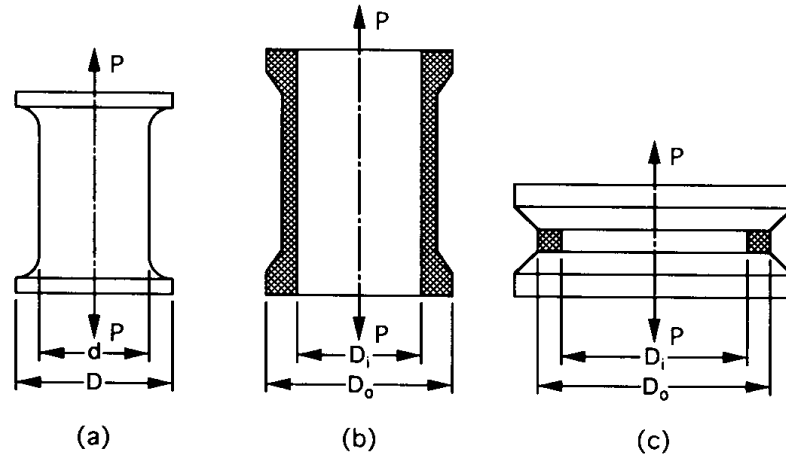
### 8.4.2 Double Notched Shear Test (ASTM D3846)



$$F_{31} \cong \frac{P}{wl}$$

Note:  $\frac{2l}{h} < \frac{F_1}{F_{31}}$

### 8.4.3 Interlaminar Tensile Strength



$$\sigma_z = \frac{3PL}{2bhR}$$

$R$  = Mean radius of the circular section.