

$$\phi = \cos^{-1} \left[ \frac{(0)(1) + (0)(1) + (1)(1)}{\sqrt{[(0)^2 + (0)^2 + (1)^2][(1)^2 + (1)^2 + (1)^2]}} \right]$$

$$= \cos^{-1} \left( \frac{1}{\sqrt{3}} \right) = 54.7^\circ$$

And, finally, using Equation 7.4, the critical resolved shear stress is equal to

$$\tau_{\text{crss}} = \sigma_y (\cos \phi \cos \lambda)$$

$$= (13.9 \text{ MPa}) [\cos(54.7^\circ) \cos(45^\circ)] = (13.9 \text{ MPa}) \left( \frac{1}{\sqrt{3}} \right) \left( \frac{1}{\sqrt{2}} \right) = 5.68 \text{ MPa} \quad (825 \text{ psi})$$