

**Mechanical Behavior of
Materials, 4/e
Instructor's Solution Manual**

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1.7 Plate with width change, Fig. A.11(c).

$$P = 3600 \text{ N}, w_2 = 24, w_1 = 16, t = 5 \text{ mm}$$

Polycarbonate, $\sigma_o = 62 \text{ MPa}$, $\epsilon_f = 110$ to 150%

$X_1 = ?$ adequate?

$$S = \frac{P}{w_1 t} = \frac{3600 \text{ N}}{16(5) \text{ mm}^2} = 45 \text{ MPa}$$

$$X_1 = \frac{\sigma_o}{S} = \frac{62 \text{ MPa}}{45 \text{ MPa}} = 1.38 \quad \blacktriangleleft$$

The value is a bit low but may be suitable under ideal circumstances. Note that the material is quite ductile. \blacktriangleleft