16-5

A -1/16-in.-diameter steel wire is wound into a coil. Determine the minimum diameter of the coil if the allowable flexural stress is 24 ksi.

Solution.

$$E = 30 \times 10^3 \text{ ksi} \quad (\text{steel})$$

$$d = \frac{Ec}{\sigma_{Allow}} = \frac{30 \times 10^3 \text{ ksi} \left(\frac{1}{32} \text{ in} \right)}{24 \text{ ksi}}$$

$$= 39.1 \text{ in} \quad \times \quad \frac{1 \text{ ft}}{12 \text{ in}}$$

$$= 3.26 \text{ ft}$$