

19.9 The linear coefficient of thermal expansion for this material may be determined using a rearranged form of Equation 19.3b as

$$\begin{aligned}\alpha_l &= \frac{\Delta l}{l_0 \Delta T} = \frac{\Delta l}{l_0 (T_f - T_0)} = \frac{0.48 \times 10^{-3} \text{ m}}{(0.4 \text{ m})(100^\circ\text{C} - 20^\circ\text{C})} \\ &= 15.0 \times 10^{-6} (\text{C})^{-1}\end{aligned}$$