Example

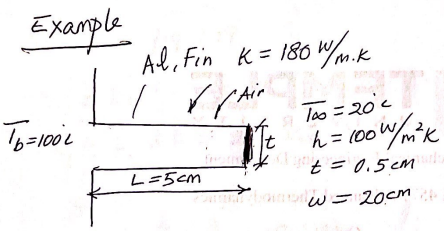

Table 3.4

$$q_f = \left[\frac{(\sinh mL + \frac{h}{mk}\cosh mL)}{(\cosh mL + \frac{h}{mK}\sinh mL)}\right] M$$

$$m = \sqrt{\frac{hP}{kAc}} = \sqrt{\frac{100 \times (0.2+0.005) \times 2}{180 \times (0.2 \times 0.005)}} = 15.1$$

$$M = \sqrt{kh PAc}\,\theta_b = \sqrt{180 \times 100 (0.2+0.005) \times 2 \times 0.2 \times 0.005} \times (100-20)$$

$$= 217$$

$$mL = 15.1 \times (0.05) = 0.76$$

$$q_f = 143\ W$$

adiabatic fin $\longrightarrow$ $q_f = M \tanh mL_c$

$$= 217 \tanh (15.1 \times 0.0525)$$

$$= 143\ W$$

$$L_c = L + t/2$$

$$= 0.05 + \frac{0.005}{2}$$

$$= 0.0525\ m$$

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