

$$Bi = \frac{k}{hL} = \frac{215}{525 \times 0.025} = 16.38$$

$$\alpha = \frac{k}{\rho c} = 8.84 \times 10^{-5} \text{ m}^2/\text{s}$$

$$Fo = \frac{\alpha t}{L^2} = \frac{8.84 \times 10^{-5} \times 60}{(0.025)^2} = 8.48$$

$$\chi^* = \frac{x}{L} = \frac{1.25}{2.5} = 0.5$$

From Heister chart

Fig 5 S.1 with $\begin{cases} Fo = 8.48 \\ Bi = 16.38 \end{cases} \Rightarrow \theta_o^* = \frac{\theta_o}{\theta_i} = \frac{T_o - T_\infty}{T_i - T_\infty} = 0.61$

$$\theta_o = 0.61 \theta_i = 0.61 (T_i - T_\infty) = 0.61 (200 - 70) = 79.3^\circ\text{C}$$

From Fig 5 S.2 with $\begin{cases} Bi = 16.38 \\ \chi/L = 0.5 \end{cases}$

$$\frac{\theta}{\theta_o} = \frac{T - T_\infty}{T_o - T_\infty} = 0.98 \Rightarrow \theta = 0.98 \theta_o = 0.98 \times 79.3 = 77.7^\circ\text{C}$$

$$\theta = T - T_\infty \Rightarrow T = 77.7 + 70 = 147.7^\circ\text{C}$$

From Fig 5 S.3 with $Bi = 0.061$

$$Bi^2 Fo = (0.061)^2 \times 8.48 = 0.03$$

$$\frac{Q}{Q_o} = 0.41 \Rightarrow \frac{Q/A}{Q_o/A} = 0.41$$

$$Q/A = 0.41 \times 15.8 \times 10^6 = 6.48 \times 10^6 \text{ J/m}^2$$