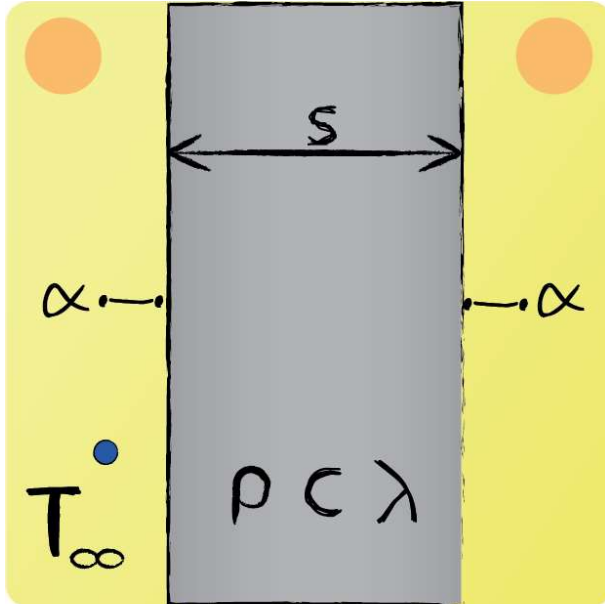


Exam Preparation - Conduction 27



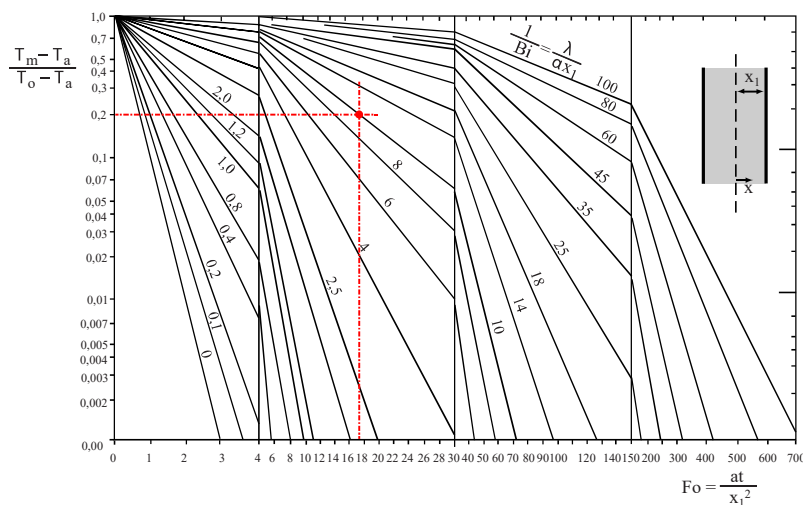
A plate with thickness $x = 2 \text{ cm}$ with initial homogeneous temperature $T(x, t = 0) = 293 \text{ K}$, is suddenly exposed to a medium of temperature $T_A = 353 \text{ K}$. Determine the time t_1 at which $T(x = 0, t_1) = 341 \text{ K}$ is reached.

Problem type:

One-dimensional, unsteady-state heat conduction that does penetrate.

$$\frac{1}{\text{Bi}} = \frac{\lambda}{\alpha \cdot x_1} = 10$$

$$\frac{T_m - T_a}{T_o - T_a} = 0.2$$



$$\rightarrow \text{Fo} = 17.33$$

$$t = 12507.77 \text{ s}$$