

Conductive heat transfer is the process through which heat is transferred through a material. Heat transfer can occur in one, two, or three dimensions. In almost all real-life situations, heat transfer occurs in three dimensions but for buildings, considerations for heat transfer are to only one-dimensional.

$$L=0.4\text{m } A= 20\text{m}^2 \text{ Delta}T= 25 \text{ K}=0.78\text{W/mK}$$

Using the simple method:

$$Q= K * A (\text{Delta}T/L)$$

$$= 0.78 * 20(25/0.4)$$

$$=0.78 * 1250$$

$$=975\text{Watts}$$

Using the resistance concept:

$$\begin{aligned}\text{Resistance of the wall}(R_{\text{wall}}) &= L / (K * A) \\ &= 0.4 / (0.78 * 20) \\ &= 0.025641\end{aligned}$$

$$\begin{aligned}\text{Conductive heat transfer}(Q) &= (\text{Delta } T / R_{\text{wall}}) \\ &= 25 / 0.025641 \\ &= 975 \text{ Watts}\end{aligned}$$