

Conductive heat transfer is heat flow through a body (example: a wall) from a hot environment to a colder one. The body or the element's conductivity can vary from one material to the other. For example, copper's a much more conductive material than plastic.

Also, the dimensions of the body itself can affect the heat transfer through a wall. Therefore, heat transfer through a body is proportional to its area, thickness difference of temperature and the conductivity of the material.

$$L = 0.4 \text{ m}$$

$$A = 20 \text{ m}^2$$

$$\Delta T = 25$$

$$K = 0.78 \text{ W/mK}$$

Simple Method:

$$*Q = KA \frac{\Delta t}{L} = 0.78 \times 20 \times \frac{25}{0.4} = 975 \text{ W}$$

Resistance Concept Method

$$*Q = \frac{\Delta t}{R_{wall}}$$

$$*R_{wall} = \frac{L}{KA} = \frac{0.4}{0.78 \times 20} = 0.0256 \text{ } ^\circ\text{C/W}$$

$$*Q = \frac{\Delta t}{R_{wall}} = \frac{25}{0.0256} = 976.56 \text{ W}$$