

The transfer through the wall can be modeled as steady and one-dimensional, and in the steady operation.

The rate of heat through the wall is constant, and is inversely proportional to the wall thickness, so the thicker the wall, the less heat goes through.

$$\dot{Q} = kA \frac{\Delta T}{L} = 0.78 * 20 * \frac{25}{0.4} = 975 \text{ W}$$

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

$$\dot{Q} = \frac{\Delta T}{R_{Wall}} = \frac{25}{0.0256} = 974.999 \text{ W}$$