

Conductive heat transfer by Rubén Darío Uriza Escobar

The reactions is produced in solids due to the differences in the temperature in some parts of the solid.

The unit of conductivity is W/mk

$$Q = K \cdot A \cdot \Delta T / L$$

$$Q_{\text{cond.wall}} = K \cdot A \cdot T_1 - T_2 / L$$

$$Q_{\text{cond.wall}} = T_1 - T_2 / R_{\text{wall}}$$

$$R_{\text{wall}} = L / K \cdot A$$

$$Q = \Delta T / R_{\text{wall}}$$

Exercise

L= 0.4 m, A= 20 m², DeltaT= 25, and k=0.78 W/m K

$$Q = K \cdot A \cdot \Delta T / L$$

$$Q = 0,78 \text{ W/m} \cdot 20 \text{ m}^2 \cdot (25 / 0,4 \text{ m})$$

$$Q = 975 \text{ W}$$

$$R_{\text{wall}} = L / K \cdot A$$

$$R_{\text{wall}} = 0,4 \text{ m} / (0,78 \text{ W/mk} \cdot 20)$$

$$R_{\text{wall}} = 0,0256 \text{ }^\circ\text{C/W}$$

$$Q = \Delta T / R_{\text{wall}}$$

$$Q = 25^\circ\text{C} / 0,0256 \text{ }^\circ\text{C/W}$$

$$Q = 976,56 \text{ W}$$