



POLITECNICO
MILANO 1863

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Summary

There are three possible ways that heat can travel from one substance to the other one. Conduction, Convection and Radiation. Conduction is the transfer of heat between substances which are in direct physical contact. Heat flows from a hotter environment to the colder one and the rate of this transfer depends on four elements:

- 1- Temperature difference between two environments
 - 2- Thermal conductivity of the material of conductive surface
 - 3- Area of the conductive surface
 - 4- Thickness of the conductive surface
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Exercise

1- Simple Method

$$\dot{Q} = kA \frac{\Delta T}{L} \Rightarrow \dot{Q} = 0.78 \times 20 \times \frac{25}{0.4} \Rightarrow \dot{Q} = 975$$

2- Resistance Concept

$$R_{wall} = \frac{L}{kA} \Rightarrow R_{wall} = \frac{0.4}{0.78 \times 20} \Rightarrow R_{wall} = 0.02564$$

$$\dot{Q} = \frac{\Delta T}{R_{wall}} \Rightarrow \dot{Q} = \frac{25}{0.02564} \Rightarrow \dot{Q} = 975.0390 \approx 975$$