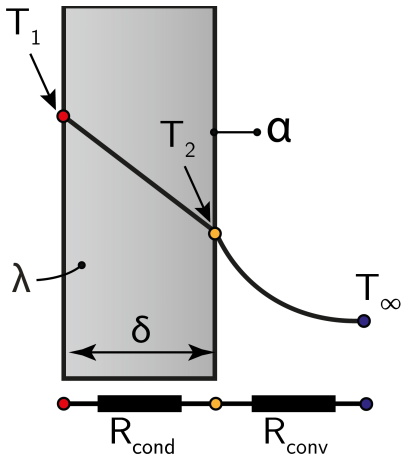
Conduction - Thermal Resistance 03

Define the heat transfer resistance R_{conv} for a flat surface of area A:



The standard expression for thermal resistance is:

$$R_{\text{conv}} = \frac{\Delta T}{\dot{Q}_{\text{conv}}}$$

The temperature difference can be expressed as:

$$\Delta T = T_2 - T_\infty$$

Where the rate of heat transfer for a plane wall can be stated as follows:

$$\dot{Q}_{\text{conv}} = \alpha A \left(T_2 - T_\infty\right)$$

Substitution yields:

$$\rightarrow R_{\text{conv}} = \frac{1}{\alpha A}$$