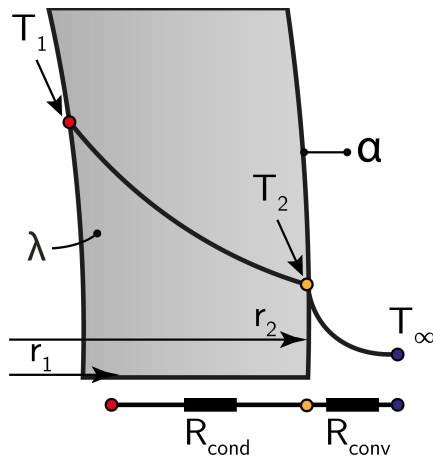# Conduction - Thermal Resistance 04

Define the heat transfer resistance R_{conv} for a tube of length L with the given radii r_1 and r_2:

The standard expression for convective 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:

$$\dot{Q}_{\text{conv}} = \alpha A \left(T_2 - T_\infty\right) = \alpha 2\pi r_2 L \left(T_2 - T_\infty\right)$$

Substitution yields:

$$\rightarrow R_{\text{conv}} = \frac{1}{2\pi r_2 L \alpha}$$