

**Answer on Question #46034, Physics, Electromagnetism**

*A coil of wire has a resistance of 25.0Ω at 20°C and a resistance of 25.1Ω at 35°C What is its temperature coefficient of resistance?*

Resistance of wire depends on temperature by equation:

$$R_T = R_{T_0}(1 + \alpha\Delta T)$$

Where  $\alpha$  – is temperature coefficient of resistance,  $\Delta T$  – temperature difference.

From this equation we can find temperature coefficient of resistance:

$$\alpha = \left( \frac{R_T}{R_{T_0}} - 1 \right) \frac{1}{\Delta T}$$
$$\alpha = \left( \frac{25.1 \text{ Ohm}}{25.0 \text{ Ohm}} - 1 \right) \frac{1}{15K} \approx 2.7 \cdot 10^{-4} K^{-1}$$

**Answer:** temperature coefficient of resistance  $\alpha \approx 2.7 \cdot 10^{-4} K^{-1}$