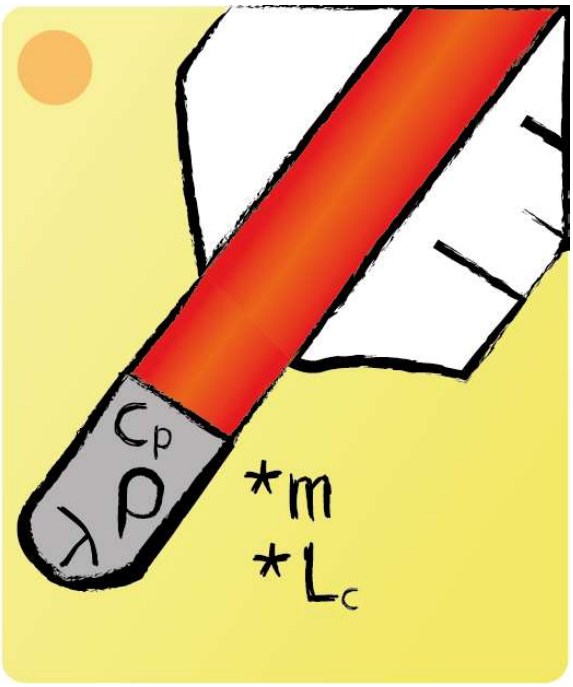
Lecture 15 - Question 2



Remember, from the lumped capacity model, parameter m:

$$m = \frac{\alpha A}{\rho c_p V} = \frac{\alpha}{\rho c_p \cdot L_c}$$

Consider the thermometer as in the figure. Take $m = 0.03$, $\rho = 15000$ kg/m^3, $c_\mathrm{p} = 140$ J/kg·K and $L_\mathrm{c} = 1.25$ mm. Determine the heat transfer coefficient α. Select the proper range.

$$\alpha = \frac{m \cdot \rho \cdot c_p \cdot d}{4} = 78.75\ W/m^2K$$