Nusselt Number 06
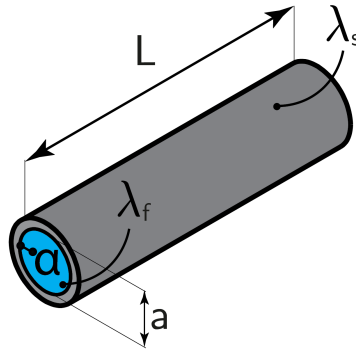
Give an expression for the Nusselt number in terms of given variables.

The standard expression for the Nusselt number is:

$$\mathrm{Nu} = \frac{\alpha L_{\mathrm{c}}}{\lambda_{\mathrm{fluid}}}$$

The characteristic length has to be determined. For pipe flow in a cylindrical pipe, this is the diameter of the pipe.

Which thus is:

$$L_{\mathrm{c}} = a$$

And therefore the Nusselt number can be expressed as:

$$\mathrm{Nu} = \frac{\alpha a}{\lambda_{\mathrm{f}}}$$