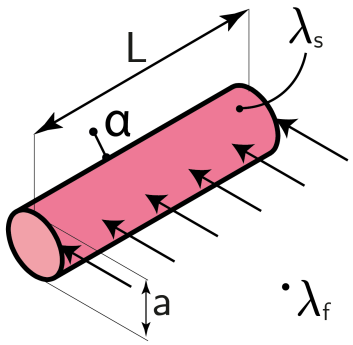
Biot Number 01

Give an expression for the Biot number of a long cylinder in terms of given variables.



The standard expression for the Biot number is:

$$\mathrm{Bi} = \frac{\alpha L_c}{\lambda_s}$$

The characteristic length in the given situation should be determined.

In this case, the characteristic length is:

$$L_c = \frac{V}{A_s} = \frac{\frac{\pi a^2}{4} L}{\pi a L} = \frac{a}{4}$$

With this finding, the Biot number in the given situation can be expressed as:

$$\mathrm{Bi} = \frac{\alpha a}{4\lambda_s}$$