In[ ]:=
$$\text{hPlate} = 0.943 \left(\frac{h_{fg}\,(1 + 0.68\,\text{Ja})\,g\,\rho_l\,(\rho_l - \rho_v)\,\kappa_l^{\,3}}{\mu_l\,(T_{sat} - T_w)\,L} \right)^{1/4};$$

$$\text{mPlate} = \frac{\text{hPlate}\,L\,(T_{sat} - T_w)}{h_{fg}};$$

$$\text{mCylinder} = 1.923 \left(\frac{g\,\rho_l\,(\rho_l - \rho_v)\,\kappa_l^{\,3}\,d^3\,(T_{sat} - T_w)^3}{8\,\mu_l\,h_{fg}^{\,3}} \right)^{1/4};$$

In[ ]:=
$$\text{ratio} = \text{Simplify}\left[\left(\frac{\text{mPlate}}{\text{mCylinder}} \right) /. \{\text{Ja} \to 0,\ g \to 9.81\},\ \{T_{sat} > T_w,\ \rho_l > \rho_v > 0,\ \kappa_l > 0,\ \mu_l > 0,\ h_{fg} > 0\} \right]$$

Out[ ]=
$$\frac{0.824717}{\left(d^3\right)^{1/4} \left(\frac{1}{L}\right)^{3/4}}$$

In[ ]:=
$$\text{Simplify}\left[\text{ratio} /. \left\{L \to \frac{\pi\,d}{2}\right\},\ d > 0\right]$$

Out[ ]=
$$1.15716$$