$$r = 1 - \frac{2.312}{99.132} = 0.922$$

$$C_{\mathrm{f}} = \left[\frac{2 \cdot 1.399 \cdot \left(0.922^{\frac{1.399-1}{1.399}} - 1\right)}{(1.399-1) \cdot \left(0.8^4 - 0.922^{\frac{-2}{1.399}}\right)} \right]^{\frac{1}{2}}$$

$C_{\mathrm{f}} = 0.472$

$$C_{\mathrm{d}} = 2.395 \cdot \frac{101325 \cdot \sqrt{1 \cdot 0.0287805 \cdot 8.314472 \cdot 298.15}}{0.472 \cdot 0.01824 \cdot 8.314472 \cdot 99132 \cdot 293.15}$$

$C_{\mathrm{d}} = 0.985$

(vi) Calculate the Reynolds number, $Re^{\#}$, for each reference flow rate, $\dot{Q}_{\mathrm{ref}}$, using the throat diameter of the venturi, d_{t}, and the uncorrected air density, ρ. Because the dynamic viscosity, μ, is needed to compute $Re^{\#}$, you may use your own fluid viscosity model to determine μ for your calibration gas (usually air), using good engineering judgment. Alternatively, you may use the Sutherland three-coefficient viscosity model to approximate μ, as shown in the following sample calculation for $Re^{\#}$:

$$Re^{\#} = \frac{4 \cdot \rho \cdot \dot{Q}_{\mathrm{ref}}}{\pi \cdot d_{\mathrm{t}} \cdot \mu}$$

Eq. 1066.625-8

Where, using the Sutherland three-coefficient viscosity model:

$$\mu = \mu_0 \cdot \left(\frac{T_{\mathrm{in}}}{T_0}\right)^{\frac{3}{2}} \cdot \left(\frac{T_0 + S}{T_{\mathrm{in}} + S}\right)$$

Eq. 1066.625-9