Performance Estimates for Venturis and ASME Flow Nozzles: Helium
Performance Estimates for Venturis and ASME Flow Nozzles
Based on Helium at 14.696 psia and 70 deg. F.

Where:
- \( m \) = mass flow (lbm/sec)
- \( P_1 \) = Inlet Static Pressure (psia)
- \( P_2 \) = Throat Static Pressure (psia)
- \( T_1 \) = Inlet Temperature (Rankine)
- \( D_p = P_1 - P_2 \)
- \( D \) = Inlet Diameter (inches)
- \( d \) = Throat Diameter (inches)

\[ \frac{D_p}{P_1} = 0.513 = \text{Choke Point} \]

Beta Ratio:
- \( \beta = \frac{d}{D} = 0 \)
- \( \beta = \frac{d}{D} = 0.5 \)
- \( \beta = \frac{d}{D} = 0.75 \)

Flow Function:
\[ \frac{m \times (T_1)^{1/2}}{P_1} \left( \frac{\text{lbm} \times (R^{0.5})}{\text{sec} \times \text{psia}} \right) \]
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Where:
- m = mass flow (lbfm/sec)
- P1 = Inlet Static Pressure (psia)
- P2 = Throat Static Pressure (psia)
- T1 = Inlet Temperature (Rankine)
- Dp = P1 - P2
- D = Inlet Diameter (inches)
- d = Throat Diameter (inches)

Beta Ratio = d/D = 0
Beta Ratio = d/D = 0.5
Beta Ratio = d/D = 0.75

Flow Function = \[ \frac{m \times (T1)^{1/2}}{P1 \times \text{lbm}^* (R^{0.5})/(\text{sec}^*\text{psia})} \]