Performance Estimates for Venturis and ASME Flow Nozzles: Oxygen

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Performance Estimates for Venturis and ASME Flow Nozzles

Based on Oxygen at 14.696 psia and 70 deg. F.

\[ \frac{Dp}{P1} = 0.471 = \text{Choke Point} \]

Where:
- \( m \) = mass flow (lbm/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)

\[ \text{Beta Ratio} = \frac{d}{D} = 0 \]
\[ \text{Beta Ratio} = \frac{d}{D} = 0.5 \]
\[ \text{Beta Ratio} = \frac{d}{D} = 0.75 \]

Flow Function = \[ \frac{m \times (T1)^{1/2}}{P1} \times \frac{(R^{0.5})}{(\text{sec} \times \text{psia})} \]
Performance Estimates for Venturis and ASME Flow Nozzles
Based on Oxygen 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)

Beta Ratio = \( d/D = 0 \)
Beta Ratio = \( d/D = 0.5 \)
Beta Ratio = \( d/D = 0.75 \)

Flow Function = \[ \frac{m \times (T_1)^{1/2}}{P_1} \left( \text{lbm}^* (\text{R}^{0.5})/(\text{sec}^{*}\text{psia}) \right) \]