The Gas-Dynamics model: Soon to be updated.

Assumptions:

Gas Dynamics model equations:

General state equations: (Applies to any substance)

$$m = \rho \cancel{V};\ \rho = \frac{1}{v};\ \text{ke} = \frac{V^2}{2000};\ \text{pe} = \frac{gz}{1000};\ \ e \equiv u + ke + pe;\ \ j \equiv h + ke + pe;\ h \equiv u + pv \qquad (4)$$

$$E = me;\ \ S = ms;\ KE = m(\text{ke});\ PE = m(\text{pe}) \qquad (5)$$

$$\dot{m} = \rho AV;\ \ \cancel{\dot{V}} = AV;\ \dot{E} = \dot{m}e;\ \ \dot{S} = \dot{m}s \qquad (6)$$

Reference: Chapter 15 discusses high speed flow and gas dynamics models.