A.5.3 Formulation of Flow Rate Calculations

The various procedures used to calculate each of the available flow rates are detailed below, based on a known molar flow:

Molar Flow Rate

$$Total\ Molar\ Flow = Molar\ Flow_{Stream} \tag{A.60}$$

Mass Flow

$$Mass\ Flow = Total\ Molar\ Flow \times MW_{Stream} \tag{A.61}$$

Std Ideal Liq Vol Flow

This volumetric flow rate is calculated using the ideal density of the stream and thus is somewhat empirical in nature.

Note that even if a stream is all vapour, it will still have a LiqVolume flow, based upon the stream's Standard Ideal Liquid Mass density, whose calculation is detailed in the previous section.

$$LiqVolFlow = \frac{Total\ Molar\ Flow \times MW_{Stream}}{Ideal\ Density_{Stream}} \tag{A.62}$$

Liq Vol Flow @Std Cond

This volumetric flow rate is calculated using a rigorous density calculated at standard conditions, and will reflect non-ideal mixing effects.

$$Std\ Liquid\ Volume\ Flow = \frac{Molar\ Flow \times MW}{Std\ Liq\ Density} \tag{A.63}$$