Environmental Protection Agency § 1065.659

\[ \dot{n}_{\text{exh}} = \frac{3.780}{1 + (0.69021 - 1.10764)} \]

\[ \dot{n}_{\text{exh}} = 6.066 \text{ mol/s} \]

(3) Fuel mass flow rate calculation.

Based on \( \dot{m}_{\text{fuel}} \), calculate \( \dot{n}_{\text{exh}} \) as follows:

\[ \dot{n}_{\text{exh}} = \frac{\dot{m}_{\text{fuel}} \cdot W_{C} \cdot (1 + x_{\text{H2O\text{dry}}})}{M_{C} \cdot x_{\text{Comb\text{dry}}}} \]

Eq. 1065.655-21

Where:

\( \dot{n}_{\text{exh}} \) = raw exhaust molar flow rate from which you measured emissions.

\( \dot{m}_{\text{fuel}} \) = fuel flow rate including humidity in intake air.

Example:

\[ \dot{n}_{\text{exh}} = \frac{7.559 \cdot 0.869 \cdot (1 + 0.10764)}{12.0107 \cdot 0.09987} \]

\[ \dot{n}_{\text{exh}} = 6.066 \text{ mol/s} \]


§ 1065.659 Removed water correction.

(a) If you remove water upstream of a concentration measurement, \( x \), or upstream of a flow measurement, \( n \), correct for the removed water. Perform this correction based on the amount of water at the concentration measurement, \( x_{\text{H2O\text{emission}}} \), and at the flow meter, \( x_{\text{H2O\text{exh}}} \), whose flow is used to determine the concentration’s total mass over a test interval.

(b) When using continuous analyzers downstream of a sample dryer for transient and ramped-modal testing, you must correct for removed water using signals from other continuous analyzers. When using batch analyzers downstream of a sample dryer, you must correct for removed water by using signals either from other batch analyzers or from the flow-weighted average concentrations from continuous analyzers. Downstream of where you removed water, you may determine the amount of water remaining by any of the following:

(1) Measure the dewpoint and absolute pressure downstream of the water removal location and calculate the amount of water remaining as described in §1065.645.

(2) When saturated water vapor conditions exist at a given location, you may use the measured temperature at that location as the dewpoint for the downstream flow. If we ask, you must demonstrate how you know that saturated water vapor conditions exist. Use good engineering judgment to measure the temperature at the appropriate location to accurately reflect the dewpoint of the flow. Note that if you use this option and the water correction in paragraph (d) of this section results in a corrected value that is greater than the measured value, your saturation assumption is invalid and you must determine the water content according to paragraph (b)(1) of this section.
§ 1065.660 THC, NMHC, and CH₄ determination.

(a) THC determination and THC/CH₄ initial contamination corrections. (1) If we require you to determine THC emissions, calculate \( x_{THC[THC-FID]cor} \) using the initial THC contamination concentration \( x_{THC[THC-FID]init} \) from §1065.520 as follows:

\[
x_{THC[THC-FID]cor} = x_{THC[THC-FID]uncor} - x_{THC[THC-FID]init}
\]

Example:
\[
\begin{align*}
x_{THCuncor} & = 150.3 \text{ μmol/mol} \\
x_{THCinit} & = 1.1 \text{ μmol/mol} \\
x_{THCcor} & = 149.2 \text{ μmol/mol}
\end{align*}
\]

(2) If you do not measure CH₄, you may determine NMHC concentrations as described in §1065.650(c)(1)(vi).

(b) NMHC determination. Use one of the following to determine NMHC concentration, \( x_{NMHC} \):

(1) If you do not measure CH₄, you may determine NMHC concentrations using Eq. 1065.660–1, substituting in CH₄ concentrations for THC.

(2) For nonmethane cutters, calculate \( x_{NMHC} \) using the nonmethane cutter’s penetration fractions \( (PF) \) of CH₄ and C₂H₆ from §1065.365, and using the HC contamination and dry-to-wet corrected THC concentration \( x_{THC[THC-FID]cor} \) as determined in paragraph (a) of this section.

Example:
\[
\begin{align*}
x_{THCuncor} & = 150.3 \text{ μmol/mol} \\
x_{THCcor} & = 149.2 \text{ μmol/mol}
\end{align*}
\]