sampling period (approximately five minutes).

(4) The calculations are performed in the normal way except in the case of propane. The density of propane (0.6109 kg/m³/carbon atom) is used in place of the density of exhaust hydrocarbons.

(5) The gravimetric mass is subtracted from the CVS measured mass and then divided by the gravimetric mass to determine the percent accuracy of the system.

(6) Good engineering practice requires that the cause for any discrepancy greater than ±two percent must be found and corrected.

§ 90.425 CVS calibration frequency.

Calibrate the CVS positive displacement pump or critical flow venturi following initial installation, major maintenance, or as necessary when indicated by the CVS system verification (described in § 90.424(e)).

§ 90.426 Dilute emission sampling calculations—gasoline fueled engines.

(a) The final reported emission test results must be computed by use of the following formula:

$$A_{WM} = \frac{\sum_{i}^{n}\left(W_i \cdot WF_i\right)}{\sum_{i}^{n}\left(P_i \cdot WF_i\right)} \cdot K_{H_i}$$

Where:

A_{WM} = Final weighted brake-specific mass emission rate for an emission (HC, CO, CO_2, or NO_X) [g/kW-hr]

W_i = Average mass flow rate of an emission (HC, CO, CO_2, NO_X) from a test engine during mode i [g/hr]

WF_i = Weighting factor for each mode i as defined in § 90.410(a).

P_i = Gross average power generated during mode i [kW], calculated from the following equation,

$$P_i = \frac{2\pi}{60{,}000} \times \text{speed} \times \text{torque}$$

Where:

speed = average engine speed measured during mode i [rev./minute]

torque = average engine torque measured during mode i [N-m]

K_{Hi} = NO_X humidity correction factor for mode i. This correction factor only affects calculations for tion factor only affects calculations for NO_X and is equal to one for all other emissions. K_{Hi} is also equal to 1 for all two-stroke engines.

(b) The mass flow rate, W_i in g/hr, of an emission for mode i is determined from the following equations:

$$W_i = Q_i \cdot \text{Density} \cdot \left(\frac{C_{Di} - C_{Bi}}{10^6} \cdot \left(1 - \frac{1}{DF_i}\right)\right)$$

Where:

Q_i = Volumetric flow rate oandard conditions [m³/hr at STP].

Density = Density of a specific emission (Density_{HC}, Density_{CO}, Density_{CO2}, Density_{NOx}) [g/m³].

DF_i = Dilution factor of the dilute exhaust during mode i.

C_{Di} = Concentration of the emission (HC, CO, NO_X) in dilute exhaust extracted from the CVS during mode i [ppm].

C_{Bi} = Concentration of the emission (HC, CO, NO_X) in the background sample during mode i [ppm].

STP = Standard temperature and pressure. All volumetric calculations made for the equations in this section are to be corrected to a standard temperature of 20 °C and 101.3 kPa.

(c) Densities for emissions that are to be measured for this test procedure are:

Density_{HC} = 576.8 g/m³
Density_{NOX} = 1912 g/m³
Density_{CO} = 1164 g/m³
Density_{CO2} = 1829 g/m³

(1) The value of Density_{HC} above is calculated based on the assumption that the fuel used has a carbon to hydrogen ratio of 1:1.85. For other fuels Density_{HC} can be calculated from the following formula:

$$\text{Density}_{HC} = \frac{M_{HC}}{R_{STP}}$$

Where:

M_{HC} = The molecular weight of the hydrocarbon molecule divided by the number of carbon atoms in the molecule [g/mole]

R_{STP} = Ideal gas constant for a gas at STP=0.024065 [m³-mole].

(2) The idealized molecular weight of the exhaust hydrocarbons, i.e., the molecular weight of the hydrocarbon molecule divided by the number of carbon atoms in the molecule, M_{HC}, can be calculated from the following formula: