

FEDERAL REFERENCE METHOD 4
Determination of Moisture Content of Stack Gases

Plant _____ Date _____

Location _____ Test No. _____

INPUT PARAMETERS

Volume of gas sampled through dry gas meter = V_m = _____

Dry gas meter (DGM) calibration factor = Y = _____

Average DGM temperature (°R) = °F + 460° = T_m = _____

Average DGM orifice pressure differential = ΔH = _____

Volume of water collected, condensed, $[V_f - V_i]$, g = V_{lc} = _____

Volume of water collected in silica gel ($W_f - W_i$) = V_{wsg} = _____

Barometric pressure (in. Hg) = P_{bar} = _____

CALCULATIONS

$V_{m(std)}$ = Volume of gas sampled at standard conditions, dscf

$$V_{m(std)} = 17.64 \times Y \times V_m \times \frac{P_{bar} + \left(\frac{\Delta H}{13.6}\right)}{T_m}$$

$$V_{m(std)} = 17.64 \times (\quad) \times (\quad) \times \frac{(\quad) + \left(\frac{(\quad)}{13.6}\right)}{(\quad)} = \text{_____ dscf}$$

$V_{wc(std)}$ = Volume of water vapor condensed at standard conditions, scf

$$V_{wc(std)} = 0.04707 \times V_{lc}$$

$$V_{wc(std)} = 0.04707 \times (\quad) = \text{_____ scf}$$

Determination of Moisture Content of Stack Gases (continued)

$V_{wsg(std)}$ = Volume of water vapor collected in silica gel

$$V_{wsg(std)} = 0.04715 \times V_{wsg}$$

$$V_{wsg(std)} = 0.04715 \times (\quad) = \underline{\hspace{2cm}} \text{scf}$$

B_{ws} = Mole fraction of water vapor

$$B_{ws} = \frac{V_{wc(std)} + V_{wsg(std)}}{V_{wc(std)} + V_{wsg(std)} + V_{m(std)}}$$

$$B_{ws} = \frac{(\quad) + (\quad)}{(\quad) + (\quad) + (\quad)} = \underline{\hspace{2cm}}$$

$\%H_2O$ = Percent moisture

$$\%H_2O = 100 \times B_{ws}$$

$$\%H_2O = 100 \times (\quad) = \underline{\hspace{2cm}} \%$$