FEDERAL REFERENCE METHOD 2
Determination of Stack Gas Velocity and Volumetric Flow Rate
(Type S Pitot Tube)

Plant _____ **Date** _____

Location _____ **Test No.** _____

INPUT PARAMETERS

Area of stack (ft^2)	**= π (D/2)^2 or L x W**	=	**A_s**	= _____
Pitot tube coefficient		=	**C_p**	= _____
Stack gas temperature (°R)	**= °F + 460°**	=	**T_s**	= _____
Average of square root of velocity head (in. H_2O)$^{1/2}$		=	**$(\sqrt{\Delta p})_{avg}$**	= _____
Barometric pressure (in. Hg)		=	**P_{bar}**	= _____
Stack gas static pressure (in. H_2O)		=	**P_g**	= _____
Absolute stack gas pressure (in. Hg)		=	**P_s**	= _____

Note: $P_s = P_{bar} + P_g$ (in. H_2O)/13.6

Stack gas moisture (fraction)	=	**B_{ws}**	= _____
Stack gas dry molecular weight (lb/lb-mole)	=	**M_d**	= _____
Stack gas wet molecular weight (lb/lb-mole)	=	**M_s**	= _____

Note: $M_s = M_d (1 - B_{ws}) + 18.0\ B_{ws}$

CALCULATIONS

v_S = Stack gas velocity, ft/s

$$v_s = 85.49 \times C_p \times (\sqrt{\Delta p})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s M_s}}$$

$$v_s = 85.49 \times (\quad) \times (\quad) \times \sqrt{\frac{(\quad)}{(\quad)\times(\quad)}} = \_\_\_\_\_ \text{ft/s}$$

Q_a = Volumetric flow rate, acfm

$$Q_a = 60 \times v_s \times A_s$$

$$Q_a = 60 \times (\quad) \times (\quad) = \_\_\_\_\_ \text{acfm}$$

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(continued)

Q_d = Dry volumetric flow meter, scfm

$$Q_d = 60 \text{ x } (1 - B_{ws}) \text{ x } v_s \text{ x } A_s$$

$$Q_d = 60 \text{ x } (1 - (\quad)) \text{ x } (\quad) \text{ x } (\quad) = \_\_\_\_\_ \text{scfm}$$

Q_{sd} = Volumetric flow rate, dscfm

$$Q_{sd} = 60 \text{ x } (1 - B_{ws}) \text{ x } v_s \text{ x } A_s \text{ x } \frac{528}{T_s} \text{ x } \frac{P_s}{29.92}$$

$$Q_{sd} = 60 \text{ x } (1 - (\quad)) \text{ x } (\quad) \text{ x } (\quad) \text{ x } \frac{528}{(\quad)} \text{ x } \frac{(\quad)}{29.92} = \_\_\_\_\_ \text{dscfm}$$