7011.0620 PERFORMANCE TEST PROCEDURES.

Subpart 1. **In general.** Performance tests shall be conducted according to the requirements of this part and parts 7017.2001 to 7017.2060.

Subp. 2. **Sampling site.** The sampling site, as selected by Method 1, shall be the same for each pollutant during a performance test.

Subp. 3. **Sampling time for Methods 5 and 202.** For Methods 5 and 202, the sampling time for each run must be at least 60 minutes and the minimum sampling volume must be 0.85 dscm (30 dscf) except that owners or operators may, prior to testing, request approval from the commissioner for smaller sampling times or volumes, when necessitated by process variables or site-specific limitations.

Subp. 4. **Sampling point for Method 6.** For Method 6, the sampling point in the duct shall be at the center of the cross section or at a point no closer to the walls than one meter (3.28 ft.). The sample shall be extracted at a rate proportional to the gas velocity at the sampling point.

Subp. 5. **Sampling time for Method 6.** For Method 6, the minimum sampling time shall be 20 minutes and the minimum sampling volume 0.02 dscm (0.71 dscf) for each sample. The arithmetic mean of two samples shall constitute one run. Samples shall be taken at approximately 30-minute intervals.

Subp. 6. **Sulfur dioxide emissions.** For each performance test for sulfur dioxide emissions, the emissions expressed in g/million cal (lb/million Btu) shall be determined by the following procedure if the actual heat input is used:

$$E = CF \left(\frac{20.90}{20.9 - \%O_2} \right)$$

where:

A. E = pollutant emission, g/million cal (lb/million Btu);

B. C = pollutant concentration, g/dscm (lb/dscf);

C. $\%O_2$ = oxygen content by volume (expressed as percent), dry basis. Percent oxygen shall be determined by using the integrated sampling procedures of Method 3 or with the Orsat analyzer. The sample shall be obtained at approximately the same point in the duct as used to obtain the samples for Method 6;

D. The owner or operator may use either subitem (1) or (2) to determine the value of F. F = factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted.

(1) Values of F are given as follows:

(a) for anthracitic coal according to A.S.T.M. D388-66, F = 0.01139 dscm/10^4 cal (101.4 dscf/10^4 Btu);

(b) for subbituminous and bituminous coal according to A.S.T.M. D388-66, F = 0.01103 dscm/10^4 cal (98.2 dscf/10^4 Btu);

(c) for liquid fossil fuels including crude, residual, and distillate oils, F = 0.01036 dscm/10^4 cal (92.2 dscf/10^4 Btu); and

(d) for gaseous fossil fuels including natural gas, propane, and butane, F = 0.00982 dscm/10^4 cal (87.4 dscf/10^4 BTU).

(2) An owner or operator may use the following equation to determine an F factor (dscf/10^4 Btu):

$$F = \frac{10^6 3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%)}{GVH}$$

where:

(a) H, C, S, N, and O are content by weight of hydrogen, carbon, sulfur, nitrogen, and oxygen (expressed as percent), respectively, as determined by ultimate analysis of the fuel fired, dry basis, using A.S.T.M. methods D3178-74 or D3176 (solid fuels) or D240-64(73) (liquid fuels) or computed from results using A.S.T.M. method D1137-53(70), D1945-64(73) or D1946-67(72) (gaseous fuels) as applicable; and

(b) GHV is the gross heating value.

E. When combinations of fuels are fired, the F factors determined by item D or E shall be prorated in accordance with the following formula:

$$F = \frac{xF_1 + yF_2 + zF_3}{100}$$

where:

x = the percentage of total heat input derived from gaseous fossil fuel;

y = the percentage of total heat input derived from liquid fossil fuel;

z = the percentage of total heat input derived from solid fossil fuel;

F_1 = the value of F for gaseous fossil fuels according to item D or E;

F_2 = the value of F for liquid fossil fuels according to item D or E;

F_3 = the value of F for solid fossil fuels according to item D or E.

F. When combinations of fossil fuels are fired, the actual heat input, expressed in cal/hr (Btu/hr), shall be determined during each testing period. The rate of fuels burned during each testing period shall be determined by suitable methods and shall be confirmed by a material balance over the direct heating system.

Statutory Authority: *MS s 115.03; 116.07*

History: *18 SR 614; 18 SR 1412; 22 SR 1237; 41 SR 763*

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