

2.106 Ammonium Sulfate Processes

2.106.1 Applicability and Designation of Affected Facility

The provisions of this source category are applicable to each ammonium sulfate dryer used in the ammonium sulfate process and to the caprolactam, synthetic and coke oven by product ammonium sulfate processes.

2.106.2 Test Methods and Procedures

(a) In conducting the performance tests required in Section 1.2, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of this part or other methods and procedures as specified in this section, except as provided in §1.2(b).

(b) The owner or operator shall determine compliance with the particulate matter standards as follows:

(1) The emission rate (E) of particulate matter shall be computed for each run using the following equation:

(i) Where the units of the standard are expressed as kg/Mg (lbs/ton):

$$E = (C_s Q_{sd}) / (PK)$$

Where:

E = emission rate of particulate matter, kg/Mg (lb/ton) of ammonium sulfate produced.

C_s = concentration of particulate matter, g/dscm (g/dscf).

Q_{sd} = volumetric flow rate of effluent gas, dscm/hr (dscf/hr).

P = production rate of ammonium sulfate, Mg/hr (ton/hr).

K = conversion factor, 1000 g/kg (453.6 g/lb).

(ii) Where the units of the standard are expressed as lbs/hr:

$$E = C Q_{sd} / K$$

Where:

E = emission rate of particulate matter, lbs/hr.

Q_{sd}, K = same as in 2.106.2(b)(i) above.

(2) Method 5 shall be used to determine the particulate matter concentration (C_s) and volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 1.50 dscm (53 dscf).

(3) Direct measurement using product weigh scales or computed from material balance shall be used to determine the rate (P) of the ammonium sulfate production. If production rate is determined by material balance, the following equations shall be used:

- (i) For synthetic and coke oven by-product ammonium sulfate plants:

$$P = A' B C K$$

Where:

- A = sulfuric acid flow rate to the reactor/crystallizer averaged over the time period taken to conduct the run, liter/min.
- B = acid density (a function of acid strength and temperature), g/cc.
- C = acid strength, decimal fraction.
- K' = conversion factor, 0.0808 (Mg-min-cc)/(g-hr-liter)[0.0891 (ton-min-cc)/(g-hr-liter)].

- (ii) For caprolactam by-product ammonium sulfate plants:

$$P = D E F K''$$

Where:

- D = total combined feed stream flow rate to the ammonium crystallizer before the point where any recycle streams enter the stream averaged over the time period taken to conduct the test run, liter/min.
- E = density of the process stream solution, g/liter.
- F = percent mass of ammonium sulfate in the process solution, decimal fraction.
- K'' = conversion factor, 6.0×10^{-5} (Mg-min)/(g-hr)[6.614×10^{-5} (ton-min)/(g-hr)].

- (4) Method 9 and the procedures in Section 1.3 shall be used to determine the opacity.