

## DEPARTMENT OF ENVIRONMENTAL QUALITY

### AIR QUALITY DIVISION

#### PART 10. INTERMITTENT TESTING AND SAMPLING

##### **R 336.2013 Reference test method 5D.**

Rule 1013. Reference test method 5D, testing of steel manufacturing sources, reads as follows:

(a) General description. Emission testing procedures shall follow the methodology specified in R 336.2004(1)(c) and (d) and R 336.2012, unless otherwise provided in this rule.

(b) Coke battery pushing emission control equipment outlet test procedure for scrubbers. Outlet emission tests for any scrubber emission control equipment controlling coke battery emissions shall be conducted as follows:

(i) The pushing emission control system is operated on a batch type process and shall be tested as such using the reference test methods specified in subdivision (a) of this rule.

(ii) Each sampling point shall be sampled for 1 cycle operation, which is defined as beginning when the coke guide and snorkels are engaged and continuing until the quench car leaves the hood.

(iii) For a shed, the sampling period shall begin with the first movement of coke and shall end when the car enters the quench tower.

(iv) Integrated gas samples shall be taken over the entire test period. The samples shall be analyzed for carbon monoxide, carbon dioxide, oxygen, and nitrogen by means of an Orsat analyzer. The sampling and sample analysis shall be performed in accordance with R 336.2004(1)(c). The average values from the 3 samples shall be used in determining the dry molecular weight of the exhaust gas. If a complete test is not performed during the day, at least 1 sample shall be taken.

(v) Based on design and previous data, saturated conditions shall be assumed. The moisture content shall be calculated as per R 336.2004(1)(d), based on stack conditions during the preliminary and sampling traverses.

(vi) The stack sampling equipment and procedures as described in method 5C shall be used in performing a particulate emission test, with the following variations:

(A) Due to the varying time required for pushing operations, an integer sampling time increment shall not be required.

(B) Because of the shorter sampling periods at each sampling point, a specific gas volume cannot be guaranteed. Therefore, an average sampling rate of not less than 0.90 dry standard cubic feet per minute shall be used during each sampling run.

(C) A stainless steel probe liner after the nozzle may be used.

(D) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.

(E) The probe and filter heating system may be heated at  $248 \pm 25$  degrees Fahrenheit.

(c) Basic oxygen furnace primary emissions control equipment outlet test procedure. Outlet emission tests for any emission control equipment controlling only the primary emissions from a basic oxygen furnace shall be conducted as follows:

(i) The testing program shall consist of 3 valid sampling runs. A sampling run is the composite of those portions of 4 heats starting with oxygen blowing and ending not more than 180 seconds following the last oxygen blow or the beginning of the tap, whichever occurs first. Each process cycle shall be used to obtain the sample for 1 quadrant of the traverse.

(ii) When testing a wet scrubber outlet, saturated conditions shall be assumed and moisture content shall be calculated based on stack conditions during the preliminary and sampling traverses.

(iii) The particulate emission rate shall be determined as specified in reference test method 5C, with the following variations:

- (A) A stainless steel probe liner after the nozzle may be used.
- (B) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.
- (C) The probe and filter heating system may be heated to 248 ±25 degrees Fahrenheit.
- (d) Basic oxygen furnace secondary emissions control equipment outlet test procedure. Outlet emission tests for any emission control equipment controlling only the secondary emissions from a basic oxygen furnace shall be conducted as follows:
  - (i) The testing program shall consist of 3 valid sampling runs. A sampling run shall be defined as the composite of the following portions of 4 heats:
    - (A) Charging.
    - (B) Tapping.
    - (C) Turndown.
    - (D) Slagging.
    - (E) The first 5 minutes of oxygen blowing for those systems with a separate secondary collector.
  - (ii) When testing a wet scrubber outlet, saturated conditions shall be assumed and moisture content shall be calculated based on stack conditions during the preliminary and sampling traverses.
  - (iii) The particulate emission rate shall be determined as specified in reference test method 5C, with the following variations:
    - (A) A stainless steel probe liner after the nozzle may be used.
    - (B) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.
    - (C) The probe and filter heating system may be heated to 248 ±25 degrees Fahrenheit.
- (e) Basic oxygen furnace primary and secondary emissions control equipment outlet test procedures. Outlet emission tests for any emission control equipment controlling both the primary and secondary emissions from a basic oxygen furnace shall be conducted as follows:
  - (i) One vessel:
    - (A) For testing of primary control equipment that captures secondary emissions from a single vessel, the testing program shall consist of 3 valid sampling runs. A sampling run is the composite of the following portions of 8 heats:
      - (1) Charging.
      - (2) Oxygen blowing.
      - (3) Tapping.
      - (4) Turndown.
      - (5) Slagging.
    - Four heats are to be sampled only during oxygen blowing, with each heat used to obtain the sample from 1 quadrant. The remaining 4 heats are to be sampled only during the portions of the heat other than oxygen blowing, with each heat used to obtain the sample from 1 quadrant.
  - (B) When testing a wet scrubber outlet, saturated conditions shall be assumed and moisture content shall be calculated based on stack conditions during the preliminary and sampling traverses.
  - (C) The particulate emission rate shall be determined as specified in reference test method 5C, with the following variations:
    - (1) A stainless steel probe liner after the nozzle may be used.
    - (2) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.
    - (3) The probe and filter heating system may be heated to 248 ±25 degrees Fahrenheit.
  - (ii) More than one vessel:
    - (A) For testing of control equipment that captures both primary and secondary emissions from more than 1 vessel, the testing program shall consist of 3 valid sampling runs. A sampling run is the composite of the following portions of 4 heats for 1 or more vessels:

- (1) Charging.
- (2) Oxygen blowing.
- (3) ) Tapping.
- (4) Turndown.
- (5) Slagging.

At least 1 heat shall be used to obtain the sample from each quadrant of the traverse.

(B) When testing a wet scrubber outlet, saturated conditions shall be assumed and moisture content shall be calculated based on stack conditions during the preliminary and sampling traverses.

(C) The particulate emission rate shall be determined as specified in reference test method 5C, with the following variations:

- (1) A stainless steel probe liner after the nozzle may be used.
- (2) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.
- (3) The probe and filter heating system may be heated to  $248 \pm 25$  degrees Fahrenheit.
- (f) Blast furnace casthouse air-cleaning device outlet test procedure. Outlet emission tests for any air-cleaning device controlling fugitive emissions from a blast furnace casthouse shall be conducted as follows:

(i) The testing program shall consist of 3 sampling runs. A sampling run shall be performed during a 2-hour period, sampling only when casting takes place. If 50 dry standard cubic feet are not sampled during this period, the sampling run shall be extended so as to fulfill this condition.

(ii) The particulate emission rate shall be determined as specified in reference test method 5C, with the following variations:

- (A) A stainless steel probe liner after the nozzle may be used.
- (B) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.
- (C) The probe and filter heating system may be heated to  $248 \pm 25$  degrees Fahrenheit.
- (g) Coke oven combustion stack test procedures. Emissions from any coke oven combustion stack shall be tested as follows:

(i) The testing program shall consist of 3 valid sampling runs.

(ii) Saturated conditions shall be assumed for stacks controlled by wet scrubbers. The moisture content shall be calculated as per R 336.2004(1)(d) based on stack conditions during the preliminary and sampling traverses.

(iii) The stack sampling equipment and procedures described in method 5C shall be used in performing a particulate emission test with the following variations:

- (A) A stainless steel probe liner after the nozzle may be used.
- (B) Heated flexible teflon tubing and a glass cyclone between the probe and filter holder may be used.

(C) The probe and filter heating system may be heated at  $248 \pm 25$  degrees Fahrenheit.

(D) All filters shall be cooled and stored in a dessicator previous to weighing. Exposure to the ambient air shall be minimized to the extent that it is practical. This same procedure shall be used if any subsequent weighing is necessary.

(iv) The sampling time shall correspond to a minimum of 5 coke oven pushes per battery.

(h) Coke oven coal preheater scrubber outlet test procedures. Outlet emission tests for any scrubber emission control equipment controlling emissions from a coke oven coal preheater shall be conducted as follows:

(i) The testing program shall consist of 3 valid sampling runs.

(ii) Based on design and previous data, saturated conditions shall be assumed. The moisture content shall be calculated as per R 336.2004(1)(d) based on stack conditions during the preliminary and sampling traverses.

(iii) The stack sampling equipment and procedures described in method 5C shall be used in performing a particulate emission test with the following variations:

(A) A stainless steel probe liner after the nozzle may be used.

(B) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.

(C) The probe and filter heating system may be heated at  $248 \pm 25$  degrees Fahrenheit.

(i) Electric arc furnace stack test procedures. Emissions from any electric arc furnace stack shall be tested as follows:

(i) The testing program shall consist of 3 valid sampling runs. A sampling run is the time beginning when the roof is placed on the furnace, after the first charge, and ending with the time when the roof is removed, just prior to tapping.

(ii) The particulate emission rate shall be determined as specified in reference test method 5C, with the following exceptions:

(A) A stainless steel probe liner after the nozzle may be used.

(B) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.

(C) The probe and filter heating system may be heated to  $248 \pm 25$  degrees Fahrenheit.

(D) The emission rate for any furnace controlled by a positive pressure baghouse, or by a baghouse exhausted by more than 5 stacks, shall be determined as specified in R 336.2014.

(j) Sinter plant gravel bed filter test procedures. Emissions from any gravel bed filter emission control equipment controlling emissions from a sinter plant shall be tested as follows:

(i) The testing program shall consist of 3 valid sampling runs.

(ii) The stack sampling equipment and procedures described in method 5C shall be used in performing a particulate emission test with the following variations:

(A) A stainless steel probe liner after the nozzle may be used.

(B) Glass or glass-lined stainless steel tubing and a glass cyclone between the probe and filter holder may be used.

(C) The probe and filter heating system may be heated at  $248 \pm 25$  degrees Fahrenheit.

(k) Miscellaneous. During each stack test performed, the owner or operator shall provide a representative of the department access to production data and other parameters that are necessary for determining compliance.

(l) Sample volume. The minimum volume per sample shall be 50 cubic feet of dry gas corrected to standard conditions, 70 degrees Fahrenheit, 29.92 inches of mercury, unless specified otherwise in the provisions of this rule.

(m) Opacity tests. During each stack test performed, simultaneous visible emission evaluations shall be conducted according to the reference test method specified in R 336.1303 for the process being tested.

(n) Operating conditions. During each run of a stack test, the facility to be tested shall be operated at a batch or other similar production level which is representative of the actual level during the preceding 3 months before the first day of the test, unless the department approves or specifies alternate acceptable operating conditions.

(o) Compliance. Compliance with any mass emission standard shall be determined by averaging 3 test runs using all test procedures specified for the tested process in this rule.

History: 1985 MR 2, Eff. Feb. 22, 1985; 2002 MR 5, Eff. Mar. 19, 2002.