1100 Air Quality Management Section

1123 Standards of Performance for Steel Plants: Electronic Arc Furnaces

02/01/1981

1.0 Applicability

The provisions of this regulation are applicable to existing electric arc furnaces over 100 tons capacity and their associated dust-handling equipment in steel plants.

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2.0 Definitions

As used in this regulation, all terms not defined herein shall have the meaning given them in 7 **Del.C.**, Ch. 60 and in 7 **DE Admin. Code** 1101.

"**Capture system**" means the equipment (including ducts, hoods, fans, dampers, etc.) used to capture or transport particulate matter generated by an EAF to the air pollution control device.

"**Charge**" means the addition of iron and steel scrap or other materials into the top of an electric arc furnace.

"**Charging period**" means the time period commencing at the moment an EAF starts to open and ending either three minutes after the EAF roof is returned to its closed position or six minutes after commencement of opening of the roof, whichever is longer.

"**Control device**" means the air pollution control equipment used to remove particulate matter generated by an EAF from the effluent gas stream.

"**Direct shell evacuation system**" means any system that maintains a negative pressure within the EAF above the slag or metal and ducts these emissions to the control device.

"**Dust-handling equipment**" means any equipment used to handle particulate matter collected by the control device and located at or near the control device for an EAF subject to this regulation.

"**Electric arc furnace (EAF)**" means any furnace that produces molten steel and heats the charge materials with electric arcs from carbon electrodes. Furnaces from which the molten steel is cast into the shape of finished products, such as in foundry, are not applicable facilities included within the scope of this definition. Furnaces which, as the primary source of iron, continuously feed prereduced ore pellets are not applicable facilities within the scope of this definition.

"**Heat time**" means the period commencing when scrap is charged to an empty EAF and terminating when the EAF tap is completed.

"**Meltdown and refining**" means that phase of the steel production cycle when charge material is melted and undesirable elements are removed from the metal.

"**Meltdown and refining period**" means the time period commencing at the termination of the initial charging period and ending at the initiation of the tapping period, excluding any intermediate charging periods.

"**Shop opacity**" means the arithmetic average of 24 or more opacity observations of emissions from the shop taken from the applicable time periods in accordance with Method 9

set forth in Appendix A, 40 CFR Part 60, revised July 1, 1975. All sections of Method 9 not previously adopted are hereby adopted by reference.

"**Shop**" means the building which houses one or more EAFs.

"**Tap**" means the pouring of molten steel from an EAF.

"**Tapping period**" means the time period commencing at the moment an EAF begins to tilt to pour and ending either three minutes after an EAF returns to an upright position or six minutes after commencing to tilt, whichever is longer.

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3.0 Standard for Particulate Matter

3.1 No owner or operator subject to the provisions of this regulation shall cause to be discharged into the atmosphere from an electric arc furnace any gases which:

3.1.1 Exit from a control device and contain particulate matter in excess of 12 mg/dscm (0.0052 gr/dscf).

3.1.2 Exit from a control device and exhibit 3% opacity or greater.

3.1.3 Exit from a shop and, due solely to operations of any EAF or EAFs, exhibit greater than zero% shop opacity except:

3.1.3.1 Shop opacity greater than zero%, but less than 20%, may occur during charging periods.

3.1.3.2 Shop opacity greater than zero%, but less than 40%, may occur during tapping periods for no longer than 13 minutes, with an additional three minute period of less than 10% opacity.

3.1.3.3 Where the capture system is operated such that the roof of the shop is closed during the charge and the tap, and emissions to the atmosphere are prevented until the roof is opened after completion of the charge or tap, the shop opacity standards under paragraph 3.1.3 of this regulation shall apply when the roof is opened and shall continue to apply for the length of time defined by the charging or tapping periods.

3.2 No owner or operator subject to the provisions of 3.0 of this regulation shall cause to be discharged into the atmosphere from dust-handling equipment any gases which exhibit 10% opacity or greater.

02/01/1981

4.0 Monitoring of Operations

4.1 The owner or operator subject to the provisions of this regulation shall maintain records daily of the following information:

4.1.1 Time and duration of each charge; all records shall be made available to the Department upon request.

4.1.2 Time and duration of each tap; all records shall be made available to the Department upon request.

4.1.3 All flow rate data obtained under 4.2 of this regulation, or equivalent obtained under 4.4 of this regulation; and

4.1.4 All pressure data obtained under 4.5 of this regulation.

4.2 Except as provided under 4.4 of this regulation, the owner or operator subject to the provisions of 4.0 of this regulation shall install, calibrate, and maintain a monitoring device that continuously records the volumetric flow rate through each separately ducted hood. The monitoring device or devices may be installed in any appropriate location in the exhaust duct such that reproducible flow rate monitoring will result. The flow rate monitoring device or devices shall have an accuracy of +/-10% over its normal operating range and shall be calibrated according to the manufacturer's instruction. The Secretary may require the owner or operator to demonstrate the accuracy of monitoring device or devices relative to Methods 1 and 2 of Appendix A, 40 CFR Part 60, revised July 1, 1975.

4.3 When the owner or operator of an EAF is required to demonstrate compliance with the standard under 3.1.3 of this regulation and at any other time the Secretary may require the volumetric flow rate through each separately ducted hood shall be determined during all periods in which the hood is operated for the purpose of capturing emissions from the EAF using the monitoring device under 4.2 of this regulation. The owner or operator may petition the Secretary for reestablishment of these flow rates whenever the owner or operator can demonstrate to the Secretary's satisfaction that the EAF operating conditions upon which the flow rates were previously established are no longer applicable. The flow rates determined during the most recent demonstration of compliance shall be maintained (or may be exceeded) at the appropriate level for each applicable period. Operation at lower flow rates may be considered by the Secretary to be unacceptable operation and maintenance of the applicable facility.

4.4 The owner or operator may petition the Secretary to approve any alternative method that will provide a continuous record of operation of each emission capture system.

4.5 Where emissions during any phase of the heat time are controlled by use of a direct shell evacuation system, the owner or operator shall install, calibrate, and maintain a monitoring device that continuously records the pressure in the free space inside the EAF. The pressure shall be recorded as 15-minute integrated averages. The monitoring device may be installed in any appropriate location in the EAF such that reproducible results will be obtained. The pressure monitoring device shall have an accuracy of +/-5 mm of water gauge over its normal operating range and shall be calibrated according to the manufacturer's instructions.

4.6 When the owner or operator of an EAF is required to demonstrate compliance with the standard under 3.1.3 of this regulation and at any other time the Secretary may require, the pressure in the free space inside the furnace shall be determined during the meltdown and refining period or periods using the monitoring device under 4.5 of this regulation. The owner or operator may petition the Secretary for reestablishment of the 15-minute integrated average pressure whenever the owner or operator can demonstrate to the Secretary's satisfaction that the EAF operating conditions upon which the pressures were previously established are no longer applicable. The pressure determined during the most recent demonstration of compliance shall be maintained at all times the EAF is operating in a meltdown and refining period. Operating at higher pressures may be considered by the Secretary to be unacceptable operation and maintenance of the applicable facility.

4.7 Where the capture system is designed and operated such that all emissions are captured and ducted to a control device, the owner or operator shall not be subject to the requirements of 4.0 of this regulation.

02/01/1981

5.0 Test Methods and Procedures

5.1 Except as allowed pursuant to 4.4 of this regulation, reference method in Appendix A, 40 CFR Part 60, revised July 1, 1975, shall be used to determine compliance with the standards prescribed under 3.0 of this regulation as follows:

5.1.1 Method 5 for concentration of particulate matter and associated moisture content;

5.1.2 Method 1 for sample and velocity traverses;

5.1.3 Method 2 for velocity and volumetric flow rate; and

5.1.4 Method 3 for gas analysis.

5.2 For Method 5, the sampling time for each run shall be at least four hours. When a single EAF is sampled, the sampling time for each run shall also include an integral number of heats. Shorter sampling times, when necessitated by process variables or other factors, may be approved by the Secretary. The minimum sample volume shall be 4.5 dscm (160 dscf).

5.3 For the purpose of 5.0 of this regulation, the owner or operator shall conduct the demonstration of compliance with 3.1.3 of this regulation and furnish the Secretary a written report of the results of the test.

5.4 During any performance test required by 5.0 of this regulation, no gaseous diluents may be added to the effluent gas stream after the fabric in any pressurized fabric filter collector, unless the amount of dilution is separately determined and considered in the determination of emissions.

5.5 When more than one control device serves the EAF or EAFs being tested, the concentration of particulate matter shall be determined by dividing the total of the particulate matter discharged from each control device, in mg/dscm, by the total of the volumetric flow rates of each effluent gas stream, in dscm/hour.

5.6 Any control device subject to the provisions of 5.0 of this regulation shall be designed and constructed to allow measurement of emissions using applicable test methods and procedures.

5.7 Where emissions from an EAF are combined with emissions from facilities not subject to the provisions of 5.0 of this regulation but controlled by a common capture system and control device, the owner or operator may use any of the following procedures during a performance test:

5.7.1 Base compliance on control of the combined emissions.

5.7.2 Utilize a method acceptable to the Secretary which compensates for the emissions from the facilities not subject to the provisions of 5.0 of this regulation.

5.7.3 Any combination of the criteria of 5.7.1 and 5.7.2 of this regulation.

5.8 Where emissions from an EAF are combined with emissions from facilities not subject to the provisions of 5.0 of this regulation, the owner or operator may use any of the following procedures for demonstrating compliance with 3.1.3 of this regulation:

5.8.1 Base compliance on control of the combined emissions.

5.8.2 Shut down operation of facilities not subject to the provisions of 5.0 of this regulation.

5.8.3 Any combination of the criteria of 5.8.1 and 5.8.2 of this regulation.

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