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## Title 40—Protection of Environment

CHAPTER I—ENVIRONMENTAL  
PROTECTION AGENCY

[FRL 509-3]

## PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

## Ferroalloy Production Facilities

On October 21, 1974 (39 FR 37470), under section 111 of the Clean Air Act, as amended, the Environmental Protection Agency (EPA) proposed standards of performance for new and modified ferroalloy production facilities. Interested persons participated in the rulemaking by submitting comments to EPA. The comments have been carefully considered, and where determined by the Administrator to be appropriate, changes have been made to the regulations as promulgated.

The standards limit emissions of particulate matter and carbon monoxide from ferroalloy electric submerged arc furnaces. The purpose of the standards is to require effective capture and control of emissions from the furnace and tapping station by application of best systems of emission reduction. For ferroalloy furnaces the best system of emission reduction for particulate matter is a well-designed hood in combination with a fabric filter collector or venturi scrubber. For some alloys the best system is an electrostatic precipitator preceded by wet gas conditioning or a venturi scrubber. The standard for carbon monoxide requires only that the gas stream be flared or combusted in some other manner.

The environmental impact of these standards is beneficial since the increase in emissions due to growth of the industry will be minimized. Also, the standards will remove the incentive for plants to locate in areas with less stringent regulations.

Upon evaluation of the costs associated with the standards and their economic impact, EPA concluded that the costs are reasonable and should not bar entry into the market or expansion of facilities. In addition, the standards will require at most a minimal increase in power consumption over that required to comply with the restrictions of most State regulations.

## SUMMARY OF REGULATION

The promulgated standards limit particulate matter and carbon monoxide emissions from the electric submerged arc furnace and limit particulate matter emissions from dust-handling equipment. Emissions of particulate matter from the control device are limited to less than 0.45 kg/MW-hr (0.99 lb/MW-hr) for furnaces producing high-silicon alloys (in general) and to less than 0.23 kg/MW-hr (0.51 lb/MW-hr) for furnaces producing chrome and manganese alloys. For both product groups, emissions from the control device must be less than 15 percent opacity. The regulation requires that the collection hoods capture all emissions generated within the furnace and capture all tapping emissions for at least 80 percent of the tap-

ping time. The concentration of carbon monoxide in any gas stream discharged to the atmosphere must be less than 20 volume percent. Emissions from dust-handling equipment may not equal or exceed 10 percent opacity. Any owner or operator of a facility subject to this regulation must continuously monitor volumetric flow rates through the collection system and must continuously monitor the opacity of emissions from the control device.

## SUMMARY OF COMMENTS

Eighteen comment letters were received on the proposed standards of performance. Copies of the comment letters and a report which contains a summary of the issues and EPA's responses are available for public inspection and copying at the U.S. Environmental Protection Agency, Public Information Reference Unit (EPA Library), Room 2922, 401 M Street, S.W., Washington, D.C. Copies of the report also may be obtained upon written request from the EPA Public Information Center (PM-215), 401 M Street, S.W., Washington, D.C. 20460 (specify—Supplemental Information on Standards of Performance for Ferroalloy Production Facilities). In addition to the summary of the issues and EPA's responses, the report contains a reevaluation of the opacity standard in light of revisions to Reference Method 9 which were published in the FEDERAL REGISTER November 12, 1974 (39 FR 39872).

The bases for the proposed standards are presented in "Background Information for Standards of Performance: Electric Submerged Arc Furnaces for Production of Ferroalloys" (EPA 450/2-74-018a, b). Copies of this document are available on request from the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention: Mr. Don R. Goodwin.

## SIGNIFICANT COMMENTS AND CHANGES TO THE PROPOSED REGULATION

Most of the comment letters contained multiple comments. The more significant comments and the differences between the proposed and the final regulations are discussed below. In addition to the discussed changes, several paragraphs were reworded and some sections were reorganized.

(1) *Mass standard.* Several commenters questioned the representativeness of the data used to demonstrate the achievability of the 0.23 kg/MW-hr (0.51 lb/MW-hr) standard proposed for facilities producing chrome and manganese alloys. Specifically, the commenters were concerned that sampling only a limited number of compartments or control devices serving a furnace, nonisokinetic sampling of some facilities, and the procedures used to determine the total gas volume flow from open fabric filter collectors would bias the data low. For these reasons, the commenters argued that the standard should be 0.45 kg/MW-hr (0.99 lb/MW-hr) for all alloys. As additional support for their position, they claimed that control equipment vendors will not

guarantee that their equipment will achieve 0.23 kg/MW-hr (0.51 lb/MW-hr).

Because of these comments, EPA thoroughly reevaluated the bases for the two mass standards of performance and concluded that the standards are achievable by best systems of emission reduction. For open ferroalloy electric submerged arc furnaces, the best system of emission reduction is a well-designed canopy hood that minimizes the volume of induced air and a well-designed and properly operated fabric filter collector or high-energy venturi scrubber. In a few cases, an electrostatic precipitator preceded by a venturi scrubber or wet gas conditioning is a best system. In EPA's opinion, revising the standard upward to 0.45 kg/MW-hr (0.99 lb/MW-hr) would allow installation of systems other than the best. Therefore, the promulgated standard of performance for furnaces producing chrome and manganese alloys is 0.23 kg/MW-hr (0.51 lb/MW-hr). The standard for furnaces producing the specified high-silicon alloys is 0.45 kg/MW-hr (0.99 lb/MW-hr). The rationale for establishing the standards at these levels is summarized below.

The reevaluation of the data bases for the standards showed that the emission test procedures used did not significantly bias the results. Therefore, contrary to the commenter's concerns, the procedures did not result in emission limitations lower than those achievable by best systems of emission reduction. The deviations and assumptions made in the test procedures were based on consideration of the particle size of the emissions, an evaluation of the performance of the control systems, and factors affecting the induction of air into open fabric filter collectors.

EPA tests, and allows testing of, a representative number of stacks or compartments in a control device because subsections of a well-designed and properly operating control device will perform equivalently. Evaluation of the control system and the condition of the control device by EPA engineers at the time of the emission test showed that sections not tested were of equivalent design and in operating condition equivalent to or better than the tested sections. Thus, the performance of the non-tested portions of the control device are considered to be equivalent to or better than the performance of the sections emission tested. In addition, the particle size of emissions from well-controlled ferroalloy furnaces was investigated by EPA and was found to consist of particles of less than two micrometers aerodynamic diameter for all alloys. The mass and, hence, inertia of these particles are negligible; therefore, they follow the motion of the gas stream. For emissions of this size distribution, concentrations determined by nonisokinetic sampling would not be significantly different than those measured by isokinetic sampling.

EPA determined the total gas volume flow rate from the open fabric filter collectors by measuring the inlet volume flow rate and the volume of air induced into the collector. The inlet gas volumes

to the collectors were measured during each run of each test; but the volume of air induced into the collector was determined once during the emission test. The total gas volume flow from the collector was calculated as the sum of the inlet gas volume and the induced air volume. Although the procedures used were not ideal, the reported gas volumes are considered to be reasonably representative of the total gas volumes from the facility. This conclusion is based on the fact that the quantity of air induced around the bags in an open collector is primarily dependent on the open area and the temperature of the inlet gas stream and the ambient air. Therefore, equivalent air volumes are drawn into the collector under similar meteorological and inlet gas conditions. During the periods of emission testing at the facilities, meteorological conditions were uniform and the volume of induced air was expected to be constant. Consequently, measurement of the induced air volume once during the emission test was expected to be sufficient for calculating the total gas volume flow from the collector.

Since conducting the test in question, EPA has gained additional experience and has concluded that in general it is preferable to measure the total gas volume flow during each run of a performance test. This conclusion, however, does not invalidate the use of the test data obtained by the less optimum procedure of a single determination of induced air volume. EPA evaluated possible variations in the amount of air induced into the collector by performing enthalpy balances using reported temperature data. The induced air volumes were calculated assuming adiabatic mixing (no heat transfer by inlet gases to collector) and, hence, are conservatively high estimates. The calculated induced air volumes did differ from the single measured values; however, the effect on the mass emission rate for the collectors was not significant. EPA, therefore, concluded that the use of single measurements of the induced air volume did not affect the level of the standards.

Another issue of concern to commenters is the reluctance of control equipment vendors to guarantee reduction of emissions to less than 0.23 kg/MW-hr (0.51 lb/MW-hr). It is EPA's opinion that this reluctance does not demonstrate the unachievability of the standard. The vendors' reluctance to guarantee this level is not surprising considering the variables which are beyond their control. Specifically, they rarely have any control over the design of the fume collection systems for the furnace and tapping station. Fabric filter collectors tend to control the concentration of particulate matter in the effluent. The mass rate of emissions from the collector is determined by the total volumetric flow rate from the control device, which is not determined by vendors. Further, because of limited experience with emission testing to evaluate the performance of open fabric filter collectors, vendors cannot effectively evaluate the performance of these systems over the guarantee

period. For vendors, establishment of the performance guarantee level is also complicated by the fact that the performance of the collector is contingent upon its being properly operated and maintained.

Standards of performance are necessarily based on data from a limited number of best-controlled facilities and on engineering judgments regarding performance of the control systems. For this reason, there is a possibility of arriving at different conclusions regarding the performance capabilities of these systems. Consequently, the question of vendors' reluctance to guarantee their equipment to achieve 0.23 kg/MW-hr (0.51 lb/MW-hr) was considered along with the results of additional recent emission tests on fabric filter collectors. Recognizing that the data base for the standards was limited and that a number of well-controlled facilities had started operation since completion of the original study, EPA obtained additional data to better evaluate the performance of emission control systems of interest. Under the authority of section 114 of the Clean Air Act, EPA requested copies of all emission data for well-controlled furnaces operated by 10 ferroalloy producers. Data were received for five well-controlled facilities. In general, these facilities had close fitting water cooled canopy hoods, and tapping fumes were collected and sent to the control device along with the furnace emissions.

The emission data submitted by the industry show that properly operating compartments of open fabric filter collectors have effluent concentrations of less than 0.009 g/dscm (0.004 gr/dscf). For these recently constructed facilities, the reported mass emission rates were less than 0.12 kg/MW-hr (0.24 lb/MW-hr) for 15 MW capacity silicon metal furnaces. Evaluation of possible errors in the data and uncertainties in the test procedures showed that emissions may have been as high as 0.20 kg/MW-hr (0.45 lb/MW-hr) in some cases. These emission rates were achieved by design of the collection hood to minimize the quantity of induced air. The data submitted by the industry showed that gas volumes from well-hooded large silicon metal furnaces can be reduced to 50 percent of the volumes from typically hooded large silicon furnaces. Based on the data obtained from the industry, a large well-hooded and well-controlled silicon metal furnace is expected to have an emission rate of less than 0.45 kg/MW-hr (0.99 lb/MW-hr).

In EPA's study of the ferroalloy industry, it was determined that emissions from production of high-silicon alloys would be more difficult to control than chrome and manganese emissions due to the finer size distribution of the particles and, significantly larger gas volumes from the furnace. Comparison of the gas volumes reported by the industry from silicon metal production with gas volumes from typically hooded furnaces producing chrome and manganese alloys shows that the original conclusion is still valid. Due to the lower gas volumes

associated with their production, a lower mass emission rate is still expected for chrome and manganese alloys. In addition, EPA emission tests in the original study on a number of tightly hooded open furnaces demonstrated emissions can be controlled to less than 0.23 kg/MW-hr (0.51 lb/MW-hr). Emissions were reduced to these levels by control of induced air volumes and by use of a well-designed and properly operated fabric filter collector or venturi scrubber.

Just before promulgation of the standards, members of the Ferroalloy Association informed EPA that future supplies of chrome and manganese ores will be finer and more friable than those in use during development of the standard. The industry representatives claimed that use of finer ores will affect furnace operations and prevent new furnaces from complying with the 0.23 kg/MW-hr (0.51 lb/MW-hr) standard. Although the representatives submitted statements concerning the effect of finer ores on furnace operating conditions, no data were provided to show the effect of ore size on emissions. EPA evaluated the material submitted and concluded that furnace operating problems associated with use of fine ores can be controlled by operation and maintenance procedures. With proper operation of the furnace, use of finer ores should not affect the achievability of the standard, and relaxation of the 0.23 kg/MW-hr (0.51 lb/MW-hr) standard is not justified. This evaluation is discussed in detail in Chapter II of the supplemental information document. If and when factual information is presented to EPA which clearly demonstrates that use of finer chrome and manganese ores does prevent a properly operated new furnace, which is equipped with the best demonstrated system of emission reduction (considering costs), from meeting the 0.23 kg/MW-hr (0.51 lb/MW-hr) standard, EPA will propose a revision to the standard. The best system of emission reduction (considering costs) is considered to be a well-designed collection hood in combination with a well-designed fabric filter collector or high-energy venturi scrubber.

The emission data obtained by EPA and the data provided by the industry show that the standards of performance for both product groups are achievable and the required control system clearly is adequately demonstrated. The question of the achievability of and the validity of the data basis for both the 0.23 kg/MW-hr (0.51 lb/MW-hr) and 0.45 kg/MW-hr (0.99 lb/MW-hr) standards is discussed in more detail in Chapter II of the supplemental information document.

(2) *Control device opacity standard.* On November 12, 1974 (39 FR 39872), after proposal of the standards for ferroalloy facilities, Method 9 was revised to require that compliance with opacity standards be determined by averaging sets of 24 consecutive observations taken at 15-second intervals (six-minute averages). The proposed opacity standard which limited emissions from the control

device to less than 20 percent has been revised in the regulation promulgated herein to require that emissions be less than 15 percent opacity in order to retain the intended level of control.

(3) *Control system capture requirements.* Ten commenters criticized fume capture requirements for the furnace and tapping station control systems on two basic points. The arguments were: (1) EPA lacks the statutory authority to regulate emissions within the building, and (2) the standards are not technically feasible at all times.

EPA has the statutory authority under section 111 of the Act to regulate any new stationary source which "emits or may emit any air pollutant." EPA does not agree with the opinion of the commenters that section 111 of the Act expressly or implicitly limits the Agency to regulation only of pollutants which are emitted directly into the atmosphere. Particulate matter emissions escaping capture by the furnace control system ultimately will be discharged to the atmosphere outside of the shop; therefore, they may be regulated under section 111 of the Act. Standards which regulate pollutants at the point of emission inside the building allow assessment of the control system without interference from nonregulated sources located in the same building. In addition, by requiring evaluation of emissions before their dilution, the standards will result in better control of the furnace emissions and will regulate affected ferroalloy facilities more uniformly than would standards limiting emissions from the shop.

EPA believes the standards on the furnace and tapping station collection hoods are achievable because the standards are based on observations of normal operations at well-controlled facilities. The commenters who argued that the standards are not technically feasible at all times cited examples of abnormal operations which would preclude achieving the standards. For example, several commenters cited the fact that violent reactions due to imbalances in the alloy chemistry occasionally can generate more emissions than the hood was designed to capture. If the capture system is well-designed, well-maintained, and properly operated, only failures of the process to operate in the normal or usual manner would cause the capacity of the system to be exceeded. Such operating periods are malfunctions, and, therefore, compliance with the standards of performance would not be determined during these periods. Performance tests under 40 CFR 60.8(c) are conducted only during representative conditions, and periods of start-up, shutdown, and malfunctions are not considered representative conditions.

Five commenters discussed other operating conditions which they believed would preclude a source from complying with the tapping station standard. These conditions included blowing taps, period of poling the taphole, and periods of removal of metal and slag from the spout. The commenters argued that blowing taps should be exempted from the standard and the tapping station standard

should be replaced with an opacity standard or emissions from the shop. The comments were reviewed and EPA concluded that exemption of blowing taps is justified. The regulation promulgated herein exempts blowing taps from the tapping station standard and includes a definition of blowing tap. EPA believes that conditions which result in plugging of the taphole and metal in the spout are malfunctions because they are unavoidable failures of the process to operate in the normal or usual manner. Discussions with experts in the ferroalloy industry, revealed that these conditions are not predictable conditions for which a preventative maintenance or operation program could be established. As malfunctions, these periods are not subject to the standards, and a performance test would not be conducted during such periods. Therefore, the suggested revision to the standard to exempt these periods is not necessary because of the existing provisions of 40 CFR 60.8(c) and 60.11. In EPA's judgment, both the furnace and tapping station standards are achievable for all normal process operations at facilities with well-designed, well-maintained, and properly operated emission collection systems.

The promulgated regulation retains the proposed fume capture requirements, but the regulation has been revised to be more enforceable than the proposed capture requirements, which could have been enforced only on an infrequent basis. The regulation has been reorganized to clarify that unlike the opacity standards, the collection system capture requirements (visible emission limitations) are subject to demonstration of compliance during the performance test. To provide a means for routine enforcement of the capture requirements, continuous monitoring of the volumetric flow rate(s) through the collection system is required for each affected furnace. An owner or operator may comply with this requirement either by installing a flow rate monitoring device in an appropriate location in the exhaust duct or by calculating the flow rate through the system from fan operating data. During the performance test, the baseline operating flow rate(s) will be established for the affected electric submerged arc furnace. The regulation establishes emission capture standards which are applicable only during the performance test of the affected facility. At all other times, the operating volumetric flow rate(s) shall be maintained at or greater than the established baseline values for the furnace load. Use of lower volumetric flow rates than the established values constitutes unacceptable operation and maintenance of the affected facility. These provisions of the promulgated regulation will ensure continuous monitoring of the operations of the emission capture system and will simplify enforcement of the emission capture requirements.

The requirements for monitoring volumetric flow rates will add negligible additional costs to the total costs of complying with the standards of performance. Flow rate monitoring devices

of sufficient accuracy to meet the requirements of § 60.265(c) can be installed for \$600-\$4000 depending on the flow profile of the area being monitored and the complexity of the monitoring device. A suitable strip chart recorder can be installed for less than \$600. The alternative provisions allowing calculation of the volumetric flow rate(s) through the control system from continuous monitoring of fan operations will result in no additional costs because the industry presently monitors fan operations.

(4) *Monitoring of operations.* The promulgated regulation requires reporting to the Administrator any product changes that will result in a change in the applicable standard of performance for the affected electric submerged arc furnace. This requirement is necessary because electric submerged arc furnaces may be converted to production of alloys other than the original design alloys by physical alterations to the furnace, changes to the electrode spacing, changes in the transformer capacity, and changes in the materials charged to the furnace. Thus, the emission rate from the electric submerged arc furnace and the standard of performance (which is dependent on the alloy produced) may change during the lifetime of the facility. Conversion of the furnace to production of alloys with significantly different emission rates, such as changes between the product groups for the two standards, may result in the facility exceeding the applicable standard. Consequently, the reporting requirement was added to ensure continued compliance with the applicable standards of performance. These reports of product changes will afford the Administrator an opportunity to determine whether a performance test should be conducted and will simplify enforcement of the regulation. As with the requirements applicable under the proposed regulation, the performance test still must be conducted while the electric submerged arc furnace is producing the design alloy whose emissions are the most difficult to control of the product family. Subsequent product changes within the product family will not cause the facility to exceed the standard.

(5) *Test methods and procedures.* Section 60.266(d) of the promulgated regulation requires the owner or operator to design and construct the control device to allow measurement of emissions and flow rates using applicable test methods and procedures. This provision permits the use of open pressurized fabric filter collectors (and other control devices) whose emissions cannot be measured by reference methods currently in Appendix A to this part, if compliance with the promulgated standard can be demonstrated by an alternative procedure. EPA has not specified a single test procedure for emission testing of open pressurized fabric filter collectors because of the large variations in the design of these collectors. Test procedures can be developed on a case-by-case basis, however. Provisions in 40 CFR 60.8(b) allow the owner or operator upon approval by the Administrator to use an "alternative" or

"equivalent" test procedure to show compliance with the standards. EPA would like to emphasize that development of the "alternative" or "equivalent" test procedure is the responsibility of any owner or operator who elects to use a control device not amenable to testing by Method 5 of Appendix A to this part. The procedures of an "alternative" test method for demonstration of compliance are dependent on specific design features and condition of the collector and the capabilities of the sampling equipment. Consequently, procedures acceptable for demonstration of compliance will vary with specific situations. General guidance on possible approaches to sampling of emissions from pressurized fabric filter collectors is provided in Chapter IV of the supplemental information document.

Due to the costs of testing, the owner or operator should obtain EPA approval for a specific test procedure or other means for determining compliance before construction of a new source. Under the provisions of § 60.6, the owner or operator of a new facility may request review of the acceptability of proposed plans for construction and testing of control systems which are not amenable to sampling by Reference Method 5. If an acceptable "alternative" test procedure is not developed by the owner or operator, then total enclosure of the pressurized fabric filter collector and testing by Method 5 is required.

**Effective date.** In accordance with section 111 of the Act, these regulations prescribing standards of performance for ferroalloy production facilities are effective May 4, 1976, and apply to electric submerged arc furnaces and their associated dust-handling equipment, the construction or modification of which was commenced after October 21, 1974.

(Secs. 111 and 114 of the Clean Air Act, amended by Sec. 4(a) of Pub. L. 91-604, 84 Stat. 1678 (42 U.S.C. 1857c-6, 1857c-9).)

Dated: April 23, 1976.

RUSSELL E. TRAIN,  
Administrator.

Part 60 of Chapter I, Title 40 of the Code of Federal Regulations is amended as follows:

1. The table of sections is amended by adding subpart Z as follows:

Subpart Z—Standards of Performance for Ferroalloy Production Facilities.

Sec.	
60.260	Applicability and designation of affected facility.
60.261	Definitions.
60.262	Standard for particulate matter.
60.263	Standard for carbon monoxide.
60.264	Emission monitoring.
60.265	Monitoring of operations.
60.266	Test methods and procedures.

2. Part 60 is amended by adding subpart Z as follows:

Subpart Z—Standards of Performance for Ferroalloy Production

§ 60.260 Applicability and designation of affected facility.

The provisions of this subpart are applicable to the following affected facilities: Electric submerged arc furnaces which produce silicon metal, ferrosilicon,

calcium silicon, silicomanganese zirconium, ferrochrome silicon, silvery iron, high-carbon ferrochrome, charge chrome standard ferromanganese, silicomanganese, ferromanganese silicon, or calcium carbide; and dust-handling equipment.

§ 60.261 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) "Electric submerged arc furnace" means any furnace wherein electrical energy is converted to heat energy by transmission of current between electrodes partially submerged in the furnace charge.

(b) "Furnace charge" means any material introduced into the electric submerged arc furnace and may consist of, but is not limited to, ores, slag, carbonaceous material, and limestone.

(c) "Product change" means any change in the composition of the furnace charge that would cause the electric submerged arc furnace to become subject to a different mass standard applicable under this subpart.

(d) "Slag" means the more or less completely fused and vitrified matter separated during the reduction of a metal from its ore.

(e) "Tapping" means the removal of slag or product from the electric submerged arc furnace under normal operating conditions such as removal of metal under normal pressure and movement by gravity down the spout into the ladle.

(f) "Tapping period" means the time duration from initiation of the process of opening the tap hole until plugging of the tap hole is complete.

(g) "Furnace cycle" means the time period from completion of a furnace product tap to the completion of the next consecutive product tap.

(h) "Tapping station" means that general area where molten product or slag is removed from the electric submerged arc furnace.

(i) "Blowing tap" means any tap in which an evaluation of gas forces or projects jets of flame or metal sparks beyond the ladle, runner, or collection hood.

(j) "Furnace power input" means the resistive electrical power consumption of an electric submerged arc furnace as measured in kilowatts.

(k) "Dust-handling equipment" means any equipment used to handle particulate matter collected by the air pollution control device (and located at or near such device) serving any electric submerged arc furnace subject to this subpart.

(l) "Control device" means the air pollution control equipment used to remove particulate matter generated by an electric submerged arc furnace from an effluent gas stream.

(m) "Capture system" means the equipment (including hoods, ducts, fans, dampers, etc.) used to capture or transport particulate matter generated by an affected electric submerged arc furnace to the control device.

(n) "Standard ferromanganese" means that alloy as defined by A.S.T.M. designation A99-66.

(o) "Silicomanganese" means that alloy as defined by A.S.T.M. designation A483-66.

(p) "Calcium carbide" means material containing 70 to 85 percent calcium carbide by weight.

(q) "High-carbon ferrochrome" means that alloy as defined by A.S.T.M. designation A101-66 grades HC1 through HC6.

(r) "Charge chrome" means that alloy containing 52 to 70 percent by weight chromium, 5 to 8 percent by weight carbon, and 3 to 6 percent by weight silicon.

(s) "Silvery iron" means any ferrosilicon, as defined by A.S.T.M. designation 100-69, which contains less than 30 percent silicon.

(t) "Ferrochrome silicon" means that alloy as defined by A.S.T.M. designation A482-66.

(u) "Silicomanganese zirconium" means that alloy containing 60 to 65 percent by weight silicon, 1.5 to 2.5 percent by weight calcium, 5 to 7 percent by weight zirconium, 0.75 to 1.25 percent by weight aluminum, 5 to 7 percent by weight manganese, and 2 to 3 percent by weight barium.

(v) "Calcium silicon" means that alloy as defined by A.S.T.M. designation A495-64.

(w) "Ferrosilicon" means that alloy as defined by A.S.T.M. designation A100-69 grades A, B, C, D, and E which contains 50 or more percent by weight silicon.

(x) "Silicon metal" means any silicon alloy containing more than 96 percent silicon by weight.

(y) "Ferromanganese silicon" means that alloy containing 63 to 66 percent by weight manganese, 28 to 32 percent by weight silicon, and a maximum of 0.08 percent by weight carbon.

§ 60.262 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any electric submerged arc furnace any gases which:

(1) Exit from a control device and contain particulate matter in excess of 0.45 kg/MW-hr (0.99 lb/MW-hr) while silicon metal, ferrosilicon, calcium silicon, or silicomanganese zirconium is being produced.

(2) Exit from a control device and contain particulate matter in excess of 0.23 kg/MW-hr (0.51 lb/MW-hr) while high-carbon ferrochrome, charge chrome, standard ferromanganese, silicomanganese, calcium carbide, ferrochrome silicon, ferromanganese silicon, or silvery iron is being produced.

(3) Exit from a control device and exhibit 15 percent opacity or greater.

(4) Exit from an electric submerged arc furnace and escape the capture system and are visible without the aid of instruments. The requirements under this subparagraph apply only during periods when flow rates are being established under § 60.265(d).

(5) Escape the capture system at the tapping station and are visible without the aid of instruments for more than 40 percent of each tapping period. There are no limitations on visible emissions under this subparagraph when a blowing tap occurs. The requirements under this subparagraph apply only during periods when flow rates are being established under § 60.265(d).

(b) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any dust-handling equipment any gases which exhibit 10 percent opacity or greater.

#### § 60.263 Standard for carbon monoxide.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any electric submerged arc furnace any gases which contain, on a dry basis, 20 or greater volume percent of carbon monoxide. Combustion of such gases under conditions acceptable to the Administrator constitutes compliance with this section. Acceptable conditions include, but are not limited to, flaring of gases or use of gases as fuel for other processes.

#### § 60.264 Emission monitoring.

(a) The owner or operator subject to the provisions of this subpart shall install, calibrate, maintain and operate a continuous monitoring system for measurement of the opacity of emissions discharged into the atmosphere from the control device(s).

(b) For the purpose of reports required under § 60.7(c), the owner or operator shall report as excess emissions all six-minute periods in which the average opacity is 15 percent or greater.

(c) The owner or operator subject to the provisions of this subpart shall submit a written report of any product change to the Administrator. Reports of product changes must be postmarked not later than 30 days after implementation of the product change.

#### § 60.265 Monitoring of operations.

(a) The owner or operator of any electric submerged arc furnace subject to the provisions of this subpart shall maintain daily records of the following information:

(1) Product being produced.

(2) Description of constituents of furnace charge, including the quantity, by weight.

(3) Time and duration of each tapping period and the identification of material tapped (slag or product.)

(4) All furnace power input data obtained under paragraph (b) of this section.

(5) All flow rate data obtained under paragraph (c) of this section or all fan motor power consumption and pressure drop data obtained under paragraph (e) of this section.

(b) The owner or operator subject to the provisions of this subpart shall install, calibrate, maintain, and operate a device to measure and continuously record the furnace power input. The furnace power input may be measured at the output or input side of the transformer. The device must have an accuracy of  $\pm 5$  percent over its operating range.

(c) The owner or operator subject to the provisions of this subpart shall install, calibrate, and maintain a monitoring device that continuously measures and records the volumetric flow rate through each separately ducted hood of the capture system, except as provided under paragraph (e) of this section. The owner or operator of an electric submerged arc furnace that is equipped with a water cooled cover which is designed to contain and prevent escape of the generated gas and particulate matter shall monitor only the volumetric flow rate through the capture system for control of emissions from the tapping station. The owner or operator may install the monitoring device(s) in any appropriate location in the exhaust duct such that reproducible flow rate monitoring will result. The flow rate monitoring device must have an accuracy of  $\pm 10$  percent over its normal operating range and must be calibrated according to the manufacturer's instructions. The Administrator may require the owner or operator to demonstrate the accuracy of the monitoring device relative to Methods 1 and 2 of Appendix A to this part.

(d) When performance tests are conducted under the provisions of § 60.8 of this part to demonstrate compliance with the standards under §§ 60.262(a) (4) and (5), the volumetric flow rate through each separately ducted hood of the capture system must be determined using the monitoring device required under paragraph (c) of this section. The volumetric flow rates must be determined for furnace power input levels at 50 and 100 percent of the nominal rated capacity of the electric submerged arc furnace. At all times the electric submerged arc furnace is operated, the owner or operator shall maintain the volumetric flow rate at or above the appropriate levels for that furnace power input level determined during the most recent performance test. If emissions due to tapping are captured and ducted separately from emissions of the electric submerged arc furnace, during each tapping period the owner or operator shall maintain the exhaust flow rates through the capture system over the tapping station at or above the levels established during the most recent performance test. Operation at lower flow rates may be considered by the Administrator to be unacceptable operation and maintenance of the affected facility. The owner or operator may request that these flow rates be reestablished by conducting new performance tests under § 60.8 of this part.

(e) The owner or operator may as an alternative to paragraph (c) of this section determine the volumetric flow rate through each fan of the capture system from the fan power consumption, pressure drop across the fan and the fan per-

formance curve. Only data specific to the operation of the affected electric submerged arc furnace are acceptable for demonstration of compliance with the requirements of this paragraph. The owner or operator shall maintain on file a permanent record of the fan performance curve (prepared for a specific temperature) and shall:

(1) Install, calibrate, maintain, and operate a device to continuously measure and record the power consumption of the fan motor (measured in kilowatts), and

(2) Install, calibrate, maintain, and operate a device to continuously measure and record the pressure drop across the fan. The fan power consumption and pressure drop measurements must be synchronized to allow real time comparisons of the data. The monitoring devices must have an accuracy of  $\pm 5$  percent over their normal operating ranges.

(f) The volumetric flow rate through each fan of the capture system must be determined from the fan power consumption, fan pressure drop, and fan performance curve specified under paragraph (e) of this section, during any performance test required under § 60.8 of this part to demonstrate compliance with the standards under §§ 60.262(a) (4) and (5). The owner or operator shall determine the volumetric flow rate at a representative temperature for furnace power input levels of 50 and 100 percent of the nominal rated capacity of the electric submerged arc furnace. At all times the electric submerged arc furnace is operated, the owner or operator shall maintain the fan power consumption and fan pressure drop at levels such that the volumetric flow rate is at or above the levels established during the most recent performance test for that furnace power input level. If emissions due to tapping are captured and ducted separately from emissions of the electric submerged arc furnace, during each tapping period the owner or operator shall maintain the fan power consumption and fan pressure drop at levels such that the volumetric flow rate is at or above the levels established during the most recent performance test. Operation at lower flow rates may be considered by the Administrator to be unacceptable operation and maintenance of the affected facility. The owner or operator may request that these flow rates be reestablished by conducting new performance tests under § 60.8 of this part. The Administrator may require the owner or operator to verify the fan performance curve by monitoring necessary fan operating parameters and determining the gas volume moved relative to Methods 1 and 2 of Appendix A to this part.

(g) All monitoring devices required under paragraphs (c) and (e) of this section are to be checked for calibration annually in accordance with the procedures under § 60.13(b).

#### § 60.266 Test methods and procedures.

(a) Reference methods in Appendix A of this part, except as provided in § 60.8 (b), shall be used to determine compliance with the standards prescribed in § 60.262 and § 60.263 as follows:

(1) Method 5 for the concentration of particulate matter and the associated moisture content except that the heating systems specified in paragraphs 2.1.2 and 2.1.4 of Method 5 are not to be used when the carbon monoxide content of the gas stream exceeds 10 percent by volume, dry basis.

(2) Method 1 for sample and velocity traverses.

(3) Method 2 for velocity and volumetric flow rate.

(4) Method 3 for gas analysis, including carbon monoxide.

(b) For Method 5, the sampling time for each run is to include an integral number of furnace cycles. The sampling time for each run must be at least 60 minutes and the minimum sample volume must be 1.8 dscm (64 dscf) when sampling emissions from open electric submerged arc furnaces with wet scrubber control devices, sealed electric submerged arc furnaces, or semi-enclosed electric submerged arc furnaces. When sampling emissions from other types of installations, the sampling time for each run must be at least 200 minutes and the minimum sample volume must be 5.7 dscm (200 dscf). Shorter sampling times or smaller sampling volumes, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) During the performance test, the owner or operator shall record the maxi-

mum open hood area (in hoods with segmented or otherwise moveable sides) under which the process is expected to be operated and remain in compliance with all standards. Any future operation of the hooding system with open areas in excess of the maximum is not permitted.

(d) The owner or operator shall construct the control device so that volumetric flow rates and particulate matter emissions can be accurately determined by applicable test methods and procedures.

(e) During any performance test required under § 60.8 of this part, the owner or operator shall not allow gaseous diluents to be added to the effluent gas stream after the fabric in an open pressurized fabric filter collector unless the total gas volume flow from the collector is accurately determined and considered in the determination of emissions.

(f) When compliance with § 60.263-1s to be attained by combusting the gas stream in a flare, the location of the sampling site for particulate matter is to be upstream of the flare.

(g) For each run, particulate matter emissions, expressed in kg/hr (lb/hr), must be determined for each exhaust stream at which emissions are quantified using the following equation:

$$E_s = C_s Q_s$$

where:

$E_s$  = Emissions of particulate matter in kg/hr (lb/hr).

$C_s$  = Concentration of particulate matter in kg/dscm (lb/dscf) as determined by Method 5.

$Q_s$  = Volumetric flow rate of the effluent gas stream in dscm/hr (dscf/hr) as determined by Method 2.

(h) For Method 5, particulate matter emissions from the affected facility, expressed in kg/MW-hr (lb/MW-hr) must be determined for each run using the following equation:

$$E = \frac{\sum_{i=1}^N E_i}{p}$$

where:

$E$  = Emissions of particulate from the affected facility, in kg/MW-hr (lb/MW-hr).

$N$  = Total number of exhaust streams at which emissions are quantified.

$E_i$  = Emission of particulate matter from each exhaust stream in kg/hr (lb/hr), as determined in paragraph (g) of this section.

$p$  = Average furnace power input during the sampling period, in megawatts as determined according to § 60.265 (b).

(Secs. 111 and 114 of the Clean Air Act, as amended by sec. 4(a) of Pub. L. 91-604, 84 Stat. 1678 (42 U.S.C. 1857c-6, 1857c-9))

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