

COMMONWEALTH OF VIRGINIA  
STATE AIR POLLUTION CONTROL BOARD  
REGULATIONS FOR THE CONTROL AND ABATEMENT OF AIR POLLUTION

9 VAC 5 CHAPTER 40.  
EXISTING STATIONARY SOURCES.

PART II.  
Emission Standards.

Article 8                    Emission Standards for Fuel Burning Equipment (Rule 4-8)

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**9 VAC5-40-880. Applicability and designation of affected facility.**

A. Except as provided in subsections C, D, and E of this section, the affected facility to which provisions of this article apply is fuel burning equipment.

B. The provisions of this article apply throughout the Commonwealth of Virginia.

C. Exempted from the provisions of this article are the following:

1. Any fuel burning equipment unit using solid fuel with a maximum heat input of less than 350,000 Btu per hour.

2. Any fuel burning equipment unit using liquid fuel (exclusive of coal slurry mixtures) with a maximum input of less than 1,000,000 Btu per hour.

3. Any fuel burning equipment unit using gaseous fuel with a maximum heat input of less than 10,000,000 Btu per hour.

D. The provisions of this article do not apply to fuel burning equipment units that power mobile sources but are removed for maintenance or repair and testing.

E. The provisions of this article do not apply to stationary internal combustion engines.

**9 VAC 5-40-890. Definitions.**

A. For the purpose of the Regulations for the Control and Abatement of Air Pollution and subsequent amendments or any orders issued by the board, the words or terms shall have the meanings given them in subsection C of this section.

B. As used in this article, all terms not defined here shall have the meanings given them in 9 VAC 5 Chapter 10 (9 VAC 5-10-10 et seq.), unless otherwise required by context.

C. Terms defined.

"Capacity factor" means the ratio of the average load on a machine or equipment for the period of time considered to the capacity rating of the machine or equipment.

"Fossil fuel" means natural gas, petroleum, coal and any form of solid, liquid or gaseous fuel derived from such materials for the purpose of creating useful heat.

"Fossil-fuel fired steam generator" means furnace or boiler, or both, used in the process of burning fossil fuel for the primary purpose of providing steam by heat transfer.

"Fuel burning equipment" means any furnace, with fuel burning equipment appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat to be utilized by indirect heat transfer, or by indirect production of power. This includes facilities that are designed as boilers to produce steam or heated water and are designed to burn either fossil fuel or refuse derived fuel. It does not include such facilities if designed primarily to burn raw refuse. This includes fuel burning equipment units (both permanently installed units and portable units) used to replace the power used by mobile sources. For the purposes of this article, stationary combustion turbines are considered to be fuel burning equipment.

"Fuel burning equipment installation" means all fuel burning equipment units within a stationary source in operation prior to October 5, 1979.

"Heat input" means the total gross calorific value of all fuels burned.

"Rated capacity" means the capacity as stipulated in the purchase contract for the condition of 100% load, or such other capacities as mutually agreed to by the board and owner using good engineering judgment.

"Refuse derived fuel (RDF)" means fuel produced from solid or liquid waste (includes materials customarily referred to as refuse and other discarded materials), or both, which has been segregated and classified, with the useable portions being put through a size reduction and classification process which results in a relatively homogeneous mixture.

"Stationary combustion turbine" means any air-breathing internal combustion engine consisting of an air compressor, combustion chamber, and a turbine wheel.

"Stationary internal combustion engine" means an engine in which fuel is burned within a machine in which energy is converted directly into mechanical motion or work. The energy is used directly for the production of power, locomotion or work. Internal combustion engines include, but are not limited to, diesel engines, gasoline engines, and diesel pumps. For the purposes of this article, stationary combustion turbines are not considered to be stationary internal combustion engines.

"Total capacity" means with reference to a fuel burning equipment installation, the sum of the rated capacities (expressed as heat input) of all units of the installation which must be operated simultaneously under conditions of 100% use load.

#### **9VAC5-40-900. Standard for particulate matter.**

##### **A. Fuel burning equipment installations.**

No owner or other person shall cause or permit to be discharged into the atmosphere from any fuel burning equipment installation any gaseous products of combustion containing particulate emissions in excess of the following limits.

##### **1. In AQCR 1 through 6.**

a. For fuel burning equipment installations with total capacity less than 10 million (10 X 10<sup>6</sup>) Btu per hour, the maximum allowable emission ratio shall be 0.6 pounds of particulate per million Btu input.

b. For fuel burning equipment installations with total capacity between 10 million (10 X 10<sup>6</sup>) and 10 billion (10,000 X 10<sup>6</sup>) Btu per hour, the maximum allowable emission ratio, E, in pounds of particulate per million Btu input, shall be determined by the following equation:  $E = 1.0906H - 0.2594$ , where H is the total capacity in millions of Btu per hour.

c. For fuel burning equipment installations with total capacity in excess of 10 billion (10,000 X 10<sup>6</sup>) Btu per hour, the maximum allowable emission ratio shall be 0.1 pounds of particulate per million Btu input.

2. In AQCR 7.

a. For fuel burning equipment installations with total capacity less than 100 million (100 X 10<sup>6</sup>) Btu per hour, the maximum allowable emission ratio shall be 0.3 pounds of particulate per million Btu input.

b. For fuel burning equipment installations with total capacity between 100 million (100 X 10<sup>6</sup>) and 10 billion (10,000 X 10<sup>6</sup>) Btu per hour, the maximum allowable emission ratio, E, in pounds of particulate per million Btu input, shall be determined by the following equation:  $E = .9000H^{-0.2386}$ , where H is the total capacity in millions of Btu per hour.

c. For fuel burning equipment installations with total capacity in excess of 10 billion (10,000 X 10<sup>6</sup>) Btu per hour, the maximum allowable emission ratio shall be 0.1 pounds of particulate per million Btu input.

B. Fuel burning equipment units.

1. The maximum allowable particulate emissions for each fuel burning equipment unit shall be the product of the rated capacity and the emission ratio (determined in accordance with subsection A of this section).

2. The allowable particulate emissions for each fuel burning equipment unit when operating at less than rated capacity shall be the product of the emission ratio, actual heat input and efficiency factor for the collection equipment. The efficiency factor for the collection equipment of each unit shall be determined using procedures set forth in 9VAC5-40-920.

3. For fuel burning equipment installations consisting of multiple fuel burning equipment units, except where all of the units burn liquid or gaseous fuels, or both, exclusively, the maximum allowable particulate emissions for each unit may be determined as provided in 9VAC5-40-910.

**9 VAC5-40-910. Emission allocation system.**

A. This section applies only to fuel burning equipment installations consisting of multiple fuel burning equipment units which do not burn liquid or gaseous fuels, or both, exclusively.

B. The maximum allowable particulate emissions for a fuel burning equipment installation shall be the product of the total capacity and the emission ratio (determined in accordance with 9VAC5-40-900 A).

C. The allowable particulate emissions for a fuel burning equipment installation when operating at less than total capacity, shall be the product of the percent load, emission allocation and efficiency factor for the collection equipment. The percent load shall be the quotient of the actual load and the rated capacity. The efficiency factor for the collection equipment of each unit shall be

determined using procedures set forth in 9VAC5-40-920. The emission allocation shall be determined using procedures set forth in subsection D of this section.

D. The emission allocation for each of the fuel burning equipment units of the fuel burning equipment installation shall be its designated portion of the maximum allowable particulate emissions from the fuel burning equipment installation when operating at total capacity. The portions shall be proposed by the owner initially and determined in a manner mutually acceptable to the board and the owner. Once accepted by the board, the portions may not be changed without the consent of the board.

**9 VAC 5-40-920. Determination of collection equipment efficiency factor.**

The efficiency factor for the collection equipment shall be established as follows:

1. For all collection equipment, except mechanical collectors, the efficiency factor shall be 1.0.

2. For mechanical collectors, the efficiency factor shall be the quotient of the design efficiency of the collector at rated capacity and the actual efficiency of the collector at the reduced actual load. The actual efficiency shall be the product of the design efficiency and the correction factor where:

$$\frac{\text{Correction Factor} = 1 + \log_{\text{sub}10}(\text{actual load})}{1 + \log_{\text{sub}10}(\text{rated capacity})}$$

3. For collection equipment where the owner does not wish to accept the efficiency factor established by subsection A or B of this section, the owner may provide information and data as a substitute. Such information and data may be emissions test results or other conclusive evidence. If such information and data is found acceptable by the board, it may be used to establish the efficiency factor for the collection equipment.

**9 VAC 5-40-930. Standard for sulfur dioxide.**

A. No owner or other person shall cause or permit to be discharged into the atmosphere from any fuel burning equipment installation any sulfur dioxide emissions in excess of the following limits:

1. S = 2.64K (AQCR 1 through 6).
2. S = 1.06K (for liquid or gaseous fuels - AQCR 7).
3. S = 1.52K (for solid fuels - AQCR 7).

where:

S = allowable emission of sulfur dioxide expressed in pounds per hour.

K = heat input at total capacity expressed in Btu X 10<sup>6</sup> per hour.

B. Where there is one or more units in a fuel burning equipment installation and where the installation can be shown, to the satisfaction of the board, to be in compliance when the installation is operating at total capacity, the installation will be deemed to still be in compliance when the installation is operated at reduced load or one or more units are shut down for maintenance or repair, provided that the same type of fuel with the same sulfur content, or an equivalent, is continued in use.

C. For installations in AQCR 7 at which different fossil fuels are burned simultaneously, whether in the same or different units, the allowable emissions shall be determined by proration using the following formula:

$$PS=K \left[ \frac{X (1.06) + Y (1.52)}{X + Y} \right]$$

Where:

PS = prorated allowable emissions of sulfur dioxide expressed in pounds per hour.

X = percentage of heat input at total capacity derived from liquid or gaseous fuel.

Y = percentage of heat input at total capacity derived from solid fuels.

K = heat input at total capacity expressed in Btu x 10<sup>6</sup> per hour.

#### **9 VAC 5-40-940. Standard for visible emissions.**

A. The provisions of Article 1 (9VAC5-40-60 et seq.) of this part (Emission Standards for Visible Emissions and Fugitive Dust/Emissions, Rule 4-1) apply except that the provisions in subsection B of this section apply instead of 9VAC5-40-80 A.

B. No owner or other person shall cause or permit to be discharged into the atmosphere from any fuel burning equipment unit any visible emissions which exhibit greater than 20% opacity, except for one, six-minute period in any one hour of not more than 60% opacity. Failure to meet the requirements of this section because of the presence of water vapor shall not be a violation of this section.

#### **9VAC5-40-950. Standard for fugitive dust/emissions.**

The provisions of Article 1 (9VAC5-40-60 et seq.) of this chapter (Emission Standards for Visible Emissions and Fugitive Dust/Emissions, Rule 4-1) apply.

**9 VAC 5-40-960. [Not in SIP]**

**9 VAC 5-40-970. [Not in SIP]**

**9 VAC5-40-980. Compliance.**

The provisions of 9VAC5-40-20 (Compliance) apply.

**9 VAC 5-40-990. Test methods and procedures.**

The provisions of 9VAC5-40-30 (Emission Testing) apply.

**9 VAC 5-40-1000. Monitoring.**

A. The provisions of 9VAC5-40-40 (Monitoring) apply.

B. Unless otherwise approved by the board, owners of fossil-fuel fired steam generators specified in subsection C of this section shall install, calibrate, maintain and operate systems for continuously monitoring and recording specified emissions in accordance with 9VAC5-40-40 and 9VAC5-40-41.

C. Fossil-fuel fired steam generators of greater than 250 million Btu per hour maximum heat input with an annual average capacity factor of greater than 30% (as reported to the Federal Power Commission for calendar year 1974, or as otherwise demonstrated to the board by the owner) shall be monitored for opacity except where:

1. Gaseous fuel is the only fuel burned, or

2. Oil or a mixture of gas and oil are the only fuels burned and the facility is able to comply with applicable particulate matter and visible emission standards without utilization of particulate matter collection equipment, and where the facility has never been found, through any administrative or judicial proceedings, to be in violation of any visible emission standard.

D. The continuous monitoring system shall be spanned at 80, 90 or 100% opacity.

**9 VAC 5-40-1010. Notification, records and reporting.**

A. The provisions of 9 VAC 5-40-50 (Notification, Records and Reporting) apply.

B. For the purpose of reports required under 9VAC5-40-50 C periods of excess emissions that shall be reported are defined as any one-hour period during which there are two or more six-minute periods when the average opacity exceeds 20%.

**9 VAC 5-40-1020. Registration.**

The provisions of 9VAC 5-20-160 (Registration) apply.

**9 VAC 5-40-1030. Facility and control equipment maintenance or malfunction.**

The provisions of 9VAC 5-20-180 (Facility and Control Equipment Maintenance or Malfunction) apply.

**9 VAC 5-40-1040. Permits.**

A permit may be required prior to beginning any of the activities specified below if the provisions of 9 VAC 5 Chapter 50 (9VAC5-50-10 et seq.) and 9 VAC 5 Chapter 80 (9VAC5-80-10 et seq.) apply. Owners contemplating such action should review those provisions and contact the appropriate regional office for guidance on whether those provisions apply.

1. Construction of a facility.
2. Reconstruction (replacement of more than half) of a facility.
3. Modification (any physical change to equipment) of a facility.
4. Relocation of a facility.
5. Reactivation (restart-up) of a facility.
6. Operation of a facility.