

# **RULE 233 BIOMASS BOILERS**

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## 100 GENERAL

- 101 APPLICABILITY:** This rule applies to stoker and circulating fluidized bed boilers and steam generators which have a heat input rating of less than 500 million Btu per hour and a potential to emit, as defined in Rule 502, NEW SOURCE REVIEW, 25 tons or more of NO<sub>x</sub> emissions and which have a primary energy source of biomass consisting of a minimum of 75 percent of the total annual heat input.
- 102 FEDERAL REGULATIONS:** Compliance with this rule shall not exempt a person from complying with any federal regulation promulgated pursuant to the Clean Air Act (42 U.S.C. Section 7401 et seq.).
- 103 EXEMPTION, BOILERS, STEAM GENERATORS, AND PROCESS HEATERS:** This rule shall not apply to boilers, steam generators, and process heaters subject to Rule 231, INDUSTRIAL, INSTITUTIONAL, AND COMMERCIAL BOILERS, STEAM GENERATORS, AND PROCESS HEATERS.
- 104 EXEMPTION, MUNICIPAL SOLID WASTE:** This rule shall not apply to combustion units whose primary purpose is to burn municipal solid waste, as defined in Section 209.
- 105 EXEMPTION, WASTE HEAT RECOVERY BOILERS:** The provisions of this rule do not apply to waste heat recovery boilers used to recover sensible heat from the exhaust of combustion turbines or unfired waste heat recovery boilers used to recover sensible heat from the exhaust of any combustion equipment.

## 200 DEFINITIONS

- 201 BIOMASS:** Any organic material not derived from fossil fuels, such as agricultural crop residues, bark, lawn, yard and garden clippings, leaves, silvicultural residue, tree and brush pruning, wood and wood chips, and wood waste, including these materials when separated from other waste streams. Biomass does not include material containing sewage sludge, industrial sludge, medical waste, hazardous waste, or radioactive waste.
- 202 BIOMASS BOILER OR STEAM GENERATOR:** Any combustion equipment used in any industrial, institutional, or commercial operation designed to burn biomass to produce steam, heat water or other fluids, and/or produce electricity.
- 203 BLOCK 24-HOUR AVERAGE:** The arithmetic average of the hourly air pollution emission rates of discharge as measured over 24 contiguous one-hour periods from 00:00:00 to 23:59:59, 24-hour clock time.
- 204 BRITISH THERMAL UNIT (BTU):** The amount of heat required to raise the temperature of one pound of water from 59 degrees F to 60 degrees F at one atmosphere.
- 205 CIRCULATING FLUIDIZED BED BOILER:** A boiler that burns solid fuel in a moving suspension of inert materials, forced through upward blowing of air jets, and where the ash and inerts are captured and recirculated back into the moving fluidized bed.
- 206 CURING STARTUP:** A startup which includes heating the boiler at predetermined rate and holding temperature at several points to allow for insulating materials to cure in the boiler refractory. A curing startup shall not exceed 96 hours.
- 207 HEAT INPUT:** The chemical heat released due to fuel combustion in a boiler, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.
- 208 HIGHER HEATING VALUE (HHV):** The total heat liberated per mass of fuel burned (BTU per pound), when fuel and dry air at standard conditions undergo complete combustion and all resultant products are brought to their standard states at standard conditions. HHV shall be determined by one of the following test methods:

- 208.1 ASTM E711 for biomass; or
- 208.2 ASTM D 240-87 or ASTM D 2382-82 for liquid hydrocarbon fuels; or
- 208.3 ASTM D 1826-88 or ASTM D 1945-81 in conjunction with ASTM D 3588-89 for gaseous fuels.
- 209 MUNICIPAL SOLID WASTE:** Household, commercial/retail, and/or institutional waste. Household waste includes material discarded by single or multiple residential dwellings, hotels, motels, and other similar permanent or temporary housing establishments or facilities. Commercial/retail waste includes material discarded by stores, offices, restaurants, warehouses, non-manufacturing activities at industrial facilities, and other similar establishments or facilities. Institutional waste includes material discarded by schools, hospitals, prisons, and government facilities and other similar establishments or facilities.
- 210 NO<sub>x</sub> EMISSIONS:** The sum of nitric oxides and nitrogen dioxide in the flue gas, collectively expressed as nitrogen dioxide (NO<sub>2</sub>).
- 211 PARTS PER MILLION BY VOLUME (PPMV):** The ratio of the number of gas molecules of a given species, or group, to the number of millions of total gas molecules.
- 212 RATED HEAT INPUT CAPACITY:** The heat input capacity, in million BTU per hour, specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the input capacity specified on the nameplate, and this alteration or modification has been approved by the Air Pollution Control Officer and made a limiting condition of operation, then the new maximum heat input shall be considered as the rated heat input capacity.
- 213 RESPONSIBLE OFFICIAL:** An individual with the authority to certify that a source complies with all applicable requirements, including the conditions of permits issued to sources in accordance with Regulation 5, PERMITS. A "responsible official" means one of the following:
- 213.1 For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
- 213.1.1 The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars); or
- 213.1.2 The delegation of authority to such representative is approved in advance by the Air Pollution Control Officer;
- 213.2 For a partnership or sole proprietorship, a general partner or the proprietor, respectively; or
- 213.3 For a municipality, state, federal, or other public agency, either a principal executive officer or a ranking elected official; or
- 213.4 For an acid rain unit subject to Title IV (Acid Deposition Control) of the Clean Air Act, the "responsible official" is the designated representative of that unit for any purposes under Title IV and Rule 507, FEDERAL OPERATING PERMITS PROGRAM.
- 214 SHUTDOWN:** A shutdown starts when fuel feed is curtailed and the unit begins cooling from the unit's normal operating temperature, as specified by the manufacturer, and ends when steam flow is zero or 24 hours has elapsed since the start of the shutdown, whichever occurs first.

- 215 STARTUP:** The period of time a unit is heated to the normal operating temperature, as specified by the manufacturer. A normal startup shall not exceed 24 hours. A curing startup shall not exceed 96 hours.
- 216 STOKER BOILER:** A boiler that burns solid fuel on a stationary or moving grate located at the bottom of the furnace, and where the fuel is supplied and ash removed continuously.
- 217 UNIT:** Any biomass boiler or steam generator as defined in Sections 202.
- 218 WOOD:** Wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including but not limited to sawdust, sanderdust, wood chips, scraps, slabs, millings, shavings, and processed pellets made from wood or other forest residues.

**300 STANDARDS**

**301 LIMITATIONS:**

No person shall allow the discharge of NO<sub>x</sub> and CO emissions into the atmosphere from a biomass boiler or steam generator in excess of the following standards, excluding startup and shutdown conditions:

Type of Boiler	NOx (Emission limits effective until December 31, 2012)	NOx (Emission limits effective January 1, 2013)	CO
Circulating Fluidized Bed (<500 MMBtu/hour)	115 ppmv corrected to 12% CO2 (3 hour rolling average)	115 ppmv corrected to 12% CO2 (3 hour rolling average)	400 ppmv corrected to 12% CO2 (3 hour rolling average)
		68 ppmv corrected to 12% CO2 (24 hour block average)	
Stoker (<500 MMBtu/hour)	115 ppmv corrected to 12% CO2 (3 hour rolling average)	115 ppmv corrected to 12% CO2 (3 hour rolling average)	1000 ppmv corrected to 12% CO2 (3 hour rolling average)
		68 ppmv corrected to 12% CO2 (24 hour block average)	

**302 STARTUP AND SHUTDOWN PROVISIONS**

The emission limits of Section 301 shall not apply during startup or shutdown provided the following requirements are met:

- 302.1 CO<sub>2</sub> emissions are 10 percent or less by volume stack gas on a one-hour average dry basis.
- 302.2 During startup and shutdown, the mass emissions of NO<sub>x</sub> and CO shall not exceed the levels shown below. The block averaging time starts at the beginning of either the startup or the shutdown.

Type of Boiler	NOx	CO
Circulating Fluidized Bed (<500 MMBtu/hour)	35 pounds per hour (24 hour block average)	56 pounds per hour (24 hour block average)
	35 pounds per hour (72 hour block average during curing startup)	56 pounds per hour (72 hour block average during curing startup )
Stoker (<500 MMBtu/hour)	37.6 pounds per hour (3 hour rolling average)	170 pounds per hour (3 hour rolling average)

- 302.3 A normal startup shall not exceed 24 hours. A startup which involves curing of refractory shall not exceed 96 hours.

#### **400 ADMINISTRATIVE REQUIREMENTS**

**401 OPERATION AND MAINTENANCE PLAN:** Any person installing an emission control device as a means of complying with the emission limitations of Section 301 shall submit an Operation and Maintenance Plan with the application for Authority to Construct for the emission control device.

401.1 The Operation and Maintenance Plan shall specify:

401.1.1. Operation and maintenance procedures that will demonstrate continuous operation of the emission control device during emission-producing operations; and

401.1.2 Records that must be kept to document the operation and maintenance procedures.

401.1.3. Each source must provide to the District a description of the actions that will be taken to minimize emissions during startup and shutdown events.

401.2 The records must comply with Sections 501, 502, and 505.

401.3 The Operation and Maintenance Plan shall be implemented upon approval by the Air Pollution Control Officer.

401.4 Subsequent to the construction of any emission control device used for demonstrating compliance with the emission limitation of Section 301, an Operation and Maintenance Plan shall be submitted or resubmitted in conjunction with any changes in the procedures addressed in the plan, or upon the request of the Air Pollution Control Officer.

**402 COMPLIANCE COSTS:** A person operating a unit subject to this rule shall bear all expenses associated with compliance with the monitoring and reporting provisions of this rule.

**403 CERTIFICATION:** All reports submitted in accordance with this rule shall be signed by a responsible official who shall certify the truth, accuracy, and completeness of the report.

#### **500 MONITORING AND RECORDS**

**501 RECORDKEEPING:** A person operating a unit subject to this rule shall keep the following records for each unit:

501.1 Calendar date of record.

501.2 Number of hours the unit is operated during each day.

501.3 Boiler load.

501.4 Fuel types, including supplementary gaseous or liquid fuels.

501.5 Duration of startups and shutdowns.

501.6 Type and duration of maintenance and repairs.

501.7 Results of compliance tests.

501.8 Three-hour average NO<sub>x</sub> emission concentration (expressed as NO<sub>2</sub> and corrected to 12 percent by volume stack gas CO<sub>2</sub>).

- 501.9 Twenty-four hour average NOx emission concentration (expressed as NO2 and corrected to 12 percent by volume stack gas CO2).
- 501.10 Three-hour average CO emission concentration (corrected to 12 percent by volume stack gas CO2).
- 501.11 Startup and shutdown emissions records using averaging periods as required in Section 302.1.
- 501.12 Identification of time periods during which NOx and CO emission limitations are exceeded, the reason for the exceedance, and a description of corrective action taken.
- 501.13 Identification of time periods during which operating condition and pollutant emission data were not obtained, the reason for not obtaining this information, and a description of corrective action taken.
- 501.14 If zero steam flow is used to determine the end of a shutdown, then steam flow must be recorded.

## **502 CONTINUOUS EMISSIONS MONITORING**

- 502.1 A person operating a unit subject to this rule shall install, calibrate, operate, and maintain a Continuous Emissions Monitoring System (CEMS) in accordance with applicable requirements of Appendices B and F of Title 40 Code of Federal Regulations Part 60 (40 CFR 60).
- 502.2 The CEMS shall include equipment that measures and records the following:
  - 502.2.1. Continuous exhaust gas NOx and CO concentrations corrected to 12 percent by volume stack gas CO2 dry basis.
  - 502.2.2. Average NOx and CO concentrations calculated on a three-hour rolling average basis.
  - 502.2.3 Average NOx concentrations calculated on a twenty-four hour block average basis.
- 502.3 A person operating a CEMS shall submit an excess emissions and monitoring systems performance report to the Air Pollution Control Officer within 30 days after the end of each calendar quarter in accordance with 40 CFR 60, Section 60.7(c) and (d) and Section 60.13.
- 502.4 The enhanced monitoring requirements of Sections 113 and 114 of the Federal Clean Air Act shall take precedence over the requirements of this Section for facilities subject to Rule 507, FEDERAL OPERATING PERMIT PROGRAM.

## **503 INITIAL COMPLIANCE TEST**

- 503.1 An initial compliance test shall be conducted within 60 days of achieving the maximum firing rate at which the unit will be operated, but not later than 180 days after initial startup.
  - 503.1.1 Each emission test run shall be conducted while the unit is operated within 10% of the maximum steady-state steam production rate. No emission test shall be conducted during startup, shutdown, or under breakdown conditions for the purpose of the initial compliance test.
  - 503.1.2. The initial compliance test shall be conducted for NOx and CO using the test methods specified in Section 504.

503.2 At least sixty (60) days prior to the initial compliance test, a written test plan detailing the test methods and procedures to be used shall be submitted for approval by the Air Pollution Control Officer. The plan shall cite the test methods to be used for the determination of compliance with the emission limitations of this rule. The plan shall provide the proposed procedures for the characterization of the representative biomass materials to be burned during testing.

**504 TEST METHODS:** A person conducting source tests shall use the following test methods:

504.1 Nitrogen Oxides (NO<sub>x</sub>): ARB Test Method 100, Title 17, CCR, Section 94114, Procedures for Continuous Emission Stack Sampling, or EPA Test Method 7E, 40 CFR 60, Appendix A. A violation determined by any of these test methods shall constitute a violation of this rule.

504.2 Carbon Monoxide (CO): ARB Test Method 10, Title 17, CCR, Section 94109, Determination of Carbon Monoxide Emissions from Stationary Sources, or ARB Test Method 100, or EPA Test Method 10, 40 CFR 60, Appendix A. A violation determined by any of these test methods shall constitute a violation of this rule.

504.3 Carbon Dioxide (CO<sub>2</sub>): ARB Test Method 100, Title 17, CCR, Section 94114, Procedures for Continuous Emission Stack Sampling, or EPA Test Method 3A, 40 CFR 60, Appendix A.

**505 DURATION OF RECORDS:** All records maintained pursuant to this rule shall be retained for at least two years from date of entry, with the exception that sources subject to the requirements of Rule 507, FEDERAL OPERATING PERMIT PROGRAM, shall retain records at least five years. Records shall be made available for inspection by the Air Pollution Control Officer upon request.