

RULE 2.45 BOILERS

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100 GENERAL

- 101 **PURPOSE:** To reduce emissions of Nitrogen Oxides (NO_x) from boilers, steam generators and process heaters.
- 102 **APPLICABILITY:** This Rule applies to boilers, steam generators, and process heaters with rated heat inputs of greater than or equal to one (1.0) million BTU per hour and less than five (5.0) million BTU per hour.
- 110 **EXEMPTIONS – GENERAL:** The provisions of this Rule shall not apply to:
- 110.1 Boilers used by electric utilities to generate electricity;
 - 110.2 Waste heat recovery boilers;
 - 110.3 Dryers;
 - 110.4 Cement and lime kilns, glass melting furnaces and smelters;
 - 110.5 Hot water pressure washers; or
 - 110.6 Boilers or process heaters installed prior to January 1, 2020.
- 111 **EXEMPTION, CERTIFIED UNIT(S):** Initial portable analyzer testing, as required by Section 302 of this Rule shall not apply to certified units.

200 DEFINITIONS

- 201 **BOILER:** Any external combustion equipment fired with any fuel and used to produce hot water or steam including: boilers, steam generators, and hot water heaters.
- 202 **BRITISH THERMAL UNIT (BTU):** The amount of heat required to raise the temperature of one pound of water from 59°F to 60°F at one atmosphere.
- 203 **CERTIFIED UNIT:** Any unit which has been demonstrated to comply with the emissions limits of the Rule and has been certified by a program approved by the APCO, including the South Coast Air Quality Management District and San Joaquin Valley Air Pollution Control District certification programs.
- 204 **DRYER:** Any unit where the material being dried comes into direct contact with the products of combustion.
- 205 **GASEOUS FUEL:** Any fuel which is a gas at standard conditions.
- 206 **HEAT INPUT:** The chemical heat released due to fuel combustion in a unit, using the higher heating value of the fuel. This does not include the sensible heat of incoming combustion air.

- 207 **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 D 2015-85 for solid fuels; or
 - 208.2 ASTM D 240-87 or ASTM D 2382-88 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.
- 208 **HOT WATER PRESSURE WASHER:** High-pressure cleaning machine in which the hot water discharge line (spray nozzle) is hand supported and intended for residential, commercial or industrial applications.
- 209 **NO_x EMISSIONS (NO_x):** The sum of nitric oxides and nitrogen dioxide in the flue gas.
- 210 **NONGASEOUS FUEL:** Any fuel which is not a gas at standard conditions.
- 211 **PARTS PER MILLION BY VOLUME (ppmv):** The ratio of the number of gas molecules of a given species, or group of species, to the number of millions of total gas molecules.
- 212 **PROCESS HEATER:** Any combustion equipment fired with any fuel, and which transfers heat from combustion gases to water or process streams. This definition does not include any dryers in which the material being dried is in direct contact with the products of combustion, cement or lime kilns, glass melting furnaces, and smelters.
- 213 **RATED HEAT INPUT:** 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 heat input capacity specified on the nameplate, the maximum heat input shall be considered as the rated heat input.
- 214 **STANDARD CONDITIONS:** 68°F and one atmosphere.
- 215 **UNIT:** Any boiler, steam generator, or process heater as defined in Sections 201 or 212 of this Rule.
- 216 **WASTE HEAT RECOVERY BOILER:** A device that recovers normally unused energy and converts it to usable heat. Waste heat recovery boilers incorporating duct or supplemental burners that are designed to supply 50 percent or more of the

total rated heat input capacity of the waste heat recovery boiler are not considered waste heat recovery boilers, but are considered boilers. Waste heat recovery boilers are also referred to as heat recovery steam generators.

300 STANDARDS

301 EMISSION LIMITS

301.1 Gaseous Fuel Firing: Effective January 1, 2020, NO_x emissions shall not exceed 30 ppmvd @ 3% O₂ when firing on gaseous fuels.

301.2 Nongaseous Fuel Firing: Effective January 1, 2020, NO_x emissions shall not exceed 40 ppmvd @ 3% O₂ when firing on nongaseous fuels.

301.3 Emissions from units subject to this Section shall not exceed a carbon monoxide concentration of 400 ppmvd @ 3% O₂.

302 **PERFORMANCE TESTING:** Any unit subject to Section 301 shall perform an initial portable analyzer test upon start-up and at least once every 24 months thereafter to demonstrate compliance with the emission limitations.

303 MONITORING EQUIPMENT:

303.1 Fuel meters: Owners or operators of units subject to this Rule shall install and maintain a dedicated non-resetting totalizing fuel meter in each fuel line. If a volumetric flow rate meter is installed, it must compensate for temperature and pressure using integral gauges. Owners or operators may use the serving utility provider meter if the meter serves only one unit.

303.2 Hour meters: Owners or operators may use a non-resetting totalizing hour meter or computerized tracking system in lieu of a dedicated fuel meter. In this case, the fuel usage shall be calculated by multiplying the number of operating hours for the unit by the maximum fuel usage for the unit as specified by the unit manufacturer.

400 ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE DETERMINATION:

401.1 When making determinations in accordance with Section 302, the determinations shall be made in the as-found operating condition, except that emission determinations shall include at a minimum at least one test run conducted at the maximum firing rate allowed by the District permit,

and no compliance determination shall be established within two hours after a continuous period in which fuel flow to the unit is zero, or shut off, for 30 minutes or longer.

401.2 All ppmv emission limits specified in Section 301 are referenced at dry stack-gas conditions and 3.00 percent by volume stack-gas oxygen. Emission concentrations shall be corrected to 3.00 percent oxygen as follows:

$$[ppm\ NOx]_{corrected} = \frac{20.9\% - 3.0\%}{20.9\% - [\%O2]_{measured}} * [ppm\ NOx]_{measured}$$

$$[ppm\ CO]_{corrected} = \frac{20.9\% - 3.0\%}{20.9\% - [\%O2]_{measured}} * [ppm\ CO]_{measured}$$

402 **TEST REPORTS:** The owners or operators of units subject to Section 302 of this Rule shall submit a written protocol to the District for approval at least 14 days prior to the test event, and shall submit a completed written test report to the District for approval within 60 days after performing any test.

500 MONITORING AND RECORDS

501 **USAGE MONITORING:** Owners or operators of units subject to this Rule shall monitor and record for each unit the actual annual hours of operation or usage of each fuel using the meter(s) required in Section 303. Records shall be updated quarterly.

Records shall be maintained by the owner operator for the five previous calendar years and made available to the District upon request.

502 **TEST METHODS:**

502.1 For portable analyzer testing pursuant to Section 302, emission readings shall be averaged over a 15 consecutive minute period by either taking a cumulative 15 consecutive minute sample reading or by taking at least four (4) readings evenly spaced out over the 15 consecutive minute period.