

SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DISTRICT

RULE 428 - CONTROL OF OXIDES OF NITROGEN FROM RESIDENTIAL NATURAL GAS-FIRED WATER HEATERS AND FURNACES*(Adopted 7/26/95)***A. APPLICABILITY**

The provisions of this Rule apply to any person who sells, offers for sale, or installs any natural gas-fired residential water heater or fan-type central furnace within the District.

B. DEFINITIONS

For the purposes of this Rule the following definitions shall apply:

1. "Fan-Type Central Furnace": A self-contained space heater providing for circulation of heated air at pressures other than atmospheric through ducts more than 10 inches in length that has a rated heat input capacity of less than 175,000 British Thermal Units (BTU) per hour and, for combination heating and cooling units, a rated cooling capacity of less than 65,000 BTU per hour.
2. "Heat Output (Central Furnace)": The product obtained by multiplying the annual fuel utilization efficiency as defined by Section 4.6 of the Code of Federal Regulations (CFR), Title 10, Part 430, Subpart B, Appendix N, by the rated heat input capacity of the natural gas-fired central furnace.
3. "Heat Output (Water Heater)": The product obtained by multiplying the recovery efficiency as defined by Section 6.1.3 of 10 CFR 430, Subpart B, Appendix E, by the rated heat input capacity of the water heater.
4. "Manufactured Home": As defined in 42 US Code Section 5402 and California Health and Safety Code Section 18007.
5. "Natural Gas": A mixture of gaseous hydrocarbons containing at least 80% methane by volume as determined by ASTM Method D 1945-64.
6. "Rated Cooling Capacity": The cooling capacity specified on the nameplate of the cooling unit. Cooling capacity is the amount of heat energy the cooling system can displace in one hour.
7. "Rated Heat Input Capacity": The heat input capacity specified on the nameplate of the unit. Heat input is the amount of energy consumed in one hour.
8. "Unit": Any water heater or fan-type central furnace as defined in either Subsection B.1 or B.9 of this Rule.
9. "Water Heater": A device that heats water at a thermostatically-controlled temperature of no more than 210 degrees Fahrenheit for delivery on demand.

C. EXEMPTIONS

The provisions of this Rule shall not apply to:

1. Water heaters with a rated heat input capacity of 75,000 BTU per hour or greater.
2. Water heaters used in recreational vehicles.
3. Units installed in manufactured homes (mobile homes).

D. REQUIREMENTS

1. No person shall sell, offer for sale, or install within the District any natural gas-fired water heater or fan-type central furnace with emissions of oxides of nitrogen (NO_x) in excess of 40 nanograms per joule (0.093 lbs NO_x per million BTU) of heat output.
2. If the combustion unit has been physically modified such that its maximum heat input capacity is different than the rated heat input capacity specified on the nameplate, the modified maximum heat input capacity shall be considered as the rated heat input capacity. The modified maximum heat input capacity shall be demonstrated to the District by a fuel meter while operating the unit at maximum capacity.

E. CERTIFICATION AND IDENTIFICATION

1. The manufacturer shall have tested or shall test each appliance model in accordance with Section F.
2. The manufacturer shall display the model number of the unit and a statement of compliance with the emission limit specified in Subsection D.1 on the shipping carton and rating plate.

F. TEST METHODS

1. During testing, each tested furnace shall be operated in accordance with the procedures specified in 10 CFR 430, Subpart B, Appendix N.
2. Compliance with the NOx emission requirements in Subsection D.1 shall be determined using California Air Resources Board (ARB) Method 100, or United States Environment Protection Agency (EPA) Methods 7E and 3A.
3. Each tested water heater shall be operated in accordance with Section 2.4 of American National Standards Institute (ANSI) Z21.10.1-1990 at normal test pressure, input rates, and with a five-foot exhaust stack installed during the NOx emissions tests.
4. The following calculation shall be used to determine the nanograms of NOx per joule of heat output:

$$N = \frac{4.566 \times 10^4 \times P \times U}{H \times C \times E}$$

where:

4.566×10^4 = unit conversion factor [parts per million (ppm) to nanograms and BTU to joules]

N = nanograms of emitted NOx per joule of heat output

P = concentration of NOx in flue gas in ppm by volume

U = dry volume percent of CO₂ in flue gas necessary for stoichiometric combustion

H = gross heating value of fuel, BTU/cu.ft. at 60°F and 30 in. mercury

C = measured dry volume percent of CO₂ in the flue gas, assuming complete combustion and no carbon monoxide present

E = efficiency, annual fuel utilization efficiency for natural gas-fired central furnaces or recovery efficiency for water heaters as referenced in Subsections B.2 and B.3 of this Rule

G. COMPLIANCE SCHEDULE

The provisions of this Rule shall become effective on January 26, 1996.