

RULE 424 Residential Water Heaters (Oxides of Nitrogen) Adopted 4/19/93

I. **Applicability**

The provisions of this rule shall apply to any person selling, offering for sale, or installing natural gas-fired residential water heaters.

II. **Definitions**

- A. Residential water heater - a natural gas-fired appliance designed to supply hot water to a residence, but not including space heating equipment.
- B. Heat output - the product of the "recovery efficiency", as defined by Title 20, California Administrative Code, Chapter 2, Subchapter 4, Article 4, Sections 1603 and 1607 and the rated heat input of natural gas (@ 1050 Btu's/scf) of the water heater.
- C. Natural gas - a mixture of gaseous hydrocarbons containing at least 80 percent methane by volume, as determined according to Standard Method ASTM D1945-64.
- D. Rated heat input - the maximum design amount of energy a water heater consumes in one hour (Btu/hr).

III. **Exemptions**

- A. Water heaters with a rated heat input of 75,000 Btu per hour, or greater.
- B. Water heaters used in recreation vehicles.
- C. Water heaters installed in mobile homes constructed in compliance with Title 24, CFR, Part 3280 (Manufactured Home Construction and Safety Standards).

IV. **Requirements**

After 11/1/93, a person shall not sell, offer for sale, or install, any residential water heater within the Kern County Air Pollution Control District:

- A. Emitting oxides of nitrogen (NO_x) in excess of 40 nanograms of NO_x (calculated as NO₂) per joule (70 lb per billion Btu) of heat output.
- B. Not certified in accordance with Section V.

V. Certification

A. Testing

The manufacturer of any water heater offered for sale in Kern County Air Pollution Control District shall have each water heater model offered for sale tested in accordance with the following procedures:

1. During testing, operated in accordance with Section 2.4 of American National Standard ANSI Z21.01.1-1975 at normal test pressure, input rates, and with a five-foot exhaust stack.
2. During oxides of nitrogen emissions testing, tested in accordance with SCAQMD Rule 1121 "NO_x Compliance Testing Procedure for Natural Gas-Fired Water Heaters and Small Boilers". (Based upon EPA test methods 7 and 7-A-E.)

B. Calculations

The following formula shall be used to determine a water heater's NO_x emission factor:

$$N = \frac{(4.566 \times 10^4 \times P \times U)}{HCE}$$

Where:

- N = nanograms of NO_x emitted per joule of heat output
- P = parts per million (volume) NO_x in flue gas
- U = volume percentage of CO₂ in dry flue gas for stoichiometric combustion
- H = gross heating value of gas, 1050 Btu/scf (60°F, 30" Hg)
- C = volume percentage of CO₂ in dry flue gas
- E = recovery efficiency (percentage) as defined in Section 6.1.3, CFR, Title 10, Part 430, Subpart B, Appendix E.

C. Compliance Report

The manufacturer of a water heater subject to this rule and to be offered for sale in Kern County APCD shall submit to the Air Pollution Control Officer a compliance report by 11/1/93 containing the following information for each model:

1. General Information

- a. Name and address of manufacturer,
- b. Brand name,
- c. Rated heat input (Btu's/Hr), and
- d. Model number, as it appears on the water heater rating plate.

2. Test Report

- a. All certification test data, and
- b. Calculations showing compliance with Section IV.

Manufacturer may submit a certification report including the above approved by the South Coast Air Quality Management District or the Bay Area Air Quality Management District.

3. Compliance Statement

- a. Signed and dated statement attesting to the accuracy of all statements and information in the Compliance Report.
- b. A new Compliance Report shall be submitted for any water heater whose design is changed in any manner which may change NO_x emissions. New Compliance Reports, for either altered models or new models, shall be submitted to the APCO at least 30 days before the water heater is offered for sale in Kern County.

VI. **Identification of Complying Water Heaters**

Each water heater manufacturer offering for sale water heaters subject to this rule shall display the model number of the water heater on the shipping carton and heater rating plate.

VII. **Enforcement**

- A. The Air Pollution Control Officer may require of the manufacturer additional emission test results when deemed necessary to verify compliance.
- B. The Air Pollution Control Officer may periodically inspect distributors, retailers, and installers of water heaters located in the District and conduct such tests as deemed necessary to insure compliance with the provisions of this Rule.