

**REGULATION 9  
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RULE 6  
NITROGEN OXIDES EMISSIONS FROM  
NATURAL GAS-FIRED BOILERS AND WATER HEATERS  
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**REGULATION 9**  
**INORGANIC GASEOUS POLLUTANTS**  
**RULE 6**  
**NITROGEN OXIDES EMISSIONS FROM NATURAL GAS-FIRED WATER**  
**HEATERS**

(Adopted April 1, 1992)

**9-6-100 GENERAL**

**9-6-101 Description:** This rule limits the emissions of nitrogen oxides from natural gas-fired water heaters and boilers.

*(Amended November 7, 2007)*

**9-6-102 Applicability:** This Rule applies to any person who sells, installs, or offers for sale a natural gas-fired water heater for use within the District (Section 9-6-300s Standards) and any manufacturer who intends to sell or distribute for sale or installation a natural gas-fired water heater for use within the District (Section 9-6-400s Administrative Requirements and Section 9-6-600s Manual of Procedures).

**9-6-110 Exemptions:** The requirements of Section 9-6-301 shall not apply to the following:

- 110.1 Natural gas-fired boilers and water heaters with a rated heat input capacity of greater than 2,000,000 BTU/Hour.
- 110.2 Natural gas-fired water heaters used in recreational vehicles.
- 110.3 Water heaters using a fuel other than natural gas.
- 110.4 Natural gas-fired pool/spa heaters with less than 400,000 Btu/Hour rated heat input capacity used exclusively to heat swimming pools, hot tubs or spas.

*(Amended November 7, 2007)*

**9-6-200 DEFINITIONS**

**9-6-201 Boilers and Water Heaters:** Any combustion equipment used to heat water or produce steam and that is not exclusively used to produce electricity for sale. For the purposes of this Rule, a boiler does not include any waste heat recovery boiler that is used to recover sensible heat from the exhaust of a combustion turbine or any unfired waste heat recovery boiler that is used to recover sensible from the exhaust of any combustion equipment.

*(Adopted November 7, 2007)*

**9-6-202 BTU:** British thermal unit or units.

*(Adopted November 7, 2007)*

**9-6-203 Direct-Vent Water Heater:** A storage tank water heater with air intake and exhaust ducts that use a gravity system to collect air from outside a building for combustion and exhaust combustion byproducts to the outside of a building.

*(Adopted November 7, 2007)*

**9-6-204 Heat Input:** The heat of combustion released by fuels burned in a unit based on the higher heating value of fuel. This does not include the enthalpy of incoming combustion air.

*(Adopted November 7, 2007)*

**9-6-205 Heat Output:** The product obtained by multiplying the recovery efficiency, as defined by Section 6.1.3 of the Code of Federal Regulation, Title 10, Part 430, Subpart B, Appendix E, by the input rating of the water heater.

*(Renumbered November 7, 2007)*

- 9-6-206 Instantaneous Water Heater:** A device in which water is heated only when the water flows through a heat exchanger.  
(Adopted November 7, 2007)
- 9-6-207 Mobile Home Water Heater:** A closed vessel manufactured exclusively for mobile home use in which water is heated and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210°F (99°C).  
(Adopted November 7, 2007)
- 9-6-208 Natural Gas:** A mixture of gaseous hydrocarbons containing at least 80 percent methane by volume as determined according to Standard Method ASTM D1945-64.  
(Renumbered November 7, 2007)
- 9-6-209 NO<sub>x</sub> Emissions:** The sum of nitric oxide and nitrogen dioxide in the flue gas, collectively expressed as nitrogen dioxide.  
(Adopted November 7, 2007)
- 9-6-210 Pool/Spa Heater:** A device in which water is heated when pool or spa water circulates through a heat exchanger.  
(Adopted November 7, 2007)
- 9-6-211 Power Direct-Vent Water Heater:** A storage tank water heater with an air intake duct outside of a building with a blower installed to assist in the expulsion of exhaust gases.  
(Adopted November 7, 2007)
- 9-6-212 Power-Vent Water Heater:** A storage tank water heater with an air intake duct outside of a building with a blower installed to assist in the expulsion of exhaust gases.  
(Adopted November 7, 2007)
- 9-6-213 Rated Heat Input Capacity:** The heat input capacity specified on the nameplate of the combustion unit.  
(Renumbered November 7, 2007)
- 9-6-214 Storage Tank Water Heater:** A closed vessel, in which water is heated and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210°F.  
(Renumbered November 7, 2007)
- 9-6-300 STANDARDS**
- 9-6-301 Natural Gas-Fired Storage Tank Water Heaters with a Rated Heat Input Capacity of 75,000 BTU/Hour or Less:**
- 301.1 No person shall sell, install, or offer for sale within the District any natural gas-fired storage tank water heater, manufactured after July 1, 1992, with a rated heat input capacity of 75,000 BTU/Hour or less, that emits more than 40 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output.
- 301.2 No person shall sell, install, or offer for sale within the District any natural gas-fired storage tank water heater less than or equal to 50 gallons capacity that is manufactured after January 1, 2009, and that emits more than 10 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output. This subsection shall not apply to direct-vent, power-vent, power direct-vent water storage tank heaters and water heaters used for mobile homes.

301.3 No person shall sell, install, or offer for sale within the District any natural gas-fired storage tank water heater greater than 50 gallons capacity that is manufactured after January 1, 2010, and that emits more than 10 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output. This subsection shall not apply to direct-vent, power-vent, power direct-vent storage tank water heaters and water heaters used for mobile homes.

301.4 No person shall sell, install, or offer for sale within the District any natural gas-fired storage tank water heater that is manufactured after January 1, 2011, and that emits more than 10 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output. This subsection shall not apply to water heaters used for mobile homes.

301.5 No person shall sell, install, or offer for sale within the District any natural gas-fired storage tank water heater that is manufactured after January 1, 2027, with a rated heat input rating of 75,000 BTU/hour or less, that emits more than 0 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output. This subsection shall not apply to mobile home water heaters.

*(Amended November 7, 2007)*

**9-6-302 Certification of Boilers and Water Heaters:** No person shall sell, install, or offer for sale within the District any water heaters subject to Section 9-6-301, 303, 304, or 305 unless the water heater manufacturer brand name and model is certified in accordance with Sections 9-6-401, and 402.

*(Amended November 7, 2007)*

**9-6-303 Natural Gas-Fired Boilers and Water Heaters with a Rated Heat Input Capacity of 75,001 to 2,000,000 BTU/Hour:**

303.1 No person shall sell, install, or offer for sale within the District any large natural gas-fired boiler, storage tank water heater, or instantaneous water heater with a rated heat input capacity from 75,001 to 400,000 BTU/Hour, inclusive, manufactured after January 1, 2008, that emits more than 40 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output.

303.2 No person shall sell, install, or offer for sale within the District any large natural gas-fired boiler, storage tank water heater, or instantaneous water heater with a rated heat input capacity from 75,001 to 400,000 BTU/Hour, inclusive, manufactured after January 1, 2013, that emits more than 14 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output.

303.3 No person shall sell, install, or offer for sale within the District any large natural gas-fired boiler, storage tank water heater, or instantaneous water heater with a rated heat input capacity from 400,001 to 2,000,000 BTU/Hour, inclusive, manufactured after January 1, 2008, that emits more than 20 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output, or more than 30 ppm NO<sub>x</sub> at 3% O<sub>2</sub>, dry.

303.4 No person shall sell, install, or offer for sale within the District any large natural gas-fired boiler, storage tank water heater, or instantaneous water heater with a rated heat input capacity from 400,001 to 2,000,000 BTU/Hour, inclusive, manufactured after January 1, 2013, that emits more than 14 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output, or more than 20 ppm NO<sub>x</sub> at 3% O<sub>2</sub>, dry.

303.5 No person shall sell, install, or offer for sale within the District any large natural gas-fired boiler, storage tank water heater, or instantaneous water heater with a rated heat input capacity from 75,001 to 2,000,000 BTU/Hour, inclusive, manufactured after January 1, 2031, that emits more than 0.0 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output.

*(Adopted November 7, 2007)*

**9-6-304 Natural Gas-Fired Mobile Home Water Heaters:** No person shall sell, install, or offer for sale within the District any natural gas-fired mobile home water heater

manufactured after January 1, 2008, that emits more than 40 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output.

*(Adopted November 7, 2007)*

**9-6-305 Natural Gas-Fired Pool/Spa Heaters:**

305.1 No person shall sell, install, or offer for sale within the District any natural gas-fired pool/spa heater with an input rating from 400,001 to 2,000,000 BTU/Hour, inclusive, manufactured after January 1, 2008, that emits more than 40 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output, or more than 55 ppm NO<sub>x</sub> at 3% O<sub>2</sub>, dry.

305.2 No person shall sell, install, or offer for sale within the District any natural gas-fired pool/spa heater with an input rating from 400,001 to 2,000,000 BTU/Hour, inclusive, manufactured after January 1, 2013, that emits more than 14 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output, or more than 20 ppm NO<sub>x</sub> at 3% O<sub>2</sub>, dry.

*(Adopted November 7, 2007)*

**9-6-400 ADMINISTRATIVE REQUIREMENTS**

**9-6-401 Compliance with Emissions Standards:** The manufacturer shall obtain confirmation from an independent testing laboratory that each boiler or water heater model it intends to sell or distribute for sale into the District that is subject to the requirements of Sections 9-6-301, 303, 304, or 305 has been tested in accordance with the procedures in [Section 9-6-601](#).

*(Amended November 7, 2007)*

**9-6-402 Compliance Statement: Application for Certification:** ~~The manufacturer shall submit to the APCO either of the following:~~

402.1 ~~The Each~~ manufacturer shall submit ~~an application a statement~~ to the APCO ~~that each boiler or water heater model meets the emission standard set forth in Section 9-6-301 or 9-6-303, for certification of their compliant boiler or water heater model.~~ The compliance statement application must:

402.1.1 Provide the following general information: name and address of manufacturer, brand name, trade name, model number and heat input rating as it appears on the water heater rating plate.

402.1.2 Provide a description of the model being certified

402.1.3 Include a complete certification source test report demonstrating that the boiler or water heater model was tested in accordance with procedures in Section 9-6-601 and a written statement that the model complies with Section 9-6-301, 303, 304, or 305 ~~and is tested in accordance with procedures in Section 9-6-601.~~

402.1.4 Be submitted to the District APCO no more than 90 days after the date of the emissions compliance test conducted in accordance with Section 9-6-401.

402.1.5 Be submitted to the District APCO no less than 90 days before the intention to sell or distribute a new water heater model within the District, or no less than 90 days before the effective dates in Section 9-6-301, 303, 304, 305.

~~402.2 After completing review of the application for certification and source test report, the APCO will approve, or will deny approval of, the device.~~

~~402.3 Certification status shall be valid for three years from the date of approval by the APCO. After the third year, recertification shall be required according to the requirements in 9-6-402.~~

~~402.24~~ In lieu of submitting an application as provided in Section 9-6-402.1, tThe manufacturer ~~may~~ shall submit to the District APCO an approved South Coast Air Quality Management District (SCAQMD) certification issued pursuant to

SCAQMD Rules 1121 and 1146.2 to demonstrate compliance that complies with Section 9-6-301.1 through 301.4, 303.1 through 303.4, 304, or 305. This option does not apply to units demonstrating compliance with Sections 9-6-301.5 and 303.5.

*(Amended November 7, 2007)*

**9-6-403 Identification:** The water heater manufacturer shall display the model number and the certification status of a water heater complying with this rule on the shipping carton and on the rating plate of each unit.

*(Amended November 7, 2007)*

**9-6-404 Interim Report:** At least two years prior to the compliance date listed in Sections 9-6-301.5 and 303.5, the APCO shall present to the Air District Board of Directors for consideration at a public meeting a report that includes the technology options currently (and projected to be) available to be sold, installed or offered for sale that do not conflict with the standard in Section 301.3; the projected costs of purchase and installation of such technology, including any ancillary costs, as applicable; any incentive programs available to reduce these costs; and infrastructure readiness associated with rule compliance.

## **9-6-600 MANUAL OF PROCEDURES**

**9-6-601 Determination of Emissions:** Emissions of oxides of nitrogen from water heaters subject to Section 9-6-301, 303, 304, or 305 shall be tested in ~~accordance with the South Coast Air Quality Management District Protocol: "Nitrogen Oxides Emission Compliance Testing for Natural Gas-Fired Water Heaters and Small Boilers, January 1995", or in~~ accordance with the following provisions:

- 601.1 ~~Each water heater model shall receive certification Confirmation shall be~~ based on emission tests of a randomly selected unit of ~~that each~~ water heater model.
- 601.2 The measurement of nitrogen oxides emissions shall be conducted in accordance with ~~the Manual of Procedures, Volume IV, Method ST-13B or~~ EPA Reference Method 7, including 7A-7E.
- 601.3 Each tested water heater shall be operated in accordance with Section 2.4 of American National Standards ANSI Z21.10.1-1990 at normal test pressure, input rates, and with a five-foot exhaust stack installed during the nitrogen oxides emissions tests.
- 601.4 The following procedure shall be used to calculate the NO<sub>x</sub> emission rate in nanograms of NO<sub>x</sub> per joule of heat output:

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

Where:

N = NO<sub>x</sub> Emission Rate in nanograms of NO<sub>x</sub> emitted per joule of heat output

P = Concentration of NO<sub>x</sub> in the flue gas in parts per million (volume)

U = Dry volume percent of CO<sub>2</sub> in flue gas necessary for stoichiometric combustion

H = Gross heating value of the gas, BTU/ft<sup>3</sup> (at 60°F and 30"Hg)

C = Dry volume percent of CO<sub>2</sub> in flue gas

E = Recovery efficiency, percentage, as defined in Section 6.1.3 of the Code of Federal Regulation, Title 10, Part 430, Subpart B, Appendix E.

*(Amended November 7, 2007)*