

RULE 425.3 Portland Cement Kilns (Oxides of Nitrogen) - Adopted 10/13/94, Amended 3/8/18

I. Purpose

The purpose of this Rule is to limit nitrogen oxide (NO_x) emissions from Portland cement kilns.

II. Applicability

Provisions of this Rule shall apply to all Portland cement manufacturing facilities operating in the Eastern Kern Air Pollution Control District (District).

III. Definitions

- A. 30-Operating Day Rolling Average: Total of all hourly emissions data (in pounds) fuel was combusted in a cement kiln, in the preceding 30 operating days, divided by the total number of tons of clinker produced in that kiln during the same 30-day period.
- B. Clinker: The product of feedstock sintered in a kiln which is then ground and mixed with additives to make cement.
- C. Continuous Emissions Monitoring System (CEMS): An instrument satisfying the requirements of 40 CFR, Part 60.
- D. Low-NO_x Burner: Type of cement kiln burner that results in decreasing NO_x emissions and has an indirect-firing system and a series of channels or orifices that:
 - 1. Allow for the adjustment of the volume, velocity, pressure, and direction of the air carrying the fuel (known as primary air) and the combustion air (known as secondary air) into the kiln; and
 - 2. Impart high momentum and turbulence to the fuel stream to facilitate mixing of the fuel and secondary air.
- E. Kiln: Any device including associated preheater and precalciner devices that produce clinker by heating limestone and other raw materials for subsequent production of Portland cement.
- F. Nitrogen Oxides (NO_x) Emissions: The sum of nitric oxide (NO) and nitrogen dioxide (NO₂) in the flue gas, collectively expressed as nitrogen dioxide.
- G. Operating Day: A calendar day during which Portland cement is manufactured by the kiln. An operating day includes all valid data obtained in any daily 24-hour period during which the kiln operates and excludes any measurements made during the daily 24-hour period when the kiln was not operating or was in startup or shutdown.

- H. Portland Cement: A hydraulic cement produced by pulverizing clinker consisting essentially of hydraulic calcium silicates, usually containing one or more of the forms of calcium sulfate as an interground addition.
- I. Portland Cement Manufacturing Facility: Any facility that produces Portland cement or associated products, as defined in the Standard Industrial Classification Manual as Industry Number 3241, Portland Cement Manufacturing.
- J. Shutdown: The period of time between when kiln raw material feed and fuel to the kiln begin to be decreased to reduce the kiln operating temperature until both feed and fuel are no longer fed into the kiln and it has ceased operation. A shutdown period shall not last more than 36 hours.
- K. Startup: Period of time after non-production of clinker during which a cement kiln is heated to operating temperature from a lower temperature and feed rate is increased to normal production levels. A startup period shall not last longer than 48 hours.

IV. Exemptions

The requirements of Section V of this Rule shall not apply to:

- A. Startup and shutdown as defined in this rule; and
- B. Breakdown conditions qualifying under District Rule 111.

V. Requirements

- A. Emissions Limits: Effective March 8, 2018, No person shall operate a Portland cement manufacturing facility unless 30-operating day rolling average of NO_x emissions from the kiln do not exceed:
 - 1. 2.8 lb/ton of clinker produced; or
 - 2. 3.4 lb/ton of clinker produced if low-NO_x burner or low-NO_x precalciner was installed and made operational by January 1, 2007.
- B. Emissions Monitoring: Any person who operates a Portland cement manufacturing facility shall provide, properly install, maintain, calibrate, and operate a continuous emission monitoring system (CEMS), as defined in Section III.C., for each emission point from the kiln.
- C. Production Monitoring: Any person who operates a Portland cement manufacturing facility shall determine hourly clinker production by one of the following two methods:
 - 1. Install, calibrate, maintain, and operate a permanent weigh scale system to measure and record weight rates in tons-mass per hour of the amount of clinker produced. The system of measuring hourly clinker production must be maintained within ± 5 percent accuracy; or

2. Install, calibrate, maintain, and operate a permanent weigh scale system to measure and record weight rates in tons-mass per hour of the amount of feed to the kiln. The system of measuring feed must be maintained within ± 5 percent accuracy. Calculate the hourly clinker production rate using a kiln specific feed to clinker ratio based on reconciled clinker production determined for accounting purposes and recorded feed rates. This ratio must be updated monthly. Note that if this ratio changes at clinker reconciliation, the new ratio must be used going forward, but a retroactive change in clinker production rates previously estimated is not required.

VI. Administrative Requirements

- A. Annual Demonstration of Compliance: Any person who operates a Portland cement manufacturing facility shall demonstrate compliance with this Rule by conducting annual testing, not more than 13 months after the most recently conducted testing, pursuant to the following test methods:
 1. NO_x stack testing for purposes of this Rule shall be conducted using EPA Test Method 7E.
 2. Stack gas flow rate testing for purposes of this Rule shall be conducted using EPA Test Method 2.
 3. Any owner or operator of a kiln subject to this Rule shall convert observed NO_x concentrations to a mass emission rate using the following formula (for purposes of this calculation, standard conditions are @ 68° F and 29.92 inches Hg):
$$\text{lb/hr} = 7.1497 \times 10^{-6} (\text{ppmv})(\text{dscfm})$$

Parts Per Million by Volume: (ppmv)

Dry Standard Cubic Feet per Minute: (dscfm)
 4. For the purposes of this Rule, NO_x shall be calculated as NO₂ on a dry basis.
- B. Recordkeeping: Any person subject to the requirements of this rule shall maintain records of the following:
 1. Results of any testing conducted to determine compliance with this Rule as specified in Section VI.A;
 2. Daily clinker production rates and kiln feed rates. During each quarter of operation, you must determine, record, and maintain the ongoing accuracy of the system of measuring hourly clinker production (or feed mass flow);
 3. Calculated NO_x emission rates from the kiln in lbs/ton of clinker produced for each day of operation of the kiln;

4. Date, time, and duration of any startup, shutdown or malfunction in the operation of any unit, emissions control equipment or emission monitoring equipment; and
5. Results of performance testing, evaluations, calibrations, checks, adjustments, and maintenance of CEMS required by this rule.

Such records shall be retained for a minimum of 60 months from date of entry and be made available to District staff upon request.

C. Reporting: Any person subject to this Rule shall meet the following reporting requirements:

1. Report to the APCO: date, time, duration, magnitude, nature and cause (if known), and corrective action taken of any exceedance;
2. Supply APCO copy of all test protocols at least 30-days prior to testing and copy of test results within 60 days following testing.

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