

Subpart EEE - National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors

Source: [63 FR 33781, June 19, 1998; as amended at 64 FR 53041, Sept. 30, 1999; 65 FR 42298, July 10, 2000]

Sec. 63.1204 What are the standards for hazardous waste burning cement kilns?

(a) Emission limits for existing sources. You must not discharge or cause combustion gases to be emitted into the atmosphere that contain:

(1) For dioxins and furans:

(i) Emissions in excess of 0.20 ng TEQ/dscm corrected to 7 percent oxygen; or

(ii) Emissions in excess of 0.40 ng TEQ/dscm corrected to 7 percent oxygen provided that the combustion gas temperature at the inlet to the initial dry particulate matter control device is 400 deg.F or lower based on the average of the test run average temperatures;

(2) Mercury in excess of 120 μ g/dscm corrected to 7 percent oxygen;

(3) Lead and cadmium in excess of 240 μ g/dscm, combined emissions, corrected to 7 percent oxygen;

(4) Arsenic, beryllium, and chromium in excess of 56 μ g/dscm, combined emissions, corrected to 7 percent oxygen;

(5) Carbon monoxide and hydrocarbons.

(i) For kilns equipped with a by-pass duct or midkiln gas sampling system, either:

(A) Carbon monoxide in the by-pass duct or mid-kiln gas sampling system in excess of 100 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis and corrected to 7 percent oxygen. If you elect to comply with this carbon monoxide standard rather than the hydrocarbon standard under paragraph (a)(5)(i)(B) of this section, you must also document that, during the destruction and removal efficiency (DRE) test runs or their equivalent as provided by Sec. 63.1206(b)(7), hydrocarbons in the by-pass duct or mid-kiln gas sampling system do not exceed 10 parts per million by volume during those runs, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane; or

(B) Hydrocarbons in the by-pass duct or midkiln gas sampling system in excess of 10 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane;

(ii) For kilns not equipped with a by-pass duct or midkiln gas sampling system, either:

(A) Hydrocarbons in the main stack in excess of 20 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane; or

(B) Carbon monoxide in the main stack in excess of 100 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis and corrected to 7 percent oxygen. If you elect to comply with this carbon monoxide standard rather than the hydrocarbon standard under paragraph (a)(5)(ii)(A) of this section, you also must document that, during the destruction and removal efficiency (DRE) test runs or their equivalent as provided by Sec. [63.1206\(b\)\(7\)](#), hydrocarbons in the main stack do not exceed 20 parts per million by volume during those runs, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane.

(6) Hydrochloric acid and chlorine gas in excess of 130 parts per million by volume, combined emissions, expressed as hydrochloric acid equivalents, dry basis, corrected to 7 percent oxygen; and

(7) Particulate matter in excess of 0.15 kg/Mg dry feed and opacity greater than 20 percent.

(i) You must use suitable methods to determine the kiln raw material feedrate.

(ii) Except as provided in paragraph (a)(7)(iii) of this section, you must compute the particulate matter emission rate, E, from the following equation:

$$E = \frac{(C_s \times Q_{sd})}{P}$$

where:

E = emission rate of particulate matter, kg/Mg of kiln raw material feed;

C_s = concentration of particulate matter, kg/dscm;

Q_{sd} = volumetric flowrate of effluent gas, dscm/hr;

P = total kiln raw material feed (dry basis), Mg/hr.

(iii) If you operate a preheater or preheater/precalciner kiln with dual stacks, you must test simultaneously and compute the combined particulate matter emission rate, E_c, from the following equation:

$$E_c = \frac{(C_{sk} \times Q_{sdk} + C_{sb} \times Q_{sdb})}{P}$$

where:

E_c = the combined emission rate of particulate matter from the kiln and bypass stack, kg/Mg of kiln

raw material feed;

Csk = concentration of particulate matter in the kiln effluent, kg/dscm;

Qsdk = volumetric flowrate of kiln effluent gas, dscm/hr;

Cs = concentration of particulate matter in the bypass stack effluent, kg/dscm;

Qsdb = volumetric flowrate of bypass stack effluent gas, dscm/hr;

P = total kiln raw material feed (dry basis), Mg/hr.

(b) Emission limits for new sources. You must not discharge or cause combustion gases to be emitted into the atmosphere that contain:

(1) For dioxins and furans:

(i) Emissions in excess of 0.20 ng TEQ/dscm corrected to 7 percent oxygen; or

(ii) Emissions in excess of 0.40 ng TEQ/dscm corrected to 7 percent oxygen provided that the combustion gas temperature at the inlet to the initial dry particulate matter control device is 400 deg.F or lower based on the average of the test run average temperatures;

(2) Mercury in excess of 56 $\mu\text{g/dscm}$ corrected to 7 percent oxygen;

(3) Lead and cadmium in excess of 180 $\mu\text{g/dscm}$, combined emissions, corrected to 7 percent oxygen;

(4) Arsenic, beryllium, and chromium in excess of 54 $\mu\text{g/dscm}$, combined emissions, corrected to 7 percent oxygen;

(5) Carbon monoxide and hydrocarbons.

(i) For kilns equipped with a by-pass duct or midkiln gas sampling system, carbon monoxide and hydrocarbons emissions are limited in both the bypass duct or midkiln gas sampling system and the main stack as follows:

(A) Emissions in the by-pass or midkiln gas sampling system are limited to either:

(1) Carbon monoxide in excess of 100 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis and corrected to 7 percent oxygen. If you elect to comply with this carbon monoxide standard rather than the hydrocarbon standard under paragraph (b)(5)(i)(A)(2) of this section, you also must document that, during the destruction and removal efficiency (DRE) test runs or their equivalent as provided by Sec. [63.1206\(b\)\(7\)](#), hydrocarbons do not exceed 10 parts per million by volume during those runs, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane; or

(2) Hydrocarbons in the by-pass duct or midkiln gas sampling system in excess of 10 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane;

and

(B) Hydrocarbons in the main stack are limited, if construction of the kiln commenced after April 19, 1996 at a plant site where a cement kiln (whether burning hazardous waste or not) did not previously exist, to 50 parts per million by volume, over a 30-day block average (monitored continuously with a continuous monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane.

(ii) For kilns not equipped with a by-pass duct or midkiln gas sampling system, hydrocarbons and carbon monoxide are limited in the main stack to either:

(A) Hydrocarbons not exceeding 20 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane; or

(B) (1) Carbon monoxide not exceeding 100 part per million by volume, over an hourly rolling average (monitored continuously with a continuous emissions monitoring system), dry basis, corrected to 7 percent oxygen; and

(2) Hydrocarbons not exceeding 20 parts per million by volume, over an hourly rolling average (monitored continuously with a continuous monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane at any time during the destruction and removal efficiency (DRE) test runs or their equivalent as provided by Sec. 63.1206(b)(7); and

(3) If construction of the kiln commenced after April 19, 1996 at a plant site where a cement kiln (whether burning hazardous waste or not) did not previously exist, hydrocarbons are limited to 50 parts per million by volume, over a 30-day block average (monitored continuously with a continuous monitoring system), dry basis, corrected to 7 percent oxygen, and reported as propane.

(6) Hydrochloric acid and chlorine gas in excess of 86 parts per million, combined emissions, expressed as hydrochloric acid equivalents, dry basis and corrected to 7 percent oxygen; and

(7) Particulate matter in excess of 0.15 kg/Mg dry feed and opacity greater than 20 percent.

(i) You must use suitable methods to determine the kiln raw material feedrate.

(ii) Except as provided in paragraph (a)(7)(iii) of this section, you must compute the particulate matter emission rate, E , from the equation specified in paragraph (a)(7)(ii) of this section.

(iii) If you operate a preheater or preheater/precalciner kiln with dual stacks, you must test simultaneously and compute the combined particulate matter emission rate, E_c , from the equation specified in paragraph (a)(7)(iii) of this section.

(c) Destruction and removal efficiency (DRE) standard--(1) 99.99% DRE. Except as provided in paragraph (c)(2) of this section, you must achieve a destruction and removal efficiency (DRE) of 99.99% for each principle organic hazardous constituent (POHC) designated under paragraph

(c)(3) of this section. You must calculate DRE for each POHC from the following equation:

$$DRE = \left[1 - \left(\frac{W_{out}}{W_{in}} \right) \right] \times 100\%$$

Where:

Win=mass feedrate of one principal organic hazardous constituent (POHC) in a waste feedstream;
and

Wout=mass emission rate of the same POHC present in exhaust emissions prior to release to the atmosphere

(2) 99.9999% DRE. If you burn the dioxin-listed hazardous wastes FO20, FO21, FO22, FO23, FO26, or FO27 (see Sec. 261.31 of this chapter), you must achieve a destruction and removal efficiency (DRE) of 99.9999% for each principle organic hazardous constituent (POHC) that you designate under paragraph (c)(3) of this section. You must demonstrate this DRE performance on POHCs that are more difficult to incinerate than tetra-, penta-, and hexachlorodibenzo-p-dioxins and dibenzofurans. You must use the equation in paragraph (c)(1) of this section calculate DRE for each POHC. In addition, you must notify the Administrator of your intent to burn hazardous wastes FO20, FO21, FO22, FO23, FO26, or FO27.

(3) Principal organic hazardous constituents (POHCs). (i) You must treat the Principal Organic Hazardous Constituents (POHCs) in the waste feed that you specify under paragraph (c)(3)(ii) of this section to the extent required by paragraphs (c)(1) and (c)(2) of this section.

(ii) You must specify one or more POHCs from the list of hazardous air pollutants established by 42 U.S.C. 7412(b)(1), excluding caprolactam (CAS number 105602) as provided by Sec. 63.60, for each waste to be burned. You must base this specification on the degree of difficulty of incineration of the organic constituents in the waste and on their concentration or mass in the waste feed, considering the results of waste analyses or other data and information.

(d) Cement kilns with in-line kiln raw mills--(1) General. (i) You must conduct performance testing when the raw mill is on-line and when the mill is off-line to demonstrate compliance with the emission standards, and you must establish separate operating parameter limits under Sec. [63.1209](#) for each mode of operation, except as provided by paragraph (d)(1)(iv) of this section.

(ii) You must document in the operating record each time you change from one mode of operation to the alternate mode and begin complying with the operating parameter limits for that alternate mode of operation.

(iii) You must establish rolling averages for the operating parameter limits anew (i.e., without considering previous recordings) when you begin complying with the operating limits for the alternate mode of operation.

(iv) If your in-line kiln raw mill has dual stacks, you may assume that the dioxin/furan emission

levels in the by-pass stack and the operating parameter limits determined during performance testing of the by-pass stack when the raw mill is off-line are the same as when the mill is on-line.

(2) Emissions averaging. You may comply with the mercury, semivolatile metal, low volatile metal, and hydrochloric acid/chlorine gas emission standards on a time-weighted average basis under the following procedures:

(i) Averaging methodology. You must calculate the time-weighted average emission concentration with the following equation: Where:

C_{total} = time-weighted average concentration of a regulated constituent considering both raw mill on time and off time.

$C_{mill-off}$ = average performance test concentration of regulated constituent with the raw mill off-line.

$C_{mill-on}$ = average performance test concentration of regulated constituent with the raw mill on-line.

$T_{mill-off}$ = time when kiln gases are not routed through the raw mill

$T_{mill-on}$ = time when kiln gases are routed through the raw mill

$$C_{total} = \left\{ C_{mill-off} \times \left(\frac{T_{mill-off}}{T_{mill-off} + T_{mill-on}} \right) \right\} + \left\{ C_{mill-on} \times \left(\frac{T_{mill-on}}{T_{mill-off} + T_{mill-on}} \right) \right\}$$

(ii) Compliance. (A) If you use this emission averaging provision, you must document in the operating record compliance with the emission standards on an annual basis by using the equation provided by paragraph (d)(2) of this section.

(B) Compliance is based on one-year block averages beginning on the day you submit the initial notification of compliance.

(iii) Notification. (A) If you elect to document compliance with one or more emission standards using this emission averaging provision, you must notify the Administrator in the initial comprehensive performance test plan submitted under Sec. [63.1207\(e\)](#).

(B) You must include historical raw mill operation data in the performance test plan to estimate future raw mill down-time and document in the performance test plan that estimated emissions and estimated raw mill down-time will not result in an exceedance of an emission standard on an annual basis.

(C) You must document in the notification of compliance submitted under Sec. [63.1207\(j\)](#) that an emission standard will not be exceeded based on the documented emissions from the performance test and predicted raw mill down-time.

(e) Preheater or preheater/precalciner kilns with dual stacks.--(1) General. You must conduct

performance testing on each stack to demonstrate compliance with the emission standards, and you must establish operating parameter limits under Sec. 63.1209 for each stack, except as provided by paragraph (d)(1)(iv) of this section for dioxin/furan emissions testing and operating parameter limits for the by-pass stack of in-line raw mills.

(2) Emissions averaging. You may comply with the mercury, semivolatile metal, low volatile metal, and hydrochloric acid/chlorine gas emission standards specified in this section on a gas flowrate-weighted average basis under the following procedures

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(i) Averaging methodology. You must calculate the gas flowrate-weighted average emission concentration using the following equation:

$$C_{tot} = \left\{ C_{main} \times \left(\frac{Q_{main}}{Q_{main} + Q_{bypass}} \right) \right\} + \left\{ C_{bypass} \times \left(\frac{Q_{bypass}}{Q_{main} + Q_{bypass}} \right) \right\}$$

Where

C_{tot}=gas flowrate-weighted average concentration of the regulated constituent

C_{main}=average performance test concentration demonstrated in the main stack

C_{bypass}=average performance test concentration demonstrated in the bypass stack

Q_{main}=volumetric flowrate of main stack effluent gas

Q_{bypass}=volumetric flowrate of bypass effluent gas

(ii) Compliance. (A) You must demonstrate compliance with the emission standard(s) using the emission concentrations determined from the performance tests and the equation provided by paragraph (e)(1) of this section; and

(B) You must develop operating parameter limits for bypass stack and main stack flowrates that ensure the emission concentrations calculated with the equation in paragraph (e)(1) of this section do not exceed the emission standards on a 12-hour rolling average basis. You must include these flowrate limits in the Notification of Compliance.

(iii) Notification. If you elect to document compliance under this emissions averaging provision, you must:

(A) Notify the Administrator in the initial comprehensive performance test plan submitted under Sec. [63.1207](#)(e). The performance test plan must include, at a minimum, information describing the flowrate limits established under paragraph (e)(2)(ii)(B) of this section; and

(B) Document in the Notification of Compliance submitted under Sec. [63.1207](#)(j) the demonstrated gas flowrate-weighted average emissions that you calculate with the equation provided by

paragraph (e)(2) of this section.

(f) Significant figures. The emission limits provided by paragraphs (a) and (b) of this section are presented with two significant figures. Although you must perform intermediate calculations using at least three significant figures, you may round the resultant emission levels to two significant figures to document compliance.

(g) [Reserved]

(h) When you comply with the particulate matter requirements of paragraphs (a)(7) or (b)(7) of this section, you are exempt from the New Source Performance Standard for particulate matter and opacity under Sec. 60.60 of this chapter.