

Typical Emissions Investigation

Test Protocol

Company
Location

Prepared By
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Month, Year

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1.0 INTRODUCTION

This test plan is designed to make emission determinations for dioxins/furans (PCDD/PCDFs), particulate emissions as PM-10, total hydrocarbon emissions and other emissions as deemed necessary to address agency concerns. The test results will help (company) demonstrate compliance and/or investigate potential control strategies for compliance with local requirements.

2.0 FACILITY DESCRIPTION

The (company, location) kiln was built in (year). The plant is located: The kiln is designed to provide XX tons/hour of clinker. The kiln is a (long wet, long dry, preheater/precalciner) LL meters long and D meters in diameter.

3.0 STACK AND PROCESS SAMPLE TESTING

This hazardous air pollutant test plan will determine PCDD/PCDF, particulate, THC, and other emissions and selected operational parameters through the monitoring of the cement kiln and testing of stack gases. Process samples will be collected during the emissions testing in the event that subsequent analysis of the samples is desired.

3.1 Stack Testing

The test parameters for the emissions test will include dioxin/furans, total hydrocarbons and particulates. The emission gases will be sampled utilizing accepted practices.

3.2 Process Sampling

The process inputs into the cement kiln includes a coal, as the primary fuel, raw material feed and alternate fuel material(s). Process outputs include the cement manufacturing product called clinker and a cement by-product called cement kiln dust (CKD).

Each stack testing run is expected to take approximately three to four hours. One sample of each of the three process input streams and each of the two process output streams will be collected for each emission test run. The samples will be stored in the event that subsequent analysis is desired.

4.0 TEST PLAN

4.1 Testing Conditions

Two days (or more) of actual emissions testing will be required. (Generally this consists of a baseline test performed without alternate fuel and one or more days of testing utilizing alternate fuel at an usage rate of at least 15% of heat replacement.) PCDD/PCDF emissions testing requires at least three hours per sample run, three runs minimum, the sampling trains for the other emissions parameters (particulates, THC, etc.) are run concurrently. There will be three runs per day. (A number of target operating parameters may be specified such as: maximum alternate fuel feed rate, maximum ID fan RPM, minimum /maximum temperatures at selected locations, minimum oxygen at kiln exit, etc. These parameters may be different for each of the different conditions.) The applicable operating conditions are listed in Table 4.1. Testing is planned for (dates).

Table 4.1
Summary of Expected Operating Conditions
and Test Parameters

Parameter	Units	Test Day	
		1	2
Kiln Coal	tonnes/hr		
Calciner Coal	tonnes/hr		
Kiln or Calciner Feed-Dry	tonnes/hr		
Alternate Fuel Feed	tonnes/hr		
APCD Inlet Temp.	°C		

In addition to the above data, the following process data will be gathered during the stack test: (This is specified as needed and per available process data.

5.0 DESCRIPTION OF SAMPLING AND MONITORING LOCATIONS

(number) sampling locations have been identified for the test including the stack sampling

locations. (typical sampling locations)The sampling locations are briefly discussed below:

Coal:

The sampling point is located below the ground coal feed hopper.

Kiln or Calciner Feed:

The sampling point is located just prior to injection.

Cement Kiln Dust (CKD) Wasted:

The sampling point is located prior to the entrance to the the storage bin.

Product Clinker:

The sampling point is located at the clinker elevator discharge.

Alternate Fuel:

Batch sample prior to testing or grab samples prior to injection.

5.1 Stack Gas Sampling

Pre-approved procedures will be utilized for all stack gas samples collected during the test. (It is recommended to utilize USEPA or other recognized sampling procedures.) Table 5.1 presents these sampling procedures, the required equipment needed to perform these procedures are described in detail in the referenced procedures. **Stack gas sampling must be conducted by personnel experienced at such sampling and the associated QA/QC procedures.**

Table 5.1
Stack Gas Sampling
Summary of Test Methods
(the following are USEPA Methods)

		Test Day	
Analysis	Sampling Method	1	2
Stack Traverse Sampling	Method 1 or 1a as appropriate	+	+
Stack Gas Velocity	Method 2, 2a, 2b, 2c as appropriate	+	+
Stack Gas Composition	Method 3, 3a, 3b as appropriate	+	+

Stack Gas Moisture	Method 4	+	+
Total hydrocarbons	Method 25A	+	+
PCDD/PCDF	Method 23	+	+
Particulate	Method 5	+	+

5.2 Process and Fuel Samples

All process samples will be collected by personnel trained in proper sampling technique and chain of custody procedures. The samples will be logged by time and a unique identifying number. The process and fuel sampling will be overseen by an individual who will be responsible for the coordination of all process and fuel sampling and composite preparation.

Tables 5.1 and 5.2 present all sampling which will occur during the testing program. Process samples will be taken on Test Days 1 and 2.

Table 5.2

Summary of
Process Sampling

Sample Location	Description	Sampling Frequency
1	Kiln or Calciner feed	1 per run
2	Coal	1 per run
3	Alternate Fuel	1 per run
4	Clinker	1 per run
5	CKD	1 per run

6.0 DETAILED TEST SCHEDULE INCLUDING DATE AND DURATION

(Date, 1 Day Prior to Testing)

Sample equipment set up and instruction of samplers. No specified duration for these activities.

(Date - Test Day 1)

At approximately 8:00 A.M., after it has been determined by cement plant personnel that the kiln is in a stable operating mode consistent with the parameters specified in Table 4.1, the sample and data collection for Test Day 1 will begin.

Each of the three runs of this test is expected to require three to four hours to complete, with a period of about one hour between runs for equipment reset and the required QA/QC activities.

The Process Sampling during these Runs is specified in Table 5.2. The sampling of the stack gas is summarized in Table 5.1.

(Date - Test Day 2)

At approximately 8:00 A.M., after it has been determined by cement plant personnel that the kiln is in a stable operating mode consistent with the parameters specified in Table 4.1, the sample and data collection for Test Day 2 will begin.

Each of the three runs of this test is expected to require three to four hours to complete, with a period of about one hour between runs for equipment reset and the required QA/QC activities.

The Process Sampling during these Runs is specified in Table 5.2. The sampling of the stack gas is summarized in Table 5.1.

7.0 QA/QC

All testing will be performed in full accordance with prescribed QA/QC procedures identified with the selected sampling methods. Table 7.1 summarizes these methods.

Table 7.1

Test Procedures
(the following are for USEPA methods)

Matrix	Parameter	Sampling Method	Analytical Method
Stack	Particulate	5	EPA 5
Stack	THC	25A	FID

Stack	PCDD/PCDF	23	SW-846 8290
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