

PC MACT Operations and Maintenance Plan

FG KG5, KG6 and KG 5 & 6 Systems

Sources: EU: KILN 19, KILN 20, KILN 21, KILN 22, KILN 23, (DAA, SNCR, WFGD)

1.0 Source Description

FG KG5, KG6 AND KG 5&6 Systems are used to manufacture cement clinker. The Kiln Groups each have four main system components:

Kiln Groups 5 and 6

- A feed system that conveys solid feed materials to the kiln.
- A feed reclaim system that returns raw materials from other collection points in the plant to the kiln.
- A main stack exhaust system that controls emissions from the kilns prior to release to the stack.
- A rotary kiln and cooler system [Kilns 19, 20 and 21 for Kiln Group 5 and Kilns 22 and 23 for Kiln Group 6] that is used to manufacture clinker.

2.0 System Emission Points and Air Pollution Control Equipment

In the FG KG5, KG6 AND KG 5&6 Systems operations, particulate matter is emitted at several emission points. The system includes fabric filters to control particulate matter emissions. The following table summarizes system emission points and applicable air pollution control devices (APCDs), as well as the visual inspection interval (see Section 6.0):

Emission Point #	Description	Air Pollution Control Device	Equipment #	VE Inspection Interval
25-275	Dust collector, feed silos	Fabric Filter #35	25-275	Monthly
25-280	Dust collector, bucket elevators	Fabric Filter #40	25-280	Monthly
25-247	Dust collector, surge bin, Kiln 19	Fabric Filter #14	25-247	Monthly
25-278	Dust collector, surge bin, Kiln 20	Fabric Filter #38	25-278	Monthly
25-279	Dust collector, surge bin, Kiln 21	Fabric Filter #39	25-279	Monthly
25-253	Dust collector, Kiln 19 exhaust	Fabric Filter #13	25-253	Monthly
25-252	Dust collector CC60 boiler	Collector #12	25-252	Monthly
25-265	Dust collector, Kiln 20 exhaust	Fabric Filter #25	25-265	Monthly
25-263	Dust collector, CC60 boiler	Collector #23	25-263	Monthly
25-266	Dust collector, Kiln 21 exhaust	Fabric Filter #26	25-266	Monthly
25-264	Dust collector, CC60 boiler	Collector #24	25-264	Monthly
26-263	Dust collector, feed silos 3 and 4 vent	Fabric Filter #63	26-263	Monthly

26-254	Dust collector, screw conveyer, house 22	Fabric Filter #54	26-254	Monthly
26-260	Dust collector, screw conveyer, pups #23	Fabric Filter #60	26-260	Monthly
32-171	Dust collector, reclaim elevator	Fabric Filter #101	32-171	Monthly
32-172	Dust collector, Kiln 23 screw conveyer pups	Fabric Filter #102	32-172	Monthly
32-173	Dust collector, Kiln 22 screw conveyer pups	Fabric Filter #103	32-173	Monthly
26-256	Dust collector, Kiln 22 feed end	Fabric Filter #56	26-256	Monthly
26-262	Dust collector, Kiln 23 feed end	Fabric Filter #62	26-262	Monthly
26-261	Dust collector, CC59 boiler	Fabric Filter #61	26-261	Monthly
26-255	Dust collector, CC59 boiler	Fabric Filter #55	26-255	Monthly

Applicable Emission Limit

The emission limits applicable to the Kiln System are the following:

- For the kilns (40 CFR 63.1343):
 1. Particulate emissions must not exceed 0.3 lb/ton dry feed;
 2. Visible emissions must not exceed 20 percent opacity; and
 3. Dioxin/furan emissions must be less than 0.20 ng/dscm (TEQ), corrected to 7% oxygen.

3.0 Operator Procedures for Minimizing Visible Emissions from Kiln Groups 5 and 6 During Normal Kiln System Operations

FG KG5, KG6 AND KG 5&6 Systems operations are performed in accordance with the Lafarge Standard Operating Procedure (SOP) documents for the Feed System, Feed Reclaim, Main Stack Exhaust, and Kiln Groups 5 and 6. Applicable SOPs include the following:

- Kiln 19
- Kiln 20
- Kiln 21
- Kiln 22
- Kiln 23
- KG5 evac to offspec
- KG5 evac to storage barn
- KG6 evac to clinker silos
- KG6 evac to offspec
- KG6 evac to storage barn
- KG5 evac to clinker silos
- Reclaim clinker to clinker silos

These procedures are kept in the Environmental Department system. The SOPs discuss how the plant shall be operated, and are used for job-specific training. The tasks necessary to ensure proper operation of the FG KG5, KG6 AND KG 5&6 Systems with minimum emissions are also included within the SOPs.

4.0 Preventive Maintenance

Preventative maintenance work orders are maintained on the Plant's Windows-based electronic maintenance management system, MAXIMO. Maintenance Department technicians perform preventative maintenance (PM) tasks on FG KG5, KG6 AND KG 5&6 Systems equipment, including:

Equipment #	Equipment Name
Kiln Group 5 Feed System	
25-002	CC19 Feed silo 1
25-003	CC19 Feed silo 2
25-275	Dust collector, feed silos
25-318	Air slide
25-428	Air slide, feed silo 1
25-429	Air slide, feed silo 2
25-280	Dust collector, bucket elevators
25-282	Bucket elevator, feed silo 1
25-283	Bucket elevator, feed silo 2
25-312	Screw conveyor, kiln 19
25-247	Dust collector, surge bin, kiln 19
25-315	Screw conveyor, kiln 20
25-278	Dust collector, surge bin, kiln 20
25-316	Screw conveyor, kiln 21
25-279	Dust collector, surge bin, kiln 21
Kiln Group 5 Equipment Exhausting to Main Stacks	
25-253	Dust collector, Kiln 19 exhaust
25-252	Dust collector, CC60 boiler
25-119	Kiln 19
25-265	Dust collector, Kiln 20 exhaust
25-263	Dust collector, CC60 boiler
25-120	Kiln 20
25-266	Dust collector, Kiln 21 exhaust
25-264	Dust collector, CC60 boiler
25-121	Kiln 21
Kiln Group 6 Feed System	
26-263	Dust collector, feed silos 3 and 4 vent
26-003	Feed silo 3

Equipment #	Equipment Name
26-004	Feed silo 4
26-254	Dust collector, screw conveyor, house 22
26-260	Dust collector, screw conveyor, pups #23
26-315	Screw conveyor
26-316	Screw conveyor
26-015	Cyclone
26-016	Cyclone
	Equipment Exhaust to Main Stacks/Kilns 22, 23
26-256	Dust collector, Kiln 22 feed end
26-262	Dust collector, Kiln 23 feed end
26-261	Dust collector, CC59 boiler
26-255	Dust collector, CC59 boiler
26-122	Kiln 22
26-123	Kiln 23
26-163	K23 clinker cooler
26-183	Clinker breaker
26-307	Screw conveyor
26-308	Screw conveyor
26-309	Screw conveyor
26-310	Screw conveyor
26-311	Screw conveyor
26-312	Screw conveyor
26-840	Dust collector, reclaim tunnel, KG6 cc process

The FG KG5, KG6 AND KG 5&6 Systems PM schedule is maintained on MAXIMO. The PM schedules and the PM task lists for equipment in the FG KG5, KG6 AND KG 5&6 Systems are based upon past experience with similar equipment and upon the manufacturer's documentation.

When conducting PM activities, maintenance technicians use checklists from the MAXIMO database that list PM tasks, steps, and instructions. The technician completes the PM checklist and returns the form to the Maintenance Planner, who verifies completion of the checklist and logs the completed checklist into MAXIMO. Electronic verification of the completed checklist is maintained in the MAXIMO database for a minimum of five years following completion of the PM.

5.0 Monitoring Requirements

5.1 Opacity Monitoring Requirements

The FG KG5, KG6 AND KG 5&6 System fabric filter's emissions are monitored for opacity using the Methods described in the next two subsections. All kilns utilize continuous opacity monitors (COMs) in accordance with 40 CFR 63.1350(c). The COMs are installed, maintained, calibrated, and operated as required by 40 CFR 63, Subpart A and 40 CFR 60 Appendix B PS-1. Opacity is maintained such that the 6-minute average opacity does not exceed 20 percent for the kilns.

5.2 Periodic Method 22 Visible Emissions Monitoring Requirements

Parts of the FG KG5, KG6 AND KG 5&6 Systems, including feed conveyors, bucket elevators, feed silos, and dust collector fabric filters, will be tested for visible emissions once each month using USEPA Method 22 – Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares. Totally enclosed transfer points are exempt from this requirement. However, partially enclosed transfer points should be monitored by using this method on whatever building or enclosure surrounds the transfer location. The Method 22 tests will be conducted by trained observers when the FG KG5, KG6 AND KG 5&6 Systems are in operation. The Shift Coordinator (or a designated representative) will schedule the Method 22 testing. Copies of the Method 22 procedures, Field Data Worksheets, and equipment needed to conduct the tests (stopwatch, etc.) will be maintained in the Environmental Department.

As noted in the Method 22 procedures, observers will take care to perform the test from the proper location relative to the source and the sun, as well as to avoid degraded visibility of emissions caused by improper background contrast, ambient lighting, and observer position relative to lighting and wind.

During the Method 22 test, the observer should determine the presence or absence of visible emissions at points above or beyond the fabric filter exhaust vents or transfer point. The duration of the Method 22 tests will be 10 minutes. Upon completion of the test, the observer will record the results on the Method 22 Field Data Worksheet, and submit the worksheet to the Production Coordinator, who will forward the results to the Environmental Department. The Environmental Department will maintain the Method 22 records for a period of 5 years.

If visible emissions are noted during a daily Method 22 test, a Method 9 test consisting of five 6-minute averages of opacity readings for that stack must be conducted within 1 hour. The observer

will also initiate proper corrective actions within one hour by submitting a maintenance work order request to the MAXIMO maintenance control system.

Note: If monthly Method 22 tests indicate no visible emissions for six consecutive monthly tests, the test frequency may be reduced to once every six months. If no visible emissions are detected on the next six-month test, the test frequency may be reduced to once per year. Any time visible emissions are detected by these Method 22 tests, monthly testing must be resumed [40 CFR 63.1350(a)(4)(ii) & (iii)].

5.3 *Periodic Method 9 Opacity Tests*

Whenever visible emissions are observed during a Method 22 test of the FG KG5, KG6 AND KG 5&6 Systems emissions sources, an opacity test using the procedures described in USEPA Method 9 – Visual Determination of the Opacity of Emissions from Stationary Sources must be performed to determine if the applicable opacity limit is being exceeded. If visible emissions were observed during a 10-minute Method 22 test, the Method 9 test must be conducted within 1 hour.

The Environmental Manager (or a designated representative) will ensure that trained and certified Method 9 observers are available each day the Method 22 testing is conducted on the FG KG5, KG6 AND KG 5&6 Systems. Copies of the Method 9 procedures, Field Data Worksheets, and equipment needed to conduct the tests will be maintained in the Environmental Department.

As noted in the Method 9 procedures, observers will take care to perform the test from the proper location relative to the source and the sun, as well as to avoid degraded visibility of emissions caused by improper background contrast, ambient lighting, and observer position relative to lighting and wind.

During the Method 9 test, the observer should determine the opacity of visible emissions plume at points above or beyond the fabric filter exhaust vents and stacks. The Method 9 test must include five 6-minute averages of opacity. Upon completion of the test, the observer will record the results on the Method 9 Field Data Worksheet, and submit the worksheet to the Environmental Department. The Environmental Department will maintain the Method 9 records for a period of 5 years.

The observer will notify the Environmental Manager (or a designated representative) and initiate corrective action immediately if the Method 9 test indicates the opacity limit has been exceeded.

6.0 Maximum Operational Temperature (DegC) for KG5 and KG6

Kiln 19 – 256.6
Kiln 20 – 267.5
Kiln 21 – 257.4
Kiln 22 – 278.2
Kiln 23 – 276.8

This limit changes every 30 months – next testing scheduled for March 2012

7.0 Periodic Review and Update of this Operations and Maintenance Plan

The Environmental Manager (or a designated representative) will review this FG KG5, KG6 AND KG 5&6 Systems Operations and Maintenance Plan once per year for adequacy and currency. Documentation of the annual review or update will be retained in Environmental Department files for five years.

8.0 Operations and Maintenance Plan Revision History

Revision	Date	Purpose
1.0	February 2004	Initial plan generation
2.0	June 2008	Production Increase
3.0	October 2011	ROP Renewal