

## 1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a compliance test program for Holcim (US) Inc. d/b/a Lafarge Alpena at the Alpena Cement Plant in Alpena, Michigan. This report summarizes the results of the test program and test methods.

The test location, test date, and test parameter are summarized below.

<b>TEST INFORMATION</b>		
<b>Test Location</b>	<b>Test Date</b>	<b>Test Parameter</b>
Kiln 20 Breaching Duct	May 19, 2021	Filterable Particulate Matter (FPM)

The purpose of the test program was to demonstrate compliance with Title 40, *Code of Federal Regulations*, Part 60 (40CFR60), and 40CFR63, Subpart LLL “*National Emission Standards for Hazardous Air Pollutants (NESHAP) for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants.*” Specifically, to demonstrate that each of the below listed sources meet their FPM emission limit and to establish a site-specific operating limit (SSOL) for the Kiln 20 continuous parameter monitoring system (CPMS).

<b>Test Location</b>	<b>Parameter</b>	<b>Emission Rate</b>	<b>Emission Limit</b>	<b>CPMS SSOL</b>
Kiln 20 Breaching Duct	FPM	0.036 lb/ton	0.07 lb/ton	6.68

The identifications of the individuals associated with the test program are summarized below.

<b>TEST PERSONNEL INFORMATION</b>		
<b>Location</b>	<b>Address</b>	<b>Contact</b>
Test Facility	Holcim (US) Inc. Alpena Plant 1435 Ford Avenue Alpena, MI 49707	Mr. Travis Weide Area Environmental & Public Affairs Manager 989-358-3321 travis.weide@lafargeholcim.com
Testing Company Supervisor	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Eric Ehlers Director, Field Operations 630-699-7690 eehlers@mp-mail.com

The test crew consisted of Messrs. C. Reice, D. Jordan, and E. Ehlers.

Miss Lindsey Wells of Environment, Great Lakes, & Energy (EGLE) observed portions of the testing.

## 2.0 TEST METHODOLOGY

Emission testing was conducted following the United States Environmental Protection Agency (USEPA) methods specified in 40CFR60, Appendix A in addition the Mostardi Platt Quality Manual. Schematics of the test section diagrams and sampling trains used are included in

Appendix A and B respectively. Calculation nomenclature are included in Appendix C. Laboratory analysis for each test run are included in Appendix D. The computerized reference method test data is included in Appendix E. CEM data and process data as provided by Holcim (US) Inc. are also included in Appendix F.

The following methodologies were used during the test program:

### Method 1 Sample and Velocity Traverse Determination

Test measurement points were selected in accordance with USEPA Method 1, 40CFR60, Appendix A. The characteristics of the measurement location are summarized below.

TEST POINT INFORMATION							
Test Location	Stack Dimensions	No. of Ports	Port Length (Inches)	Upstream Diameters	Downstream Diameters	Test Parameter	Number of Sampling Points
Kiln 20 Breaching Duct	96"x104"	3	3	>0.5	>2.0	FPM	24

### Method 2 Volumetric Flow Rate Determination

Gas velocity was measured following USEPA Method 2, 40CFR60, Appendix A, for purposes of calculating stack gas volumetric flow rate and emission rates on a lb/hr and lb/ton basis. An S-type pitot tube, 0-10" differential pressure gauge, and K-type thermocouple and temperature readout were used to determine gas velocity at each sample point. All of the equipment used was calibrated in accordance with the specifications of the Method. Copies of field data sheets are included in Appendix G. Calibration data are presented in Appendix H. This testing met the performance specifications as outlined in the Method.

### Method 3A Oxygen (O<sub>2</sub>)/Carbon Dioxide (CO<sub>2</sub>) Determination

Flue gas O<sub>2</sub> and CO<sub>2</sub> concentrations were determined in accordance with USEPA Method 3A. An ECOM analyzer was used to determine the O<sub>2</sub> and CO<sub>2</sub> concentrations by connecting the analyzer to the exit of the dry gas meter. The O<sub>2</sub> instrument operates in the nominal range of 0% to 25% with the specific range determined by the high-level calibration gas. The CO<sub>2</sub> instrument operates in the nominal range of 0% to 20% with the specific range determined by the high-level calibration gas. High and mid-range calibrations were performed using USEPA Protocol gas. Zero nitrogen (a low ppm pollutant in balance nitrogen calibration gases) was introduced during other instrument calibrations to check instrument zero. Zero and mid-range calibrations were performed using USEPA Protocol gas after each test run. Copies of the gas cylinder certifications are found in Appendix H.

## **Method 5 Filterable Particulate Matter (FPM) Determination**

Particulate matter was sampled in accordance with USEPA Method 5, 40CFR60, Appendix A. The particulate matter sampling train was manufactured by Environmental Supply Corporation and meets all specifications required by Method 5. Velocity pressures were determined simultaneously during sampling with an S-type pitot tube and inclined manometer. All temperatures will be measured using K-type thermocouples with calibrated digital temperature indicators. The probe and filter temperatures were maintained at 248°F +/- 25°F throughout sampling.

The filter media are high purity quartz that meet all requirements of Method 5. All sample contact surfaces of the train were washed with HPLC reagent-grade acetone. These washes were placed in sealed and marked containers for analysis.

All sample recoveries were performed at the test site by the test crew. All final particulate sample analyses were performed by Mostardi Platt personnel at the laboratory in Elmhurst, Illinois.

Laboratory analysis data are found in Appendix D. Calibration data are presented in Appendix H.

### 3.0 TEST RESULT SUMMARIES

**Client:** Holcim (US) Inc.  
**Facility:** Alpena Cement Plant  
**Test Location:** Kiln 20 Breaching Duct  
**Test Method:** 5

	Source Condition	Normal	Normal	Normal	
	Date	5/19/21	5/19/21	5/19/21	
	Start Time	9:50	11:50	13:35	
	End Time	11:04	12:56	14:41	
	Run 1	Run 2	Run 3	Average	
<b>Stack Conditions</b>					
Average Gas Temperature, °F	391.0	388.8	388.1	389.3	
Flue Gas Moisture, percent by volume	4.6%	5.6%	5.6%	5.3%	
Average Flue Pressure, in. Hg	29.51	29.51	29.53	29.52	
Gas Sample Volume, dscf	46.961	48.526	49.527	48.338	
Average Gas Velocity, ft/sec	37.071	38.678	39.271	38.340	
Gas Volumetric Flow Rate, acfm	154,202	160,890	163,353	159,482	
Gas Volumetric Flow Rate, dscfm	89,978	93,148	94,706	92,611	
Gas Volumetric Flow Rate, scfm	94,364	98,718	100,362	97,815	
Average %CO <sub>2</sub> by volume, dry basis	17.1	18.1	17.4	17.5	
Average %O <sub>2</sub> by volume, dry basis	9.6	9.2	9.7	9.5	
Isokinetic Variance	99.8	99.6	100.0	99.8	
Clinker Production Rate, ton/hr	52.62	52.64	52.61	52.6	
CPMS Response, mA	4.58	4.43	4.64	4.6	
<b>Filterable Particulate Matter (Method 5)</b>					
grams collected	0.00805	0.00375	0.01047	0.00742	
grains/acf	0.0015	0.0007	0.0019	0.0014	
grains/dscf	0.0026	0.0012	0.0033	0.0024	
lb/hr	2.041	0.953	2.647	1.880	
lb/ton of clinker	0.039	0.018	0.050	0.036	
<b>Site Specific Operating Limit (SSOL) Determination</b>					
Source Emissions Limit, lb/ton			0.07		
CPMS Zero, mA			0		
Filterable Particulate Matter, % of Emissions Limit			51.1%		
SSOL			6.68		

## 4.0 CERTIFICATION

MOSTARDI PLATT is pleased to have been of service to Holcim (US) Inc. If you have any questions regarding this test report, please do not hesitate to contact us at 630-993-2100.

### CERTIFICATION

As the program manager, I hereby certify that this test report represents a true and accurate summary of emissions test results and the methodologies employed to obtain those results. The test program was performed in accordance with the test methods and the Mostardi Platt Quality Manual, as applicable.

MOSTARDI PLATT



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Eric L. Ehlers

Project Manager



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Jeffrey M. Crivlare

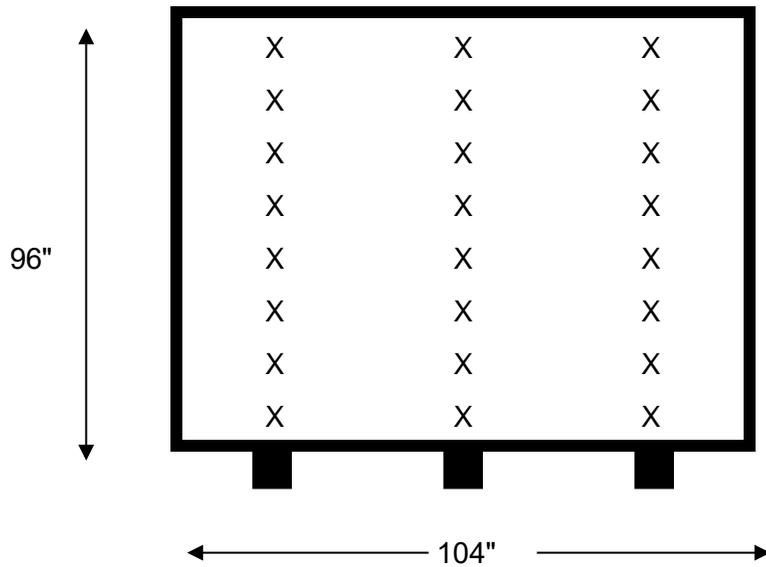
Quality Assurance

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## APPENDICES

## Appendix A - Test Section Diagram

# EQUAL AREA TRAVERSE FOR RECTANGULAR DUCTS



Job: Holcim (US) Inc.  
Alpena Cement Plant

Dates: May 19, 2021

Area: 69.33 Square Feet

Test Location: Kiln 20 Breaching Duct

Test Ports: 3

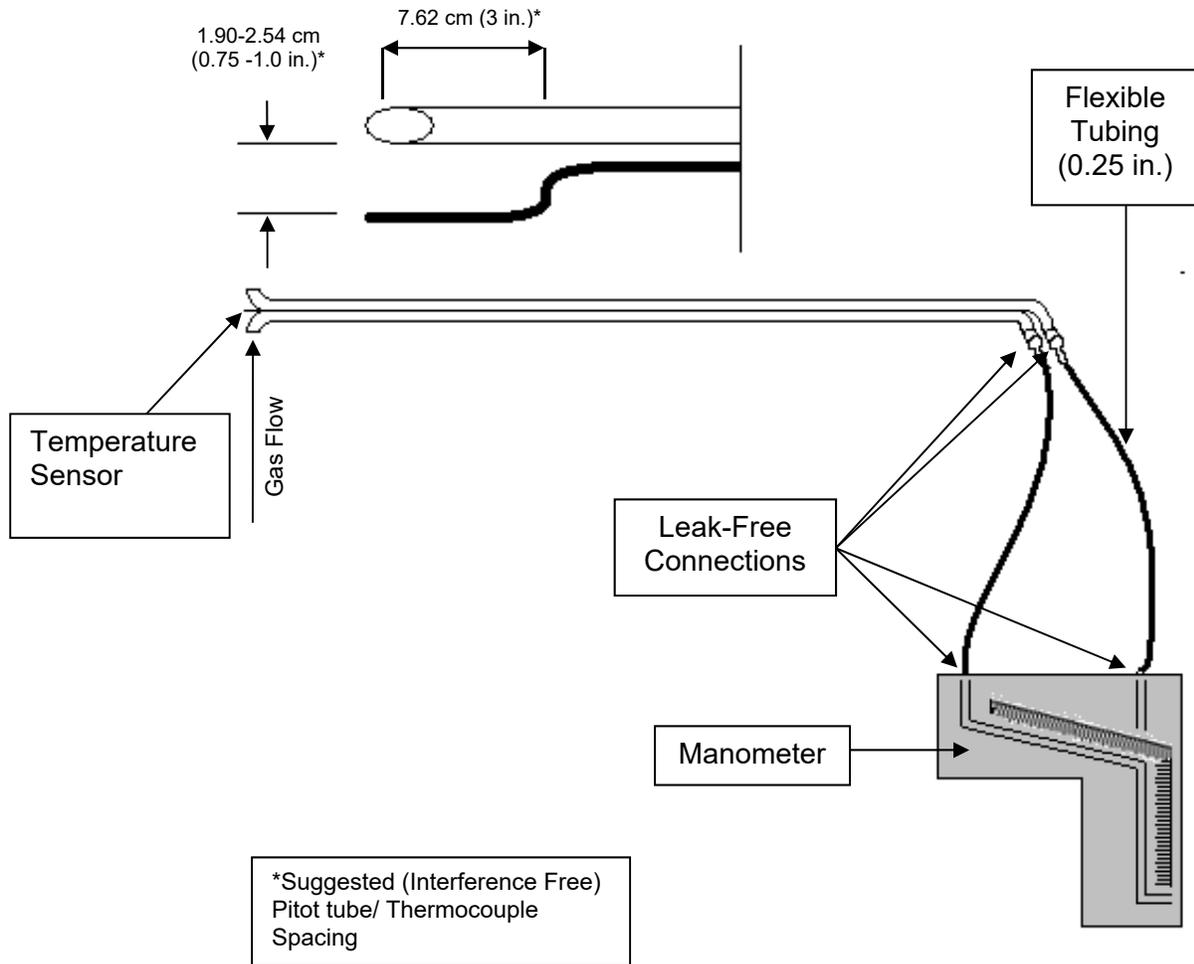
Length: 96"

Tests Points per Port: 8

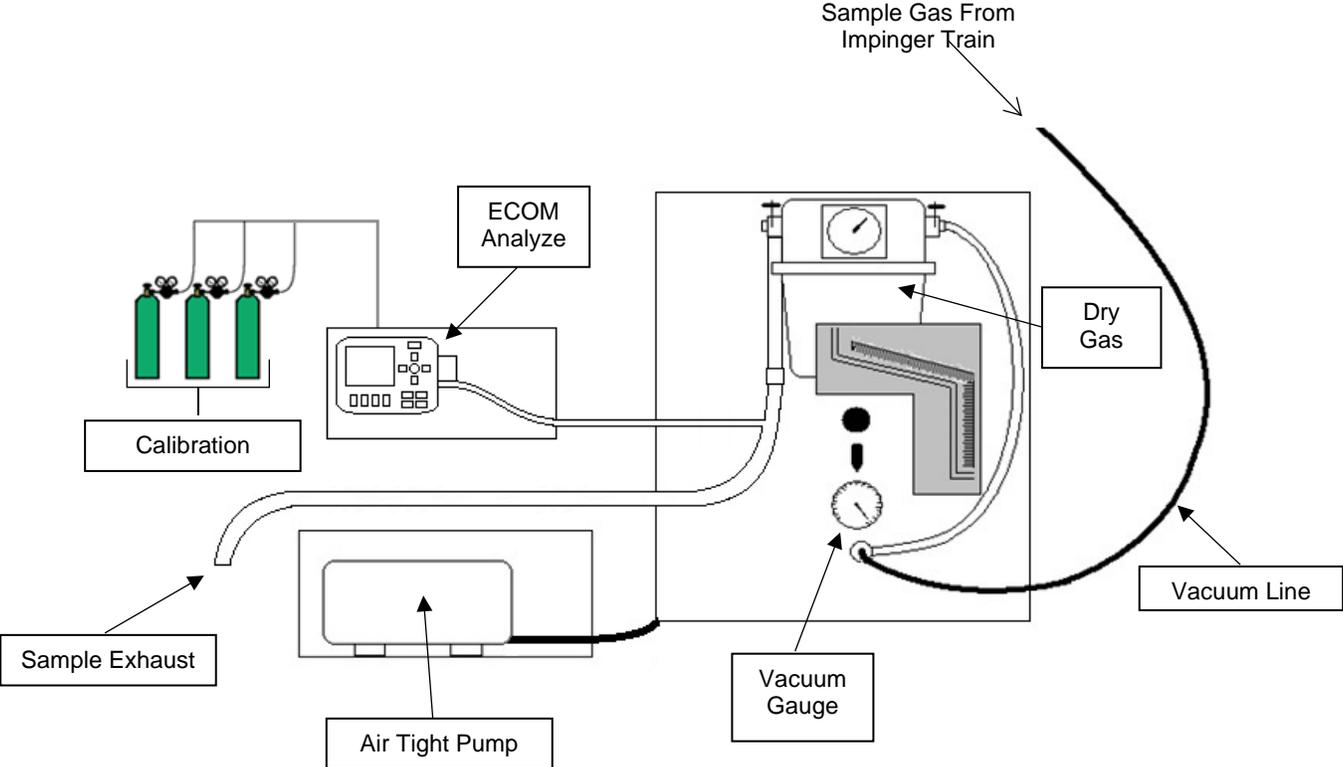
Width: 104"

## Appendix B - Sample Train Diagrams

# USEPA Method 2 – Type S Pitot Tube Manometer Assembly



# USEPA Method 3A - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing ECOM To Measure from Sample Exhaust



# USEPA Method 5- Particulate Matter Sample Train Diagram

