1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a compliance test program for Holcim (US) Inc. d/b/a Lafarge Alpena at the Alpena Plant in Alpena, Michigan, on the Clinker Cooler 22 Stack on July 30, 2021. This report summarizes the results of the test program and test methods.

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

TEST INFORMATION		
Test Location	**Test Date**	**Test Parameter**
Clinker Cooler 22 Stack	July 30, 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.*"

Test Location	Parameter	Date	Emission Rate	Emission Limit	CPMS SSOL*
Clinker Cooler 22 Stack	FPM	7/30/2021	0.013 lb/ton	0.07 lb/ton	5.06

*The CPMS SSOL was based on mA recorded by CPMS during testing.

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

TEST PERSONNEL INFORMATION		
Location	**Address**	**Contact**
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. Daniel Kossack Project Supervisor 630-993-2100 (phone) ctrezak@mp-mail.com
Testing Company Personnel		Mr. Jeff Meyerhoff Test Engineer
		Mr. Donald Jordan Test Engineer
		Mr. William Petrovich Test Engineer

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**
Clinker Cooler 22 Stack	66" x 85.9"	6	4.25"	>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 basis. A 9-foot-long 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 3 Oxygen (O_2)/Carbon Dioxide (CO_2) Determination

Per section 8.6 of EPA Method 2 (i.e., "for processes emitting essentially air, an analysis need not be conducted"), carbon dioxide and oxygen (CO_2/O_2) analysis was not be performed per EPA Method 3 or 3A. Instead, a dry molecular weight of 29.0 was assumed.

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: Clinker Cooler 22 Stack
Test Method: 5

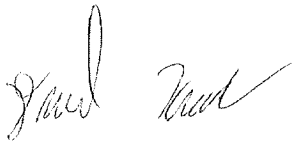
Source Condition	Normal	Normal	Normal	
Date	7/30/21	7/30/21	7/30/21	
Start Time	10:10	12:15	12:39	
End Time	11:13	13:18	13:42	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	254.3	250.1	285.7	263.4
Flue Gas Moisture, percent by volume	1.2%	0.7%	1.5%	1.1%
Average Flue Pressure, in. Hg	29.34	29.34	29.34	29.34
Gas Sample Volume, dscf	51.458	41.692	48.939	47.363
Average Gas Velocity, ft/sec	26.285	21.455	26.051	24.597
Gas Volumetric Flow Rate, acfm	61,439	50,149	60,891	57,493
Gas Volumetric Flow Rate, dscfm	44,005	36,303	41,652	40,653
Gas Volumetric Flow Rate, scfm	44,536	36,570	42,282	41,129
Isokinetic Variance	102.3	100.5	102.8	101.9
Clinker Production Rate, ton/hr	74.80	76.20	76.30	75.77
CPMS Response, mA	4.55	4.15	4.25	4.32
Filterable Particulate Matter (Method 5)				
grams collected	0.02494	0.00229	0.00400	0.01041
grains/acf	0.0054	0.0006	0.0009	0.0023
grains/dscf	0.0075	0.0008	0.0013	0.0032
lb/hr	2.821	0.264	0.450	1.178
lb/ton of clinker	0.038	0.003	0.006	0.016
Site Specific Operating Limit (SSOL) Determination				
Source Emissions Limit, lb/ton		0.07		
CPMS Zero, mA		4.00		
Filterable Particulate Matter, % of Emissions Limit		22.4%		
SSOL		5.06		

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.

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



Project Manager

Daniel J. Kossack

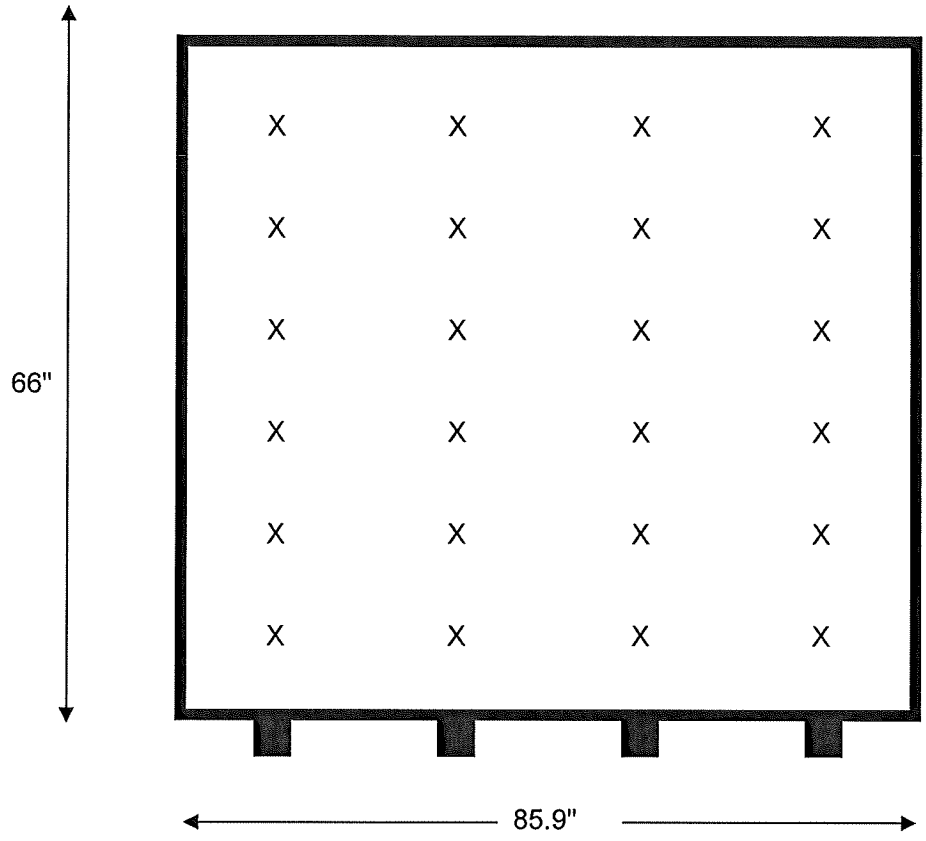
Quality Assurance

Eric L. Ehlers

APPENDICES

Appendix A - Test Section Diagram

EQUAL AREA TRAVERSE FOR RECTANGULAR DUCTS



Job: Holcim (US) Inc.
Alpena Cement Plant
Alpena, Michigan

Date: July 30, 2021

Test Location: Clinker Cooler 22 Stack

Length: 66 inches

Width: 85.9 inches

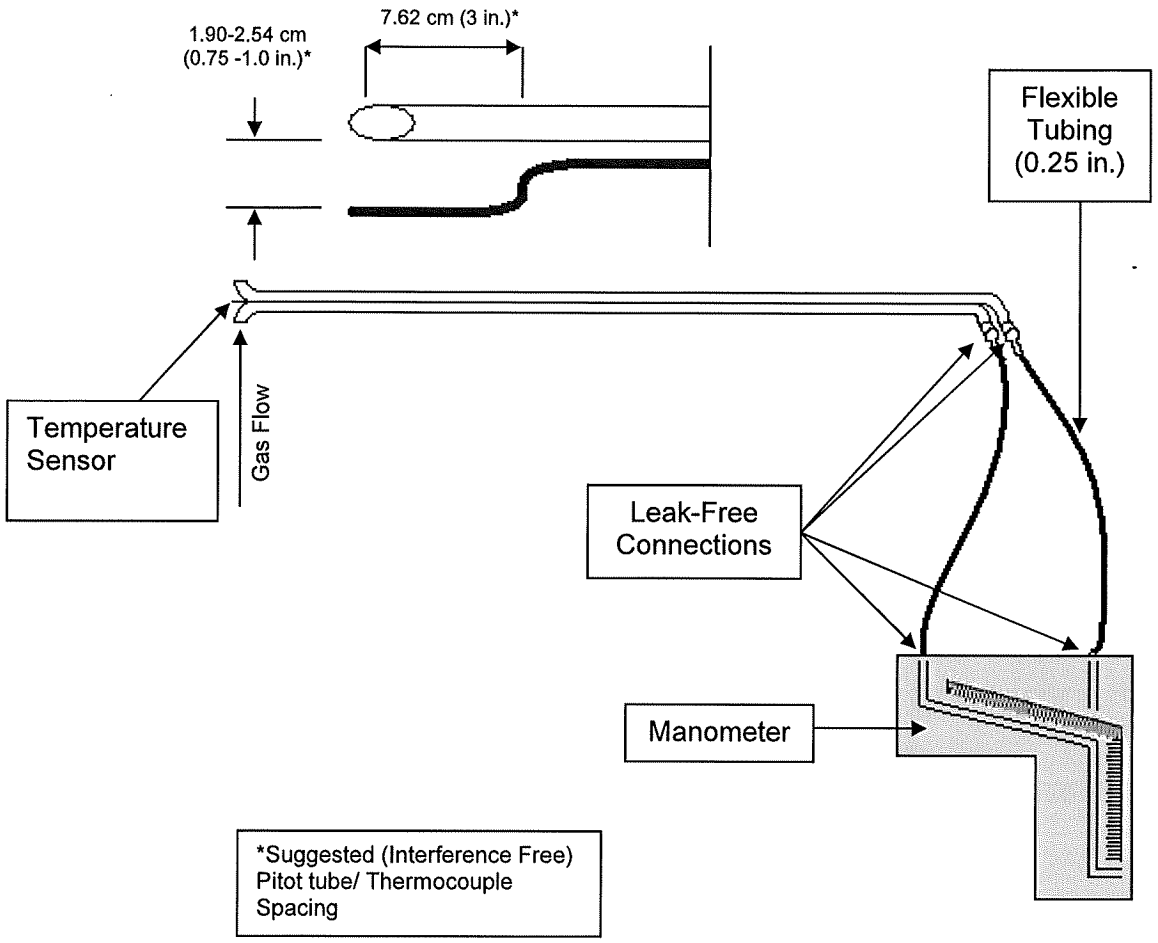
Area: 38.957 Square Feet

No. Test Ports: 4

Tests Points per Port: 6

Appendix B - Sample Train Diagrams

USEPA Method 2 – Type S Pitot Tube Manometer Assembly



USEPA Method 5- Particulate Matter Sample Train Diagram