CTL | THOMPSON MATERIALS ENGINEERS, INC.

ASTM C618-23E01 - Chemical and Physical Analyses - Coal Ash/Pozzolans

CTL Ticket: 24219	Plant of Origin: Bridger	Sample Date Range: 10/14/2024
CTL Project: CT17328	Sample Type: Fly Ash	to: 11/15/2024
Report Date: 01/22/2025	Sample ID: BSL-011-24	Date Received: 11/21/2024
	Supplier: Bridgesource	

Chemical Composition (%)

(by Wyoming Analytical Laboratories, Inc.)

		ASTM C618-23 Class N	Class F	Class C
Silicon Dioxide:	62.9			
Aluminum Oxide:	15.6			
Iron Oxide:	5.1			
Total Silica, Aluminum, Iron:	83.6	≥70.0%	≥50.0%	≥50.0
Sulfur Trioxide:	1.3	≤4.0%	≤5.0%	≤5.0%
Calcium Oxide:	5.8	N/A	≤18.0%	>18.0%
Magnesium Oxide:	2.18	N/A	N/A	N/A
Total Alkalis, as Na_2O:	4.60			
Sodium:	3.65	Product Class:	Class F	
Potassium:	1.45	Conforms to Class:	Yes	

Volatile Composition (Mass%)

Moisture Content:	0.1	≤3.0%	≤3.0%	≤3.0%
Loss on Ignition:	0.4	≤10.0%	≤6.0%	≤6.0%

Physical Test Results

Fineness, Retained on #325 Sieve (%):	24.6	≤34%	≤34%	≤34%
Fineness, Retained on #100 Sieve (%)*:			≤10%	≤10%
*(Harvested ash / bottom ash blends only				
Strength Activity Index (%) *		* No 7-day limit if 28-day meets		
Percent of Control @ 7 Days:	115	≥75%	≥75%	≥75%
Percent of Control @ 28 Days:	104	≥75%	≥75%	≥75%
Water Requirement, % of Control:	96	≤115%	≤105%	≤105%
Soundness, Autoclave Expansion (%):	-0.02	≤0.8%	≤0.8%	≤0.8%
Density (g/cm3) :	2.37	N/A	N/A	N/A

Uniformity

Established from 10 previous tests

Average Fineness:	21.1	Difference	3.5(%)	±5(%)	±5(%)	±5(%)
Average Density:	2.35	Difference	0.86%	±5%	±5%	±5%

Supplementary Requirements

Available Alkalis, as Na_2O	1.5%				
Sodium Oxide:	1.26%	Drying Shrinkage %: 0.00	≤0.03	≤0.03	≤0.03
Potassium Oxide:	0.37%				

Comments: *Meets ASTM and AASHTO.*

CTL | Thompson Materials Engineers, Inc.

Damon B. Thomas, P.E.

COLORADO REGISTERED DAMON B. THOMAS 30990 PROFESSIONAL ENGINEER 01/22/2025

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December 02, 2024

Dan Barrett
CTL Thompson, Materials Engineers, Inc.
22 Lipan St.
Denver, CO 80223

Request #: 44761
WAL Sample #: T7956
Customer Sample ID: Bridgesource BSL-001-24 10-14-24--11-15-24 CT 17328.000 CTL 24219

Date Received: 11/25/2024
Sample Matrix: fly ash

PO#:
Project#:

CHEMICAL ANALYSIS
WT%, DRY BASIS

Silicon Dioxide, SiO_2	62.94
Aluminum Oxide, Al_2O_3	15.56
Iron Oxide, Fe_2O_3	5.14
Total (SiO_2 + Al_2O_3 + Fe_2O_3)	83.64
Calcium Oxide, CaO	5.76
Magnesium Oxide, MgO	2.18
Sodium Oxide, Na_2O	3.65
Potassium Oxide, K_2O	1.45
Total Alkalies as Na_2O	4.60
Titanium Dioxide, TiO_2	0.86
Manganese Dioxide, MnO_2	0.05
Phosphorus Pentoxide, P_2O_5	0.10
Strontium Oxide, SrO	0.17
Barium Oxide, BaO	0.48
Sulfur Trioxide, SO_3	1.28
Loss on Ignition (750°C)	0.39
Total	100.00
Moisture (105°C), as Received	0.07

Analysis per ASTM C 311/XRF
Analyst CRW/ 11/27/2024

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Mineral Manager

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Laboratory Director

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