

ASTM C618-19 - Chemical and Physical Analyses - Fly Ash/Pozzolans

CTL Ticket: 20213	Plant of Origin: Jim Bridger	Sample Date Range: 12/01/2020
CTL Project: CT16927	Sample ID: BSL-005-20	to: 12/15/2020
Report Date: 04/27/2021	Supplier: Bridgesource	Date Received: 12/28/2020

Chemical Composition (%) <small>(by Wyoming Analytical Laboratories, Inc.)</small>		ASTM C618-19		
		<u>Class N</u>	<u>Class F</u>	<u>Class C</u>
Silicon Dioxide:	62.2			
Aluminum Oxide:	18.3			
Iron Oxide:	4.3			
Total Silica, Aluminum, Iron:	84.8	≥70.0%	≥50.0%	≥50.0
Sulfur Trioxide:	0.5	≤4.0%	≤5.0%	≤5.0%
Calcium Oxide:	5.9	N/A	≤18.0%	>18.0%
Magnesium Oxide:	1.93	N/A	N/A	N/A
Total Alkalis, as Na ₂ O	3.82			
Sodium:	2.75	Product Class: Class F		
Potassium:	1.63	Conforms to Class: Yes		

Volatile Composition (Mass%)				
Moisture Content:	0.1	≤3.0%	≤3.0%	≤3.0%
Loss on Ignition:	0.5	≤10.0%	≤6.0%	≤6.0%


Physical Test Results				
Fineness, Retained on #325 Sieve (%):	20.8	≤34%	≤34%	≤34%
Strength Activity Index (%) *		* No 7-day limit if 28-day meets		
Percent of Control @ 7 Days:	95	≥75%	≥75%	≥75%
Percent of Control @ 28 Days:	103	≥75%	≥75%	≥75%
Water Requirement, % of Control:	96	≤115%	≤105%	≤105%
Soundness, Autoclave Expansion (%):	-0.01	≤0.8%	≤0.8%	≤0.8%
Density (g/cm ³):	2.33	N/A	N/A	N/A


Uniformity Established from 4 previous tests				
Average Fineness:	24.8	Difference 4(%)	±5(%)	±5(%)
Average Density:	2.33	Difference 0%	±5%	±5%

Supplementary Requirements				
Available Alkalis, as Na ₂ O	2.06%			
Sodium Oxide:	1.67%	Drying Shrinkage %: -0.01		Max 0.03%
Potassium Oxide:	0.59%			

Comments:

CTL | Thompson Materials Engineers, Inc.



 Orville R. Werner, P.E.
 

sent to client

January 14, 2021

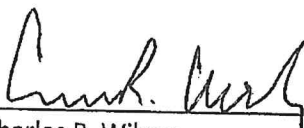
John Archibald
CTL Thompson, Materials Engineers, Inc.
22 Lipan St.
Denver, CO 80223

Mineral Division #: 40334
WAL Sample #: S2529
Customer Sample ID: BSL-005-21 CT 16927.000 CTL 20213
PO#:
Project#:
Date Received: 1/4/2021
Sample Matrix: fly ash

CHEMICAL ANALYSIS
WT%, DRY BASIS

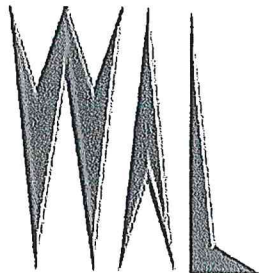
Silicon Dioxide, SiO ₂	62.19
Aluminum Oxide, Al ₂ O ₃	18.32
Iron Oxide, Fe ₂ O ₃	4.28
Total (SiO ₂ + Al ₂ O ₃ + Fe ₂ O ₃)	84.79
Calcium Oxide, CaO	5.86
Magnesium Oxide, MgO	1.93
Sodium Oxide, Na ₂ O	2.75
Potassium Oxide, K ₂ O	1.63
Total Alkalies as Na ₂ O	3.82
Titanium Dioxide, TiO ₂	0.95
Manganese Dioxide, MnO ₂	0.04
Phosphorus Pentoxide, P ₂ O ₅	0.54
Strontium Oxide, SrO	0.16
Barium Oxide, BaO	0.34
Sulfur Trioxide, SO ₃	0.54
Loss on Ignition (750°C)	0.48
Total	100.00
Moisture (105°C), as Received	0.06

Analysis per ASTM C 311/XRF
Analyst CRW/ 1/12/21 9:40 PM


Charles R. Wilson
Mineral Manager

End of Report
rrj

Monte L. Ellis
Laboratory Manager



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