



Cement Mill Test Report

Date of Issue: January 11, 2023

Plant: Exshaw, AB
 Product: Portland Limestone Cement Type IL(13) (HS)
 Mill Test Report Number: MTR-IL-2022-12
 Manufactured: December 1-31, 2022

CHEMICAL ANALYSIS

Item	Spec limit	Test Result
Rapid Method, X-Ray (C114)		
SiO ₂ (%)		18.2
Al ₂ O ₃ (%)		3.7
Fe ₂ O ₃ (%)		3.3
CaO (%)		60.8
MgO (%)		4.6
SO ₃ (%)	3.0 max*	3.2
Loss on Ignition @ 950 (%)	10.0 max	6.0
Loss on Ignition @ 550 (%)		0.7
CaCO ₃ in Limestone (%)	70 min	90.9
Inorganic Process Addition	5.0 max	-
Adjusted Potential Phase Composition (C 150 - For information only)		
C ₃ S (%)	---	47
C ₂ S (%)	---	16
C ₃ A (%)	---	4
C ₄ AF (%)	---	10

PHYSICAL ANALYSIS

Item	Spec limit	Test Result
Blaine Fineness (m ² /kg) (C204)		496
Passing 45 μm (%) (C430)		99.4
Autoclave Expansion (%) (C151)*	-0.20 to 0.80	0.10
Air Content (%) (C186)	12 max	6
Compressive Strength (MPa[psi]) (C109)		
1 day		18.7 [2720]
3 days	13.0 [1890] min	31.8 [4610]
7 days	20.0 [2900] min	37.1 [5390]
28 days (Reflects previous month's data)	25.0 [3620] min	44.5 [6450]
Time of setting (minutes) (C191)		
Vicat Initial	45 min.	117
ASTM C1012 Expansion %, (6 months)***		0.048
Mortar Bar Expansion (%) (C1038)*	0.020 max	0.010

NaEq (%) 0.53

* May exceed the SO₃ maximum based on C1038 results of <0.020% expansion at 14 days.

** Most recent result provided

*** Performed by Lafarge Edmonton and/or Seattle Labs

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C 595-21 & AASHTO M 240-20 STANDARD SPECIFICATIONS FOR TYPE IL CEMENT.

Prepared By:

Lorraine Johnson

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Lorraine Johnson
 Quality Manager



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Additional Data - For information only.

Item	Test Result	Test Result
	Limestone	Inorganic Process Addition Lafarge Cement Kiln Dust
Amount (%)	12.8	-
SiO ₂ (%)	1.8	n/a
Al ₂ O ₃ (%)	0.7	n/a
Fe ₂ O ₃ (%)	0.2	n/a
CaO (%)	50.9	n/a
SO ₃ (%)	0.2	n/a
CO ₂ (%)	42.0	n/a

Base Cement Phase Composition - C150 - For information only.

Item	Test Result
C ₃ S (%)	54
C ₂ S (%)	19
C ₃ A (%)	4
C ₄ AF (%)	11

Specific Gravity: 3.11**

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