



Cement Mill Test Report

Date of Issue: December 12, 2022

Plant: Exshaw, AB
 Product: Portland Limestone Cement Type IL(13) (HS)
 Mill Test Report Number: MTR-IL-2022-11
 Manufactured: November 1-30, 2022

CHEMICAL ANALYSIS

PHYSICAL ANALYSIS

Item	Spec limit	Test Result	Item	Spec limit	Test Result
Rapid Method, X-Ray (C114)			Blaine Fineness (m ² /kg) (C204)		505
SiO ₂ (%)		18.0	Passing 45 μm (%) (C430)		99.5
Al ₂ O ₃ (%)		3.6	Autoclave Expansion (%) (C151)*	-0.20 to 0.80	0.12
Fe ₂ O ₃ (%)		3.2	Air Content (%) (C186)	12 max	6
CaO (%)		61.1	Compressive Strength (MPa[psi]) (C109)		
MgO (%)		4.4	1 day		18.2 [2650]
SO ₃ (%)	3.0 max*	3.2	3 days	13.0 [1890] min	31.4 [4450]
Loss on Ignition @ 950 (%)	10.0 max	6.1	7 days	20.0 [2900] min	37.2 [5400]
Loss on Ignition @ 550 (%)		0.8	28 days (Reflects previous month's data)	25.0 [3620] min	43.7 [6340]
Limestone (%)	15.0 max	12.7	Time of setting (minutes) (C191)		
CaCO ₃ in Limestone (%)	70 min	95	Vicat Initial	45 min.	104
Inorganic Process Addition	5.0 max	-	ASTM C1012 Expansion %, (6 months)***		0.048
Adjusted Potential Phase Composition (C 150 - For information only)			Mortar Bar Expansion (%) (C1038)*	0.020 max	0.011
C ₃ S (%)	---	50			
C ₂ S (%)	---	14			
C ₃ A (%)	---	4			
C ₄ AF (%)	---	10			
NaEq (%)		0.51			

* 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

Western BU - Exshaw Plant
 P.O. Box 160, Highway 1A, Exshaw AB T0L 2C0
 Phone: 403-673-3815

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 (%)	12.6	-
SiO ₂ (%)	1.2	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 (%)	41.8	n/a

Base Cement Phase Composition - C150 - For information only.

Item	Test Result
C ₃ S (%)	57
C ₂ S (%)	16
C ₃ A (%)	5
C ₄ AF (%)	11

Specific Gravity: 3.11**

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