



# Cement Mill Test Report

Date of Issue: April 12, 2022

Plant: Exshaw, AB  
 Product: Portland Limestone Cement Type IL(10) (HS)  
 Mill Test Report Number: MTR-IL-2022-03  
 Manufactured: March 1-31, 2022

## CHEMICAL ANALYSIS

## PHYSICAL ANALYSIS

Item	Spec limit	Test Result	Item	Spec limit	Test Result
Rapid Method, X-Ray (C114)			Blaine Fineness (m <sup>2</sup> /kg) (C204)		506
SiO <sub>2</sub> (%)		18.2	Passing 45 μm (%) (C430)		99.6
Al <sub>2</sub> O <sub>3</sub> (%)		3.7	Autoclave Expansion (%) (C151)	-0.20 to 0.80	0.12
Fe <sub>2</sub> O <sub>3</sub> (%)		3.4	Air Content (%) (C186)	12 max	5
CaO (%)		60.9	Compressive Strength (MPa[psi]) (C109)		
MgO (%)		4.5	1 day		20.7 [3000]
SO <sub>3</sub> (%)	3.0 max*	3.3	3 days	13.0 [1890] min	33.3 [4820]
Loss on Ignition @ 950 (%)	10.0 max	5.4	7 days	20.0 [2900] min	38.7 [5610]
Loss on Ignition @ 550 (%)		0.9	28 days (Reflects previous month's data)	25.0 [3620] min	47.0 [6810]
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max	-	Time of setting (minutes) (C191)		
Adjusted Potential Phase Composition (C 150 - For information only)			Vicat Initial	45 min.	116
C <sub>3</sub> S (%)	---	51	ASTM C1012 Expansion %, (6 months)***		0.048
C <sub>2</sub> S (%)	---	14	Mortar Bar Expansion (%) (C1038)	0.020 max	0.009
C <sub>3</sub> A (%)	---	4			
C <sub>4</sub> AF (%)	---	10			

NaEq (%) 0.53

\* May exceed the SO<sub>3</sub> 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 595-20 & AASHTO M 240-20 STANDARD SPECIFICATIONS FOR TYPE IL CEMENT.

Prepared By:

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 Quality Control Coordinator



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## Additional Data - For information only.

Item	Test Result	Test Result
	Limestone	Inorganic Process Addition Lafarge Cement Kiln Dust
Amount (%)	10.7	-
SiO <sub>2</sub> (%)	0.6	n/a
Al <sub>2</sub> O <sub>3</sub> (%)	0.5	n/a
Fe <sub>2</sub> O <sub>3</sub> (%)	0.2	n/a
CaO (%)	51.4	n/a
SO <sub>3</sub> (%)	0.1	n/a
CO <sub>2</sub> (%)	43.0	n/a

## Base Cement Phase Composition - C150 - For information only.

Item	Test Result
C <sub>3</sub> S (%)	56
C <sub>2</sub> S (%)	15
C <sub>3</sub> A (%)	4
C <sub>4</sub> AF (%)	11

Specific Gravity: 3.11

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