



# Cement Mill Test Report

Date of Issue: January 12, 2022

Plant: Exshaw AB  
 Product: Portland Limestone Cement Type IL(10) (HS)  
 Mill Test Report Number: MTR-IL-2021-12  
 Manufactured: December 1-31, 2021

## 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)		489
SiO <sub>2</sub> (%)		18.6	Passing 45 μm (%) (C430)		99.4
Al <sub>2</sub> O <sub>3</sub> (%)		3.8	Autoclave Expansion (%) (C151)	-0.20 to 0.80	0.05
Fe <sub>2</sub> O <sub>3</sub> (%)		3.5	Air Content (%) (C186)	12 max	4
CaO (%)		61.4	Compressive Strength (MPa[psi]) (C109)		
MgO (%)		4.3	1 day		23.7 [3430]
SO <sub>3</sub> (%)	3.0 max*	3.2	3 days	13.0 [1890] min	35.7 [5170]
Loss on Ignition @ 950 (%)	10.0 max	4.7	7 days	20.0 [2900] min	40.5 [5880]
Loss on Ignition @ 550 (%)		0.8	28 days (Reflects previous month's data)	25.0 [3620] min	42.8 [6210]
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.	112
C <sub>3</sub> S (%)	---	50	ASTM C1012 Expansion %, (6 months)***		0.048
C <sub>2</sub> S (%)	---	16	Mortar Bar Expansion (%) (C1038)	0.020 max	0.005
C <sub>3</sub> A (%)	---	4			
C <sub>4</sub> AF (%)	---	11			

NaEq (%) 0.52

\* 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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## Additional Data - For information only.

Item	Test Result	Test Result
	Limestone	Inorganic Process Addition Lafarge Cement Kiln Dust
Amount (%)	9.5	-
SiO <sub>2</sub> (%)	0.8	n/a
Al <sub>2</sub> O <sub>3</sub> (%)	0.7	n/a
Fe <sub>2</sub> O <sub>3</sub> (%)	0.2	n/a
CaO (%)	52.1	n/a
SO <sub>3</sub> (%)	0.1	n/a
CO <sub>2</sub> (%)	41.5	n/a

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

Item	Test Result
C <sub>3</sub> S (%)	55
C <sub>2</sub> S (%)	17
C <sub>3</sub> A (%)	4
C <sub>4</sub> AF (%)	12

Specific Gravity: 3.11

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