



# Cement Mill Test Report

Date of Issue: August 16, 2021

Plant: Exshaw AB  
 Product: Portland Limestone Cement Type IL(10) (HS)  
 Mill Test Report Number: MTR-IL-2021-07  
 Manufactured: July 1-31, 2021

## CHEMICAL ANALYSIS

Item	Spec limit	Test Result
Rapid Method, X-Ray (C114)		
SiO <sub>2</sub> (%)		18.1
Al <sub>2</sub> O <sub>3</sub> (%)		3.7
Fe <sub>2</sub> O <sub>3</sub> (%)		3.4
CaO (%)		60.7
MgO (%)		4.4
SO <sub>3</sub> (%)	3.0 max*	3.3
Loss on Ignition @ 950 (%)	10.0 max	5.6
Loss on Ignition @ 550 (%)		0.9
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max	-
Adjusted Potential Phase Composition (C 150 - For information only)		
C <sub>3</sub> S (%)	---	49
C <sub>2</sub> S (%)	---	15
C <sub>3</sub> A (%)	---	4
C <sub>4</sub> AF (%)	---	10

## PHYSICAL ANALYSIS

Item	Spec limit	Test Result
Blaine Fineness (m <sup>2</sup> /kg) (C204)		504
Passing 45 µm (%) (C430)		99.5
Autoclave Expansion (%) (C151)**	-0.20 to 0.80	0.12
Air Content (%) (C186)	12 max	5
Compressive Strength (MPa[psi]) (C109)		
1 day		18.4 [2660]
3 days	13.0 [1890] min	29.9 [4330]
7 days	20.0 [2900] min	34.5 [5000]
28 days (Reflects previous month's data)	25.0 [3620] min	43.4 [6300]
Time of setting (minutes) (C191)		
Vicat Initial	45 min.	105
ASTM C1012 Expansion %, (6 months)***		0.048
Mortar Bar Expansion (%) (C1038)**	0.020 max	0.010

NaEq (%) 0.51

\* May exceed the SO<sub>3</sub> maximum based on C1038 results of <0.020% expansion at 14 days.

\*\* Current Production run not available - most recent 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:

*Lorraine Richards*

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

Lorraine Richards  
 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 (%)	11.2	-
SiO <sub>2</sub> (%)	1.3	n/a
Al <sub>2</sub> O <sub>3</sub> (%)	0.8	n/a
Fe <sub>2</sub> O <sub>3</sub> (%)	0.2	n/a
CaO (%)	51.4	n/a
SO <sub>3</sub> (%)	0.2	n/a
CO <sub>2</sub> (%)	42.2	n/a

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

Item	Test Result
C <sub>3</sub> S (%)	55
C <sub>2</sub> S (%)	16
C <sub>3</sub> A (%)	4
C <sub>4</sub> AF (%)	12

Specific Gravity: 3.11

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