



# Cement Mill Test Report

Date of Issue: September 12, 2022

Plant: Exshaw, AB  
 Product: Portland Cement Type I/II/V  
 Mill Test Report Number: MTR-I/II/V-2022-08  
 Manufactured: August 1-31, 2022

## ASTM C 150-21 and AASHTO M 85-18 Standard Requirements

CHEMICAL ANALYSIS			PHYSICAL ANALYSIS		
Item	Spec limit	Test Result	Item	Spec limit	Test Result
Rapid Method, X-Ray (C114)			Air content of mortar (%) (C185)	12 max	8
SiO <sub>2</sub> (%)	---	19.5	Blaine Fineness (m <sup>2</sup> /kg) (C204)	260 min	396
Al <sub>2</sub> O <sub>3</sub> (%)	6.0 max	4.0	Passing 45 µm (%) (C430)	---	98.1
Fe <sub>2</sub> O <sub>3</sub> (%)	6.0 max	3.6	Autoclave Expansion (%) (C151)	0.80 max	0.05
CaO (%)	---	62.2	Compressive strength (MPa, [psi]) (C 109)		
MgO (%)	6.0 max	4.7	3 days	12.0 [1740] min	28.8 [4170]
SO <sub>3</sub> (%)	2.3 max *	2.9	7 days	19.0 [2760] min	35.1 [5080]
Loss on Ignition (%)	3.5 max	2.5	28 days (Reflects previous month's data)		45.2 [6560]
Insoluble Residue (%)**	1.5 max	0.33	Time of setting (minutes)		
CO <sub>2</sub> (%)	---	1.9	Vicat Initial (C191)	45 - 375	108
Limestone (%)	5.0 max	4.4	Sulfate Resistance (%) (C452)**	0.040 max	0.032
CaCO <sub>3</sub> in Limestone (%)	70 min	93	Mortar Bar Expansion (%) (C1038)	0.020 max	0.009
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max	-			
Adjusted Potential Phase Composition (C 50)					
C <sub>3</sub> S (%)	---	56			
C <sub>2</sub> S (%)	---	14			
C <sub>3</sub> A (%)	5 max	4			
C <sub>4</sub> AF (%)	---	11			
C <sub>4</sub> AF + 2(C <sub>3</sub> A)	25 max	19			
C <sub>3</sub> S+4.75*C <sub>3</sub> A (%)	100 max	76			
ASTM C 150-17 and AASHTO M 85-17 Optional Requirements:					
NaEq (%)	0.60 max	0.54	False set (%) (C451)	50 min	77

\* May exceed the SO<sub>3</sub> maximum based on C 1038 results of <0.020% expansion at 14 days.

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

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C 150-21 & AASHTO M 85-18 STANDARD SPECIFICATIONS FOR TYPES I, II & V CEMENTS; and ASTM C 150-21 & AASHTO M 85-18 OPTIONAL CHEMICAL REQUIREMENTS FOR TYPES I, II & V LOW ALKALI CEMENT.

Certified By:

*Lorraine Johnson*

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Lorraine Johnson  
 Quality Manager



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#### Additional Data

Item	Test Result	
	Limestone	Inorganic Process Addition Lafarge Cement Kiln Dust
Amount (%)	4.4	-
SiO <sub>2</sub> (%)	0.7	n/a
Al <sub>2</sub> O <sub>3</sub> (%)	0.4	n/a
Fe <sub>2</sub> O <sub>3</sub> (%)	0.2	n/a
CaO (%)	51.7	n/a
SO <sub>3</sub> (%)	0.2	n/a
CO <sub>2</sub> (%)	42.9	n/a

#### Base Cement Phase Composition

Item	Test Result
C <sub>3</sub> S (%)	59
C <sub>2</sub> S (%)	14
C <sub>3</sub> A (%)	5
C <sub>4</sub> AF (%)	11

We certify that the data above reflects the materials used in cement manufacture during the production period indicated.

Note: Specific Gravity for Portland Cements is 3.14

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