



# Cement Mill Test Report

Date of Issue: December 13, 2023

Plant: Exshaw AB  
 Product: Portland Cement Type I/II/V  
 Mill Test Report Number: MTR-I/II/V-2023-09  
 Manufactured during the month of: November 2023

## ASTM C 150-22 and AASHTO M 85-22 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)		
SiO <sub>2</sub> (%)	---	19.2		12 max	6
Al <sub>2</sub> O <sub>3</sub> (%)	6.0 max	3.9	Blaine Fineness (m <sup>2</sup> /kg) (C204)		
Fe <sub>2</sub> O <sub>3</sub> (%)	6.0 max	3.6		260 min	447
CaO (%)	---	62.0	Passing 45 μm (%) (C430)		
MgO (%)	6.0 max	4.8		---	98.3
SO <sub>3</sub> (%)	2.3 max *	3.0	Compressive strength (MPa, [psi]) (C 109)		
Loss on Ignition (%)	3.5 max	2.6	3 days		
Insoluble Residue (%)*	1.5 max	0.2		12.0 [1740] min	29.7 [4300]
CO <sub>2</sub> (%)	---	1.9	7 days		
Limestone (%)	5.0 max	4.5		19.0 [2760] min	36.6 [5301]
CaCO <sub>3</sub> in Limestone (%)	70 min	96.0	28 days (Reflects previous month's data)		
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max				43.8 [6345]
Adjusted Potential Phase Composition (C50)			Time of setting (minutes)		
C <sub>3</sub> S (%)	---	58	Vicat Initial (C191)		
C <sub>2</sub> S (%)	---	11		45 - 375	83
C <sub>3</sub> A (%)	5 max	4	Sulfate Resistance (%) (C452)**		
C <sub>4</sub> AF (%)	---	11		0.040 max	0.031
C <sub>4</sub> AF + 2(C <sub>3</sub> A)	25 max	20	Mortar Bar Expansion (%) (C1038)**		
C <sub>3</sub> S+4.75*C <sub>3</sub> A (%)	100 max	79		0.020 max	0.012
ASTM C 150-17 and AASHTO M 85-17 Optional Requirements:			False set (%) (C451)		
NaEq (%)	0.60 max	0.58		50 min	80

\* 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



Certified to NSF/ANSI/CAN 61

AASHTO ACCREDITED

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of:

ASTM C 150-22 & AASHTO M 85-22 STANDARD SPECIFICATIONS FOR TYPES I, II & V CEMENTS; and  
 ASTM C 150-22 & AASHTO M 85-22 OPTIONAL CHEMICAL REQUIREMENTS FOR TYPES I, II & V LOW ALKALI CEMENT.

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

Certified By:

John W Blair  
 Quality Manager



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### Additional Data

Item	Test Result	
	Limestone	Inorganic Process Addition Lafarge Cement Kiln Dust
Amount (%)	4.5	-
SiO <sub>2</sub> (%)	2.0	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 (%)	50.0	n/a
SO <sub>3</sub> (%)	0.1	n/a
CO <sub>2</sub> (%)	42.4	n/a

### Base Cement Phase Composition

Item	Test Result
C <sub>3</sub> S (%)	61
C <sub>2</sub> S (%)	11
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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