



Cement Mill Test Report

Date of Issue: October 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: September 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 ₂ (%)	---	19.3		12 max	6
Al ₂ O ₃ (%)	6.0 max	4.0	Blaine Fineness (m ² /kg) (C204)		
Fe ₂ O ₃ (%)	6.0 max	3.6		260 min	415
CaO (%)	---	62.1	Passing 45 μm (%) (C430)		
MgO (%)	6.0 max	4.7		---	96.5
SO ₃ (%)	2.3 max *	2.9	Autoclave Expansion (%) (C151)**		
Loss on Ignition (%)	3.5 max	2.6		0.80 max	0.17
Insoluble Residue (%)	1.5 max	0.2	Compressive strength (MPa, [psi]) (C 109)		
CO ₂ (%)	---	1.9			
Limestone (%)	5.0 max	4.4	3 days	12.0 [1740] min	27.4 [3975]
CaCO ₃ in Limestone (%)	70 min	96.0	7 days	19.0 [2760] min	34.5 [4995]
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max		28 days (Reflects previous month's data)		43.3 [6278]
Adjusted Potential Phase Composition (C 50)			Time of setting (minutes)		
C ₃ S (%)	---	58	Vicat Initial (C191)	45 - 375	91
C ₂ S (%)	---	11	Sulfate Resistance (%) (C452)**		
C ₃ A (%)	5 max	4		0.040 max	0.032
C ₄ AF (%)	---	11	Mortar Bar Expansion (%) (C1038)**		
C ₄ AF + 2(C ₃ A)	25 max	19		0.020 max	0.008
C ₃ S+4.75*C ₃ A (%)	100 max	78			
ASTM C 150-17 and AASHTO M 85-17 Optional Requirements:					
NaEq (%)	0.60 max	0.56	False set (%) (C451)	50 min	82

* May exceed the SO₃ 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 150-22 & 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 (%)	4.4	-
SiO ₂ (%)	2.1	n/a
Al ₂ O ₃ (%)	0.7	n/a
Fe ₂ O ₃ (%)	0.3	n/a
CaO (%)	49.0	n/a
SO ₃ (%)	0.2	n/a
CO ₂ (%)	42.3	n/a

Base Cement Phase Composition

Item	Test Result
C ₃ S (%)	61
C ₂ S (%)	12
C ₃ A (%)	5
C ₄ 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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