



Cement Mill Test Report

Date of Issue: June 20, 2023

Plant: Exshaw AB
 Product: Portland Cement Type I/II/V
 Mill Test Report Number: MTR-I/II/V-2023-05
 Manufactured: May 1 - 31, 2023

ASTM C 150-20 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	6
SiO ₂ (%)	---	18.8	Blaine Fineness (m ² /kg) (C204)	260 min	388
Al ₂ O ₃ (%)	6.0 max	3.8	Passing 45 μm (%) (C430)	---	98.1
Fe ₂ O ₃ (%)	6.0 max	3.5	Autoclave Expansion (%) (C151)**	0.80 max	0.17
CaO (%)	---	60.3	Compressive strength (MPa, [psi]) (C 109)		
MgO (%)	6.0 max	4.6	3 days	12.0 [1740] min	28.6 [4146]
SO ₃ (%)	2.3 max *	2.8	7 days	19.0 [2760] min	34.5 [5007]
Loss on Ignition (%)	3.5 max	2.7	28 days (Reflects previous month's data)		44.4 [6443]
Insoluble Residue (%)	1.5 max	0.5	Time of setting (minutes)		
CO ₂ (%)	---	1.9	Vicat Initial (C191)	45 - 375	105
Limestone (%)	5.0 max	4.5	Sulfate Resistance (%) (C452)**		
CaCO ₃ in Limestone (%)	70 min	96.0	Mortar Bar Expansion (%) (C1038)**	0.020 max	0.010
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max		ASTM C 150-17 and AASHTO M 85-17 Optional Requirements:		
Adjusted Potential Phase Composition (C 50)			NaEq (%)	0.60 max	0.54
C ₃ S (%)	---	56	False set (%) (C451)	50 min	78
C ₂ S (%)	---	12			
C ₃ A (%)	5 max	4			
C ₄ AF (%)	---	11			
C ₄ AF + 2(C ₃ A)	25 max	74			
C ₃ S+4.75*C ₃ A (%)	100 max	18			

* 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 150-20 & AASHTO M 85-18 STANDARD SPECIFICATIONS FOR TYPES I, II & V CEMENTS; and ASTM C 150-20 & AASHTO M 85-18 OPTIONAL CHEMICAL REQUIREMENTS FOR TYPES I, II & V LOW ALKALI CEMENT.

Certified By:

John W Blair

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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 ₂ (%)	1.9	n/a
Al ₂ O ₃ (%)	0.5	n/a
Fe ₂ O ₃ (%)	0.2	n/a
CaO (%)	49.3	n/a
SO ₃ (%)	0.1	n/a
CO ₂ (%)	42.5	n/a

Base Cement Phase Composition

Item	Test Result
C ₃ S (%)	58
C ₂ S (%)	12
C ₃ A (%)	4
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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