



Cement Mill Test Report

Date of Issue: February 12, 2021

Plant: Exshaw AB
 Product: Portland Cement Type I/II/V
 Mill Test Report Number: MTR-I/II/V-2021-01
 Manufactured: January 2021

ASTM C 150-19 and AASHTO M 85-17 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	7
SiO ₂ (%)	---	19.9	Blaine Fineness (m ² /kg) (C204)	280 - 430	419
Al ₂ O ₃ (%)	6.0 max	3.9	Passing 45 µm (%) (C430)	---	98.9
Fe ₂ O ₃ (%)	6.0 max	3.7	Autoclave Expansion (%) (C151)	0.80 max	0.09
CaO (%)	---	62.3	Compressive strength (MPa, [psi]) (C 109)		
MgO (%)	6.0 max	4.7	3 days	12.0 [1740] min	30.0 [4350]
SO ₃ (%)	2.3 max *	2.9	7 days	19.0 [2760] min	35.8 [5190]
Loss on Ignition (%)	3.5 max	2.3	28 days (Reflects previous month's data)		44.5 [6450]
Insoluble Residue (%)	1.5 max	0.34	Time of setting (minutes)		
CO ₂ (%)	---	1.7	Vicat Initial (C191)	45 - 375	110
Limestone (%)	5.0 max	4.0	Sulfate Resistance (%) (C452)**	0.040 max	0.034
CaCO ₃ in Limestone (%)	70 min	95	Mortar Bar Expansion (%) (C1038)**	0.020 max	0.011
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max	-			
Adjusted Potential Phase Composition (C 150)					
C ₃ S (%)	---	55			
C ₂ S (%)	---	15			
C ₃ A (%)	5 max	4			
C ₄ AF (%)	---	11			
C ₄ AF + 2(C ₃ A)	25 max	19			
C ₃ S+4.75*C ₃ A (%)	100 max	74			
ASTM C 150-17 and AASHTO M 85-17 Optional Requirements:					
NaEq (%)	0.60 max	0.57	False set (%) (C451)	50 min	84

* 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 (Q4)

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C 150-19 & AASHTO M 85-17 STANDARD SPECIFICATIONS FOR TYPES I, II & V CEMENTS; and ASTM C 150-17 & AASHTO M 85-17 OPTIONAL CHEMICAL REQUIREMENTS FOR TYPES I, II & V LOW ALKALI CEMENT.

Certified By:

Lorraine Richards

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Lorraine Richards
 Quality Control Coordinator



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Additional ASTM C 150-19 and AASHTO M 85-17 Standard data

Additional Data

Item	Test Result	
	Limestone	Inorganic Process Addition Lafarge Cement Kiln Dust
Amount (%)	4.0	-
SiO ₂ (%)	2.9	n/a
Al ₂ O ₃ (%)	0.9	n/a
Fe ₂ O ₃ (%)	0.3	n/a
CaO (%)	50.3	n/a
SO ₃ (%)	0.3	n/a
CO ₂ (%)	41.7	n/a

Base Cement Phase Composition

Item	Test Result
C ₃ S (%)	58
C ₂ S (%)	15
C ₃ A (%)	4
C ₄ AF (%)	12

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 3.15

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