



Cement Mill Test Report

Date of Issue: March 12, 2021

Plant: Exshaw AB
 Product: Portland Limestone Cement Type IL(10) (HS)
 Mill Test Report Number: MTR-IL-2021-02
 Manufactured: February 2021

CHEMICAL ANALYSIS

Item	Spec limit	Test Result
Rapid Method, X-Ray (C114)		
SiO ₂ (%)		18.5
Al ₂ O ₃ (%)		3.7
Fe ₂ O ₃ (%)		3.5
CaO (%)		61.1
MgO (%)		4.6
SO ₃ (%)	3.0 max*	3.3
Loss on Ignition @ 950 (%)	10.0 max	4.7
Loss on Ignition @ 550 (%)		0.7
Inorganic Process Addition (Lafarge Cement Kiln Dust)	5.0 max	-
Adjusted Potential Phase Composition (C 150 - For information only)		
C ₃ S (%)	---	50
C ₂ S (%)	---	15
C ₃ A (%)	---	4
C ₄ AF (%)	---	10

PHYSICAL ANALYSIS

Item	Spec limit	Test Result
Blaine Fineness (m ² /kg) (C204)		499
Passing 45 µm (%) (C430)		99.2
Autoclave Expansion (%) (C151)**	-0.20 to 0.80	0.03
Air Content (%) (C186)	12 max	7
Compressive Strength (MPa[psi]) (C109)		
1 day		21.7 [3140]
3 days	13.0 [1890] min	31.8 [4610]
7 days	20.0 [2900] min	37.2 [5400]
28 days (Reflects previous month's data)	25.0 [3620] min	42.7 [6200]
Time of setting (minutes) (C191)		
Vicat Initial	45 min.	107
ASTM C1012 Expansion %, (6 months)***		0.043
Mortar Bar Expansion (%) (C1038)**	0.020 max	0.010

NaEq (%) 0.55

* May exceed the SO₃ maximum based on C1038 results of <0.020% expansion at 14 days.

** Current Production run not available - most recent provided

*** Performed by Lafarge Edmonton and/or Seattle Labs

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C 595-20 & AASHTO M 240-20 STANDARD SPECIFICATIONS FOR TYPE IL CEMENT.

Prepared By:

Lorraine Richards

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

Lorraine Richards
 Quality Control Coordinator



Cement Mill Test Report

Date of Issue: March 12, 2021

Plant: Exshaw AB
Product: Portland Limestone Cement Type IL(10) (HS)
Mill Test Report Number: MTR-IL-2021-02
Manufactured: February 2021

Additional Data - For information only.

Item	Test Result	Test Result
	Limestone	Inorganic Process Addition Lafarge Cement Kiln Dust
Amount (%)	9.5	-
SiO ₂ (%)	1.5	n/a
Al ₂ O ₃ (%)	0.7	n/a
Fe ₂ O ₃ (%)	0.3	n/a
CaO (%)	52.2	n/a
SO ₃ (%)	0.2	n/a
CO ₂ (%)	42	n/a

Base Cement Phase Composition - C150 - For information only.

Item	Test Result
C ₃ S (%)	55
C ₂ S (%)	17
C ₃ A (%)	4
C ₄ AF (%)	12

Specific Gravity: 3.13

Prepared By:

Lorraine Richards

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

Lorraine Richards
Quality Control Coordinator