



Cement Mill Test Report

Date of Issue: July 7, 2023

Plant: Exshaw AB
 Product: OneCem
 Mill Test Report Number: MTR-IL-2023-06
 Manufactured: June 1 - 30, 2023

CHEMICAL ANALYSIS

| Item | Spec limit | Test Result |
|---|------------|-------------|
| Rapid Method, X-Ray (C114) | | |
| SiO ₂ (%) | | 17.4 |
| Al ₂ O ₃ (%) | | 3.5 |
| Fe ₂ O ₃ (%) | | 3.2 |
| CaO (%) | | 60.4 |
| MgO (%) | | 4.4 |
| SO ₃ (%) | 3.0 max* | 3.3 |
| Loss on Ignition @ 950 (%) | 10.0 max | 6.6 |
| Loss on Ignition @ 550 (%) | | 0.9 |
| Inorganic Process Addition (Lafarge Cement Kiln Dust) | 5.0 max | - |
| Adjusted Potential Phase Composition (C 150 - For information only) | | |
| C ₃ S (%) | --- | 51 |
| C ₂ S (%) | --- | 11 |
| C ₃ A (%) | --- | 4 |
| C ₄ AF (%) | --- | 10 |

PHYSICAL ANALYSIS

| Item | Spec limit | Test Result |
|---|-----------------|-------------|
| Blaine Fineness (m ² /kg) (C204) | | 515 |
| Passing 45 μm (%) (C430) | | 99.4 |
| Autoclave Expansion (%) (C151)** | -0.20 to 0.80 | 0.13 |
| Air Content (%) (C186) | 12 max | 6 |
| Compressive Strength (MPa[psi]) (C109) | | |
| 1 day | | 18.7 [2713] |
| 3 days | 13.0 [1890] min | 31.2 [4518] |
| 7 days | 20.0 [2900] min | 36.0 [5215] |
| 28 days (Reflects previous month's data) | 25.0 [3620] min | 44.4 [6437] |
| Time of setting (minutes) (C191) | | |
| Vicat Initial | 45 min. | 98 |
| ASTM C1012 Expansion %, (6 months)*** | | 0.048 |
| Mortar Bar Expansion (%) (C1038)** | 0.020 max | |

NaEq (%) 0.51

* 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 595-21 & AASHTO M 240-20 STANDARD SPECIFICATIONS FOR TYPE IL (13) and (HS) CEMENT.

Our laboratory is AASHTO accredited. Grey highlighted tests are not within current Scope of Accreditation.



Certified to NSF/ANSI/CAN 61



AASHTO ACCREDITED

Western 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 - For information only.

| Item | Test Result | Test Result |
|------------------------------------|-------------|--|
| | Limestone | Inorganic Process Addition Lafarge Cement Kiln Dust |
| Amount (%) | 13.3 | - |
| SiO ₂ (%) | 1.6 | n/a |
| Al ₂ O ₃ (%) | 0.4 | n/a |
| Fe ₂ O ₃ (%) | 0.2 | n/a |
| CaO (%) | 49.5 | n/a |
| SO ₃ (%) | 0.2 | n/a |
| CO ₂ (%) | 42.5 | n/a |

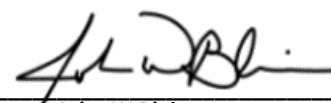
Base Cement Phase Composition - C150 - For information only.

| Item | Test Result |
|-----------------------|-------------|
| C ₃ S (%) | 59 |
| C ₂ S (%) | 12 |
| C ₃ A (%) | 4 |
| C ₄ AF (%) | 11 |

Specific Gravity: 3.11

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