



Cement Mill Test Report

Date of Issue: January 10, 2024

Plant: Exshaw AB
 Product: Portland Cement Type I/II
 Mill Test Report Number: ESW_Type I-II 2024-12
 Manufactured during the month of: December 2024

ASTM C 150-24 and AASHTO M 85-24 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 (%) | --- | 19.3 | Blaine Fineness (m ² /kg) (C204) | 260 min | 390 |
| Al ₂ O ₃ (%) | 6.0 max | 4.0 | Passing 45 μm (%) (C430) | --- | 98.4 |
| Fe ₂ O ₃ (%) | 6.0 max | 3.4 | Compressive strength (MPa, [psi]) (C 109) | | |
| CaO (%) | --- | 61.9 | 3 days | 12.0 [1740] min | 26.7 [3870] |
| MgO (%) | 6.0 max | 4.7 | 7 days | 19.0 [2760] min | 34.1 [4947] |
| SO ₃ (%)* | 3.0 max * | 3.3 | 28 days (Previous Month's Result) | | 44.8 [6503] |
| Loss on Ignition (%) | 3.5 max | 2.4 | Time of setting (minutes) | | |
| Insoluble Residue (%) | 1.5 max | 0.2 | Vicat Initial (C191) | 45 - 375 | 99 |
| CO ₂ (%) | --- | 1.8 | Mortar Bar Expansion (%) (C1038)** | 0.020 max | 0.011 |
| Limestone (%) | 5.0 max | 4.3 | | | |
| CaCO ₃ in Limestone (%) | 70 min | 97.0 | | | |
| Inorganic Process Addition (Lafarge Cement Kiln Dust) | 5.0 max | -- | | | |
| Adjusted Potential Phase Composition (C50) | | | | | |
| C ₃ S (%) | --- | 57 | | | |
| C ₂ S (%) | --- | 12 | | | |
| C ₃ A (%) | 8 max | 5 | | | |
| C ₄ AF (%) | --- | 10 | | | |
| C ₃ S+4.75*C ₃ A (%) | 100 max | 81 | | | |

ASTM C 150-17 and AASHTO M 85-17 Optional Requirements:

| | | | | | |
|---------------------------------|----------|------|----------------------|--------|----|
| Na ₂ O _{eq} | 0.60 max | 0.54 | False set (%) (C451) | 50 min | 89 |
|---------------------------------|----------|------|----------------------|--------|----|

* May exceed the SO₃ maximum based on C 1038 results of <0.020% expansion at 14 days.


We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of:

ASTM C 150-24 & AASHTO M 85-24 STANDARD SPECIFICATIONS FOR TYPES I / II CEMENTS; and
 ASTM C 150-24 & AASHTO M 85-24 OPTIONAL CHEMICAL REQUIREMENTS FOR TYPES I / II LOW ALKALI CEMENT.

AASHTO Accrediation Exceptions: C430

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



Certified to
NSF/ANSI/CAN 61



AASHTO
ACCREDITED



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Additional Data

| Item | Test Result | |
|------------------------------------|-------------|--|
| | Limestone | Inorganic Process Addition Lafarge Cement Kiln Dust |
| Amount (%) | 4.3 | -- |
| SiO ₂ (%) | 2.6 | 13.6 |
| Al ₂ O ₃ (%) | 0.5 | 3.4 |
| Fe ₂ O ₃ (%) | 0.2 | 2.0 |
| CaO (%) | 47.8 | 50.2 |
| SO ₃ (%) | 0.2 | 4.7 |
| CO ₂ (%) | 42.4 | n/a |

Base Cement Phase Composition

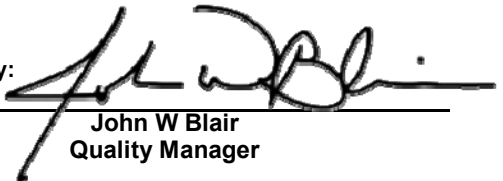
| Item | Test Result |
|-----------------------|-------------|
| C ₃ S (%) | 59 |
| C ₂ S (%) | 13 |
| C ₃ A (%) | 5 |
| C ₄ AF (%) | 11 |

Specific Gravity: 3.16 For information purposes only.

We certify that the data above reflects the materials used in cement manufacture during the production period indicated.

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