



3250 Linebaugh Rd.  
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 Telephone (800) 762-0040  
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**CEMENT  
MILL  
TEST**

**Cement Identified as:** Type I, Type II **Date:** 06/28/21

**Production Period:** May, 2021 **Silos:** 2, 6

| STANDARD CHEMICAL REQUIREMENTS<br>(ASTM C 114)               | SPECIFICATIONS    | ASTM C 150    |               | AASHTO      | RESULTS              |
|--|-------------------|---------------|---------------|-------------|----------------------|
|  |                   | TYPE I        | TYPE II (MH)  | M85 Type I  |                      |
| Silicon Dioxide (SiO <sub>2</sub> ), %                       |                   | -----         | -----         | -----       | <b>19.3</b>          |
| Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ), %          | Maximum           | -----         | 6.0           | -----       | <b>4.6</b>           |
| Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ), %            | Maximum           | -----         | 6.0           | -----       | <b>3.1</b>           |
| Calcium Oxide (CaO), %                                       |                   | -----         | -----         | -----       | <b>62.6</b>          |
| Magnesium Oxide (MgO), %                                     | Maximum           | 6.0           | 6.0           | 6.0         | <b>4.8</b>           |
| Sulfur Trioxide (SO <sub>3</sub> ), % <sup>A</sup>           | Maximum           | 3.0           | 3.0           | 3.0         | <b>3.3</b>           |
| Loss on Ignition (LOI), %                                    | Maximum           | 3.5           | 3.5           | 3.5         | <b>2.7</b>           |
| Insoluble Residue, %   | Maximum           | 1.50          | 1.50          | 1.5         | <b>0.67</b>          |
| Alkalies (Na <sub>2</sub> O equivalent), %                   |                   | -----         | -----         | -----       | <b>0.85</b>          |
| Tricalcium Silicate (C <sub>3</sub> S), Potential %          |                   | -----         | -----         | -----       | <b>61</b>            |
| Dicalcium Silicate (C <sub>2</sub> S), Potential %           |                   | -----         | -----         | -----       | <b>7</b>             |
| Tricalcium Aluminate (C <sub>3</sub> A), Potential %         | Maximum           | -----         | 8             | -----       | <b>7</b>             |
| Tetracalcium Aluminoferrite (C <sub>4</sub> AF), Potential % |                   | -----         | -----         | -----       | <b>9</b>             |
| C <sub>3</sub> S + 4.75C <sub>3</sub> A                      | Maximum           |               | 100           |             | <b>92</b>            |
| CO <sub>2</sub> , %  |                   |               |               |             | <b>1.6</b>           |
| Limestone, %   | Maximum           | 5.0           | 5.0           |             | <b>3.8</b>           |
| CaCO <sub>3</sub> in Limestone, %                            | Minimum           | 70            | 70            |             | <b>97</b>            |
| <b>PHYSICAL REQUIREMENTS</b>                                 |                   |               |               |             |                      |
| (ASTM C 204) Blaine Fineness, m <sup>2</sup> /kg             | Range             | 260 Min.      | 260 - 430     | 260 Min.    | <b>415</b>           |
| (ASTM C 191) Time of Setting (Vicat)                         |                   |               |               |             |                      |
| Initial Set, minutes   | Minimum           | 45            | 45            | 45          | <b>104</b>           |
| Final Set, minutes   | Maximum           | 375           | 375           | 375         | <b>211</b>           |
| (ASTM C 185) Air Content, %                                  | Maximum           | 12            | 12            | 12          | <b>7</b>             |
| (ASTM C 151) Autoclave Expansion, %                          | Maximum           | 0.80          | 0.80          | 0.80        | <b>0.16</b>          |
| (ASTM C 1038) Expansion in Water, %                          | Maximum           | 0.02          | 0.02          | 0.02        | <b>0.015</b>         |
| (ASTM C 187) Normal Consistency, %                           |                   | -----         | -----         | -----       | <b>26.0</b>          |
| Heat of Hydration (ASTM C 1702)                              |                   |               |               |             |                      |
| 3 day, cal/g   | Most Recent Value |               |               |             | <b>82</b>            |
| (ASTM C 109) Compressive Strength, psi (Mpa)                 |                   |               |               | -----       |                      |
| 1 Day  |                   | -----         | -----         | -----       | <b>2657 ( 18.3 )</b> |
| 3 Day  | Minimum           | 1740 ( 12.0 ) | 1450 ( 10.0 ) | 1740 (12.0) | <b>4271 ( 29.4 )</b> |
| 7 Day  | Minimum           | 2760 ( 19.0 ) | 2470 ( 17.0 ) | 2760 (19.0) | <b>5109 ( 35.2 )</b> |
| 28 Day   | Minimum           | 4060 ( 28.0 ) | 4060 ( 28.0 ) | 4060 (28.0) | <b>6101 ( 42.1 )</b> |

<sup>A</sup> Per ASTM C150 Table 1 footnote D

We hereby certify that this cement conforms to all of the standard requirements for portland cement in the above specification for the type specified.

By: Rusty Strader

Physical Testing completed by: DG, MS  
 Chemical Testing completed by: TA, NC, KL, NM

Rusty Strader  
 Quality Control Manager  
 Fairborn Cement Company



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**Additional Data**

| Type       | Inorganic Processing Addition Data |           |
|------------|------------------------------------|-----------|
|            | Baghouse Dust                      | Limestone |
| Amount (%) | 0.8                                | 3.8       |
| SiO2 (%)   | 12.2                               | 0.9       |
| Al2O3 (%)  | 4.2                                | 0.6       |
| Fe2O3 (%)  | 1.7                                | 0.6       |
| CaO (%)    | 42.0                               | 45.9      |
| SO3 (%)    | 0.6                                | 0.2       |

Base cement Phase Composition

|          |    |
|----------|----|
| C3S (%)  | 56 |
| C2S (%)  | 13 |
| C3A (%)  | 7  |
| C4AF (%) | 9  |

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