

**CEMENT MILL TEST RESULTS**

This form is for use by a cement mill in reporting test results to the Pennsylvania Department of Transportation, Bureau of Project Delivery Construction and Materials, 81 Lab Lane, Harrisburg, Pa, 17110.

**Complete fillable fields, print and sign before submitting.**

Mill Argos Roberta Plant Mill Location Calera, Alabama  
 Silo/Lot Number 1R2NOV Dates(s) Produced (Ground) 11/1/2021 - 11/30/2021  
 Cement Type Type I/II Other \_\_\_\_\_  
 Quantity and Unit 117,257 MT Mill Test Date 12/15/2021

List below only those properties required by the Specification for type of cement indicated

| CHEMICAL RESULTS                                      |       |   |
|---|-------|---|
| Silica (SiO <sub>2</sub> )                            | 19.7  | % |
| Alumina (Al <sub>2</sub> O <sub>3</sub> )             | 4.7   | % |
| Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )          | 3.3   | % |
| Lime (CaO)  | 62.9  | % |
| Magnesia (MgO)  | 3.0   | % |
| Sulfur Trioxide (SO <sub>3</sub> )                    | 3.2   | % |
| Loss on Ignition                                      | 2.8   | % |
| Insoluble Residue                                     | 0.39  | % |
| Alkalies (Na <sub>2</sub> O + 0.658 K <sub>2</sub> O) | 0.41  | % |
| Chloride  | 0.009 | % |
| Carbon Dioxide (CO <sub>2</sub> )                     | 1.7   | % |
| Potential phase composition                           |       |   |
| Tricalcium Silicate (C <sub>3</sub> S)                | 54    | % |
| Dicalcium Silicate (C <sub>2</sub> S)                 | 15    | % |
| Tricalcium Aluminate (C <sub>3</sub> A)               | 7     | % |
| Tetracalcium Aluminoferrite (C <sub>4</sub> AF)       | 10    | % |
| C <sub>4</sub> AF + 2(C <sub>3</sub> A)               | 24    | % |
| C <sub>3</sub> S + 4.75 C <sub>3</sub> A              | 83    | % |

| LIMESTONE                                    |      |   |
|--|------|---|
| Processing Addition Data                     |      |   |
| Amount                                       | 2.8  | % |
| Silica (SiO <sub>2</sub> )                   | 0.7  | % |
| Alumina (Al <sub>2</sub> O <sub>3</sub> )    | 0.4  | % |
| Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> ) | 0.2  | % |
| CaCO <sub>3</sub> in Limestone               | 98   | % |
| Lime (CaO)                                   | 53.9 | % |
| Sulfur Trioxide (SO <sub>3</sub> )           | 0.1  | % |
| Carbon Dioxide (CO <sub>2</sub> )            | 42.9 | % |
| Loss on Ignition                             |      | % |

| PHYSICAL RESULTS                  |       |                    |
|-----------------------------------|-------|--------------------|
| Air Content (ASHTO T 137)         | 8     | %                  |
| Fineness (Blaine)                 | 411   | m <sup>2</sup> /kg |
| Soundness-Autoclave Expansion     | 0.08  | %                  |
| Fineness (No. 325)                | 97    | %                  |
| Compressive Strength:             |       |                    |
| 3 Day                             | 4080  | (28.1) psi (Mpa)   |
| 7 Day                             | 5080  | (35.0) psi (Mpa)   |
| 28 Day                            | 6780  | (46.8) psi (Mpa)   |
| Normal Consistency (AASHTO T 129) | 25.9  | %                  |
| Time of Setting by Vicat          |       |                    |
| Initial Set                       | 110   | min.               |
| Final Set                         | 220   | min.               |
| False Set                         | 81    | %                  |
| ASTM C1038 Mortar Bars            | 0.009 | %                  |
| Heat of Hydration (7 day)         |       | cal/g (KJ/kg)      |
| Date Performed                    |       |                    |

| BASE CEMENT COMPOSITION                         |    |   |
|---|----|---|
| Tricalcium Silicate (C <sub>3</sub> S)          | 57 | % |
| Dicalcium Silicate (C <sub>2</sub> S)           | 16 | % |
| Tricalcium Aluminate (C <sub>3</sub> A)         | 7  | % |
| Tetracalcium Aluminoferrite (C <sub>4</sub> AF) | 10 | % |

**INORGANIC**  
Processing Addition Data

|   |               |   |
|---|---------------|---|
| Type  | Baghouse Dust |   |
| Source  | Argos Roberta |   |
| Amount  | 1.8           | % |
| Silica (SiO <sub>2</sub> )                            | 12.3          | % |
| Alumina (Al <sub>2</sub> O <sub>3</sub> )             | 3.5           | % |
| Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )          | 1.6           | % |
| Lime (CaO)  | 48.4          | % |
| Sulfur Trioxide (SO <sub>3</sub> )                    | 1.1           | % |
| Loss on Ignition                                      |               | % |
| Insoluble Residue                                     |               | % |
| Sodium Oxide (Na <sub>2</sub> O)                      |               | % |
| Potassium Oxide (K <sub>2</sub> O)                    |               | % |
| Alkalies (Na <sub>2</sub> O + 0.658 K <sub>2</sub> O) |               | % |
| Specific Gravity                                      |               |   |

**ORGANIC**  
Processing Addition Data

|                  |  |   |
|------------------|--|---|
| Type             |  |   |
| Source           |  |   |
| Amount           |  | % |
| Specific Gravity |  |   |
| Water Content    |  | % |

We certify that the above-described cement, at the time of shipment, meets the chemical and physical requirements of AASHTO M 85 (current version)

Authorized Signature  Title Quality Coordinator Date 12/15/21