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STANDARD

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Standard Specification for NATURAL CEMENT¹

This Standard is issued under the fixed designation C 10; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This specification covers two types of natural cement as follows:

1.1.1 *Type N*—Natural cement for use with portland cement in general concrete construction.

1.1.2 *Type NA*—Air-entraining natural cement for the same uses as Type N.

2. Basis of Purchase

2.1 The purchaser shall specify the type of cement desired.

3. Definition

3.1 *natural cement*—a hydraulic cement produced by calcining a naturally occurring argillaceous limestone at a temperature below the sintering point and then grinding to a fine powder.

4. Additions During Grinding

4.1 No addition to this product shall be made subsequent to calcination other than water or untreated calcium sulfate, or both, except at the option of the manufacturer, processing additions may be used in the manufacture of the cement, provided such materials in the amounts used have been shown to be not harmful in accordance with ASTM Specification C 465, for Processing Additions for Use in the Manufacture of Hydraulic Cements.² For air-entraining natural cement, an addition shall be interground that will produce air-entraining natural cement meeting this specification. This addition shall conform to ASTM Specification C 226, for Air-Entraining Additions for Use in the Manufacture of Air-Entraining Portland Cement.²

5. Chemical Requirements

5.1 The loss on ignition of the cement shall not exceed 12 weight percent.

5.2 The insoluble residue of the cement shall not be less than 2 weight percent.

6. Physical Requirements

6.1 Natural cements shall conform to the respective physical requirements prescribed in Table 1.

6.2 The cement used in preparing the test specimens for normal consistency, time of setting, strength, and air-entrainment test shall be the natural cement being tested. The cement used in preparing the test specimens for autoclave expansion shall be a blend of 75 percent of the natural cement being tested and 25 weight percent of portland cement conforming to the requirements for Type II cement in ASTM Specification C 150, for Portland Cement,² unless otherwise specified by the purchaser. The natural cement and the portland cement shall be dry mixed to a uniform blend before water is added.

7. Acceptance and Rejection

7.1 Natural cement may be accepted on the basis of 7-day tests. If the natural cement fails to pass 7-day strength requirements, the cement may be accepted on the basis of 28-day strength tests.

7.2 Cement failing to meet the initial test for autoclave soundness may be accepted if it

¹ This specification is under the jurisdiction of ASTM Committee C-1 on Cement.

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² *Annual Book of ASTM Standards*, Part 13.

passes a retest on a second and third series of test specimens.

7.3 The cement shall be rejected if it fails to meet any of the requirements of this specification subject to specific modification by the purchaser or to the modifications indicated herein, or both.

7.4 Cement remaining in storage for a period longer than 6 months after test may be retested and shall be rejected if it fails to meet any of the requirements of this specification at that time.

7.5 Tentative or provisional acceptance of the cement shall not deprive the purchaser of the right of rejection in the event final tests or retests fail to meet applicable requirements.

8. Packaging and Marking

8.1 When the cement is delivered in packages, the name and brand of the manufacturer, the type of natural cement contained therein, as defined under this specification and the weight of the cement contained therein, shall be plainly indicated on each package. Similar information shall be provided in the shipping advices accompanying the shipment of packaged or bulk cement. All packages shall be in good condition at the time of inspection.

8.2 Packages varying more than 3 percent from the weight marked thereon may be rejected; and if the average weight of packages in any shipment, as shown by weighing 50 packages taken at random, is less than that marked on the packages, the entire shipment may be rejected.

9. Test Methods

9.1 Sample the cement and determine the properties enumerated in this specification in accordance with the following ASTM methods:

9.1.1 *Sampling*—Methods C 183, Sampling Hydraulic Cement.²

9.1.2 *Chemical Analysis*—Methods C 114, Chemical Analysis of Hydraulic Cement,² Sections 35 to 37 and 65 to 68.

9.1.3 *Fineness*—Method C 204, Test for Fineness of Portland Cement by Air Permeability Apparatus.² In this fineness determination the specific gravity of natural cement shall be considered to be 2.90. Tests shall be made at a porosity of 0.530 ± 0.005 . In case of dispute, the true specific gravity used shall be as determined in accordance with ASTM Method C 188, Test for Specific Gravity of Hydraulic Cement.²

9.1.4 *Autoclave Expansion*—Method C 151, Test for Autoclave Expansion of Portland Cement,² with the following modification:

9.1.4.1 The cement used in preparing the test specimens shall be a blend of 75 weight percent of the natural cement to be tested with 25 weight percent of portland cement conforming to the requirements of Type II cement in Specification C 150.

9.1.5 *Time of Setting*—Method C 191, Test for Time of Setting of Hydraulic Cement by Vicat Needle.²

9.1.6 *Air Content of Mortar*—Method C 185, Test for Air Content of Hydraulic Cement Mortar.²

9.1.7 *Compressive Strength*—The compressive strength shall be determined for mortar cubes prepared as follows:

9.1.7.1 The proportions shall be 1 part of cement to 1 part of standard sand by weight.

9.1.7.2 The standard sand shall be 20–30 Ottawa sand conforming to Section 3 of ASTM Method C 190, Test for Tensile Strength of Hydraulic Cement Mortars.²

9.1.7.3 The mortar shall be mixed in accordance with Section 6.1.2 of Method C 190.

9.1.7.4 The 2-in. (50.8-mm) cube specimens shall be molded using the same procedure as described for briquet specimens in Section 6.2 of Method C 190.