Designation: C 87 – 03

Standard Test Method for Effect of Organic Impurities in Fine Aggregate on Strength of Mortar[1]

This standard is issued under the fixed designation C 87; 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. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope *

1.1 This test method covers the determination of the effect on mortar strength of the organic impurities in fine aggregate, whose presence is indicated using Test Method C 40. Comparison is made between compressive strengths of mortar made with washed and unwashed fine aggregate.

1.2 The SI values shown are to be regarded as the standard. The inch-pound values shown in parentheses are provided for information purposes only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*(**Warning—**Fresh hydraulic cementitous mixtures are caustic and may cause chemical burns to exposed skin and tissue upon prolonged exposure.)[2]

2. Referenced Documents

2.1 *ASTM Standards:*

C 33 Specification for Concrete Aggregates[3]

C 40 Test Method for Organic Impurities in Fine Aggregates for Concrete[3]

C 109/C 109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)[4]

C 128 Test Method for Density, Relative Density, (Specific Gravity), and Absorption of Fine Aggregate[3]

C 150 Specification for Portland Cement[4]

C 230 Specification for Flow Table for Use in Tests of Hydraulic Cement[4]

C 305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency[4]

C 511 Specification for Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes[4]

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials[3]

C 702 Practice for Reducing Samples of Aggregate to Testing Size[3]

D 75 Practice for Sampling Aggregates[5]

D 3665 Practice for Random Sampling of Construction Materials[5]

3. Significance and Use

3.1 This test method is of significance in making a final determination of the acceptability of fine aggregates with respect to the requirements of Specification C 33 concerning organic impurities.

3.2 This test method is applicable to those samples which, when tested in accordance with Test Method C 40, have produced a supernatant liquid with a color darker than that of the reference standard color plate No. 3 or color solution.

4. Basis for Comparison

4.1 The fine aggregate shall be compared in mortar, as described in this test method, with a sample of the same aggregate that has been washed in a 3 % solution of sodium hydroxide followed by thorough rinsing in water. The washing shall be repeated until the supernatant liquid obtained in Test Method C 40 has a color lighter than the reference standard. The washing shall be performed in such a way as to minimize the loss of fines, so that the washed aggregate has a fineness modulus within 0.10 of that of the unwashed aggregate. The prepared aggregate shall be checked with a suitable indicator such as phenolphthalein, pH paper or by using a pH meter to assure that sodium hydroxide has been removed prior to preparation of the mortar.

4.2 Unless otherwise specified or permitted, strength comparisons shall be made at 7 days in accordance with the following conditions:

4.2.1 Mix three batches of mortar with the prepared aggregate washed in sodium hydroxide and three batches with the

[1] This test method is under the jurisdiction of ASTM Committee C09 on Concretes and Concrete Aggregates and is the direct responsibility of Subcommittee C09.20 on Normal Weight Aggregates.

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[2] See section on Safety Precautions, *Manual of Aggregate and Concrete Testing, Annual Book of ASTM Standards,* Vol 04.02.

[3] *Annual Book of ASTM Standards,* Vol 04.02.

[4] *Annual Book of ASTM Standards,* Vol 04.01.

[5] *Annual Book of ASTM Standards,* Vol 04.03.

***A Summary of Changes section appears at the end of this standard.**