Designation: C856 – 14

Standard Practice for Petrographic Examination of Hardened Concrete[1]

This standard is issued under the fixed designation C856; 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.

1. Scope*

1.1 This practice outlines procedures for the petrographic examination of samples of hardened concrete. The samples examined may be taken from concrete constructions, they may be concrete products or portions thereof, or they may be concrete or mortar specimens that have been exposed in natural environments, or to simulated service conditions, or subjected to laboratory tests. The phrase "concrete constructions" is intended to include all sorts of objects, units, or structures that have been built of hydraulic cement concrete.

NOTE 1—A photographic chart of materials, phenomena, and reaction products discussed in Sections 8 – 13 and Tables 1-6 are available as Adjunct C856 (ADJCO856).

1.2 The petrographic procedures outlined herein are applicable to the examination of samples of all types of hardened hydraulic-cement mixtures, including concrete, mortar, grout, plaster, stucco, terrazzo, and the like. In this practice, the material for examination is designated as "concrete," even though the commentary may be applicable to the other mixtures, unless the reference is specifically to media other than concrete.

NOTE 2—Appendix X1 outlines an uranyl acetate method for identifying locations where alkali-silica gel may be present. It is a requirement that the substances in those locations must be identified using any other more definitive techniques, such as petrographic microscopy.

1.3 The purposes of and procedures for petrographic examination of hardened concrete are given in the following sections:

	Section
Qualifications of Petrographers and Use of Technicians	4
Purposes of Examination	5
Apparatus	6
Selection and Use of Apparatus	7
Samples	8
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Specimen Preparation	10
Visual and Stereomicroscope Examination	11
Polarizing Microscope Examination	12
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1.4 The values stated in inch-pound units are to be regarded as the standard. The SI units in parentheses are provided for information purposes only.

1.5 *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.* A specific hazard statement is given in 6.2.10.1.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C125 Terminology Relating to Concrete and Concrete Aggregates

C215 Test Method for Fundamental Transverse, Longitudinal, and Torsional Resonant Frequencies of Concrete Specimens

C227 Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)

C342 Test Method for Potential Volume Change of Cement-Aggregate Combinations (Withdrawn 2001)[3]

C441 Test Method for Effectiveness of Pozzolans or Ground Blast-Furnace Slag in Preventing Excessive Expansion of Concrete Due to the Alkali-Silica Reaction

C452 Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate

C457 Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete

C496/C496M Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens

C597 Test Method for Pulse Velocity Through Concrete

C803/C803M Test Method for Penetration Resistance of Hardened Concrete

C805 Test Method for Rebound Number of Hardened Concrete

C823 Practice for Examination and Sampling of Hardened Concrete in Constructions

[1] This practice is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.65 on Petrography.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

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

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