



Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)¹

This standard is issued under the fixed designation C289; 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 U.S. Department of Defense.

1. Scope*

1.1 This test method covers chemical determination of the potential reactivity of an aggregate with alkalies in portland-cement concrete as indicated by the amount of reaction during 24 h at 80 °C between 1 *N* sodium hydroxide solution and aggregate that has been crushed and sieved to pass a 300- μ m sieve and be retained on a 150- μ m sieve.

1.2 The values stated in SI units are to be regarded as standard.

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.* A specific precautionary statement is given in 5.7.1.

2. Referenced Documents

2.1 ASTM Standards:²

- C114 Test Methods for Chemical Analysis of Hydraulic Cement
- C227 Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
- C295 Guide for Petrographic Examination of Aggregates for Concrete
- C702 Practice for Reducing Samples of Aggregate to Testing Size
- C1005 Specification for Reference Masses and Devices for Determining Mass and Volume for Use in the Physical Testing of Hydraulic Cements
- C1260 Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)

¹ This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.26 on Chemical Reactions.

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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.

- C1293 Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction
- D75 Practice for Sampling Aggregates
- D1193 Specification for Reagent Water
- D1248 Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
- E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves
- E60 Practice for Analysis of Metals, Ores, and Related Materials by Spectrophotometry
- 2.2 American Chemical Society Documents:
Reagent Chemicals, American Chemical Society Specifications

NOTE 1—For suggestions on the testing of reagents not listed by the American Chemical Society, see “Reagent Chemicals and Standards,” by Joseph Rosin, D. Van Nostrand Co., Inc., New York, NY, and the “United States Pharmacopeia.”

3. Significance and Use

3.1 When this test method is used to evaluate the potential reactivity of siliceous components in the aggregate with alkalies in hydraulic-cement concrete, it must be used in combination with other methods. Do not use the results of tests by this test method as the sole basis for acceptance or rejection for sources with regard to ASR.

3.2 Reactions between a sodium hydroxide solution and siliceous components in the aggregate have been shown to correlate with the performance of some aggregates in concrete structures. The results from this test method can be obtained quickly, and, while not completely reliable in all cases, they can provide useful data.

3.3 This test method can be employed as a quality control tool to periodically check samples from an existing source with an acceptable service history.

4. Apparatus

4.1 *Scales*—The scales and weights used for weighing materials shall conform to the requirements prescribed in Specification C1005.

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