



Designation: C 1293 – 95

Standard Test Method for Concrete Aggregates by Determination of Length Change of Concrete Due to Alkali-Silica Reaction¹

This standard is issued under the fixed designation C 1293; 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 test method covers the determination, by measurement of length change of concrete prisms, of the susceptibility of a sample of an aggregate for participation in expansive alkali-silica reaction involving hydroxide ions associated with alkalies (sodium and potassium).

1.2 *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.*

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound values in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

C 1260 Test Method for Potential Alkali Reactivity of Aggregates (Mortar Bar Method)² (formerly Proposal P 214)

C 33 Specification for Concrete Aggregates²

C 125 Terminology Relating to Concrete and Concrete Aggregates²

C 138 Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete²

C 143 Test Method for Slump of Hydraulic Cement Concrete²

C 150 Specification for Portland Cement³

C 157 Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete²

C 192 Practice for Making and Curing Concrete Test Specimens in the Laboratory²

C 227 Test Method for Potential Alkali Reaction of Cement-Aggregate Combinations (Mortar-Bar Method)²

C 289 Test Method for Potential Reactivity of Aggregates (Chemical Method)²

C 294 Descriptive Nomenclature of Constituents of Natural Mineral Aggregates²

C 295 Guide for Petrographic Examination of Aggregates for Concrete²

C 490 Practice for Use of Apparatus for the Determination of Length Change of Hardened Cement Paste, Mortar, and Concrete³

C 511 Specification for Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes³

C 702 Practice for Reducing Field Samples of Aggregate to Testing Size²

C 856 Practice for Petrographic Examination of Hardened Concrete²

D 75 Practice for Sampling Aggregates³

D 1193 Specification for Reagent Water⁴

2.2 CSA Standards:⁵

CSA A23.1-M90 Concrete Materials and Methods of Concrete Construction, Appendix B

CSA A23.2-14A-M90 Potential Expansivity of Aggregates (Procedure for Length Change due to Alkali-Aggregate Reaction in Concrete Prisms)

3. Terminology

3.1 Terminology used in this standard is as given in Terminology C 125 or Descriptive Nomenclature C 294.

4. Significance and Use

4.1 Alkali-silica reaction is a chemical interaction between some siliceous constituents of concrete aggregates or particles of such constituents in fine aggregates and hydroxyl ions **(1)**.⁶ The concentration of hydroxyl ion within the concrete is predominantly controlled by the concentration of sodium and potassium **(2)**.

4.2 This test method is intended to evaluate the potential of an aggregate to expand deleteriously due to any form of alkali-silica reactivity **(3,4)**.

4.3 When selecting a sample or deciding on the number of samples for test, it is important to recognize the variability in lithography of material from a given source, whether a deposit of sand, gravel, or a rock formation of any origin. For specific

¹ This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.26 on Chemical Reactions.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.01.

⁴ *Annual Book of ASTM Standards*, Vol 11.01.

⁵ Canadian Standards Association Standards for Concrete Construction, 173 Rexdale Blvd., Rexdale, Ontario Canada, M9W1R3.

⁶ The boldface numbers in parentheses refer to the list of references at the end of this test method.