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Australian Standard®

Methods for sampling and testing aggregates
Method 60.1: Potential alkali-silica reactivity—Accelerated mortar bar method

PREFACE

This Standard was prepared by Standards Australia Committee CE-012, Aggregates and Rock for Engineering Purposes.

This Standard incorporates Amendment No. 1 (February 2019). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This test method for alkali silica reaction is based on international methods, including ASTM C1260 *Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar–Bar Method*). However, the classification limits for the test have been drawn from local methods based on Australian experience of alkali-silica reaction. The method has been modified to include procedures, based on Australian and international research, intended to improve repeatability and reproducibility.

If a blended cement is used in this test method, the classification limits given in this method may not be applicable.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

WARNING: SOME OF THE CHEMICALS OR PROCEDURES SPECIFIED IN THIS STANDARD COULD LEAD TO A HAZARDOUS SITUATION IF CORRECT SAFETY MEASURES ARE NOT FOLLOWED. PERSONS USING THIS AUSTRALIAN STANDARD MUST BE FAMILIAR WITH NORMAL LABORATORY PRACTICE. THIS STANDARD DOES NOT ADDRESS THE SAFETY PROBLEMS, IF ANY, ASSOCIATED WITH ITS USE. IT IS THE RESPONSIBILITY OF THE LEGAL ENTITY USING THIS STANDARD TO ESTABLISH APPROPRIATE SAFETY AND HEALTH PRACTICES, TO ENSURE COMPLIANCE WITH ANY NATIONAL, STATE OR LOCAL REGULATORY REQUIREMENTS, AND TO INSTRUCT IN, AND ENFORCE COMPLIANCE OF, THE SAFETY AND HEALTH PRACTICES.

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(a) Paragraph 4 of Clause 1, *Scope*.

(b) Clause 4.5, *Containers* (modified).

(c) Clause 4.8, *Mixer, paddle and mixing bowl* (modified).

(d) Note to Item (b) of Clause 6.5.2, *Preparation of moulds*.

(e) Clause 6.5.7, *Moulding of test specimens* (modified).

(f) Items (b) to (e) of Clause 7.1, *Initial storage and reading* (modified).

(g) Items (b) to (e) of Clause 7.2, *Zero readings* (modified).

METHOD

1 SCOPE

This Standard sets out the procedure to classify aggregate according to its susceptibility to alkali attack leading to expansive reactions in concrete. This expansion-inducing reaction is known as alkali-silica reaction (ASR) (see Note). The classification is determined from the measured increase in length of mortar bars prepared using the aggregate under consideration, during storage of the bars under the prescribed test conditions.

NOTE: The test is suitable for alkali-silica reactivity. It is not suitable for alkali-carbonate reactivity.

This test method permits detection of the potential for deleterious alkali-silica reaction of aggregate using mortar bars exposed to a solution of sodium hydroxide over a period of 21 days.

Certain rock types, such as deformed granites, granitic gneisses and some metabasalts, fail to react to this procedure and yet are deleteriously expansive in the field. By contrast, some glassy basalt aggregates, which are not reactive in concrete when used as coarse aggregate, may cause excessive expansion when used in fine aggregate in this test. With such aggregates, prior field experience and concrete prism test results should be considered in determining the potential for alkali-silica reactivity (see SA HB 79 for further information).

This method does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this Standard to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

NOTES:

1 See Preface for copyright information about this Clause.

2 Appendix A provides guidance on alkali-silica reaction.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1012	Methods of testing concrete	
1012.13	Method 13:	Determination of the drying shrinkage of concrete for samples prepared in the field or in the laboratory
1141	Methods for sampling and testing aggregates	
1141.3.1	Method 3.1:	Sampling—Aggregates
1141.3.2	Method 3.2:	Sampling—Rock spalls and boulders
1141.60.2	Method 60.2:	Potential alkali-silica reactivity—Concrete prism test

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