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Australian STANDARD®

STANDARDS Australia

Methods for sampling and testing aggregates

Method 60.3: Combinations of supplementary cementitious materials and aggregates — Potential alkali silica reactivity — Accelerated mortar bar method



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Australian Flexible Pavement Association
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This page explains the meaning of the language and structure of this Standard.

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Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

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(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

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

The objective of this document is to set out the procedure to classify an aggregate when used in conjunction with a predetermined combination of cementitious materials, and potentially mitigate its susceptibility to alkali attack leading to expansive reactions in concrete containing a combination of cementitious materials. This expansion-inducing reaction is known as alkali-silica reaction (ASR).

This test method for alkali silica reaction is based on international methods, 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.

WARNING — SOME OF THE CHEMICALS OR PROCEDURES SPECIFIED IN THIS DOCUMENT COULD LEAD TO A HAZARDOUS SITUATION IF CORRECT SAFETY MEASURES ARE NOT FOLLOWED. PERSONS USING THIS DOCUMENT NEED TO BE FAMILIAR WITH NORMAL LABORATORY PRACTICE. THIS DOCUMENT DOES NOT ADDRESS THE SAFETY PROBLEMS, IF ANY, ASSOCIATED WITH ITS USE. IT IS THE RESPONSIBILITY OF THE LEGAL ENTITY USING THIS DOCUMENT 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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Contents

Page

Preface ..... **v**
Introduction ..... **viii**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **2**
4 Apparatus **2**
4.1 General 2
4.2 Standard mortar and mould 2
4.3 Laboratory mixing area and humidity-controlled storage area 2
4.4 Balance 2
4.5 Oven 2
4.6 Timing device 2
4.7 Measuring cylinders 2
4.8 Comparator 2
4.8.1 General 2
4.8.2 Vertical comparator 3
4.8.3 Horizontal or inclined comparator 3
4.8.4 Reference bar 3
4.8.5 Operator precision check 3
4.9 Containers 3
4.10 Gauge studs 4
4.11 Length gauge 4
4.12 Mixer, paddle and mixing bowl 4
4.13 Moulds 4
4.14 Oven or water bath 4
4.15 Sieves 4
4.16 Sodium hydroxide bath 5
4.17 Tamper and trowel 5
4.18 Temperature recording apparatus 5
5 Reagents **5**
5.1 General 5
5.2 Sodium hydroxide solution 5
5.3 Hydrochloric acid solution 6
6 Sampling, preparation of aggregates and preparation of test specimens **6**
6.1 Sampling of aggregate 6
6.2 Initial preparation of aggregate 6
6.2.1 General 6
6.2.2 Fine aggregates 6
6.2.3 Coarse aggregate 7
6.3 Final preparation of manufactured fine aggregate and coarse aggregate 7
6.4 Selection and preparation of cementitious materials 7
6.4.1 Selection of cementitious materials 7
6.4.2 Preparation of cementitious materials 8
6.5 Preparation of test specimens 8
6.5.1 General 8
6.5.2 Preparation of moulds 8
6.5.3 Proportioning of mortar 8
6.5.4 Conditioning of materials 9
6.5.5 Mixing of mortar 9
6.5.6 Measuring of flow 9
6.5.7 Moulding of test specimens 9
7 Procedure **10**

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7.1 Initial storage and reading 10
7.2 Zero readings 10
7.3 Subsequent storage and measurement 11
8 Calculation 11
9 Aggregate reactivity classification 11
10 Test report 12
Appendix A (informative) **Guidance on alkali-silica reaction 13**
Bibliography 14

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Introduction

Certain rock types, such as deformed granites, granitic gneisses and some meta basalts, fail to react to this procedure and can have the potential to be deleteriously expansive in the field. By contrast, some glassy basalt aggregates, which are not reactive in concrete when used as coarse aggregate, can 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 (refer to SA HB 79 for further information).

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1 Scope

This document sets out the procedure to classify an aggregate when used in conjunction with a predetermined combination of cementitious materials, and potentially mitigate its susceptibility to alkali attack leading to expansive reactions in concrete. This expansion-inducing reaction is known as alkali-silica reaction (ASR). The classification is determined from the measured increase in length of mortar bars prepared using the aggregate and a combination of cementitious materials under consideration, during storage of the bars under the prescribed test conditions. This test is not suitable for alkali-carbonate reactivity.

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

NOTE 1 Appendix A provides guidance on alkali-silica reaction.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1012.8.4, *Methods of testing concrete, Method 8.4: Determination of the drying shrinkage of concrete for samples prepared in the field or in the laboratory*

AS 1141.1, *Methods for sampling and testing aggregates, Part 1: Definitions*

AS 1141.2, *Methods for sampling and testing aggregates, Method 2: Basic testing equipment*

AS 1141.3.1, *Methods for sampling and testing aggregates, Method 3.1: Sampling — Aggregates*

AS 1141.3.2, *Methods for sampling and testing aggregates, Method 3.2: Sampling — Rock spalls and boulders*

AS 2350.12, *Methods of testing portland, blended and masonry cements, Method 12: Preparation of a standard mortar and moulding of specimens*

AS 2701, *Methods of sampling and testing mortar for masonry construction*

AS 3582.1, *Supplementary cementitious materials, Part 1: Fly ash*

AS 3582.2, *Supplementary cementitious materials, Part 2: Slag — Ground granulated blast-furnace*

AS 3582.3, *Supplementary cementitious materials, Part 3: Amorphous silica*

AS 3582.4, *Supplementary cementitious materials, Part 4: Pozzolans — Manufactured*

AS 3972, *General purpose and blended cements*

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