

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 2350.14—2006

Methods of testing portland, blended and masonry cements

Method 14: Length change of cement mortars exposed to sulfate solution

RECONFIRMATION NOTICE

Technical Committee BD-010 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Reconfirmed documents cannot be amended, but may be formally revised and a new edition published.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 24 February 2016.

The following are represented on Technical Committee BD-010:

AUSTROADS
Cement & Concrete Association of New Zealand
Cement Concrete & Aggregates Australia
Cement Concrete & Aggregates Australia – Cement
Cement Concrete & Aggregates Australia – Concrete
Concrete Institute of Australia
Concrete Masonry Association of Australia Limited
Engineers Australia
Portland Cement Association

NOTES

Australian Standard®

AS 2350.14—2006

Methods of testing portland, blended and masonry cements**Method 14: Length change of cement mortars exposed to sulfate solution****1 SCOPE**

This Standard sets out the method for determining the length change of mortar bars, of defined composition, immersed in a sodium sulfate solution. The length change is taken as a measure of the sulfate resistance of cement.

NOTES:

- 1 The testing procedure herein may involve the use of materials or equipment that require safety measures to be observed.
- 2 This Standard does not purport to address all of the safety concerns, if any, associated with its use.
- 3 The user of this Standard should establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- 2350 Methods of testing portland, blended and masonry cements
2350.12 Method 12: Preparation of a standard mortar and moulding of specimens

AS/NZS

- 2350 Methods of testing portland, blended and masonry cements
2350.1 Method 1: Sampling
2350.11 Method 11: Compressive strength

ASTM

- C1012 Standard Test Method for Length Change of Hydraulic-cement Mortars Exposed to a Sulfate Solution

3 PRINCIPLE

The method determines length change of prismatic test specimens 40 mm × 15 mm × 150 mm in size after immersion in a sulfate solution.

The mortar is prepared and the specimens are moulded generally in accordance with AS 2350.12. The specimens are cured for 7 d before immersion in the standard sulfate solution. Measurement of the specimen length is carried out, initially after the 7 d curing and before immersion in the sulfate solution, and subsequently every 2 weeks and up to 16 weeks after immersion in the sulfate solution.

The standard sulfate solution to be used in this test method contains 0.352 mol/L of Na_2SO_4 (50g/L). Some technical background on the composition of the test solution is given in ASTM C1012.

NOTE: This test method does not simulate the mechanism of sulfate attack by solutions of sulfate compositions other than that used. If evaluation of behaviour due to exposure to a given sulfate solution is desired, that solution should be used.

4 APPARATUS AND RELATED CONDITIONS

4.1 Laboratory

The conditions of the laboratory shall comply with the requirements of AS 2350.12.

4.2 Mixer

The mixer shall comply with the requirements of AS 2350.12.

4.3 Mould

The mould shall, in principle, comply with the mould specified in AS 2350.12 and be provided with the modifications shown in Figure 1 to reduce the size of the cast specimens to a thickness of 15 ± 0.1 mm. The size of the modified mould shall take into consideration the thickness of the mould release material used in the moulding process.

The mould shall be provided with two loose end plates which act as gauge stud holders. Each gauge stud holder shall fit inside the end of the mould to locate and secure a gauge stud. Each gauge stud holder shall be secured to the end of the mould using the socket head cap screw. Each mould end shall be drilled to a depth of 3 mm to accommodate the adjustment of the gauge studs

In assembling the cleaned mould ready for use, a suitable sealing material shall be used to coat the outer joints of the mould. Teflon tape, pre-cut to strips suitable to cover the interior surfaces of the mould, shall be used. After removing the backing paper adhere the tape onto all surfaces.

The gauge stud is screwed into the holder at each end. Once assembled, the studs are adjusted using the length gauge to a gauge length of 130 ± 0.1 mm.

NOTES:

- 1 The gauge stud holders may be manufactured out of teflon.
- 2 The use of teflon tape facilitates ease of demoulding and serves as a parting agent without affecting the setting of the cement and without leaving any residue that will inhibit the penetration of water into the specimen.
- 3 If a release agent such as petroleum jelly is used in addition to the teflon tape, care should be taken to avoid contamination of the specimen.
- 4 PTFE-fluorocarbon tape or equivalent is recommended as a mould release agent.

4.4 Gauge studs

Gauge studs shall be of stainless steel and shall comply with the dimensions shown Figure 2.

4.5 Length gauge

A length gauge shall be provided for checking the nominal length between gauge studs. The length gauge/bar shall be made of metal and shall have a diameter of at least 6 mm and a length of 130 ± 0.05 mm. The ends of the bar shall be flat and perpendicular to its length.

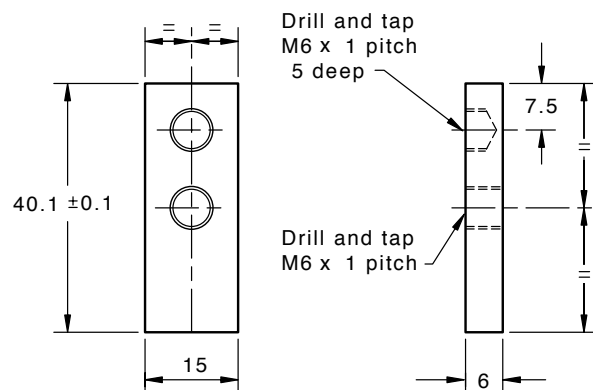
4.6 Length comparator

The comparator for measuring length changes shall be capable of measuring the length of specimens over a range of 150 mm to 160 mm, with a resolution of 0.001 mm. It shall consist of a frame for supporting the specimen during measurement in such a way that no weight is carried by the gauge studs, and a measuring device, e.g., a micrometer, readable to 0.001 mm.

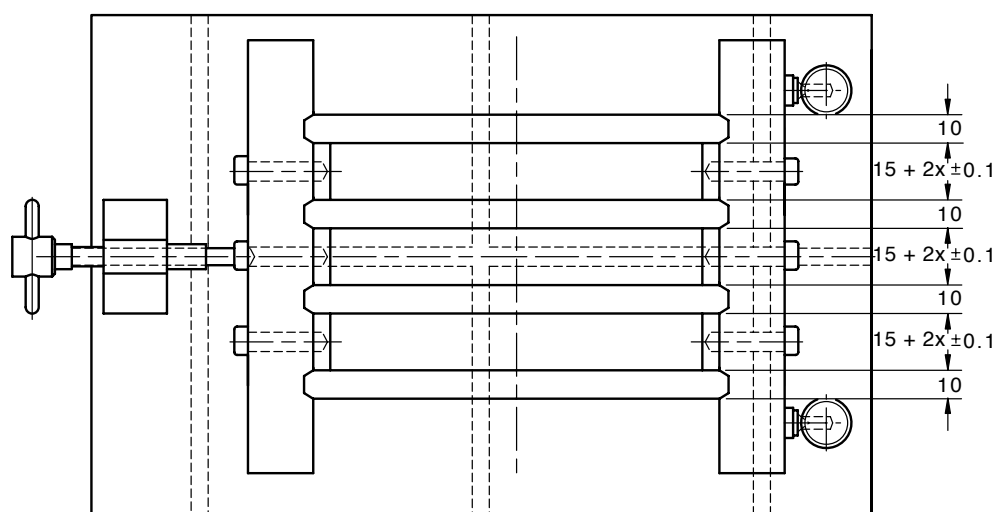
The precision of the length measurement, by a single operator, shall be checked by recording the length of a specimen, prepared according to this Standard, 20 times within a 15 min period, replacing the specimen in the comparator for each reading. The standard deviation of these 20 length measurements shall not exceed 0.001 mm. This check shall be performed by each new operator, and by each operator at least every six months.

NOTES:

- 1 Specimens used for a precision check should be aged in water for at least 28 d prior to use.
- 2 In practice it has been found that some comparators need to be inclined at $45 \pm 5^\circ$ to enable them to meet the required precision.



(a) End plate detail



(b) Shrinkage mould

DIMENSIONS IN MILLIMETRES

NOTE: x = the thickness of the mould release material used.

FIGURE 1 TYPICAL ARRANGEMENT OF MOULD FOR TEST SPECIMENS