Australian/New Zealand Standard™

Masonry units, segmental pavers and flags—Methods of test

Method 10: Determining resistance to salt attack

This Standard incorporates Amendment No. 1 (August 2004) and Amendment No. 2 (September 2009). 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.

1 SCOPE

This Standard sets out methods for testing masonry units, segmental pavers and flags, to determine their resistance to salt attack.

A1

2 PRINCIPLE

Specimens cut from masonry or segmental pavers are subjected to cycles of soaking in salt solution, oven-drying and cooling. When particle losses occur, the total mass of the particles lost from each specimen is determined by weighing. Alternative methods are presented for stone, and for materials other than stone.

When the resistance of the sample against the action of sodium chloride is to be determined, the sodium sulphate solution used in the test method may be substituted with a 14% solution of sodium chloride.

NOTE: A sodium chloride test can be used when the users of this method find, after comparative testing in solutions of both sodium chloride and sodium sulphate, that the product tested fails more quickly in 14% sodium chloride solution. Satisfactory performance in a 14% sodium chloride solution does not guarantee satisfactory performance in a 6.2% sodium sulphate solution.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
1289 Methods of testing soils for engineering purposes
1289.0 Part 0: General requirements and list of methods

3700 Masonry structures

AS/NZS
A2
4455 Masonry units, pavers, flags and segmental retaining wall units

4456 Masonry units, segmental pavers and flags—Methods of test
4456.0 Part 0: General introduction and list of methods
4456.1 Method 1: Sampling for testing
4456.14 Method 14: Determining water absorption properties

4 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 4456.0 apply.

5 APPARATUS AND REAGENT

5.1 General

The following apparatus is required for both Method A (see Clause 8.2) and Method B (see Clause 8.3):

(a) A controlled temperature space in which the temperature is controlled to 19 ±3°C.

NOTE: The structure of the salt crystals is dependent on the temperature at formation. The temperatures specified herein are critical.

(b) Individual containers for each specimen complying with the following:

(i) Wide enough to allow the insertion and removal of the specimen without damage.

(ii) With covers to reduce evaporation (optional).

(iii) Rigid enough to support the weight of the specimen.

NOTE: Plastic beakers of 600 mL capacity are suitable for Method A; beakers or cups of 200 mL are suitable for Method B.

(c) A desiccator of sufficient capacity with dry silica gel as desiccant.

(d) A drying oven that meets the following requirements:

(i) Fan-forced and adequately vented to permit escape of moisture-laden air.

(ii) The working space of the oven shall be capable of maintaining temperatures of 65 ±3°C for Method A or 115 ±3°C for Method B at the eight corners and centre of the oven's working space.

(iii) The oven shall be provided with a thermometer whose sensing element is located in the airstream moving towards the vents of the oven. The temperature indicator shall be located so that it can be observed from in front of the oven and shall be readable to ±1°C.

(iv) The oven shall be dedicated to this test (no other samples may be placed in this oven whilst salt cycle specimens are being dried).

(v) The oven shall be large enough to accept all specimens without undue interference to the flow of air through the heated cabinet.

(vi) At any working space in the oven, the minimum rate of evaporation, when determined according to AS 1289.0, shall be not less than 20 g/h.

(vii) The performance of the oven shall be calibrated biennially for temperature and evaporation rate.

(e) Open mesh corrosion resistant shelves to suit the drying oven. These may consist of wire mesh, punched or slotted sheet, or spaced strips 40 to 60 mm wide with a gap of not less than 10 mm between each strip.

(f) Draining tray(s) to suit corrosion-resistant shelves.

(g) Balance accurate to 0.01 g.

(h) Buchner filter funnel.

(i) Suitable Buchner flask.

NOTE: A nominal capacity of one litre has been found satisfactory

(j) Fast filtration rate paper

NOTE: For example, comparable to Whatman 541.

(k) Watch glasses, or other suitable dishes.

(l) Temperature recording equipment (optional).

(m) Technical grade anhydrous sodium sulphate.

(n) Technical grade sodium chloride.

5.2 Method A

The following additional apparatus is required for Method A only:

(a) Glass rods to rest on the tops of the containers from which the specimens are suspended.

(b) Twine, nylon or similar, to suspend specimens.

5.3 Method B

Additional apparatus required for Method B only is a small (25 mm) stiff brush.

6 TEST SAMPLE

6.1 Selection

Specimens accumulated from continuous sampling shall be deemed to meet the requirements of this method provided that the number of specimens accumulated is at least 5. For assessment of an individual lot, 5 units shall be selected in accordance with AS/NZS 4456.1.

A2 NOTE: For fired clay products, 10 specimens should be taken. The 24 h cold water absorption values of the 10 units should be determined according to AS/NZS 4456.14. Absorption values should be used as a basis for selecting a sample of 5 units to represent the range of firing temperatures.

6.2 Preparation of test specimens

6.2.1 *Method A—stone*

Each specimen shall be a cube with sides of 50 ±2 mm cut from the unit by a diamond saw. It shall be washed thoroughly after sawing to free the surface from all fines produced by sawing. The faces shall be smooth and free from ribs, and the edges clean and free from chips.

The specimens shall be fitted with supporting loops of twine and identification labels attached to the twine. If the bedding is known, it shall be ensured that it is positioned horizontally. The loops and labels shall remain with the specimens throughout the entire procedure.

6.2.2 *Method B—materials other than dimension stone*

A2 One specimen 50 ±2 mm long, 25 ±2 mm wide and 20 ±5 mm thick shall be cut with a masonry saw from each of the five units. The locations from which the specimens are cut shall vary to represent the colour and texture variation of the sample. At least one of the long surfaces of each test specimen shall be from a face of the unit that would normally be exposed in the wall or pavement.

The specimens thus produced shall be brushed with a stiff brush and washed under running water to remove any loose material from the surfaces. All specimens shall be marked with an indelible ink or some other means that clearly identifies them.

When testing double-sided masonry units or segmental pavers, test specimens from both faces shall be included in the sample.