



Test method T362

Interim test for verification of curing regime - Sorptivity

OCTOBER 2012



Revision Summary

| Ed/Rev Number | Clause Number | Description of Revision | Authorisation | Date |
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| | | Reformatted and Revision Summary Added | D.Dash | May 1999 |
| | | Date on Test Method Revised to Agree with Date on Revision Summary | D.Dash | Feb 2001 |
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Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T362 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T362

Interim test for verification of curing regime - Sorptivity

1. Scope

The purpose of this test is to determine the effectiveness of the concrete curing regime by measuring the penetration of water into the surface of the cured concrete. The depth of water penetration into test specimens, prepared and cured in accordance with the mix design and curing regime under consideration, is measured and reported.

2. Equipment for preparation and testing of specimens

Necessary supplies and equipment include the following:-

- (a) At least three concrete moulds 100 high x 100 wide x 350 long with lids capable of being fully sealed (with a tolerance of ± 3 mm on all dimensions);
- (b) Callipers to measure the depth of water penetration
- (c) A water bath at least 200 mm deep and of sufficient plan dimensions to contain six 100 x 100 x 350 long concrete beams;
- (d) Adequate supplies of "Ritchie's water front fixing powder" a compound developed at the CSIRO Division of Building Construction and Engineering, composed of 40 parts of glucose to one part of methylene blue, referred to hereinafter as "methylene blue".
- (e) A large water bath suitable for storing concrete specimens in lime-saturated water and which is kept within a temperature range corresponding to the standard moist-curing conditions specified in Australian Standard AS 1012 - Methods for testing concrete. Method 8 - Method for making and curing concrete compression, indirect tensile and flexure test specimens in the laboratory or in the field. The bath shall be equipped with an automatic chart recorder to record the temperature in the curing bath. (A fog room shall not be an acceptable alternative to the bath unless it can be demonstrated that the surfaces of the specimens will be kept wet at all times).
- (f) A standard dry conditioning room or chamber maintained at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity, equipped with an automatic chart recorder to record the temperature and the relative humidity of conditioning.
- (g) Appropriate equipment for removing curing compound from the surface of concrete specimens
- (h) Where applicable, equipment for steam curing, application of curing compounds and insulation
- (i) A press capable of breaking a 100 deep x 100 wide x 350 long unreinforced concrete beam in flexure.

3. Preparation of specimens

3.1 Batching, mixing, curing, and drying of specimens

- (a) All test specimens shall be prepared from concrete batched and mixed in accordance with Australian Standard AS 1012 - Methods of testing concrete, Method 2 - Preparation of concrete mixes in the laboratory.
- (b) The specimens shall be made using the proposed materials and mix proportions batched at the highest water/cement ratio conforming to the allowable slump range specified for the nominated mix and allowing for batching tolerances and anticipated variations in aggregate moisture
- (c) The moisture content of the aggregates shall be determined and the batch weights adjusted accordingly as required by AS 1012.2. The report shall include details of the calculations of batch weights in a format similar to the method suggested in Appendix A of AS 1012.2
- (d) The concrete shall be batched and mixed in a pan mixer.

- (e) A separate set of specimens shall be made for each proposed combination of curing regime and mix design. Each set shall comprise at least two specimens.
- (f) The specimens shall then be cured in a manner which simulates the proposed field curing. The curing shall be applied to all surfaces of the specimen.
- (g) Following curing and, where applicable, the removal of the curing medium, the specimens shall be conditioned in the dry conditioning chamber for a minimum period determined from Table 1.

Table 1 - Drying Period Requirements

| Exposure classification | Drying period requirement (days) |
|--------------------------------|---|
| A and B1 | 21 |
| B2 | 28 |
| C | 35 |

3.2 Special Provisions Where Curing Compounds are Proposed

- (a) Where a curing compound is proposed for use after finishing (of screeded surfaces), or after stripping the formwork (for vertical or inclined surfaces), the sealing effect of the membrane shall be assumed not to exceed seven days.
- (b) When the proposed curing period has elapsed, the curing compound shall be removed using a method which leaves the concrete surfaces clean and dry and does not leave foreign material in the pores below the surface or clog them with additional cement paste.
- (c) To verify that the test results are not affected by the method of removing the curing compound two additional (control) specimens shall be prepared.
- (d) The control specimens shall, after finishing of the top surface, be totally sealed in the mould so that evaporation is prevented at all surfaces. The sealing medium shall be such that it can be removed without leaving the top surface of the specimen impregnated or contaminated with foreign material.

4. Testing for Sorptivity

4.1 Soaking

- (a) Immediately following dry conditioning, the specimens shall be marked on the bottom moulded face, placed in a water bath at a temperature of $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$, with the bottom moulded face upwards and supported so that all faces are at least 15 mm clear of the base or sides of the bath, and so that there is at least 20 mm between specimens. The bath shall be filled and kept filled so that between 45 mm and 55 mm of water covers the specimens at all times during the soaking period.
- (b) The two specimens shall be placed in the bath. The period of soaking shall be 24 hours, except for classification A and B1 mixes where the soaking period shall be only 6 hours.
- (c) Excess moisture shall be removed from the sample on removal from the bath.
- (d) The tolerance for the period of soaking shall be ± 10 minutes.

4.2 Breaking samples

- (a) Specimens shall be broken within 5 minutes of removal from the soaking bath.
- (b) Each specimen shall be broken by applying a knife-edge loading to the top (unmoulded) face at a cross-section within 50 mm of the transverse centre-line. Within 30 seconds of breaking the specimen each face shall be dusted, by sprinkling, with methylene blue to provide a permanent record of the advance of the water front from all four faces.
- (c) The specimens shall be transferred to shrinkage room conditions within 90 seconds after breaking.

4.3 Measuring penetration depth

- (a) 9 ± 1 minute after breaking, measurements of the depth of water penetration as recorded by the blue-stained area of the broken face shall commence using callipers, to an accuracy of 0.5 mm.

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- (b) Six measurements shall be made for each specimen, three on each broken face. Measurements shall be made from the bottom moulded face, within the middle 30 mm of the face and not less than 5 mm apart. All measurements shall be completed within 3 minutes.
 - (c) The average depth of penetration, P (mm), shall be calculated and recorded. For classification A and B1 mixes, the average depth of penetration shall be the average of the measured depth of penetration multiplied by 2.
 - (d) The specimens with their water fronts “fixed” by methylene blue shall be kept for future reference.

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