

Australian Standard®

Methods of testing concrete

Method 13: Determination of the drying shrinkage of concrete for samples prepared in the field or in the laboratory

PREFACE

This Standard was prepared by the Standards Australia Committee on Methods of Testing Concrete, to supersede AS 1012, *Methods of testing concrete*, Part 13—1970, *Determination of drying shrinkage of concrete*.

The format of the Standard has been rearranged to comply with AS 2929, *Test methods — Guide to the format, style and content* and with Standards Australia Format B, which is the preferred format for a series of test methods as it reduces the amount of common content and precludes the need for separate covers.

The technical content of this edition is generally unchanged from the 1970 edition, except that —

- (a) the differences between laboratory sampling/standard initial curing and field sampling/non-standard initial curing have been acknowledged with the inclusion of a requirement that samples prepared in the field be treated separately and reported as such;
- (b) provision for the rejection of obviously incorrect specimens has been added; and
- (c) a precision statement for laboratory prepared samples has been added.
- (d) Provision has been made for the testing of concrete with aggregate up to a nominal 40 mm in size.

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METHOD

1 SCOPE This Standard sets out a method for preparing and curing of concrete shrinkage specimens, and for determining the length changes of these specimens due to drying in air. It provides for testing of specimens prepared in the laboratory or in the field, in which the nominal size of aggregate in the concrete, in accordance with AS 2758.1, does not exceed 40 mm.

The precision statement in Clause 9 does not apply to specimens which have had non-standard initial curing (normally field-prepared specimens). In addition this Standard requires that field-prepared specimens are marked, recorded and reported as such.

NOTES:

- 1 This test method is not always suitable for very low slump concrete (less than 20 mm), primarily due to the difficulties in obtaining adequate compaction. Provided adequate compaction is obtained, the method is applicable.
- 2 The method is specifically designed for measurement of drying shrinkage of concrete, but it is capable of adaptation for measurement of length changes of specimens subjected to a variety of environmental conditions.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- | | |
|--------|--|
| 1012 | Methods of testing concrete |
| 1012.1 | Part 1: Method for sampling fresh concrete |
| 1012.2 | Part 2: Method for preparation of concrete mixes in the laboratory |
| 1012.3 | Part 3: Methods for the determination of properties related to the consistence of concrete |
| 1012.4 | Part 4: Methods for the determination of air content of freshly mixed concrete |
| 1012.8 | Part 8: Method for making and curing concrete compression, indirect tensile and flexure test specimens in the laboratory or in the field |
| 2758 | Aggregates and rock for engineering purposes |
| 2758.1 | Part 1: Concrete aggregates |

3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

3.1 Standard moist curing conditions—as required by AS 1012.8 for lime-saturated water.

NOTE: Standard temperate conditions are required for a minimum of 24 h prior to initial measurement (see Clause 7.3.3).

3.2 Preparing laboratory—the laboratory responsible for sampling of concrete, moulding of specimens, initial curing in moulds, demoulding, initial moist curing, transport to measuring laboratory (if required).

3.3 Measuring laboratory—the laboratory responsible for completion of initial moist curing, storage in drying room, measurement of specimens.

NOTE: In some instances the preparing and measuring laboratories will be the same.

3.4 Micrometer—a linear measuring system.

NOTE: Typical examples include dial gauges and digital readout systems.

4 PRINCIPLE Specimens are cured and air dried for a specified time and the change in length is measured.

5 APPARATUS

5.1 General The apparatus shall consist of—

- (a) a drying room for drying the specimens and in which they can be measured; and
- (b) equipment for making and measuring the test specimens.

5.2 Drying room A drying room with suitably controlled temperature, humidity and air circulation shall be provided for storing specimens in air in accordance with the following requirements:

- (a) Air shall be circulated through the room in a uniform manner so that the specified conditions are attained adjacent to all specimens under test.
- (b) The temperature in the drying room shall be maintained at $23 \pm 1^\circ\text{C}$ for 90% of each 24 h period, at all times remaining within the range $23 \pm 2^\circ\text{C}$.
- (c) The relative humidity in the drying room shall be maintained at $50 \pm 5\%$ at all times.

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