

Australian Standard®

AS 1012.8.3:2015

Methods of testing concrete

Method 8.3: Methods of making and curing concrete—Mortar and grout specimens

1 SCOPE

This Standard sets out the method for making, curing and testing mortar and grout cubes for compression sampled in the laboratory or in the field.

NOTE: This Standard may involve hazardous materials, operations, and equipment. This Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1012 Methods of testing concrete

1012.1 Method 1: Sampling of concrete

3 DEFINITIONS

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

3.1 Composite sample

Three or more sample increments mixed in accordance with Clause 7.

3.2 Individual sample

A single sample increment of the grout or mortar.

3.3 Sample increment

The basic unit of sampling—sample increments are taken in approximately equal volumes so that three or more sample increments constitute a composite sample. Each sample increment is not less than 1 L of grout or mortar.

4 EQUIPMENT

4.1 Moulds

Cube moulds (with cover plates and clamps if grout is expansive).

The cube moulds shall have nominal side dimension of between 50 mm and 75 mm and shall be made of rigid material so that they hold their shape and dimensions under normal conditions of use. When assembled and sealed the moulds shall be watertight and the dimensional tolerance on any compartment side shall be within $\pm 0.5\%$. The moulds shall be firmly secured to their bases.

The inside faces shall be straight and flat. The sides, bottoms and ends shall be at right angles to each other with a tolerance of $\pm 0.5^\circ$.

The cover plates shall be rigid with similar dimensions to the base plate of the mould. They shall be so designed to ensure watertightness and even grout level without warpage or deflection and be able to withstand the clamping force without damage. When an expanding admixture has been used in the grout or mortar, the cover plate shall be firmly secured to the moulds by clamps.

4.2 Tamping rod

A 25 mm square, straight rod of 300 mm length made out of hard rubber or hard plastic.

NOTE: A normal concrete tamping bar (25 mm square) is too heavy and not suitable for use with mortars.

4.3 Mallet

The mallet used in the moulding of the specimens shall be fitted with a hard rubber or hard plastic head of mass approximately 0.25 kg.

4.4 Receptacle

A scoop, shovel, sampling container or other receptacle used for sampling grout or mortar, with a capacity of not less than 1 L.

5 SAMPLING

5.1 Shape and size of standard test specimens

Specimens shall be cubic having the following dimensions:

- (a) For grout nominal size of 50 mm to 75 mm.
- (b) For mortar nominal size of 75 mm.

5.2 Grout

Individual samples shall be collected only after all adjustments to the grout mix have been made from point of discharge (i.e. grout pump outlet point) at representative intervals of approximately 25%, 50% and 75% of batch volume.

The individual samples shall be obtained by collecting grout discharge in a container, diverting discharge to sampling container or by a receptacle completely passing through discharge stream and not restricting flow or causing segregation.

The sample used for the test cubes shall be a composite sample made from at least three individual samples.

The individual samples shall be mixed to form a composite sample of uniform consistency within 5 min of the taking of the last sample increment ensuring the grout is protected from sun, wind and rain as far as practicable. Sample collection shall not take more than 15 min per batch.

Total volume of composite sample shall be based on the number of specimens required and the specified consistency test, but with a minimum volume of 6 L per batch.

Unless otherwise specified the number of specimens shall be at least one set of three cubes per each specified test age for each batch.

Moulding location shall be as close as possible to point of sampling.

5.3 Mortar

The mortar shall be sampled at the discharge point of a batch in a dry, clean, non-absorbent receptacle in such a manner as will ensure the collection of representative sample.

At least three sample increments shall be taken, one each at about the time when one-quarter, one-half and three-quarters of the batch have been discharged. If more than three portions are taken, they shall be at correspondingly shorter, equally spaced, intervals.

The sample increments shall be immediately combined and mixed together to form a representative sample.

6 CONSISTENCY TEST

If required, a consistency test for the mortar or grout shall be performed to the test method specified, prior to the moulding of specimens.

7 MOULDING SPECIMENS

7.1 General

The specimen shall be moulded in accordance with Clause 7.2. The aim is to achieve full compaction of the grout or mortar.

7.2 Moulding procedure

The procedure for the moulding of specimens shall be as follows:

- (a) Thinly coat the inside surface of moulds, base plates and covers with a concrete release agent to prevent adhesion of the concrete. Mould base plates and covers other than steel may not require oiling, depending on the material used in their construction.
- (b) Take the sample of grout or mortar as quickly as possible to the place selected for moulding the specimens.
- (c) After mixing the test sample to offset any segregation that has occurred during transportation, commence casting without delay.
- (d) Place grout or mortar in the mould in approximately two equal layers using a scoop ensuring symmetrical distribution of the grout or mortar within the mould.
- (e) Compact the grout or mortar without causing segregation or excessive laitance as follows:
 - (i) *Grout* Tap the mould with the mallet until no air bubbles are seen to rise and the grout is level. The corners of the mould shall be completely filled. Less tapping may be required where the grout is more fluid. Repeat the process for the second layer, slightly overfilling the mould.
 - (ii) *Mortar* Rod the entire surface of the mould with firm even pressure with the tamping rod, sufficient to produce even consolidation without segregation. Avoid striking through the mortar as this can leave holes behind after filling the second layer. The number of strokes per layer, required to produce full compaction will vary according to the mortar or mixed material type. At the conclusion of the tamping, lift and drop the mould through a height of 10 mm 5 times to force any remaining air bubbles out. Repeat the process for the second layer, slightly overfilling the mould.
- (f) Complete moulding within 20 min of the completion of mixing the composite sample.
- (g) Strike off and smooth the surface of the grout or mortar. Avoid a mirror finish.

7.3 Finishing

The procedure shall be as follows:

- (a) Strike off excess grout or mortar with edge of trowel held vertically drawn in a sawing motion.
- (b) Float and trowel as required to a flat, even surface level with mould edge.
- (c) Place the cover plate on the mould.
- (d) Clamp or secure cover plates, if restrained setting is specified for expansive grout or mortar.