



Transport
Roads & Maritime
Services

Test method T375

Sampling and testing of grout

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Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		First Issue	D.Dash	Nov 2002
Ed 2/ Rev 0	All	Reformatted RMS template	J. Friedrich	October 2012

Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T375 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T375

Sampling and testing of grout

1. Scope

This test method describes the procedures for on site sampling, moulding, curing and testing of cube specimens for assessing the compressive strength of grout under restrained or non-restrained setting conditions.

The grout ingredients may be pre-packaged or individually batched on site.

2. General

Term	Definition
Self-levelling grout	Fluid to flowable grout that exhibits flow sufficient to cause levelling out under gravity when moulded in horizontal position at a temperature not less than 5°C

3. Apparatus

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

The cubes shall have side dimension of between 50 and 75 mm and shall be made of steel or cast iron either as single or gang moulds. Moulds shall 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 positively secured to their bases.

The inside faces shall be straight with flatness tolerance over any face of ± 0.05 mm to AS 1100.201, free of warpage and not rougher than R_a of $0.8 \mu\text{m}$ to AS 1100.201. 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 steel 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.

- (b) Tamping rod.

A round, straight steel rod of 300 mm length and 10 mm diameter with flat tamping ends perpendicular to its axis.

- (c) Mallet

The mallet used together with the rod for compacting the grout shall be fitted with a hard rubber or hard plastic head of mass approximately 0.25 kg.

- (d) Sampling container (6 litre), 1 litre container (for temperature measurements), scoop and shovel or other receptacle of suitable size.

- (e) Consistency test apparatus (as specified for the grout).

- (f) Temperature measuring devices.

4. Sampling

The sample used for the test cubes shall be a composite sample made from at least three individual samples. 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 5 litres 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, but not less than two sets of three cubes.

Collect individual samples only after all adjustments to the grout mix have been made. The individual samples shall be collected from point of discharge, ie grout pump outlet point, at between 20% and 80% of batch volume. Moulding location shall be as close as possible to point of sampling. Protect the sample from sun, wind and rain as far as practicable.

Sample collection shall not take more than 15 minutes per batch.

Obtain the individual samples 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. Remix the individual samples until uniform consistency of the composite sample is reached.

Measure temperature of the grout in the one litre container, within 5 minutes from the collection of the final sample increment, then remix this quantity with the remainder of grout.

Determine consistency of the grout using the specified test method for the grout. Classify consistency as either non-self levelling or self-levelling grout.

Identify the sample.

5. Moulding

Apply a thin coat of mineral oil or a suitable concrete release agent to the mould internal faces before use.

Assemble the mould and its base plates with joints sealed to ensure watertightness.

Position the assembled mould on a horizontal rigid surface free of vibration as near as possible to storing area to be used for initial curing.

Wipe off excess oils or sealants from inside the mould prior to moulding.

Remix the sample and fill the mould in two equal layers using scoop.

Compact layers as specified in Clause 6. Gang moulds should have the bottom halves of all compartments compacted before the top ones are filled and compacted.

Overfill top half of the mould to allow for compaction.

Complete moulding within 20 minutes from completion of composite sampling.

6. Compaction

6.1 Non-self levelling grout

Rod each layer at a rate of one stroke per 3 cm², uniformly distributed, throughout the layer depth.

Rodding shall not hit the moulds or base plates.

Rodding pressure shall be just sufficient to produce even consolidation without segregation.

Rodding of top layer shall penetrate the bottom layer but by not more than 5 mm.

Tap compacted layer 10-15 times uniformly and lightly with the mallet to close any surface voids left by the rodding and to release air bubbles.

6.2 Self-levelling grout

Insert the rod to almost the full depth of layer and puddle it through the layer 5 times using a slow motion to release entrapped air.

Tap puddled layer 5-10 times uniformly and lightly with the mallet to close any surface voids left by the rodding and to release air bubbles.

7. Finishing

Strike off excess grout with edge of trowel held vertically drawn in a sawing motion.

Float and trowel as required to a flat, even surface level with mould edge.

Clamp or secure cover plates if restrained setting is specified for expansive grout.

Mark mould not grout cube.

8. On Site Curing

Store specimens in an area protected from the sun, wind and vibration.

Cover specimens which are not restrained from the top by non-absorbent non-reactive plate or sheet of impervious plastic.

Demould specimens after 24 ± 2 hrs from moulding or final setting whichever occurs later.

Identify specimens (marking) and wrap with wet hessian or paper and encase in plastic bags and send off to testing lab within 4 hrs from demoulding.

9. Transport

Specimens shall be cushioned and protected against damage and the elements during transport.

The specimens shall be placed under standard moist curing conditions to AS 1012.8.1 within 3 hrs after arrival, until testing.

10. Testing

Use Class A machines as defined in AS 2193.

Testing shall be carried out on wet specimens with no more than two hours between removal from curing conditions to completion of testing.

Rate of loading 1-2 kN/sec.

Use formed faces for loading.

Report test failure load and measured dimensions of cubes.

Calculate compressive strength as load divided by nominal cross-sectional area. Use actual cross-sectional area if it differs from the nominal by more than $\pm 1.5\%$.

11. Reporting

The following information shall be included in the test report:

- (a) Identification of the grout.
- (b) Cube size e.g. 50 mm or 75 mm.
- (c) Date and location of sampling and testing.
- (d) Temperature of grout at sampling.
- (e) Consistency of grout.
- (f) Age of the specimen, if known, at testing.
- (g) Compressive strength of the specimen, calculated to the nearest 0.5 MPa, except where the strength is less than 10 MPa, in which case it shall be calculated to the nearest 0.1 MPa.
- (h) Any apparent defects of the specimen, any relevant comments on the moisture condition of the specimen, as received, or any other significant factor(s) noted before, during or after testing.
- (i) Reference to this Test Method, i.e. RTA T375.
- (j) Such other information contained in the sampling records (see AS 1012.1) as may be requested.