



Transport
Roads & Maritime
Services

Test method T307

Compressive strength of concrete
specimens (manual machine)

OCTOBER 2012



Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		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
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 T307 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T307

Compressive strength of concrete specimens (manual machine)

1. Scope

This test method sets out the procedure to be followed for determining the compressive strength of concrete specimens which have been prepared in accordance with the provisions of Test Method T304 and inspected and capped according to Test Method T305. The method has no counterpart in recognised standards and is normally only applied to seven day tests of trial concrete mixes, or concrete piles or where early test results are required for some constructional purpose.

2. Testing Machine

A hand operated hydraulic press type of compression tester with a Bourdon tube pressure gauge having a minimum dial diameter of 200 mm, capable of reading to 1500 kN. The top platen of the machine shall be mounted on a hemispherical head. The machine shall be fitted with a suitable guard to prevent damage or injury during testing.

3. Procedure

- (a) Carry out all measuring and testing operations as promptly as possible after removal of the test specimen from the curing environment.
- (b) Test all specimens in a wet condition unless dry testing is specified (eg cores and steam-cured concrete). Wipe away surplus water on specimens which have been cured by immersion before measuring and testing operations begin.
- (c) Inspect each specimen before placing in the machine, testing each cap by tapping with a suitable instrument. Any hollow caps are to be removed and replaced before the specimen is tested.
- (d) Measure and record the diameter and height of each specimen, the diameter being the mean of two diameters at right angles to each other near the centre of the length of the specimen, the measurements being made to the nearest 0.5 mm. The height is to be measured over the full dimension including the caps to the nearest 2 mm.
- (e) Clean the platens of the testing machine with clean rag whenever necessary, making sure that the surfaces are free from films of oil or other lubricating materials and particles of grit.
- (f) Clean the bearing surfaces of the specimens, making sure that they are free from oil and particles of grit.
- (g) Place the specimen on the spacer disc in the machine, aligning the axis of the specimen with the centre of thrust of the spherically seated platen.
- (h) Bring the upper platen into contact with the top of the specimen so that uniform bearing is obtained. Place the guard in position.
- (i) Apply the load to the specimen, without shock and aiming to give a rate of load increase of 20 MPa compressive stress per minute, excluding the time of upstroke of the pump handle. The following operations are necessary:
 - (i) Open the air cock situated at the top of the master oil cylinder.
 - (ii) **Note:** The arm of the cock will be horizontal when open.
 - (iii) Close the control valve and begin pumping. It will take several short strokes before the dial needle will begin to move as the large ram moves slowly.
 - (iv) Pump with long even strokes, avoiding sudden application and release of load at the start and finish of the stroke. Tap the dial gently as the load is applied at the prescribed rate.
 - (v) As the pointer appears to hesitate, reduce the rate of application of load so as to minimise the rebound shock when the cylinder cracks or breaks. Release the main valve. Close the air valve when work ceases for the day.

- (vi) Keep the machine oiled and covered with a canvas cover when not in use.
- (j) Record the maximum load applied to the test specimen.
- (k) If an abnormal test result is obtained, fully break open the specimen to facilitate further examination. Note any unusual feature in the type of failure.

4. Calculations

- (a) Calculate the compressive strength of the specimen by dividing the maximum load carried by the specimen by the calculated cross sectional area.
- (b) Record the maximum compressive strength in MPa to the nearest 0.5 MPa.

Note: Report the compressive strength of any non-standard specimens as "non-standard". The strength result of a non-standard size specimen other than a core is not to be converted and reported as the purported strength of a standard specimen.

5. Records

Record the following information concerning each test specimen.

- (a) Identification
- (b) Date of test
- (c) Age of the specimen at the date of test
- (d) Height of specimen
- (e) Each measured diameter and the average of the two measurements of diameter of a cylinder or core
- (f) Maximum load sustained
- (g) Compressive strength of the specimen to the nearest 0.5 MPa
- (h) Type of cap, if at variance with Test Method T305
- (i) Any apparent imperfections or other significant factors noted in the specimen or the caps before or after testing.
- (j) Comments on the type of fracture

6. Reporting

The following details are to be included in the report.

- (a) Identification mark
- (b) Date of test
- (c) Age of specimen at date of test
- (d) Size of specimen:
 - (i) Moulded specimen report "standard" (actual dimensions not required) or "non-standard" actual dimensions
 - (ii) Cores - report actual dimensions
- (e) Compressive strength of specimen
- (f) Type of cap used, if the compressive strength is greater than 50 MPa
- (g) Any apparent imperfections and any relevant comments on the quality of the specimen, or the caps, or the type of fracture