



Transport
Roads & Maritime
Services

Test method T121

Moisture content of road construction materials (Sand bath or hot plate method)

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.	D. Dash	Feb 2001
Ed 2/Rev 0	All	General revision and reformatting	G. Donald	Sep 2007
Ed 3/Rev 0	All. 2(a),(b),(d)(i). 5(g). 6(b). 7(a), (b)	New issue. Clarify usage and correlation requirement. Reference added. Results to be corrected.	D Hazell	Oct 2011
Ed 4/ 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 T121 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T121

Moisture content of road construction materials (Sand bath or hot plate method)

1. Scope

This test method sets out a subsidiary method for the determination of the moisture content of road construction materials as a percentage of its dry mass using a heated sand bath or hot plate.

2. General

- (a) This method is an option for the determination of moisture content. However, it must not be used when material contains a significant proportion of minerals with crystalline water (e.g. gypsum) or organic matter. Use T120 for such material
- (b) This subsidiary method must be correlated with T120 in accordance with T2105
- (c) Following this test, the portion must not be used for other testing
- (d) The following documents are referred to in this test method:
 - (i) T105 Preparation of Samples for Testing (Soils)
 - (ii) T2105 Correlation of Moisture Content with Standard Method

3. Apparatus

- (a) Means of heating the sample:
 - (i) A hotplate or burnerOR
 - (ii) A suitable sand bath
- (b) Heat-resistant, non-absorbent and corrosion resistant moisture containers of appropriate capacities
- (c) Wire gauze or a perforated plate to cover the container
- (d) A balance of suitable capacity with a limit of performance of not greater than ± 5 g
- (e) Scoops, spatula, tongs, etc

4. Preparation

Samples shall be prepared in accordance with T105

5. Procedure

- (a) Determine the mass of a clean dry container and record the mass (M_1) in grams
- (b) Place the sample in the container and determine the mass of the container and moist sample (M_2)
- (c) Place the container and sample on top of the hot plate or sand bath. Cover with a wire gauze or a perforated plate. Assist drying by stirring the sample frequently with the spatula.

NOTE: Initial crumbling of the moist sample will reduce drying time. Ensure that any adhering material is returned to the sample. The cover is to prevent losing exploding materials.

- (d) Allow an initial drying period

NOTE: The drying period will vary with the type of material, the size of the sample, and its moisture content. A period of about 10 minutes may be sufficient for a 3 kg sample.

- (i) Remove the container, sample and cover from the sand bath or hotplate, remove the cover and allow to stand until cool to touch
- (ii) Determine the mass of the container and sample; calculate the moisture content and record

- (iii) Replace the cover and return the container, sample and cover to the sand bath or hotplate for a further period
- (e) Drying to Constant Mass:
- NOTE: *The sample is probably dry when fines no longer stick to the spatula when the sample is stirred.*
- (i) Remove the container, sample and cover from the sand bath or hotplate, remove the cover and allow to stand until cool to touch
- (ii) Determine the mass of the container and sample; calculate the moisture content and record
- (iii) Compare successive moisture contents. Constant Mass (M_3) has been achieved if the moisture contents from successive determinations are within 0.1%
- (iv) Otherwise return the container, sample and cover to the sand bath or hotplate for a further period and repeat Step (e)
- (f) Use the correlation determined in T2105 to calculate the corrected moisture content using results to the nearest 0.1%

6. Calculations

- (a) Calculate the uncorrected moisture content (w_u) of the sample as a percentage of the dry mass of the sample as follows:

$$w_u = \frac{(M_2 - M_3)}{(M_3 - M_1)} \times 100\%$$

Where:

w_u = Uncorrected moisture content (%)

M_1 = Mass of container (g)

M_2 = Mass of container and moist sample (g)

M_3 = Mass of container and dry contents at constant mass (g)

- (b) Calculate the corrected moisture content (w) of the sample based on the correlation from T2105 as follows:

$$w = A + (B \times w_u)$$

w = Corrected moisture content (%)

A = Correlation intercept from T2105

B = Correlation gradient from T2105

7. Reporting

Include the following data and results in the report:

- (a) The uncorrected moisture content (w_u) of the sample to the nearest 0.1%
- (b) The corrected moisture content to the nearest 0.5%

NOTE: *Where the result is to be used in subsequent calculations, report the moisture content to the nearest 0.1%.*

- (c) Reference to this test method