# Test method T208

## Water adsorption of coarse aggregate

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

The most recent revision to Test method T208 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

# Test method T208

# Water adsorption of coarse aggregate

## 1. Scope

This method sets out the procedure for the determination of water adsorption of coarse aggregate.

## 2. General

| Term | Definition |
|---|---|
| Adsorbed water | Is that water retained on the surface of a particle by physico-chemical attraction. Adsorption results from exposure to water vapour. |
| Absorbed water | Is that water retained in spaces within the particle. Absorption results from soaking in water. |

## 3. Apparatus

(a) A balance accurate and readable to 0.001 g within the operating range

(b) A thermostatically controlled oven with good air circulation capable of maintaining a temperature within the range of 50°C to 60°C

(c) A humidity cabinet capable of maintaining a humidity of at least 90% at a temperature within the range of 21°C to 25°C

(d) Desiccator

(e) Beaker

(f) 13.2 mm and 19.0 mm AS sieves

## 4. Test Portion

(a) Sieve the sample to obtain the fraction passing the 19.0 mm sieve and retained on the 13.2 mm sieve.

(b) Quarter or riffle the above fraction to obtain a test portion of approximately 100 g.

## 5. Procedure

(a) Dry the test portion to constant mass at a temperature between 50°C and 60°C.

(b) Cool in a desiccator, remove and weigh to the nearest 0.001 g and record the mass ($M_1$).

(c) Place the test portion in a humidity cabinet in which the humidity is at least 90% and the temperature within the range 21°C to 25°C. Record the humidity and temperature at which the test was carried out.

(d) After one hour remove the test portion from the humidity cabinet, weigh to the nearest .001 g and return to the humidity cabinet. Record the mass ($M_2$).

(e) After a further hour remove the test portion from the humidity cabinet, weigh to the nearest .001 g and return to the humidity cabinet. Record the mass ($M_3$).

(f) After a further two hours remove the test portion from the humidity cabinet, weight to the nearest .001 g and record the mass ($M_4$).

(g) Soak the test portion in a beaker of distilled water for at least 12 hours.

(h) Drain off the water and roll the test portion in a large absorbent cloth wiping the larger particles individually if necessary with an absorbent cloth.

(i) Continue the procedure of rolling and wiping. Take care to minimise evaporation until all visible films of water have been removed but the surface of the particles still appear to be damp. Determine the mass ($M_5$) of the test portion at the saturated surface dry condition.

(j) Dry the test portion to constant mass ($M_6$) at a temperature between 50°C and 60°C.

(k) Record any observable changes in the material after testing.

(l) Calculate the percent absorption and percent adsorption to the nearest 0.1%.

## 6. Calculations

(a) Calculate the percent water absorption (Abs) as follows:

$$(Abs) = \frac{M_5 - M_6}{M_6} \times 100$$

Where

(Abs) = percent water absorption

($M_5$) = mass at saturated surface dry condition

($M_6$) = dry mass after test.

(b) Calculate the percent water adsorption (Ads) as follows:

$$(Ads) = \frac{M_4 - M_1}{M_1} \times 100$$

Where

(Ads) = percent water adsorption after four hours in humidity cabinet.

($M_4$) = mass after four hours in humidity cabinet.

($M_1$) = mass prior to testing.

Adsorption after 1 hour and 2 hours is calculated in a similar manner, substituting ($M_2$) and ($M_3$) respectively for ($M_4$) in the above calculation.

## 7. Reporting

Report the following:

(a) Aggregate type

(b) Humidity and temperature of test

(c) Absorption

(d) Adsorption after

(i) 1 hour in humidity cabinet

(ii) 2 hours in humidity cabinet

(iii) 4 hours in humidity cabinet

(e) Observable changes, if any, in the test portion

## 8. Techniques

This test may be carried out on size fractions other than the fraction passing 19.0 mm retained 13.2 mm fraction. In such cases the size fraction tested must be reported.