



Transport
Roads & Maritime
Services

Test method T168

Determination of in situ infiltration of
water into a road pavement

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	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 T168 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T168

Determination of in situ infiltration of water into a road pavement

1. Scope

This test method describes the procedure for the determination of in situ infiltration of water into a pavement layer. It is suitable for use with sprayed sealed surfaces, asphaltic concrete, crushed rock and natural gravel pavement materials.

2. Equipment

- (a) Permeability apparatus such as that described in the attached Figures 1, 2 and 3
- (b) Weights of at least 20 kg mass
- (c) A circular template of diameter 120 to 130 mm
- (d) Plasticine or other suitable sealant material. Clay may be used provided it is kept in a moist, mouldable state
- (e) Rapid setting bitumen emulsion
- (f) Brush, bristle, flat-form, wood handle, approximately 35 mm width
- (g) Funnel with stem appreciably smaller than internal diameter of nylon viewing tube
- (h) Beaker, approximately 600 mL capacity
- (i) Cloth
- (j) Brush, banister
- (k) Detergent
- (l) Dye (e.g. a few drops of potassium permanganate)
- (m) Stop watch

3. Procedure

- (a) Brush the area to be tested to remove loose stones and dust
- (b) Place the template over the area to be tested and apply a 75 mm band of bitumen emulsion around it. Remove the template
- (c) Paint other areas to be tested whilst waiting for the bitumen emulsion to break
- (d) If the surface is porous apply a second coat of bitumen emulsion
- (e) Take sufficient plasticine (or other suitable material) to go around the base of the permeability cell. Rub it in the hands to form a cord approximately 20 mm in diameter. Loop it around the thick edge of the plate and pinch up the join between the two ends. Ensure that there is a good seal to the base plate
- (f) Place the base plate, with sealant attached; on the band of bitumen emulsion such that the centre of the plate coincides with the centre of the annulus formed by the bitumen emulsion and the air bleed valve is toward the high side of the pavement. Ensure that the base is seated on the bitumen emulsion
- (g) Press the base plate tightly to the surface. Ensure that there is a good seal between the base plate and the road surface, and that the sealant has penetrated any surface irregularities
- (h) Insert the nylon viewing tube into the centre hole of the base. Ensure that both O rings in the base are in contact with the tube
- (i) Place a mass of approximately 20 kg on the base

- (j) Place two drops of detergent in a 600 mL beaker and add 600 mL of water. A dye may also be added to the water (*see Techniques*)
- (k) Open the bleed valve and carefully pour water into the viewing tube. Close the bleed valve when all the air is expelled and water commences to flow through it
- (l) Bring the water carefully but quickly to the desired height as marked on the tube
- (m) Time the rate of fall of the water level between the upper and lower marks and record the time in seconds
- (n) Remove the base plate and collect uncontaminated sealant for possible future use

4. Calculations

Calculate the rate of infiltration (I) as follows:

$$I = \frac{60 \times (H_1 - H_2 \times \pi D_2^2}{400 \times T} \text{ mL./minute}$$

Where

- H_1 = initial head (mm)
- H_2 = final head (mm)
- D_2 = internal diameter of viewing tube (mm)
- T = time (in seconds) for head to fall between H_1 and H_2

5. Reporting

Report the following:

- (i) Initial head (H_1) in mm
- (ii) Final head (H_2) in mm
- (iii) Time interval (T) in seconds
- (iv) Diameter of template (D) in mm
- (v) Infiltration rate in mL/minute
- (vi) Moisture condition of surface immediate prior to test (e.g. dry, damp)
- (vii) Moisture condition of sub-surface, if known

6. Techniques

- (a) It is often found helpful to add dye to the water to aid viewing the water level in the tube. The dye must not affect the nylon tube or it quickly makes the tube impossible to view through. The dye must not affect the sealant, brass, and bitumen emulsion or road surface. Ensure that the inside of the viewing tube is cleaned after use
- (b) Initial heads are normally 800 mm and final head 700 mm. Low heads suffer from surface tension interference

