



Transport
Roads & Maritime
Services

Test method T740

Segregation test for bituminous binders

NOVEMBER 2012



Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Reformatted and Revision Summary Added. Safety notes added. 4(a) warning removed.	D.Dash	Jan 2000
Ed 2/ Rev 0	All	Reformatted RMS template	J. Friedrich	November 2012

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

The most recent revision to Test method T740 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T740

Segregation test for bituminous binders

1. Scope

This test applies to all bituminous binders. It provides information on the likelihood of segregation into additive-rich and additive-lean phases which could result in work of varying quality.

Note: When two or more samples are taken it may provide evidence of actual batch segregation.

2. Safety Notes

A poster describing the action to be taken in the event of bitumen burns must be displayed in the laboratory in the vicinity of the bitumen pouring area(s).

Use either tongs or heat resisting gloves when handling hot bitumen. Loosen or puncture lids before heating containers. Examine cold samples for signs of water. Remove all visible water. Wear spectacles when heating samples suspected of containing water. Cleaning solvents such as toluene may be toxic, handle such solvents in a fume cupboard, consult safety data sheet.

3. Apparatus

- (a) Metal toothpaste tubes, closed at the screw end open at the other; nominal dimensions: length 153 mm, diameter 30 mm. Suitable tubes may be available from Crane Packaging from time to time. Other containers such as beverage cans and cigar tubes may be used.
- (b) Oven maintained at $163 \pm 1^\circ\text{C}$ (the oven used for T511 or T517 may be used. The test will not be invalidated by the temperature dropping momentarily while these other tests are carried out).
- (c) Flat plates of cardboard, tinfoil or glass panels.
- (d) Oven maintained at 50 - 80°C.
- (e) Refrigerator or beaker of iced water.
- (f) Tongs or heat resistant gloves and safety glasses for handling hot bituminous materials.
- (g) Pliers, protective gloves.

4. Sample Preparation

- (a) Where two or three samples are taken from the one batch, testing must be done in parallel. Each sample must have the same stirring and heat treatment both in sampling and testing.
- (b) Heat the sample to 150°C with gentle stirring with a palette knife or glass rod.
- (c) Slightly flatten the toothpaste tube so that minor axis of the elliptical cross section is no less than 20 mm. Stand the tooth paste tube in a vertical position, for example in a test tube rack.
- (d) Fill with the hot binder to 75 - 80% capacity. Allow to cool. Squeeze open end together, leaving an air space to allow for expansion, fold over and crimp (like a toothpaste tube) and mark with sample identification.

5. Procedure

- (a) Arrange the sample tubes to be tested in a heat resistant container so that they are within 10° of vertical with the crimped end up.
- (b) Place in 163°C oven for 72 hours \pm 1 hour
- (c) Remove from oven while maintaining the vertical orientation and allow to cool to below 26°C.
- (d) Cool further in refrigerator or iced water (orientation not critical) for greater than 30 minutes.
- (e) Remove and rip tube away from sample, eg. with pliers and gloved hands.
- (f) Place lump of bitumen on a flat plate marked with identification; rule lines at right angles to the sample axis at the top and bottom of the sample extending the full width of the plate.

- (g) If time allows leave horizontally at room temperature under observation for up to 24 hours. Note any changes in shape of the bituminous lump.
- (h) Place the flat plate of bituminous material on a horizontal shelf in the 50-80°C oven. Observe the shape of the lump at 4-5 minute intervals for the first 15 minutes and at 10 minute intervals thereafter up to a maximum time of one hour.
- (i) Remove from oven as soon as significant flow has occurred or in any case after 1 hour.
- (j) Observe whether there is any differential flow. That is, part of the sample retains its shape while part flows out like ordinary bitumen.
- (k) Samples which do not flow when first placed in the oven are returned to the oven with the temperature increased by 10°, for at least 30 minutes until at least part of the sample flows by at least 20 mm.
- (l) Note the position of a dividing line (if any) between the flowed out portion and the shape-retained portion. Mark the position on the plate with another line called the "phase dividing line" parallel to the lines previously drawn (*f*). Measure the distance from the line representing the top of the sample to the phase dividing line and express this distance as a % of the total original length of the sample (the distance between the original two lines drawn in (*f*)).

6. Recording and Reporting

- (a) Whether some flow occurred at room temperature or if not, when and at what temperature flow did occur.
- (b) The length of the upper portion as a % of the original length; (see *Clause 4(l)*).
- (c) Whether the part which flowed out was on the top or bottom during the initial oven treatment.
- (d) In the case of duplicate or triplicate samples whether the dividing line and flow characteristics were the same or different.
For the summary report the result to be reported is pass or fail.
- (e) Report a sample failure if and only if differential flow (see *Clause 4 (j)* above) is observed at any stage irrespective of the temperature at which flow occurred.
Report a pass for all cases of uniform flow.

Note: Samples taken at the beginning, middle and end of a delivery may be individually homogeneous but demonstrate uniform flow at different temperatures. In this instance the batch fails and the temperature at which "uniform" flow occurred should be recorded for each sample.