Transport Roads & Maritime Services

NSW GOVERNMENT

Test method T508

Proportion of bituminous material insoluble in toluene

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Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Scope revised and Safety Notes added. Generally Reformatted and Revision Summary Added	D.Dash	Sep 1999
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 T508 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T508

Proportion of bituminous material insoluble in toluene

1. Scope

This test method sets out the procedure for determining the proportion of bituminous material which is insoluble in toluene. The procedure conforms to the procedure set out in Australian Standard 2341.8

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. Loose 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 and consult safety data sheets.

3. Apparatus

(a) A No. 4 porosity sintered glass crucible approximately 44 mm in width at the top, tapering to 36 mm at the bottom with a depth of 25 mm (working capacity about 30 mL).

(b) Filtering flask.

(c) Filter tube fitted with a rubber filter cone.

(d) Two Erlenmeyer flasks of 125mL capacity (for duplicates) fitted with corks covered with aluminium foil.

(e) A thermostatically controlled oven with good air circulation capable of maintaining a temperature within the range of 105^{O}C to 110^{O}C.

(f) A suction pump, vapour trap and pressure tubing.

(g) A balance of 200 g capacity accurate and readable to 0.2 mg.

(h) A desiccator.

(i) A heating device such as a hot plate.

(j) A metal container of about 0.5 litre capacity with double crimped seams.

(k) Tongs or asbestos gloves to handle containers of molten material.

(l) Toluene (AR Grade complying with BS 805/l).

(m) Glass stirring rods with flame polished ends.

4. Preparation of Test Sample

(a) Melt the sample in its original container by means of an air oven at 105°C to 110°C avoiding unnecessary exposure to air. Stir thoroughly when just sufficiently fluid and pour off a portion of about 100 mL into a metal container. Heat this portion on a hot plate until sufficiently fluid to pour into the conical flask. Stir thoroughly.

(b) If traces of moisture are evident during the heating, maintain at a temperature of about 110°C for no longer than 15 minutes, if practicable. Record the extent of any additional treatment necessary to remove remaining moisture completely.

5. Procedure

(a) Weigh to the nearest 0.2 mg about 2 g of the sample into a tared conical flask plus stirring rod. Add in small portions 100 mL of toluene with continued agitation until all lumps disappear and nothing adheres to the bottom of the flask. Stopper the flask and set aside in subdued light for at least 12 hours.

(b) Assemble the filtering apparatus and decant the toluene solution carefully through the crucible (with or without light suction as may be necessary), retaining as much of the sediment as possible in the conical flask until the solution has drained.

(c) With a small amount of toluene wash down the sides of the flask and transfer the sediment and precipitate from the flask to the crucible.

(d) Wash the contents of the crucible with toluene until the washings are colourless; then apply suction to remove the toluene.

(e) Dry the crucible flask and stirrer in an oven at 105°C to 110°C for 20 minutes, cool in the desiccator and weigh. The increase in mass over the original mass is the mass of matter insoluble in toluene.

6. Calculation and Report

The percentage of material insoluble in toluene is calculated and reported to the nearest 0.1 per cent as follows:-

$$\text{Mass of Material insoluble in toluene} = \frac{\text{Mass of material in soluble in toluene}}{\text{Mass of water free sample}} \times 100$$

7. Techniques

(a) During the preheating of the sample it is usual to keep the container closed to minimise the occurrence of chemical and physical change in the material. However, care is necessary in preheating to ensure that excessive pressure does not build up when volatile matter is present or when appreciable air space remains in the container. A full 1 litre container of Class 170 residual bitumen will completely soften and reach about 80°C after 2 hours heating in an oven at 105°C to 110°C.

(b) Toluene is a toxic and flammable chemical. Appropriate precautions should be taken in its use.

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