



Transport
Roads & Maritime
Services

Test method T743

Colour of blond binders for asphalt

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Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
Ed 1/ Rev 0	All	New Method - John Cunningham	D. Hazel	Apr 2008
Ed 2/ Rev 0	All	New Issue. Reformatted and revised.	J Friedrich	May 2011
Ed 3/ 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 T743 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T743

Colour of blond binders for asphalt

1. Scope

This Test Method sets out the procedure for determining the colour of blond binders used in coloured asphalt by reference to the colour of gilsonite.

2. General

(a) The method is applicable to blond binders used in bituminous mixes

NOTE: As a guide to interpreting the test, the colour of normal bitumen on the gilsonite scale is about 60%.

(b) The following materials are required for the test:

(i) Gilsonite free of contaminants

(ii) Solvent – commercial grade toluene conforming to AS 3529

(c) Referenced documents include:

(i) AS 3529 Solvents – Toluene

(ii) AG:PT/T102 Austroads Test Method Protocol for Handling Polymer Modified Binders in the Laboratory
(available from: http://www.austroads.com.au/pdf/TestMethod/T102_Handling.pdf)

3. Apparatus

(a) An analytical balance of suitable capacity and a limit of performance of 0.001 g

(b) The following volumetric glassware with at least Class B accuracy

(i) 50 mL and 100 mL volumetric flasks with stoppers

(ii) 100 mL beakers and stirring rod

(iii) 50 mL Nessler tubes

NOTE: An alternative is large test tubes of about 50 mL but each with the same capacity.

(iv) Graduated pipette size 10 mL and pipette filler

(v) Burette size 50 mL

(vi) Second graduated pipette or burette size 50 mL

4. Preparation

(a) Prepare the gilsonite colour standard as follows:

(i) Weigh approximately 0.15 g of gilsonite to an accuracy of 0.001g (M_I) into a 100 mL beaker.

(ii) Dissolve the gilsonite in approximately 20 mL of toluene. Stir the concentrate well to dissolve all particles

(iii) Transfer the concentrate to a 50 mL volumetric flask

(iv) Wash the beaker and stirring rod with toluene and use to make up to 50 ± 0.1 mL in the volumetric flask

(v) Label the gilsonite standard with the % of gilsonite in concentrate (G) from Calculation 6(a), time and date of preparation, and use by date

NOTE: The gilsonite standard has a shelf life of 10 days.

5. Procedure

5.1 Sample solution

- (a) Heat the binder to pouring temperature according AG:PT/T102
- (b) Weigh approximately 10 g of the sample into a beaker and determine the mass to the nearest 0.01 g (M_2)
- (c) Allow the binder to cool
- (d) Keep beakers or flasks sealed when not in use to prevent evaporation
- (e) Add small quantities of toluene to the beaker, stirring with gentle warming until there are no lumps and no material adheres to the bottom of the beaker
- (f) Transfer the solution to a 50 mL volumetric flask without loss
- (g) Wash the beaker and stirring rod with toluene and use to make up to 50 ± 0.1 mL of sample solution in the volumetric flask
- (h) Mix thoroughly and then measure out 10 ± 0.1 mL of sample solution using a pipette into a second volumetric flask

NOTE: Capacity of flask depends on the following step.

- (i) Make up to 50 ± 0.1 mL with toluene in the second volumetric flask (use $f = 1$ in Calculation 6(c)). However, for very dark samples make up to 100 ± 0.1 mL and use $f = 2$ in Calculation 6(c)
- (j) Mix thoroughly then pour the diluted sample solution from the second volumetric flask into a Nessler tube and label as the sample

5.2 Matching colour

NOTE: An initial colour match is carried out and then the volume of toluene is adjusted for a final colour match.

- (a) Measure out 50 ± 0.1 mL of toluene using a pipette into a Nessler tube
- (b) Use a burette to add and measure the standard gilsonite to the toluene in the Nessler tube as follows:
 - (i) Slowly add the gilsonite standard and stop when the colour of the gilsonite solution appears to match the colour of diluted sample prepared in Step 5.1(j)
 - (ii) Check the colour by holding both Nessler tubes in front of a bright light source and compare both horizontally and vertically against a white background. If the colour does not match return to Step 5.2(b)(i) to add more gilsonite standard
- (c) When the colour matches, record the volume of gilsonite standard added (V_1) to the nearest 0.1 mL
- (d) Calculate the adjusted volume of toluene (V_T) using Calculation 6(b) so that the standard and the sample are equal volume
- (e) Measure out $V_T \pm 0.1$ mL of toluene using a burette or graduated pipette into a clean Nessler tube and carry out Step 5.2(b). When the colour matches, record the volume of gilsonite standard added (V_2) to the nearest 0.1 mL

6. Calculations

- (a) Calculate the % of gilsonite in concentrate (G) of the gilsonite colour standard as follows:

$$G = \frac{M_1}{50} \times 100\%$$

Where:

$$G = \text{\% of gilsonite in concentrate (g/mL)}$$

$$M_1 = \text{Mass of gilsonite used to prepare standard (g)}$$

- (b) Calculate the adjusted volume of toluene (V_T) as follows:

$$V_T = \frac{2,500}{(V_I + 50)}$$

Where:

V_T = Adjusted volume of toluene (mL)

V_I = Initial volume of standard gilsonite added to match colour of sample (mL)

- (c) Calculate the Colour expressed as % gilsonite (C) for the sample as follows:

$$C = \frac{V_2}{50} \times G \times \frac{250 f}{M_2}$$

Where:

C = Colour expressed as % gilsonite

G = % of gilsonite in concentrate (g/mL)

V_2 = Final volume of standard gilsonite added to match colour of sample (mL)

M_2 = Mass of sample (g)

f = Factor for dilution of sample (defined in Step 5.1(i))

7. Reporting

Include the following results in the report:

- (a) Type, class and source of bituminous binder
- (b) Colour expressed as % gilsonite (C) to the nearest 1%
- (c) Reference to this test method