Transport Roads & Maritime Services

NSW GOVERNMENT

Test method T647

Dynamic binder drainage test

NOVEMBER 2012

Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		New Issue (David Bligh)	D.Dash	Aug 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 T647 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T647

Dynamic binder drainage test

1. Scope

This test method sets out the procedure for measuring the binder drainage characteristics of asphalt mixes. The method is suitable for both laboratory and plant prepared mixes.

2. Referenced Documents

Test Method T608 - Bitumen Content of Bituminous Plant Mix.
Test Method T635 – ASH PAC Compaction.
Australian Standards Test Method AS 1141.3.1, Sampling Aggregates.
Australian Standards Test Method AS 2891.2.1, Sample Preparation - Mixing, Quartering and Conditioning of Asphalt in the Laboratory

3. Apparatus

(a) Sieve shaker capable of maintaining an amplitude of 1.0 ± 0.1 mm and a frequency of 25 ± 2.5 Hz

(b) Rubber Gloves

(c) Straight edge

(d) Suitable asphalt sampling and quartering equipment

(e) Dish with the capacity to hold at least 3 kg of mix

(f) Heat insulation gloves

(g) A thermostatically controlled oven with good air circulation, capable of maintaining a temperature within the range of 200 ± 2^{o} C

(h) A balance of at least 3 kg capacity readable and accurate to 0.1 g

Determination of the Binder Drainage of a Plant prepared asphalt mix

4. Sample Preparation

Take a representative bulk sample of approximately 10 - 12 kg of the mix and reduce by quartering to obtain a test sample of about 3kg in mass.

5. Testing Procedure

(a) Place the ASH PAC mould assembly and the test sample into the oven and heat to a constant temperature of 190 ± 2^{o}C.

(b) Once the test temperature is reached, remove the mould and sample from the oven and, without delay, transfer the sample into the mould assembly and level the sample to the top of the mould with a straight edge.

Note:

(c) Place the mix sample uniformly into the mould taking care to ensure the sample is not compacted, does not segregate and is not allowed to cool. The sample must not be left in the oven for any length of time after the desired temperature is reached otherwise the binder may be damaged.

(d) Promptly transfer and clamp the prepared sample onto the sieve shaker and vibrate for 10 minutes. Set the sieve shaker to have an amplitude of 1.0 ± 0.1 mm and a frequency of 25 ± 2 Hz.

Caution: When handling hot materials and apparatus use heat insulation gloves.

(e) After vibrating on the sieve shaker, extrude the sample from the mould and divide into three sub-samples - top, middle and bottom. Retain all sub-samples but only test the top and bottom portions as follows.

(f) Determine the bitumen content, as a percentage of the total mix, for the top and the bottom sub-samples in accordance with the RTA Test Method T608. Record the percentage of bitumen in the top sub-sample as (BC_t) and the bottom sub-sample as (BC_b).

Determination of the Binder Drainage of a laboratory prepared asphalt mix

This procedure is the same as for part 1 "Determination of the Binder Drainage of a Plant mix" except that the mix is prepared in the laboratory.

6. Testing Procedure

(a) Obtain representative quantities of the raw mix materials - aggregates, filler, binder, additive and fixative to make a mix of between 10 - 12 kg in mass.

(b) Sample and prepare the aggregates in accordance with the procedures described in AS 1141.3 test method. The individual components shall be in a ratio of the designated mix design.

(c) Blend the prepared mix components to form the mix sample in accordance with the procedures described in AS 2891.2.1 test method. The following exceptions apply:

(i) Bitumen additives shall be combined with the bitumen prior to adding the binder to the aggregate.

(ii) Fixative shall be added to the mix according to the manufacturer's recommendations.

(iii) The test sample shall be about 3 kg in mass.

Note: If the mixing bowl is clean, it should be coated with a smear of bitumen from a small 'dummy' mix before blending the mix components.

(d) Follow procedure (a) to (e) from part 1"Determination of the Binder Drainage of a Plant mix".

7. Calculations

The binder drainage value (B_{DV}) to the nearest 0.1%

$B_{DV} = BC_b - BC_t$.

Where:

BC_b = the percentage of bitumen in the top sub-sample recorded to the nearest 0.1%

BC_t = the percentage of bitumen in the bottom sub-sample recorded to the nearest 0.1%

8. Report

Report the bitumen content of each sub-sample to the nearest 0.1%.

Report the binder drainage value for the mix to the nearest 0.1%.