Test Method T153

The half-life and expansion ratio of foamed bitumen

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About this release

Title:	The half-life and expansion ratio of foamed bitumen
Test method number:	T153
Author:	Materials Technology
Authorised by:	Director Pavements and Geotechnical

Summary of changes

Issue number	Clause number	Revision description	Authorised by	Publication date
Issue 3.0	All All	Template updated Test method is revised to follow AGPT/T301 with some exceptions.	Director Pavements and Geotechnical	October 2020
Ed 2 / Rev 0	All	Reformatted and revised.	D. Hazell	April 2012
Ed 1 / Rev 0		New issue.	D. Hazell	May 2009

NOTE: The functions of the former State Government agency Roads and Maritime Services (RMS or Roads and Maritime) are now administered by Transport for NSW.

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1 Scope

This test method sets out the procedure to determine the half-life and expansion ratio for the production of foamed bitumen used to stabilise pavement materials.

2 General

(a) This method is applicable to dedicated foamed bitumen laboratory equipment.

(b) This method may be applied to dedicated foamed bitumen inspection jets on reclaimers and stationary plant mix.

(c) This method may be applied to devices that generate a foamed bitumen spray that can be safely contained for the purpose of measuring volume.

(d) Terms used in this test method are defined in Table 1.

Table 1. Terms and definitions

Term	Definition
Expansion ratio	A measure of the viscosity of the foamed bitumen, calculated as the ratio of the maximum volume of the foam relative to the original volume of bitumen.
Foaming agent	A substance designed to increase the half-life and expansion ratio of foamed bitumen. Also known as foaming additive.
Foamed bitumen	A mixture of air, water, and hot bitumen. The mixture may also contain a foaming agent.
Half-life	A measure of the stability of the foamed bitumen, calculated as the time taken in seconds for foamed bitumen to collapse to half its maximum volume.

3 Equipment and procedure

(a) This test method is identical to AGPT/T301, except that:

(i) Clause 4 (b) is replaced by the following: A cylindrical metal container with diameter of 280 ± 10 mm and capacity of about 20 L suitable for holding foamed bitumen.

(ii) Following addition note is added in Clause 6.1 (g) Note 9: If a foaming agent is required, determine the target volume. Add the target volume of foaming agent to the bitumen and continue to circulate for a minimum of 10 minutes, and for no longer than 4 hours.

(iii) Clauses 6.1 (m) and (n) are replaced with T153 Clause 3.1 Optimal Foaming Conditions as follows.

NOTE: Ensure the metal container is stable and in a safe position to receive foamed bitumen from the apparatus.

3.1 Optimal foaming conditions

(a) Where the optimal bitumen foaming conditions are to be determined, repeat the test procedures outlined in Clause 6 of AGPT/T301 using variations of target water flow rates, target bitumen temperatures and/or target foaming agent volumes. Recommended variations include, but not limited to, the following:

(i) Water flow rates of 2.0, 2.5, 3.0, 3.5, and 4.0% by mass of bitumen.

(ii) Bitumen foaming temperatures of 175, 180, and 185 °C.

(iii) Foaming agent volumes of 0.5 and 1.0% by mass of bitumen.

NOTE: Trials using various foaming conditions are required for each batch of bitumen to determine the optimal conditions required to achieve a minimum expansion ratio of 10 and minimum half-life of 20 seconds.

4 Reporting

Follow AGPT/T301 reporting requirements.

5 References

The following documents are referred to in this test method:

- AGPT/T301 (2017). "Austroads test method AGPT/T301 - Determining the foaming characteristics of bitumen". Austroads.

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