



# Test method T153

The half-life and expansion ratio of foamed bitumen

APRIL 2012



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## Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
Ed 1/ Rev 0		New issue	D Hazell	May 2009
Ed 2/ Rev 0	All	Reformatted and revised.	D Hazell	Apr 2012

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

The most recent revisions to Test method T153 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

# Test method T153

## The half-life and expansion ratio of foamed bitumen

### 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.

### 1. General

- (a) This method is applicable to dedicated foamed bitumen laboratory equipment and inspection jets on reclaimers and stationary plant mix.
- (b) This method is applicable to any device that generates a foamed bitumen spray that can be safely contained for the purpose of measuring volume.
- (c) The duration of the collapse of the foamed bitumen production is also recorded.

### 2. Apparatus

- (a) Specialised bitumen foaming machine incorporating temperature controls and water addition for foaming.
- (b) A cylindrical metal container with diameter of  $280 \pm 10$  mm and capacity of about 20 L suitable for holding foamed bitumen. The metal container must be securely attached to the apparatus during the foaming process.
- (c) A metal dipstick with 5 mm linear increments and longer than the depth of the metal container.
- (d) Calibrated timing device to  $\pm 0.5$  second.

### 3. Preparation

- (a) Ensure that the metal container is free of build-up. On the inside of the container make a top mark at a height of 250 mm from the internal base including any residue.
- (b) Prepare the bitumen, water, additive (if used) and foamed bitumen apparatus according to the supplier and manufacturer's recommendation.

### 4. Procedure

- (a) Secure the metal container to receive foamed bitumen from the apparatus.
- (b) Record following temperatures to the nearest  $1^\circ\text{C}$ :
  - (i) Water used for foaming.
  - (ii) Bitumen immediately prior to foaming.
- (c) Inject the foamed bitumen into the cylindrical metal container.
- (d) When the foamed bitumen level reaches the top mark, stop the foamed bitumen supply and start the timer.
- (e) Measure the time for the foam to subside to  $125 \pm 5$  mm and record the duration ( $T_{HL}$ ) in seconds. Continue timing.

*NOTE: Use the dipstick to measure the receding level of the foamed bitumen.*

- (f) When the bitumen has collapsed to a liquid state at the bottom of the container:
  - (i) Record the duration ( $T_F$ ) in seconds.
  - (ii) Measure the average depth of the bitumen ( $b_F$ ) to the nearest 10 mm.

*NOTE: If foaming does not subside after 10 minutes, stop the test and record  $T_F$  as 600 seconds.*

## 5. Calculations

- (a) Calculate the expansion ratio ( $ER$ ) as follows:

$$ER = \frac{250 - b_F}{b_F}$$

Where:

$ER$  = Expansion ratio.

$b_F$  = The final depth of bitumen in the container (mm).

*NOTE: 250 mm is the height to the top mark.*

## 6. Reporting

Include the following information, data and results in the report:

- (b) The following information about the foamed bitumen:
- (i) The source and type of bitumen and the temperature of the bitumen immediately prior to foaming.
  - (ii) The source, quantity and temperature of the water used in the foaming process.
  - (iii) If used, the source and quantity of the additive used with the bitumen (as a percentage of the bitumen mass) and when additive incorporated into the bitumen.
- (a) The name and model number of the apparatus to produce the foamed bitumen.
- (b) The expansion ratio ( $ER$ ).
- (c) The half-life ( $T_{HL}$ ) in seconds.
- (d) The duration ( $T_F$ ) in seconds and the average depth of the collapsed foamed bitumen ( $b_F$ ) in mm.
- (e) Reference to this test method.