Transport Roads & Maritime Services

NSW GOVERNMENT

Test method T703

Flash point by Pensky-Martens closed tester

NOVEMBER 2012

Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Reformatted and Revision Summary Added. Safety Notes Added	D.Dash	Jan 2000
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 T703 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T703

Flash point by Pensky-Martens closed tester

1. Scope

This test method sets out the procedure for determining the flash point by closed tester of fuel oils, lubricating oils, bitumen cutter oils and flux oils. The method is not applicable to drying oils and solvent type liquid waxes or cutback bitumen with a flash point below 110°C. The method is adapted from that set out in the Australian Standard 2106-1977, Part 2.

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. Loosen 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, consult safety data sheets.

3. Apparatus

(a) A Pensky-Martens closed flash tester as described in Appendix B of A.S. 2106-1977. Supported on a level steady table.

(b) Thermometers - two standard thermometers as follows:

IP 15C or ASTM E1 Thermometer 9C range - 7°C to 110°C.
IP 16C or ASTM E1 Thermometer 10C range - 90°C to 370°C.

For the range of 93°C to 110°C, any of the above thermometers specified may be used.

(c) If the test is not being carried out in a draught free area, it is recommended that a shield comprising three sections each about 450 mm wide by 600 mm high be provided.

4. Preparation of Sample

(a) Samples of bituminous materials or very viscous materials may be warmed while still sealed in their original containers, by standing the container in warm or hot water until they are reasonably fluid. However, no sample should be heated more than is absolutely necessary. No sample must be heated above a temperature of 16°C below its expected flash point. Shake or stir thoroughly and immediately transfer to the test apparatus.

(b) Samples containing dissolved or free water may be hydrated with calcium chloride, anhydrous sodium sulphate or by filtering through qualitative filter paper or a loose plug of dry absorbent cotton. Warming the sample is permitted but heating must not be continued for prolonged periods or above a temperature of 16°C below its expected flash point.

5. Procedure

(a) Thoroughly clean and dry all parts of the cap and its accessories before starting the test, being sure to remove all solvent used to clean the apparatus.

(b) Fill the cup with the sample to be tested to the level indicated by the filling mark.

(c) Place the lid on the cup and set the assembly in the stove making sure that the locating or locking device is properly engaged.

(d) Insert the thermometer and light the test flame and adjust it to 4 mm in diameter.

(e) Apply heat at such a rate that the temperature of the sample increases at 5°C to 6°C per minute. Turn the stirrer at 90 to 120 rpm. stirring in a downward direction.

(f) If the sample is known to have a flashpoint at 104°C or below, apply the test flame when the temperature is 17°C to 28°C below the expected flash point and thereafter at a temperature reading

that is a multiple of 1°C. Apply the flame by operating the mechanism on the cover which controls the shutter and test flame burner, so that the flame is lowered into the vapour space of the cup in 0.5 second, left in the lowered position for 1 second and quickly raised to its high position. Do not stir the sample while applying the flame.

(g) If the sample is known to have a flash point above 104°C, apply the test flame in the manner described in (f) above at each temperature that is a multiple of 3°C, beginning at a temperature of 17°C to 28°C below the expected flash point.

6. Calculations

When the barometer pressure at the time of testing differs from 1013 HPa (1013 mb) correct the flash point by means of the following equation:-

Corrected flash point = C + 0.025 (1013-P)

Where

C= Observed flash point (°C)

7. Reporting

Report the fully corrected result to the nearest 0.5°C.

8. Techniques

(a) In all cases, the sample for flash point must be taken from the previously unopened sample container. In case of dispute, a separate sample of at least one half litre shall be made available for test. No dehydrating of the sample is allowable in any check testing.

(b) If it is found after determination of the flash point that any of the conditions laid down in respect of temperature and temperature rise, have not been observed, repeat the test with the temperatures suitably adjusted.

RMS 12.700