

COMMENTARY TO AG:PT/T270 - CONSISTENCY OF BITUMINOUS SLURRY

PREFACE

This bituminous slurry surfacing test method was prepared by Working Group 1, Bituminous Slurry Surfacing, of the Bitumen Emulsions and Foamed Bitumen Project Group on behalf of Austroads. Representatives of Austroads, ARRB Group and the Australian Asphalt Pavement Association have been involved in the development and review of this test method.

PRINCIPLE

A sample of aggregate is dried and mixed with the other bituminous slurry components, including filler, water, bituminous emulsion and additive, to the proportions of the particular slurry mix design. The amount of added water is varied. The resultant bituminous slurry mixtures are placed in an inverted truncated cone, whilst still in the fluid state. The cone is removed and the bituminous slurry “flows”. The extent of flow is a measure of the Consistency of the mix and is determined for each water content tested. A flow of 25 mm to 35 mm is considered satisfactory for field use, but is not specified. Determination of the total water content of a bituminous slurry, which satisfies the Consistency requirement of 25 mm to 35 mm flow, is required so that subsequent tests can be performed on mixes with an appropriate flow characteristic.

SCOPE

This Standard sets out the procedure to determine the Consistency of a bituminous slurry and may be used to optimise the amount of water required to form a workable bituminous slurry mixture. This test may not be applicable to certain microsurfacing systems due to their setting characteristics.

Further Development

There are no further plans for the development of this test method.

CONSISTENCY OF BITUMINOUS SLURRY

1 REFERENCED DOCUMENTS

The following documents are referred to in this method:

AS/NZS

1141	Methods for sampling and testing of aggregates
1141.2	Basic testing equipment
1141.3	Sampling of aggregates and rock
1289	Methods of testing soils for engineering purposes
1289.A1	Scope and general
2357	Mineral fillers for asphalt

2 APPARATUS

The following apparatus is required:

- a. Drying oven capable of operating at 105°C to 110°C, which complies with the requirements of clause A1.3.2 of AS 1289.A1.

Note: Alternatively, thermostatically controlled drying ovens operating at up to 160 ± 3°C, or microwave ovens may be used.

- b. A truncated conical metal mould, hereafter referred to as the “cone” as described in clause C4 of AS1141.2 Appendix C
- c. Metal plate (or sheet of paper) about 300 mm square, inscribed with concentric circles of 45 mm, 50 mm, 55 mm, 60 mm, 65 mm and 70 mm diameter and two lines passing through the centre of the inscribed circles across the plate at 90° to each other.
- d. Mixing bowl and a suitable implement for mixing bituminous slurry mixes.
- e. Metal spatula.

3 PROCEDURE

The procedure shall be as follows:

- a. Obtain representative samples of the required aggregate in accordance with AS1141.3 and filler in accordance with AS2357.
- b. Dry the aggregate in the drying oven at 105°C to 110°C for approximately 16 hours, until constant mass is achieved, or for a lesser time if drying by alternative means (refer 4(a)). Remove the aggregate from the oven and allow to cool to room temperature.
- c. For each total water content the bituminous slurry surfacing mix will be described in terms of parts by mass, where the total dry aggregate and filler components shall total 100 parts. The required proportions of bituminous emulsion, water and additive shall be described in terms of parts by mass, relative to 100 parts by mass of total

dry aggregate and filler. The format for recording bituminous slurry surfacing mix designs shall be as shown in the following example:

Component	Proportion
Aggregate, dry (nominal size, source, reference to laboratory report on grading analysis, etc.)	97.5
Filler (source and description)	2.5
Bituminous Emulsion (description, e.g. batch number, etc.)	12.0
Water (source)	7.0
Additive (description, e.g. batch number, etc.)	0.5

- d. Mix approx. 400 g of the combined aggregate, filler, water and bituminous emulsion until a uniform slurry is formed (see Note). Mixing of the bituminous slurry shall commence immediately upon addition of the bituminous emulsion and be continued for 30 seconds.

Note: It is necessary to add the components in the order of dry aggregate and filler, water, additive and bituminous emulsion. Mixing should be undertaken between addition of each subsequent component.

- e. Immediately upon completion of mixing, transfer the bituminous slurry mixture to the cone, which has been centred on the metal plate (see Note). Strike off the surface of the slurry with the spatula and immediately remove the cone using a smooth vertical motion.

Note: The method of addition of the slurry to the cone may affect the test result. Pouring the slurry mixture from the mixing bowl directly into the cone may allow free fluid to enter the cone first before the bulk of the mixture. Spooning the mixture into the cone may require more time, but may provide a more representative result. However, spooning may allow partial breaking before transfer is complete.

- f. Allow the slurry to flow across the plate until no further flow is evident.
- g. Note and record the distance of the extent of slurry flow at the four points along the inscribed lines from the centre of the plate.

4 CALCULATIONS

Calculate for each water content as follows:

- a. The mean radius of the extent of the slurry flow.

5 TEST REPORT

Report the following:

- a. The bituminous slurry surfacing mix proportions, to the nearest 0.1 parts by mass, at which the extent of the slurry flow is between a mean radius of 25 mm and 35 mm. The format for reporting shall be as follows:

Component	Proportion (Parts by mass)
Aggregate, dry	
Filler	
Bituminous Emulsion	
Additive	
Water (added)	

Note: Parts by mass of aggregate and filler shall total 100.

AMENDMENT RECORD

Amendment No.	Clauses amended	Action	Date
1	Commentary Page	New	June 2005
	Footer and header	Format	
	Applied revised test method number	Format	
	Applied new styles	Format	

Key

Format	Change in format
Substitution	Old clause removed and replaced with new clause
New	Insertion of new clause
Removed	Old clauses removed