STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
METHODS OF TESTING BITUMEN AND RELATED ROADMAKING PRODUCTS

AS 2341.4

DETERMINATION OF DYNAMIC VISCOSITY BY ROTATIONAL VISCOMETER

1 SCOPE. This standard sets out procedures (general and particular) for the determination of dynamic viscosity of bituminous materials using two selected, established makes of constant rate-of-rotation viscometers.

2 REFERENCE. This standard requires reference to the following standard:

ASTM E1 ASTM Thermometers

3 APPLICATION. The method is applicable to materials having dynamic viscosities in the range 0.006 Pa.s to 3000 Pa.s. In particular, the method is applicable to the following materials:

(a) Residual bitumens for pavements (AS 2008). (Viscosities at 135°C and 60°C both before and after RTFO treatment.)

(b) Cutback bitumens (AS 2157). (Viscosity at 60°C and viscosity at 60°C of the residue from distillation.)

(c) Road tars for pavements (AS 1507). (Viscosity at 50°C.)

NOTE: When testing Class 600 bitumens at 60°C, the flow response can be dependent on the rate of shear strain. To ensure that this effect is avoided, measurements on this class of bitumen needs to be done at shear rates not exceeding 0.3 s^{-1}.

The following instruments and cup/rotor assemblies are applicable for such measurements:

Rotovisco—Instruments RV2, RV3 and RV13 using cup/rotor assemblies MV-2 and MV-DIN.

Rheomat —Instrument RM 30 using cup/rotor assemblies MS-A, MS-B, MS-VT (30.5/24) and MS-45 DIN.

4 PRINCIPLE. The material being tested is sheared in the annular space between two concentric cylinders by rotating the inner cylinder (rotor) at constant speed and keeping the outer cylinder (cup) stationary. The torque (moment of couple) generated in the drive to the inner cylinder by the viscous resistance of the material is measured by the angular displacement of either a torsion bar or coil spring integral with the drive shaft. The rotor/cup test assembly is shown diagrammatically in Fig. 1. Further detailed information is given in Appendix A.

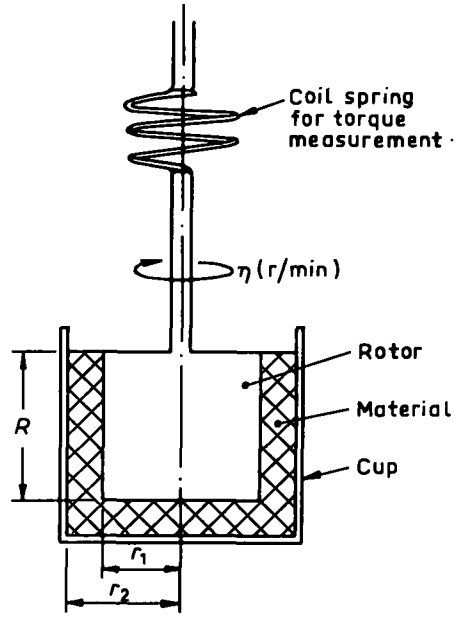

Fig. 1. ROTOR/CUP ASSEMBLY
Illustrating principle of viscosity measurement using a rotational viscometer

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