Under Revision. See DR 91240 Dup

Superseded by AS 2341.12-1993

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
METHODS OF TESTING BITUMEN AND RELATED ROADMAKING PRODUCTS

AS 2341.12
DETERMINATION OF PENETRATION OF RESIDUAL BITUMEN*

PREFACE

This second edition of this standard has been prepared to align Fig. 1 with that given in IP 49, Method of Test for Penetration of Bituminous Materials, and thus eliminate a metrological error in the angle.

1 SCOPE. This standard sets out a procedure for the determination of the penetration of bituminous materials.

2 REFERENCES. This standard requires reference to the following standards:

AS 1965	The Measurement of Surface Roughness with Direct-reading Stylus Electronic Instruments
ASTM E1	ASTM Thermometers
IP Standard Thermometers	

3 PRINCIPLE. The test sample is melted and cooled under controlled conditions. The penetration is measured with a penetrometer by means of which a standard needle is applied to the sample under specific conditions of load (200 g), time (60 s), and temperature (15°C).

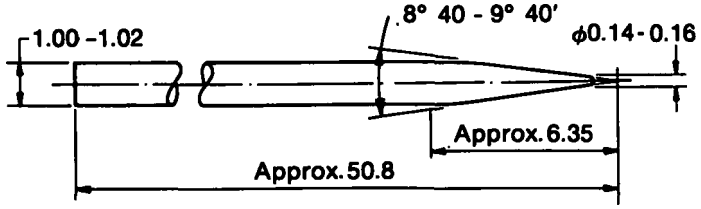
4 DEFINITION. For the purpose of this standard, the following definition applies:

Penetration—the distance in millimetres (to the nearest 0.1 mm) that a standard needle vertically penetrates a sample of the material under known conditions of loading, time and temperature.

5 APPARATUS. The following items of apparatus are required:

(a) *Penetration apparatus.* Any apparatus that permits the needle holder (spindle) to move vertically without measurable friction and is capable of indicating the depth of penetration to an accuracy of 0.1 mm. The mass of the spindle shall be 47.5 ± 0.05 g. The total mass of the needle and spindle assembly shall be 50.0 ± 0.1 g. Weights of 50 ± 0.5 g and 100 ± 0.05 g shall also be provided for a total load of 200 ± 0.2 g, as required for conditions of the test The surface on which the sample container rests shall be flat and the axis of the plunger shall be at approximately 90 degrees to the surface. The spindle shall be easily detachable for checking its mass.

(b) *Penetration needle.* The needle (see Fig. 1) shall be made from fully hardened and tempered stainless steel, Grade 440—C or equivalent, HRC 54 to 60. It shall be approximately 50 mm in length and 1.00 mm to 1.02 mm in diameter. It shall be symmetrically tapered at one end by grinding to a cone having an angle between 8.7 degrees and 9.7 degrees over the entire cone length. The cone should be coaxial with the straight body of the needle. The total axial variation of the intersection between the conical and straight surfaces shall not be in excess of 0.2 mm. The truncated tip of the cone shall be within the diameter limits of 0.14 mm and 0.16 mm and square to the needle axis within 2 degrees. The entire edge of the truncated surface at the tip shall be sharp and free from burrs. When the surface texture is measured in accordance with AS 1965, the surface roughness of the tapered cone surface shall be not greater than 0.4 μm R_a (roughness average). The needle shall



ALL DIMENSIONS ARE IN MILLIMETRES

Fig. 1 NEEDLE FOR PENETRATION TEST

*This method is substantially similar to IP 49, Method of Test for Penetration of Bituminous Materials.