

DETERMINATION OF SOFTENING POINT

STANDARD

- IS: 1205 – 1978.

DEFINITION

- Softening point is the temperature at which the substance attains a particular degree of softening under specified conditions of test.

APPARATUS

- Standard Ring and Ball Apparatus.
- Steel balls 2 No, each 9.5mm in diameter and weighing 3.5 ± 0.05 grams.
- Brass rings 2 No, the rings shall be tampered and shall confirm to the following
 - Depth : 6.4 ± 0.1 mm
 - Inside diameter at bottom : 15.9 ± 0.1 mm
 - Inside diameter at top : 17.5 ± 0.1 mm
 - Outside diameter : 20.6 ± 0.1 mm
- Thermometer capable of reading temperature up to 0 to 250 °C.
- Water bath should be a heat resistant glass vessel not less than 85mm in diameter and 120mm in depth.
- Stirrer shall be manual or mechanical to ensure uniform heat distribution at all times throughout the water bath.

PROCEDURE

- Heat the material to a temperature between 75 to 100 °C above its softening point.
- Stir until it is completely fluid and free from air bubbles and water, and filter if necessary, through IS sieve 30.
- Place the rings, previously heated to a temperature approximately to that of molten material on a metal plate, which has been coated with a mixture of equal parts of glycerin and dextrin.
- Fill the mould with sufficient melt to give excess above the level of the ring.
- Remove the excess material with a warmed sharp knife after cooling in air for 30 minutes.

- Assemble the apparatus with the rings, thermometer and ball guides in position
- Fill the bath to a height of 50mm above the upper surface of the rings with the freshly boiled distilled water or pure glycerin at a temperature of 5 °C
- The water bath liquid shall be freshly boiled distilled water when testing materials having softening points below 80 °C and pure glycerin for material having softening points above 80 °C.
- There shall be exactly 25mm difference between the bottom of the rings and the top surface of the bottom plate of the support, if any, or the bottom of the bath.
- Maintain the bath at a temperature of 5 °C for 15 minutes after which place the balls previously cooled to a temperature of 5 °C by forceps in each ball guide.
- Apply heat to the bath and stir the liquid so that the temperature rises at a uniform rate of 5 ± 0.5 °C per minute until the material softens and allow the balls to pass through the ring.
- Record the temperature shown by the thermometer for each ring and ball at the instant the sample surrounding the ball touches the bottom plate of the support, if any or the bottom of the bath.



Softening point test for bitumen.

REPORT

- Report to the nearest 0.5 °C the mean of the temperature recorded in duplicate as the softening point.

PRECISION

- Test results shall not differ from the mean by the following

Softening Point	Repeatability	Reproducibility
40 to 60	1.00	5.50
61 to 80	1.50	5.50
81 to 100	2.00	5.50
101 to 120	2.50	5.50
121 to 140	3.00	5.50

PRECAUTIONS

- The stirrer shall be so placed that the moulds are not disturbed when the stirrer is in operation.
- The prescribed rate of heating shall be rigidly adhered to for ensuring accuracy of results.
- The rate of temperature rise shall not be averaged over the period of the test.