

BITUMEN: PAVING BITUMEN TYPE 1

Bitumen is used for road construction, surfacing airfield runways and taxi tracks, hydraulic applications such as canal lining, river bank protection, dam construction, and sea defence.

It is also used in industrial applications like roofing, felt manufacture, printing inks, electrical cable/junction boxes, mastic for flooring, water proofing, of terraces, duplex paper manufacture, etc.

Paving bitumen Type 1 shall be classified into six grades according to their penetration and each grade shall be given designation as given in the table with letter "S" denoting the type and a numeral representing the mean of the limits of the penetration specified for the grade.

BITUMEN CONFORMS TO IS 73:1992 (REAFFIRMED 1998) SPECIFICATION FOR STRAIGHT GRADES. Requirement for Paving Bitumen (Type 1) from non waxy crude

| Sr.No. | Characteristics | Requirement for grades | | | | | | Method of test |
|--------|---|------------------------|-------------|-------------|-------------|------------|------------|-----------------------|
| | | S 35 | S 45 | S 55 | S 65 | S90 | S 200 | |
| i) | Specific gravity at 27°C, min. | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | IS 1202:1978 |
| ii) | Water, percent by mass, max. | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | IS 1211:1978 |
| iii) | Flash point, Cleveland open Cup, °C, min. | 175 | 175 | 175 | 175 | 175 | 175 | IS 1448(P:69):1969 |
| iv) | Softening Point, °C | 50 to 65 | 45 to 60 | 45 to 60 | 40 to 55 | 35 to 50 | 30 to 45 | IS 1205:1978 |
| v) | Penetration at 25°C, 100g, sec, 1/10 mm | 30 to 40 | 40 to 50 | 50 to 60 | 60 to 70 | 80 to 100 | 175 to 225 | IS 1203:1978 |
| vi) | Penetration ratio ¹ , min. | 35 | 35 | 35 | 35 | 35 | 35 | - |
| vii) | Ductility at 27°C, cm, min. | 50 | 75 | 75 | 75 | 75 | - | IS 1208:1978 |
| viii) | Paraffin wax content, percent by mass, max. | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | IS 10512:1983 |
| ix) | Frass breaking point, °C, min. | -4 | -4 | -6 | -6 | -8 | -10 | IS 9381:1979 |
| x) | Loss on heating, thin film oven test, percent by mass, max. | 1 | 1 | 1 | 1 | 1 | 2 | IS 1212:1978 |
| xi) | Retained penetration after thin film oven test, 25°C, 100g, 5 sec, 1/10 mm, percent of original, min. | 55 | 55 | 52 | 52 | 47 | 42 | IS 9382:1979 |
| xii) | Matter soluble in trichloroethylene, percent by mass, min. | 99 | 99 | 99 | 99 | 99 | 99 | IS 1216:1978 |
| xiii) | Viscosity at: | | | | | | | |
| | a. 60°C, Poises | 2500 +/- | 2000 +/- | 1500 +/- | 1000 +/- | 500 +/- | 250 +/- | IS 1206(Part 2):1978 |
| | b. 135 °C, cst, min. | 500 220 | 400 210 | 300 180 | 200 150 | 100 110 | 50 20 | IS 1206 (Part 3) 1978 |

Note:

Penetration at 4 °C, 200 g, 60 s

Penetration ratio = ----- X 100

Penetration at 25 °C, 100 g, 5