

*Indian Standard*

**SPECIFICATION FOR  
INDUSTRIAL BITUMEN**

( *Second Revision* )

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**BUREAU OF INDIAN STANDARDS**  
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INDUSTRIAL BITUMEN**

*( Second Revision )*

**0. FOREWORD**

**0.1** This Indian Standard ( Second Revision ) was adopted by the Bureau of Indian Standards on 26 August 1988, after the draft finalized by the Bitumen, Tar and Their Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

**0.2** This standard was first published in 1955 and revised in 1961 to incorporate the new grades of 65/25, 75/15, 75/30 and 105/20 and also to modify the 95/15 grade to 90/15 to cover a wider range of softening point in accordance with methods of tests published in IS : 1201 to IS : 1220-1958\*. The requirements for ten grades of bitumen were stipulated on the basis of investigations carried out and data made available on the material marketed at that time.

**0.3** The Committee responsible for the preparation of this standard decided to revise the earlier version in accordance with data made available based on revised methods of tests in IS : 1202 to IS : 1220-1978\*. In the present version, ten grades of the material have been unified into six grades on the basis of softening point and penetration which are currently available and marketed in the country.

**0.4** Any single grade or blend of two or more grades would be used for the following:

- a) Manufacture and fixing of roofing and damp proofing felts;
- b) Manufacture of plastic bitumen for leak stops;

\*Methods for testing tar and bituminous materials ( *first revision* ).

c) Fixing of heat insulation materials for buildings, refrigeration and cold storage equipment;

d) Manufacture of waterproof packing paper;

e) Manufacture of asphalts for pipeline coatings;

f) Manufacture of joint filler boards and joint sealing compounds;

g) Manufacture of bituminous filling compounds for cable boxes for sealing accumulators and batteries; and

h) Preparation of bitumen mastic.

**0.5** This standard is one of a series of Indian Standards on bitumen. Other specifications so far published in the series are:

IS : 73-1961 Paving bitumen ( *under revision* )

IS : 217-1988 Cutback bitumen ( *second revision* )

IS : 454-1961 Digboi type cutback bitumen ( *revised* )

**0.6** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

\*Rules for rounding off numerical values ( *revised* ).

**1. SCOPE**

**1.1** This standard covers the physical and chemical requirements of industrial bitumen for use in buildings and other industrial purposes.

**2. TERMINOLOGY**

**2.1** For the purpose of this standard, the definitions given in IS : 334-1982\* shall apply.

\*Glossary of terms relating to bitumen and tar ( *second revision* ).

**3. GRADES**

**3.1** Industrial bitumen shall be of the following six grades:

- a) 85/40
- b) 85/25
- c) 90/15
- d) 115/15
- e) 135/10
- f) 155/6.

NOTE — The two figures given in the grades denote approximate values of softening point and penetration in that order, for example, 85/25 means that industrial bitumen corresponding to this grade has approximately a softening point of 85°C and a penetration of 25.

#### 4. MANUFACTURE AND SOURCE

4.1 The material shall be prepared from petroleum residue by air blowing at atmospheric pressure or under pressure with or without catalyst.

4.2 The source and grade of the material shall be stated by the manufacturer.

#### 5. REQUIREMENTS

5.1 Industrial bitumen shall comply with the requirements specified in Table 1.

#### 6. TESTS

6.1 Tests shall be carried out as described in the relevant Indian Standards specified in col 9 of Table 1.

#### 7. PACKING AND MARKING

7.1 **Packing** — The material may be supplied in drums of Type A or Type B as specified in IS : 3575-1977\* or as agreed to between the purchaser and the supplier.

7.2 **Marking** — Each container of industrial

\*Specification for bitumen drums ( *first revision* ).

bitumen shall be legibly and indelibly marked with the following:

- a) Manufacturer's name or trade-mark, if any;
- b) Month and year of manufacture;
- c) Grade; and
- d) Batch number.

7.2.1 Each container may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

#### 8. SAMPLING AND CRITERIA FOR CONFORMITY

8.1 Representative samples of the material shall be drawn and their conformity to the requirements of this standard be judged as prescribed in Appendix A.

TABLE 1 REQUIREMENTS OF INDUSTRIAL BITUMEN

( Clauses 5.1 and 6.1 )

Sl. No.	CHARACTERISTICS	REQUIREMENTS FOR GRADES						METHODS OF TEST, REF TO
		85/25	85/40	90/15	115/15	135/10	155/6	
( 1 )	( 2 )	( 3 )	( 4 )	( 5 )	( 6 )	( 7 )	( 8 )	( 9 )
i)	Specific gravity at 27°C	1.00 to 1.05	1.00 to 1.05	1.01 to 1.06	1.01 to 1.06	1.02 to 1.07	1.02 to 1.07	IS : 1202-1978*
ii)	Flash point, Cleaveland open cup, °C, <i>Min</i>	225	225	225	225	225	225	IS : 1209-1978†
iii)	Softening point, °C	80 to 90	80 to 90	85 to 100	110 to 120	130 to 140	150 to 160	IS : 1205-1978‡
iv)	Penetration at 25°C, 100 g, 5 sec, 1/10 mm	20 to 30	35 to 45	10 to 20	8 to 20	7 to 12	2 to 10	IS : 1203-1978§
v)	a) Loss on heating, percent by mass, <i>Max</i>	0.30	0.30	0.30	0.30	0.30	0.30	IS : 1212-1978 ¶
	b) Penetration of the residue at 25°C, 100 g, 5 s, percent of original, <i>Min</i>	60	60	60	60	60	60	IS : 1203-1978§
vi)	Ductility at 27°C, cm, <i>Min</i>	3	3	2	2	1	0	IS : 1208-1978¶¶
vii)	Matter soluble in trichloroethy- lene, percent by mass, <i>Min</i>	99	99	99	99	99	99	IS : 1216-1978**

\*Methods for testing tar and bituminous materials — Determination of specific gravity ( *first revision* ).

†Methods for testing tar and bituminous materials — Determination of flash and fire point ( *first revision* ).

‡Methods for testing tar and bituminous materials — Determination of softening point ( *first revision* ).

§Methods for testing tar and bituminous materials — Determination of penetration ( *first revision* ).

¶Methods for testing tar and bituminous materials — Determination of loss on heating ( *first revision* ).

¶¶Methods for testing tar and bituminous materials — Determination of ductility ( *first revision* ).

\*\*Methods for testing tar and bituminous materials — Determination of solubility in carbon disulphide or trichloroethylene ( *first revision* ).

## APPENDIX A

( Clause 8.1 )

SAMPLING AND CRITERIA FOR CONFORMITY  
FOR INDUSTRIAL BITUMEN

## A-1. SCALE OF SAMPLING

**A-1.1 Lot** — In any consignment, all the containers of same type, same grade and belonging to the same batch of manufacture shall be grouped together to constitute a lot.

**A-1.2** The number of containers to be selected from the lot shall depend upon the size of the lot and shall be in accordance with Table 2.

TABLE 2 SCALE OF SAMPLING

Lot Size	NUMBER OF CONTAINERS TO BE SELECTED
( 1 )	( 2 )
Up to 50	3
51 to 150	5
151 to 500	7
501 and above	10

**A-1.3** These containers shall be selected at random from the lot. In order to ensure the randomness of selection, procedure given in IS : 4905-1968\* may be followed.

## A-2. PREPARATION OF TEST SAMPLES

**A-2.1** From each of the containers selected according to A-1.2 and A-1.3, a sample representative of material in the container shall be drawn in accordance with the methods prescribed in IS : 1201-1978†, taking all the precautions mentioned therein. All these samples from individual containers shall be stored separately.

\*Methods for random sampling.

†Methods for testing tar and bituminous materials: Sampling ( first revision ).

## A-3. NUMBER OF TESTS

**A-3.1** All the individual samples shall be tested for softening point, penetration and ductility.

**A-3.2** For the remaining characteristics given in Table 1 of the specification, a composite sample prepared by mixing together approximately equal quantities of bitumen from all individual samples shall be tested.

**A-3.3** All samples shall be tested in duplicate and average value shall be reported.

## A-4. CRITERIA FOR CONFORMITY

**A-4.1** The lot shall be declared as conforming to the requirements of this specification if A-4.1.1 and A-4.1.2 are satisfied.

**A-4.1.1** From the test results of each of the characteristics given in A-3.1, the mean (  $X$  ) and the range (  $R$  ) shall be calculated as below:

$$\text{Mean ( } X \text{ )} = \frac{\text{Sum of test results}}{\text{Number of test results}}$$

$$\text{Range ( } R \text{ )} = \text{Difference in the largest and the smallest of the test results}$$

If the expression (  $X - 0.6 R$  ) is greater than or equal to the *minimum* specification limit, the expression (  $X + 0.6 R$  ) is less than or equal to the *maximum* specification limit and both the conditions are satisfied in case of two-sided specification limits, the lot shall be considered to have met these requirements.

**A-4.1.2** The composite sample, when tested for the characteristics mentioned in A-3.2, shall satisfy the corresponding specification requirements.

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[Page 3, Table 1, Sl No. (ii), col 2] - Substitute  
'Cleveland' for 'Cleaveland'.

[Page 3, Table 1, Sl No. (ii), col 9] - Substitute  
'IS 1448 [P:69]:1969 †' for 'IS 1209:1978 †'.

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† Methods of test for petroleum and its products:  
[P:69] Flash and fire point by Cleveland (open) cup.

(PCD 6)