

No. RW/NH-33044/1/2001-S&R (R)-Vol. III

Dated, the 29th November, 2006

To,

The Chairman, National Highways Authority of India; The Secretary-General, Indian Roads Congress;
The Director, Central Road Research Institute; The Director, NITHE.

Subject : Ministry of Shipping, Road Transport & Highways Specifications for Road and Bridge Works (Fourth Revision) 2001-proposed Corrigendum to Section 500 on "Base and Surface Courses (Bituminous)" and other Relevant Section-reg.

Bureau of Indian Standards (BIS) has revised the Specifications of Paving Bitumen with publication of IS:73-2006 [Paving Bitumen-Specification (Third Revision)] in July 2006. This specification, inter-alia, specifies the Grades of Paving Bitumen, based on viscosity as against the previous grading based on penetration in IS:73-1992.

2. As per IS:73-2006, paving grade bitumen have been classified into 4 types, viz. VG-10, VG-20, VG-30 & VG-40. The minimum absolute viscosity (in Poises) of these 4 grades at 60°C are 800, 1600, 2400 & 3200 respectively when tested in accordance with IS:1206 (Part-2). In other words, index of VG multiplied by 80 gives the minimum absolute viscosity (in Poises) of the particular grade of bitumen at 60°C. From the comparison of the requirements for paying bitumen as per IS:73-2006 with that of IS:73-1992 as amended in 2002, as indicated in Annexure to this letter, it appears that VG-30 may replace 60-70 penetration grade bitumen; similarly, VG-10 & VG-40 may replace 80-100 and 30-40/40-50 penetration grade bitumen respectively.

3. Based on feedback from NHAI, IRC, CRRI etc. to above proposed equivalents, a draft corrigendum to relevant sections of the Ministry's Specifications will be circulated. However, it may be noted here that the present requirements for physical properties of binder for Mastic Asphalt (Table 500-29 of Ministry's Specifications for Road and Bridge Works (Fourth Revision 2001) inter-alia stipulated Penetration requirement of 15±5 at 25°C when tested in accordance with IS:1203. In the absence of commensurate viscosity grade of bitumen in IS:73-2006, these provisions are proposed to be retained unchanged. Similarly the evaluation to bitumen for recycling of bituminous pavement (Clause 517.2.26 of the Ministry's Specifications for Road and Bridge Works (Fourth Revisions 2001) inter-alia stipulate that when the amount of reclaimed bituminous materials to be used in the mixture exceeds 10%, the penetration value of the recovered binder from the reclaimed bituminous materials to be used in the mixture exceeds 10%, the penetration value of the recovered binder from the reclaimed bituminous material, before mixing, shall exceed 15 pen, after recovery of binder in accordance with the requirements of BS:2000: Part 397, when tested in accordance with IS:1203. This requirement has also been retained as it is.

4. It is requested that comments on the proposed equivalents referred in para 2 above, and other comments, if any, may be sent at the earliest and preferably within one month to this Ministry.

(Enclosure to Ministry of Shipping, Road Transport and Highways (Deptt. of Road Transport & Highways letter No. RW/NH-33041/3/2001-S&R (R)-Vol. III dated 29.11.2006).

Requirements for Paving Bitumen as per IS:73-2006

Sl. No.	Characteristics	Paving Grades				Methods of Test, Ref to IS No.
		VG 10	VG 20	VG 30	VG 40	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Absolute viscosity at 60°C, Poises, Min	800	1600	2400	3200	IS 1260 (Part 2)
ii)	Kinematic viscosity at 135°C, cST, Min	250	300	350	400	IS 1206 (Part 3)
iii)	Flash Point (Cleveland open cup), °C, Min	220	220	220	220	IS 1209
iv)	Solubility in trichloroethylene, percent, Min	99.0	99.0	99.0	99.0	IS 1216
v)	Penetration at 25°C, 100g, 5s, 0.1 mm	80-100	60-80	50-70	40-60	IS 1203
vi)	Softening point (R&B), °C, Min	40	45	47	50	IS 1205
vii)	Tests on residue from thin-film over tests/RTFOT					
	1) Viscosity ratio at 60°C, Max	4.0	4.0	4.0	4.0	IS 1206 (Part 2)
	2) Ductility at 25°C, cm, Min, after thin-film over test	75	50	40	25	IS 1208

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	1) Viscosity ratio at 60°C, Max	4.0	4.0	4.0	4.0	IS 1206 (Part 2)
	2) Ductility at 25°C, cm, Min, after thin-film over test	75	50	40	25	IS 1208

Requirements for Paving Bitumen Type 1 as per IS:73-1992

Sl. No.	Characteristics	Requirements for Grades						Methods of Test Ref to
		S35	S45	S55	S65	S90	S200	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
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) 1978
iv)	Softening point °C	55-65	50-60	50-60	45-55	40-55	30-45	IS 1205:1978
v)	Penetration at 25°C 100 g. 5 Sec., 1/10 mm	30-40	40 to 50	50 to 60	60 to 70	80 to 100	175 to 225	IS 1203:1978
vi)	Penetration ratio ¹ , Min	42	40	40	35	30	20	
vii)	Ductility at 27°C, cm, Min	50	75	75	75	75	—	IS 1208:1978
viii)	Paraffin was content, percent by mass, Max	4.5	4.5	4.5	4.5	4.5	4.5	IS 10512:1983
ix)	Frass breaking point ² °C, Max	-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 per cent 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	5000+ 1000	4000+ 800*	3000+ 600	2000+ 500*	1000+ 250*	250+ 50	IS 1206 (Part 2): 1978
	b) 135°C cst, Min	500	400	350	300	250	125	IS 1206 (Part 3): 1978

1 Penetration ratio = $\frac{\text{Penetration at 4°C, 200g 60s} \times 100}{\text{Penetration at 25°C, 100g 5s}}$

2 This characteristic is subject to the agreement between the supplier and the purchaser

* Amendment No. 3 October, 2002.