

**TABLES 1.1-1.6 PRODUCT SPECIFICATIONS**

To be read in conjunction with section 1.2 of IP *Bitumen safety code*.

**Table 1.1 Product specifications – Paving and hard paving grade bitumens**

**Table 1.1a Product specifications – Paving grade bitumens  
(from 20 dmm to 330 dmm penetration) (BS EN 12591)**

Property	Test method	Grade								
		20/30	30/45	35/50	40/60	50/70	70/100	100/150	160/220	250/330
Penetration at 25°C	IP49	20-30	30-45	35-50	40-60	50-70	70-100	100-150	160-220	250-330
Softening point °C (min.)	IP58	55	52	50	48	46	43	39	35	30
(max)		63	60	58	56	54	51	47	43	38
Resistance to hardening at 163°C	IP460 part 1 Or IP460 part 3									
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- change of mass % (max)		0,5	0,5	0,5	0,5	0,5	0,80	0,8	1,0	1,0
- retained penetration (min)	IP49	55	53	50	50	50	46	43	37	35
- softening point after hardening, minimum (°C)	IP58	57	54	49	49	48	45	41	37	32
Flash Point, minimum (°C)	IP36	240	240	240	230	230	230	230	220	220
Solubility, minimum (%)	IP47	99,0	99,0	99,0	99,0	99,0	99,0	99,0	99,0	99,0
Kinematic viscosity at 135°C, minimum (mm <sup>2</sup> /s)	IP319	530	400	370	325	295	230	175	135	100

Note IP34 can be used to investigate contamination, but is likely to give lower results.

**Table 1.1b Product specifications – Paving grade bitumens**

**(from 250 dmm to 900 dmm penetration) (BS EN 12591)**

Property	Test method	Grade			
		250/330	330/430	500/650	650/900
Penetration at 15°C	IP49	70-130	90-170	140-260	180-360
Dynamic viscosity at 60°C, minimum (Pa.s)	IP222	18	12	7,0	4,5
Kinematic viscosity at 135°C, minimum (mm <sup>2</sup> /s)	IP319	100	85	65	50
Resistance to hardening at 163°C	IP460 part 1 Or IP460 part 3				
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- change of mass % (max)		1,0	1,0	1,5	1,5
- viscosity ratio at 60°C, maximum		4,0	4,0	4,0	4,0
Flash Point, minimum (°C)	IP34	180	180	180	180
Solubility, minimum (%)	IP47	99,0	99,0	99,0	99,0

**Table 1.1c Product Specifications – Paving grade bitumens  
(soft bitumens) (BS EN 12591)**

Property	Test method	Grade			
		V1500	V3000	V6000	V12000
Kinematic viscosity at 60°C (Pa.s)	IP319	1000-2000	2000-4000	4000-8000	8000-16000
Flash Point, minimum (°C)	IP34	160	160	180	180
Solubility, minimum (%)	IP47	99,0	99,0	99,0	99,0
Resistance to hardening ,TFOT 120°C	IP460 part 2				
- change of mass % ±(max)		2,0	1,7	1,4	1,0
- viscosity ratio at 60°C, maximum		3,0	3,0	2,5	2,0

**Table 1.1d Product Specifications –Hard Paving grade bitumens  
(BS3690 Part1)**

Property	Penetration at 25°C	Softening Point (°C)	Loss on heating for 5h at 163°C	
			Loss by mass % (max.)	Drop in penetration % ( max)
Grade : 15pen	10-20	63-76	0,1	20
Test method	IP49	IP58	IP460 Part 2	

**Table 1.2 Product Specifications –Hard industrial grade bitumens (BS EN 13305)**

Property	Test method	Limits and Tolerances
Softening Point, min	IP58	±5°C of value
Penetration at 25°C ,min	IP49	NR <sup>a</sup>
Solubility in toluene, min	IP47	99%
Loss on heating for 5h at 163°C	IP506	NR <sup>a</sup>
Flash point, min	IP36	250°C

Note: common grades would be : H80/90 and H100/120

<sup>a</sup> No requirement: values can be agreed between client and supplier.

**Table 1.3 Product Specifications – Oxidised Bitumens (BS EN 13304)**

Property	Test method	Limits and Tolerances
Softening Point, min	IP58	±5°C of value
Penetration at 25°C ,min	IP49	±5dmm of value
Solubility in Xylene, min	IP47	99%
Loss on heating for 5h at 163°C	IP506	0,5%
Flash point, min	IP36	250°C

**Table B.1 Recommended bitumen handling & storage temperatures**

To be read in conjunction with Annex B of the IP Bitumen Safety Code

Grade	Minimum pumping temperature (°C) Note 1	Typical bitumen temperature at time of application (°C)		Maximum handling and storage temperature (°C) Note 4	Typical Long term storage temperature (°C) Note 6
		Mixing and short term storage Note 2 Note 5 Note 9	Spraying Note 3		
<b>Paving grades (BS EN 12591:2000)</b>					
250/330	100	135	165	190	60
160/220	110	140	175	190	65
100/150	110	150	190	190	70
70/100	120	155		190	75
50/70	125	160		190	80
40/60	125	165		200	80
35/50	130	165		200	85
30/45	130	170		200	85
20/30	140	175		200	90
<b>Hard paving grades (BS EN 13924)</b>					
15/25	145	180		200	90
10/20	150	180		200	90
<b>Hard industrial grades (BS EN 13305)</b>					
H80/90	160	200		230	120
H100/120	190	220		230	130
<b>Oxidised grades (BS EN 13304)</b> <span style="float: right;">Note 7</span>					
75/30	150	195			110
85/25	165	210		230	110
85/40	165	210		230	110
95/25	175	215		230	120
105/35	190	220		230	130
115/15	205	225		230	130
<b>Cutback grades (BS3690 Part 1)</b> <span style="float: right;">Note 8</span>					
50secs	65	105		160	
100secs	70	110		170	
200secs	80	120		180	

Notes:

1. Maximum pumping viscosity - approx. 2000cSt (all grades)
2. Mixing / coating viscosity - approx 200cSt (all grades)
3. Spraying viscosity - approx 60cSt (penetration grades)
4. Based on generally satisfactory experience of the storage and handling of paving, hard paving & oxidised grades in contact with air. Subject to the avoidance of flammable atmospheres in the vapour spaces of storage tanks.
5. Based on satisfactory experience of the storage of bitumen in a manner consistent to preserve its quality and performance.
6. Based on a protracted storage period without the addition of fresh binder. For bulk bitumens the temperature should not fluctuate above and below 100°C as this increases the risk of condensation leading to boil over.
7. In oxidised bitumen rundown tanks i.e. those that are, or can be, directly connected to the process plant and, except where oxygen depletion is applied, temperatures should not exceed 200°C.

8. Based on generally satisfactory experience of storage and handling cutback bitumen in contact with air. Subject to the avoidance of sources of ignition in the vicinity of tank vents and open air operations.
9. For polymer-modified bitumens, emulsions and proprietary products advice on handling and storage temperatures should be contained in a MSDS obtained from the supplier.