

NRA Binder Specifications

April 2013

TABLE 1 - IS EN 13808 & NRA RC 380

Irish National Application Document - Cationic Bitumen Emulsions

EN 13808, Table 1, EN Grade	Standard ⁵	Unit	C72BP 3	C72BP 3	C69B 3	C69BF 3	C65B 3	C40B 4	C60B 4	C65BP 4	C65BP 3
Nominal Grade			Super Premium Polymer	Premium Polymer	Cationic 70%	Cationic 70%	Cationic 65%	Cationic 40%	Cold Mix & Recycling	Slurry Seal	Bond Coat
Suggested Use			Surface Dressing	Surface Dressing	Surface Dressing	Grouting October to April	Patching & Tack Coat	Tack Coat			

IS EN 13808 Table 2 - Specification Framework for Cationic Bituminous Emulsions - Properties of the Emulsion as such

Binder Content ^{2 & 3}	IS EN 1428	% by mass	≥ 71 (Class 11)	≥ 71 (Class 11)	67 to 71 (Class 9)	67 to 71 (Class 9)	63 to 67 (Class 7)	38 to 42 (Class 3)	58 to 62 (Class 6)	63 to 67 (Class 7)	63 to 67 (Class 7)
Residual Binder after distillation	IS EN 1431	% by mass			≥ 67 (Class 9)	≥ 67 (Class 9)	≥ 63 (Class 7)	≥ 38 (Class 3)	≥ 58 (Class 6)	≥ 63 (Class 7)	≥ 63 (Class 7)
Breaking Value (Forshammer filler)	IS EN 13075-1		< 110 & 70-155 (Class 2 & 3)	< 110 & 70-155 (Class 2 & 3)	< 110 & 70-155 (Class 2 & 3)	< 110 & 70-155 (Class 2 & 3)	< 110 & 70-155 (Class 2 & 3)	< 110 & 110-195 (Class 2 & 4)	< 110 & 110-195 (Class 2 & 4)	< 110 & 110-195 (Class 2 & 4)	< 110 & 110-195 (Class 2 & 4)
Residue on Sieving, 500um	IS EN 1429	% by mass	≤ 0.5 (Class 4)	≤ 0.2 (Class 3)	≤ 0.2 (Class 3)	≤ 0.2 (Class 3)	NR (Class 0)	NR (Class 0)	NR (Class 0)	NR (Class 0)	NR (Class 0)
Redwood #2 Viscosity @ 85°C	IS EN 16345	Seconds	20-100 (Class 3)	20-100 (Class 3)	20-100 (Class 3)	20-100 (Class 3)	NR (Class 0)	NR (Class 0)	NR (Class 0)	NR (Class 0)	NR (Class 0)

IS EN 13808 Table 3 - Specification Framework for Cationic Bituminous emulsions - properties of Residual, Recovered, Stabilised and Aged Binders

Bituminous Phase of the emulsion	Bituminous Phase of the emulsion	Residual Binder by Distillation	Residual Binder by Distillation	Residual Binder by Distillation	NR	NR	NR	NR
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TABLE 1 - IS EN 13808 & NRA RC 380 (Cont'd)

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EN 13808, Table 1, EN Grade	Standard ⁵	Unit	C72BP 3	C72BP 3	C69B 3	C69BF 3	C65B 3	C40B 4	C60B 4	C65BP 4	C65BP 3
Nominal Grade			Super Premium Polymer	Premium Polymer	Cationic 70%	Cationic 70%	Cationic 65%	Cationic 40%	Cold Mix & Recycling	Slurry Seal	Bond Coat
Suggested Use			Surface Dressing	Surface Dressing	Surface Dressing	Grouting October to April	Patching & Tack Coat	Tack Coat			

IS EN 13808 Table 4 - Specification Framework for the Technical Requirements and Performance Classes for Residual, Recovered, Stabilised and Aged Binders from Cationic Bituminous Emulsions

Penetration @ 25°C	IS EN 1426	0.1mm	≤ 270 (Class 6)	≤ 270 (Class 6)	< 270 (Class 6)	< 330 (Class 7)	≤ 270 (Class 6)				
Softening Point °C	IS EN 1427	°C	≥ 39 (Class 7)	≥ 39 (Class 7)	DV (Class 1)	DV (Class 1)	DV (Class 1)				
Cohesion by Pendulum Test	IS EN 13588	J/cm ²	≥ 1.4 (Class 2)	≥ 1.2 (Class 3)							

- (1) Tests must be carried out within 10 days of sampling. Sampling should be taken at point of delivery only in accordance with IS EN 58 & IS EN 12594.
- (2) Binder contents carried by IS EN 1428 exceeding the upper limit are permitted once the viscosity requirement is met.
- (3) The binder content when determined by IS EN 1428 shall be defined as , 100 - Water Content.
- (4) DV: Declared Value
- (5) Standard: refers to the most current standard available.
- (6) Cationic 70% (C69BF3) is permitted to be used during the period of October to April.
- (7) NR: Not Required

TABLE 2 - IS EN 12591 and NRA RC 380

Paving Grade Bitumen

Paving Grade	Standard ²	Unit	40/60	70/100	160/220
Nominal Grade			50 pen	100 pen	200 pen

IS EN 12591 Table 1A – Paving Grade Bitumen Specification for Grades from 20 x 0.1mm to 220 x 0.1mm Penetration

Penetration @ 25°C	IS EN 1426	0.1 mm	40-60	70-100	160-220
Softening Point	IS EN 1427	°C	48-56	43-51	35-43
Resistance to hardening, at 163°C	IS EN 12607-1				
Retained penetration		%	≥50	≥46	≥37
Increase in softening point - Severity 1		°C	≤9	≤9	≤11
Change of mass (absolute value)		%	≤0.5	≤0.8	≤1
Flash Point (COC)	IS EN ISO 2592	°C	≥230	≥230	≥220
Solubility	IS EN 12592	%	≥99	≥99	≥99

(1) Sampling should be taken at point of delivery only in accordance with IS EN 58 & IS EN 12594.

(2) Standard: refers to the most current standard available.

TABLE 3 - IS EN 15322 and NRA RC 380

Cutback and Fluxed Bitumen Binders

EN 15322, Table 1, EN Grade	Standard ³	Unit	Fm 3-45 B 0	Fm 3-30 B 0
Nominal Grade			Cutback Binder	Cutback Binder
Suggested Use			Delayed Set Macadam	Delayed Set Macadam

IS EN 15322 Table 3 – Specification Framework for Technical Requirements and Performance Classes of Cut-Back and Fluxed Bituminous Binders

Efflux Viscosity, 10mm @ 25°C	IS EN 12846-2	Seconds	30-60 (Class 3)	20-40 (Class 3)
Solubility	IS EN 12592	%	> 99.0 (Class 2)	> 99.0 (Class 2)
Flash Point - Pensky Martens CC	IS EN ISO 2719	°C	> 60 (Class 7)	> 60 (Class 7)
Total Distillates at 360°C	IS EN 13358	%	NR (Class 0)	NR (Class 0)

- (1) Sampling should be taken at point of delivery only in accordance with IS EN 58 & IS EN 12594.
- (2) NR: Not Required
- (3) Standard: refers to the most current standard available.

TABLE 4 - IS EN 14023 and NRA RC 380

Polymer Modified Paving Grade Bitumen

Polymer Modified Bitumen	Standard ²	Unit	65-105/60	65-105/70
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IS EN 14023 Table 1 - Framework Specification for Polymer Modified Bitumens - Properties Applying to all Polymer Modified Bitumens

Penetration @ 25°C	IS EN 1426	0.1 mm	65-105 (Class 6)	65-105 (Class 6)
Softening Point	IS EN 1427	°C	≥60 Class 6)	≥70 (Class 4)
Cohesion Force Ductility (50mm/min traction)	IS EN 13589 followed by IS EN 13703	J/cm ²	≥ 1 (Class 4)	≥ 1 (Class 4)
Resistance to hardening, at 163°C	IS EN 12607-1			
Retained penetration		%	≥60 (Class 7)	≥60 (Class 7)
Increase in softening point		°C	≤8 (Class 2)	≤8 (Class 2)
Change of mass		%	≤1.0 (Class 5)	≤1.0 (Class 5)
Flash Point (COC)	IS EN ISO 2592	°C	≥220 (Class 4)	≥220 (Class 4)

IS EN 14023 Table 2 - Framework Specification for Polymer Modified Bitumens- Properties Associated with Regulatory or Other Regional Requirements

Frass Breaking Point	IS EN 12593	°C	≤ - 12 (Class 6)	≤ - 12 (Class 6)
Elastic Recovery @ 25°C	IS EN 13398	%	TBR (Class 1)	TBR (Class 1)

IS EN 14023 Table 3 - Framework Specification for Polymer Modified Bitumens - Additional Properties

Drop in Soft pt after EN 12607-1	IS EN 1427	°C	≤ 2 (Class 2)	≤ 2 (Class 2)
Storage Stability Difference in Softening Point	IS EN 13399 IS EN 1427	°C	≤ 5 (Class 2)	≤ 5 (Class 2)
Storage Stability Difference in Penetration	IS EN 13399 IS EN 1426	0.1mm	NR (Class 0)	NR (Class 0)

- (1) Sampling should be taken at point of delivery only in accordance with IS EN 58 & IS EN 12594.
 (2) Standard: refers to the most current standard available.
 (3) TBR: To Be Reported
 (4) NR: Not Required

TABLE 5 - IS EN 13924-1 and NRA RC 380

Hard Grade Bitumen

Hard Paving Grade Bitumen	Standard ²	Unit	Class 2	Class 3
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IS EN 13924-1 Table 1 - Specification for Hard Paving Grade Bitumens

Penetration @ 25°C	IS EN 1426	0.1 mm	15 to 25 (Class 2)	10 to 20 (Class 3)
Softening Point	IS EN 1427	°C	55 to 71 (Class 2)	58 to 78 (Class 3)
Resistance to hardening, at 163°C	IS EN 12607-1			
Change of mass		%	≤ 0.5	
Retained penetration		%	≥ 55	
Increase in Softening Point		°C	≤ 8	≤ 10
Flash Point	IS EN ISO 2592	°C	≥ 235	≥ 245
Solubility	IS EN 12592	%	≥ 99.0	

(1) Sampling should be taken at point of delivery only in accordance with IS EN 58 & IS EN 12594.

(2) Standard: refers to the most current standard available.

