

Bituminous Emulsions



Emulsions



Bituminous Emulsions are colloidal dispersions of globules of bitumen in an aqueous phase, comprising water and one or more anionic or cationic emulsifiers whose purpose is to enable the dispersion of the bitumen, ensure the stability of the emulsion and guarantee adhesion with aggregates at room temperature.

The main characteristic of Bituminous Emulsions is that they can be used as a binder at lower temperatures than usual and even at room temperature. Their fluid consistency allows coats between the different layers of the road and mixing and/or binding with aggregates. This is achieved in the emulsion breaking process, where the bitumen particles that remain free provide cohesion to the whole. Bituminous emulsions are the fundamental base that has made the development of cold mix technology for roads possible.

Repsol produces all types of emulsions: cationic and anionic, rapid, medium, slow breaking and super-stabilised, which cover all the areas of use of these materials.

/ APPLICATIONS

• Cationic bituminous emulsions

Application	Emulsion type
Primer coats	C50BF4 IMP
	C60BF4 IMP
Tack coats	C50B3 ADH
	C60B3 ADH
	C60B3 ADH d
Curing coats	C50B3 CUR
	C60B3 CUR
	C60B3 CUR d
Bitumen slurries and cold microsurfacing	C60B4 MIC Slurry
Emulsion gravel	C60B5 GE
Surface treatments using coats with gravel	C65B2 TRG
	C65B2 TRG d
	C69B2 TRG
Open-graded bitumen mixes	C67BF3 MBA
	C67BF3 MBA d
	C69BF3 MBA d
	C67BF3 MBA Efimul

• Anionic bituminous emulsions

Application	Emulsion type
Primer coats	A60BFL
	A50BFL
Tack coats	A60BR
Curing coats	A60BR
Anti-dust coats	A60BFL
Bitumen slurries and cold microsurfacing	A60BL
Emulsion gravel	A60BL
Surface treatments using coats with gravel	A60BR
	A65BR
Open granulometry bitumen mixes	A60BFL
	A67BFM

/ PRODUCT CHARACTERISTICS

The following table shows the characteristics of the Bituminous Emulsions:

• Cationic bituminous emulsions

UNE EN 13808 DENOMINATION			C50BF4 IMP	C60BF4 IMP	C50B3 ADH	C60B3 ADH	C50B3 CUR	C60B3 CUR
Previous denomination			ECI	ECL-1	ECR-0	ECR-1	ECR-0	ECR-1
Characteristics	UNE EN	Unit	Tests on original emulsion					
Polarity of the particles	1430	-	Positive					
Breaking Index [Forshamer filler]	13075-1	-	110-195 Class 4	110-195 Class 4	70-155 Class 3	70-155 Class 3	70-155 Class 3	70-155 Class 3
Binder content (from content in water)	1428	%	48-52 Class 4	58-62 Class 6	48-52 Class 4	58-62 Class 6	48-52 Class 4	58-62 Class 6
Residual binder after distillation	1431	%	≥ 48 Class 4	≥ 58 Class 6	≥ 48 Class 4	≥ 58 Class 6	≥ 48 Class 4	≥ 58 Class 6
Content in fluidiser by distillation	1431	%	5-15 Class 7	≤ 8 Class 5	≤ 2 Class 2	≤ 2 Class 2	≤ 2 Class 2	≤ 2 Class 2
Creep time [2mm, 40 °C]	12846-1	s	≤ 20 Class 2	15-70 Class 3	15-70 Class 4	15-70 Class 3	15-70 Class 4	15-70 Class 3
Sieving residue [0.5 mm sieve]	1429	%	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2
Sedimentation tendency [7d]	12847	%	≤ 10 Class 3	≤ 10 Class 3	≤ 10 Class 3	≤ 10 Class 3	≤ 10 Class 3	≤ 10 Class 3
Adhesiveness	13614	%	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3
Recovered binder: by evaporation according to EN 13074-1								
Penetration at 25 °C	1426	0.1 mm	90-170 ^[1] Class 8	≤ 330 Class 7	≤ 330 Class 7	≤ 330 Class 7	≤ 330 Class 7	≤ 330 Class 7
Softening Point	1427	°C	< 35 Class 9	≥ 35 Class 8	≥ 35 Class 8	≥ 35 Class 8	≥ 35 Class 8	≥ 35 Class 8
Stabilised binder: by evaporation according to EN 13074-1, followed by stabilisation according to EN 13074-2								
Penetration at 25 °C	1426	0.1 mm	≤ 220 Class 5	≤ 220 Class 5	≤ 220 Class 5	≤ 220 Class 5	≤ 220 Class 5	≤ 220 Class 5
Softening Point	1427	°C	≥ 35 Class 8	≥ 35 Class 8	≥ 35 Class 8	≥ 35 Class 8	≥ 35 Class 8	≥ 35 Class 8

[1] Penetration at 15 °C



UNE EN 13808 DENOMINATION			C60B4 MIC SLURRY	C60B5 GE	C65B2 TRG	C69B2 TRG	C67BF3 MBA	C69BF4 MBA D
Previous denomination			ECL-2	ECL-2	ECR-2	ECR-3	ECM	
Characteristics	UNE EN	Unit	Tests on original emulsion					
Polarity of the particles	1430	-	Positive					
Breaking Index (Forshamer filler)	13075-1	-	110-195 Class 4	> 170 Class 5	< 110 Class 2	< 110 Class 2	70-155 Class 3	70-155 Class 3
Binder content (from content in water)	1428	%	58-62 Class 6	58-62 Class 6	63-67 Class 7	67-71 Class 9	65-69 Class 8	67-71 Class 9
Residual binder after distillation	1431	%	≥ 58 Class 6	≥ 58 Class 6	≥ 63 Class 7	≥ 67 Class 9	≥ 65 Class 8	≥ 67 Class 9
Content in fluidiser by distillation	1431	%	≤ 2 Class 2	≤ 2 Class 2	≤ 2 Class 2	≤ 2 Class 2	≤ 10 Class 6	5-15 Class 7
Creep time (2 mm, 40 °C)	12846-1	s	15-70 Class 3	15-70 Class 3	5-70 (2) Class 5	5-70 (2) Class 5	5-70 (2) Class 5	5-70 (2) Class 5
Sieving residue (0.5 mm sieve)	1429	%	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2	≤ 0.1 Class 2
Sedimentation tendency (7d)	12847	%	≤ 10 Class 3	≤ 10 Class 3	≤ 10 Class 3	≤ 5 Class 2	≤ 5 Class 2	≤ 10 Class 3
Adhesiveness	13614	%	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3	≥ 90 Class 3
Recovered binder: by evaporation according to EN 13074-1								
Penetration at 25 °C	1426	0.1 mm	≤ 100 Class 3	≤ 220 Class 5	≤ 330 (1) Class 7	≤ 330 Class 7	140-260 (1) Class 9	≤ 330 Class 7
Softening Point	1427	°C	≥ 43 Class 6	≥ 39 Class 7	≥ 35 Class 8	≥ 35 Class 8	≤ 35 Class 9	≥ 35 Class 8
Stabilised binder: by evaporation according to EN 13074-1, followed by stabilisation according to EN 13074-2								
Penetration at 25 °C	1426	0.1 mm	≤ 100 Class 3	≤ 220 Class 5	≤ 220 Class 5	≤ 220 Class 5	≤ 220 Class 5	≤ 220 Class 5
Softening Point	1427	°C	≥ 43 Class 6	≥ 39 Class 7	≥ 35 Class 8	≥ 35 Class 8	≥ 39 Class 7	≥ 39 Class 7

[1] Penetration at 15 °C

[2] 4 mm sieve time at 40 °C.

• Anionic bituminous emulsions

UNE DENOMINATION 51603			A50BR	A50BFR	A60BR	A65BR	A67BFM	A67BPFM	A60BFL	A60BL	A50BFL
Previous denomination			EAR-0	EAR-0 (3)	EAR-1	EAR-2	EAM	EAM-m	EAL-1	EAL-2	EAI
Characteristics	UNE EN	Unit	Tests on original emulsion								
Polarity of the particles	1430	-	Negative								
Binder content (from content in water)	1428	%	48-52	48-52	58-62	63-67	65-69	65-69	58-62	58-62	48-52
Content in fluidiser by distillation	1431	%	≤ 3	3-5	≤ 3	≤ 3	3-10	3-10	3-8	≤ 3	5-15
Creep time (2mm, 40 °C)	12846-1	s	15-70	15-70	40-130 (4)	5-70 (2)	5-70 (2)	5-70 (2)	15-70	40-130 (4)	15-70
Sieving residue (0.5 mm sieve)	1429	%	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Sedimentation tendency (7d)	12847	%	≤ 10	≤ 10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 10	≤ 10	≤ 10
Mix stability with complement	12848	%								< 2	
Content in fluidiser by distillation (EN 1431)											
Penetration at 25 °C	1426	0.1 mm	≤ 220/100(5)	≤ 220/100(5)	≤ 220/100(5)	≤ 220/100(5)	≤ 270	≤ 220	≤ 220/100(5)	220/220/100(5)/330(4)	220-330
Softening Point	1427	°C	≤ 35/39(5)	≤ 35/39(5)	≥ 35/39(5)	≥ 35/39(5)	≥ 35	≥ 39	≥ 35/39(5)	≥ 35/39(5)	≥ 35/39(5)
Elastic Recovery	13398	%						≥ 40			

[2] 4 mm sieve time at 40 °C.

[3] Emulsion with a content in fluidiser between 3 and 5 %.

[4] These emulsions can be manufactured with lower viscosities (15-70 sec.) according to the conditions of use.

[5] These emulsions with harder distillation residues are designated with the corresponding type followed by the letter "d".