

Thermo-Adhesive Emulsions



Emulsions



Thermo-Adhesive Emulsions are rapid breaking emulsions with special characteristics with regards to adhesiveness between layers, adhesion to the support and little to no sticking to the tyres of the work vehicles.

Due to the thermo-adhesive property of the product, it is guaranteed not to stick to any element until the application of the hot bituminous mix, which then modifies the viscosity of the binder, facilitating adhesion between layers.

The residual bitumen of conventional emulsions for tack coats tends to get detached with the passage of work vehicles and of the mix-extension machinery. This decreases the adhesion between layers due to the lack of solidity between them, which entails a large reduction in the life of the road surface.

Thermo-adhesive emulsions prevent this situation providing the following benefits:

- The tack coat applied is not removed;
- There is significant cost saving due to optimisation of the quantity of emulsion and the means employed for its installation, as it is not necessary to go over areas not covered by the emulsion again;
- It is not necessary to stop work vehicles (greater availability).

Repsol's range of thermo-adhesive emulsions includes the following types of emulsion: **C60B3 TER Antistick**, **C60B3 TER Antistick Plus** and **C60BP3 TER Antistick Plus**. All of these are rapid breaking cationic emulsions and are manufactured using hard bitumens or polymer-modified bitumens.

/ APPLICATIONS

The thermo-adhesive emulsions are usually used in tack coats under coats of bituminous mixes applied at temperatures of over 100 °C.

The C60BP3 TER Antistick Plus emulsion is usually used for tack coats of the road surface, especially when there is a draining mix (PA) or a thin-layer mix (BBTM or SMA).

The conventional C60B3 TER Antistick and C60B3 Antistick Plus emulsions are preferably used for adhesion of the remaining layers of the road surface.

/ PRODUCT CHARACTERISTICS

The following table shows the characteristics of the thermo-adhesive emulsions:

UNE EN 13808 DENOMINATION			C60B3 ADH	C60B3 TER ANTISTICK	C60B3 TER ANTISTICK PLUS	C60BP3 TER ANTISTICK PLUS
Characteristics	UNE EN	Unit	Tests on original emulsion			
Polarity of the particles	1430	-	Positive			
Breaking Index (Forshamer filler)	13075-1	-	70-155 Class 3	70-155 Class 3	70-155 Class 3	70-155 Class 3
Binder content (from content in water)	1428	%	58-62 Class 6	58-62 Class 6	58-62 Class 6	58-62 Class 6
Residual binder after distillation	1431	%	≥ 58 Class 6	≥ 58 Class 6	≥ 58 Class 6	≥ 58 Class 6
Content in fluidiser by distillation	1431	%	≤ 2 Class 2	≤ 2 Class 2	≤ 2 Class 2	≤ 2 Class 2
Creep time (2 mm, 40 °C)	12846-1	s	15-70 Class 3	15-70 Class 3	15-70 Class 3	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
Sedimentation tendency (7d)	12847	%	≤ 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
Recovered binder: by evaporation according to EN 13074-1						
Penetration at 25 °C	1426	0.1 mm	≤ 330 Class 7	≤ 100 Class 3	≤ 50 Class 2	≤ 50 Class 2
Softening Point	1427	°C	≥ 35 Class 8	≥ 50 Class 4	≥ 50 Class 4	≥ 55 Class 3
Cohesion by pendulum testing	13588	J/cm ²	-	-	-	≥ 0.5 Class 6
Elastic Recovery at 25 °C	13398	%	-	-	-	DV Class 1
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	≤ 50 Class 2	≤ 50 Class 2	≤ 50 Class 2
Softening Point	1427	°C	≥ 35 Class 8	≥ 50 Class 4	≥ 50 Class 4	≥ 55 Class 3
Cohesion by pendulum testing	13588	J/cm ²	-	-	-	≥ 0.5 Class 6
Elastic Recovery at 25 °C	13398	%	-	-	-	DV Class 1

/ RECOMMENDATIONS FOR USE

Installation is performed at a temperature between 50 and 70 °C. The speed of breaking depends on ground temperature, environmental conditions (temperature, wind, humidity, sun) and the type of support, varying between 5 and 10 minutes in ideal conditions and extending to 60 minutes under the most extreme conditions.

For its installation, it is necessary to use a coat tanker in good condition with clean injectors (avoid coating with lance dispenser). Once emulsion breaking has been completed, the hot agglomerate layer can be spread.

If these simple rules are followed, the behaviour of this type of emulsion under work vehicles is excellent.

/ EVALUATION AND CONTROL OF THERMO-ADHESIVE EMULSIONS

To verify the optimal behaviour of emulsions manufactured with lower-penetration bitumen compared to the traditional C60B3 ADH emulsion, a comparative study has been carried out using the LCB layer binding test developed by the Polytechnic University of Catalonia.

This study shows that binding between layers when using an antistick thermo-adhesive emulsion is higher than for the conventional C60B3 ADH emulsion. This result is shown in the following graph:

