Multigrade Bitumen

Special binders

Multigrade bitumen BMG 35/50 is a special binder with a lower thermal susceptibility than conventional binders; it is less fragile at low temperatures and more consistent at high temperatures.

Although variants have been formulated, multigrade bitumen BMG 35/50 is the most suitable according to the different thermal summer areas set out in Spanish regulations, offering optimal behaviour for roads that suffer extreme service temperatures and thermal gradients.

/ APPLICATIONS

These bitumens are applicable to all types of bituminous mixes and especially in wearing courses and intermediate layers with strong weather and traffic stress such as slow lanes, heavy and channelled traffic, motorways, toll stations, intersections, port bays, airports, parking areas in general and mountain passes.

/ PRODUCT CHARACTERISTICS

The following table shows the characteristics of the BMG 35/50 multigrade bitumen:

CHARACTERISTICS		UNE EN	UNIT	35/50	50/70	BMG 35/50
Penetration at 25ºC		1426	0,1 mm	35-50	50-70	35-50
Softening Point		1427	ºC	50-58	46-54	64-72
Resistance to ageing UNE EN 12607-1	Change of mass	12607-1	%	≤ 0,5	≤ 0,5	≤ 0,5
	Retained penetration	1426	%	≥ 53	≥ 50	≥ 50
	Increase in softening point	1427	ºC	≤ 11	≤ 11	≤ 8
Penetration ratio		12591 13924 Appendix A	-	De -1,5 a +0,7	De -1,5 a +0,7	> 1,5
Fraass breaking point		12593	ºC	≤ -5	≤ -8	≤ -15
Flash point in open cup		ISO 2592	ºC	≥ 240	≥ 230	≥ 245
Solubility		12592	%	≥ 99,0	≥ 99,0	≥ 99,0

As stated in the above table, the BMG 35/50 bitumen presents an increase in the softening point temperature and penetration rate, and a decrease in Fraass breaking point temperature.

/ CHARACTERISATION ACCORDING TO SHRP LEVEL

Figure 1 shows the SHRP level obtained from the testing of two conventional bitumens and one BMG 35/50.
As shown, the service temperature range is vastly superior for the BMG 35/50 than for either of the two other analysed bitumens. This implies a much lower risk of both ruts at high temperatures, and fatigue or fracture failures at low temperatures.

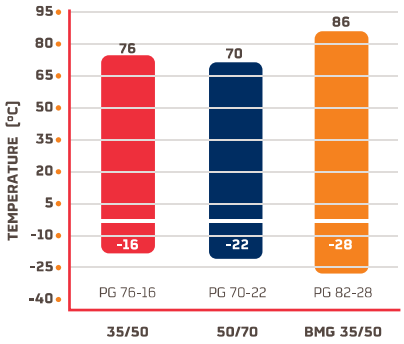

Figure 1.
SHRP level of the multigrade bitumens. Indicative data, not contractual and not subject to specifications.

/ RECOMMENDATIONS FOR USE

Due to the special characteristics of these binders, slightly higher than conventional working temperatures (10-20 ºC) are recommended (see figure 2).

TEMPERATURE RANGES	MIXING	170 - 180ºC
	SPREADING AND COMPACTING	160 - 165ºC

Temperatures depend on the specific viscosity curves of each product.

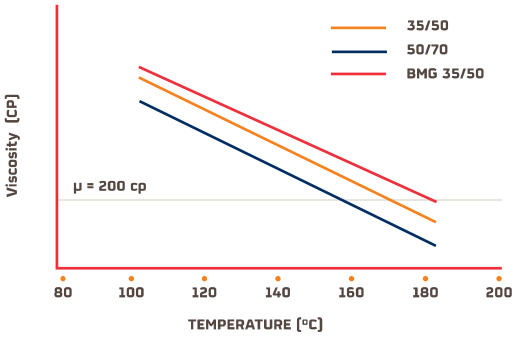

Figure 2.
Diagram
Viscosity - Temperature
Indicative data, not contractual and not subject to specifications.

/ PRODUCT BEHAVIOUR IN THE MIX

Compared with conventional bitumens used for asphalt road mixes, the multigrade bitumens developed by Repsol feature:

- Greater resistance to plastic deformation.
- Greater resistance to fatigue.
- Greater resistance to ageing.