

## **TECHNICAL SPECIFICATION FOR BINDER DHE ASPALTOCONCRETE.**

*Production of bituminous mixtures (KM Decision No. 628 dated 15.07.2015)*

*The production of bituminous mixtures must be done mechanically and provided in a special production plant for the preparation of bituminous mixtures. Dosing equipment must ensure the placement by weight of the correct amounts of the constituent elements of the bituminous mixture. Mixing time and other factors affecting the quality of the coating of the granules with binding material should be such as to ensure a uniform consistency of the bituminous mixture. Bituminous mixtures for BS and ShSS must be produced through the warm process. The temperature of the bituminous mixture produced for BS and ShSS depends on the type of bitumen used and, at the exit of the mixing machine, it should be:*

- for BIT 100, 135-155°C;
- for BIT 80, 145-160°C;
- for BIT 60, 145-165°C.

The highest temperature allowed is 10°C higher than that mentioned above. The produced bituminous mixture must be immediately transported to the construction site to be placed in BS or ShSS.

*Transportation of bituminous mixtures*

*The bituminous mixture for BS or ShSS must be transported over the surface of the formation of the base prepared in a suitable way, which must not be frozen or wet.*

*For the transportation-unloading of the material, suitable vehicles must be used, equipped with means for pouring the material from the back (in the finitric) as well as a cover to protect the bituminous mixture from precipitation, cold and dust. The inner surface (sides and floor) of the metal body of the self-unloading vehicle must be sprayed with suitable anti-adhesion agents before loading the bituminous mixture into the vehicle. Depending on the capacity of the production machines and the distance of transport, the number of vehicles for transporting the bituminous mixture to the construction site must be adapted to the conditions that ensure a uniform placement of the material on the site.*

*Laying bituminous mixture*

*The distribution of the bituminous mixture for BS and ShSS must be done mechanically, by using a paver (asphalt paver). Hand dispensing is only allowed in cases where the use of machines is limited due to space.*

*Depending on the type of bitumen used for production, the lowest temperature of the bituminous mixture at the place of its placement (on site) can be:*

- for BIT 100, 125°C;
- for BIT 80, 130°C;
- for BIT 60, 135°C.

The optimal temperature for placement is 10-30°C higher than the temperature mentioned above. For manual distribution of the bituminous mixture this temperature for the particular type of bitumen may be 20°C higher than the values mentioned above.

The construction of stabilized surface and binding layers (ShSLS) of asphalt concrete includes the supply of appropriate mixtures of inert material and binder as well as the production, transportation and placement of bituminous mixtures at the construction site defined in the project. This type of work must be carried out in atmospheric conditions without precipitation and when the soil and air temperature (without wind) is above 5° C. Depending on the type of inert material mix and binders, asphalt concrete ShSLS are designed to be placed in road structures for all groups of traffic loads, usually as a surface layer of the road structure or as a bond layer below its surface layer.

**Reference to the European standard EN 13108-1:2006 "Bituminous mixtures. Materials specifications. Asphalt concrete".**

Asphaltoconcrete mixtures formed by mixing the basic fractions of grains 0/4 mm, 0/8 mm, 0/12.5 mm and 0/16 mm are usable for ShSLS. The names and granulometric limits of these bituminous mixtures for our cases should be:

- Asfaltobeton AB 8 (figure 3.3);
  
- Asfaltobeton AB 12 and AB 12S (figures 3.4 and 3.5);
  
- Asfaltobeton AB16 and AB 16S (figures 3.6 and 3.7).

For bituminous mixtures with the suffix "s", gravel mixtures of silicate origin should be used. For ShSLS, the bituminous mixtures of inert material given in the Table should be used

Technological conditions for the thickness of ShSLS are given in Table 3.12:

Limit value	Type of bituminous mixture					
	AB 4	AB 8	AB 12	AB 12S	AB 16	AB 16S
	technological thicknesses of the layers, in mm					
min	20	25	30	35	40	45
max	30	40	50	60	60	75

Table 3.12: ShSLS thickness limit value based on bituminous mix type

Any mixture of inert material that is expected to be used for ShSLS, must be checked before the start of work in accordance with the requirements of these technical conditions. It is not necessary to repeat the control for cases where the approval has been given to the Contractor for the use of the same mixture of inert material to be placed in the ShSLS.

*Qualities of binders*

*The basic properties required for binders of asphalt-concrete mixtures for ShSLS are given in the table below, but At a reasonable time before the start of the works, the Contractor must submit, in accordance with the requirements of these conditions, relevant evidence on the properties of the binder that he intends to use for ShSLS. It may require the use of other types of connectors, especially when the reasons for this are traffic load and climatic conditions. In these cases, it can also determine the conditions on the quality of these connectors.*

Types of betumen	Unit of measurement	Type of bitumen			
		BIT 180	BIT 100	BIT 80	BIT 60
		Amount requested			
Penetration at 25°C	mm/10	160-180	80-100	60-80	50-70
Softening point according to KP	°C	40-45	48-50	48-55	48-55
penetration indicator, at least	-	-1.0	-1.0	-1.0	-1.0
Elasticity at 25°C, at least	cm	100	100	100	100
The breaking point according to Fraa, at least	°C	-15	-13	-11	-8
Reduction after heating: penetration, not more than	%	40	40	40	40
The breaking point, no more than	°C	-12	-10	-8	-6

#### *Bonding agents*

*Means for connecting bituminous mixtures placed in ShSLS, on a base layer (stabilized base), must ensure a good and uniform connection of both layers. Spraying the base prepared from a bituminous mixture is necessary only if the traffic has removed the binder from the granules of this layer. Semi-stable or unstable anionic bituminous emulsions, which must contain at least 55% bitumen, are usually usable for bonding layers.*

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