



Application instruction

Polymer modified bitumen according to EN 14023

(product operating manual in accordance with CPR 305/2011 art.11 para.6)

1. Types of product

Instruction covers all types of polymer modified bitumens according to EN 14023 produced by PKN ORLEN S.A.

2. Transport

Products should be transported in a liquid state at an elevated temperature ensuring pumpability. General rules of transport safety should comply with the requirements of ADR.

3. Storage of polymer modified bitumens (PMB)

The products should be stored in appropriate tanks, equipped with a heating installation and a mixing installation (recommended). Tanks should be equipped with temperature control apparatus and appropriate sampling connectors according to EN 58.

Polymer modified bitumen can be delivered at the asphalt mixing plant at temperatures above 185°C as a result of the refinery's production process. In such a situation, after unloading the bitumen to the storage tank, the heating in it should be turned off and the bitumen temperature should be brought to recommended.

3.1. Short-term storage at high temperature (up to 5 days)

- recommended bitumen storage temperature: 160÷180°C
- guaranteed shelf life of bitumen for asphalt mixture production: 5 days*

*It is recommended to use the binder directly after its delivery, without unnecessary storage in the tank.

If the mixing plant is equipped with tanks with agitators, bitumen should be periodically mixed in the tank. Circulation can also be used for this purpose.

3.2. Long-term storage (more than 5 days) at high temperature

It is not recommended to store polymer modified bitumen for more than 5 days. If necessary, it is recommended to maintain the temperature of the product in the tank in the range of 140÷160°C. It is also desirable to periodically mix the polymer modified bitumen in the tank.

It is not recommended to cool the polymer modified bitumen to ambient temperature and warm it up again.

4. Product samples

The procedure for handling bitumen test samples is specified in the EN 12594 standard. Preheating of samples in the laboratory according to the standard procedure:

- the container cannot be tightly closed,
- under no circumstances should the samples be heated to the temperature exceeding 200°C,
- containers of the volume of less than 1 litre, heating time of up to 120 minutes, oven heating temperature: not more than 100°C above the expected bitumen softening point,

- containers of the volume of 1–2 litres, heating time of up to 3 hours, oven heating temperature: not more than the bitumen softening point +100°C,
- containers of the volume of 2–3 litres, heating time of up to 3.5 hours, oven heating temperature: not more than the bitumen softening point +100°C,
- containers of the volume of 3–5 litres, heating time of up to 4 hours, oven heating temperature: not more than the bitumen softening point +100°C,
- containers of the volume of more than 5 litres, heating time of up to 12 hours, oven heating temperature: not more than the bitumen softening point +50°C, temperature should be raised adequately for the last 2 hours.

After the samples are warmed up in the containers, they should be homogenized by mixing, taking care not to introduce air bubbles into the sample. The maximum mixing (homogenization) time is 10 minutes.

When specimens of bituminous binders are intended for testing their properties, it is recommended, in accordance with the rules specified in EN 12594, item 7.1, that after the sample is heated and homogenized, the material should be poured through a heated metal sieve with mesh #0.5 mm in order to elimination of possible impurities affecting the test results.

5. Production temperatures of mineral asphalt mixture

Polymer modified bitumen ORBITON according to EN 14023: 2010	Compaction temperature of samples during type testing ^{1) 2) 3) 4)}	Bitumen temperature in the tank at the mixing plant for the production of asphalt mixture	Temperature of the asphalt mixture immediately after pouring out of the mixer ⁴⁾	Initial temperature of the asphalt mixture during compaction ⁴⁾
	[°C]	[°C]	[°C]	[°C]
10/40-65	145÷155	170÷185	170÷185	>160
25/55-55 EXP/DE 25/55-60	140÷150	170÷185	165÷185	>160
45/80-55	140÷150	170÷185	160÷185	>155
45/80-65	145÷155	170÷185	165÷185	>160

¹⁾ The temperatures recommended by the manufacturer may be changed in the case of other Contractor's experiences

²⁾ The given ranges of the compaction temperature of samples in the laboratory should be used depending on the expected conditions during the paving of the asphalt mixture - lower values of the compaction temperature of the samples should be used in the case of construction works carried out in the period of low air temperature and for thin layers of pavement, higher values of the compaction temperature of the samples should be used in other conditions.

³⁾ Compaction of samples from coarse-grained mixtures and paved in thick technological layers, with high heat capacity - requires the determination of the individual concentration temperature of samples in the laboratory on the basis of previous experience and expected paving conditions.

⁴⁾ The given technological temperatures apply to hot rolled mixtures (AC, SMA, BBTM, PA, etc.). For the MA mastic asphalt mix, process temperatures should be used based on the mix workability test in the laboratory.

Note: Polymer modified bitumens from different manufacturers and bitumens of different types of the same manufacturer should not be mixed

6. Safety information

Information data sheets prepared in accordance with EU Regulation No. 453/2010 are available on the website <http://www.orlen-asfalt.pl/PL/InformacjeTechniczne/Strony/Karty-charakterystyki.asp>



7. Unit preparing the Instruction

PKN ORLEN S.A.

Quality, Benchmark and Catalogues Department