

# CHARACTERISTICS OF ASPHALT CONCRETE PROCESSING IN HOT CLIMATIC CONDITIONS

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**Abstract:** This article provides information on the operation of asphalt roads in hot climates, slippage, deformation of the road surface.

**Key words:** hot climate, asphalt concrete, paving, deformation, sliding.

**Аннотация:** В данной статье приведены сведения об эксплуатации асфальтированных дорог в условиях жаркого климата, пробуксовке, деформации дорожного покрытия.

**Ключевые слова:** жаркий климат, асфальтобетон, мощение, деформация, скольжение.

The climatic conditions of Uzbekistan require a special approach to the construction and operation of asphalt concrete pavements on highways in accordance with the requirements of current regulations. This is due to the fact that the asphalt concrete pavement is negatively affected by sunlight, increased temperature, wind, rain, snow and passing days through temperatures of 0 °C. This leads primarily to a change in the chemical content, viscosity and brittleness of the organic binder under the influence of oxygen, which manifests itself in the upper layer of the asphalt concrete coating.

Many years of experience shows the use of such coatings that in some cases they do not reach the service life specified in the project, because changes under the influence of deformation in a dry hot climate have not been well studied and because of the local climate have not been considered separately. In addition, the coefficient of linear thermal expansion of organic binders and mineral aggregates in asphalt concrete is a factor that leads to a deterioration in the quality of the coating.

The properties of asphalt concrete depend on the temperature, in summer the coating surface rises to 60-70 ° C due to an increase in temperature to 40 ° C (sometimes 50 ° C), According to GOST 22245, the softening temperature of bitumen reaches 330-52 ° C, as a result of which asphalt concrete softens, and its strength

decreases 3-4 times compared to the required 20 ° C at 50 ° C. Deformation occurs in asphalt concrete, which softens and becomes plastic at high temperatures.

The size and type of deformation depend on the amount of elevated temperatures and the duration of exposure during the day and year. Under the influence of sunlight and high temperatures of bitumen, aging accelerates, losing its elastic properties. Under the influence of natural and climatic factors, asphalt concrete is reduced.

Under the influence of temperature, the heating rate and plasticity of bitumen are manifested at different thicknesses of asphalt concrete pavement. As a result of an increase in the heating depth and the thickness of the coating, the mass of asphalt concrete of large thickness slips under the action of the movement of the car wheel.

Under the influence of horizontal load, when the car wheel is moving, asphalt concrete becomes slippery, and deformation occurs in the road surface. Asphalt concrete has the property of restoring deformation. As a result, longitudinal traces and transverse waves are formed on the coating under the influence of prolonged and frequent movement of the wheels of the car. The horizontal load can be 0.6-0.8 MPa of the vertical load.

The condition of the coating is adhesive-plastic and the temperature rises to 600-70 ° C, the coating softens, longitudinal and transverse waves are formed, slip resistance decreases. The condition of the coating is elastic-plastic, which reduces the strength of the pavement base. Cracks and swellings form in the thin layer of the coating, and small particles begin to separate and collapse. As a result of an increase in the surface temperature of the coating to 70 ° C and above, traces of ruts and drifts are formed on the road.

The slip resistance of asphalt concrete depends on its strength (especially at elevated temperatures). Regulatory documents developed for asphalt concrete do not take into account local climatic conditions. The resistance of asphalt concrete pavement to skidding under the action of the movement of the wheels of the car is characterized as follows.

$$K_p \leq \delta_m$$

where  $K$  is the coefficient that takes into account the horizontal load,  $P_a$  - the specific pressure from the car wheel,  $P_a$  - the yield strength of the coating material,  $P_a$ .

The resistance to skidding largely depends on the proportion of mineral material particles in asphalt concrete.

Thus, in order to ensure the durability of asphalt concrete in a hot climate, solving these issues will increase production efficiency in the following form:

- local climatic conditions require special requirements for organic binders, since it is impossible to use all brands of bitumen in a hot climate. In such conditions, only bitumen can be used, the softening temperature of which is not lower than high summer temperatures, that is, it can be used. modified types of organic binding polymers;

- the resistance of asphalt concrete to shear often depends on the choice of the granulometric composition of mineral aggregates and their shape. The shear stability of the coating is achieved only when the amount of crushed stone is sufficient to form a strong frame. It is necessary to establish the production of cubic stones and accelerate their use in the composition;

- it is advisable to study the experience of processing technical specifications and test methods of asphalt concrete and bitumen, taking into account local climatic conditions and their compatibility with foreign standards;

- will adjust with the use of asphalt concrete and bitumen production;

- great attention should be paid to quality control in the design, production, manufacture and operation of coatings.

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