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## Innovative Solutions

can significantly increase the service life of pavement road structures and improve their performance. The developments of ABZ -1 enable the introduction of domestically produced materials, their use makes it possible to contribute to the solution of environmental problems, as well as to improve the safety of road users.

# ABZ-1 is always the first!

**ABZ-1 is dating back to 1932**

**1994** ABZ-1 was the first in the Russian Federation to re-equip its productive facilities with imported equipment, which allowed it to produce asphalt mixes with enhanced performance properties

**2005** Introduction of the asphalt complex Amomatic at the ABZ-1 manufacturing site with a capacity of 240 tons per hour, which made it possible to get all types of asphalt mixes according to current Russian and foreign standards, specially designed for the conditions of St. Petersburg

**2005** Additional provision of the Amomatic plant with equipment for the production of mixes. ABZ-1 pioneered the production and use of application of mastic asphalt in bridge and road structures in St. Petersburg

**2014** Opening of the most powerful production complex in Russia, consisting of two Benninghoven CONCEPT TBA 4000 asphalt plants with a total capacity of 640 tons of products per hour



# ABZ-1 developments in the production of road construction materials

**Innovative developments of ABZ-1 Group are used to extend the service life of road surfaces, reduce maintenance and repair costs during the life cycle of road structures**

- All kinds of asphalt mixes with improved characteristics
- Mastic asphalt mixes
- Polymer bitumen binders
- Polymer bitumen emulsions
- Stone-mastic asphalt (SMA)



- «Warm» asphalt mixes
- Asphalt mixtures modified by natural bitumen
- Colorless polymer binder for hot mix colored asphalt production
- Colored asphalt mixes
- Cold asphalt mixes
- Asphalt mixes with addition of secondary resources (activated crumb rubber products, slag products, RAP recycled asphalt)
- Asphalt with reduced noise level
- Radar-absorbing asphalt mixes
- Expert opinions on the evaluation and implementation of various modifiers
- Selection of compositions of asphalt mixes and organic binders according to the requirements of the Customer



# Mastic asphalt

Since 2000, ABZ-1 has been successfully applying the technology of the assembly for coating of the carriageway of the engineering structures and buildings with mastic asphalt. mixes The material is produced and laid at a temperature of 190-230°C in a liquid or viscous-flowing state without compaction.

Transportation is carried out in special bunkers-thermoses (Kochers) with continuous mixing

- Bridges and roads
- Engineering construction
- Tram tracks
- Multilevel parking lots
- Industrial, residential and public buildings
- Supermarkets
- Railway platforms
- Humidity areas, etc

Mastic asphalt mixes is used not only in road, but also in industrial and civil construction



## Advantages of the application of mastic polymerasphalt in road and bridge construction

The nature of the loads to which the road topping of a bridge structure on reinforced concrete spans, and especially on metal orthotropic slabs, is subjected, is fundamentally different from standard road paving.

The constant natural vibrations of the bridge, the flexibility of the slab design, the speed of the traffic flow determine the value of the frequencies, amplitudes and deformations of the road paving. Deflection deformations on metal bridges are several times higher than the deformations of conventional modern road surfaces.

- Reduces the thickness and weight of asphalt pavement by 33%
- High degree of adhesion to underlying layers
- Water and vapor barrier layers
- High fatigue crack resistance under compression, bending of the coating layer
- Ability to dampen structural vibrations
- No material corrosion effect, antibacterial resistance, environmental protection
- Increasing the service life of waterproofing protective layers from 2-5 years (when using compacted asphalt) to 15-20 years



# Warm mix asphalt

Since 2010, ABZ-1 has been developing the technology of warm asphalt mixes

Warm mix asphalt is an energy-saving technology recognized in the world, which makes it possible to reduce the process temperatures of asphalt mixtures production and laying by 25-30% and reduce the emissions into the atmosphere by 80%.

## Advantages over traditional technology

- Saving energy and reducing the cost of laying of asphalt
- Production and compaction with 25-30% lower process temperatures
- Increasing the plasticity of the mixture at low temperatures due to a specialized additive
- Reduction of emissions into the atmosphere up to 80%
- Durability: aging of bituminous binder is slower by 25-30%
- Increasing the delivery distance up to 300 km
- Prolongation of the construction season by 1.5-2 months: laying the mixture at an ambient temperature of up to minus 10°C without reducing the durability and strength of the coating



# Colorless polymer binder for hot mix colored asphalt production

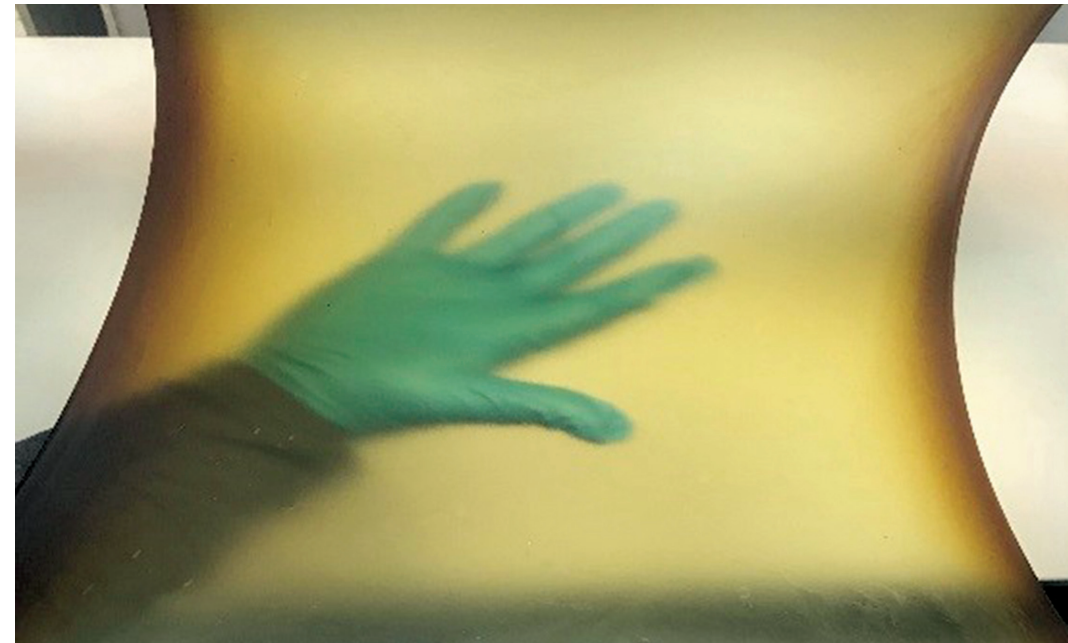
The transparency of the binder makes it possible to color the asphalt mix, give it different colors and shades, and make it bright as well.

Transparent binder is made by means of synthesis of petroleum resins, aromatic oils, polymers with the addition of antioxidants, adhesive additives and, if necessary, cross- linking agents

The synthesis process is carried out in specialized equipment capable of maintaining dosing accuracy, temperature-time conditions and mixing speed required for a particular stage of synthesis



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# Colored asphalt

**Since 2004 , ABZ-1 Group has initiated experiments for production and laying of colored asphalt mixes**

ABZ-1 is the leader in the production of colored asphalt in Russia. Technological means of ABZ-1 enable producing colored asphalt mixes of any gradation

## **Advantages of colored asphalt:**

- Attractiveness of urban facilities
- 100% Russian eco-friendly ingredients
- Suitable for recycling
- Does not contain epoxy resins

**Colored pavements increase the attractiveness of urban sites and help improve the identification of special traffic zones**

- Paths and bicycle lanes, sidewalks
- Lanes for public transport
- Parking and recreations zones, etc.



## System of volumetric and volumetric- functional design of asphalt mixes

In the summer of 2018, DSK ABZ-Dorstroy (part of the ABZ-1 Group) became the first in St. Petersburg to carry out the construction of the upper layer of the coating on St.Petersburg Ring Road according to the method of volumetric design with use of Stone-mastic asphalt-19 (SMA-19). The use of SM A-19 is aimed to reduce rutting, which occurs both as a result of plastic ruts and wear ruts on roads with high traffic intensity.

**In the field of using the system of volumetric and volumetric-functional design of asphalt mixes, ABZ-1 has carried out the following:**

- provision of laboratories with the necessary equipment for research and testing of organic binders, mineral aggregates and asphalt
- selection of grades of bituminous binders and systematic production release
- selection of asphalt mixtures and their release for Federal motorways since 2018
- planning the design of pilot areas



# Rubberised asphalt

Cost-effective rubberized asphalt mix, consisting of a grain mineral part (aggregate, sand and crushing screenings) and a rubber-bitumen binder, consisting of a modifier based on partially destructured rubber crumb and oil bitumen. The mix is used for coating of roads, bridges, engineering structures and for tunnels

Since 2013, ABZ-1 has produced several pilot batches of asphalt mix with a modifying elastomer additive based on activated rubber powder and arranged sections on various highways of St. Petersburg.

**Compared with the traditional types of asphalt mixes, it provides:**

- reduction of the plastic gauge by 3 times
- Increase in fatigue life by more than 20 times
- reduction of crack formation
- noise reduction in residential areas by 8-12 dB
- increase in the adhesion coefficient of the coating
- reduction of CO2 emissions by 10%

**The production of rubberised asphalt is the solution to the problem of tire recycling!**



## Reclaimed asphalt pavement technology (RAP)

The use of RAP technology is a way to reduce CO2 emissions into the atmosphere. For example, if 25% of recycled asphalt is used, CO2 emissions are reduced by about 20% compared to production based on «primary» materials

In 2021, a Preliminary National Standard came into force in Russia, according to which asphalt granulate can be reused for the production of asphalt mixes. This technology is treated as a resource saving, eco-friendly technology for processing secondary resources.

The introduction of RAP into the composition of the asphalt mix allows reducing the use of mineral materials and organic binder while strictly following all the requirements of this technology and obtaining asphalt mixes without reducing their performance properties. ABZ-1 first began to master this technology in 1979 and has now begun to improve it again, together with the world's leading companies.

A prerequisite is the separate storage of RAP materials according to its fractions, type of binder, type of stone material and according to the use in the layers of road constructions.



# Radar-absorbing asphalt

- Conform to the requirements of current National Standards
- Protect from harmful effects of electromagnetic radiation, converting their energy into heat, without re-reflecting
- Able to soften, heating up evenly over the volume under the influence of a high-power microwave field, which makes it possible to quickly restore damaged sections of the road, airfield
- Allow sterilization of the road surface by its exposure to a microwave field
- Create the ability to mask objects (stealth technology)



# Flavored asphalt

The world's first use of flavoring in the field of production and laying of asphalt mixes.

## Effect of technology introduction:

- Solving the problem with the smell of asphalt mixes at all stages of the life cycle
- Increasing the comfort level of end users during the road construction season
- Strengthening the mental health of people
- Increasing tourist attraction during the road construction season

## Fragrance options:

- vanilla
- apricot
- strawberry
- rose
- raspberry





[abz-asphalt.ru](http://abz-asphalt.ru)



[abz-1@abz-1.ru](mailto:abz-1@abz-1.ru)  
[info@abz-1.ru](mailto:info@abz-1.ru)



Sales department  
**+7 (812) 777-89-84**



ABZ-1 Group  
4 Sverdlovskaya nab., lit. B,  
St. Petersburg, 195009, Russia