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ROADS, ROAD LINES AND THERMOPLASTIC PRODUCTS USED IN THEIR DRAWING

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ABSTRACT

The development of transport communications and the improvement of their use is one of the most pressing tasks in the development of the economy. In fact, the share of domestic goods in the transport of goods in the country is the share of roads shows that roads are one of the key factors in the development of the economy of the republic. The use of lanes determines certain modes and procedures for the movement of vehicles and pedestrians. Road lanes are a means of visual guidance for drivers and play an important role in increasing the speed and through put of vehicles and ensuring road safety.

KEYWORDS: *Economic Development, Transport Communications, State Road Policy, Highways, Highway Users, Road Lines, Alkyd Or Acrylic Paints, Thermoplastics.*

INTRODUCTION

Main part

The priorities of the state road policy are the creation of international transport corridors that ensure the conditions of economic development of the country, ensuring reliable transit and inter-regional transport links, the formation of a single integrated transport environment of the republic, the restoration of the Great Silk Road and access to world markets. marked as The practical solution of these tasks requires improving the quality of transport and operation of the existing road network, adapting the technical and operational conditions of roads to the needs of road users, ensuring the comfort and safety of traffic, effective organization of road maintenance [1].

Speaking of "Motor Roads", the purpose of the Law of the Republic of Uzbekistan "On Motor Roads" dated 29.07.2007 is to regulate relations in the field of design, construction, reconstruction, repair, maintenance and operation of highways.

Highway - a set of engineering structures designed for the movement of vehicles, ensuring their continuous and safe movement at a specified speed, weight, size, as well as the land allotted for the placement of this complex and the space within the specified range above the complex [2].

The classification of the appendix to the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On improving the organization and quality control of construction and operation of roads" dated 29.07.2007, public roads, inter-farm rural roads, cities, urban settlements, villages and defines the types and structure of repair and maintenance of aul streets (hereinafter referred to as "highways") and the basis for substantiating the use of funds, forecasting the cost of repair and maintenance of roads and road structures and the organization of road works is calculated.

Road diagnostics is a key element in the system of collecting information on the condition of roads and includes determining the technical condition of roads in the period under review, forecasting the technical condition of the road after a certain period, identifying the primary causes of defects on roads.

Roads in the Republic of Uzbekistan are classified as follows:

Public highways;

Streets of cities and other settlements;

Farm highways [3].

The constant proliferation of vehicles and the operation of asphalt pavements in aggressive conditions of external factors lead to the appearance of various defects and, as a result, premature deformation and deterioration of roads. Most of the defects are primarily due to the specific physical, mechanical and rheological properties of the organic binder used. The use of modified additives that affect its structure and properties and, consequently, improve the quality of road-building compositions, allows to regulate the properties of bitumen.

Along with highways, lanes also play an important role in ensuring road safety.

Edward N. Hines (Edward N. Hines, 1870-1938), a member of the Wayne County Road Commission in Michigan (USA), is the inventor of road lines. In 1911, Woodward Avenue in Detroit proposed the use of the world's first road line to split the flow of traffic in the middle of a concrete road. [4].

Ten years later (in 1921) the first British road markings appeared in the English town of Sutton Coldfield (on the outskirts of Birmingham). This experience in improving road safety has been very successful, and later white road lines became the standard in the UK and many other countries. [5].

For some time, different options have been used for road signs in different countries. In Germany, for example, black marks were used in the 1930s, which were later rejected as ineffective. Nowadays, black is used in conjunction with white when vertical symbols are used.

In the 1930s, the British Percy Shaw invented cataphats ("cat's eyes"), a device that reflected light even in the dark, and these catapults were widely used by drivers in the UK during the dark hours of the day during World War II.

In the 1950s, Elbert Daysart Botts, an expert in paint chemistry at Caltrans (California Department of Transportation), used paint containing glass beads to improve the appearance of road lines. At the same time, the light-reflecting elements in the line began to rise to a quarter of the way (about 6 mm) so that the water layer covering the road line would not worsen the view. At the same time, if the driver did not notice the lanes, he felt the shocks as the car wheel crossed the raised lanes, in this way the "lanes" begin to warn drivers that they are crossing the lane.

Botts was invented by former student Herb Rooney in the 1950s as a durable adhesive epoxy resin on the road with a special nail with the addition of ceramic or plastic markers. Since 1966, markers called Botts-Dots have been used on U.S. roads and later in other parts of the world. [6].

In 1955, the first peripheral noisy (road lane) lanes appeared in New Jersey. Today, they are widely used in many countries, including the United States, Canada, Finland, Norway, Sweden and others. [7].

With the increase in traffic on highways, vertical lines have also been used to block dangerous sections of roads, to identify sudden obstacles.

At the same time, road lines are widely used in gas stations, underground and above-ground parking lots, as well as in the territory of airports in neighboring areas outside the roads.

Road lanes can be permanent or temporary. In all countries, white paint is used for permanent road lines. Yellow paint is used for temporary road lines, and such colors mainly indicate parking lots for vehicles and taxis on the route, as well as places where parking or parking is prohibited.

It can be applied with yellow (Germany, Estonia), orange or red (Austria, Switzerland) paints when drawing permanent road lines and is used in traffic repair and reorganization.

Permanent and temporary road lines can be drawn at the same time, when using temporary road lines, it is usually applied with a paint with a short shelf life, when the repair work is completed, the road line itself is erased or removed by road service personnel.

Noisy road lanes (noise lanes) are used to draw attention, especially at emergency pedestrian crossings, to show the edges and subdivisions of federal roads. This marking method allows the tired driver to “Trigger” and also reminds them to slow down the car. [8].

Relevance of the case. The use of lanes determines certain modes and procedures for the movement of vehicles and pedestrians. Road lanes are a means of visually guiding drivers and play an important role in ensuring road safety, increasing the speed and throughput of vehicles, and in conditions that are not sufficiently visible.

Currently, the marking of roads is carried out using paints, cold and hot plastics, polymer tapes, materials using traditional and new technologies. Studies show that the design and performance efficiency of horizontal road signs depends on the drying time (thermoplastic) of the paint, its recovery, adhesion coefficient and abrasion resistance. To ensure traffic safety, horizontal lanes should be visible at any time of the day and easily recognizable (understandable) to drivers of vehicles.

The most budget and most common option for marking with road lines are acrylic and alkyd paints, in other words, these are acrylic or alkyd resin-based paints containing organic solvents with the addition of coloring pigments and targeted additives.

Acrylic and alkyd paints are used for marking concrete, asphalt and petroleum bitumen coatings. They provide the coating with a separate coating. Other advantages of this type of marking material include:

- good meteorological stability, including abrupt changes in temperature and high humidity;
- resistance to chemicals, abrasives and mechanical damage.

Alkyd or acrylic marking paints are applied without a compressor (using a sprayer) or in a pneumatic manner. For road lines, it is advisable if the air temperature is above 20 degrees Celsius, and the paint dries in 5 minutes.

Road thermoplastic is a granular mixture of thermoplastic resins, plasticizers, pigments and various target additives. It is designed for drawing road lines on asphalt and concrete pavements. To draw road lines on roads, thermoplastics are placed on the pavement using a special machine in the form of a solution. The melting temperature of thermoplastics requires a temperature of 170-200 degrees. Excessive heat should be avoided, as this can cause the thermoplastic to crack or turn yellow. In order for the paint to solidify in a short time (10 minutes), it is advisable that the air temperature is above 10 degrees and the air humidity is at least 80%.

For better adhesion of thermoplastics to concrete, the road surface should be cleaned before applying thermoplastics. Paint for this type of road sign is applied only to dry surfaces. In areas with large temperature differences, cracks may appear after the application of thermoplastics.

To increase the visibility of the marking line, light-reflecting particles reflecting the appearance of microscopic balls are added to the thermoplastic for marking. It is recommended to apply a layer of quartz sand to the markings before coating with thermoplastic to enhance the grip of the car tires on the road.

Thermoplastic road signs have clear advantages over alkyd and acrylic paints. First, it's a long-lasting coating. Second, thermoplastics do not contain solvents and volatiles, which means that the negative impact on the environment is minimized.

Thermoplastics are a mixture of a hard resin plasticizer (30 2%) and an inorganic pigment fraction (70 3%). Petroleum polymer paint and varnish resin is used as a binder, POD oil (oxidation and dehydration products, waste from caprolactam production) is used as a plasticizer. becomes a mass.

Thermoplastic is used in the molten state for marking road markings (drawing a safety line), which is done using road marking machines. The cost of drawing a safety line is 8-10 kilograms of thermoplastic granules per 1 square meter of asphalt-concrete road with a thickness of 3-5 millimeters of coating.

Cold plastic, unlike thermoplastic, all components of the mixture are in a liquid state and the solvent is added separately before drawing.

Cold plastic is the most modern and reliable, and the advantages of this type of material over thermoplastics for road signs include:

- high resistance to friction of car tires with spikes;
- good adhesion to asphalt, as well as concrete after its initial cleaning;
- Installation (drawing) of thermoplastics on the road does not require the use of separate techniques, cold thermoplastics can also be done by hand.

Cold plastic, as well as the thickness of the line after laying the thermoplastic is 1.5-3 mm, and even in summer the material has excellent weather resistance. A hot air temperature of 0 to 40 degrees is suitable for cold plastic laying.

This material does not contain thermoplastics as well as solvents or other volatile substances, making it environmentally friendly for the workers and the environment in which it is installed. It is only applied to a dry surface at a temperature not lower than 0 degrees.

CONCLUSION

Road strips made of thermoplastic and cold plastics are modern methods of marking on the road surface, they are used more economically, have a high level of environmental friendliness and ensure almost perfect teething of car tires on the road. These advantages allow these two types of lanes to be used on any highway. As a result, it plays an important role in ensuring road safety and preventing road traffic accidents.

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