

**CREATION OF TECHNOLOGY FOR THE PRODUCTION OF SALT- AND HEAT-
RESISTANT COATINGS OF BUILDING MATERIALS BASED ON POLYMER
WASTE**

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Annotation: Polymer sand products appeared on the market relatively recently, but in record time captured the hearts of leading designers and large construction companies. Tiles are widely used for paving sidewalks, roads, for the decoration of the facade of houses and in the process of creating landscape design.

Keywords: Polymer-sand composite, sand, polymers, coloring pigment, polymer hatch, paving slabs, lawn grating, curb, segment for laying paths and paths, observation well hatches.

One of the most adverse consequences of human activity is the formation of plastic waste. More than 400 different types of industrial and household plastic waste are known, and many of them are identified as mixed plastic waste not suitable for recycling [1]. Recycling of mixed plastic waste is a very important topic that has a great impact on the environment and industry. Today, options for recycling mixed plastics include incineration, burial and mechanical recycling, while mechanical recycling is sustainable and can be economically beneficial. The problem of recycling technology is highly polluted and mixed plastic waste. Finding a recycling option for this type of waste is an extremely important task [2].

One of the most important tasks of the modern construction industry is the development and implementation of resource-saving technologies that provide for the widespread use of industrial waste and local natural materials, allowing for the rational use of raw materials and fuel and energy resources. The optimal solution to the problem is to develop and introduce low-waste technologies into production, which is undoubtedly relevant.

Advantages of polymer-sand products. Such composition and production technology make it possible to obtain finished products with unique technical and consumer properties. The service life is 50 years. The long service life is due to the fact that the composition includes a natural material – sand, which has an unlimited service life, and a polymer that has the property of not being destroyed for decades, even under the influence of the harshest natural conditions.

High strength. Compared with cement-sand products, they do not break during transportation, during installation and when exposed to shock loads. Withstand high loads.

Wear resistance. Abrasion is 10 times lower than all major analogues.

Dustlessness. No concrete dust is formed during installation and use, which simplifies installation and cleaning. Resistance to aggressive environments – acids, petroleum products.

Impact resistance. The product does not form cracks, chips, dents during transportation, storage, installation and operation.

Oil-gasoline resistance. Compared with cement products, they do not absorb oil and gasoline, there are no stains on the products.

High moisture resistance. Allows products made of polymer-sand composite to be not susceptible to sudden changes in ambient temperatures from positive to negative.

Resistance to corrosion, fungi and mold. Resistance to UV rays and atmospheric conditions (retains color) - has a uniform color throughout the structure of the product, thanks to the addition of a light stabilizer.

Environmental friendliness. It does not emit toxic fumes. The material is 100% recyclable. Multiple use, if it is necessary to carry out any repair work, polymer-sanded products can be easily disassembled, carry out the necessary work and put again.

Temperature resistance. The products can be operated in the conditions of the Far North, at negative temperatures up to -55°C .

Color stability. The color of the product is unchanged throughout the entire service life under all weather conditions and mechanical influences, the products have a uniform color throughout the structure of the material.

All products are checked annually for radiation, toxicological, biological safety. Rain, hail do not cause a strong and unpleasant sound. Economy. Lightness. Polymer-sand products are twice as light as cement-sand analogues. The hood and parapet made of polymer-sanded composite has an attractive appearance, has no seams, rivets, chips, sharp cutting edges. For installation, we only need a stepladder, the hood is simply put on the pole, without tools, fasteners and solutions. The polymer-sand composite tile has a uniform color, has stiffening ribs, which makes it possible to hold a truck (Fig.1)[3].

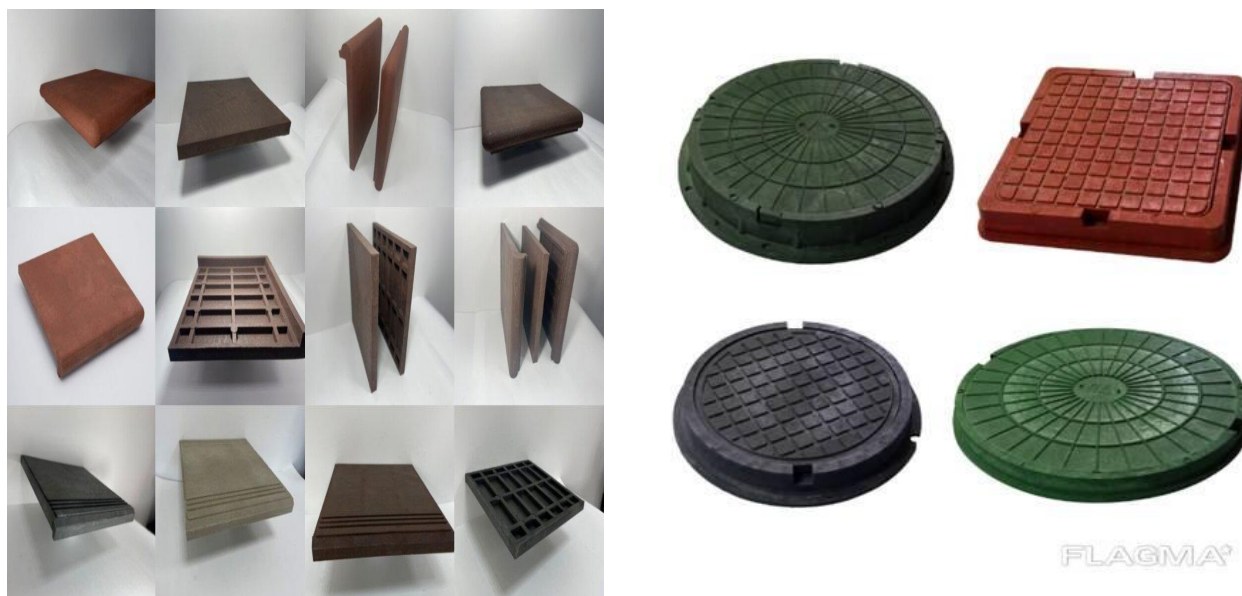


Fig.1. Polymer-sand composite tiles

Technical characteristics of polymer-sanded steps.

Tools and equipment necessary for the production of polymer-sand composites:

- polymer shredders (knife rotary crushers and shredders);
- agglomerators and granulators of plastics;
- mixers;
- melting and heating units (units with the help of which the main stage of the preparation of the molding mass is carried out - heating, plasticization and homogenization of the composition and its extrusion);
- hydraulic presses (on which the composite mass is formed by direct pressing);
- tooling in the form of molds;
- auxiliary installations – transporters, storage devices, pneumatic transport devices connecting primary installations and, thereby, links of the technological chain together[4].

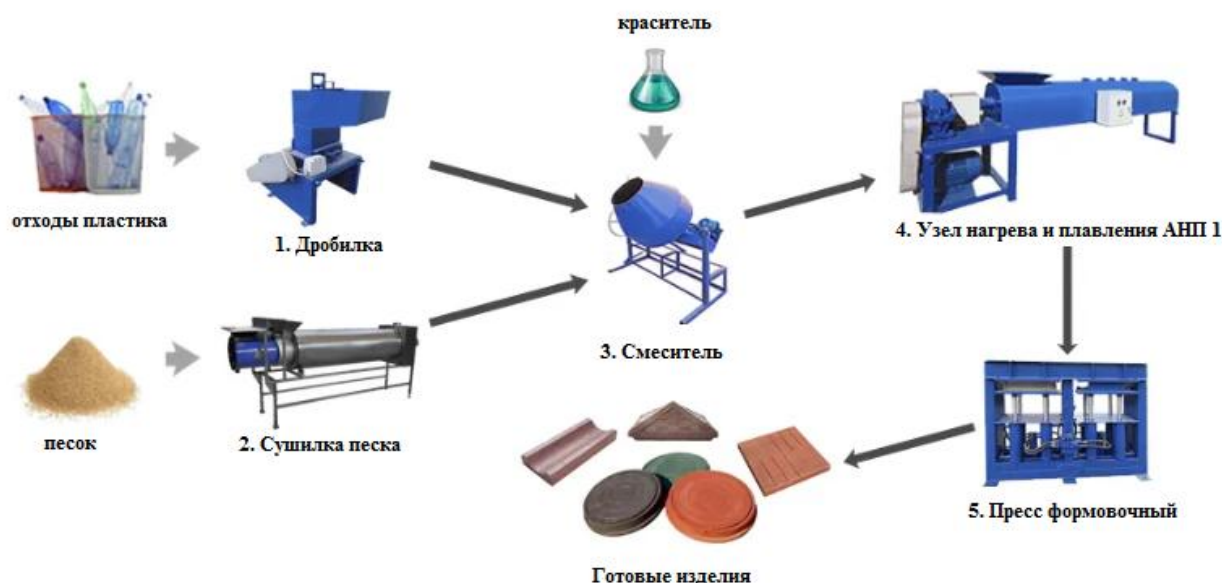


Fig.2. The scheme of production of polymer-sand composites:

The broad prospects for the use of polymer-sand composite products are due to absolute environmental safety. The problem of plastic recycling is also solved in the production process. As is known, polymer waste practically does not decompose in the natural environment, which leads to "plastic" contamination of soil and surface waters. Any plastic is suitable for the production of polymer-sand products, while no additional sorting is required. The sources of raw materials can be landfills, reception points for secondary raw materials, waste from polymer production (marriage, scrap, etc.). Since secondary raw materials are very cheap, the cost of finished products is much lower than from traditional materials. By collecting and recycling plastic waste, we help make the planet cleaner!

In the production of premium products, it is possible to use primary raw materials. It does not require any additional preparation, but it costs an order of magnitude more expensive, which naturally leads to an increase in the cost of the final product.

Another environmental plus is the possibility of repeated processing of the polymer-sand composite itself. It does not matter how long the product has served: at any time it can be

dismantled and melted down almost without loss. Compared to brick or concrete, this is a fantastic advantage.

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