

DEVELOPMENT AND ADVANCEMENT OF POLYMER CONCRETE WAREHOUSES FOR OPERATION IN AGGRESSIVE ENVIRONMENTS

Derius D.V., Karev A.I., Cherkashina G.M.

National Technical University

"Kharkiv Polytechnic Institute", Kharkiv

Among the largest producers of polymer concrete, one of the first places is the life-saving industry. The widespread use of polymer concrete in everyday life is not only due to its high chemical resistance, but also to its decorative power, as well as the equal ease of curing, manufacturability and high mechanical displays. Modern polymer concretes are effective chemically resistant materials, in some stages the mineral filling reaches up to 90 – 95 %, instead of the polymer binder it becomes less than 5 – 10 % mortar mixture for polymer concrete. A high level of surface allows you to reduce shrinkage and significantly increase the elastic modulus, which allows you to set polymer concrete in load-bearing structures. The choice of a specific type of polymer binder is determined by the nature of the aggressive medium, the benefits of value, manufacturability and economic efficiency. Research shows that the skin type polymer provides a different level of resistance to the most common types of chemical aggression.

Particular attention is paid to the modification of polymer concrete through the introduction of various filling materials, such as quartz sand and granite crushed stone of various fractions, basalt fiber, as well as special additives, such as andesite minerals, which enhance their chemical resistance and other performance characteristics. The correct selection and composition of the components of the polymer concrete mix is a key factor for ensuring the durability of the structure in aggressive minds.

A new, resistant to aggressive media warehouse for polymer concrete based on ED-20 has been installed and divided. Divided warehouse for polymer concrete:

1) epoxy oligomer grade ED-20 – 100 - 110 parts by weight; 2) amine hardener UP-0633 M + PEPA – 20 - 22 parts by weight; 3) andesitic boron – 125 - 138 parts by weight; 4) quartz sand (fraction 0.5 - 2 mm) – 150 - 165 parts by weight; 5) crushed stone (three fractions from 5 to 40 mm) – 410 - 420 parts by weight; 6) furfural acetone oligomer – 5 - 15 parts by weight.

From the dismantled polymer concrete warehouse, 8 cube-shaped cubes with dimensions of 10x10x10 cm were prepared to determine the space between them when compressed. Mind conservation: 1) natural conservation of 4 control specimens in the laboratory for normal minds; 2) entrapment of 4 sparks in an aggressive medium for investigation in real-life exploitation.