

POLYMER CONCRETE AND POLYMER CONCRETE PRODUCTS

Description:

Composite construction and chemically resistant material on base of non-saturated polyester bisphenol polyester and epoxy-vinyl-ester resins in combination with different additives, inhibitors, accelerants and a mixture of quartz fillers with different grain-metric composition.

Designation:

Manufacturing of details, products, facilities (electrolyte baths, grates and covers for inspection shafts, elements of waste water drains, anchorage elements, fundaments, insulators for high tension etc.)

Fields of application - workshops, storehouses, purification stations, in the food industry, chemical, ferrous and non-ferrous metallurgy, textile, cellulose and paper industry, pharmaceuticals.

Application scheme for internal protection of electrolytic baths.

Structure of the polymer concrete:

Resins - thermo reactive, unsaturated polyester, polyester, epoxide vinyl-ester.

Hardeners - organic peroxides

Quartz fillers with fraction structure from 0,05 to 16 mm.

Polymer concrete is made during the application - pouring in appropriate shapes (dies) with geometry and configuration depending on the requirements.

The ratio resins-fillers is equal to 8-20/92-80 (depending on the type of the resins, the ratio of the fractions of the quartz fillers, the sizes and the configuration of the products, the exploitation requirements).

Main characteristics of the polymer concrete and its products:

- high resistance in heavily acting aggressive media
- high strength indicators including abrasive resistance
- exploitation within a wide range of temperatures
- lightweight - three times lighter than the cast iron and metal products
- lower price in comparison with the metal ones

Main characteristics of the polymer concrete made of polyester, vinyl-ester resins:

- density, g/cm³ - 1,8 - 2,4
- compressive strength, MPa - > 100
- tensile strength, MPa - > 15
- bending strength, MPa - > 40
- ration of linear thermal expansion - 1,9 - 2 cm⁻¹/cm⁻¹ x °C⁻¹

Table for comparative characteristics of regular concrete and polymer concrete

Indicators	Regular concrete	Polymer concrete
Compressive strength, MPa	20-25	>100
Tensile strength, MPa	9	20-25
Bending strength	2-3	30-35
Shrinking by hardening, %	0,1-0,2	0,1-0,2
Water resistant on weight modification, %	5-8	0,1-0,2
Eraseability on Taber on weight modification, %	5	0,38

Resistance of the polymer concrete in different aggressive media:

- water - drink water, waste water, technical water, sea water
- acids - salt acid, sulphuric acid, nitric acid, phosphor acid, acetic acid, formaldehyde
- bases - sodium base, potassium base, ammonium base
- salts - chlorides, sulfates, nitrates, phosphates
- petroleum products - gas, crude oil, naphtha, mazut, diesel
- organic solvents - alcohols, acetates, aromatic hydrocarbons

Scheme for internal protective insulation of concrete and electrolytic baths

Designation - replace of up to now used protective systems of the baths - lead linings, polymer linings.

Ground coat

System "Glass flake" with thickness of 0,5 mm

Laminate with thickness of 1 mm

Lining with polymer concrete shaped plates, laid on connecting kit.

Common thickness of the internal protective system - 2 cm