

INTERNAL PROTECTIVE COVERS AND INSULATIONS OF STATIONARY METAL RESERVOIR FOR STORAGE OF PETROLEUM PRODUCTS

1. Internal protective armoured insulation (laminate) of bottom and first mantel

Structure of the laminate:

- 1 layer electrically conductive vinyl-ester ground coat modified with rubber
- 4 - 6 layers vinyl-ester and polyester resins
- 2 - 3 layers glass fabrics (mat and veil)
- Thickness of the laminate 2,5 - 3,5 mm

Scheme of execution of the laminate:

- sandblasting to the SA 2,5 level of cleaning
- ground coating with a single layer of electrical conductive vinyl-ester ground coat modified with rubber
- execution of reparation works on the metal surface at the bottom of the reservoir - cutting out, filling of the established defects (holes, cracks and others) with appropriate kit
- laying of the system laminate, containing of:
 - 4 layers vinyl-ester resin
 - 2 layers glass mat
 - 1 layer glass veil
- finishing cover layer of vinyl-ester resin:
common thickness of the laminate - 3,2 mm

Basic exploitation features of the laminate:

- hardness on Barcole
- compressive strength > 130 mPa
- tensile strength >140 mPa
- bending strength > 200 mPa
- impact strength - 6,5 J

Use:

1. Scheme of the laminate
2. Scheme of testing by hydrostatic hydro-pressure of a pole with a height of 20 m (pressure 27 800 kg/cm²) of insulation with thickness 3,2 mm in a metal bottom with diameter of 30 mm.

Basic designation of the laminate:

- Instead of replacing a partially corroded bottom of metal reservoir, as well as bottoms with reduced inadmissible thickness of the metal from the point of view of the exploitation with new metal bottom.
- Protection of the bottom and the first mantel of the newly constructed reservoirs for ensuring their long-term protection (15 - 20 y)

Basic advantages of the laminate compared to the variant execution of a new metal bottom:

- Significantly shorter duration of the repair works (for reservoir with bottom of 1000 m² - 4 weeks, with a new metal bottom - 2-3 months)
- Significantly less funds (30-40%) necessary for the repair works when compared to the construction of a new bottom and first mantel.
- Significant suitability for repair works, i.e. possibility for carrying out of partially local operations during the repair stays as well as after the expiration of the exploitation time limit.

Warranty time limit of the protection with laminate - 10 years

Exploitation suitability of the laminate 15-20 years

2. Protective cover of bottom, first mantel and walls:

Materials for the execution of the cover:

- Epoxide ground coating
- Epoxide tar ground coating
- Vinyl-ester ground coating modified with rubber
- Polyester and vinyl-ester varnishes
- Epoxide and epoxide tar varnishes
- Polyurethane vinyl-ester varnishes

Structure of the cover:

1-2 layers ground coat, 2 to 4 layers varnish

Thickness of the cover up to 1 mm

Exploitation term of the cover approximately 5 years

Designation of the cover:

- Protection of the bottom and the first mantel of the newly constructed reservoirs
- Protection of reservoirs after a particular period of exploitation, after a particular period without protection and in case of reservoir corrosion of metal, which is not significant sizes.