



PASSATSTAL

**COATING MATERIALS AND
INDUSTRIAL COATINGS.
LINED PIPES, FITTINGS,
VESSEL AND PROCESS
EQUIPMENT**

ABOUT COMPANY

2014 - Year of company foundation

2015 - mastered the production technology of steel pipes and fittings lined with composite materials and organized a site for the manufacture of non-standard equipment

2016 - mastered the production technology of non-standard metal lined trays designed for the transportation of aggressive media

2017 - organized the production and launched the production of anti-corrosion industrial coatings and PWM under the trademark “Farbacoat”

2018 - execution of a full cycle of works on anti-corrosion protection of the material production before the turnkey facility

OUR CUSTOMERS AND PARTNERS



STRICTLY OBSERVE THE RULES

There are all the documents necessary for production and execution of works, including:

- Certificate of technical competence
- TR for all coatings produced
- TR for steel lined pipes and fittings
- Technical evidence of the suitability of materials and products for the construction use
- Certificate of state registration for all coatings
- Certificate of compliance category III for the protection of building structures and equipment



OUR RESOURCES AND POTENTIAL

- Production of steel lined pipes and fittings with a total length of up to 1000 m per month;
- Lining of capacitive and process equipment up to 400 m² per month;
- Production of industrial coatings and PWM up to 120 tons per month;
- The abrasive blasting surface preparation is performed with the help of: GTV shotblasting chamber, innovative materials and equipment Sponge-Jet, Clemco, Contracor;
- The production area is about 2500m².

PRODUCED COATINGS AND PWM

- Industrial coatings for all media and all materials
- Thermal-shielding coatings
- Polyurethane coatings
- Epoxy coatings
- Primers
- Enamels



ADVANTAGES OF FARBACOAT COATINGS



High resistance to adverse atmospheric conditions and mechanical abrasion



Resistance to aggressive chemicals



Ensures flawless corrosion protection



Fast polymerization and curing



High mechanical stability



High adhesion

In 2018, more than **500** tons of industrial coatings were sold to more than **45** customers.

- Enamel "Farbacoat EP-152"
- Primer "Farbacoat EP-045"
- Epoxy coating "Farbacoat Epoxy 20"
- Polyurethane coating "Farbacoat Urethane 35"
- Polyurethane coating "Farbacoat Urethane 30"
- "Farbacoat Vinylester"
- "Farbacoat Polyester"
- "Farbacoat Protect"
- "Farbacoat Termofur"
- "Farbacoat Synergy"
- "Farbacoat Profi"

These coatings were most intensively applied to protect metal construction, non-standard equipment, technological and capacitive equipment for the mining industry of JSC Belaruskali and other industrial enterprises, some facilities of the agro-industrial complex. For painting construction and agricultural equipment.



STEEL PIPES AND FITTINGS WITH ANTI-CORROSION, ABRASIVE-RESISTANT COATINGS

For the production of pipes and fittings lined with industrial coatings the following is used:

- electric welded steel pipes according to GOST 10704;
- seamless hot-deformed steel pipes according to GOST 8732;
- elbows according to GOST 17375, GOST 24950;
- tees according to GOST 17375;
- transitions according to GOST 17378;
- flanges according to GOST 12820, GOST 12822, GOST 12815.

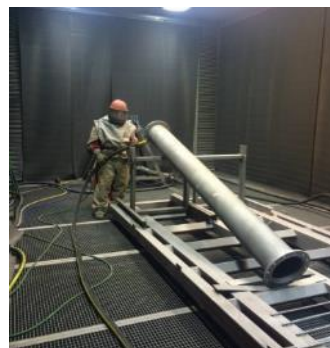
In agreement with the customer, it is possible to manufacture any other lined pipes in accordance with GOST 8732, GOST 10705.

The maximum pipe length is 5500 mm,
The minimum length is 300 mm (limited by the possibility of flanging).



STAGES OF LINED PIPELINES MANUFACTURING

1. Pipe cutting
2. Flanging
3. Preparing internal surface
4. End zones treatment
5. Finished material application
6. Mechanical treatment of end planes
7. Quality control



OUR OBJECTS

Technology upgrade SOF 4PU Construction of a vacuum crystallization unit.
Pipelines from DN 100 to DN 2600, total lining area is more than 2500 m²

- Vacuum pump exhaust pipeline
- Cool recirculated water pipeline
- Secondary steam pipeline
- Warm recirculated water pipeline
- Condensate pipeline
- Salt slurry pipeline
- Mother solution pipeline



OUR OBJECTS

4 RU Section of lined pipeline DN 1100.
Technology upgrade SOF 4PU
Construction of a vacuum crystallization unit.

Coatings: internal coating of steel pipe DN1100

Material: FARBACOAT PROTECT

Operation period: from August 2018 to the present time

Characteristics of the production environment: saline water

Composition:

KCl+NaCl – 0.5%

Temperature, °C up to 26





OUR OBJECTS

Steel tank B06. 4 RU. Technology upgrade SOF 4PU Construction of a vacuum crystallization unit.
First stage.

Coatings: inner surfaces of the steel tank

Material: FARBACOAT VINYLESTER

Operation period: from 01.08.2018 to the present day

Characteristics of the production environment: (mother solution)

Composition:

KCl – up to 10.86%
NaCl – up to 16.10%
MgCl₂ – 2.24%
CaCl₂ – 2.24%
CaSO₄ – 0.11 %
Solids – 0.01%
water – 68.45%
Temperature, °C 34



OUR OBJECTS

3 PU. Flotation machine 1st section. Grinding separation . Technological section №1. Modernization of the equipment of the hardware scheme of the grinding separation and flotation sections SOF 3PU under the productivity of 250 t/h of ore First section. Second stage.

Coatings:

- internal surfaces of the housing of the flotation machine FKM-7.3,
- the surface of the concentric gutters of the main and control flotation of the flotation machine FKM-7.3,
- the surface of the drain funnels of the hydrocyclone unit SR-1300,
- the surface of the pad of hydrocyclone sands SR-1300,
- the surface of boxes and chutes of sieves of direct and preliminary classification of ore,
- the surface of boxes and chutes of sieves of arc and three-section classification of ore,
- the surface of the concentrate gutters of the flotation machine EFM,
- the surface of the elevator of the flotation machine EFM,
- the surface of the tanks of the THl pumps.

Material: "Farbacoat Polyester"

Operation period: from 10.08.2016 to the present day

Composition: sylvinit ore

Density, kg/m³ 1350-1400

Temperature, °C 10-35

pH 6.5-7.5

The composition of the liquid phase:

KCl, % 9-11

NaCl, % 18-20

MgCl₂ + CaCl₂, % not more than 1

Other salts, % not more than 0.5

Water, % 55-65



The composition of the solid phase:

Density, kg/m³ 1990-2100

insoluble residue (i.o.), %, 3-4%

NaCl, % 65-68

KCl, % 27-29

Average particle size, NaCl, KCl, mm 0.7-1.8

According to the results of the control examination, there are acts of visual and instrumental inspection, confirming the absence of cracks, gaps, chips and other defects; the thickness of the coating has not changed during operation.

OUR OBJECTS

Injection of saturated liquor into the body of the vacuum crystallizer pos. 1EV1 RWCU SOF 4PU JSC Belaruskali.

The test section of the pipeline: steel pipe DN 500 L-1800mm, lined with a two-component vinyl ester-acrylic coating filled with modified glass pellets Polyglass VE (Corrocoat)

Operation period: from 08.12.2015 to the present time

Line operating time during the test period: 15 800 hours

Characteristics of the production environment

(saturated liquor):

Potassium chloride suspension:

Density, kg/m ³	1220:1255
Temperature, °C	up to 108
pH	6.5-7.5
When cooled tends to	crystallize

The composition of the liquid phase:

KCl content, %	10-20
NaCl content, %	15-19
MgCl ₂ + CaCl ₂	not more than 4
Other salts, %	not more than 0.5
Water, %	61.5-63

The composition of the solid phase:

Density, kg/m ³	1220:1255
I.r. + CaSO ₄ , mgl	15
NaCl, %	0-2
KCl, %	98-100
The average particle size, NaCl, KCl, mm	0.28-0.33
Finely dispersed insoluble residue, mg/l	up to 150

The absence of cracks, chips, gaps and changes in the thickness of the coating is confirmed by an act of visual and instrumental inspection.





OUR OBJECTS

Pipeline pumping salt pulp unloading thickeners "Brandess" into the solvent A 351-2
SOF 4 PU, JSC Belaruskali.

Characteristics of the production environment:

solids, %: 33-45 (L:S-2.0:1.2)
suspension density, kg/m³: 1550-1460
solid content in suspension:
NaCl+KCl, % 98-99
i.r.+CaSO₄, % 1-2
temperature, not more than, °C 100

The results of the control examination after 20 000 hours of operation

Visual inspection of the test section of the pipeline revealed no visible damage, scratches, blisters or cracks.

The obtained measurements indicate that for the period from the moment of the first visual and instrumental inspection of the pipeline section lined with the two-component vinyl ether-acrylic coating Polyglas VE PG at pos. A 352-2, from the beginning of 2015 there was no change in the thickness of the lined coating layer.



OUR OBJECTS

The hydrocyclone discharge pipeline of the 4th stage of desliming of the thickening section of SOF 1PU JSC Belaruskali was put into operation on 08.09.2015.

Lining material: Polyglas VE PG for pipes and Polyglas VE WR for fittings

Characteristics of the production environment (saturated liquor):

- Potassium chloride suspension:
- Density, kg/m³ 1350:1400
 - Temperature, °C 10-50
 - pH 6.5-7.5
 - When cooled tends to crystallization
- The composition of the liquid phase:
- KCl, % 9-11
 - NaCl, % 18-19
 - MgCl₂ + CaCl₂ not more than 1
 - Other salts, % not more than 0.5
 - Water, % 55-65
- The composition of the solid phase:
- Density, kg/m³ 1220:1255
 - I.r., % 3-4
 - NaCl, % 65-68
 - KCl, % 27-29
 - The average particle size, NaCl, KCl, mm 0.07-0.1



According to the results of the control measurements, there are acts of visual and instrumental inspection, confirming the absence of cracks, gaps, chips and other defects; the thickness of the coating has not changed during operation.

OUR OBJECTS

Pipeline for transportation of mother liquor of SOF 4PU JSC Belaruskali was put into operation on November 15, 2015. It is working to the present day.

Lining material: Polyglas VE PG for pipes and Polyglas VE WR for fittings

Characteristics of the production environment (mother liquor):

Density, kg/m³ 1220:1255

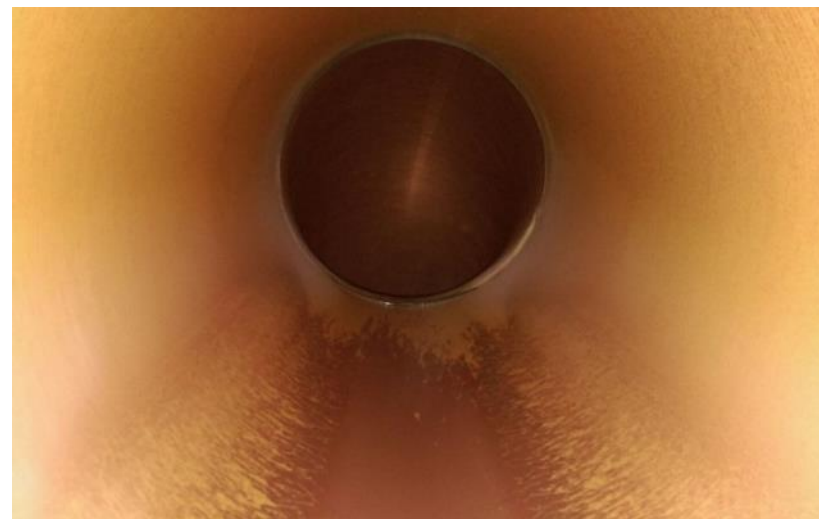
Temperature, °C 25-80

pH 6.5-8.0

When cooled tends to
crystallize

The composition of the liquid phase: KCl,% 9-14
NaCl,% 14-18
MgCl₂ + CaCl₂ not more than 5
Other salts,% not more than 0.1

The composition of the solid phase: The content of solid crystals
NaCl + KCl, g/l not more than 25



The results of the control inspection after 10 050 hours of operation:

- there was a highlighting of the lining material, which is a natural process and allowed by the manufacturer;
- no cracks, cracks, tears or damage to the lining material;
- the material did not subject to abrasive wear, traces of manual application remained;
- according to the results of eddy current measurement performed with the help of Elcometer 456 thickness gauge, the lining thickness did not change in comparison with the original one (20 measurements were made over the entire area).

OUR OBJECTS

Tank of saturated liquor $V = 169 \text{ m}^3$ pos. 1CU1 in the section of RVKU SOF 4PU JSC Belaruskali.

Selected material - anti-corrosion mixture "Farbacoat Polyester"

This material is an abrasion-resistant two-component thick-layer coating with a high content of solids and with high resistance to corrosion. It is a composition based on isophthalic polyester resin and a number of special organic and inorganic fillers and additives.

Characteristics of the production environment (saturated liquor):

Potassium chloride suspension: Density, kg/m^3 1220:1255
 Temperature, $^{\circ}\text{C}$ up to 108
 pH 6.5-7.5
 When cooled tends to
 crystallize

The composition of the liquid phase: KCl content, % 10-20
 NaCl content, % 15-19
 $\text{MgCl}_2 + \text{CaCl}_2$ not more than 4
 Other salts, % not more than 0.5
 Water, % 61.5-63

The composition of the solid phase: Density, kg/m^3 1220:1255
 I.r. + CaSO_4 , mgl 15
 NaCl, % 0-2
 KCl, % 98-100
 The average particle size, NaCl, KCl, mm 0.28-0.33
 Finely dispersed insoluble residue, mg/l up to 150

Visual and instrumental inspection is confirmed by the act. No operational defects.



OUR OBJECTS

Technology upgrade SOF 4PU. Reconstruction of the 3rd pair of lightening along the line B", lining of the "Brandes" type thickener pos. B353/2 with a total area of 600 m²

Selected material - anti-corrosion mixture Corrotan XT

This material is a vinyl ether-urethane three-component polymer alloy of natural curing with a glass pellets filler. Welding seams of tanks before applying a protective coating are reinforced with multidirectional fiberglass impregnated with special Corrocoat resin.

Characteristics of the production environment:

The total content of clay-salt sludge is up to 450 kg/m

Clay-salt pulp: Density, kg/m³ 1280-1400
 Pulp temperature, C +95-98
 Limit temperature, C up to 105
 pH 6.5-7.5

The composition of the liquid phase:

Density 1248-1252
CaCl 18.5-19.5
NaCl 15.0-16.0
CaCl₂+CaSO₄+MgCl₂ 2.8-3.0
the rest is water

The composition of the solid phase:

Weight content of KCl,% up to 2
Weight content of HO, % up to 1.8
Weight content of CaSO₄,% up to 0.3
The rest is NaCl



According to the results of the control measurements, there are acts of visual and instrumental inspection, confirming the absence of cracks, gaps, chips and other defects; the thickness of the coating has not changed during operation.

OUR OBJECTS

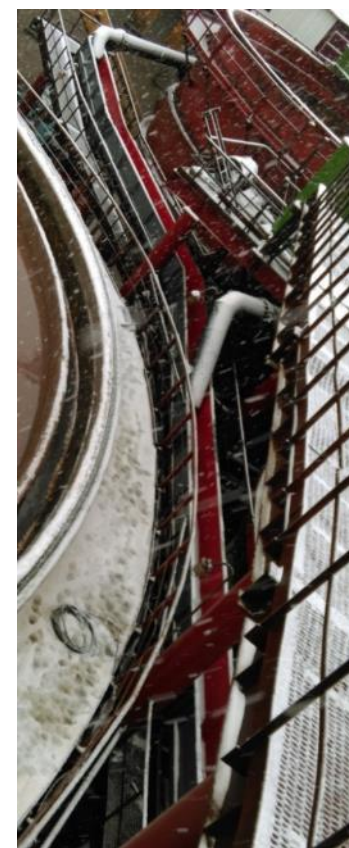
1 PU. Reconstruction of the scheme II, III stage of desliming the section of SOF.
The lining of the metal tray was completed with high-molecular modified elastopolyurethane.
Control inspection after 17112 hours of operation is confirmed by the act.
No operational defects.

Advantages of lining with high-molecular modified elastopolyurethane:

- high resistance to mechanical impacts,
- high tensile strength and low coefficient of hydraulic resistance ensures the resistance to the aggressive media,
- reduces the possibility of crystallization of the product on the walls,
- allows mechanical removal of crystallization products.

The lining is made by gluing on special adhesives that allow it to withstand multiple changes of the ambient temperature and the moving medium as well as the mechanical impact on the lining.

The coating is used for lining trays, hoppers, tanks.



List of references

Ser. No.	Year	Object name	Pipe material	Medium	DN	The total length of the pipeline, lm
1	2015-2016	Technology upgrade SOF 4PU Reconstruction of the 3rd pair of lightning along line B. 0.62.8, 0.62.9, 0.63.10, 0.63.12, 0.65.11, 0.65.12 The discharge line from the pumps.	Steel 20	Salt slurry	DN300	914
2	2015-2016	Technology upgrade SOF 4PU Reconstruction of the 3rd pair of lightning along line B. 0.63.2 - 0.63.8 Pipeline for the discharge of clay slurry from the pump pos. B356/2a to the sump pos. B357	Steel 20	Clay-salt slurry, liquor	DN150 DN200	197
3	2015	SOF 1PU. Thickening section. Pipeline P2 (№5) of the hydroseparator №4 discharge.	Steel 20	Sylvinite ore	DN200	124
4	2015	Technology upgrade SOF 4PU Installation of thickeners on lines A and B. The second stage. Pipeline of thickening section	Steel 20	Mother liquor	DN100	158

List of references

Ser. No.	Year	Object name	Pipe material	Medium	DN	The total length of the pipeline, Im
5	2016	Technology upgrade SOF 4PU Reconstruction of the northern map of the slurry storage. The third launch unit.	Steel 20	Clay slurry, Clay-salt pulp	DN500	804
6	2016	Reconstruction of the grinding and flotation sections with installation of pneumatic ejector flotation machines on the SOF 2PU in round-up operations. First stage.	Steel 20	Salt pulp	DN150 DN250 DN400	88
7	2017	4RU. Technology upgrade SOF. Installation of sump tanks on line B. Second stage. The first launch unit.	Steel 20	Salt slurry	DN250 DN300 DN400	587

List of references

Ser. No.	Year	Object name	Pipe material	Medium	DN	The total length of the pipeline, lm
8	2017-2018	Technology upgrade SOF 4PU Construction of a vacuum crystallization unit. First stage. Vacuum pump exhaust pipeline Cool recirculated water pipeline. Secondary steam pipeline. Warm recirculated water pipeline. Condensate pipeline	Steel 20 AISI 316Ti (08X17H13M 2T)	Saturated liquor Salt pulp Purified solution Mother solution Steam-air mixtures Cooling water Circulating saline water	DN800 DN900 DN1000 DN1100 DN1300 DN1600 DN2600	80
9	2017-2018	Technology upgrade SOF 4PU Construction of a vacuum crystallization unit. First stage. Salt slurry pipeline Mother solution pipeline.	AISI 316Ti (08X17H13M 2T)	Salt pulp Mother solution Steam-air mixtures Cooling water	DN150 DN200 DN250 DN300 DN350 DN400 DN500 DN600 DN700	604

List of references

Ser. No.	Year	Object name	Pipe material	Medium	DN	The total length of the pipeline, Im
10	2018	SOF 4PU. Reconstruction of the second pair of lightning along line B.	Steel 20	Clay slurry Salt slurry	DN250 DN300	168
11	2018	Technology upgrade SOF 4PU Construction of a vacuum crystallization unit. First stage. 0.5.47, 0.5.48 pulp pipelines	AISI 316Ti (08X17H13M 2T)	Salt pulp	DN300 DN400 DN500 DN600 DN700	314

WE WILL BE HAPPY TO COOPERATE WITH YOU

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