



STANDARDIZED PROCESS CHART FOR APPLICATION OF HEAT-INSULATING COATINGS

PROTERM® ZINC

I. GENERAL NOTES

1.1. Anticorrosive treatment of surfaces with PROTERM® ZINC coating is performed in accordance with this process chart.

1.2. PROTERM® ZINC spreads well on all metal surfaces.

- Applied at the ambient temperature: from -30°C to +40°C;
- Applied on surfaces with temperature: from -30°C to +40°C;
- After drying the coating layer operates within the temperature range: from -60°C to +150°C;
- Basic color of coating: — gray;
- Film thickness: 40 µm for one layer;
- Material consumption: 250-280 g/m² for 40-60 µm thick layer (depending on application technique and properties of the surface);
- Solvent: — orthoxylene (5-15% of the volume, depending on the equipment used);
- Transport conditions: from: +30°C to +30°C;
- **Material PROTERM® ZINC and solvents should be stored in closed well-ventilated explosion-protected and fireproof areas.**

Material «**PROTERM ZINC**» is a professional anticorrosive thin-film zinc coating, which efficiently protects ferrous metals against corrosion. The cold-galvanizing composition PROTERM has high protective properties and high adhesion to metal surfaces and can be used for protecting both exterior and interior surfaces against corrosion. It provides the simultaneous active (cathodic) and passive (barrier) anticorrosion protection and is used in such areas as industrial and civil construction, transport construction, oil and gas sector, power industry, railway structures, harbor and hydraulic facilities, motor transport. The protective coating «**PROTERM ZINC**» is highly elastic, resistant to impact and vibration actions and abrasion-resistant. The operating ambient temperature range is from -60°C to +150°C. The «**PROTERM ZINC**» coating, obtained after applying the composition, is resistant to both fresh water and sea water, as well as to water solutions of various salts (pH = 6.0 – 10.0); it is also resistant to ethanol and its water solutions. The resulting coatings can be used for anticorrosion protection of centralized cold water supply systems.

The resulting coating is not resistant to the action of certain organic solvents and to gasoline.

Technical characteristics of the protective cold-galvanizing composition «**PROTERM ZINC**»:

The protective coating «PROTERM Zinc» is a liquid single-component composition, ready for use and represented by electrolytic zinc of high chemical purity degree, with certain volatile substances and binding agents. The composition is supplied in air-tight containers. The guaranteed storage time at ambient temperature from -40°C to +30°C is 2 years, under condition of preserving the factory package integrity.

II. Cold galvanizing technology:

The cold galvanizing of metal is the technology of obtaining anticorrosive coating by using the special protective composition «PROTERM ZINC», including the following successive steps:

1. Preparing the surface for anticorrosive coating application;
2. Preparing the composition for application;
3. Application of the protective layer;
4. Interlayer drying of the coating;
5. Quality control of the anticorrosive coating;
6. The final curing of anticorrosive coating before putting it in operation.

The anticorrosive coating application technology implies that the composition should be applied at ambient temperature not lower than -30°C.

III. Preliminary preparation of metal surface for the application of «**PROTERM ZINC**»:

The parts of metal structures to be protected should be accessible for direct inspection, for preparation of their surface, for the subsequent application of the protective composition and for the quality control of the resulting coating.

The prepared surface of the structure should have no defects (sharp edges with radius less than 0.3 mm, burrs, welding splashes, drop-throughs, solder overlaps or residues of fluxing agent). In places of welding of the structures (metal plates, metal angles etc.) there should be no unreachable slits or cavities. If there are greasy or other impurities on the metal, its surface should be cleaned with household detergents.

IV. Before application of the «PROTERM ZINC» composition, thoroughly prepare the metal surface:

New steel and rolled metal products, if they have the tightly stuck dross, should be treated with abrasive blast cleaning up to 2nd grade according to GOST 9-402 with the subsequent degreasing. If there is no dross, new steel and rolled metal products are only degreased. The old surface with rust stains is cleared mechanically (with a scraper, emery paper or brush etc.), or with pressured water under the pressure 10-20 MPa, and then the cleaned surface is degreased.

On the previously galvanized steel the impurities and the superficial layer of zinc salts are scraped off with water under the pressure 10-20 MPa, and then the surface is degreased. On the previously painted surface the remaining paint should be removed mechanically or chemically, or with water under the pressure 175-275 MPa, with the subsequent degreasing of the cleaned surface. If the metal is treated with abrasive wheels or manually with emery paper, the abrasive grain size is selected from 5 to 6 according to GOST 3647-71, or, according to ZINC FEPA (European) - from 180 to 220. After manual or mechanical treatment remove dust from the metal surface. It is important not to miss any untreated spots. The compressed air, used for treatment, should be dry and pure, and meet the requirements of GOST 9.010-80. If the metal surface is degreased in small patches, it should be treated with a brush soaked in xylene. If the metal structures are treated outdoors, the ready protective composition should be applied not later than 12 hours after cleaning and degreasing of surface. If the treated structures are indoors, then the protective composition should be applied not later than after 48 hours.

The protective composition «PROTERM ZINC» is ready for use and can be applied with a paint brush, paint roller or paint sprayer. If necessary, the composition can be diluted with such solvents as xylene or orthoxylene. Don't use other types of solvents. Before application mix the composition thoroughly with a mixer paddle for electric drill until you get a uniform mass.

Application with a brush:

Choose the paint brush made of natural bristle. It should be clean of various impurities and dust. Under ordinary conditions the composition needn't be diluted with the above-mentioned solvents.

Application with a paint roller:

Choose the paint roller, which is resistant to organic solvents. The roller should be clean of dust and various impurities, as well as of previously applied paintwork materials. Under ordinary conditions the composition needn't be diluted with the above-mentioned solvents.

Application with a pneumatic sprayer:

The used equipment should be clean of dirt and of previously applied paintwork materials. If necessary, the «PROTERM ZINC» composition can be diluted with such solvent as xylene, at the ratio up to 5% by weight. Diameter of the nozzle used is 2.0-3.0 mm. Pressure in the sprayer is 2-3 bar (0.2-0.3 MPa).

Application with an airless sprayer:

The used equipment should be clean of dirt and of previously applied paintwork materials. If necessary, the «PROTERM ZINC» composition can be diluted with such solvent as xylene, at the ratio up to 4% by weight. Diameter of the nozzle used is 0.38-0.63 mm or 0.015-0.025 inches. Pressure in the sprayer is 80-120 bar (8-12 MPa).

Application by dipping:

If necessary, the «PROTERM ZINC» composition can be diluted with such solvent as xylene, at the ratio up to 15% by weight. If metal structures are treated outdoors, the ready protective composition should be applied on the cleaned and degreased metal surface not later than after 12 hours. If the treated metal structures are indoors the ready protective composition should be applied not later than after 48 hours.

Depending on the selected application method of the composition, the welded seams, as well as the areas of the metal surface, which are unreachable for painting equipment, should be treated first with the composition by using a paint brush. If there are hidden slits or cavities, remaining after welding the structures, it is especially important to prevent the penetration of water or moisture into these places (by various means of damp-proofing, which don't taint the treated surface).

The ready protective composition «PROTERM ZINC» should be mixed at an interval of 20-30 min during the whole time of work.

The composition is applied in layers, overlapping the previously applied band.

The resulting thickness of the applied «PROTERM ZINC» coating should be from 40 to 160 µm. If the composition is applied on metal structures, having small mechanical deformations, the resulting thickness can be increased up to 200 µm. At applying the protective composition all works should be performed at the ambient humidity up to 90% and at the ambient temperature from -30°C to +50°C. The material can be applied on damp metal, but there should be no water drops on it. If the application is performed at negative air temperatures, don't apply the material on ice crust.

In conditions of atmospheric precipitations (rain or snow), use awnings during application of the material.

Application	Pressure at application	Nozzle	Number of layers
Spray gun with an upper tank	3 bar	2.0-3.0 mm	1-2
Application life	Unlimited; diluted with a solvent if necessary		
Dry layer thickness	40-60 µm		
Curing time between layers	10-40 min		
Covering with protective and decorative coatings	Only solvent-borne paintwork materials; drying time before applying them onto the «PROTERM Zinc» coating is 4-6 hours		
Drying time at temperature:			
-30°C	50 min		
-10°C	40 min		
+20°C	20 min		
+60°C	10 min		
Thermal stability	from -60°C to +150°C		
Flexural resilience of the film	1 mm		
Adhesion of the coating	1 grade		
Density of the composition at 20°C	2400 kg/m ³		
Equal corrosion rate in sea water	0.02 mm/year		
Polishing	Acquires metallic luster, but 5 µm of coating is worn off		
Operating conditions	from -35°C to +90°C		
Packing	Euro-type can: 2 kg, 10 kg, 40 kg.		
Used as	Protective anticorrosive coating for metal (cold galvanizing), and as a primer for decorative paintwork materials		
Consumption	250-280 g/m ² for 40-60 µm thick layer		
Color	Dull gray, the shade is not specified		
Visual appearance of the dry coating	After drying the coating should be dull in color, uniform and smooth, without drips or extraneous impurities		
Solvent	Orthoxylene, xylene		
Viscosity at application (20°C)	60 s by viscometer VZ-3		

VI. OCCUPATIONAL, ENVIRONMENTAL AND FIRE SAFETY REQUIREMENTS at working with the PROTERM® ZINC anticorrosive coating

5.1 Personal protection

At the application of PROTERM ZINC® material, the workers should be provided with:

- safety footwear and protective clothing (GOST 12.4.103-83);
- rubber gloves (GOST 20010-93);
- cotton gloves (TR 17 RSFSR 06-7745-84);
- safety glasses or goggles for eye protection;
- respirators RU-60M, RU-60MA, RPG-67A, SHB-1, U2K, Topol-A1, Uralets-GP-A, Unix-A, ZM-7202 for breathing protection.

5.2. Emergency situations

5.2.1 In case of contact with eyes, rinse immediately with flowing water within 15 minutes. If the irritation stays, seek medical advice.

5.2.2 In case of contact with skin or mucous linings, remove the material with hand cleaner and wash with plenty of water.

5.2.3. At the ignition of structures, covered with the coating, extinguish fire with water, foam, dry chemicals or carbon dioxide. If the material is spilled, use any absorbing matter like sand, soil etc.

5.3. General occupational safety requirements

The application of PROTERM ZINC® material should be performed with strict adherence to occupational, environmental and fire safety requirements according to:

- SNiP 12-03-2001. Occupational safety in construction. Part 1. General requirements.
- SNiP 12-04-2002. Occupational safety in construction. Part 2. Building construction.
- SSBT. Occupational safety standards system. Organization of training for labour safety. General rules.
- SSBT. Occupational safety standards system. Fire safety. General requirements.

- SSBT. Occupational safety standards system. Painting works. General safety requirements.
- POT RM-016-2001 Cross-industry occupational safety regulations at electricity-generating equipment maintenance.
- SP 12-135-2002 Safety on labor conditions in construction. Industry branch standard instructions on labor protection.

Foremen and workers must bear in mind that in case of nonobservance of occupational safety requirements they endanger both themselves and the people working with them.

Before starting work check the stability of scaffolding and hanging stages. The frames of scaffolding must be completely stable, firmly fastened to the wall and mounted on solid base; the flooring ends must lie on bases; the joints of flooring and planks between bases are not allowed. Flooring and ladders must be fenced with guard rails and (below) with guard boards to prevent foot slipping and the fall of materials; there must be no sticking nails or clamps in the flooring, rails, posts or steps. Scaffolding should be cleared from debris regularly. If the works are performed at several scaffolding levels simultaneously, the workers should be placed in such a way, so that no one was directly above another.

When working from hanging stages the strength of hawsers, ropes and pulleys should be ensured, the security of their fastening should be checked. To prevent damage to the ledges the hanging stage should be hung on special equipment (hammer beams, footboards, wall hooks etc.). Before use the hanging stage should be tested with double working load, and the stability and operability of hoisting machine and brake assembly should be checked. Ascent and descent of hanging stage with people in it is allowed only if there is special mechanism for it in the hanging stage itself. When working from hanging stages, on the roof or in other high places, having no guard rails, the workers should be provided with safety belts and ropes, fixed to solid parts of the building. The area under hanging stages at the façade should be fenced.

During works all the electrized devices and tools must be thoroughly grounded, to prevent the occurrence of electrical shock. All the electric wire connections must be properly insulated; the wires must be hung on insulators, and not on temporary planks or nails; switches and safety fuses should be placed in special cases.

Special safety measures should be taken when working on façades near electric power lines: do not touch wires; if the lines of tram or trolley-bus overhead wirings are fastened to the façade, do not start work until getting allowance from tram or trolley-bus service and until they switch off current.

When working with mechanisms and apparatuses follow the guidelines for use, specified in the instructions, as well as the following rules:

1. Before starting a mechanism, check its functioning at idle speed.
2. Do not clean, grease, open or repair a switched-on mechanism.
3. Do not use defective or unchecked testing or tuning devices (reducing valves, pressure regulating valves, manometers, starters etc.), or mechanisms without the enclosing of all moving parts of the drive (transmission belts, gears etc.).

If a worker feels nausea, dizziness, headache or any other sickness during working on a façade, he should address to the medical station immediately.

A worker must thoroughly wash hands and face after finishing work or before meal.

Persons under the age of 18 are not accepted to perform works in applying the PROTERM® ZINC coating.

A worker should keep in mind that in case of nonobservance of the requirements, stated in the workplace safety guidelines and the day plan, the following hazards may occur;

- electrical shock;
- falling from height;

The working site should be organized in accordance with work flow charts and kept clean.

The state of scaffolding, hanging stages and scaffold towers should comply with the requirements of:

GOST 12.2.003-91, GOST 26887-86, GOST 27321-87, GOST 27372-87.

In hazard areas safety posters and signs should be installed.

Safety requirements before starting works

A worker must:

- receive safety briefing from the job supervisor in case of changes in work type or labor conditions, understand the set task;
- put on and arrange the protective clothing or personal protective equipment;
- examine the working site; remove unnecessary objects, clear the passages;
- check the equipment health;
- put on the lighting if necessary;
- when using power-driven hand tools – check the integrity of electric equipment, cables, grounding, compressed air hose connections, check the equipment at idle;
- check the readiness of energy-saving coating for application.

Safety requirements at work

A worker must:

- not obstruct exits and working site with building materials or packages;
- use only ready paints;
- hand over pricking and cutting tools in such a way, that the worker taking the tool could take it by the handle.

Working at height:

- stack tools and containers only after taking measures against their inadvertent falling;
- use tested safety belts;
- descend only by portable or permanent ladders;

PROHIBITED ACTIVITIES:

- do not perform works without protective clothing or personal protective equipment;
- do not use defective equipment or tools;
- do not perform works at the malfunctioning or insufficient lighting;
- do not approach or stand under the suspended load;
- do not shim up trestlework or scaffolding poles with deal ends, bricks or other undue items or materials;
- do not dismantle trestlework or scaffolding by collapsing method;
- do not perform works on working sites without guard rails at height over 1 meter above ground level;

Safety requirements after finishing work.

A worker must:

- clear out the working space;
- disconnect mechanisms and electro-driven tools from the electrical network;
- wash removable equipment and tools and put them into the storage location;
- remove mechanisms from trestlework and scaffolding.

Requirements to worker's actions in the emergency situation.

Emergency situation can occur due to:

- overloading the scaffold;
- short circuit and ignition of current-carrying cables;
- failure of power supply.

A worker must:

- give the danger alarm signal immediately;
- take measures for accident prevention and leave the hazard area;
- inform the job supervisor;
- render first aid to the injured if necessary.

In case of nonobservance of the material application and storage instruction, the manufacturer will not be liable for the quality of coating.

Approved by _____ A.V. Zapara

I have read and understood the process chart _____
(job position) (signature) (full name)

Warning! All the aforementioned information is obtained as a result of laboratory testing and operational experience, and based on the material components' characteristics, but it is not warranty information. Due to impossibility to control the conditions of material application and the ready coating use, the manufacturer assumes no liability for the result, or for the possible expenses or damage, caused by using this product. The user evaluates the expedience of using the product in each specific case at his discretion and accepts all risks, connected with using this material. The product is intended solely for industrial usage by qualified personnel.