PROTERM®
ENERGY EFFICIENT COATINGS
AVAILABLE TO EVERYONE
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# STANDARDIZED PROCESS CHART FOR APPLICATION OF HEAT-INSULATING COATINGS

# PROTERM® ANTIPYREN

## I. GENERAL NOTES

1.1. Heat insulation of surfaces with the heat-insulating coating PROTERM® ANTIPYREN is performed in accordance with this process chart.
1.2. PROTERM® ANTIPYREN spreads well on all types of surfaces: metal, wood, plastic, glass, concrete, brick etc.
1.3. The temperature of the surface should be 5-7°C higher than the dew point temperature, determined with Elcometer 319 device.

- Applied at the ambient temperature: from +7˚C to +45˚C;
- Applied on surfaces with temperature: from +7˚C to +150˚C;
- After drying the coating layer operates within the temperature range: from -30˚C to +200˚C;
- Basic color of coating: — white;
- Film thickness: 500 μm for one layer;
- Material consumption: 1.0-1.5 l/m$^2$ for 1 mm thick layer (depending on application technique and properties of the insulated surface);
- Solvent: — water (5-20% of the volume, depending on the equipment used);
- Transport conditions: from +7˚C to +40˚C;
- Material PROTERM® ANTIPYREN and solvents should be stored in closed well-ventilated areas.

## II. OPERATING PROCEDURES AND WORKS ORGANIZATION

2.1. Material PROTERM® ANTIPYREN belongs to water-activated systems and contains suspension of closed-cell microgranules in silicone-modified resin solution with the added plasticizers and other admixtures. It is moisture-resistant and has high light resistance. Material PROTERM® ANTIPYREN has good adhesion to most of substrates, is waterproof and alkali-resistant and can be used on various surfaces.
2.2. Material PROTERM® ANTIPYREN is supplied ready for use in air-tight containers, which must have the marking, including the following data:
- name and trademark of the manufacturer; - instruction on application;
- weight; - color; - manufacture date.
2.3. After transportation or long storage the layering of material inside the storing container is acceptable, which is eliminated by thorough mixing immediately before application.
2.4. To achieve the required consistency of the material it is recommended to use the following solvents: water (distilled water). Do not use other types of solvents!
2.5. For material application it is allowed to use airless spraying devices or paint brushes. The thickness of the applied layer should be no more than 1 mm. One layer should be dried for no less than 12 hours. Please note that with the increase of air humidity or with the reduction of substrate temperature or ambient temperature the drying time may increase up to 24 hours.
2.6. The surfaces, prepared for the material application, should be dry, smooth and clean. The dampness of the surfaces to be coated should be no more than 5%.
2.7. At applying the material PROTERM® ANTIPYREN the ambient air humidity should be no more than 80%;
2.8. Do not perform the application of PROTERM® ANTIPYREN:
- when it rains or when the façade surface is damp after raining;
- when it snows or when the façade surface is damp after snow;
- if there is hoarfrost or ice on the treated surface.
2.9. The material PROTERM® ANTIPYREN is not recommended to be applied on substrates, which have been previously coated with silicate paints or primers.
2.10. Please bear in mind that despite the high alkali-resistance of the polymerized coating, material PROTERM® ANTIPYREN in its liquid state poorly interacts with substrates having high pH.
2.11. Before applying the PROTERM® ANTIPYREN coating the surface to be coated should be prepared. When preparing the surface remove the peeling paint layers mechanically by using scrapers, pallet knives and other tools.
2.12. The coating is applied in a solid uniform layer without gaps. Each new layer is applied after the previous layer is completely dry.
2.13. During spray application of the coating conform to the following rules:
- the material is applied in two perpendicular directions: the first layer is applied moving the paint sprayer vertically, the second layer - moving the paint sprayer horizontally;
- the velocity of the paint sprayer movement should be uniform and amount to 14 - 18 m/min.;
- to obtain solid coating the applied band of material should overlap the previous one by 0.3-0.5 breadthwise;

- when preparing paint sprayers for work pay attention to the cleanness and the coaxiality of nozzle openings in the air cap and air-tightness of the device.

## III. Surface Preparation.

3.1. Before applying the PROTERM® ANTIPYREN energy-saving coating clean the surface from dirt, rust, dust and old paint, remove the peeling layers etc. Pay attention that there were no loose rust on metal surfaces, which can detach later from the metal with the coating layer after applying the coating. Metal surfaces are cleaned from rust by means of wire brushes or abrasive discs, removing the loose rust layer till the appearance of metallic luster.

*Cleaning grade ISO-St2 (Thorough cleaning by hand and with electric tools).*

*On cursory examination, the substrate should be clean from the evident traces of oil, grease and dirt and from the loose slack, rust, paint and other substances.*

*Cleaning grade ISO-Sa2,5 (Very thorough sand-blast cleaning).*

*On cursory examination, the surface should look cleaned from the evident traces of oil, grease and dirt and from the most of slack, rust, paint and other substances. All the residual traces of impurities should be only in form of barely discernible stains or stripes.*

3.2. The derusted surface is treated with rust converter solution, which can be kept for 2 hours if necessary. New metal surfaces may require removing the preservation agents. The ready surface should have no peeling elements, should be dry (have no condensate), should have no oily or greasy elements, should not be excessively plastic.

## VI. Preparation of the Energy-Saving Coating.

4.1. The energy-saving coating PROTERM® ANTIPYREN is ready for use.

To achieve the required consistency of the material it is recommended to use distilled water. The amount of water (from 0 to 50%) depends on the temperature of the substrate to be coated and on the subsequent maintenance of it. Do not use other types of solvents! Seek advice in the nearest representative office.

4.2. After long storage the layering of material into fractions inside the storing container is acceptable. When using a mixer, the allowed mixing rate is up to 200 rpm. Moving the blade vertically, submerge the thickened part into the liquid, switch on the mixer and use slow rotation of the blade to blend the thickened clusters with the liquid. Mix until the material has the consistency of heavy cream.

Approximate mixing time:

- mixer 3-5 minutes,
- manual mixing 5-7 minutes.

## V. Application of the coating.

5.1. On small surfaces and surfaces with complex configuration the material can be applied with a soft brush. The surfaces from 100 m² can be treated with airless sprayers. The coating can be applied on surfaces with temperature from +7°C to +150°C; the work in humid weather is not allowed, as the material is deliquated with water and dries slowly.

5.2. The complete drying time of one layer of the coating 1 mm thick is no less than 24 hours.

The next layer is applied only after the previous layer is completely dry. A layer 1 mm thick is obtained with one-two passes of a sprayer or brush. The application of a thicker layer of material is not allowed, as it results in the formation of a water-proof film on its surface, which in its turn prevents the complete evaporation of the moisture, contained in it, and causes the loss of thermophysical properties and deformation of the coating.

5.3. The hotter is the surface to be coated, the more diluted the material should be. The diluted material is applied with quick short movements; the layer at this way of application would be very thin.

The drying time of each such layer is no less than 1 hour. After that the material is dried for 20 – 24 hours. Then the less diluted material is applied. The working consistency of the material, as well as the consistency of the first layer material at applying on the surface with the temperature less than +45°C, is regulated with distilled water as a dilutant in amount of 5-10 % of the volume.

5.4. The material is applied in a solid uniform layer without gaps. Each new layer is applied after the previous layer is completely dry.

5.5. During spray application of the coating conform to the following rules:

- the material is applied in two perpendicular directions: the first layer is applied moving the paint sprayer vertically, the second layer - moving the paint sprayer horizontally;
- the velocity of the paint sprayer movement should be uniform and amount to 14 - 18 m/min;
- to obtain solid coating the applied band of material should overlap the previous one by 0.3-0.5 breadthwise;
- when preparing paint sprayers for work pay attention to the cleanness and the coaxiality of nozzle openings in the air cap and air-tightness of the device.

5.6. Material consumption for 1 mm layer amounts to approximately 1.0-1.5 litres for 1 m² depending on the type of the treated surface, weather conditions and the qualification of workers.

The 1 mm thickness of the layer can be identified with a thickness gauge of the "painter's comb" type or by the "optical depth" of the material (the substrate is not visible through the material).

The coating is not washed off after drying, therefore the stained clothes, tools, window glasses should be washed with water before the material is dry.

## VI. Conditions of storage and transportation of the PROTERM® ANTIPYREN energy-saving coating

6.1. Material PROTERM® ANTIPYREN should be stored in tightly closed containers at temperature from +7°C to +40°C and air humidity no more than 80%, out of direct sunlight.
6.2. Material can be transported by any means of transport at temperature from +7°C to +40°C, keeping out of direct sunlight. Transport packing should provide for the correct arrangement of containers and their safety. Damage to containers' integrity causes the spoilage of material.
6.3. Storage time - 12 months in air-tight factory package.

## VII. OCCUPATIONAL, ENVIRONMENTAL AND FIRE SAFETY REQUIREMENTS at working with the PROTERM® ANTIPYREN energy-saving coating

**7.1. Personal protection**
In normal conditions the material is non-hazardous. In well-ventilated areas or outdoors respirators are not used. In unventilated rooms use standard respirators. Use protective goggles for eye protection. Use gloves and protective clothing for skin protection.

**7.2. Emergency situations**
7.2.1 In case of contact with eyes, rinse immediately with flowing water within 15 minutes. If the irritation stays, seek medical advice.
7.2.2 In case of contact with skin or mucous linings, remove the material with hand cleaner and wash with plenty of water.
7.2.3. 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.

**7.3. General occupational safety requirements**
The application of PROTERM® ANTIPYREN 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® ANTIPYREN 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)