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Research Article

HEAT CONSUMPTION COATS

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ABSTRACT

The article describes the results of experimental studies on the analysis and improvement of existing methods for determining the thermal conductivity of liquid composite heat-insulating coatings.

KEYWORDS

Energy efficiency, thermal insulation material, thermal conductivity, microsphere, thermal insulation paint, stationary method, non-stationary method, thermocouple sensors.

INTRODUCTION

One of the most important and priority tasks in the modern construction industry is to save energy by reducing the energy consumption of buildings. In particular, the efficient use of thermal energy in buildings, heat pipelines, energy networks and other areas is one of the priorities. This is due to limited energy resources, high energy costs and the negative impact on the environment as a result of its production. The use of modern thermal insulation materials, including liquid energy-saving heat-insulating coatings, is an important study in the current era of rising prices and the scarcity of traditional

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energy carriers. In recent years, thermal insulation paints based on hollow ceramics, glass and polymer microspheres have attracted a lot of attention [1-3].

MATERIALS AND METHODS

The Youth Center for Innovative Technologies of the Fergana Polytechnic Institute is conducting research to improve the method of determining the thermal conductivity of heat-insulating coatings. This paint is used for thermal insulation, waterproofing, corrosion protection and construction of facades of residential and industrial buildings, internal heat retention and protection, heating and engineering networks, process pipes, thermal energy and capacity equipment designed for constructions. The paint is made on the basis of acrylic binders and hollow microspheres in the form of whole fillers and other components [4-9]. The mechanism of operation of thermal insulators with hollow microspheres, which are part of the composition, is radically different from the mechanism of operation of "classic" heaters. Due to its unique properties, the material has a significant energy-saving result even at a thickness of 1 mm.

Picture 1. Results from the experiment

Our paint is flexible and has a high viscosity at low and high temperatures. The paint does not contain residues of the base material and does not form cracks or chemical changes during its long service life (up to 15 years).

In addition to its heat-insulating properties, which include water-resistant (impermeable) additives, waterproofing also has anti-corrosion properties. The components make the coating waterproof, flexible, and at the same time resistant to UV, temperature drops, moisture and external factors [10-13].

Once applied, the coating reacts with air to form a durable, polymer coating, which provides excellent thermal insulation properties that reduce heat loss. The drying layer of one coating forms a film with a thickness of 0.1 to 0.5 mm [14-19].The paint has a high adhesion (glass (glass) adheres to concrete, brick, cement-sand plaster, metal, plastic, wood and other materials), prevents corrosion and condensation on cold surfaces, mechanical and atmospheric does not require additional protection from impact. Vacuum ceramic or silicone balls inside [20-23]. They are

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suspended components in liquid synthetic rubber, acrylic polymers and inorganic pigments. It resembles a light gray suspension and forms an elastic ultra-thin coating after drying. The combination of such components has allowed creating a unique material with flexibility, lightness, elasticity and the ability to perfectly adhere to surfaces of any shape and almost any chemical composition.

The paint has the following advantages:

- Easy to apply (can be done by spraying with a brush, roller and compressor);
- Small size, compactness;
- Environmentally friendly;
- Does not contain harmful substances;
- Good resistance to both alkalis and acids;
- Fire resistant;
- Areas of application
- Residential and industrial buildings (external and internal insulation);
- Easy-to-install structures;
- Metal structures (garages, containers,);
- Heating mains, pipes, ventilation ducts;
- Shut-off valves (valves and valves);
- Industrial containers;
- Car showrooms;

Non-combustible fireproof material. There are two other types of resistance to liquid insulation: temperature and humidity and resistance to ultraviolet radiation. The composition of liquid thermal insulation contains only environmentally friendly components, which allows it to be used indoors and outdoors, in children's institutions, public catering establishments, etc., without restrictions on their functionality.

Easy to apply even in difficult areas. There are several ways to apply liquid thermal insulation to the surface of your choice. You just have to choose the one that suits you best. You can use a variety of tools: brushes, rollers, etc.

If your surface is concrete, use a brush to remove dust, mold, and oil;

- Metal surfaces should also be cleaned and degreased. If there are rust stains on the metal, it is recommended to treat them with a phosphating compound.
- Before applying the insulation, the wood should be primed with primer and biocides.
- If you are reworking a brick surface, you must first prime it and then plaster it.

Thermal insulation coating is applied to metal, concrete, brick, wood, plastic and many other surfaces. The surface is pre-cleaned, primed if necessary, diluted with water of the same composition (not more than 5%) or as a primer can be used as a primer of any acrylic paint, liquid glass mixture.

Do not push the mixture on a damp, icy surface. The mixture is laid in several layers. The number of layers is determined by the tasks, depending on the objectives. The layers can be applied several times with drying intervals. The final thickness of the finished coating is selected depending on the heat carrier temperature and the desired surface temperature.

CONCLUSION

The coating is easily (laid) on the surface of any geometric shape using a brush, spatula, roller or sprayer. The coating does not emit harmful compounds into the atmosphere. It is recommended to use a normal respirator when working indoors, and no respirator is required when working outdoors or in a ventilated room. Average consumption for obtaining

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a dry coating layer with a thickness of 1 mm: 750-1000 g/m2.

The inspection was outdoors. The coating is laid in 3 layers. The final thickness was 3 mm. Total coating consumption was 0.9 liters.

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