THERMOPHYSICAL PROPERTIES OF THIN FILM COATINGS BASED ON THE HOLLOW MICROSPHERES

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The attention of researchers and engineers is currently attracted to energy-saving paints, which are used to reduce heat losses during transport and consumption of thermal energy. Paints based on hollow microspheres have a number of advantages in comparison with traditional types of thermal insulation: low thermal conductivity, low moisture absorption, low corrosion activity and sufficient mechanical strength. Thin-film energy-saving coatings have the properties of paints, which greatly simplifies the process of applying the composition to an insulated surface.

Despite the listed advantages, the thermophysical properties of energy-saving paints have not been adequately studied. The data on the values of the thermophysical coefficients presented in the scientific and technical literature differ by at least an order of magnitude. Therefore, the study of the thermophysical properties of energy-saving paints is currently an urgent task, the solution of which will increase the accuracy of thermal engineering calculations.

The report presents the results of an experimental study of the thermophysical properties of energy-saving paints, in particular, an experimental stand for estimating the coefficient of thermal conductivity and a stand for estimating the coefficient of thermal diffusivity of paints based on hollow glass microspheres and the base in the form of styrene acrylic dispersion ¡¡Akrilan 101¿¿.

According to the results of a series of experiments, the average value of the thermal conductivity in the temperature range 293 — 373 K was 0,019 — 0,028 W/mK. A range of values for the thermal diffusivity was also obtained.

New experimental data on thermophysical properties of thin-film coatings (energy-saving paints) increase the accuracy of thermal engineering calculations in determining heat losses in multi-layered enclosing structures.