STATIONARY AND MOBILE APPLIANCES FOR DEFINITION OF EMISSIONS COEFFICIENT

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Introduction. The issue of measurement of the emission factor is relevant to many areas of the national economy. So, it is important to increase the thermal protection characteristics of window constructions, and the way for this is an optimization of radiation heat exchange of the surface of glazing with the environment. To control the quality of energy-efficient glass, windows, translucent structures in production and certification, devices that allow the emission factor to be determined are required. Another area of application of devices to determine the emission factor is the aerospace industry. As a rule, for space technology, it is actual possibility of high heat transfer from the surface of the apparatus for the removal of heat released during the operation of the built-in equipment, that is, the coverage should have a high (close to 1.0) value of the emission factor and, as low as possible, the absorption coefficient of solar radiation. In order to solve such problems in recent decades, new materials and coatings with the given selective characteristics are created, as well as the means for determining their thermo-radiation characteristics.

The purpose of the work is to compare the characteristics of stationary and mobile devices to determine the hemispherical emission factor of the material or coating surface, to check the possibility of determining the emission factor without vacuuming the camera with the samples in the stationary instrument and selecting the structure of the mobile device for express control.

Results. Computer simulation of complex radiation and convective-conductive heat transfer processes in a stationary laboratory installation and experimental verification of results were carried out. Boundaries of the working zone with uniform distribution of the density of the heat flux are established. The stationary laboratory installation has been tested experimentally and the thermo-radiation characteristics of materials for energy-efficient windows and coatings of spacecraft designs have been determined. The comparative analysis of the methods for determining the emission factor and the perspective of the application of the relative radiation method are shown, and the structure of the portable device for express control of the emission factor is proposed.

Conclusions. The possibility of determining the emission factor without vacuuming the chamber with the investigate samples under is shown. The structure of a mobile device, in which the characteristics of the test specimen are comparing with the characteristics of two reference samples, is proposed.