FACTORS, SCHO PLEASE ON THE REPLACEMENTS OF THE HEAT EXPOSURE THROUGH THE VIKONNI CONSTRUCTION

Liliya Kuzhel, B. Basok, B. Davydenko, V. Novikov, L. Oliinyk
Institute of Engineering Thermophysics of the National Academy of Sciences of Ukraine
Tel. (044) 456-92-72; (044) 424-96- 44. E-mail: basok@ittf.kiev.ua

Objective: to determine patterns of heat transfer through window profiles and double-glazed windows of various types in real climatic conditions and their use to develop measures to reduce heat loss in a building.

Results. The issue of energy efficiency and energy saving in modern conditions is one of the most important priorities of the socio-economic development of the country. Residential and public buildings remain the main priority of the state policy in the field of energy efficiency. The technical condition of the majority of existing buildings and engineering systems of energy supply does not allow to provide the necessary level of energy characteristics of buildings. The greatest heat loss of the outer shell of the building occurs through the window structures due to the low value of their thermal resistance to heat transfer. Therefore, an important task for improving the energy efficiency of buildings for various purposes is the optimal choice of window structures.

We have carried out a number of experimental studies of the profiles of window frames and various types of window structures in real conditions of their operation. The accumulated database was used to develop an algorithm for determining heat loss through window structures, taking into account the influence of the radiation component of solar radiation.

With the help of numerical modeling studies of the laws of heat transfer through double-glazed windows have been carried out. Using CFD packages, numerical simulation of the radiation-convection heat exchange of a two-chamber glass unit was carried out. The distribution of temperature and air velocity in the between glass panes, and the values of the heat transfer coefficient of the glass unit were also determined. The features of the distribution of the heat flux density on the surfaces of the glass are established. The obtained calculated results of heat transfer through the double-glazed windows within the limits of random error coincide with the experimental data that were obtained independently.

Conclusions. The features of heat transfer through a double-chamber double-glazed window, affecting the increase in its thermal resistance compared to single-chamber double-glazed windows, are established. The influence of the low-emission coating and the thickness of the gas layer on the thermal resistance of a double-glessed windows is determined. The influence of the low-emission coating and the thickness of the gas layer on the thermal resistance of a double-glessed windows is determined. This made it possible to estimate the effect of convection and radiation components of heat transfer through window structures

on the total heat loss of a building. Are proposed measures to reduce heat loss through the window structures.