عنوان مقاله:

Optimization of Thermal Performance of Windows in Intermediate Housing in Cold and Dry Climate of Tabriz

محل انتشار:

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خلاصه مقاله:

Windows in the building are the biggest elements of heat loss through convective heat transfer. The purpose of study is to select appropriate dimensions for windows relative to shell and appropriate glazing for windows, in order to achieve optimal pattern to reduce energy consumption. The research method is based on the simulation and research tool is DesignBuilder software. Therefore, amount of natural gas consumed annually in the studied building was received from the National Iranian Gas Company and then the basic research was modeled by software and after converting unit from kWh to m۳ and validating simulation results. In the next step, the range of ۲۰% to ۸۰% of window-to-wall-ratio, types of glazing and window height is considered and through parametric optimization, all conditions in the windows are simulated and analyzed for sensitivity index. The calculations confirm that in an intermediate residential building with a rotation of ۱۲ degrees to the southeast in Tabriz, by reducing window-to-wall-ratio from ۵۰% to ۲۰% and replacing triples-glazed-glazing with a low-emission coating filled with argon gas with a transparent single-glazed glazing and UPVC frame and a canopy with a depth of ۴۸cm and windows height of ۱.۵m, the heat losses were reduced by ۶۰.۳۴% and ۷۵.۲۴%, respectively.

کلمات کلیدی:

Building design, Cold and dry climate, energy conservation, Glazing, heat losses, Windows design