

Heat influx causing discomfort within residential panel buildings in Sofia

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The period of year with discomfort within rooms of residential and public buildings in Sofia (Bulgaria) is observed in general during summer months, but in some years it can be expanded in late spring and early autumn. During this period of year (likewise to the heating season during winter) the energy consumption for maintaining of comfortable and healthy conditions within the buildings increase. Not long ago this part of year was neglected in this context. The question of improving of buildings's energy effectiveness with aim to decrease its energy consumption, both in cold half year and during warm half year, will take increasingly importance in Bulgaria. The process of improving of thermal insulation and waterproofing of this widespread type of buildings is implemented in the country nowadays. In this paper the heat influx, causing discomfort within the standard panel residential buildings is calculated by means of the thermal system equation. A method is presented to determine the coefficient of self-shading for facades with different exposure. The beginning, end and duration of the discomfort space of time for premises with different aspect are determined. The norms of the period of discomfort for rooms with South exposure is 66 days in year, for East/West exposure - 106 days, and for this one with North exposure - 0 days, as the discomfort in this rooms is observed only in single years. The concept "equivalent temperature" is used to estimate for the joined effect of air temperature and solar radiation on building walls. Maximum values for the equivalent temperature with given reliability are calculated. During the 9 hours in year the equivalent temperature of the walls with West exposure can reach up to 51°C.