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THERMAL IMPROVEMENT IN RESIDENTIAL BUILDINGS IN VIEW OF THE INDOOR AIR QUALITY – CASE STUDY FOR POLISH DWELLING

Monika BLASZCZOK [a*], Andrzej BARANOWSKI [b]

[a] PhD Eng.; Department of Heating, Ventilation and Dust Removal Technology, Faculty of Energy and Environmental Engineering, Silesian University of Technology, Konarskiego 20, 44-100 Gliwice, Poland
* E-mail address: *monika.blaszczok@polsl.pl*

[b] DSc Eng.; Department of Heating, Ventilation and Dust Removal Technology, Faculty of Energy and Environmental Engineering, Silesian University of Technology, Konarskiego 20, 44-100 Gliwice, Poland

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Abstract
The widespread thermal improvement in residential buildings involves not only the insulation of outdoor walls but also window replacement. In Poland it is the residents of individual premises who manage the replacement and in order to keep their heating bills low, they seek airtight solutions to minimize the cooling of premises due to air infiltration. In this situation the indoor air quality is not considered at all and no exchange of used air and fresh air occurs. Unawareness on the part of residents and the increased costs of replacing the windows which need additional devices to ensure the inflow of air are the main reason for the deteriorating microclimate conditions in residential dwellings.
The present paper demonstrates the measurement of indoor air quality, the building leakage test and the measurement of air flow in exhaust opening a four-bedroom dwelling located in Gliwice, Poland. In order to evaluate the air exchange within a longer period and in different outdoor climate conditions, the measurements were supplemented with numerical simulation of ventilating airflows. Modifications to improve the indoor air quality in the examined flat were also suggested.

Keywords: **Indoor air quality; Airtightness measurement; Exhaust air flow measurement; Natural ventilation; Numerical simulation.**