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THE EFFICIENCY OF A DYNAMICALLY INSULATED WALL IN THE PRESENCE OF AIR LEAKAGES

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ABSTRACT

The movement of air in and through the building envelope often plays a leading role in the transport of heat and moisture into the building. It is caused by pressure and temperature variations around the building envelope, inbuilt ventilation system, occupancy, etc. In order to improve the energy consumption, alternative designs for the ventilation systems are considered. One of them is a dynamically insulated wall as an inlet unit for the supplying air. In order to predict the performance of a dynamically insulated wall, it is necessary to make an analysis of the building as a system. This paper presents such system analysis which takes into account the interaction between the building components and indoor and outdoor climate, both in terms of the air leakage and heat and mass transfer to and from the building components. It is shown that, in the presence of air leakages (unintentional openings) in the enclosure of the building, the efficiency of the dynamic insulation is significantly decreased.

KEYWORDS

dynamic insulation, air leakages, building simulations, energy efficiency

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