

VERIFICAREA CONDITIILOR DE MICROCLIMAT DIN SPATIILE LOCUITE, IN SEZONUL CALD SI DETERMINAREA NECESARULUI DE FRIG

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REZUMAT

In lucrare se prezinta succesiunea de proceduri necesara determinarii variatiei temperaturilor interioare reprezentative (t_i , t_o) in zilele sezonului cald, atat in cladiri existente, cat si in cladiri noi. In cazul cladirilor nou proiectate, inca in faza de proiectare simularea variatiei $t_i(t)$ si $t_o(t)$ constituie o etapa de verificare a performantei energetice a cladirii. Pentru cladirile existente se prezinta algoritmul de tip Predictor-Corector, care permite determinarea rezistentelor termice corectate ale elementelor de constructie opace. Modelul utilizat este de tip bi-zonal, cu o zona principala a spatiilor locuite si o zona secundara a anexelor. Analiza in cazul cladirilor colective impune simularea sub forma unui model multizonal rezolvabil prin metoda Runge-Kutta de ordinul patru. Elementul de baza al modelului de simulare il constituie determinarea variatiei temperaturii exterioare virtuale a elementelor de constructie perimetrale. Variatia $t_{ev}(t)$ se determina fie pe baza programului de calcul INVAR, fie pe baza raspunsului termic al unei structuri constructive reprezentative. Lucrarea contine modele de calcul absolut necesare etapei de proiectare pentru cladirile noi si la fel de necesare activitatii de reabilitare energetica a celor existente. Procedurile prezentate reprezinta noutati in literatura de specialitate, motiv pentru care autorii au detaliat elementele de calcul pana la nivel de metoda de rezolvare.

Cuvinte cheie: simularea microclimatului spatiilor ocupate, confort termic, performanta energetica

ABSTRACT

This paper presents the algorithm used in order to determine the representative temperatures variation (t_i , t_o) in the hot season for existing and new buildings. For new buildings, the simulation of $t_i(t)$ and $t_o(t)$ variation from the planning phase is a verification stage for the building energy performance. In order to determine the corrected thermal resistance of opaque building elements of the existing buildings is presented a recursive prediction-error algorithm. The mathematical model is bi-zone with a main area for the living area and a secondary zone. The analysis of condominium buildings could be done by solving a multi-zone model with order four Runge-Kutta method. The main element of the simulation model is the estimation of the exterior virtual temperature for the building envelope elements. The $t_{ev}(t)$ variation is determined using the INVAR software or the thermal response of the building structure. This paper presents an algorithm absolutely necessary for the new buildings in the planning phase and for the existing buildings, subject of the thermal rehabilitation. The algorithm is a novelty in specialized literature; therefore the authors had explained the calculus procedure as detailed as a resolving method phase.

Keywords: building simulation, thermal comfort, energy performance