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EXPERIMENTAL STUDY CONCERNING THE THERMIC TRANSFER INFLUENCE TROUGH SIMPLESTRATIFIED INSULATED PANELS USED IN HOUSING CONSTRUCTION. PART II.

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Abstract: The *results of the theoretical and experimental researches which represented the objective of this paper respond to the permanent requirements in the heat transfer field area, using sandwich type panels for wooden prefabricated buildings.*

1. INTRODUCTION

The present researches aimed at the possibility of combining some local thermal insulation materials (mineral wool, polystyrene, PAL), in order to obtain a sandwich type structure with thermo-physical properties which fits the preoccupations area concerning the heat transfer through panels that consist walls for wooden prefabricated buildings and the correction coefficient calculus as a ratio between the experimental determined heat transfer coefficient and the theoretical determine one. Knowing this correction coefficient allows a better design from dimensional and thermal point of view of the constructions, having a similar composition with those studies.
The thermic insulation is made by putting an insulated material stratum, with a minimum thermal conductivity (λ<0, 12), to prevent heat flow from outside to inside or vice versa, and consequently, to lessen the heat transfer coefficient.
We did theoretical and experimental researches in many "sandwich" structures which can be largely used in prefabricated wood housing.
By using the constructive solutions adopted for the version of simplestratified structures the study of the influence of the thickness of the PAL sheets on the thermal transfer coefficient was considered.
For this purpose, the data obtained experimentally and the calculated data were put together in table 1 in order to explain graphically this influence.

Table 1. Table of cumulative data for simplestratified sample

Sample	**Thickness (mm)**	**Thermal transfer coefficient determined experimentally λ_e (W/mK)**	**Thermal transfer coefficient determined theoretically λ_t (W/mK)**	**Thermal resistance determined theoretically R (m^2K/W)**	**Correction coefficient $c=\frac{\lambda_e}{\lambda_t}$**
PvvP 16,20,20,16	72	0,051	0,065	1,104	0,784
PvvP 16,35,35,16	102	0,049	0,055	1,843	0,890
PvvP	117	0,047	0,053	2,209	0,886

16,35,50,16					
PvvP 16,50,50,16	132	0,040	0,051	2,575	0,784
PppP 16,40,30,16	102	0,048	0,058	1,764	0,827
PppP 16,40,50,16	122	0,047	0,055	2,229	0,854
PpppP 16,50,20,50,16	152	0,043	0,052	2,927	0,826
PpppP 16,50,40,50,16	172	0,040	0,051	3,392	0,784

The results are presented graphically in figure 1, respectively the variation of the thermal transfer coefficient λ_e and λ_t function of the thickness of the mineral wool layer.

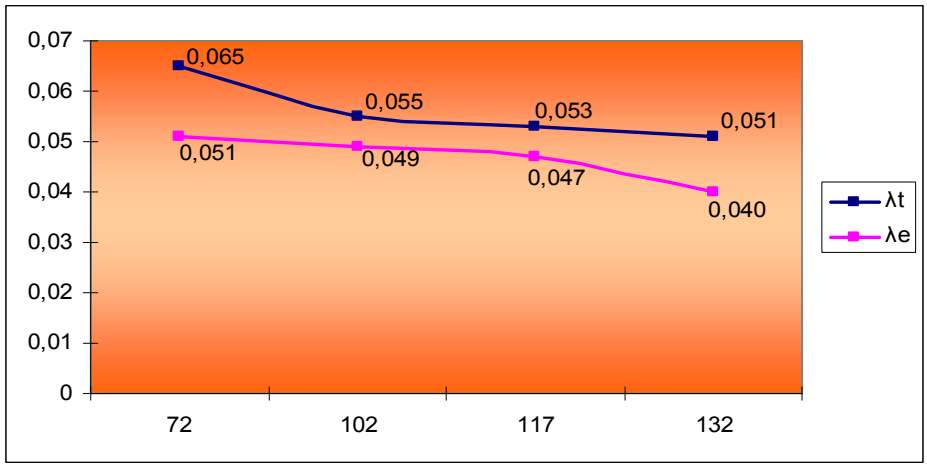

Figure 1. *The variation of the thermal transfer coefficient λ_e şi λ_t function of the thickness of the sample (layer of mineral wool)*

The variation of the thermal transfer coefficient determined theoretically and the thermal transfer coefficient determined experimentally shows a liniar decrease, most identically while the thickness of the themal insulation layer increment

By maintaining the thickness of the PAL consistent (16 mm), we modifying the thickness of themal insulation layer. In this case we change the mineral wool layer with polystiren layer Figures for the thermal transfer coefficient that are very similar to the previous ones, their variation being indicated in the graphic below.

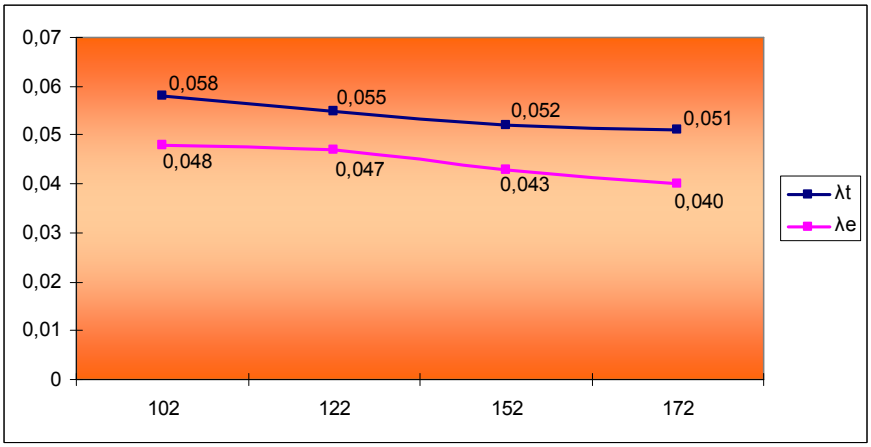

Figure 2. *The variation of the thermal transfer coefficient* λ_e *şi* λ_t *function of the thickness of the sample (layer of polystiren)*

2. CONCLUSION

The achieved results can be used as a rough guide for thicknesses larger than those studied in the thesis. Te aim of the research is the possibility to compound some indigenous thermal insulator material (i.e. mineral wool, polystyrene, PAL) in order to obtain a "sandwich" structure with thermo-physical properties which matches the author preoccupations.
The very small difference between the variation of the thermal transfer coefficient in the two categories of structures and also the close figures of these coefficients justifies the fact that by replacing the mineral wood sheets with polystiren sheets has not got a significant influence on the heat transfer through these types of sample.

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