



APPLICATIONS OF PHASE CHANGE MATERIALS FOR TEST HOUSE POLYGON

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ABSTRACT

Energy efficiency of houses is highly topical problem nowadays. “Nearly zero energy consumption buildings” are built in EU. In the climatic conditions of Latvia, the coefficient of heat transmission (U value) has to be relatively low. At the same time, a relatively small exploitation costs is recommended. For this purpose the test polygon of five houses with various construction solutions are being built in Riga, Latvia. Effective way to decrease heat losses in building houses is to use phase change materials (PCM), which helps to stabilize indoor temperature. PCM will be tested in one house of the test polygon. In this work, 3D model, using wufi plus software, and a simple 1D integral model, which takes into account all surfaces of building walls, windows, roof and floor, are used for simulations. Using two different simulation methods, optimal solutions of PCM applications in building constructions are analyzed. Also, PCM applications are analyzed to keep stable temperature indoor in the summer period, therefore it is important to choose such PCM, which is suitable both summer and heating seasons periods. Temperature indoor is analyzed using two different temperature conditions outdoor: a year cycle and 24h period

Keywords: phase change materials, energy efficiency of houses, multi-layer wall