

Surface temperatures of public buildings, built in 1880, 1970 and 2002, in Northern Greece

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Abstract. The purpose of this paper is to investigate the surface temperatures of the shelter of three public buildings in the city of Xanthi, in northern Greece. The buildings were built in different time periods and consequently they have different technical characteristics. Respectively, we survey the three following buildings that have been built in 1880 (Municipality Hall of Xanthi), in 1970 (Municipality Amphitheatre) and in 2002 (Bank offices building). Data have been gathered by the use of thermal camera and the survey has been conducted from January up to July. The data gathered regard measurements of the surface temperature of the exterior walls of the shelters, both inside and outside. The study aims at the evaluation of the thermal behavior of the shelter of buildings, which built in different time and under different regulations. The gathered data of the surface temperatures compare the different thermal behavior of the shelter. The analysis of the results and diagrams show that the thick masonry of the traditional Municipality Hall offers an insulation that is adequate. The building of 1970, which was constructed with the previous buildings regulation, has thermal losses due to inadequate insulation. The new building of 2002 has low thermal losses.

Keywords: thermal behavior; surface temperature; public buildings

1. Introduction

The energy saving in the buildings and the implementation of environmental and bioclimatic design solutions are contemporary subjects of analysis and research. The main aim of energy efficiency buildings is to reduce the energy consumption and to ensure comfort thermal conditions in the buildings.

A major number of the buildings of the Greek urban centers have been built at previous decades without specific constructive techniques for energy losses reduction of the building's shell. Nowadays, the new version of the contemporary technical regulations focuses upon the improvement of the energy efficiency of older buildings (change of frames, improve the insulation) and to design new buildings of low energy consumption.

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