

EXPERIMENTAL STUDY OF INNOVATIVE BUILDING PANEL SYSTEM

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Abstract

An experimental study of an innovative building panel system is presented in this research. The building panel system consists of three major components: exterior cladding made of gypsum fibreboard, a core made of cold formed steel thin-walled C-profiles, and polymer foam. The innovativeness of the building panel system is reflected in the connection of three different materials into one composite construction element that has a number of beneficial technical properties. The polymer foam in the composite structural element has the following benefits: (a) allows a steel profile in the core of the cross-section to be connected to the cladding panels, (b) laterally restrains the thin-walled steel profiles, and increases their flexural buckling resistance. Innovative solutions are manifested through the implementation of panel systems in the development of technology for the construction of almost zero energy buildings in an industrial way. To enable practical application of the prototype panel system as a load-bearing structural element of the building, a design model for the structural element's resistance must be defined. Therefore, extensive experimental research is required, including testing the materials of all panel components, testing the joints, and testing the panels. This paper describes the first phase of testing, which involves the experimental examination of material properties.

Keywords

Building panel system, polymer foam, open thin-walled steel C-profile, gypsum fibreboard, laboratory tests

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