

PRACTICAL ASSESSMENT OF WINDOW SHUTTERS FOR NIGHT INSULATION AND SOLAR SHADING FOR DOMESTIC BUILDINGS

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This paper is concerned with improving the thermal performance of windows to reduce energy consumption and improve comfort in domestic buildings.

Global and local climate systems are changing as a result of anthropogenic carbon emissions, part of which can be attributed to energy demand for domestic buildings. A reduction of energy consumption in buildings is therefore desirable, but buildings will also need to be adapted to suit the future climate. However, climate change scenarios cannot categorically predict what the future climate will be.. It is hypothesized that window shutters could assist in the adaptation of buildings, by protecting against heat loss in cold conditions and against excessive heat gain in warm conditions.

The results of experiments to test the performance of several generic window shutter systems will be discussed. The experiments take the form of a number of tests on test cells using data logging equipment, followed by a computer simulation of the thermal behaviour of a building fitted with the shading/insulating devices. This simulation allows for a comparison of internal temperatures and carbon dioxide emissions for variations of window treatment, both in the current climate and in several opposing climate change scenarios. A technical, social and economic evaluation of the systems being tested will be performed, concluding with some recommendations for building designers and policy makers. While the research focuses mainly on the application of the technology in the UK, the Relevance to the New Zealand context will also be discussed.