Double Skin Facades (DSFs) have been developed as an alternative technology to improve the thermal performance of conventional fully glazed buildings. Nevertheless, there is little test information on the behaviour and real performance of DSFs. This is specifically the case when the facade has to perform under extreme or moderate summer conditions. The characteristics of thermal overheating of a specific type of DSF with various configurations and its practical control have not been subjected to systematic experimental and computational investigations. This research which is based on an existent load of knowledge, carried out experiments of a full-scale one-storey laboratory chamber of a selected type of Double Skin Facade in which a comparative analysis of the thermal performance is assessed, CFD simulations of the experimental model and a Field Case Study of an existing building in the United Kingdom is also monitored. The basic thermal behaviour in the facade cavity and adjacent room is investigated by a series of parametric studies and basic flow field investigations. Section models of the DSF chamber and the case building were made and modelled using CFD in order to visualise the thermal and airflow behaviour inside the DSF complementing the experimental and field work.

The modelling work has demonstrated the feasibility and versatility of the technique for probing the flow and thermal behaviour of double skin facades. It was found that natural ventilation through the cavity by a series of controlled opening shafts on the upper and lower facade are effective means to reduce DSF overheating. It was also observed that the optical properties of cavity elements, cavity depth size, solar control and the basic operation of the facade are key issues to address in order to prevent overheating and additional heat loads from the facade.
and there is still too little experience of their behavior in operation. In this matter, we choose to study the natural ventilation in multi-storey double-skin facades. **KEYWORDS** Double skin façade, Thermal characteristics, Linear relation, Room heat gain, Energy evaluation.

**INTRODUCTION** Double skin façade (DSF) system is a building façade usually consisting of double glazing and a single glass pane. It is increasingly used in high-rise buildings in the hot summer and cold winter zone in China, due to its advantages in sound proof, aesthetic appearance and the potential in energy saving. Because of improved structural features, double skin façades are claimed to be energy efficient by providing better. * Corresponding author email: Gouqinghe@zju.edu.cn. Double skin façades (DSF) are installed on various locations worldwide, to reduce energy use of buildings. It has been demonstrated that DSFs on moderate climate can improve heating energy performance of a building. Shading devices are often installed in the cavity to reduce solar heat loads and thus cooling energy use. [Show full abstract] characteristics of thermal overheating and its practical control have not been subjected to systematic experimental and computational investigations. This paper presents both experiments on a full-scale one-storey laboratory model of a Double Skin Façade and CFD simulations.