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Abstract: The DSF concept belongs to the dynamic building systems, which act in unison with weather variation, taking the benefits from the outdoor climatic conditions. The DSF concept carries the notion of transparency, openness and intelligence, which are highly appreciated together with the concept's advantages in improving the acoustics, providing the daylight and, if well designed, being energy efficient. The design, dimensioning and then the application of DSF are exceptionally responsible tasks, as in case of misfortune, it will lead to an increased energy use (mainly for cooling) and inferior indoor climate. In the meantime, it is not enough to use the standard tools for designing of conventional buildings when dimensioning the DSF, as it requires the detailed analysis of the results from the dynamic simulations.

A literature review is made to point out the main difficulties in the DSF modeling and simulations. It demonstrates that there is a serious lack of experimental data available for the DSF buildings, most of the models have not been empirically validated and require an expert knowledge in the DSF physics to perform the simulations.

To fill in the gap of lacking experimental data a wide range of measurements has been carried out in an outdoor, double-skin façade full-scale test facility 'the Cube'. Finally, three complete sets of accurate experimental data have been composed for the DSF empirical validation of various building simulation software. This work has been conducted in the frame of IEA SHC Task 34 /ECBCS Annex 43 "Testing and Validation of Building Energy Simulation Tools". Finally, a concept for a new model, suitable for simulation of a naturally ventilated double skin façade is developed and explained in detail for further research and improvements.

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