



Fraunhofer ISE

FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE



- 1 *Semi-transparent solar thermal façade collectors.*
- 2 *A façade collector integrated into rendering plaster.*

SOLAR THERMAL FAÇADES

Building-integrated solar thermal systems (BIST) save costs in comparison to constructing the building envelope and a solar thermal system separately by reducing material and labor expenditure. Innovative multifunctional BIST components simultaneously provide solar thermal yield, visual transparency and solar control.

Together with project partners, Fraunhofer ISE develops new, innovative solutions for Solar Thermal Façades. Our advanced test facilities allow accurate measurements of solar collector performance as well as heat transfer to the building interior with full-scale façade elements. Detailed, physics-based computer models are used to optimize new components. In addition, we also develop and optimize building-integrated photovoltaic thermal systems (BIPVT).

From specific consultancy services for architects up to large-scale European projects, Fraunhofer ISE offers many ways for clients to benefit from its leading role in building integration of solar thermal systems.

Innovations

Fraunhofer ISE develops technologies from the initial concept to commercial success. Within the European "Cost-Effective" research project, for instance, Fraunhofer ISE and globally leading industrial partners developed three different BIST technologies. The solutions not only incorporated innovative components but the entire energy system. With our long term experience we supplement the in-depth knowledge of our project partners in their respective areas and can thus check the feasibility of new ideas. This also means estimating the performance and the price at an early stage.

Measurement Services

The TestLab Solar Façades at Fraunhofer ISE offers a variety of high-accuracy measurements. Experienced testing engineers propose a combination of measurements to provide reliable answers efficiently – for development tasks as well as for building projects.

Fig. 5 presents a schematic drawing of our indoor calorimeter with its solar simulator.

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The solar irradiance can be adjusted as well as the temperature of the surroundings and the (emulated) building interior. The solar collector performance of the component is measured simultaneously to the energy flux between the component and the building interior. These measurements are also used to calibrate component computer models in order to allow whole-year simulations based on a few laboratory measurements.

Optimization

Fraunhofer ISE deploys various computer models to explore the value of new concepts - from a simple empirical model through CFD simulations, to a detailed physical model. By varying the parameters, even better solutions can be developed and their costs compared.

Based on our long-term experience, we work with our customers to choose the suitable combination of simulations and measurements. A model can later serve to calculate the advantages of the optimized component anywhere in the world in combination with any user-defined energy system.

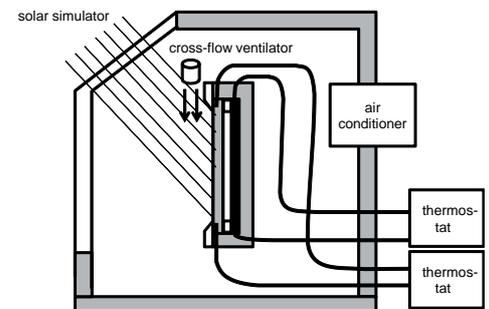
Consulting Services

As Europe's largest solar research institute, we aim to bring cutting-edge research into the market. We assist companies of all sizes and from a broad range of business sectors in optimizing their product portfolio. We support building projects with our knowledge and analyse complex problems scientifically. We have the wider context in mind and also provide suggestions which go beyond the original scope.

The research group working on Solar Thermal Façades at Fraunhofer ISE provides world-wide access to knowledge about building-integrated solar thermal systems and offers its knowledge to partners for success on the global market.

3 Semi-transparent tubular collectors.

4 The Outdoor test Facility for Real-Size building Envelope Elements (OFREE).



5 Schematic drawing of the indoor calorimeter test facility.