



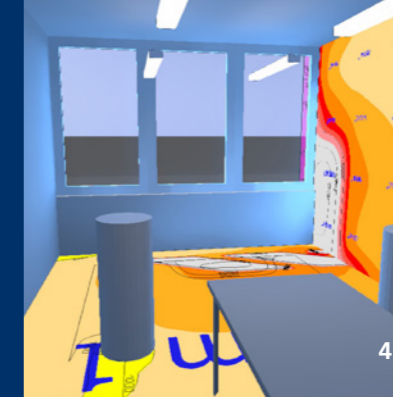
Fraunhofer

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**FRAUNHOFER INSTITUTE FOR
BUILDING PHYSICS IBP**

ENHANCED PLANNING SECURITY THROUGH FUNCTIONAL MOCK-UPS





THE BENEFITS OF FUNCTIONAL MOCK-UPS AT A GLANCE

- Performance check of new, complex façade developments
- Improved planning security, validation of dimensioning technical building systems
- Verification and validation of simulation models and calculation algorithms by measurement
- Elimination of potential trouble spots before construction
- Time and cost savings, prevention of cost-intensive retrofits
- Avoidance of excessive operating costs
- Validation of comfort requirements (thermal, visual comfort)
- Making future office worlds "come alive" before construction
- Realizing optimization potentials by tapping into the networked research community's interdisciplinary know-how

Title Modular test facility for energy performance and indoor environments (VERU).

1 Exterior view of mock-up façade.

INITIAL SITUATION

The planning of complex façade systems is associated with particular difficulties: on the one hand, a building's facade has to fulfil multiple requirements; on the other hand, there are diverse technical disciplines involved, which need to be coordinated to collaborate in planning and implementation – all these processes being based merely on assumptions and calculations.

Different functions (such as weather protection, energy efficiency and thermal comfort, ventilation, daylight supply, glare control, generation of thermal and electrical energy) need to be merged with the specialist departments involved (e. g. metal construction, mechanical engineering, glazing etc.). Posing major challenges to both planners and builders, this task can only be coped with by a collaborative team.

Despite this tremendous complexity, even large-scale projects encompassing highly expensive properties are often lacking sufficient technical-functional quality control before production. In many cases, merely aesthetic sampling (which is usually taking place on site) is common practice. This situation may entail financial risks for the entire project, which may become evident during building operation or require costly maintenance.

OUR SOLUTION APPROACH

In order to enhance planners' and builders' security regarding their façade choices, we offer functional model tests on façade mock-ups. In addition, these tests facilitate trouble-free commissioning, since interaction of individual components was previously tested.

Functional mock-up tests also help reduce costly rework during operation. After all, roughly 15 to 25 percent of construction costs for large-scale projects are being invested in façades. In the scope of this work phase, functional mock-up sampling should be implemented, which currently is still all too rare.

Relying on our competencies, our experience and our test facilities, we are capable of carrying out such individual sampling under real conditions. This is all the more important in view of the fact that up to now established or standardized test procedures are not available.

→ Contact us now for further information and personal consultation.

OUR SERVICES

- Integral assessment of façade solutions and their interaction with technical supply systems, with regard to energy efficiency, thermal and visual comfort (daylight supply, glare control)
- Layout of an appropriate test design
- Selection of suitable procedures/ concepts of measurement
- Performance and supervision of experiments
- Data analysis and evaluation
- Development and validation of models used in thermal and energy simulation
- Support in the development of an optimized integral concept
- Documentation and publication of results

2 Installation of a mock-up façade. (Installation of ISOshade elements from iconic skin GmbH)

3 Test room with a DressMAN test dummy for thermal comfort assessment.

4 Evaluation of daylight conditions with the DIALux Evo software.

5 CO₂ dosing system for a realistic representation of use profiles.

Contact

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