



LABORATORY

Façade System Interactions Lab

Facility for evaluating facade system and indoor environment interactions

Façade System Interactions Lab

In order to accurately assess the operational performance of a building's elements, complex methodological approaches able to capture the different conditions and interactions found in real life, are necessary. In order to be reliable when they are put on the market, envelope systems and components, as well as ventilation, heating and cooling systems all need to be tested under conditions that best replicate the behaviour of real buildings. These conditions can be reproduced in Eurac Research's "Façade System Interactions Lab", designed and developed to assess the interaction between the elements that make up a building and its interior environment. Under realistic operating conditions, the laboratory is able to verify the energy performance and quality of the indoor environment as affected by façade systems, while using different system configurations. The laboratory allows the study, on a real scale, of the influence of these systems on perceived and measured comfort. Manufacturing companies, design studios, builders, service industries and research partners can make use of the multifunctional and flexible laboratory to optimise and analyse the performance of innovative solutions with absolute or relative measurements for comparison.

Test room

The laboratory consists of two test chambers (8 x 4 x 3m) mounted on a rotating platform to reproduce the orientation of any real structure. In each test chamber, one of the walls is designed to house a façade sample with a maximum size of 3.7 x 2.8 x 0.5m (base x height x depth). Each chamber is equipped with a floating floor, a false ceiling and structures from which surface heating components can be attached. Air and surface temperature, rela-

tive humidity and ventilation modes can be controlled according to the experimental requirements. The interior spaces can be fitted with furniture according to the type of test and, if required, can accommodate people or thermal dummies that allow objective and reproducible measurements of human heat exchange.

Monitoring system

The monitoring system allows the precise control of the construction solution's operating conditions with the added possibility of evaluating thermal, energy and optical performance. In addition, the laboratory makes it possible to measure thermo-hygrometric and visual comfort as well as the air quality and indoor soundscape in order to study the performance of indoor settings.

Services for businesses

In the Façade System Interactions Lab, state-of-the-art infrastructure is supplemented by the expertise of an interdisciplinary team of researchers. Thanks to their international network, Eurac Research experts contribute to the development of knowledge on zero-energy buildings and energy flexible buildings that can adapt to the dynamics of the context. By working on the development of solutions to reduce energy demand and improve comfort, their expertise can be made available to the construction industry. Furthermore, researchers can support companies and designers in the development, performance characterisation and optimisation of innovative solutions: from active façades that integrate solar or ventilation systems to passive solutions for heating, cooling, lighting and natural ventilation.

