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LABORATORY

Hygrothermal Testing Lab

Laboratory for the hygrothermal characterisation of building materials

Hygrothermal Testing Lab

The Hygrothermal Testing Lab performs measurements of the thermal and hygrometric properties of building materials. Knowledge of the properties of building materials is essential for the design of new buildings and renovations. Calculation models and simulation tools require laboratory measured input data that are reliable and validated. This particular type of data play a fundamental role in the context of the energy retrofit of buildings: thanks to these parameters it is possible to correctly evaluate their performance and define design solutions that are energy efficient and prevent any moisture-related damage such as interstitial condensation, mould formation or rising damp.

The laboratory and the tests carried out

The following properties are measured in the Hygrothermal Testing Lab:

- Basic properties: density.
- Thermal properties: thermal conductivity, specific heat capacity.
- Hygrometric properties: vapour permeability, water uptake coefficient, moisture storage function, liquid (capillary) conductivity.

To carry out these tests, the laboratory is equipped with state-of-the-art instruments, such as analytical balances, climatic chambers, drying ovens and pressure plate extractors.

The properties described above can be measured individually in the laboratory or, alternatively, a complete hygrothermal characterisation of the material can be carried out. In the latter case, all properties of the material are measured and the data obtained can be used in advanced dynamic simulation software, such as

WUFI or DELPHIN, which enables the simulation of the hygrothermal behaviour of the material in its entirety.

In addition to that, the Hygrothermal Testing Lab can design tailor-made experiments for the verification of the hygrothermal performance of technological solutions in the construction industry.

Skills at the service of businesses

Thanks to their knowledge in the field of building physics, Eurac Research experts can support companies in developing innovative materials by focusing on their hygrothermal behaviour. Additionally, they can test the performance of building materials in accordance with standard requirements or perform a full characterisation with the aim of modelling them in advanced hygrothermal simulation software. Laboratory measurements can also provide valuable support for the renovation of buildings where it is important to know the hygrothermal properties of existing materials to better plan the renovation work.

Thanks to the interdisciplinarity of the Eurac Research team, in addition to laboratory measurements, other specific services can be provided: dynamic simulation of the behaviour of wall/floor build-ups and construction details, support in the creation of design solutions free from moisture related damages, and on-site monitoring of the performance of materials and construction details.

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