

Research equipment and facilities of the building physics and service life of engineering of structures laboratory

In the field of building physics various testing is done related to the hygrothermal performance of building materials, structures and buildings, as well as energy consumption and the conditions of indoor air.

Research services are divided into four main categories:

- Calculation modelling
- Material testing
- Structural testing
- Examination on buildings

More information on [research services](#) can be found on the website of the building physics research group. Descriptions of the research methods and equipment for studying [building materials](#), [structures](#) ja [buildings](#) can be found on the website.

The building physics research group's research infrastructure includes the following equipment and facilities for studying building materials, structures and buildings

- Heat flow meter instruments
- Test equipment for studying water vapor permeability
- Dynamic vapor sorption analyzer
- Pressure plate extractor
- Automatic absorption equipment of free water
- Research equipment of the air permeability of materials

- Frost rooms
- Constant climate rooms and climate cabinets

- Building physical research equipment of wall structures
- Building physical research equipment of roof structures

- Testing buildings for studying structural elements in real climate conditions
- A test hall and a testing awning for long-term arrangements
- Weather station

- Research equipment for studying the air tightness of structures and an infrared camera
- Calibration equipment of temperature and relative humidity

The research infrastructure of building physics also includes, among other things, the measuring sensors and equipment for the following quantities:

- Temperature
- Relative humidity
- Air pressure difference
- Air flow speed

- Air flow rate
- Heat flow rate
- Carbon dioxide content
- Moisture content
- Condensate
- Wind direction and speed
- Solar radiation
- Long-wave thermal radiation
- Precipitation
- Wind-driven rain
- Weight and density

The research group for renovation and service life engineering of structures has access to field research instruments for studying existing structures, and accelerated stress equipment for studying the long-term durability of structures. Additionally, the group has plenty of experience of applied research in situations where standardized methods for example are not available, and the research equipment is assembled to suit the project. In addition to the regular measuring instruments, the research group also has access to, among other things, the following:

- Weathering action equipment of structures, 2 pcs
- Fast carbonization equipment of plasters and concrete
- Melting-freezing –equipment
- 30 kN pull test equipment (universal) and a pull-off test equipment for field use
- 200 kN compression test equipment (universal, e.g. the bending and compression of plaster prisms)
- Equipment suitable for tracking long-term transformations
- Equipment for studying the condition of structures, in accordance with the BY42 instructions (sampling, cover thickness measuring, field experiments, laboratory experiments, impact hammer)