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Hygrothermal Building Envelope, Indoor Climate and Whole Building Simulation

WUFI® PLUS

VALIDATION

WUFI® Plus has been validated by comparisons to field measurements and to other calculations and standards.

Building energy simulation

Validated against standards (e.g. ASHRAE 140, DIN EN ISO 13791, ISO 13792, VDI 6020) and measurements (e. g., in accordance with IEA EBC Annex 58).

Hygrothermal simulation

Component module validated in accordance with EN 15026 and applicable for ASHRAE 160 simulations. Indoor climate simulation validated with measurements, such as those within the framework of IEA ECBCS Annex 41.

3D thermal bridging

Validated in accordance with DIN EN ISO 10211.

TARGET USERS

- Planners, architects and engineers
- Consultants
- Building products companies
- Construction and housing companies

Web, support and purchase

Further information and application examples, seminar schedule, webshop, etc. can be found on our homepage:
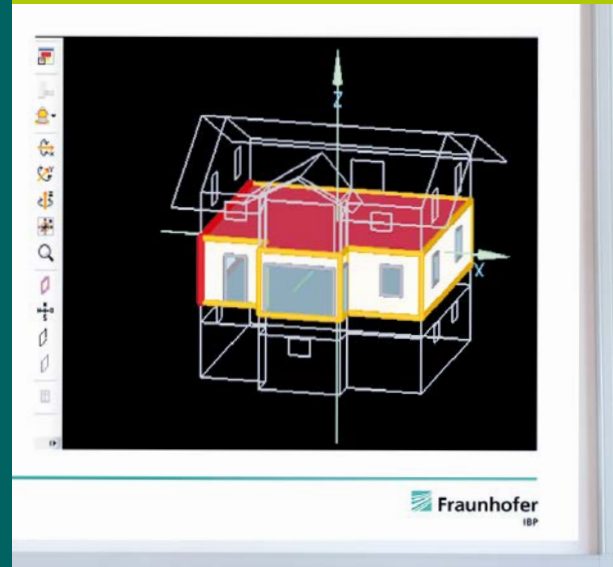www.wufi.com
www.wufi-forum.com
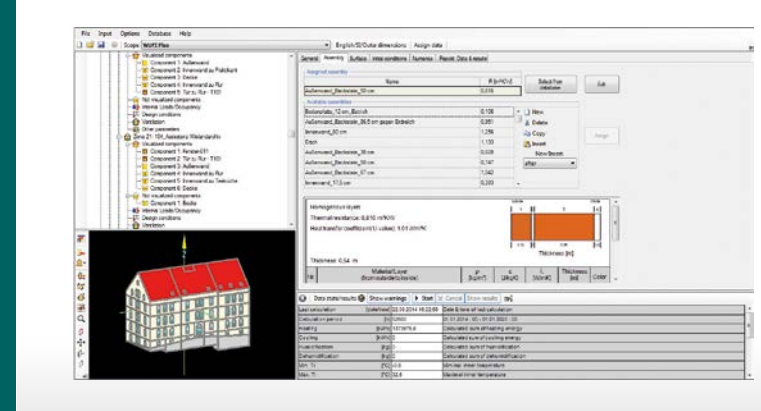www.wufi-wiki.com

Contact

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WHAT IS WUFI® PLUS?

WUFI® Plus is a comprehensive simulation tool for evaluating the dynamic hygrothermal behavior of buildings. With WUFI® Plus, the assessment of energy needs, indoor climate and comfort conditions, air quality, and one dimensional hygrothermal conditions within building components is done for calculated indoor climate conditions and location-related outdoor climates. An easy-to-use graphical user interface, various user-accessible databases, and extensive options for presenting results allow users to quickly and accurately evaluate proposed designs. Some of the main features of WUFI® Plus are as follows:

- Multi-zone building simulation with hygrothermal calculations for all components
- Energy demand calculations for maintaining heating, cooling, humidification, and dehumidification set-points
- 3-D visualization of the building with geometry import options
- Comprehensive databases for climate, materials, components, and windows
- Flexible scheduling for internal loads and HVAC equipment
- Dynamic, 3-dimensional calculation of thermal bridges
- Passive house module for rapid design of energy efficient buildings using the monthly balance method
- Module for verifying summer overheating protection according to the German DIN 4108-2 standard

RESULTS AND OUTPUTS

For each simulated zone in the building
- Dynamic, hourly simulation of room environments (temperature, humidity, and CO_2 content)
- Heating and cooling energy demand, humidification and dehumidification loads, dynamic heat and moisture fluxes
- Air flow rates (resulting from infiltration, wind and buoyancy, and mechanical ventilation)
- Comfort indices (Predicted Mean Vote (PMV), operative temperature, etc.)

For all orientations of each component
- Temporal and spatial distributions of the hygrothermal conditions (temperature, relative humidity, and water content) in each component including WUFI® movie export

Automatic and user-defined export options
- Word export of complete project documentation, specific results, and comprehensive passive house certification reports with detailed descriptions
- Graphical representation of the component and zone results
- Excel or text export of all dynamic component, zone, and plant engineering results
- Movie export of dynamic component and system behavior

APPLICATION AREAS

With its wide-ranging capabilities, WUFI® Plus can be used to address various problems in new construction and renovation of residential and non-residential buildings. WUFI® Plus evaluates the energy- and hygrothermal-related behavior of materials, systems, components, and entire buildings. The software allows users to assess buildings for occupant requirements, energy use, health, and durability. Furthermore it enables the detection and prevention of weaknesses in the design, implementation, and planned operation already in the planning phase.

Typical applications
- Hygrothermal component evaluation under usage-dependent boundary conditions
- Indoor climate, thermal comfort, and energy consumption
- Energy-efficient ventilation settings/response to prevent moisture damage and mold growth
- Influence of thermal and hygric storage masses on building energy consumption and indoor climate
- Strategies to reduce summer overheating
- Hygrothermal building and component behavior for extreme or intermittent use
- Drying of building moisture or water damage