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FRAUNHOFER INSTITUTE FOR BUILDING PHYSICS IBP

ADVANTAGES OF WUFI® PASSIVE

WUFI® Passive allows a double assessment of buildings. On the one hand a monthly energy balance method is used to check if the buildings meet the Passive House criteria. On the other hand the same building model is used for a detailed dynamic assessment of the hygrothermal behavior of building and components. Of course several ways to reduce the energy demand of the buildings can be determined. But also an analysis of comfort conditions in several zones of the building as well as the development of strategies to avoid moisture related problems in the building components is possible. By combining the monthly balance and the dynamic method Passive Houses can be designed which are optimally adapted to the respective outdoor climate conditions. Additionally comfortable indoor conditions can be ensured.

Characteristics:

- one software for two building assessment methods
- user-friendly interface
- easy switch between hygrothermal simulation and Passive House verification
- just one building model for both features
- extensive data bases
- user support by wizards and calculators
- easy import of climate data
- combined energy, comfort and hygrothermal component analysis
- comprehensive results export

WUFI[®] ON THE WEB

Further information and application examples, seminar schedule, etc. can be found on our homepage: www.WUFI.com I www.WUFI-Forum.com I www.WUFI-Wiki.com WUFI® operates according to international standards and is applied worldwide.

OUR COOPERATION PARTNER



INFORMATION

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WUFI[®] PASSIVE







Certificate Criteria: Furopear Heating Deman 10.9 kWh/m²a 938 kWh/a 4 KWh/n Cooling Deman 8,9 kWh/m²a 217 KWh/a neak - sen 1,7 kWb/m² 6.4 kWh/m²a latent: Heating Load specific Cooling Loa specific Primary Energ Air Tightness ACH50 0.6

Development of WUFI® PASSIVE

Passive Houses are characterized by extremely low energy consumption. Rigorous certification criteria govern boundary conditions for primary energy or air-tightness of the thermal envelope. In times of decreasing fossil fuel resources, such criteria for efficiency and renewable resources are becoming more important than ever. Passive Houses have proven to be an important step towards the future. The concept can even be used as a basis for net-zero or plus energy buildings.

Dynamic models, using hourly data, are necessary to accurately model the hygrothermal behavior of Passive Houses in climates where cooling and dehumidification of the indoor air are playing an important role. Previous Passive House Verification tools are not suited to fit those needs properly. In the field of hygrothermal simulations the WUFI® software family has become well known in recent years.

Therefore the Fraunhofer-Institute for Building Physics (IBP) and the Passive House Institute US (PHIUS) developed WUFI® Passive combining the WUFI® Plus building simulation tool with a Passive House Verification feature which meets the needs of Passive House communities worldwide.

Dynamic Hygrothermal Simulation

WUFI® Plus is a holistic model that calculates all hygrothermal interactions between the indoor air and the building envelope in a dynamic fashion. It analyzes the wall, roof and basement components and the indoor conditions with different heating, ventilation and air-conditioning approaches. In addition to the hygrothermal assessment of single components, WUFI® Plus allows holistic evaluations such as the appropriate air-conditioning to avoid mold growth, comparison of shading strategies to reduce overheating or the influence of

thermal and hygric inertia on building energy demand and indoor environment.

Characteristics:

- dynamic hygrothermal whole building simulation
- multi-zone model
- 3D visualization
- Sketch-Up import
- SI/IP units switch
- extensive material and climate data base
- building energy, comfort and hygrothermal component analysis

To ensure detailed hygrothermal assessment of buildings, all features of WUFI[®] Plus are incorporated into WUFI[®] Passive.

Passive House Verification

The Passive House Verification in WUFI® Passive is a tool that calculates the energy demand of buildings on monthly or annual basis. Thereby transmission, ventilation, radiation and inner loads are considered. The energy gains and losses are balanced and a detailed input of the heating, ventilation and air conditioning systems (HVAC) allows the calculation of final energy. Depending on the energy sources used the primary energy is determined.

Characteristics:

- instant calculation
- balancing method
- input support
- enhanced HVAC support
- automatic area detection
- 3D visualization
- Sketch-Up import
- SI/IP units switch
- consideration of domestic hot water consumption
- consideration of photovoltaic
- calculation of overheating frequency
- primary energy assessment
- Passive House energy pass