Passive houses, Sustainable Building & Renovation

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Future-oriented building concepts from Austria

Not only the building concepts of the future come from Austria, but Austria also has the highest concentration of

passive houses worldwide.

Every fourth passive house worldwide is located in Austria. The concept was proactively established in 1994, and only two years later the first passive house was built in Austria. As early as 2010, around 6,000 passive houses were built in Austria, compared to 50 in all of North America. In 2016, there were already more than 14,000 buildings in passive house standard in Austria and thus still the world's highest density of passive houses.

The heat demand (HWB) of a passive house - also known as the energy rating (ECC) - must not exceed 15 kWh / m²a calculated according to PHPP (passive house configuration package). This corresponds to a maximum of 10 kWh / m²a calculated in accordance with OIB (Austrian Institute for Construction Engineering - Directive 6). However, under unfavorable conditions, a heating heat demand of max. 8 kWh / m²a is acceptable.

If a heating capability of a passive house is to be guaranteed by means of comfort ventilation, the heating load is also limited to 10 W / m². The building shell is to be constructed without thermal bridges, as well as air- and wind-tight, the last two values being tested by means of a building pressure test and not exceeding an n50 value of 0.6 h-1. The maximum primary energy consumption is set to 120 kWh / m²a in order to ensure an environmentally friendly coverage of energy consumption (including household electricity which alone accounts for half of the total demand).

In order to achieve this overall goal, there are specific guideline values which individual components or components of passive houses must fulfill. These include:

- U-values of all components for large-volume objects ? 0.15 W / m²K, for single-family houses ? 0.10 W / m²K
- Glazing with Ug values ? 0.8 W / m²K and a g-value ? 50%
- Window frame with a Uf-value ? 0.8 W / m²K according to DIN EN 10077
- Heat-brushless version in relation to the external dimension
- Complete patent of the airtight level
- Complete patent of the windproof layer
- Comfort ventilation with highly efficient heat recovery ? 75% (according to PHI certificate) with low power consumption (? 0.4 Wh / m³)
- Lowest heat losses during the process of water heating and distribution
- Highly efficient use of household electricity
- Calculation with the PHPP (passive house design package) according to the Passivhaus Institut Darmstadt, Dr. Wolfgang Feist

Sources and additional information:

Passivhaus Austria: http://www.passivhaus-austria.org/

APA: https://science.apa.at/rubrik/natur_und_technik/ConClip_-_Videoplattform_fuer_Passivhaus-Know_How/SCI_20160406_SCI39471352429107630

Innovative Gebäude: http://www.innovativegebaeude.at/innovative-gebaeude/baukonzepte/passivhaus/was-ist-ein-passivhaus/

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