1 Introduction to the energy balance calculations

Passive House buildings are very well insulated and draught-proofed buildings whose annual space heating demand is so low that the conventional heating system can be omitted. The small amount of heat still required can be delivered to the individual rooms by heating the air supplied by the ventilation system.

The heating load accounts for around 10 W/m² depending on the necessary air flows, and the space heating energy demand is up to 15 kWh/(m²a) (kilowatt-hours per square meter of treated floor area per annum). For warm climates it works similar for indoor cooling and dehumidification: the building can be cooled through the necessary supply air: this way usually the annual energy demand is very low.

The construction of a Passive House is very demanding in terms of the performance of the building components used. The following reference values apply to the Central European cool moderate climate. However, the principles are valid in other climates as well:

- Exterior building elements must have a U-value below 0.15 W/(m²K).
- The external envelope must be constructed without thermal bridges (see section 11.10).
- The airtightness of the building envelope should be verified by means of an air leakage test complying with the DIN EN 13829 standard. The measured air leakage must not exceed 0.6 h^{-1} at a pressure differential of 50 Pa (for both over and under-

"Certification: Building Certifiers").

Evaluation criteria for the certification of residential buildings (excerpt)

Heating

Space heating demand	**≤ 15 kWh/(m²a)**
or alternative: Heating load	**≤ 10 W/m²**

Cooling[2] (including dehumidification[3])

Total cooling demand	**≤ 15 kWh/(m²a) + 0.3 W/(m²aK) • DDH**
or alternative: Cooling load	**≤10 W/m²**
AND Cooling demand	**≤ 4 kWh/(m²aK) • ϑ_e + 2 • 0.3 W/(m²aK) • DDH–75 kWh/(m²a)**
but not larger than:	**45 kWh(m²a) + 0.3 W/(m²aK) • DDH**

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2 The criteria for cooling and dehumidification apply provisionally and may possibly have to be adapted with advances in knowledge. The requirements applicable for each building are calculated automatically in the PHPP ("Verification" Sheet).
ϑ_e: Annual mean outdoor temperature in °C
DDH: Dry degree hours (time integral of the difference between the dew-point temperature and the reference temperature of 13 °C throughout all periods during which this difference is positive)

3 The partial requirement for dehumidification is described by the term '0.3 W/(m²aK) · DDH'.