

Certification criteria

For an entry door as a certified Passive House component

in cool-temperate climates. Version 1.1, 24. February 2012

For the certification of an entry door as a Passive House certified component, the Passive House Institute has established the following criteria:

1. Comfort criterion

$$U_{D, \text{ installed}} \leq 0.80 \text{ W/(m}^2 \text{ K)}$$

The U-value of a door set (door and frame) with external dimensions of 1.10 m wide by 2.20 m tall, calculated in accordance with EN 10077-2 including installation thermal bridges must not exceed 0.80 W / (m² K) for any examined installation type. Certification will be based on three different installations:

- a. Installation in a Passive House suitable solid wall with an exterior insulation and finish system
- b. Installation in a Passive House suitable timber wall
- c. Installation in a Passive House suitable, insulated concrete formwork block wall

Rationale: As with windows, it is important that the entry door does not reduce of thermal comfort due to radiant cooling or downdraught. This results in limiting values for heat loss of the installed entry door. Good thermal insulation of the entry door is also essential for the overall heat balance of a Passive House. For example, about as much heat is lost through a door with a U-value of 3 W/(m² K) as though a 50 m² segment of a Passive House exterior wall.

2. Air tightness criterion

$$Q_{100} \leq 2.25 \text{ m}^3/(\text{hm})$$

Under all conditions listed below, the entry door must meet air tightness class of 3 according to EN 12207 (with respect to the joint length; Q_{100} : reference permeability at a test pressure of 100 Pa).

The air tightness of a complete door element is determined by according to EN 1026 under the following conditions:

1. Laboratory conditions

2. Boundary conditions according to EN 1121, Testing Conditions d: an internal temperature of $23 \pm 2^{\circ} \text{C}$ with a relative humidity of $30 \pm 5\%$; an external temperature of $-15 \pm 2^{\circ} \text{C}$.
3. Boundary conditions according to EN 1121, Testing Conditions e: an internal temperature of $25 \pm 5^{\circ} \text{C}$; an external temperature stress imposed by infrared emitters of $55 \pm 5^{\circ} \text{C}$ above the internal temperature.
4. For timber doors only: boundary conditions in accordance with EN 1121, Testing Conditions "C": an internal temperature of $23 \pm 2^{\circ} \text{C}$ with a relative humidity of $30 \pm 5\%$, an external temperature of $3 \pm 2^{\circ} \text{C}$ with a relative humidity of $85 \pm 5\%$.

The test differs from EN 1121 in that it is for a door that has been closed but left unlocked. The door must still close normally under extreme climatic conditions. To facilitate practical application of the testing procedure, the deformation of the door may be measured under the climatic boundary conditions specified. The degree of deformation must then be taken into account when measuring the joint permeability coefficient.

Rationale: In contrast to modern windows, standard doors are often not sufficiently airtight. Up to half of the measured leakage of a very airtight Passive House can be caused by a leaking door. The Passive House Institute thus includes this stringent air tightness test as a requirement for the certification of a door as a certified Passive House component.