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## Certification of airtightness systems

The Passive House Standard is characterised by very high energy savings compared with conventional new builds. This is achieved by means of highly efficient building systems, careful planning and highly efficient components. Besides careful detail planning, the use of highly efficient components is also a prerequisite for this. As a rule, these components are two to three times more efficient than the corresponding commonly used products. This high level of efficiency is crucial for achieving the Passive House Standard.

However, for the designer it is often very difficult to assess the energy efficiency, durability and the necessary energy parameters of a component as the available standard parameters are frequently unrealistic or are not accurate enough; reliable project planning using manufacturers' data alone is often not possible.

As an independent authority, the Passive House Institute tests and certifies products in respect of their suitability for use in Passive House buildings. Products that carry the **Certified Passive House Component** seal have been tested according to uniform criteria; they are comparable in terms of their specific values, and are of excellent quality with regard to their energy efficiency. Their use facilitates the designer's task and contributes significantly to ensuring the faultless functioning of the resultant Passive House building.

### Component certification

In the area of airtightness, **airtightness systems** are tested as they are applied in Passive House buildings. The focus is not on the individual product alone; instead, the entire system as a whole is put to the test with the corresponding connections.

Testing takes place under the aspects of "**airtight window connection**" and "**surface sealing**"

Thus, for example, **window sealing** is tested in solid and wooden walls, the bonding of **sealing membranes and composite wood boards** (surface sealing) to concrete/plaster, adjacent wood panels or membranes and the joining of these materials with each other is tested. Each kind of connection is specially prepared threefold by the PHI and tested for airtightness at different pressure stages. The measurement of the volume flow rate takes place using a highly precise laminar flow element.

Besides the testing of the systems in realistic situations, the corresponding instructions for use are also examined for their practical applicability; installation takes place strictly in accordance with the manufacturer's instructions. If uncertainties arise in the process, suggestions for improving these are devised and submitted to the manufacturer.

The **Certified Passive House Component** certificate is issued if the limiting values are complied with. The measurement results (test report) and the instructions for use (revised if applicable) are made available to building owners and designers in the component database (<https://database.passive-house.com>) under the heading "Airtightness systems". After certification, details about the component will also be published in the IG-Passivhaus/iPHA component newsletter ([www.passivhaus.de](http://www.passivhaus.de)).

## Limiting values for certification classes

### ***Airtight window connection***

Products for airtight and thermal bridge minimised installation of PH windows in wall openings.

Airtightness testing of the window to wall joint sealing in solid and lightweight wall constructions is carried out. Window frames made of PVC as well as wood are tested in the process.

The required values for PH certification for a "*window connection*" can be taken from the following table:

| Class | Air permeability<br>per unit length<br>@ 50 Pa<br>[m <sup>3</sup> /(hm)] |
|-------|--|
|       | phA+   |
| phA   | ≤ 0.30   |
| phB   | ≤ 0.50   |
| phC   | ≤ 0.80   |

### ***Surface sealing***

Systems for surface sealing of walls, roof, floors in lightweight or solid constructions.

Testing of the airtightness of the sealing systems takes place in accordance with DIN 12114. System-specific butt joints and connections are included:

- 0 Material on its own without a connection
- 1 Force fitting of similar adjacent surfaces
- 2 Adjacent surfaces consisting of airtight composite wood board
- 3 Adjacent concrete building component/plastered surface

The required values for PH certification for "*surface sealing*" can be taken from the following table:

| Class | Air permeability<br>per unit area<br>@ 50 Pa<br>[m <sup>3</sup> /(hm <sup>2</sup> )] |
|-------|--|
|       | phA  |
| phB   | ≤ 0.18   |
| phC   | ≤ 0.25   |