

## Efficiency first – why the need for certification?

Worldwide, the market for highly energy efficient buildings is growing rapidly, and with it the need for reliably performing components. But often, the requirements as well as the approaches how to fulfill them are unclear and some producers might claim specifications that they cannot guarantee in reality.

The Passive House Institute certifies highly energy efficient components according to international criteria in order to meet comfort, hygiene and efficiency requirements. As part of the certification process, PHI offers consultation for manufacturers. The manufacturer receives a certificate that guarantees reliable performance. Furthermore, the specifications needed as data input for a reliable energy balance with the PHPP are provided to designers.

### Benefits of certification

- Profit from the consultation of decades of experience from skilled PHI experts to get your product ready for certification
- Quality assurance for product design of highperformance buildings
- Entrance into a growing market
- Increased market visibility and product recognition
- Independently tested and certified, use of Certified Passive House Component seal
- Presentation in Passive House Institute component database and integration in PHPP

For more information please check:

[www.passipedia.org/basics](http://www.passipedia.org/basics) | [www.componentdatabase.org](http://www.componentdatabase.org)

**i** You want to apply for the Passive House Institute's Component certification? You are most welcome! Please get in touch with us: [Adrian.Muskatewitz@passiv.de](mailto:Adrian.Muskatewitz@passiv.de)

## About us

### International Passive House Association (iPHA)

iPHA is the global network for connecting Passive House stakeholders, promoting the Passive House Standard and disseminating relevant knowledge and information worldwide. iPHA runs Passipedia – the online knowledge database on energy efficiency.

[www.passivehouse-international.org](http://www.passivehouse-international.org)

### New York Passive House (NYPH)

NYPH promotes the Passive House Standard in NYS and the NYC metropolitan area – through public outreach, education, support of industry professionals and advocacy. NYPH is an iPHA affiliate.

[www.nypassivehouse.org](http://www.nypassivehouse.org)

### PHPP and designPH – Quality assured design

The Passive House Planning Package (PHPP) is an affordable energy balance tool for high performance building standards. PHPP has a validated result accuracy and can be used reliably by all stakeholders. The PHPP can be combined with designPH, a SketchUP plugin which allows data input via 3D sketches.

[www.passivehouse.com](http://www.passivehouse.com) | [www.designph.org](http://www.designph.org)

### Passive House Institute (PHI)

PHI is an independent research institute that has played an especially crucial role in the development of the Passive House concept – an internationally recognized, performance-based energy standard in construction.



The certification criteria and testing requirements are available on our website or via email:

[components@passiv.de](mailto:components@passiv.de) | [www.passivehouse.com](http://www.passivehouse.com)

## Passive House Institute window certification



### Passive House windows for New York City



**CERTIFIED COMPONENT**

Passive House Institute

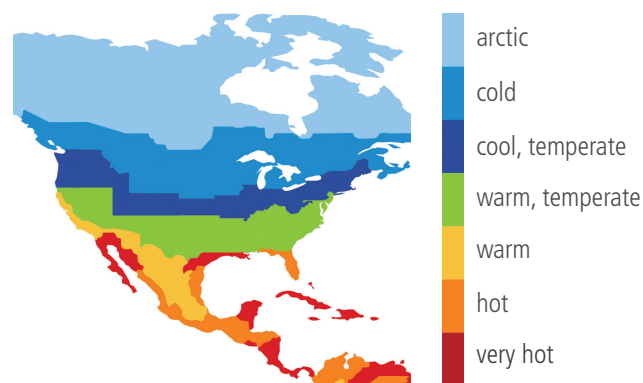
## Energy efficiency and high comfort

The Passive House Standard provides high energy efficiency, as well as high quality and high comfort. The components of each Passive House building must be selected to meet the energy targets, as well as to ensure a comfortable indoor environment. Suitable component qualities can effectively be identified with the Passive House Planning Package (PHPP) during the various design stages.

### Indoor comfort

The comfort level in a building during winter is significantly influenced by the temperatures of all surfaces surrounding us. A person will feel comfortable only if the coldest surface in the room is not significantly below the perceived room temperature (less than 4.2 K or 7.6 °F difference). There will be no cold downdraughts causing cold feet or radiant heat losses towards the cold surface.

The thermal performance of windows used in a Passive House building must therefore be selected carefully to ensure a minimum surface temperature (so-called "comfort criterion"). This functional requirement depends largely on the outside climate conditions of where the building is being built.



Passive House climate regions

## Windows for New York City

Given an outside design temperature of -15 °C or 5 °F in the climate of New York City (according to PHPP), the installed windows must fulfill the following thermal specifications:

U-Value below **0.87 W/(m²K) | 0.153 BTU/(hr.ft².°F)**

Windows used in Passive House buildings in New York City will thus be triple-glazed with a warm edge bond.

### Two strategies are possible:

1. Combining a highly insulated window frame (e.g. certified for the cool, temperate climate) with typical triple-glazing.
2. Combining a less insulated window frame (e.g. certified for the warm, temperate climate) with highly insulating triple-glazing.

When selecting a window frame for a project, higher performance (i.e. Strategy 1) is strongly recommended as a general approach, as it provides a significantly more robust solution in terms of both performance and comfort. The glazing specifications often change during detailed planning stages (e.g. for fire & security requirements), which will compromise meeting the requirements if the window frame cannot compensate for the higher heat losses.

Certified windows and respective specifications are listed on the component database: [www.componentdatabase.org](http://www.componentdatabase.org)

Climate region	$U_{W, installed}$ [BTU/(hr.ft².°F)]	Temperature factor	$U_{g, reference}$ [BTU/(hr.ft².°F)]
cool, temperate	0.15	0.70	0.123
warm, temperate	0.18	0.65	0.158

Certification criteria for Passive House windows

## Examples

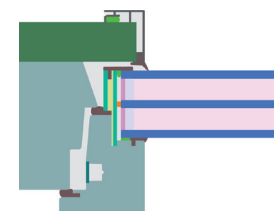
### Two possible solutions for an example window:

Size = 1.23 x 1.48 m | 4' x 4'10"

Frame width = 13 cm | 5 1/8" in

Installation 0.02 W/(mK) | 0.012 BTU/(hr.ft.°F)

**Strategy 1:** Insulated frame, certified for the Passive House cool, temperate climate zone and typical triple-glazing:



#### Glazing

0.70 W/(m²K)

0.123 BTU/(hr.ft².°F)

#### Edge bond

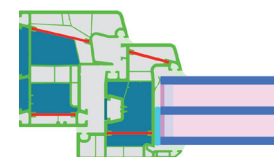
0.030 W/(mK)

0.017 BTU/(hr.ft.°F)

#### Frame

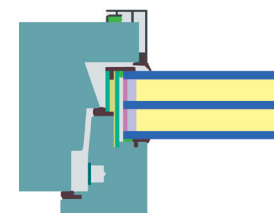
0.80 W/(m²K)

0.141 BTU/(hr.ft².°F)



$U_{W, installed} = 0.87 \text{ W/(m}^2\text{K)} \mid 0.153 \text{ BTU/(hr.ft}^2\text{.}^\circ\text{F)}$

**Strategy 2:** Frame, certified for the warm, temperate climate combined with a very good glazing:



#### Glazing

0.58 W/(m²K)

0.102 BTU/(hr.ft².°F)

#### Edge bond

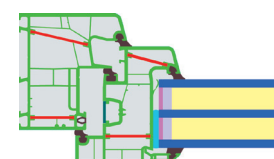
0.035 W/(mK)

0.020 BTU/(hr.ft.°F)

#### Frame

1.00 W/(m²K)

0.176 BTU/(hr.ft².°F)



$U_{W, installed} = 0.87 \text{ W/(m}^2\text{K)} \mid 0.153 \text{ BTU/(hr.ft}^2\text{.}^\circ\text{F)}$