

# Certificate

## Passive House Suitable Component

For cool temperate climates, valid until 31. December 2012

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Category **Glazing**  
Manufacturer **Guardian Flachglas GmbH**  
**06766 Thalheim, Guardianstraße 1, GERMANY**  
Product name: **Guardian ClimaGuard nrG**

This certificate was awarded based on the following criteria:

### Thermal Comfort

$$U_g \text{ (EN 673)} \leq 0.80 \text{ W/(m}^2\text{K)} \quad [1]$$

Explanatory statement: in Passive Houses buildings with standard room height, no heating units are needed along the outer walls. In order to avoid thermal discomfort due to radiation heat losses, glazing U-values must be limited.

### Energy Balance for glazings

for cool temperate climates

$$U_g \text{ [W/m}^2\text{/K]} - 1.6 * g \leq 0 \quad [2]$$

Explanatory statement: Glazing on south facing facades with minimal shading must also provide net heat gains during the relatively short Passive House heating period (November to February).

Please note: Formula [2] is a rough estimation for this component in cool, temperate climates and thus reflects the energy balance for a very particular set of conditions. For the actual building the energy balance must be evaluated with the Passive House Planning Package (PHPP) or other suitable thermal simulation tool. The value given on the left hand side of formula [2] may not be used in place of the certified  $U_g$ -values given below.

### Passive Houses Requirements

For proper function in a Passive House this glazings must be mounted into a well-insulated Passive House suitable window frame. A thermally separated spacer must be used at the glass edge to reduce thermal bridging.

### Thermal quality and solar throughput:

Glazing Profile	$U_g$ (EN 673) [W/(m <sup>2</sup> K)]	g (EN 410) [ - ]
4:/18/4/18/:4 (Ar 90%)	0.64	0.62
4:/16/4/16/:4 (Ar 90%)	0.69	0.62
4:/14/4/14/:4 (Ar 90%)	0.75	0.62
4:/12/4/12/:4 (Kr 90%)	0.60	0.62

