CERTIFICATE

Certified Passive House Component
ID: 0813gl03 …. 0816gl03 valid until 31. December 2025

Passive House Institute
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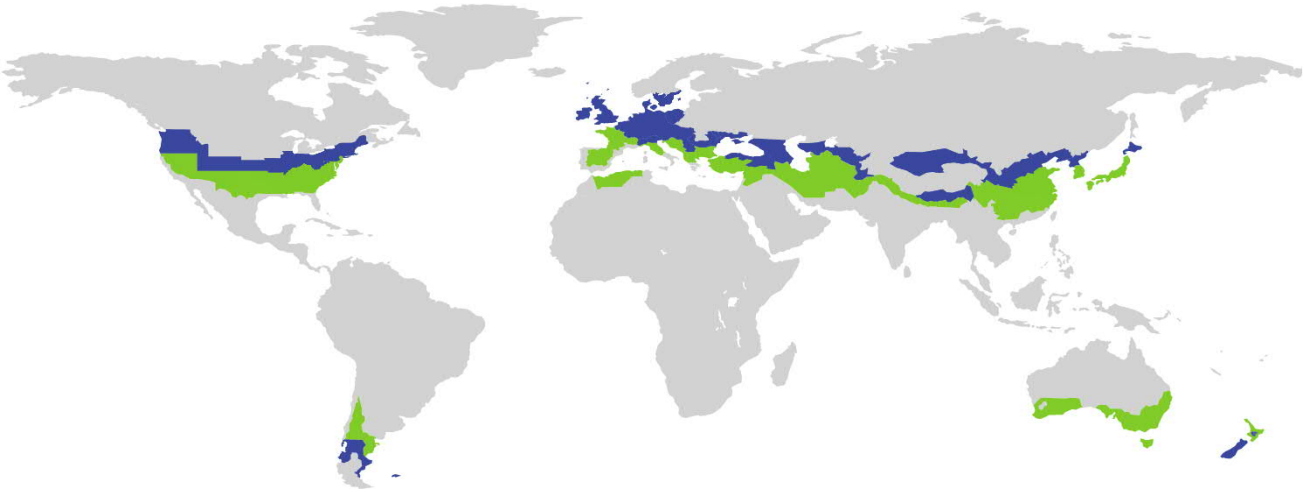

Category	**Triple pane low-e glazing with argon-gas filling**
Manufacturer	**Saint Gobain Glass**
	Stolberg, GERMANY
Product name	**CLIMATOP PLANITHERM XN & XN II**

Glazing configuration	**4:| gap (Ar) | 4 | gap (Ar) |:4**
Coating (name)	**PLANITHERM XN**
ε_{normal} (eps_normal)	**0.030**

This certificate was awarded based on the following criteria:

Climate zone **3 cool-temperate climate**

U-value requirement **$U_g \leq$ 0.80 W/m²K**
maximum allowed Ug-value for this climate zone
(for details see table on page 2)

Comfort criterion **$t_{comfort, min}$ -19 °C**
Minimum allowed design-outside temperature to fulfil
the comfort requirement (for details see table on page 2)

Efficiency criterion **g/U_g = 0.94**
The ratio g/Ug describes the energy efficiency of the glazing
(for details see table on page 2)

cool-temperate climate

ph **B**

CERTIFIED COMPONENT
Passive House Institute

Saint Gobain Glass
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Product name **CLIMATOP PLANITHERM XN & XN II**

Total energy throughput, optical transmission and selectivity

The total energy throuput, optical transmission and the selectivity of a glazing system depend mainly on the coatings, the position of the coatings and the thickness of the glass panes. The values are calculated according to ISO 15099 for the glazing configuration given for this product.

Total energy throughput	0.54	(g-value or SHGC)
Optical transmission	0.74	(T_{vis})
Selectivity, S	1.39	(T_{vis} / g)

Heat transfer coefficient, thermal comfort, efficiency classes

The overall heat transfer coefficient in the centre of the glazing package, Ug, depends on the temperature difference between inside and outside, the depth of the gap between glass panes, the gas filling inside the gap, the thickness of the glass panes and the quality of the coatings (eps_normal), if present. It is calculated according ISO 15099 for the given coatings and glazing configuration.

Coating: **PLANITHERM XN** ε_{normal} **0.030** Glazing configuration **4:| gap (Ar) | 4 | gap (Ar) |:4**

Climare zone	arctic	cold	cool-temp.	warm-temp.	warm	hot	very hot	The comfort criterium is achieved down to	**g/Ug**	**Passive House Efficiency Class reached**
	Design temperature for the energy balance of the building [°C]									
	-15	-5	0	5	10	15	20	$t_{comfort, min}$		
gap	**Overall heat transfer coefficient Ug [W/(m²K)]**							**[°C]**	[m²K/W]	
12 mm	0.71	0.71	0.71	0.71	0.72	0.73	0.73	-18	0.75	phC
14 mm	0.67	0.64	0.64	0.64	0.64	0.64	0.65	-19	0.84	phB
16 mm	0.67	0.61	0.59	0.58	0.58	0.58	0.58	-19	0.91	phB
18 mm	0.68	0.61	0.57	0.55	0.53	0.53	0.53	-18	0.94	phB

Passive House Efficiency Classes	**g/U_g** [m²K/W]
phA+	1.10
phA	0.95
phB	0.80
phC	0.65
phD	0.50
phE	0.30

Please note:
The minimum design temperature for comfort requirement is given according to the coldest daily average temperature of a test-reference-year. For the energy balance of a building (PHPP), the monthly average temperatures of the climate zone and the according Ug-values (see table) are relevant. The Ug-values are calculated according to ISO 15099. Boundary conditions for temperature and surface heat transfer coefficients are chosen for each climate zone, see certification criteria.
For proper function in a Passive House, these glazings should be used in a well-designed Passive House window frame. A thermally separating spacer has to be used at the glazing edge to reduce thermal bridges.