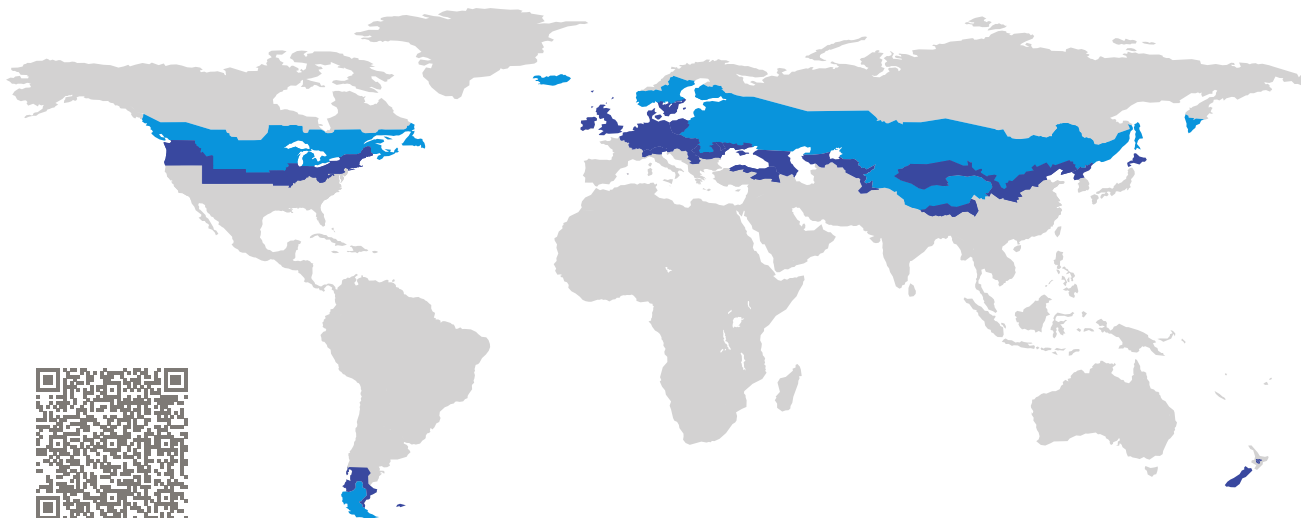


# CERTIFICATE

Certified Passive House Component

Component-ID 1702fx02 valid until 31st December 2025

Passive House Institute  
Dr. Wolfgang Feist  
64283 Darmstadt  
Germany

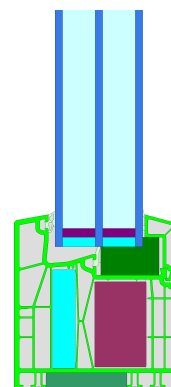


Category: **Fixed window**  
Manufacturer: **Innotech Windows & Doors, Inc.,  
Langley, BC,  
Canada**  
Product name: **Defender 88PH+ XI**

**This certificate was awarded based on the following  
criteria for the cold climate zone**

Comfort  $U_W = 0.59 \leq 0.60 \text{ W}/(\text{m}^2 \text{ K})$   
 $U_{W, \text{installed}} \leq 0.65 \text{ W}/(\text{m}^2 \text{ K})$   
with  $U_g = 0.52 \text{ W}/(\text{m}^2 \text{ K})$

Hygiene  $f_{Rsi=0.25} \geq 0.75$



Passive House  
efficiency class

phE

phD

phC

phB

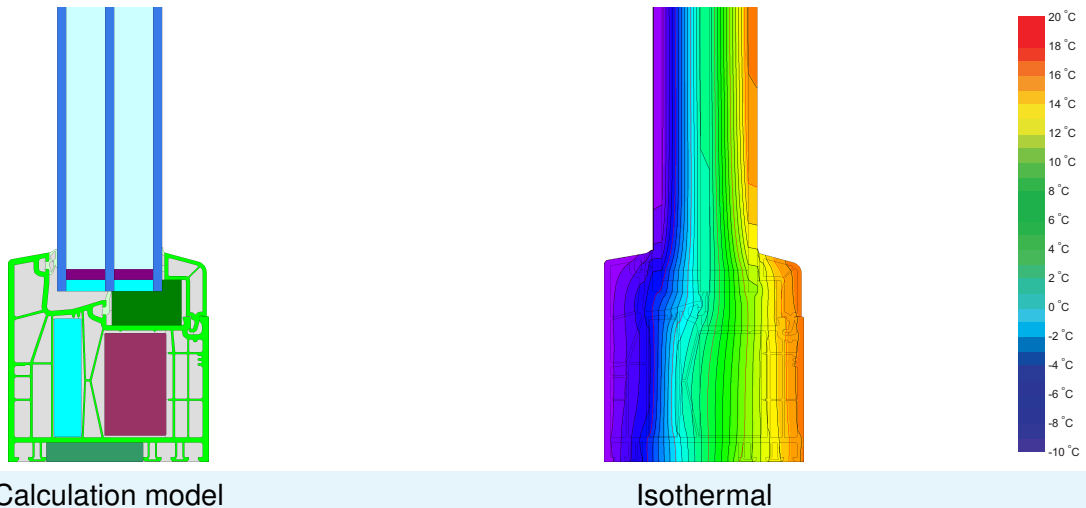
phA

cold climate



**CERTIFIED  
COMPONENT**

Passive House Institute



### Description

Vinyl-frame for fixed glazing, partially filled with EPS (0.032 W/(mK)), aerogel (0.016 W/(mK)) and high-density EPS (150kg/m<sup>3</sup>, 0.041 W/(mK)). No colour-restrictions. For max. dimensions see table in technical documents. Pane thickness: 46 mm (4/17/4/17/4), rebate depth: 17 mm. Spacer: SuperSpacer Premium with butyl as secondary seal.

### Explanation

The window U-values were calculated for the test window size of 1.23 m × 1.48 m with  $U_g = 0.52 \text{ W}/(\text{m}^2 \text{ K})$ . If a higher quality glazing is used, the window U-values will improve as follows:

Glazing	$U_g =$	0.52	0.50	0.48	0.70	W/(m <sup>2</sup> K)
		↓	↓	↓	↓	
Window	$U_W =$	0.59	0.57	0.56	0.72	W/(m <sup>2</sup> K)

Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations performed in the context of certification is available from the manufacturer.

The Passive House Institute has defined international component criteria for seven climate zones. In principle, components which have been certified for climate zones with higher requirements may also be used in climates with less stringent requirements. In a particular climate zone it may make sense to use a component of a higher thermal quality which has been certified for a climate zone with more stringent requirements.

Further information relating to certification can be found on [www.passivehouse.com](http://www.passivehouse.com) and [passipedia.org](http://passipedia.org).

## Validated installations

Lightweight timber (fixed glazed)		Deep stud wall		Exterior insulation and finishing system (EIFS) (fixed glazed)	
$U_{\text{Wall}} = 0.09 \text{ W}/(\text{m}^2 \text{ K})$		$U_{\text{Wall}} = 0.09 \text{ W}/(\text{m}^2 \text{ K})$		$U_{\text{Wall}} = 0.12 \text{ W}/(\text{m}^2 \text{ K})$	
$\Psi_{\text{install}}$	W/(m K)	$\Psi_{\text{install}}$	W/(m K)	$\Psi_{\text{install}}$	W/(m K)
Top	0.003	Top	0.011	Top	0.003
Side	0.003	Side	0.011	Side	0.003
Bottom	0.008	Bottom	0.021	Bottom	0.030
$U_{W,\text{installed}} = 0.60 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W,\text{installed}} = 0.63 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W,\text{installed}} = 0.61 \text{ W}/(\text{m}^2 \text{ K})$	

Frame values		Frame width $b_f$ mm	$U$ -value frame $U_f$ W/(m <sup>2</sup> K)	$\psi$ -glazing edge $\Psi_g$ W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Mullion fixed	(OM1)	98	0.64	0.022	0.77
Bottom fixed	(FB1)	92	0.54	0.023	0.77
Top fixed	(FH1)	92	0.54	0.023	0.77
Lateral fixed	(FJ1)	92	0.54	0.023	0.77
Spacer: Super Spacer® Premium			Secondary seal: Butyl		

