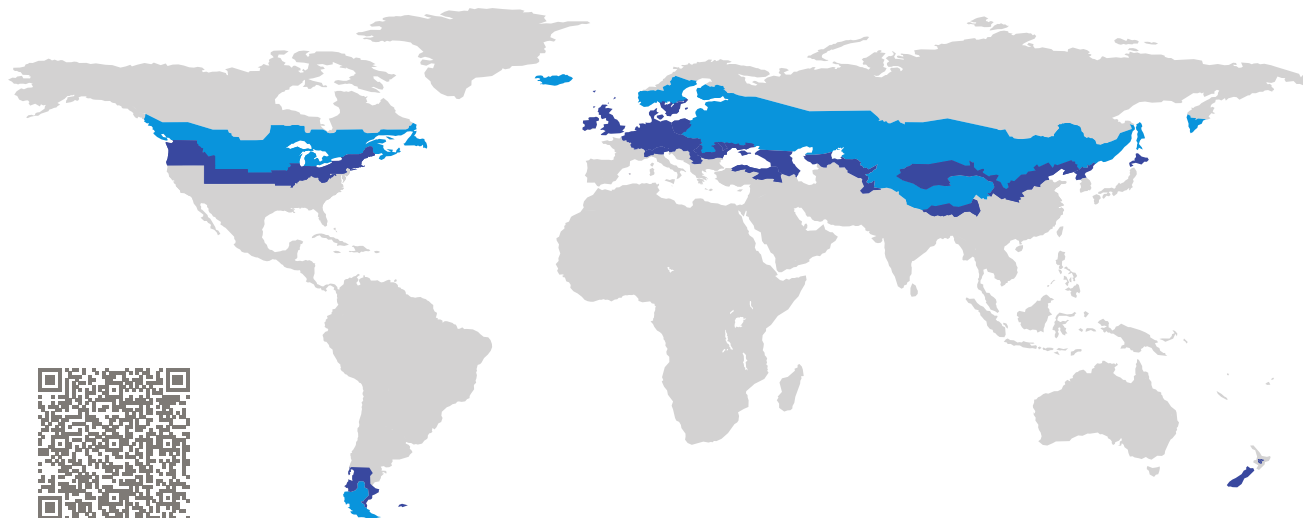


# CERTIFICATE

Certified Passive House Component

Component-ID 1912wi02 valid until 31st December 2025

Passive House Institute  
Dr. Wolfgang Feist  
64283 Darmstadt  
Germany

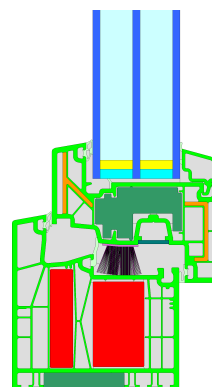


Category: **Window Frame**  
Manufacturer: **Innotech Windows & Doors, Inc.,  
Langley, BC,  
Canada**  
Product name: **Defender 88PH+ XI**

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

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

Hygiene  $f_{R_{Si}=0.25} \geq 0.75$



Passive House  
efficiency class

phE

phD

phC

phB

phA

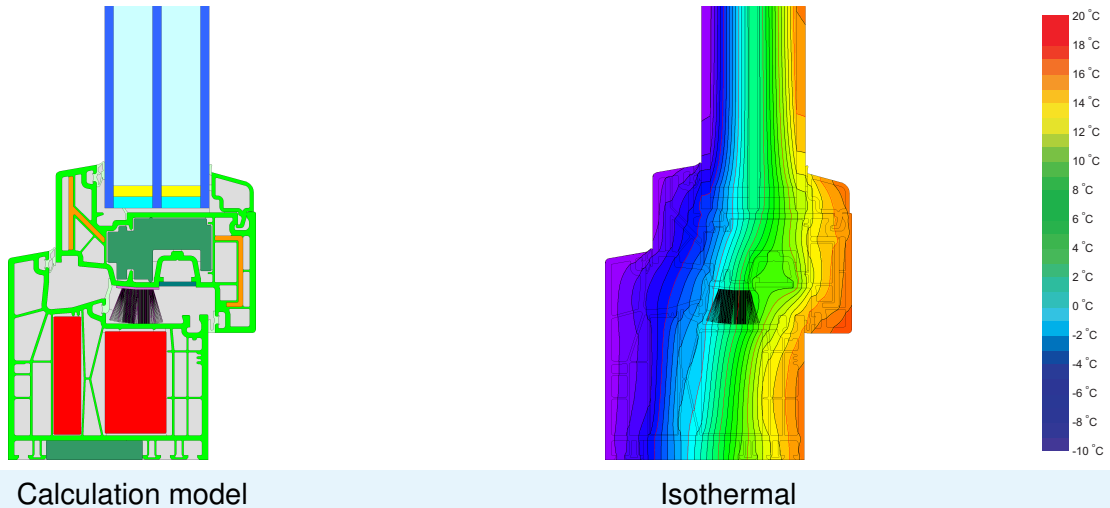
[www.passivehouse.com](http://www.passivehouse.com)

cold climate



**CERTIFIED  
COMPONENT**

Passive House Institute



### Description

Vinyl-frame with fibreglass-composite-reinforcements (0.48 W/(mK)). Aerogel insulation blocks (0.016 W/(mK)) inside the main frame, Graphite Polystyrene insulation (0.031 W/(mK)) inside the rebate. No colour-restrictions. For maximum heights: - White H:2500mm x W:1100mm; Colour H:2350mm x W:1200mm For maximum width: - White or Colour H:1500mm x W:1500mm Pane thickness: 46 mm (4/17/4/17/4), Glass inset: 20 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:

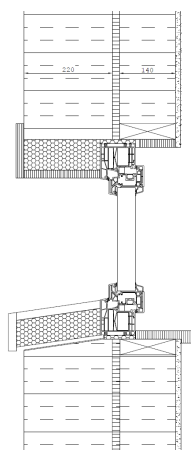
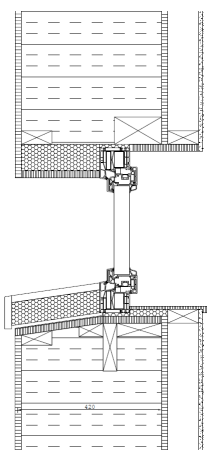
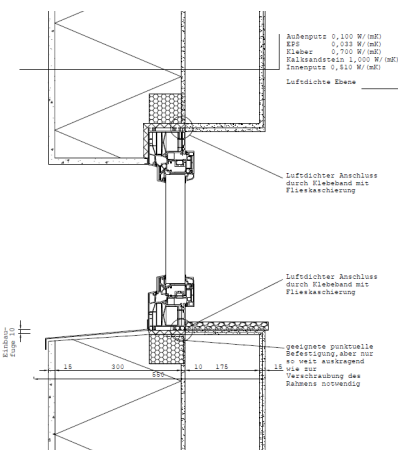
Glazing	$U_g =$	0.52	0.50	0.48	0.46	W/(m <sup>2</sup> K)
		↓	↓	↓	↓	
Window	$U_w =$	0.60	0.59	0.57	0.56	W/(m <sup>2</sup> K)





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 (operable)		Deep stud wall		Exterior insulation and finishing system (EIFS) (operable)	
$U_{\text{Wall}} = 0.09 \text{ W}/(\text{m}^2 \text{ K})$		$U_{\text{Wall}} = 0.08 \text{ W}/(\text{m}^2 \text{ K})$		$U_{\text{Wall}} = 0.11 \text{ W}/(\text{m}^2 \text{ K})$	
					
$\Psi_{\text{install}}$	W/(m K)	$\Psi_{\text{install}}$	W/(m K)	$\Psi_{\text{install}}$	W/(m K)
Top	0.011	Top	0.012	Top	0.009
Side	0.011	Side	0.012	Side	0.009
Bottom	0.024	Bottom	0.042	Bottom	0.029
$U_{W, \text{installed}} = 0.64 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W, \text{installed}} = 0.65 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W, \text{installed}} = 0.64 \text{ W}/(\text{m}^2 \text{ K})$	

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 $f_{Rsi=0.25}$ [-]
Transom 1 casement	(1T1)		136	0.71	0.023	0.77
Bottom	(OB1)		130	0.59	0.022	0.78
Top	(OH1)		130	0.59	0.022	0.78
Lateral	(OJ1)		130	0.59	0.022	0.78
Spacer: Super Spacer Premium			Secondary seal: Butyl			

