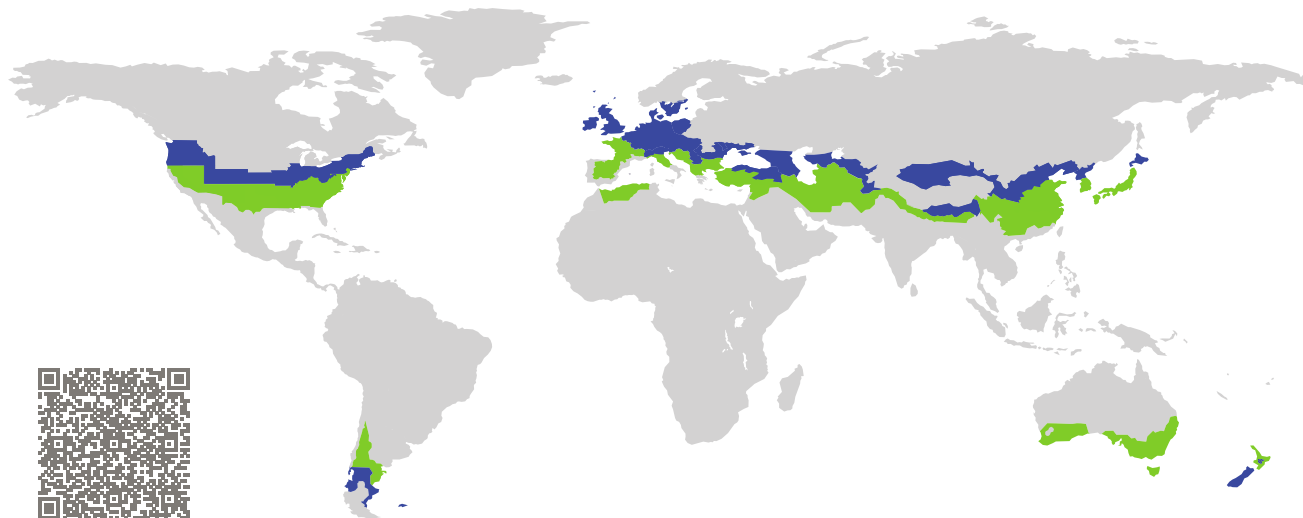


CERTIFICATE

Certified Passive House Component

Component-ID 1756wi03 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

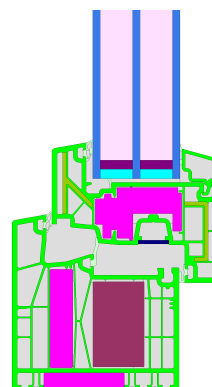


Category: **Window Frame**
Manufacturer: **Innotech Windows & Doors, Inc.,
Langley, BC,
Canada**
Product name: **Defender 88PH+ Pro - T&T Window**

**This certificate was awarded based on the following
criteria for the cool, temperate climate zone**

Comfort $U_W = 0.77 \leq 0.80 \text{ W}/(\text{m}^2 \text{ K})$
 $U_{W, \text{installed}} \leq 0.85 \text{ W}/(\text{m}^2 \text{ K})$
with $U_g = 0.70 \text{ W}/(\text{m}^2 \text{ K})$

Hygiene $f_{R_{si}=0.25} \geq 0.70$



Passive House
efficiency class

phE

phD

phC

phB

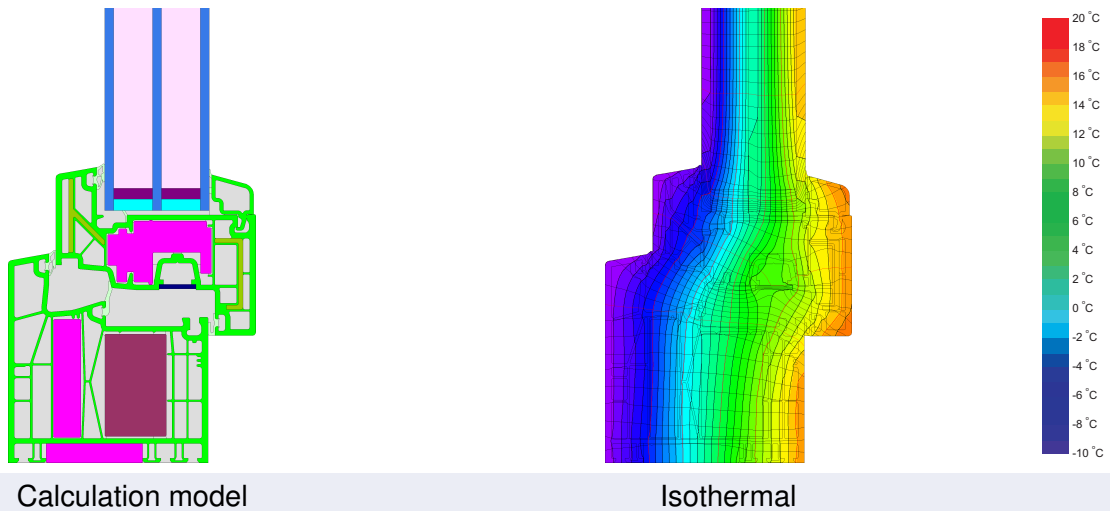
phA

cool, temperate climate



**CERTIFIED
COMPONENT**

Passive House Institute



Description

Vinyl-frame partially filled with EPS (0.032 W/(mK)) and high-density EPS (150kg/m³, 0.041 W/(mK)). No colour-restrictions. For max. dimensions see table in technical documents. Pane thickness: 46 mm (4/17/4/17/4), Glass inset: 18 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 $U_g = 0.70$ W/(m² K). If a higher quality glazing is used, the window U-values will improve as follows:

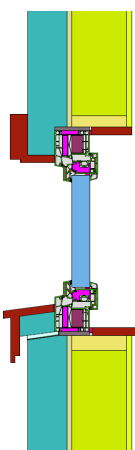
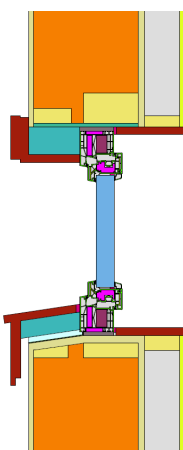
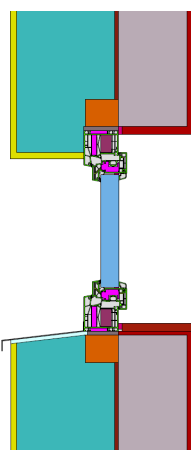
Glazing	$U_g =$	0.70	0.64	0.58	0.54	W/(m ² K)
		↓	↓	↓	↓	
Window	$U_w =$	0.77	0.73	0.69	0.66	W/(m ² K)





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 and passipedia.org.

Validated installations

Lightweight timber (operable)		Deep stud wall		Exterior insulation and finishing system (EIFS) (operable)	
$U_{\text{Wall}} = 0.14 \text{ W}/(\text{m}^2 \text{ K})$		$U_{\text{Wall}} = 0.14 \text{ W}/(\text{m}^2 \text{ K})$		$U_{\text{Wall}} = 0.13 \text{ W}/(\text{m}^2 \text{ K})$	
					
Ψ_{install}	W/(m K)	Ψ_{install}	W/(m K)	Ψ_{install}	W/(m K)
Top	0.004	Top	0.021	Top	0.004
Side	0.004	Side	0.021	Side	0.004
Bottom	0.012	Bottom	0.022	Bottom	0.027
$U_{W,\text{installed}} = 0.78 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W,\text{installed}} = 0.83 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W,\text{installed}} = 0.79 \text{ W}/(\text{m}^2 \text{ K})$	

Frame values		Frame width b_f mm	U -value frame U_f W/(m ² K)	Ψ -glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Mullion 1 casement	(1M1) 	136	0.83	0.023	0.74
Bottom	(OB1) 	130	0.74	0.023	0.75
Top	(OH1) 	130	0.74	0.023	0.75
Lateral	(OJ1) 	130	0.74	0.023	0.75
Spacer: Super Spacer® Premium			Secondary seal: Butyl		

