CERTIFICATE

Certified Passive House Component

ID: 1642rc03 valid until 31. December 2021

Passive House Institute
Dr. Wolfgang Feist
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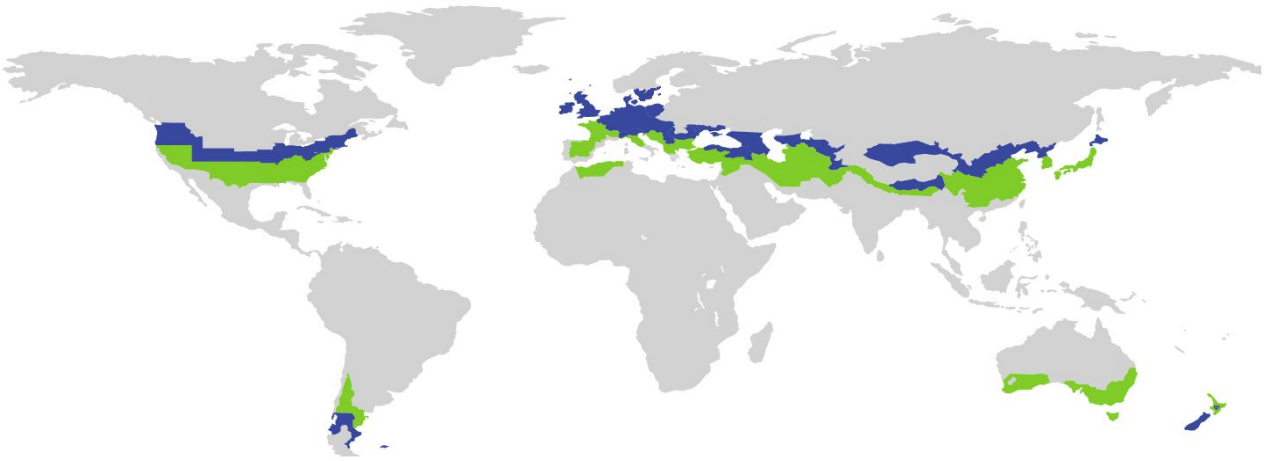
GERMANY



Category	**Roof system | Mixed construction**
Manufacturer	**BEMO Systems GmbH** **Ilshofen-Eckartshausen** **GERMANY**
Product name	**BEMO-Thermohalter Softdach**

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

Hygiene criterion

The minimum temperature factor of the interior surfaces is	$f_{Rsi=0,25m^2K/W} \geq$	**0,70**

Comfort criterion

The U-value of the installed skylight is	$U_{sk,i} \leq$	**1,10** W/(m²K)

Efficiency criteria

Heat transfer coefficient of building envelope	$U^*f_{PHI} \leq$	**0,15** W/(m²K)
Temperature factor of opaque junctions	$f_{Rsi=0,25m^2K/W} \geq$	**0,86**
Thermal bridge-free design for key connection details	$\Psi \leq$	**0,01** W/(mK)

An airtightness concept for all components and connection details was provided

cool, temperate climate

CERTIFIED COMPONENT
Passive House Institute

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Opaque building envelope

The BEMO soft roof system with a standing seam made of aluminum with thermal brackets made of fiberglass-reinforced plastic (0.30 W / mK, E-Rovings Sinorma) and mineral wool insulation and a supporting shell made of steel, provides both weather protection and the requirements for thermal insulation for passive house comfort. The calculations and connection details were carried out with an EIFS for the cool, temperate climate zone (<0.15 W / m²K). Punctual penetrations are determined by 3D-FEM simulation. The system was evaluated according to the criteria of the Passive House Institute for roof systems and is considered suitable for passive house projects in the cool-temperate and warm-temperate climate zone.

Windows

The analysis was carried out for a Lamilux skylight: an openable glass skylight (Usk = 0.97 W / m²K with Ug = 0.71 W / m²K) based on the dimensions 1.5 x 1.5 m. It is installed using an upstand. The calculations show that the installation situations are suitable for the cool, temperate climate zone, without the risk of surface condensation and mold formation.

Airtightness concept

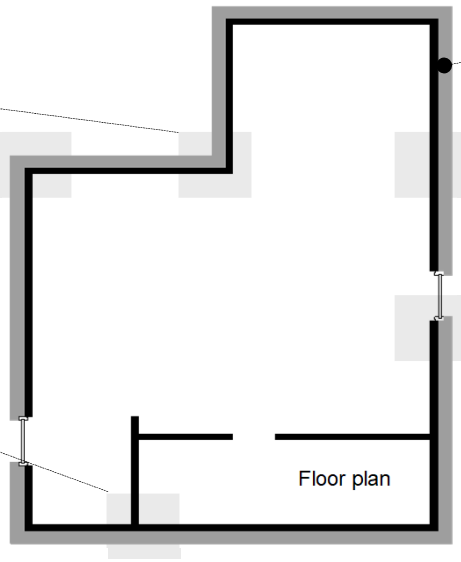
The airtightness is achieved by the following procedure: Skylights with curbs are adapted airtight to the outer roof cladding. Inner surfaces made airtight by applying a vapor barrier to the profiled sheets (supporting shells). Components: BEMO DS 3, cold selfadhesive,fire-load-reduced vapor barrier membrane made of a reinforced aluminum composite film, accessible and penetration-proof, sd value:> 1,500 On rising components, run up to the upper edge of the insulation and fix mechanically if necessary. Absorbent substrates (connection areas) must be pretreated with a primer. Longitudinal seams are to be arranged on the top chord, transverse joints are to be underlaid.

Explanatory notes

The Passive House Institute has defined global component requirements for seven climate zones based on hygiene, comfort and economy criteria. In principle, components that are certified for climates with higher requirements can also be used in climates with lower requirements. This can also be economical in individual cases.

Thermal bridge not calculated
Criteria achieved

Efficieny criteria not achieved
Hygiene or comfort criterion not achieved



EWIC01	
Ext. wall-inner corner	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

EWEC01	
Ext. wall-outer corner	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

EWIW01	
Ext. wall-int. wall	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

EW01	External wall
U [W/(m²K)]	0,128
Thickness [m]	0,465

EWEJ01	
Ext. wall-panel joint	
Ψ [W/(mK)]	
$f_{Rsi=0,25\ m²K/W}$	

WISI	Window side		
Typ	01	02	03
b_f [m]			
U_f [W/m²K]			
Ψ_g [W/mK]			
Ψ_i [W/mK]			
$f_{Rsi=0,25\ m²K/W}$			

ROVE01	
Verge	
Ψ [W//mK]	-0,028
$f_{Rsi=0,25\ m^2K/W}$	0,94

ROIW01	
Roof-internal wall	
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

RWSI01	
Roof window side	
Ψ [W//mK]	0,046
$f_{Rsi=0,25\ m^2K/W}$	0,82

WITO	Window top		
Typ	01	02	03
b_f [m]			
U_f [W/m²K]			
Ψ_g [W/mK]			
Ψ_i [W/mK]			
$f_{Rsi=0,25\ m^2K/W}$			

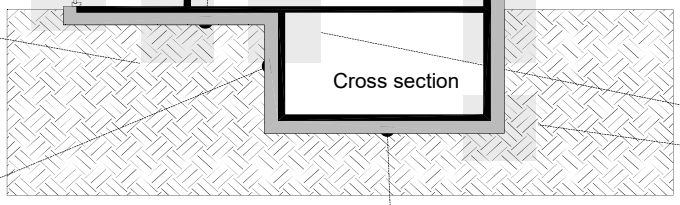
WIBO	Window bottom		
b_f [m]			
U_f [W/m²K]			
Ψ_g [W/mK]			
Ψ_i [W/mK]			
$f_{Rsi=0,25\ m^2K/W}$			
$U_{w,i}$ [W//m²K]			

EWCE01	
Ext. wall-ceiling	
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

WITH01	
Window threshold	
b_f [m]	
U_f [W/m²K]	
Ψ_e [W/mK]	
Ψ_i [W/mK]	
$f_{Rsi=0,25\ m^2K/W}$	
$U_{w,i}$ [W//m²K]	

RO01	Roof
U [W/(m²K)]	0,147
Thickness [m]	0,220

FS01	Fl. slab
U [W/(m²K)]	
Thickness [m]	



BWBC01	Bsmnt w.-bsmnt c.
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

FSIW01	
Fl. slab-int. w.	
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

BWFS01	Bsmnt w.-fl. slab
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

FSBW01	Fl. slab-bsmnt w.
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

BW01	Basement wall
U [W/(m²K)]	
Thickness [m]	

FS02	Fl. slab	U [W/(m²K)]		Thickness [m]	

ROEA01	Eaves
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

RWBO01	Roof window bttm
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

RWTO01	Roof window top
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

RORI01	Ridge
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

FRAW01	
Flat roof-asc. wall	
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

TC01	Cold roof
U [W/(m²K)]	
Thickness [m]	

ROJU01	Junction
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

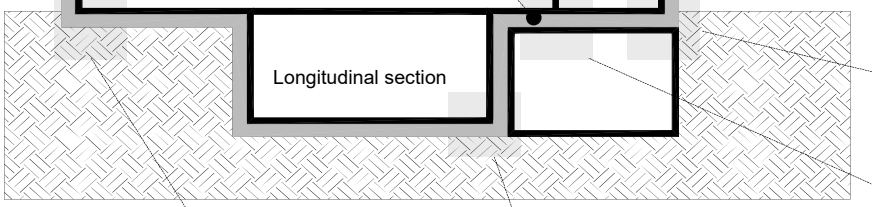
FR01	Flat roof
U [W/(m²K)]	0,147
Thickness [m]	0,220

EO01	Overhang
U [W/(m²K)]	
Thickness [m]	

TCEA01	Cold roof-eaves
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

EWEO01	Ext. wall-overhang
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

BC01	Basement ceiling
U [W/(m²K)]	
Thickness [m]	



EWEO02	Ext. wall-overhang
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

BCEW01	Bsmnt clg-ext. wall
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

FRRP01	Roof parapet
Ψ [W//mK]	-0,028
$f_{Rsi=0,25\ m^2K/W}$	0,94

FSEW01	Fl. slab-ext. wall
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

FSBW02	Fl. slab-bsmnt w.
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	

BCIW01	Bsmnt clg-int. wall
Ψ [W//mK]	
$f_{Rsi=0,25\ m^2K/W}$	