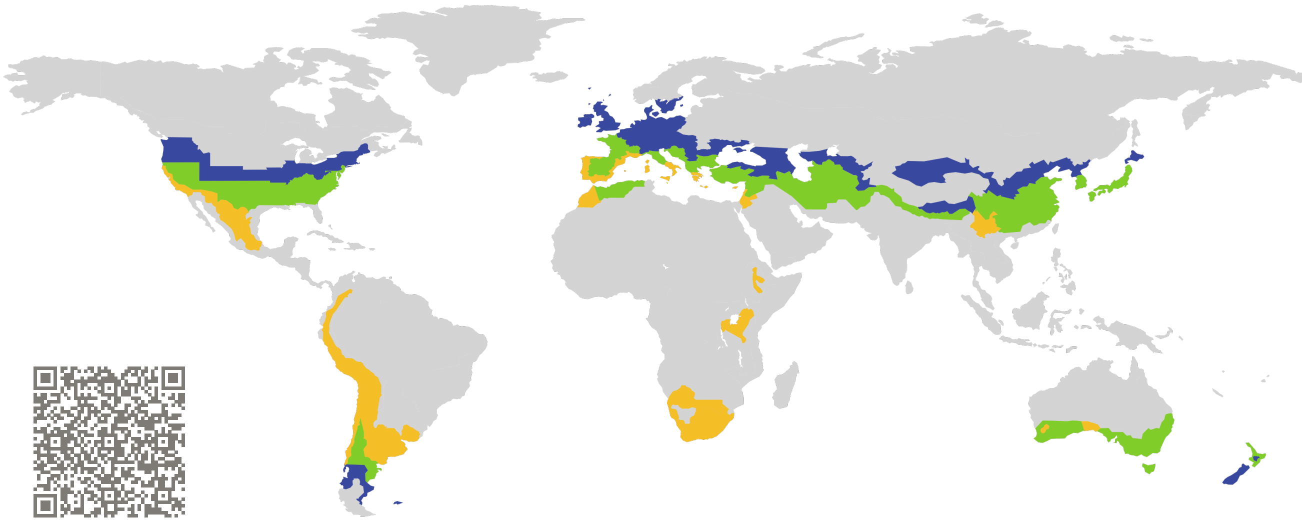
CERTIFICATE

Certified Passive House Component

Component-ID 1505sp03 valid until 31st December 2023

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category: **Spacer for low-E-glazing**

Manufacturer: **Alu-Pro S.r.l, Noale, Italy**

Product name: **Thermix TX Pro**

Type
Plastic with stainless steel foil
Height Box 2
6.85 mm
Thermal conductivity Box 2
0.310 W/(m · K)

This certificate was awarded based on the following criteria:

Depending on the climatic region, the spacer prevents high surface temperatures, which can cause mould. At least 3 out of the 7 reference frames fulfilled the spacer hygiene criteria for the relevant climatic region.

Hygiene $f_{Rsi} \geq 0.70$

The specific resistance of the spacer's edges is greater than the climate-independent minimum requirement.

Efficiency $R_E = 3.40\,\text{m} \cdot \text{K/W} \geq 1.50\,\text{m} \cdot \text{K/W}$

cool, temperate climate

phB

CERTIFIED COMPONENT

Passive House Institute

Passive House efficiency class	phE	phD	phC	phB	phA	phA+

Alu-Pro S.r.l
Via A. Einstein 8, Z.I., 30033 Noale, Italy
☎ +39 041 5897311 | ✉ alupro@alupro.it | http://www.alupro.it |

Description

Spacer based on Polypropylen, thickness 0,5-0,9 mm with 0,09 mm stainless steel vapor barrier and 2 special wires.

Spacer height:	6.85 mm
Thermal conductivity:	0.310 W/(m · K) (WA-17/1 measured)
Available spacer widths:	8, 10, 12, 13, 14, 15, 16, 18, 20, 22 and 24 mm

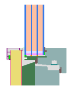
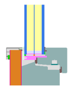
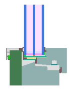
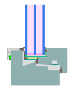
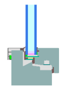
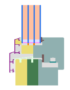
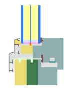
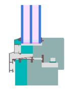
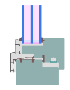
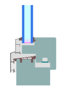
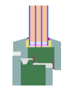
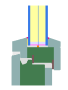
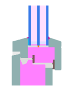
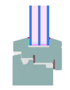
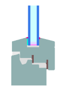
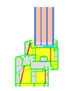
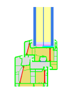
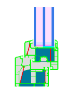
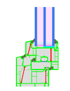
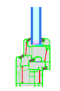
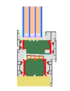
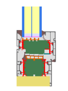
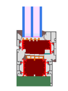
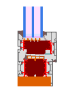
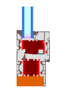
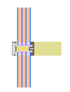
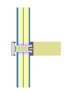
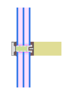
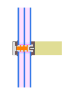
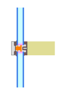
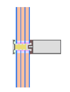
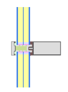
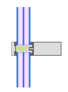
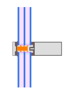
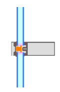
Appropriate secondary seal	Specific edge resistance R_E	Efficiency class
Polysulfide	3.40 m · K/W	phB
Polyurethane	3.40 m · K/W	phB
Silicone	3.60 m · K/W	phB
Hotmelt Butyl	4.10 m · K/W	phB

Explanation

Spacers are categorized into different efficiency classes based on the resistance of their edges R_E. A secondary polysulfide sealant is typically used, unless the spacer is not approved for polysulfide. A detailed report with the calculations is available from either the manufacturer or the Passive House Institute.
The Passive House Institute has defined global component requirements for seven climate regions. In principle, components that have been certified for climates with higher requirements can also be used in climates with lower requirements. This may be economically advantageous.

Use in PHPP:
If individually calculated values are not available then the thermal bridge loss coefficient specified in this document can be used. In this case, the appropriate reference frame must be selected and a 10 % safety margin should be applied.

Further information regarding certification is available
on www.passivehouse.com and www.passipedia.org .

Reference frames calculated with Polysulfide					
Climate	Arctic	Cool	Cool temperate ✓	Warm temperate ✓	Warm ✓
Glass	Quadruple	Triple	Triple	Triple	Double
Glass package	4/12/3/12/3/12/4	6/18/2/18/6	6/16/6/16/6	6/16/6/16/6	6/16/6
Glass U-value	0.35 W/(m^2 · K)	0.52 W/(m^2 · K)	0.70 W/(m^2 · K)	0.70 W/(m^2 · K)	1.20 W/(m^2 · K)
Timber-aluminium integral frame					
U_f [W/(m^2 · K)]	0.48	0.62	0.73	0.87	1.03
Ψ_g [W/(m · K)]	0.037	0.040	0.039	0.038	0.043
f_{Rsi} [-]	0.77	0.73	0.70 ✓	0.68 ✓	0.58 ✓
Timber-aluminium					
U_f [W/(m^2 · K)]	0.54	0.57	0.75	0.97	1.19
Ψ_g [W/(m · K)]	0.040	0.043	0.042	0.041	0.048
f_{Rsi} [-]	0.73	0.73	0.67	0.64	0.52
Timber					
U_f [W/(m^2 · K)]	0.51	0.53	0.78	0.86	0.99
Ψ_g [W/(m · K)]	0.035	0.039	0.039	0.038	0.043
f_{Rsi} [-]	0.75	0.74	0.71 ✓	0.71 ✓	0.60 ✓
Vinyl					
U_f [W/(m^2 · K)]	0.70	0.75	0.82	1.02	1.16
Ψ_g [W/(m · K)]	0.041	0.043	0.044	0.045	0.050
f_{Rsi} [-]	0.76	0.73	0.71 ✓	0.70 ✓	0.59 ✓
Aluminium					
U_f [W/(m^2 · K)]	0.60	0.61	0.71	0.73	1.17
Ψ_g [W/(m · K)]	0.043	0.048	0.049	0.049	0.055
f_{Rsi} [-]	0.77	0.76 ✓	0.74 ✓	0.74 ✓	0.61 ✓
Curtain wall timber					
U_f [W/(m^2 · K)]	0.60	0.65	0.66	0.71	1.11
Ψ_g [W/(m · K)]	0.056	0.056	0.058	0.057	0.069
f_{Rsi} [-]	0.71	0.70	0.67	0.67 ✓	0.63 ✓
Curtain wall aluminium					
U_f [W/(m^2 · K)]	0.67	0.73	0.75	0.79	1.33
Ψ_g [W/(m · K)]	0.067	0.066	0.070	0.069	0.094
f_{Rsi} [-]	0.80 ✓	0.78 ✓	0.76 ✓	0.79 ✓	0.64 ✓