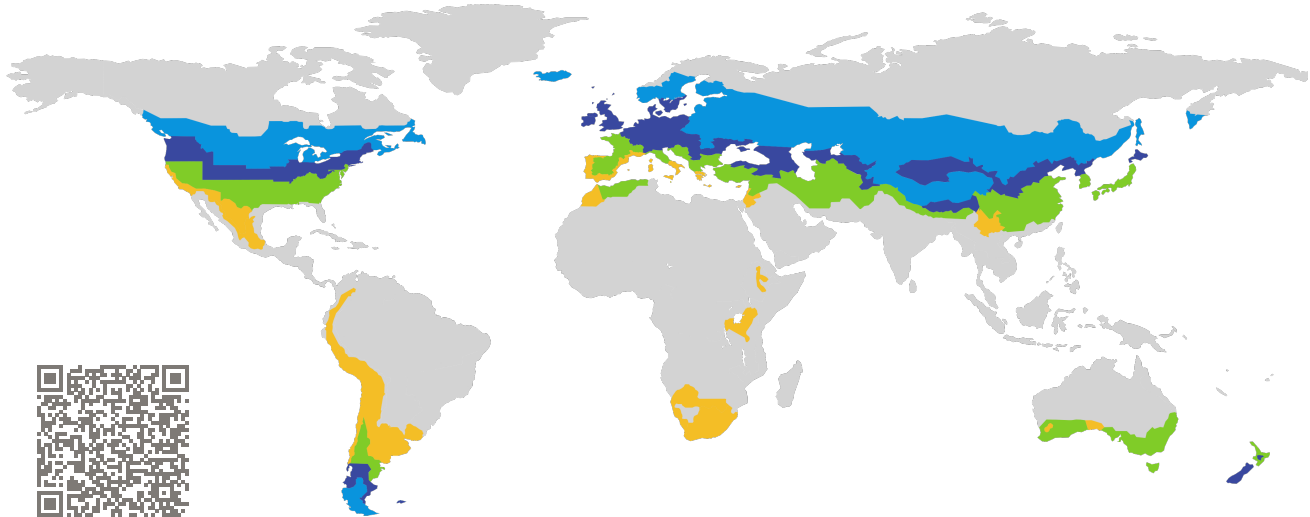


# CERTIFICATE

Certified Passive House Component

Component-ID 1181sp02 valid until 31st December 2018

Passive House Institute  
Dr. Wolfgang Feist  
64283 Darmstadt  
Germany



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

Manufacturer: **Alu-Pro,  
Noale,  
Italy**

Product name: **CHROMATECH ultra F**

## 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  $f_{Rsi} \geq 0.75$

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

Efficiency  $R_E = 3.77 \text{ m K/W} \geq 1.50 \text{ m K/W}$

Type
Plastic with stainless steel
Height Box 2
6.90 mm
Thermal conductivity Box 2
0.28 W/(m K)

Passive House  
efficiency class

phE

phD

phC

phB

phA

phA+

cold climate



**CERTIFIED  
COMPONENT**

Passive House Institute

## Alu-Pro

Via A. Einstein 8, Z.I., 30033 Noale, Italy

☎ +39 041 5897311 | ✉ alupro@alupro.it | 🌐 <http://www.alupro.it> |

### Description

Spacer Bar in stainless steel (0.10 mm combined with a special Plastic Top).

Spacer height: 6.90 mm

Thermal conductivity: 0.28 W/(m K) (WA 17/1, Hochschule Rosenheim / ift Rosenheim)

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	3.77 m K/W	phB
Polyurethane	4.39 m K/W	phB
Silicone	3.95 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](http://www.passivehouse.com) and [www.passipedia.org](http://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 <sup>2</sup> K)	0.52 W/(m <sup>2</sup> K)	0.70 W/(m <sup>2</sup> K)	0.70 W/(m <sup>2</sup> K)	1.20 W/(m <sup>2</sup> K)
Timber-aluminium integral frame					
$U_f$ [W/(m <sup>2</sup> K)]	0.48	0.62	0.73	0.87	1.03
$\Psi_g$ [W/(m K)]	0.033	0.036	0.035	0.034	0.039
$f_{Rsi}$ [-]	0.79	0.75 ✓	0.71 ✓	0.69 ✓	0.59 ✓
Timber-aluminium					
$U_f$ [W/(m <sup>2</sup> K)]	0.54	0.57	0.75	0.97	1.19
$\Psi_g$ [W/(m K)]	0.036	0.038	0.037	0.037	0.043
$f_{Rsi}$ [-]	0.75	0.72	0.68	0.65 ✓	0.53
Timber					
$U_f$ [W/(m <sup>2</sup> K)]	0.51	0.53	0.78	0.86	0.99
$\Psi_g$ [W/(m K)]	0.031	0.035	0.035	0.035	0.039
$f_{Rsi}$ [-]	0.77	0.76 ✓	0.72 ✓	0.72 ✓	0.62 ✓
Vinyl					
$U_f$ [W/(m <sup>2</sup> K)]	0.70	0.75	0.82	1.02	1.16
$\Psi_g$ [W/(m K)]	0.036	0.039	0.039	0.040	0.045
$f_{Rsi}$ [-]	0.77	0.75 ✓	0.72 ✓	0.72 ✓	0.60 ✓
Aluminium					
$U_f$ [W/(m <sup>2</sup> K)]	0.60	0.61	0.71	0.73	1.17
$\Psi_g$ [W/(m K)]	0.038	0.042	0.042	0.043	0.049
$f_{Rsi}$ [-]	0.78	0.78 ✓	0.75 ✓	0.75 ✓	0.62 ✓
Curtain wall timber					
$U_f$ [W/(m <sup>2</sup> K)]	0.60	0.65	0.66	0.71	1.11
$\Psi_g$ [W/(m K)]	0.042	0.042	0.044	0.044	0.055
$f_{Rsi}$ [-]	0.76	0.74	0.71 ✓	0.71 ✓	0.58 ✓
Curtain wall aluminium					
$U_f$ [W/(m <sup>2</sup> K)]	0.67	0.73	0.75	0.79	1.33
$\Psi_g$ [W/(m K)]	0.049	0.052	0.052	0.052	0.074
$f_{Rsi}$ [-]	0.84 ✓	0.82 ✓	0.80 ✓	0.80 ✓	0.68 ✓

