

## Environmental protection Cost-effectiveness

Lower heat requirements through better insulation – SWISSPACER saves energy. This benefits the environment in several ways. Unneeded energy must not be extracted, transported, supplied and processed. This not only saves resources but also decreases the level of CO<sub>2</sub> emissions in these areas. Moreover, by being 100% recyclable, SWISSPACER benefits not only the environment in terms of production but also later, in terms of disposal.

SWISSPACER is cost-effective in two ways. On the one hand, no investment (or only minor investment) is necessary for manufacturing. On the other hand, the consumer's pay-back time is only 5 years or so on average. With rising energy costs, this time period is reduced even further. Thus the use of SWISSPACER represents a very sensible investment in terms of energy conservation, comfort, aesthetics and environmental protection.



## Contact

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## THE "WARM EDGE" FOR INSULATING GLASS



**FULL RANGE:**  
 • 8–27 mm • 17 colors  
 • matching Georgian bars

## ENERGY SAVING BEST THERMAL VALUES

## COMFORT HIGHEST SURFACE TEMPERATURES

## AESTHETICS PERFECT DESIGN



At low temperatures, condensation develops on windows along the edges of the glass panes. By using SWISSPACER or SWISSPACER V, the risk of condensation building up is significantly reduced as compared to the use of aluminium spacer bars. Taking wooden windows as an example: when aluminium spacers are used and with an outside temperature less than -1 °C under consistent temperature boundary conditions, condensation begins to form. By integrating SWISSPACER V, condensation only forms when outside temperatures drop to less than -10 °C.

## A company of the Saint-Gobain Group

As a company of GLASSOLUTIONS Saint-Gobain, the leading network of glass fabricators in Europe, SWISSPACER has access to global knowledge transfer and innovations on an international level. Since the firm's establishment in 1998, our products have been convincing consumers

due to outstanding technical and aesthetic characteristics. With the SWISSPACER spacer system – engineered in Switzerland – we are your high-performance partner for the future. By offering these products, we not only contribute our part to climate protection but are also able to lower heating costs.

## New version Caluwin 4

With Caluwin 4, we provide you with a high-quality calculation program – absolutely free of charge! You can use it not only to compute the thermal conductivity coefficient  $U_w$  of a window based on the latest standards, glass data and technical specifications, but also the dew point – for double as well as for triple glazing, up to  $U_g$  0.4 W/m<sup>2</sup>K for triple glazing.

The computation of façades is carried out in accordance with EN 13947:2007,

and along with the component method now also offers the simplified computation method. Updated Psi values, calculated by Prof. Franz Feldmeier (UAS Rosenheim) in accordance with EN 10077, allow calculations for façade post-and-beam systems, as well as special designs, e.g. glass butts or structural glazing constructions. This enables you to compute the most current  $U_{cw}$  values for nearly any type of façade.



**SWISSPACER®**  
 engineered in Switzerland

CONAMA • Cologne  
 GB • 04.2011 • Data subject to change.  
 SWISSPACER is a registered trademark.

# THE NO.1 FOR EVERY WINDOW



## Product variety

SWISSPACER sets optimal visual accents – from bold yellow to discreet grey.

Titanium grey RAL 9023	Black RAL 9005	White RAL 9016	Sapphire blue RAL 5003	Light brown RAL 8003	Light grey RAL 7035
Dark brown RAL 8014	Sulphur yellow RAL 1016	Yellow-green RAL 6018	Opal green RAL 6026	Brown green RAL 7013	Beige RAL 1001
Beige brown RAL 1011	Pastel yellow RAL 1034	Grass green RAL 6010	Light ivory RAL 1015	Red brown RAL 8012	Further colours available upon request

Similar to RAL tones

1. SWISS RE Tower in London with SWISSPACER V, built in 2003
2. Turning Torso in Malmö with SWISSPACER, built in 2005
3. BV Heiligendamm in Rostock with SWISSPACER, built in 2002
4. BAUMANN Wintergarten GmbH, Stockheim (GER), image owner: Saint-Gobain Glass Deutschland GmbH, architect: unknown, photo: Stefan Diller
5. LISEC bending system, image owner: LISEC Maschinenbau GmbH
6. Forming process using the SWISSPACER bending system, producer: SEVA
7. Roweldo automated frame welding machine from R & R, image owner: R & R Sondermaschinen GmbH
8. HSBC Canary Wharf in London, architect: Foster & Partners

## The best product on the market by quite an “edge”

### Energy saving

Lower heating costs through better insulation: the thermally improved spacer SWISSPACER V excels with an optimised heat transfer resistance. The heat transmission coefficient is at least 0.1 W/m<sup>2</sup>K lower than that of conventional aluminium spacer bars. Reductions of up to 0.3 W/m<sup>2</sup>K can even be attained. The result: the high tech spacer bar SWISSPACER V enables heating costs to be reduced by up to 5%. That's easy on the wallet, and with reduced CO<sub>2</sub> emissions, also on the environment.

### Comfort

Due to the superior isolation characteristics of SWISSPACER V, higher temperatures are maintained at the edges of glass panes – significantly reducing the risk of condensation forming. This, in turn, reduces the build-up of harmful mould and mildew on the window. Higher temperatures at the edge of the pane also mean less cold radiation, ensuring more comfort inside and a healthy indoor climate.

### Aesthetics

The high-quality plastic of SWISSPACER in combination with a unique colour range means you can design each window and any façade to perfectly suit your tastes. The attractive look brings a velvety, matt finish, without any shiny metal effects.

Material	Thermal conduction [W/mK]
Aluminium	160
Stainless steel	15
Float glass	1
SWISSPACER	0.16

Table 1

## You have the choice

### Physical characteristics

SWISSPACER is a thermally optimised spacer bar made from a highly insulating composite plastic. Extremely thin metal membranes, consisting of either aluminium or stainless steel, guarantee both leak tightness for the filling gases and water vapour and an excellent adhesion for all insulation glass sealing compounds. SWISSPACER is mechanically and thermally resistant up to constant temperatures of 100 °C.

### Bended corners

With the new bending system for SWISSPACER you have the opportunity to combine automation and aesthetics in insulated glass production with a small amount of investment.



### Plugged corners

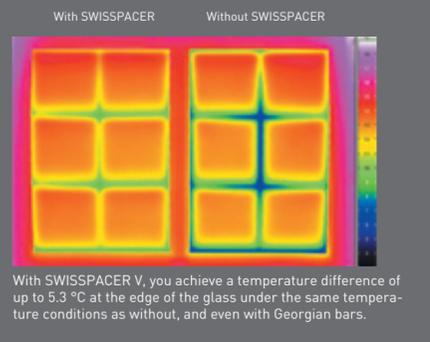
With corner keys, you can immediately begin using the SWISSPACER without any investment whatsoever. Models with flexible corner keys are always possible.



## What is a “Warm Edge”?

At the edge bonds, a “gap” is created between the double glazing panes with the help of spacers. This creates a space filled with inert gas or air between the glass panes, a key factor for the insulating efficiency of the glazing. The spacers create a linear thermal bridge of considerable length within the window component. When metal profiles are used, thermal heat is more or less released into the atmosphere – along the entire transition area between glass and window frame.

This loss is not only reflected in a building's energy balance, but also leads to a cooling of the inside surface temperature along the glass edge – i.e. the edge becomes cold. If the surface temperature sinks below the dew point temperature of the surrounding air, condensation will develop – a comfort and hygiene flaw which consumers frequently object to. Apart from the health risks posed to residents, long-term condensation can also cause damage to the window frame.



With SWISSPACER V, you achieve a temperature difference of up to 5.3 °C at the edge of the glass under the same temperature conditions as without, and even with Georgian bars.

SWISSPACER – product range			
Types	SWISSPACER with aluminium membrane	SWISSPACER V with stainless steel membrane	Georgian bars
Dimensions	Widths for double glazing cavity: 8, 10, 11, 12, 14, 15, 16, 18, 20, 22, 24 and 27 mm		7.5/9.5/11.5 mm x 20 mm 7.5/9.5/11.5 mm x 24 mm 7.5/9.5/11.5 mm x 30 mm
	Overall height: 6.5 mm		
	Length: 5.1 m, 6 m		
Accessories	Corner keys (90° or flexible) in the same colour as the profile type, all widths		
	Cross connectors for Georgian bars		
	Stoppers for Georgian bars		
	Steel longitudinal connectors: 8, 10, 12, 14, 15, 16, 18 and 20 mm		
	Corner keys for manual gas filling: 10, 12, 14, 16, 18 and 20 mm (including plugs)		

Table 2

## Thermotechnical data

SWISSPACER – thermic performance in different types of window								
Spacer system	Double glazing				Triple glazing			
	Aluminium	Stainless steel	SWISSPACER	SWISSPACER V	Aluminium	Stainless steel	SWISSPACER	SWISSPACER V
Wooden frames: Frame value: U <sub>f</sub> = Glass value: U <sub>g</sub> =	1.4 W/m <sup>2</sup> K 1.1 W/m <sup>2</sup> K				1.4 W/m <sup>2</sup> K 0.7 W/m <sup>2</sup> K			
Psi value [W/mK]	0.081	0.053	0.047	0.032	0.086	0.052	0.046	0.031
Window, U <sub>w</sub> 1-sash [W/m <sup>2</sup> K]	1.4	1.3	1.3	1.3	1.1	1.0	1.0	1.0
Window, U <sub>w</sub> 2-sash [W/m <sup>2</sup> K]	1.5	1.4	1.4	1.3	1.3	1.2	1.1	1.1
Minimal surface temperature* [°C]	6.5	9.2	10.0	11.2	8.2	11.2	11.7	13.2
PVC windows: Frame value: U <sub>f</sub> = Glass value: U <sub>g</sub> =	1.2 W/m <sup>2</sup> K 1.1 W/m <sup>2</sup> K				1.2 W/m <sup>2</sup> K 0.7 W/m <sup>2</sup> K			
Psi value [W/mK]	0.077	0.051	0.045	0.034	0.075	0.048	0.042	0.032
Window, U <sub>w</sub> 1-sash [W/m <sup>2</sup> K]	1.3	1.3	1.2	1.2	1.0	1.0	1.0	0.9
Window, U <sub>w</sub> 2-sash [W/m <sup>2</sup> K]	1.4	1.3	1.3	1.3	1.2	1.1	1.0	1.0
Minimal surface temperature* [°C]	7.7	10.2	10.7	12.0	9.0	11.5	12.0	13.0
Wood-aluminium windows: Frame value: U <sub>f</sub> = Glass value: U <sub>g</sub> =	1.4 W/m <sup>2</sup> K 1.1 W/m <sup>2</sup> K				1.4 W/m <sup>2</sup> K 0.7 W/m <sup>2</sup> K			
Psi value [W/mK]	0.092	0.058	0.052	0.035	0.097	0.058	0.051	0.033
Window, U <sub>w</sub> 1-sash [W/m <sup>2</sup> K]	1.4	1.3	1.3	1.3	1.2	1.1	1.0	1.0
Window, U <sub>w</sub> 2-sash [W/m <sup>2</sup> K]	1.6	1.4	1.4	1.3	1.3	1.2	1.2	1.1
Minimal surface temperature* [°C]	5.0	8.2	9.0	10.5	7.2	10.5	11.0	12.5
Aluminium windows: Frame value: U <sub>f</sub> = Glass value: U <sub>g</sub> =	1.6 W/m <sup>2</sup> K 1.1 W/m <sup>2</sup> K				1.6 W/m <sup>2</sup> K 0.7 W/m <sup>2</sup> K			
Psi value [W/mK]	0.111	0.068	0.060	0.039	0.111	0.063	0.056	0.034
Window, U <sub>w</sub> 1-sash [W/m <sup>2</sup> K]	1.5	1.4	1.4	1.3	1.2	1.1	1.1	1.1
Window, U <sub>w</sub> 2-sash [W/m <sup>2</sup> K]	1.7	1.5	1.5	1.4	1.5	1.3	1.3	1.2
Minimal surface temperature* [°C]	7.2	10.2	10.7	12.0	9.2	12.2	12.7	14.0

The technical values were determined in accordance with ift guideline WA-08/1 “Thermally Optimised Spacers – Part 1: Determining the Representative Psi Value for Window Frame Profiles”.

Psi value: linear heat conductivity at edge of glass [W/mK] to satisfy EN ISO 10077-2, 10/2003  
\* corresponds to the edge conditions set out in EN 10077  
Outside temperature T<sub>a</sub>: -5°C  
Inside temperature T<sub>i</sub>: +20°C

Window geometry  
Total surface: (1.23 x 1.48 m)  
Frame surface:  
Length of glass edge:

Window, 1 sash:  
A<sub>w</sub>=1.82 m<sup>2</sup>  
A<sub>f</sub>=0.55 m<sup>2</sup>  
l<sub>g</sub>=4.54 m

Window, 2 sashes:  
A<sub>w</sub>=1.82 m<sup>2</sup>  
A<sub>f</sub>=0.69 m<sup>2</sup>  
l<sub>g</sub>=6.84 m

Table 3