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SGG **VARIO**

European patent EP 0628672



Double glazing system with mechanical restraint

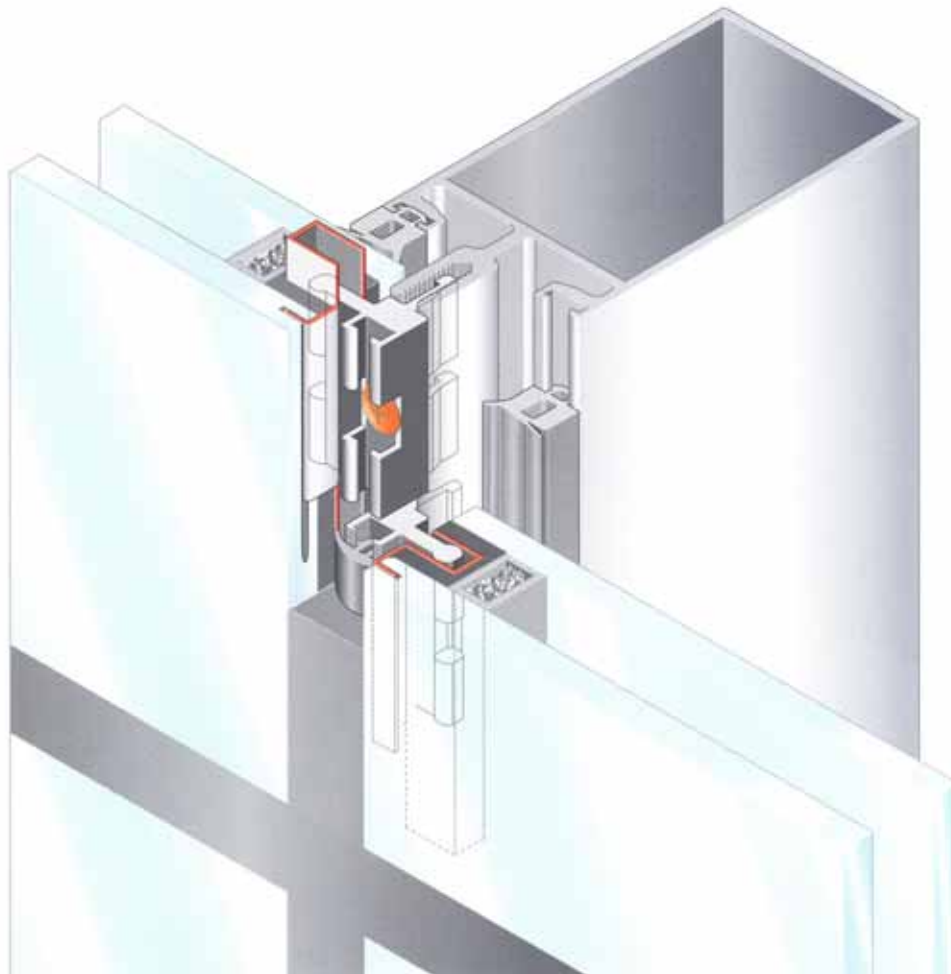
1. General

SGG **VARIO** is a patented double-glazing system with the typical appearance of a complete glass facade. The glazed elements are fixed back to the facade structure, using integrated channels. The glass is held back to the inner gasket by means of this connection. The system channels achieve both mechanical restraint and safety of the outer sheet against failure of the seal, through state of the art technology. These types of construction often require local authority approval - if necessary this must be obtained by the facade contractor.

Applications:

- Glass facades
- Strip windows
- Entrances and portal constructions
- Staircores
- Connection walkways
- Atria

System drawing:



Double glazing system with mechanical restraint



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Drugstore Douglas, Linz

Architect: Riepl-Riepl

Photography: Trizeps



Double glazing system with mechanical restraint

2. Technical information

The safety philosophy

Mechanical restraint of the outer sheet

The outer sheet is structurally bonded to the inner sheet as with "typical" SSG systems.
The mechanical restraint of the outer sheet is a common requirement of building authorities to avoid any "fallout", should the structural seal ever fail.
There are two options available in the evaluation and performance of the restraints.

Performance of the mechanical restraint

SGG VARIO S-FOR

Should the structural seal fail, the integrated Vario-channels act as breakage points in mechanical overloading.

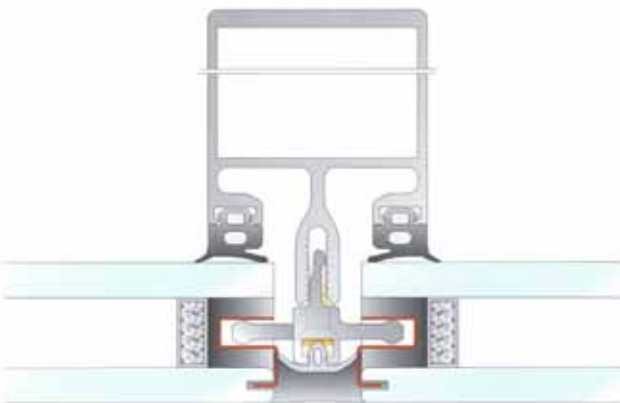
The safety glass characteristics of the outer sheet forces it to shatter into small pieces. Danger of injury from complete sheets of falling glass is avoided - the inner sheet remains held in the frame.

This application uses 4 Vario-channels per unit.

SGG VARIO DZ

Should the structural seal fail, the integrated Vario-channels are designed to withstand all normal loads with a 1,1 Factor of Safety, without allowing the outer sheet to fail.

The number of Vario-channels is determined on a project-specific basis, depending on the prevailing loads.



3. Notes regarding the sub-frame

Fixed glazing

SGG VARIO all curtainwalling systems.
The drawings shown are based on the SCHÜCO FW 50 System for fixed glazing.
The necessary connections to the sub-frame are to be provided by others

Opening Vents

Opening vents are possible to use as in typical SSG - systems - such as SCHÜCO FW 50+SG.

Following preliminary design of the facade subframe, it is necessary to determine the actual amount of system channels required.



Municipal Building Hartberg
Architect: kreuz&quer
Photography: Croce&wir

Double glazing system with mechanical restraint

4. Thermal Insulation

Improvement using Swisspacer-V (SS-V)

Conventional U-values of glazing are normally considered without influences of the edge condition of the glass element and frame.

In order to document an improvement in the thermal insulation performance of a facade, it is necessary to take the facade construction into account

An actual evaluation of our system is possible through EN ISO 10077 (provisional version 1999).

This allows evaluation of the improvement of the energy transmission value of the facade (U_w-Value) using Swisspacer V in comparison to conventional aluminium spacer bars.

Energy transmission value of the facade (U_w-Value) in W/m² K

Element size 123 x 148 cm, standard composition

	It. DIN ISO 10211-1	It. EN ISO 10077-2 (U _w -Value)		Improvement U _w -Value in W/m ² K
	U _v -glass in W/m ² K	Spacer Bar Aluminium	Swispacer V	
SGG VARIO	1,4	1,9 ¹⁾	1,7 ¹⁾	0,2 ¹⁾

¹⁾ The above data takes all influences of restraints, joint geometry and sub-frame into consideration.

Calculation programmes from Prof. Feldmaier, in accordance to EN ISO 10077 are available for project specific evaluation of U_w-Values for facades.

5. SGG VARIO glass standard composition

SGG VARIO S-FOR and SGG VARIO DZ

Outer sheet: 8 mm SECURIT, edges polished
 Cavity: 16 mm air filled Swisspacer V (SS-V) black
 Inner sheet: 6 mm SECURIT Planitherm Futur

Dimensions:

Fixed glazing:
 Standard: max. 180 x 360 cm
 Special: max. 180 x 420

Opening vents:
 Dependant on the type of frame construction chosen
 (e.g. SCHÜCO FW 50+SG element)
 max. 175 x 175 cm, max. weight 100 kg
 min. 87 x 82 cm

Double glazing system with mechanical restraint

6. Recommended glass compositions

SGG VARIO CLIMAPLUS ACOUSTIC

Type	Composition	RW, p ¹⁾	Uv-Value/m ² K ²⁾	Improvement with Swisspacer - V
WS-L 30/39	8-16-6	39 dB	1,4	0,2
WS-L 32/40	10-16-6	40 dB	1,4	0,2
WS-L 38/41	12-16-10	41 dB	1,4	0,2

SGG VARIO CLIMAPLUS SILENCE

Type	Composition	RW, p ¹⁾	Uv-Value/m ² K ²⁾	Improvement with Swisspacer - V
WS-L 32/42	8-16-8 VSG SI	42 dB	1,4	0,2
WS-L 34/44	10-16-8 VSG SI	44 dB	1,4	0,2
WS-L 36/45	12-16-8 VSG SI	45 dB	1,4	0,2
WS-L 38/46	12-16-10 VSG SI	46 dB	1,4	0,2

¹⁾ RW, p = weighted noise reduction value (dB)

²⁾ Uv-Value = W/m²K according to DIN ISO 10211-1

SGG VARIO SOLAR CONTROL - STANDARD COMPOSITION

Type	LT%	LR%	g-Value	Uv-Value/m ² K (TET)	Improvement with Swisspacer - V
Neutral 69/48	69	9	0,48	1,5	0,2
Silver 54/44 V	56	34	0,42	1,4	0,2
Sea green 47/29 V	43	31	0,25	1,4	0,2
Saphir 47/30 V	43	20	0,26	1,4	0,2
Hell bronze 38/36 V	39	34	0,33	1,4	0,2
Gold bronze 35/32 V	37	35	0,30	1,4	0,2
Blue 47/38 V	40	7	0,32	1,4	0,2
Green 61/40 V	57	9	0,32	1,4	0,2
Blau 35/30 V	30	31	0,22	1,4	0,2
Blau 35/31 V	30	13	0,24	1,4	0,2
Silver grey 44/31	44	32	0,30	1,4	0,2
Neutral blue 44/32	44	22	0,31	1,4	0,2

LT = Light Transmission
LR = Light Reflection (to external)

TET = Total Energy Transmission
Uv-Value = W/m²K according to DIN ISO 10211-1

Double glazing system with mechanical restraint



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Passage Kaufhaus, Linz

Architect: Goethestraße, Linz

Photography: Trizeps

SGG VARIO - Extract from Reference list:

Project:

Synagoge Graz
Passage Kaufhaus, Linz

Megaplex, St.Pölten
Parfumerie Douglas, Linz
Remise Ottakring, Wien
Cityplex, Wien
Interspar, Graz
Interspar, Steyr
Bergschlössl, Linz
ESG-Center, Linz
HTBLA, Ferlach
LKH Graz West
LISA Bundesschulzentrum Auhof, Linz
Sport Eybl, Linz
LKH Fürstenfeld
RZB Haus
Fliegerhorst Zeltweg
Bundesoberstufenrealgymnasium, Wien 3.
Casino Innsbruck
Bezirkshauptmannschaft Hartberg
Flughafen Graz

Frankfurter Welle
KPMG, Leipzig
Volksbank Dortmund

Gresham Street, London (Roof)
280 Bishopgate, London (Facade)

Warsaw Tower
NBC, Budapest
Darex, Prag

Architect:

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Architekten Goethestraße
Franz Kneidinger
Schwaighofer
Riepl-Riepl
Ernst Kopper
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Karl Langer
Stefan Hübner
Stefan Hübner
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ECKELT MORE THAN GLASS

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08/2000