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ETA-05/0114
of 10 March 2020

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General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Product family
to which the construction product belongs

Structural Sealant Glazing Kit - Infill Elements / Facade
Construction

Manufacturer

Schüco International KG (for the system)
Karolinenstraße 1-15
33609 Bielefeld
DEUTSCHLAND

Manufacturing plant

see Annex E

This European Technical Assessment
contains

47 pages including 6 annexes with 41 pages which form
an integral part of this assessment

This European Technical Assessment is
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No 305/2011, on the basis of

EAD 090035-00-0404

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Specific part

1 Technical description of the product

This European Technical Assessment covers the infill elements for glass façades with the trade names "System Schüco FWS 50/60 SG and FWS 50/60 SG.SI" for insulating glass units and in addition for bonding a single glass pane to a profile. The insulating glass units are fastened punctually to a mullion-transom system. For that purpose retaining devices, which are fixed to the supporting construction, grip into a U-profile which is glued into the insulating glass edge. The insulating glass units may consist of two or three glass panes. The U-profile is inserted in the insulating glass edge next to the inner pane. Different types of U-profiles are applicable. The outer panes are borne via the structural sealant of the insulating glass edge, the inner pane is held mechanically via retaining devices (Annex F pages 5-12). In the case of single glazing a monolithic glass pane is bonded by a structural sealant in the factory to a profile that is fixed to the supporting construction on site (Annex F page 13).

For the self-weight of all infill elements mechanical self-weight supports are fixed to the supporting construction and for the case of bond failure there are wind protection devices (emergency retainers) optionally.

The designation "infill elements" includes insulating glass units and single glazing.

Glass panes, fixed via retaining devices, are not larger than 2.60 m x 4.20 m (width x height and height x width). The pane thickness and formats are to be adjusted under consideration of the field of application and the required actions. Bonded single glazing (Annex F page 13) are not larger than 1.50 m x 2.00 m (width x height and height x width) with a thickness of the glass panes ≤ 12 mm.

The components and the system setup of the product are given in Annex F pages 1-13.

2 Specification of the intended use in accordance with the applicable European Assessment Document

The performances given in Section 3 are only valid if the infill elements are used in compliance with the specifications and conditions given in the Annexes A to F.

Concerning the durability of the bonding it is indispensable that the processing guidelines of the companies SCHÜCO International KG and of the manufacturer of the silicone adhesive are respected,

The infill elements are used in overhead and vertical areas.

The vertical glazing is installed vertically or with a slight inclination. The inclination angle with respect to the vertical is limited to 10° for inward inclination and 5° for inclination with a slope to the outside.

Overhead glazing is installed at inclinations with respect to the horizontal ranging from 5° to 80°.

The area of application of the insulating glass units is limited to the maximum permissible load (serviceability) of 1.33 kN/m² perpendicular to the infill elements.

For the use in structures the following types are differentiated in accordance with ETAG 002-1

Type I: mechanical transfer of the self-weight of the façade element to the support frame and/or structure and then to the substructure. The structural sealant transfers wind suction loads, and wind protection devices (emergency retainers) are used to reduce danger in the case of structural sealant failure.

Type II: mechanical transfer of the self-weight of the façade element to the support frame and/or structure and then to the substructure. The structural sealant transfers wind suction loads, and no emergency retainers are used.

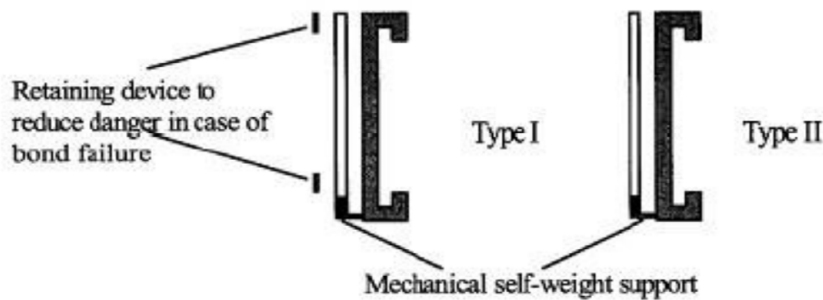


Figure 1 – Schematic example of the type I and II of Structural Sealant Glazing Kit (SSGK)

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of "System Schüco FWS 50/60 SG, FWS 50/60 SG.SI" of at least 25 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristics of the different glass products (characteristic bending strength, coating)	See Annex A
Use scenario for the heat soaking process	Use scenario 1a/1b; see Annex A
Use scenario for the compound effect of laminated safety glass	Use scenario 2a/2b; see Annex A
Structural bonding: Substrates and adhesive	See Annex B
Mechanical glazing support, retaining devices, wind protection devices (emergency retainers) - Load-bearing capacities	See Annex C
Dynamic load resistance (impact) for infill elements used as barrier against falling down	See Annex D

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire of the glass panes and metal components in accordance with the provisions of EC Decision 1996/582/EC	A 1

3.3 Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Air permeability	FWS 50/60 SG / SG.SI: AE as per EN 12152 ¹
Watertightness	FWS 50/60 SG / SG.SI: RE 120 as per EN 12154 ²
Impact	FWS 50/60 SG / SG.SI: I5/E5 as per EN 14019 ³

3.4 Energy economy and heat retention (BWR 6)

The total thermal transmittance factor U_{cw} of the façade construction is to be determined as per EN ISO 12631⁴. The following values determined for infill elements using insulated glass units may be used for dimensioning:

System Schüco FWS 50 SG mullion (with $U_g = 1.5$)

Sealing profile	Stainless steel spacer	Aluminium spacer
U-shaped seal	$U_f = 0.0011 l_f + 2.54$; $\psi = 0.13$	$U_f = 0.0011 l_f + 2.54$; $\psi = 0.15$
Flat seal	$U_f = 1.8$; $\psi = 0.11$ W/mK for 50 mm construction depth	$U_f = 0.0011 l_f + 2.19$
Wet sealing	$U_f = 0.0005 l_f + 1.74$; $\psi = 0.13$	$U_f = 0.0005 l_f + 1.74$; $\psi = 0.16$

System Schüco FWS 50 SG transom (with $U_g = 1.5$)

Sealing profile	Stainless steel spacer	Aluminium spacer
U-shaped seal	$U_f = 0.0015 l_f + 2.17$; $\psi = 0.13$	$U_f = 0.0015 l_f + 2.17$; $\psi = 0.15$
Flat seal	$U_f = 1.8$; $\psi = 0.11$ W/mK for 50 mm construction depth	$U_f = 0.0015 l_f + 1.82$
Wet sealing	$U_f = 0.0007 l_f + 1.61$; $\psi = 0.13$	$U_f = 0.0007 l_f + 1.61$; $\psi = 0.16$

System Schüco FWS 50 SG.SI mullion (with panel)

Sealing profile	Panel 0,035 W/(mK)
Hermetic sealing, wet	$U_f = 0,60 - 0,82$ W/m ² K (without concerning the influence of the screws) $U_f = 0,84 - 1,06$ W/m ² K (screw influence:0,24 W/m ² K)

1 EN 12152:2002 Curtain walling - Air permeability - Performance requirements and classification
2 EN 12154:2000 Curtain walling - Watertightness - Performance requirements and classification
3 EN 14019:2016 Curtain Walling - Impact resistance - Performance requirements
4 EN ISO 12631 Thermal performance of curtain walling - Calculation of thermal transmittance

System Schüco FWS 60 SG.SI mullion (with panel)

Sealing profile	Panel 0,035 W/(mK)
Hermetic sealing, wet	Uf = 0,58 – 0,77 W/m ² K (without concerning the influence of the screws) Uf = 0,82 – 1,01 W/m ² K (screw influence 0,24 W/m ² K)

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD 15-09-0035-04.04 the applicable European legal act is: 1996/582/EC⁵.

The systems to be applied are:

- System 1 for Type II according to Figure 1
- System 2+ for Type I according to Figure 1

In addition, with regard to e.g. reaction to fire for products covered by this EAD the applicable European legal act is: 2003/656/EC⁶

The systems to be applied are:

- System 1, 3, 4

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 10 March 2020 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Herr

⁵ Official Journal of the European Communities no L 254/62 of 8.10.1996

⁶ Official Journal of the European Communities no L 231/15 of 17.9.2003

Characteristics of the different glass products

A double or triple glass unit is installed for "System Schüco FWS 50/60 SG and FWS 50/60 SG.SI". Depending on the use scenarios given below and the requirements due to the designing results for the existing actions at the place of installation the suitable glass products shall be chosen.

The basic glass type of all glass products is float glass according to EN 572-9¹ made of soda lime silicate glass. Dependent on the appropriate use scenario the following products are suitable: thermally toughened soda lime silicate safety glass according to EN 12150-2², coated glass according to EN 1096-4³, heat soaked thermally toughened soda lime silicate safety glass according to EN 14179-2⁴, heat soaked thermally toughened soda lime silicate safety glass according to EN 14179-2⁴ but with the involvement of a third party for controlling the heat-soaking process, heat strengthened soda lime silicate glass (TVG) according to EN 1863-2⁵ and laminated safety glass (VSG) according to EN 14449⁶ with an interlayer made of polyvinyl butyral (PVB). The PVB-interlayer has to feature the following properties for tear strength > 20 N/mm² and for elongation at rupture > 250 %.

The single glazing is to be made of heat soaked thermally toughened soda lime silicate safety glass according to EN 14179-2⁴ or heat soaked thermally toughened soda lime silicate safety glass according to EN 14179-2⁴ but with involving a third party for controlling the heat-soaking process with respect to the appropriate use scenario.

The characteristic bending strength of the glass panes according to EN 1288-3⁷ shall be given in the "Declaration of Performance" as basis for the designing respectively to ensure that they will safely transmit the wind load to the support frame via the structural sealant.

1	EN 572-9:2005-01	Glass in building – Basic soda lime silicate glass products – Part 9: Evaluation of conformity/Product standard
2	EN 12150-2:2005-01	Glass in building – Thermally toughened soda lime silicate safety glass – Part 2: Evaluation of conformity/Product standard
3	EN 1096-4:2018-11	Glass in building - Coated glass - Part 4: Evaluation of conformity/Product standard
4	EN 14179-2:2005-08	Glass in building - Heat soaked thermally toughened soda lime silicate safety glass - Part 2: Evaluation of conformity/Product standard
5	EN 1863-2:2005-01	Glass in building – Heat strengthened soda soda lime silicate glass – Part 2: Evaluation of conformity/Product standard
6	EN 14449:2005-07	Glass in building – Laminated glass and laminated safety glass – Evaluation of conformity/Product standard
7	EN 1288-3:2000-09	Glass in building - Determination of the bending strength of glass - Part 3: Test with specimen supported at two points (four point bending)

The glass panes coated or entirely or partially enamelled may only be used, if their adhesive behaviour has been verified according to ETAG 002-1 with the adhesive "DOWSIL 3363"⁸ according to ETA-13/0359⁹ or "DOWSIL 993"⁸ according to ETA-01/0005¹⁰ or "Sikasil SG 500" according to ETA-03/0038¹¹ or "Sikasil IG-25 HM Plus" according to ETA-11/0391¹² or "KÖDIGLAZE S" according to ETA-08/0286¹³. In the table given below coated glass products are listed which are suitable for bonding with "DOWSIL 993"⁸. If other enamellings or coatings of the glass panes are foreseen, the bonded area shall be left out from this enamelling or coating or shall be removed from the edges to be sealed respectively. The coating is given in the "Declaration of Performance".

In the case of overhead glazing the inner glass pane of the insulated glass unit is made of laminated safety glass.

Furthermore it shall be observed that when using the coated glass according to EN 1096-4³ as laminated safety glass the coated glass surface may not be oriented towards the PVB-interlayer.

The insulated glass units shall comply with the regulations for insulating glass units as per EN 1279-5¹⁴.

Use scenarios

- 1a Use of monolithic exterior panes for the insulated glass unit (e.g. in Germany at installation height of more than 4 m): Heat-soaked thermally toughened soda lime silicate safety glass is required according to EN 14179-1¹⁵ but with involving a third party for controlling the heat-soaking process.
- 1b Use of monolithic exterior panes for the insulated glass unit (e.g. in Germany at installation height of less than 4 m): Thermally toughened soda lime silicate safety glass according to EN 12150-1¹⁶, -2² or according EN 14179-1¹⁵, -2⁴.
- 2a Use of laminated safety glass for the exterior or interior pane of the insulated glass unit according to EN 14449⁶ with PVB-interlayer; Compound effects are not respected.
- 2b Use of laminated safety glass for the exterior or interior pane of the insulated glass unit according to EN 14449⁶; Compound effects are respected regarding $G = 0.4 \text{ N/mm}^2$.

⁸	DOWSIL 3363, DOWSIL 993 (new product names) are equivalent to DC 3363, DC 993
⁹	ETA-13/0359 DOWSIL™ 3363 (2017-12-05, UBAtc)
¹⁰	ETA-01/0005 DOWSIL™ 993N, DOWSIL™ 993 and DOWSIL™ 895 (2018-03-19, UBAtc)
¹¹	ETA-03/0038 Sikasil SG-500 (2014-03-16, DIBt)
¹²	ETA-11/0391 Sikasil IG-25 HM Plus (2016-11-08, OIB)
¹³	ETA-08/0286 KÖDIGLAZE S. (2013-10-12, CSTB)
¹⁴	EN 1279-5:2018-10 Glass in building - Insulating glass units – Part 5: Product standard
¹⁵	EN 14179-1:2005-08 Glass in building - Heat soaked thermally toughened soda lime silicate safety glass – Part 1: Definition and description
¹⁶	EN 12150-1:2019-08 Glass in building - Thermally toughened soda lime silicate safety glass - Part 1: Definition and description

Table A 1: Coated glass products, suitable for structural sealant DOWSIL 993⁸ without removing the coating

Manufacturer	Name of the product
Cerdec AG Ceramic Colours, Frankfurt/Main (D)	Emallierung 14710* Emallierung 144001* * bonding on enamel side
Glasfabrik SAS van Gent, Gent (NL)	Cool-Lite-Types: SS 108, SS 114, SS 120, SS 132 SS 208, SS 214, SS 220, SS 232 SS 308, SS 314, SS 320, SS 332 SS 408, SS 414, SS 420, SS 432 SS 508, SS 514, SS 520, SS 532 SS 608, SS 614, SS 620, SS 632
Glas Trösch AG, Switzerland	Sunstop Silber 20
Glasverarbeitungsgesellschaft Bietigheim (D)	Emalit 7016 (anthrazit), Coollite TB 125 RAL 9005 GV-Nr. 93/160
Glaverbel, Belgium	Stopsol Supersilver klar
Luxguard I.S.A., Bescharge (L)	Luxguard CR 20* Luxguard CS 35* * without Thermopac
Pilkington Deutschland AG, Gelsenkirchen (D)	Infrastop S 010 Infrastop S 020 Infraclad E 010 Infraclad E 020 K-Glas
SAS-Glas Saint Roch (Saint-Gobain-Group), (NL)	Coollite TS 120, Coollite TB 140, Coollite SS 108, Coollite SN 150, Antelio-Silber
Schott Glaswerke, Mainz (D)	Calorex AO SG 30* Calorex BO SG 30* Calorex A1 Calorex B1 * Verklebung auf Emaille-Seite
Semco, Neubrandenburg (D)	Glasemail Farbe RAL 7031 (grey), Glasemail Farbe F 79

Annex B

Structural bonding and sealing

Bonding profiles and spacers

U-profiles in combination with spacers are inserted and bonded in the insulating glass edge next to the inner pane. Different types of U-profiles and spacers are applicable. The following products are to be used as U-profiles into which the retaining devices (toggles) are inserted. The metallic U-profiles are inserted continuously and the plastic pocket U-profiles are inserted piece by piece. The U-profiles and the spacers may be used in combination with the given adhesives - see the following tables.

Table B 1: U-profiles and spacers for insulating glass units

Product	Art. No. Specification	Surface condition	Adhesives that may be used
One-piece U-profile/ spacer made of EN AW 6060 aluminium as per EN 573-3 ¹⁷ , state T66 as per EN 755-2 ¹⁸ , profile as per Annex F1	326320	Anodised aluminium: colours E6-C0 to E6-C35, Königsdorf company, Wolfhagen [*] ; colours E6-C0 to E6-C35, HD Wahl company, Jettingen - Scheppach [*] ; colour E6-C05 (1003 bronze), ALCAN company, 89600 Saint Florentin, France [*]	DOWSIL 993 [®] Sikasil SG 500 KÖDIGLAZE S
Two-piece U-profile/ spacer made of stainless steel, material number 1.4301 as per EN 10088-2 ¹⁹ as per Annex F1 Butyl Isocoll 6773 from Isocoll GmbH, Nördlingen, is used for joining the individual parts.	202669, 202670, 202671	2R surface as per EN 10088-2 ¹⁹ , Table 6	DOWSIL 993 [®] Sikasil SG 500 KÖDIGLAZE S
Spacers made of stainless steel, material number 1.4301, alternatively made of the above mentioned anodised aluminium in combination with plastic pockets as U-profile (see Annex F1)	202671	2R surface as per EN 10088-2 ¹⁹ , Table 6	DOWSIL 3363 [®] Sikasil IG-25 HM Plus

¹⁷ EN 573-3:2019-10 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products

¹⁸ EN 755-2:2016-10 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties

¹⁹ EN 10088-2:2014-12 Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes

Table B 1: U-profiles and spacers for insulating glass units

Spacer in combination with plastic pockets as U-profile	Tested according to EN 1279-1-6 ²⁰	For the spacer an explicit consent of the producer of the adhesive is required.	DOWSIL 3363 ⁸ Sikasil IG-25 HM Plus
Spacers used for the outer space of a triple glass unit	Tested according to EN 1279-1-6 ²⁰	For the spacer an explicit consent of the producer of the adhesive is required.	DOWSIL 993 ⁸ Sikasil SG 500 DOWSIL 3363 ⁸ Sikasil IG-25 HM Plus
Plastic pockets made of Polyamid PA6 GF 30	268201	The surface of the plastic pocket shall be treated before bonding according the specification deposited in Deutsches Institut für Bautechnik.	DOWSIL 3363 ⁸ Sikasil IG-25 HM Plus
* The anodising process is to be conform to the specifications described in the test reports respectively deposited in Deutsches Institut für Bautechnik.			

Table B 2: Bonding profiles for monolithic glazing

Product	Art. No.	Surface condition	Adhesives that may be used
Bonding profile for monolithic glazing made of EN AW 6060 aluminium as per EN 573-3 ¹⁷ state T66 as per EN 755-2 ¹⁸ . For stainless steel profiles the details according to Table 1 apply.	354540, 352550, 336690, 433460, 440050 (see Annex F, pages 1 and 4)	Anodised aluminium: colours E6-C0 to E6-C35, Königsdorf company, Wölfhagen [†] ; colours E6-C0 to E6-C35, HD Wahl company, Jettingen - Scheppach [†] ; colour E6-C05 (1003 bronze), ALCAN company, 89600 Saint Florentin, France [*]	DOWSIL 993 ⁸ Sikasil SG 500 KÖDIGLAZE S
* The anodising process is to conform to the specifications described in the test reports respectively deposited in Deutsches Institut für Bautechnik.			

Adhesives

Two-component silicone adhesive is to be used for the structural bonding considering the following detailed specifications. For all parts of load transmission by bonding – glass to glass, glass to U-profile and glass to the frame – the adhesives and surfaces according to the respective ETA of the silicone, Annex A and Table B 3 shall be respected.

²⁰ EN 1279-1-6:2018-10 Glass in Building - Insulating glass units - Part 1: Generalities, system description, rules for substitution, tolerances and visual quality; Part 2: Long term test method and requirements for moisture penetration; Part 3: Long term test method and requirements for gas leakage rate and for gas concentration tolerances; Part 4: Methods of test for the physical attributes of edge seal components and inserts; Part 5: Product standard; Part 6: Factory production control and periodic tests

Table B 3: Structural sealants

Structural sealant	Manufacturer	Associated ETA	Surfaces in addition to those assessed according to the associated ETA	Additional requirements
DOWSIL 993 ⁸	DOW Europe GmbH	ETA-01/0005 ¹⁰	Coated glass as per Annex A; Anodised aluminium see Table B 1 and B 2	For the manufacture of "System ERC 50" the adhesion surface may be coated – before the actual sealing – with a (1.5 ± 0.5) mm thick sealant layer according to the method deposited with Deutsches Institut für Bautechnik. Only one of the following combinations (glass face – aluminium face) may be used thereby: DOWSIL 993 ⁸ – DOWSIL 993 ⁸ DOWSIL 3793 – DOWSIL 993 ⁸ DOWSIL 3362 – DOWSIL 993 ⁸
Sikasil SG 500	SIKA SERVICES AG	ETA-03/0038 ¹¹	Anodised aluminium see Table B 1 and B 2	For the manufacture of "System ERC 50" the adhesion surface may be coated – before the actual sealing – with a (1.5 ± 0.5) mm thick sealant layer according to the method deposited with Deutsches Institut für Bautechnik. Only one of the following combinations (glass face – aluminium face) may be used thereby: SIKASIL SG 500 – SIKASIL SG 500 SIKASIL IG 25 – SIKASIL SG 500
KÖDIGLAZE S	Kömmerling	ETA-08/0286 ¹³	Anodised aluminium and stainless steel, see Table B 1 and B 2	

Table B 3: Structural sealants

DOWSIL 3363 ⁸	DOW Europe GmbH	ETA-13/0359 ⁹	Plastic pockets, see Table B 1	The surface of the plastic pocket is to be preprocessed with the purifier DOWSIL R41 from DOW Europe GmbH according to their specifications.
Sikasil IG-25 HM Plus	SIKA SERVICES AG	ETA-11/0391 ¹²	Plastic pockets, see Table B 1	The surface of the plastic pocket is to be preprocessed with the Sika Primer 210 from SIKA SERVICES AG according to their specifications.

Only compatible materials may be installed adjacent to the structural sealant, and this compatibility is to be proven in the assessment procedure. Neighbouring materials may be used in the combinations specified in Table B 4.

Table B 4: Effects of materials in contact

Permissible combinations of structural sealants and adjacent materials																
Manu- facturer	Structural sealant	Inner seal / butyl					Spacer tape Cover profile Sealing profile					Glazing support/ setting block		SI Isolator	Plastic Pocket	Frame profiles
		BU-S, Kömmerling	Climafill standard, NMC	GD 115 Kömmerling	Terostat 969, H.B. Fuller	Sika Glaze IG-5, SIKA SERVICES	Norton V 2100	Norton V 3100	Vito Glazing mount 400	Silicone EN 7863 Type B, BIW Isolierstoffe	EPDM EN 7863, Type C	Silicone, Sico	GLSV, Gluske	polypropylene, Repsol	Nomaflex PP-Foam	PA6 GF30
DOW Europe GmbH	DOWSIL 993 ⁸	X	X	X			X	X			X	X	X	X		X
	DOWSIL 3362	X	X		X						X	X				
	DOWSIL 3363 ⁸			X									X	X		
Sika AG	Sikasil SG 500	X				X	X	X		X	X		X	X	X	X
	Sikasil IG25 HM Plus	X											X	X	X	
Kömmerling	KÖDIGLAZE S			X			X	X								

Bonding process

The structural sealant is to be factory applied. The infill elements may only be manufactured in the manufacturing plants as noted in Annex E and instructed by SCHÜCO International KG.

The structural bond of the insulating glass edge compound is to be silicone according to Table B 3.

The processing guidelines of the companies SCHÜCO International KG and of the manufacturer of the silicone adhesive shall be respected,

The surfaces to be sealed may only be prepared in conformity with the manufacturing directives given by the adhesive manufacturer.

Bubbles, holes or inclusions in the structural sealant are not permissible.

For the use as horizontal respectively overhead glazing the structural sealant of the infill elements shall be positioned in such a way that it is not constantly subjected to tensile forces.

Inner sealing of insulating glass units

For the inner sealing of infill elements designed as insulating glass units, a polyisobutylene layer is to be applied between the glass panes and spacers. Details on the butylene to be used are deposited with Deutsches Institut für Bautechnik.

Sealing of the façade systems "Schüco FWS 50/60 SG and FWS 50/60 SG.SI"

The seams between two infill elements are closed by

- silicone sealant (wet sealing) on a pre-filler tape for double and triple glass units,
- U-shaped silicone seal or silicone-compatible EPDM gasket as per EN 7863²¹, shore hardness type C (70 IRHD),
- silicone or silicone-compatible EPDM gasket as per EN 7863²¹, type B that covers the outer pane.

Characteristics and load-bearing capacities of the glazing supports, retaining devices (toggles), wind protection devices (emergency retainers)

Glazing supports

Glazing supports with a width of 100 mm in accordance with Annex F page 2 support the self-weight of the glass panes. The extruded profiles as per EN 15088²² are produced of EN AW 6005A according to EN 573-3¹⁷. The material properties are deposited with Deutsches Institut für Bautechnik.

The setting blocks are of plastic with a Shore A hardness of approx. 70 ± 5 as per ISO 7619-1²³ and ISO 7619-2²⁴. Detailed information on the plastics to be used is deposited with Deutsches Institut für Bautechnik.

Table C 1: Types of glazing supports for insulating glass units of two glass panes and for monolithic panes

Support	Art. No.	Type of fixing	Glass support material	Setting block material
System FWS 50 SG				
Both panes, Standard glazing support	266674, 266675, 266676, 266677	hung in the frame transom profile	EN AW 6005A* aluminium as per EN 573-3 ¹⁷	Silicone
Inner pane, Standard glazing support	266673			
Both panes, large glass loads	242297, 242299, 242358, 242359, 242379	two ST5.5 x 23.5 screws (Art.-No. 205963) in the screw channel of the frame transom profile	EN AW 6005A aluminium as per EN 573-3 ¹⁷ , strength "F27" as per manufacturer designation**	Polypropylene – moulding compound
Inner pane, large glass loads	242298, 242300			
Outer pane	242301	two ST5.5 x 38 screws in the screw channel of the frame transom profile	EN AW 6005A aluminium as per EN 573-3 ¹⁷	The outer pane lies on the seal, may only be used with dry seal joint
	237525		aluminium EN AW 6060*	

²² EN 15088:2006-03 Aluminium and aluminium alloys - Structural products for construction works - Technical conditions for inspection and delivery

²³ ISO 7619-1:2012-02 Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 1: Durometer method (Shore hardness)

²⁴ ISO 7619-2:2012-02 Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 2: IRHD pocket meter method

System FWS 60 SG				
Both panes, Standard glazing support	266679, 266680, 266681, 266682	hung in the frame transom profile	EN AW 6005A* aluminium	Silicone
Inner pane, Standard glazing support	266678			
Both panes, large glass loads	242188, 242302, 242360, 242361, 242380	two ST5.5 x 23.5 screws (Art.-No. 205963) in the screw channel of the frame transom profile	EN AW 6005A aluminium as per EN 573-3 ¹⁷ , strength "F27" as per manufacturer designation**	Polypropylene – moulding compound
Inner pane, large glass loads	242189, 242303			
Outer pane	242301	two ST5.5 x 38 screws in the screw channel of the frame transom profile	EN AW 6005A aluminium as per EN 573-3 ¹⁷	The outer pane lies on the seal, may only be used with dry seal joint
	237525		aluminium EN AW 6060*	
Monolithic glazing				
Glass panes ≤ 1.50 m x 2.00 m d ≤ 12 mm	433600	two ST3.9 x 16 screws in the bonding profile	EN AW 6060 T66 aluminium as per EN 573-3 ¹⁷	Silicone
Glass panes ≤ 1.50 m x 2.00 m d ≤ 12 mm	433610, 433620	ST3.9 x 16 screws in the bonding profile, a ≤ 250 mm	EN AW 6060 T66 aluminium as per EN 573-3 ¹⁷	Silicone
* Extruded profiles as per EN 15088 ²² of EN AW 6060 aluminium as per EN 573-3 ¹⁷ , state T66 as per EN 755-2 ¹⁸				
** The material properties are deposited with Deutsches Institut für Bautechnik.				

Table C 2: Types of glazing supports for insulating glass units of three glass panes

Support	Art. No.	Type of fixing	Glass support material	Setting block material
System FWS 50 SG.SI				
Three panes, large glass loads	268053, 268054, 268056, 268057, 268059, 268064, 268066	two ST5.5 x 23.5 screws (Art.-No. 205963) in the screw channel of the frame transom profile	EN AW 6005A aluminium as per EN 573-3 ¹⁷ , strength "F27" as per manufacturer designation**	Silicone
System FWS 60 SG.SI				
Three panes, large glass loads	268067, 268068, 268070, 268071, 268073, 268078 268080	two ST5.5 x 23.5 screws (Art.-No. 205963) in the screw channel of the frame transom profile	EN AW 6005A aluminium as per EN 573-3 ¹⁷ , strength "F27" as per manufacturer designation**	Silicone

Table C 3: Load-bearing capacities of the glazing supports

Art.-No.		Permissible loads (5%-fractile / 75% confidence level; $\gamma_{glob} = \gamma_M \cdot \gamma_F = 1.7$)
One-piece supports		
266674, 266675, 266676, 266677, 266673, 266679, 266680, 266681, 266682, 266678		1.53 kN
242188, 242189, 242297, 242298, 242299, 242300, 242302, 242303, 242358, 242359, 242360, 242361, 242379, 242380		2.71 kN
242566 bis 242569, 242721 bis 242730		0.24 kN
Assembled supports		
outer	inner	
237525, 242301	266678/266678, 242189, 242298	1.95 kN
	242300, 242303	1.53 kN

Monolithic glazing	
266674, 266675, 266677, 266676, 266679, 266680, 266682, 266681	1.53 kN
433600 only for glass panes ≤ 1.50 m x 2.00 m and a thickness of the panes ≤ 12 mm	0.45 kN
433610, 433620 only for glass panes ≤ 1.50 m x 2.00 m and a thickness of the panes ≤ 12 mm	0.6 N/m

Table C 4: Characteristic load capacity and design values related to deflection (single support)

Art.-No.	$F_{u,Rd}$	$F_{0.5\text{ mm}}$	$F_{1\text{ mm}}$	$F_{1.5\text{ mm}}$
268053	3.4	0.97	1.77	2.48
268059	2.6	0.65	1.37	1.93
268066	1.9	0.41	0.71	0.98
268067	2.8	0.95	2.03	2.08
268073	2.3	0.73	1.46	1.73
268080	1.6	0.47	0.96	1.21

For details to the glazing supports see the processing guidelines of SCHÜCO International KG

Retaining devices (toggles)

The horizontal wind suction loads to the insulating glass units are transferred to the substructure by a composite system. The interior pane of the insulating glass unit is mechanically fastened and the exterior pane is retained by structural sealant. Retaining devices (toggles) are inserted into the U-profiles of the insulating glass units (Annex F pages 5 to 13), next to the inner pane. There are two different kinds of retaining devices, a die-cast zinc retaining device or an extruded aluminium retaining device.

The retaining devices are made of die-cast zinc of G-ZnAl 4 Cu 3 (ZP 0430) as per EN 12844²⁵. They are to be fixed to the screw channel of the load-bearing structure using self-tapping screws of type ST 5.5 x 23.5 (Art.-Nr. 205963) or ST 5.5 x 27.5 (Art.-Nr. 225082) as per EN ISO 1478²⁶.

The extruded retaining devices are profiles as per EN 15088²² and EN 1090²⁷ and consist of aluminium EN AW-6060 T66 as per EN 755-2¹⁸ according to EN 573-3¹⁷. They are 60 mm long and are to be fixed in the screw channel of the transom-mullion profiles using two self-tapping screws for each support as per EN ISO 1478²⁶.

These retaining devices (toggles) are to be used as two-sided retaining devices and as single-sided retaining devices (Annex F page 3). The Art.-No. of the two-sided retaining devices are 237855 and 242363 and 266003, 266537, 266539 and 266005. The Art.-No. of the single-sided retaining devices are 237854 and 242362 and 266002, 266536, 266538 and 266004.

In System FWS 50 SG und FWS 50 SG.SI the extruded retaining devices Art.-No. 237856, 237857, 242425, 242426, 242429 and 242430 are used. In System FWS 60 SG und FWS 60 SG.SI instead of Art.-No. 242425 and 242426 Art.-No. 242427 and 242428 are used respectively.

²⁵ EN 12844:1999-01 Zinc and zinc alloys – Castings - Specifications
²⁶ EN ISO 1478:1999-12 Tapping screw thread
²⁷ EN 1090:2018-12 Execution of steel structures and aluminium structures

Table C5: Load-bearing capacities of the retaining devices

Art. No.	Permissible loads (5%-fractile / 75% confidence level; $\gamma_{glob} = 3.0$)	Note
242363, 237855	1.18 kN	centrically loaded
242362, 237854	0.47 kN	eccentrically loaded (screw channel stressed by bending)
237856, 242429	0.50 kN	eccentrically loaded
237857, 242425, 242426, 242427, 242428, 242430	0.44 kN	eccentrically loaded

The retaining devices of an infill element may have a maximum distance of 150 mm to the element corners and 400 mm between each other. The single-sided retainers of adjacent infill elements are to be arranged alternately at a maximum distance of 200 mm.

The contact depth of the retaining devices in the U-profile is to be at least 7.5 mm (including tolerances).

Wind protection devices (emergency retainers)

For the loading case when the sealant fails, the horizontal wind suction loads are absorbed and passed on by emergency retainers. They were fixed in screw channels of the frame profiles. The load bearing capacity of those screw channels are not assessed in this ETA. The necessity to use such emergency retainers is regulated by the respective Member States.

- Aluminium emergency retainers

The aluminium emergency retainers - Art. No. 266166, 266167 and 266168 - are positioned at specific points depending on the loading and have a base area of approx. 52 mm x 60 mm. The emergency retainers are extruded precision profiles as per EN 15088²² and they are made of aluminium EN AW-6060 T66 as per EN 755-2¹⁸ according to EN 573-3¹⁷ with silicone setting blocks having a Shore A hardness of approx. 50 as per ISO 7619-1²³, -2²⁴. They are fixed to the transom-mullion profiles using two screws.

- Aluminium emergency retainers for single glazing (window bar)

Art. No. 433610 and 433620 are used for securing single glazing for façades. Their application is limited to glass panes ≤ 1.50 m x 2.00 m and a thickness of the panes ≤ 12 mm. The emergency retainers are extruded precision profiles as per EN 15088²² and they are made of aluminium EN AW 6060 T66 as per EN 755-2¹⁸ according to EN 573-3¹⁷ with silicone setting blocks having a Shore A hardness of approx. 50 as per ISO 7619-1²³, -2²⁴. They are fixed to the bonding profiles with screws at a distance of 250 mm.

Aluminium emergency retainers Art. No. 266166, 266167, 266168

The permissible centric load is: $F_{zul} = 3.86$ kN

If the load only occurs through an adjacent pane (eccentric load) then the load is to be doubled and then treated as a centric load.

Aluminium emergency retainers Art. No. 433610, 433620

The emergency retainers are only for single glazing with glass panes ≤ 1.5 m x 2.0 m and a thickness of the panes ≤ 12 mm.

The permissible wind suction load is: $F_{zul} = 1.5$ kN/ m²

Tested compositions of glazing units for the use as barrier against falling down (dynamic load from height 900 mm)

For the following compositions of insulating glass units with structural bonding the impact tests are passed in the context of issuing this ETA. As precondition U-profiles of anodized aluminium or stainless steel according to Annex B, Table B 1 are required.

Insulating glass units with two panes and without emergency retainers, respecting the installation of a combination of

- extruded aluminium retaining device
- die-cast zinc retaining device
- with the following glass composition:
 - Inner pane: laminated safety glass with a thickness of at least 5 mm annealed glass / 0,76 mm PVB-interlayer / 5 mm annealed glass;
 - Space between two panes: 20 mm
 - Outer pane: 8 mm heat soaked soda lime silicate safety glass
 - Dimensions (width x height): minimum: 500 mm x 1000 mm
maximum: 2100 mm x 4200 mm

Up to the width of the panes of about 720 mm the maximum clearance between two toggles amounts to 350 mm. For larger width the maximum clearance amounts to 400 mm.

In the area of cross beam load (h) at least two toggles are required on each side according to Annex F pages 15-16.

Insulating glass units with two panes and with emergency retainers made of aluminium, respecting the installation of a combination of

- extruded aluminium retaining device
- die-cast zinc retaining device
- emergency retainers Art.-No. 266166, 266167 or 266168 according to Annex F page 3
- with the following glass composition:
 - Inner pane: laminated safety glass with a thickness of at least 5 mm annealed glass / 0,76 mm PVB-interlayer / 5 mm annealed glass;
 - Space between two panes: 20 mm
 - Outer pane: 8 mm heat soaked soda lime silicate safety glass
 - Dimensions (width x height): minimum: 500 mm x 1000 mm
maximum: 2100 mm x 4200 mm

Up to the width of the panes of about 720 mm the maximum clearance between two toggles amounts to 350 mm. For larger width the maximum clearance amounts to 400 mm.

In the area of cross beam load (h) at least two toggles are required on each side according to Annex F pages 15-16.

Insulating glass units with three panes and without emergency retainers, respecting the installation of a combination of

- extruded aluminium retaining device
- die-cast zinc retaining device
- with the following glass composition:
 - Inner pane: laminated safety glass with a thickness of at least 5 mm annealed glass / 0,76 mm PVB-interlayer / 5 mm annealed glass;
 - Inner space between two panes: 20 mm
 - Intermediate pane: at least 4 mm annealed glass
 - Outer space between two panes: 12 or 16 mm
 - Outer pane: 8 mm heat soaked soda lime silicate safety glass
 - Dimensions (width x height): minimum: 720 mm x 720 mm
maximum: 2600 mm x 4200 mm

In the area of cross beam load (h) at least two toggles are required on each side according to Annex F pages 17-18.

Insulating glass units with three panes and with emergency retainers made of aluminium, respecting the installation of a combination of

- extruded aluminium retaining device
- die-cast zinc retaining device
- emergency retainers Art.-No. 266166, 266167 or 266168 according to Annex F page 3
- with the following glass composition:
 - Inner pane: laminated safety glass with a thickness of at least 5 mm annealed glass / 0,76 mm PVB-interlayer / 5 mm annealed glass;
 - Inner space between two panes: 20 mm
 - Intermediate pane: at least 4 mm annealed glass
 - Outer space between two panes: 12 or 16 mm
 - Outer pane: 8 mm heat soaked soda lime silicate safety glass
 - Dimensions (width x height): minimum: 720 mm x 720 mm
maximum: 2600 mm x 4200 mm

In the area of cross beam load (h) at least two toggles are required on each side according to Annex F pages 17-18.

Name	Street	Zip code	Place	Country
BGT Bischoff Glastechnik AG *	Alexanderstraße 2	75015	Bretten	Germany
Amberger Glas GmbH & Co.KG	Fuggerstr. 34	92224	Amberg	Germany
Flachglas Radeburg Glassolutions Saint Gobain	Bahnhofstraße 30	01471	Radeburg	Germany
FLACHGLAS WERNBERG GMBH *	Nürnberger Str. 140	92533	Wernberg-Köblitz	Germany
Fugen- und Verklebetechnik *	Karlstraße 8	71144	Steinenbronn	Germany
Glasbau Kraft	Ustersbacher Str. 11	86424	Dinkelscherben	Germany
GLAS-DREISBUSCH GmbH & Co. KG *	Österreicher Str. 12	63773	Goldbach	Germany
GLASZENTRUM G.F. Schweikert GmbH	Salzstr. 191	74076	Heilbronn	Germany
Gebr. Schneider Fensterfabrik GmbH & Co.KG	Rechenberger Str. 7-9	74597	Stimpfach	Germany
Heidersberger GmbH Fassadenbau	Hansaring 23	48268	Greven	Germany
Hoffmannglas GmbH & Co. Glasgroßhandlung KG	Gewerbehof Nr. 3	06188	Peissen/Halle	Germany
Hunsrücker Glasveredelung Wagner GmbH & Co. KG *	Dr.Fritz-Ries-Str. 1	55481	Kirchberg	Germany
HVF mobile structural glazing *	Rossbergweg 8	73235	Weilheim	Germany
INTERPANE Glasgesellschaft mbH Lauenförde	Sohnreyst. 21	37697	Lauenförde	Germany
Judenhofer Glas GmbH	Alter Rennweg 163	84034	Landshut	Germany
Kemper GmbH	Hünegräben 3 u. 12	57392	Schmallenberg	Germany
Linther Glas Kölling Glas GmbH & Co. KG *	Linther Str. 3	14822	Linthe	Germany
Oder-Glas GmbH	Gewerbeparkring 1	15299	Müllrose	Germany
OKALUX GMBH *	Am Jöspershecklein 1	97828	Marktheidenfeld	Germany
OPTITHERM - Glas Sander GmbH	Bachstr. 20	33178	Borchen	Germany
ROSCHMANN GLAS GmbH & Co. KG *	Dieselstr. 37	86368	Gersthofen	Germany
Philippi Metallbau	Kloppenheimer Weg 1	65191	Wiesbaden	Germany
Rupert App GmbH & Co.	Memminger Str. 77	88299	Leutkirch	Germany
RUF Fassadentechnik	Industrieweg 3	63924	Kleinheubach	Germany
Schollglas Sachsen GmbH	Vorwerkstr. 3	01683	Nossen	Germany
SEMCOGLAS GmbH *	Langebrügger Str. 10	26655	Westerstede	Germany
Teutemacher Glas GmbH	Südstr. 1-5	48231	Warendorf	Germany

* certified partner by Dow

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Manufacturing plant: Global certified companies (structural glazing)

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Name	Street	Zip code	Place	Country
SABU 2 L.iA. Sasinowscy Sp.j.	ul. Spokojna 1B	05-250	Slupno	Poland
Alu-Plus Sp. Z o.o.	Lezno 59 A	80-298	Gdansk	Poland
Reconal Sp. Z o.o	ul. Krakowska 150	35-506	Rzeszow	Poland
Elkam	ul. Olsztynska 27	11-040	Dobre Miasto	Poland
P.P.U.H. WiK Zawadka Sp.j.	ul. Jesionowa	05-816	Michalowice- Osiedle	Poland
PEMALUX SP. Z O.O.	uL.DALEKA 110A	82-200	MALBORK	Poland
KER	3MR Technika Aluminiowo-Miedziana	55-003	Czernica	Poland
Argo Spolka z Organizzona	ul. Tokarska 21	20-210	Lublin	Poland
ALREM - JERZY BYRDZIAK	ul. Zywiecka 384	43-310	Bielsko-Biala	Poland
ALUANT-Projekt	ul. Lukowska 5 m.M. 185	04-113	Warszawa	Poland
Stalbud Marcin Paluch	ul. Krasickiego 17/19	26-640	Skaryszew	Poland
VITROPLAST DYSTRYBUCJA	ul. Ruczaj 89	02-997	WARSZAWA	Poland
Opal Spolka Z Ograniczona	ul. Kakolewska 13	62-065	Grodzisk Wielkopolski	Poland
Gabit	ul. Jeziorna 41	77-100	Bytow	Poland
Alprof Sp. Z o.o.	ul. Wallenroda 17/8	80-438	Gdansk	Poland
AWILUX Polska Spolka z	ul. Wiasenna 17	64-100	Leszno	Poland
Alures Sp z o.o.	ul. Techniczna 2A	36-040	Boguchwala	Poland
Lindhorst Aluminium Spolka z	ul. Boznicza 11e	61-752	Poznan	Poland
Defor S.A.	ul. Rolna 5	63-100	Srem	Poland
BUDTRANS SYSTEMY	Stobno 9	72-002	Doluje	Poland
7 NT Hitech Sp. Z o.o.	Przemyslowa 47	28-300	Jedrzejew	Poland
Press Glass SA	ul. Kopalniana 9	42-262	Poczesna	Poland
Q4Glass, ABJ Investors sp.z.o.o.	ul. Bojownikow o Wolnosc i	75-209	Koszalin	Poland
Vetrex Sp.z.o.o.	ul.Skarszewska 13	83-110	Tczew Rokitki	Poland
Profil Wladyslaw Budek	ul. Torowa 46	32-050	Skawina	Poland
Alumikon Sp. Z.o.o.	ul. Adama Mickiewicza 27/10	82-300	Elblag	Poland
Atlanta Aluminium	ul. Wygoda 7	64-320	Buk	Poland
ASC Pawel Filipek	Miedzyrzecze Gorne 407B	43-392	Miedzyrzecze Gorne	Poland
Joy-Bud Sp.z o.o.	Grzegorzeczka 103	31-559	Krakow	Poland
Zimny Sp. Z o.o.	ul. Rzgowska 142/146	93-311	Lodz	Poland
Eljako-AL Sp. Z o.o.	ul. Olszankowa 47	05-120	Legionowo	Poland
Mitbau Sp z o.o	ul. Swojczycka 1	51-501	Wroclaw	Poland
R&M Alufasady Sp Zo.o.	ul. Kielecka 44	28-300	Jedrzejew	Poland

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

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Name	Street	Zip code	Place	Country
F.B.R. Kamila	ul. Wiewiorka 13	85-440	Bydgoszcz	Poland
P.H.U. BUD – MAR Karol Marcinkowski	ul. Tuczki 10	13-220	Rybno	Poland
AluGlass Realizacja Piotr Kalbarczyk	Kakolowa 38A	04-848	Warszawa	Poland
Hansen Polska Sp. Z o.o.	Rudna Mala 47	36-060	Glogow Malopolski	Poland
Poko-Al Cezary Pokojski	Zabytkowa 16	80-253	Gdansk	Poland
AGC Trencin s.r.o.	Suvoz 12	911 01	Trencin	Slovakia
Nitrasklo, a.s.	Levicka 3	95015	Nitra	Slovakia
Gunn Lennon Fabrications Limited	Dublin 9		Santry	Ireland
Williaam Cox Ireland Ltd	Robin Hood Industrial Estate		Clondalkin	Ireland
Norbridge Developments Ltd T/A	Le Brocquy Avem Park West Ind Park		Dublin 12	Ireland
Carey Glass Ltd	Limerick Road		Nenagh	Ireland
Friva AS	Knapstadveien 1	1820	Spydeberg	Norway
I dex gluggar ehf	Smiöjuvegi 3	200	Kopavogur	Iceland
Ariston Glass Yalourgikes	Epano Karpounari	20300	Loutraki	Greece
Yalodomi-Mavropoulos A.E.B.E	Komotinis 14	15344	Gerakas	Greece
Kademiladis Athanassios S.A.	St. Stefanoustr. 3	56429	N.Efkarpia/ Thessaloniki	Greece
Sifakis Em. Nikolaos Roido	Str. 15	12131	Perister	Greece
Athanasios Alafropatis	E co lp	35100	Vipe	Greece
Vasileiou Krystalla EPE	28th Octovriou	34002	Vasiliko Chalkida	Greece
Patsis Glass S.A.	Kleisthenous 400	15344	Gerakas - Athens	Greece
Ch N Mitroyiannis & Ch Tsiamas AE	Menexedon Str. 14	14564	Kifissia Attiki	Greece
Rakla Tampere Oy	Vehmaistenkatu 5	33730	Tampere	Finland
Lasiluoto Oy	Littoistentie 168	21500	Piikkiö	Finland
Seloy oy	Loimijoentie 215	32700	Huittinen	Finland
Lasiliiri Oy AG	Lepistöntie 3	11310	Riihimäki	Finland
Avieli Aluminium Industrial Area Kiryat Arye	Boltimor St. 9	49510	Petach Tiqva	Israel
WMA Glass s.r.o.	Skolni 70	46331	Chrastava	Czech Republic

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Name	Street	Zip code	Place	Country
Prater Ltd	Perrywood Bus Park	RH1 5JQ	Salfords	Great Britain
Optima Contracting Ltd	Courtyard Hse, West End Road	HP11 2QB	High Wycombe	Great Britain
Architectural Facades Ltd	Wilbraham Road Bridge Place, Anchor Boulevard, Admirals Park, Crossway	CB21 5GT	Fulbourn	Great Britain
Laing O'Rourke Construction Ltd	South March, Long March Ind Est	s DA2 6SN	Dartford	Great Britain
BUILDING ENVELOPE	Leeds Road	NN11 4PH	DAVENTRY	Great Britain
DUAL SEAL GLASS LTD	Prescot Road	HD2 1XU	Huddersfield	Great Britain
PILKINGTON UK LTD	EASTWAYS	WA10 3TT	Merseyside	Great Britain
EUROVIEW MANUF. LTD	Cloverhill Industrial Estate	CM8 3YQ	WITHAM	Great Britain
Alucraft Ltd.	Fowler Road, West Pitkerro Ind Est	22	Clondalkin	Great Britain
Ravensby Glass Company Ltd	Woodside Ind Est, Woodside Road	DD5 3RU	Dundee	Great Britain
New World Developments ltd	Kells Business Park	BT42 4HX	Ballymenam, Northern Kells	Great Britain
GLASS & A.L.U. CAD LTD	Belfast Road, Ballynahinch,	BT24 8EB	Co. Down	Great Britain
Glasseal (NI) Ltd	RUSSEL ROAD	EH11 2LS	EDINBURGH	Great Britain
CHARLES HENSHAW & SONS LTD	Brittania Way, Brittania Enterprise	WS14 9UY	Lichfield	Great Britain
RED ALUMINIUM LTD	Farm Road, Denton	M34 2SY	Manchester	Great Britain
System 3 Ltd	Beaconsfield Road	UB4 0SL	Hayes	Great Britain
LW Architectural Glass Ltd	FLOAT ROAD, ROUNDTORN	M23 9QA	MANCHESTER	Great Britain
FLOAT GLASS INDS LTD	Leadgate Ind.	DH8 7R	S Durham	Great Britain
Romag Ltd.	100 West Hendon Broadway	NW97AQ	Hendon	Great Britain
Crystal Units Limited	Lynn Road	CB6 1RY	Ely	Great Britain
HSG Group Ltd.	Unit 2 Eastways Ind. Est.	CM8 3 YQ	Witham	Great Britain
Euroview Architectural Glass Ltd	Langley Road	L408JS	Ormskirk	Great Britain
Hansen ThermoSpan Ltd	Unit 8 Trafalgar Estate	EN3 7TY	Enfield	Great Britain
Denis Windows Ltd	Lurgan Road66	BT37 0XL	Armagh	Great Britain
MCMullen Facades Ltd				

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

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Name	Street	Zip code	Place	Country
Petra Aluminium Company	P.O Box 2230	11181	Jordan	Jordan
Anodite S.A.	Ureta Coxh 1035		Santiago de Chile	Chile
Tycotech Aluminium Sdn Bhd	Taman Perindustrian Balakong Jaya 2/2	43300	Selangor Darul Ehsan	Malaysia
Georgios Neofytou & Sons Ltd	A. Koursoumba Str. 4	1028	Kaimakl	Cyprus
Metalco Glazing Ltd	Polyphimou Str. 1, P.O. Box 21307	1506	Nicosia	Cyprus
Porfyrios Chap Glass Ltd	PO Box 28343	2093	Nicosia	Cyprus
Staticus UAB	Metalo Str. 13	2190	Vilnius	Lithuania
Skonto Plan Ltd	SIA Rūpniecības iela 6	LV 3101	Tukums	Latvia
Alumax Group SIA	Jaunpils iela 1	LV-1002	Rīga	Latvia
Aile Grupa SIA	Pulvera iela 28	LV 3405	Liepāja	Latvia
DG Constructions SIA Garkalnes Now	Meznoru iela 5	LV-2137	Garkalnes nov.	Latvia
Glas Troesch Artemovsk LLC	Pervomajsky Str. 152	84500	Artemovsk	Ukraine
SK Intek	Plozhad Geroev Majdana	49000	Dnepropetrovsk	Ukraine
LLC Eclipse Aluminium	Street Mandrikovsay 47-107	49094	Dnipro	Ukraine
LLC Evroviknobud	Ul. Matrosova 31	1103	Kiew	Ukraine
Alutrade	South B 11 Industrial Areas, PO Box 389		Accra	Ghana
Legend Aluminium Co. Ltd.	East Legon, Adjiringano		Accra	Ghana
Polypane Glasindustrie NV	T.T.S. Industriezone C	B-9140	Temse	Belgium
Sprimoglass S.A	Zone Industrielle de Damre	4140	Sprimont	Belgium

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

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Name	Street	Zip code	Place	Country
Chau A Industry Joint Stock Company	Lot CN4-2.1, Thach That Industrial Zone, 3rd Floor, HH2 Building, Duong Dinh Nghe		Hanoi City	Vietnam
Phuc Hung Holdings Construction JSC.	Street		Ha Noi	Vietnam
Quan Dat Trading and Prod. Co. Ltd	Tan Thoi Hiep IDZ, Dist. 12		Ho Chi Minh City	Vietnam
TID Joint Stock Company 4	Lieu Giai Street		Ha Noi City	Vietnam
Eurowindow Joint Stock Company	Me Linh		Ha Noi City	Vietnam
North Phi Kha Trading –	Services TS7, Tien Son Industrial Park		Bac Ninh Province	Vietnam
Phi Kha Trading-	428 Nguyen van Nghi St,		Ward 7, Go Vap District	Vietnam
Viet Tin International Trading	106/14/18 Hoang Quoc Viet St		Ha Noi	Vietnam
Tin An JSC	Block B1, D3 Street		Binh Duong Province	Vietnam
TID South Joint Stock Company	302B Ly Thuong Kiet Street		Tan Binh Dist Ho Chi Minh	Vietnam
TID Façade Joint Stock Company	14th Floor , No 04 Lieu Giai Street		Dinh Dist, Hanoi	Vietnam
CERVI GLAS, S.L.	CTR.TURIS-SILLA,KM. 2	46389	TURIS (VALENCIA)	Spain
COMAYCO VIDRIO LA PLANA S.L.	AVDA. VALENCIA, 157	12005	CASTELLON	Spain
ARIÁ'O DUGLASS, S.A.	Pi royales bajos s/n	50171	Puebla de alfinden	Spain
UNION VIDRIERA ARAGONESA, S.L.	C/ O, 233 P.IND LA PAZ	44195	TERUEL	Spain
CONTROL GLASS ACUSTICO Y SOLAR C/ OPORTO,	4 P.IND LA PAZ	44195	TERUEL	Spain
ASTIGLASS, S.L.	P. LA LAGUNILLA 5	41400	ECIJA	Spain
LA VENECIANA IBERIAGLASS, S.L.	LUGAR CIMA DO AZZE-FILGUEIRA	36500	LALIN-PONTEVEDRA	Spain
VIDROGAL S.A.	P.I.VILAPOUCA-SOTELO DE MONTES	36560	FORCAREY-PONTEVEDRA	Spain
TEC DEL VIDRIO TRANSFORMADO S.L.	P.I. EL BAYO, PARC. I, 19	24492	CUBILLOS DEL SIL	Spain
Cristec Vipla S.L.	P.I.Cam Llong C/Marinda, 10-12	25600	Balaguer	Spain
VITRO CRISTALGLASS SL	C/ NARAYA S/N	28947	FUENLABRADA	Spain
			MATA-PORQUERES (GIRONA)	
X-VIDRESIF, S.A.	C/TREBALL, 7	17846		Spain
LA VENECIANA, S.A.	Apartado de correos 1020	28905	GETAFE	Spain
CRISTALERIA RAMOS SA	C/ Palier, 20-22	28914	Leganes (Madrid)	Spain

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Manufacturing plant: Global certified companies (structural glazing)

Annex E
Page 6

current status: May 2019

Name	Street	Zip code	Place	Country
CRIST. SOLER HERMANOS S.A.	CARRETERA DEL LEVANTE KM 53	3400	VILLENA (ALICANTE)	Spain
MURALCRIS, SL	POLIGONO INDUSTRIAL II	31592	CINTRUENIGO (NAVARRA)	Spain
CRISTALERIA JOSE VIOLA RIBA S.L.	P.I.OESTE PARCELA 26/7	30169	SAN GINES-MURCIA	Spain
Eurovidrio	POLIGONO INDUSTRIAL ERAL, S/N	25617	LA SENTIU DE SIO	Spain
VIDRIOS COBO S.A.	P.I. Agustinos	31013	Pamplona	Spain
VIDRESIF, S.L.	Bº LOS CALDERONES,2	39110	SOTO DE LA MARINA	Spain
CRISTALES CURVADOS S.A.	C/TREBALL, 7	17846	MATA-PORQUERES (GIRONA)	Spain
Valenglass SL	Cami de Can Ferran s/n	8403	Granollers	Spain
Vidraria Central de	P.I. Oeste Parcela 26/7	30169	San Gines - Murcia	Spain
COVIPOR- COMP VIDREIRA VISA OESTE - COM�RCIO DE PRODUTOS D	Rua do Vale 750	4446-908	Alfena	Portugal
A SMEFA SOC.METALURGICA DE	LUGAR DA REBOREDA	4784-909	SANTO TIRSO	Portugal
FACAL- ENGENHARIA DE PROFIAL PROFISSIONAIS	ESTRADA NACIONAL 8, 4	2510-713	GAEIRAS	Portugal
Vidraria Central de	R.DO CASAL NOVO,9-ABRUNHEIRA	2710-023	SINTRA	Portugal
COVIPOR- COMP VIDREIRA VISA OESTE - COM�RCIO DE PRODUTOS D	Z.I. DE FONTISCOS	4784-909	SANTO TIRSO	Portugal
A SMEFA SOC.METALURGICA DE	ESTRADA DE FATIMA	2490-053	ATOUGUIA - OUREM	Portugal
FACAL- ENGENHARIA DE PROFIAL PROFISSIONAIS VITRO CHAVES INDUSTRIA DE VIDRO S.A	Rua do Vale 750	4446-908	Alfena	Portugal
Vidromax – Vidros	LUGAR DA REBOREDA	4784-909	SANTO TIRSO	Portugal
OeM - Alum. e Serralharia, Lda.	ESTRADA NACIONAL 8, 4	2510-713	GAEIRAS	Portugal
	R.DO CASAL NOVO,9-ABRUNHEIRA	2710-023	SINTRA	Portugal
	Z.I. DE FONTISCOS	4784-909	SANTO TIRSO	Portugal
	STRADA DE FATIMA	2490-053	ATOUGUIA - OUREM	Portugal
	E.N.2 Zona Industrial de Bob�da	5400-757	S�o Pedro de Agost�m - Chaves	Portugal
	Z. Ind. Viadores, lotes 40 e 41	3050-481	Mealhada	Portugal
	Qta. Figueira Arz. 35/37 Aprt. 181	2615-907	Sobralinho-Alverca	Portugal

Sch co FWS 50/60 SG and FWS 50/60 SG.SI

Manufacturing plant: Global certified companies (structural glazing)

Annex E
Page 7

current status: May 2019

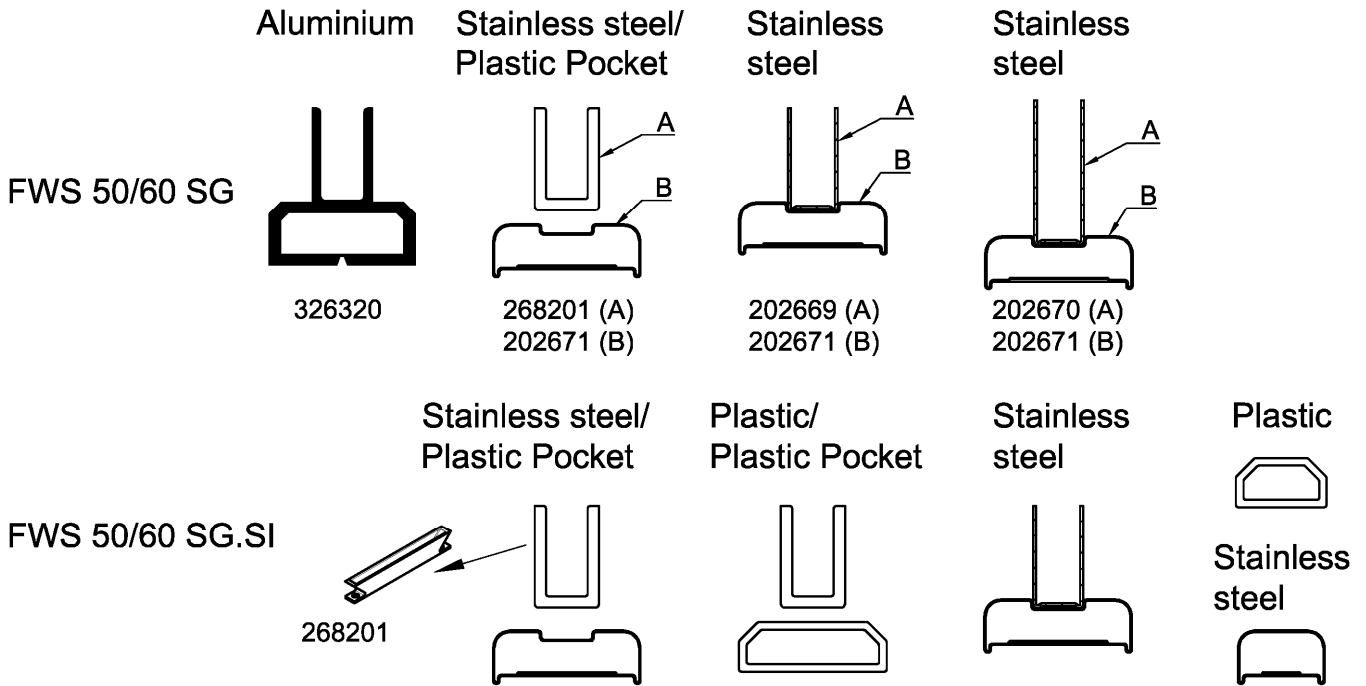
Name	Street	Zip code	Place	Country
Vidraria Bracarense Lda.	Rua da Venda Lt 1 e 2	4705-629	Braga	Portugal
Spitex II Lda.	Estr Municipal Zone Ind Dos	9560-304	Cabouco	Portugal
Aluminium & Light Industries Co. (Alico) Ltd.	P.O. Box 6011		Sharjah	United Arab Emirates
Alu Glass	7,Aflaton St.of el Oruba Heliopolis	11341	Cairo	Egypt
Egybel International	5 Baghdad Str. Korba	11341	Cairo	Egypt
Idex gluggar ehf	Smiojuvegi 3	200	Kopavogur	Iceland
Metek OÜ	Pikk 10	67404	Otepää, Valga Maakond	Estonia
Aluver Tootmine OÜ	Nurga	61702	Külitse alevik Ülenurme vald	Estonia
GlasCon OÜ	Sulevi, Kasemetsa küla	75510	Saku vald	Estonia
LV Metall OÜ	Loo 8	80043	Pärnu	Estonia
Osby Glas AB	Box 130	SE-283 23	Osby	Sweden
Fasadglas Baecklin AB	Box	161 11	Bromma	Sweden
Essaglas & Aluminium AB	Ymergatan	692 35	Kumla	Sweden
Scheuten Glas Hoorn BV	De Marowijne 4	1689	AL Zwaag	Netherlands
Pilkington Benelux B.V.	De Hoevler 25	7547	SB Enschede	Netherlands

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

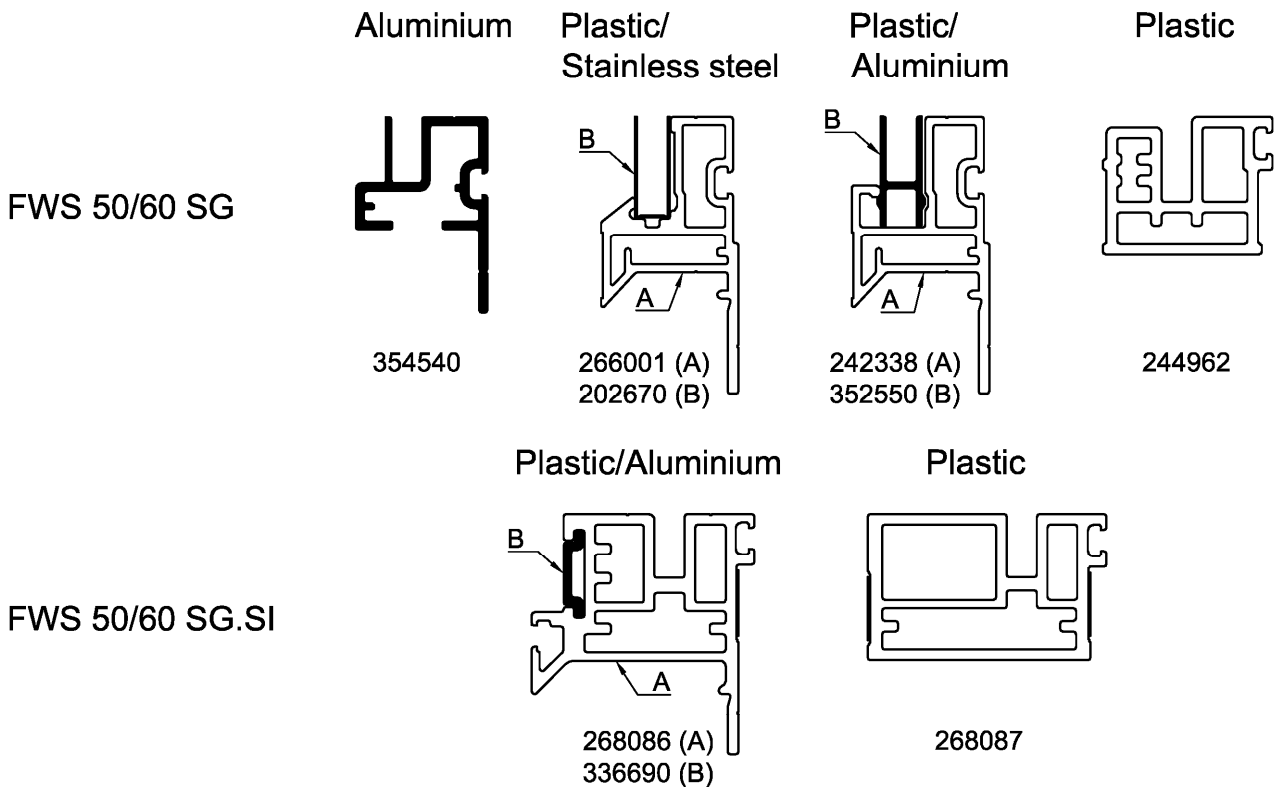
Manufacturing plant: Global certified companies (structural glazing)

Annex E
Page 8

Spacers for insulating glass



Spandrel panel profiles



Schüco FWS 50/60 SG and FWS 50/60 SG.SI

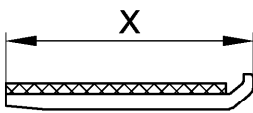
Overview spacers, spandrel panel profiles

Annex F
Page 1

Glazing supports

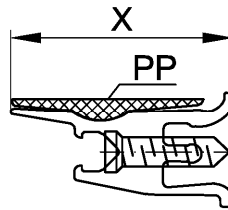
Aluminium/Silicone coating

Standard glazing support



FWS 50 SG		FWS 60 SG	
Art.-No.	X	Art.-No.	X
266673	30	266678	30
266674	38	266679	38
266675	44	266680	44
266676	46	266681	46
266677	50	266682	50

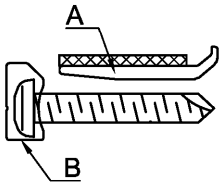
large glass loads



FWS 50 SG		FWS 60 SG	
Art.-No.	X	Art.-No.	X
242297	42	242188	41,9
242299	49,2	242302	49,2
242358	43,8	242360	43,8
242359	46,5	242361	46,5
242379	39,4	242380	39,4

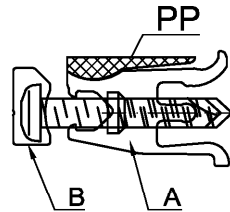
FWS 50/60 SG

Standard glazing support



FWS 50 SG	FWS 60 SG	
A	A	B
266673	266678	242301 237525

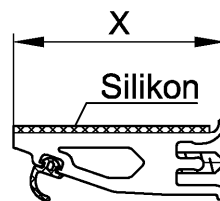
large glass loads



FWS 50 SG	FWS 60 SG	
A	A	B
242298	242189	242301 237525
242300	242303	242301 237525

FWS 50/60 SG.SI

large glass loads



FWS 50 SG.SI		FWS 60 SG.SI	
Art.-No.	X	Art.-No.	X
268053	55,8	268067	55,8
268054	57,1	268068	57,1
268056	59,8	268070	59,8
268057	61,1	268071	61,1
268059	63,8	268073	63,8
268064	65,1	268078	65,1
268066	67,8	268080	67,8

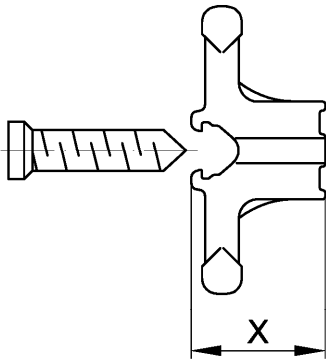
Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Overview glazing supports

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Page 2

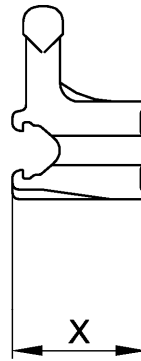
Retaining devices

Die-cast zinc



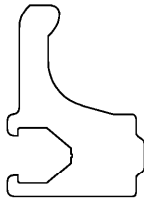
FWS 50/60 SG	
Art.-No.	X
237855	17,7
242363	21,7

Die-cast zinc



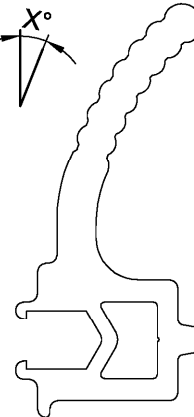
FWS 50/60 SG	
Art.-No.	X
237854	17,7
242362	21,7

Aluminium



FWS 50 SG	FWS 60 SG	
Art.-No.	Art.-No.	X
237856	237857	0-5°
242429	242430	
237857		5-10°
242430		

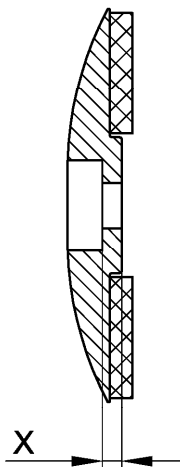
Aluminium



FWS 50 SG	FWS 60 SG	
Art.-No.	Art.-No.	X
242425	242427	10-45°
242426	242428	

Emergency retainers

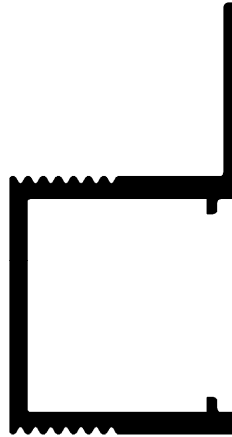
Aluminium/Silicone



FWS 50/60 SG	
Art.-No.	X
266166	2,4
266167	4,4
266168	6,4

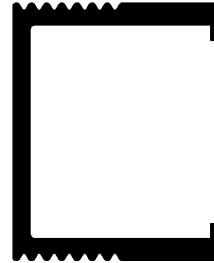
Frame profiles for ventilated cold facade

Aluminium



440050

Aluminium



433460

Glazing support profile

Aluminium



433600

Glazing bead profile

Aluminium



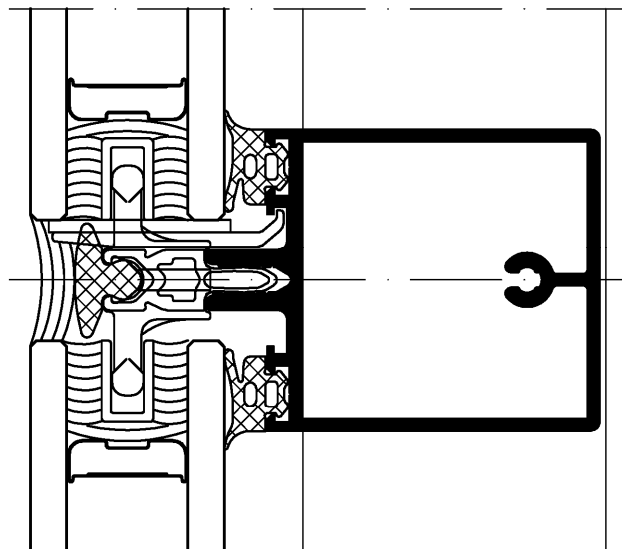
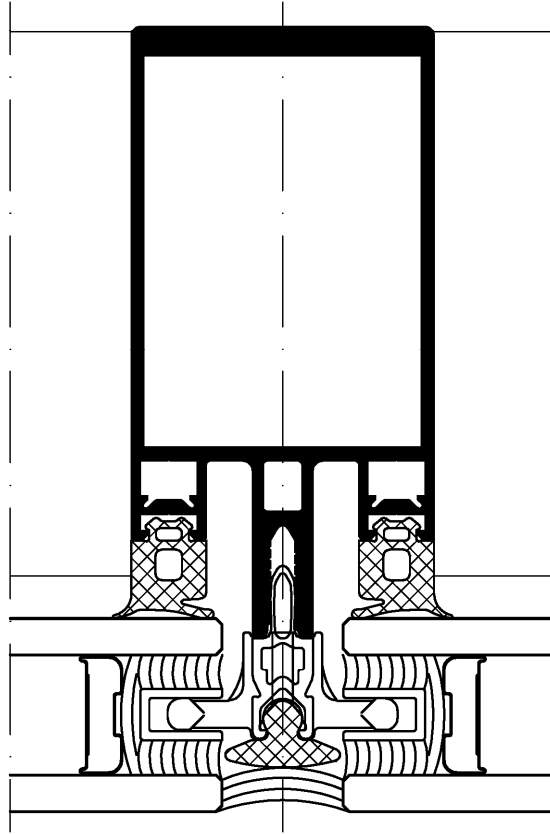
433610

Aluminium



433620

Stainless steel spacer with plastic pocket and wet sealing



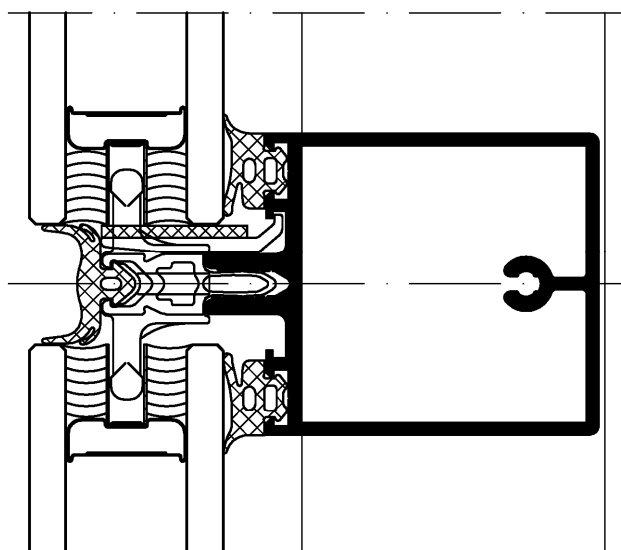
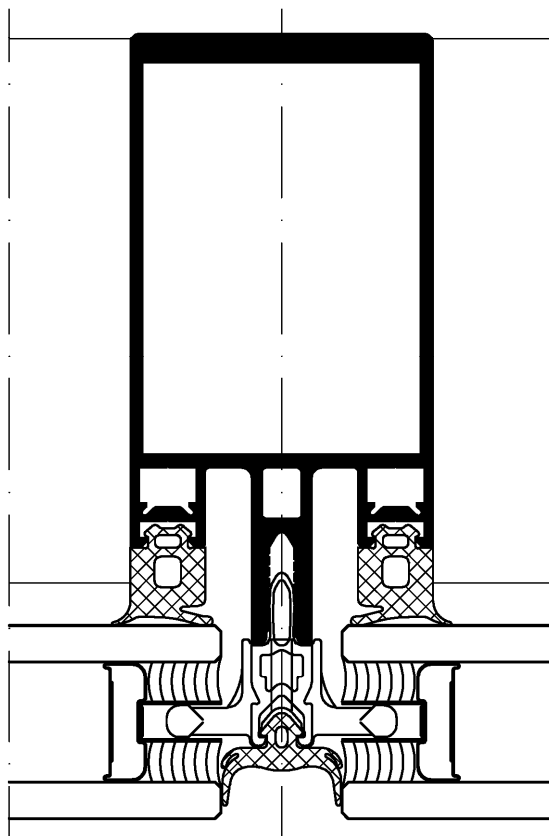
Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG
Intersection points example

Annex F
Page 5

Stainless steel spacer with u-shaped dry glazing



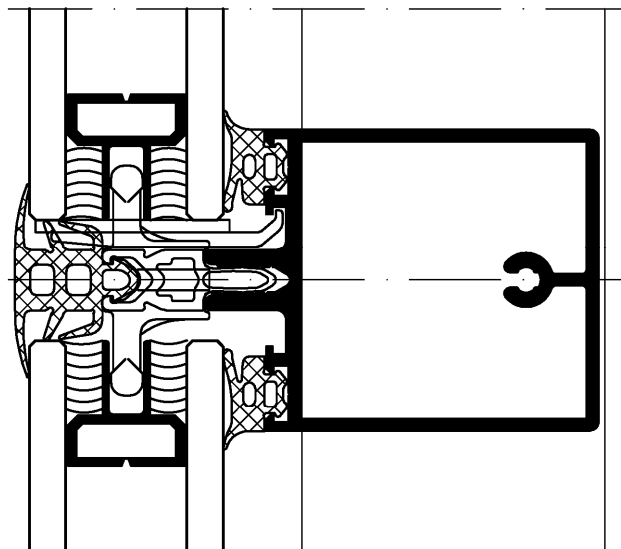
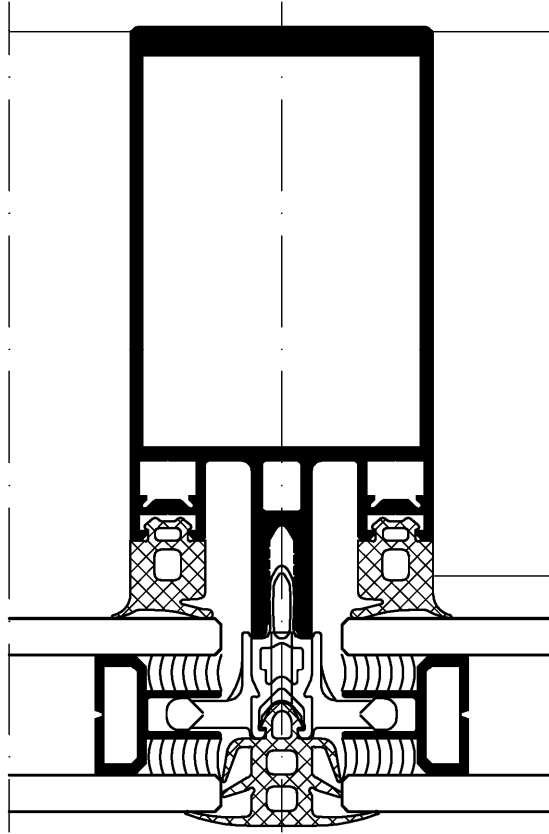
Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG
Intersection points example

Annex F
Page 6

Aluminium spacer with flush dry glazing



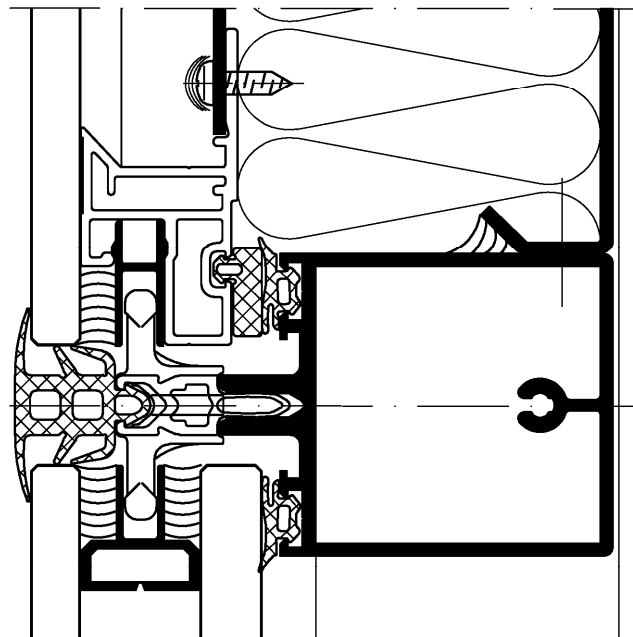
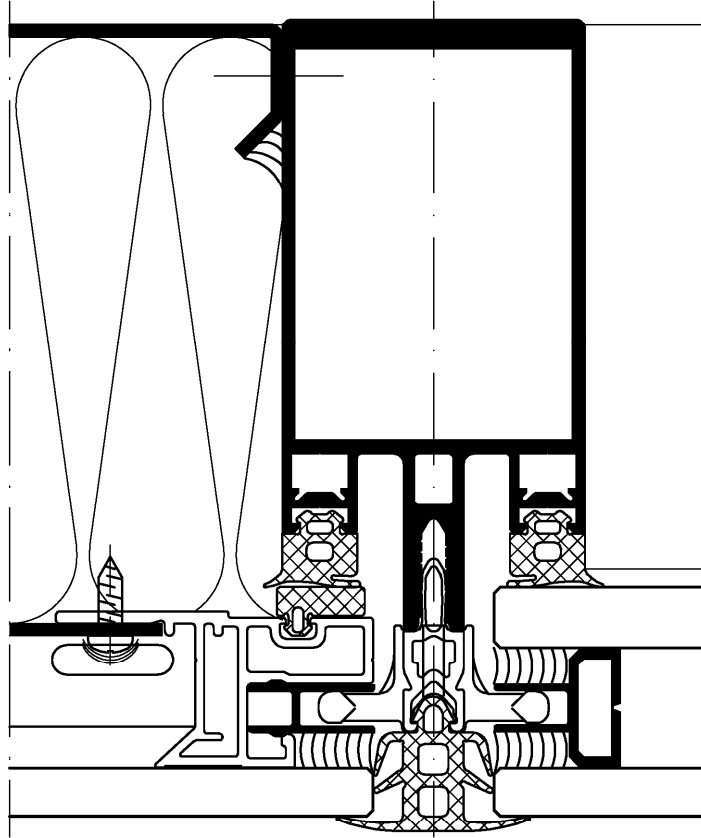
Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG
Intersection points example

Annex F
Page 7

Aluminium spacer with flush dry glazing



Electronic copy of the ETA by DIBt: ETA-05/0114

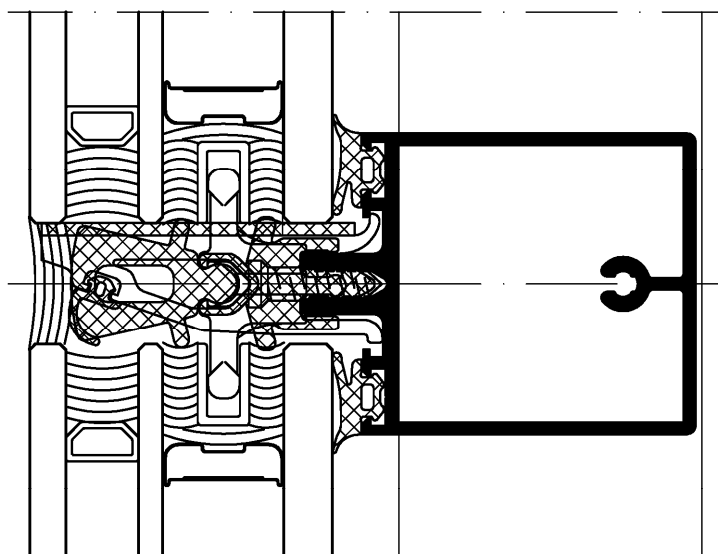
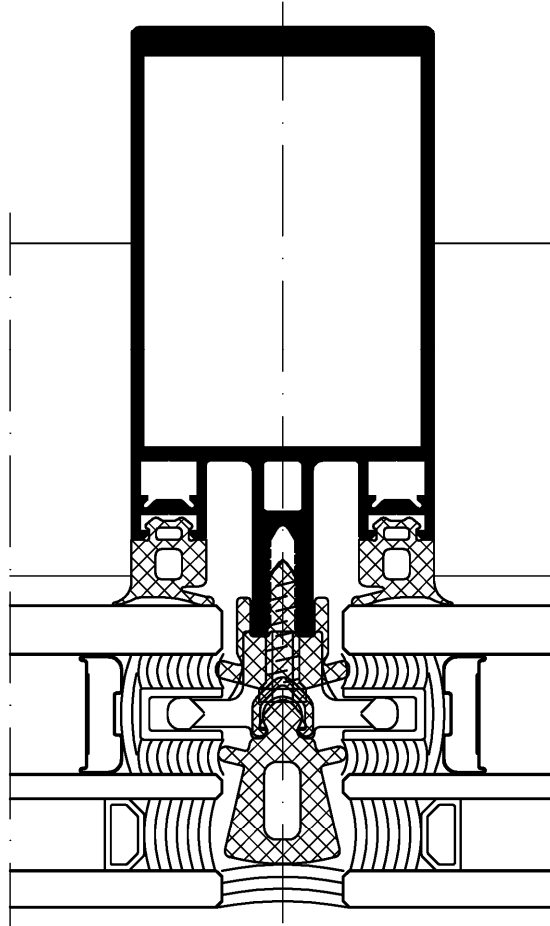
Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG

Intersection points example: Fixed glazing & spandrel panel single glass

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Page 8

Stainless steel spacer with plastic pocket / plastic spacer and wet sealing



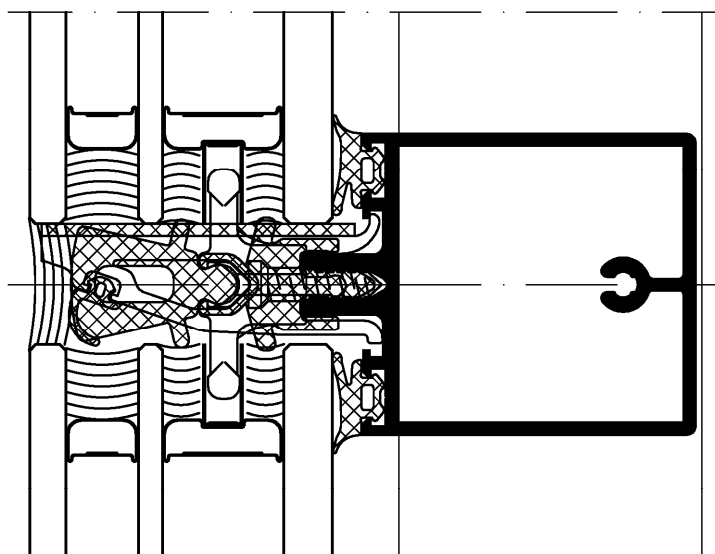
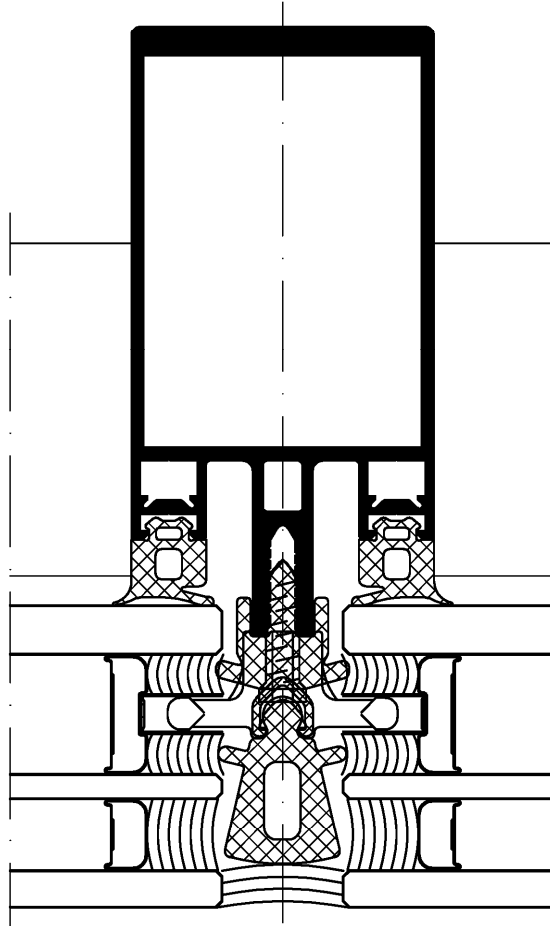
Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG.SI
Intersection points example: Triple glazing

Annex F
Page 9

Stainless steel spacer / Stainless steel spacer and wet sealing



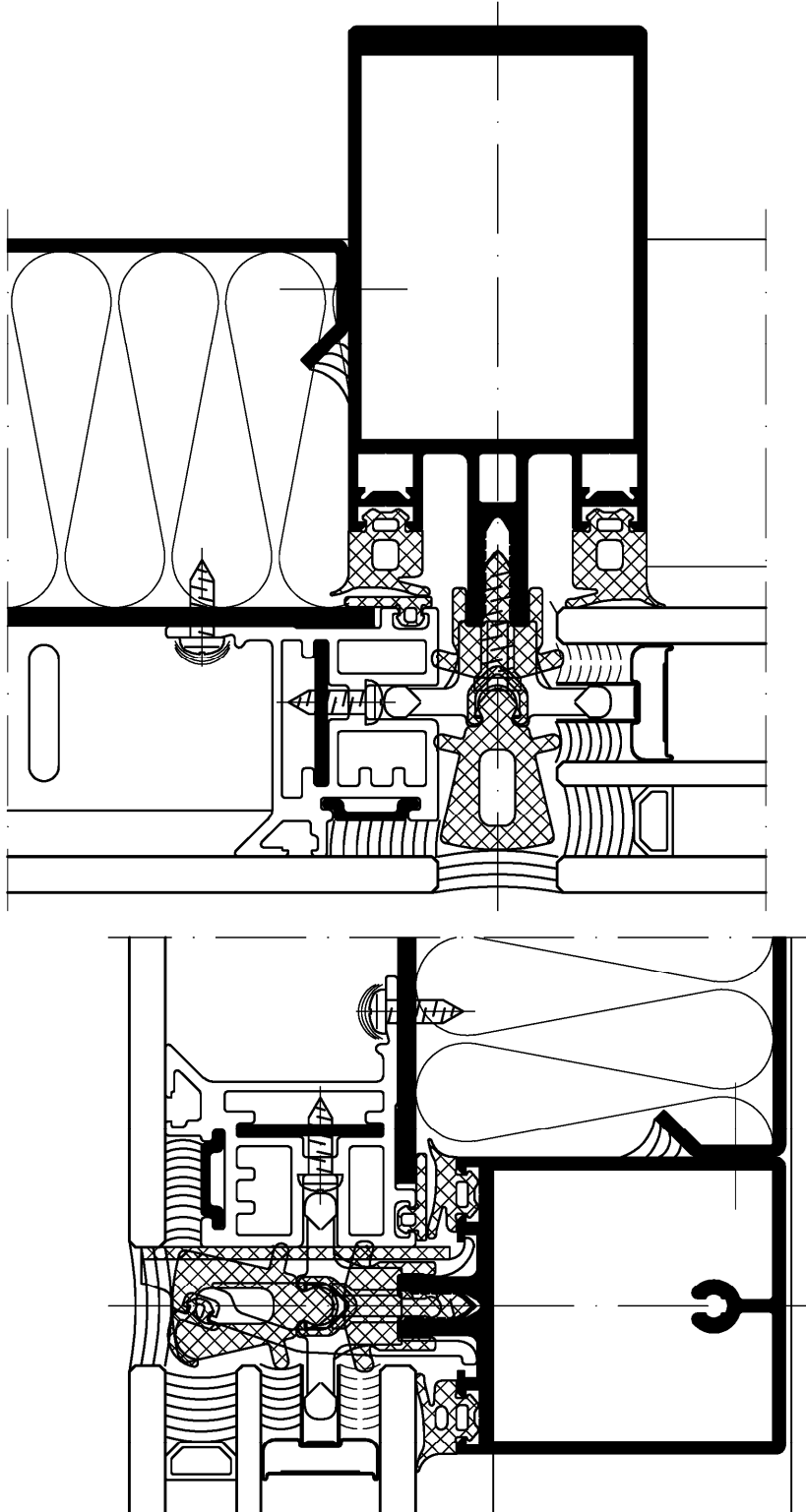
Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG.SI
Intersection points example: Triple glazing

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Stainless steel spacer / plastic spacer and wet sealing



Electronic copy of the ETA by DIBt: ETA-05/0114

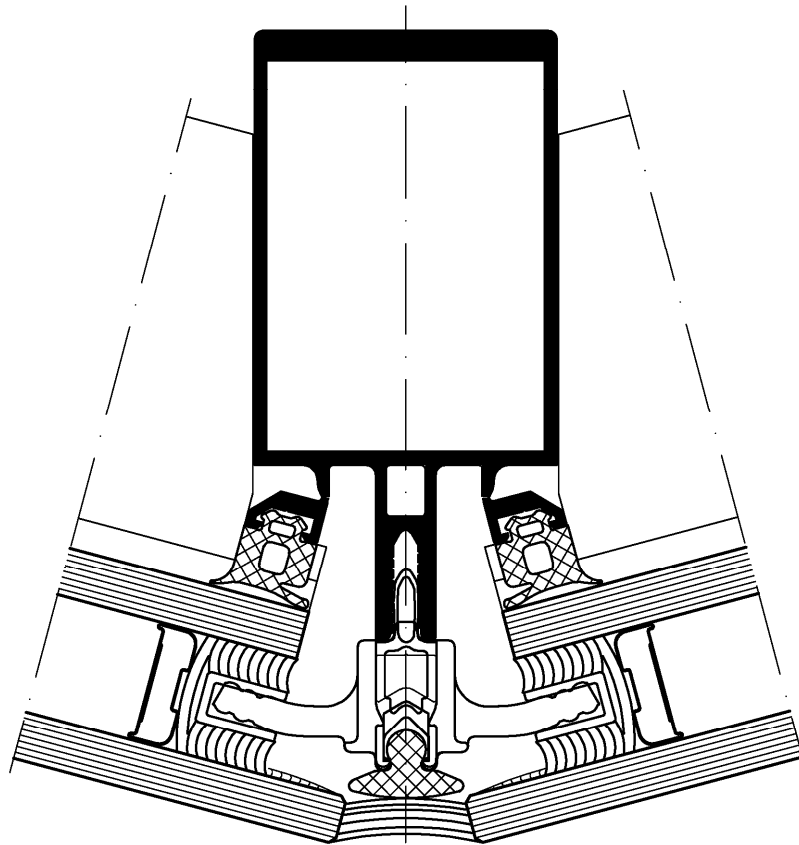
Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG.SI

Intersection points example: Fixed glazing & spandrel panel single glass

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Stainless steel spacer with plastic pocket and wet sealing



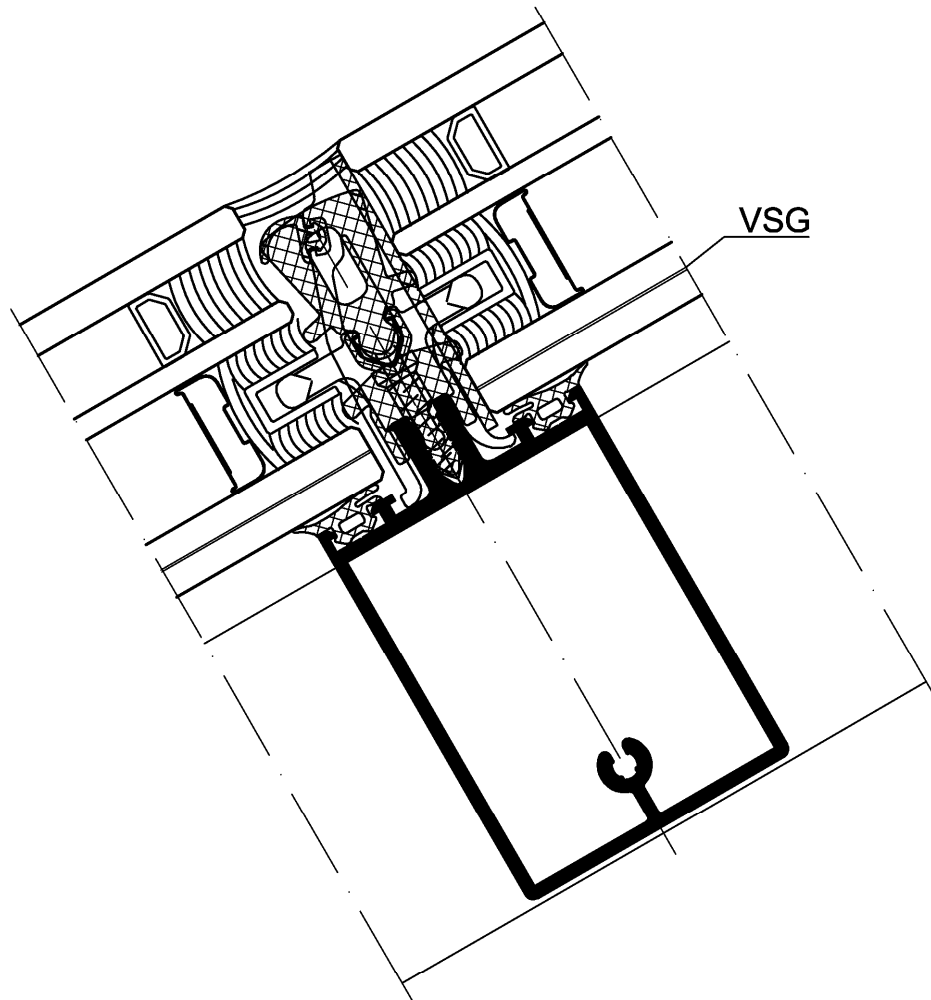
Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG
Intersection points example: External faceting

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Page 12

Stainless steel spacer with plastic pocket / plastic spacer and wet sealing

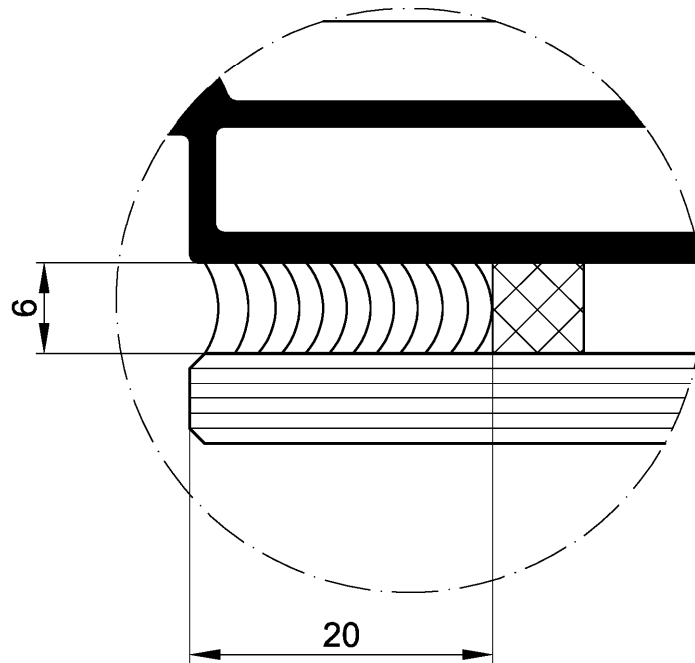


Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Schüco FWS 50/60 SG.SI
Intersection points example: Roof glazing

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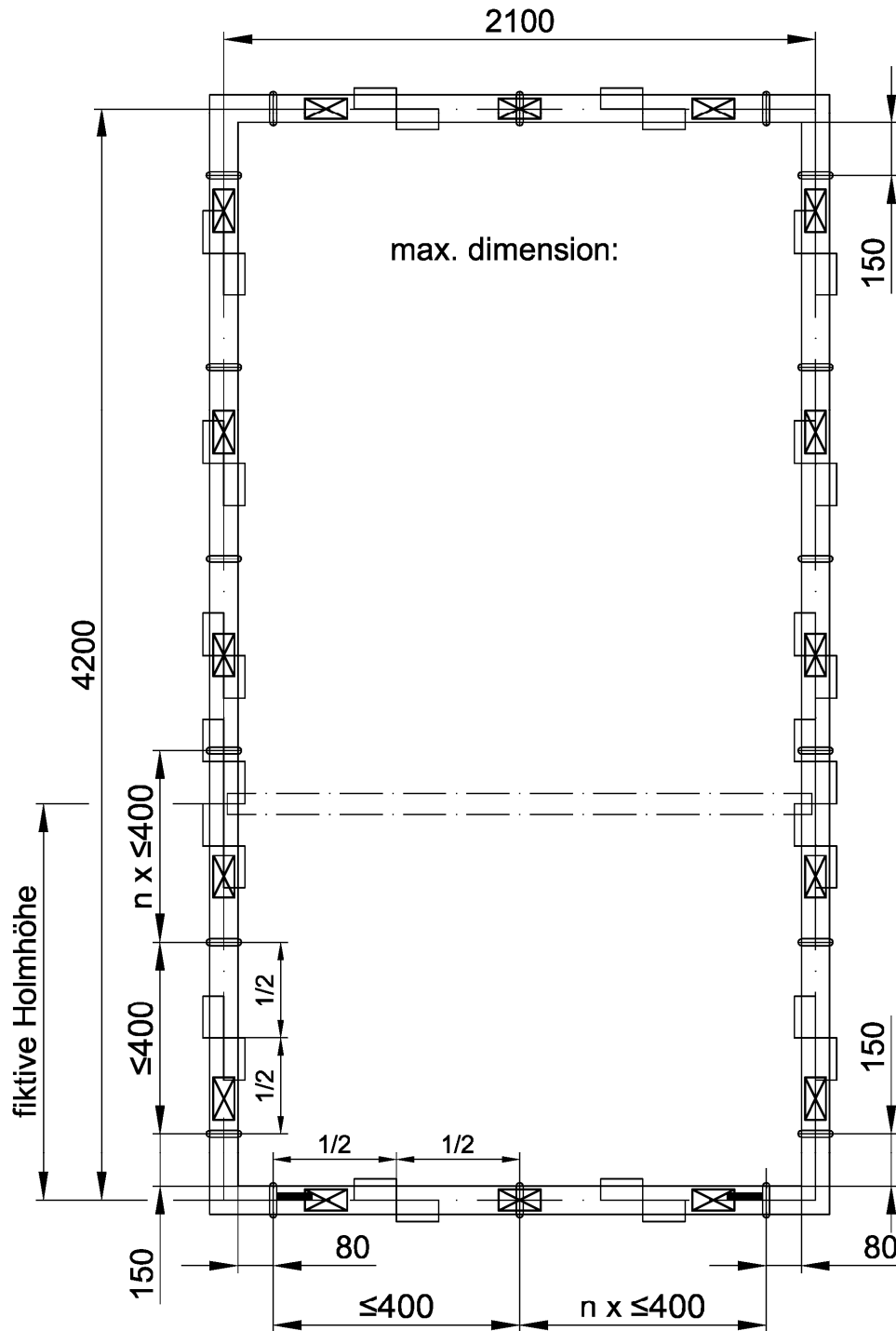


Electronic copy of the ETA by DIBt: ETA-05/0114

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Intersection points example: Structural sealing

Annex F
Page 14



Al-Emergency retainers appt. Page 3

Retaining devices Die-cast zinc appt. Page 3

Retaining devices Al appt. Page 3

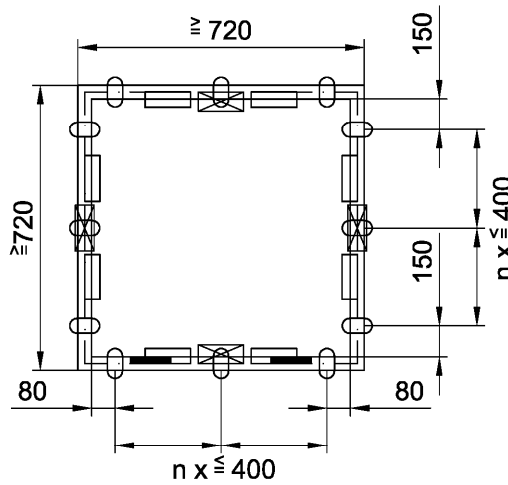
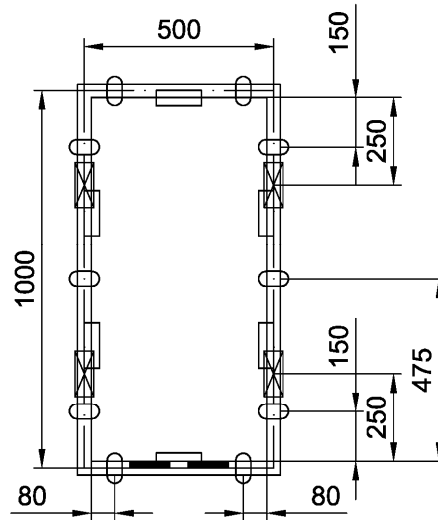
Glazing supports appt. Page 2

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Arrangement retainer zinc, besides fall protection by retainer Al and emergency arrangement by Al-Emergency retainer

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Page 15

min. dimension:



☒ Al-Emergency retainers appt. Page 3

○ Retaining devices Die-cast zinc appt. Page 3

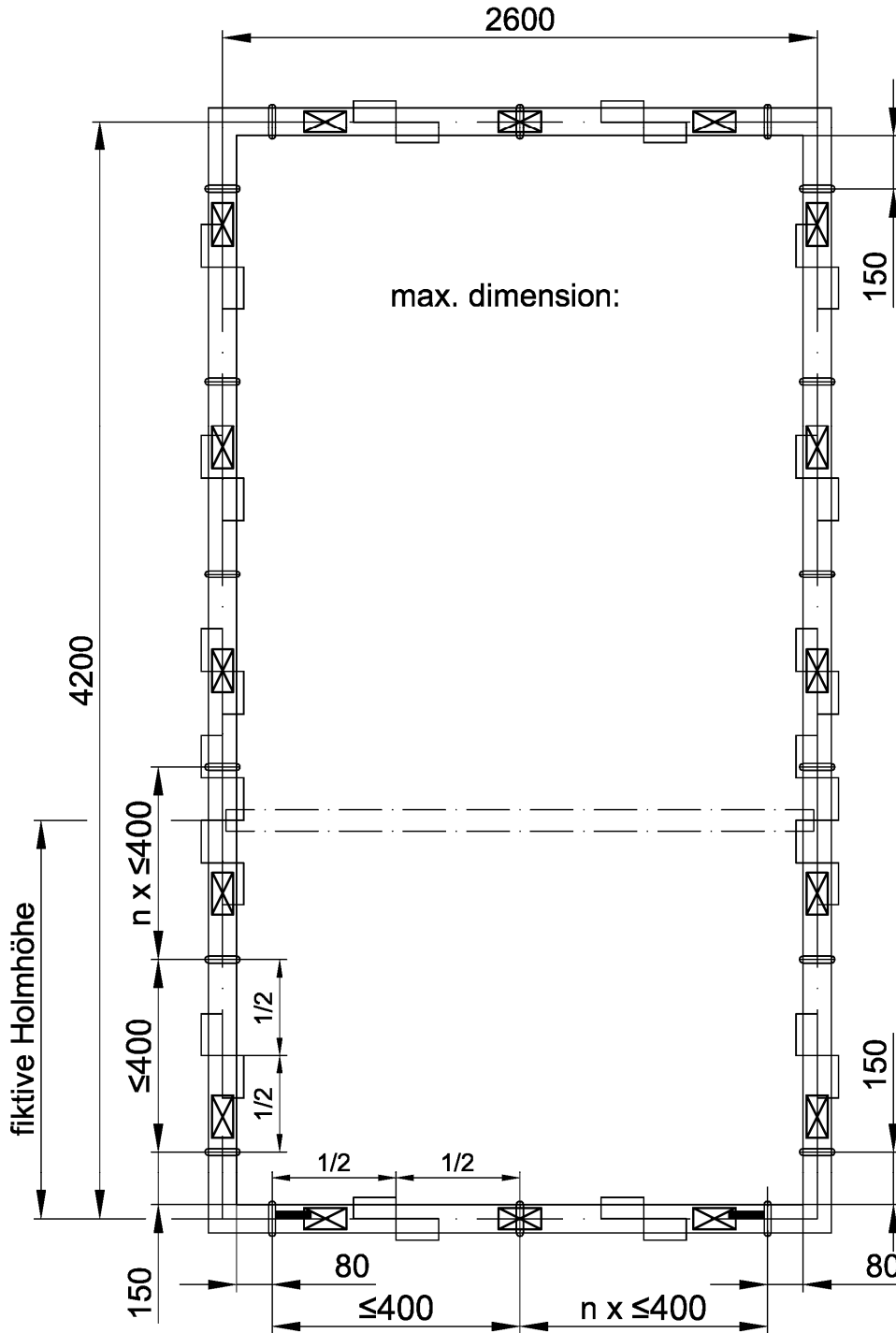
□ Retaining devices Al appt. Page 3


— Glazing supports appt. Page 2

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Arrangement retainer zinc, besides fall protection by retainer Al and emergency arrangement by Al-Emergency retainer

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 Retaining devices Die-cast zinc
appt. Page 3

 Inox-Emergency retainers appt. Page 3

 Retaining devices Al appt. Page 3

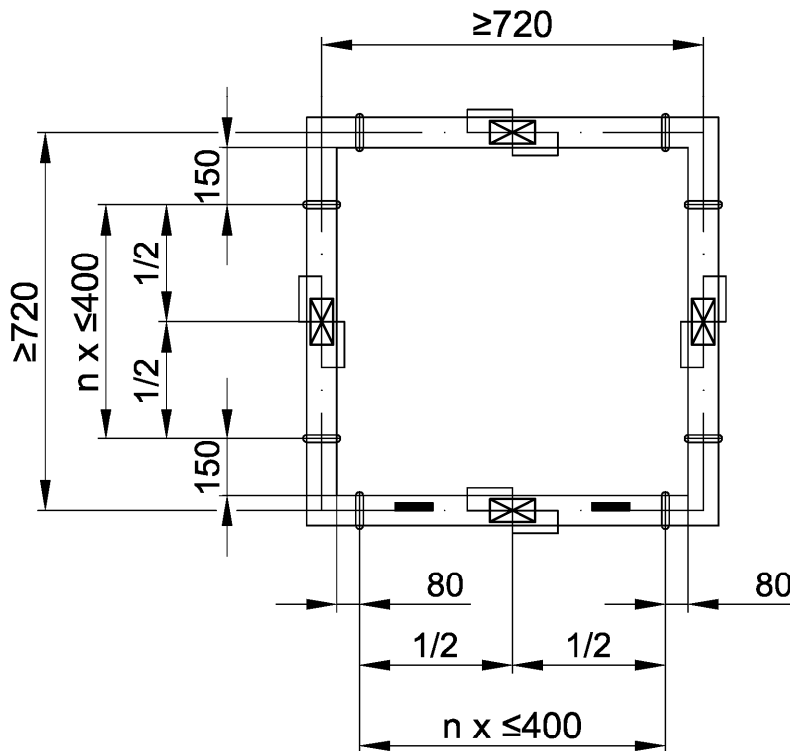
 Glazing supports appt. Page 2

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Arrangement retainer zinc, besides fall protection by retainer Al
and emergency arrangement by Al-Emergency retainer

Annex F
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min. dimension:



○ Retaining devices Die-cast zinc
appt. Page 3

⊠ Inox-Emergency retainers appt. Page 3

□ Retaining devices Al appt. Page 3

— Glazing supports appt. Page 2

Schüco FWS 50/60 SG and FWS 50/60 SG.SI

Arrangement retainer zinc, besides fall protection by retainer Al
and emergency arrangement by Al-Emergency retainer

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