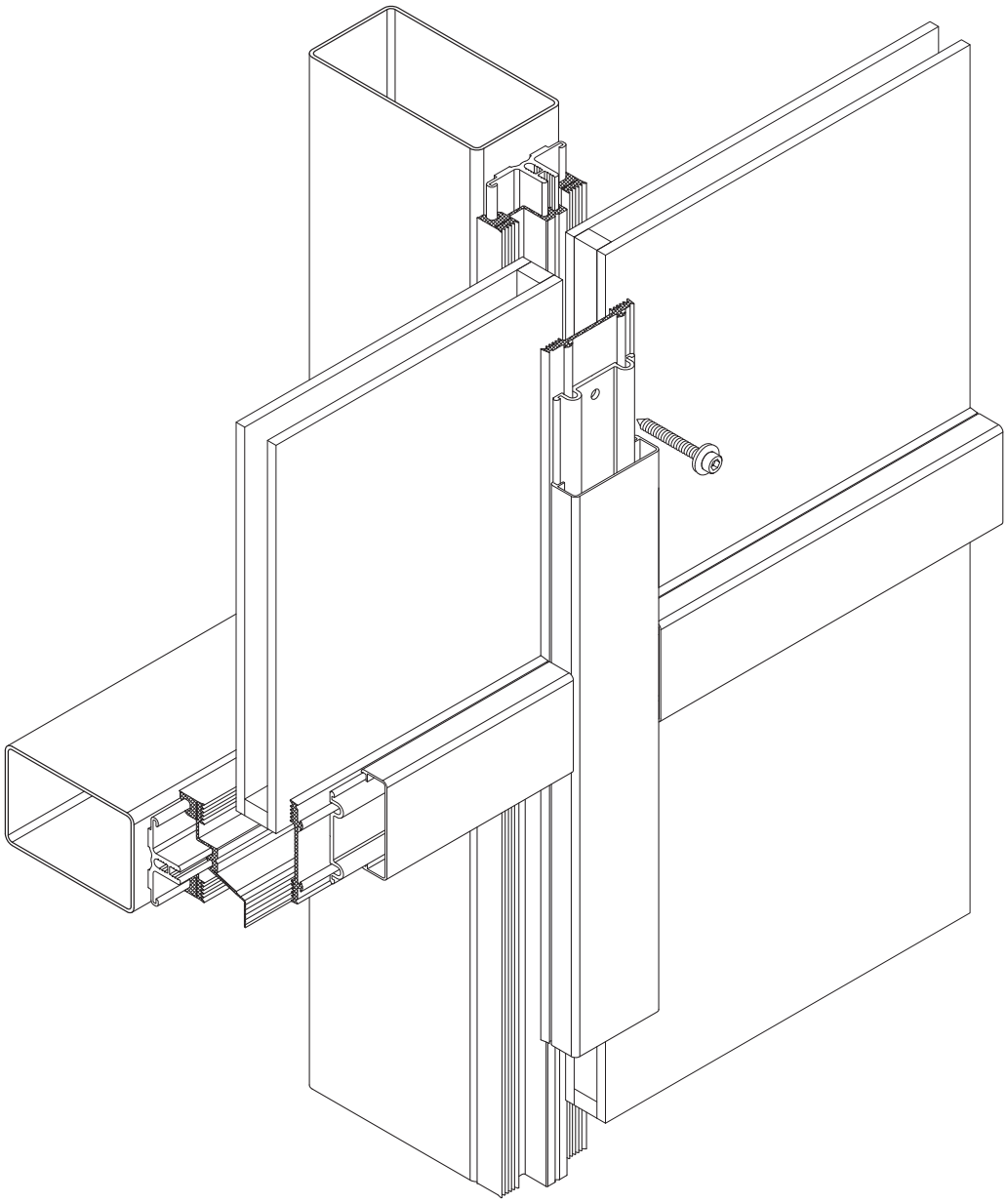
Stabalux AK-S

Stabalux AK-S
System

System properties

3.1
1

Steel facade system with add-on design



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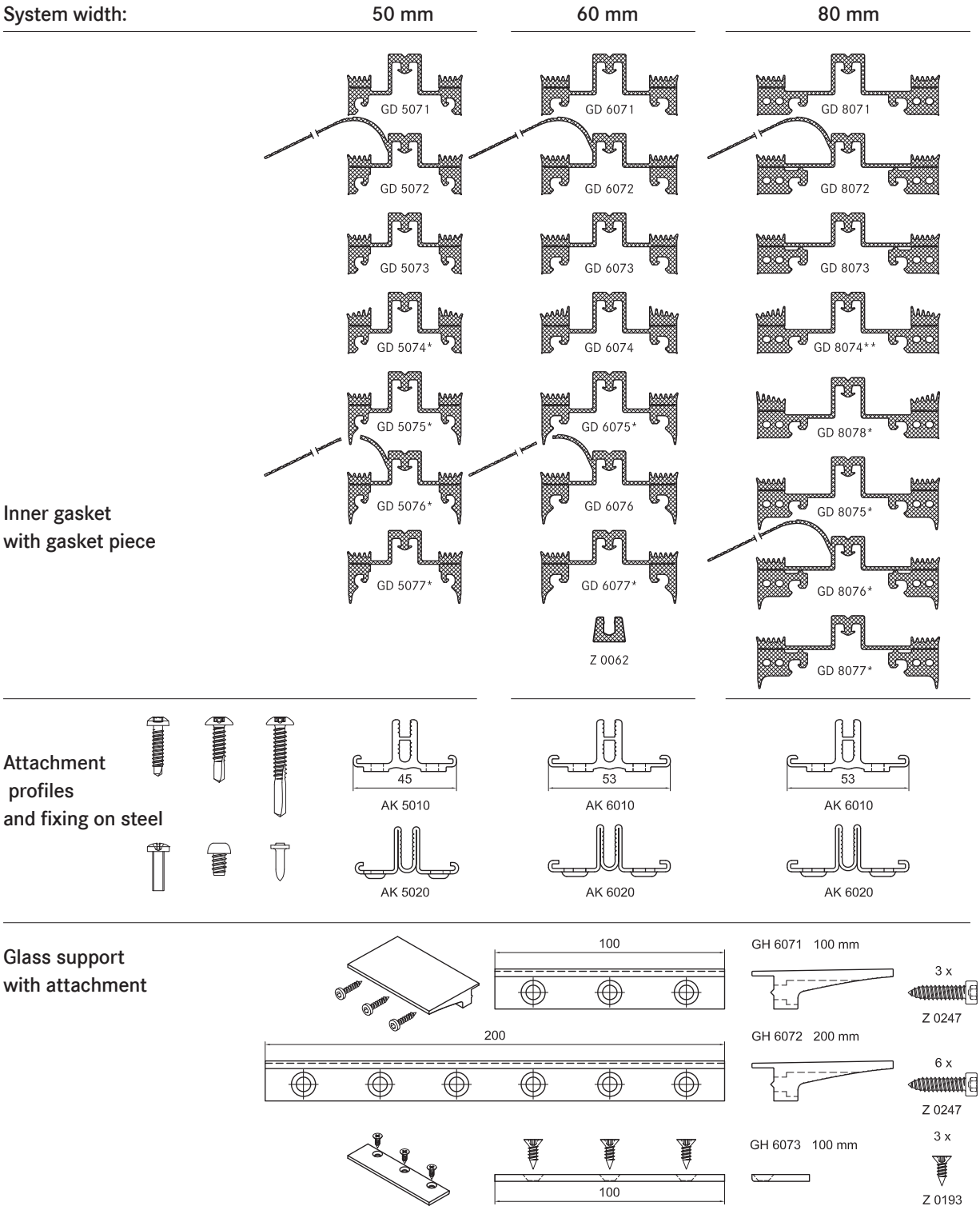
System properties

AK 5010/AK 6010 /AK 6020 - Article Overview



*) No stock items, available on request

AK-S_3.1_003.

System properties

3.1
1

Stabalux AK-S

- The Stabalux AK-S add-on system includes 2 add-on channels that differ from each other in material and method of attachment to the substructure:
  AK 5010/ AK 6010 made from aluminium for screw mounting onto a steel substructure and
  AK 6020 made from steel for welding onto a steel substructure and
  The use of inner seals and glass supports is identical for both channels.
- The Stabalux System AK-S provides a complete range of products in 50, 60 mm and 80 mm widths for vertical and inclined glazing.
- The add-on channel is used the same way for both facades and roofs.
- The Stabalux AK-S is suitable for custom glass structures with single or double glazing.
- The system allows direct attachment to a wide range of statically supporting steel substructures.
- The substructure made from steel profiles can be freely chosen and offers good value options for designing facades and roofs.
- Pre-assembly of support profiles and add-on channels in the workshop is possible. Support structures can also be mounted independent of the add-on channel. The add-on channel is then fitted on site. On-site mounting of the System AK-S therefore makes it suitable for restoration of existing facades and roofs.
- The inner seals for mullions and transoms are different and are directly pressed into the add-on channel. This guarantees exact guidance in mullions and transoms. There are various seals available with different radii for the substructure.
- Clamping strips and outer seals are screwed directly to the add-on channel. The advantages of screw channel technology become clear when implementing the clamp connection.
- Integrated glass supports with direct screw fittings in the add-on channel allow the use of glass with a thickness from 8 to 60 mm. Welded glass supports for heavy pane weights are also possible.
- Attachment to the substructure, the clamp connection and glass supports are all regulated by general building control certification Z-14.4-767.
- Attachment to the substructure, the clamp connection using Hilti fasteners and glass supports are all regulated by general building control certification Z-14.4-766.
- The System AK-S allows good U_f values to be achieved. Installing slab insulation blocks results in significant improvements to the thermal insulation properties.

Specifications AK 5010/ AK 6010/AK 6020

System widths	**50, 60, 80 mm**	
Air permeability EN 12152	AE	
Driving rain resistance EN 12154/EN 13050	static dynamic	RE 1500 Pa 250 Pa/750 Pa
Resistance to wind EN 13116	permitted load increased load	2000 Pa 3000 Pa
Shock strength EN 14019	I5/E5	
Glass weight	≤ 1452 kg	
Burglary resistance DIN EN 1627	RC 2	
Clamp connection	abZ Z-14.4-767	
U_f value	U_f = 0.74 W/(m²K) Glass thickness 46 mm, insulation block	

System properties

3.1
1

Aluminium Stabalux AK 5010/ AK 6010

- The supporting structure can be coated independently of the add-on channel and regardless of any later screw fittings.
- The screw connection between the add-on channel and substructure is achieved using system screws from the Stabalux range. The choice of system screw is dependent on the thickness of the material in the substructure. Self-tapping screws are generally used. Pre-drilling is therefore not necessary. This connection is extremely firm and, due to the combination of the AK 5010/ AK 6010 material and the coating, optimally corrosion resistant.
- Use of metric screws is possible with a material thickness from 6 mm.
- Alternatively, Hilti fasteners can be used to make the connection to the substructure.

Steel Stabalux AK 6020

- Add-on channel AK 6020 is roll formed using Sendzimir-galvanized band steel. Alternatively, the add-on channel can be delivered blank upon request.
- Alongside the holes for attachment, the add-on channels also has press cut areas that must be at a certain distance to the substructure and ensure sufficient ventilation below the channel.
- Attachment of the add-on channel is achieved using plug welds onto the steel substructure. The processor should request welding directions from Stabalux. Depending on the choice and implementation of the corrosion protection for the entire structure, either galvanized or uncoated materials can be used. Any rust must be removed from black materials prior to processing. Before applying an additional coating, we recommend cleaning any areas that have become dirty from the welding and agree protection against corrosion with the coating operation. Stabalux provides information about corrosion protection. This should also be requested.

System properties

Certifications, authorisations, CE mark
(Section 9)

The tests we have carried out provide contractors and planners with certainty as well as the ability to use the test results and system passports. For example, they might use this information to issue the CE mark.

Permeability/Safety

- The Stabalux sealing geometry prevents moisture ingress.
- Condensation is guided away in a controlled manner.
- For vertical and roof glazing, Stabalux offers an overlapping 2-level sealing system.
- Three guide rails hold the seals in exactly the right position when using the single-piece Stabalux add-on channel and ensure even support for glass on all sides.
- Transom flags increase the mount safety and impermeability of vertical glazing.
- A special sealing piece for transom seals makes overlaps more secure.
- Creation of the required drainage takes place at the construction site by pushing together the seals in the facade or slotting together the offset sealing sections.

Insulation **(Section 9)**

The System Stabalux AK-S has good thermal insulation values. A heat transfer coefficient U_f is achieved with, for example, 46 mm glass for frames of:

AK 6010: U_f = 0.69 W/(m²k)
AK 6020: U_f = 0.70 W/(m²k)

The use insulation blocks has a positive effect on thermal insulation for the entire glass installation.

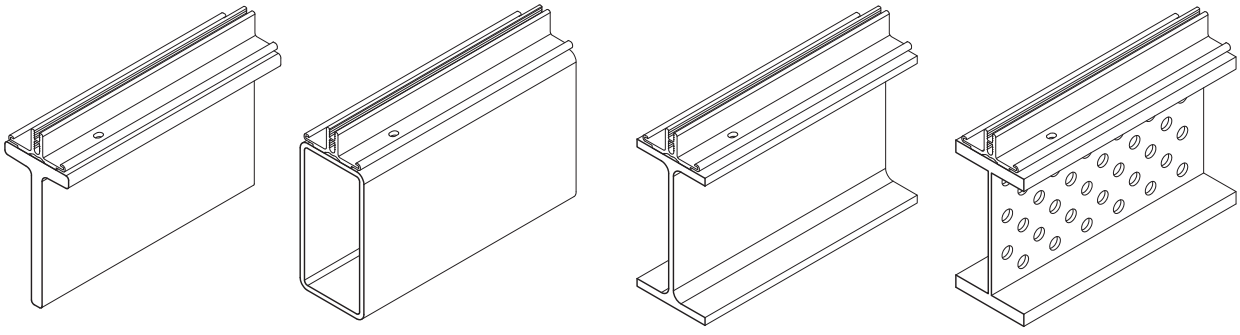
Noise insulation of the glass facade **(Section 9)**

The noise insulating properties of a facade depend on a variety of factors, each of which affects the properties in a different way. The task of the planner is to expertly select the optimum design on a case-by-case basis. Different combinations of frame profiles, glazing systems and noise reducing glass have vastly different effects on noise insulation.

Burglar resistance **(Section 9)**

The Stabalux System AK-S has burglar resistant properties. The test was performed according to DIN EN 1627. Facades in resistance class RC2 can be mounted on the system widths 50 mm, 60 mm and 80 mm.
Class RC2 is classified as a moderate risk. It is recommended for use in residential, commercial and public buildings. Very few constructive measures are needed to achieve the burglary-resistant properties; tested panels must also be installed.
The appearance of burglar-resistant facades using Stabalux System AK-S is the same as the normal construction. All benefits of using threaded tubes are preserved. The benefits of direct screw fittings in the central groove are preserved.

Example for on-site steel support profiles

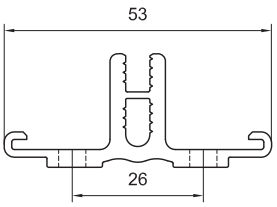


Stabalux T-profile | Hollow steel profile | Rolled steel profile | Steel profile

AK-S_3.1_002.dwg

Stabalux AK-S
System

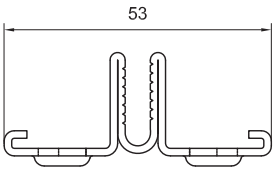
System properties



Stabalux add-on channel AK 5010/ AK 6010

Material (Section 3.2.1)		Aluminium EN 6360 T66		
Section (Section 3.2.4)	AK length on mullion	$\ell_{AK} = \ell_{mullion}$		
	AK length on transoms	$\ell_{Add\text{-}on\ channel} = \ell_{transom}$ - (2 x 15 mm)		
	AK length on intermediate mullions	$\ell_{Add\text{-}on\ channel} = \ell_{intermediate\ mullion}$ - (2 x 15 mm)		
Attachment material (Section 3.1.1)	to hollow profile	**Z 0171** **Z 0172** **Z 0173** **Hilti fasteners**	Wall thickness 2 - 4 mm Wall thickness 2.5 - 6 mm Wall thickness 4 - 12 mm Wall thickness 4 - 12 mm	Screw self-tapping Screw self-tapping Screw self-tapping
	on rolled profile	**Z 0174** **Z 0192** **Hilti fasteners**	Wall thickness from 6 mm Wall thickness 4 - 12 mm	M5 for threaded hole 4.2 x 7 mm Tapping screw blind hole 5.5 x 7 mm
Attachment (Section 3.2.4)		**First set of screw fittings placed in pairs, then every 200 mm = approx. 6 screws/m**		
	Edge distance - mullion	≤ 100 mm		
	Edge distance - transom	approx. 50 mm (be aware of T-joints)		
Glasauflager (Kapitel 3.2.9)	GH 6071 for 20 - 60 mm glass thicknesses	Screw fittings for glass supports with add-on channel		**3 x Z 0247**
		Add-on channel strengthening around the glass support		**4 x screws** **4 x Hilti fasteners**
	GH 6072 for 20 - 60 mm glass thicknesses	Screw fittings for glass supports with add-on channel		**6 x Z 0247**
		Add-on channel strengthening around the glass support		**8 x screws** **12 x Hilti fasteners**
	GH 6073 for 8 - 18 mm glass thicknesses	Screw fittings for glass supports with add-on channel		**3 x Z 0193**
		Add-on channel strengthening around the glass support		**6 x screws** **6 x Hilti fasteners**
Inner seal System 50 mm (Section 3.1.2)	Facade + roof mullion	**GD 5071 (without radii)** **GD 5074 (polygonal convex 3° - 15°)**		
	Facade transom	**GD 5072 (without radii)**		
	Roof transom	**GD 5073 (without radii) also for facade single-glazing**		
	Sealing piece	**Z 0062 | 1 x per transom end**		
Inner seal System 60 mm (Section 3.1.2)	Facade + roof mullion	**GD 6071 (without radii)** **GD 6074 (polygonal convex 3° - 15°)**		
	Facade transom	**GD 6072 (without radii)**		
	Roof transom	**GD 6073 (without radii) also for facade single-glazing**		
	Sealing piece	**Z 0062 | 1 x per transom end**		
Inner seal System 80 mm (Section 3.1.2)	Facade + roof mullion	**GD 8071 (without radii)**		
	Facade transom	**GD 8072 (without radii)**		
	Roof transom	**GD 8073 (without radii) also for facade single-glazing**		
	Sealing piece	**Z 0062 | 1 x per transom end**		

System properties



Stabalux add-on channel AK 6020

Material (Section 3.2.1)		Steel S 250 GD	
Section (Section 3.2.4)	AK length on mullion	$\ell_{AK} = \ell_{Mullion}$	
	Add-on channel length on transoms	$\ell_{Add\text{-}on\ channel} = \ell_{transom}$ - (2 x 15 mm)	
	Add-on channel length on intermediate mullions	$\ell_{Add\text{-}on\ channel} = \ell_{intermediate\ mullion}$ - (2 x 15 mm)	
Attachment material (Section 3.1.1)		Steal substructure weld seam min. wall thickness ≥ 3 mm	
Attachment (Section 3.2.4)		First set of screw fittings placed in pairs, then every 400 mm	
	Edge distance - mullion	≤ 100 mm	
	Edge distance - transom	Weld seam directly on channel end	
Glass support (Section 3.2.9)	GH 6071 for 20 - 60 mm glass thicknesses	Screw fittings for glass supports with add-on channel	**3 x Z 0247**
		Add-on channel strengthening around the glass support	**2 x slot hole welds**
	GH 6072 for 20 - 60 mm glass thicknesses	Screw fittings for glass supports with add-on channel	**6 x Z 0247**
		Add-on channel strengthening around the glass support	**2 x slot hole welds + 2 x round hole welds**
	GH 6073 for 8 - 18 mm glass thicknesses	Screw fittings for glass supports with add-on channel	**3 x Z 0193**
		Add-on channel strengthening around the glass support	**2 x slot hole welds**
Inner seal System 60 mm (Section 3.1.2)	Facade + roof mullion	**GD 6071 (without radii) GD 6074 (polygonal convex 3° - 15°)**	
	Facade transom	**GD 6072 (without radii)**	
	Roof transom	**GD 6073 (without radii) also for facade single-glazing**	
	Sealing piece	**Z 0062 | 1 x per transom end**	
Inner seal System 80 mm (Section 3.1.2)	Facade + roof mullion	**GD 8071 (without radii)**	
	Facade transom	**GD 8072 (without radii)**	
	Roof transom	**GD 8073 (without radii) also for facade single-glazing**	
	Sealing piece	**Z 0062 | 1 x per transom end**	

Stabalux AK-S
System

System properties

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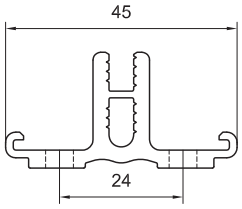
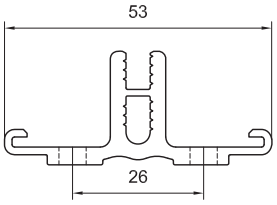
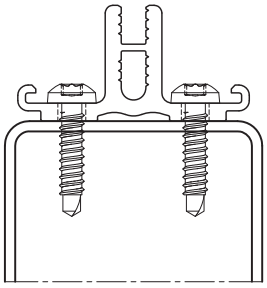
Stabalux add-on channel AK 5010



Stabalux add-on channel AK 6010

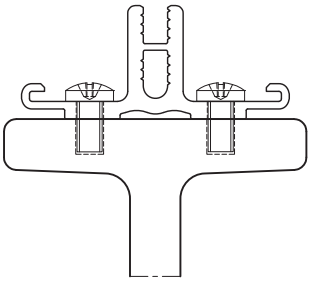


Connection
add-on channel AK 5010 / substructure

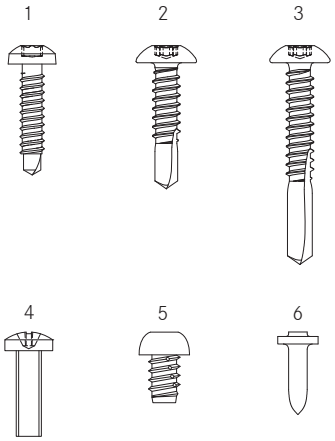


Mounting to hollow profile

Connection
add-on channel AK 6010 / substructure



Mounting to rolled profile



AK-S_3.1_003.dwg

1 Z 0171 self-tapping screw 4.8 x 22 mm
attachment UK steel wall thickness 2-4 mm
2 Z 0172 self-tapping screw 5.5 x 25 mm
attachment UK steel wall thickness 2.5-6 mm
3 Z 0173 self-tapping screw 5.5 x 40 mm
attachment UK steel wall thickness 4-12 mm

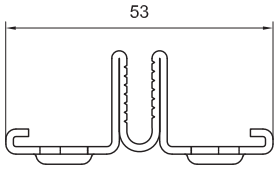
4 Z 0174 M5 5.5 x L tapped hole 4.2 x 7 mm wall thickness from 6 mm
5 Z 0192 Tapping screw blind hole 5.5 x 7 mm
6 Hilti fasteners X-R 14P8 System screw fittings add-on channel/support profile

*) For AK 5010 check the use of the screws

System properties

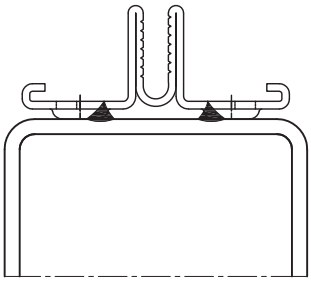
3.1
1

Stabalux add-on channel AK 6020

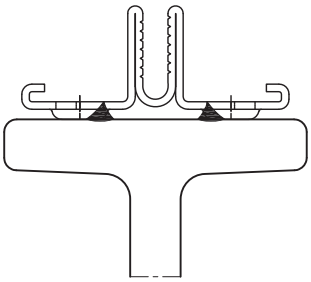


AK 6020

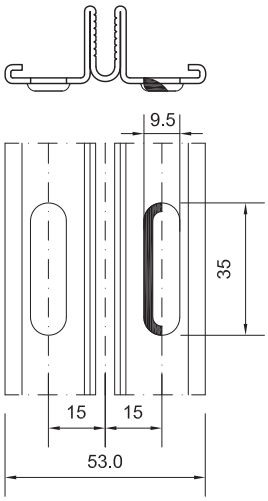
Connection
add-on channel AK 6020 / substructure



welded mount on hollow profile

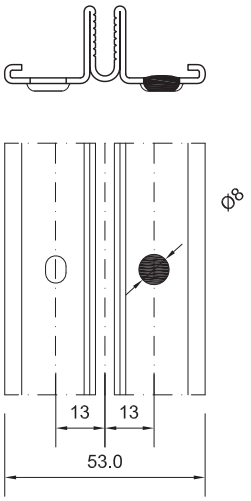


welded mount on rolled profile



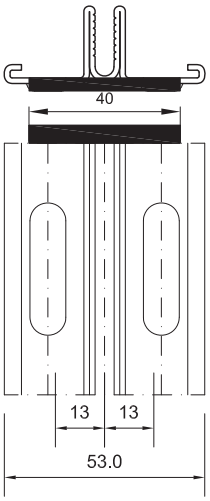
Welding in
slot hole 9.5 x 35 mm

Standard attachment



Welding in
round hole Ø 8 mm

Glass support reinforcement



Welding on
channel end 40 mm

Standard attachment transom end

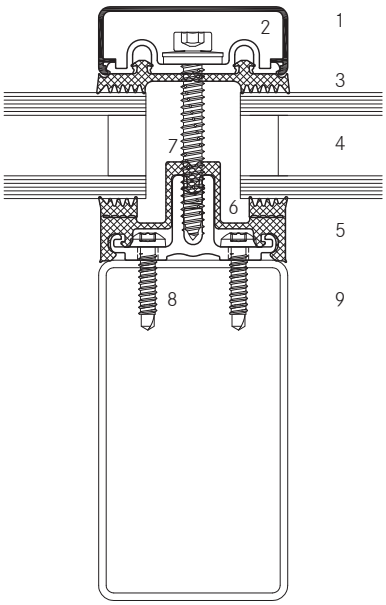
AK-S_3.1_003.dwg

System cross sections and inner seals - facade

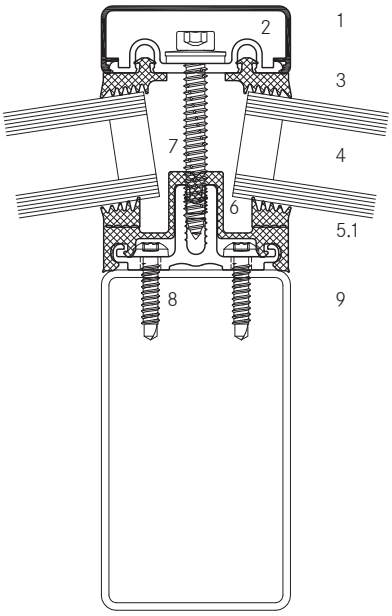
3.1
2

Inner seal 16.5 mm tall / 2 overlapping drainage levels

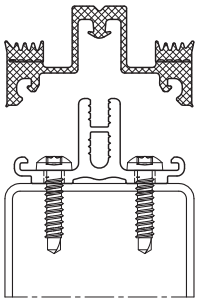
Vertical glazing mullion



Polygonal glazing mullion convex / 3° - 15°

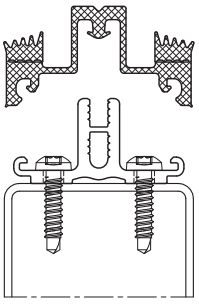


Inner seal vertical glazing mullion
System width 50 mm



GD 5071

Inner seal polygonal glazing mullion
System width 50 mm



GD 5074

1 Cover profile
2 Pressure profile
3 Outer seal
4 Glass / fill element
5 Inner mullion seal

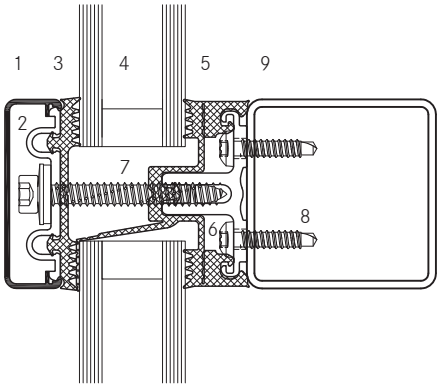
5.1 Inner mullion seal polygonal glazing
6 Add-on channel
7 System screw fittings clamp connection
8 System screw fittings add-on channel/support profile
9 Support profile

AK-S_3.1_004.dwg

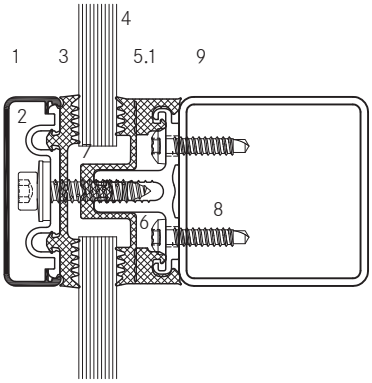
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Vertical glazing transom double glazing

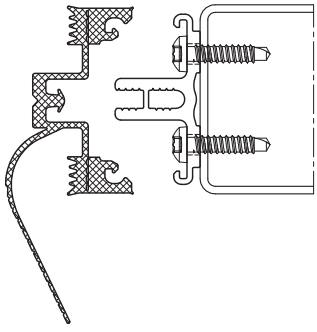


Vertical glazing transom single glazing



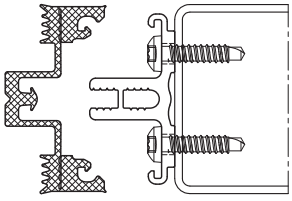
Inner seal vertical glazing transom
Double glazing system width 50 mm

GD 5072



Inner seal vertical glazing transom
Single glazing system width 50 mm

GD 5073



1 Cover profile
2 Pressure profile
3 Outer seal
4 Glass / fill element
5 Inner transom seal double glazing

5.1 Inner transom seal single glazing
6 Add-on channel
7 System screw fittings clamp connection
8 System screw fittings add-on channel/support profile
9 Support profile

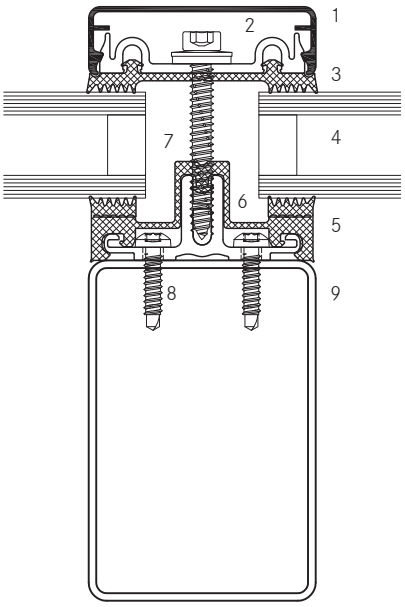
AK-S_3.1_004.dwg

System cross sections and inner seals - facade

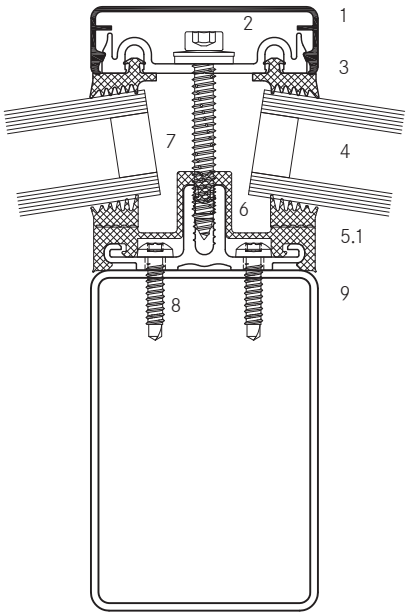
3.1
2

Inner seal 16.5 mm tall / 2 overlapping drainage levels

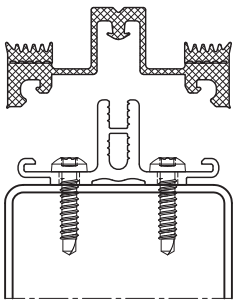
Vertical glazing mullion



Polygonal glazing mullion convex / 3° - 15°

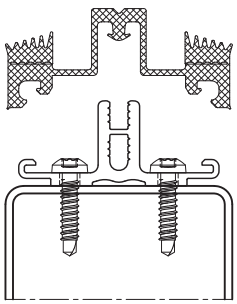


Inner seal vertical glazing mullion
System width 60 mm



GD 6071

Inner seal polygonal glazing mullion
System width 60 mm



GD 6074

1 Cover profile
2 Pressure profile
3 Outer seal
4 Glass / fill element
5 Inner mullion seal
5.1 Inner mullion seal polygonal glazing
6 Add-on channel
7 System screw fittings clamp connection
8 System screw fittings add-on channel/support profile
9 Support profile

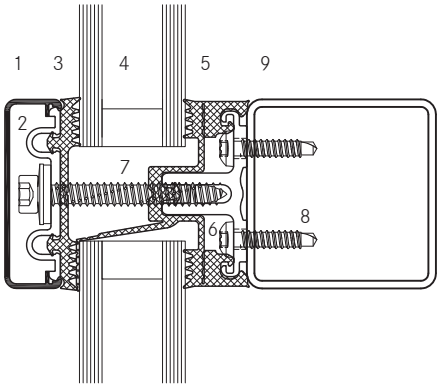
AK-S_3.1_004.dwg

System cross sections and inner seals - facade

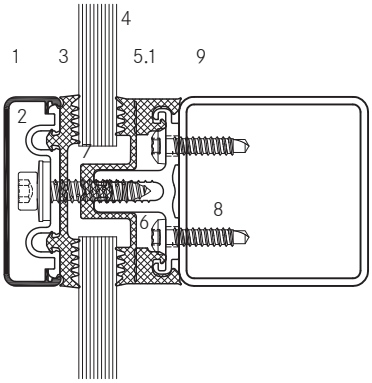
3.1
2

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Vertical glazing transom double glazing

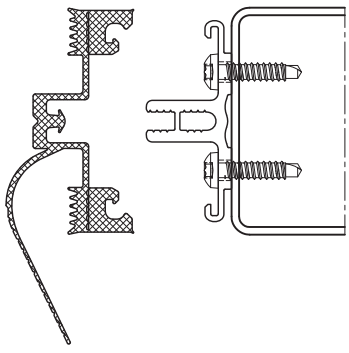


Vertical glazing transom single glazing



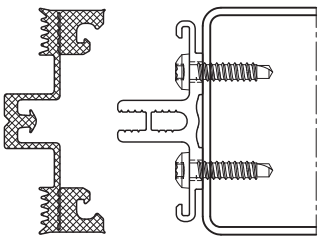
Inner seal vertical glazing transom
Double glazing system width 60 mm

GD 6072



Inner seal vertical glazing transom
Single glazing system width 60 mm

GD 6073



1 Cover profile
2 Pressure profile
3 Outer seal
4 Glass / fill element
5 Inner transom seal double glazing
5.1 Inner transom seal single glazing
6 Add-on channel
7 System screw fittings clamp connection
8 System screw fittings add-on channel/support profile
9 Support profile

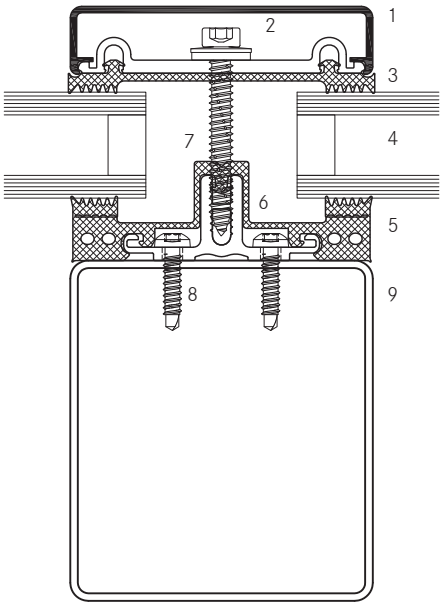
AK-S_3.1_004.dwg

System cross sections and inner seals - facade

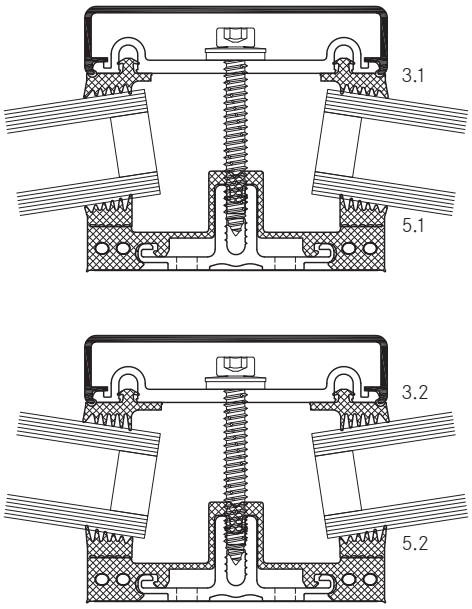
3.1
2

Inner seal 16.5 mm tall / 2 overlapping drainage levels

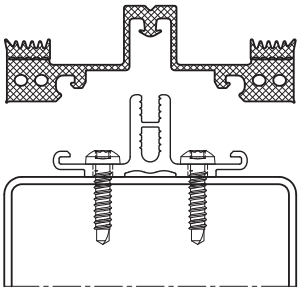
Vertical glazing mullion



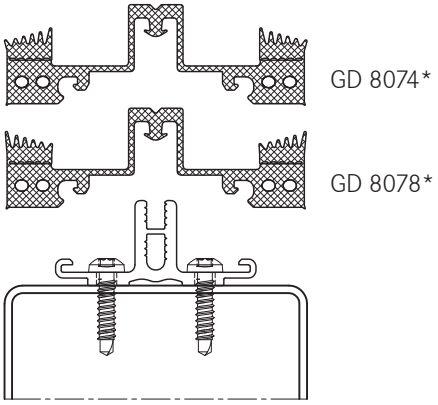
Polygonal glazing mullion- convex / 3° - 15°



Inner seal vertical glazing mullion
System width 80 mm



Inner seal polygonal glazing mullion
System width 80 mm



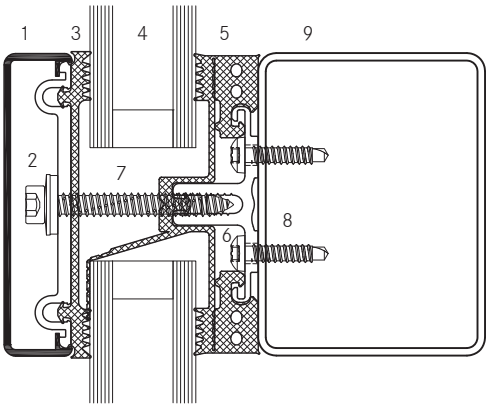
1 Cover profile
2 Pressure profile
3 Outer seal
3.1 Outer seal ploygonal glazing convex
3.2 Outer seal ploygonal glazing convav
4 Glass / fill element
5 Inner mullion seal
5.1 Inner mullion seal polygonal glazing convex
5.2 Inner mullion seal polygonal glazing convex
6 Add-on channel AK 6010
7 System screw fittings clamp connection
8 System screw fittings add-on channel AK 6010/timber profile
9 Timber profile

AK-S_3.1_004.dwg

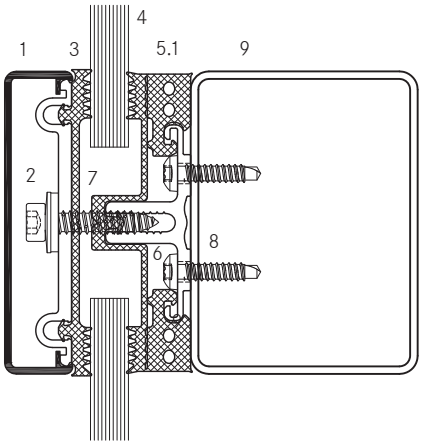
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Vertical glazing transom double glazing

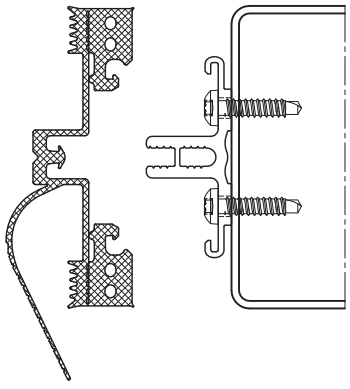


Vertical glazing transom single glazing



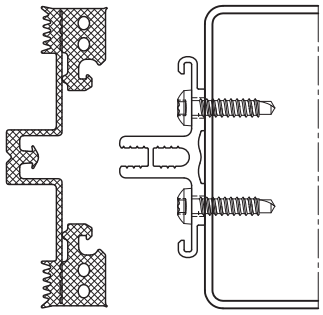
Inner seal vertical glazing transom
Double glazing system width 80 mm

GD 8072



Inner seal vertical glazing transom
Single glazing system width 80 mm

GD 8073



1 Cover profile
2 Pressure profile
3 Outer seal
4 Glass / fill element
5 Inner transom seal double glazing

5.1 Inner transom seal single glazing
6 Add-on channel
7 System screw fittings clamp connection
8 System screw fittings add-on channel/support profile
9 Support profile

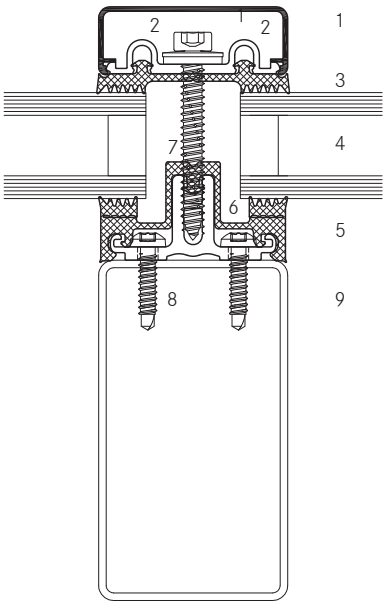
AK-S_3.1_004.dwg

System cross sections and inner seals - roof

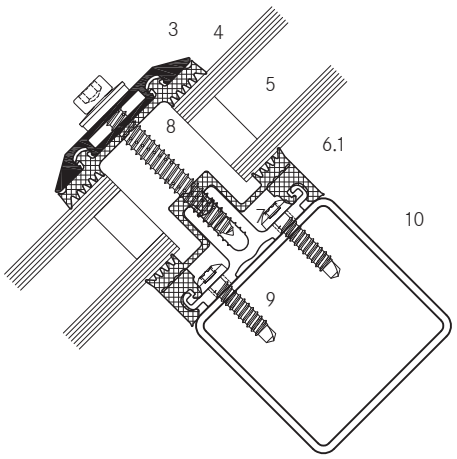
3.1
3

Inner seal 16.5 mm tall / 2 overlapping drainage levels

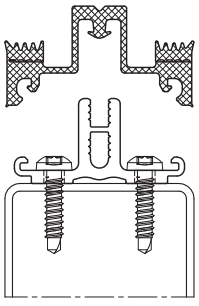
Inclined glazing rafter



Inclined glazing transom

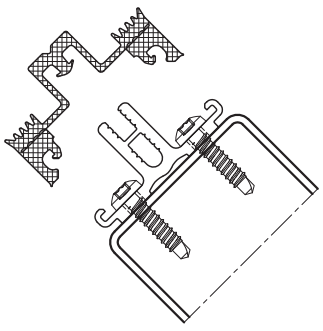


Inner seal inclined glazing rafter
System width 50 mm



GD 5071

Inner seal inclined glazing transom
System width 50 mm



GD 5073

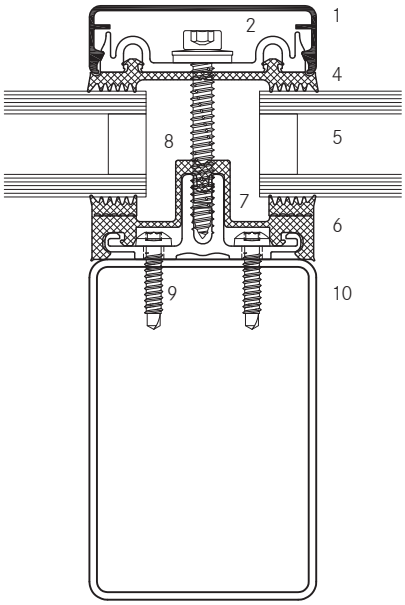
1 Cover profile
2 Pressure profile
3 Cover strip
4 Outer seal
5 Glass / fill element
6 Inner rafter seal for inclined glazing
6.1 Inner transom seal for inclined glazing
7 Add-on channel
8 System screw fittings clamp connection
9 System screw fittings add-on channel/support profile
10 Support profile

AK-S_3.1_005.dwg

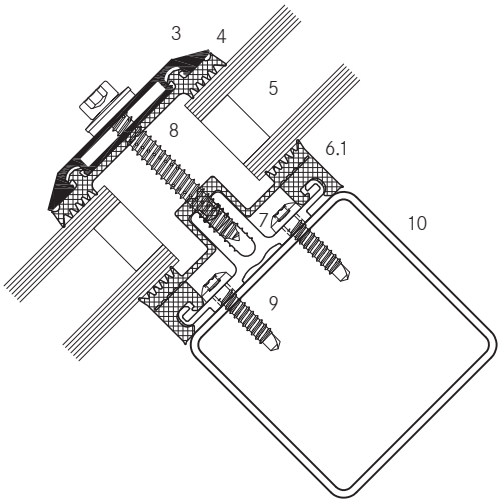
System cross sections and inner seals - roof

Inner seal 16.5 mm tall / 2 overlapping drainage levels

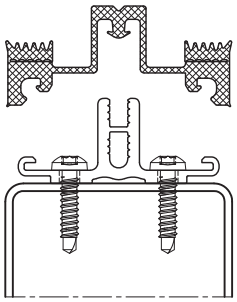
Inclined glazing rafter



Inclined glazing transom

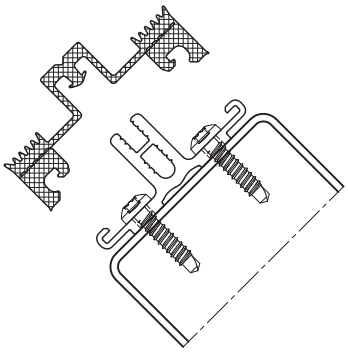


Inner seal inclined glazing rafter
System width 60 mm



GD 6071

Inner seal inclined glazing transom
System width 60 mm



GD 6073

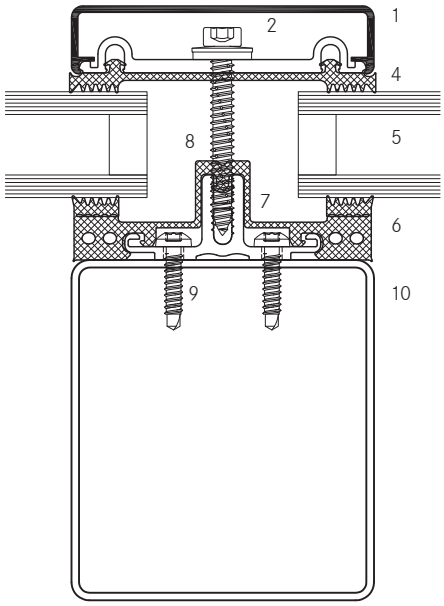
1 Cover profile
2 Pressure profile
3 Cover strip
4 Outer seal
5 Glass / fill element
6 Inner rafter seal for inclined glazing
6.1 Inner transom seal for inclined glazing
7 Add-on channel
8 System screw fittings clamp connection
9 System screw fittings add-on channel/support profile
10 Support profile

AK-S_3.1_005.dwg

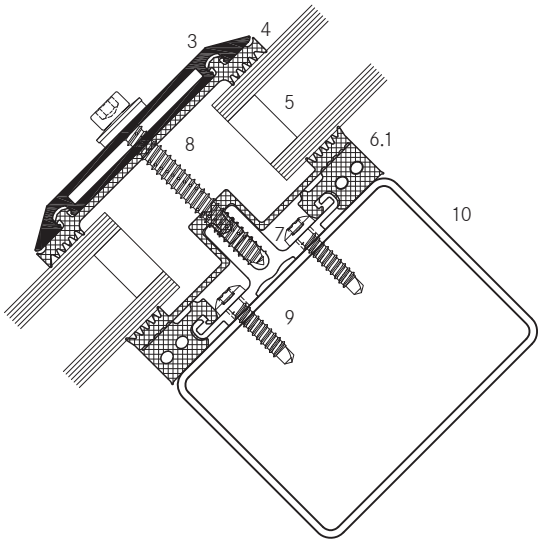
System cross sections and inner seals - roof

Inner seal 16.5 mm tall / 2 overlapping drainage levels

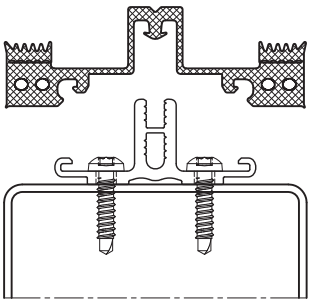
Inclined glazing rafter



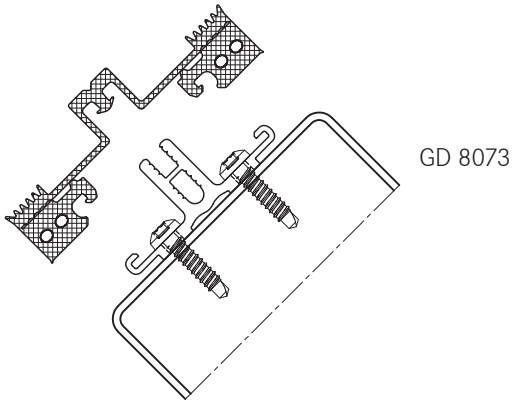
Inclined glazing transom



Inner seal inclined glazing rafter
System width 80 mm



Inner seal inclined glazing transom
System width 80 mm

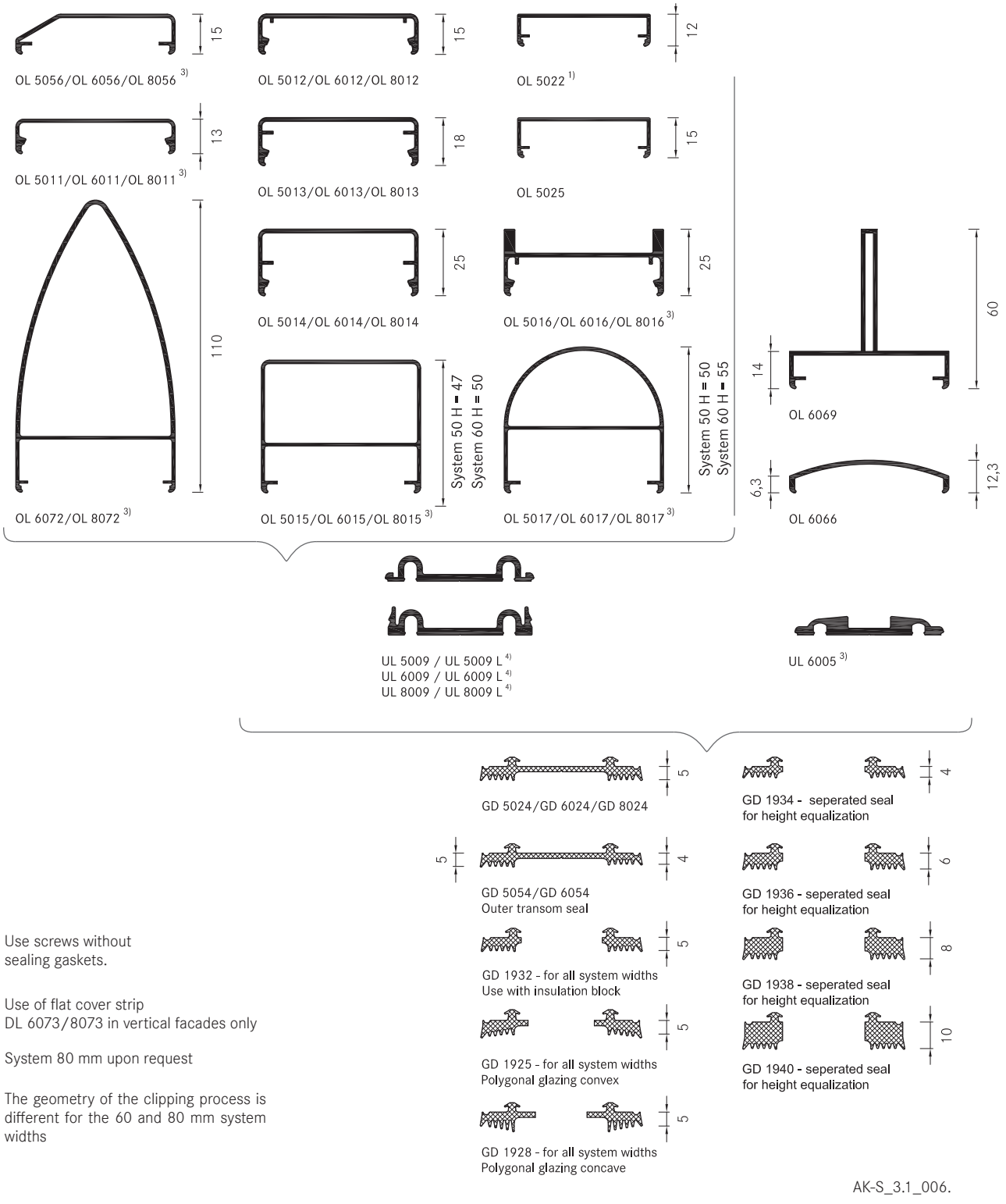


1 Cover profile
2 Pressure profile
3 Cover strip
4 Outer seal
5 Glass / fill element
6 Inner rafter seal for inclined glazing
6.1 Inner transom seal for inclined glazing
7 Add-on channel
8 System screw fittings clamp connection
9 System screw fittings add-on channel/support profile
10 Support profile

AK-S_3.1_005.dwg

Cover strips and outer seals

Aluminium - concealed screw fittings



1) Use screws without sealing gaskets.

2) Use of flat cover strip DL 6073/8073 in vertical facades only

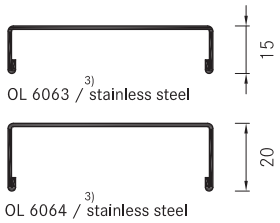
3) System 80 mm upon request

4) The geometry of the clipping process is different for the 60 and 80 mm system widths

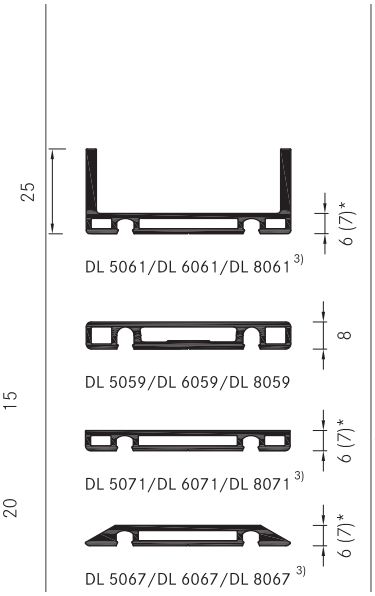
AK-S_3.1_006.

Cover strips and outer seals

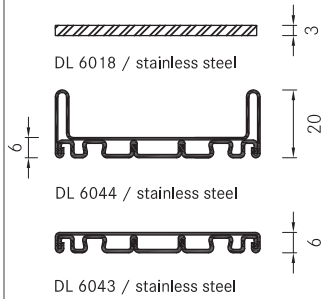
Stainless steel - concealed screw fittings



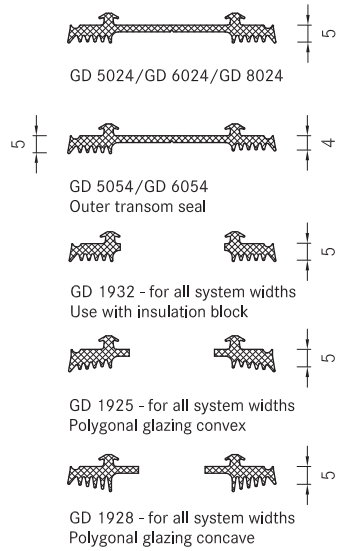
Aluminium- visible screw fittings

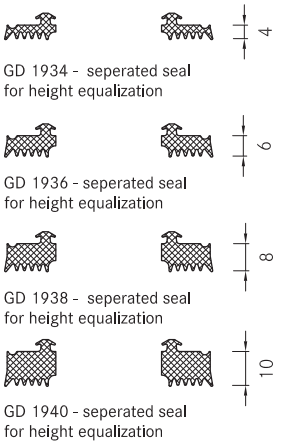


Stainless steel - visible screw fittings



Flat cover profile DL 6073





AK-S_3.1_006.

Material information

Quality of the supporting structure

The steel load-bearing substructure is used for mounting the glazing and carries the weight of external loads. It must therefore meet all load-bearing and suitability requirements. The profile dimensions and choice of materials are key. Hollow profiles, T-profiles, I-profiles and special profiles can be used for the substructure. The minimum requirement is the use of S235 EN 10025-2 steel. DIN EN 1993-1-1 and DIN EN 1993-1-3 steel type are also permitted.
Attachment to hollow profiles is generally achieved using self-tapping screws. The choice of screw is dependent on the thickness of the material in the substructure. Steel profiles with a material quality of S235 to S350 can be used. If attachment to the substructure is achieved using self-tapping screws, the yield point value should be greater than f_y = 320 N/mm². The substructure should also be pre-drilled. For each attachment method (screw fittings into hollow profiles or sectional steel with blind holes), be aware of the permitted wall thickness for the relevant profile. The diameter of the pre-drilled holes can vary with the wall thickness of the profile and the actual hardness of the material. For blind holes, the diameter is a fixed value.
If the add-on channel is attached to the substructure using Hilti fasteners, then all standards laid out in the "usage and mounting requirements" and general building approval Z-14.4-766 from Hilti Deutschland AG must be observed and adhered to.

Working on the supporting structure

The use of the Stabalux aluminium add-on channel allows work to be carried out on the mullion-transom structure in advance, including painting of the finished surface.
The supporting structure can also be mounted independent of the add-on channel. Pre-assembly of support profiles and add-on channels in the workshop is possible.

Coating the supporting structure

The choice of corrosion protection and coating is the responsibility of the clients, architects and/or processor.
The supporting structure can be receive a protective coating against corrosion either in the workshop or on the construction site itself. A final coating may be applied before mounting the add-on channel. No corrosion will occur between the add-on channel with additional ventilation slits and the corrosion-protected steel structure if the coating is applied in accordance with the DIN EN ISO 12944-5 standard. This ensures permanent protection against corrosion. Conventional coating methods such as air-drying multi-layer coating systems (wet coating) or thermosetting coatings (stove enamelling / powder-coating) can be used, provided suitable pre-treatment is applied.
We recommend consulting the Stabalux processing notes for further information.

Quality of add-on channel AK 5010/ AK 6010

The add-on channel is made from EN AW 6063 according to DIN EN 573-3, T66 according to DIN EN 755-2.

Quality of add-on channel AK 6020

The add-on channel is produced from warm and cold rolled S250 steel band. Profile production conforms to DIN ISO 2768 tolerances.
The add-on channel is made from steel band that is Sendzimir galvanised from both sides. Upon request it may also be delivered black. The surface of black material is lightly greased. The band galvanisation is approx. 275 g/m². This equates to a thickness of approx. 20 µm on each side.
When storing add-on channels, it is important to ensure sufficient ventilation.
Due to the danger of white rust developing, galvanised materials should never be covered with tarpaulins or other types of covers. Any packaging used for transporting the galvanised profiles must be immediately removed upon arrival. Please be aware that the appearance of any white rust does not constitute grounds for a complaint.
Any rust must be removed from black materials prior to processing and the add-on channels sufficiently protected against rust using appropriate agents and methods.

Aluminium profiles

The aluminium profiles we supply are generally made from EN AW 6063 and EN AW 6060 according to DIN EN 573-3, T66 according to DIN EN 755-2.

Stabalux AK-S
Processing information

Material information

3.2
1

Coating the aluminium

Alongside anodic oxidation, with the corresponding pre-treatment, conventional coating methods such as air-drying multi-layer coating systems (wet coating) or thermosetting coatings (stove enamelling / powder-coating) can be used. Due to different mass distributions, longitudinal shadow formation is possible with cover stripDL 5073, DL 6073, DL 8073. Resulting actions are to be taken with the agreement of the coater.

Longitudinal expansions in aluminium profiles exposed to temperature

When cutting the lower, upper and cover profiles from aluminium, allowance should be made for temperature-induced longitudinal expansion. The theoretical rod lengths ℓ should be shortened by $\Delta\ell = \alpha T \cdot \Delta T \cdot \ell$.

Example:
$\Delta\ell = 24 \cdot 10^{-6} \cdot 40 \cdot 1000 = 0.96 \approx$ **1 mm**

$\alpha^T \approx 24 \cdot 10^{-6}$ 1/K	Coefficient of thermal expansion for aluminium
$\Delta T = 40$ K	Assumed temperature difference of aluminium dependent on the colour and amount of solar radiation
$\ell = 1000$ mm	Rod length
$\Delta\ell \approx$ 1 mm	Longitudinal expansion

further examples:
$\Delta\ell = 24 \cdot 10^{-6} \cdot 60 \cdot 1000 = 1.44 \approx$ **1.5 mm**
$\Delta\ell = 24 \cdot 10^{-6} \cdot 100 \cdot 1000 = 2.4 \approx$ **2.5 mm**

A rod with a system length of ℓ = 1000 mm should be shortened by 1 mm for a temperature difference of ΔT = 40 °C. A rod of length ℓ = 3000 mm should be shortened by 3 mm.
For ΔT = 100 °C (often occurs in roof areas and south-facing facades), a rod of length ℓ = 1000 should be shortened by 2.5 mm.

Rod length ℓ (mm)	Temperature difference ΔT	Longitudinal expansion $\Delta\ell$ (mm)
1000	40°C	1
3000	40°C	3
1000	60°C	1.5
3000	60°C	4.5
1000	100°C	2.5
3000	100°C	7.5

Note:

We recommend shortening the pressure profile by ≈ 2.5 mm per ℓ = 1000 mm of length. When doing so, ensure to use the correct length of the outer seal.
When using cover profiles in roof area, it is recommended that holes for screwing on the cover strip are created with a diameter of d = 9 mm.

Stainless steel profile

Pressure profiles and bottom sections of cover profiles are made from 1.4301 stainless steel for visible screw fittings. The surface conforms to classification 2B according to DIN EN 10088-2. Cover profiles using 1.4401 stainless steel. The surface has a ground finish (grain 220, DIN EN 10088-2). The upper parts of the cover strip are made from 1.4571 stainless steel with ground finish (grain 240, DIN EN 10088-2). To protect the surface, a film has been applied to one side, the sharp edge of which can be seen on narrow side.

Seal profiles

Stabalux seals are organic natural rubber materials based on EPDM and conform to the DIN 7863 standard, non-cellular elastomer sealing profiles for window and facade construction. Compatibility with contact media should tested by the processor, particularly when using plastic glazing and making structural connections with non-Stabalux products.

Other items

All system items are produced according to applicable standards.

Maintenance and care (Section 9.0)

The information sheets WP.01 – WP.05 from the Association of Window and Facade Producers (VFF) must be observed. The address can be found in the address section. Further information can be found in section 9.0 - Cleaning / Maintenance.

Mullion-transom joint

Principle

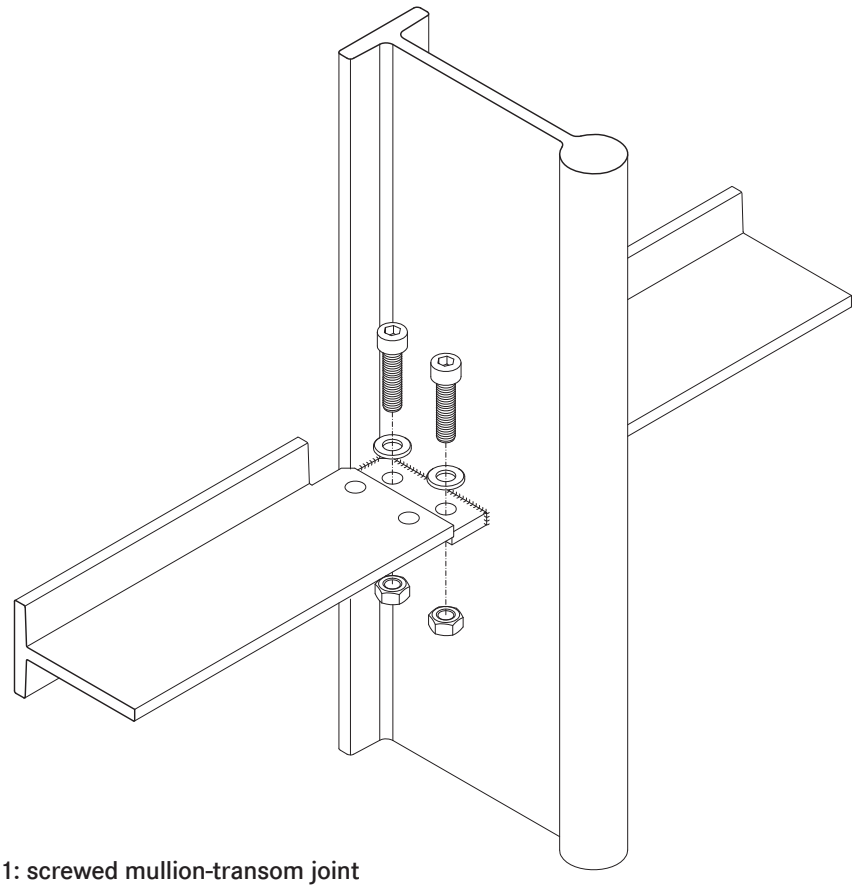
- The mullion-transom joint can be created using screws or welds.
- Attachment of the transom beams to the mullions must match the static base system of the mullion-transom design selected.
- Load bearing capacity and suitability are to be statically demonstrated on site. In doing so, the design and technical processing experiences of the processor can be considered.

Screwed connections

The mullion and transom joints in the Stabalux T-profiles must be connected in a typical manner for steel constructions; the planner or processer is free to choose their design.

- Designs are to be chosen that can be considered regular joints for the intended purpose and meet the standards of the Eurocode 3 (DIN EN 1993) or are covered by general building approvals.
- The solutions presented by us are purely examples. Ultimately, a wide range of steel constructions are possible using screw and welded joints.

Sufficient corrosion protection around joints must be ensured.



Example 1: screwed mullion-transom joint with T-profiles

AK-S_3.2_001.dwg

Mullion-transom joint

Welded joints

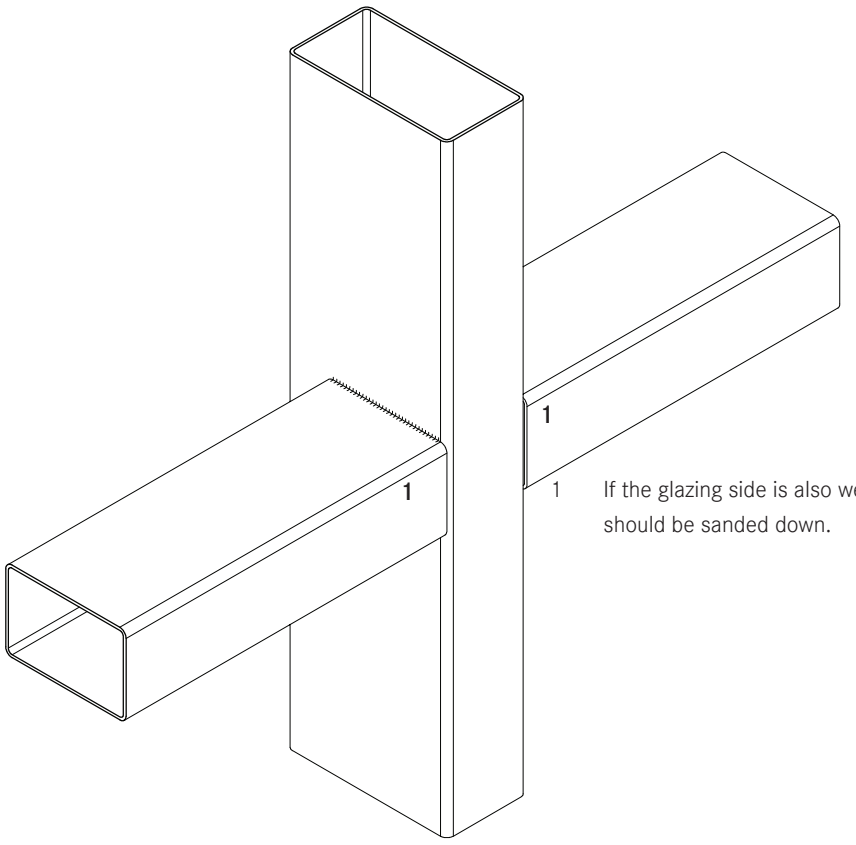
A suitable welding process must be chosen based upon the surface conditions and quality of the steel. Depending on manufacturing precision of sections, transom beams should be cut to length and welded.

Ensure the evenness of the glazing surface. It is often not necessary to weld on the glazing side. If the glazing side is also welded, the welded bead should be sanded down.

In all cases be aware, however, that moisture may get into the transom through the transom joint before laying and affixing the inner seal e.g. during transport and assembly. It must be ensured that moisture ingress is prevented or that this is removed before the glazing is installed (e.g. drilling). The design of the weld joint should be chosen based upon the static system and must securely transfer loads to which it is subjected.

Post-treatment of welding points

Before applying an additional coating, we recommend cleaning any areas that have become dirty from the welding and agree protection against corrosion with the coating operation.



1 If the glazing side is also welded, the welded bead should be sanded down.

Example 2: welded mullion-transom joint with hollow steel profiles

AK-S_3.2_002.dwg

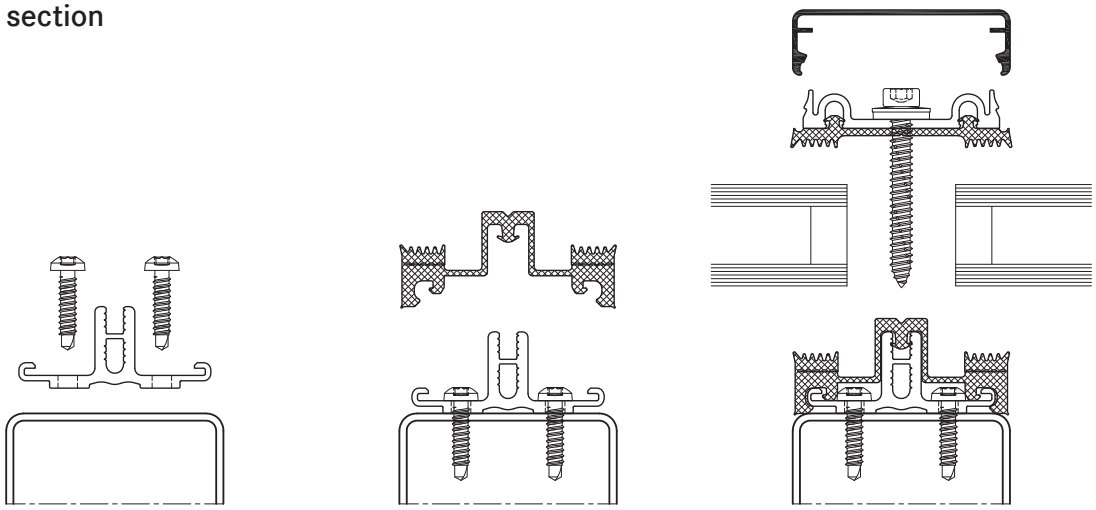
Stabalux AK-S
Processing information

Assembly sequence

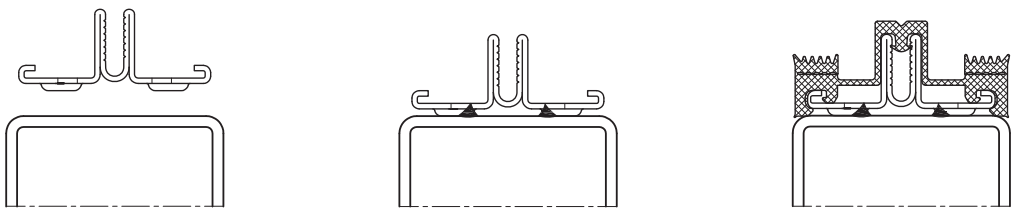
The add-on channel

The Stabalux add-on channel (AK) is mounted to a static load supporting steel substructure. The AK 5010/ AK 6010 aluminium add-on channel centrally screwed onto mullions and transoms and secured with Hilti fasteners.
The AK 6020 steel add-on channel centrally welded onto mullions and transoms.
As well as complete on-site assembly of the components, pre-assembly of supporting profiles and add-on channels in the workshop is possible.
Mounting of seals and glass supports is identical for both channels. The difference between AK 6010 and AK 6020 is the material and the method of attachment to the substructure.

Mullion section



AK 5010/ AK6010
screw attachment to hollow steel profiles



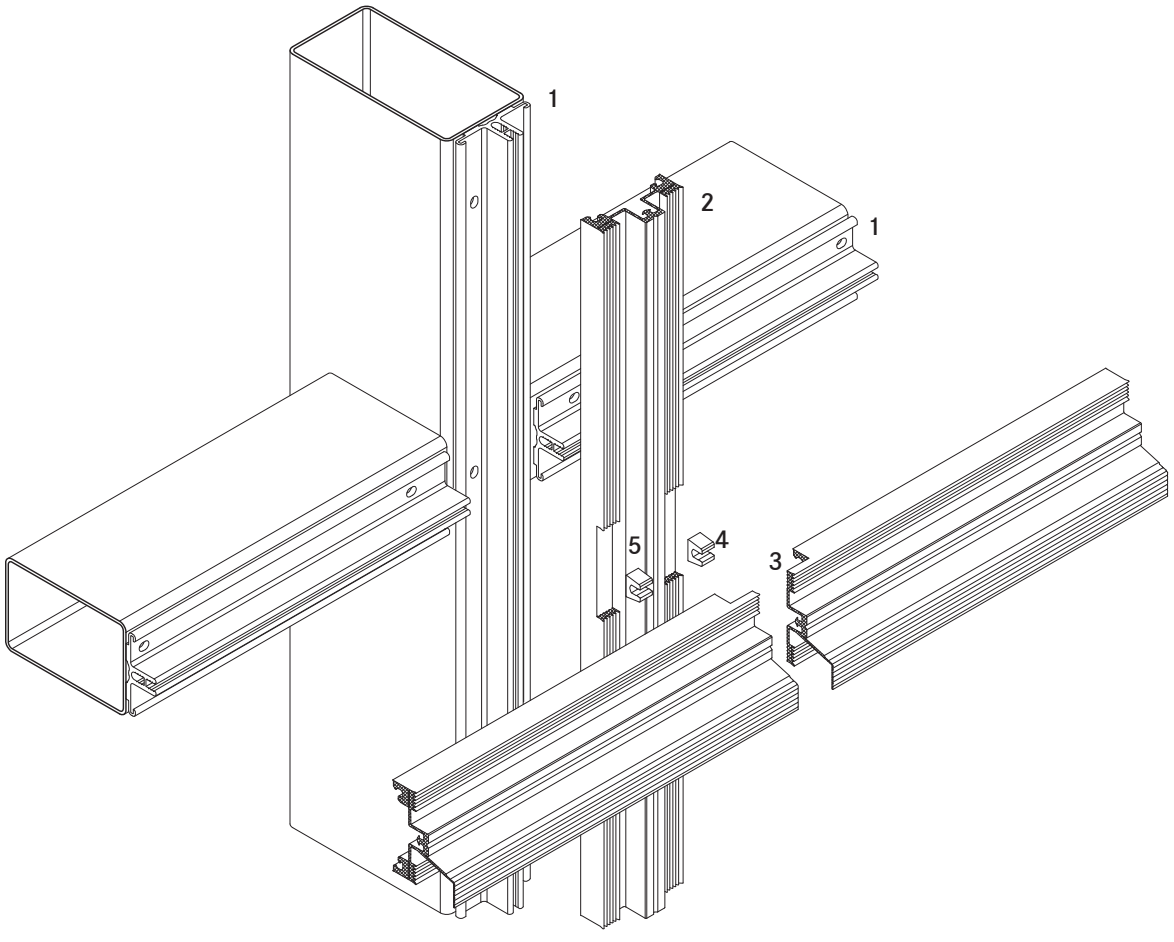
AK 6020
welded connection to hollow steel profiles

AK-S_3.2_003.dwg

Stabalux AK-S
Processing information

Assembly sequence

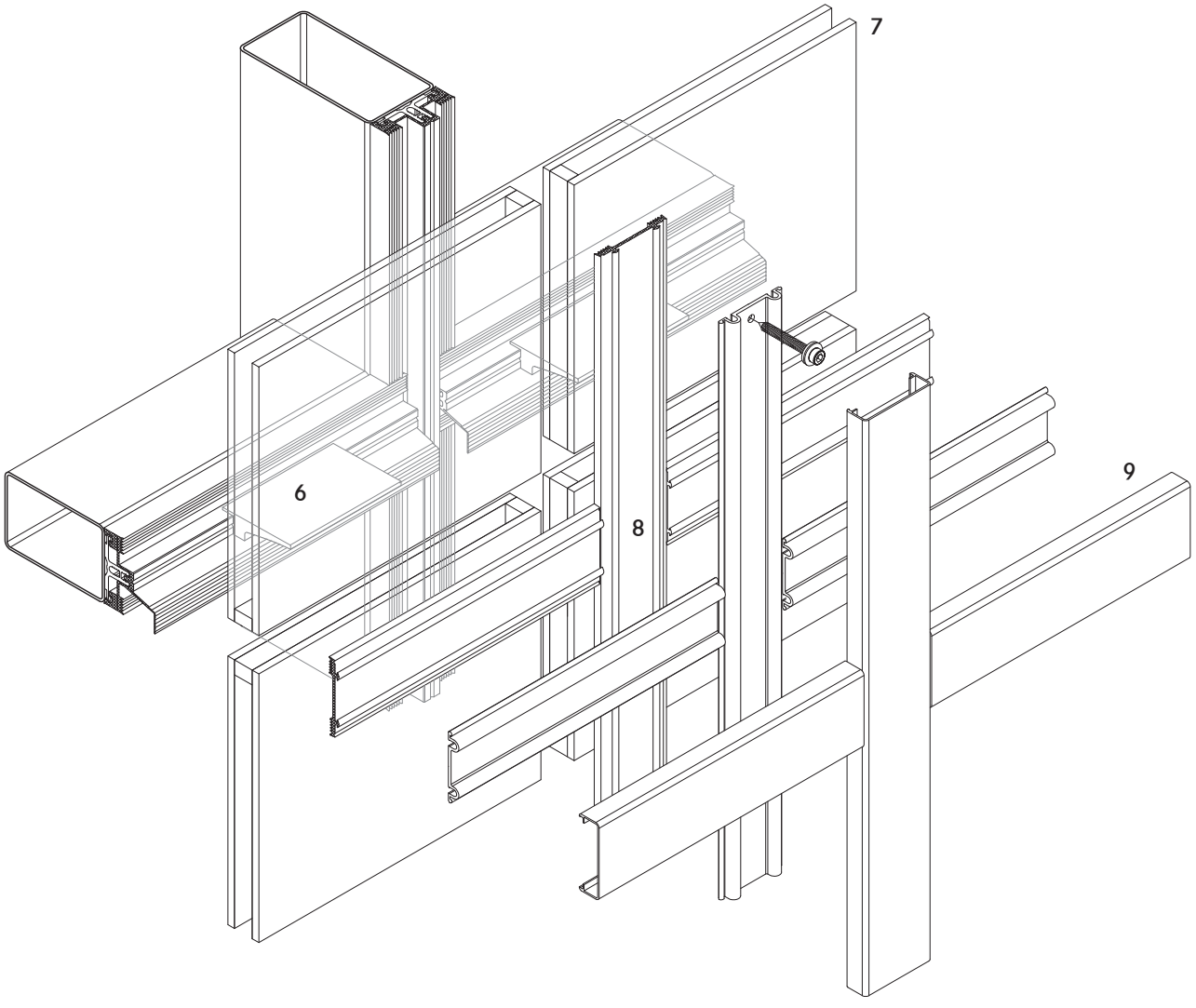
1. Attachment of the aluminium add-on channel AK 5010/ AK 6010 and steel AK 6020 to mullions and transoms. Around the glass supports, the channel is reinforced using additional attachments. (See section on glass supports).
2. Attach the inner mullion seal (e.g. GD 6071) with a recess area around the beam.
3. Attach the inner transom seal (e.g. GD 6072) with a recess area around the mullion.
4. Lay and fix the sealing pieces Z 0062 using Stabalux connecting paste Z 0094 in the ends of the transom seal.
5. Seals the overlap joints on mullion and transom seals using Stabalux connecting paste Z 0094.



AK-S_3.2_004.dwg

Assembly sequence

6. Screw on the glass support (e.g. GH 6071).
7. Mounting the filling elements.
8. Assemble the outer sealing section together with the clamping strips.
9. Clip on the cover profile with concealed screw fittings.



AK-S_3.2_004.dwg

Stabalux AK-S
Processing information

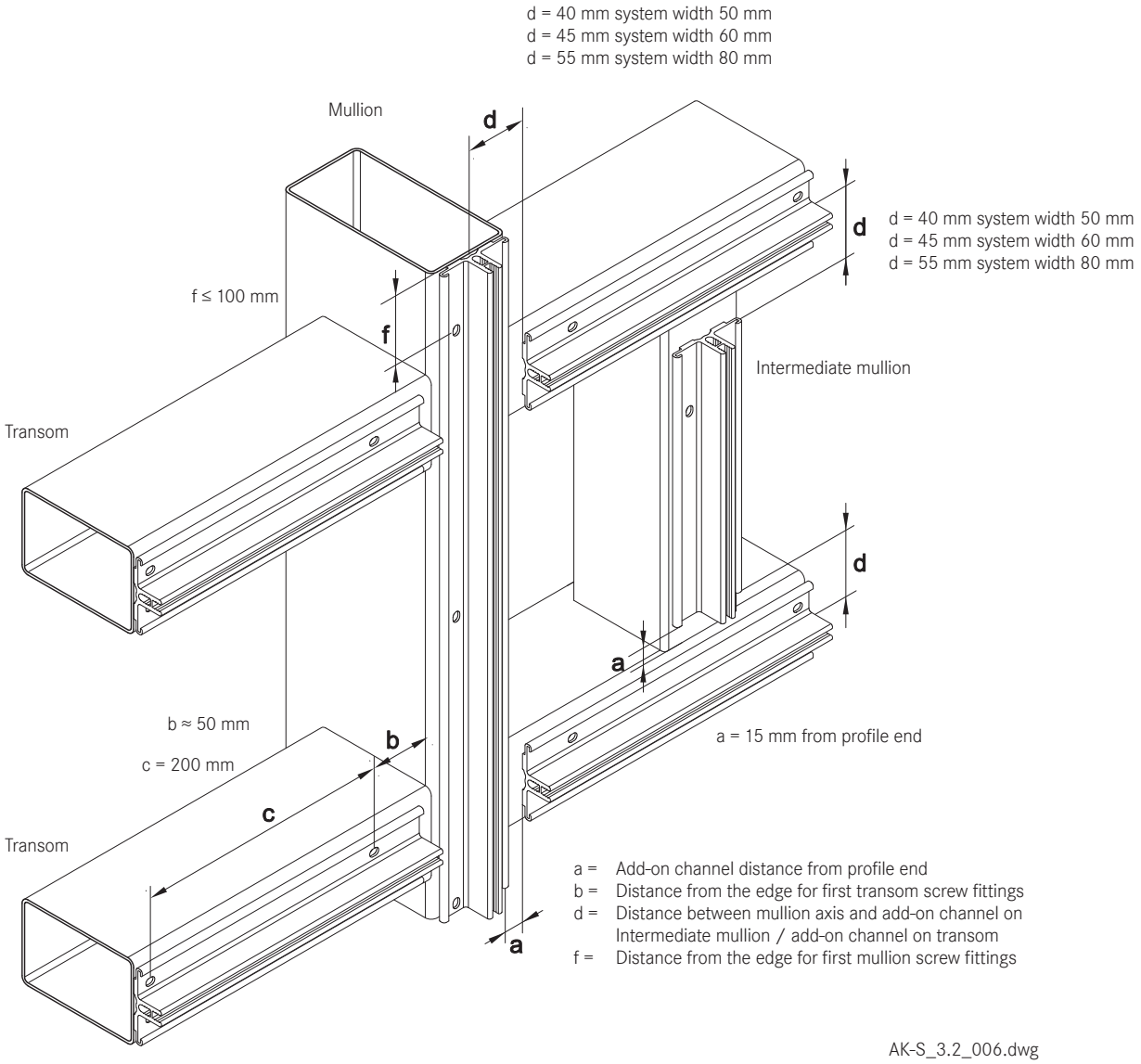
Assembly order for add-on channel

Cutting AK 5010/ AK 6010 and AK 6020 - mullion

- The length of the add-on channel AK on mullions is generally the same length as the mullion.
- When cutting, be aware of edge distance "f".
- The add-on channel is placed centrally on mullions and runs continuously along it.
- For the length of add-on channels AK on intermediate mullions, be aware of dimension “d“.
- Regardless of the system width, we therefore recommend a distance from the intermediate mullion profile end of a = 15 mm.

Cutting AK 5010/ AK 6010 and AK 6020 - transom

- The add-on channel is placed centrally on transoms and is interrupted by the mullions.
- When cutting, be aware of edge distance "b".
- Cutting the add-on channel is done in such a way that between the mullion axis and the channel, the distance "d" is maintained on the transom.
- Regardless of the system width, we therefore recommend a distance from the transom profile end of a = 15 mm.



AK-S_3.2_006.dwg

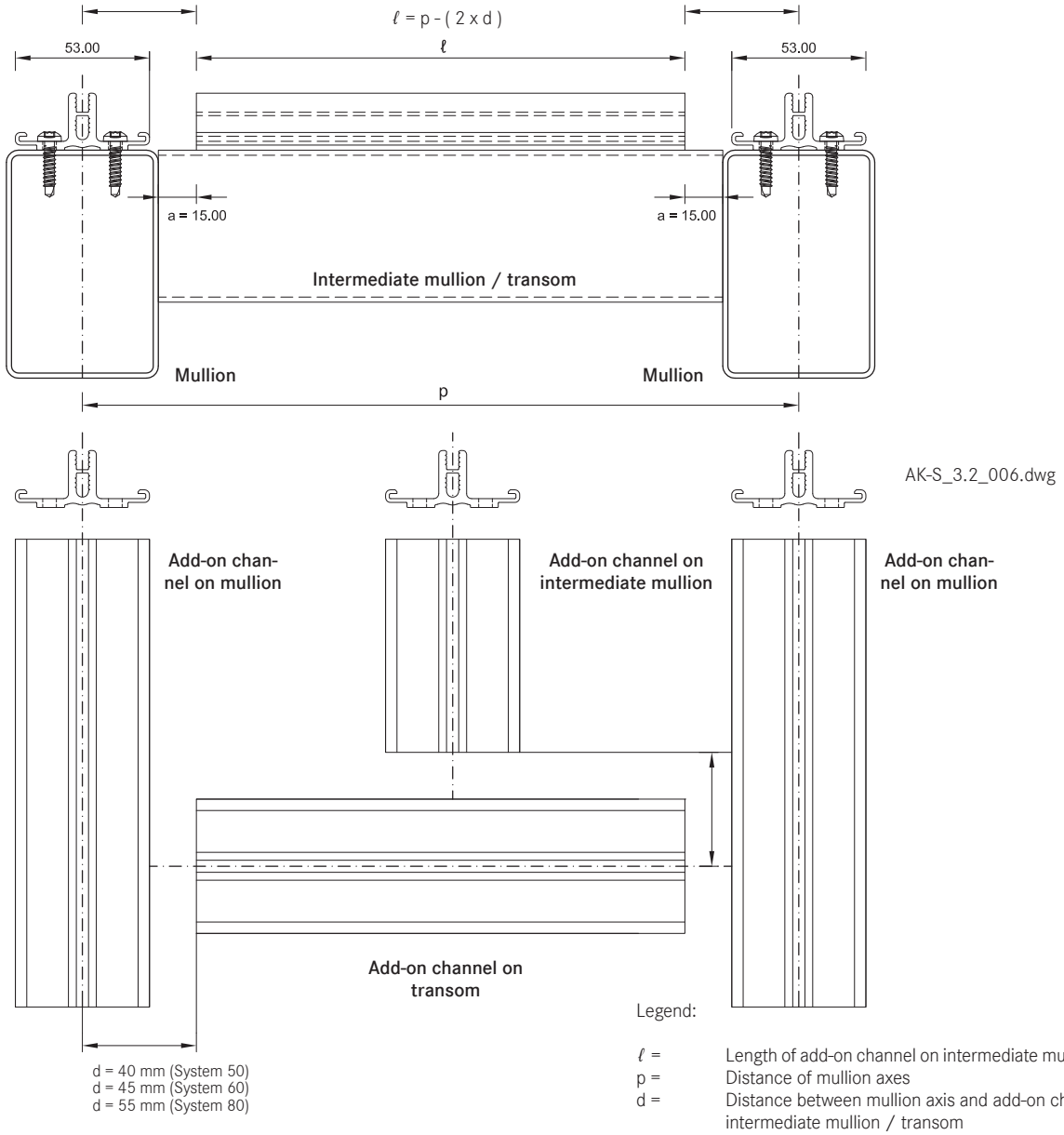
Assembly order for add-on channel

Cutting the mullions:

The length of the add-on channel on mullions is generally the same length as the mullion: $\ell_{AK} = \ell_{mullion}$

Cutting intermediate mullions and transoms:

	System width	Distance “d”	Calculate the length ℓ of the add-on channel Intermediate mullion and transom
AK 5010	50	40 mm	p - (2 x 40) = p - 80 mm
AK 6010 /AK 6020	60	45 mm	p - (2 x 45) = p - 90 mm
	80	55 mm	p - (2 x 55) = p - 110 mm



Legend:

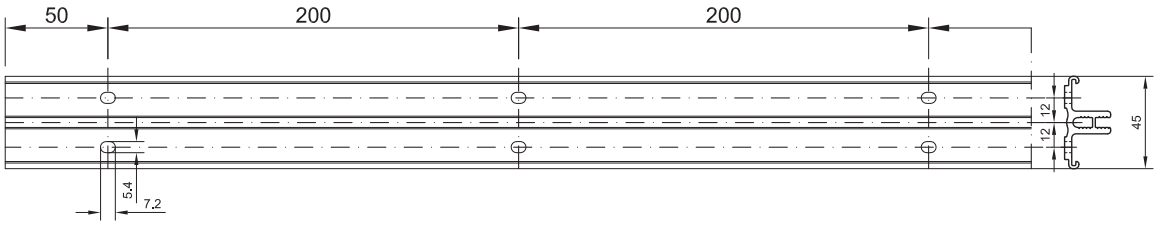
ℓ =	Length of add-on channel on intermediate mullion/transom
p =	Distance of mullion axes
d =	Distance between mullion axis and add-on channel on intermediate mullion / transom
a =	Distance from profile end

Assembly order for add-on channel

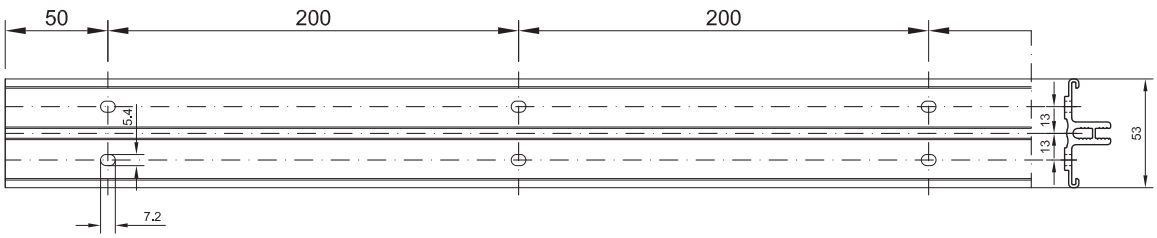
Attachment of add-on channel AK 5010/ AK 6010

- The aluminium add-on channel AK 6010 is pre-drilled with 5.4 x 7.2 mm slots at 200 mm intervals with an edge distance of 50 mm. These allow for it to be screwed to the supporting structure.
- If attachment is made using Hilti fasteners, then the screws should be placed between the slots with a minimum distance of ≥ 20 mm from the edge of these slots.
- The screw connection between the add-on channel and substructure is achieved using system screws from the Stabalux range. Screw fittings on hollow profiles are different from solid profiles.
- Screw fittings are generally placed every 200 mm (c = 200 mm).
- A pair of screws is always placed at the ends of the add-on channel. The edge distance for the screw fittings can be d/f ≤ 130 mm. However, we recommend an edge distance in mullions of f ≤ 100 mm and approx. d ≈ 50 mm for transoms.The placement of the T-connector and glass support should be taken into account.
- For mounting on hollow profiles, self-tapping and threading Stabalux system screws are used. These are suitable for substructure wall thicknesses from 2 mm to 12 mm. Pre-drilling is not necessary. Consider the material thickness of the substructure when making a selection.
- For mounting on rolled steel profiles, such as T-profiles, we recommend threaded system bolts. For threaded bolts a tapped hole 7 mm in depth with a diameter of Ø4.2 mm without positive tolerance must be pre-drilled. Alternatively, we offer self-tapping system screws. For these, a blind hole 7 mm in depth with a diameter of Ø5.5 mm without positive tolerance must be pre-drilled. A sufficient material thickness t must be available around the blind tapped hole must.
- The load bearing capacity of the screw fittings is regulated by general building approval Z-14.4-767 and should be demonstrated for each particular case.
- If the add-on channel is attached to the substructure using Hilti fasteners, then all standards laid out in the “usage and mounting requirements” and general building approval Z-14.4-766 from Hilti Deutschland AG must be observed and adhered to. Mounting to hollow profiles and sectional steel is permitted. Complete documentation is available separately.
- Important note: The Hilti fasteners must be driven through the metal of add-on profile. The location to be screwed must not be pre-drilled. The minimum distance between the axis of the slots and the axis of the fasteners is ≥ 25 mm and must be maintained.

AK 5010 hole pattern



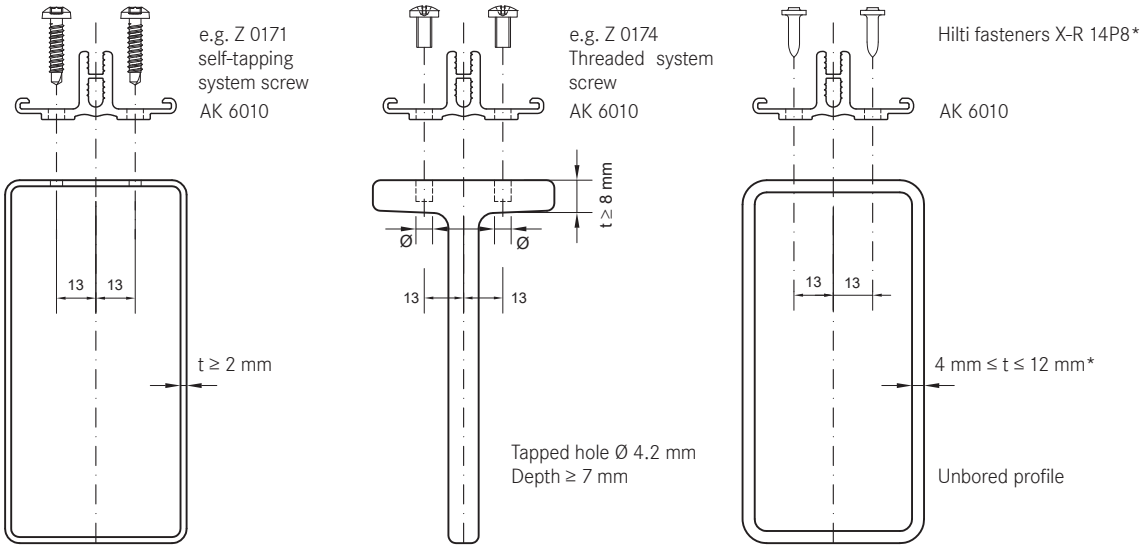
AK 6010 hole pattern



Stabalux AK-S
Processing information

Assembly order for add-on channel

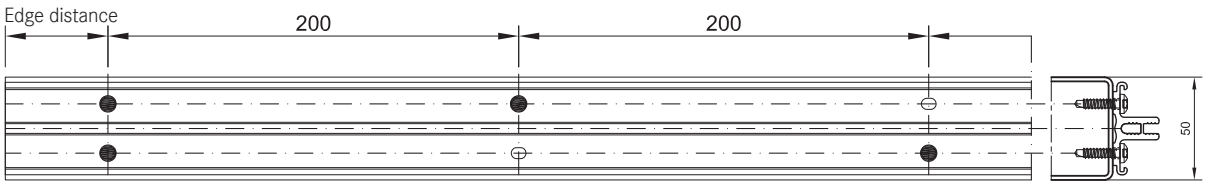
Screw fittings for add-on channel AK 6010 / substructure



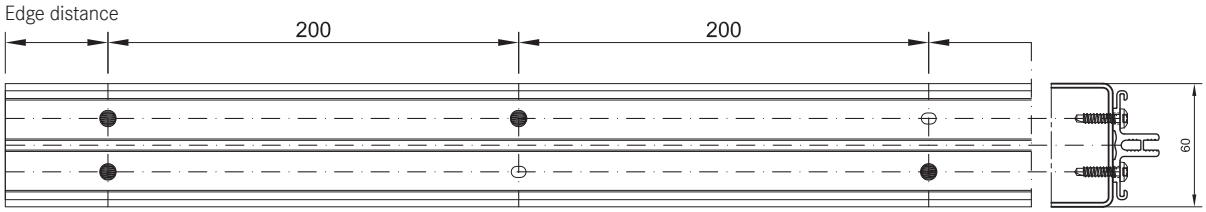
e.g. hollow steel profiles | e.g. rolled steel profile | e.g. hollow steel profile / sectional steel *

AK-S_3.2_005.dwg

*) precise information is available in building approval Z-14.4-766 and the usage and assembly conditions from Hilti Deutschland AG.



AK 5010 attachment to mullion and transom: first attachments placed in pairs, then every 200 mm



AK 6010 attachment to mullion and transom: first attachments placed in pairs, then every 200 mm

AK-S_3.2_005.dwg

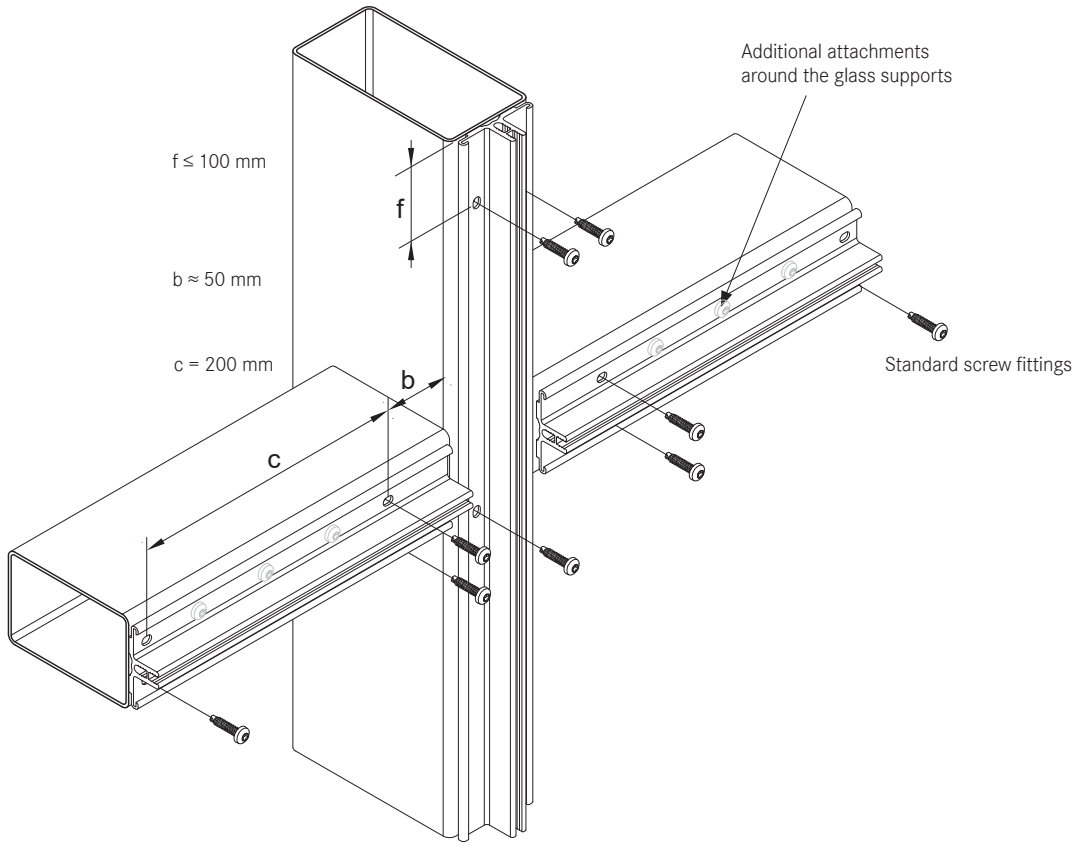
Assembly order for add-on channel

Attachment of AK 5010/AK 6010 to mullions

- The add-on channel is first positioned centrally on the mullion and screwed down on both left and right sides.
- Mullion add-on channels run continuously along the mullion.
- The edge distance of screw fittings on the mullion should not exceed 100 mm (f ≤ 100 mm).
- The distance between screw fittings is 200 mm and is usually implemented in an offset manner (c = 200 mm)

Attachment of AK 5010/ AK 6010 to transom

- The add-on channel is then positioned centrally on the transoms and screwed on both left and right sides.
- The add-on channel on transoms is interrupted by the mullions.
- The first transom attachments should generally be around 50 mm from the profile end (b approx. 50 mm). However, always ensure that there is no collision with the mullion-transom joint and the glass support assembly.
- Around the glass supports, the channel is reinforced using additional attachments. Reinforcement varies depending on the type of attachment (screws or Hilti fasteners) and glass support type. (See section on glass supports).



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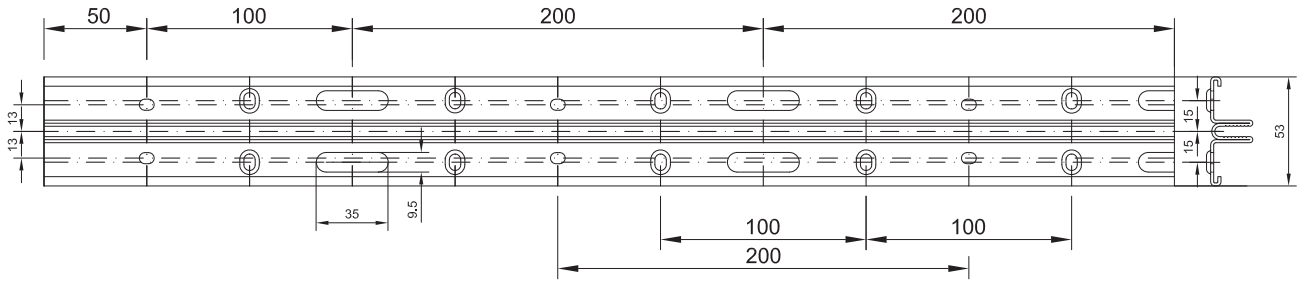
Assembly order for add-on channel

Attachment of add-on channel AK 6020

- The AK 6020 add-on channel is pre-drilled with 9.5 x 35 mm slots at 200 mm intervals with an edge distance of 150 mm. These serve for welding it to the supporting structure.
- The AK 6020 add-on channel also has press cut areas 100 mm apart that must be at a certain edge distance to the substructure and therefore ensure sufficient ventilation below the channel.
- The steel add-on channel AK 6020 is pre-drilled with 5.4 x 7.2 mm slots at 200 mm intervals with an edge distance of 50 mm. Drilled out to Ø 8 mm, the holes can be used for plug welding.
- Attachment of the AK 6020 add-on channel is achieved using plug welds onto the steel substructure.
- Welds are generally placed every 400 mm (c = 400 mm).
- At the ends of the add-on channel, plugs welds are to be made in pairs or a weld seam applied to the end of the channel into mullions. The edge distance for the weld can be d/f ≤ 130 mm. However, we recommend an edge distance in mullions of f ≤ 100 mm and a weld seam to be placed on the channel ends in transoms.
- When welding, the Stabalux welding directions should be consulted.
- Depending on the choice and implementation of the corrosion protection for the entire structure, either galvanized or uncoated materials can be used.
- Any dirt and rust must be removed from black materials prior to processing.
- Before applying an additional coating, we recommend cleaning any areas that have become dirty from the welding and agree protection against corrosion with the coating operation.
- The load bearing capacity of welds is regulated by general building approval Z-14.4-767 and should be demonstrated for each particular case.
- Alongside the regulations in the approval, welded joints should also demonstrate conformity to current standards (e.g. Eurocode 3).

AK 6010 hole pattern

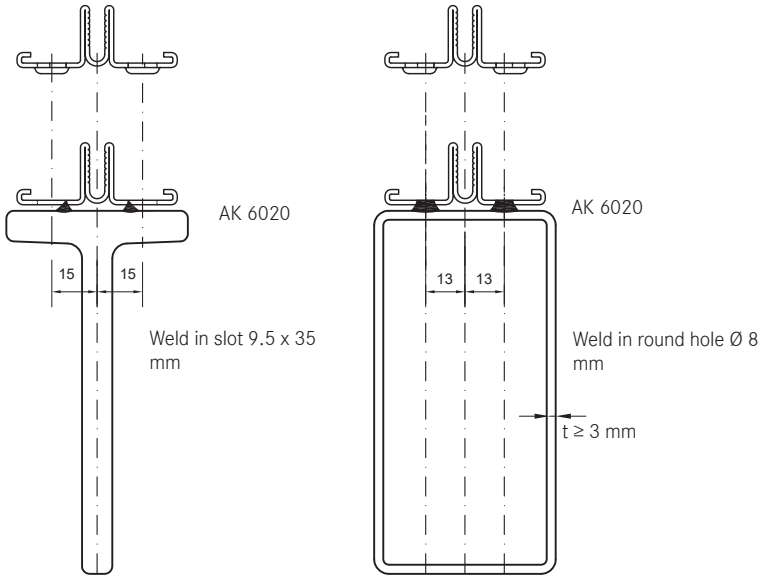


AK-S_3.2_005.dwg

Stabalux AK-S
Processing information

Assembly order for add-on channel

Weld joint for add-on channel AK 6020 / substructure

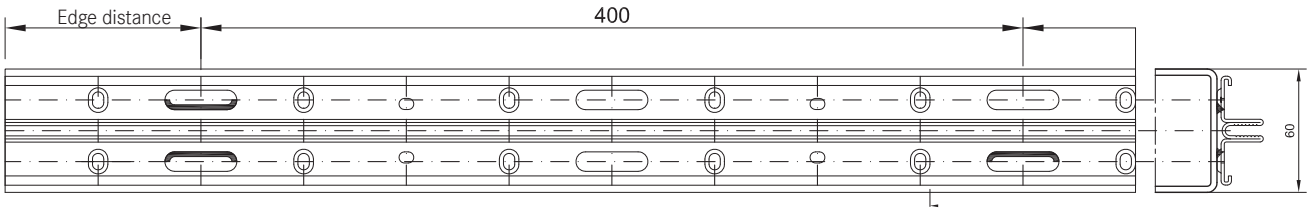


e.g. rolled steel profile

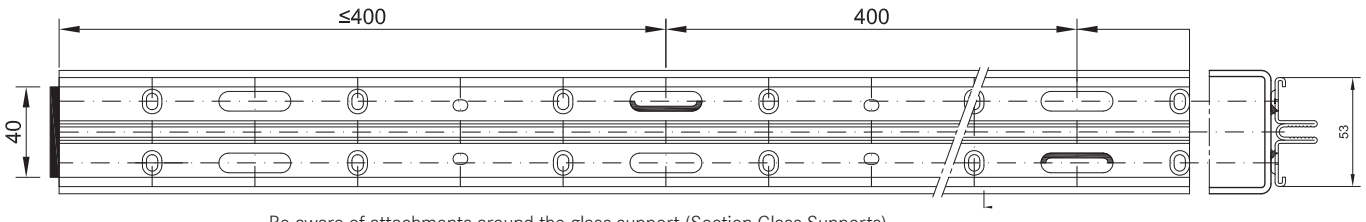
e.g. hollow steel profiles

the Stabalux welding directions must be followed

AK 6020 attachments on mullions using long plug welding: first attachments placed in pairs, then every 400 mm



AK 6020 attachments on transoms: first attachments on the end of the channel, then plug welded every 400 mm



Be aware of attachments around the glass support (Section Glass Supports)

AK-S_3.2_005.dwg

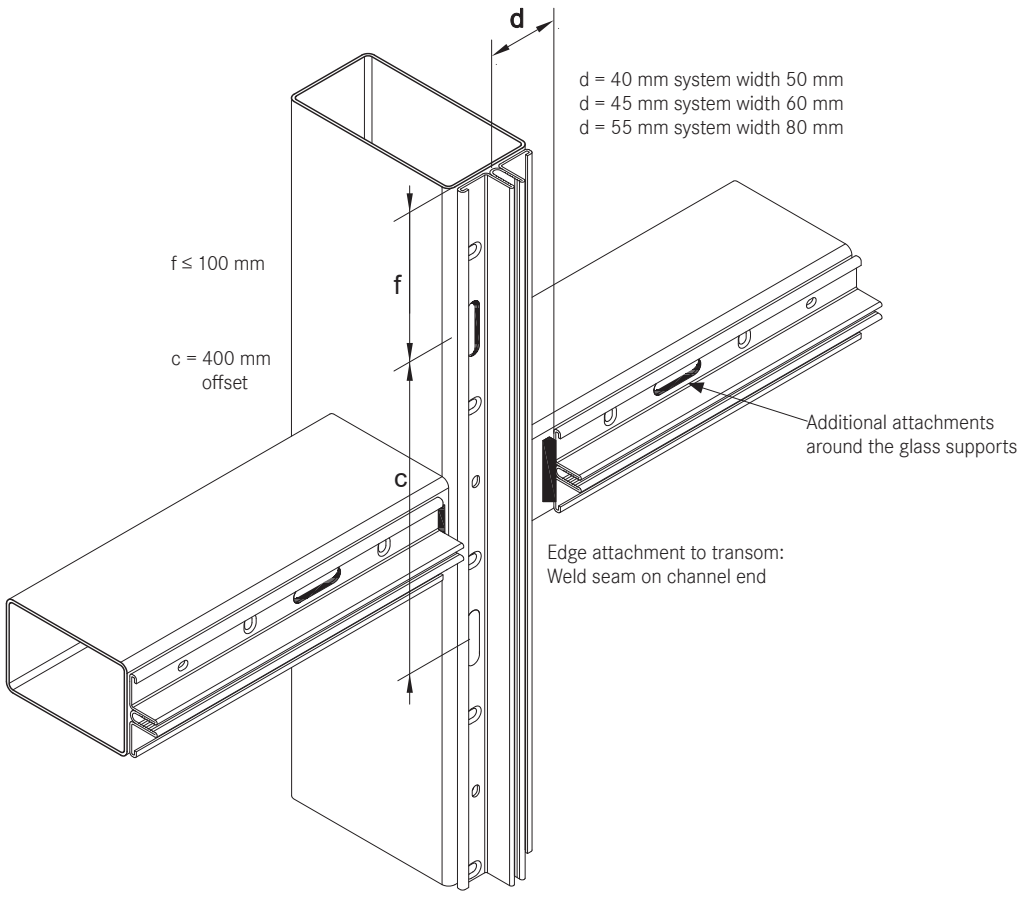
Assembly order for add-on channel

Mullion

- The add-on channel is first positioned centrally on the mullion and screwed down on both left and right sides.
- Mullion add-on channels run continuously along the mullion.
- The edge distance of screw fittings on the mullion should not exceed 100 mm (f ≤ 100 mm).
- The distance between attachments is 400 mm and is usually implemented in an offset manner (c = 400 mm)

Transom

- The add-on channel is then positioned centrally on the transoms and screwed on both left and right sides.
- The add-on channel on transoms is interrupted by the mullions.
- The initial attachment into the transom is applied at the end of the channel.



AK-S_3.2_006.dwg

Tips for laying seals

Sealing system principle, general information about glazing seals

The Stabalux sealing system consists of the outer and inner sealing sections.

- The outer sealing section has the primary function of preventing the ingress of moisture. At the same time, the sealing section provides a flexible support for the glass panes.
- The inner sealing section acts to protect the inner space, water guiding section and elastic glass supports from moisture and vapour.

Seals should be fitted on the construction site, but may also be pre-cut to the required length in the factory placed into the add-on channel and/or clamping strips following the mounting instructions for seals. Always ensure that seals are not bearing any loads once installed and are firmly pressed onto joints. All joints should be sealed as per the following descriptions.

Pressure equalisation and controlled drainage

Pressure equalisation is generally achieved via openings at the base, head and ridge points. Should additional ventilation be required in the area of the transom (e.g. where panes are only supported on 2 sides or where transom length is $\ell \geq 2$ m), then this ventilation should be created by placing holes into the cover strip and/or using notches on the lower sealing lips of the outer seal.

The pressure equalisation openings also serve to drain away moisture. The inner sealing section is formed in such a way that when the joints are properly sealed, any moisture that occurs and does not dissipate via the rebate ventilation will drain away downwards. In the AK-H system, higher sealing sections overlap lower ones. This principle must be consistently implemented down to the lowest point of the glazing so that the water-guiding level of the structure carries moisture to the outside. Film is placed beneath the add-on channels and seals accordingly. It must be ensured that the film will last for a long time (see also design details).

Inner sealing section

- The structure of the inner sealing section differs in the AK-S system for vertical facades and roof glazing.

Inner seals for vertical glazing

- Seals with two drainage sections and a 16.5 mm height to safely guide away any moisture or condensation to the outside. These seals are created by overlapping the seal joints in which the higher sealing section of the transom goes underneath the lower level of the mullion.
- The use of intermediate mullions in the system creates an exception. In verticals facades, the intermediate mullion seals are pushed up again the transom seals. We recommend forming a drain with the connecting paste at the lower joint.
- The seal flap protects the vulnerable area of the edge bonding in the rebate in double glazing and ensures that moisture is drained away via the vertical mullions.
- 8 to 18 mm single glazing use transom seals without seal flaps. Transom seal GD 6073 should be used in addition and can also be used for inclined glazing transoms. The installation of 5 mm thick glass panes is still possible, but adjustments must be made and geometrically checked.

Inner seals for glazed roofs

- A special seal geometry for glazed roofs also allows for two-level stepped drainage. The 16.5 mm high seals are laid with overlapping joints.
- The use of intermediate mullions in the system creates an exception. The intermediate mullion seals can only be pushed up flush against the transom seals. Due to the seal geometry (transom seal without seal flap), the add-on channel and roof structure (e.g. influence on roof incline) should be evaluated in each case. Generally, intermediate mullions should be avoided in glazed roofs.

Tips for laying seals

Some basic information for sealing and sticking down Stabalux seals

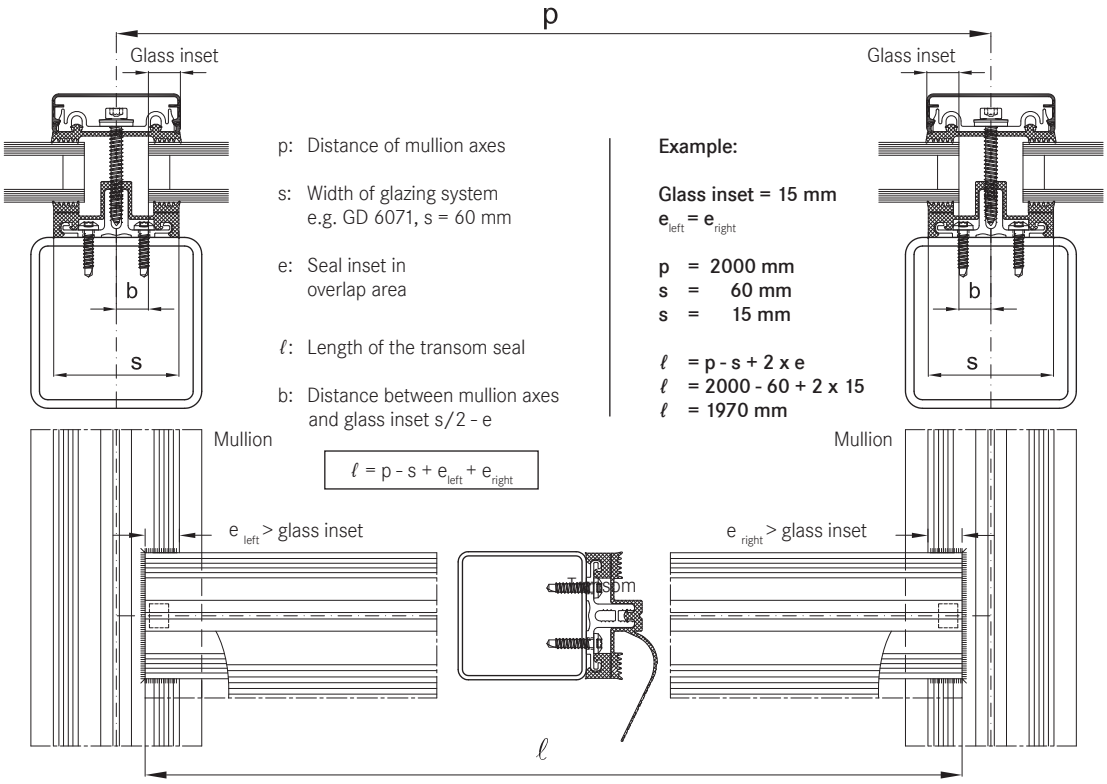
- All joints and seal penetrations must be waterproofed with the exception of the Stabalux screw fittings.
- Gasket joints in the inner sealing section should always be sealed using Stabalux sealant, regardless of whether they are butt joints or overlapping. We recommend Stabalux connecting paste Z 0094. Follow the directions provided by the manufacturer).
- For difficult to seal places we recommend first using Sicomet Z 0055 fixing glue.
- Before gluing, ensure all surfaces are free from moisture and dirt.
- Weather conditions such as snow and rain prevent an effective seal.
- Temperatures below +5 °C are not suitable for fixing seals.
- The hardened connecting paste should not prevent level support of glass.

Section

- The length of the mullion seal is generally the same length as the add-on channel attached to the mullion.
- The length of the transom seals matches the distance between the mullion seals plus an allowance for glass inset on each side. Ensure that the seal flap always covers the fill element's inset distance.
- When cutting to size, always ensure that seals are not bearing any loads when installed.

Simplified formula

System width	Calculate the length ℓ of the transom seal
50 mm	p - 2 x b = p - 2 x 13 mm = **p - 26 mm**
60 mm	p - 2 x b = p - 2 x 15 mm = **p - 30 mm**
80 mm	p - 2 x b = p - 2 x 20 mm = **p - 40 mm**



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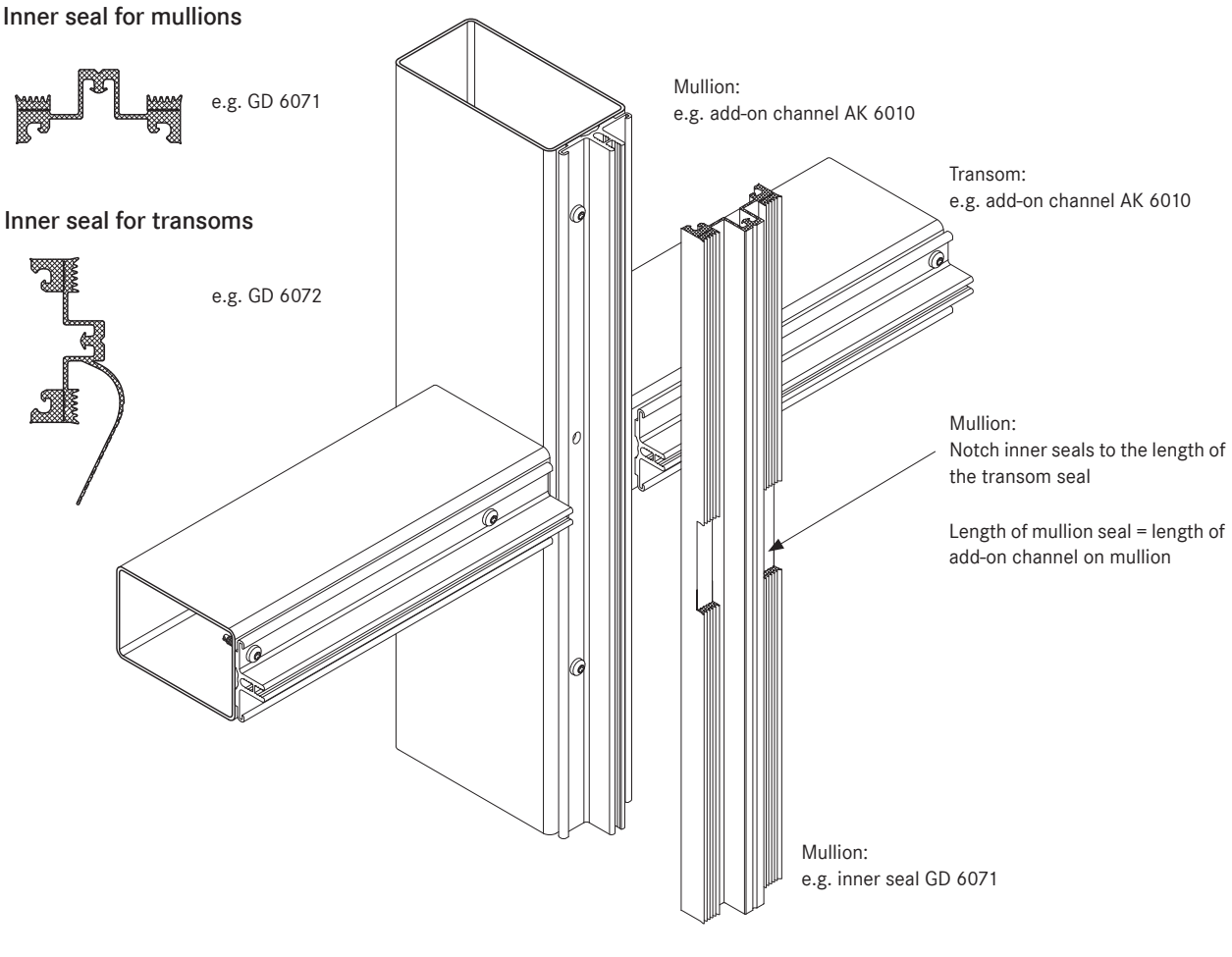
Facade seals

Assembly of inner seal for vertical roof glazing - mullions

- In the first step, the mullion seals are attached.
- The vertical seals for the mullions (2nd drainage section) are laid continuously.
- The length of the mullion seal is generally the same length as the add-on channel attached to the mullion.
- Notch out the mullion seals at the height of the transom in order to allow them to interlock with the transom seal. The 16.5 mm high seals can be divided across their height to allow a simple overlap at critical transom joints.
- As an exception, the intermediate mullion seals are pushed up against the transom seals. Therefore the intermediate mullion seals are attached after laying the transom seals. The seal flap of the upper transom runs continuously in the upper part of the joint.



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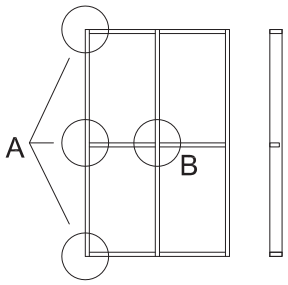
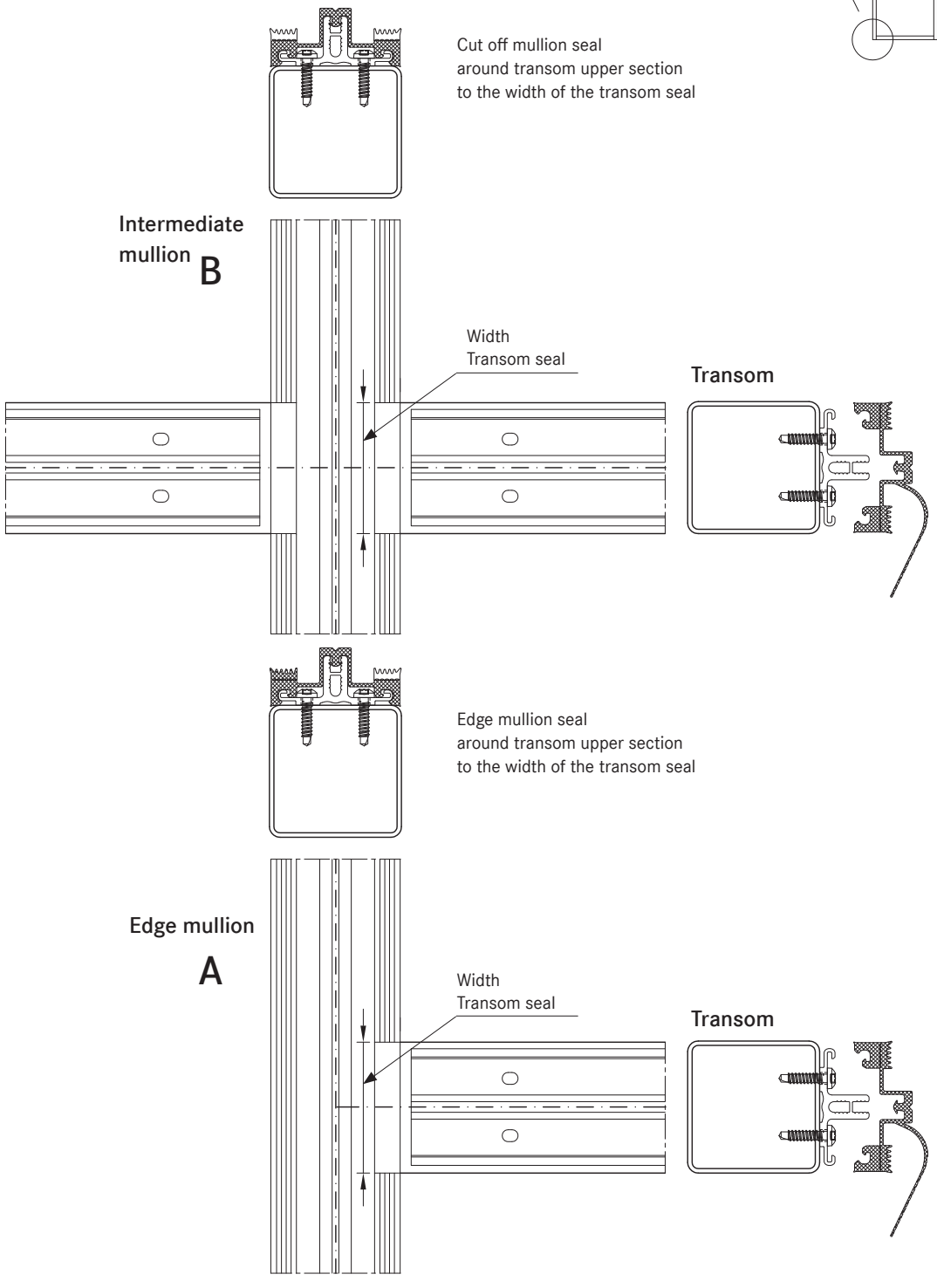
Facade seals

Assembly of inner seal for vertical roof glazing - mullions





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Facade seals

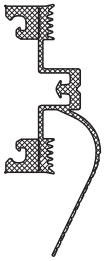
Assembly of inner seal for vertical roof glazing - mullion/transom

- In the second step, the transom seals are overlapped into the mullion seals. In the overlap area, the lower part of the 16.5 mm tall separable transom seal should also be removed.
- The length of the transom seal - see section.
- Along a transom, seals must be laid continuously.
- In order to ensure good drainage of the transom, before gluing the overlap joint, the Z 0062 sealing pieces should be inserted at the ends of the transom seal according to the following diagram and fixed with Stabalux Z 0094 connecting paste. The gasket joint should then be generously sealed. Ensure unobstructed ventilation and drainage of the rebate area.
- Moisture and condensation is guided away via the seal flap of the transom seal (1st drainage section) to the main mullion.
- The protruding length of the seal flap should be removed at the perforation once glazing is completed.
- When installing single glazing up to 18 mm thick, seals without a seal flap are used on beams (see section on “Inner seals for vertical glazing” and information about glass support GH 6073).

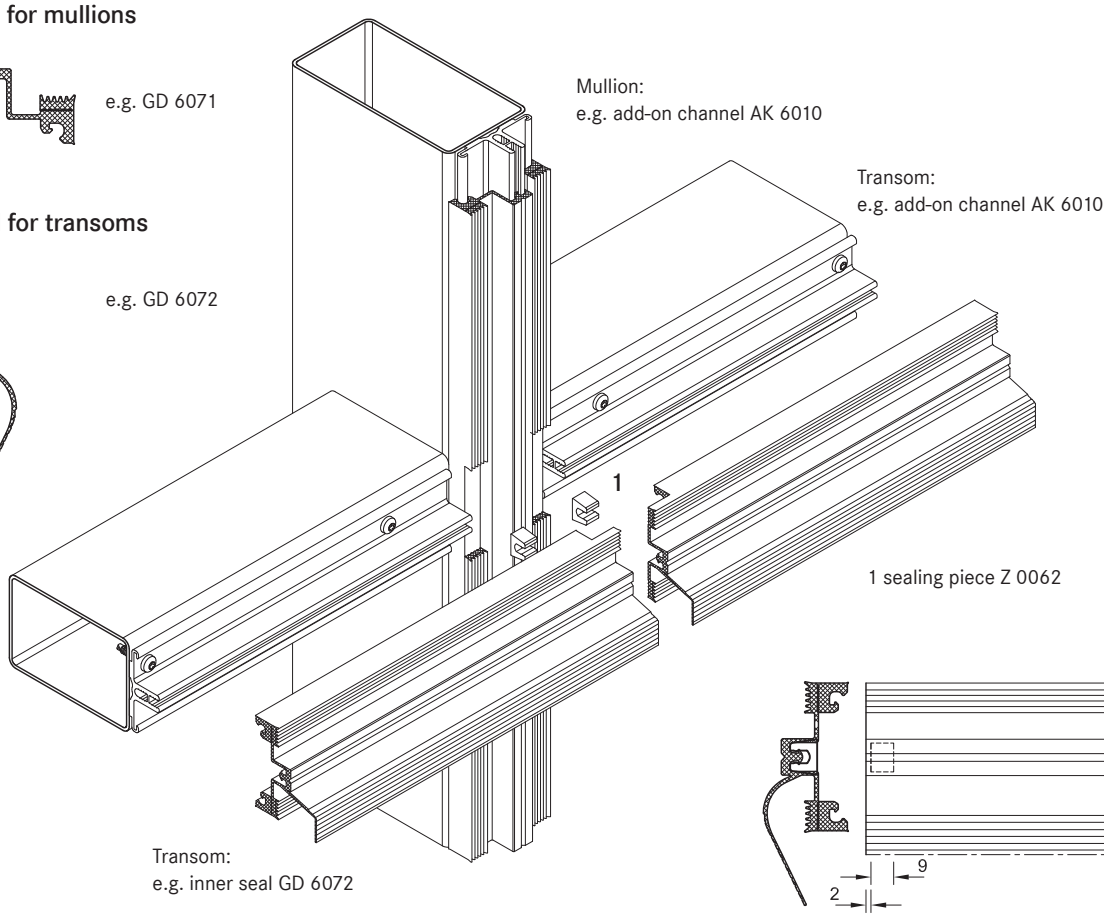
Inner seal for mullions

e.g. GD 6071

Inner seal for transoms



e.g. GD 6072



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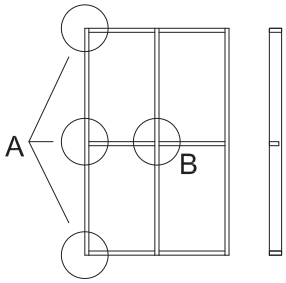
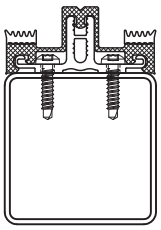
Facade seals



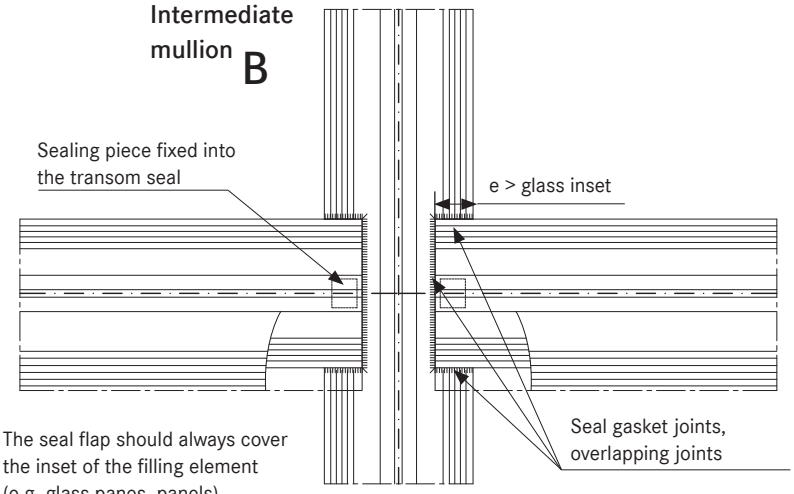
Assembly of inner seal for vertical roof glazing - mullion/transom

Completed glued joints
Intermediate mullion and end mullion

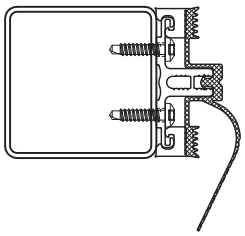


Cut off mullion seal
around transom upper section
to the width of the transom seal

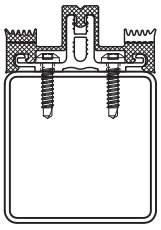
Intermediate mullion B



Transom
Transom seal
separate lower section at length of the overlap “e”

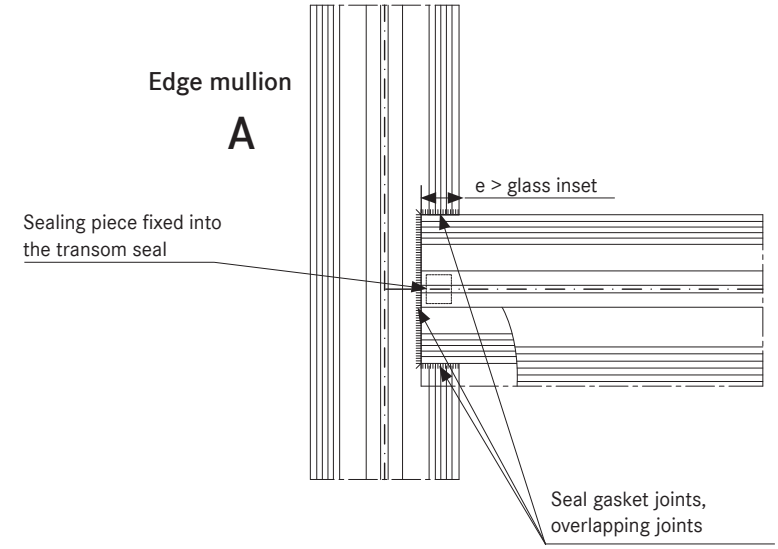


The seal flap should always cover the inset of the filling element (e.g. glass panes, panels)

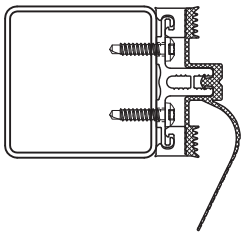


Edge mullion seal
around transom upper section
to the width of the transom seal

Edge mullion A



Transom
Transom seal
separate lower section at length of the overlap “e”



AK-S_3.2_009.dwg

Facade seals

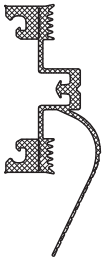
Assembly of inner seal for vertical roof glazing - intermediate mullion

- The intermediate mullion seals are pushed up against the transom seals. Therefore the intermediate mullion seals are attached after laying the transom seals. The seal flap of the upper transom runs continuously in the upper part of the joint.
- A either end of the intermediate mullion seal, Z 0062 sealing pieces are inserted and fixed in place with connecting paste Z 0094. The gasket joints are then generously sealed.
- On the lower connection to the transom seal we recommend forming a drain with the connecting paste in the intermediate mullion rebate.
- For intermediate mullions we recommend using inner seal GD 6073

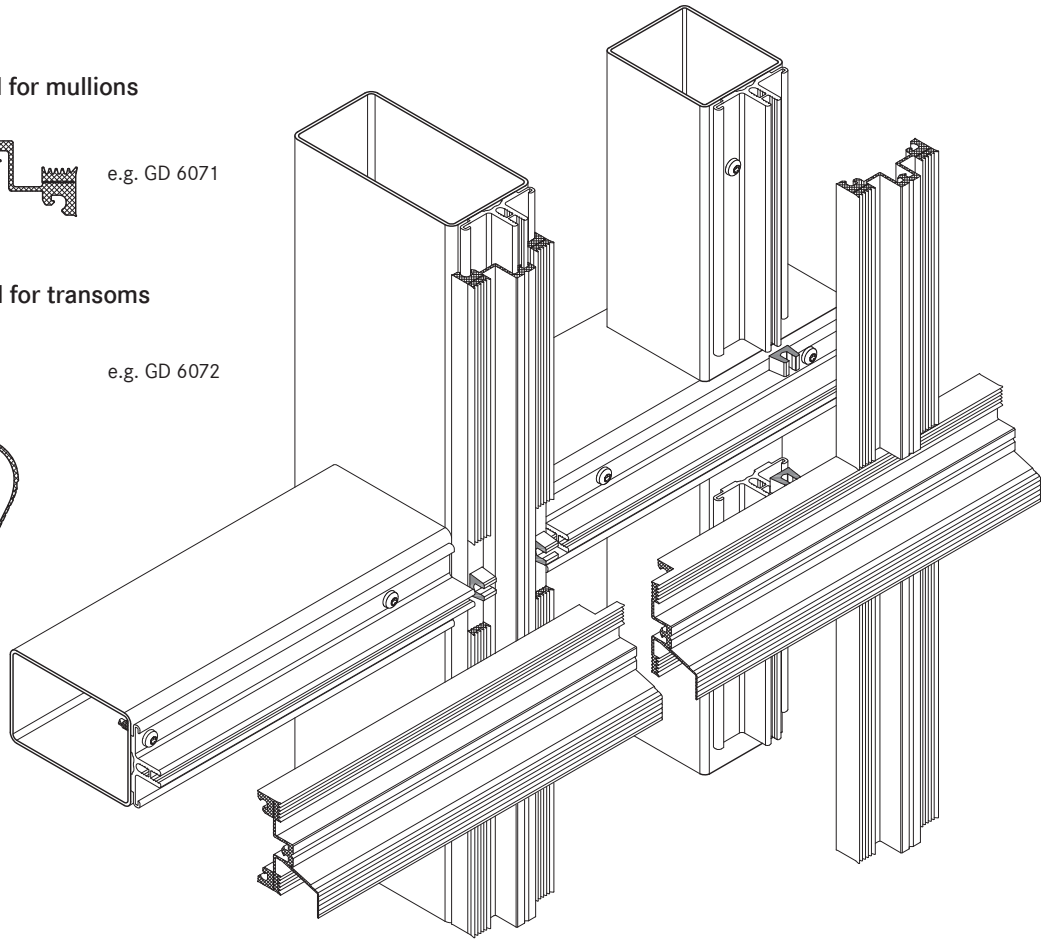
Inner seal for mullions

e.g. GD 6071

Inner seal for transoms



e.g. GD 6072



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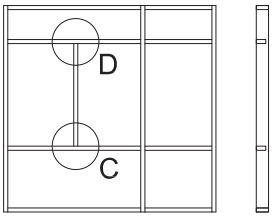
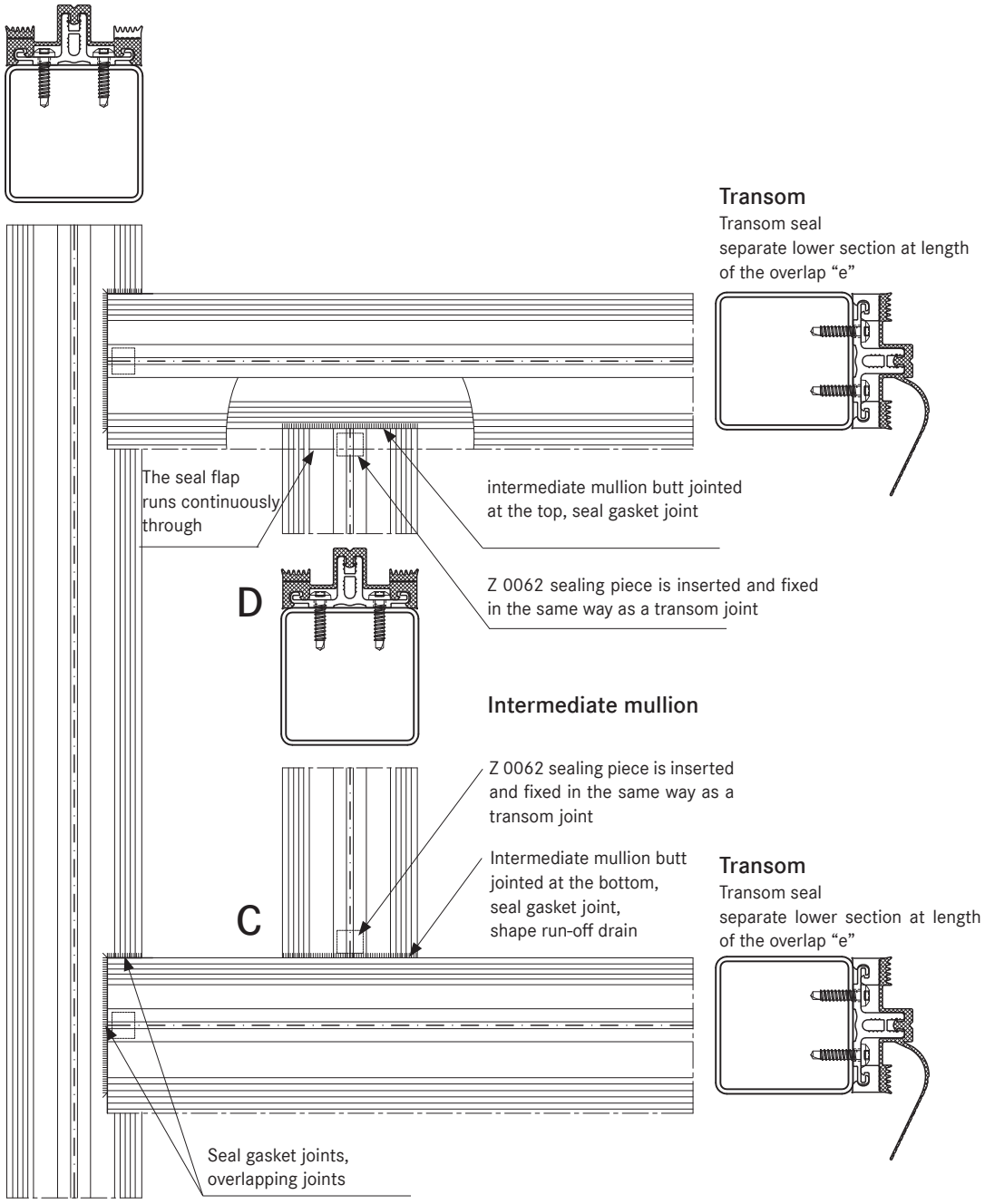
Facade seals

Assembly of inner seal for vertical roof glazing - intermediate mullion



Completed glued joints intermediate mullion / transom



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Stabalux AK-S
Processing information

Facade seals

Assembly of the outer seal for vertical glazing

- As well as gently clamping the glass in place, the outer sealing system has the primary task of protecting the rebate against moisture ingress.
- The outer level must be completely sealed except for the necessary openings for pressure equalisation and condensation dissipation.
- The outer mullion seals are laid continuously and the transom seals are joined.
- Sealant joints are to be laid flat with a slight excess in dimensions. Exact specifications depends on the situation in which the system is used.
- Tightly fitted sealant joints can be implemented without fixing the outer seal of the mullion-transom joint in vertical facades.
- The flag for the inner transom joint in combination with the outer seal creates additional safety. Ensure correct and level placement of the seal flap.
- The seal flap should be separate at its perforations to match the thickness of the glass in order that this is clamped down and concealed under the outer seal.
- Different heights of sealing lips on the outer transom seal bridge the height difference created by the seal flap in the outer sealing section.
- Separated seals with different heights allow fill elements of differing total thicknesses of up to 4 mm to be balanced.
- Differently high, split seals allow a balance between filling elements of different total thickness of up to 6 mm.
- When mounting the clamping strips, be aware of aluminium profile expansion (see section on material information).

Outer seal mullion

e.g. GD 6024

Outer seal transom

e.g. GD 6054

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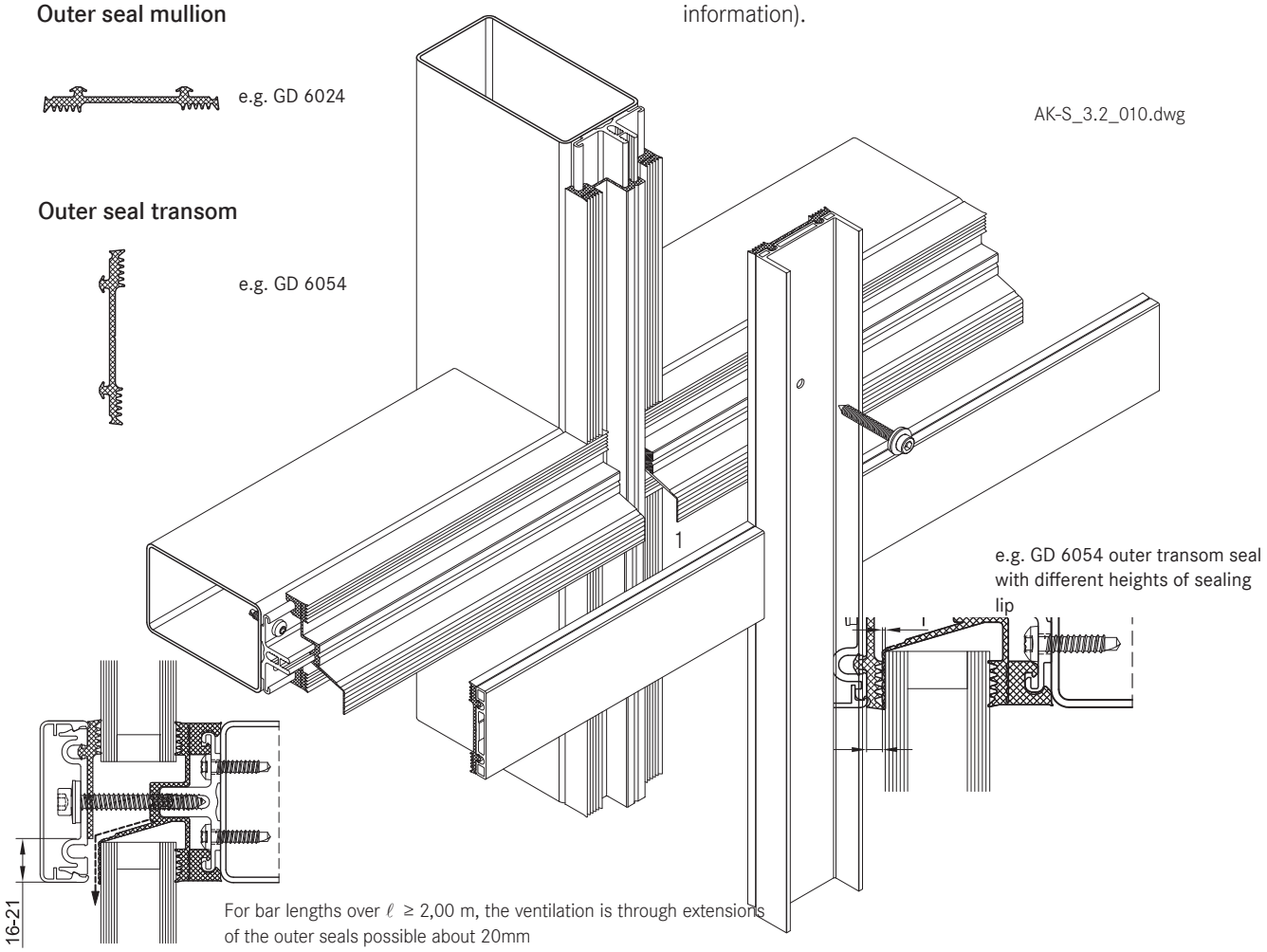


e.g. GD 6054 outer transom seal with different heights of sealing lip

For bar lengths over ℓ ≥ 2,00 m, the ventilation is through extensions of the outer seals possible about 20mm

Seals - roof

Assemble the inner seal for roof glazing - 2 overlapping layers

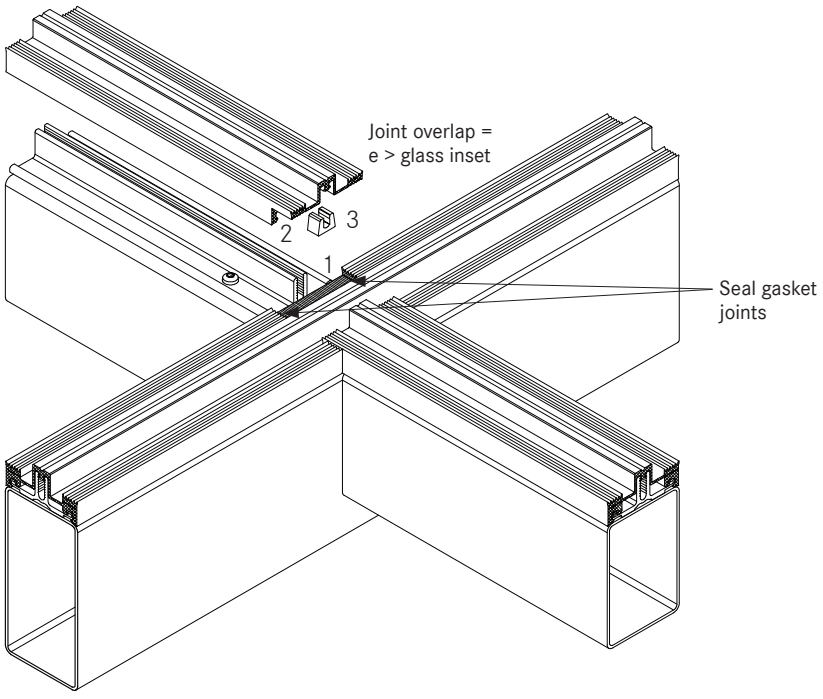
In the roof area as in the facade, seals with offset water channels can be used in the facade area which safely drain any moisture or condensation to the outside.
The 16.5 mm high seals can be divided across their height to allow a simple overlap at critical transom joints.

Rafter seals

- These are laid in fundamentally the same way as for vertical glazing.
- The use of intermediate mullions creates an exception. The principles of vertical facades can also be used as a basis here. However, due to the inclined position, each separate case should be evaluated and special attention given to sealing and ensuring drainage of any moisture that has got inside and condensation build-up. Generally, intermediate mullions should be avoided in glazed roofs.

Transom seal

- In the next step, the transom seals are clipped into the add-on channel.
- These are cut and laid in fundamentally the same way as for vertical glazing.
- Transom seals in roofs have no seal flap. The geometric form of the seal should be created in such a way as to form condensation channels in the inclined mounted position. These channels (1st drainage level) drains from the overlapping transom joint in the mullions.
- The gasket joints are sealed in the same way as described for vertical facades.



1 remove the upper perforated part on the rafter seal
2 remove the lower perforated part on the transom seal
3 Fix sealing piece Z 0062 into the transom seal and seal gasket joints.

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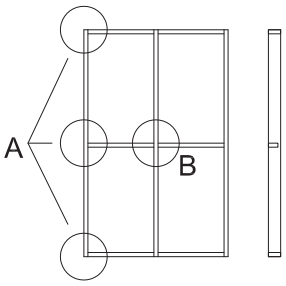
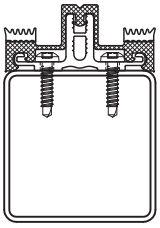
Stabalux AK-S
Processing information

Seals - roof



Assemble the inner seal for roof glazing - 2 overlapping layers

Completed glued joints
mid-rafter and
verge rafter



Rafter seals
around transom upper section
to the width of the transom seal

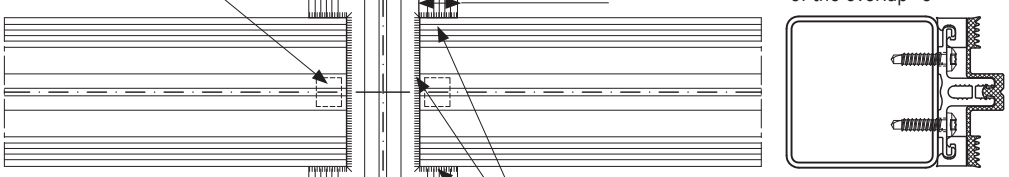
Mid-rafters

B

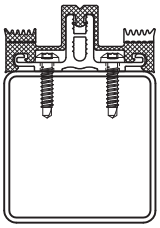
Sealing piece fixed into
the transom seal

e > glass inset

Transom
Transom seal
separate lower section at length
of the overlap “e”



Seal gasket joints,
overlapping joints



Verge rafter seal
around transom upper section
to the width of the transom seal

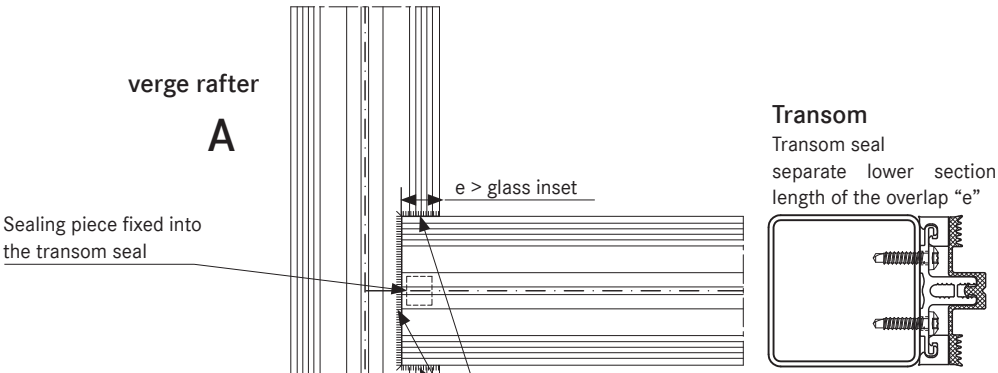
verge rafter

A

Sealing piece fixed into
the transom seal

e > glass inset

Transom
Transom seal
separate lower section at
length of the overlap “e”



Seal gasket joints,
overlapping joints

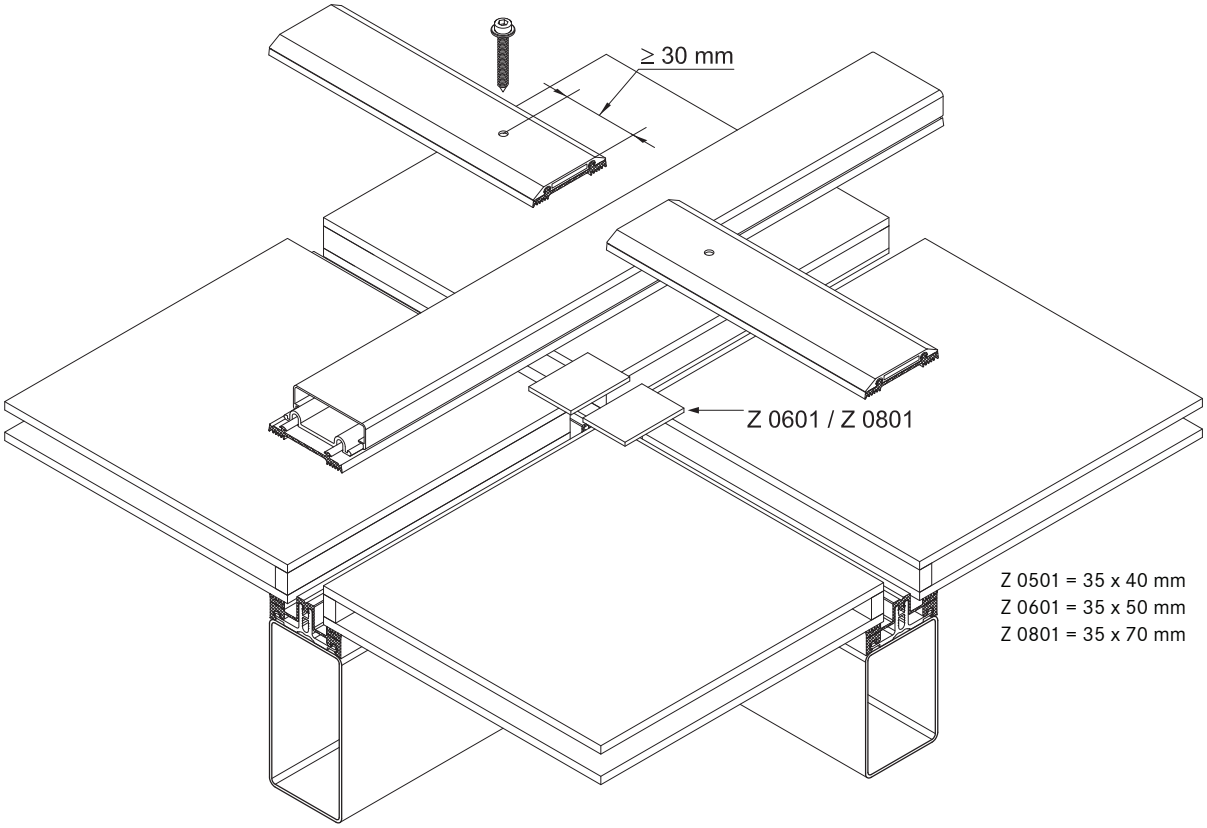
AK-S_3.2_013.dwg

Stabalux AK-S
Processing information

Seals - roof

Assembly of the outer seal for for glazed roofing

- These are laid in fundamentally the same way as for vertical glazing. Split seals such as GD 1924 are not suitable for transom seals in roofs. Split seals can only be installed in mullions in combination with insulation blocks. Each installation situation will differ to some degree and always check how well sealed it is.
- For cross joints we recommend using our self-adhesive stainless steel sealing plates with butyl coating Z 0501 for System 50, Z 0601 for System 60 and Z 0801 for System 80.
- The stainless steel sealing plates are 35 mm wide and are attached to the edge of the glass panes parallel to the mullion axis.
- Butyl tape is not suitable as a sealing tape between the glass and the outer seal.
- The outer mullion seals are laid continuously and the transom seals are joined.
- Sealant joints are to be laid flat with a slight excess in dimensions. Exact specifications depends on the situation in which the system is used.
- For glass insets of 12 and 15 mm, the first screw fittings for the transom cover strip begin 30 mm from the end of the cover strip.



Attention:

The sealing plates must be placed centrally to the transom axis!

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Seals - roof

Assembly of the outer seal for for glazed roofing

Recommendation for the use of clamping strips in roof glazing

When using aluminium cover profiles on roofs, take account of the expansion factor as a result of the high degree of heat absorption when selecting the length to use. Equally, the use of single-piece cover profiles should be carefully considered. In this case it is recommended that holes for screwing on the cover strip are created with a diameter of d = 9 mm.
For wider spans and in rafters we recommend using concealed screw fittings when selecting the clamping strips (lower + cover profile). This is the preferred option for rafters. Unused holes in the pressure profile must be sealed.

Some roof areas, such as the eaves, see the use of several different materials (glass, sealing materials, aluminium sheets, ...) each with different expansion coefficients. To avoid the formation of cracks, aluminium sheets should be installed with expansion joints.

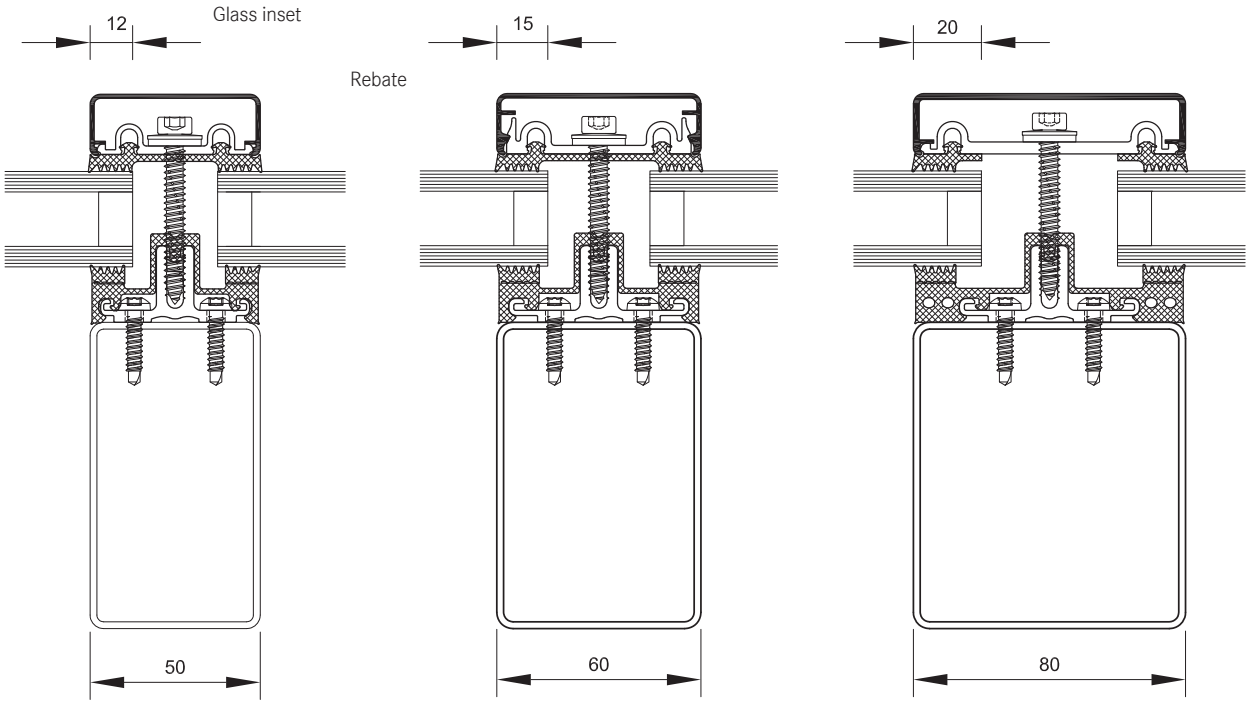
Note

- Horizontal clamping strips prevent the free run off of rain water and dirt.
- Cover strips and cover profiles with angled edges reduce the build up of water in front of the clamping strip.
- To improve water drainage, clamping strips around transom joints should be shortened by 5 mm. Gasket joints, however, are to be laid flat with a slight excess in dimensions. Open ends of transom clamping strips (upper and cover profiles) should be sealed.

Glass inset

Glass inset

- Glass industry guidelines must be observed.
- 50 mm system width = 12 mm glass inset
- 60 mm system width = 15 mm glass inset
- 80 mm system width = 20 mm glass inset
  (15 mm glass inset also possible)



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Glass support

Glass support types and choosing the glass support

The weight of the glass must be permanently and securely supported. The weight of the glass cannot be supported by the add-on channel without additional actions. Glass supports and additional attachments for the add-on channel on the supporting structure serve to carry the load of the glass panes through to the structure. The choice of glass support is made independent of the system width used. The glass supports used are dependent on the glass structure and weight. The depth of the glass supports is determined by the thickness of the glass. The system glass supports are all tested and regulated by general building control certification.

Mullion-transom connections (T-joints) must be implemented as per the statically chosen system (as articulated or rigid joints). For articulated joints, it must be ensured that there is no excessive twisting of the transom profile in the design that would lead to a lowering of glass support area. The planner and processor must take particular care in this regard.

There are four different types of glass support with three attachment variants in the Stabalux AK-S system.

- Glass supports GH 6071 with a length of ℓ = 100 mm are attached directly into the add-on channel using 3 Stabalux system screws. An additional attachment to secure the add-on channel to the supporting structure is made in the area of the glass support. Glass thicknesses of 20 – 60 mm can be used. Use is permitted for add-on channel AK 6010 attached either with screws or Hilti fasteners and for welded add-on channel AK 6020.
- Glass supports GH 6072 with a length of ℓ = 200 mm are attached directly into the add-on channel using 6 Stabalux system screws. An additional attachment to secure the add-on channel to the supporting structure is made in the area of the glass support. The strengthened attachment and longer load transfer area can support a greater glass weight. Glass thicknesses of 20 – 60 mm can be used. Use is permitted for add-on channel AK 5010/ AK 6010 attached either with screws or Hilti fasteners and for welded add-on channel AK 6020.
- Glass supports GH 6073 made from 3 mm thick aluminium sheets and a length of ℓ = 100 mm are attached directly into the add-on channel using 3 countersunk screws (Stabalux system screw Z 0193). The bars in the add-on channel should be pre-drilled. This glass support can be used with glass thicknesses between 8 and 18 mm. The installation of 5 mm thick glass panes is still possible, but adjustments must be made and geometrically checked. Use is permitted for add-on channel AK 5010/ AK 6010 attached either with screws or Hilti fasteners and for welded add-on channel AK 6020.
- Heavy glass loads require welded glass supports. Generally, 5 mm thick steel plates of length ℓ = 100 – 150 mm are directly welded to the substructure. Mill out the add-on channels AK 6010 and AK 6020 around the area of the glass support and use Stabalux connecting paste Z 0094 to seal off areas where the inner seal is penetrated. Sufficient protection against corrosion must be ensured on-site. Welded glass supports bear down on the substructure independently of the add-on channel and its attachments. The glass supports should be statically demonstrated in all cases.

Mounting the glass supports

- Positioning the glass supports and glazing according to glass industry guidelines and guidelines of the Institute for Window Technology.
- Glazing industry technical directive no. 3 “Blocking of glazing units” says: “The distance of the blocks from the corner of the glazing unit should be about the length of 1 block. The distance of the blocks may be reduced in individual cases up to 20 mm if the risk of breakage to the glass is not increased by the structure and position of the block. For very wide, fixed glazing units, a distance of about 250 mm from the corners of the glazing unit can be kept. The support blocks must sit over an attachment point in the frame.”
- Transfer of the glass weight takes place using glass supports that are mounted to the add-on channels or directly into the transoms.
- The weight of the glass must be permanently and securely supported.
- The Stabalux glass supports can be placed with an edge distance from 50 - 150 mm according to Z-14.4-767. We recommend a distance of g = 100 mm and 75 mm from the end of the transom.

Glass support

The position of T-joints should always be considered.

- Depending on how the add-on channel is attached to the substructure, the 100 mm long glass supports GH 6071 and GH 6073 are ideally screwed down at a distance of g = 75 and 100 mm.
- Depending on how the add-on channel is attached to the substructure, for the 200 mm long glass support GH 6072 we recommend reducing the distance to g = 50 and 75 mm.
- Depending on their length, welded glass supports are welded directly to the substructure at distance g = 75 to 100 mm.
- Distance “g“ is measured from the end of the transom.
- For all glass support variants, the position of the additional attachment to secure the add-on channel to the supporting structure and the position of the milling groove should be ensured.
- So that the same pattern of holes can be created on both left and right of the transom ends for mounting the glass supports, we recommend separating the add-on channel in the area around a transom and creating a joint in the middle of the transom. A pair of screws is always placed at the ends of the add-on channel.
- The pre-drilled add-on channels (with slot 5.4 x 7.2 mm and 9.5 x 35 mm with distance c = 200 mm) make mounting easier. Any additional holes required around the glass support or generally required by the design should be drilled with a diameter of d = 5.5 mm.
- Inner seal penetrations must be sealed using Stabalux connecting paste Z 0094 with the exception of the Stabalux screw fittings.

Glazing blocks

- Glazing blocks must be compatible with the edge bonding of the insulated glass panes.
- They should be stable under constant pressure and be able to withstand loads, aging and temperature changes.
- It is important that the blocking allows sufficient surrounding space for pressure equalisation and that drainage of condensation is not obstructed as well as allowing small design tolerances to be accommodated.
- If the length of the glass support is more than 100 mm, blocks should be placed along the entire length of the glass support to ensure equal load distribution.

When mounting the glass supports we recommend maintaining the distance "g" from the end of the transom:

Add-on channel	**AK 5010/ AK 6010**		**AK 6020**
Attachment of the add-on channel to the substructure	**screwed**	**Hilti fasteners**	**welded**
Glass support types	Distance **g** measured from the end of the transom		
GH 6071 (100 mm long)	100 mm	100 mm	100 mm
GH 6072 (200 mm long)	75 mm	75 mm	75 mm
GH 6073 (100 mm long)	100 mm	100 mm	100 mm
Welded glass support (100 - 150 mm long)	75 - 100 mm	75 - 100 mm	75 - 100 mm

Additional attachments around the glass supports

Add-on channel	**AK 5010/ AK 6010**		**AK 6020**
Attachment of the add-on channel to the substructure	**screwed**	**Hilti fasteners**	**welded**
Glass support types	Additional add-on channel attachments around the glass supports per glass support		
GH 6071 (100 mm long)	4	4	2 x slot plug welds
GH 6072 (200 mm long)	8	12	2 slot plug and 2 round plug welds
GH 6073 (100 mm long)	6	6	2 x slot plug welds
Welded glass support (100 - 150 mm long)	75 - 100 mm	75 - 100 mm	75 - 100 mm

Glass support GH 6071

Additional attachments for AK 5010/ AK 6010

Additional add-on channel attachments around GH 6071 glass support are required. The following diagram shows the arrangement and must be adhered to.

- Strengthening of the add-on channel using additional attachments is achieved in the same way as the standard add-on channel attachments with steel substructures. (see section on types of attachment).
- Attachment variants using screws see the AK 5010/ AK 6010 pre-drilled with additional holes at a diameter of d = 5.5 mm.
- If the add-on channel is attached to the substructure using Hilti fasteners, then all standards laid out in the “usage and mounting requirements” and general building approval Z-14.4-766 from Hilti Deutschland AG must be observed and adhered to.
- **Important note:** The Hilti fasteners must be driven through the metal of add-on profile. The location to be screwed must not be pre-drilled.The minimum distance between the axis of the slots and the axis of the fasteners is ≥ 25 mm and must be maintained.

Edge distances transom / add-on channel

- Edge distances are given in the diagram.

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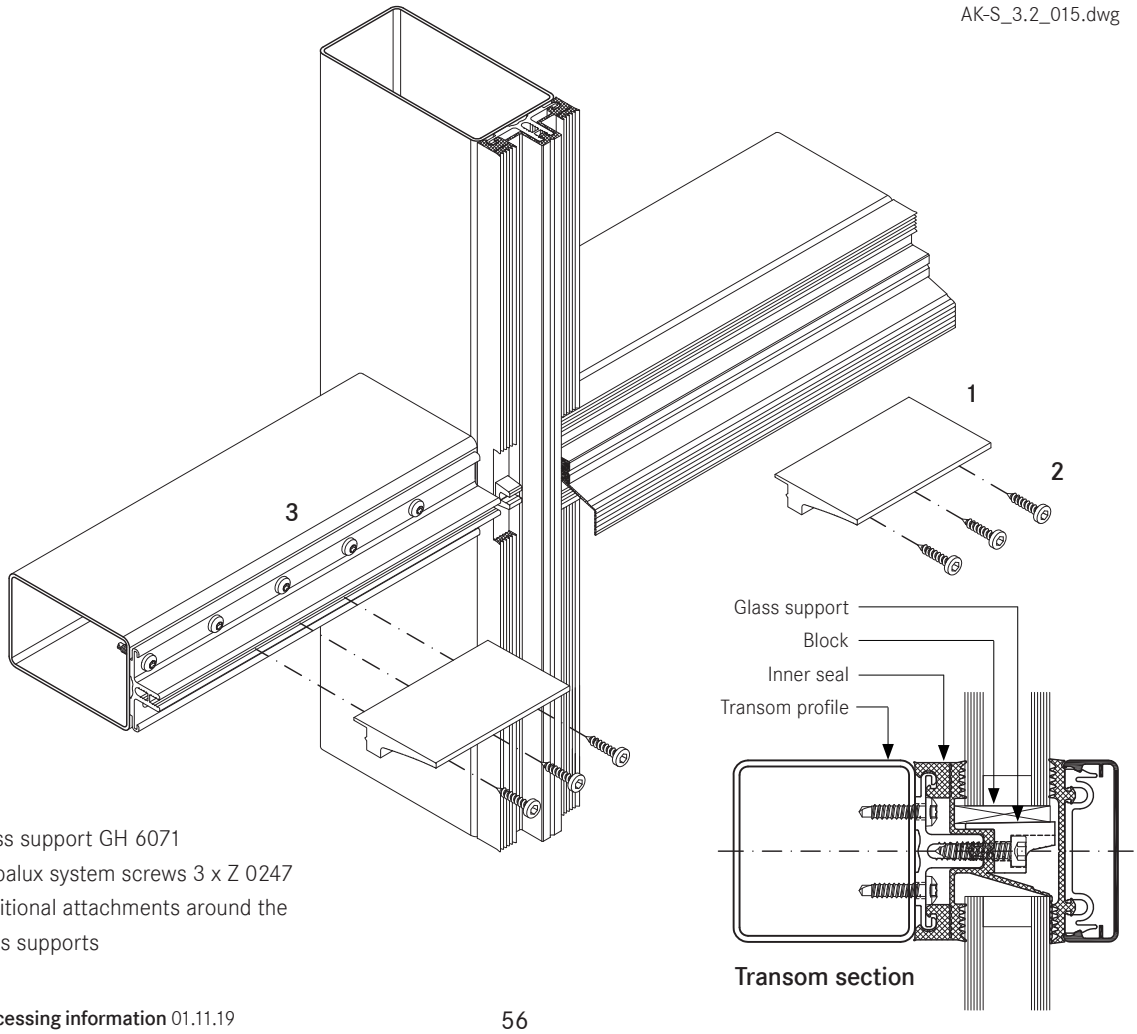


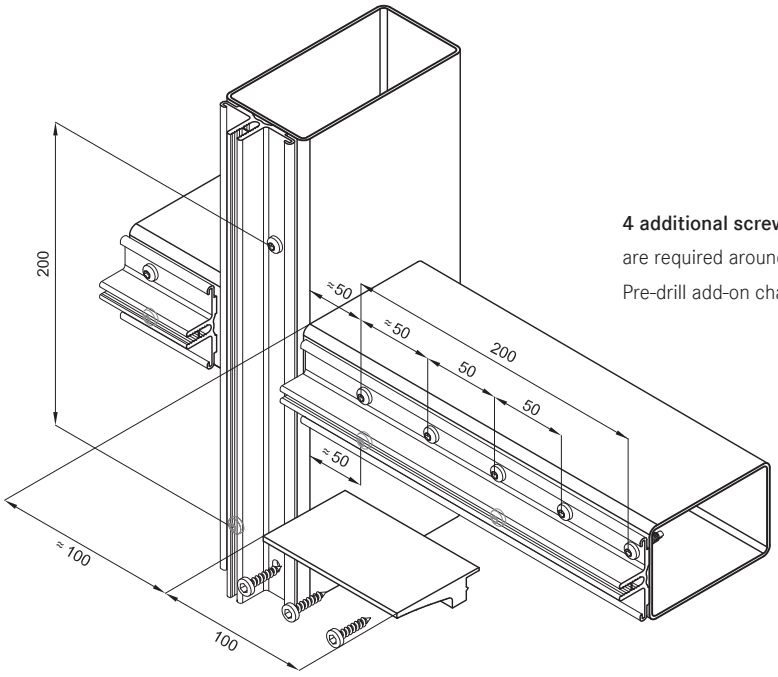
Transom section

1 Glass support GH 6071
2 Stabalux system screws 3 x Z 0247
3 Additional attachments around the glass supports

Stabalux AK-S
Processing information

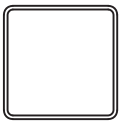
Glass support GH 6071

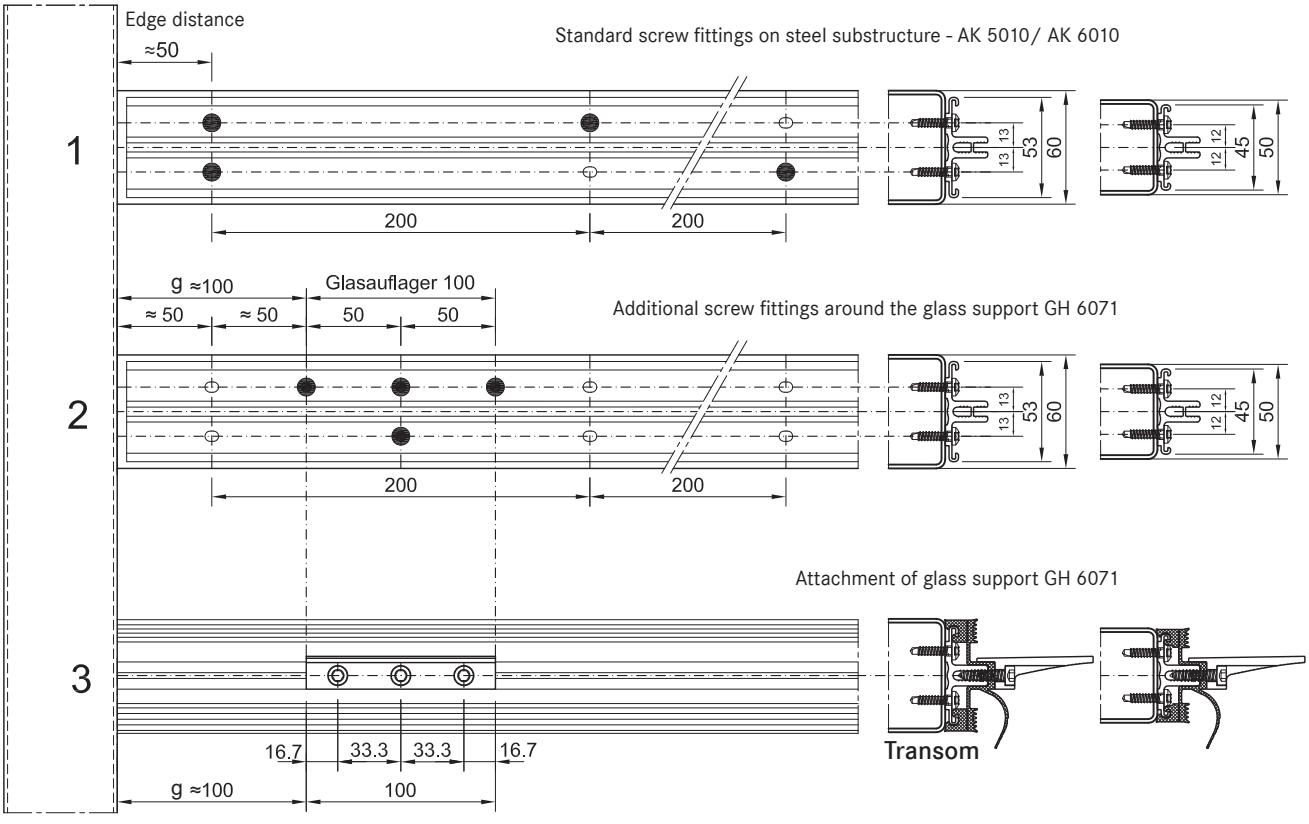
AK 5010/ AK 6010 on steel substructure, screwed



4 additional screws
are required around the glass support
Pre-drill add-on channel with d = 5.5 mm

Mullion





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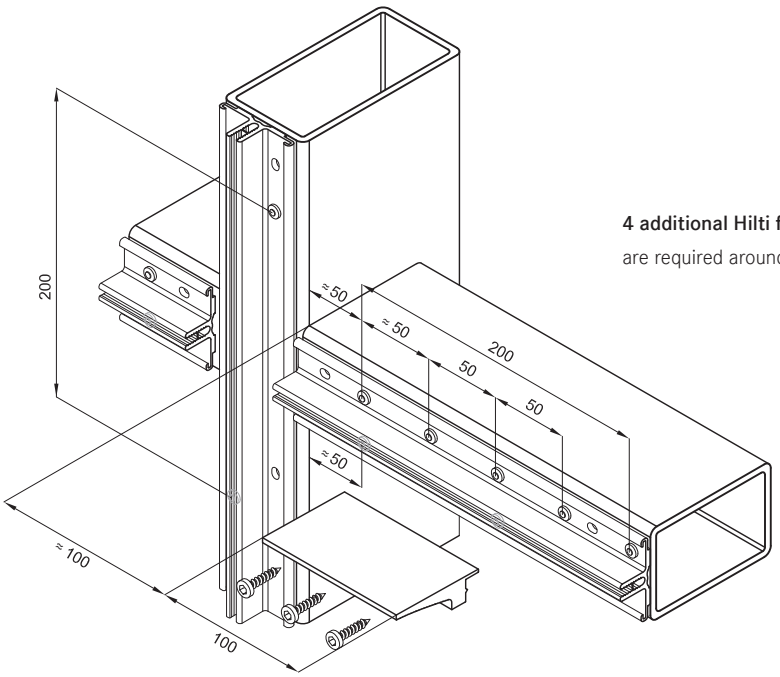
Stabalux AK-S
Processing information

Glass support GH 6071

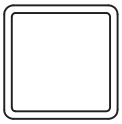
3.2
10

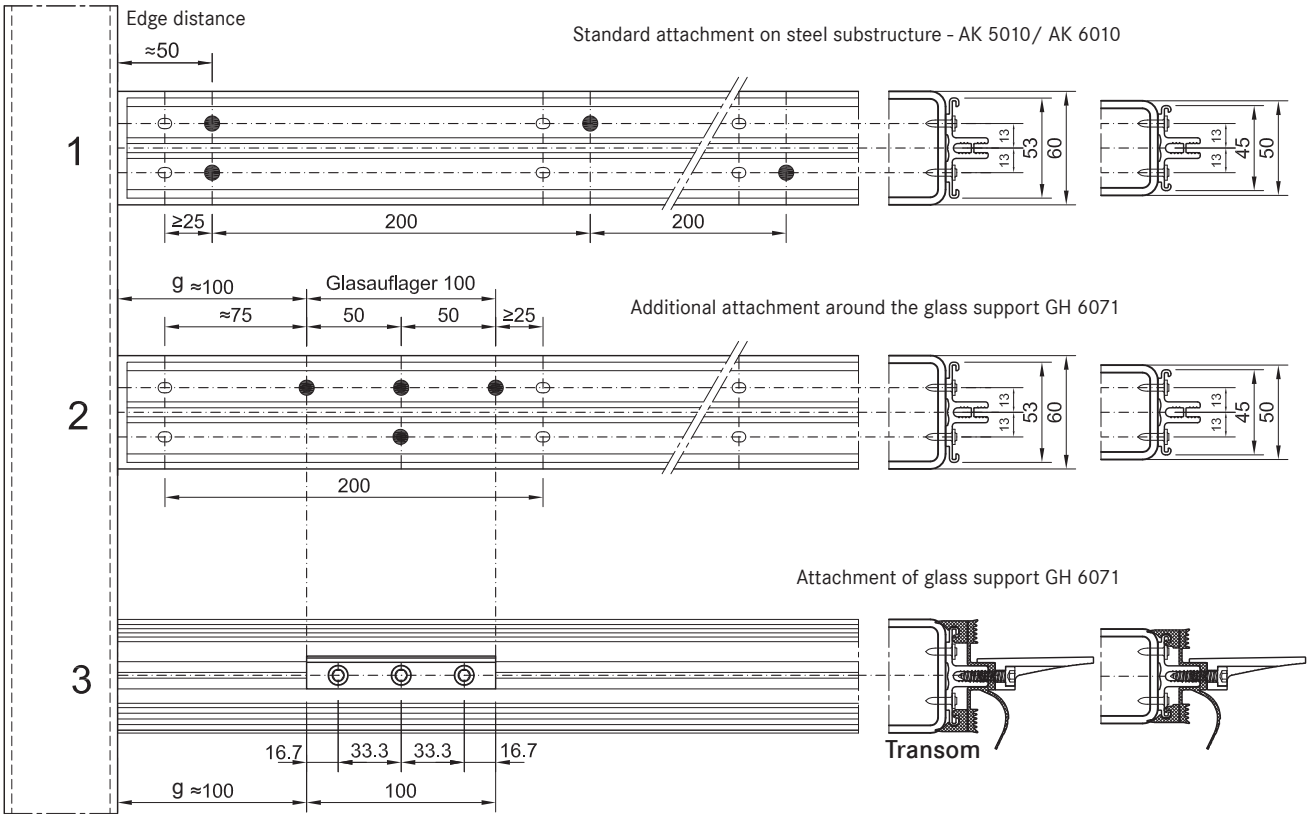
AK 5010/ AK 6010 on steel substructure, Hilti fasteners



4 additional Hilti fasteners
are required around the glass support

Mullion





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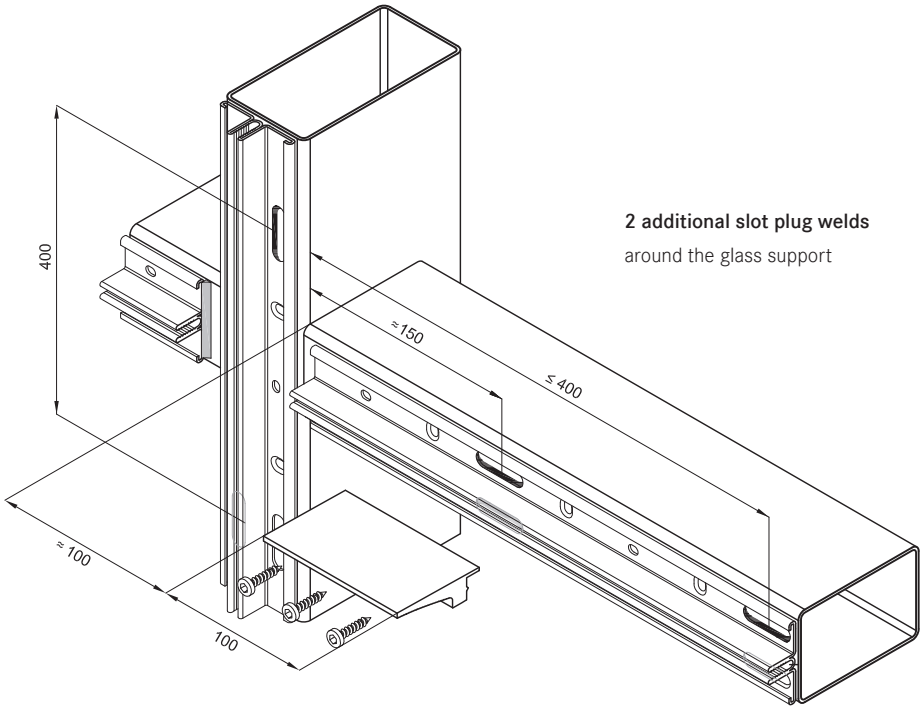
Glass support GH 6071

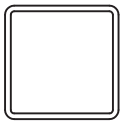
3.2
10

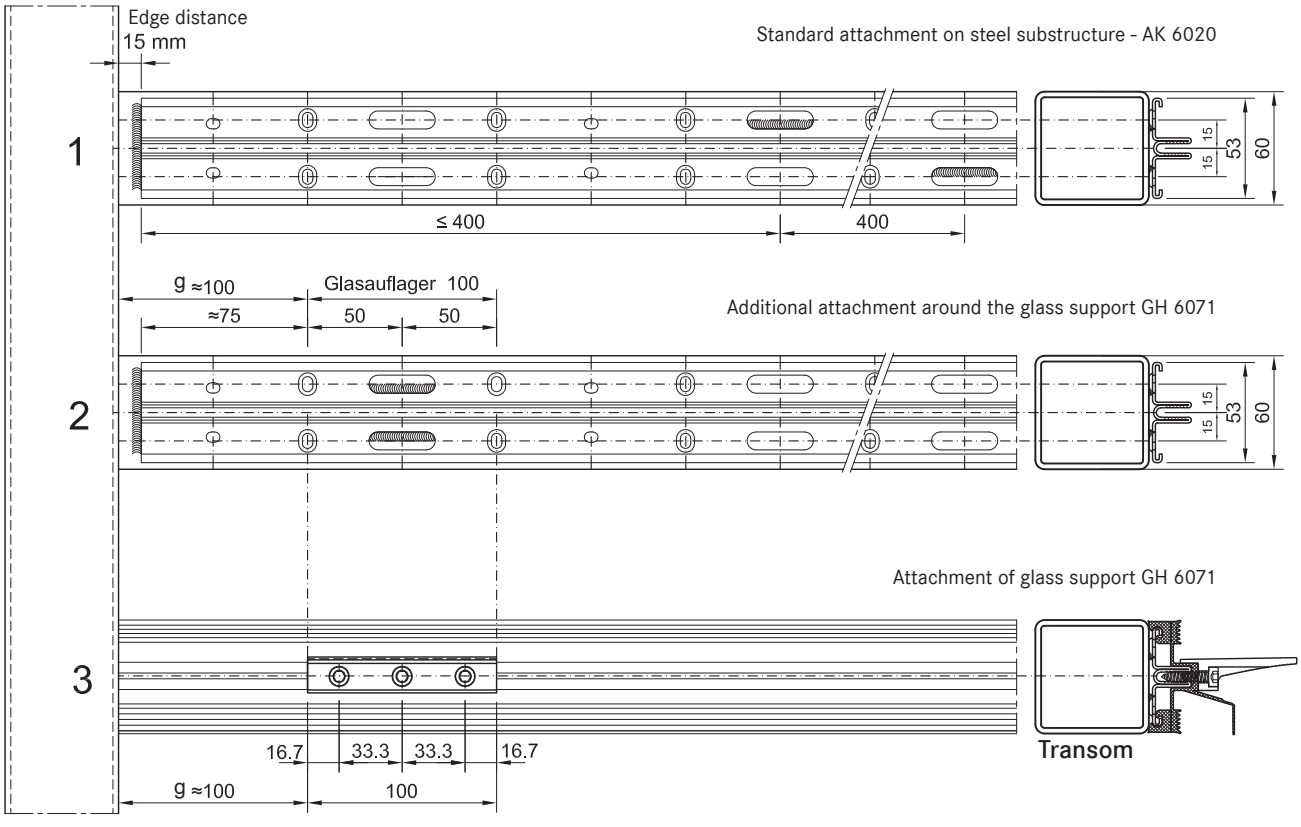
AK 6020 on steel substructure, welded



2 additional slot plug welds
around the glass support

Mullion





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Glass support GH 6072

Additional attachments for add-on channel AK 5010/ AK 6010

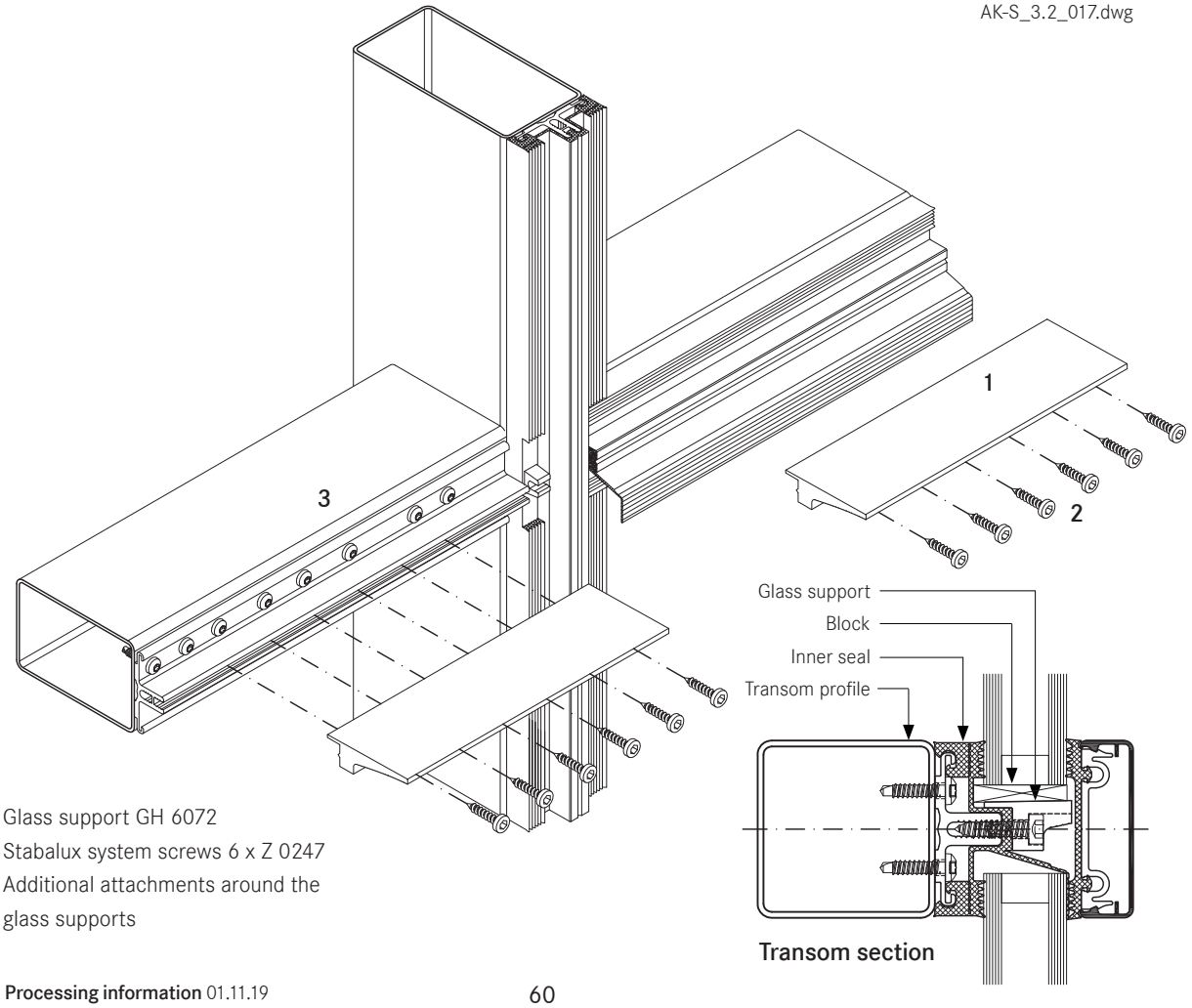
Additional add-on channel attachments around GH 6072 glass supports are required. The following diagram shows the arrangement and must be adhered to.

- Strengthening of the add-on channel using additional attachments is achieved in the same way as the standard add-on channel attachments with steel substructures. (see section on types of attachment).
- Attachment variants using screws see the AK 6010 pre-drilled with additional holes at a diameter of d = 5.5 mm.
- If the add-on channel is attached to the substructure using Hilti fasteners, then all standards laid out in the “usage and mounting requirements” and general building approval Z-14.4-766 from Hilti Deutschland AG must be observed and adhered to.
- **Important note:** The Hilti fasteners must be driven through the metal of add-on profile. The location to be screwed must not be pre-drilled.The minimum distance between the axis of the slots and the axis of the fasteners is ≥ 25 mm and must be maintained.
- For the welded variant, the 5.4 x 7.2 mm slots in the AK 6020 are enlarged to a diameter of Ø8 mm for the additional plug welds.

Edge distances transom / add-on channel

- Edge distances are given in the diagram.

AK-S_3.2_017.dwg



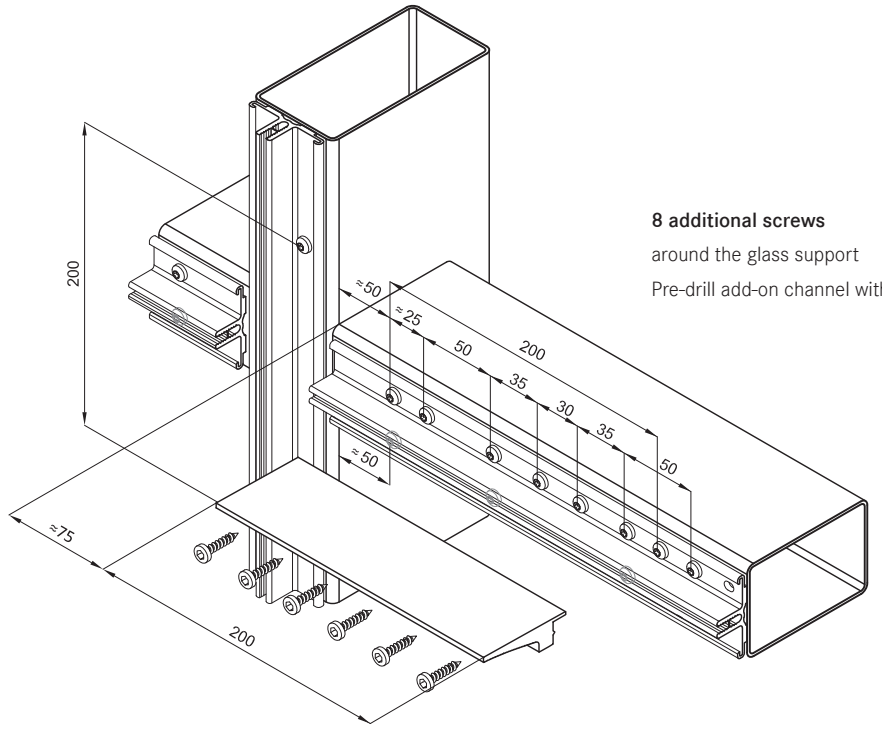
Transom section

1 Glass support GH 6072
2 Stabalux system screws 6 x Z 0247
3 Additional attachments around the glass supports

Stabalux AK-S
Processing information

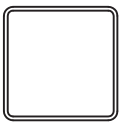
Glass support GH 6072

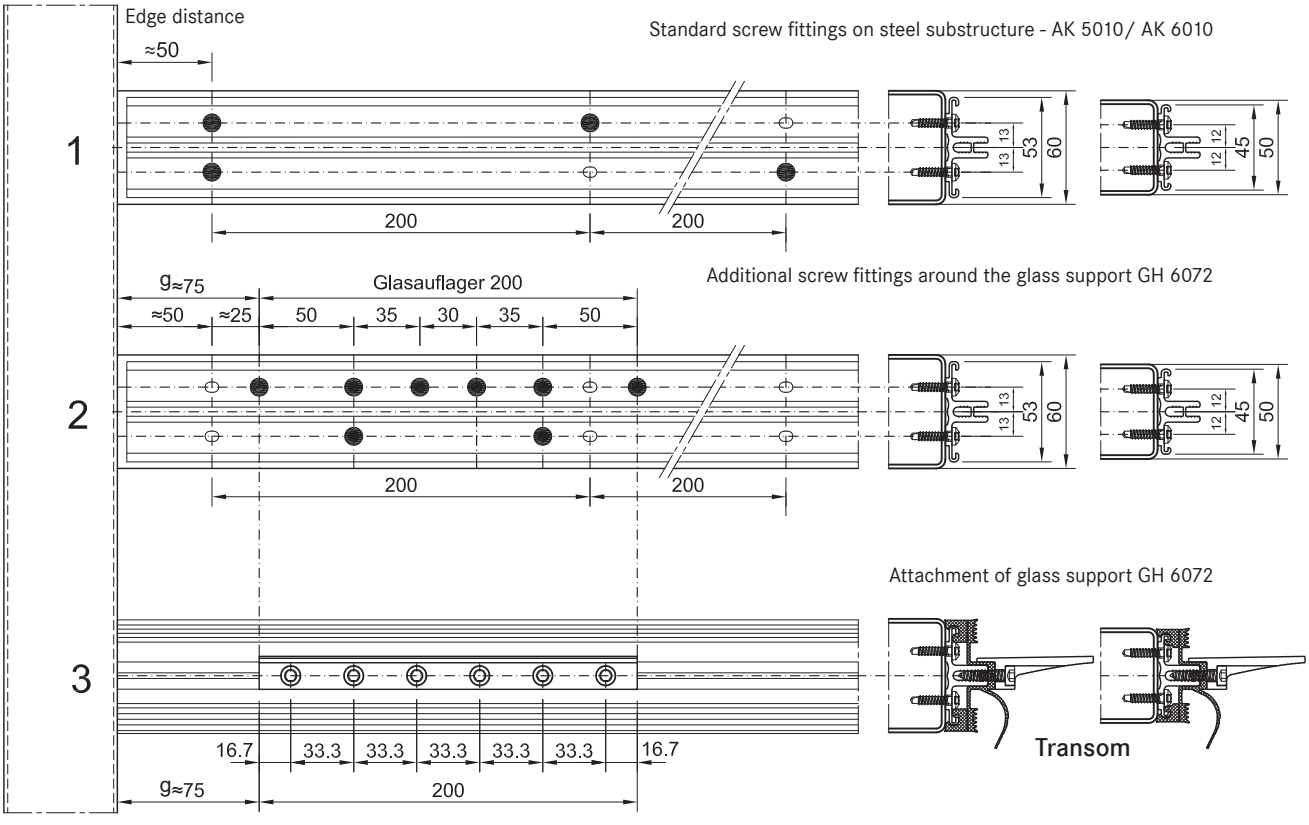
AK 5010/ AK 6010 on steel substructure, screwed



8 additional screws
around the glass support
Pre-drill add-on channel with d = 5.5 mm

Mullion



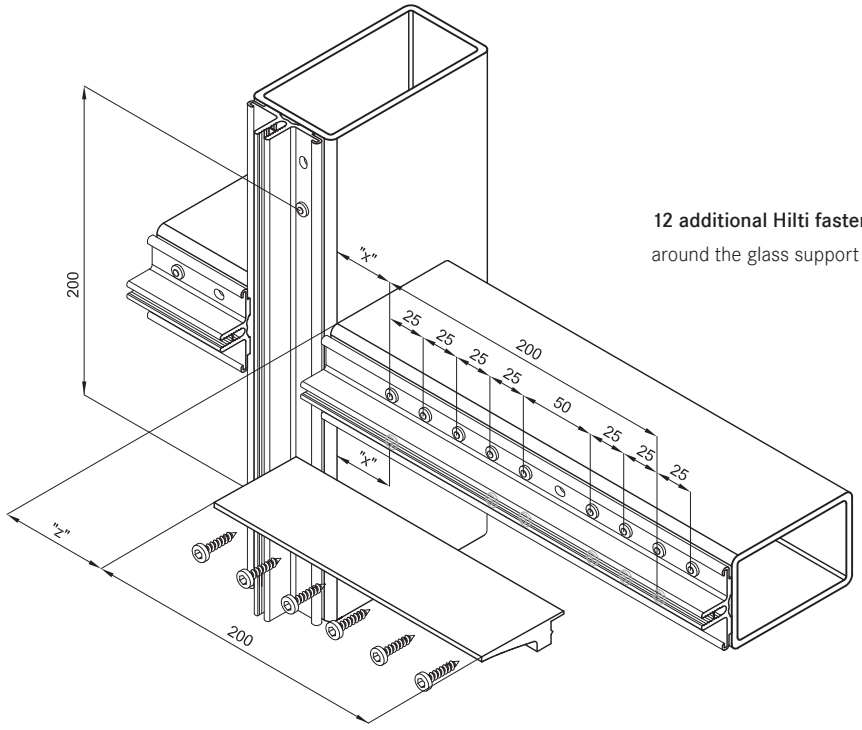


AK-S_3.2_018.dwg

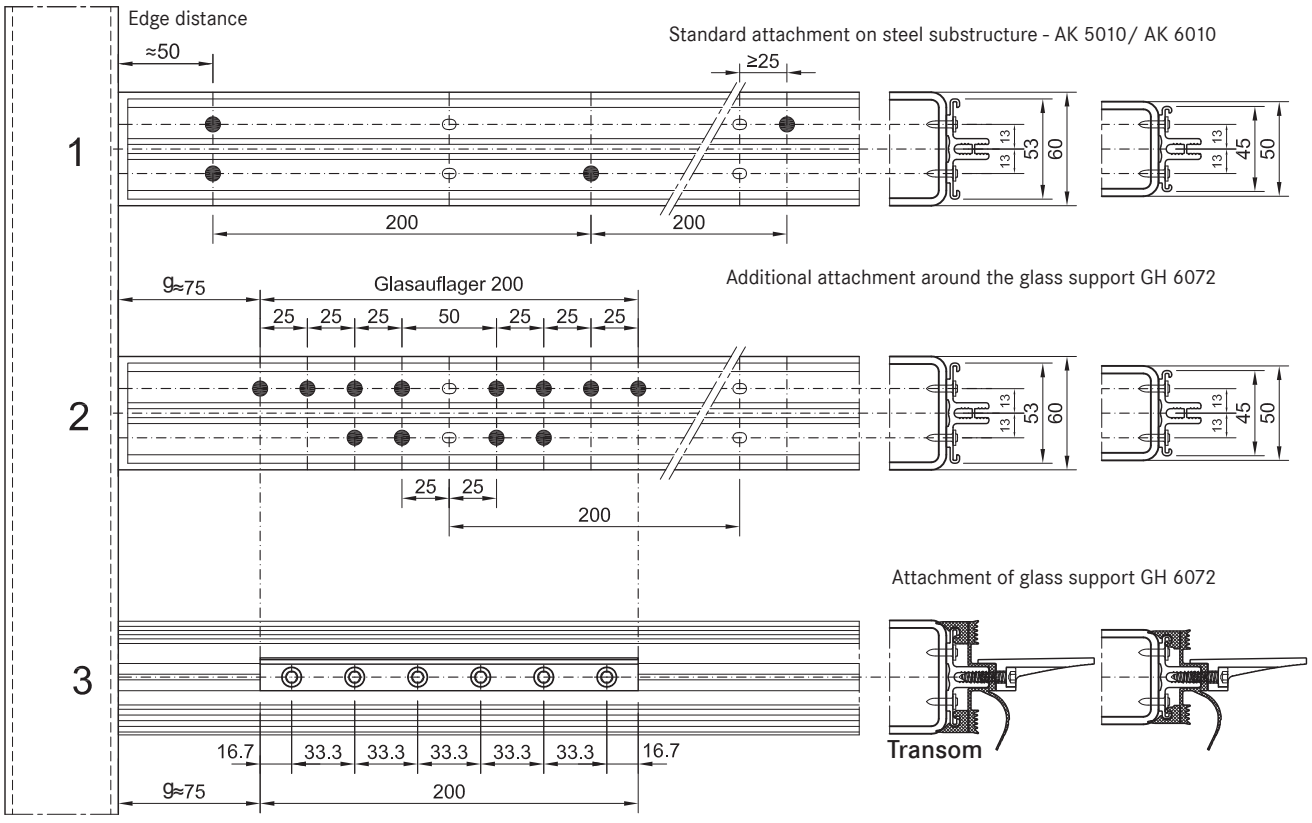
Stabalux AK-S
Processing information

Glass support GH 6072

AK 5010/ AK 6010 on steel substructure, Hilti fasteners



Mullion

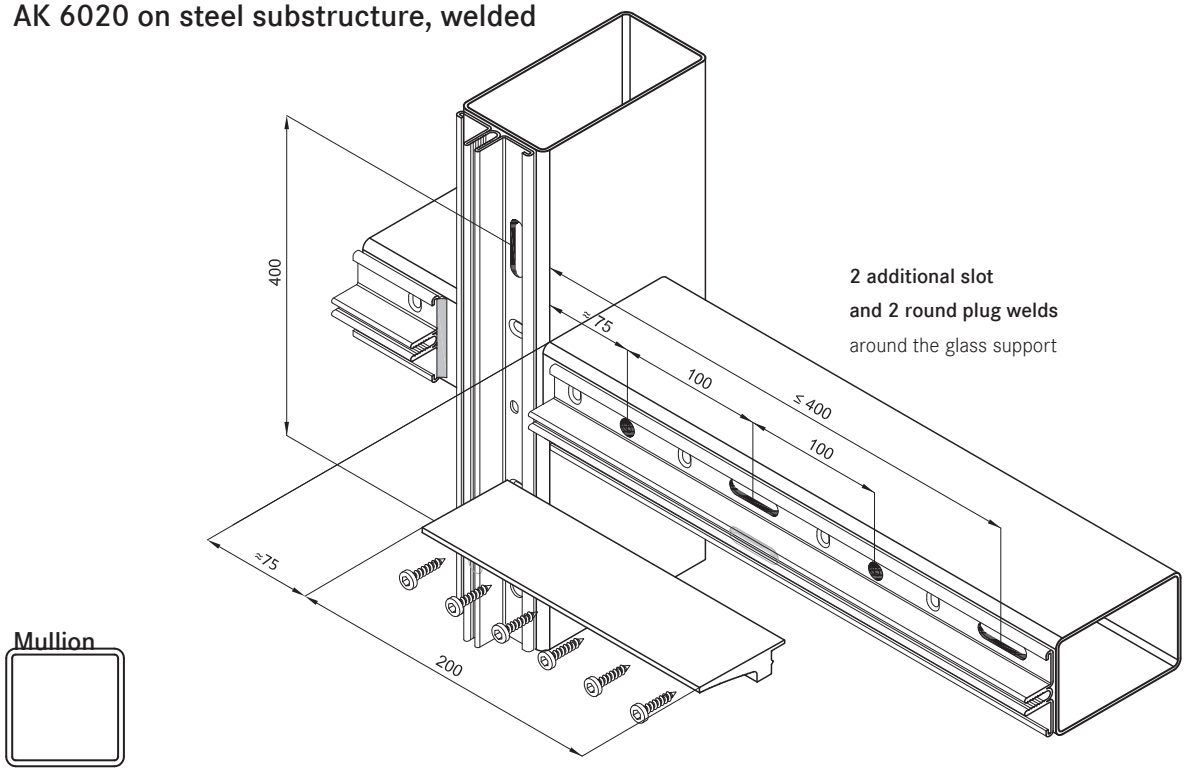


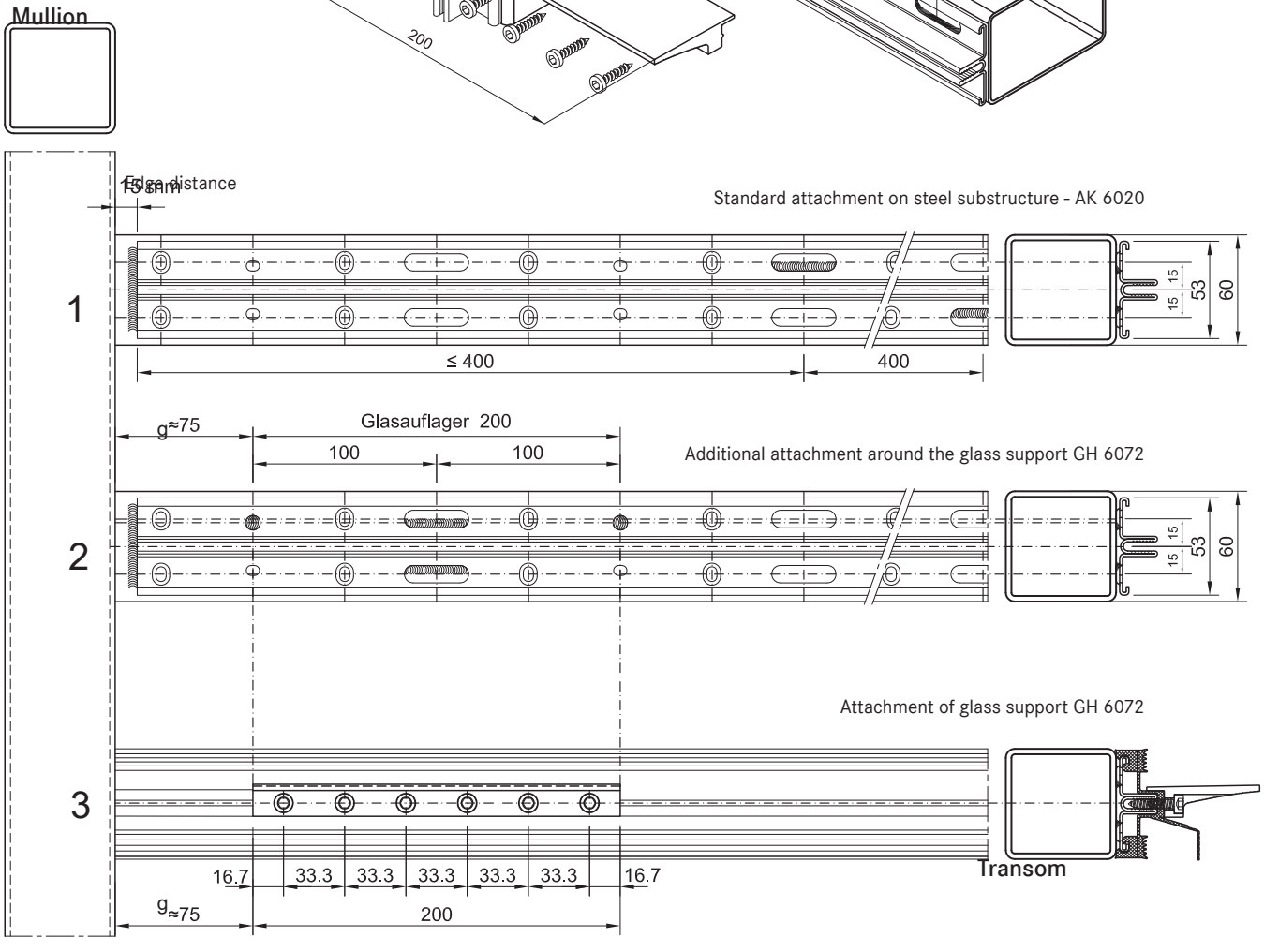
AK-S_3.2_018.dwg

Stabalux AK-S
Processing information

Glass support GH 6072

AK 6020 on steel substructure, welded





AK-S_3.2_018.dwg

Section of glass support GH 6071 / GH 6072

Acceptable glass weights for glass support GH 6071 and GH 6072

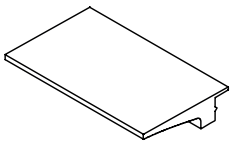
Permitted glass weights can be found in authorisation Z-14.4-767 and section 9.

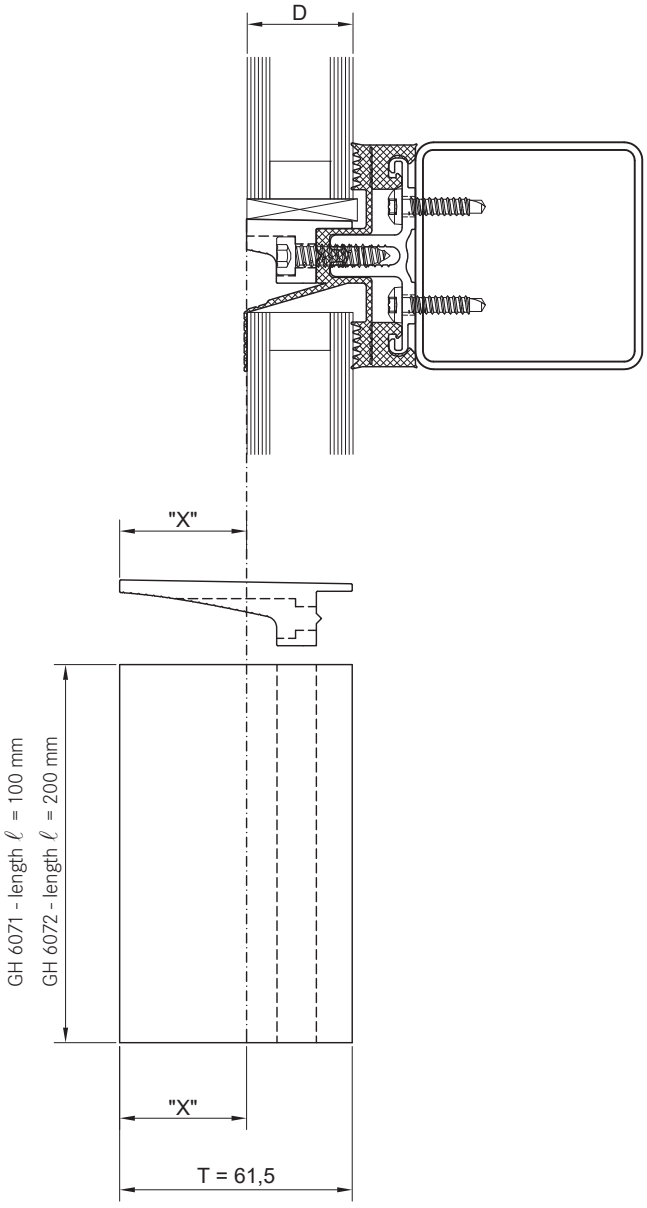
Glass thicknesses of 20 – 60 mm can be used

Depending on the thickness of the glass, the depth of the glass support is shortened by "X"

T = depth of glass support
D = thickness of glass pane
} **X = T - D**

Example:
Depth of glass support
T = 61.5 mm
Thickness of pane 6 / 16 /6
D = 28 mm
} X = 61.5 - 28
T = 33.5 mm





AK-S_3.2_023.dwg

Glass support GH 6073

Additional attachments for add-on channel AK 5010/ AK 6010

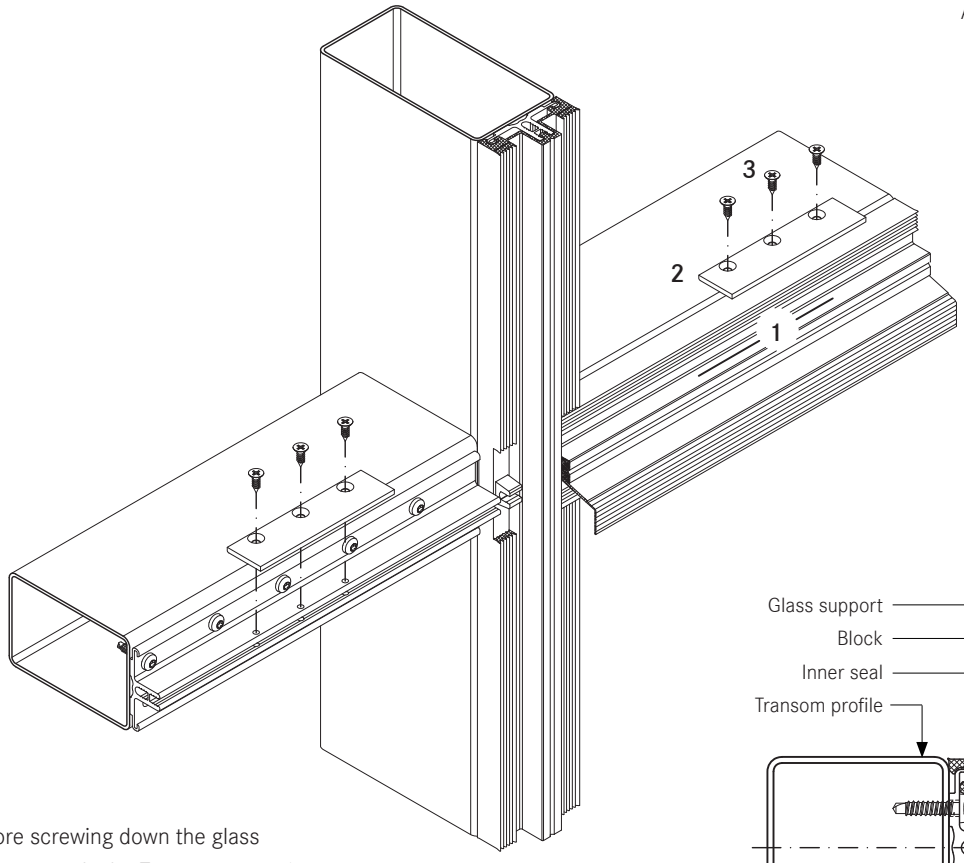
Additional add-on channel attachments around GH 6073 glass supports are required. The following diagram shows the arrangement and must be adhered to.

- Strengthening of the add-on channel using additional attachments is achieved in the same way as the standard add-on channel attachments with steel substructures. (see section on types of attachment).
- Attachment variants using screws see the AK 5010/ AK 6010 pre-drilled with additional holes at a diameter of d = 5.5 mm.
- If the add-on channel is attached to the substructure using Hilti fasteners, then all standards laid out in the “usage and mounting requirements” and general building approval Z-14.4-766 from Hilti Deutschland AG must be observed and adhered to.
- **Important note:** The Hilti fasteners must be driven through the metal of add-on profile. The location to be screwed must not be pre-drilled.The minimum distance between the axis of the slots and the axis of the fasteners is ≥ 25 mm and must be maintained.

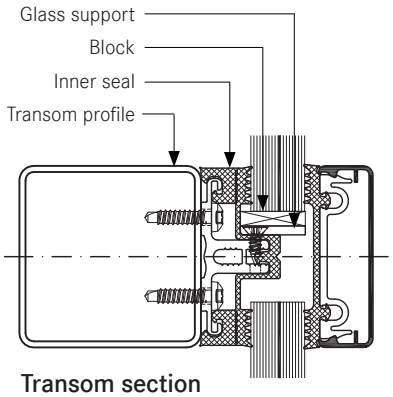
Edge distances transom / add-on channel

- Edge distances are given in the diagram.

AK-S_3.2_019.dwg



1 Before screwing down the glass support, apply the Z 0094 connecting paste around the screw fitting
2 Glass support GH 6073
3 Stabalux system screws 3 x Z 0193



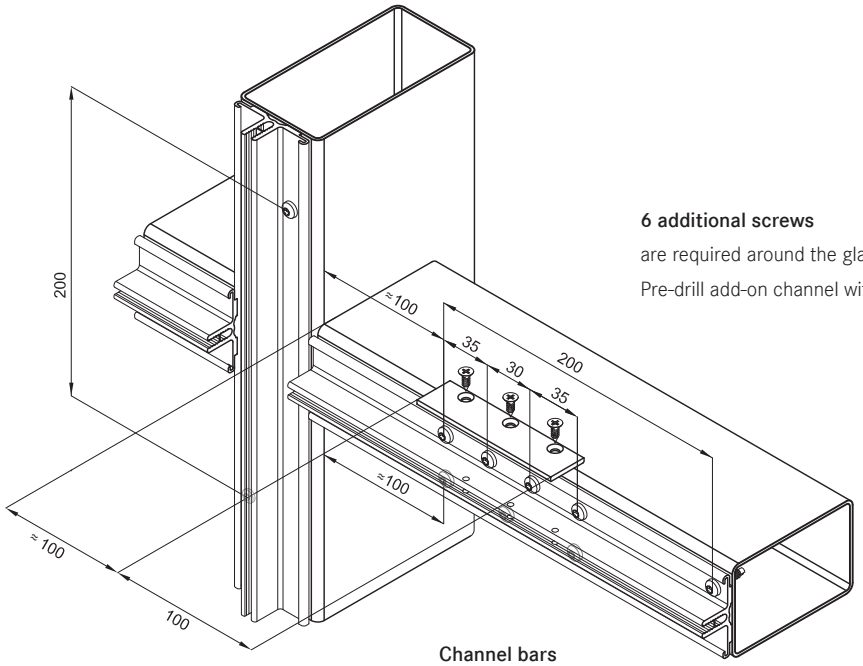
Transom section

Stabalux AK-S
Processing information

Glass support GH 6073

3.2
13

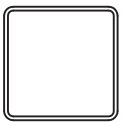
AK 5010/ AK 6010 on steel substructure, screwed

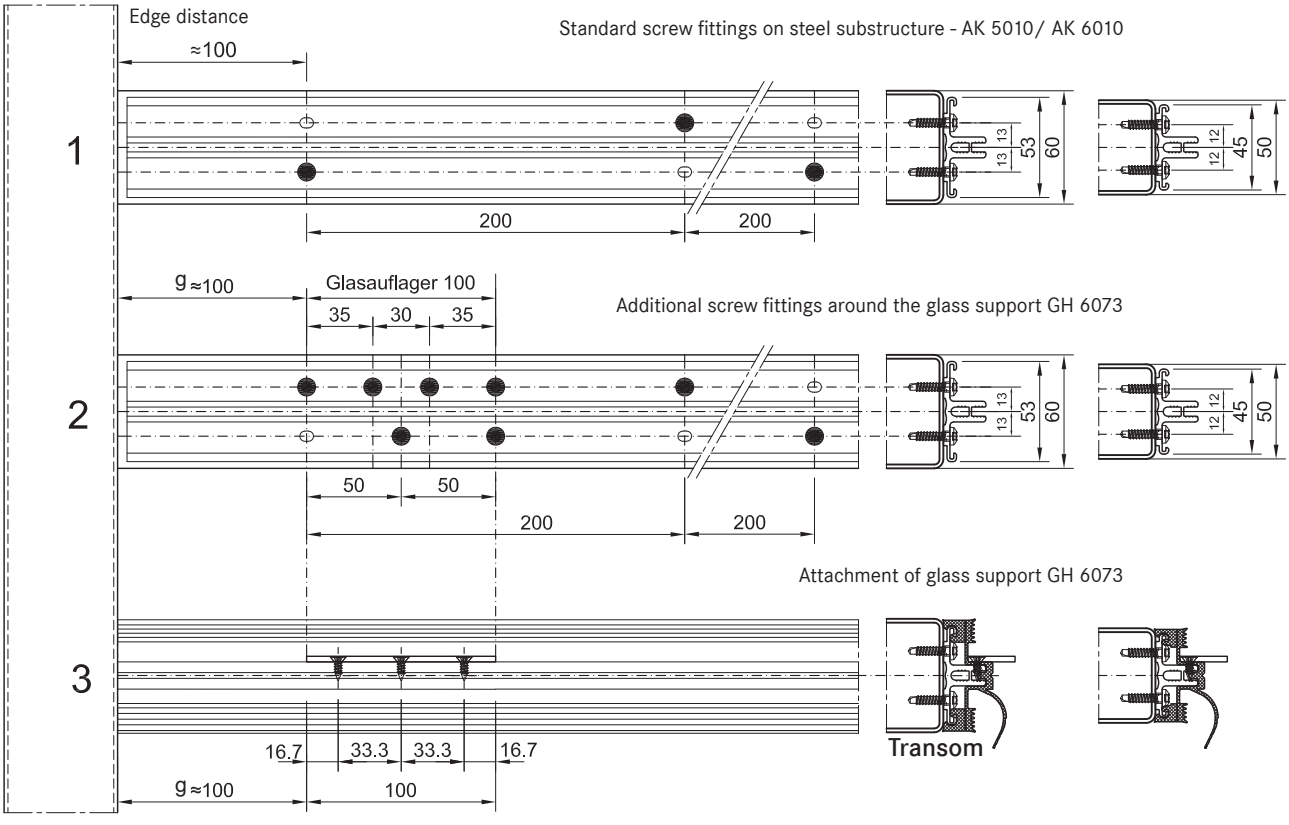


6 additional screws
are required around the glass support
Pre-drill add-on channel with d = 5.5 mm

Channel bars
pre-drilled with d = 3.5 mm

Mullion



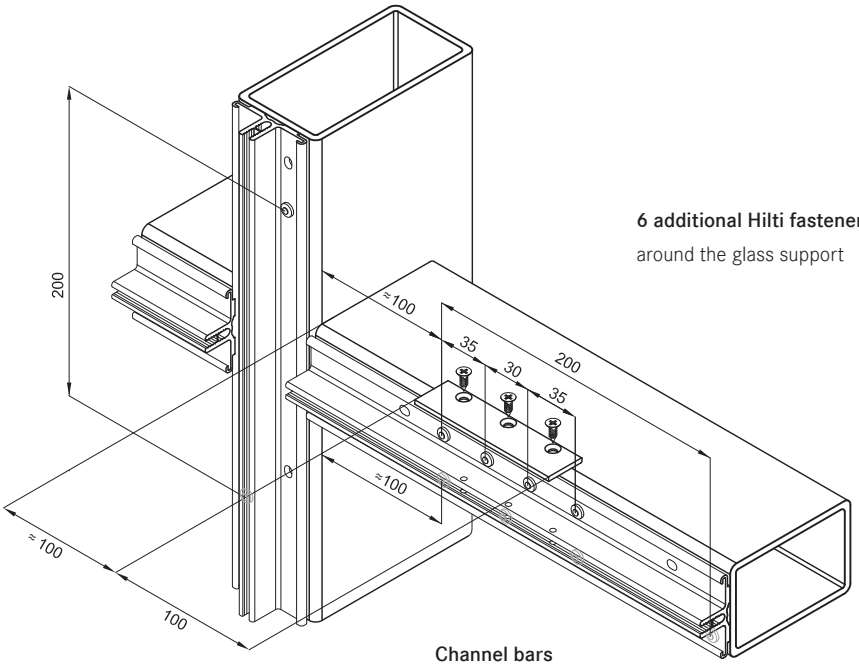


AK-S_3.2_020.dwg

Stabalux AK-S
Processing information

Glass support GH 6073

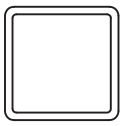
AK 5010/ AK 6010 on steel substructure, Hilti fasteners

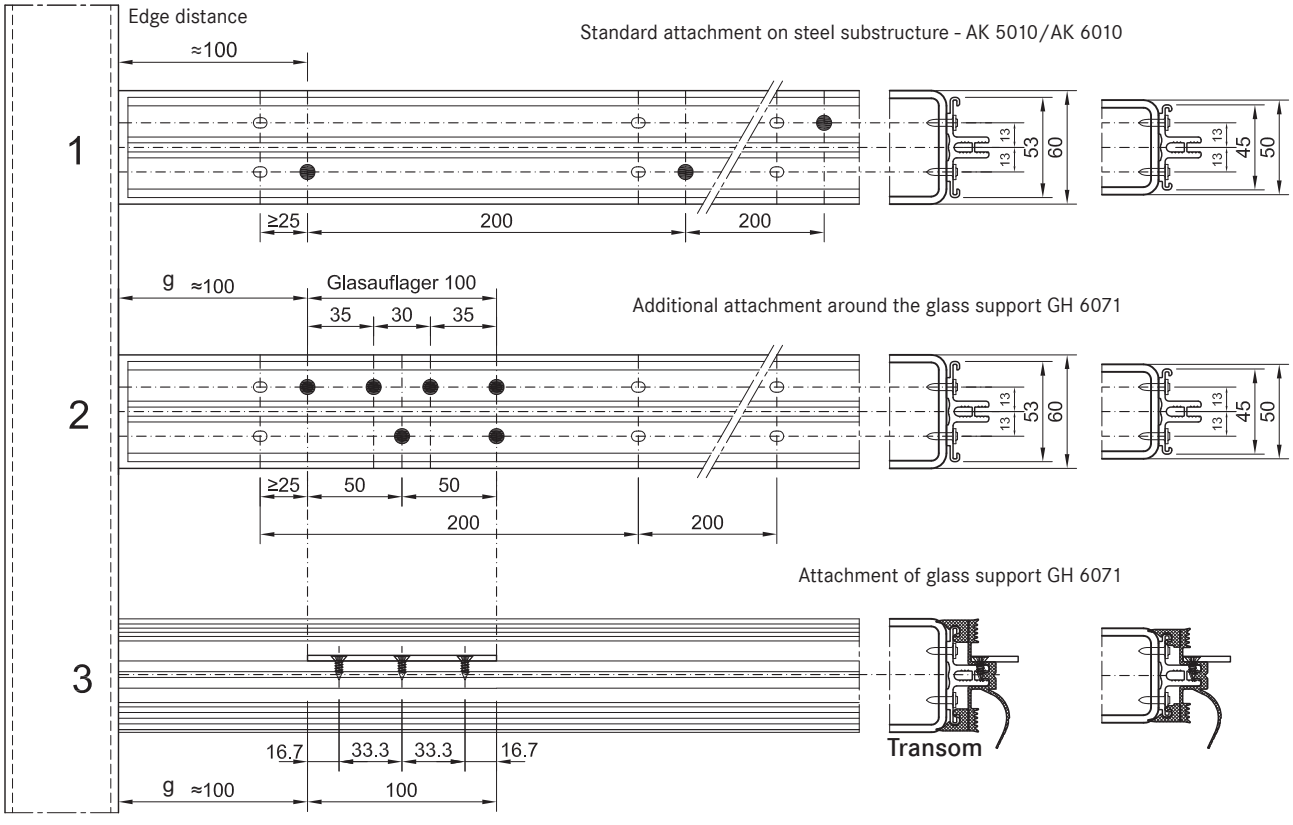


6 additional Hilti fasteners
around the glass support

Channel bars
pre-drilled with d = 3.5 mm

Mullion



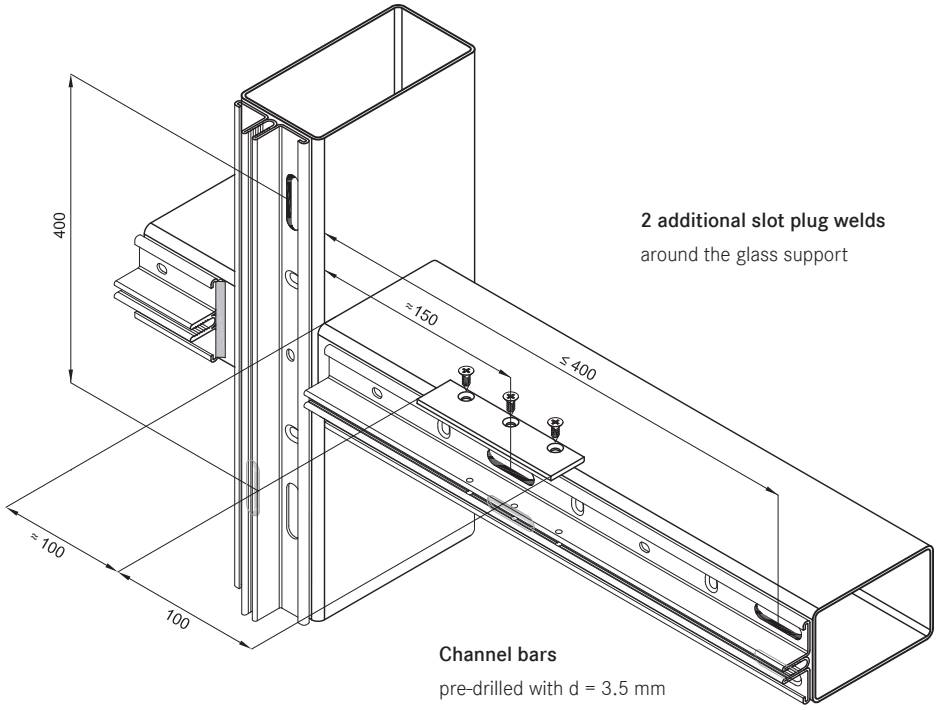


AK-S_3.2_020.dwg

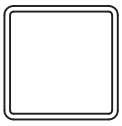
Stabalux AK-S
Processing information

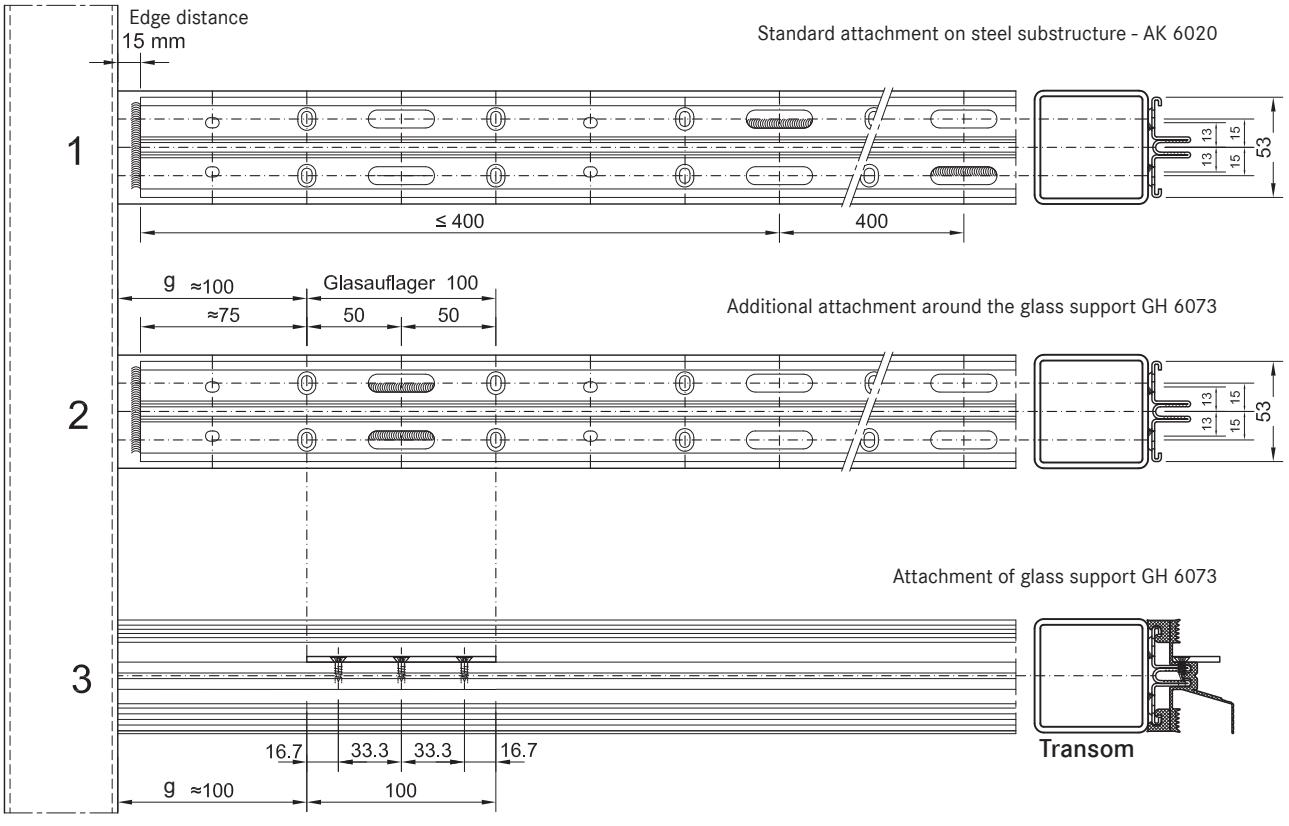
Glass support GH 6073

AK 6020 on steel substructure, welded



Mullion





AK-S_3.2_020.dwg

Glass support GH 6073

Additional holes in the add-on channel bars

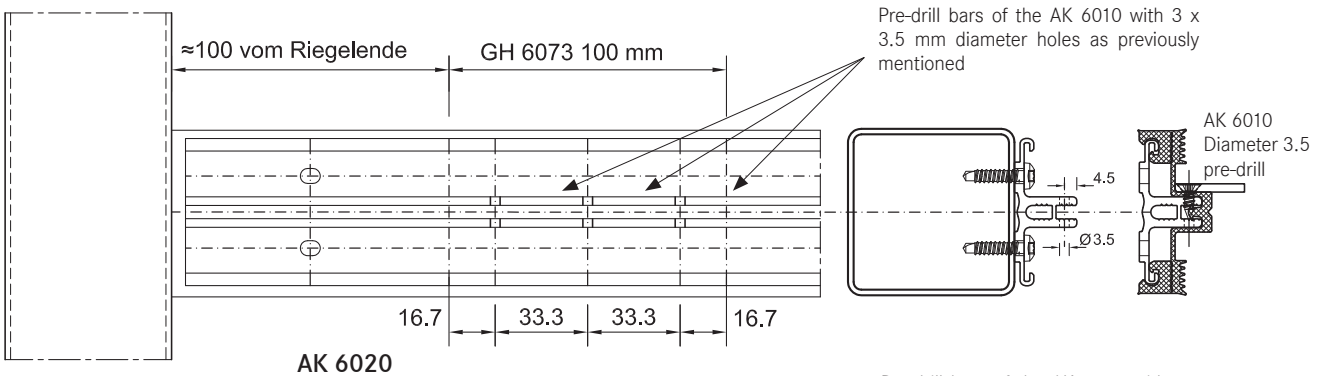
- Glass support GH 6073 is fixed to the add-on channel using 3 Stabalux system screws Z 0193 (countersunk screw diameter 4.2 x 13 mm).
- The bars of the add-on channel should also be predrilled at a distance of 4.5 mm from the edge of the bar and with a diameter of d = 3.5 mm.
- Longitudinal positioning of the add-on channel is required.

Note:

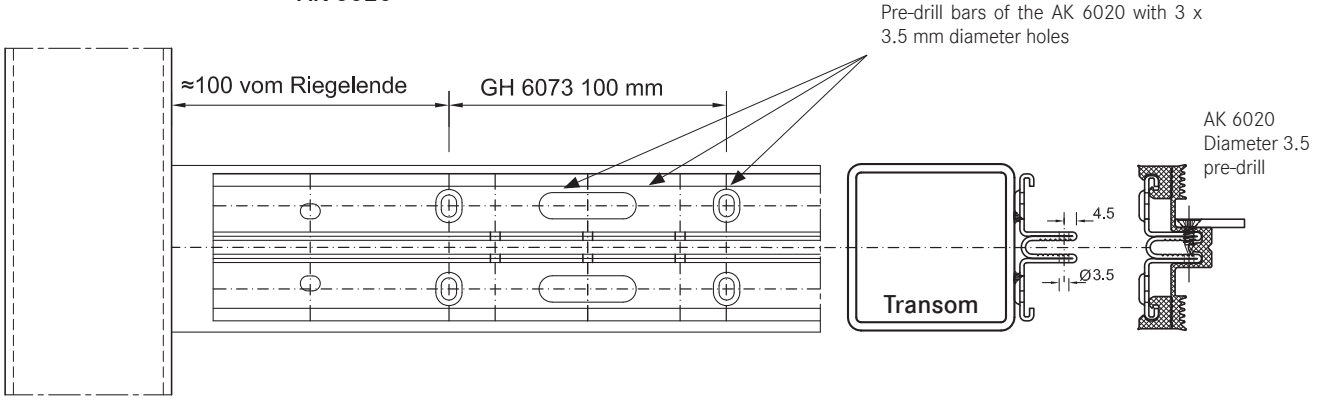
Glass support GH 6073 is fixed to the add-on channel AK 5010/ AK 6010 and AK 6020 using three Stabalux system screws Z 0193 (diameter 4.2 x 13 mm). Before screwing down the glass support, apply the Z 0094 connecting paste around the screw fitting.

Mullion

Example: AK 6010 (assembly GH 6073 on AK 5010 identical)



AK 6020



AK-S_3.2_020.dwg

Section of glass support GH 6073

Acceptable glass weights for glass support GH 6073

Permitted glass weights can be found in authorisation Z-14.4-767 and section 9.

Glass thicknesses of 10 – 18 mm can be used

The installation of 8 mm thick glass panes is still possible, but adjustments must be made and geometrically checked.

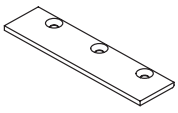
Depending on the thickness of the glass, the depth of the glass support is shortened by
“X”

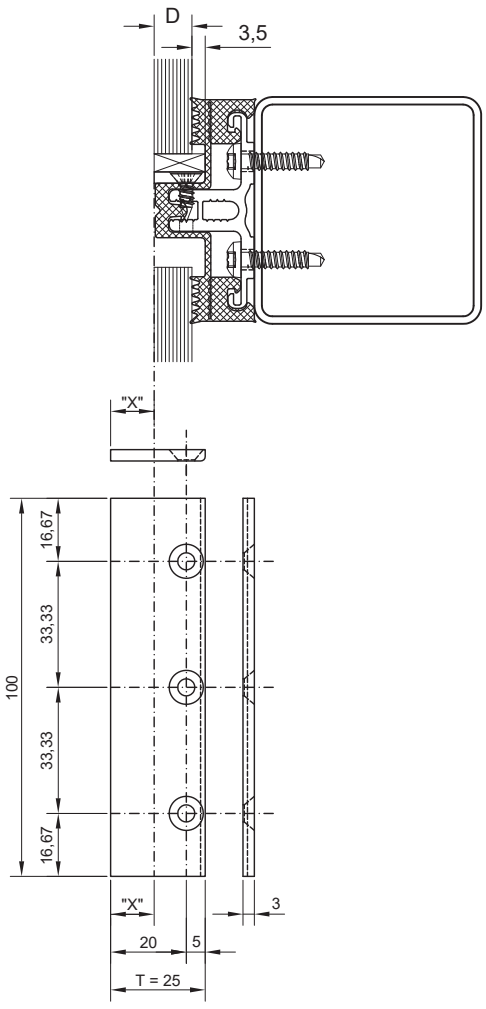
T = depth of glass support
D = thickness of glass pane
Δ = 3.5 mm (system size)

X = T - D - Δ

Example:
Depth of glass support
T = 25 mm
Thickness of glass pane 10 mm
D = 10 mm
System size
Δ = 3.5 mm

X = 25 - 10 - 3.5
X = 11.5 mm





AK-S_3.2_023.dwg

Stabalux AK-S
Processing information

Welded glass supports

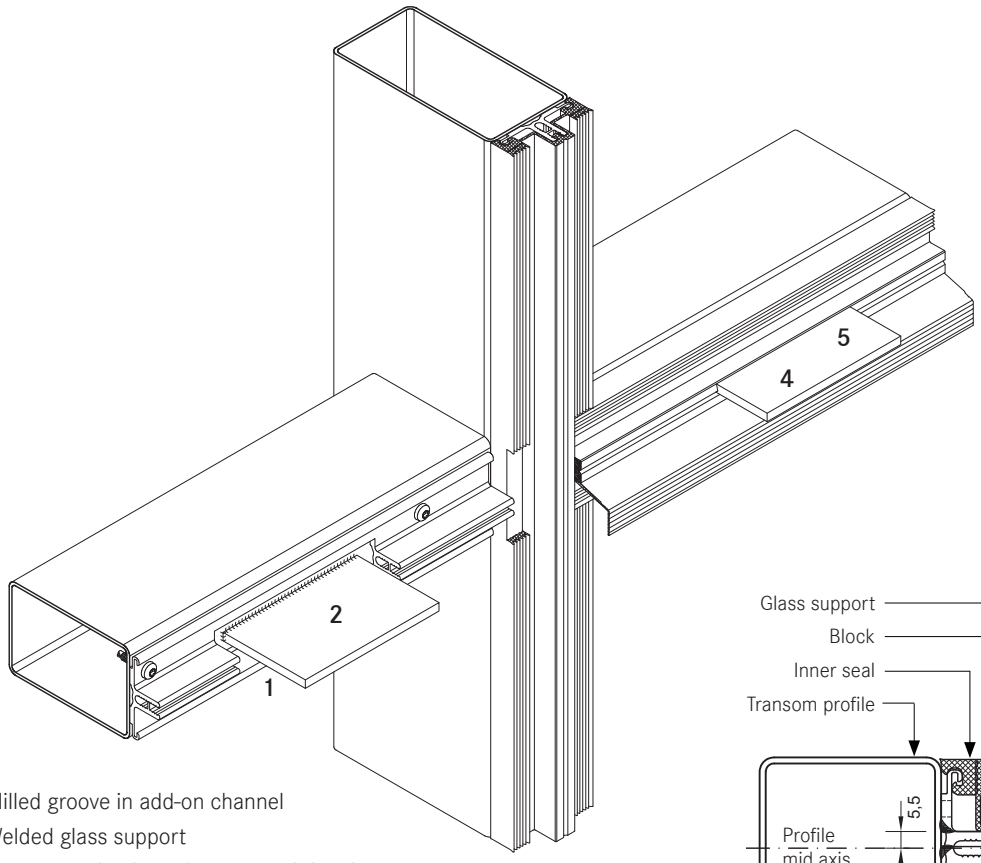
Positioning glass support in the transom / add-on channels AK 5010/ 6010 and 6020

- Standard attachment of the add-on channel to the substructure is done as previously described.
- The arrangement of the welded glass support is carried out as per the following and must be adhered to.
- The length of the welded glass support can lie between 100 and 150 mm.
- The axis of symmetry of the welded glass support lies central between the add-on channel attachment points.
- The upper edge of the welded glass support lies 5.5 mm above the mid axis of the transom profile.
- The add-on channel is milled out in the area of the glass support.
- We recommend additional attachment of the add-on channel around the glass support. See diagrams

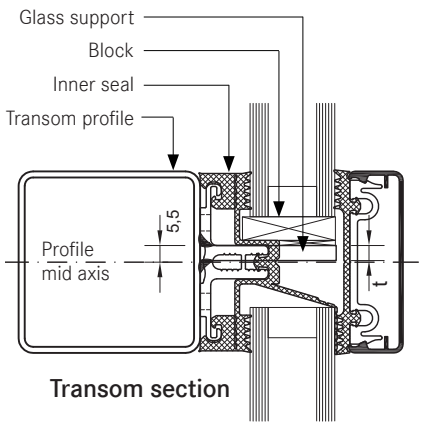
Edge distances transom / add-on channel

- Edge distances are given in the diagram.

AK-S_3.2_021.dwg



1 Milled groove in add-on channel
2 Welded glass support
3 Remove gasket base from around the glass support
4 Cut the seal to the exact size and pull over the glass support
5 Fill seal with Stabalux connection paste Z0094

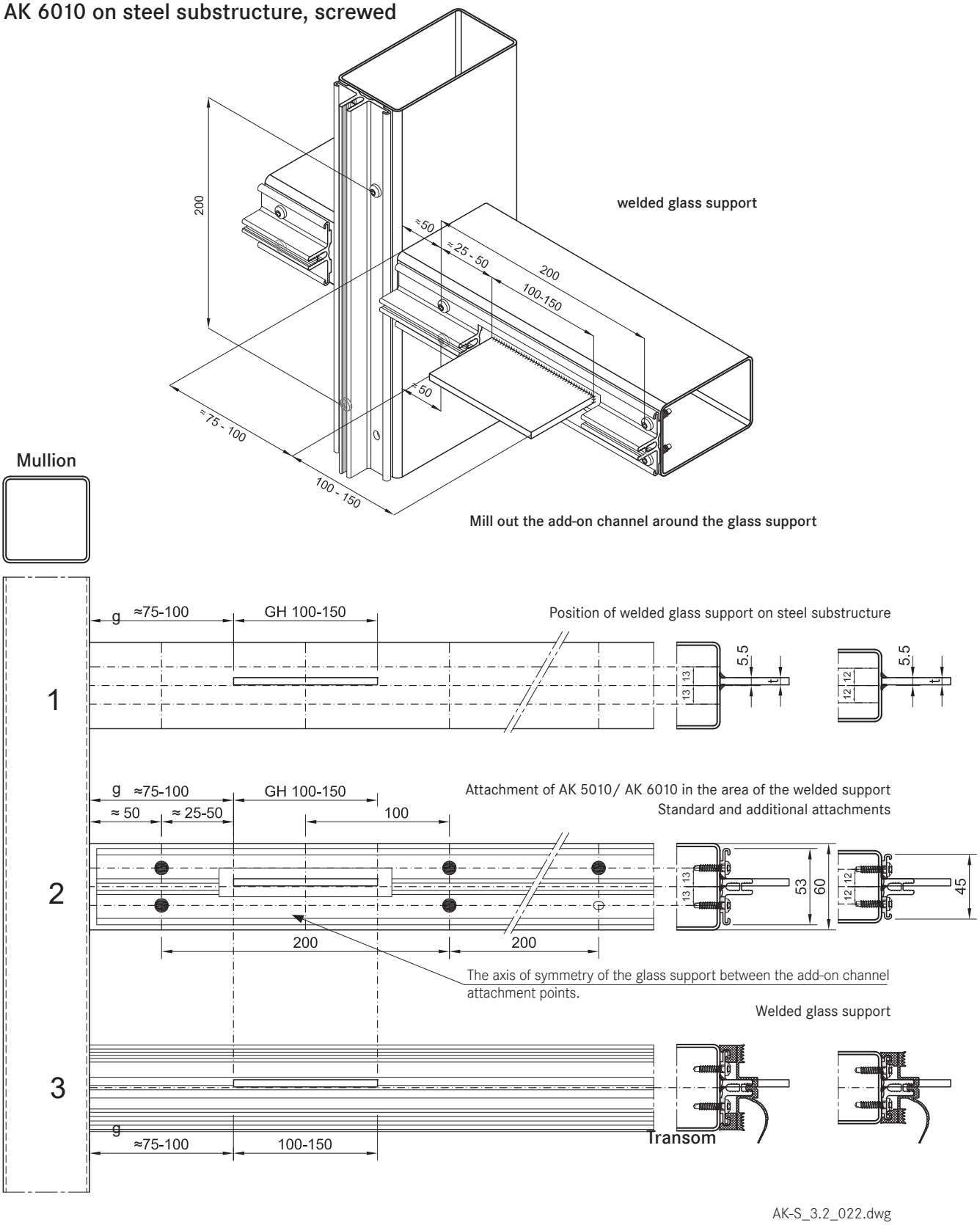


Transom section

Stabalux AK-S
Processing information

Welded glass supports

AK 6010 on steel substructure, screwed

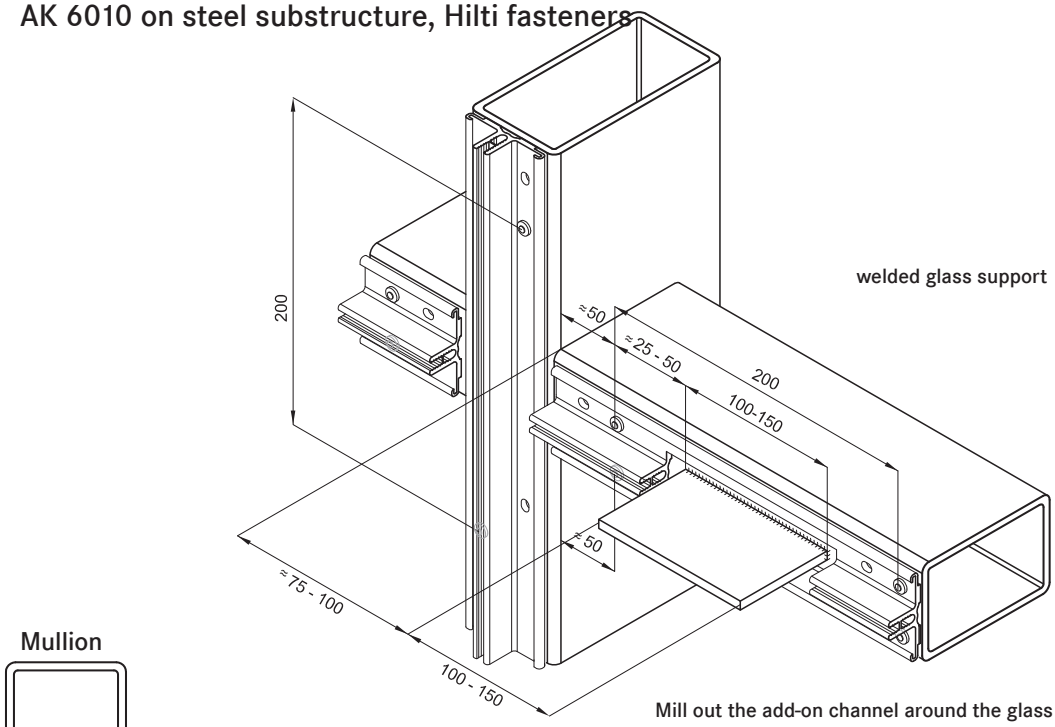


AK-S_3.2_022.dwg

Stabalux AK-S
Processing information

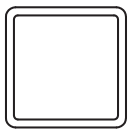
Welded glass supports

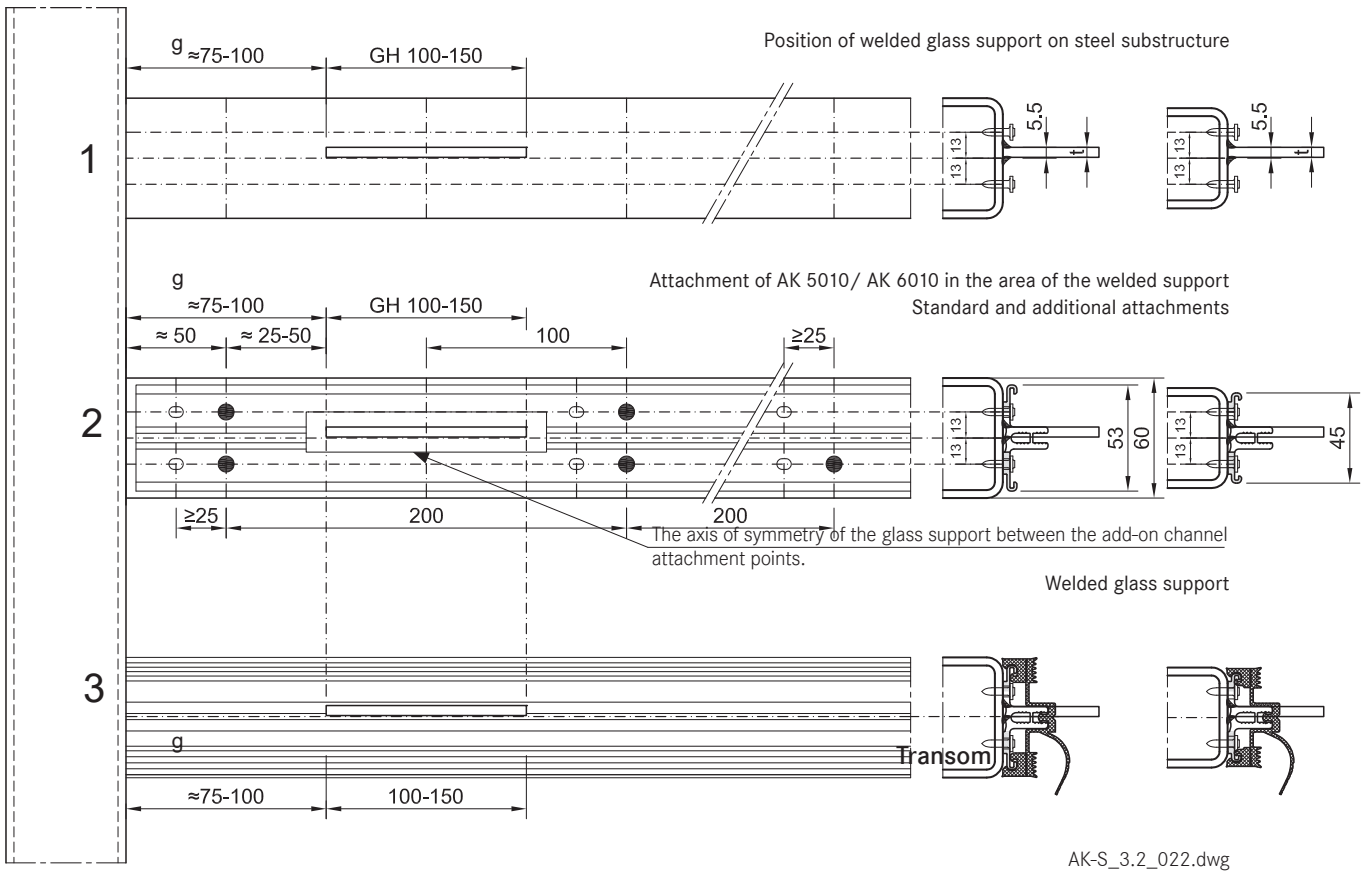
AK 6010 on steel substructure, Hilti fasteners



Mill out the add-on channel around the glass support

Mullion



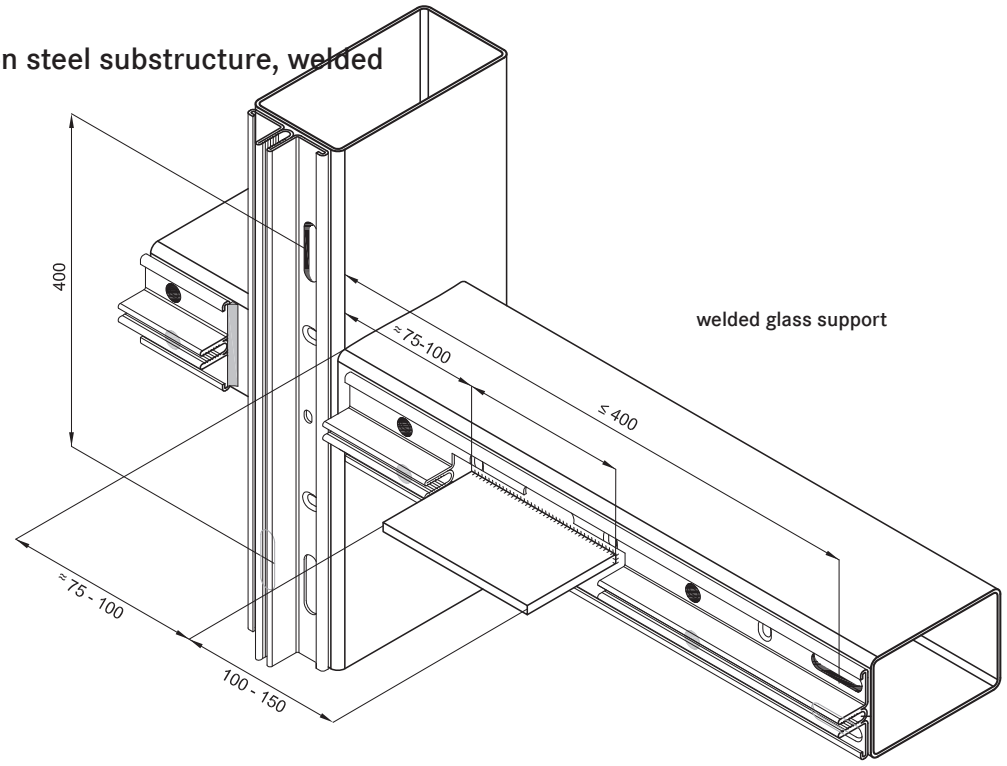


AK-S_3.2_022.dwg

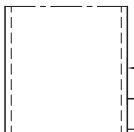
Stabalux AK-S
Processing information

Welded glass supports

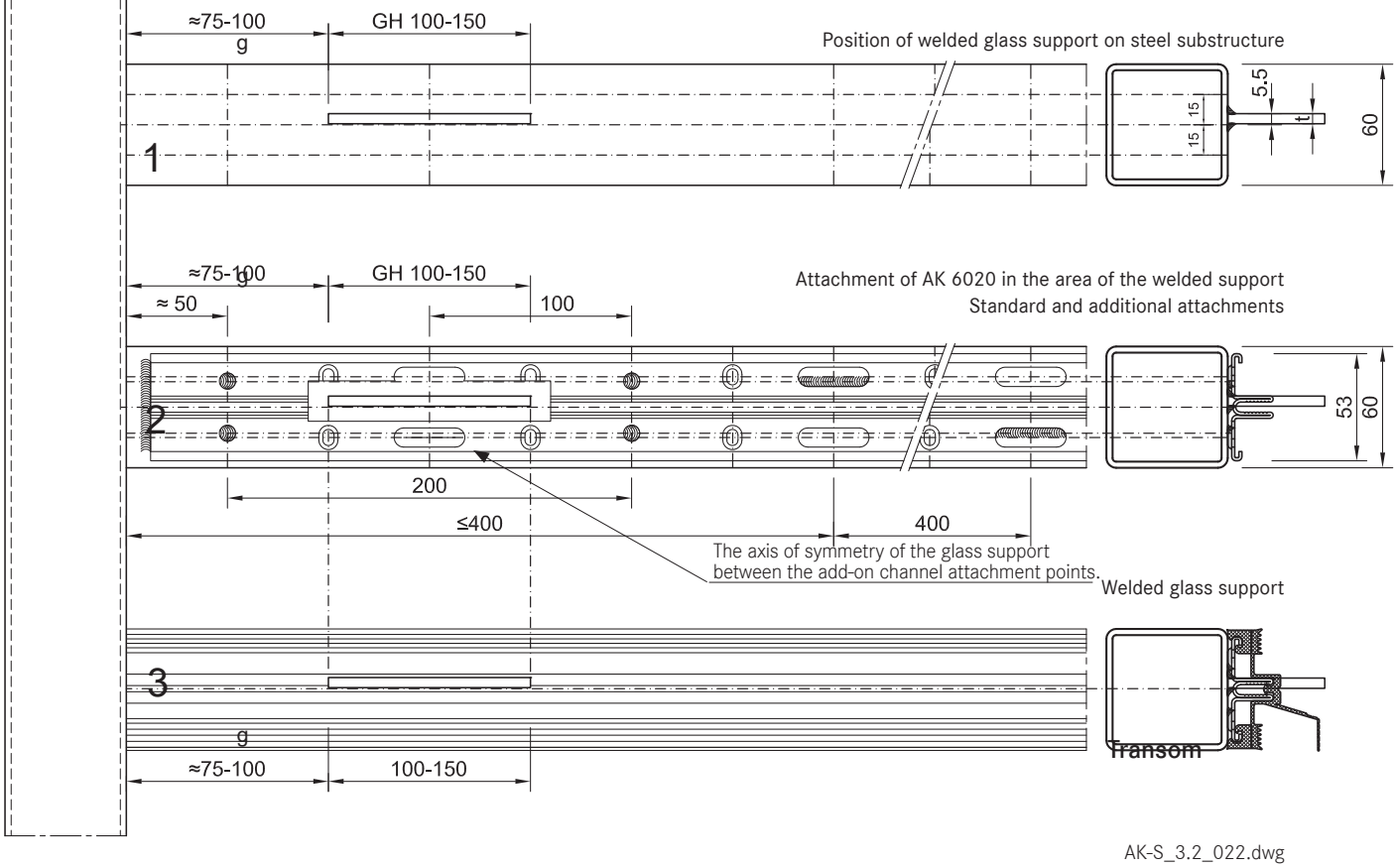
AK 6020 on steel substructure, welded



Mullion



Mill out the add-on channel around the glass support



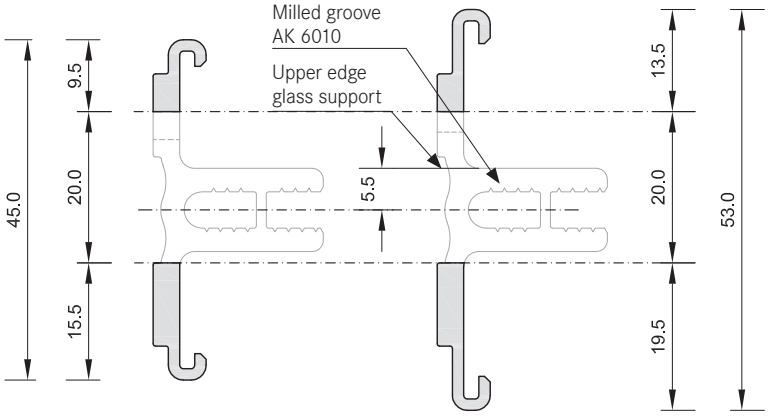
AK-S_3.2_022.dwg

Welded glass supports

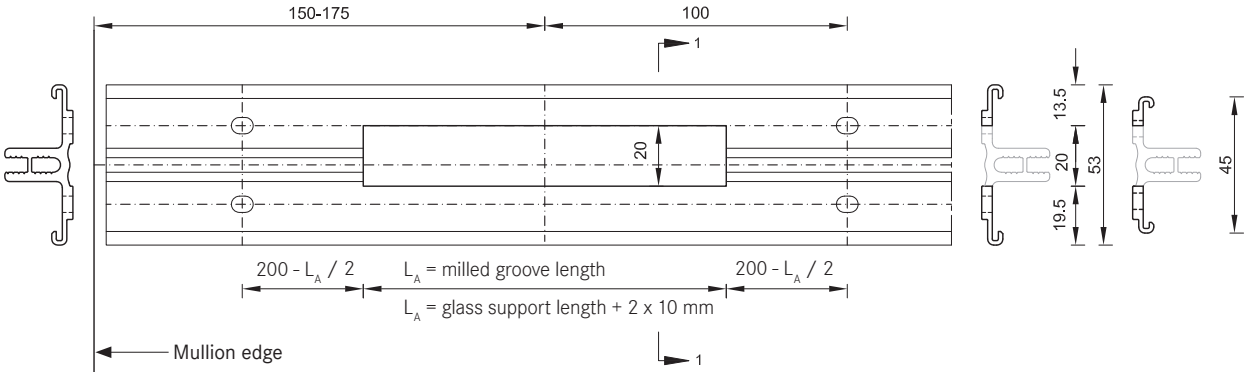
Milled groove in add-on channel AK 5010/ AK 6010

- The milled groove in the add-on channel is 20 mm longer than the glass support itself and is arrange symmetric to the glass support.
- The position of the milled groove in the cross-section is shown in the following diagram.

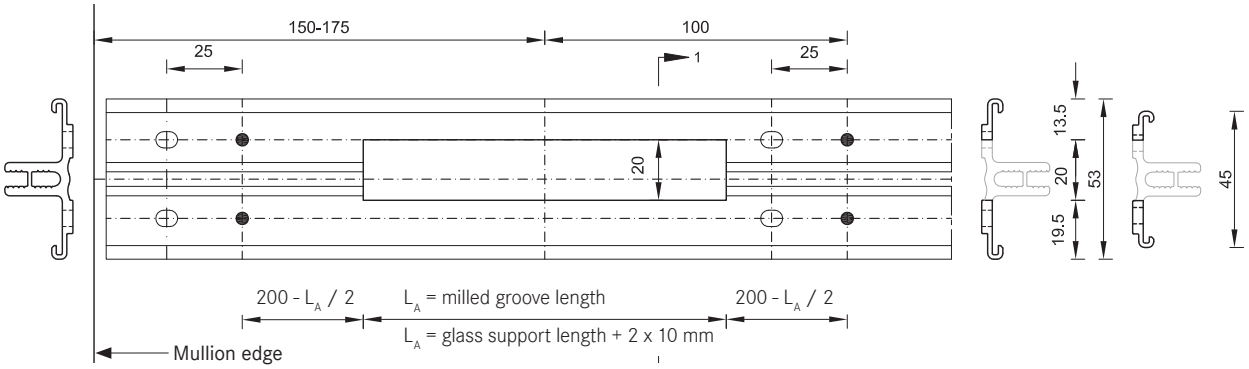
Milled groove cross-section / section 1 – 1



Milled groove in add-on channel AK 5010/ AK 6010 with screw attachment to the substructure



Milled groove in add-on channel AK 5010/ AK 6010 with substructure attachment using Hilti fasteners



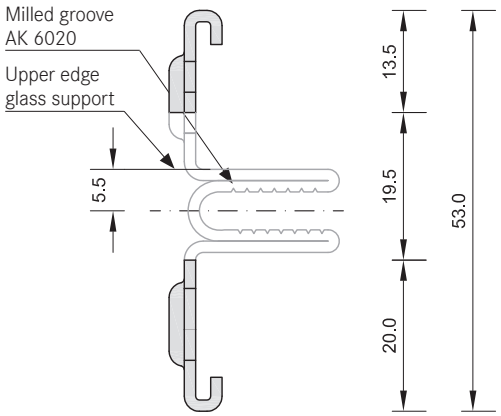
AK-S_3.2_022.dwg

Welded glass supports

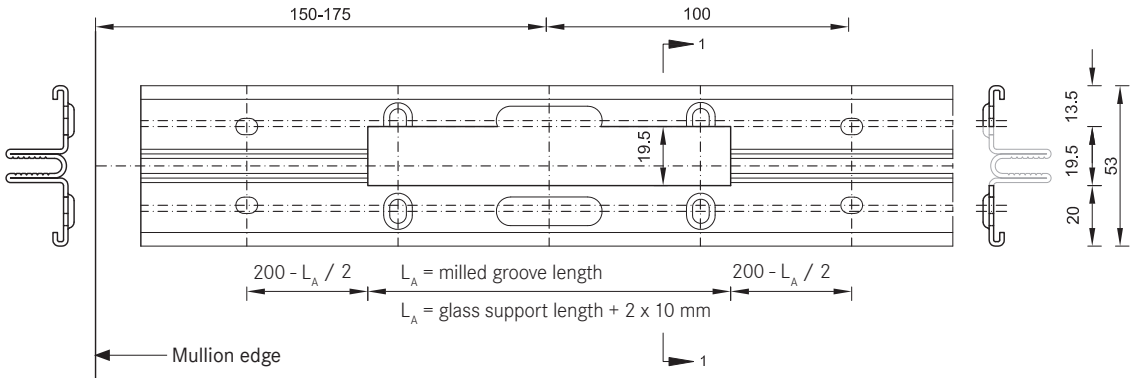
Milled groove in add-on channel AK 6020

- The milled groove in the add-on channel is 20 mm longer than the glass support itself and is arrange symmetric to the glass support.
- The position of the milled groove in the cross-section is shown in the following diagram.

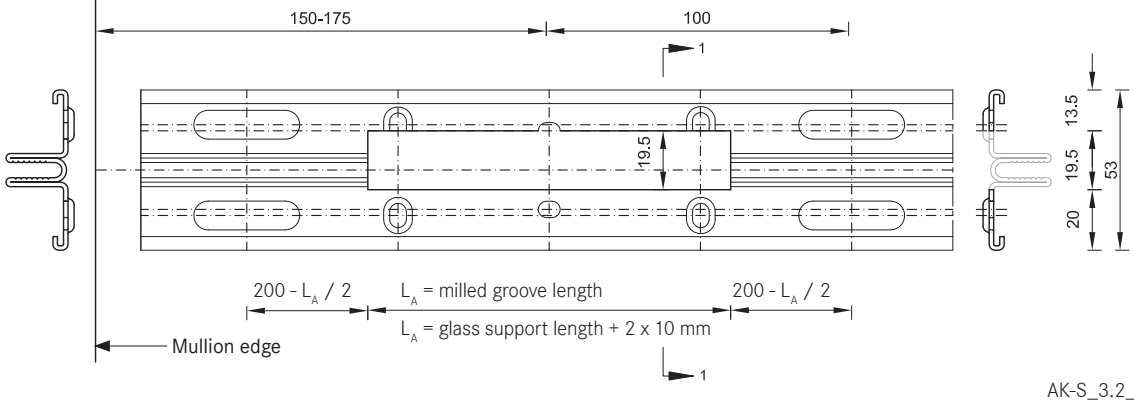
Milled groove cross-section / section 1 – 1



Milled groove in add-on channel AK 6020 with weld attachment to the substructure variant 1



Milled groove in add-on channel AK 6020 with weld attachment to the substructure variant 2



AK-S_3.2_022.dwg

Welded glass supports

Acceptable glass weights for welded glass support

Heavy glass loads require welded glass supports. Welded glass supports bear down on the substructure independently of the add-on channel and its attachments. The glass supports should be statically demonstrated against all current standards and technical guidelines in all cases. The minimum requirement is the use of S235 EN 10025-2 steel. DIN EN 1993-1-1 and DIN EN 1993-1-3 steel type are also permitted. The material's suitability for welding must be established and must also be compatible with the substructure material. Sufficient protection against corrosion must be ensured on-site.

Section of welded glass support

The material thickness "t" is determined by the static calculation. A value of t ≥ 5 mm is generally chosen.

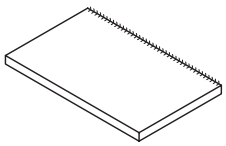
Depending on the thickness of the glass, the depth "T" of the glass support must be determined.

T = depth of glass support
D = thickness of glass pane
Δ = 16.5 mm (system size)

} **T = D + Δ**

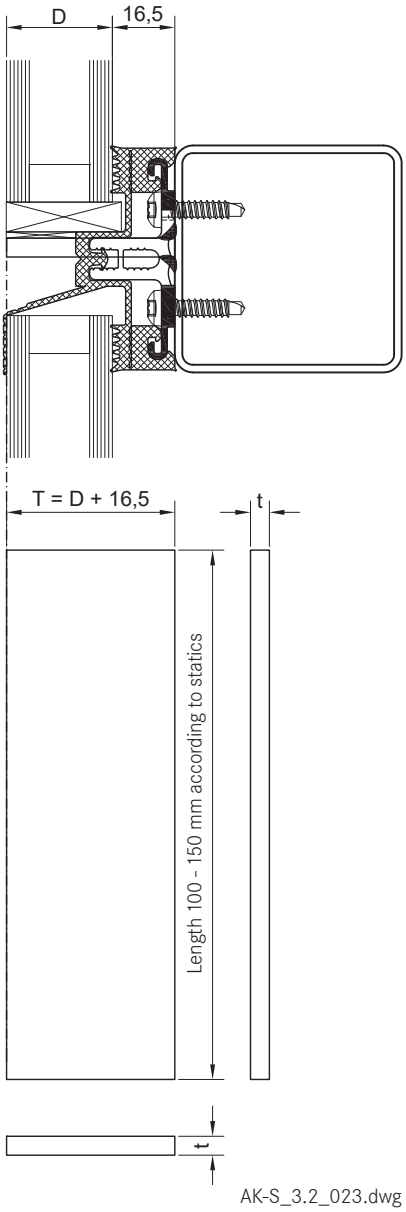
Example:
Thickness of glass pane 54 mm
D = 54 mm
Δ = 16.5 mm (system size)

} T = 54 + 16.5
T = 25 mm



Finished dimensions of welded glass support

Generally, 5 mm thick steel plates of length ℓ = 100 – 150 mm are directly welded to the substructure. Mill out the add-on channels around the area of the glass support and use Stabalux connecting paste Z 0094 to seal off areas where the inner seal is penetrated.



AK-S_3.2_023.dwg

Screw fittings

Fastenings

- The fastenings for the Stabalux AK-S system allow filling elements to be easily secured. The clamping strips are connected to the add-on channel using Stabalux system screws.
- Stainless steel 1.4301 DIN EN 10088 is the material used to produce screws for the Stabalux system. To make screws easier to install, they are coated with a lubricating zinc layer.
- Depending on the type of screw fittings chosen, Stabalux system screws are available with and without sealing gaskets. These special sealing gaskets are made from stainless steel with a 4 mm thick vulcanised EPDM seal.
- For special use cases, separate 2 and 4 mm vulcanised EPDM sealing gaskets are available. A plastic (PA) 1.5 mm thick washer with a diameter of 10 mm is additional available.
- The AK-S system can be used with glass from 8 mm thick. The installation of 5 mm thick glass panes is still possible, but adjustments must be made and geometrically checked. An exception to this is the use of cover profiles DL 6073/DL 8073 which require a minimum glass thickness of 18 mm.
- Screw lengths are available for all common glass thicknesses. The screw length is determined from a table.
- The minimum screw depth is 12.5 mm. The maximum screw depth is 17 mm.
- The distance for screw fittings is variable. The maximum distance for clamping strip screw fittings is a = 250 mm.
- On mullions, the edge distance for clamp joints measured from the end of the mullion must be maintained at f ≤ 100 mm.
- The edge distance for the first screw fittings of the transom clamp connection should be in the area of 30 to 80 mm measured from the transom end. The placement and choice of glass support should be taken into account.
- The clamp connection is exclusively subject to tensile forces. The maximum tensile force that can be taken by the tested system is regulated in general building approval Z-14.4-767. The information provided on characteristic loads allows crash-proof glazing to be demonstrated according to DIN 18008.
- Screw fittings are applied using a conventional electric screwdriver with depth stop. This guarantees uniform application of pressure. The depth setting should be chosen so that a gasket compression of 1.5 - 1.8 mm is achieved.

Screw fittings

Concealed screw fittings

- Choosing pre-drilled clamping strips (e.g. UL 50009-L, UL 6009-L and UL 8009-L, slot 7 x 10 mm, a = 125 mm) with clippable cover profiles makes assembly easier. The remaining clamping strips should be provided with a round hole of d = 8 mm. The functionality of the clip procedure can be checked after the first cover profile has been pushed against the pressure profile.

Visible screw fittings

- Cover strips should be drilling with a round hole of d = 8 mm (see note below).

Visible recessed screw fittings

- When creating visible recessed screw fittings, a stepped bore is required. The lower part of the cover strip should be drilled with a d = 7 mm diameter. The upper part of the cover strip needs a d = 11 mm diameter for the screw head. It is recommended to install a washer (PA washer, Z 0033) with all screw fittings.
- Additional factors must be considered for installing cover profilesDL 5073, DL 6073 and DL 8073 (See section on flat cover profiles DL 5073/ DL 6073/ DL 8073).

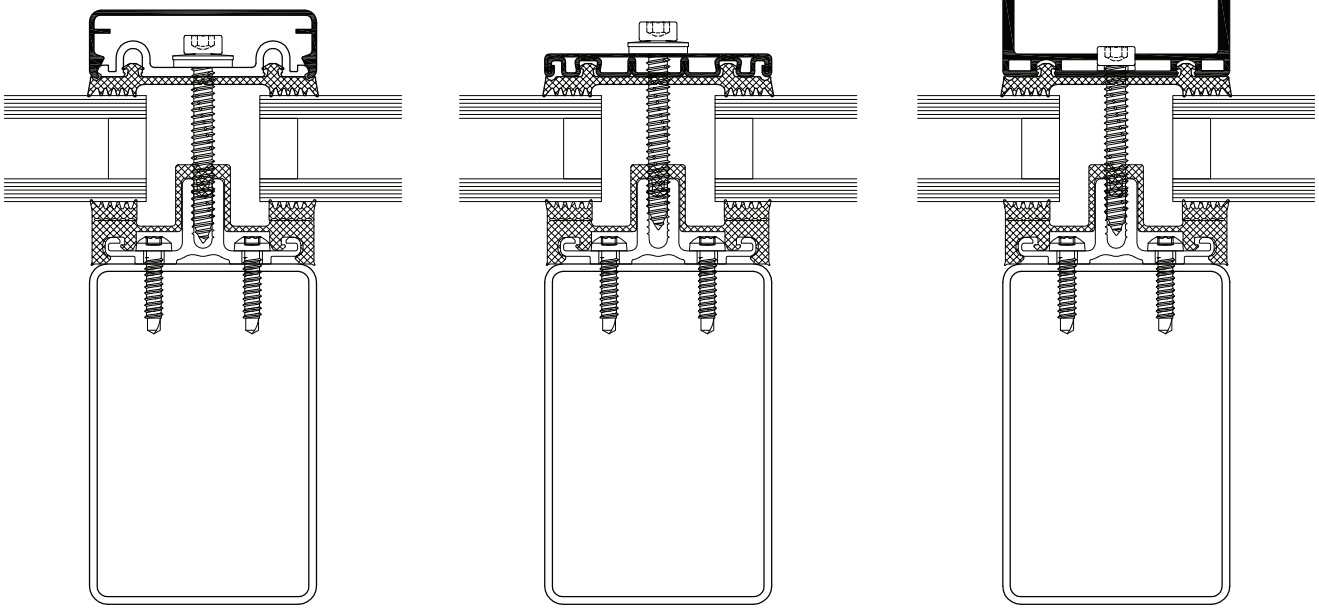
Note

When using aluminium strips on roofs, take account of the expansion factor as a result of the high degree of heat absorption when selecting the length to use. Equally, the use of single-piece cover profiles should be carefully considered. In these cases it is recommended that holes for screwing the clamping strips (cover and pressure profiles) are created with a diameter of d = 9 mm.

Stabalux AK-S
Processing information

screw fittings

Fastenings



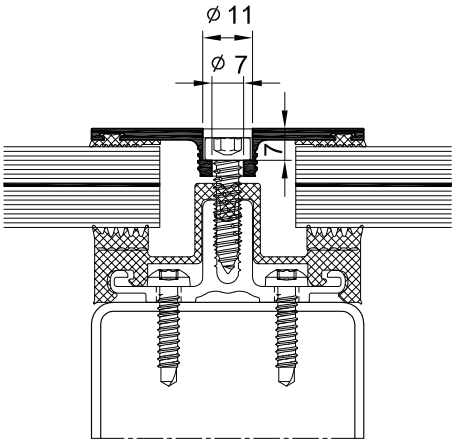
Concealed screw fittings
Stabalux system screws with cylinder head
d = 10 mm und 4 mm sealing gasket
e.g. Z 0153

Visible screw fittings
Stabalux system screws with cylinder head
d = 10 mm und 4 mm sealing gasket
e.g. Z 0153

Visible recessed screw fittings
Stabalux system screws with cylinder head
d = 10 mm with additional PA washer
e.g. Z 0252 with Z 0033

AK-S_3.2_024.dwg

Calculating the screw length for DL 5073/DL 6073 / DL 8073



Attention!

For special cover profiles DL 5073/ DL 6073/DL 8073, the calculation to determine screw lengths is:

Glass thickness + 8 mm for system width 50/ 60 mm
Glass thickness + 9 mm for system width 80 mm

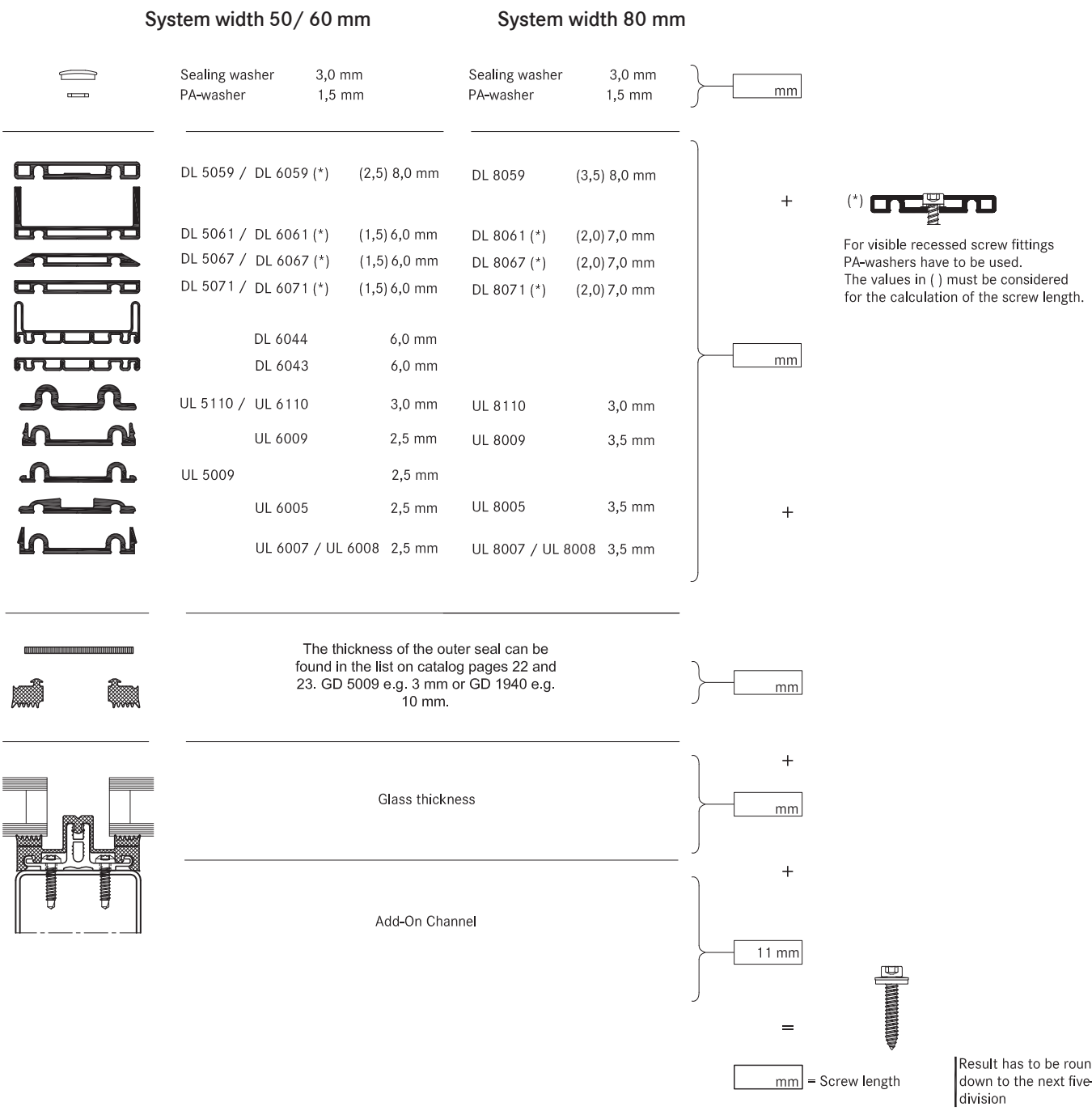
Using the system add-on channel, the use of DL 5073/ DL 6073/DL 8073 is possible from a glass thickness of 18 mm.

AK-S_3.2_025.dwg

Stabalux AK-S
Processing information

Screw fittings

Calculating the screw length

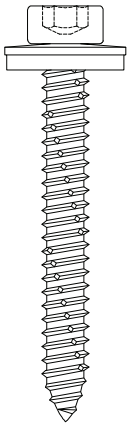


AK-S_3.2_026.dwg

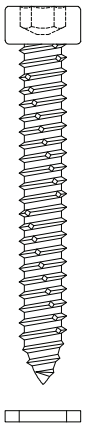
Stabalux AK-S
Processing information

screw fittings

System screws for Stabalux AK-S



Cylinder head screws ⌀ 10 mm with hex socket | with sealing gasket		
Z 0148	Cylinder head screw	6.3x 30 mm
Z 0149	Cylinder head screw	6.3x 35 mm
Z 0151	Cylinder head screw	6.3x 40 mm
Z 0152	Cylinder head screw	6.3x 45 mm
Z 0153	Cylinder head screw	6.3x 50 mm
Z 0154	Cylinder head screw	6.3x 55 mm
Z 0155	Cylinder head screw	6.3x 60 mm
Z 0156	Cylinder head screw	6.3x 65 mm
Z 0157	Cylinder head screw	6.3x 70 mm
Z 0158	Cylinder head screw	6.3x 75 mm
Z 0161	Cylinder head screw	6.3x 80 mm
Z 0162	Cylinder head screw	6.3x 85 mm
Z 0163	Cylinder head screw	6.3x 90 mm
Z 0164	Cylinder head screw	6.3x 95 mm
Z 0165	Cylinder head screw	6.3x100 mm
Z 0166	Cylinder head screw	6.3x120 mm



Cylinder head screws ⌀ 10 mm with hex socket | without sealing gasket		
Z 0293	Cylinder head screw	6.3x 18 mm
Z 0247	Cylinder head screw	6.3x 25 mm
Z 0116	Cylinder head screw	6.3x 30 mm
Z 0249	Cylinder head screw	6.3x 35 mm
Z 0118	Cylinder head screw	6.3x 40 mm
Z 0119	Cylinder head screw	6.3x 45 mm
Z 0253	Cylinder head screw	6.3x 50 mm
Z 0114	Cylinder head screw	6.3x 55 mm
Z 0255	Cylinder head screw	6.3x 60 mm
Z 0256	Cylinder head screw	6.3x 65 mm
Z 0257	Cylinder head screw	6.3x 70 mm
Z 0258	Cylinder head screw	6.3x 75 mm
Z 0241	Cylinder head screw	6.3x 80 mm
Z 0242	Cylinder head screw	6.3x 85 mm
Z 0243	Cylinder head screw	6.3x 90 mm
Z 0033	**PA washer**	⌀ 10 x 1.5 mm

AK-S_3.2_024.dwg

Flat cover strip DL 5073/ DL 6073/DL 8073

Tips for laying the cover strip DL 5073/ DL 6073/DL 8073

We assume that this cover strip will be used with glass panes that are supported on two sides and the recessed screw head is concealed. In this case, a cylinder head screw with inner hex is to be used e.g. Z 0253 without a washer. When covering with a 2 mm cover plug Z 0089, a bore depth of 7 mm is calculated.

Depending on the precision of the bore, it should be decided on case by case basis if any slight changes to this depth are necessary. The cover plug Z 0089 does not need to be glued in place, but may be levelled using levelling compound.

Coating the cover strip

Profile production (aluminium extrusion moulding) with different mass distributions is extremely difficult. Lengthwise shadow formation may result. Resulting actions are to be taken with the agreement of the coater.

Intersections

Due to the special shape of the strip (the material extends into the rebate), there is no closed sealing section available at intersections. We therefore recommend placing particular attention to ensure tightness of the joints and fill will Stabalux connecting paste Z 0094.

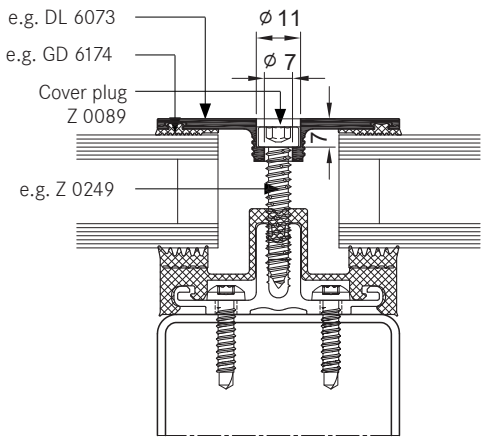
Glass thickness

When using cover profiles DL 5073/ DL 6073 / DL 8073 in combination with the add-on channel, a glass thickness of at least ≥ 18 must be used.

Glass supports/blocking

- The glass support GH 6073 can be installed with a glass thickness of 18 mm.
- Special attention should be given to dimensional proportions for thicker glass. Glass supports should be designed by the processor depending on the glass thickness and weight.
- In all cases, to support the panes, glazing blocks must be installed that can carry the load to safely ensure the glass load is distributed effectively.
- When using glass supports GH 6071 and GH 6072 the cover strip should be milled out centrally in the area of the rebate in order to avoid a collision with the glass support.
- The minimum glass thickness is d = 28 mm.
- Welded glass supports should be determined statically.
- To prevent a collision with DL 5073/ DL 6073/ DL 8073 in the rebate, the lower edge of the glass support must sit 7.5 mm above the mid axis of the profile.
- All seal penetrations must be thoroughly waterproofed.

Mullion



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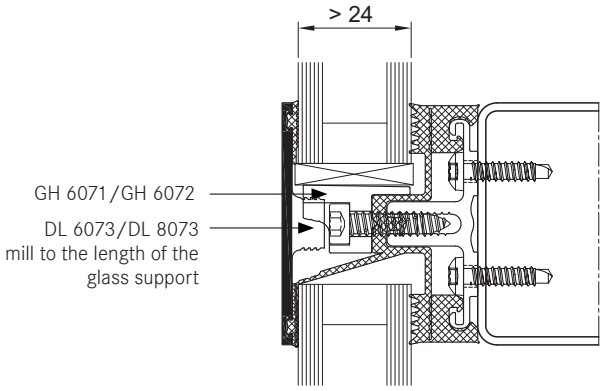
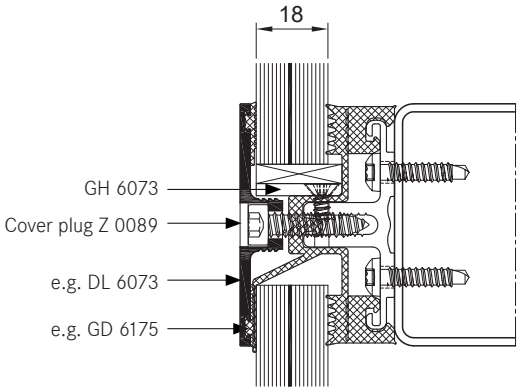
Flat cover strip DL 5073/ DL 6073/DL 8073

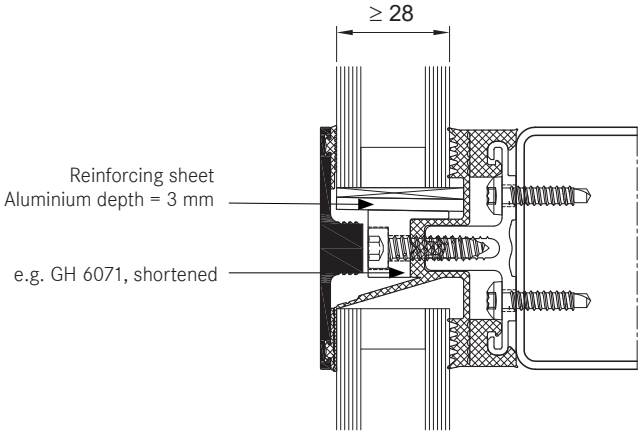
Flat cover strip and glass support GH 6071/GH 6072



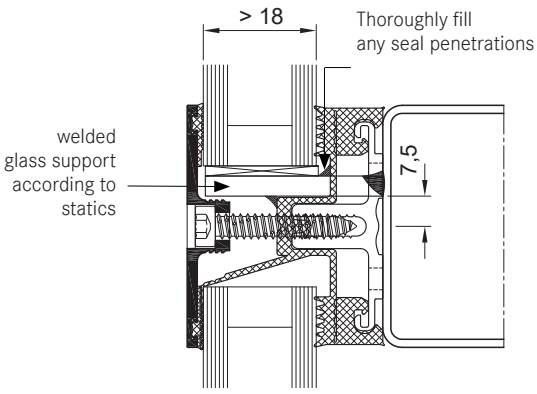
Flat cover strip and glass support GH 6073



Flat cover strip and glass support GH 6071/GH 6072



Flat cover strip and welded glass support



AK-S_3.2_025.dwg

Stabalux AK-S
Processing information

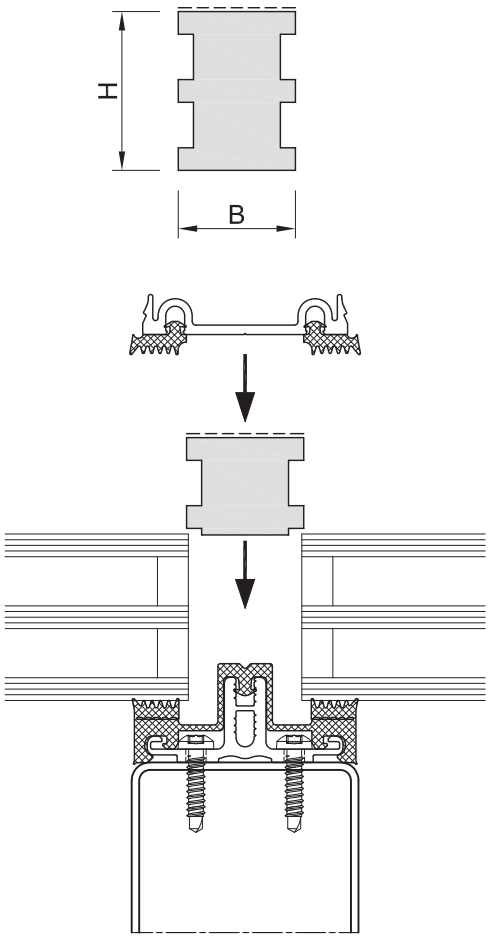
Using insulation blocks

Using insulation blocks significantly reduces heat dissipation. The highly effective insulation blocks have a permanently adhesive HOT-MELT. Depending on the situation where they are used, insulation blocks can be directly applied to the cover strip/pressure profile or placed into the rebate over the screw fittings and pushed into position with the cover strip/pressure profile.

The use of insulation blocks with cover profiles DL 5073/ DL 6073 / DL 8073 should be tested for each individual situation.

2-piece outer seals are always used with slab insulation blocks:

- System width 50 mm
  Glass inset 12 mm – outer insulation **GD 1932**
  with insulation block Z 0607 or Z 0608



- System width 60 mm
  Glass inset 15 mm – outer insulation **GD 1932**
  with insulation block Z 0607 or Z 0608

- System width 80 mm
  Glass inset 20 mm – outer insulation **GD 1932**
  with insulation block 2x Z 0605 or 2x Z 0606.
  Insulation block with corresponding rebate width available upon request.

System width 50 mm

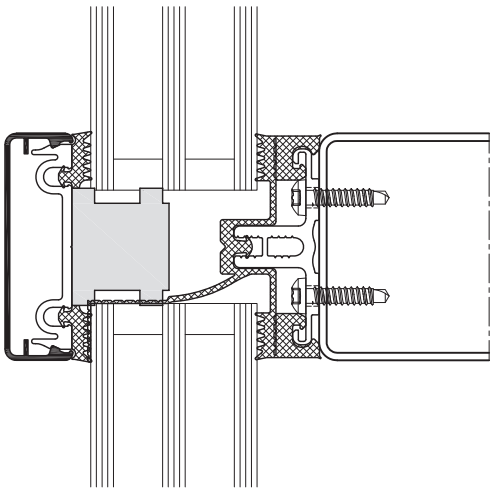
Insulation block	Width "W" (=rebate width)	Height "H"
Z 0608 Insulation block 30/26	26 mm	26 mm glass thickness from 32 mm
Z 0607 slab insulation 30/42	26 mm	42 mm glass thickness from 48 mm

System width 60 mm

Insulation block	Width "W" (=rebate width)	Height "H"
Z 0608 Insulation block 30/26	30 mm	26 mm glass thickness from 32 mm
Z 0607 slab insulation 30/42	30 mm	42 mm glass thickness from 48 mm

System width 80 mm

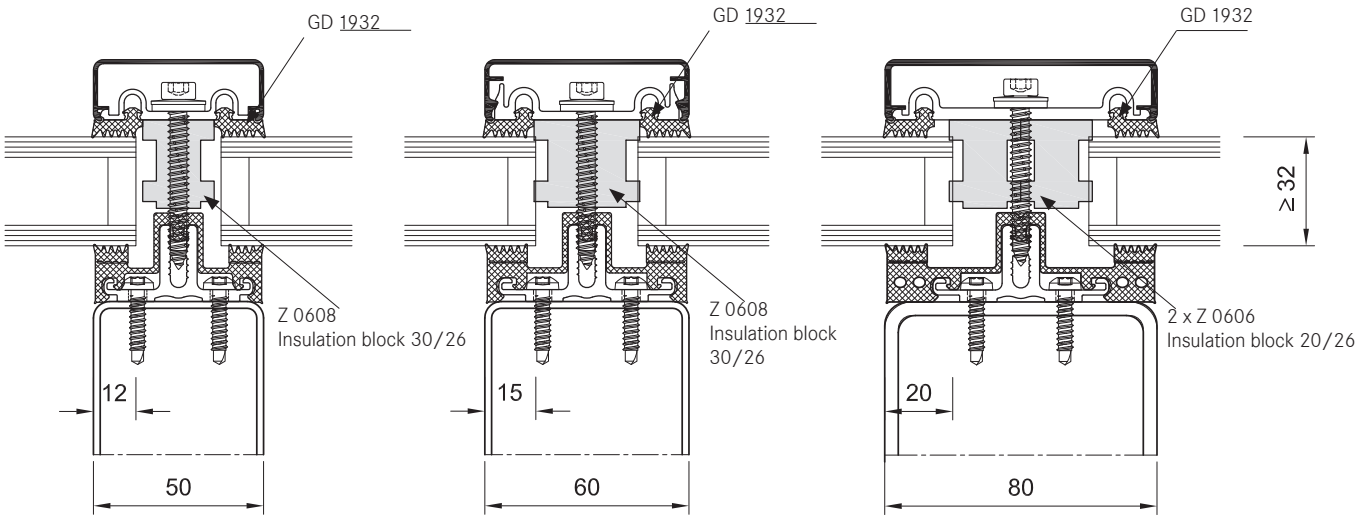
Insulation block	Width "W" (=rebate width)	Height "H"
2 x Z 0606 Insulation block 20/26	40 mm	26 mm glass thickness from 32 mm
2x Z 0605 Insulation block 20/42	40 mm	42 mm glass thickness from 48 mm



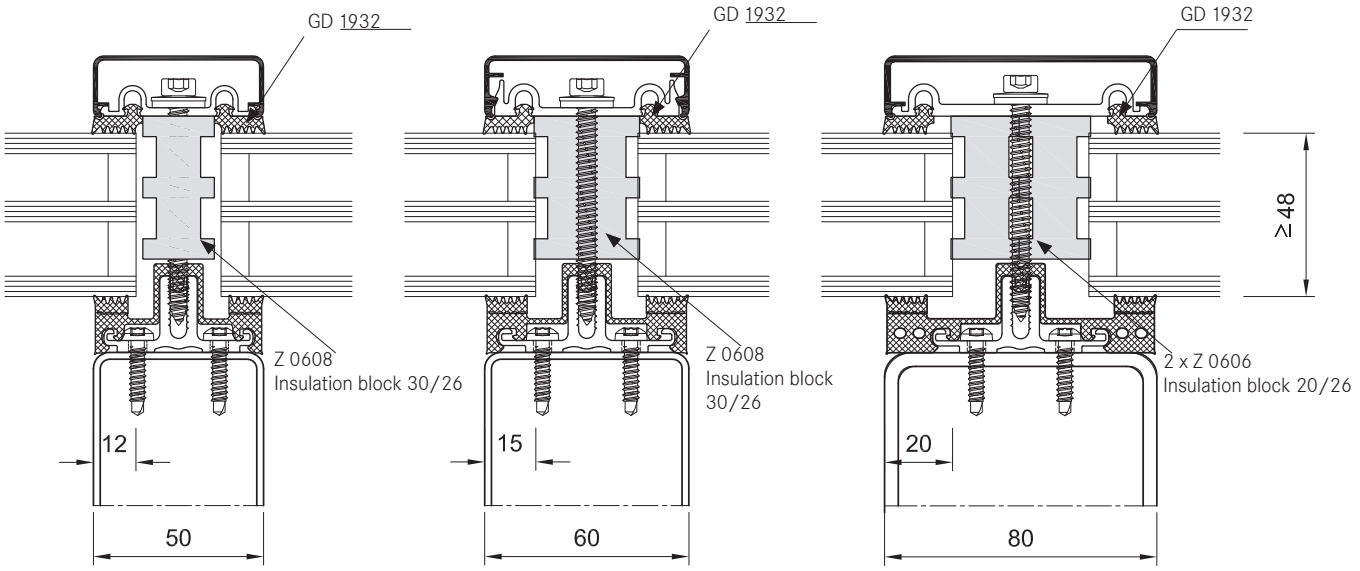
AK-S_3.2_027.dwg

Using insulation blocks

Examples for installing insulation blocks



System width 50 mm | System width 60 mm | System width 80 mm



System width 50 mm | System width 60 mm | System width 80 mm

AK-S_3.2_027.dwg

Pane support variants

3.3
1

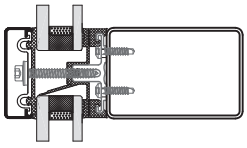
Special design

Glass structures that partially refrain from using visible cover profiles are considered **special designs.**

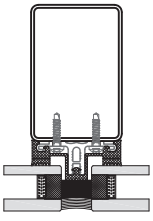
These designs **do not** conform to the intended uses of the system. No guarantees are made for e.g. quality of seals, durability and structural stability. Responsibility here lies entirely with the company implementing the design.

Based on our experience we recommend paying close attention to the points made on the following pages during planning and implementation.

Mullion-transom structure, 2-sided cover strip

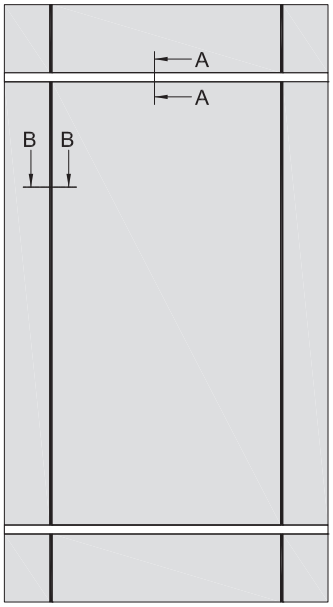


Cut A - A



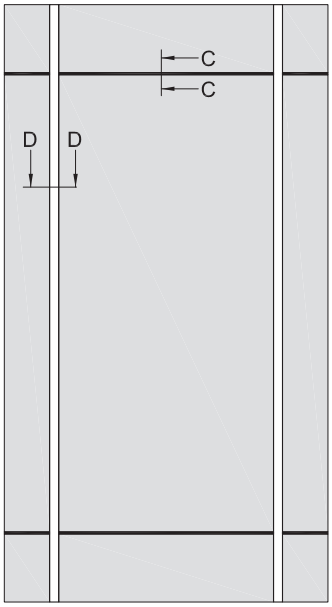
Cut B - B

Mullion-transom structure with transom cover profiles [1)]

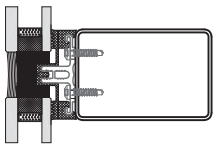


[1)] Seals with 1, 2 or 3 sections are possible

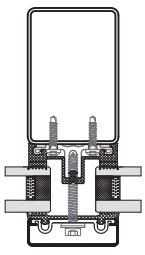
Mullion-transom structure with mullion cover profiles [2)]



[2)] Use of mullion seals with 1 section in mullions and transoms



Cut C - C



Cut D - D

AK-S_3.3_027_1.dwg

Pane support variants

3.3
1

Vapour seal:

When using this type of structure, it is important to be aware that any loss of contact pressure can affect the room-side permeability. There is an increased risk of condensation build up in the rebate.

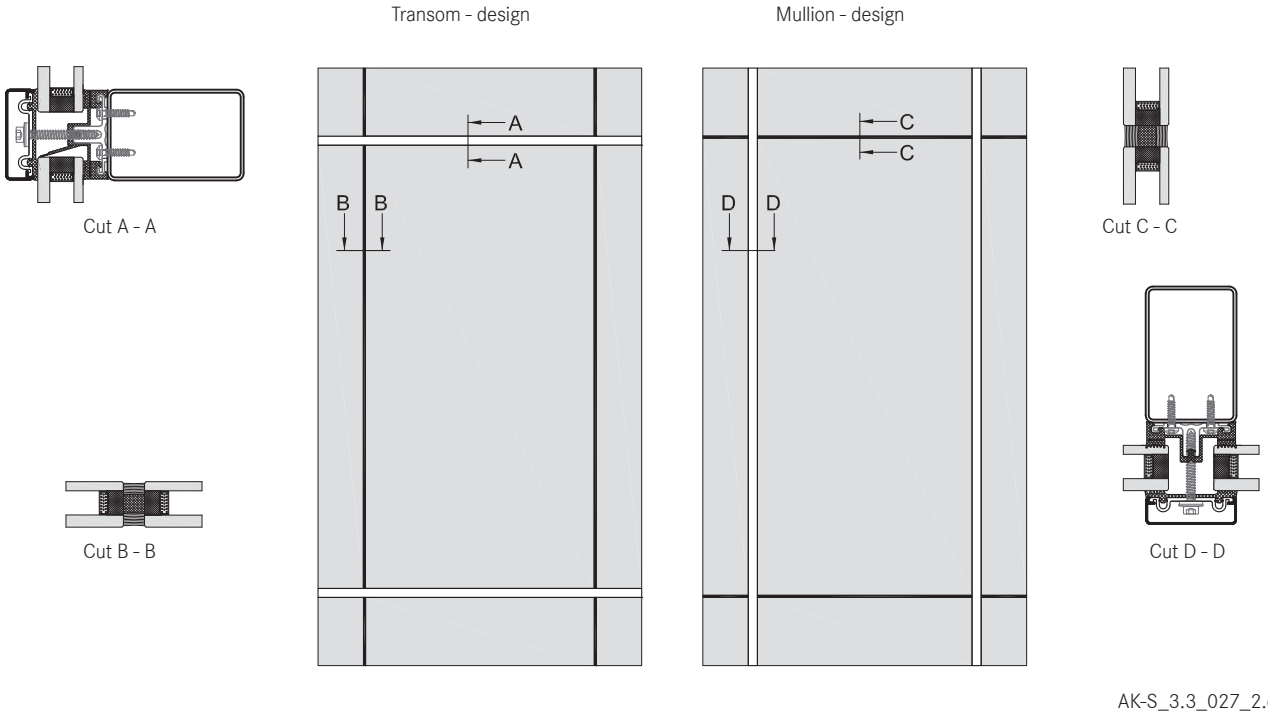
Vertical clamping strips

The glass supports should be placed to below the outer pane and sealed with it.

Horizontal clamping strips

Ventilation and condensation drainage is achieved via a recess in the lower sealing lip in the centre of the outer seal or at one third intervals.

Transom structure, mullion structure
2-sided cover strip



AK-S_3.3_027_2.dwg

Pane support variants

3.3
1

Design requirements

1 Vapour seal:

The room-side level of glazing must have the best possible vapour seal. In this regard, the vapour diffusion properties of the silicone sealant to be used should be tested.

Ensure that there are no permeable areas around concave cross joints.

2 Rebate ventilation, pressure equalisation and condensation drainage

Systems with partially sealed rebate represent a limitation to rebate ventilation. Check on a case-by-case basis that no damage will be caused by standing condensation. It is especially critical that designs with sealed vertical joints are evaluated. To allow ventilation of the horizontal rebate we recommend installing a suitable vertical ventilation space. Alternatively, ventilation can be achieved using the outer joints.

3 Weatherproofing

The outward facing seals must be watertight. In cross joints, it is especially important to ensure a firm join between the Stabalux profile seal and the silicone joints. We recommend sealing up to the outer edge of the glass before mounting the cover profiles.

We would like emphasise once again that our profile seals will not make a permanent bond with commonly used silicone sealants. A seal can only be created at contact points through permanent application of pressure.

4 Mechanical strength of the screw fittings

Ensure screw fittings are of a sufficiently size. Special attention should be given to the effects of wind suction and the reduced support.

5 Glass weight distribution

Mechanical distribution of the weight of the glass panes through the structure must be ensured. System glass supports can be used for existing horizontal transoms. Designs using “only” mullions require special glass supports which carry the weight of the glass directly into the mullions.

6 Glass sizing

Attention should be given to the reduced support of panes when dimensioning the glass. For example, only the vertical or horizontal cover profiles are effective in the event of wind suction stresses or stress on the fall protection.

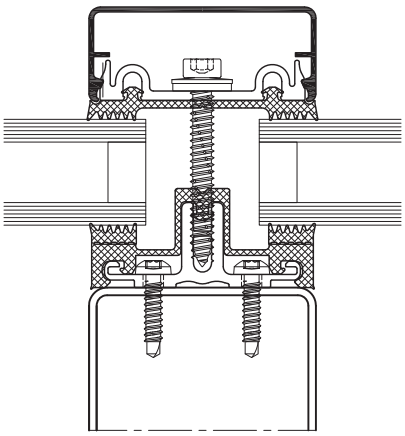
7 Material compatibility

Compatibility of the silicone sealants with our profile sealants and the edge bonding of the glass must be ensured. We recommend the exclusive use of tested silicone sealants from the whole-glass facades sector. Approval is usually given by the silicone manufacturer.

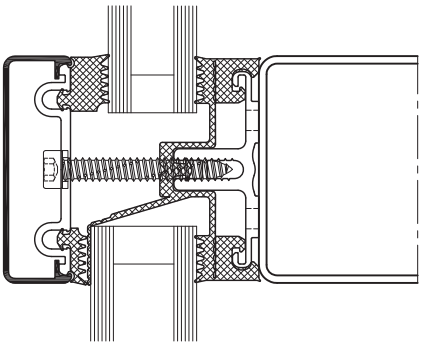
System cross sections

3.3
2

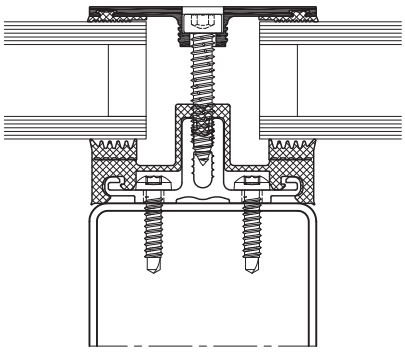
Examples:



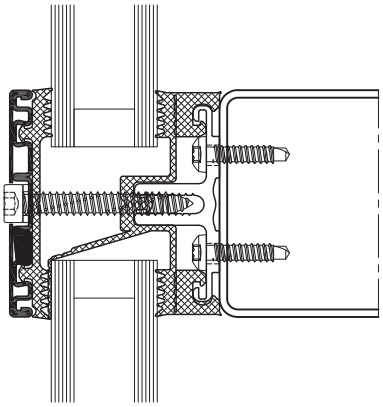
Vertical glazing
Mullion, concealed screw fittings



Vertical glazing
Transom visible screw fittings
with split seal for height compensation



Vertical glazing
Mullion flat cover strip DL 6073



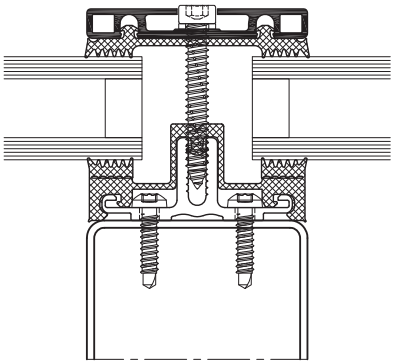
Vertical glazing
Transom, visible recessed screw fittings

AK-S_3.3_001.dwg

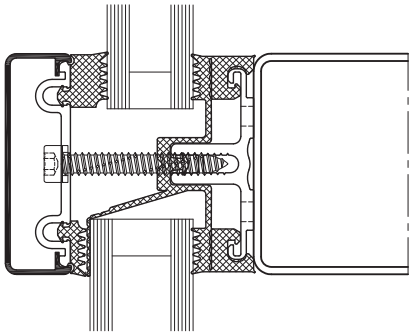
System cross sections

3.3
2

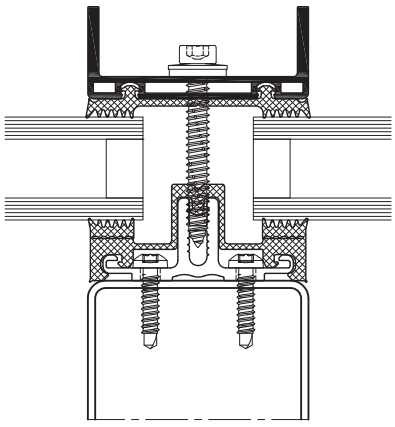
Examples:



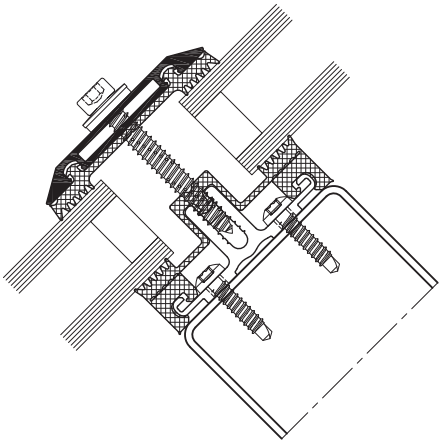
Vertical glazing
Mullion visible recessed screw fittings



Vertical glazing
Transom, concealed screw fittings



Vertical glazing
Mullion visible screw fittings



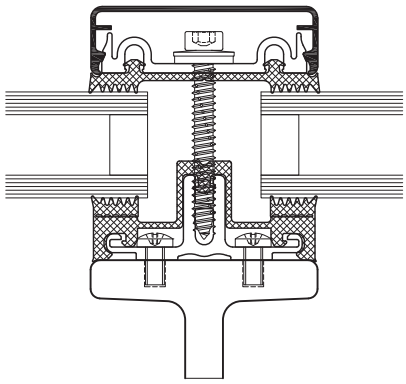
Inclined glazing
Transom visible screw fittings

AK-S_3.3_001.dwg

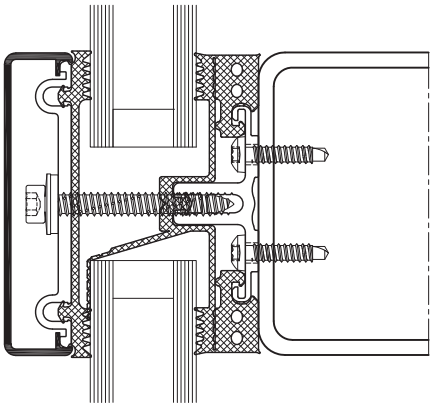
System cross sections

3.3
2

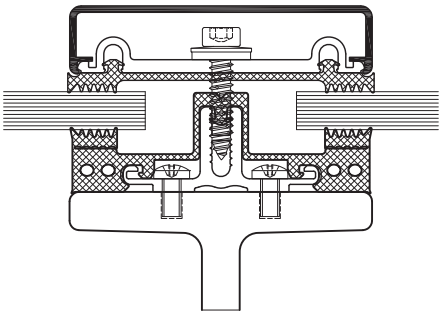
Examples:



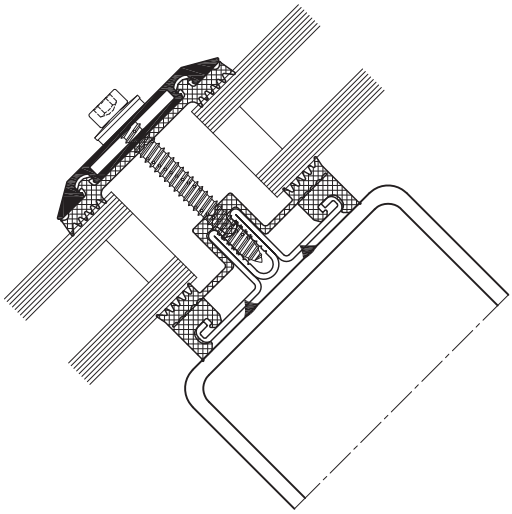
Vertical glazing
Mullion, concealed screw fittings



Vertical glazing
Transom, concealed screw fittings



Vertical glazing
Vertical glazing mullion

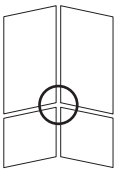


Inclined glazing
Transom visible screw fittings

AK-S_3.3_001.dwg

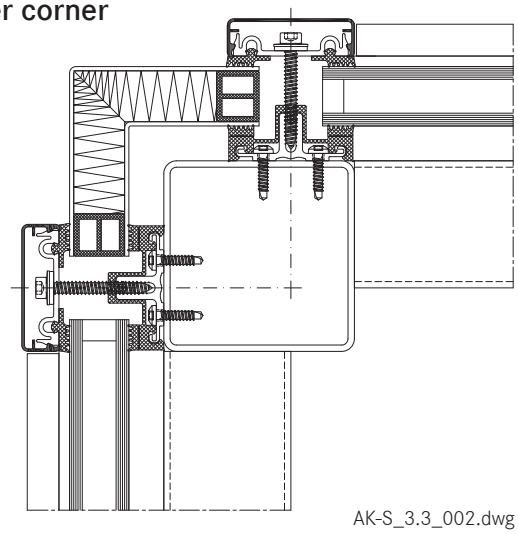
System details

Creating facade corners



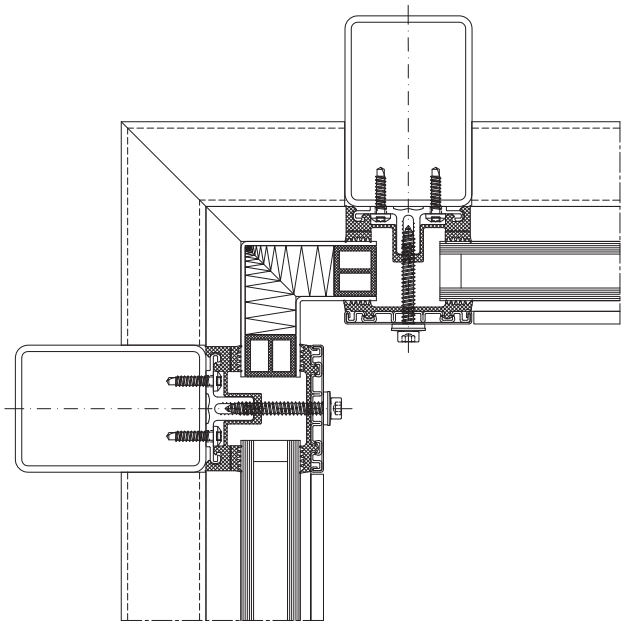
At exposed areas such as glass facade corners, consideration must be made to ensure sufficient heat insulation in order to avoid the creation of thermal bridges and prevent condensation build up. Thermal current calculations provide information about the actual heat loss.

Outer corner



AK-S_3.3_002.dwg

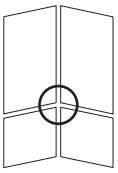
Inner corner



AK-S_3.3_003.dwg

System details

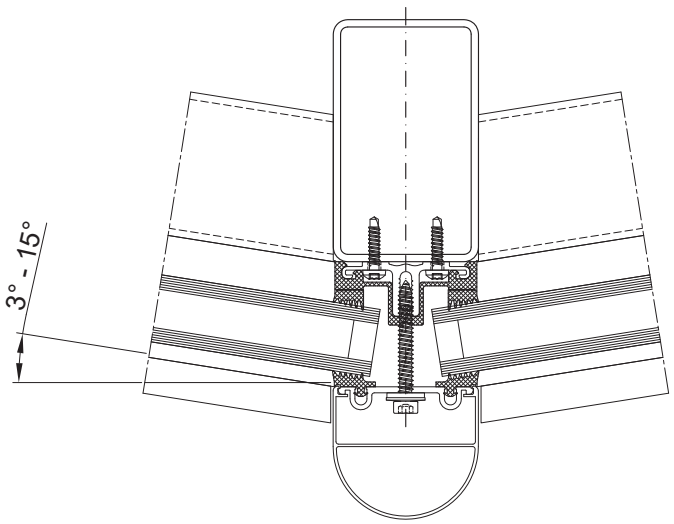
Facade polygon



Special seals allow a polygon shaped arrangement of the facade mullions. For convex glass surfaces an angle between 3° and 15° can be freely chosen. For concave glass surfaces the angle can vary between 3° and 10°.

Attention:
Observe the minimum glass inset,
e.g. ≥ 15 mm for System 60!

Geometrically test feasibility depending on glass thickness, inset and angle!



AK-S_3.3_004.dwg

System details

Eaves with glass roof connection

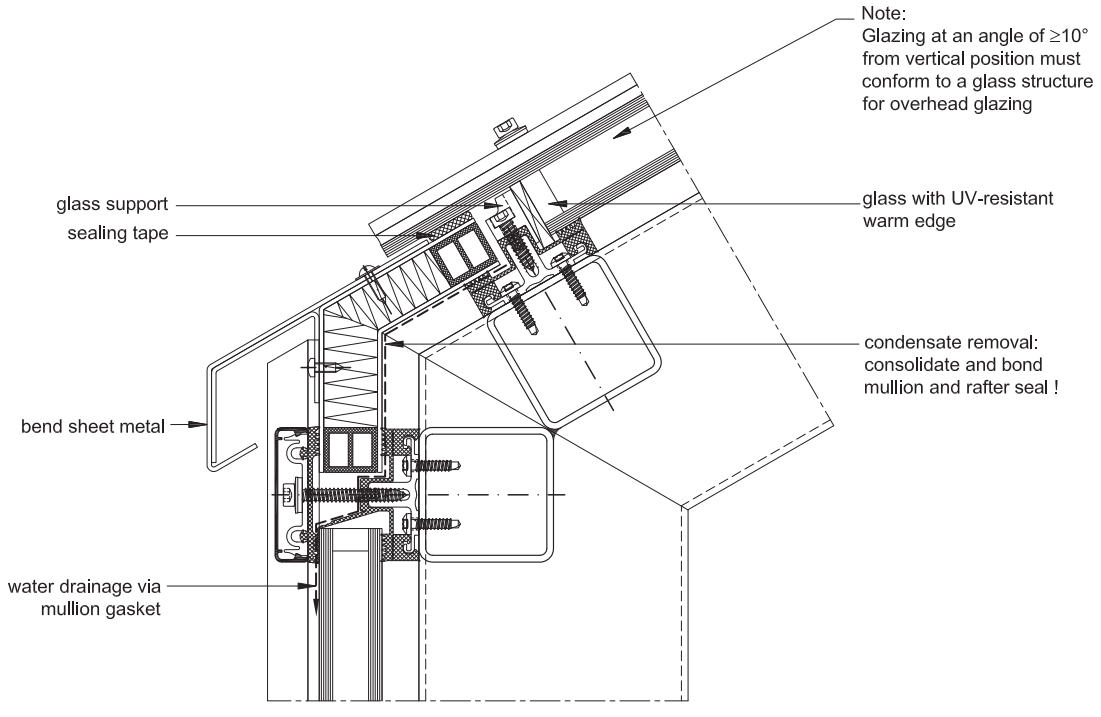
- Depending on the transom construction, a design with or without rain gutters and the choice of stepped glazing or closable cover profiles gives us different variants for implementation.
- All options require condensation and moisture to be drained away at the eaves.

Design with stepped glazing

- With a stepped glazing design it is important to select a UV-resistant edge bonding for the glass. This edge bonding systems, usually silicone-based, are quite permeable to gases and are therefore unable to achieve the required high values for sound and heat insulation of conventional systems and require additional sealing around the edges.
- Our thermal calculations show that stepped glass panes, compared to covered glass edges, have a much less favourable isothermal movement.
- Stepped glass panes must also be statically measured according to their reduced hold against wind suction.
- The additional thermal loads that occur in stepped glass panes should countered by the use of pre-tensioned glass (TVG, ESG) for the outer panes.
- Stepped glass panes should be preferred for flatter inclined roofs as water can drain away at the eaves unhindered.

Example 1:

Design with stepped glazing



AK-S_3.3_005.dwg

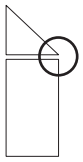
System details

Eaves with glass roof connection design using cover profiles

- Horizontal pressure strips prevent the free run off of rain water and dirt.
- Cover strips with angled edges reduce the build up of water in front of the cover strip.
- The outer sealing level on glass roofs must also be thoroughly sealed.
- In combination with our butyl clad stainless steel panels, glazing with pressure strips on 4 sides achieves a higher level of safety.
- Make sure that the inner sealing section provides guaranteed drainage for condensation.
- To improve drainage and heat-induced expansion, cover profiles should be shortened by 5 mm at transom joints. Gasket joints, however, are to be laid flat with a slight excess in dimensions. Open ends of the transom cover profiles must be sealed.

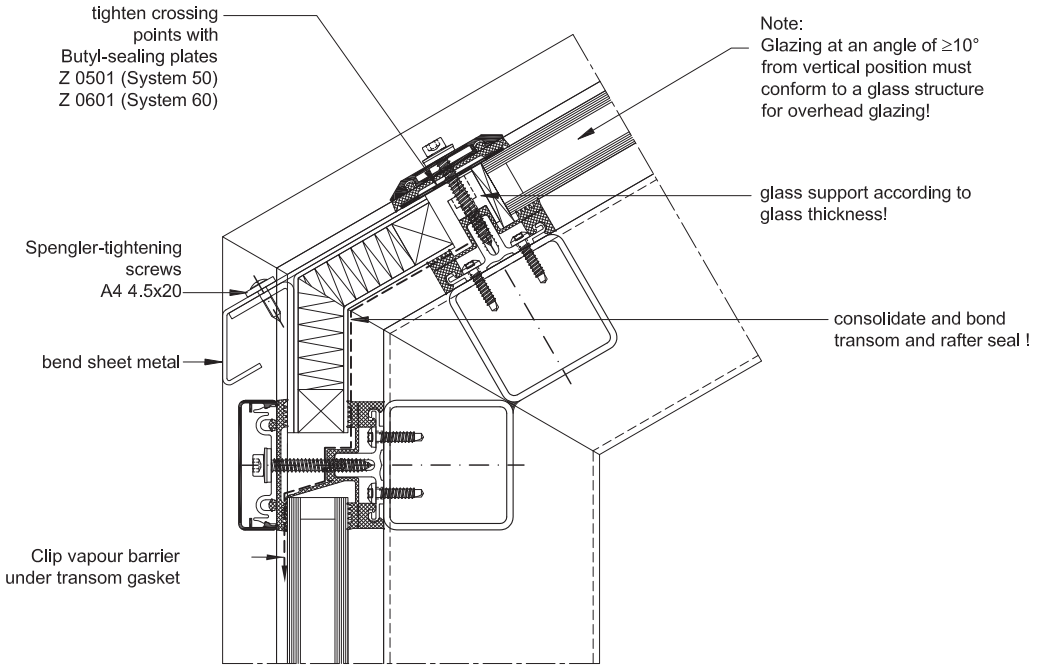
Note:

Due to the increased thermal stresses in the roof, we recommend using concealed screw fitting when choosing clamping strips for larger system lengths and in rafters. Unused holes in the pressure profile must be sealed.



Example 2:

Design using cover profiles



AK-S_3.3_006.dwg

System details

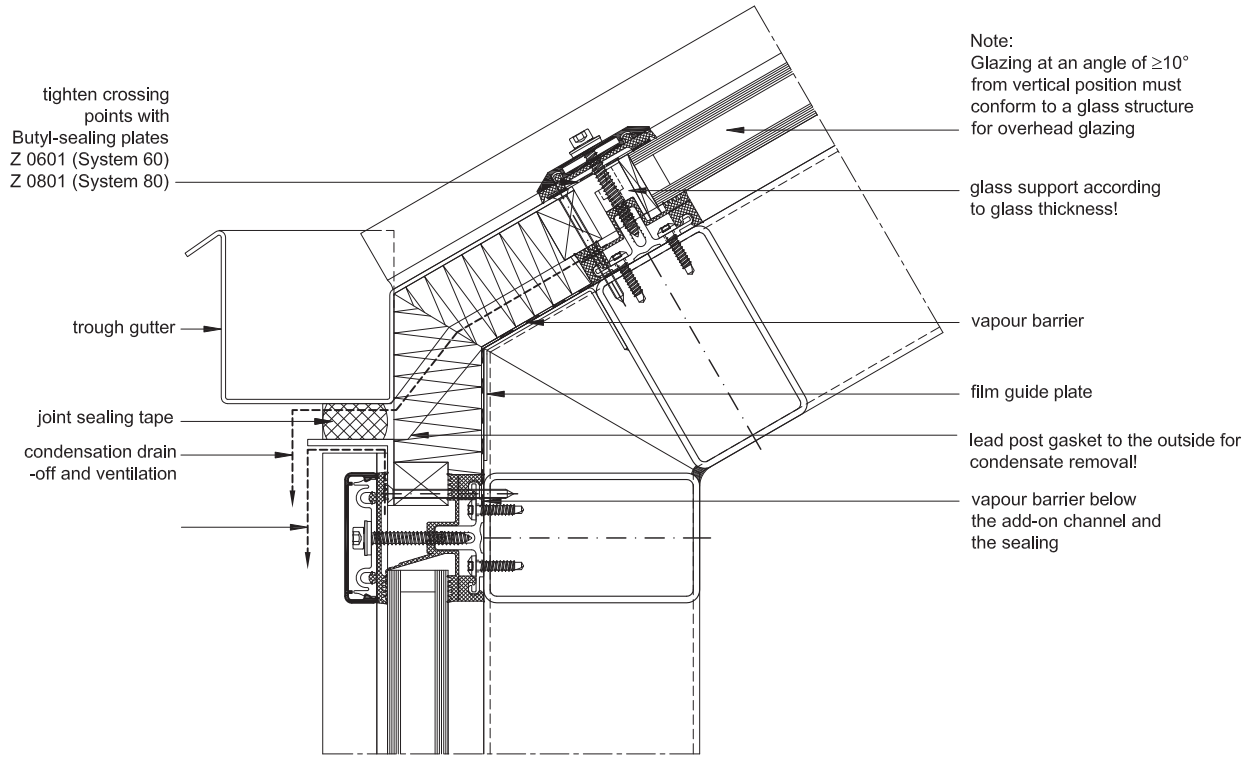
3.3
3

Eaves with glass roof connection design with gutter

- The gutter must be able to take its own weight and mounted in such a way that stresses from its own weight, water and ice will not lead to deformations and directly apply a load to the glazing.
- Overflowing water must not be able to get inside the structure. Alongside the gutter-shaped outer rafter seal, the moisture barrier installed over the guide plate also acts to drain away condensation.

Example 3:

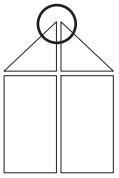
Design with gutter



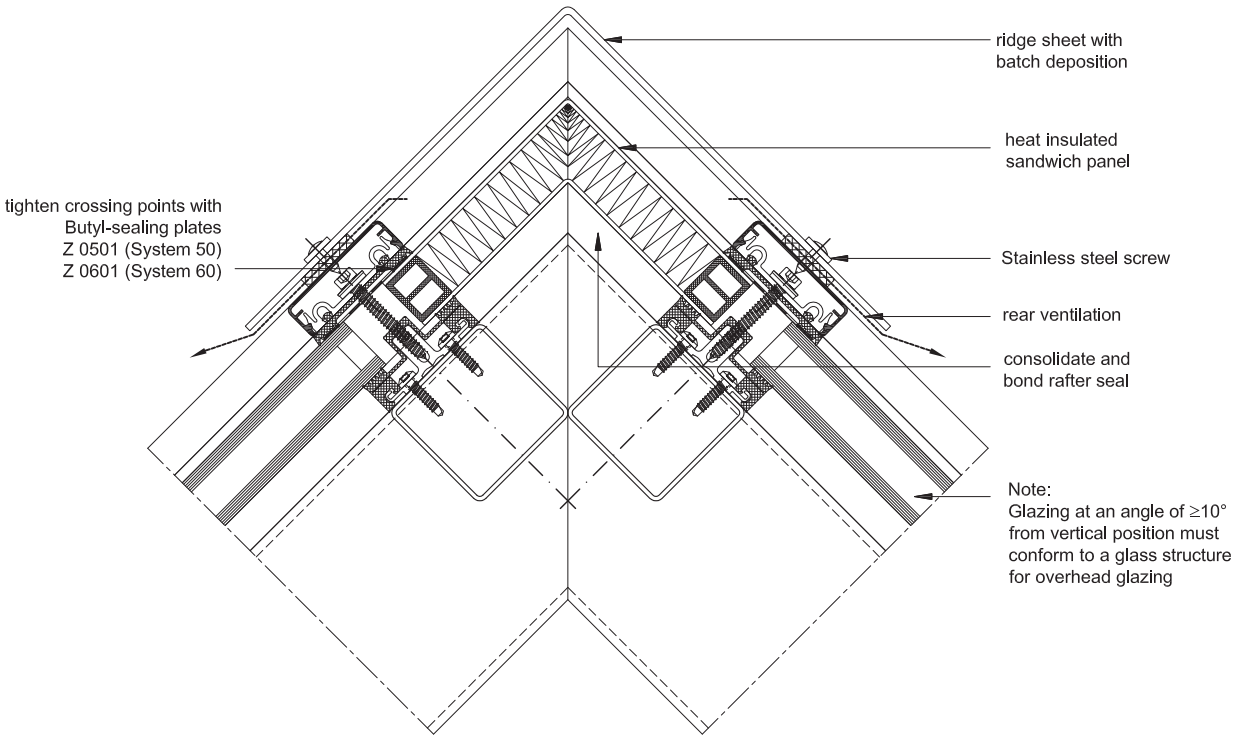
AK-S_3.3_007.dwg

System details

Roof ridge design



- When designing the ridge cap, ensure that the rafter cover profiles are pulled under the ridge cap.



AK-S_3.3_008.dwg

Structural attachments

3.3
4

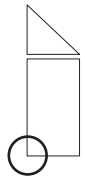
Structural attachment film baffles

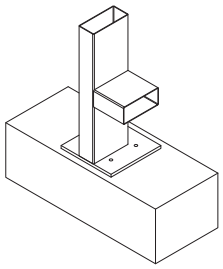
- Attachment of glazing to the building structure requires a well thought out approach.
- Moisture damage can occur if moisture condenses at any thermal bridges.
- Thermal bridges must be avoided and warm air from the inside spaces must not penetrate too deeply into the structure.
- The required moisture barriers must be installed as deeply as possible into the inner space using impermeable structural film baffles. This prevents moisture penetration into the structure via condensation from the air inside.
- An additional foil to seal against rainwater must be permeable to moisture. Only if this foil has a water vapour diffusion resistance value of μ = 3000 can a dry structure be guaranteed in the transition zone.

Structural attachments

Facade base

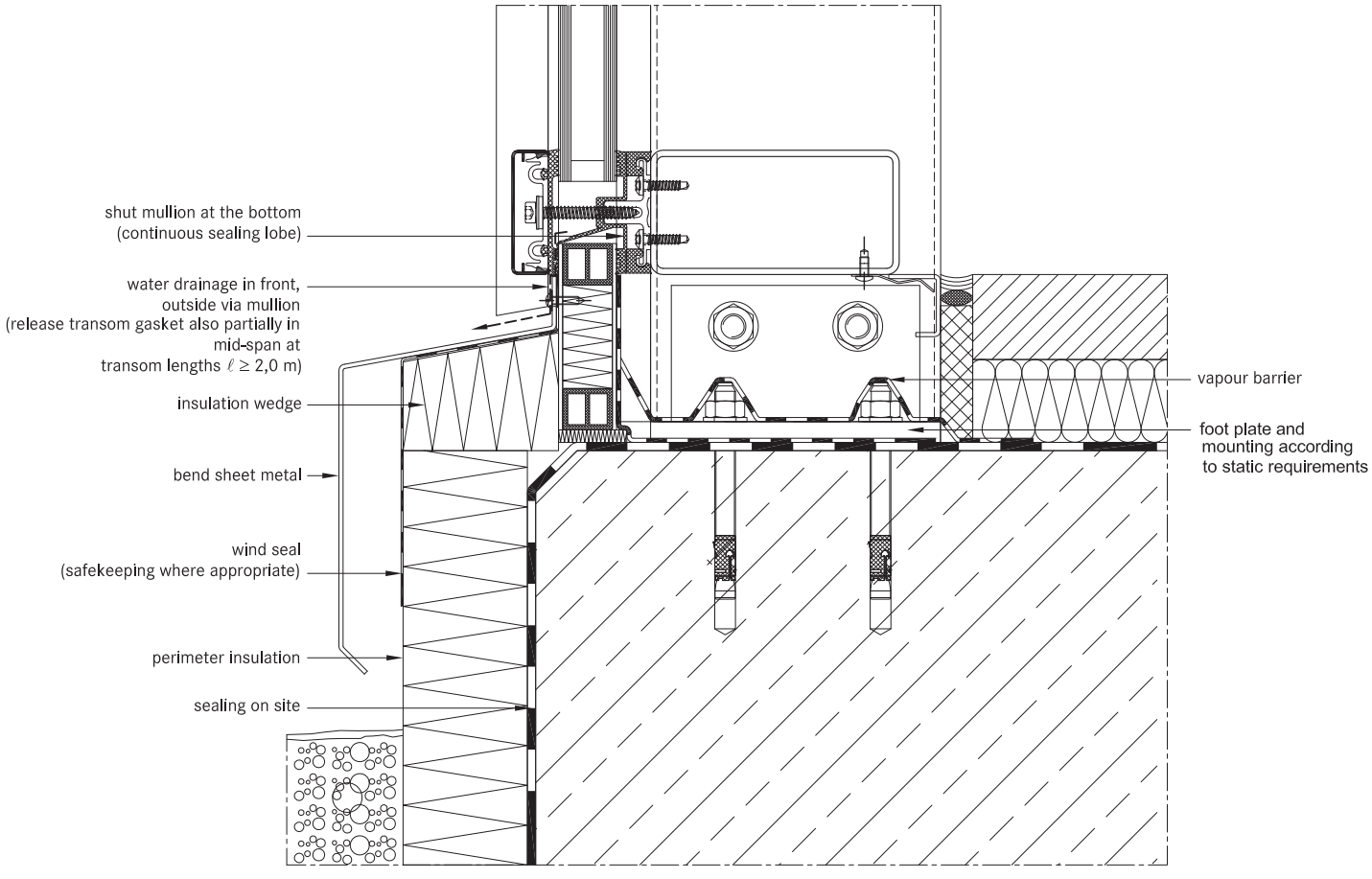
- Controlled drainage of the rebate space can only be ensured if the sealing sections overlap in such a way that no moisture can get under the seals and foils.
- Run foils under the transom seal to act as a moisture barrier and glue to the steel structure. In accordance with DIN 18195 the seal should be run at least 150 mm above the water-guiding layer.
- Attach foil with moisture barrier in accordance with the requirements of DIN 18195.
- Rebate space ventilation is achieved via the open end of the vertical cover profiles.
- Ensure the connection is impermeable to vapour.
- Mullion mountings must be sufficiently statically dimensioned. Required centre and edge distances for anchoring with base plates and the building structure must be observed.





Example 1:

Mounting intermediate mullion to base plate

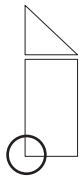


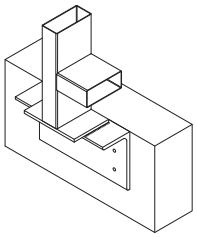
AK-S_3.3_009.dwg

Structural attachments

Facade base

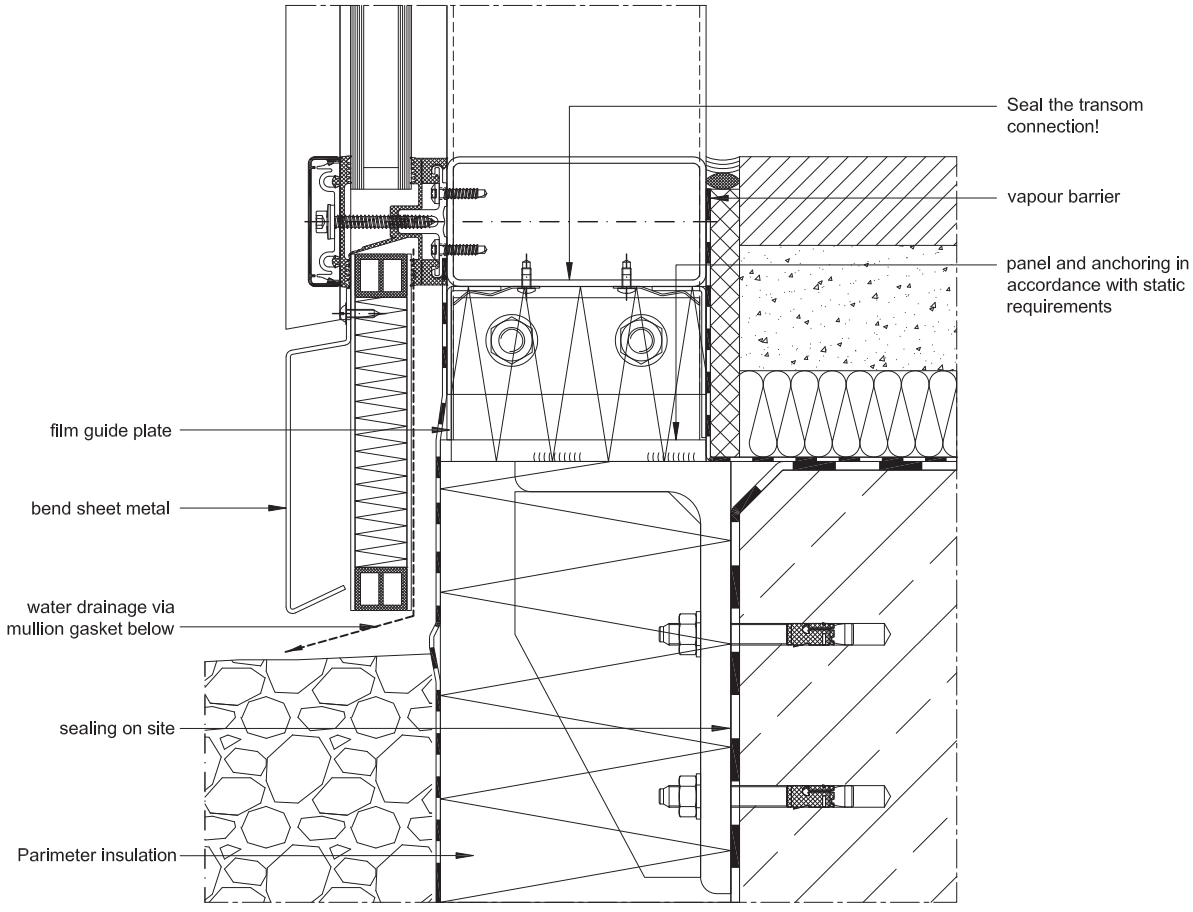
- Heat insulation around the structural connection should be designed in such as way as to prevent cold bridges forming.
- Steel parts should also be provided with sufficient protection against corrosion even in concealed areas.
- Weather-protection sheets should be used depending on the requirements of the construction. Sufficient rear ventilation must be ensured.





Example 2:

Attaching intermediate mullion before base plates

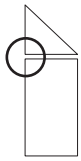


AK-S_3.3_011.dwg

Structural attachments

Connection before intermediate floors

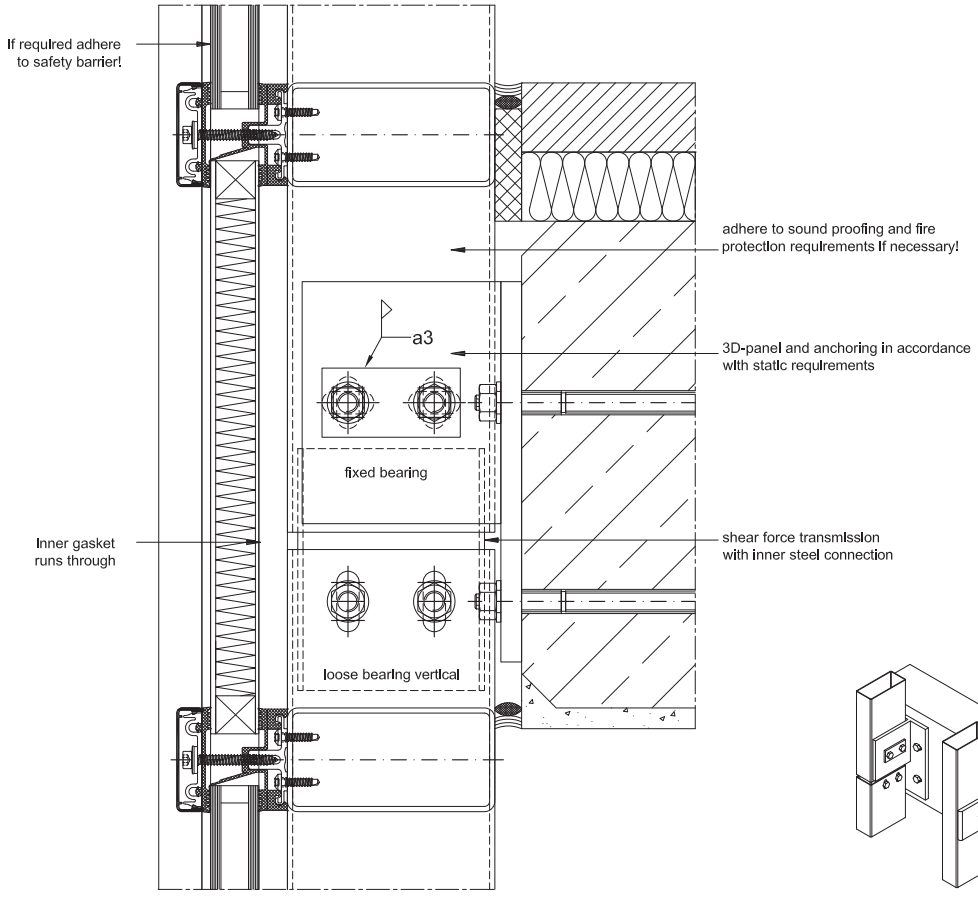
- Depending on requirements, mullions are designed as continuous multi-span beams or separated at each floor.
- Reasons for separating mullions can include e.g. building settlement, fire protection, sound insulation, etc.
- If the separation joint is intended to absorb expansion, then as well as the required degree of freedom for mullion posts, the ability for movement of integrated elements must also be ensured.
- The constructive design of the mullion joint and mounting should be chosen according to the statically calculated base system and determines the choice and arrangement of fixed and movable bearings, type of screw fittings, structural connection parts and attachment to the concrete floor.
- With continuous mullions and a corresponding mount the multi-span support principle is in effect. Sagging due to horizontal effects is lower. The required moment of inertia reduces for 2-span supports with the same span length compared to the 1-span support by a factor of 0.415. However, a tension and stability analysis should be carried out.



Example:

Mullions separated at each floor

In this example, distribution of horizontal and vertical loads is achieved at each floor through the existing floor structure.

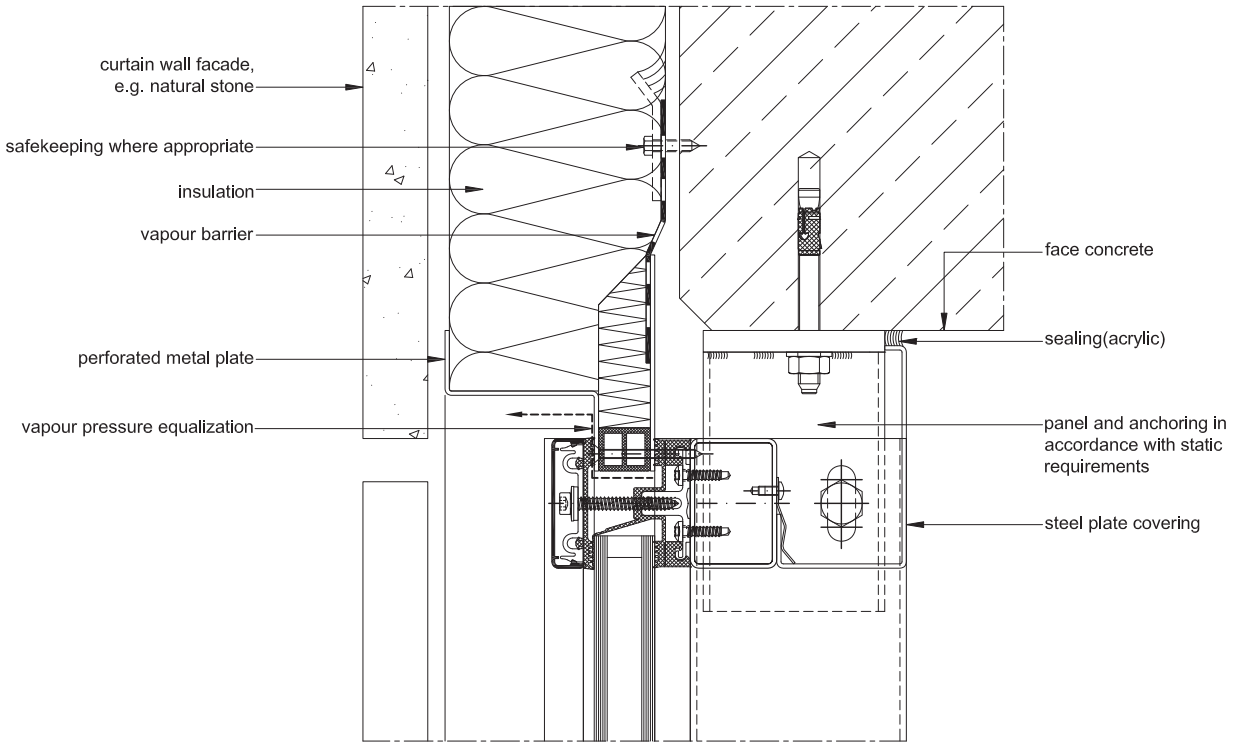


AK-S_3.3_012.dwg

Structural attachments

Ceiling connection

- Structural connections should take account of any movement that may occur.
- As well as temperature induced expansion in the facade, all longitudinal expansions and movements of the affected components must be considered.
- Additional stresses from restraints must be avoided.

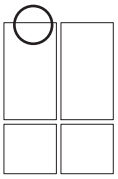


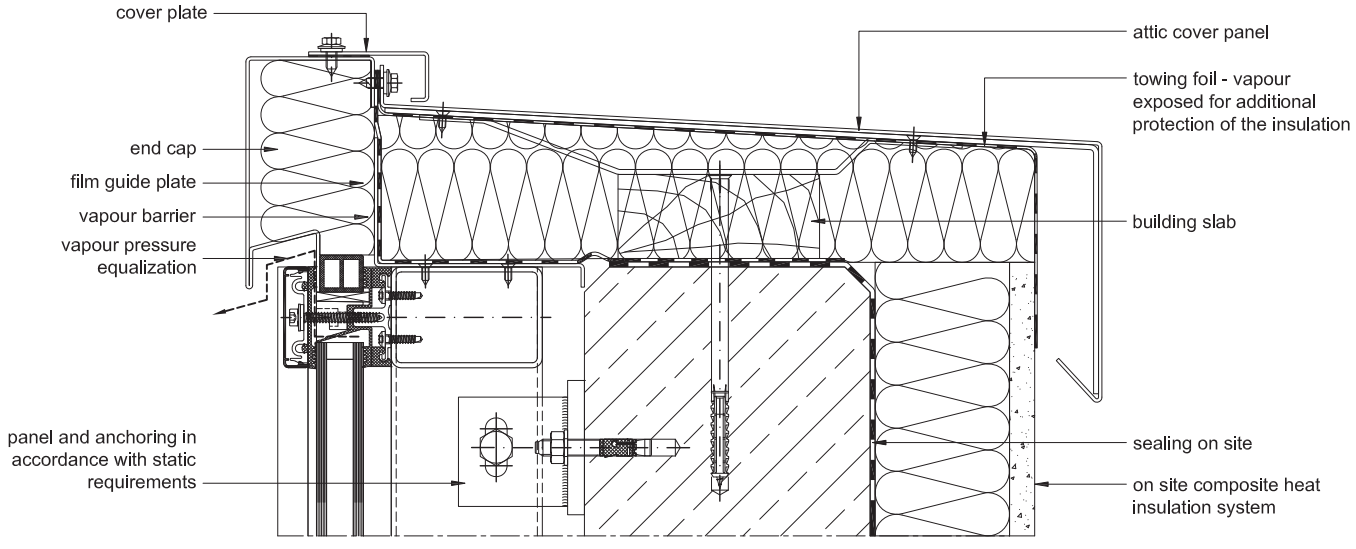
AK-S_3.3_013.dwg

Structural attachments

3.3
4

Facade connection to parapets



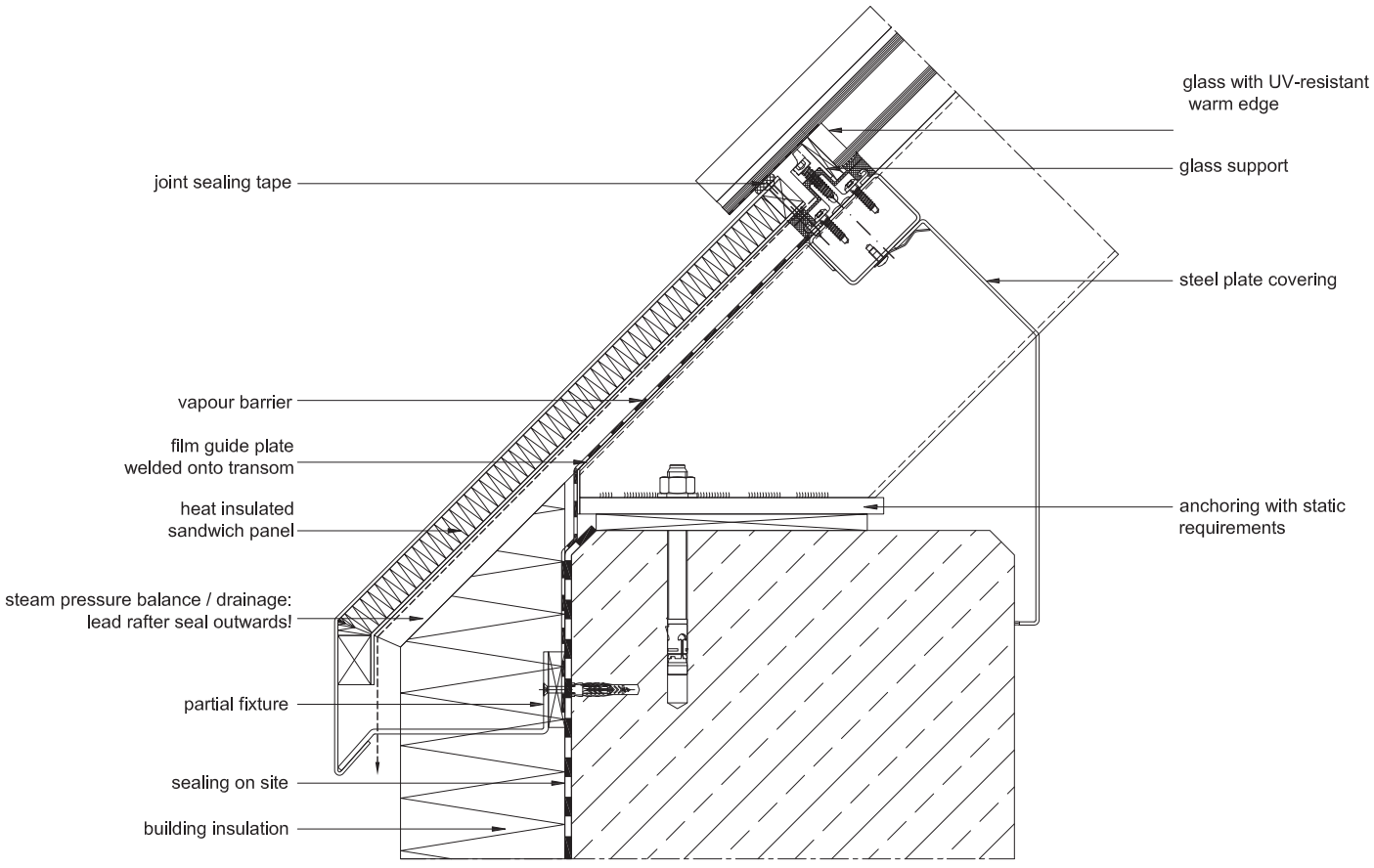


AK-S_3.3_014.dwg

Structural attachments

Connection to structural eaves

- This connection is suitable for glass roofs that are being installed as skylights in the structure. These may be gabled roofs, single pitch roofs, pyramids or arched roofs.

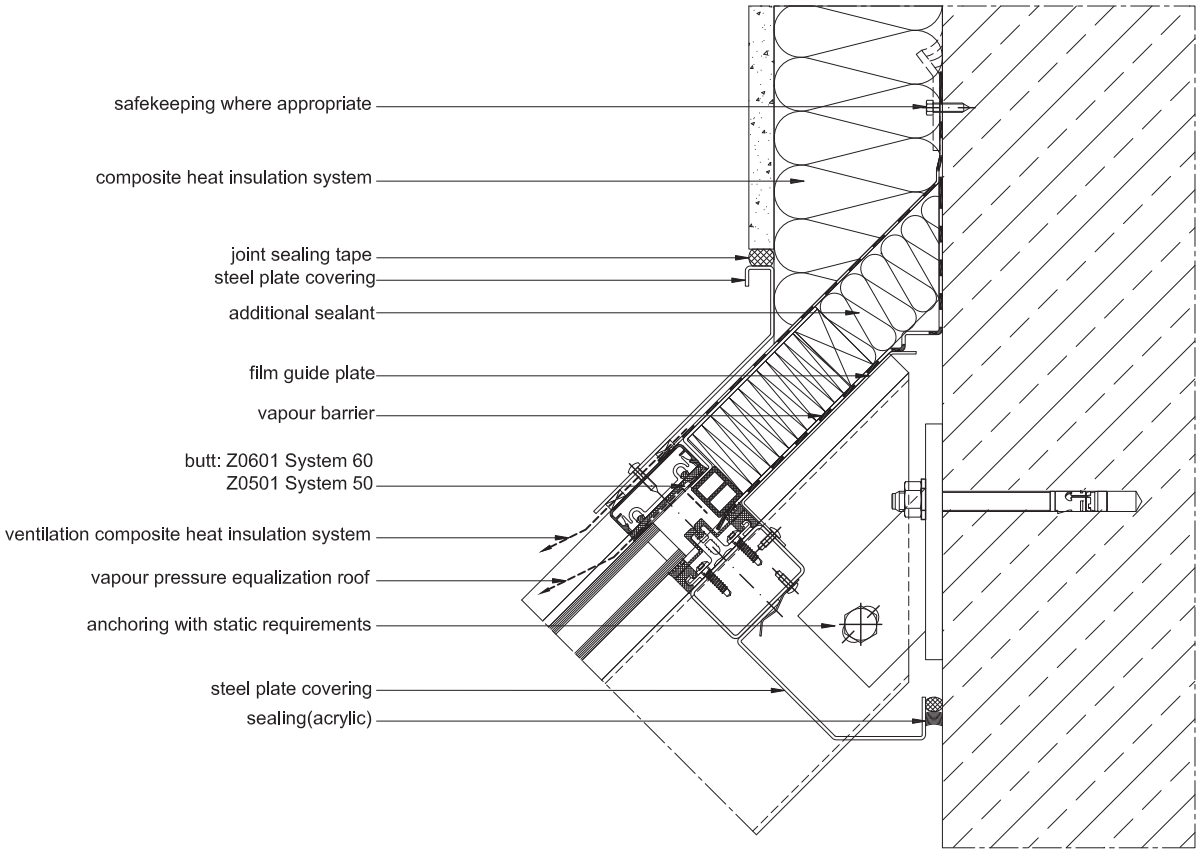


AK-S_3.3_015.dwg

Structural attachments

Ridge connection to walls

- When making ridge connections to walls, permeability to moisture is particularly important. Warm air with a high level of moisture gets into cooler zones of the inner sealing section where the design is not sufficiently sealed and can cause structural damage from penetrating into the connecting structure.
- Joint seals made from butyl-clad stainless steel plates (Z 0601, Z 0801) must be installed on the outside of joint areas.

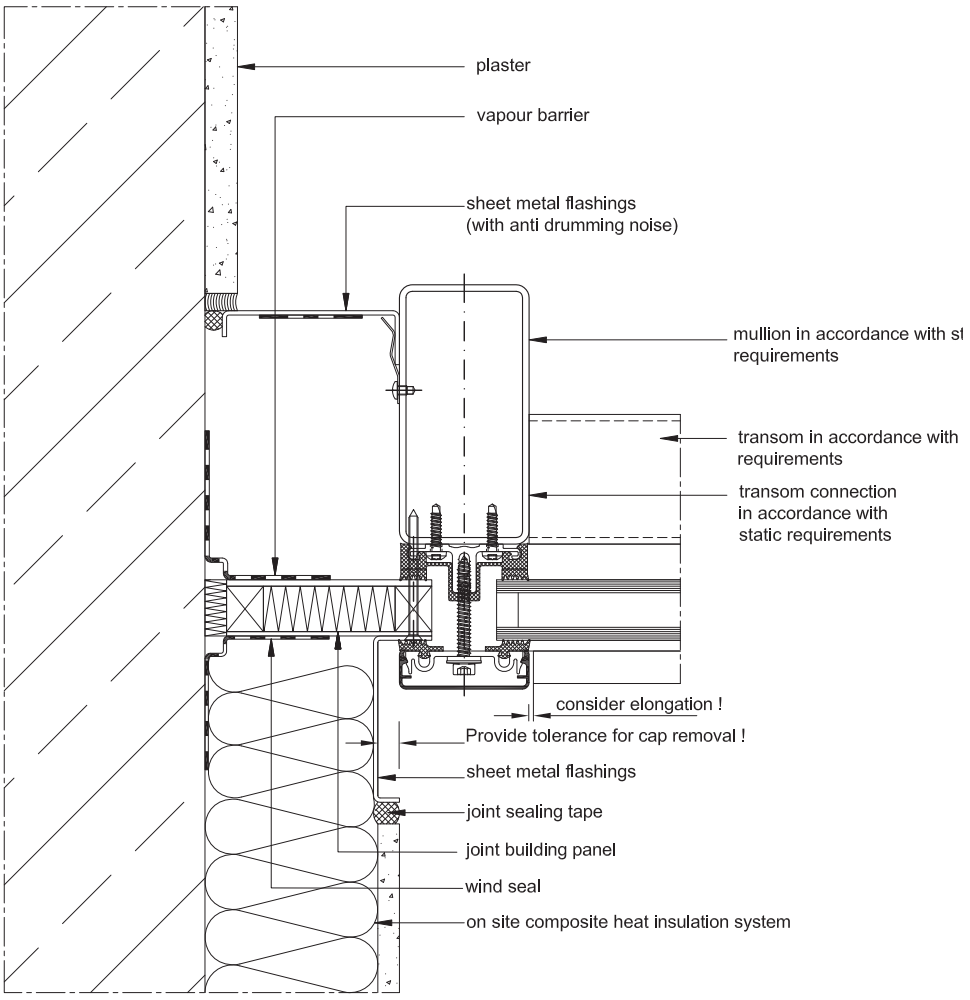


AK-S_3.3_016.dwg

Structural attachments

3.3
4

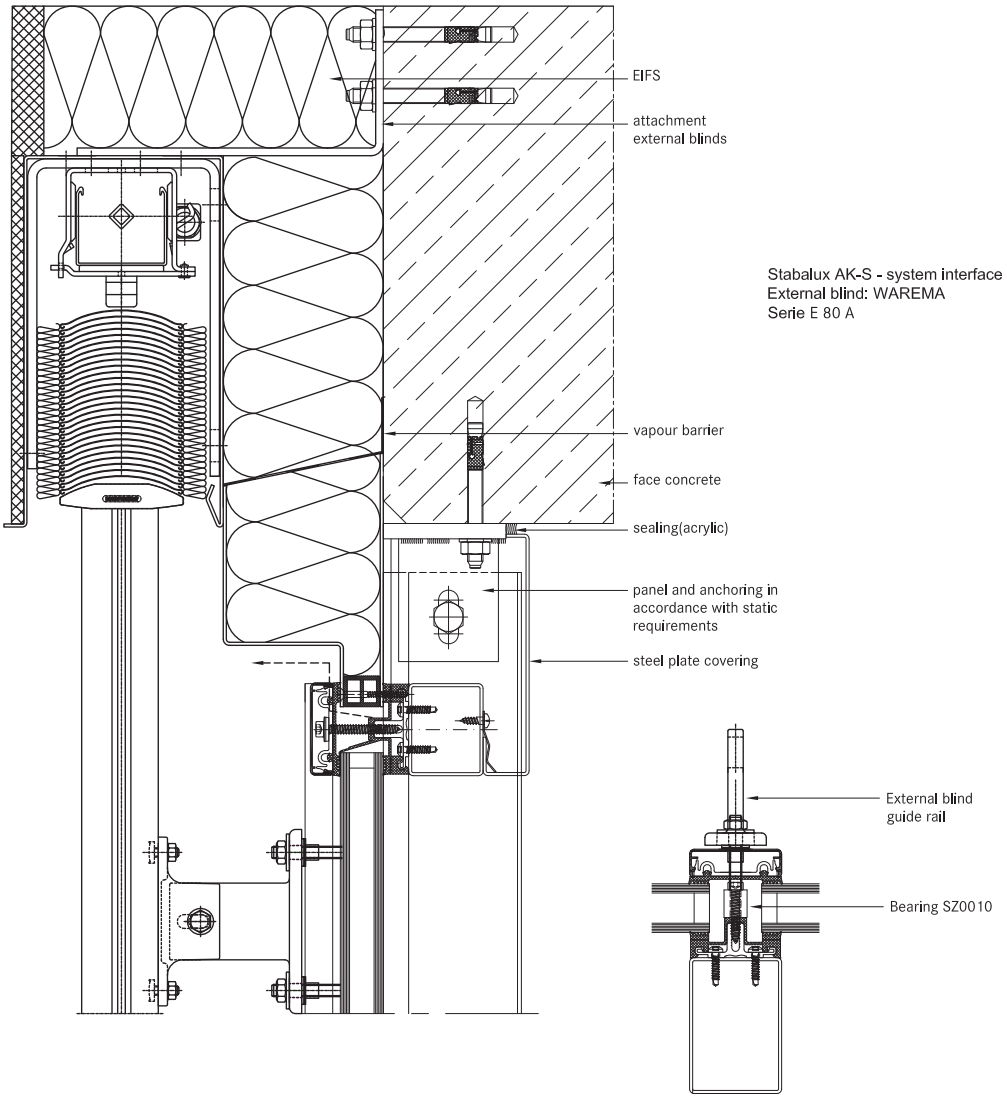
Horizontal wall connection to heat insulation bonding system



AK-S_3.3_017.dwg

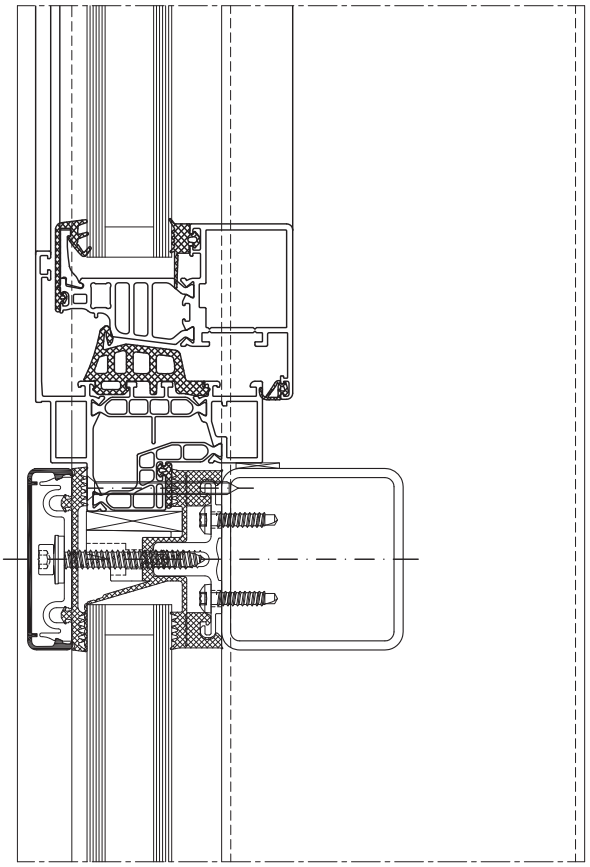
Structural attachments

Ceiling conection including WAREMA external blinds

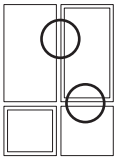


AK-S_3.3_017.dwg

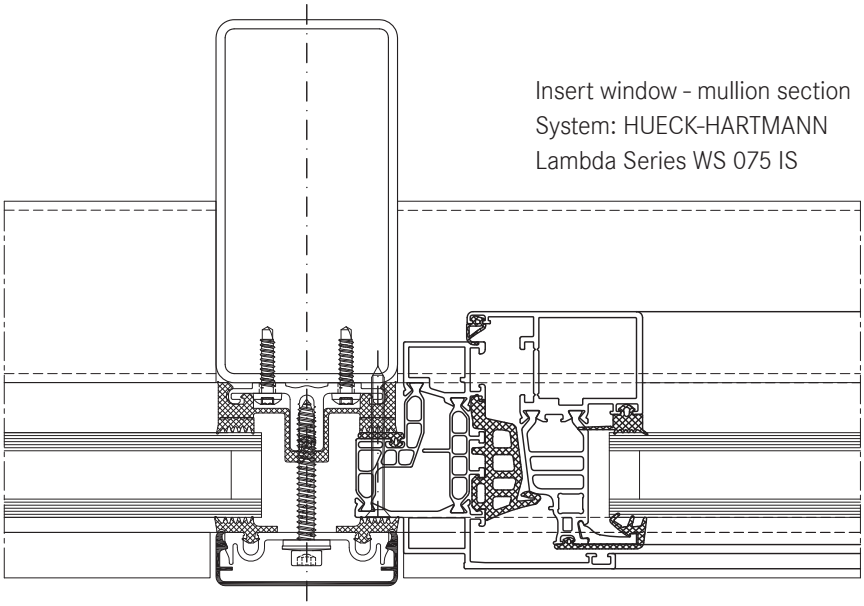
Installing windows and doors



Insert window - transom section
System: HUECK
Lambda Series WS 075 IS



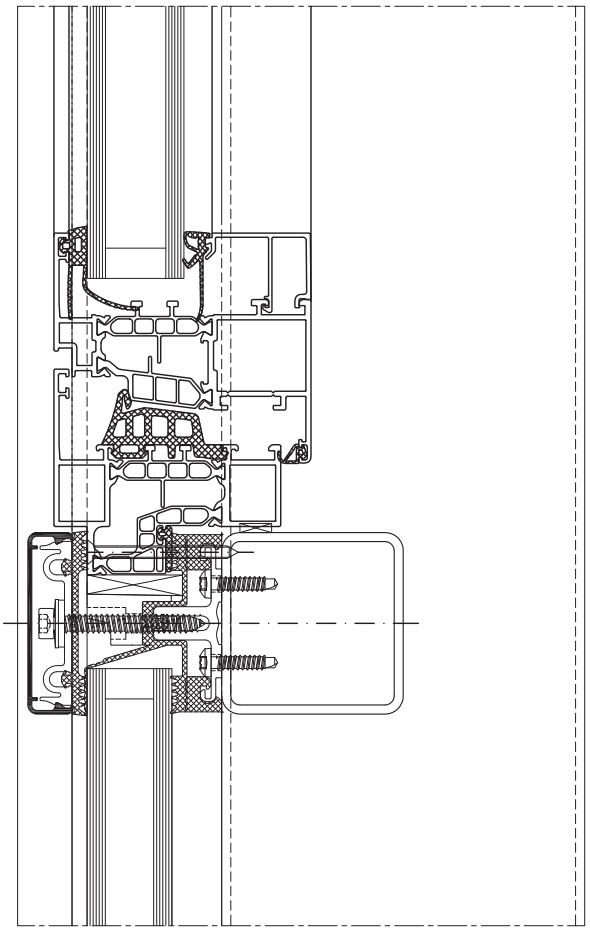
Mullion and transom facades and glass roofs from Stabalux are neutral with regards to the selection of insert elements. All commonly available window and door systems made from steel, aluminium, wood or plastic can be used. Frame profiles from the window and door manufacturer's should be selected to match the chosen glass thickness. If no profiles with a suitable insert rebate are available, mountings may be used as shown in the following examples. Like with glass elements, windows are set into the facade on glass supports, padded and then secured against slippage.



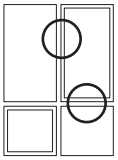
Insert window - mullion section
System: HUECK-HARTMANN
Lambda Series WS 075 IS

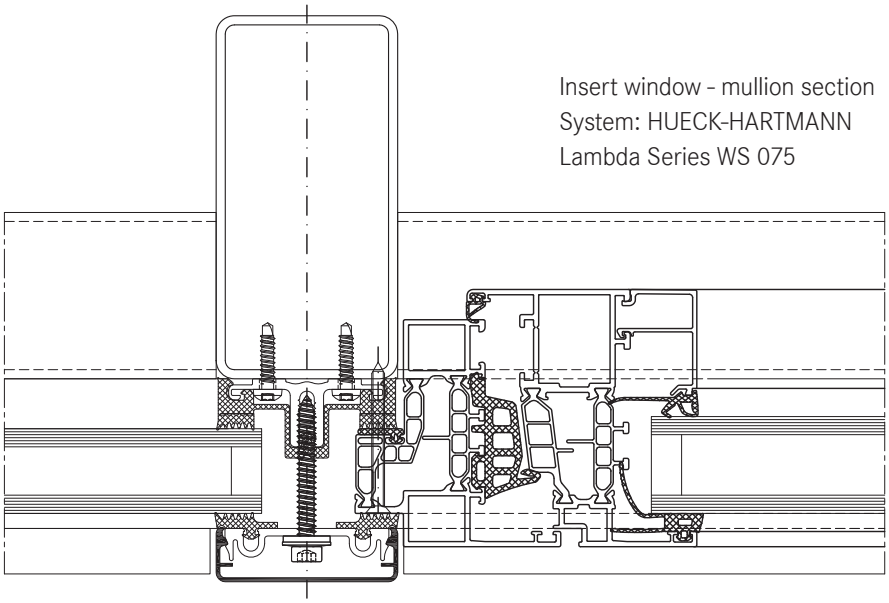
AK-S_3.3_018.dwg

Installing windows and doors



Insert window - transom section
System: HUECK-HARTMANN
Lambda Series WS 075



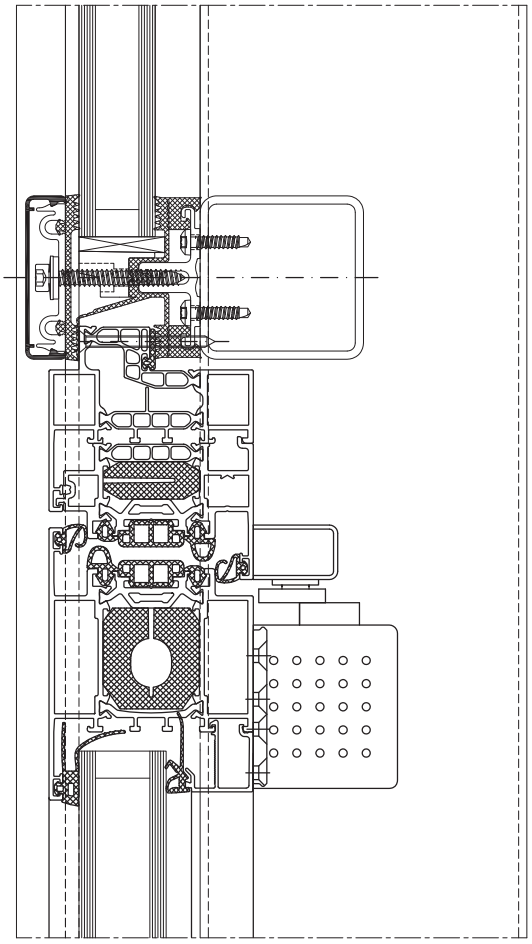


Insert window - mullion section
System: HUECK-HARTMANN
Lambda Series WS 075

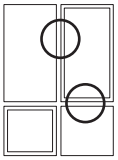
AK-S_3.3_019.dwg

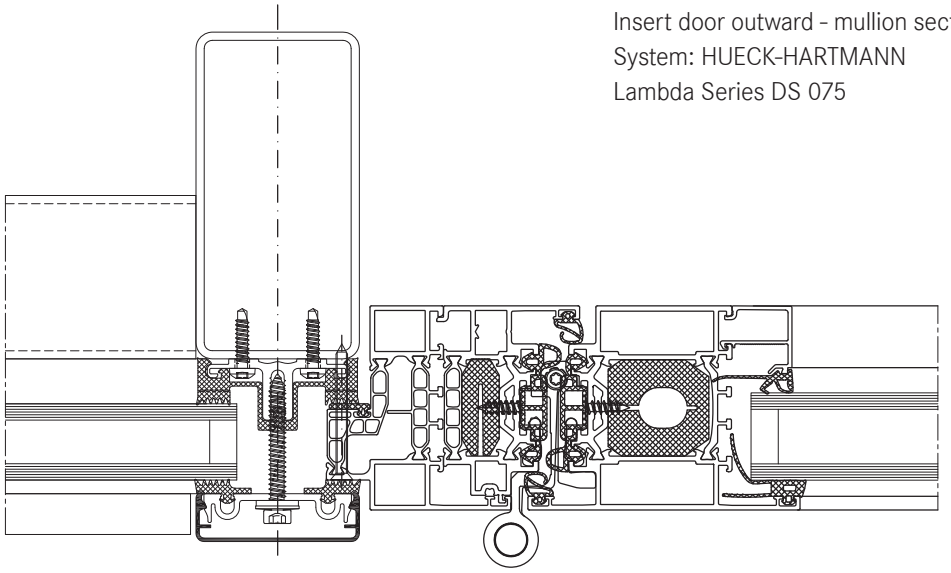
Stabalux AK-S
Design

Installing windows and doors



Insert door outward - transom section
System: HUECK-HARTMANN
Lambda Series DS 075

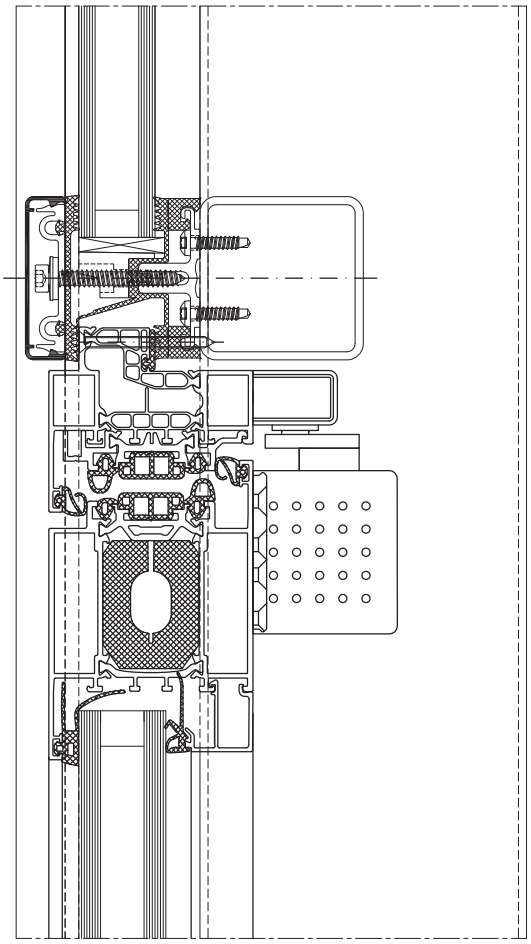




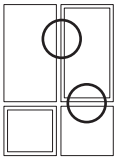
Insert door outward - mullion section
System: HUECK-HARTMANN
Lambda Series DS 075

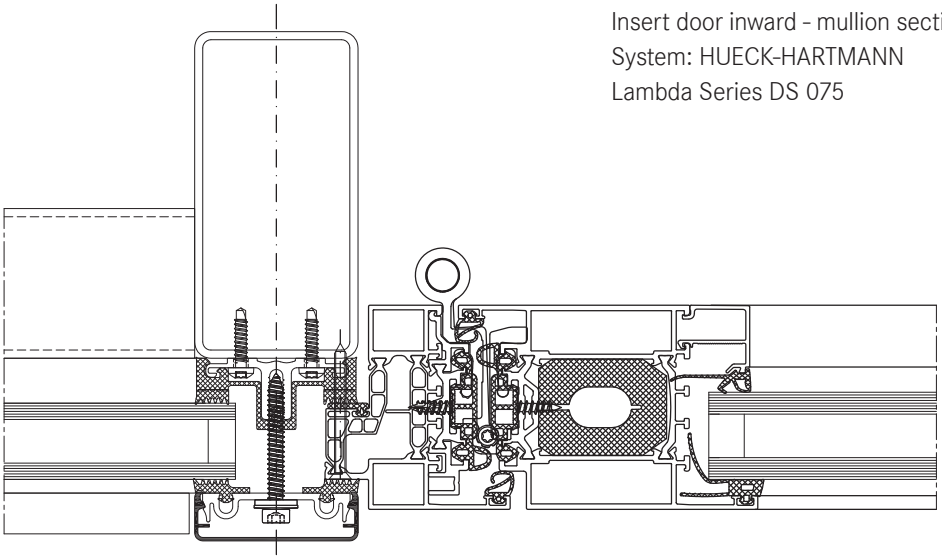
AK-S_3.3_020.dwg

Installing windows and doors



Insert door inward - transom section
System: HUECK-HARTMANN
Lambda Series DS 075

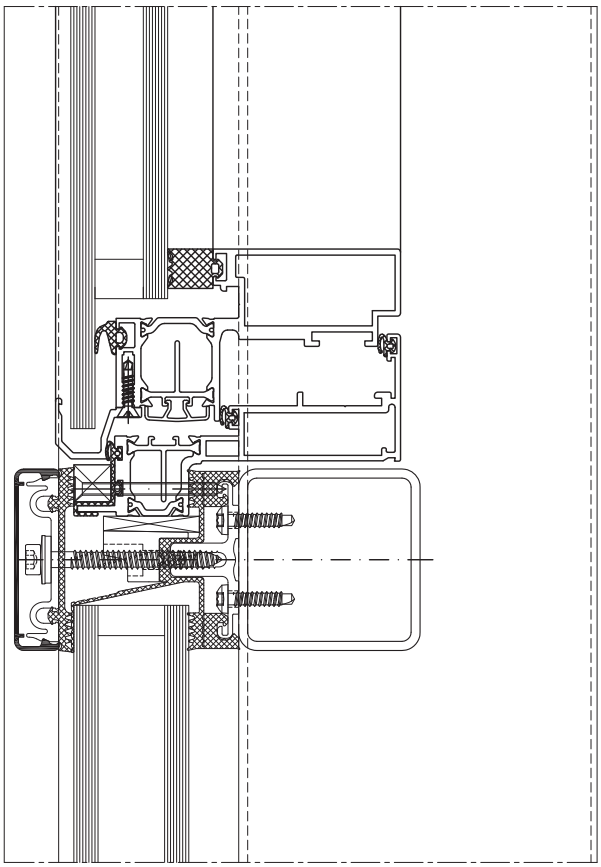




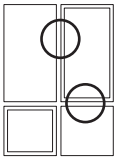
Insert door inward - mullion section
System: HUECK-HARTMANN
Lambda Series DS 075

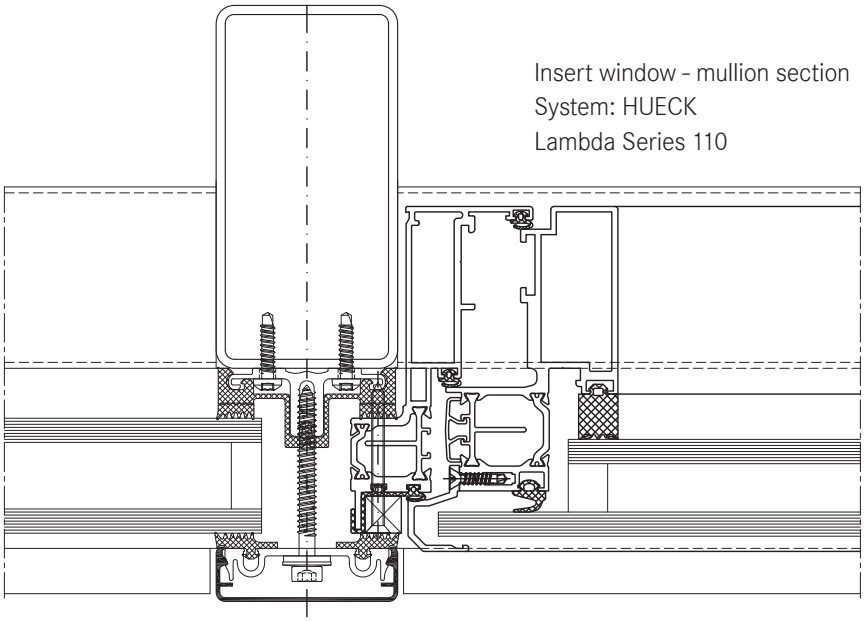
AK-S_3.3_021.dwg

Installing windows and doors



Insert window - transom section
System: HUECK
Lambda Series 110

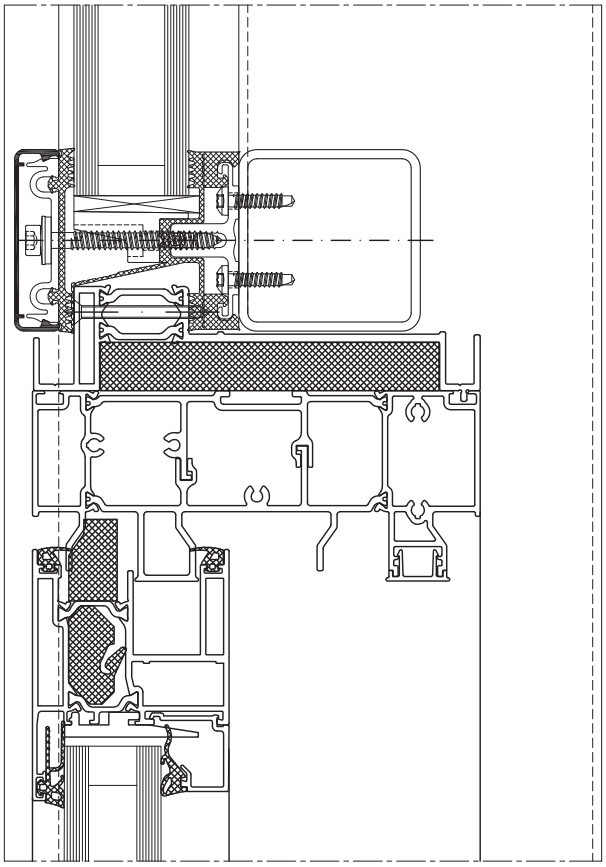




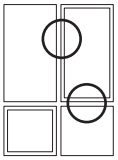
Insert window - mullion section
System: HUECK
Lambda Series 110

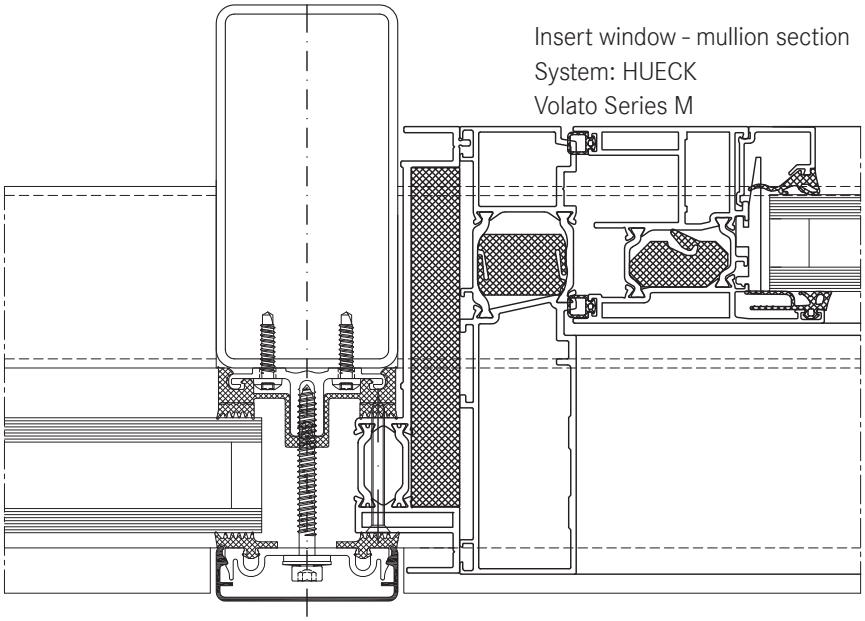
AK-S_3.3_022.dwg

Installing windows and doors



Insert window - transom section
System: HUECK
Volato Series M



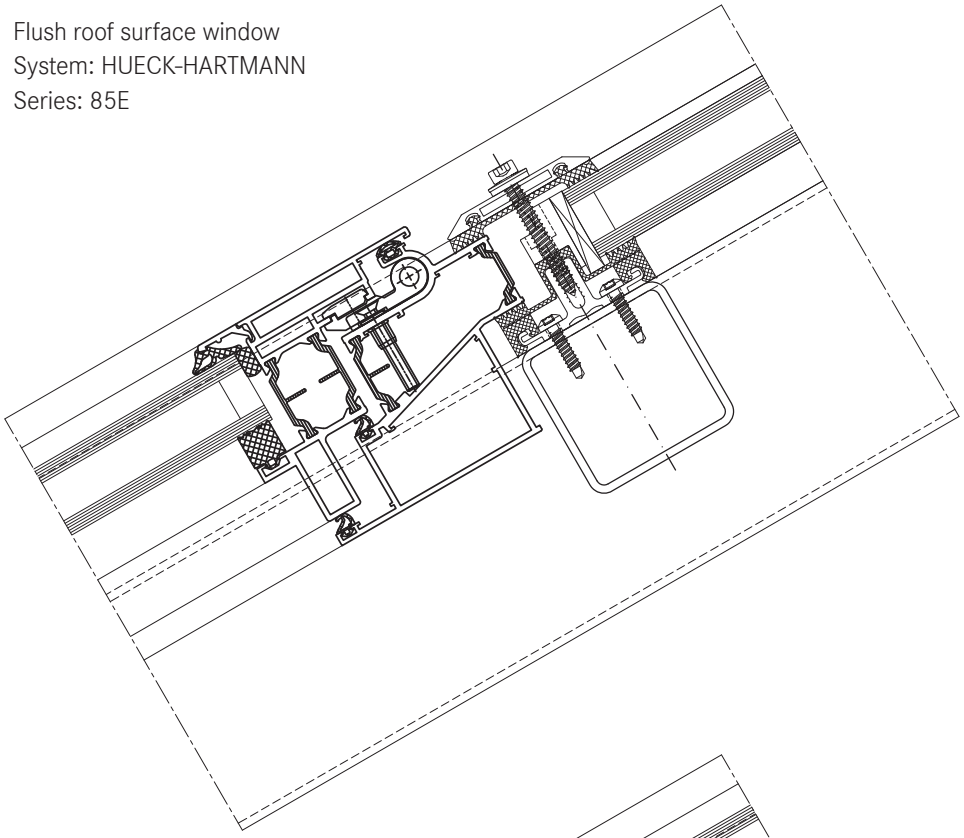


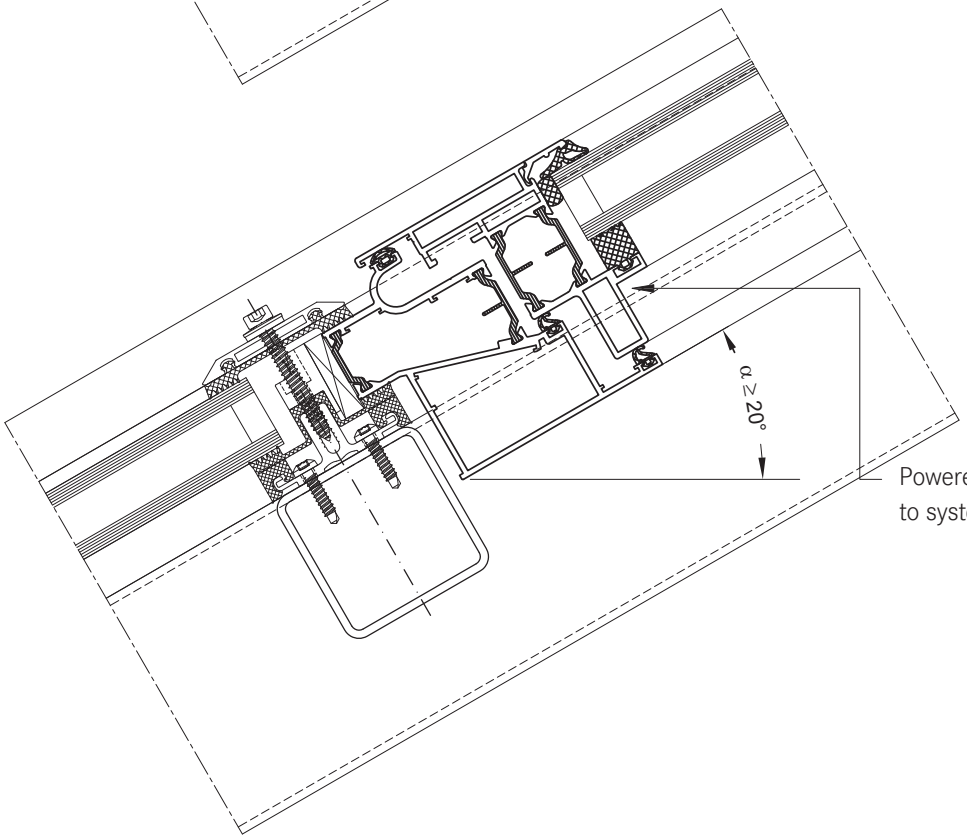
Insert window - mullion section
System: HUECK
Volato Series M

AK-S_3.3_023.dwg

Installing windows and doors

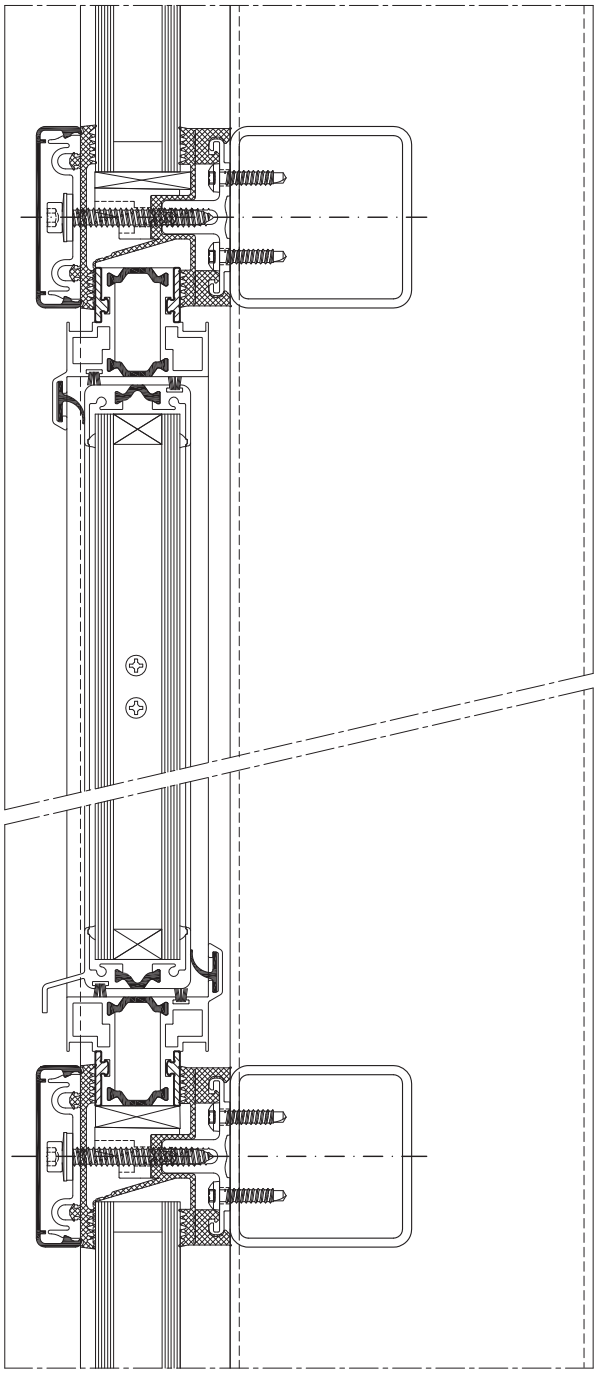
Flush roof surface window
System: HUECK-HARTMANN
Series: 85E



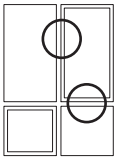


AK-S_3.3_024.dwg

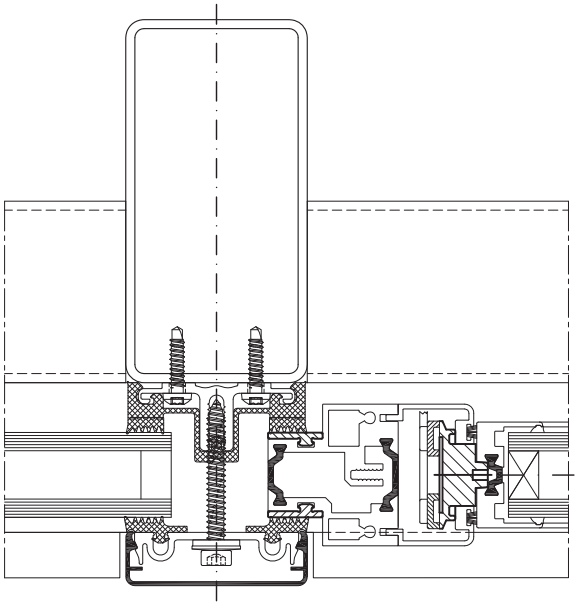
Installing windows and doors



Insert window - transom section
System: Hahn
Series: Louvered windows S9-iVt-05

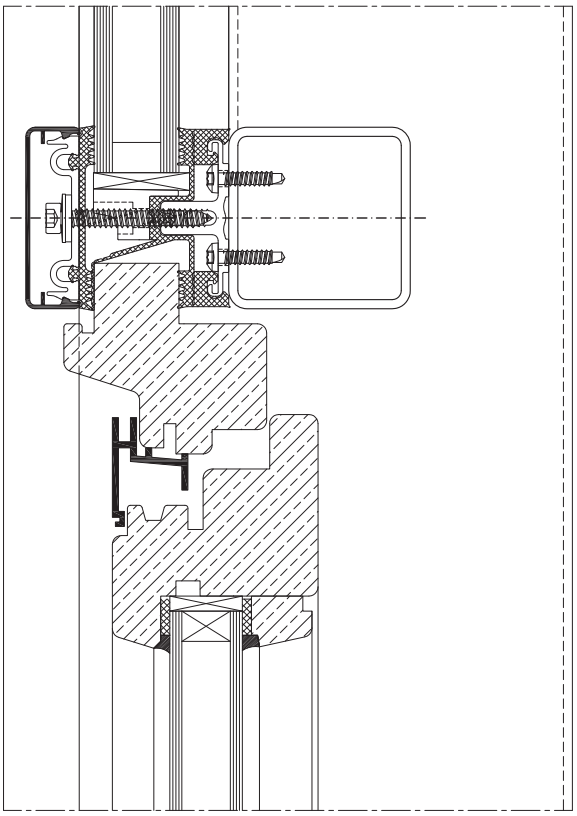


Insert window - mullion section
System: Hahn
Series: Louvered windows S9-iVt-05

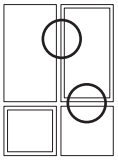


AK-S_3.3_025.dwg

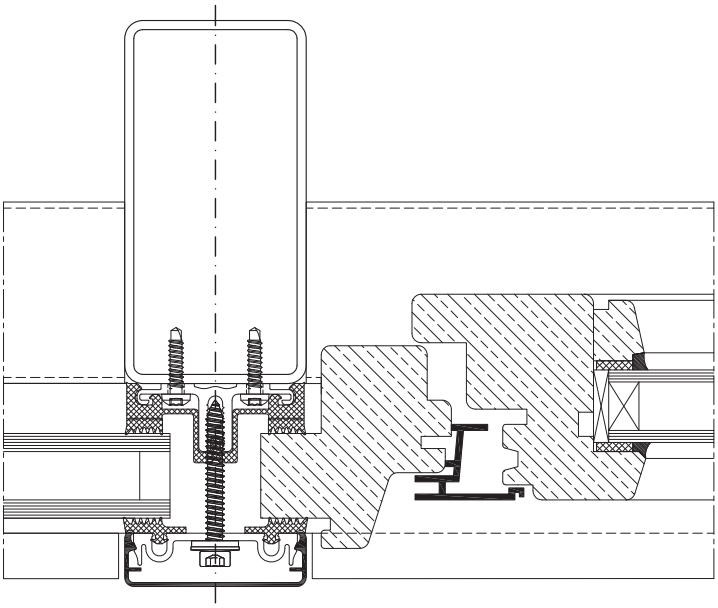
Installing windows and doors



Insert window - transom section
Timber



Insert window - mullion section
Timber



AK-S_3.3_026.dwg