Norden Facade AK-H

By EFTCG
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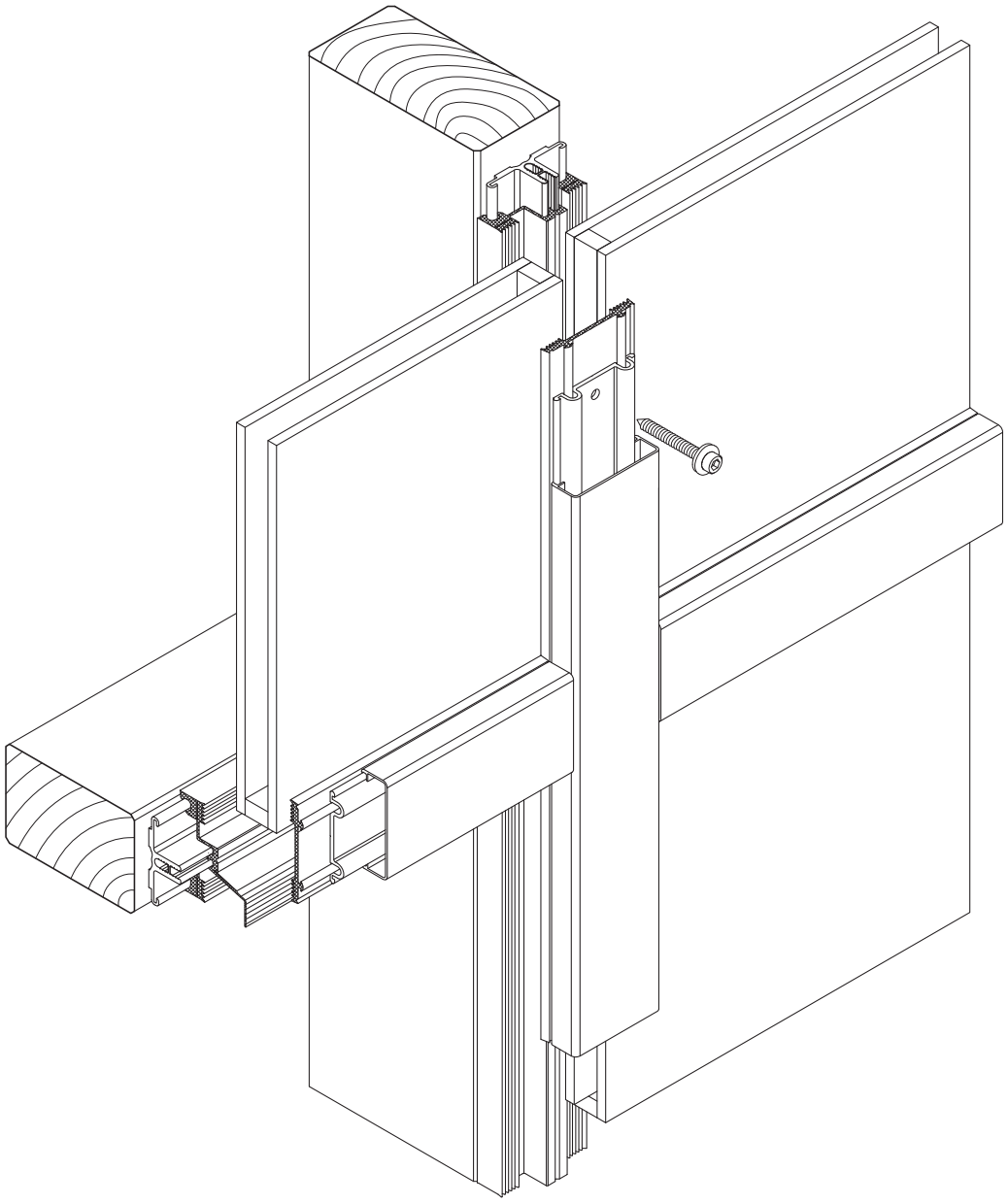
System properties

3.1
1

Timber facade system with add-on design



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System properties

System Norden Facade AK-H Aluminium Add-On Channel AK 5010/ AK 6010

- The Norden Facade System AK-H provides a complete range of products in 50 mm. 60 mm and 80 mm widths for vertical and inclined glazing.
- The single piece add-on channel is used the same way for both facades and roofs.
- The Norden Facade add-on channel is suitable for custom glass structures with single or double glazing.
- The Norden Facade add-on channel allows direct attach-ment to a timber supporting substructure.
- The substructure made from timber profiles can be freely chosen and offers good value options for designing facades and roof.
- Pre-assembly of support profiles and add-on channels in the workshop is possible. Timber 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-H therefore makes it suitable for restoration of existing facades and roofs.
- The timber 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 Norden Facade range. Pre-drilling of timber profiles is generally not necessary. However, this should be considered in the case of high-quality timbers. Application of screw fittings should be controlled.
- 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
- 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 up to 60 mm.
- Attachment to the substructure, the clamp connection and glass supports are all regulated by general building control certification Z-14.4-767.
- The System AK-H allows good U_f values to be achieved. Installing slab insulation results in significant improvements to the thermal insulation properties.

Specifications

System widths	**50, 60, 80 mm**	
Air permeability EN 12152	AE	
Driving rain resistance EN 12154/ENV 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		≤ 1030 kg
Clamp connection		abZ Z-14.4-767
Burglary resistance DIN EN 1627	RC 2	
U_f value	U_f = 0.67 W/(m²K) Glass thickness 46 mm, slab insulation	

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 Norden Facade sealing geometry prevents moisture ingress.
- Condensation is guided away in a controlled manner.
- For vertical and roof glazing, Norden Facade offers an over-lapping 2-level sealing system.
- Three guide rails hold the seals in exactly the right position when using the single-piece Norden Facade add-on channel and ensure even support for glass on all sides.
- Seal flaps 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 Norden Facade AK-H has good thermal insulation values. A heat transfer coefficient of U_f for frames of up to 0.69 W/(m²K) are achieved with a glass thickness of 44 mm.
The use slab insulation 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.

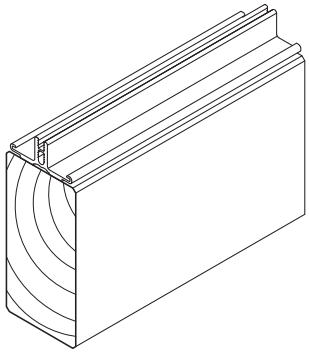
Burglar resistance **(Section 9)**

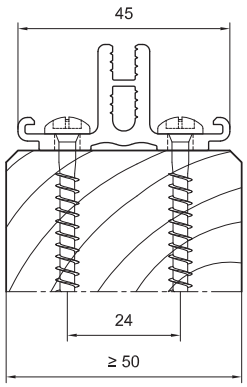
The Norden Facade System AK-H has burglar resistant proper-ties. The test was performed according to DIN EN 1627. Facades in resistance class RC2 can be mounted on the system widths 50 mm, 60 mm and 80 mm.
Class RC2 is classified as a moderate risk. It is recom-mended for use in residential, commercial 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 Norden Facade System AK-H is the same as the normal con-struction. All benefits of using threaded tubes are pre-served. The benefits of direct screw fittings in the central groove are preserved.

System properties

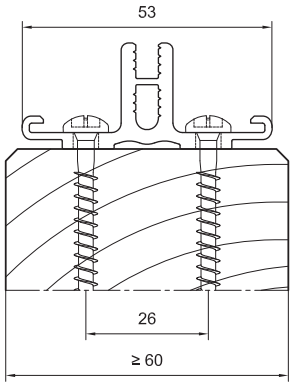
Timber profile with add-on channel AK 5010/ AK 6010

AK 5010





AK 6010



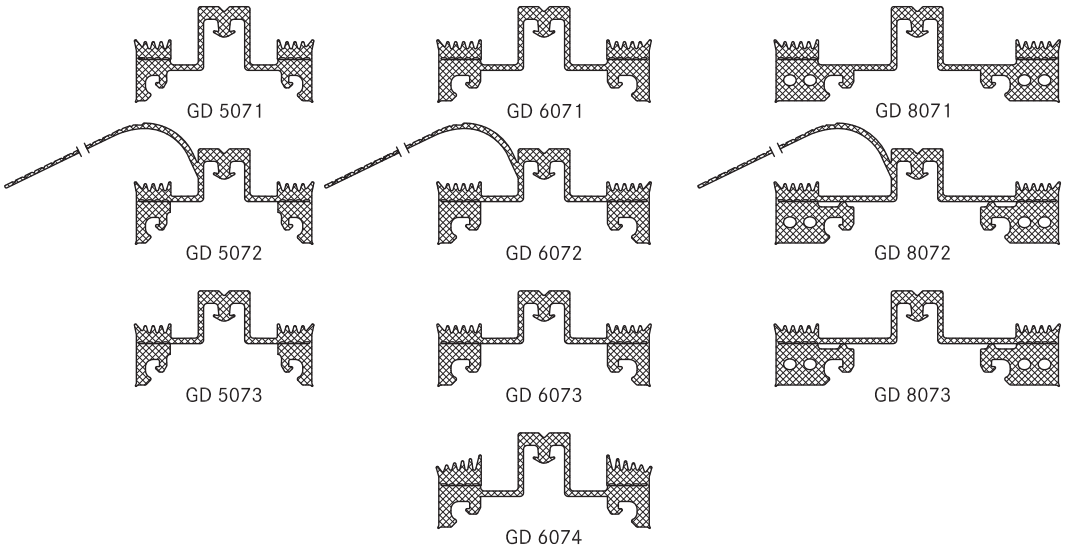
Overview

Material (Section 3.2.1)	AK 5010/ AK 6010	Aluminium EN 6360 T66	
	Wood types	min. softwood C24 (with a gross density of 350 kg/m³) min. laminated timber GL24h (with a gross density of 380 kg/m³)	
Pre-cut (Section 3.2.5)	AK length on mullion	$\ell_{AK} = \ell_{mullion}$	
	AK length on transoms	$\ell_{AK} = \ell_{transom}$ - (2 x 15 mm)	
	AK length on intermediate mullions	$\ell_{AK} = \ell_{intermediate\ mullion}$ - (2 x 15 mm)	
Attachments (Section 3.1.1)	to timber profile	**Z 0170**	
Attachment (Section 3.2.5)		First set of screw fittings placed in pairs, then every 200 mm **= approx. 6 screws/m**	
	Edge distance - mullion	≤ 100 mm	
	Edge distance - transoms	approx. 100 mm (be aware of T-joints and glass supports)	
Glass supports (Section 3.2.10)	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	**6 x Z 0170**
	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 Z 0170**
	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 Z 0170**
Inner seal System 60 mm (Section 3.1.2)	Facade + roof mullion	**GD 6071** (without radii) **GD 6074** (polygonal convex 3° - 15°)	
	Facade transoms	**GD 6072** (without radii)	
	Roof - transoms	**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 transoms	**GD 8072 (without radii)**	
	Roof - transoms	**GD 8073 (without radii) also for facade single-glazing**	
	Sealing piece	**Z 0062 | 1 x per transom end**	

System properties

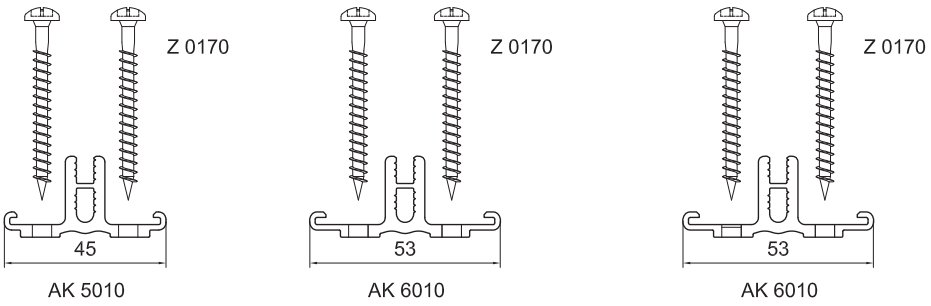
AK 5010/AK 6010 - Product Overview

System width:	50 mm	60 mm	80 mm

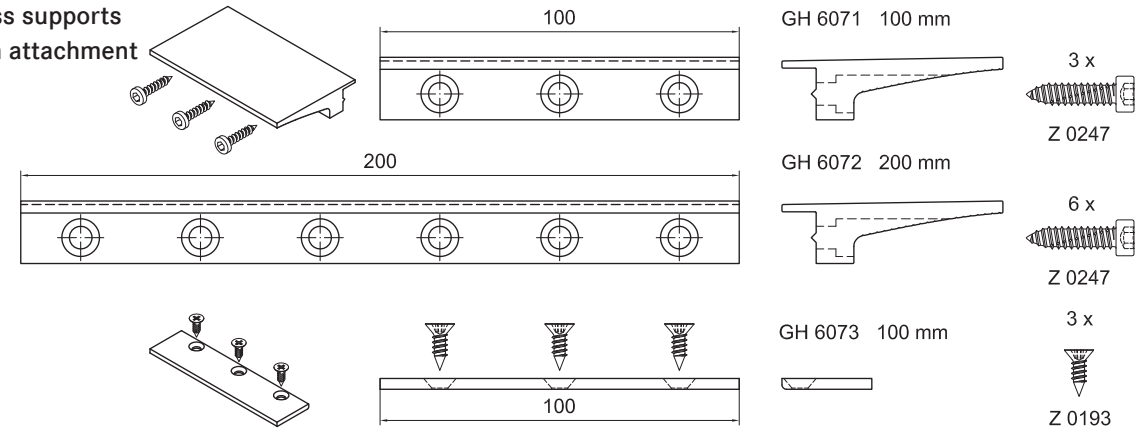


Inner seals with sealing piece

add-on profiles with attachment on wood



Glass supports with attachment

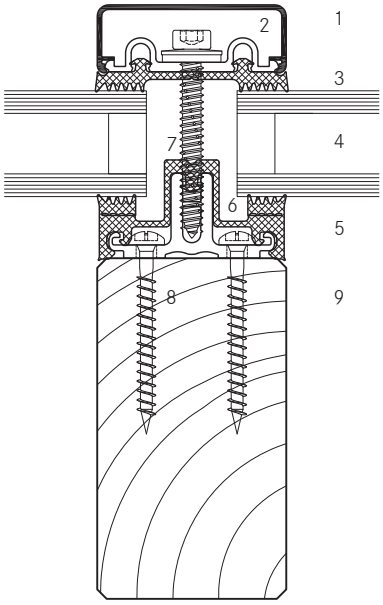


*) Available on request

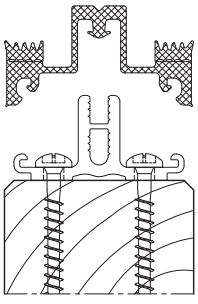
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Vertical glazing mullion



Inner seal vertical glazing mullion
System width 50 mm



GD 5071

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

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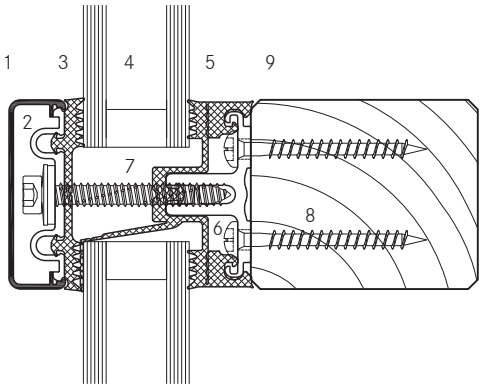
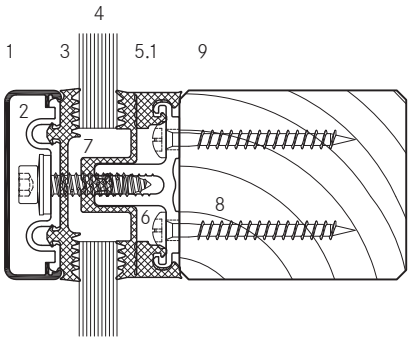
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Vertical glazing transom double glazing

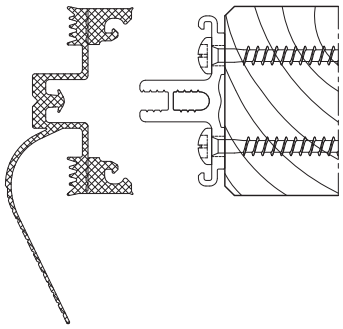


Vertical glazing transom single glazing



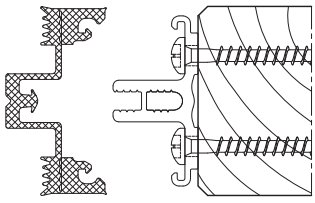
Inner seal vertical glazing transoms System 50 mm double glazing

GD 5072



Inner seal vertical glazing transoms System 50 mm single glazing

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 Timber profile

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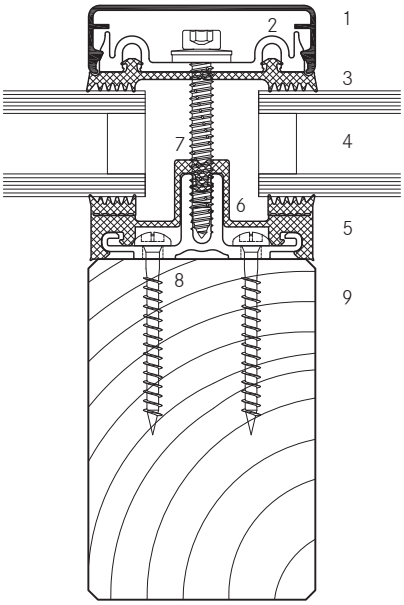
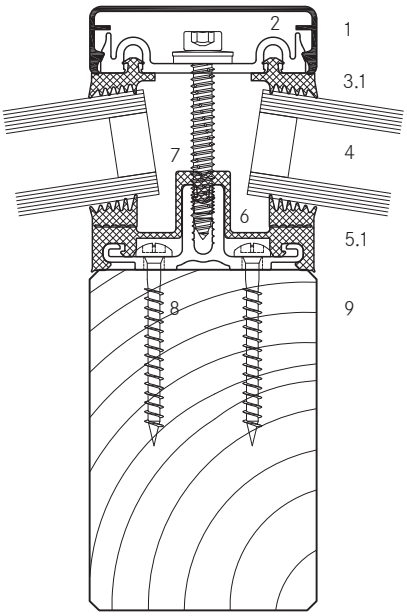
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

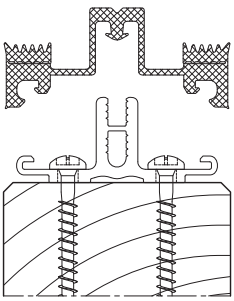
Vertical glazing mullion



Polygonal glazing mullion- convex / 3° - 15°

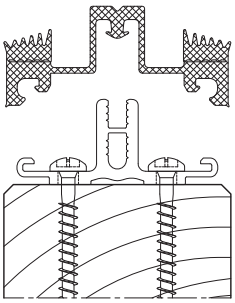


Inner seal vertical glazing mullion
System width 60 mm



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 AK 6010
7 System screw fittings clamp connection
8 System screw fittings add-on channel AK 6010/timber profile
9 Timber profile

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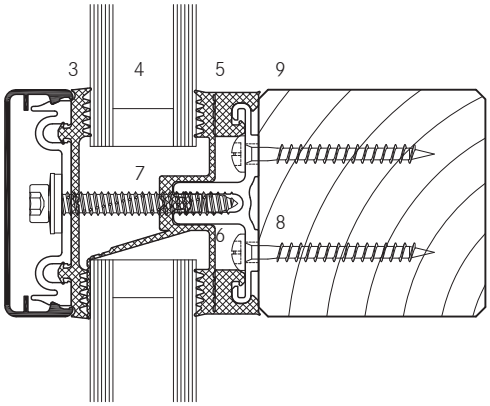
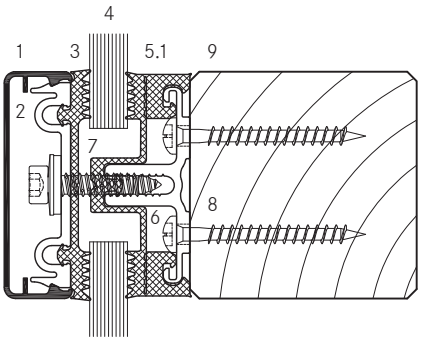
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Vertical glazing transom double glazing

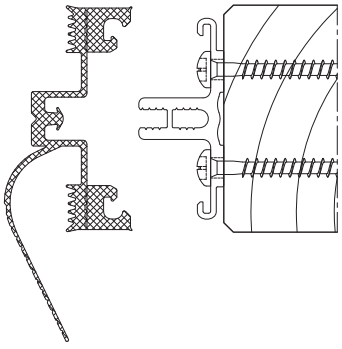


Vertical glazing transom single glazing



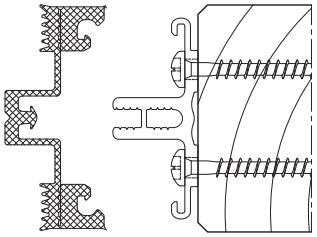
Inner seal vertical glazing transoms System 60 mm single glazing

GD 6072



Inner seal vertical glazing transoms System 60 mm single glazing

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 AK6010
7 System screw fittings clamp connection
8 System screw fittings add-on channel/support profile
9 Timber profile

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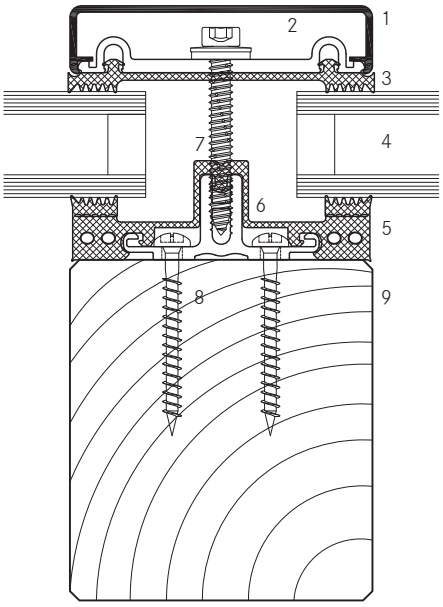
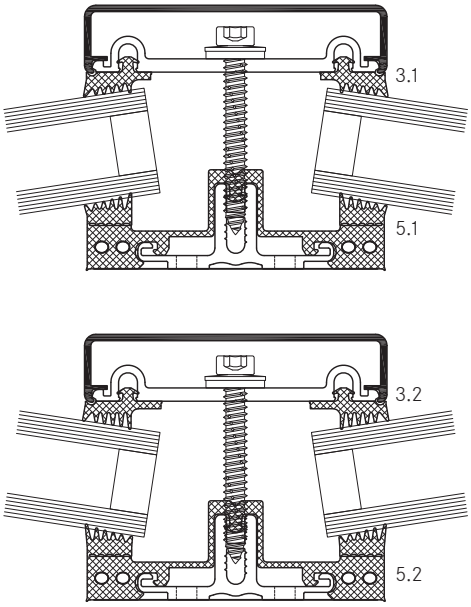
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

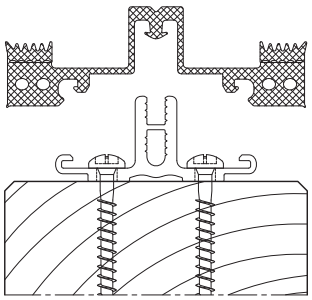
Vertical glazing mullion



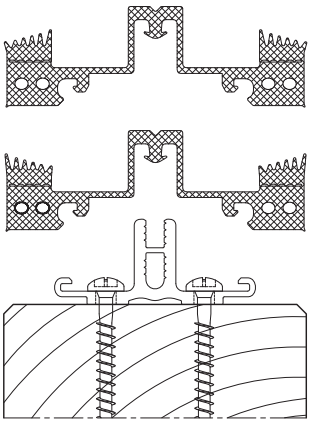
Polygonal glazing mullion- convex / 3° - 15°



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

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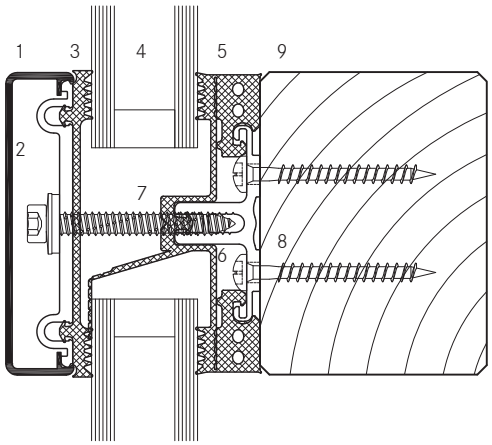
*) Erhältlich auf Anfrage

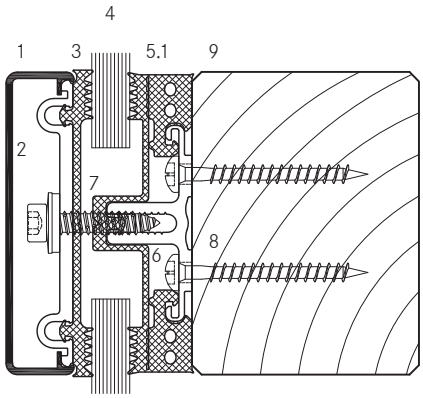
System cross sections and inner seals - facade

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Vertical glazing transom double glazing

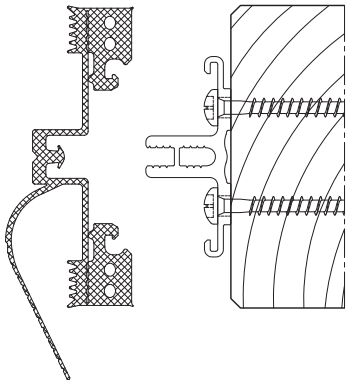


Vertical glazing transom single glazing



Inner seal vertical glazing transoms
System 80 mm single glazing

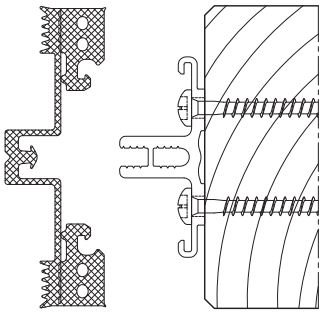
GD 8072



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

Inner seal vertical glazing transoms
System 80 mm single glazing

GD 8073



5.1 Inner transom seal single glazing
6 Add-on channel AK6010
7 System screw fittings clamp connection
8 System screw fittings add-on channel/support profile
9 Timber profile

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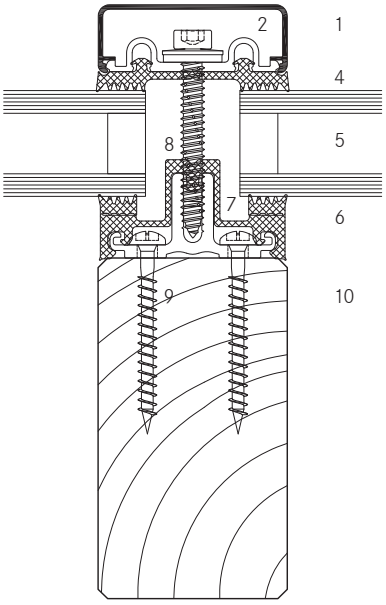
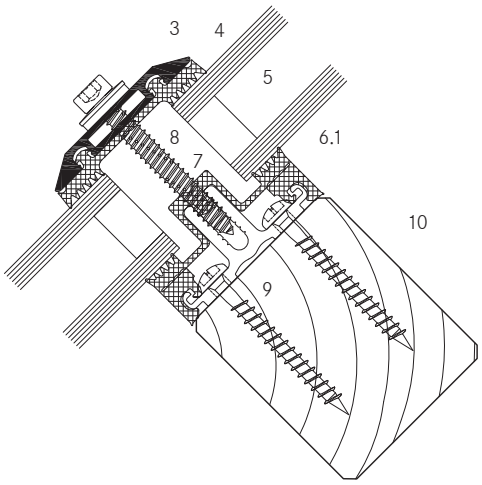
System cross sections and inner seals - roof

Inner seal 16.5 mm tall / 2 overlapping drainage levels

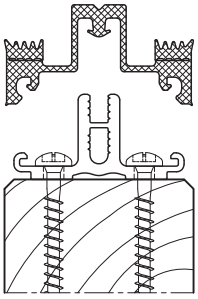
Inclined glazing rafter



Inclined glazing transom



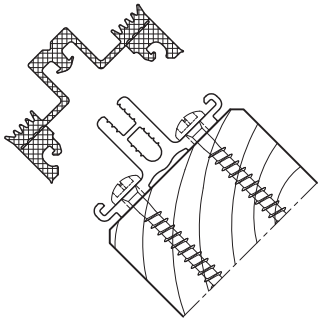
Inner seal inclined glazing rafter
System width 50 mm



GD 5071

Inner seal inclined glazing transom
System width 50 mm

GD 5073



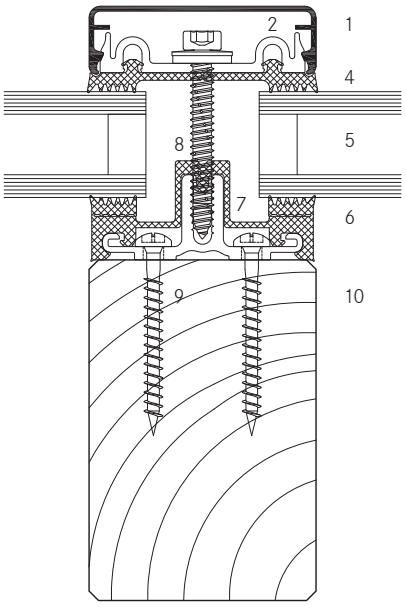
1 Cover profile
2 Pressure profile
3 Cover strip
4 Outer seal
5 Glass / fill element
6 Inner mullion seal
6.1 Inner transom seal for inclined glazing
7 Add-on channel AK 5010
8 System screw fittings clamp connection
9 System screw fittings add-on channel/timber profile
10 Timber profile

AK-H_3.1_003.dwg

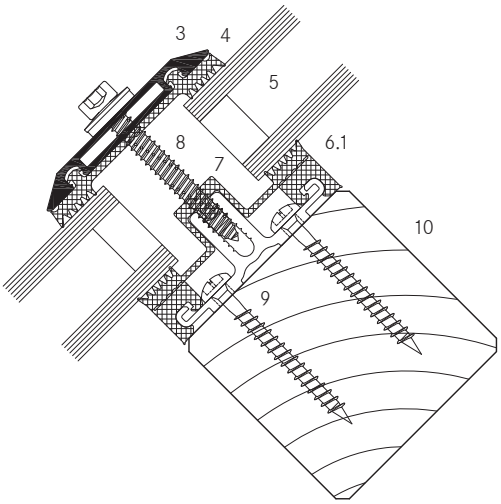
System cross sections and inner seals - roof

Inner seal 16.5 mm tall / 2 overlapping drainage levels

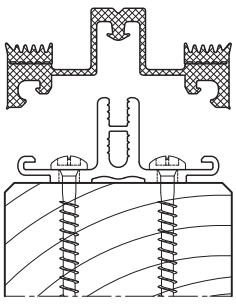
Inclined glazing rafter



Inclined glazing transom



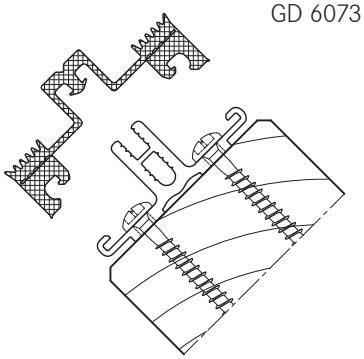
Inner seal inclined glazing rafter
System width 60 mm



GD 6071

Inner seal inclined glazing transom
System width 60 mm

GD 6073



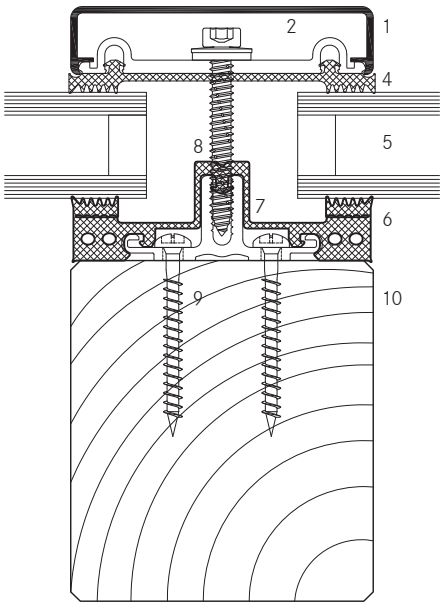
1 Cover profile
2 Pressure profile
3 Cover strip
4 Outer seal
5 Glass / fill element
6 Inner mullion seal
6.1 Inner transom seal for inclined glazing
7 Add-on channel AK 6010
8 System screw fittings clamp connection
9 System screw fittings add-on channel/timber profile
10 Timber profile

AK-H_3.1_003.dwg

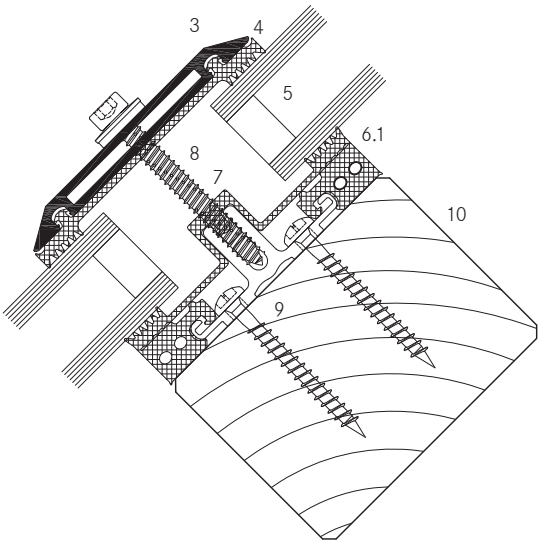
System cross sections and inner seals - roof

Inner seal 16.5 mm tall / 2 overlapping drainage levels

Inclined glazing rafter

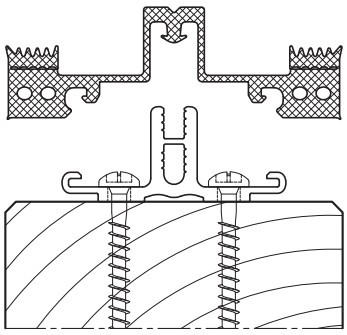


Inclined glazing transom



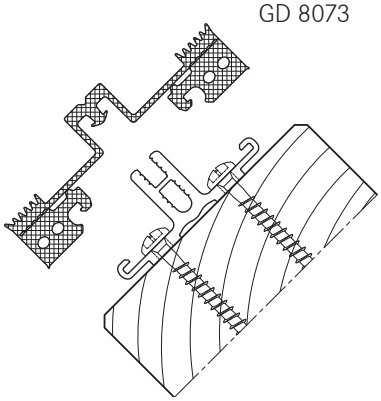
Inner seal inclined glazing rafter
System width 80 mm

GD 8071



Inner seal inclined glazing transom
System width 80 mm

GD 8073



1 Cover profile
2 Pressure profile
3 Cover strip
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6.1 Inner transom seal for inclined glazing
7 Add-on channel AK 6010
8 System screw fittings clamp connection
9 System screw fittings add-on channel/timber profile
10 Timber profile

AK-H_3.1_003.dwg

Cover strips and outer seals

Wooden covering strips

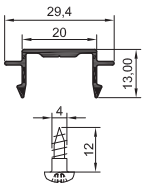
Wooden cover strips can be easily mounted to mullions and transoms using aluminium top or lower bars. The pressure profile UL5003/UL6003/UL8003 acts as a clamping strip.

Assembly: apply the two-piece GD 1903 outer seal to the upper strip attach to the system using screws. Divide the OL 1903 into 80 mm long pieces and attached centrally using 3 screws to the wooden cover strip at 300 mm intervals and then clip to the upper strip.

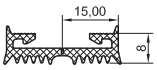
The wooden cover strip to be provided by the customer is a supplement to the Norden Facade System ware and, if necessary, mechanically due to the natural properties of wood weathering to secure. Guidelines for the use of exterior wood should be followed.

(Please see section 3.2.7 on assembling the outer seal)

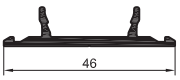
OL1903



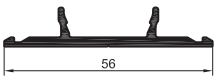
GD1903 (2-teilig)



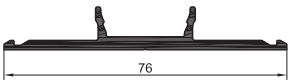
UL5003



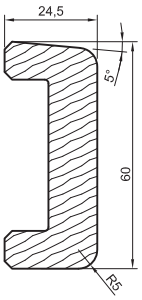
UL6003



UL8003



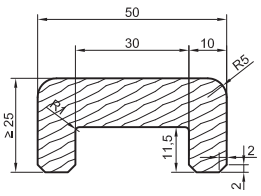
Transom

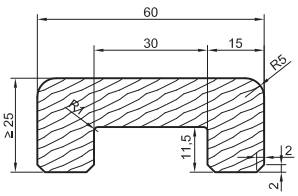


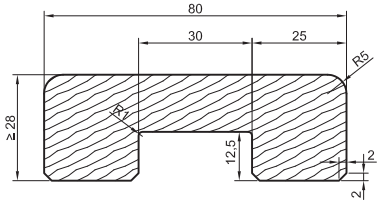
Set the wooden upper strip in the transom with an incline of 5°.

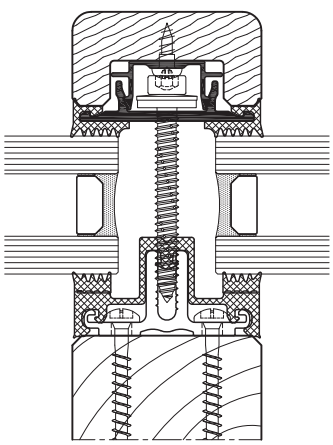
Example: System 60 mm

Mullion

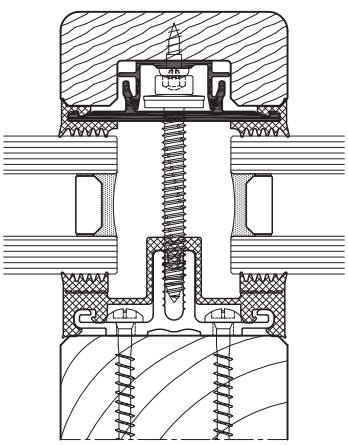




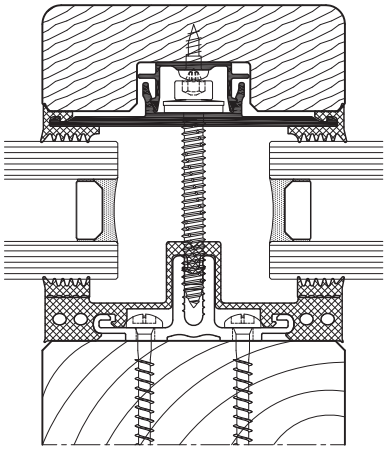




System 50



System 60



System 80

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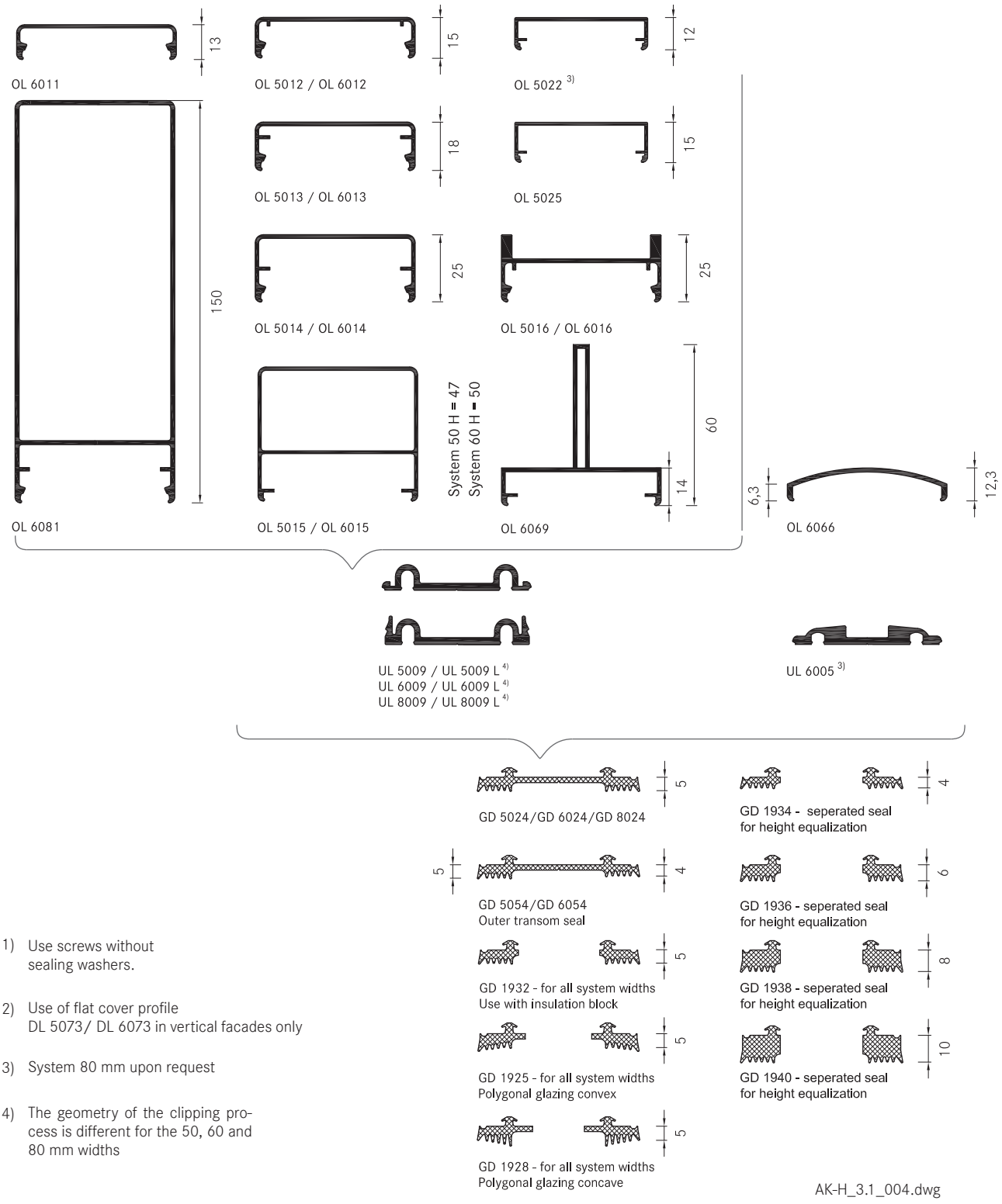
Cover strips and outer seals

Aluminium - concealed screw fittings



1) Use screws without sealing washers.

2) Use of flat cover profile DL 5073/ DL 6073 in vertical facades only

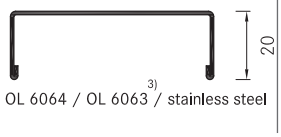
3) System 80 mm upon request

4) The geometry of the clipping process is different for the 50, 60 and 80 mm widths

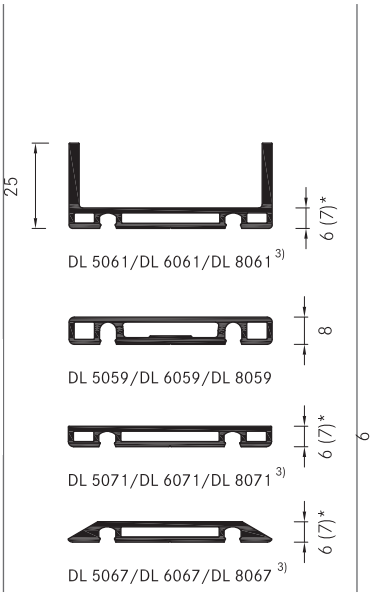
AK-H_3.1_004.dwg

Cover strips and outer seals

Stainless steel - concealed screw fittings

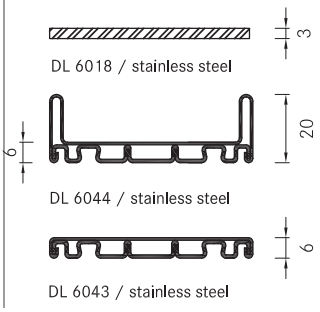


Aluminium- visible screw fittings



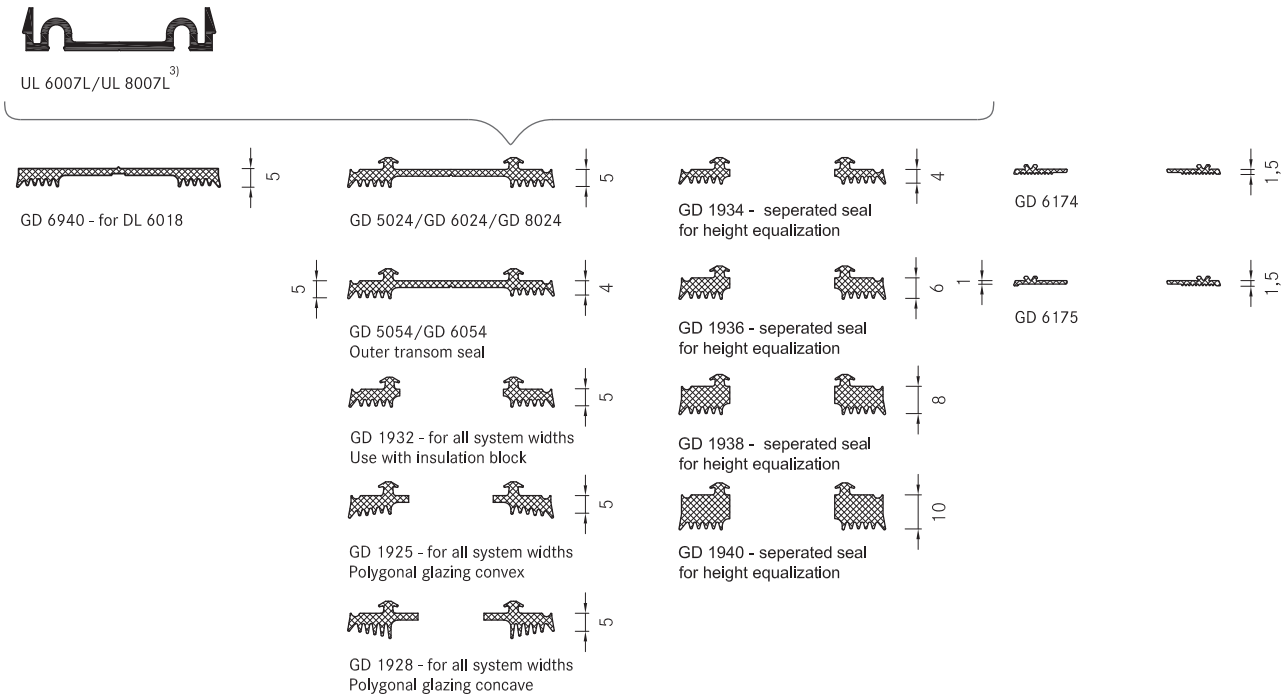
* Values in ( ) apply to system width 80 mm

Stainless steel - visible screw fittings



Flat cover profile DL 6073

* Values in ( ) apply to system width 80 mm



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Material information

Wood type and quality

The wooden load-bearing substructure is used for mounting the glazing and must meet all load and suitability requirements. The profile dimensions and choice of materials are key. The type of wood chosen depends on the client, architect and/or processor.
All wood materials are produced using wood types permitted by the current Eurocode 5 (DIN EN 1995-1) standard. Alongside the mature solid wood sections and glued laminated timbers, facade construction is increasingly using materials made from laminated veneer. Due to its stability against deformations, we recommend using plywood sections. The following minimum requirements must be met for all wooden materials:

- Softwood, strength class C24
- Laminated timber, strength class GL24h

The use of comparable hardwoods is also permitted.

Wood type	Strength class	Elastic modulus $E_{0,mean}$ [kN/cm²]
Spruce, fir	C16	800
Pine, larch	C24	1100
Douglas Fir, Southern Pine	C30	1200
Western Hemlock	C35	1300
Yellow Cedar	C40	1400
Oak, Teak, Keruing	D30	1100
Beech	D35	1200
Beech, Azalea, Intsia	D40	1300
Angelique (Basralocus)	D40	1300
Azobé (Bongossi)	D60	1700
Laminated timber made using wood from class:		
C24	GL24h	1160
C30	GL28h	1260
C35	GL32h	1370
C40	GL36h	1470
Laminated veneer:		
Kerto Q		1000-1050
Kerto S		1380
Kerto T		1000
Multiplex sheets:		
(plywood)		900-1600

The woods and values mentioned here are examples for guidance only. Exact values for your choice should be determined with the supplier and applicable standards.

Working on the supporting structure

The use of the Norden Facade aluminium add-on channel AK 5010/ AK 6010 allows work to be carried out on the mullion and 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.

Protecting and coating the timber structure

The choice of timber protection and coating is the responsibility of the clients, architects and/or processor. This should be done professionally and to the latest standards.

The supporting structure can be treated and coated either in the workshop or on the construction site itself. A final coating may be applied before mounting the add-on channel.

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.

Aluminium profiles

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

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.
By using different mass distribution, longitudinal shadow formation is possible with cover profiles D L 5073/ DL 6073 and DL 8073. Resulting actions are to be taken with the agreement of the coater.

Material information

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 profile 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 profile 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 pro iles

Norden Facade 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-Norden Facade products.

Other items

All system items are produced according to applicable standards.

Maintenance and care (Section 9)

The information sheets WP.01 – WP.05 from the Associa-tion of Window and Facade Producers (VFF) must be ob-served. The address can be found in the address section. Further information can be found in section 9.0 - Clean-ing / Maintenance.

Profile design

System AK-H

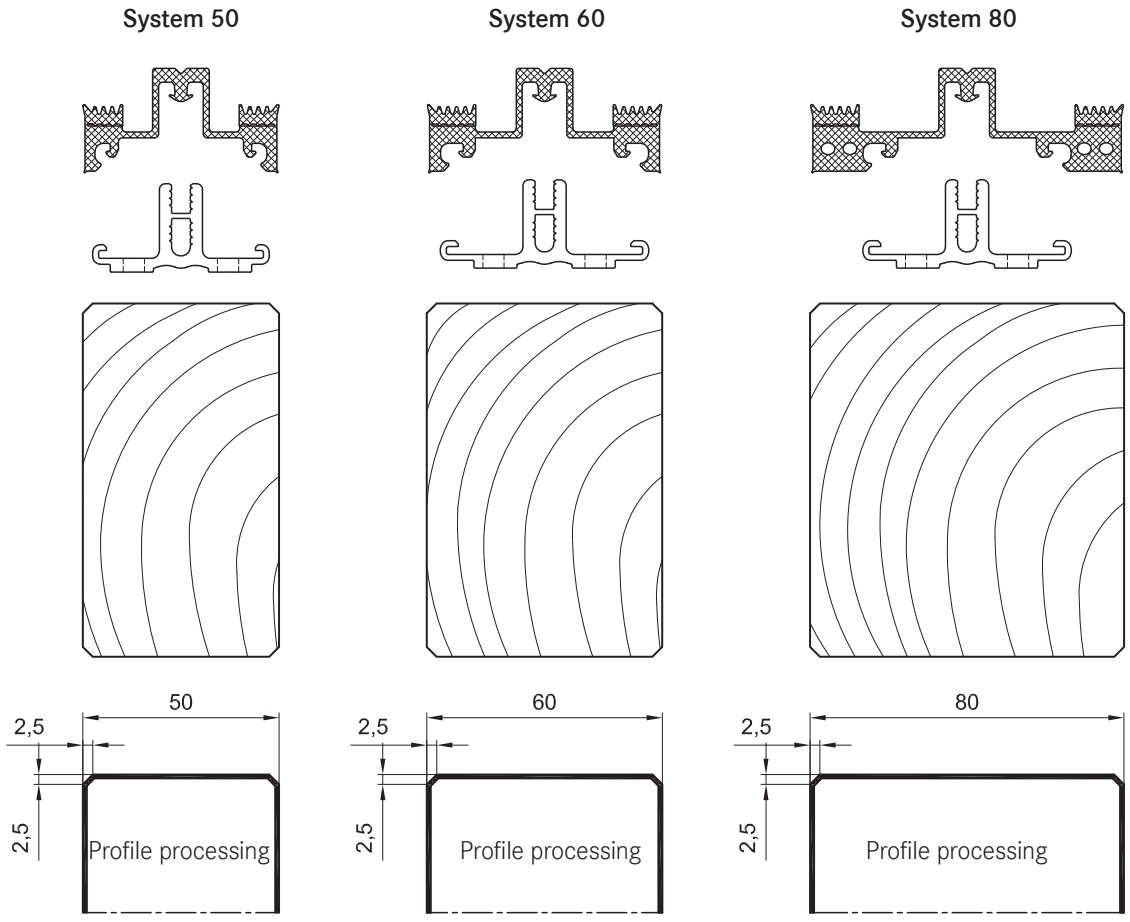
The type of wood chosen depends on the client, architect and/or processor and the following considerations:

- Softwood, strength class C24
- Softwood glued laminated timber, strength class GL24h

The use of comparable hardwoods is also permitted. The profile design is just an example. The add-on channel can also be mounted onto existing profiles.

Note:

Worked edges must be free of shavings and imperfections.



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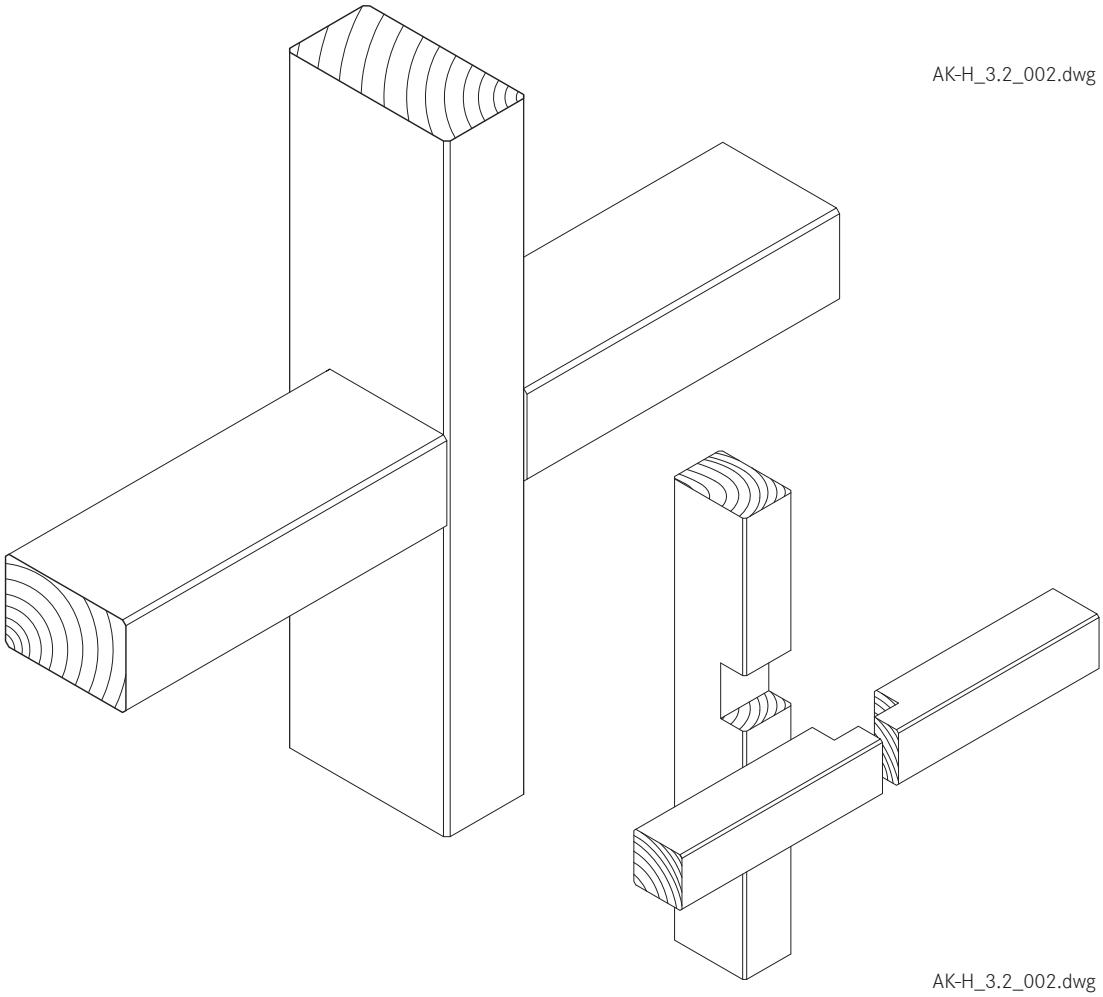
Mullion-transom joint

Principle

- Attachment of the transoms 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.
- Designs are to be chosen that can be considered regular joints for the intended purpose and meet the standards of the Eurocode 5 (DIN EN 1995) or are covered by general building approvals.
- The solutions presented by us are purely examples. A range of designs are possible depending on the shape of the wood and different jointing options.

AK-H_3.2_002.dwg



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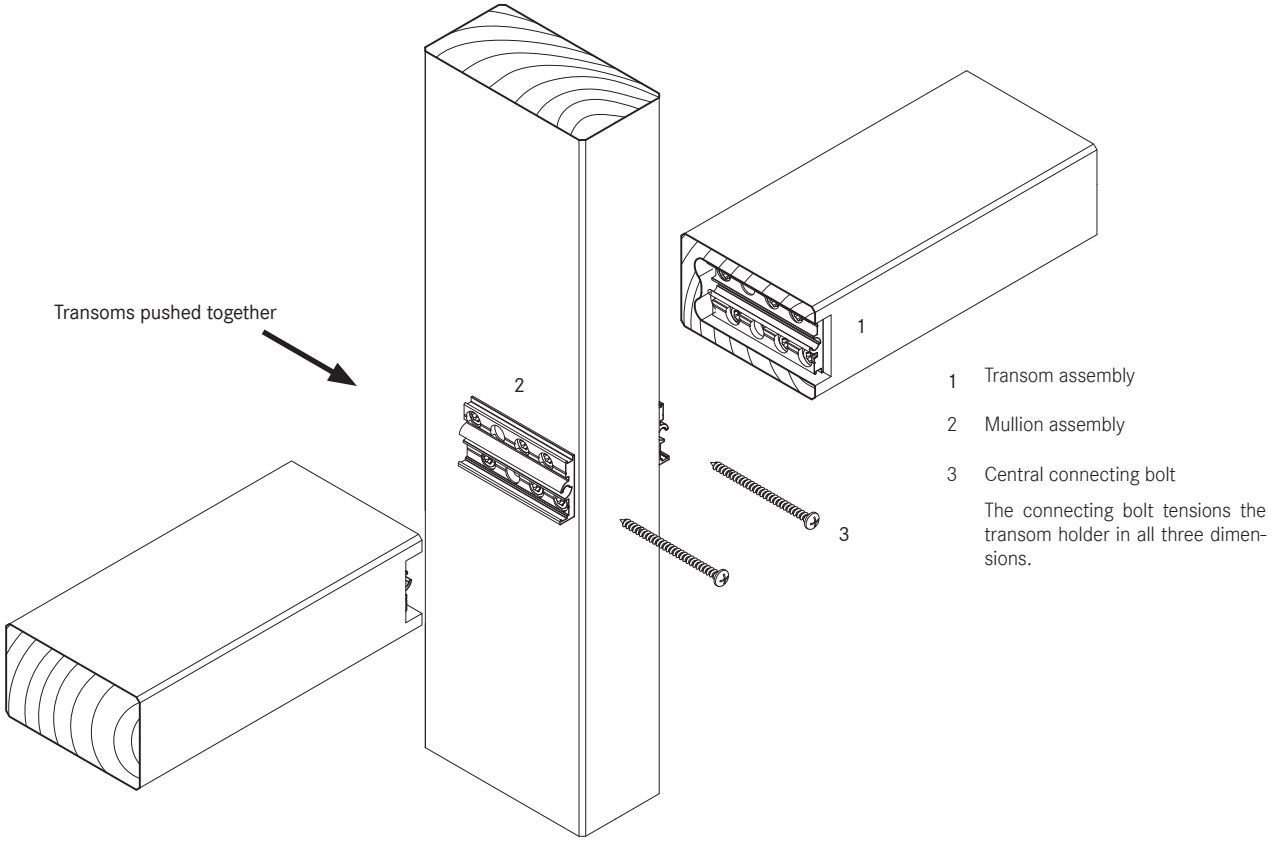
Mullion-transom joint

RHT transom connector for wood systems

- The RHT links wooden mullion and transom constructions with a visible width of 50–80 mm.
- The two identical connector parts are mounted to mullions and transoms and linked with one another by pushing together the transoms.
- A connecting screw locks the connection in all three dimensions.
- The clamping foot on the transom inner seal must be disengaged in the area of the mullion-transom joint.
- When attaching the clamping strips to the system, take care to place the screws outside of the mullion-transom connection in order to avoid a collision with the RHT connector screw fittings.
- The central wooden groove in the transom should begin approx. 80 mm before the end of the transom.
- The glass support should be mounted approx. 100 mm from the end of the transom to prevent any collision between the RHT screws in the transom.



1 Transom assembly

2 Mullion assembly

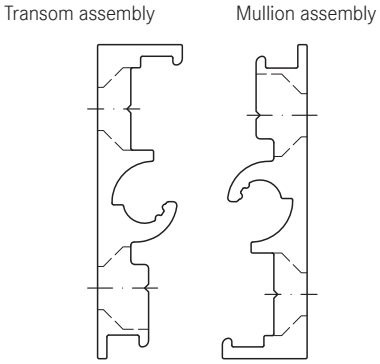
3 Central connecting bolt

The connecting bolt tensions the transom holder in all three dimensions.

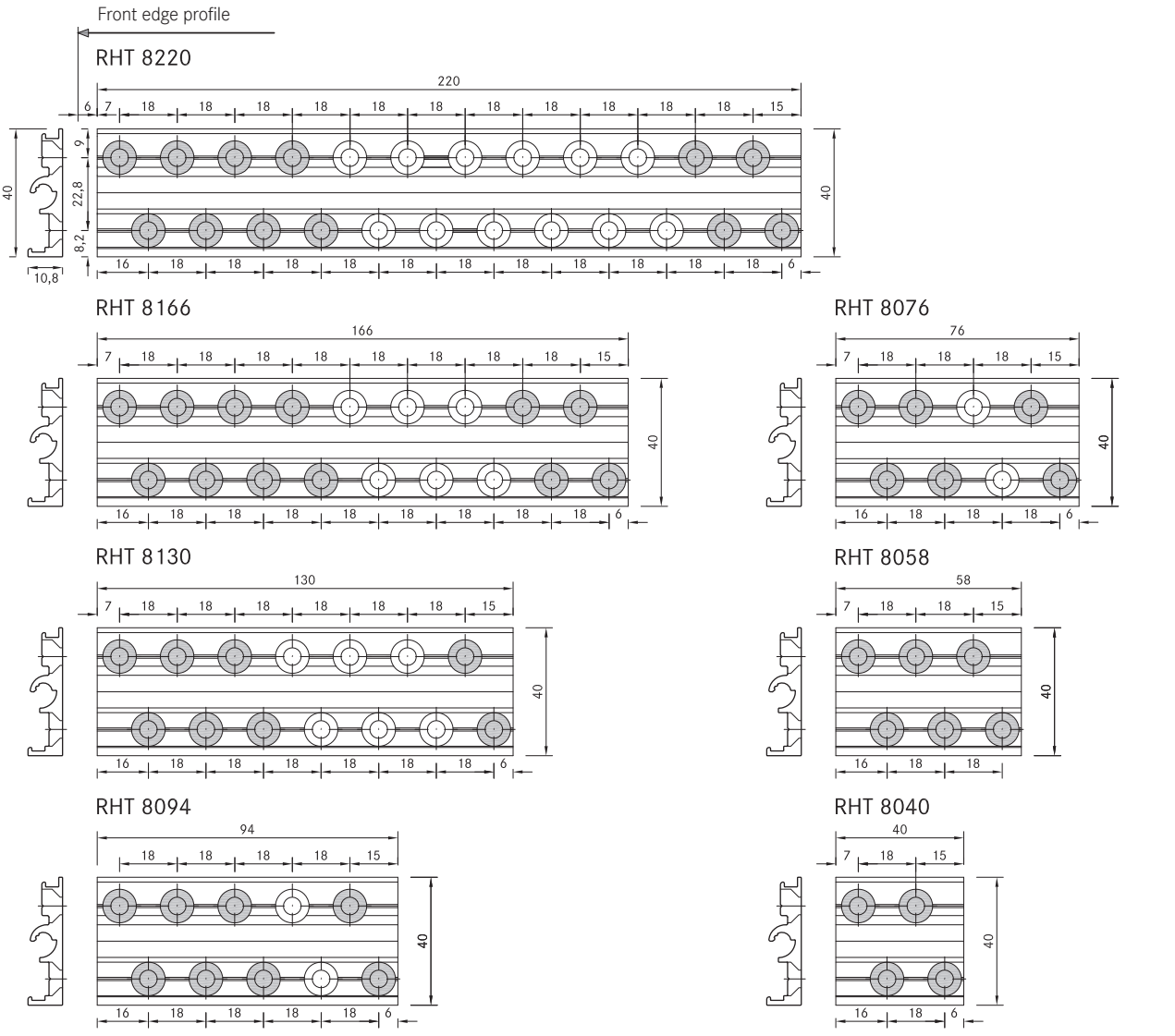
Mullion-transom joint

RHT for wood systems - types

- The range comprises 7 RHT types with different lengths and therefore different load-bearing capacities.
- The screw group comprising a larger number of screws (shown in the diagram) is positioned toward the front edge of the mullion and transom (glass side).



Connector types
Standard screw fittings



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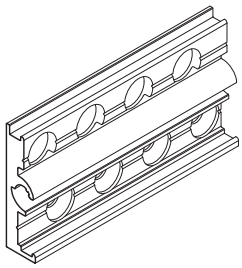
Mullion-transom joint

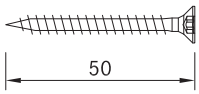
Assembly on the mullion

- The front edge of the connector lies 6 mm behind the front edge of the mullion.
- Z 0126 screws in length 5/50 are always used for attaching to horizontal timbers (mullions).
- When using hard woods or when working near the edge of the wood, a hole of 3 mm diameter should be pre-drilled.
- The number of screws varies for standard screw fittings, depending on the connector type. (Refer to the previous page)
- A combination of screws can be used and calculated case-by-case.

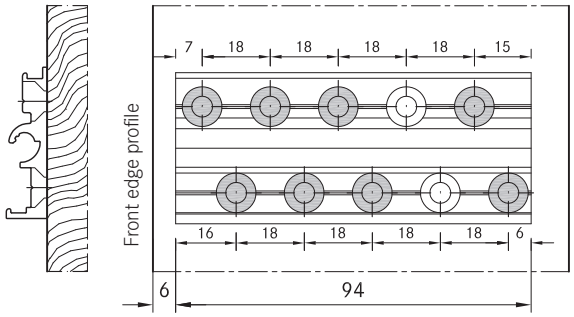
Mullion assembly



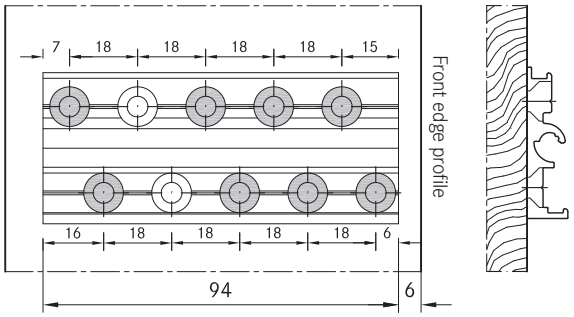
Screw fittings mullion Z 0126



Left mullion with connector e.g. RHT 8094



Right mullion with connector e.g. RHT 8094



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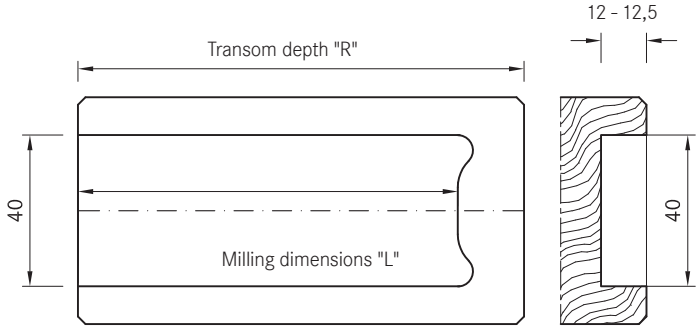
Mullion-transom joint

Assembly on the transom

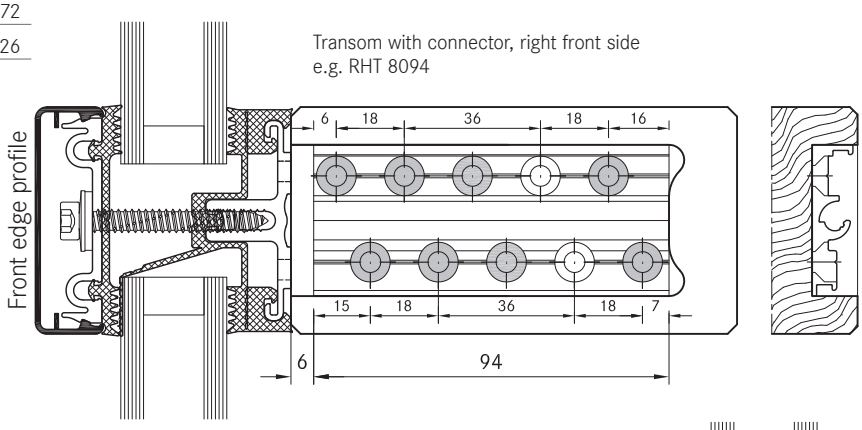
- A recess with 12-12.5 mm depth is milled into the (front of the) transom.
- The milling dimensions are:
  With x length x depth
  40 x (RHT length + 6) x 12-12.5 (mm)
- The milling can be carried out using a standard hand router.
- The front edge of the connector lies 6 mm behind the front edge of the transom.
- Z 0127 screws in length 5/80 are always used for attaching to longitudinal timbers (transoms).
- When using hard woods or when working near the edge of the wood, a hole of 3 mm diameter should be pre-drilled.
- The number of screws varies for standard screw fittings, depending on the connector type. (Refer to the previous page)
- A combination of screws can be used and calculated case-by-case.

Connector type	Transom depth R (mm)	Milling dimensions L (mm)
RHT 8040	55-73	46
RHT 8058	74-91	64
RHT 8076	92-109	82
RHT 8094	110-145	100
RHT 8130	146-181	136
RHT 8166	182-235	172
RHT 8220	236-300	226

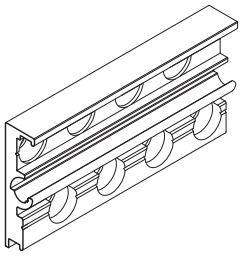


Front-side transom groove, depth 12-12.5 mm

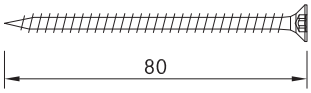
Transom with connector, right front side
e.g. RHT 8094



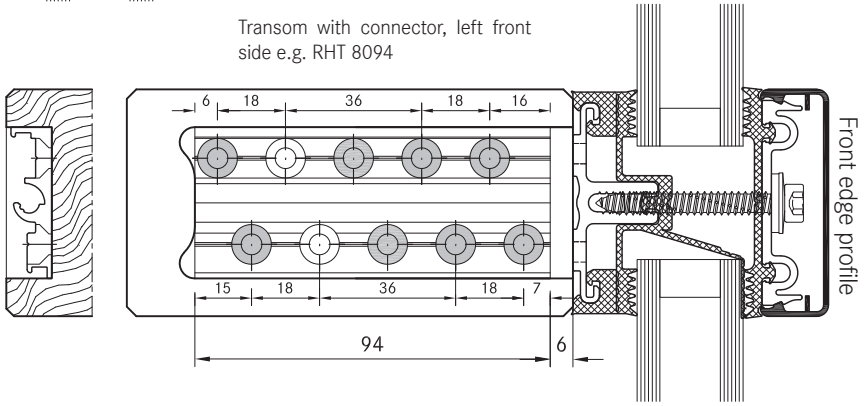
Transom assembly



Screw fitting, transom Z 0127



Transom with connector, left front
side e.g. RHT 8094



AK-H_3.2_003.dwg

Mullion-transom joint

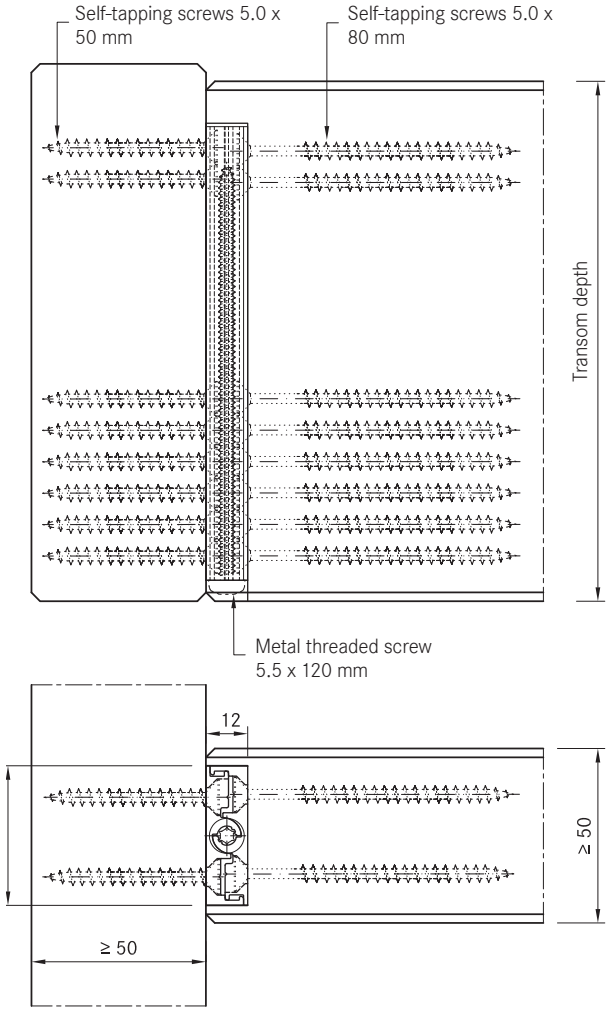
Constructing the timber joint

- The transom is pushed in from the inside to the outside.
- Screwing in the greased connecting screw allows the locked mullion-transom joint to be released in all three dimensions if necessary. This tightens the transom evenly to the mullion along the entire depth.

Linked connectors

- If the transom depth is over 300 mm, 2 connectors can be used along the entire length to improve tensioning of the mullion-transom joint.
- The connector type RHT 8220 is always used on the front edge of the profile. Another connector can be fitted on the RHT 8220 as required.
- A peg is inserted and positioned correctly by the into the connecting screw in order to improve tensioning of the second connector.
- The maximum load-bearing capacity of the RHT 8220 applies in regard to resilience.
- By request, a connector longer than 220mm can be produced. The maximum load-bearing capacity of the RHT 8220 is also valid here.

Example: RHT 8130 top and side views



AK-H_3.2_003.dwg

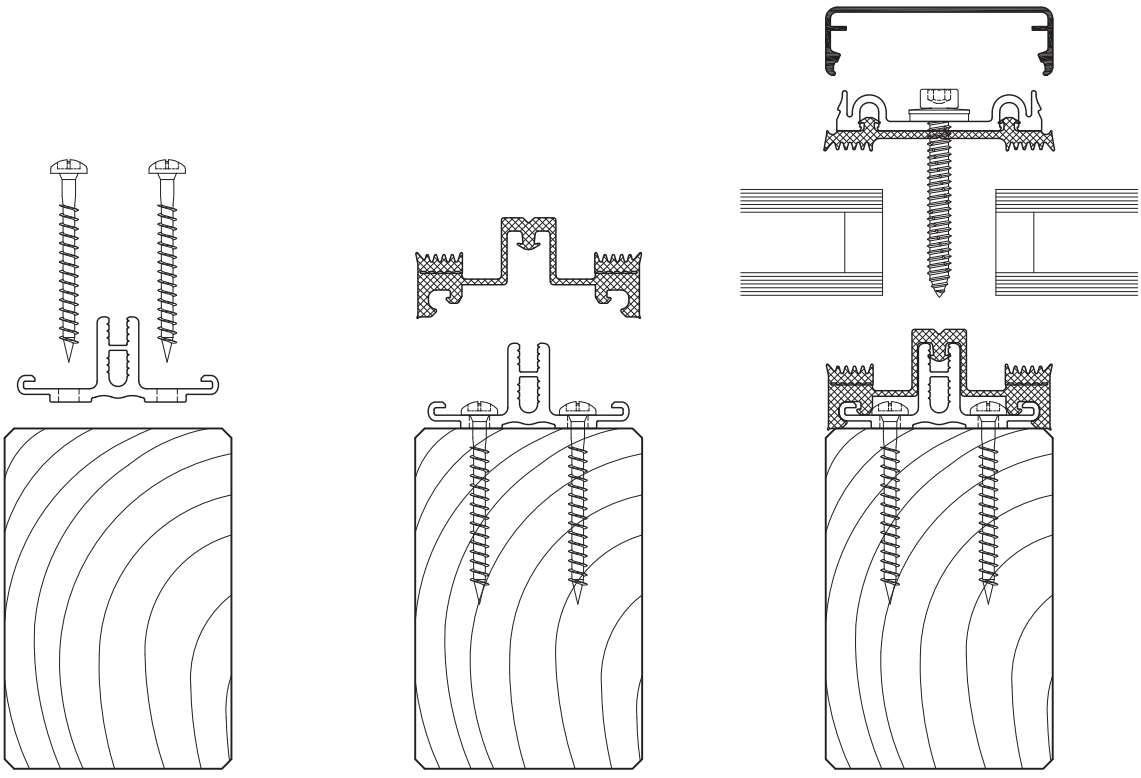
Assembly order

Add-on channel AK 5010/ AK 6010

The Norden Facade add-on channel is directly attached to supporting timber substructure. The add-on channel is placed centrally on mullions and transoms and screwed

in an alternating pattern on the left and right.
A pair of screws is always placed at the ends of the add-on channel. As well as complete on-site assembly of the components, pre-assembly of supporting profiles and add-on channels in the workshop is possible.

Mullion section

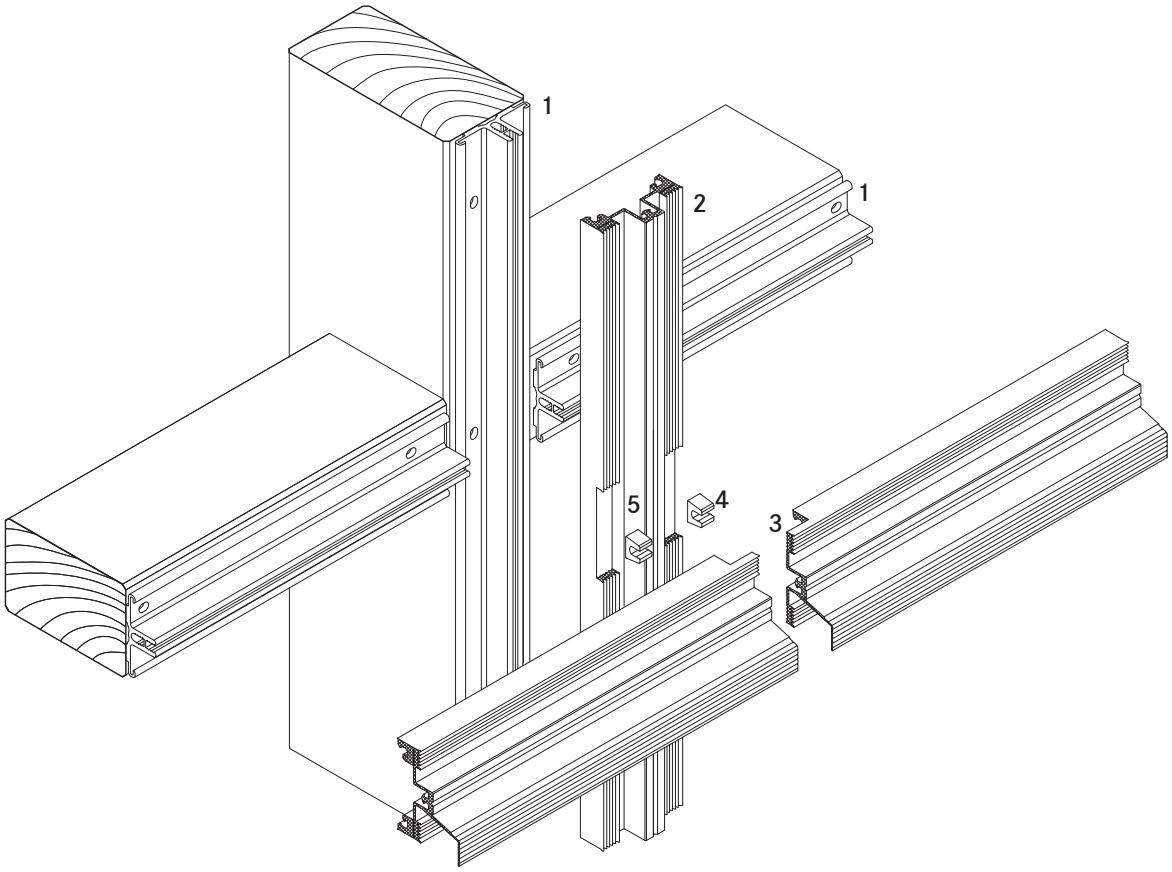


AK-H_3.2_004.dwg

Assembly order

3.2
4

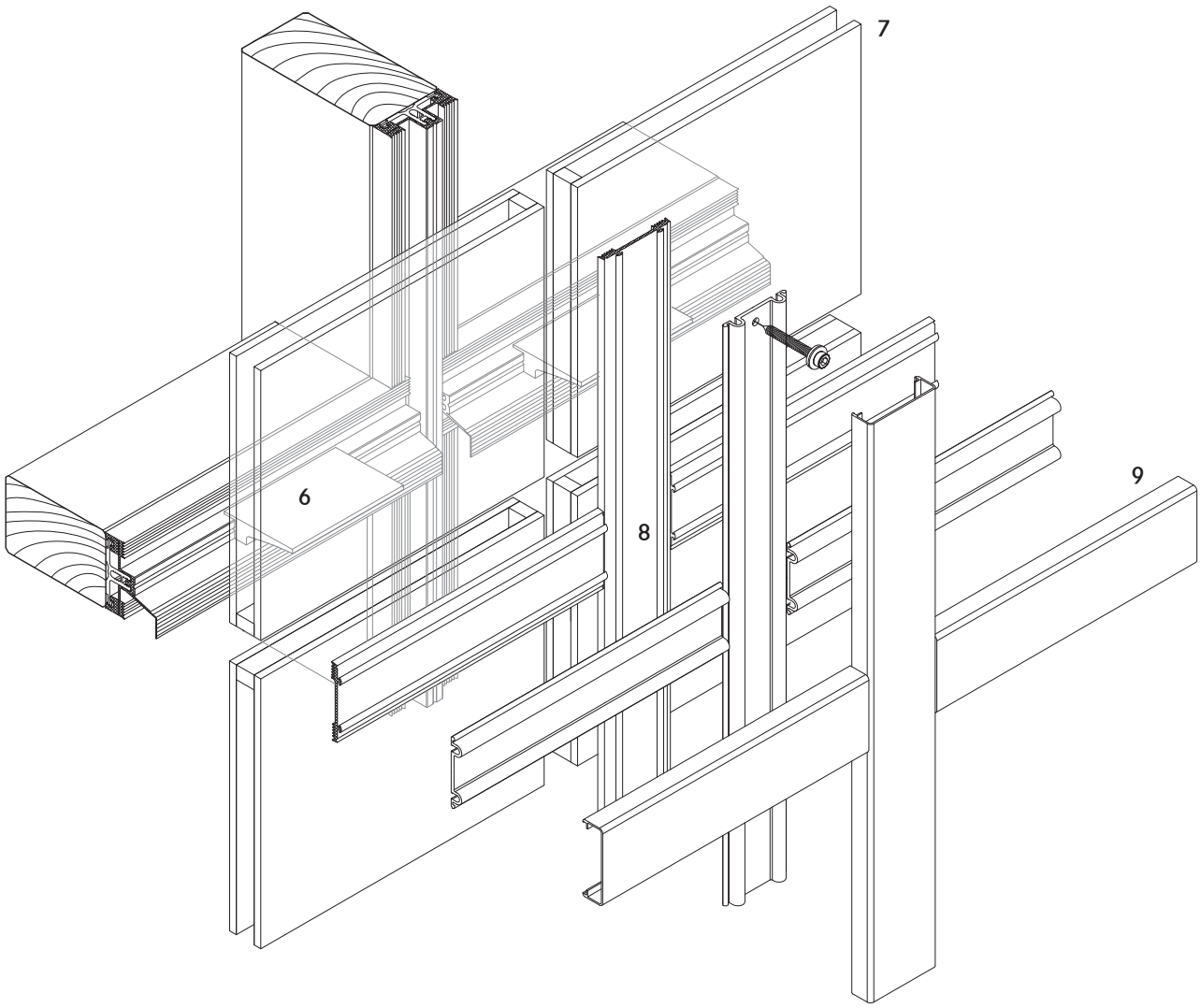
1. Attachment of the add-on channel AK 5010/ AK 6010 to mullions and transoms
2. Attach the inner mullion seal (e.g. GD 6071) with a recess area around the transom.
3. Attach the inner transom seal (e.g. GD 6072) with a recess area around the mullion.
4. Lay and fix the sealing pieces Z 0062 using Norden Facade connecting paste Z 0094 in the ends of the transom seal.
5. Seals the overlap joints on mullions and transom seals using Norden Facade connecting paste Z 0094.



AK-H_3.2_005.dwg

Assembly order

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



AK-H_3.2_005.dwg

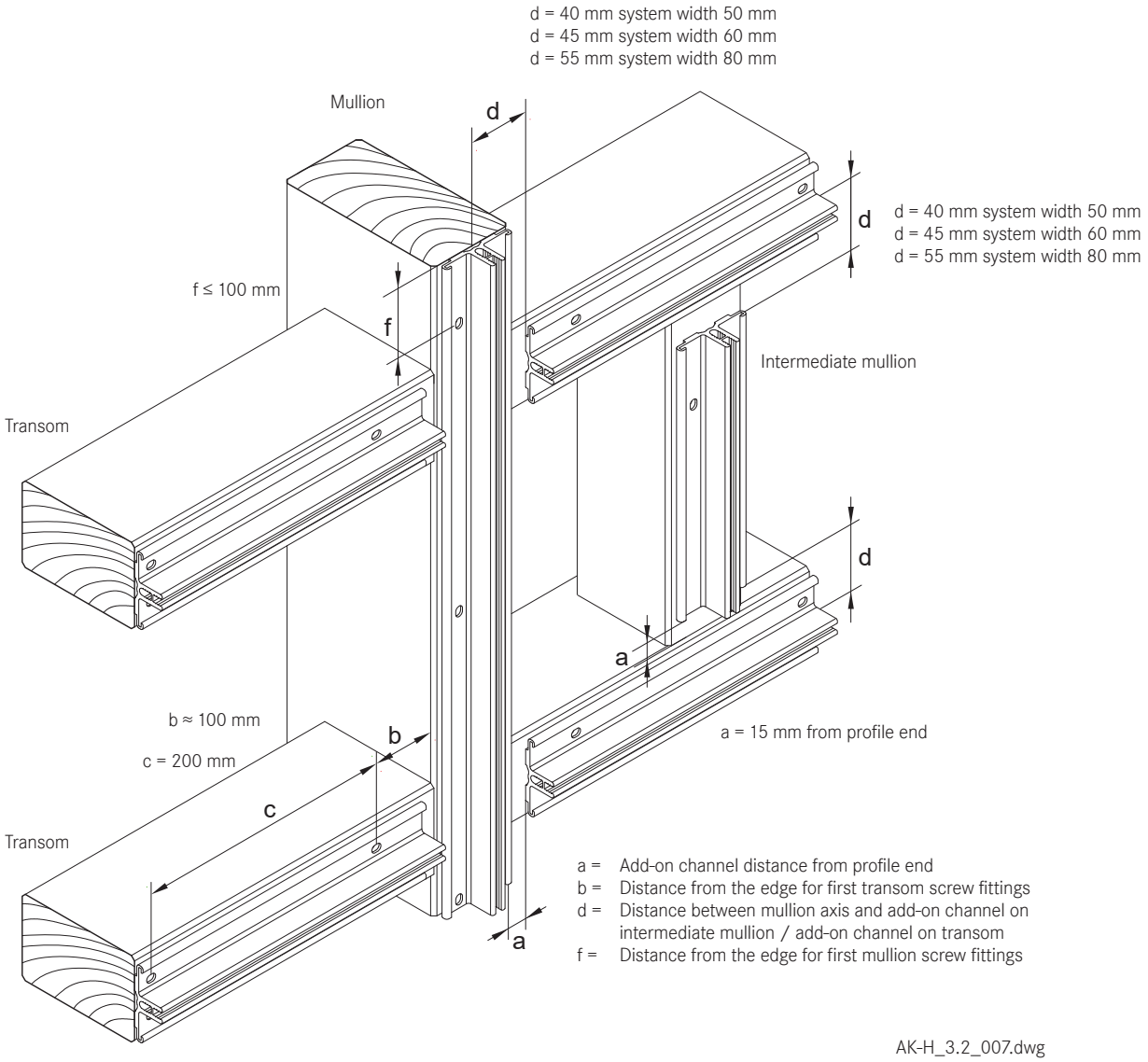
Assembly order for add-on channel

Cutting the add-on channel - mullions

- 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 the add-on channel - transoms

- The add-on channel is placed centrally on transoms and it 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-H_3.2_007.dwg

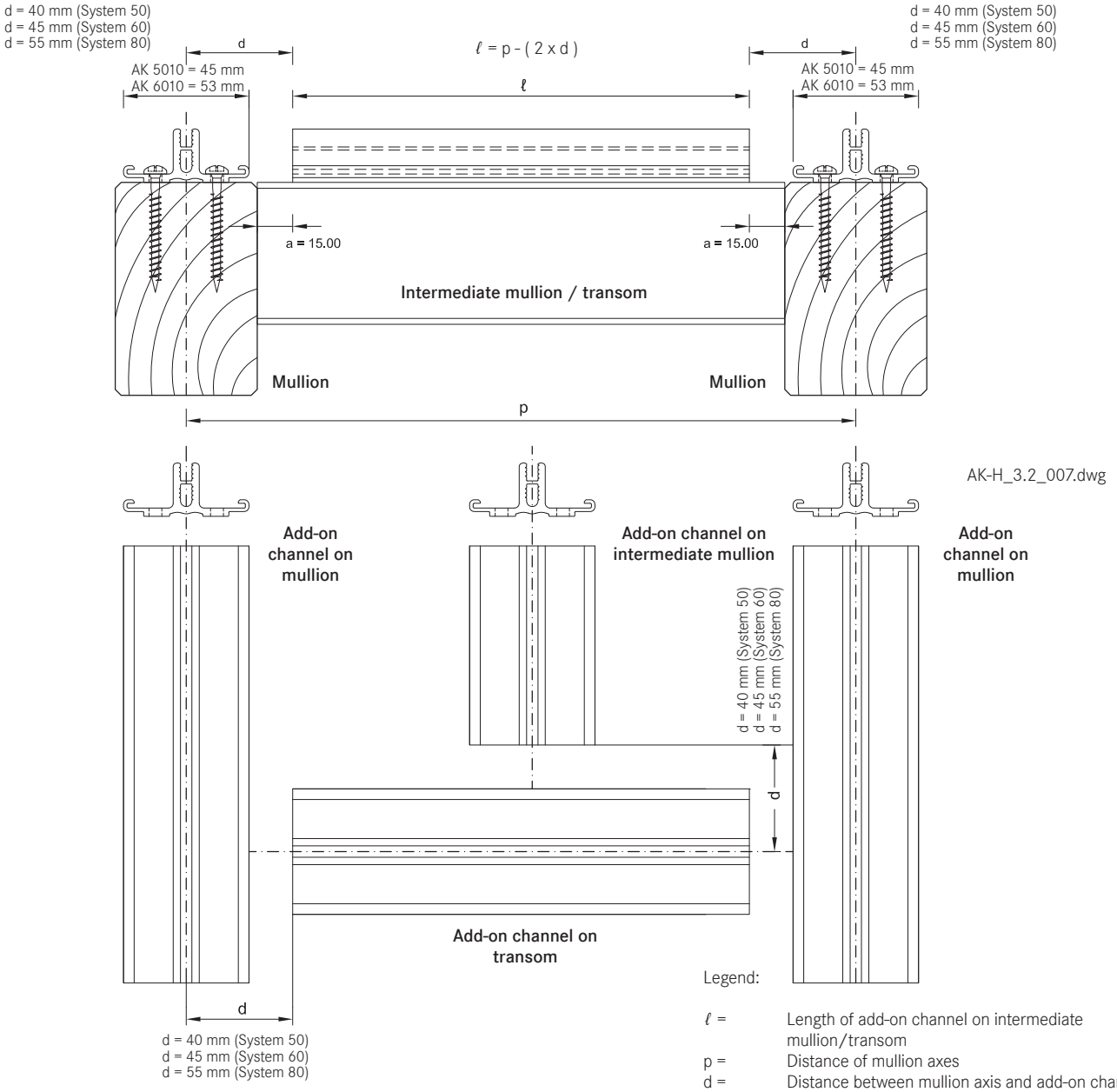
Assembly order for add-on channel

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 AK Intermediate mullions and transoms
AK 5010	50	40 mm	p - (2 x 40) = p - 80 mm
AK 6010	60	45 mm	p - (2 x 45) = p - 90 mm
	80	55 mm	p - (2 x 55) = p - 110 mm



Legend:

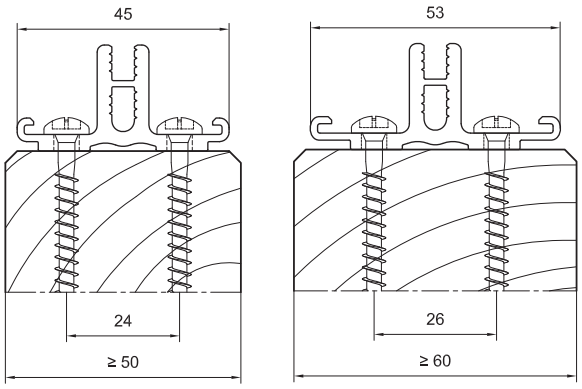
ℓ =	Length of add-on channel on intermediate mullion/transom
p =	Distance of mullion axes
d =	Distance between mullion axis and add-on channel on intermediate mullion / transom
a =	Distance from profile end

Assembly order for add-on channel

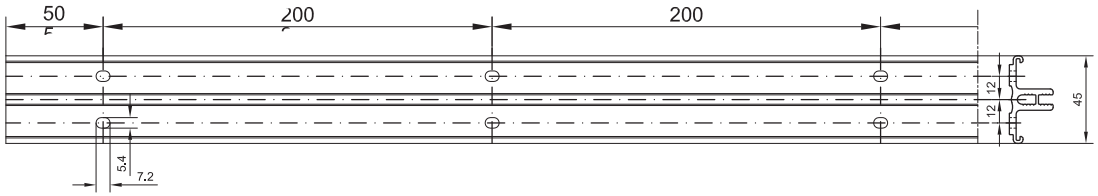
Attachment of add-on channel AK 5010/ AK 6010

- The add-on channel is pre-drilled with 5.4 x 7.2 mm slots at 200 mm intervals with an edge distance of 50 mm. These serve for screwing it to the supporting structure.
- The screw connection between the add-on channel and substructure is achieved using system screws from the Norden Facade range.
- Screw fittings are generally placed every 200 mm (c = 200 mm). If needed, they may also be placed in pairs every 200 mm (c = 200 mm).
- A pair of screws is always placed at the ends of the add-on channel.
- The Norden Facade system screws are directly screwed
- into the timber. Pre-drilling of timber profiles is generally not necessary. However, this should be considered in the case of high-quality timbers. Application of screw fittings should be controlled.
- 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.

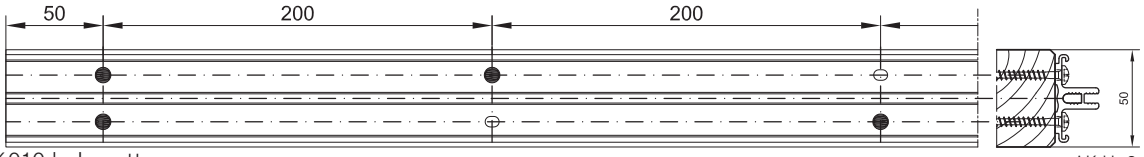
AK 5010 **AK 6010**



AK 5010 hole pattern

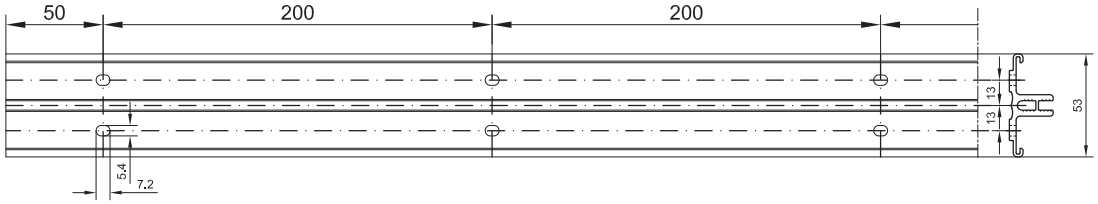


AK 5010 attachment to mullions and transoms: first attachments placed in pairs, then every 200 mm

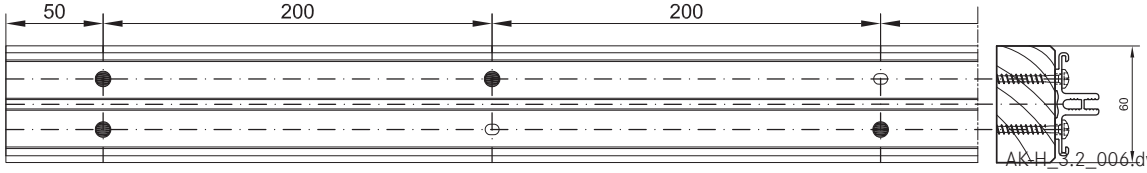


AK 6010 hole pattern

AK-H_3.2_006.dwg



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



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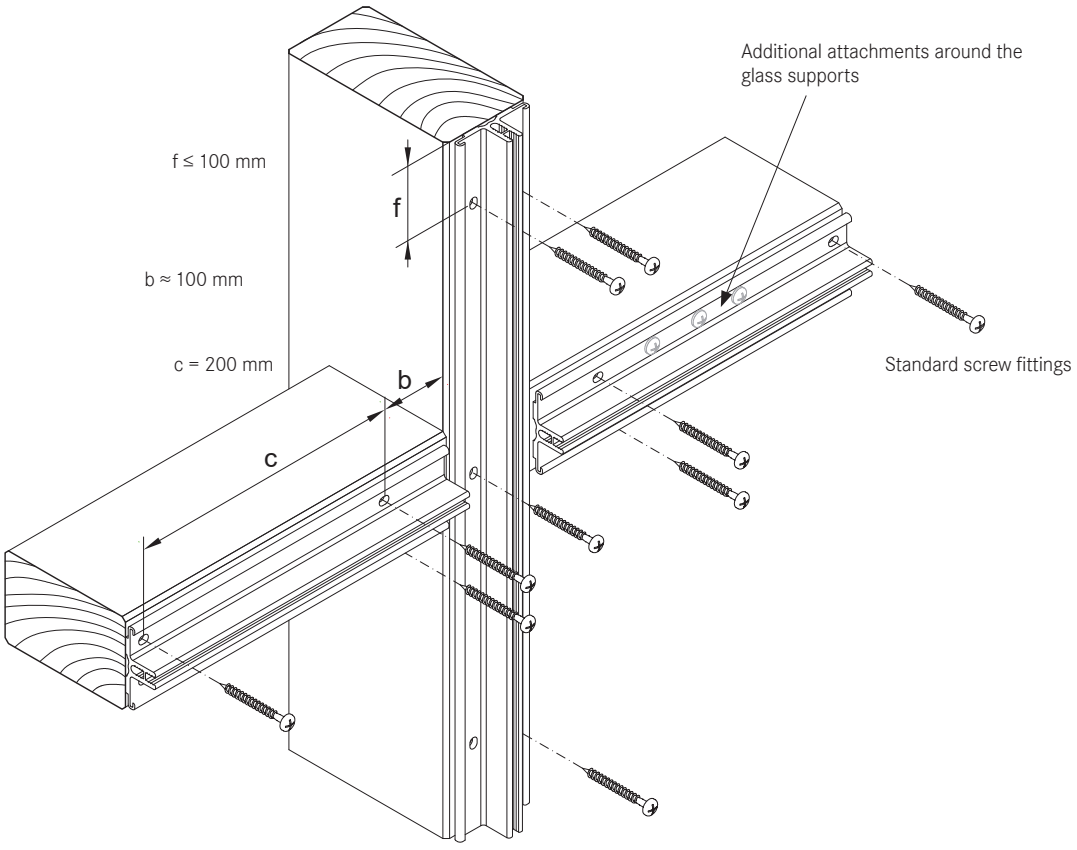
Assembly order for add-on channel

Mullion

- The add-on channel is first positioned centrally on the mullion and screwed on both left and right sides.
- Add-on channels on mullions run continuously along the mullion.
- The length of the add-on channel is generally the same length as the mullion.
- For intermediate mullions, the length of the add-on channel is dependent on the width of the substructure and the chosen system width for the glazing system.
- 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)

Transoms

- 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.
- Cut the add-on channel as described.
- The first screw fittings on the transom are placed approx. 100 mm measured from the profile end (b ≈ 100 mm). However, always ensure that there is no collision with the mullion and 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 glass support. (See section on glass supports).



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Tips for laying seals

Sealing system principle, general information about glazing seals

The Norden Facade 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 steam.

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 the 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 ℓ 2 m), then this ventilation should be created by placing holes into the cover profile 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

- To avoid condensation build-up between the timber and seal, any knotholes and grooves in the timber must be repaired on the sealed surface.
- The structure of the inner sealing section differs in the AK-H 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 in addition and can also be used in for transoms in inclined glazing. 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 Norden Facade seals

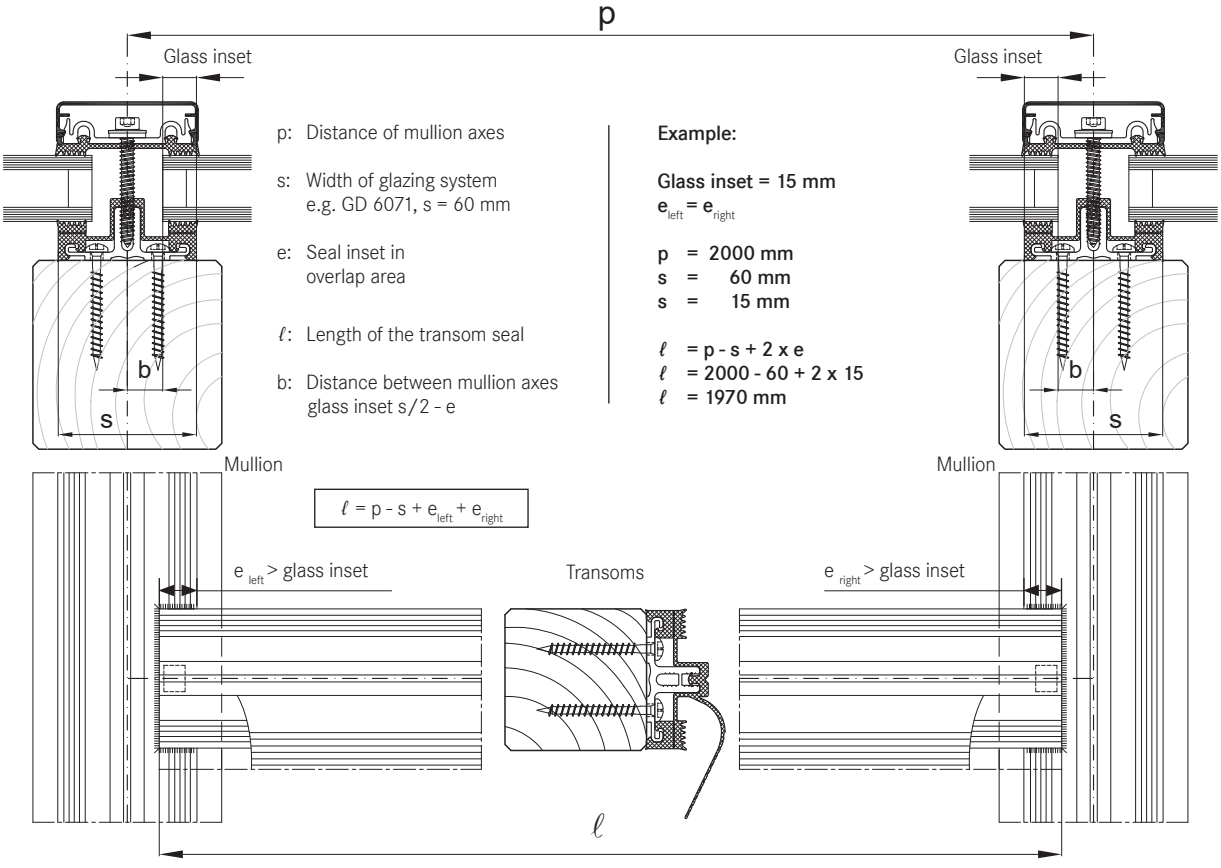
- To avoid condensation build-up between the timber and seal, any knotholes and grooves in the timber must be repaired on the sealed surface.
- All joints and seal penetrations must be waterproofed with the exception of the Norden Facade screw fittings.
- Gasket joints in the inner sealing section should always be sealed using Norden Facade sealant, regardless of whether they are butt joints or overlapping. We recommend Norden Facade 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 mois-ture 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.

Pre-cut

- 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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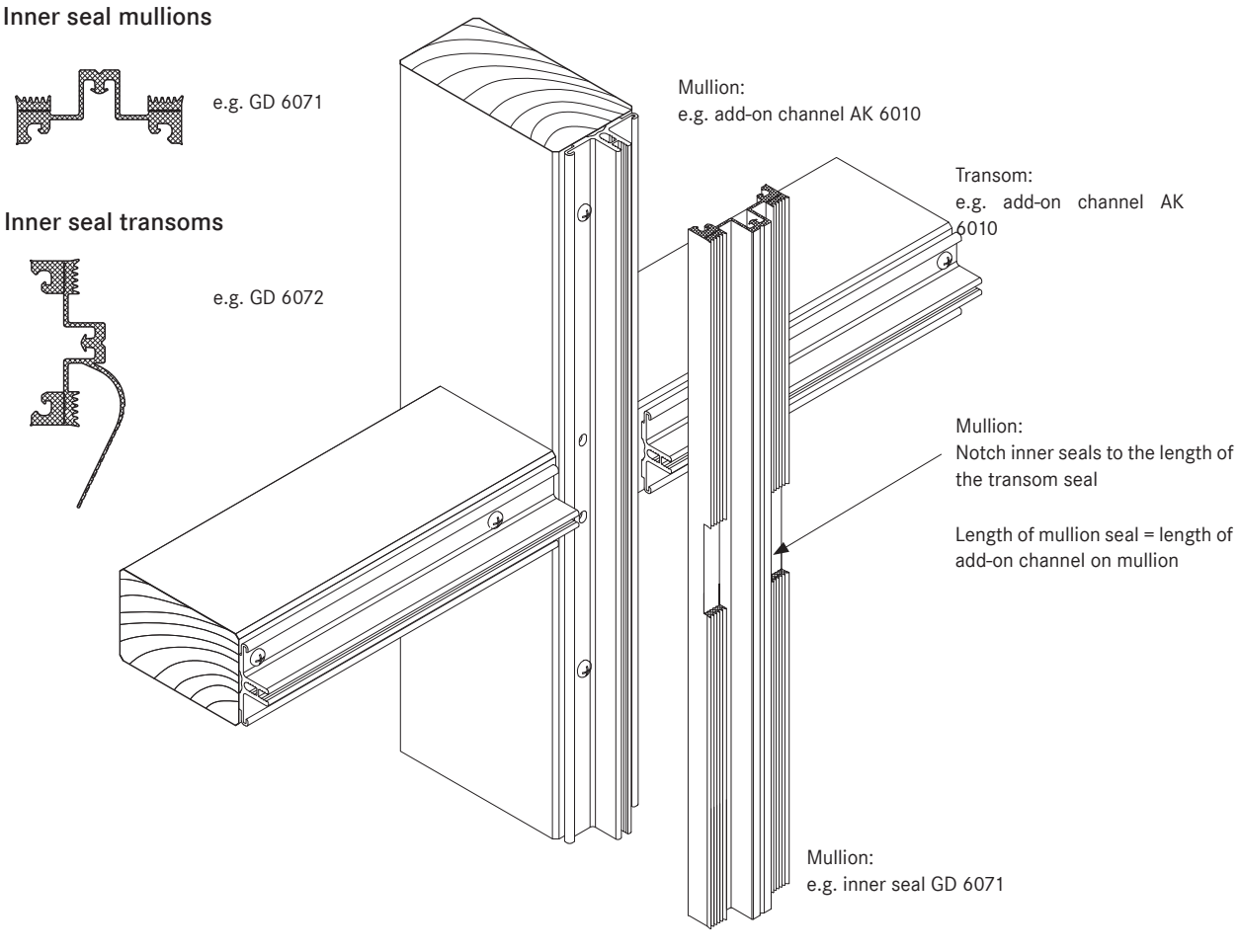
Facade seals

3.2
7

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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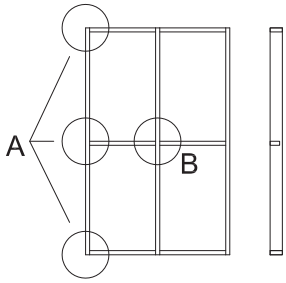
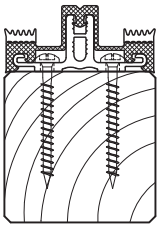
Facade seals

Assembly of inner seal for vertical roof glazing - mullions

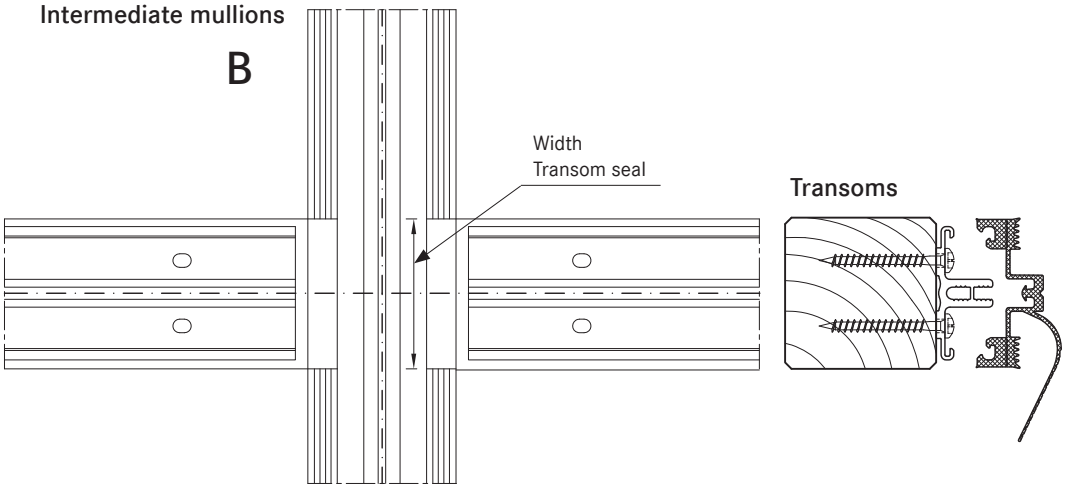


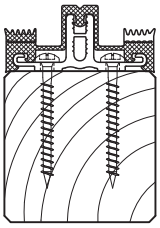


Mullion seal
around a transom upper section
separate at the width of the transom seal

Intermediate mullions

B

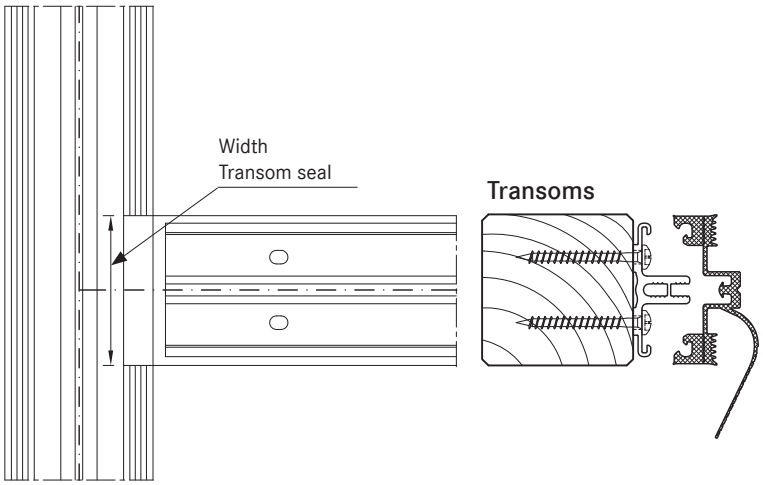




Edge mullion seal
around a transom upper section
separate at the width of the transom seal

Edge mullions

A



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Facade seals

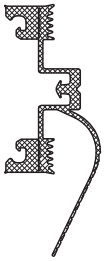
Assembly of inner seal for vertical roof glazing - mullions/transoms

- 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 pre-cut part.
- 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 Norden Facade Z 0094 connecting paste. The gasket joint should then be generously sealed.
  Ensure unob-structed 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 transoms (see section on “Inner seals for vertical glazing” and information about glass support GH 6073).

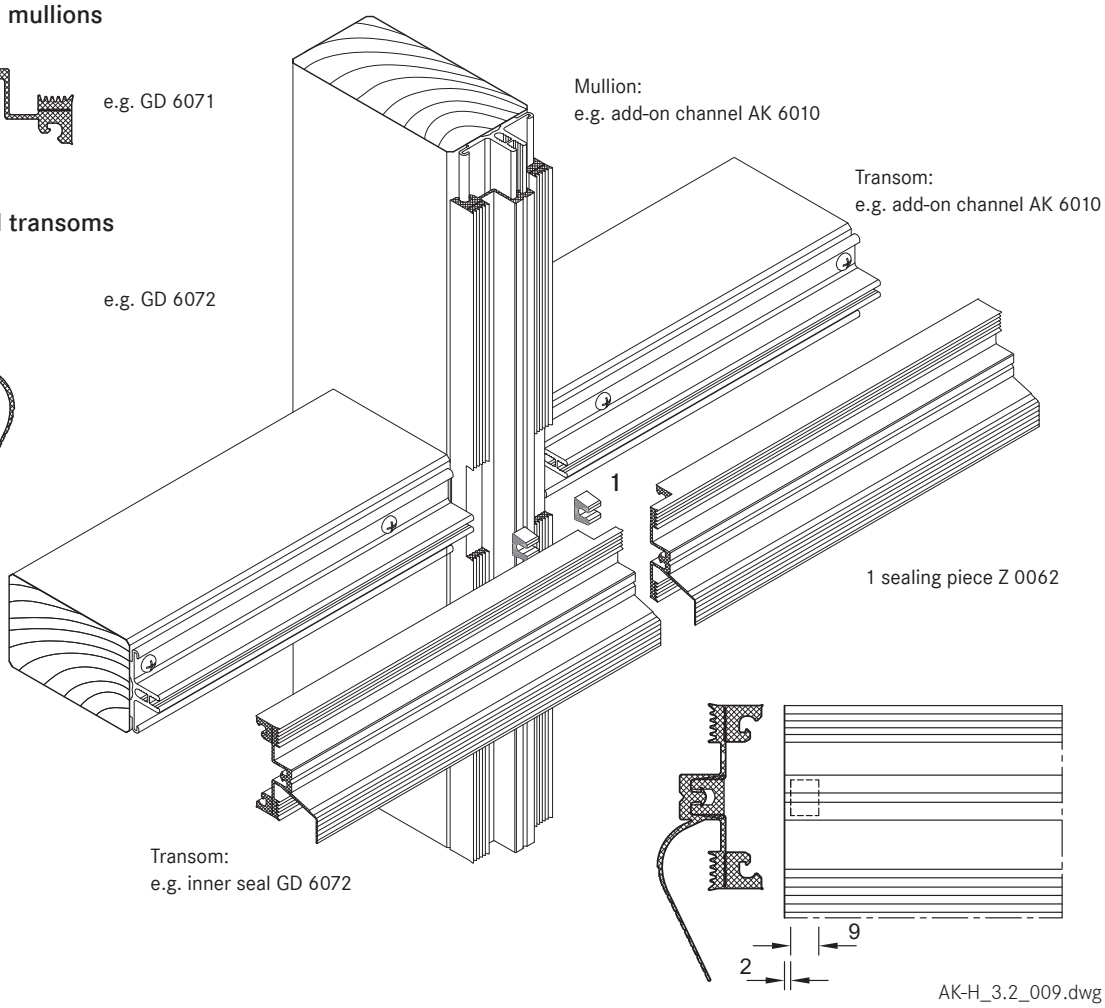
Inner seal mullions

e.g. GD 6071

Inner seal transoms



e.g. GD 6072



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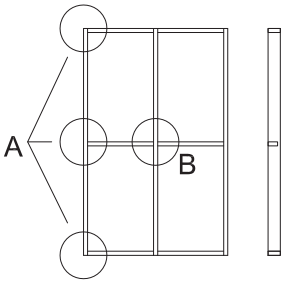
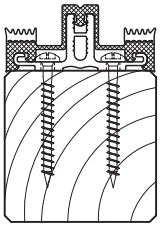
Facade seals



Assembly of inner seal for vertical roof glazing - mullions/transoms

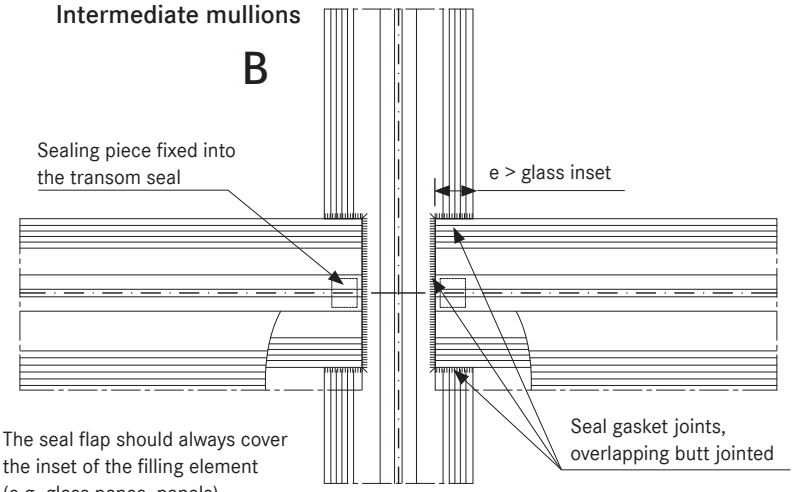
Completed glued joints
Intermediate mullion and end mullion



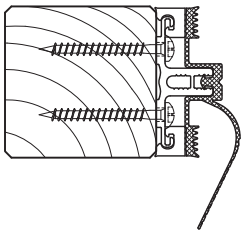
Mullion seal
around a transom upper section
separate at the width of the transom seal

Intermediate mullions

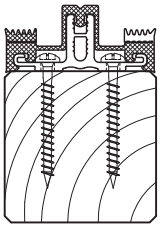
B



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



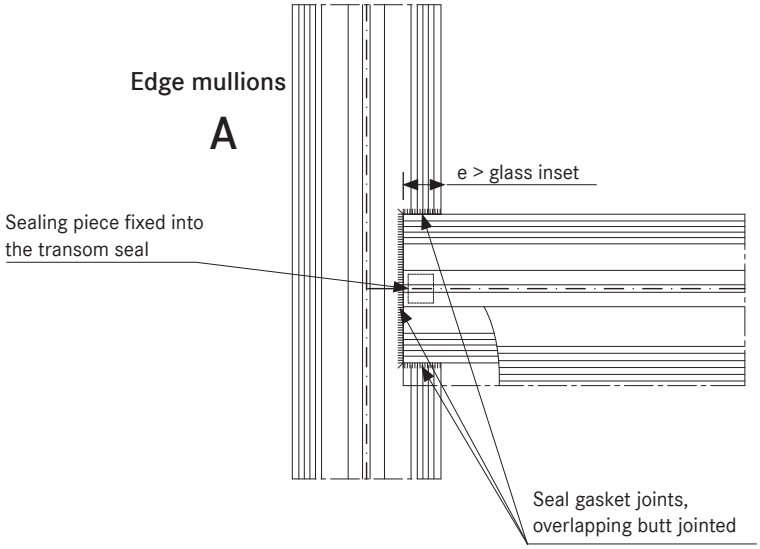
The seal flap should always cover the inset of the filling element (e.g. glass panes, panels)



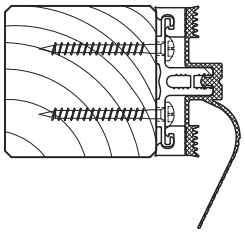
Edge mullion seal
around a transom upper section
separate at the width of the transom seal

Edge mullions

A



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



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Facade seals

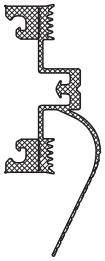
Assembly of inner seal for vertical roof glazing - intermediate mullions

- 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 e.g. GD 6073

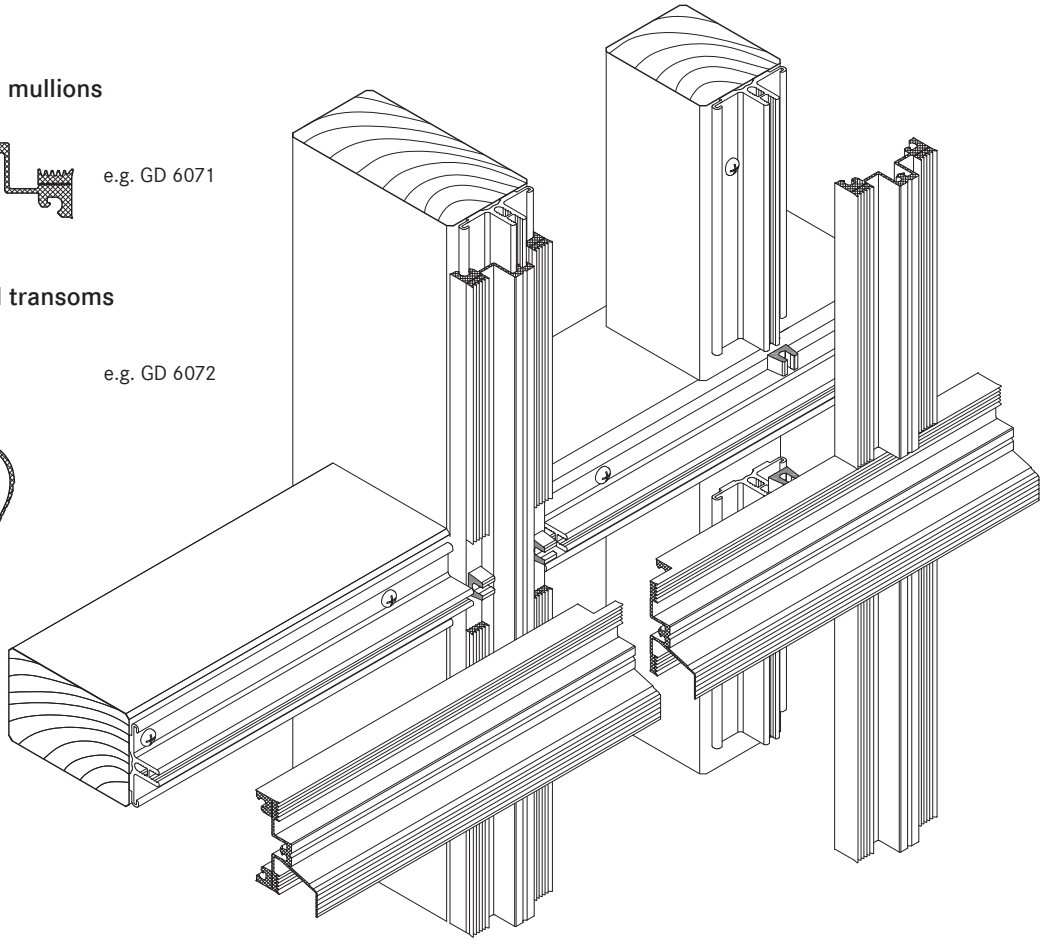
Inner seal mullions

e.g. GD 6071

Inner seal transoms



e.g. GD 6072



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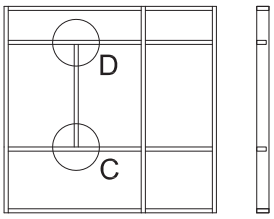
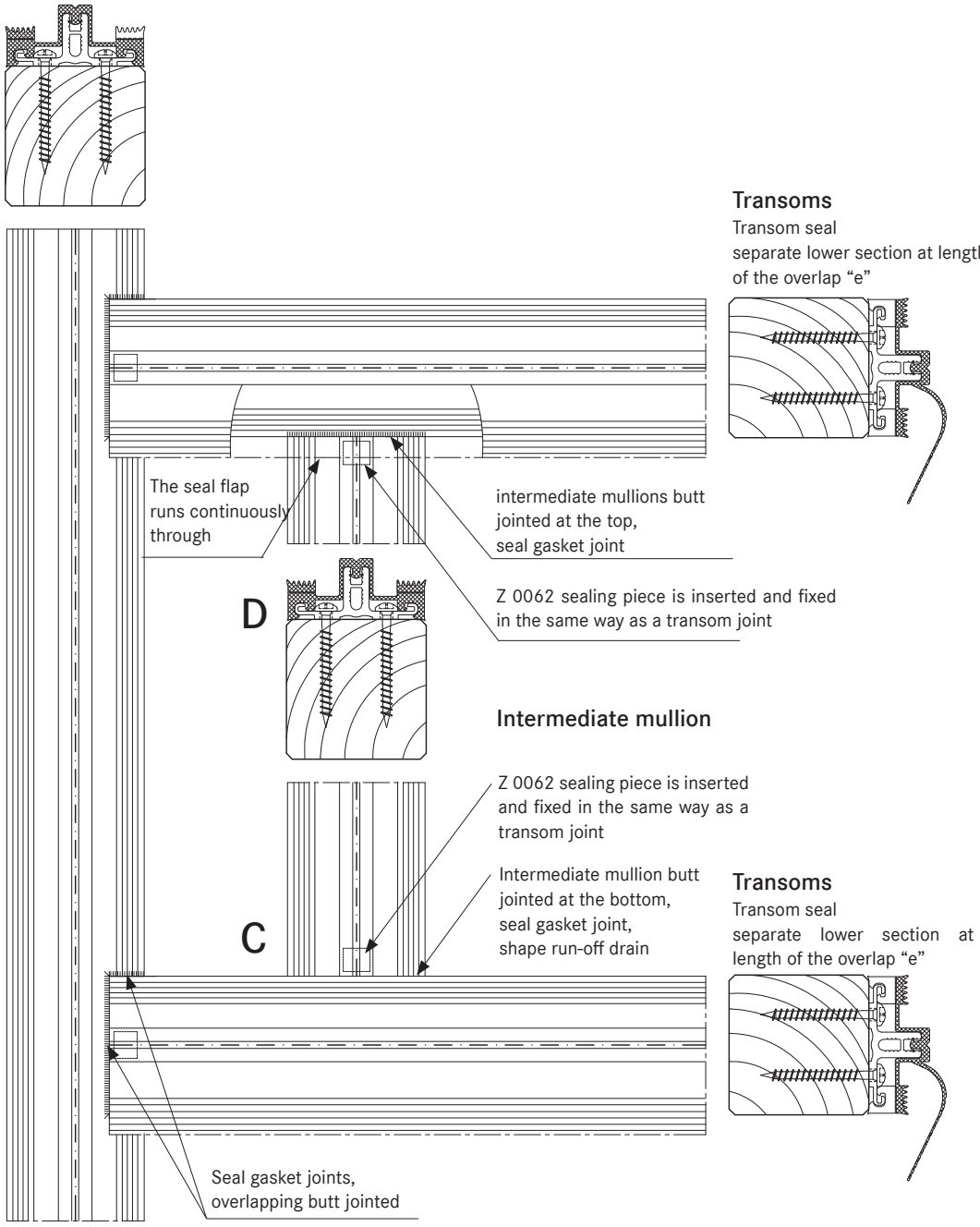
Facade seals



Assembly of inner seal for vertical roof glazing - intermediate mullions

Completed glued joints intermediate mullion / transom



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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 2.2.1 - Material information).

Outer seal mullions

e.g. GD 6024

Outer seal transom

e.g. GD 6054

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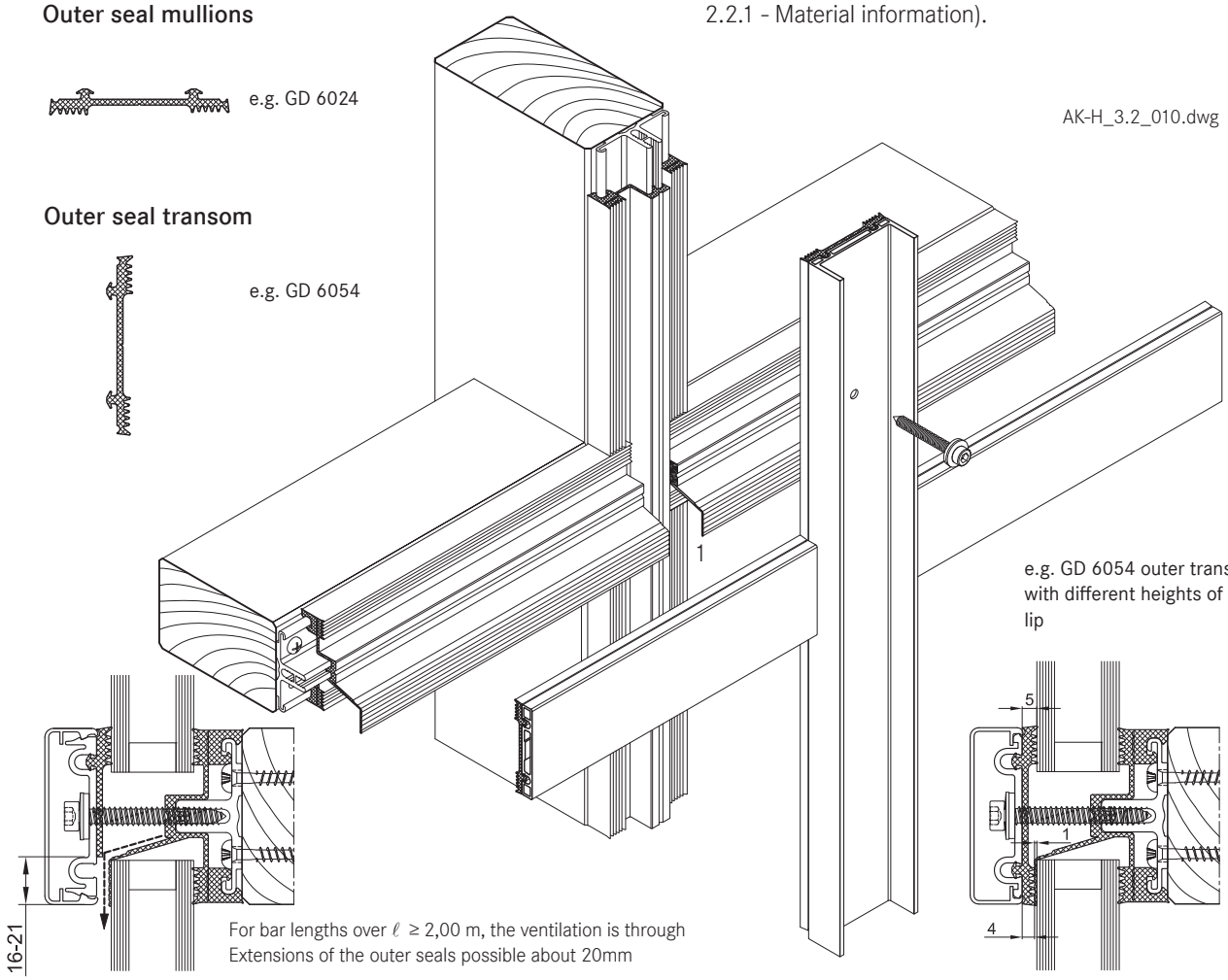


e.g. GD 6054 outer transom seal with different heights of sealing lip

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

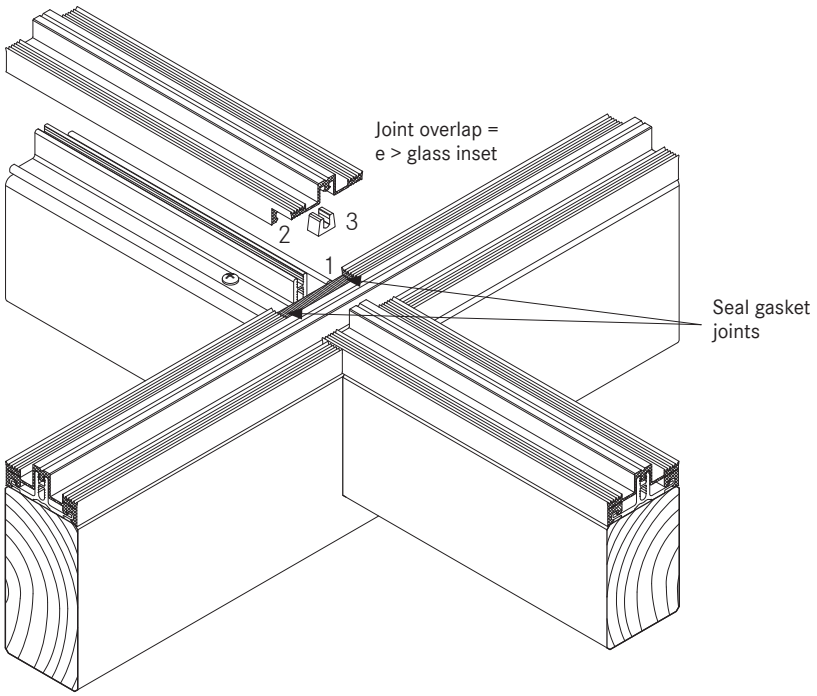
In the roof area as in the facade, seals with offset water channels can be used in the facade area which safely drain any moisture or condensation to the outside.
The 16.5 mm high seals can be divided across their height to allow a simple overlap at critical transom joints.

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 rafters.
- 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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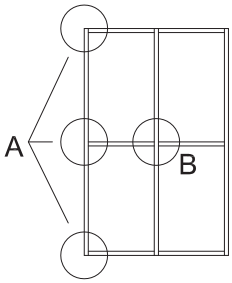
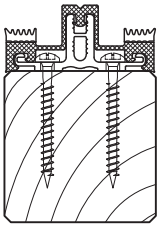
Seals - roof

Assembly of the inner seal for roof glazing - rafters/transoms



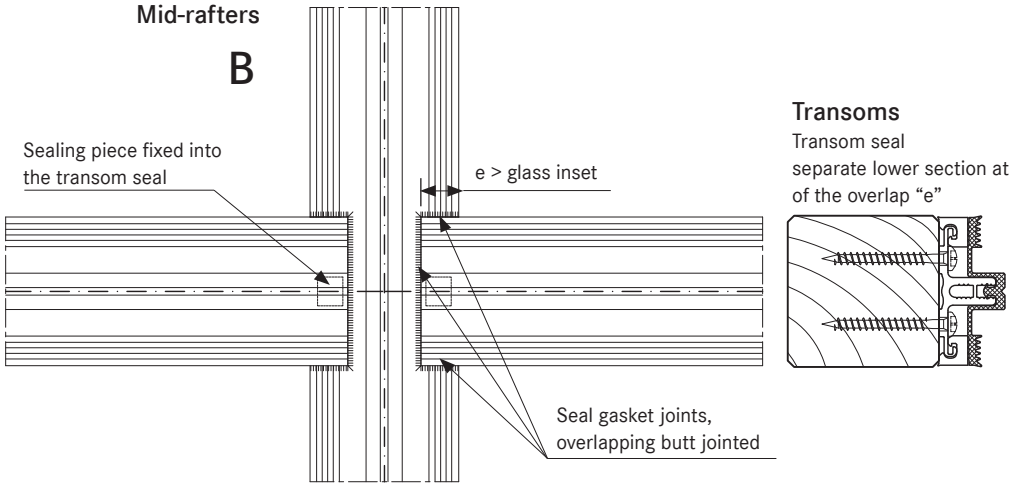
Completed glued joints
Intermediate mullion and end mullion



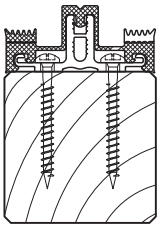
Mullion seal
around a transom upper section
separate at the width of the transom seal

Mid-rafters

B



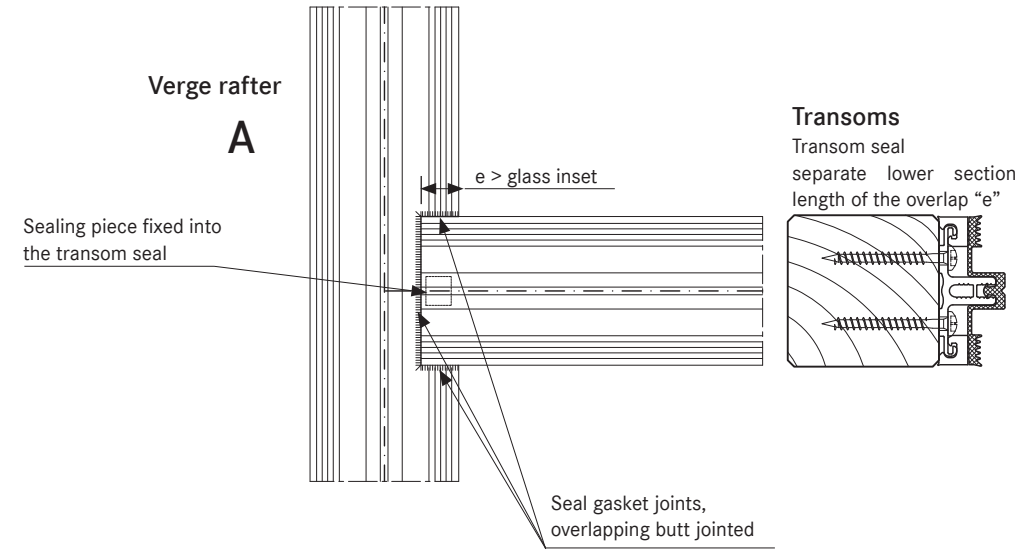
Transoms
Transom seal
separate lower section at length of the overlap “e”



Verge rafter seal
around a transom upper section
separate at the width of the transom seal

Verge rafter

A



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

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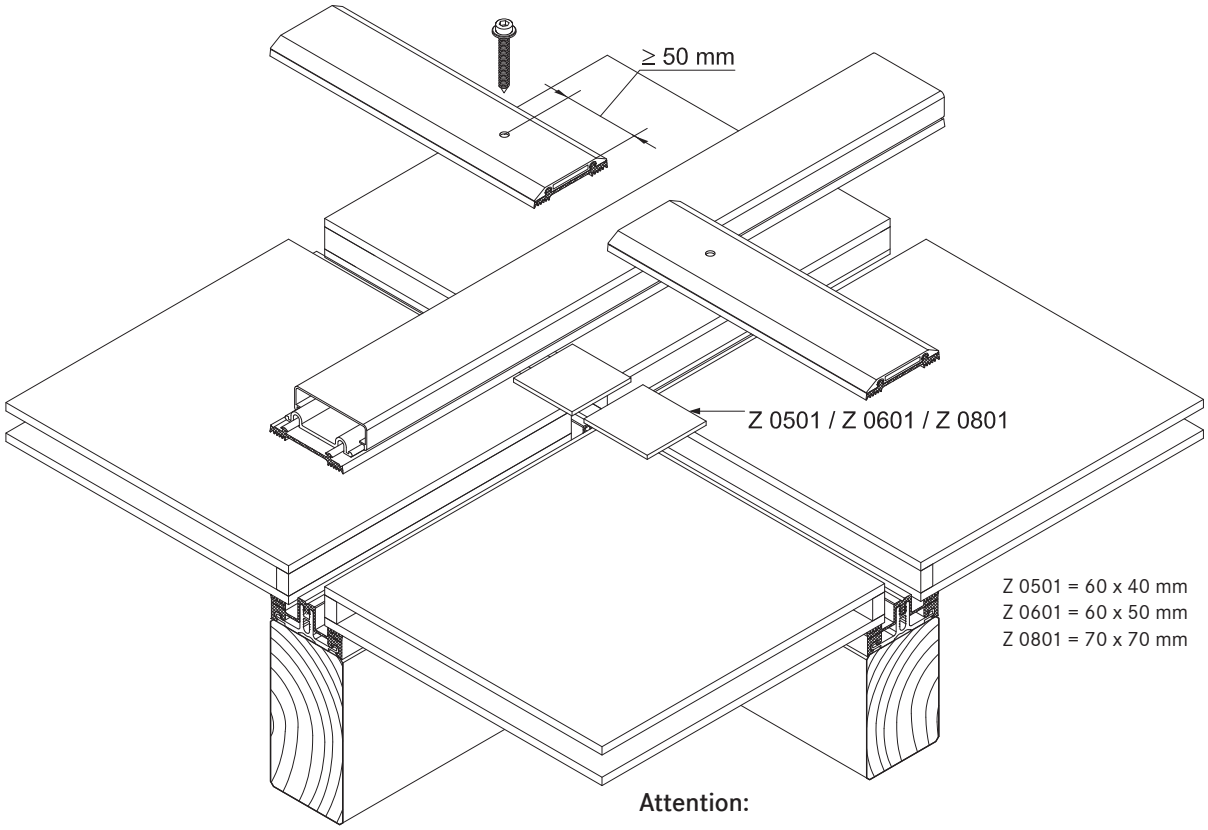
Seals - roof

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 1932 are not suitable for transom seals in roofs. Split seals can only be installed in mullions in combination with slab insulation. 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 Z 0501 for System 50, Z 0601 for System 60 and Z 0801 for System 80.
- The stainless steel sealing plates 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 15 mm, the first screw fittings for the transom cover profile begin 50 mm from the end of the cover profile.



Attention:

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

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Seals - roof

Assembly of the outer seal for glazed roofing - clamping strips

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 profile 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 + upper strip). 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.

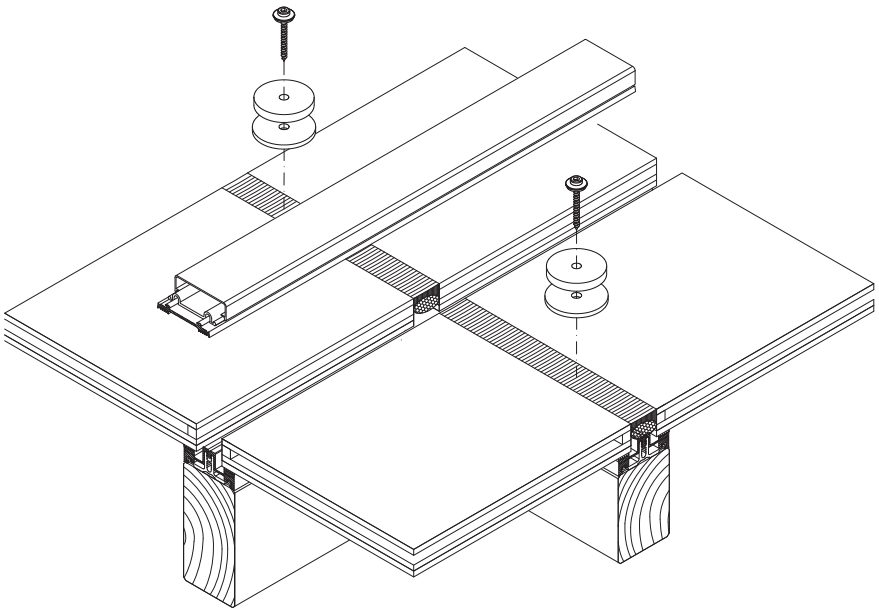
Note:

- Horizontal clamping strips prevent the free run off of rain water and dirt.
- Cover strips and upper strips with angled edges reduce the build up of water in front of the clamping strip.
- To improve water drainage, clamping strips in the joint area of transoms 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.

Seals - roof

Assembly of the outer seal for for inclined glazed roofing ≥ 2°.

- These are laid in fundamentally the same way as for vertical glazing. Split seals around the mullions in roofs such as GD 1932 are only suitable when using in combination with slab insulation. Each installation situation will differ to some degree and always check how well sealed it is.
- To ensure free run-off of rain water and dirt on roofs inclined ≥ 2°, we recommend not using clamping strips in the transoms.
- Instead, the rebate spaces should be sealed with all-weather silicone.
- Implementation of the outer sealing section around mullions is done in the same way as conventional roofs with an inclination up to 15°.
- At the high point or ridge area of the inclined glazing, it is recommended to also install and outer sealing section in the transoms with clamping strips.
- Only certified sealing materials may be used for sealing the transom rebate space.
- Pay attention to all information provided by the manufacturer and the sealing work must be carried out by trained persons. It is recommended that a licensed and certified specialist contractor is hired for this purpose. We further refer you to the DIN 52460 standard and IVD data sheets (Trade Association for Sealants).



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Tips for all roof designs:

When using aluminium cover 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 strips 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 (refer to Section 1.2.1 - Material information).

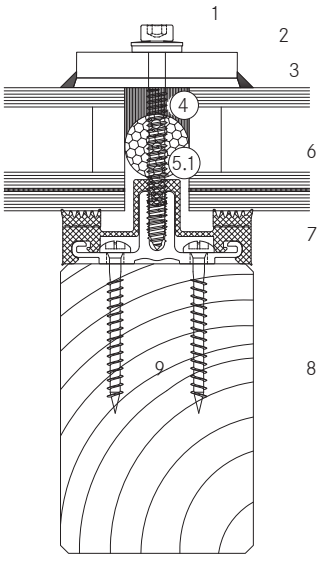
For wide spans we recommend using concealed screw fittings when selecting the clamping strips (lower + upper strip). This is the preferred option for rafters. Unused holes in the pressure profile must be sealed.
Some roof areas, such as the eaves, see the use of several different materials (glass, silicone, aluminium sheets, ...) each with different expansion coefficients. To avoid the formation of cracks, aluminium sheets should be installed with expansion joints.

Seals - roof

Assembly of the outer seal for for inclined glazed roofing ≥ 2°.

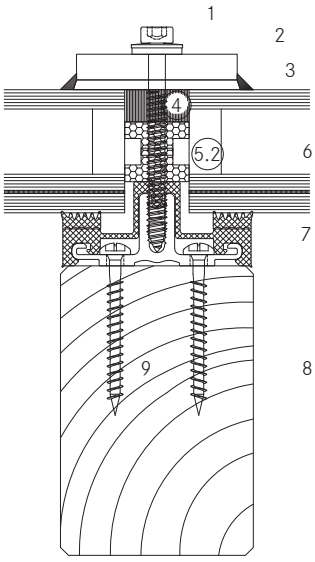
- The compatibility of the materials is particularly important when using all-weather silicone. In this case, the compatibility of the sealant with the edge bonding of the glass and the backfill of the joints. If self-cleaning glass is used, the compatibility must be established in advance.
- Glass sealants and edge bonding must be UV-resistant. The incline of roofs should also be taken into account. Information about UV-resistance can be requested from the manufacturer. Silicone edge bonding generally provides better UV-resistance than polysulfide-based materials. The advantage lies in its high vapour sealing properties which is particularly useful when using more volatile argon fillings.
- Highly elastic, weatherproof and UV-resistant seals meet the widest range of demands for reliable joints.
- If the silicone joint is created without additional mechanical safety devices, ensure that the glass is supported from two sides only. Selective installation of holding clamps can be used to achieve all round support for glass edges.
- The clamps are made from stainless steal with silicone washers and are screwed in the same as pressure strips. The hold-down clamp should be additionally sealed around the perimeter with silicone sealant. The design is based upon the dimensions of the glass as documented in the glass static analysis.

Transom inclined glazing ≥ 2° inclination with all-weather silicone and round section rope seal.



1 Hold-down clamp
2 Silicone washer
3 Silicone sealant / seal around the clamp
4 All weather silicone seal

Transom inclined glazing ≥ 2° inclination with all-weather silicone and slab insulation.



5.1 Round section rope seal
5.2 Slab insulation
6 Glass / filling element
7 Inner seal 10 mm transom
8 timber profile
9 System screw fittings

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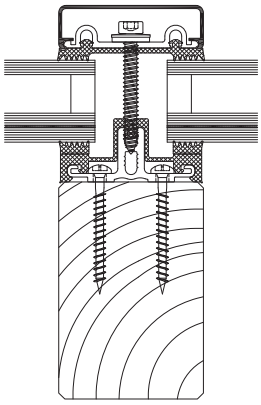
Seals - roof

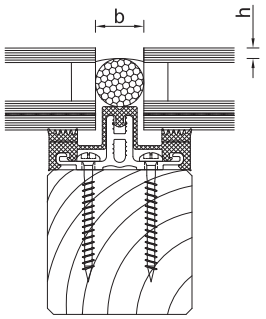
Assembly of the outer seal for for inclined glazed roofing ≥ 2°.

- The joint width and the joint height for Norden Facade Sys-tem AK-H are defined as w x h = 20 mm x 10 mm. These measurements should always checked when selecting the sealing material and adapted if neces-sary. Generally: w : h = 2 : 1 - 3.5 : 1
- PE round section seals or Norden Facade slab insulation is suitable as a back fill material.
- Silicone sealant should be applied before laying the mullion seals and cover strips.
- After the specified setting time, the seals and screw fittings can be installed in the areas around mullions.
- The mullion-transom joints around the clamps are then sealed.
- Before applying this second layer, the joints around transoms must have completely set.

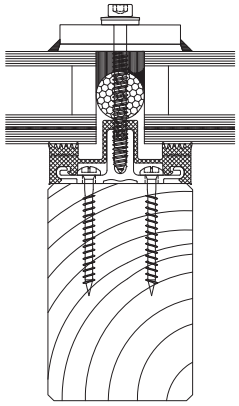
Rafters with clamping strips



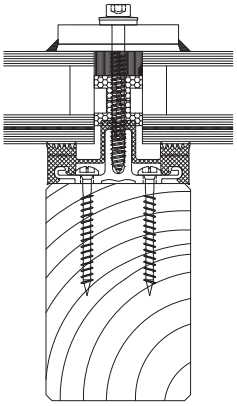
Joint design according to manufacturers specifications!
generally:
w : h = 2 : 1 - 3.5 : 1



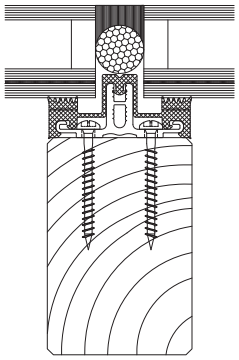
Transom with clamp, All weather silicone seal and round section rope seal



Transom with clamp, All weather silicone seal and slab insulation



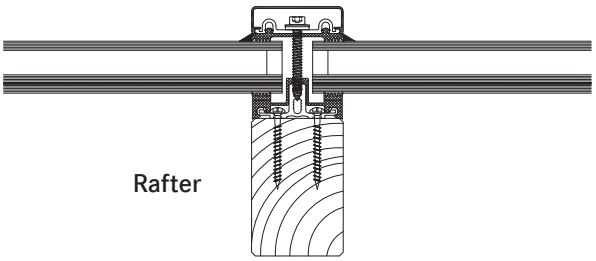
Transom with all-weather silicone and round section rope seal

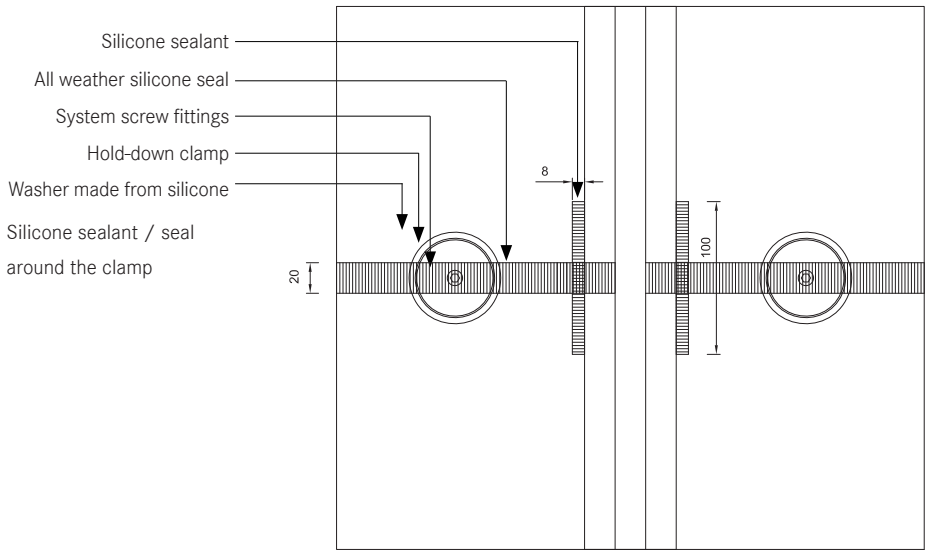


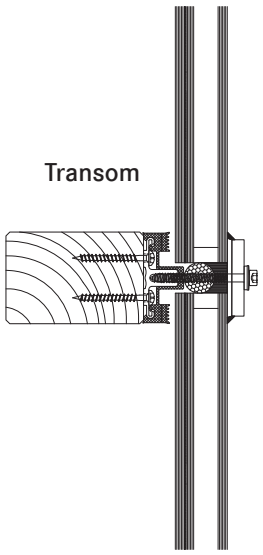
Seals - roof

Steps for implementing the seal with silicone

- Test silicone sealant and glass edge bondings and other contact surfaces (e.g. panels) for suitability.
- Clean edge bonding adhesive impurities from the surfaces to which sealant will be applied following manufacturer's directions.
- Fill the joints as per the joint dimensions using only non-water absorbent closed-cell PE profiles (no damage to the edge bonding).
- The remaining space in the glass rebate must be large enough that the pressure is able to equalise and a drainage level is available.
- Clean any impurities from the surfaces to which the sealing material is to be applied and any adjacent surfaces according to manufacturer's directions.
- Be particularly aware of any adjacent metal components. Prime according to manufacturer's directions.
- Seal joints without leaving any cavities or bubbles. Mask any adjacent components in advance where necessary.
- Smooth out the filled joints using the manufacturer's smoothing agents and conventional tools with as little water as possible. Remove adhesive tape.
- If two or more reactive sealants are used in combination, the first must completely set before the second is applied.



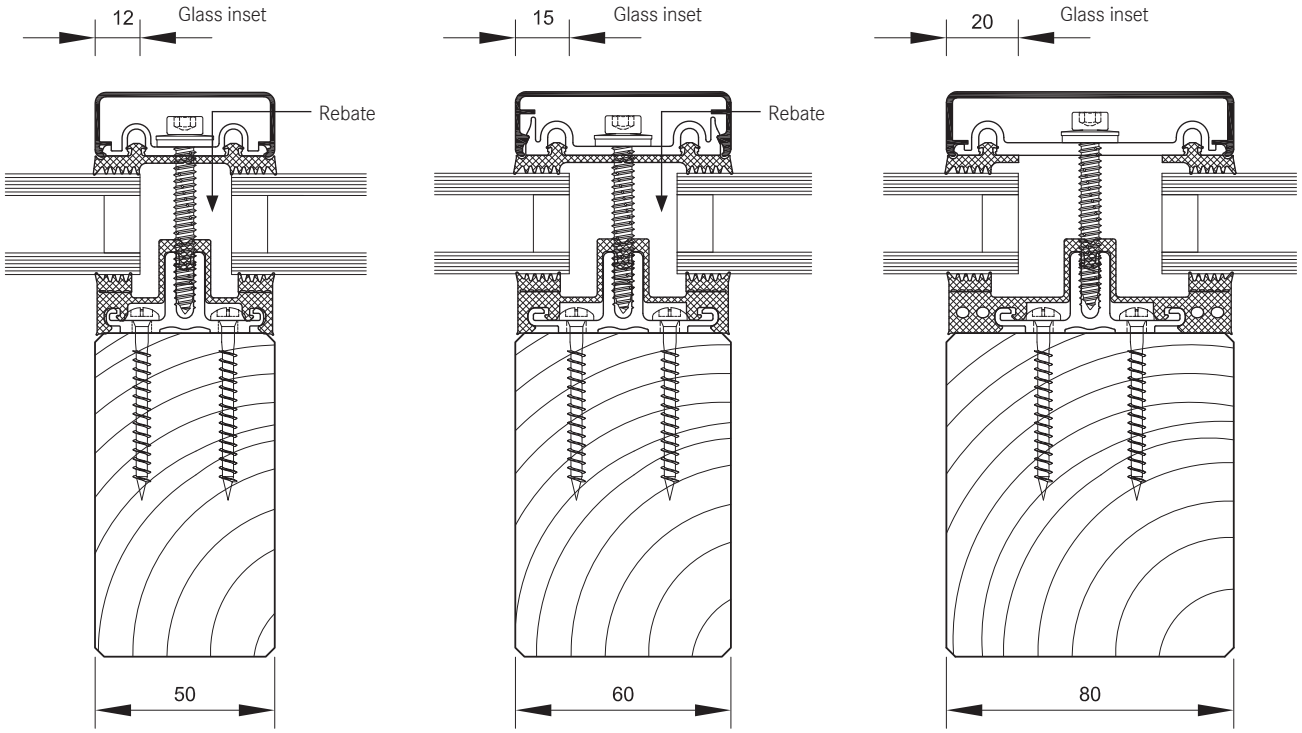




Glass inset and glass support

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 possible)



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Glass supports

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 three different types of glass support with three attachment variants in the Norden Facade AK-H system.

- Glass supports GH 6071 with a length of ℓ = 100 mm are attached directly into the add-on channel using 3 Norden Facade 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 thick-nesses of 20 – 60 mm can be used.
- Glass supports GH 6072 with a length of ℓ = 200 mm are attached directly into the add-on channel using 6 Norden Facade 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 strength-ened attachment and longer load transfer area can support a greater glass weight. Glass thicknesses of 20 – 60 mm can be used.
- 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 (Norden Facade 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 pos-sible, but adjustments must be made and geometri-cally checked.

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 Norden Facade glass supports can be placed with an edge distance from 50 - 130 mm according to Z-14.4-767. We recommend a distance of 100 mm from the end of the transom. The position of T-joints should always be considered.
- 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 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 joining 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 Norden Facade connecting paste Z 0094 with the excep-tion of the Norden Facade screw fittings.

Glass supports

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 distances"g" from the end of the transom:

Add-on channel	**AK 6010**
Glass support types	Distance **g** measured from the end of the transom
GH 6071 (100 mm long)	100 mm
GH 6072 (200 mm long)	100 mm
GH 6073 (100 mm long)	100 mm

Additional attachments around the glass supports

Add-on channel	**AK 6010**
Glass support types	Additional add-on channel attachments around the glass supports per glass support
GH 6071 (100 mm long)	6
GH 6072 (200 mm long)	11
GH 6073 (100 mm long)	6

Glass support GH 6071

Additional attachments for AK 5010/ AK 6010

- The add-on channel is screwed into the timber structure using Norden Facade Z 0170 system screws. Pre-drill-ing of timber profiles is generally not necessary.
- Around the GH 6071 glass support, 6 additional screw fittings Z 0170 are required. The following diagram shows the arrangement and must be adhered to.
- The additional holes in the add-on channel are drilled with a diameter of d = 5.5 mm.

Edge distances transom / add-on channel

- Edge distances are given in the diagram.

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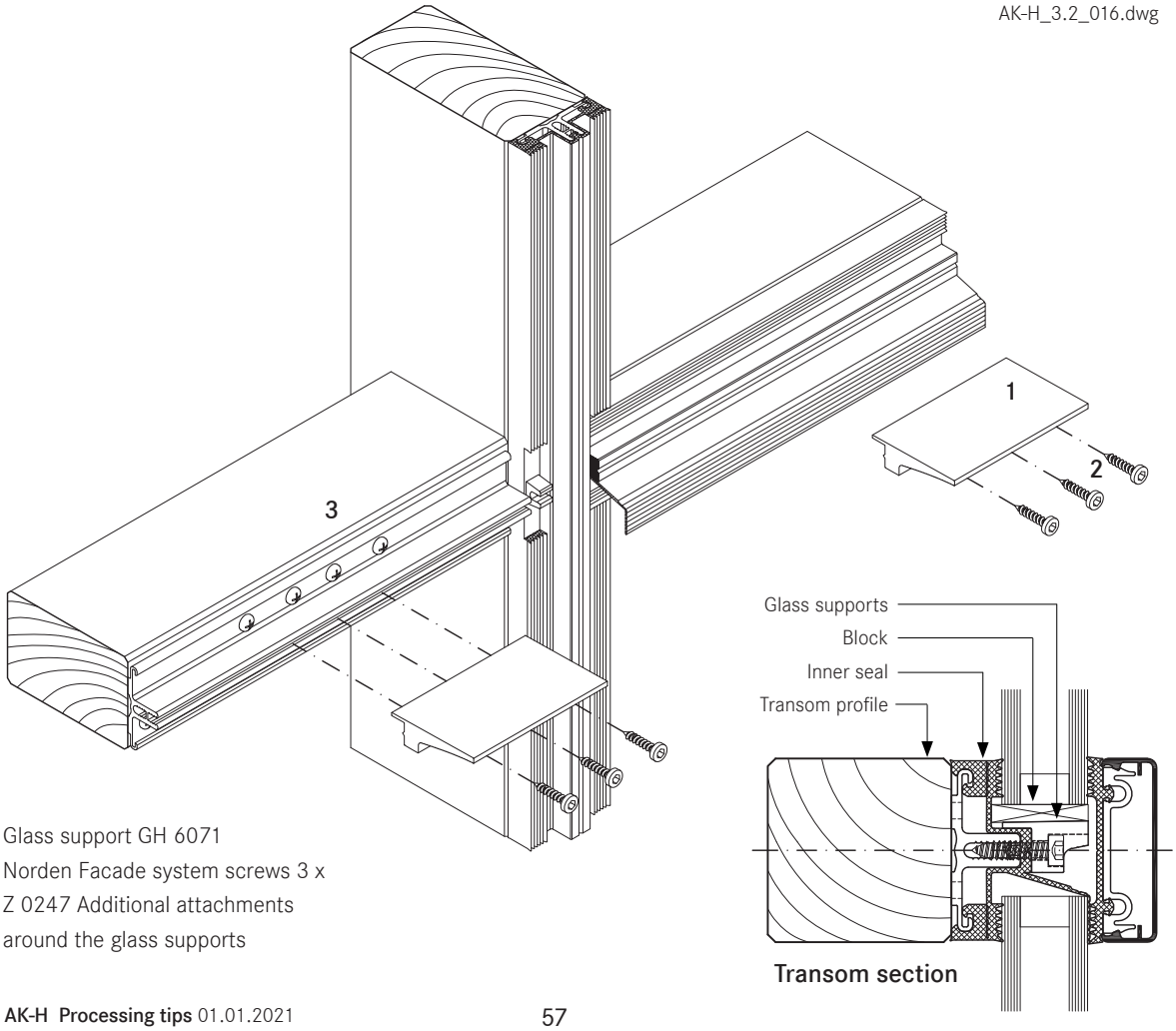
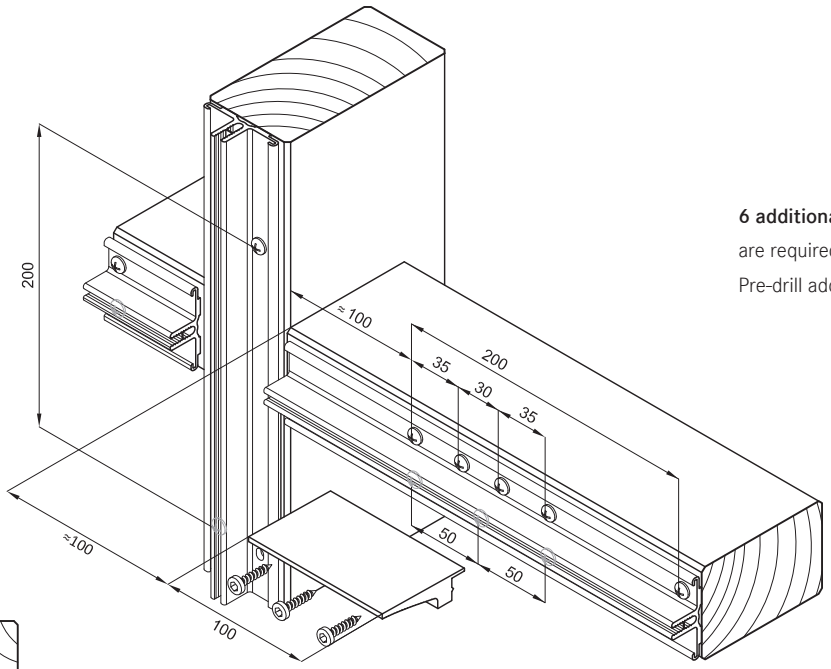


Transom section

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

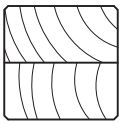
Glass support GH 6071

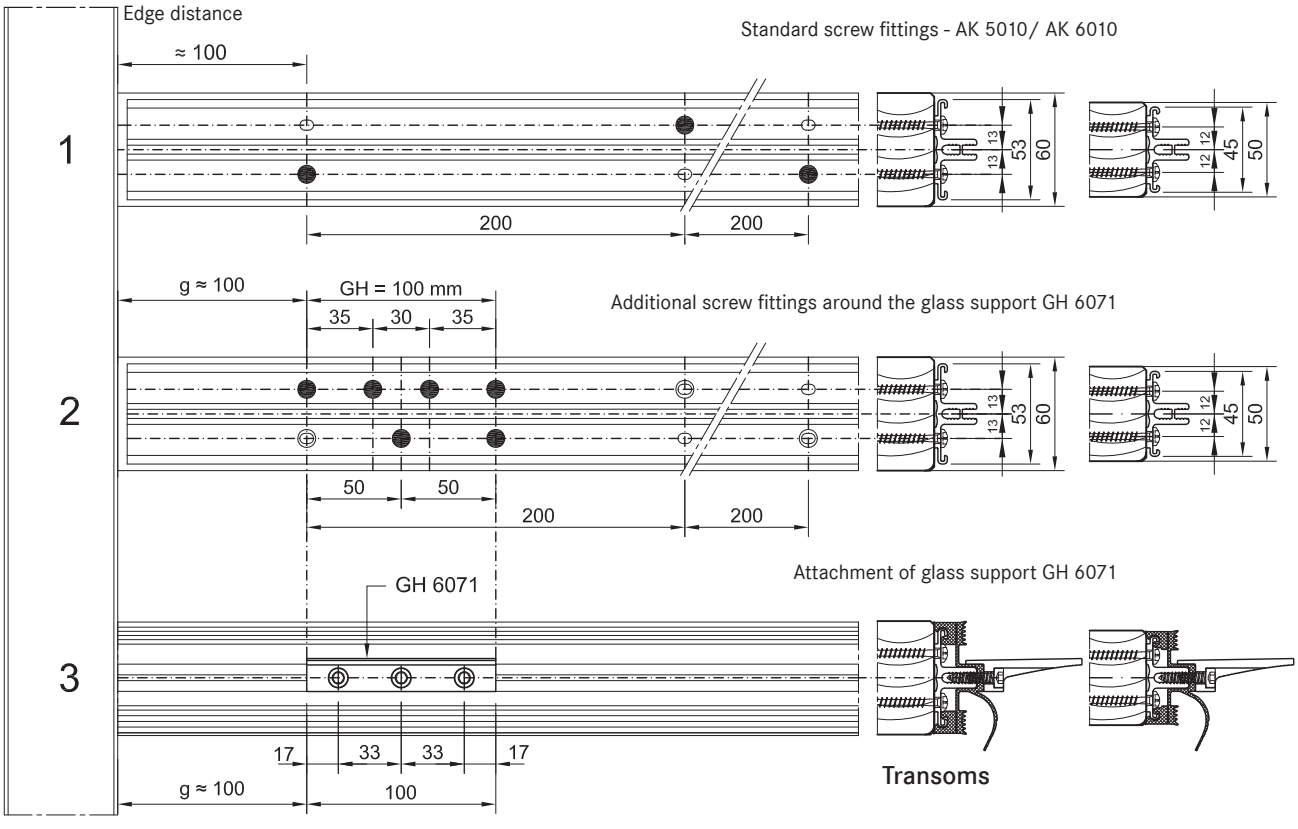
AK 5010/ AK 6010 screwed to structural timber



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

Mullion





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Glass support GH 6072

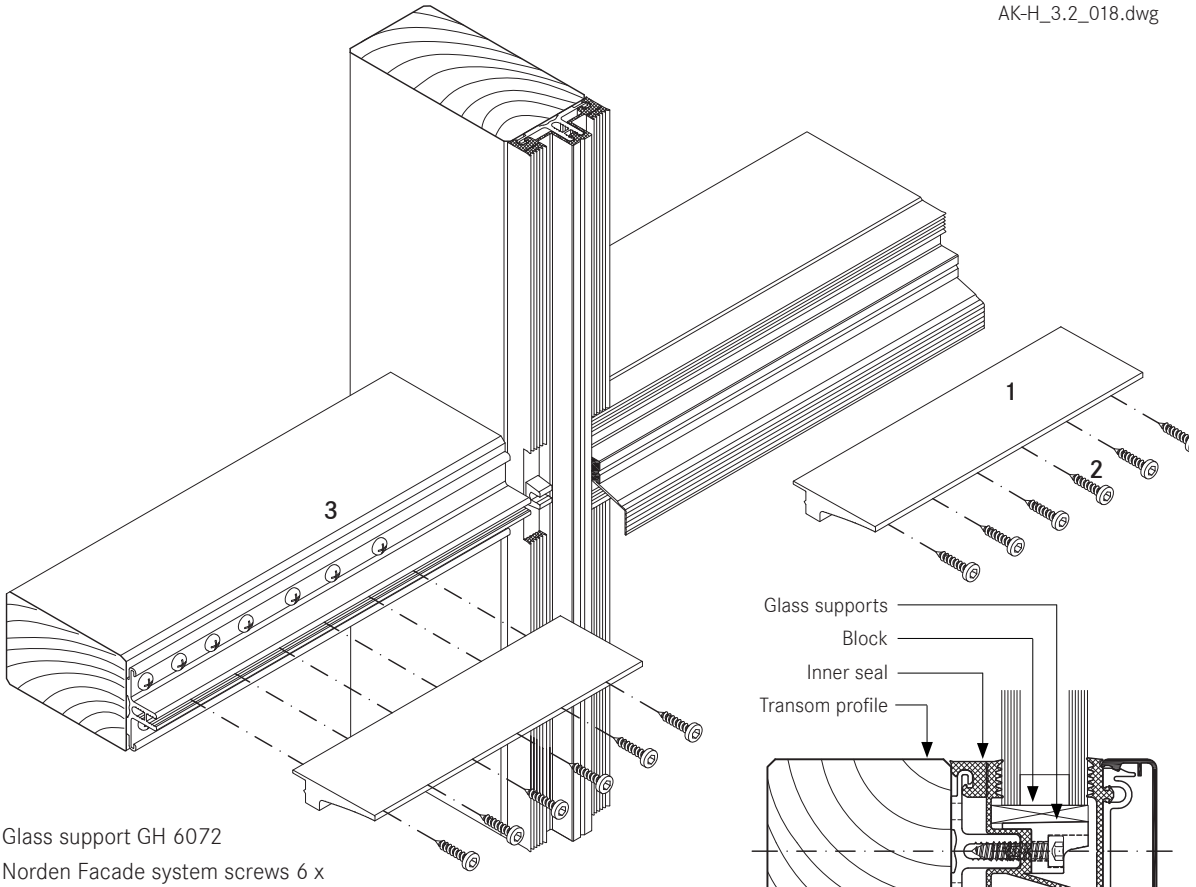
Additional attachments for AK 5010/ AK 6010

- The add-on channel is screwed into the timber structure using Norden Facade Z 0170 system screws. Pre-drill-ing of timber profiles is not necessary.
- Around the GH 6072 glass support, 11 additional screw fittings Z 0170 are required. The following diagram shows the arrangement and must be adhered to.
- The additional holes in the add-on channel are drilled with a diameter of d = 5.5 mm.

Edge distances transom / add-on channel

- Edge distances are given in the diagram.

AK-H_3.2_018.dwg

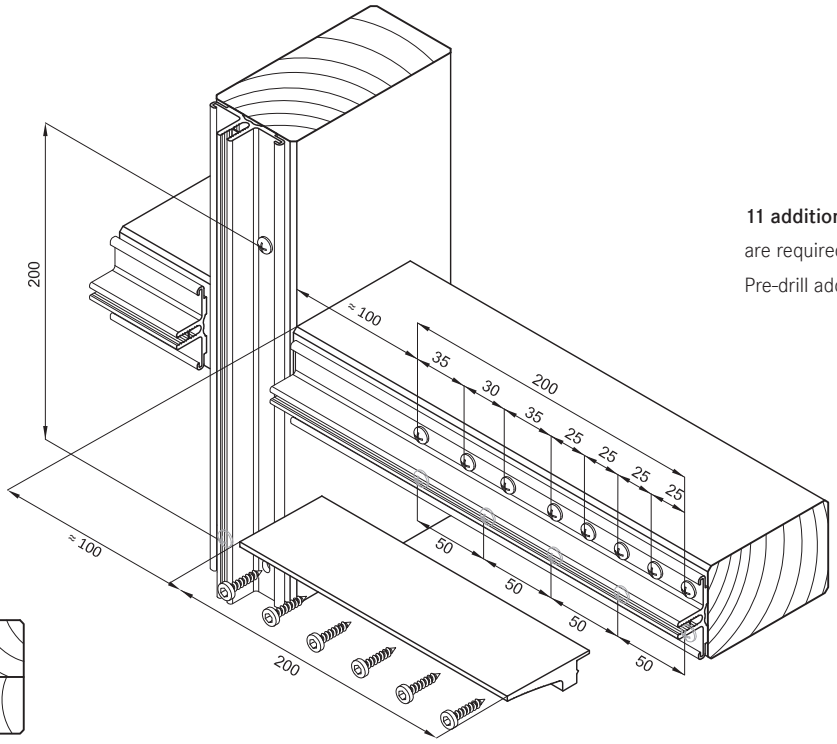


1 Glass support GH 6072
2 Norden Facade system screws 6 x
3 Z 0247 Additional attachments around the glass supports

Transom section

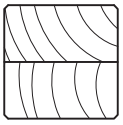
Glass support GH 6072

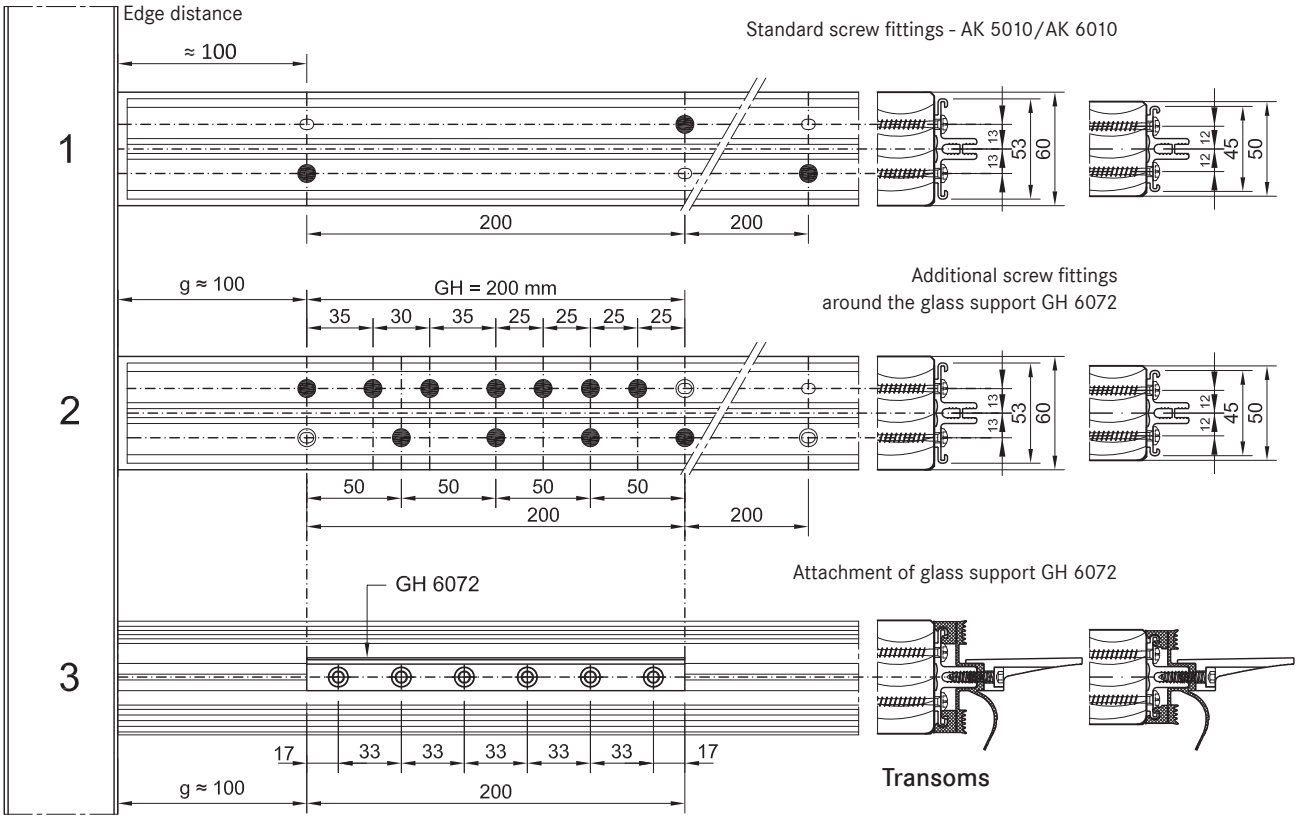
AK 5010/ AK 6010 screwed to structural timber



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

Mullion





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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

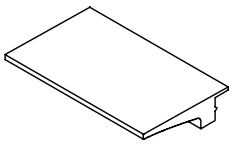
Depending on the thickness of the glass, the depth of the glass support must be shortened by "X"

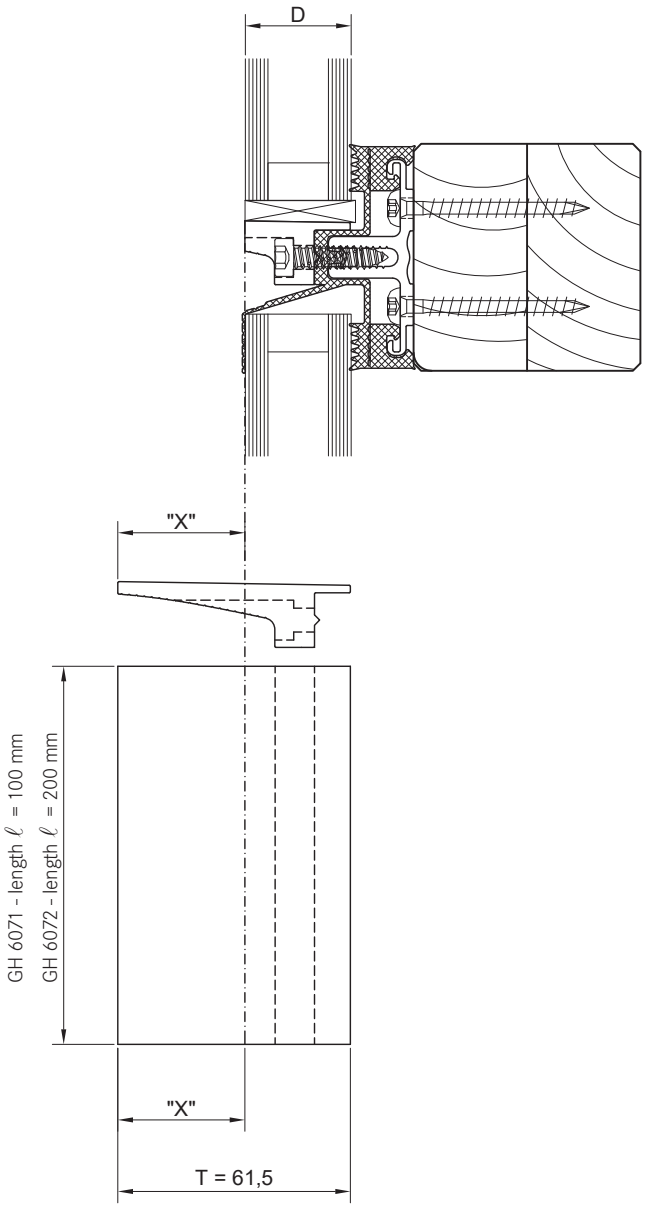
T = depth of glass support
D = thickness of glass pane

} **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





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Glass support GH 6073

Additional attachments for AK 5010/ AK 6010

- The add-on channel is screwed into the timber structure using Norden Facade Z 0170 system screws. Pre-drill-ing of timber profiles is not necessary.
- Around the GH 6073 glass support, 6 additional screw fittings Z 0170 are required. The following diagram shows the arrangement and must be adhered to.
- The additional holes in the add-on channel are drilled with a diameter of d = 5.5 mm.

Edge distances transom / add-on channel

- Edge distances are given in the diagram.

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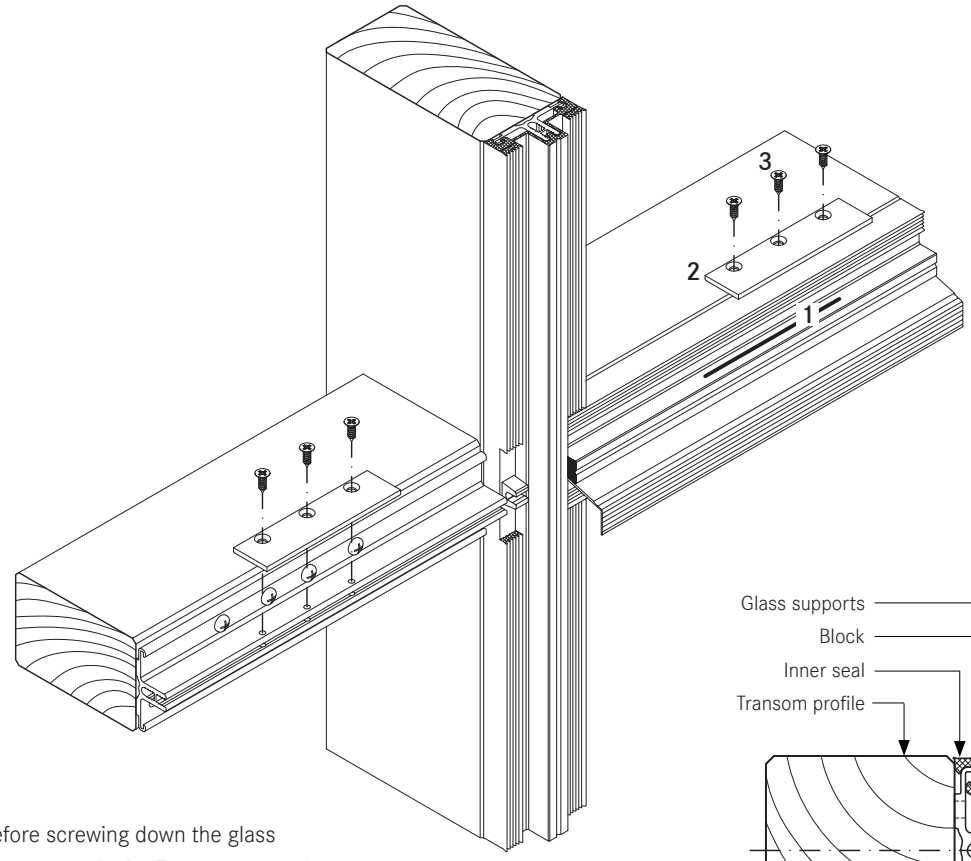
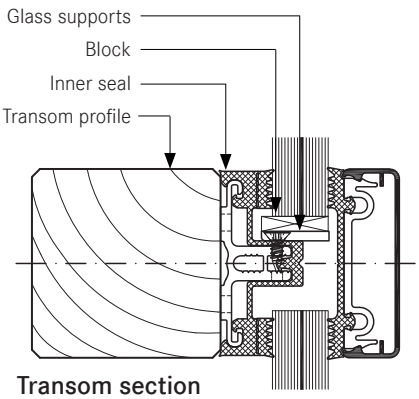


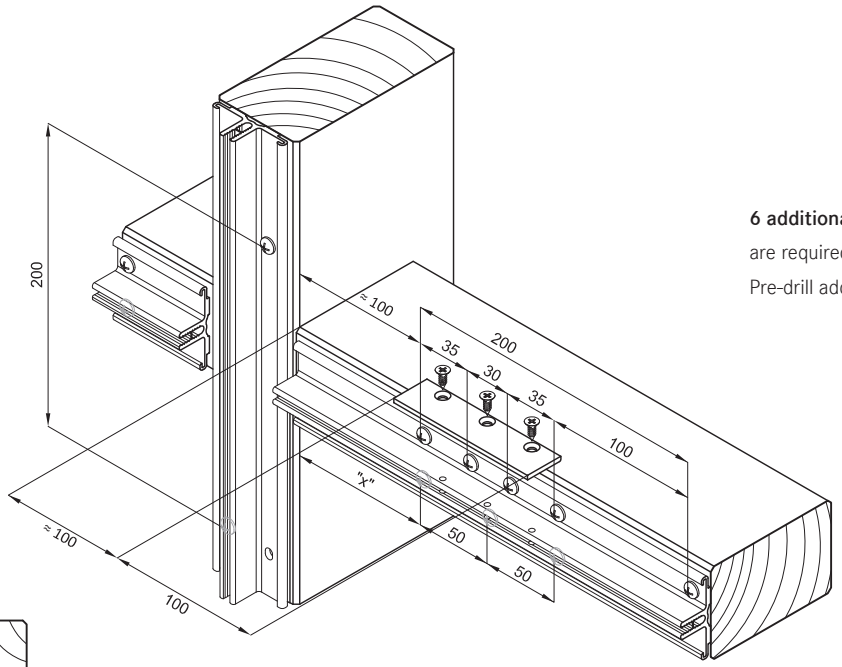
1 Before screwing down the glass support, apply the Z 0094 connecting paste around the screw fitting.
2 Glass support GH 6073
3 Norden Facade system screws 3 x Z 0193



Transom section

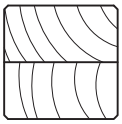
Glass support GH 6073

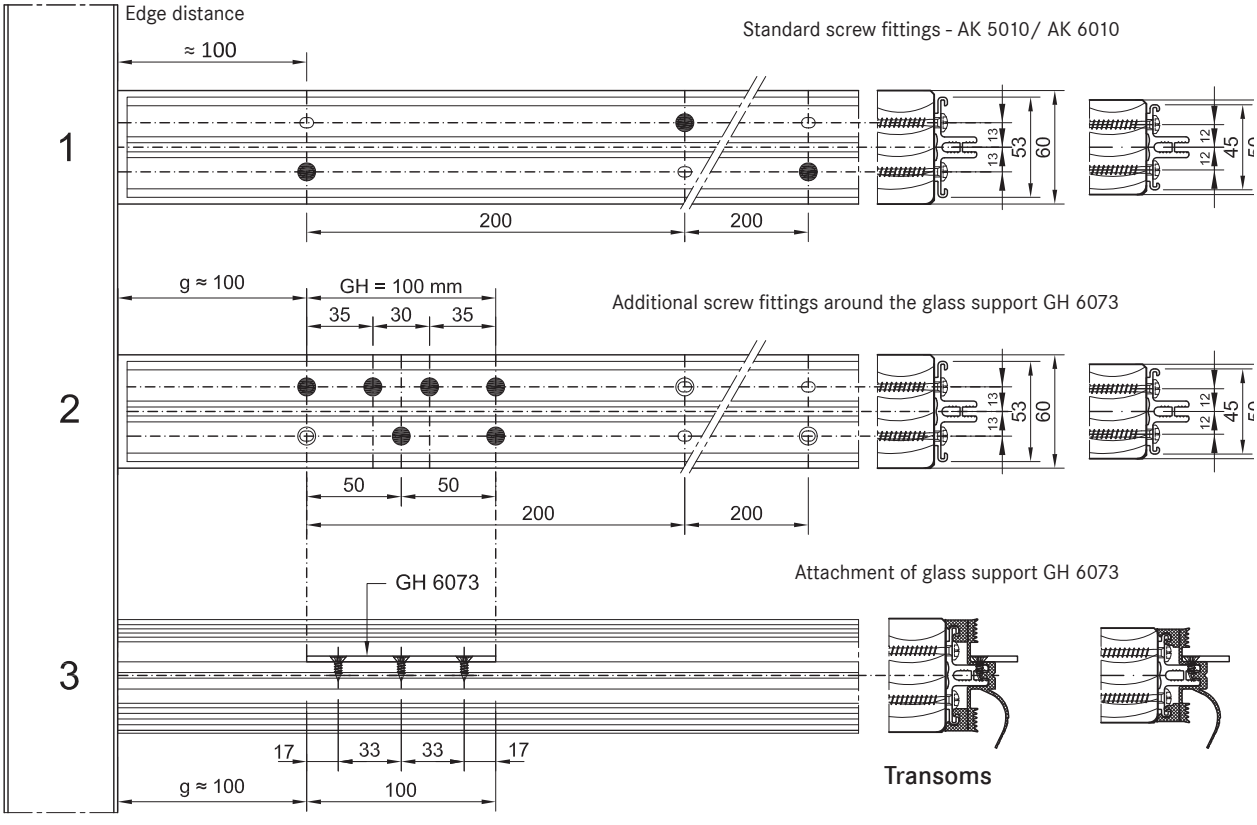
AK 5010/ AK 6010 screwed to structural timber



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

Mullion





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Glass support GH 6073

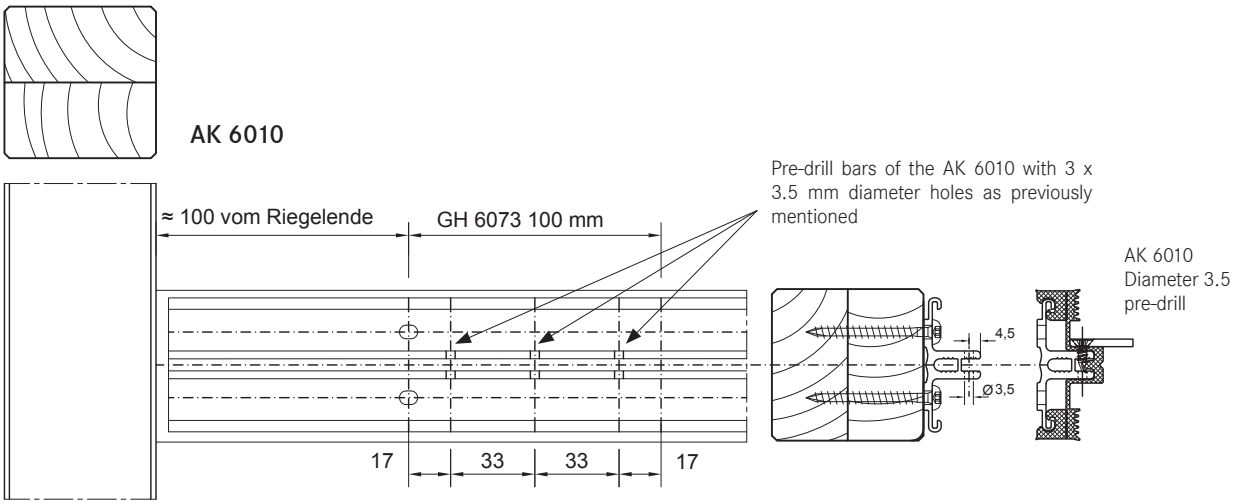
Additional holes in the add-on channel bars

- Glass support GH 6073 is fixed to the add-on chan-nel using 3 Norden Facade system screws Z 0193 (counter-sunk screw diameter 4.2 x 13 mm).
  The bars of the add-on channel should also be pre-drilled 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 re-quired.

Note 1:

Glass support GH 6073 is fixed to the add-on channel AK 6010 using three Norden Facade system screws Z 0193 (di-ameter 4.2 x 13 mm). Before screwing down the glass support, apply the Z 0094 connecting paste around the screw fitting.

Mullion



Note 2:

Assembly of the GH 6073 on AK 5010 is with AK 6010 identical.

AK-H_3.2_021.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.

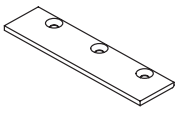
Depending on the thickness of the glass, the depth of the glass support must be shortened by "X"

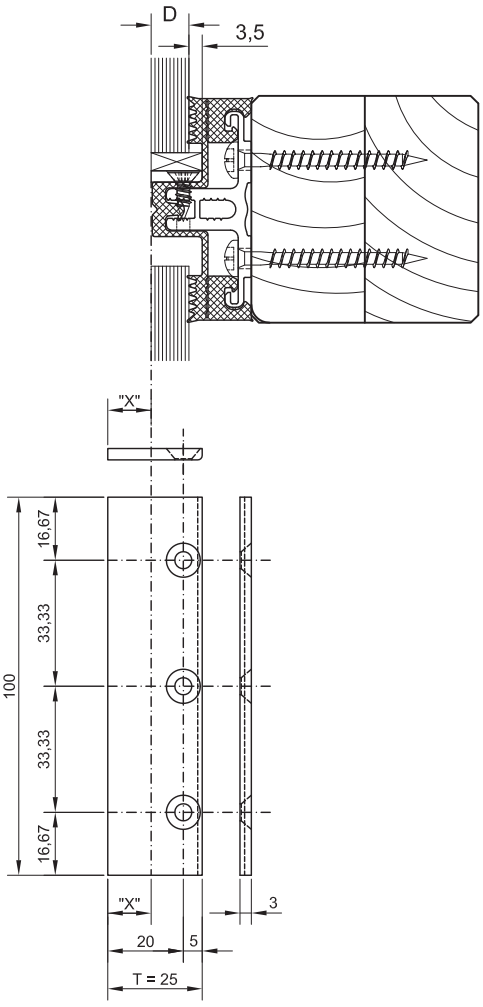
T = depth of glass support
D = thickness of glass pane
Δ = 3.5 mm (system size)

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-H_3.2_022.dwg

Screw fittings

Fastenings

- The fastenings for the Norden Facade AK-H system allow filling elements to be easily secured.
- The clamping strips are connected to the add-on channel using Norden Facade system screws.
- Stainless steel 1.4301 DIN EN 10088 is the material used to produce screws for the Norden Facade system. To make screws easier to install, they are coated with a lubricating zinc layer.
- Depending on the type of screw fittings chosen, Norden Facade system screws are available with and without sealing gaskets. These spe-cial 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 gaskets are available. A plastic (PA) 1.5 mm thick washer with a diameter of 10 mm is additional available.
- The AK-H system can be used with glass from 8 mm thick. The installation of 3 mm thick glass panes is still possible, but adjustments must be made and tested. An exception to this is the use of cover profiles DL 5073/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 main-tained at f ≤ 100 mm.
- The edge distance for the first screw fittings of the transom clamp connection should be in the area of 50 to 130 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 5009L, UL 6009-L and UL 8009-L, slot 7 x 10 mm, a = 125 mm) with clippable upper strips makes assembly easier. The remaining clamping strips should be provided with a round hold of d = 8 mm. The functionality of the clip procedure can be checked after the first upper strip 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

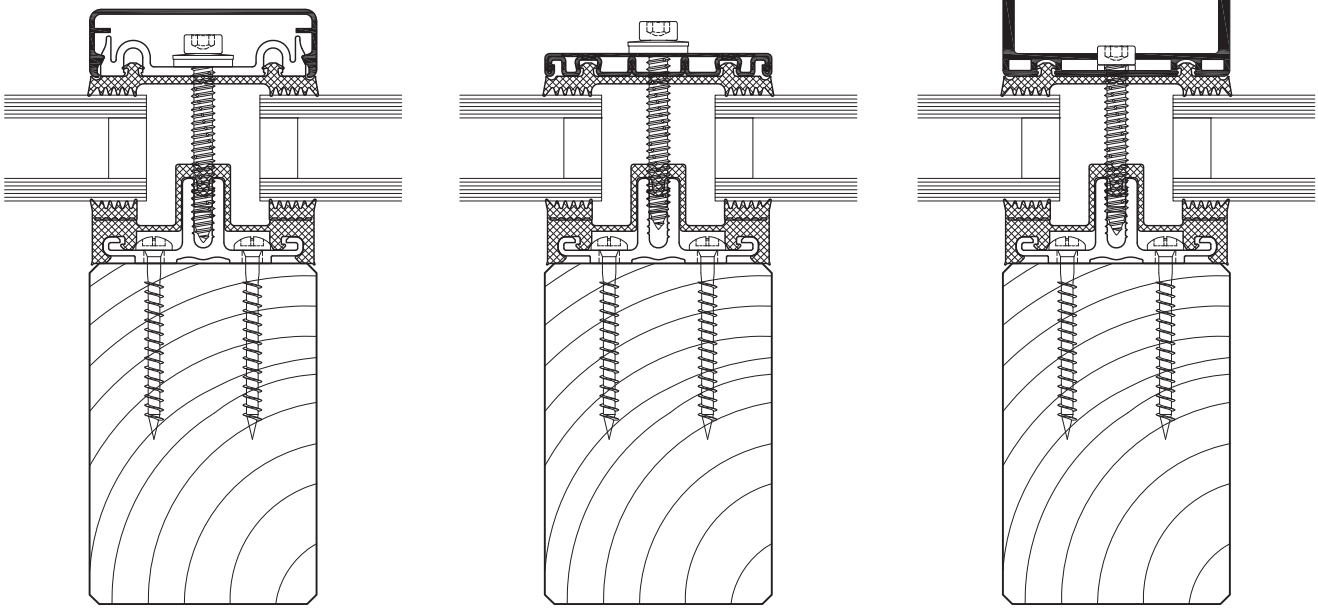
- When creating visible recessed screw fittings, a stepped bore is required. The lower part of the cover profile should be drilled with a d = 7 mm diameter. The upper part of the cover profile needs a d = 11 mm diameter for the screw head. It is recommended to install a washer (PA washer, Z 0033) with all screw fittings.
- Additional factors must be considered for installing cover 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.

Screw fittings

Fastenings



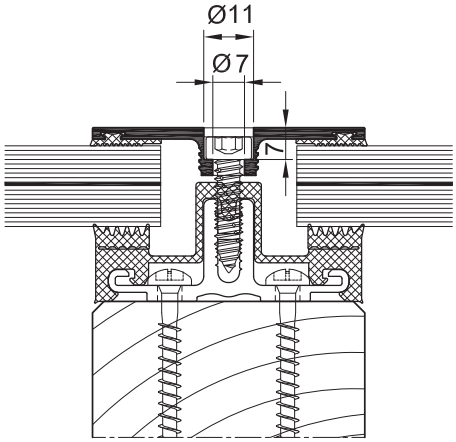
Concealed screw fittings
Norden Facade system screws with cylinder head
d = 10 mm und 4 mm sealing gasket
e.g. Z 0153

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

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

AK-H_3.2_023.dwg

Calculating the screw length for DL 6073/DL 8073



Attention!

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

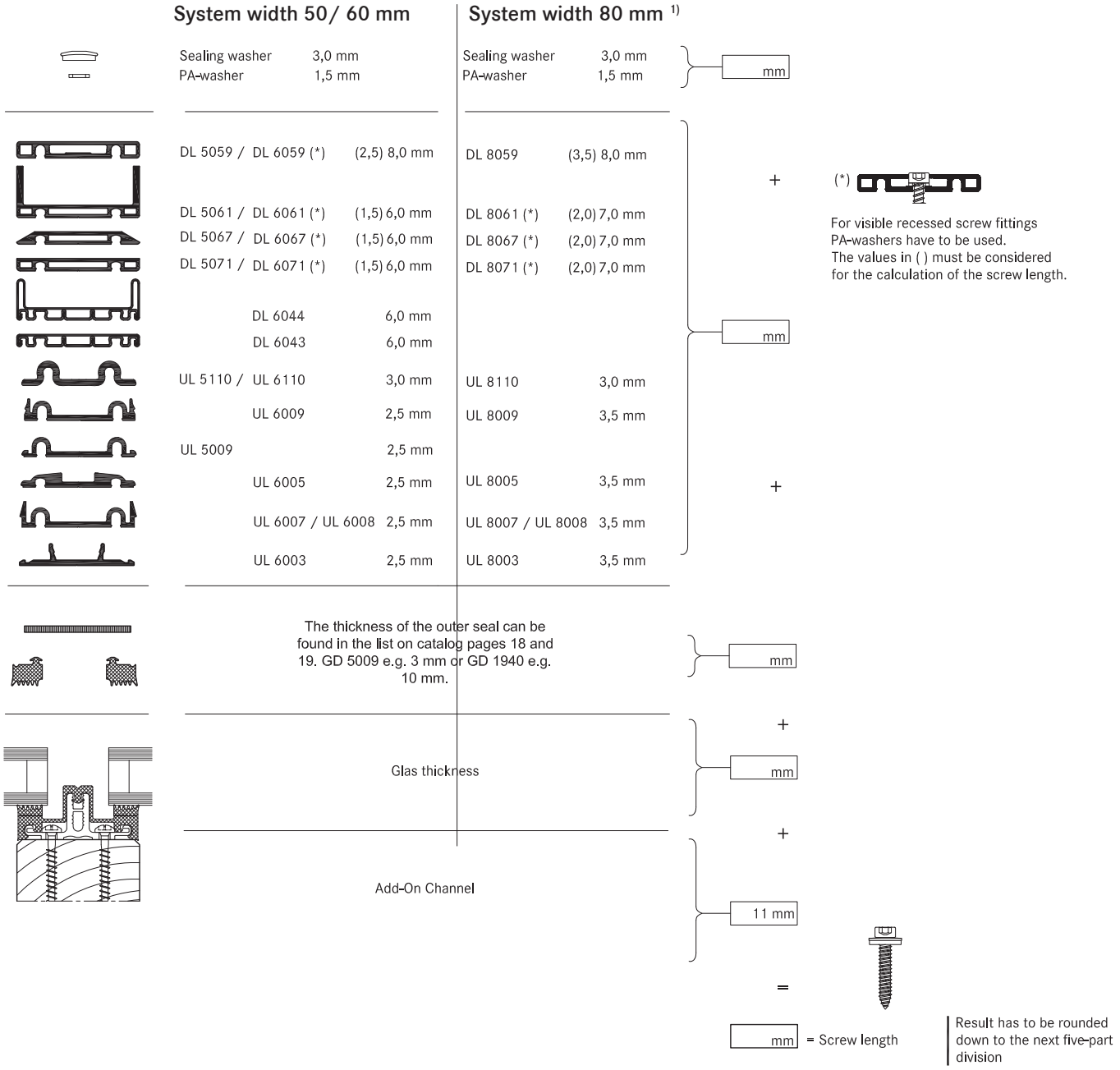
System width + 8 mm for system width 60 mm
System width + 9 mm for system width 80 mm

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-H_3.2_025.dwg

Screw fittings

Calculating the screw length



1) Delivered upon request

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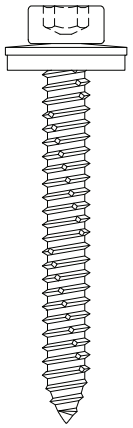
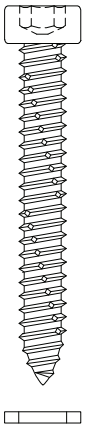
Screw fittings

System screws for Norden Facade **AK-H**



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

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Flat cover profile DL 5073/ DL 6073/DL 8073

Tips or laying the cover profile DL 5073/ DL 6073/DL 8073

We assume that this cover profile 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. 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 profile

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 Norden Facade connecting paste Z 0094.

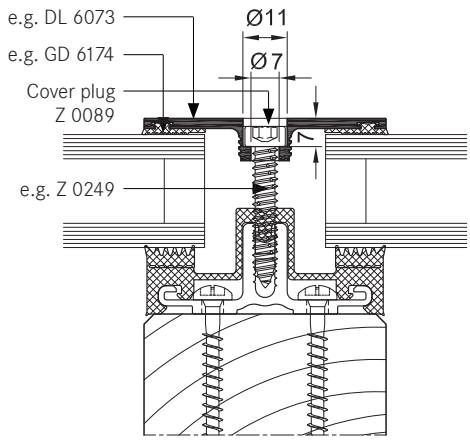
Glass thickness

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.
- Because the cover profile protrudes centrally into the rebate, the glass supports GH 6071 and GH 6072 will collide with the strip.
- Accordingly, a special glass support can be designed by shortening the glass support and strengthening it by applying a aluminium plate. The aluminium plate should be 3 mm thick and must be fixed into position. Ensure that sufficient space is available for the glazing block.
- Alternatively, the cover profile should be milled out around the glass support.
- When using GH 6071 and GH 6072 the glass thickness is d ≥ 28 mm.
- 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.

Mullion



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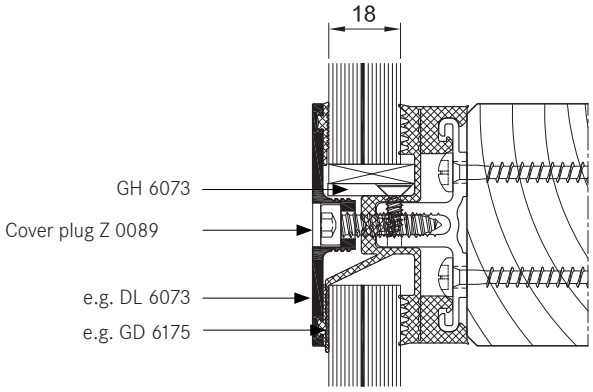
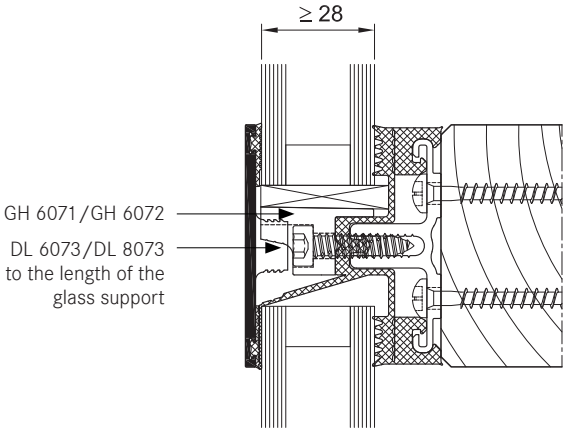
Flat cover profile DL 5073/ DL 6073/DL 8073

Transoms

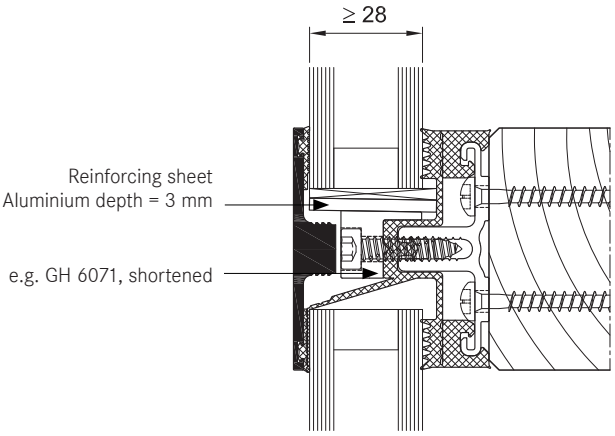
Flat cover profile and glass support GH 6073



Mill flat cover profile and glass support GH 6071/GH 6072



Flat cover profile and glass support GH 6071/GH 6072



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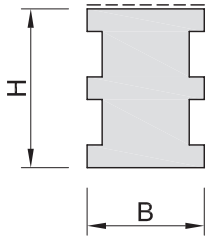
Using slab insulation

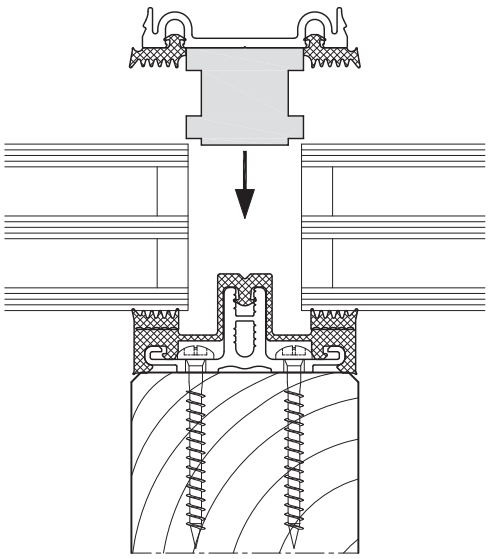
Using slab insulation significantly reduces heat dissipation. The highly effective insulation blocks have a permanently adhesive HOT-MELT. Depending on the situation where they are used, insulation blocks can be directly applied to the cover profile/pressure profile or placed into the rebate over the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

The use of insulation blocks with cover profiles DL5073/ 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 0606 Insulation block 20/26	26 mm	26 mm glass thickness from 32 mm
Z 06075 slab insulation 20/42	26 mm	42 mm glass thickness from 48 mm

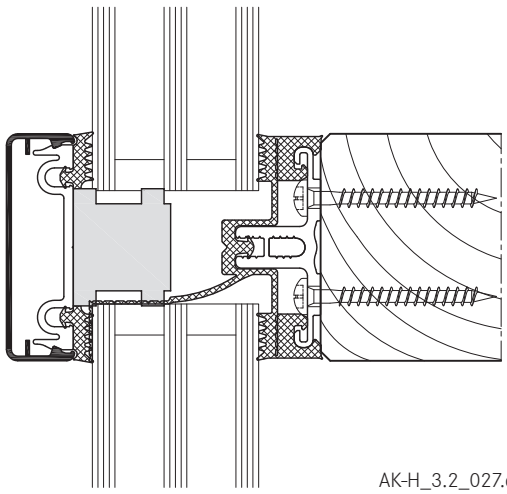
System width 60 mm

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

Note:
Correctly position the seal flap when installing the insulation blocks



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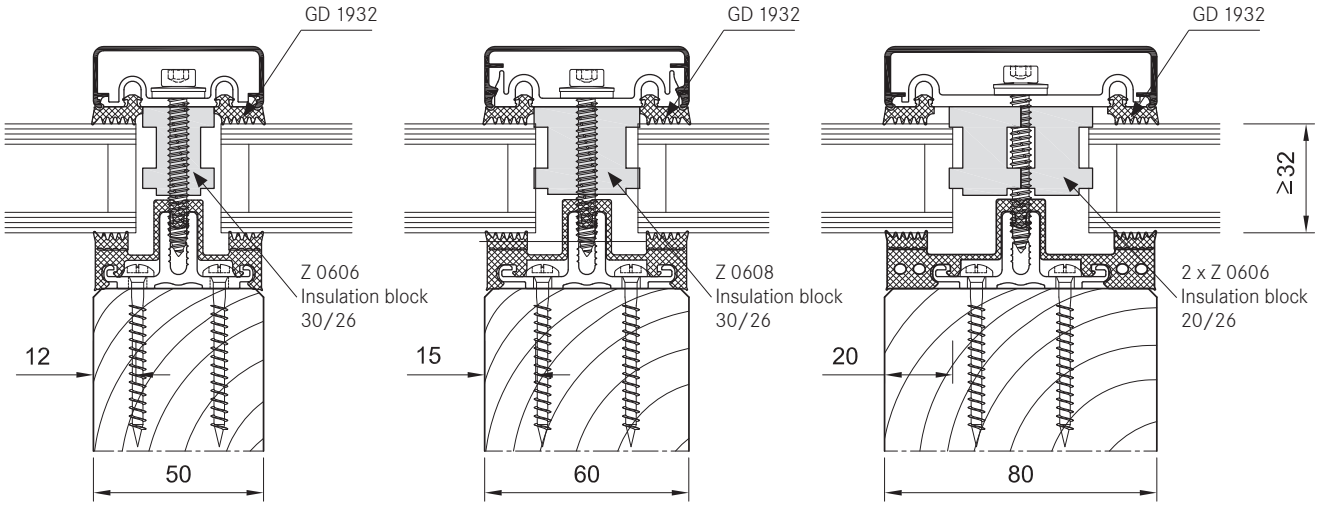
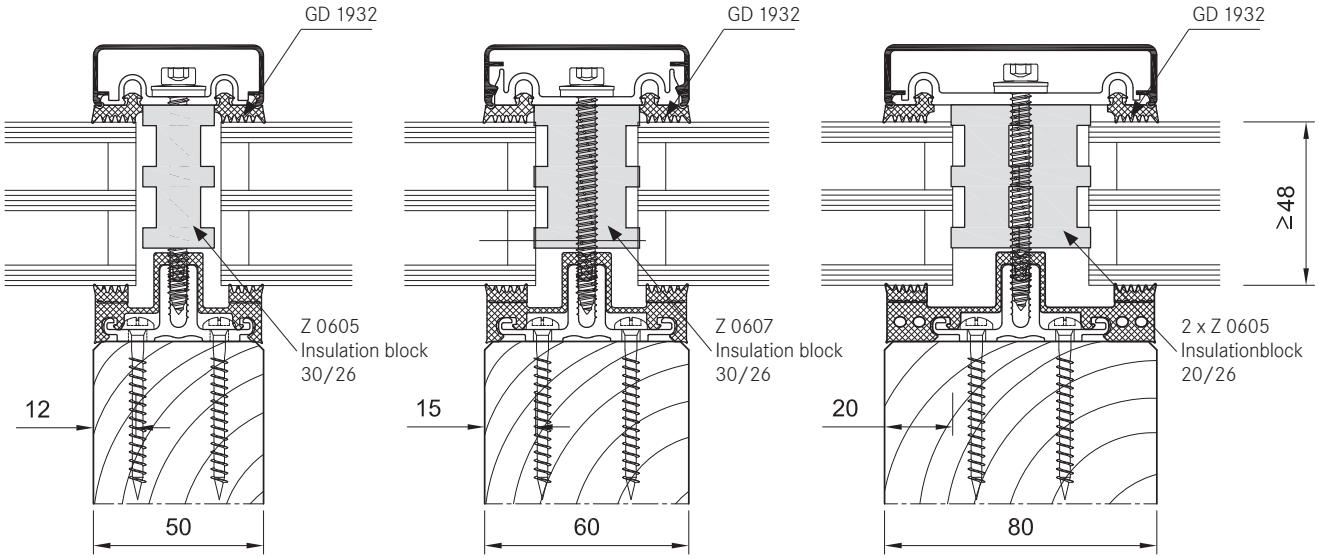
Using slab insulation

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-H_3.2_027.dwg

Pane support variants

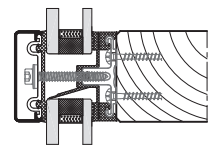
Special design

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

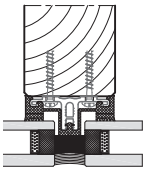
These designs do not conform to the intended uses of the system. No guarantees are made for e.g. quality of seals, durability and structural stability. Responsibility here lies entirely with the company implementing the design.

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 profile

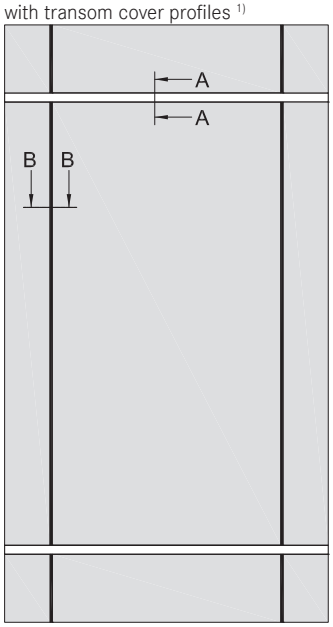


Section A-A



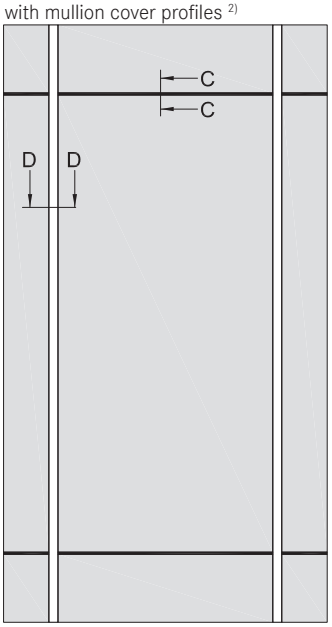
Section B-B

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

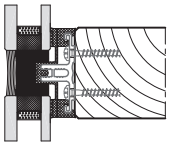


[1)] Seals with 1, 2 or 3 sections are possible

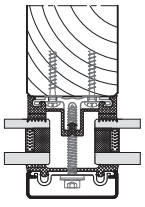
Mullion-transom structure with mullion cover profiles [2)]



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



Section C-C



Section D-D

AK-H_3.3_027_1.

Pane support variants

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.

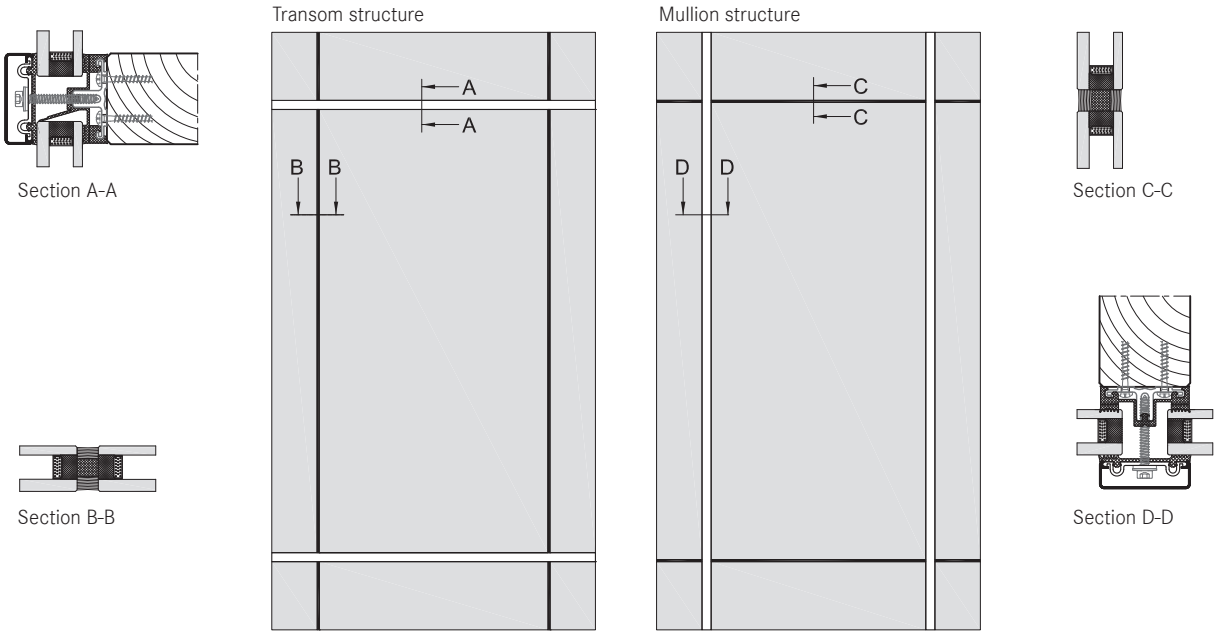
vertical clamping strips:

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 profile



AK-H_3.3_027_2.

Pane support variants

Requirements for special designs

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 Norden Facade 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 to once again emphasise 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 screw fittings

Ensure screw fittings are sufficiently planned for. 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

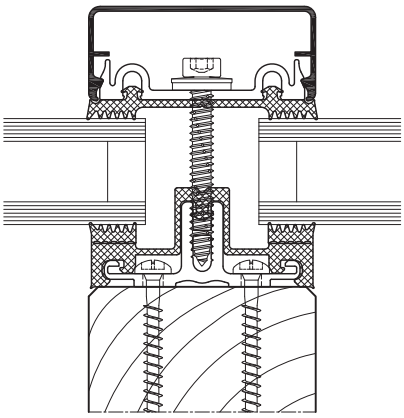
Attention should be given to the reduced support of panes when dimensioning the glass. For example, only the vertical or horizontal cover profiles are effective in the event of wind suction stresses or stress on the fall protection.

7 Material compatibility

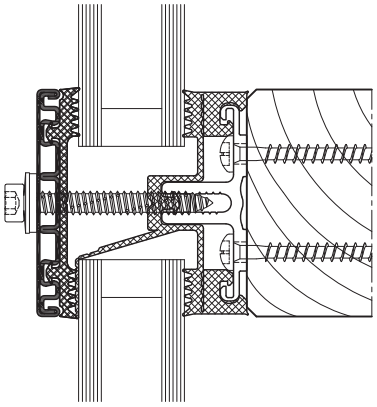
Compatibility of the silicone sealants with our profile sealants and the edge bonding of the glass must be ensured. We recommend the exclusive use of tested silicone sealants from the whole-glass facades sector. Approval is usually given by the silicone manufacturer.

System cross sections

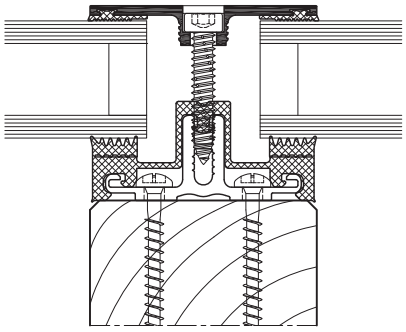
Examples:



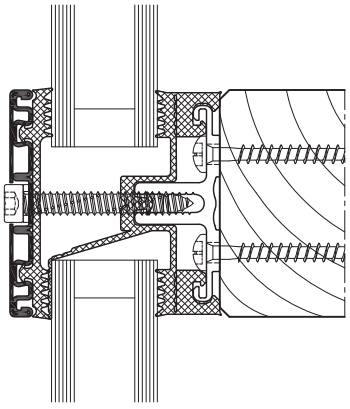
Vertical glazing
Mullion, concealed screw fittings



Vertical glazing
Transom visible screw fittings



Vertical glazing
Mullion flat cover profile DL 6073



Vertical glazing
Transom, visible recessed screw fittings

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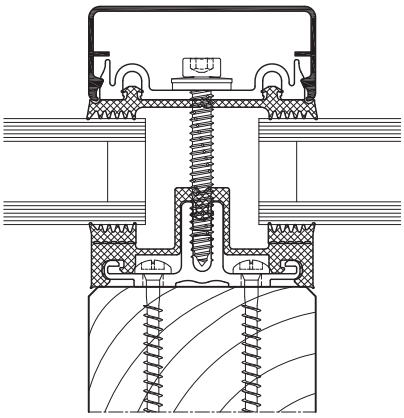
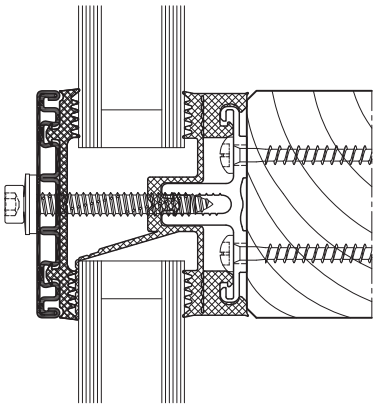
System cross sections

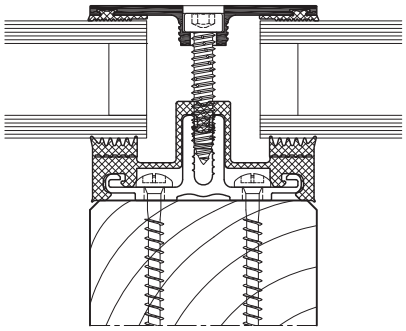
Examples:



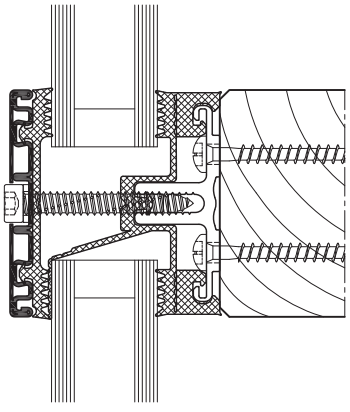
Vertical glazing
Mullion visible recessed screw fittings



Vertical glazing
Transom, concealed screw fittings



Vertical glazing
Mullion visible screw fittings



Inclined glazing
Transom visible screw fittings

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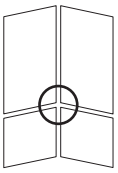
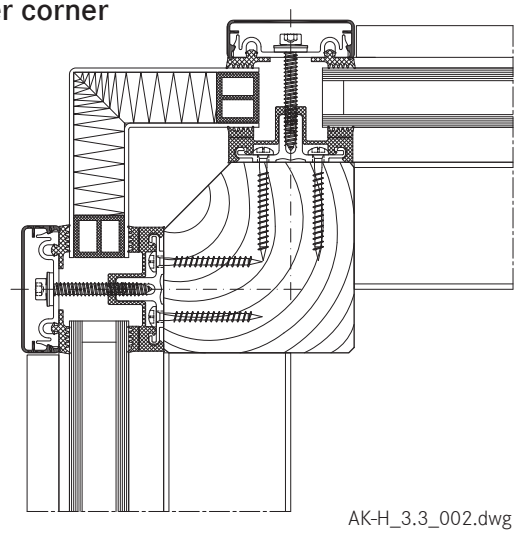
System details

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



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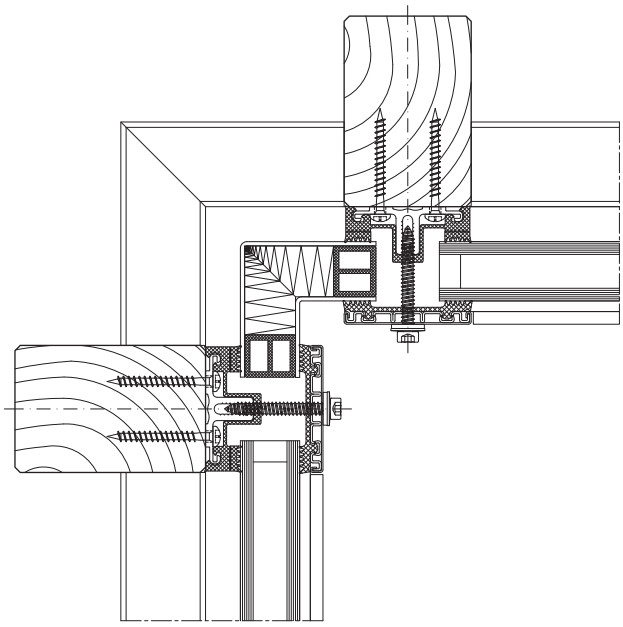
Inner corner



AK-H_3.3_003.dwg

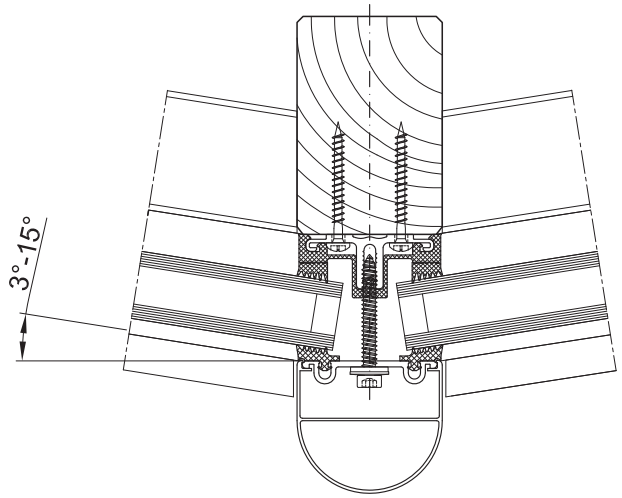
System details

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-H_3.3_004.dwg

System details

Eaves with glass roof connection

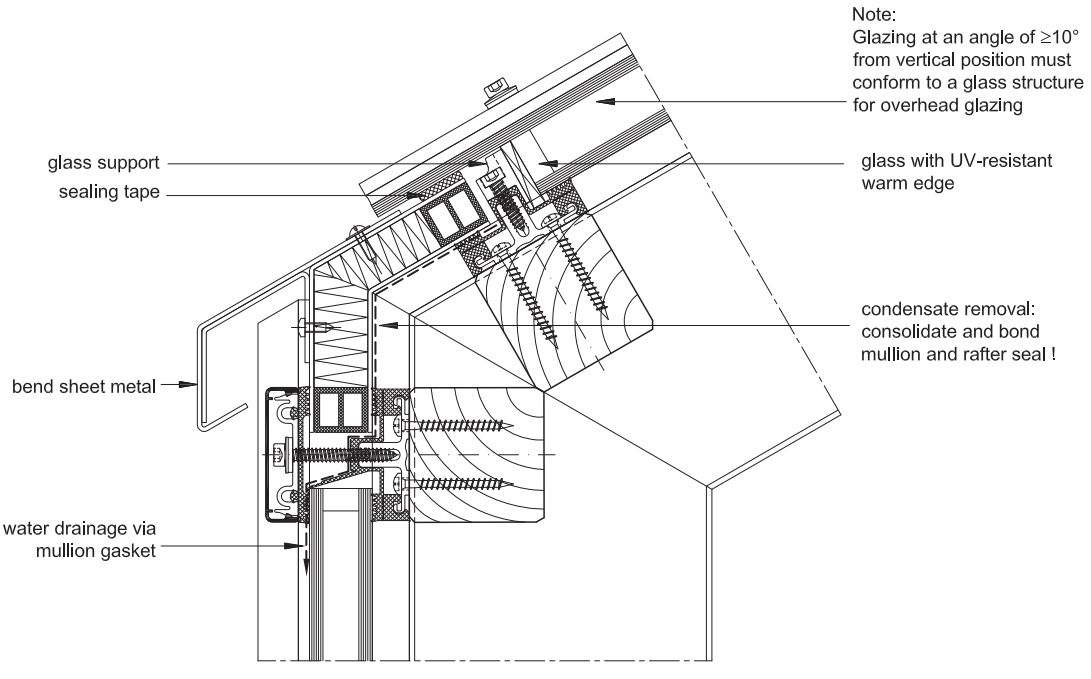
- Depending on the transom construction, a design with or without rain gutters and the choice of stepped glazing or closable cover profiles gives us different variants for implementation.
- All options require condensation and moisture to be drained away at the eaves.

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-H_3.3_005.dwg

System details

Eaves with glass roof connection design using cover profiles

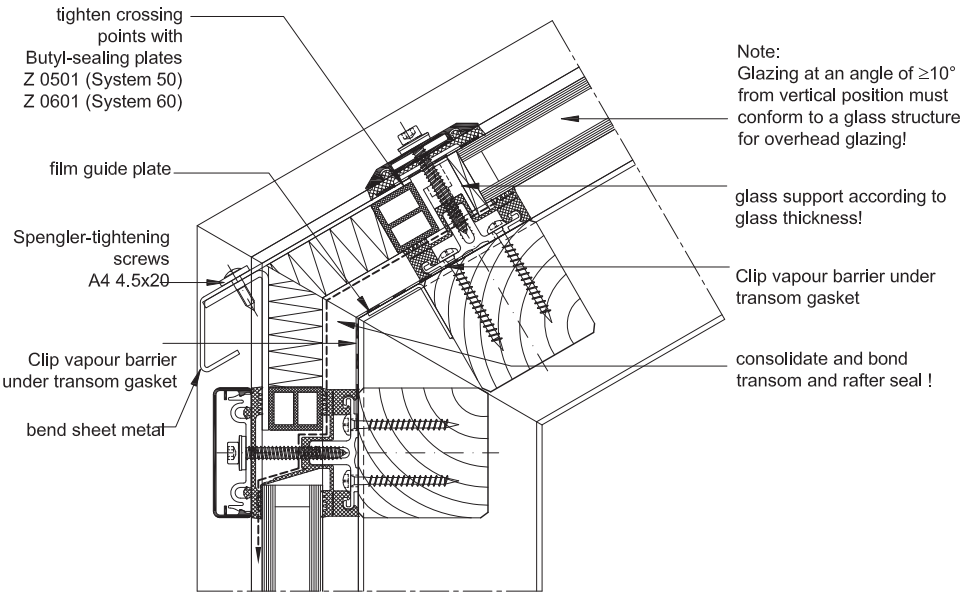
- Horizontal pressure strips prevent the free run off of rain water and dirt.
- Cover strips with angled edges reduce the build up of water in front of the cover profile.
- The outer sealing level on glass roofs must also be thoroughly sealed.
- In combination with our butyl clad stainless steel panels, 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-H_3.3_006.dwg

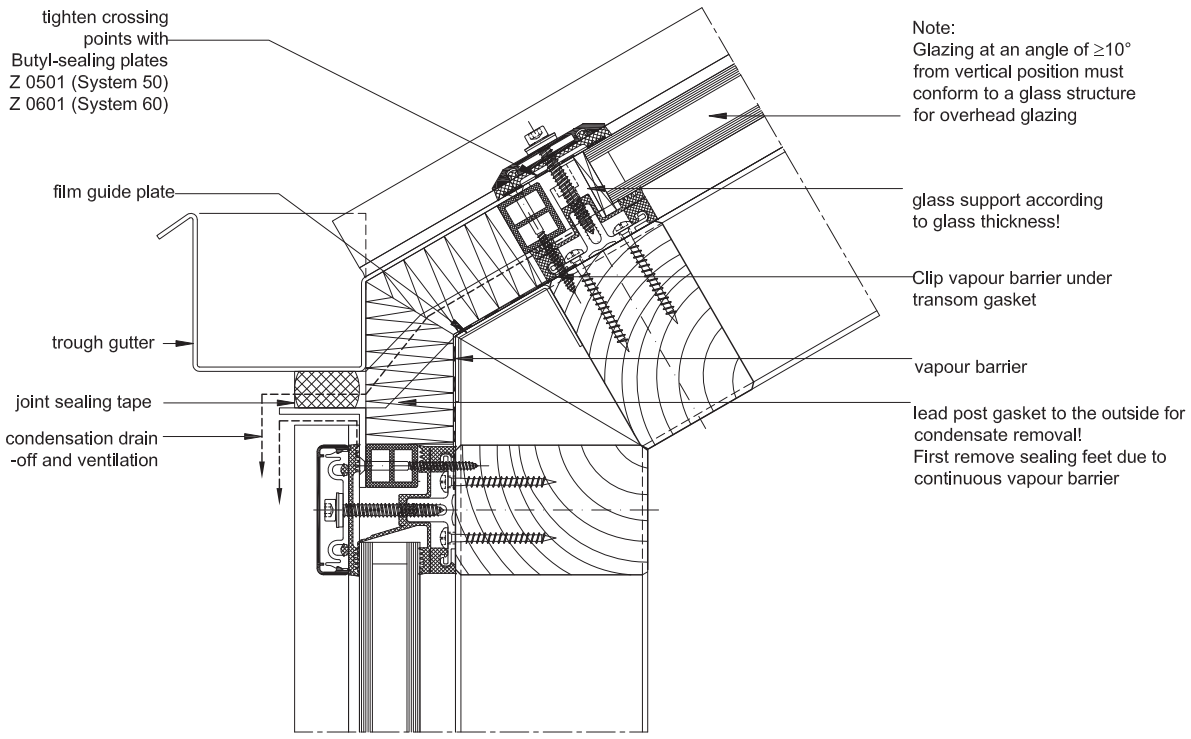
System details

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



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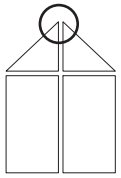
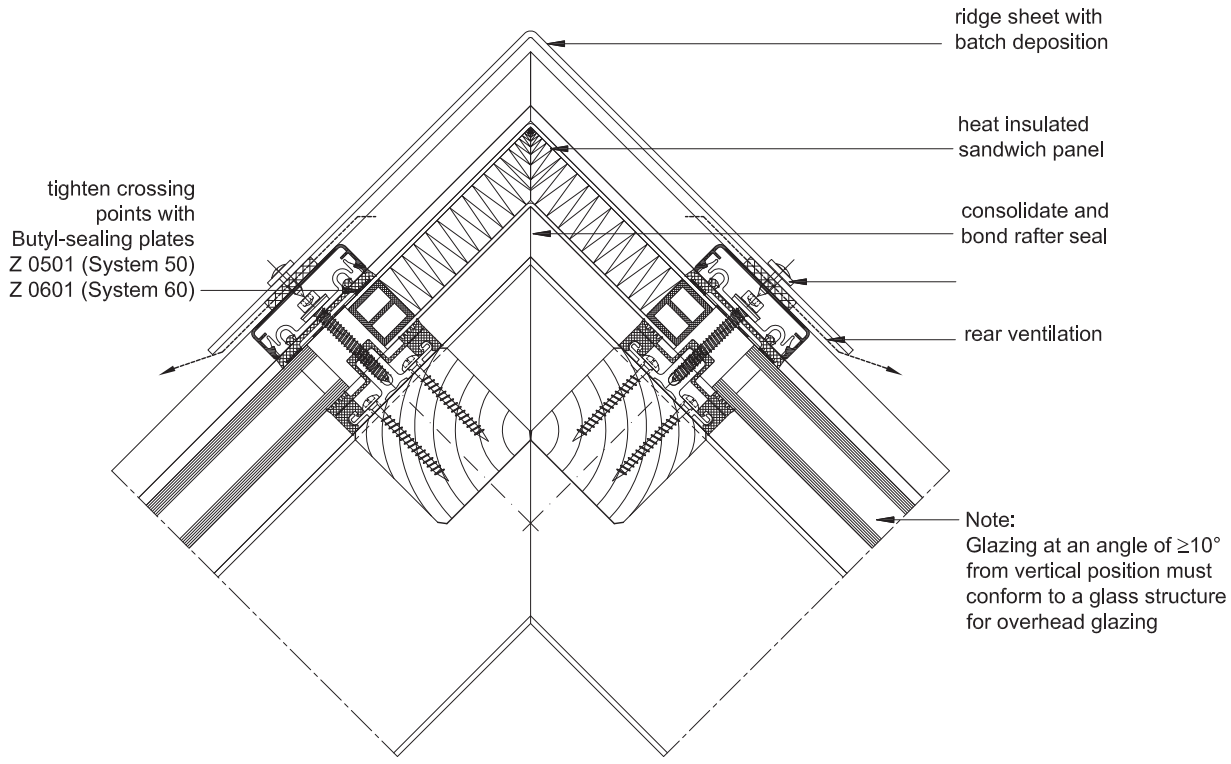
System details

Roof ridge design



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



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Structural attachments

Structural attachment film baffles

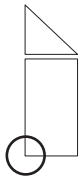
- Attachment of glazing to the building structure requires a well thought out approach.
- Moisture damage can occur if moisture condenses at any thermal bridges.
- Thermal bridges must be avoided and warm air from the inside spaces must not penetrate too deeply into the structure.
- The required moisture 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.

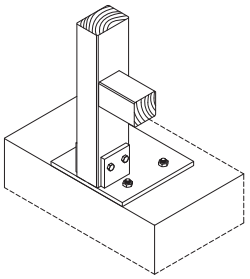
AK-H_3.3_007.dwg

Structural attachments

Facade base

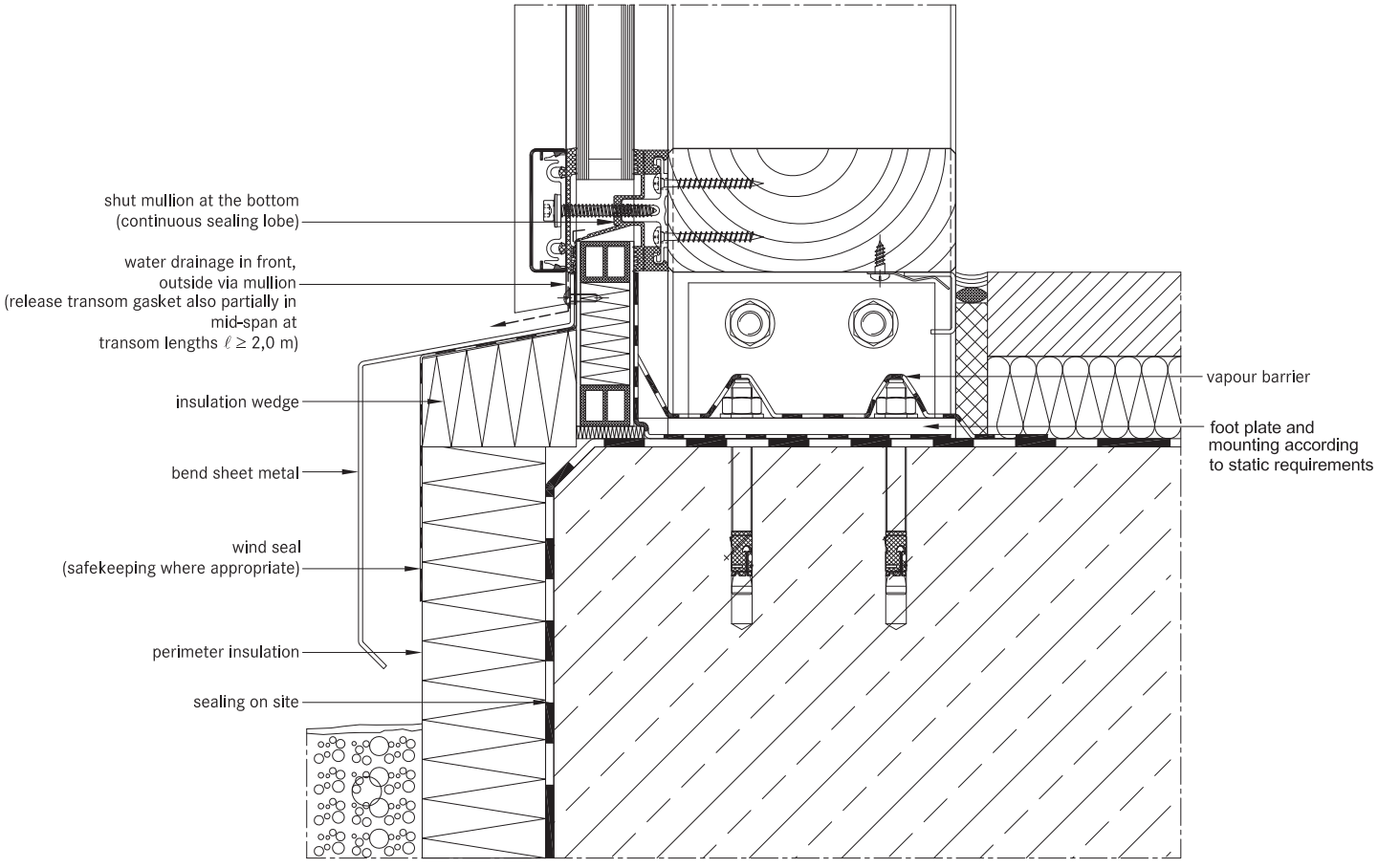
- Controlled drainage of the rebate space can only be ensured if the sealing sections overlap in such a way that no moisture can get under the seals and foils.
- Run foils under the transom seal to act as a moisture barrier and glue to the steel structure. In accordance with DIN 18195 the seal should 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

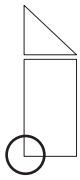


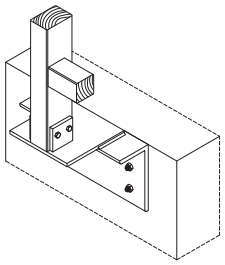
AK-H_3.3_009.dwg

Structural attachments

Facade base

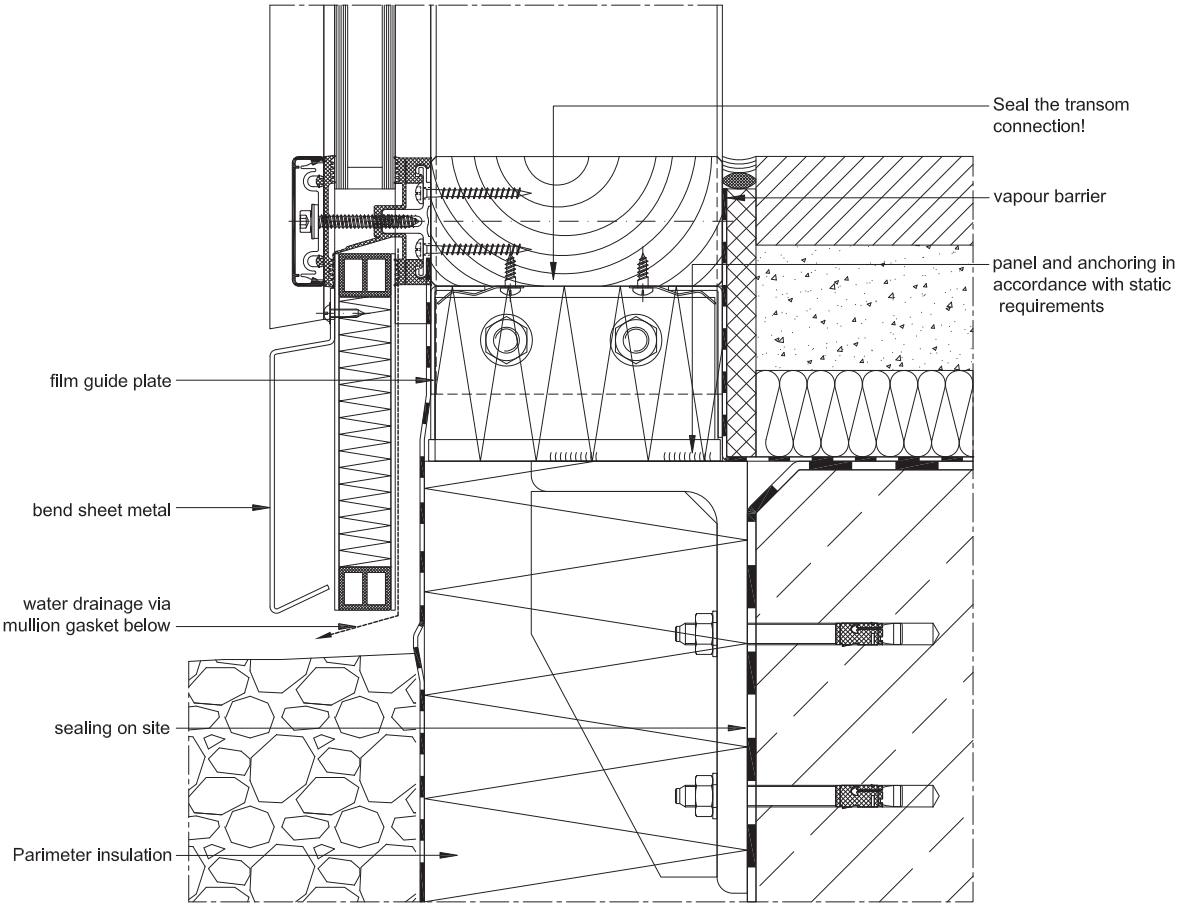
- Heat insulation around the structural connection should be designed in such as way as to prevent cold bridges forming.
- Steel parts should also be provided with sufficient protection against corrosion even in concealed areas.
- Weather-protection sheets should be used depending on the requirements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





Example 2:

Attaching intermediate mullion before base plates



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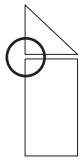
Structural attachments

Connection before intermediate floors

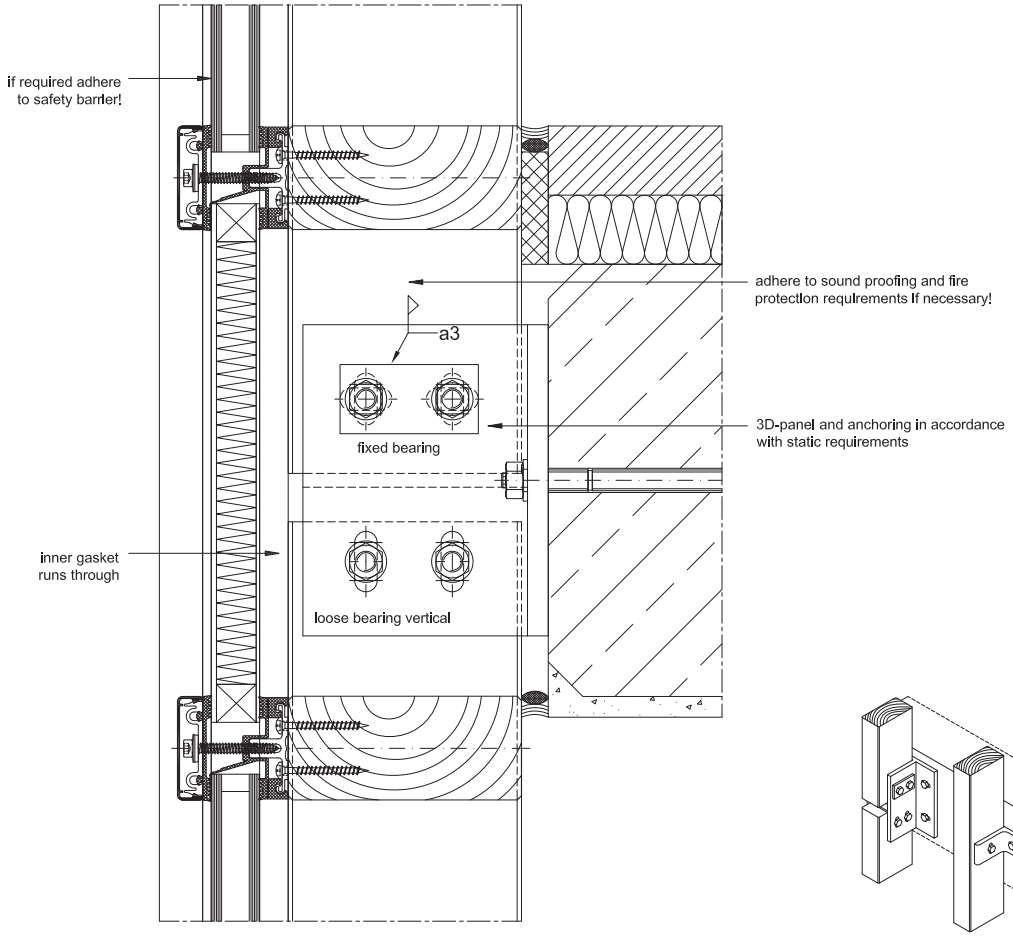
- Depending on requirements, mullions are designed as continuous multi-span transoms or separated at each floor.
- Reasons for separating mullions can include e.g. building settlement, fire protection, sound insulation, etc.
- If the separation joint is intended to absorb expansion, then as well as the required degree of freedom for mullion mullions, 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.

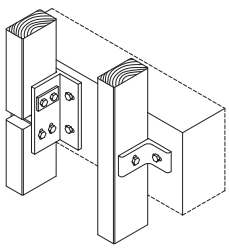


Example:

Mullions separated at each floor

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



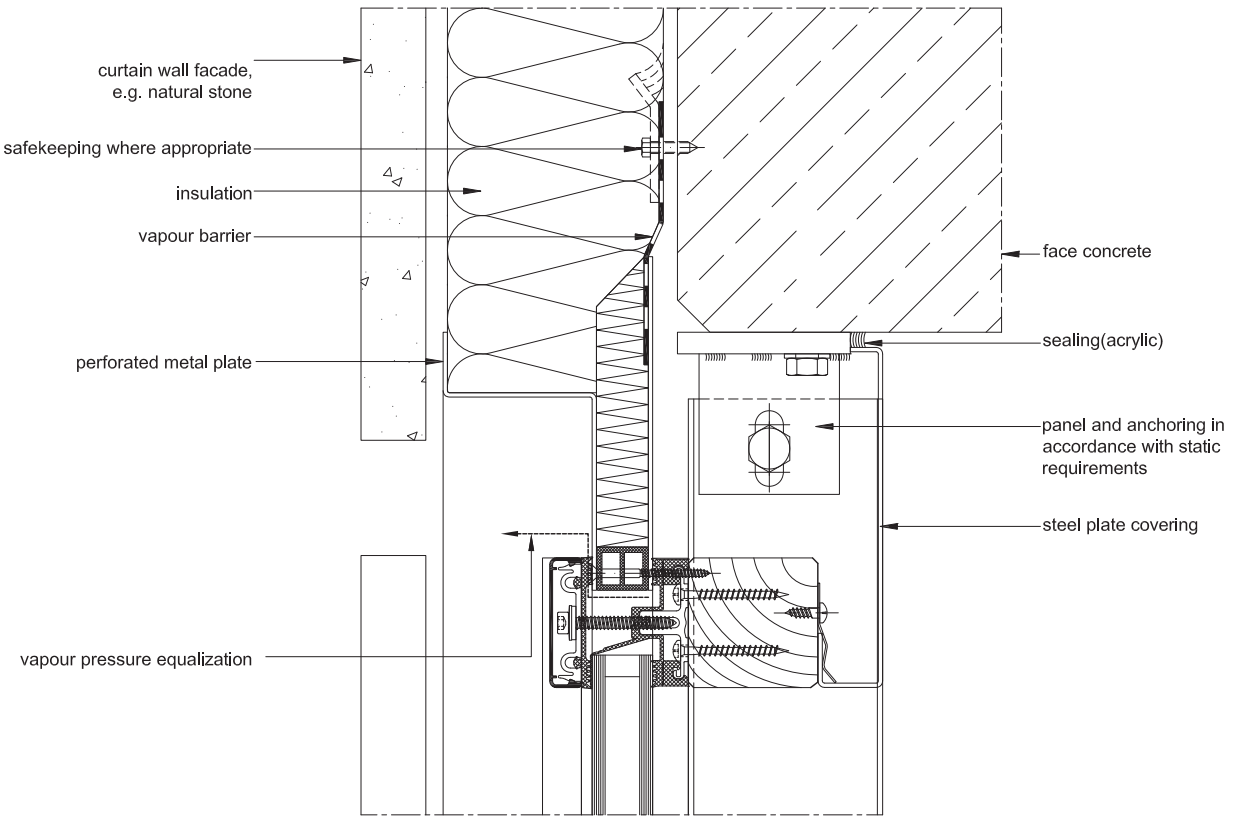


AK-H_3.3_012.dwg

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.



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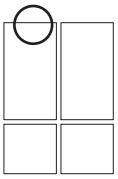
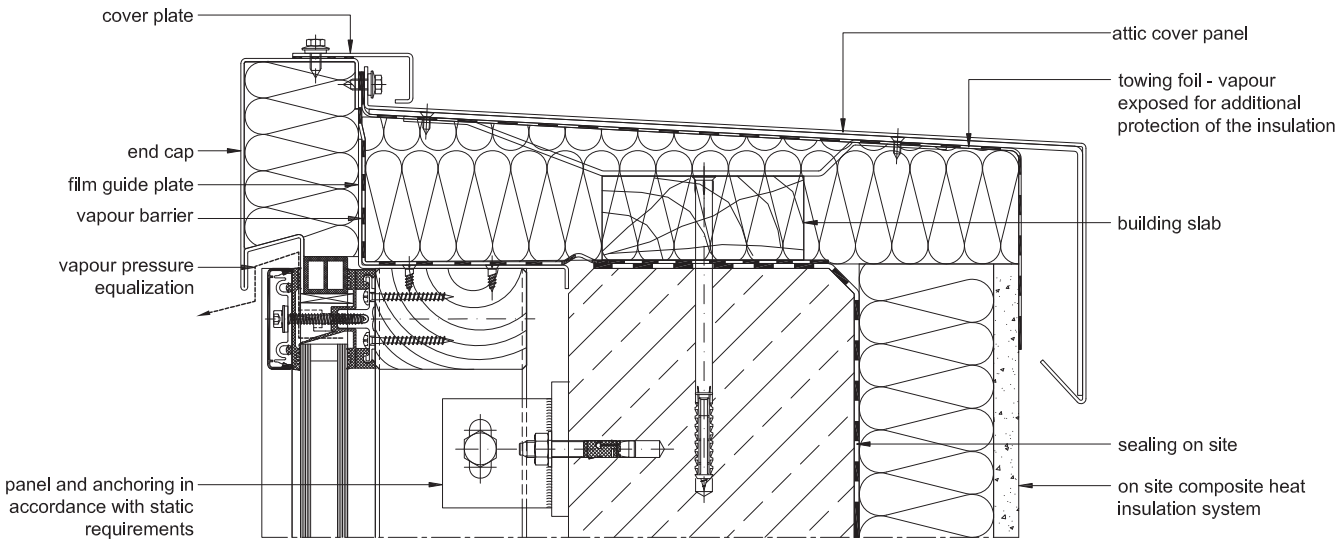
Structural attachments

Facade connection to parapets





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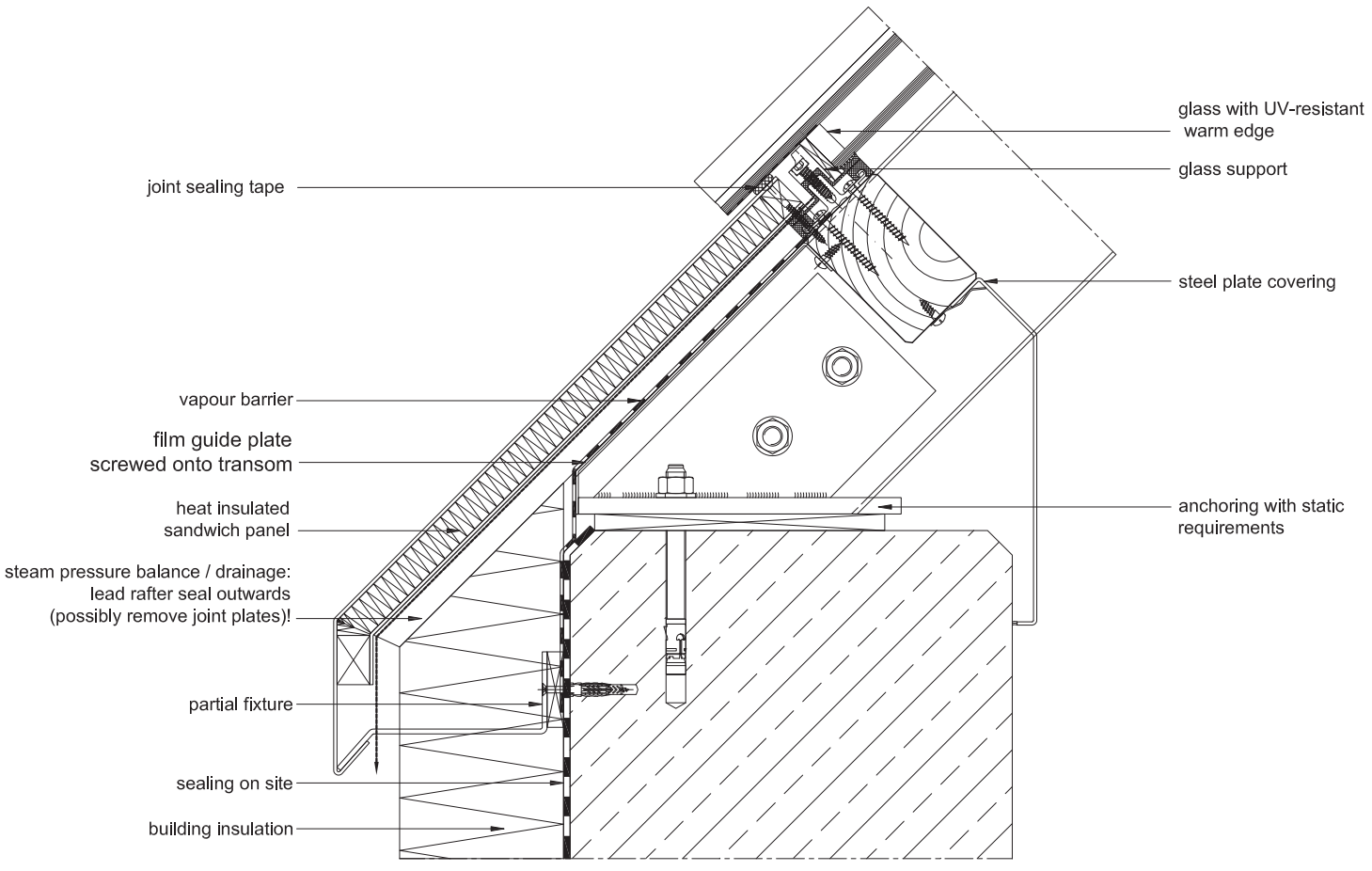
Structural attachments

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.

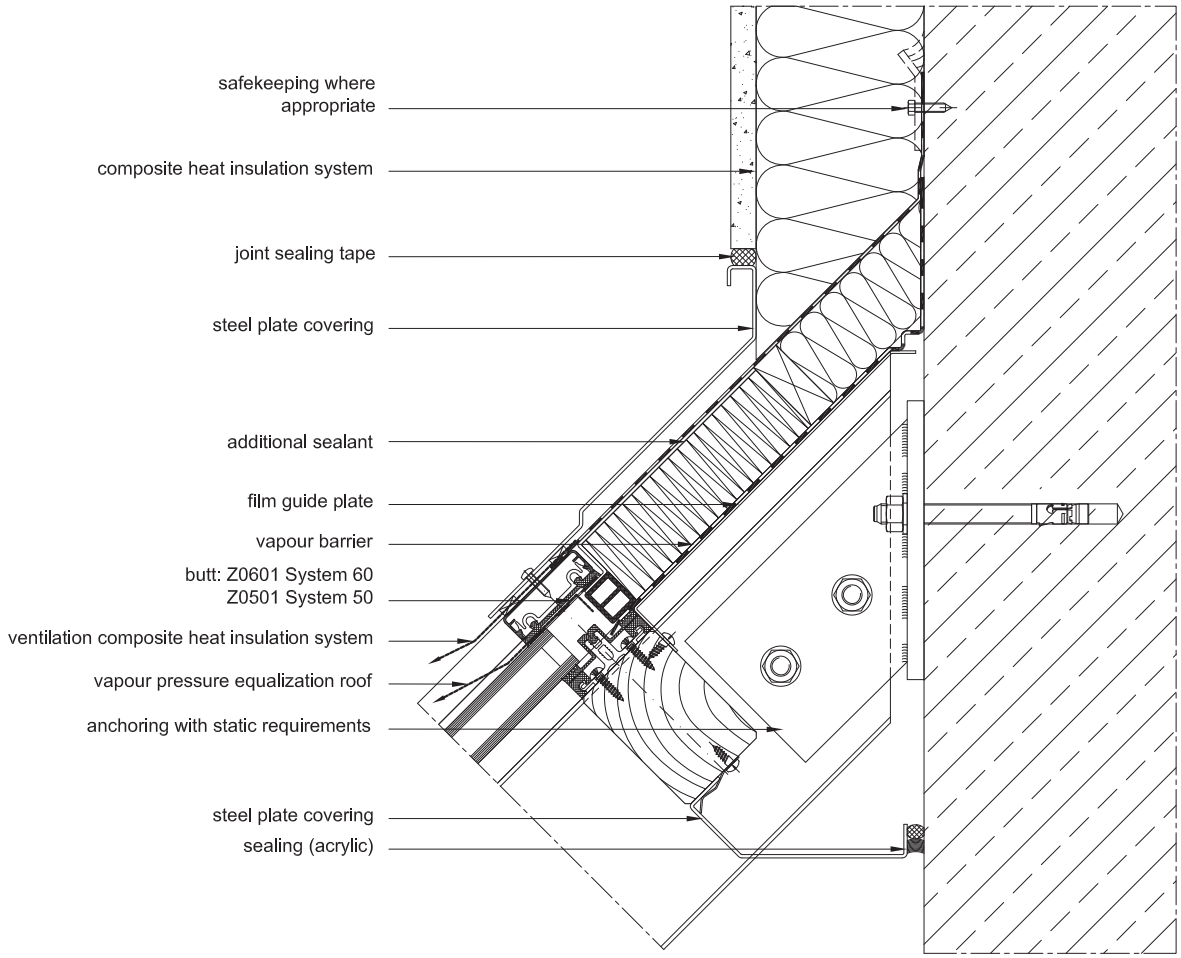


AK-H_3.3_015.dwg

Structural attachments

Ridge connection to walls

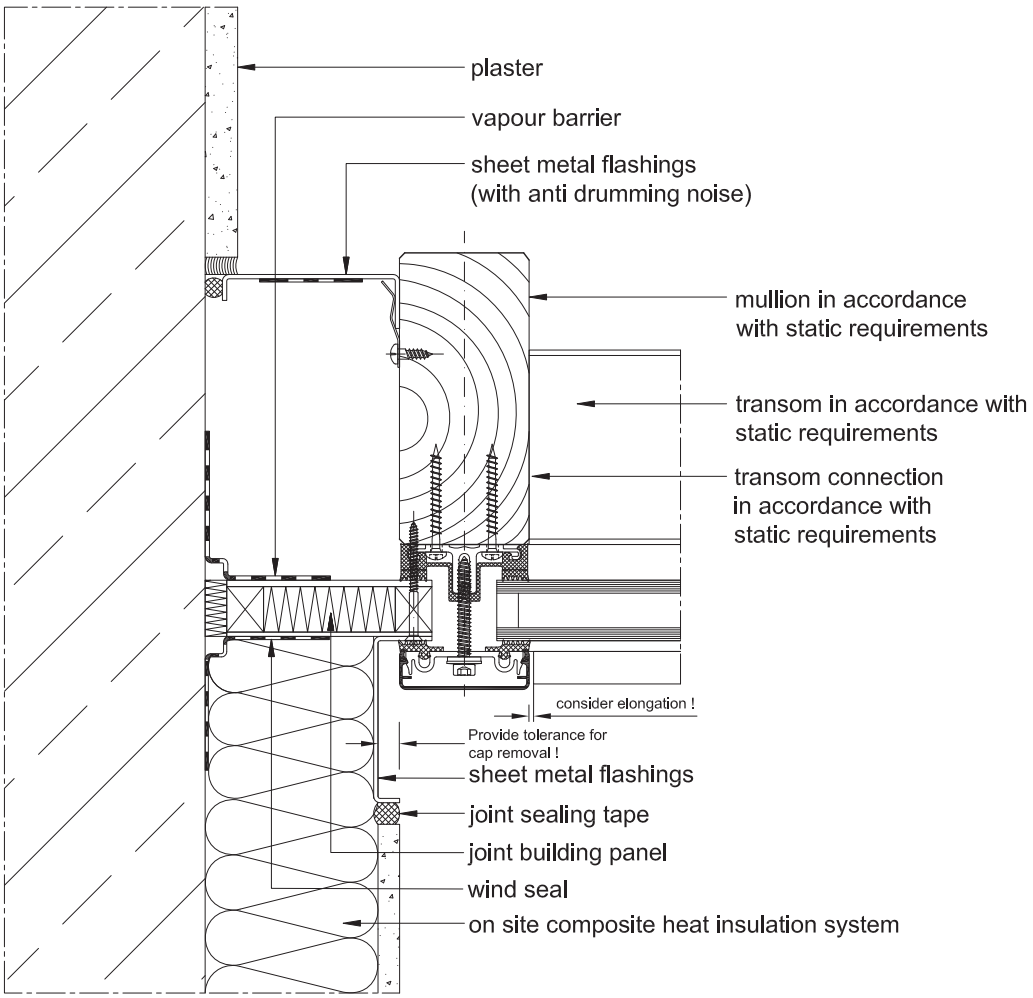
- When making ridge connections to walls, permeability to moisture is particularly important. Warm air with a high level of moisture gets into cooler zones of the inner sealing section where the design is not sufficiently sealed and can cause structural damage from penetrating into the connecting structure.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



AK-H_3.3_016.dwg

Structural attachments

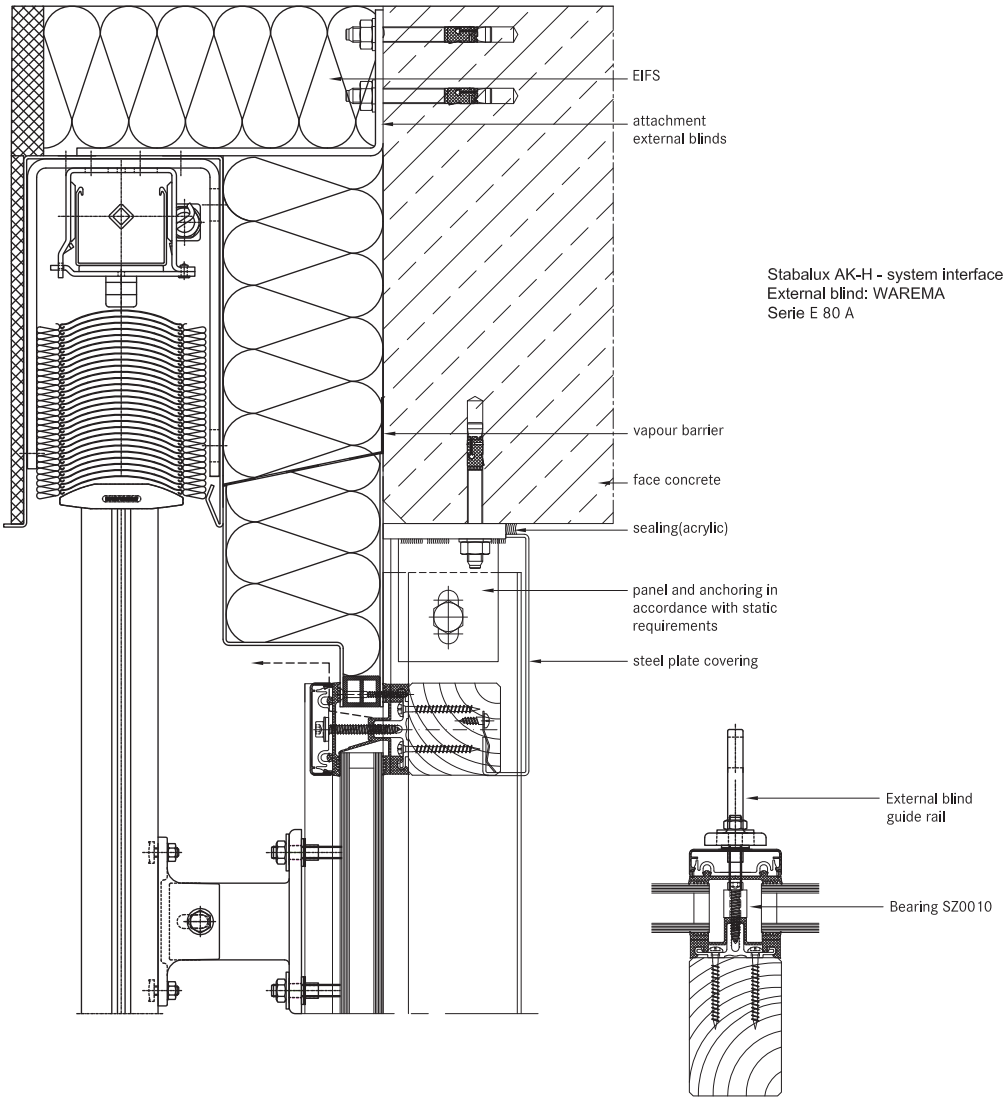
Horizontal wall connection to heat insulation bonding system



AK-H_3.3_017.dwg

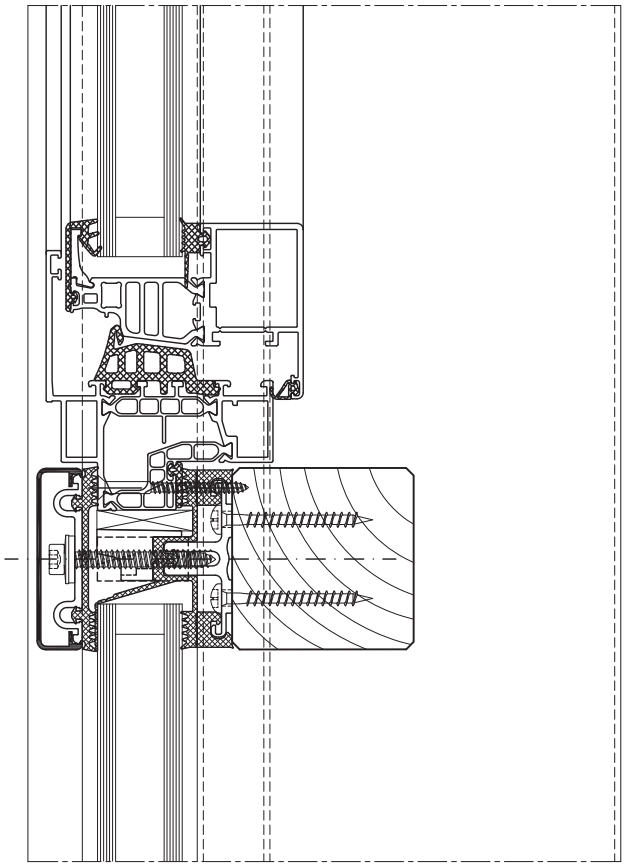
Structural attachments

Ceiling connection including WAREMA external blinds

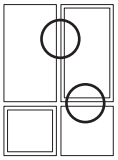


AK-H_3.3_028.dwg

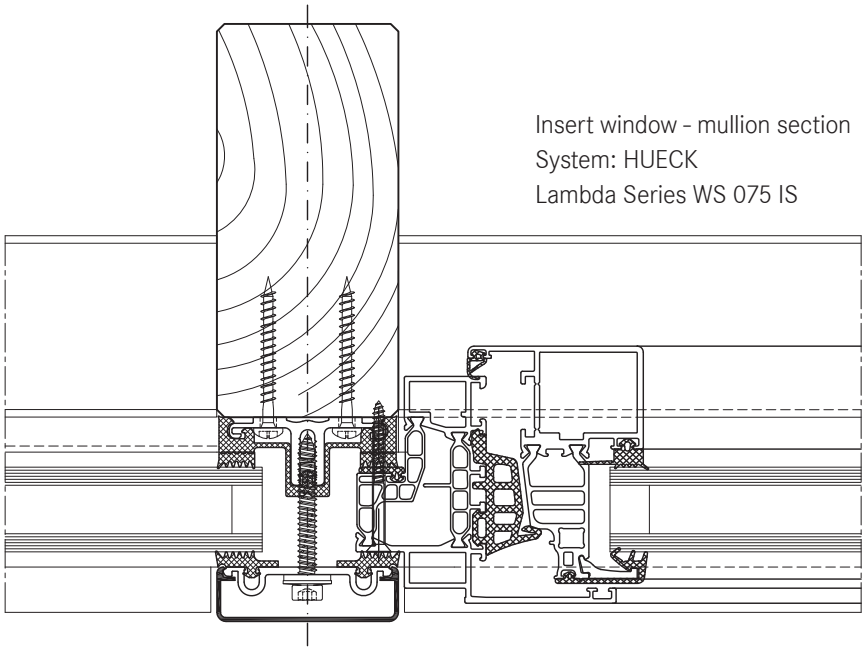
Installing windows and doors



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



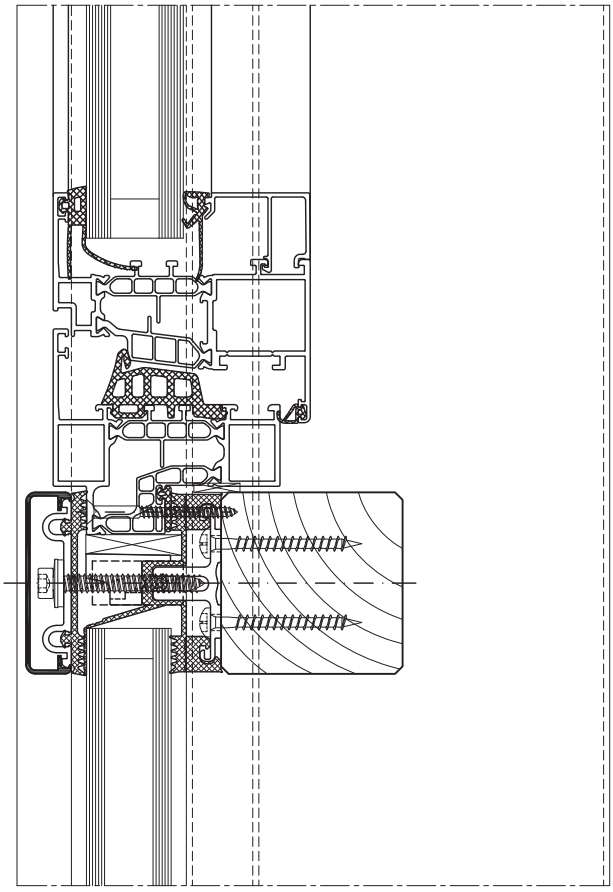
Mullion and transom facades and glass roofs from Norden Facade are neutral with regards to the selection of in-sert elements. All commonly available window and door systems made from steel, aluminium, wood or plastic can be used. Frame profiles from the window and door man-ufacturer's should be selected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



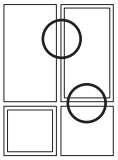
Insert window - mullion section
System: HUECK
Lambda Series WS 075 IS

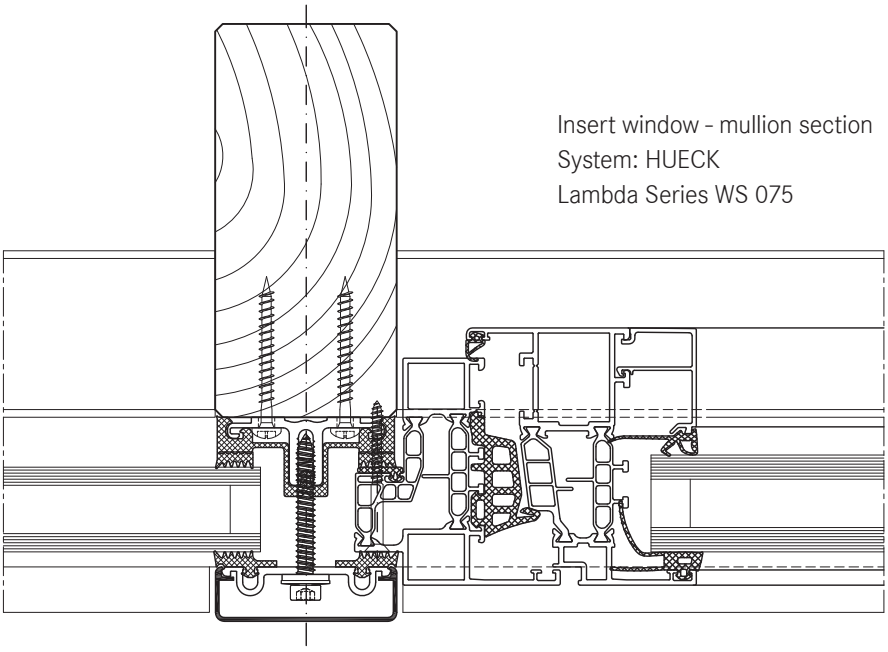
AK-H_3.3_018.dwg

Installing windows and doors



Insert window transom section
System: HUECK
Lambda Series WS 075

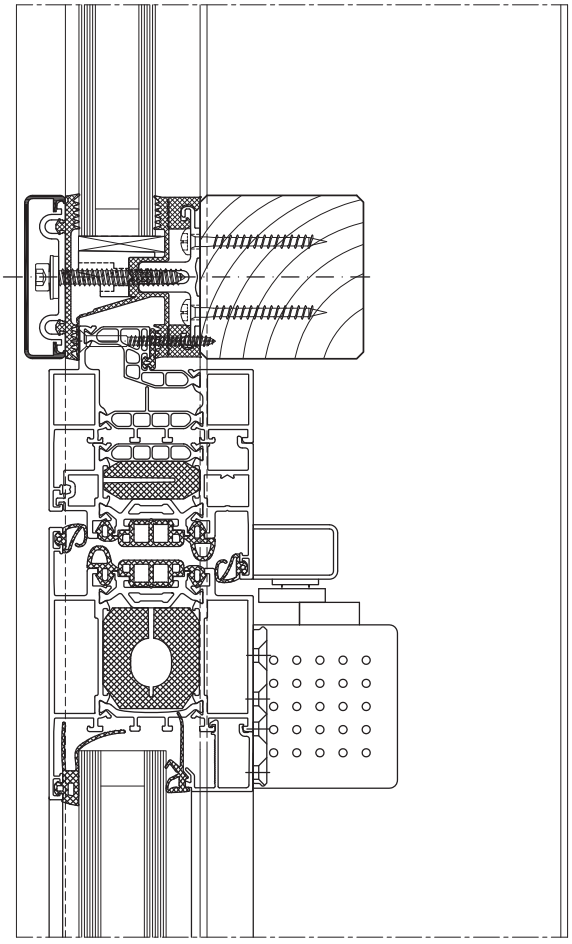




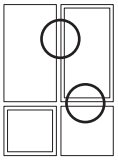
Insert window - mullion section
System: HUECK
Lambda Series WS 075

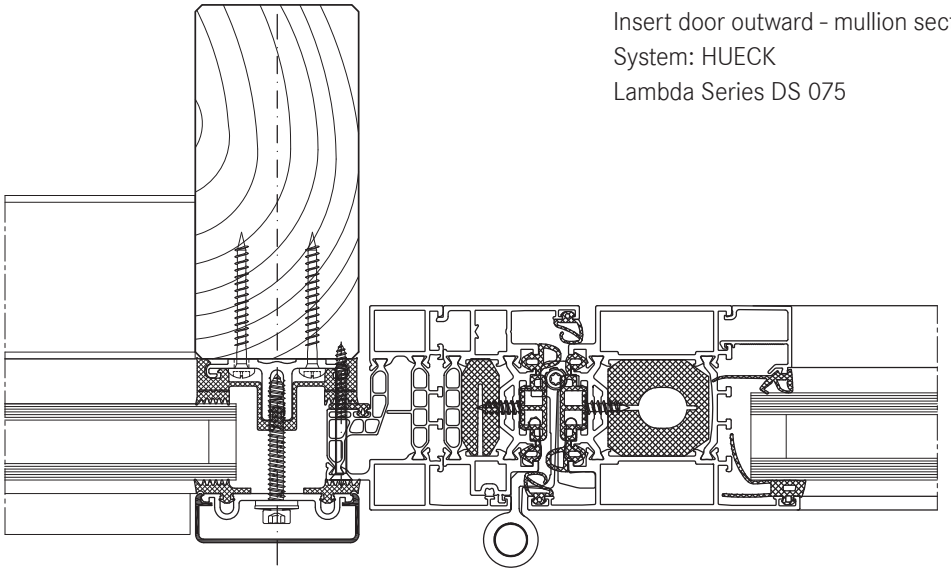
AK-H_3.3_019.dwg

Installing windows and doors



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

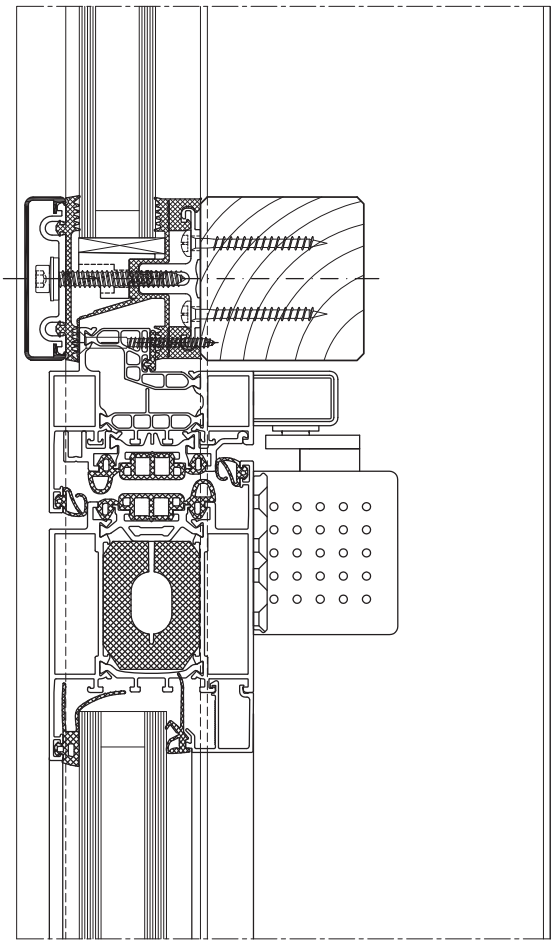




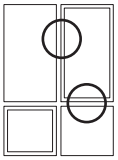
Insert door outward - mullion section
System: HUECK
Lambda Series DS 075

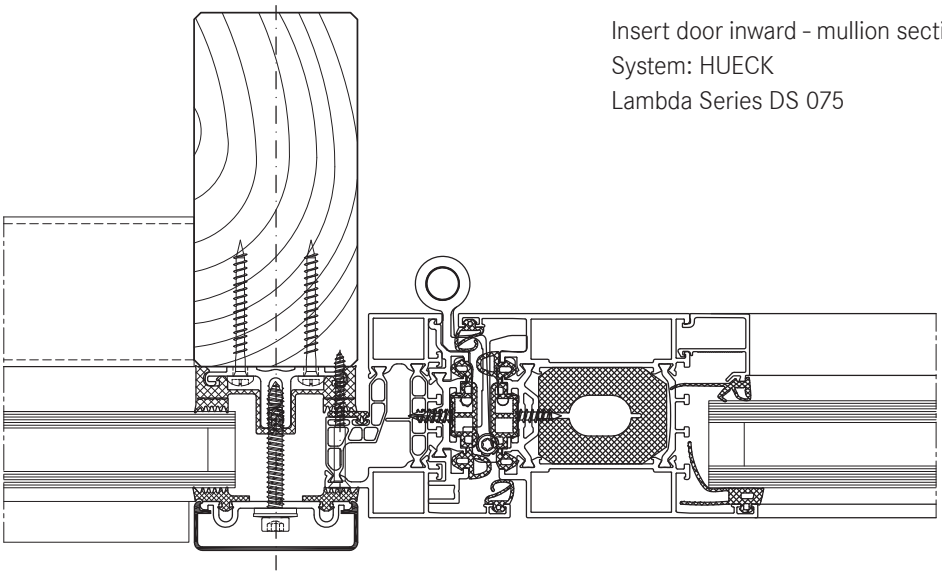
AK-H_3.3_020.dwg

Installing windows and doors



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

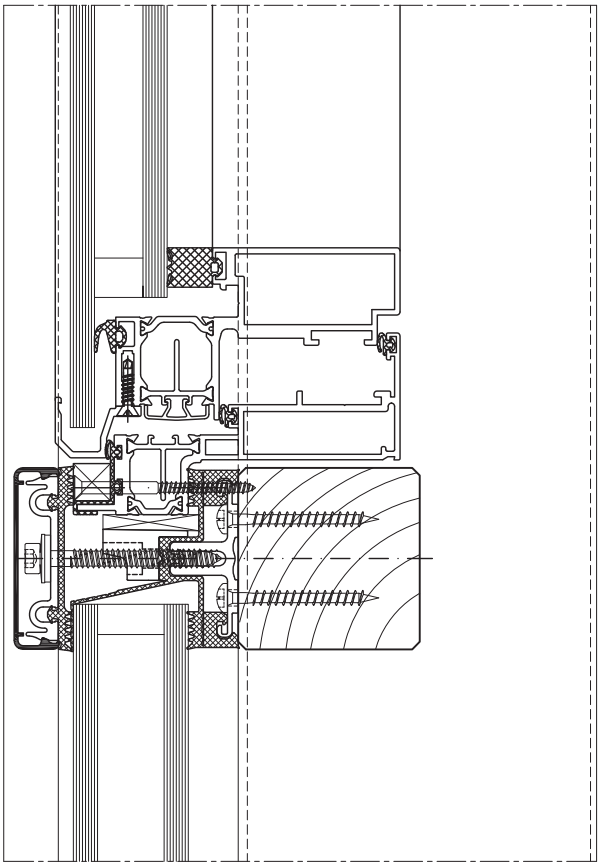




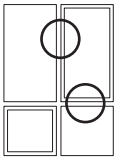
Insert door inward - mullion section
System: HUECK
Lambda Series DS 075

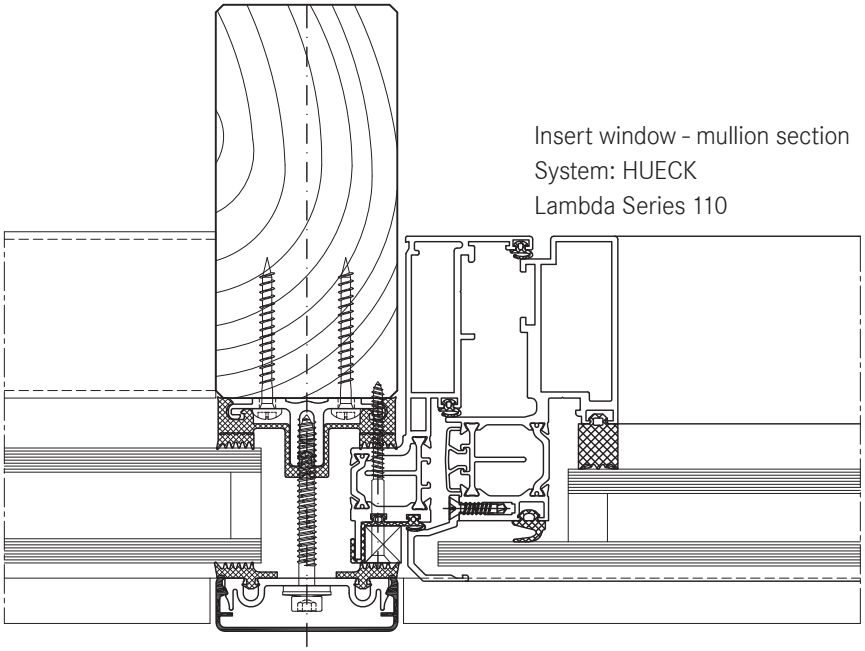
AK-H_3.3_021.dwg

Installing windows and doors



Insert window transom section
System: HUECK
Lambda Series 110

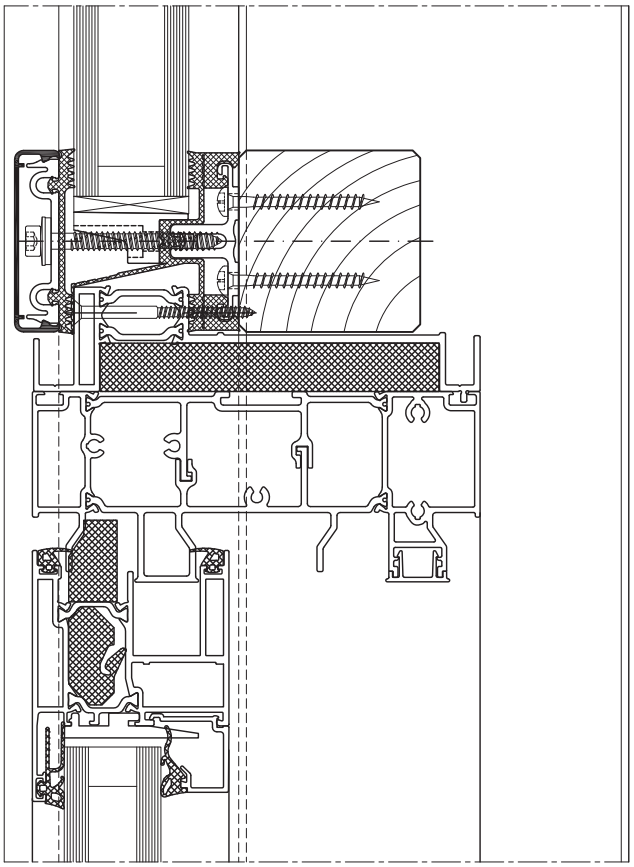




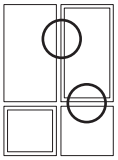
Insert window - mullion section
System: HUECK
Lambda Series 110

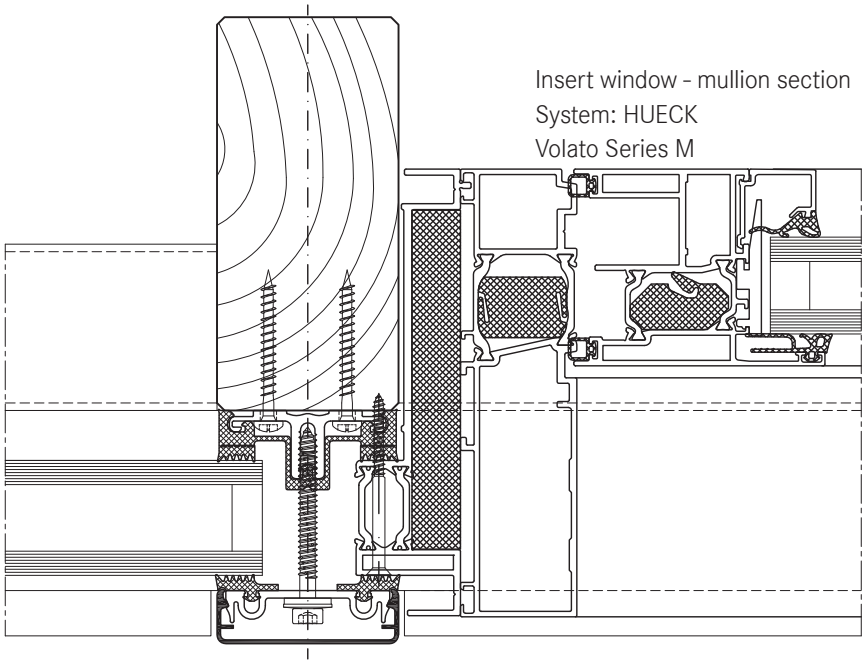
AK-H_3.3_022.dwg

Installing windows and doors



Insert window transom section
System: HUECK
Volato Series M



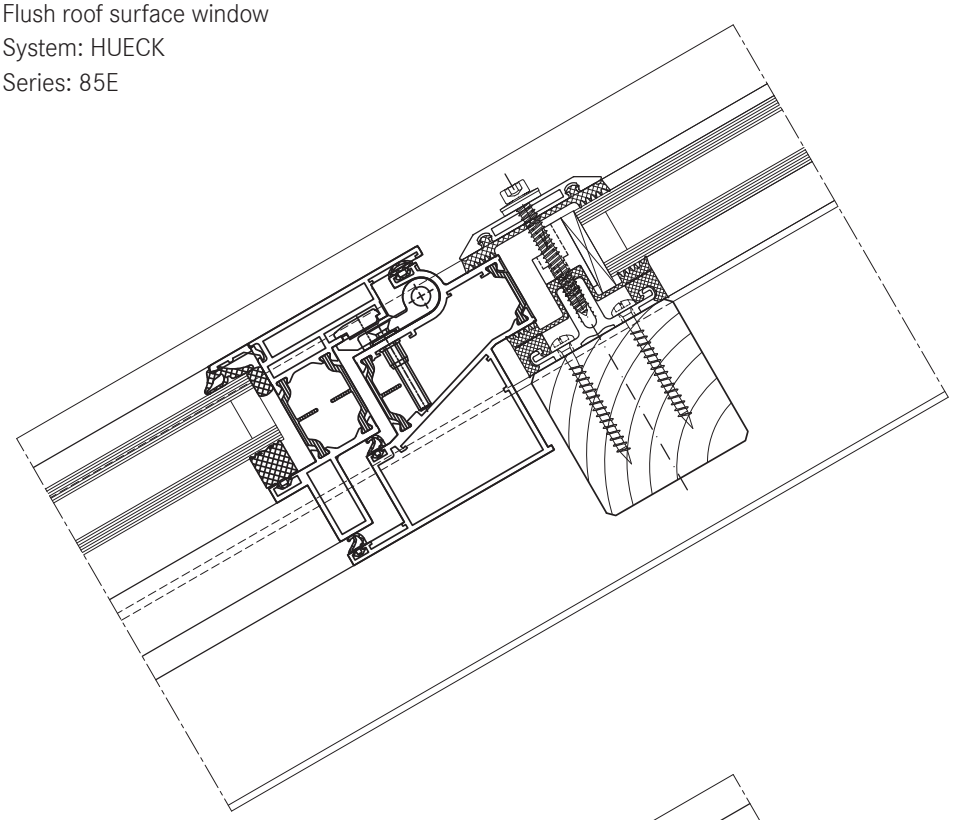


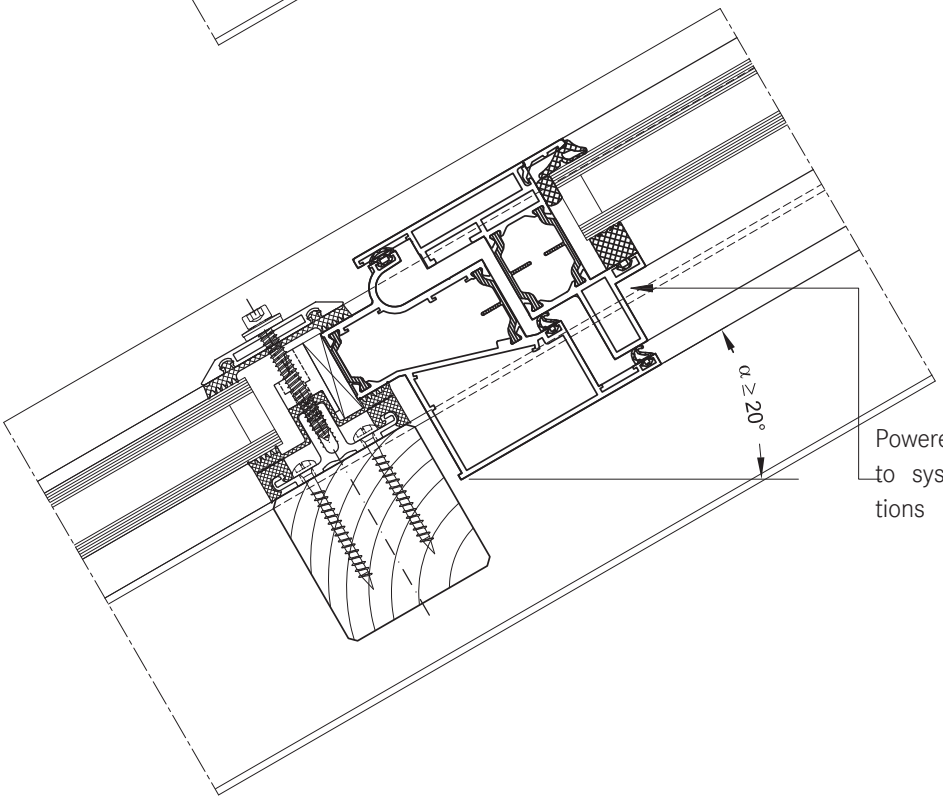
Insert window - mullion section
System: HUECK
Volato Series M

AK-H_3.3_023.dwg

Installing windows and doors

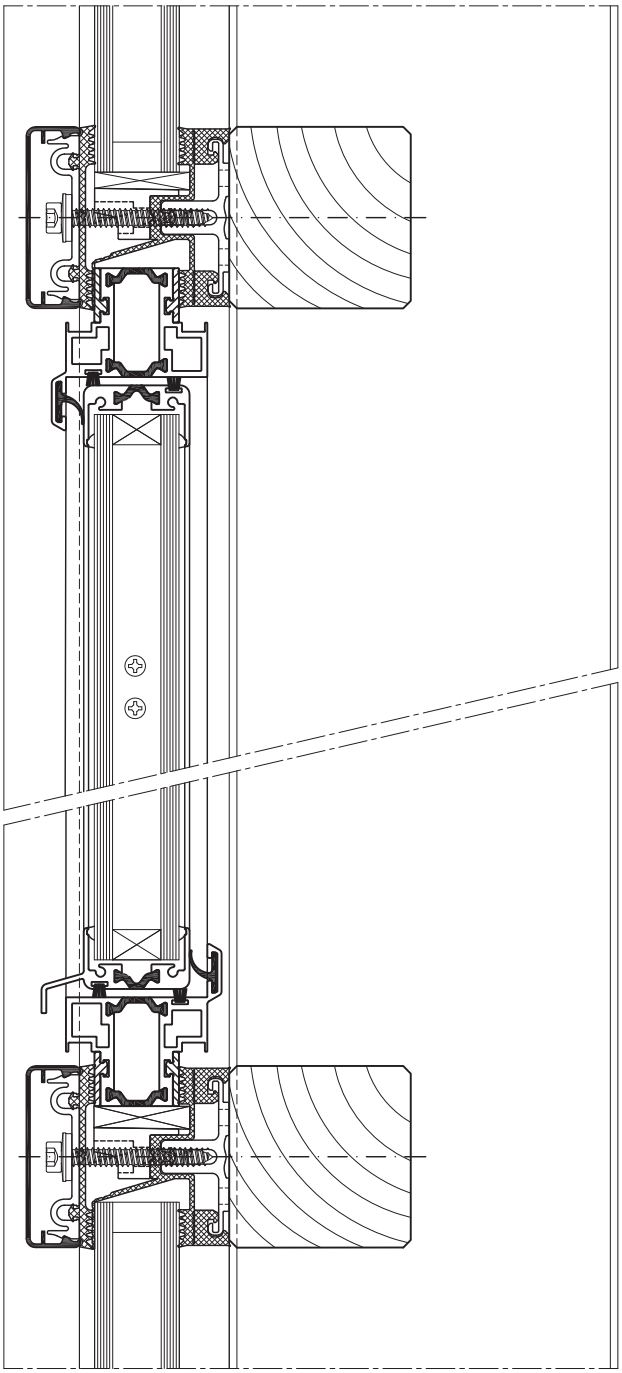
Flush roof surface window
System: HUECK
Series: 85E



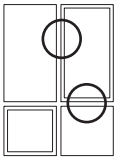


AK-H_3.3_024.dwg

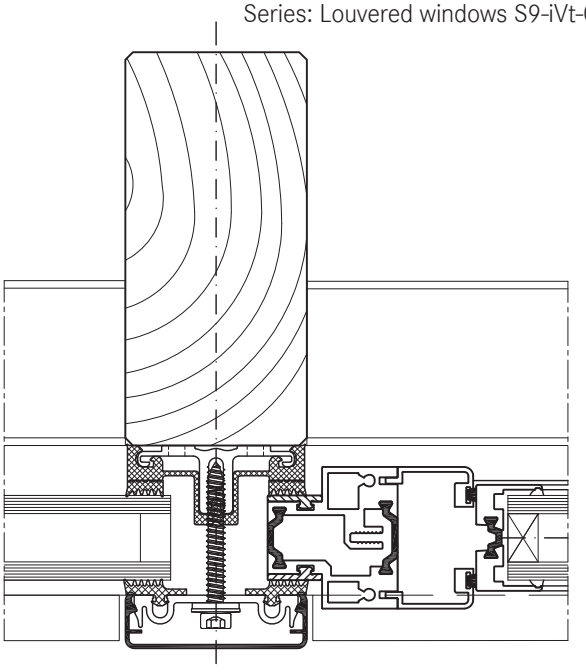
Installing windows and doors



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

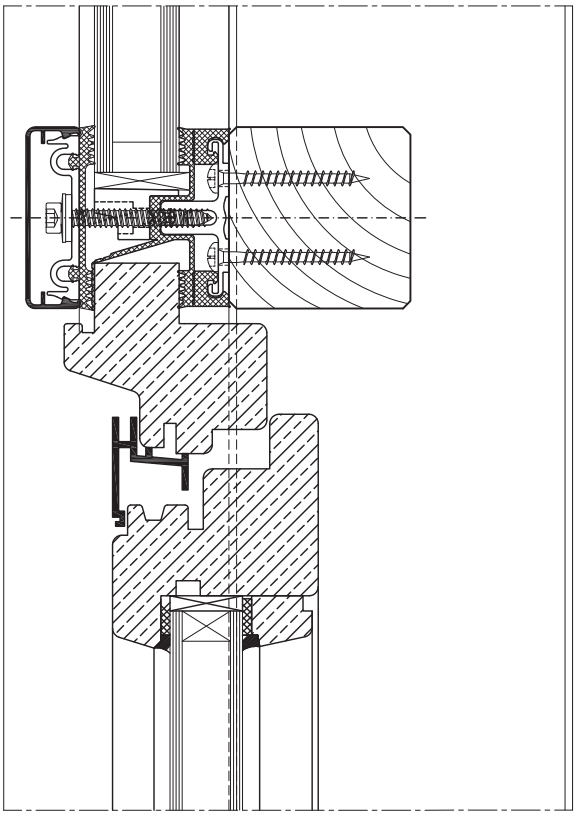


Insert window - mullion section
System: Hahn
Series: Louvered windows S9-iVt-05

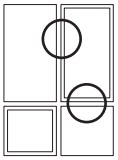


AK-H_3.3_025.dwg

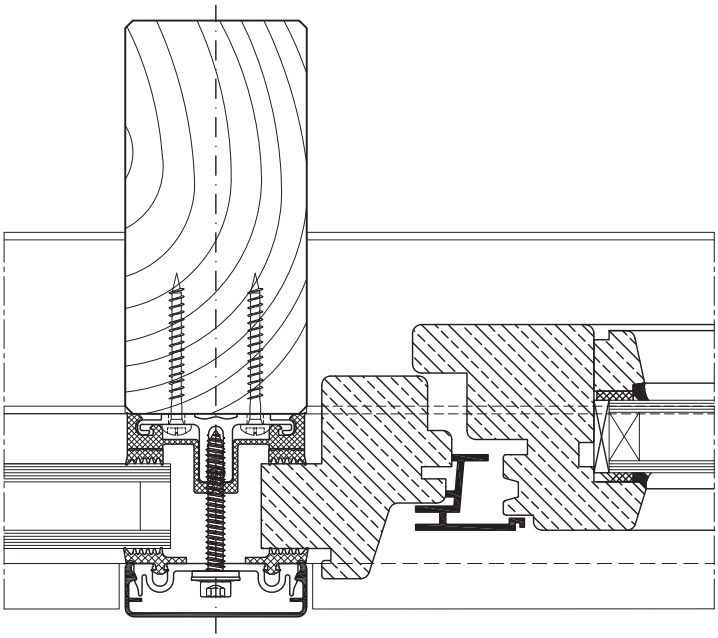
Installing windows and doors



Insert window transom section
Timber



Insert window - mullion section
Timber



AK-H_3.3_026.dwg