Norden Facade ZL-H

By EFTCG
NORDEN
FACADE

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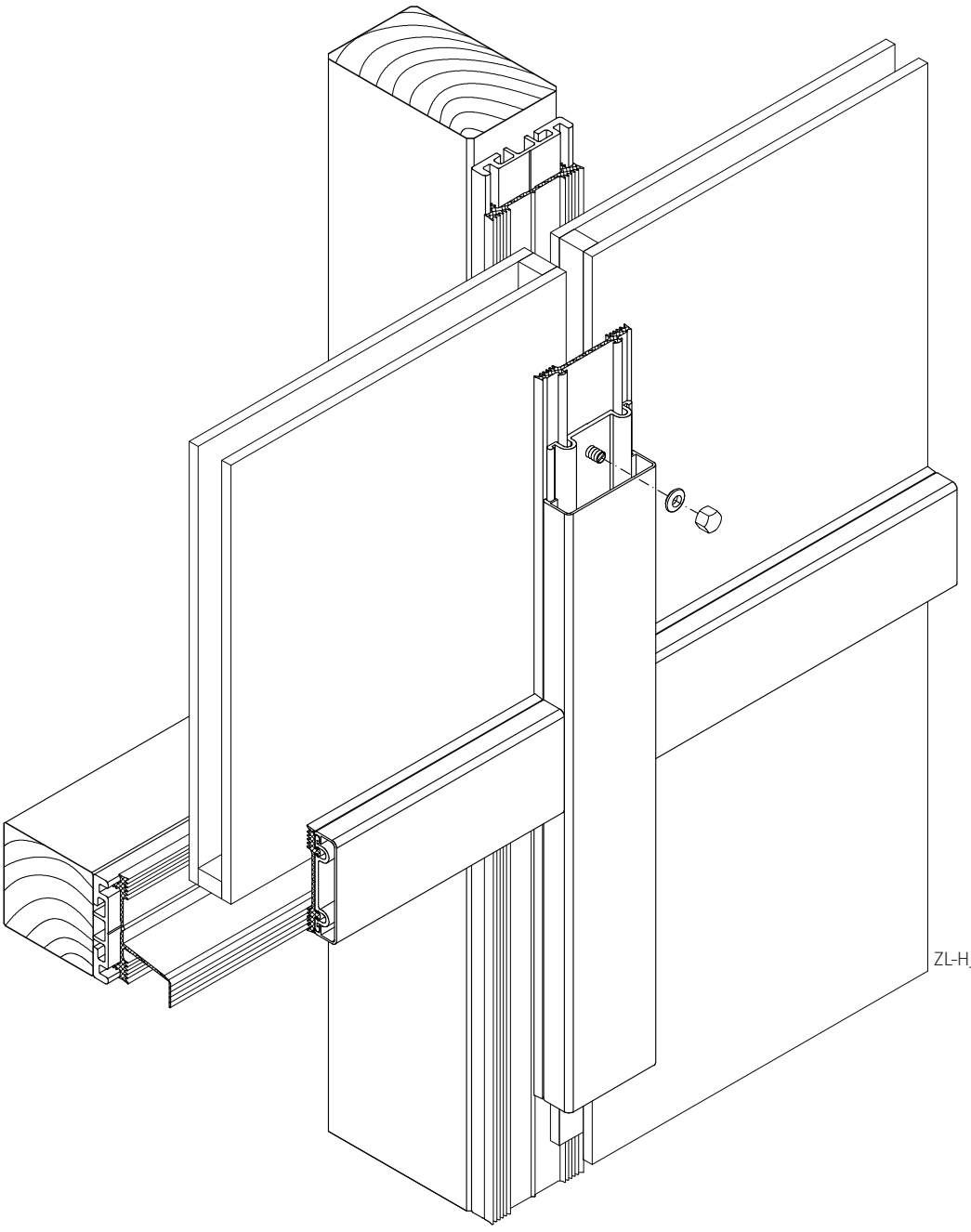
NORDEN

FACADE

System properties

2.1
1

Wood facade system with spacer strip ZL



System properties

Norden Facade **ZL-H**

- Norden Facade ZL-H is a simple and affordable add-on sys-tem for single and double glazing with a complete and customisable range for creating facades and roofs with a wooden supporting structure.
- The Norden Facade ZL-H system is available in 50, 60 and 80 mm widths.
- The spacer strip is attached centrally to the sub-structure to ensure precise seals are made. Together with the seal, this provides a uniform appearance.
- The system can be installed on the construction site without any prior processing of the sub-structure and is therefore an ideal choice for facade refurbish-ment work.

Specifications:		**Facade**	**Facades with inclinations up to 20°; overlapping inner sealing**	**Roof up to 2° inclination**
System widths		50, 60, 80 mm	50, 60, 80 mm	50, 60, 80 mm
Air permeability EN 12152		AE	AE	AE
Driving rain resistance EN 12154/ENV 13050	Static Dynamic	RE 1650 Pa 250 Pa/750 Pa	RE 1650 Pa 250 Pa/750 Pa	RE 1350 Pa [2]
Resistance to wind EN 13116	Permitted load Increased load	2 kN/m² 3 kN/m²	2 kN/m² 3 kN/m²	2 kN/m² 3 kN/m²
Shock strength EN 14019		E5 / I5	E5 / I5	**Increased requirements in accordance with Cahier 3228 du CSTB Méthode d'essai de choc sur verrière Weight 50 kg Head 2.4 m**
				[2] the test was carried out using a water volume of 3.4ℓ/(m²min) - above the amount required by the standard

Suitable for Passive building construction

System design e.g. ZL-H-60120-44-15		U_f = 0.61 W/(m²K) [1] Glass thickness 44 mm		

[1] Without effect of screws

* works only in combination with direct screw joints

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 product 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.
- Norden Facade offers slotted and overlapping sealing sys-tems for vertical glazing. Overlapping systems have been tested for inclined facades up to 20°.
- Seal flaps increase the safety and impermeability of the installation on vertical glazing.
- For roof glazing, a special Norden Facade sealing system with offset sealing sections is used. This keeps the supporting structure level during planning and pro-duction processes.
- Sealing the transom rebate allows flat roofs to be created with an incline of up to 2°.
- 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 in the facade or roof.

Insulation/Thermal Separation **(Section 9)**

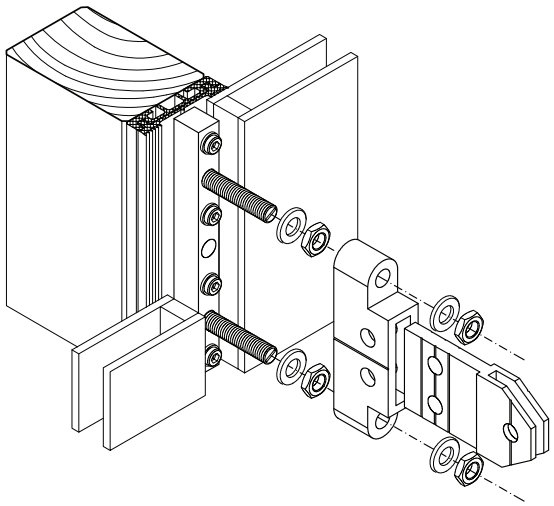
The Norden Facade System ZL-H has excellent thermal proper-ties. A heat transfer coefficient of U_f for frames of up to 0.6 W/(m^2) are achieved.

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 expert-ly 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. Investigations and measurements per-formed by us (e.g. using the Norden Facade H System) are just examples of a huge range of possibilities and serve only as a guideline.

Norden Facade SOL sun protection **(Section 9)**

Alongside the usual measures to prevent glare and ex-cessive solar energy passing through, we offer a specially developed system of outside lamellae.
Particular attention has been paid here to ensure attach-ment and assembly of these can be done easily with Norden Facade systems whilst meeting architectural and cli-matic requirements. Glass panes and clamping strips are not subject to any load from application of the sun pro-tection. Assembly and sealing are simple and efficient.

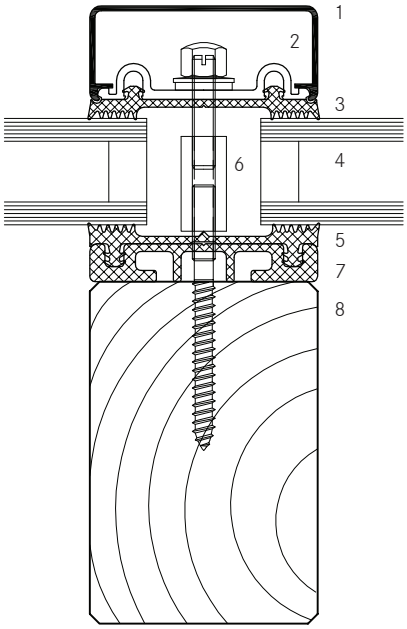


ZL-H_2.1_002.dwg

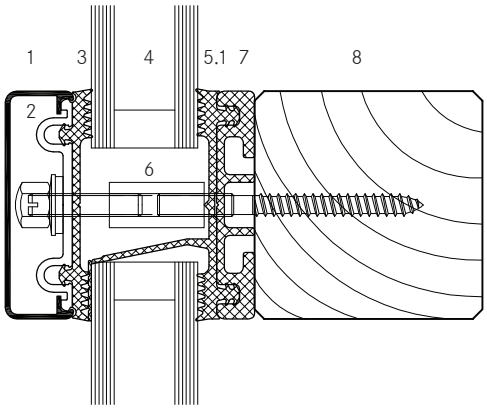
System cross sections and inner seals - facade

Inner seal 5 mm tall / 1 drainage level

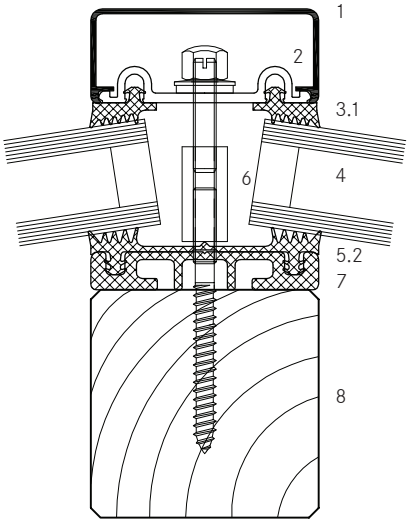
Vertical glazing mullion



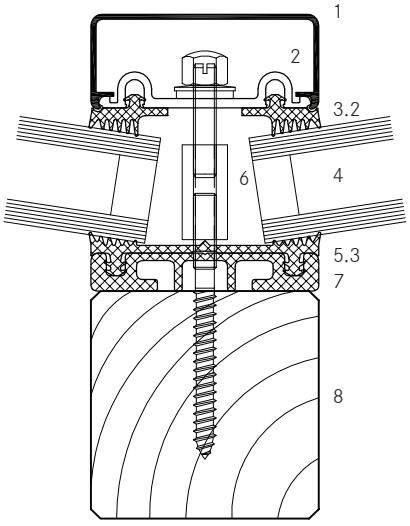
Vertical glazing transom



Polygonal glazing mullions - convex 3° - 15°



Polygonal glazing mullions - concave 3° - 10°



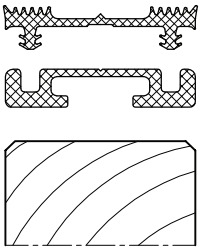
ZL-H_2.1_003.dwg

1 Upper strip
2 Pressure profile
3 Outer seal
3.1 Outer seal convex polygonal glazing
3.2 Outer seal concave polygonal glazing
4 Glass / panel
5 Inner seal
5.1 Inner sealing using a seal flap
5.2 Inner seal convex polygonal glazing
5.3 Inner seal concave polygonal glazing
6 System screw fittings
7 Spacer strip
8 Timber profile

System cross sections and inner seals - facade

Inner seal 5 mm tall / 1 drainage level

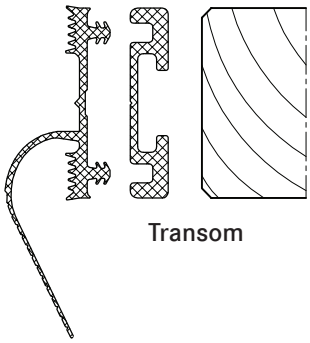
System 50 mm



GD 5025

ZL 5053

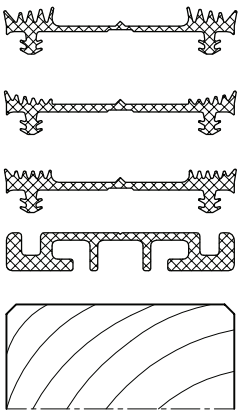
Mullion



GD 5030

Transom

System 60 mm



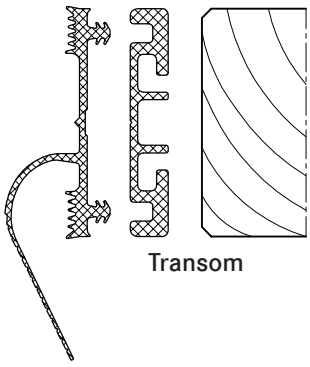
GD 6038
Polygonal/convex

GD 6036
Polygonal/concave

GD 6025

ZL 6053

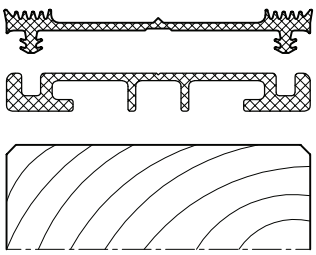
Mullion



e.g. GD 6030

Transom

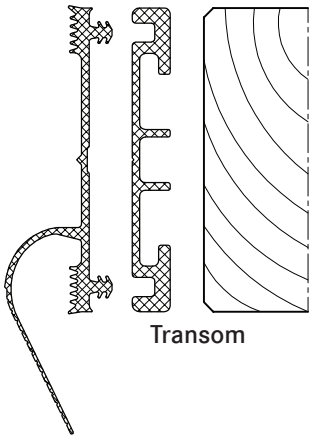
System 80 mm



GD 8025

ZL 8053

Mullion



GD 8030

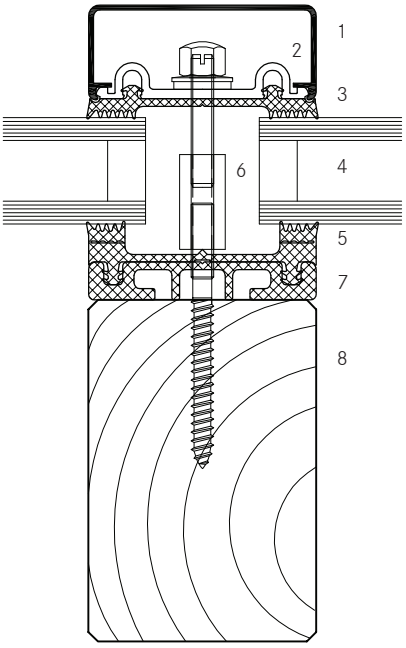
Transom

ZL-H_2.1_004.dwg

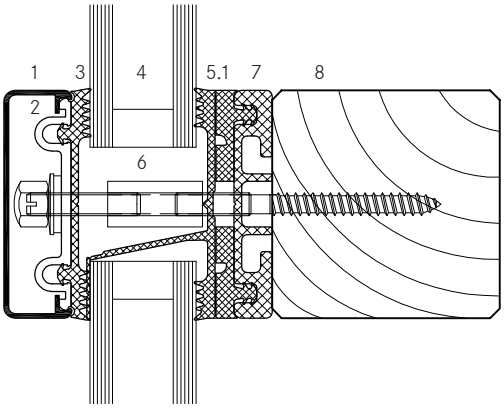
System cross sections and inner seals - facade

Inner seal 10 mm tall / 2 overlapping drainage levels

Vertical glazing mullion - 2nd level



Vertical glazing transom -1st level



ZL-H_2.1_003.dwg

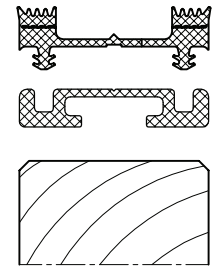
1 Upper strip
2 Pressure profile
3 Outer seal
4 Glass / panel
5 Inner seal 10 mm
5.1 Inner sealing using a seal flap 10 mm
6 System screw fittings
7 Spacer strip
8 Timber profile

* tested system for vertical facades and facades with an incline up to 20°

System cross sections and inner seals - facade

Inner seal 10 mm tall / 2 overlapping drainage levels

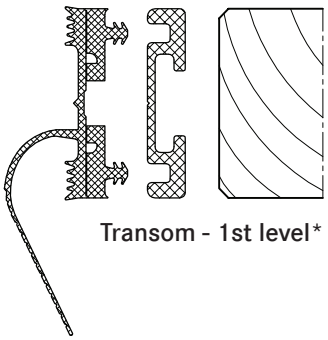
System 50 mm



GD 5033

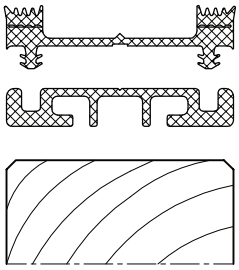
ZL 5053

Mullions - 2nd level



Transom - 1st level*

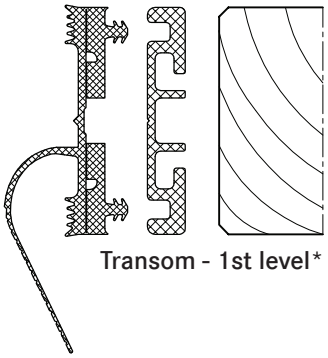
System 60 mm



GD 6033

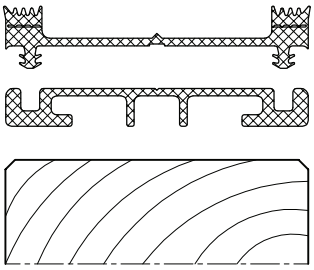
ZL 6053

Mullions - 2nd level



Transom - 1st level*

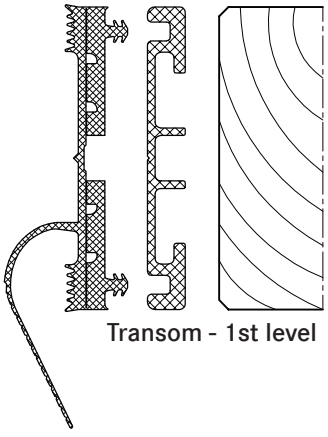
System 80 mm



GD 8033

ZL 8053

Mullions - 2nd level



GD 8031

Transom - 1st level

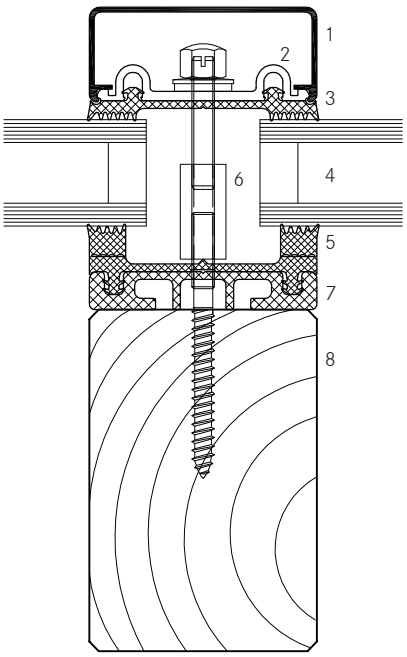
ZL-H_2.1_004.dwg

*System 50 mm and System 60 mm upon request

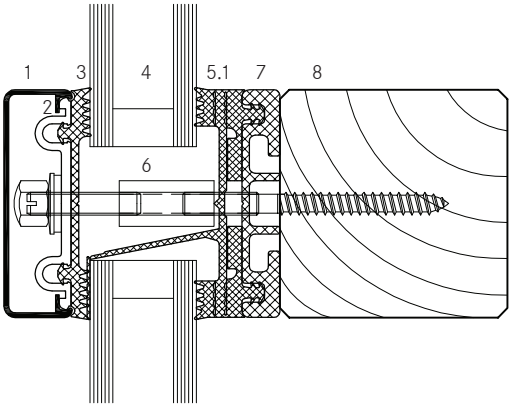
System cross sections and inner seals - facade

Inner seal 12 mm tall / 3 overlapping drainage levels

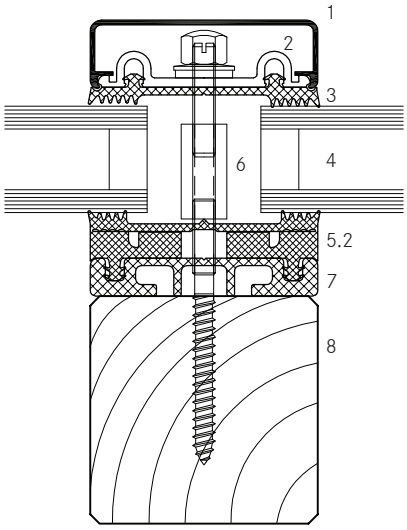
Vertical glazing main mullion - 3rd level*



Vertical glazing transom - 2nd level*



Vertical glazing secondary mullion - 1st level



ZL-H_2.1_003.dwg

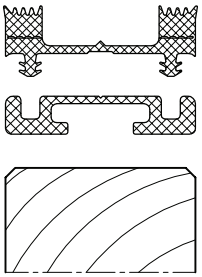
1 Upper strip
2 Pressure profile
3 Outer seal
4 Glass / panel
5 Inner seal 12 mm main mullion
5.1 Inner seal using a seal flap
5.2 Inner seal 12 mm secondary mullion
6 System screw fittings
7 Spacer strip
8 Timber profile

* tested system for vertical facades and facades with an incline up to 20°

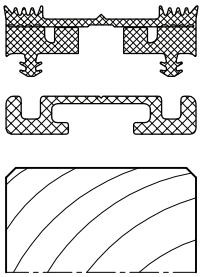
System cross sections and inner seals - facade

Inner seal 12 mm tall / 3 overlapping drainage levels

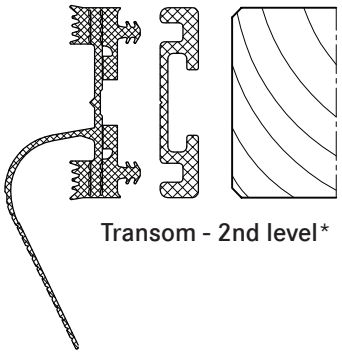
System 50 mm



Main mullion - 3rd level*

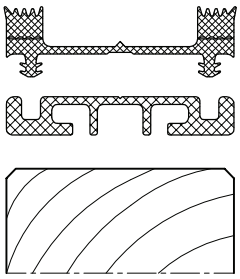


Secondary mullion - 1st level*

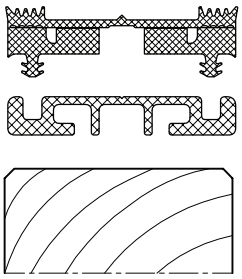


Transom - 2nd level*

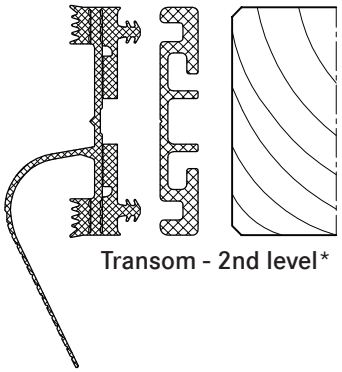
System 60 mm



Main mullion - 3rd level*

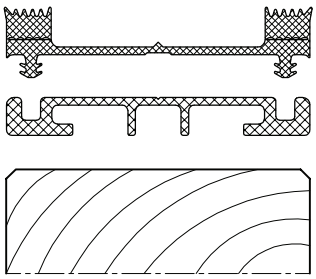


Secondary mullion - 1st level*

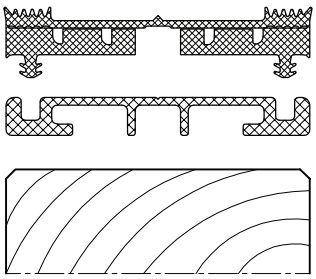


Transom - 2nd level*

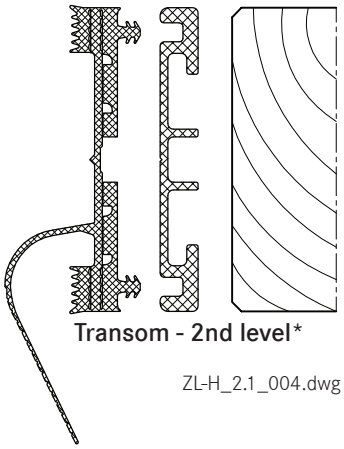
System 80 mm



Main mullion - 3rd level*



Secondary mullion - 1st level*



Transom - 2nd level*

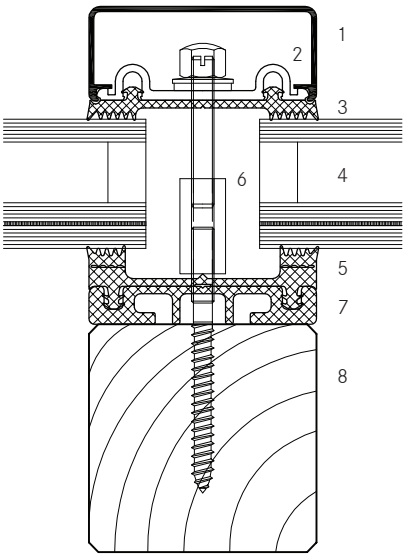
ZL-H_2.1_004.dwg

*System 50 mm, 60 mm and 80 mm upon request

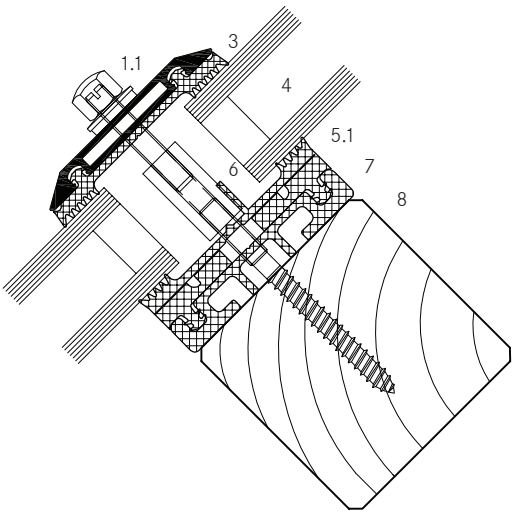
System cross sections and inner seals - roof

Inner seal 10 mm tall / 2 overlapping levels

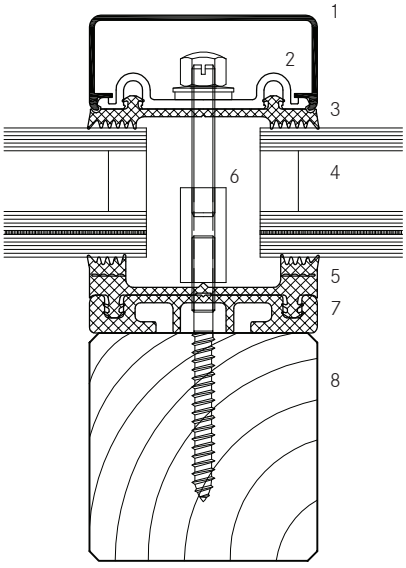
Angled glazing rafter



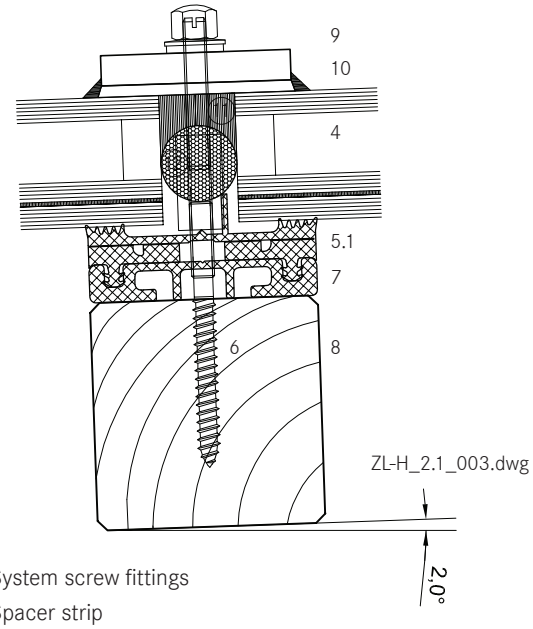
Angled glazing transom



Angled glazing rafter up to 2° inclination



Angled glazing transom up to 2° inclination

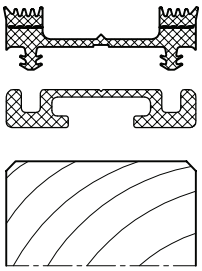


1 Upper strip
1.1 Cover strip
2 Pressure profile
3 Outer seal
4 Glass / panel
5 Inner seal 10 mm rafter
5.1 Inner seal 10 mm transom
6 System screw fittings
7 Spacer strip
8 Timber profile
9 Hold-down clamp
10 Washer
11 All weather silicone seal
12 Rope seal

System cross sections and inner seals - roof

Inner seal 10 mm tall / 2 overlapping levels

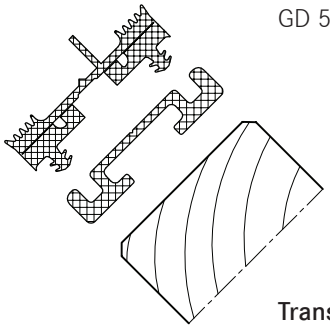
System 50 mm



GD 5033

ZL 5053

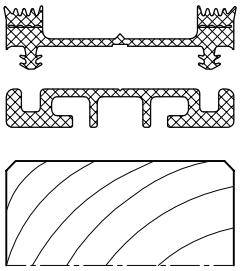
Rafter



GD 5034

Transom

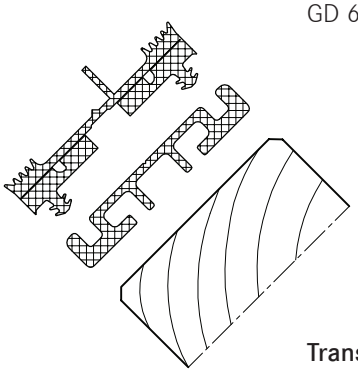
System 60 mm



GD 6033

ZL 6053

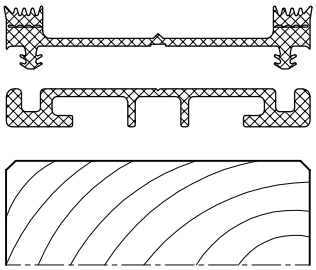
Rafter



GD 6034

Transom

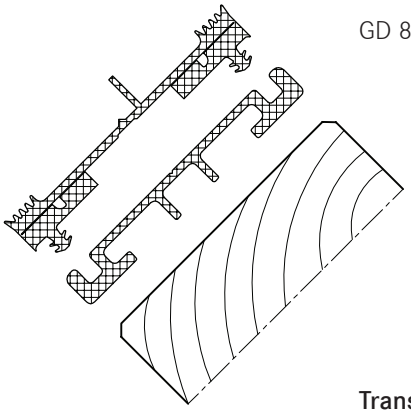
System 80 mm



GD 8033

ZL 8053

Rafter



GD 8034*

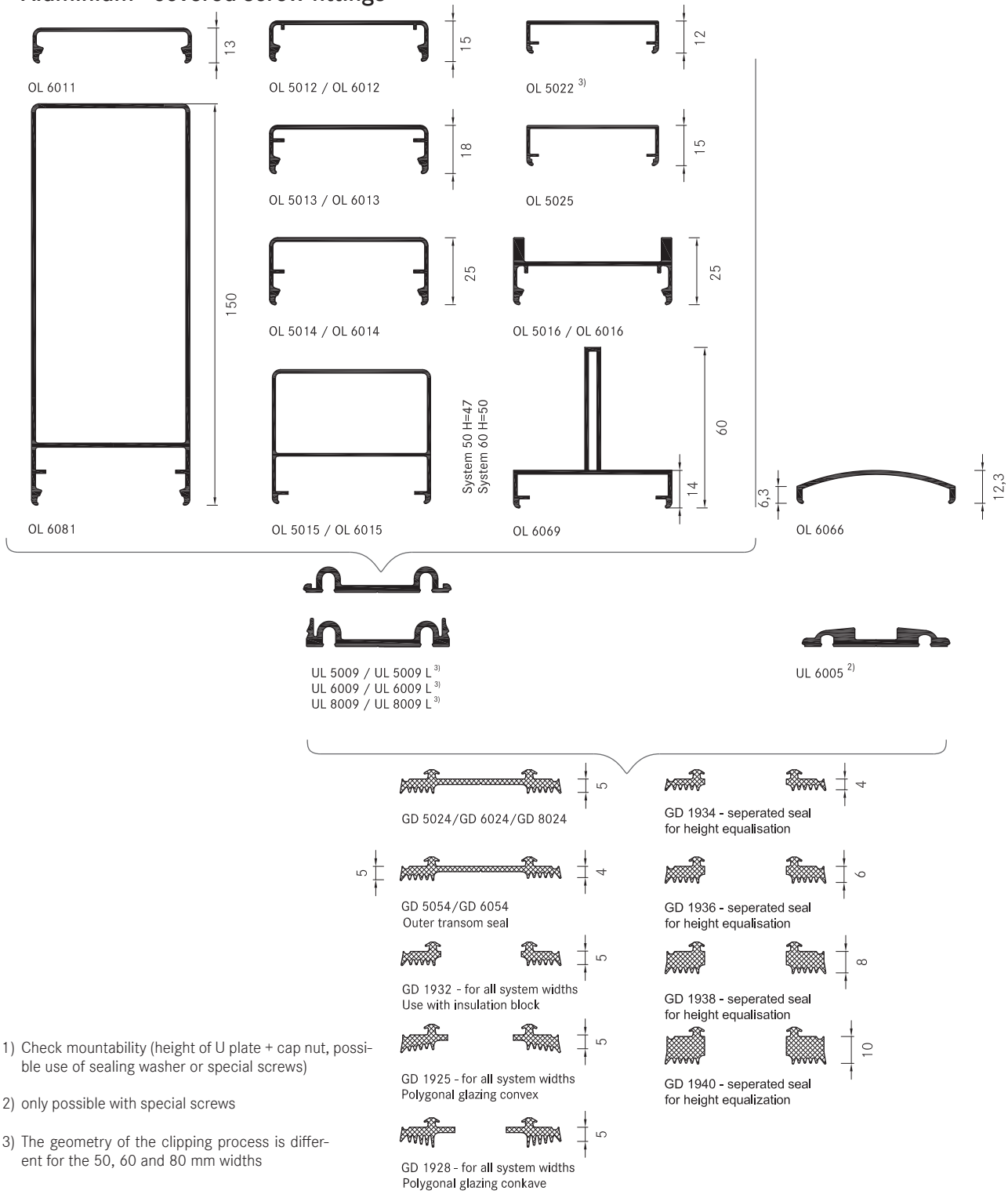
Transom

ZL-H_2.1_004.dwg

*System 80 mm upon request

Cover strips and outer seals

Aluminium - covered screw fittings



1) Check mountability (height of U plate + cap nut, possible use of sealing washer or special screws)

2) only possible with special screws

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

Cover strips and outer seals

Stainless steel - covered screw fittings

OL 6064 / Stainless steel

UL 6007 L

Aluminium- visible screw fittings

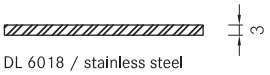
DL 5061/DL 6061

DL 5059/DL 6059/DL 8059

DL 5071/DL 6071

DL 5067/DL 6067

Stainless steel - visible screw fittings



DL 6018 / stainless steel

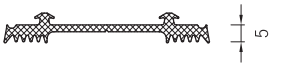
DL 6044 / Stainless steel

DL 6043 / Stainless steel

Flat cover profile DL 5073/DL 6073

DL 5073/DL 6073 [2)]

GD 6940 - for DL 6018



GD 5024/GD 6024/GD 8024

GD 5054/GD 6054
Outer gasket transom

GD 1932 - for all system widths
Use with insulation block

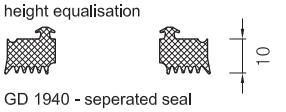
GD 1925 - for all system widths
Polygonal glazing convex

GD 1928 - for all system widths
Polygonal glazing conkave

GD 1934 - seperated seal
for height equalisation

GD 1936 - seperated seal for
height equalisation

GD 1938 - seperated seal for
height equalisation



GD 1940 - seperated seal
for height equalization

GD 6174

GD 6175

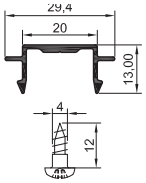
Cover strips and outer seals

Wooden covering strips

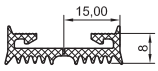
Wooden cover strips can be easily mounted to mullions and transoms using aluminium top or lower bars. The pressure profile UL5003/UL6003/UL8003 acts as a clamping strip.
Assembly: apply the two-piece GD 1903 outer seal to the upper strip attach to the system using screws. Divide the OL 1903 into 80 mm 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.

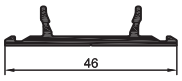
(Please see section 2.2.7 on assembling the outer seal)



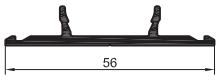
OL1903



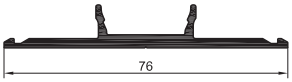
GD1903 (2-piece)



UL5003

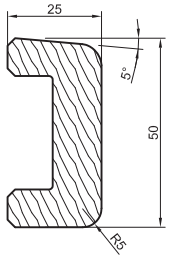


UL6003



UL8003

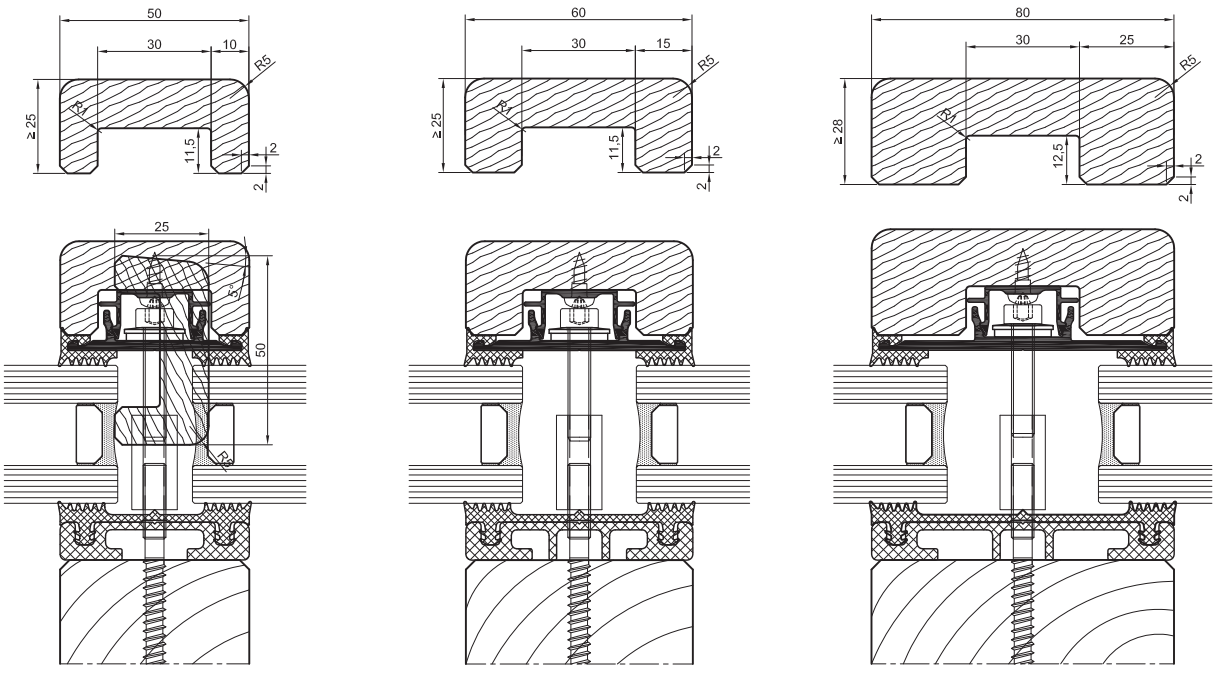
Transom



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

Example: System 50 mm

Mullion



System 50 System 60 System 80

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 laminated solid timbers, facade construction is increasingly using a multi-layer construction method. 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
- For fireproof glazing, pay attention to the specifications given in the relevant authorisations.

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, spruce, fir	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.

Spacer strip quality

Norden Facade spacer strips are made of hard PVC, unpunched, in black - suitable for a uniform visual appearance for in-ner Norden Facade seals.

Seal profiles

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 joints with non-Norden Facade products. Sealing the rebate with all weather silicone seal is possible.

All weather silicone seal

Only certified materials may be used for sealing the rebate with all-weather silicone. 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).
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 of silicone 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.

Material information

Aluminium profiles

The aluminium profiles we supply are generally made from EN AW 6060 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 DL 5073 and DL 6073. Resulting actions are to be taken with the agreement of the coater.

Longitudinal expansions in aluminium profiles exposed to temperature

When cutting the lower, upper and cover profiles from aluminium, allowance should be made for temperature-induced longitudinal expansion.
The theoretical rod lengths ℓ should be shortened by:

$$\Delta\ell = \alpha^T \cdot \Delta T \cdot \ell$$

Example:

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

$\alpha^T \approx 24 \cdot 10^{-6}$ 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.

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.
Upper strips 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 whose edge can be seen on narrow side.

Other items

All system items are produced according to applicable standards.

Maintenance and care

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

Profile design

System spacer strip ZL

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

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

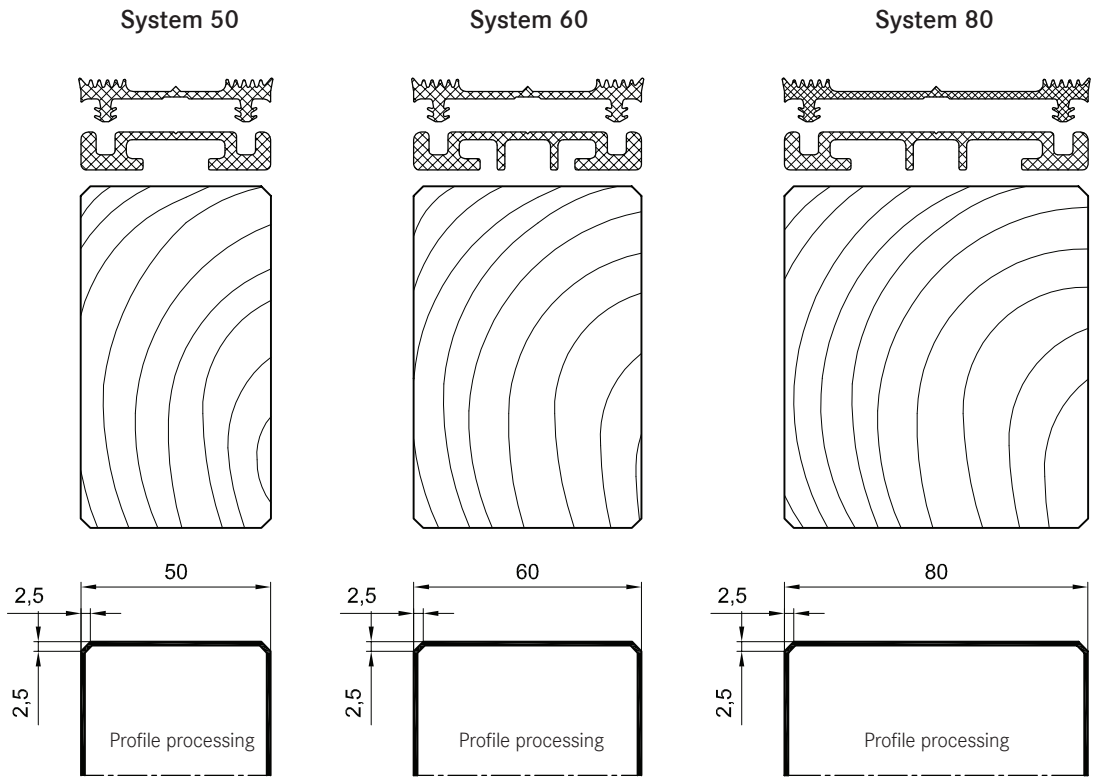
The use of comparable hardwoods is also permitted.

The profile design is just an example. Spacer strips can also be mounted onto existing profiles.

Worked edges must be free of shavings and imperfections.

When using hardwood cylinders for glass supports GH 5053 and GH 5055, you must ensure to install the cylinders before mounting the spacer strip.

Note:



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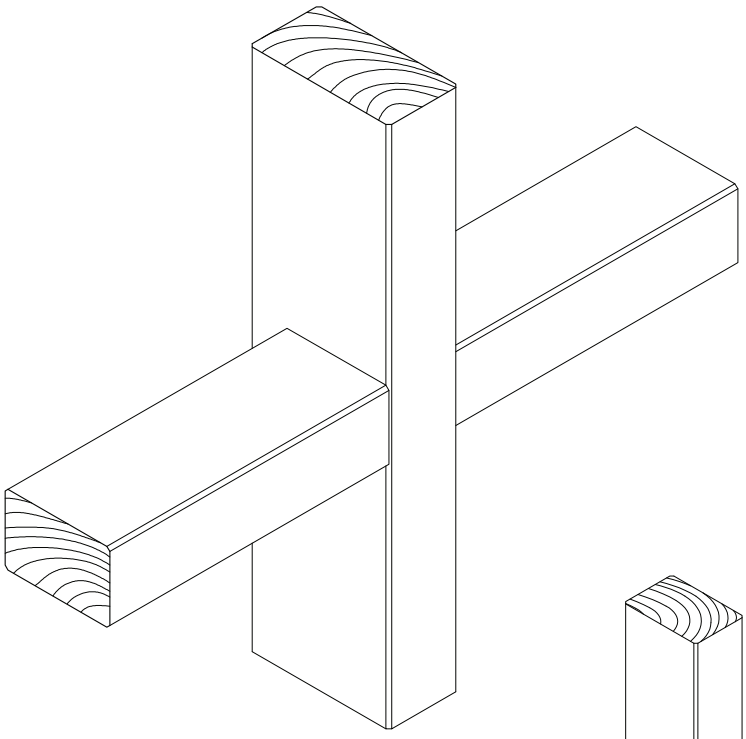
Mullion-transom joint

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.



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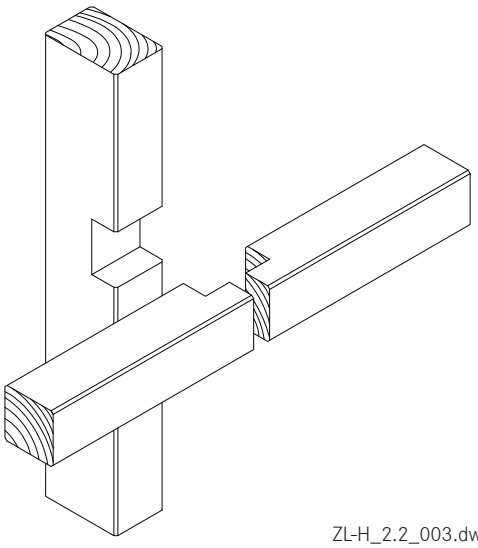

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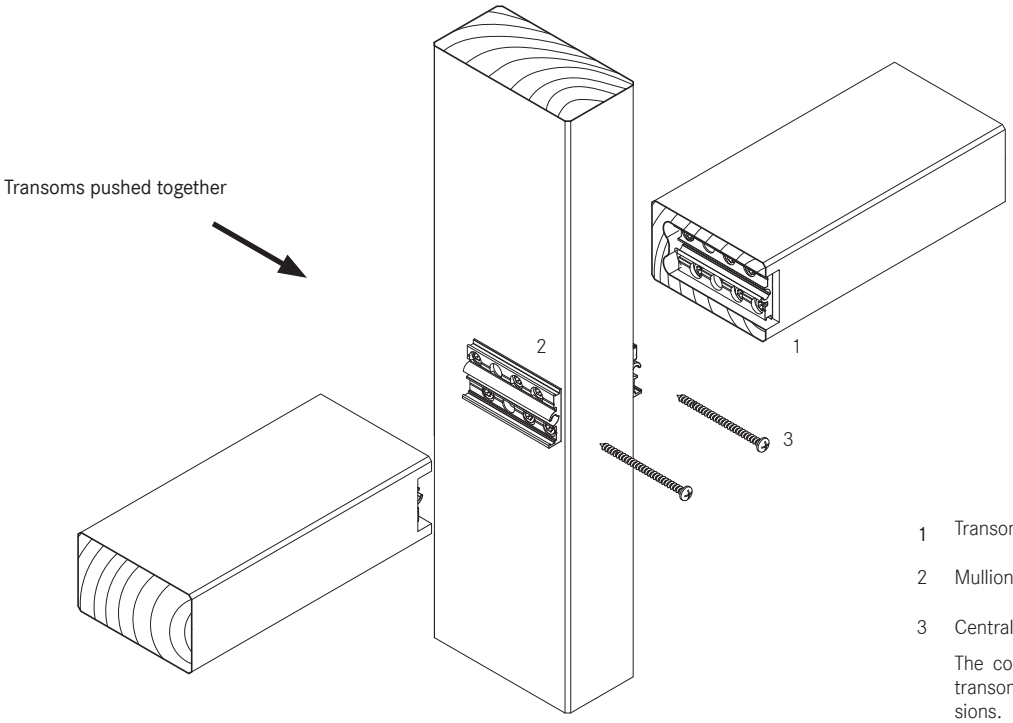
Mullion-transom joint

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.



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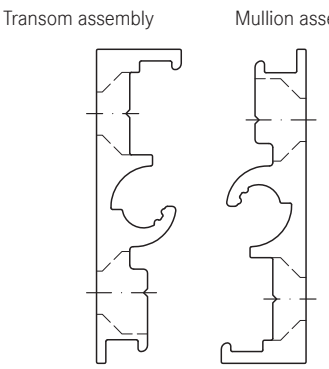
1 Transom assembly

2 Mullion assembly

3 Central connecting bolt

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



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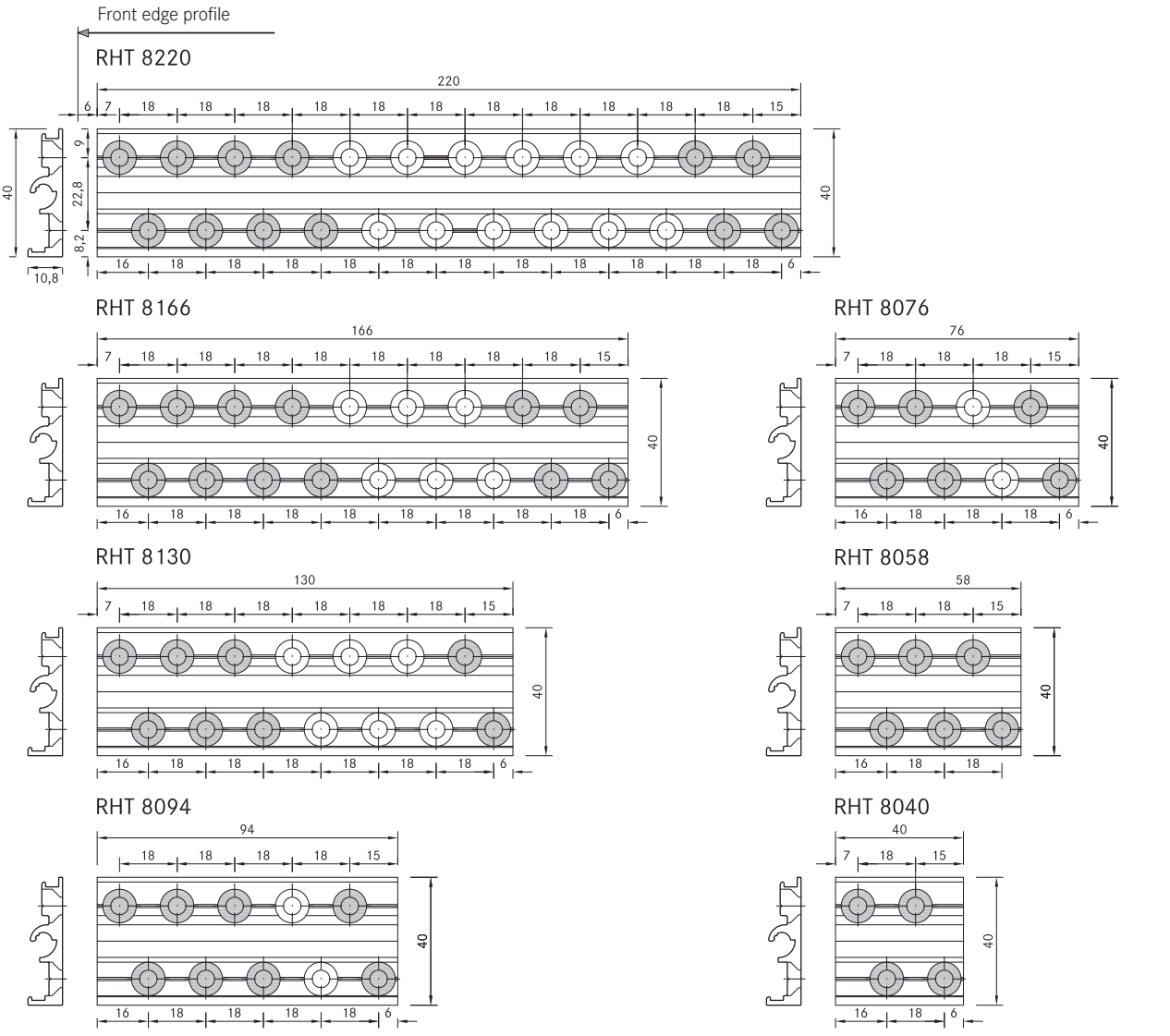
Mullion-transom joint

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



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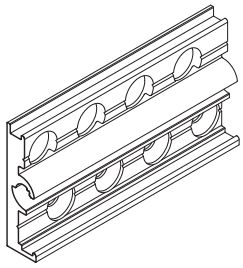
Mullion-transom joint

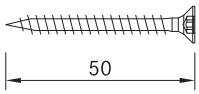
Assembly on the mullion

- 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, depending on the connector type. (Refer to the previous page)

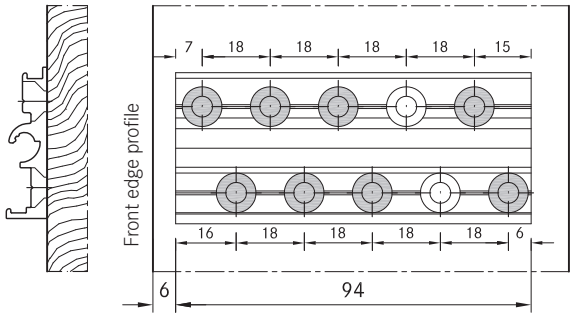
Mullion assembly



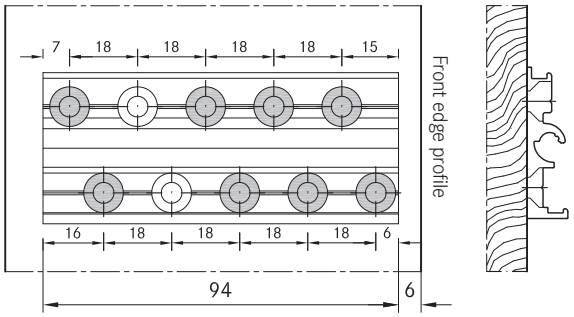
Screw fittings mullion Z 0126



Left mullion with connector e.g. RHT 8094



Right mullion with connector e.g. RHT 8094



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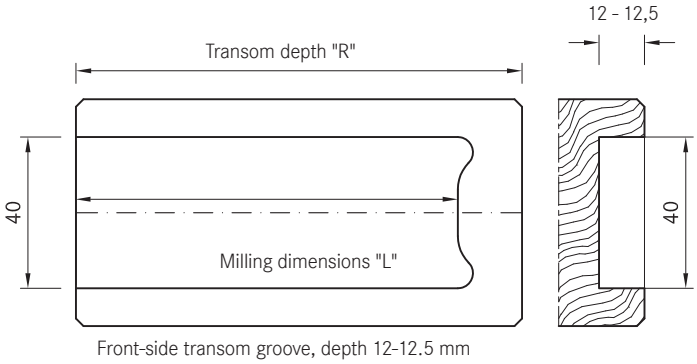
Mullion-transom joint

Assembly on the transom

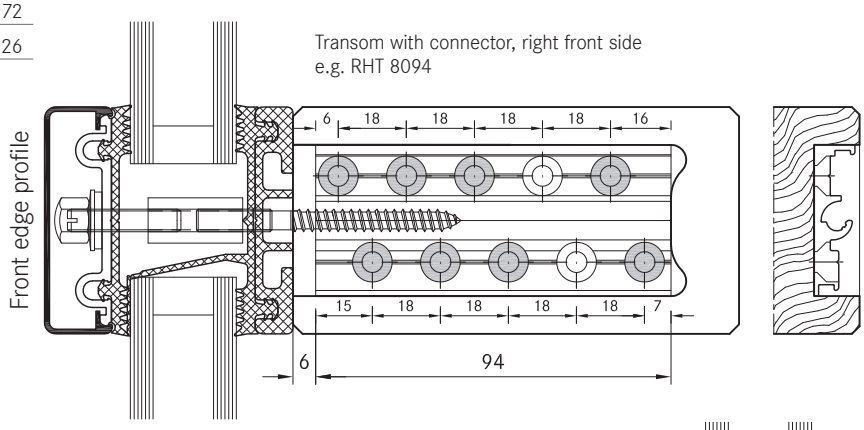
- A recess with 12-12.5 mm depth is milled into the (front of the) transom.
- The milling dimensions are:
  With x length x depth
  40 x (RHT length + 6) x 12-12.5 (mm)
- The milling can be carried out using a standard hand router.
- The front edge of the connector lies 6 mm behind the front edge of 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, depending on the connector type. (Refer to the previous page)

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

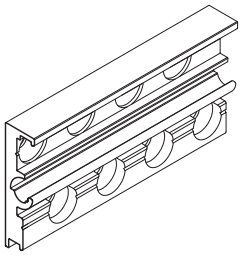


Front-side transom groove, depth 12-12.5 mm

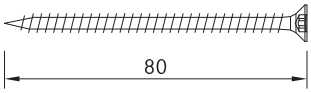
Transom with connector, right front side
e.g. RHT 8094



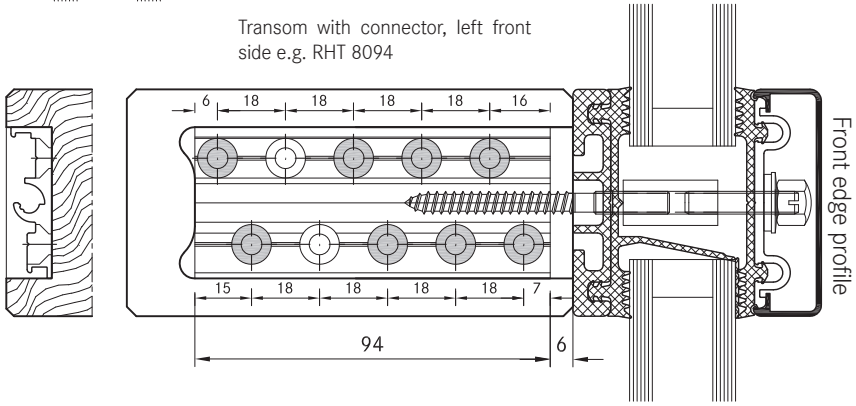
Transom assembly



Screw fitting, transom Z 0127



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



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Mullion-transom joint

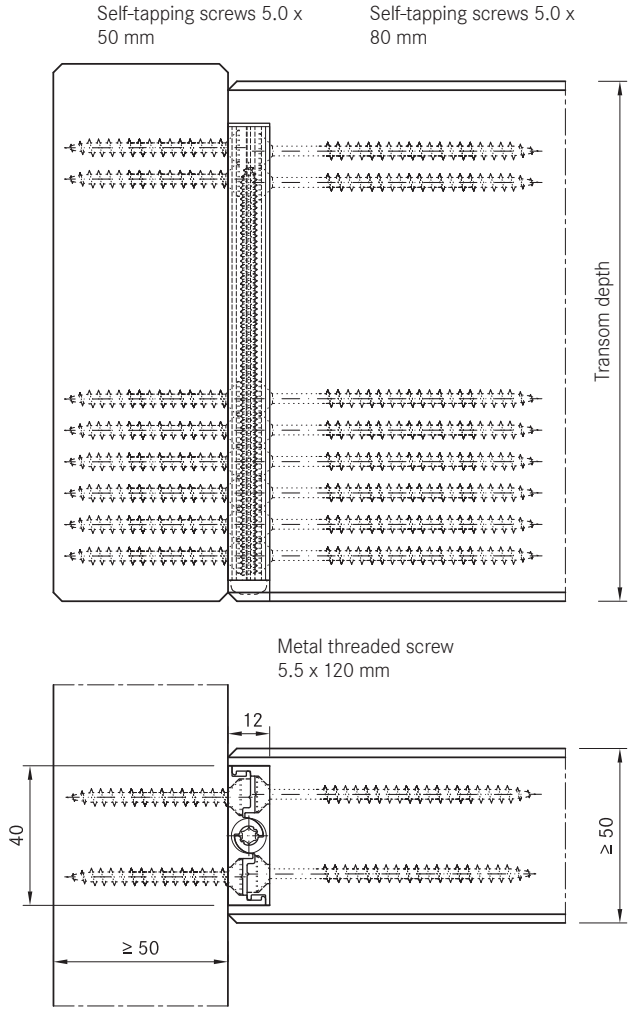
Constructing the timber joint

- 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 load-bearing capacity of the RHT 8220 applies in regard to resilience.

Example: RHT 8130 top and side views



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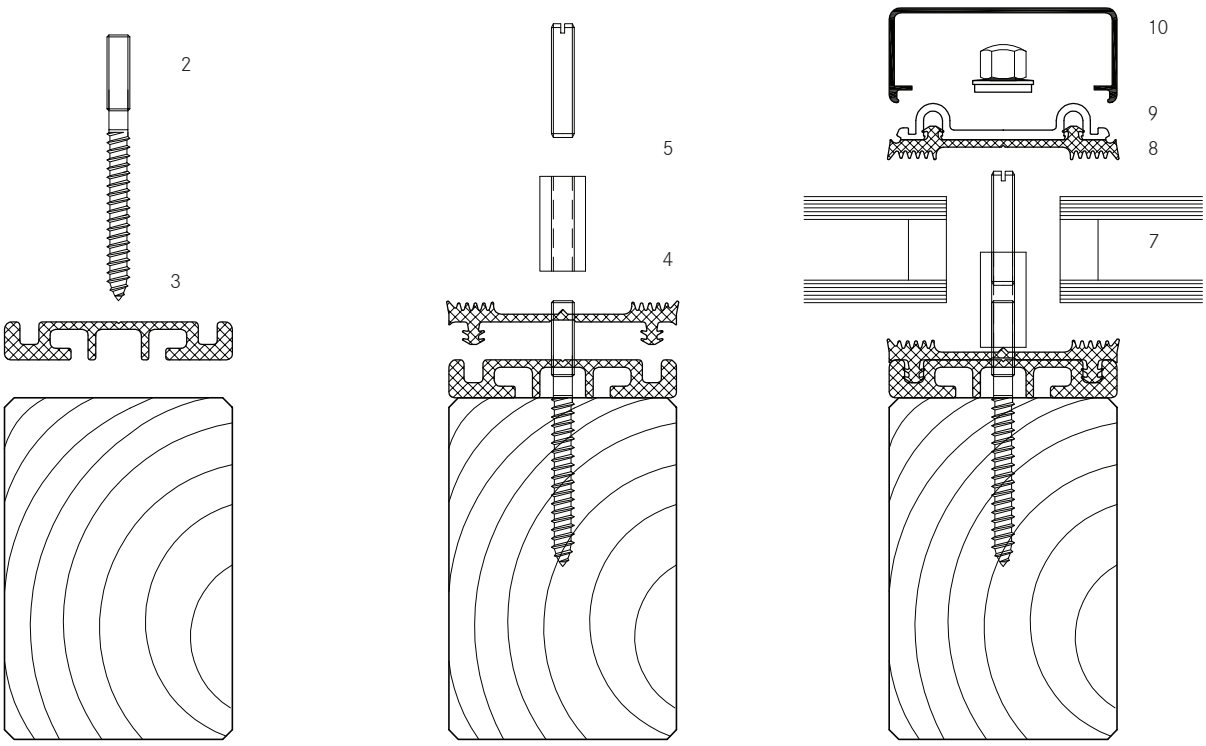
Assembly order

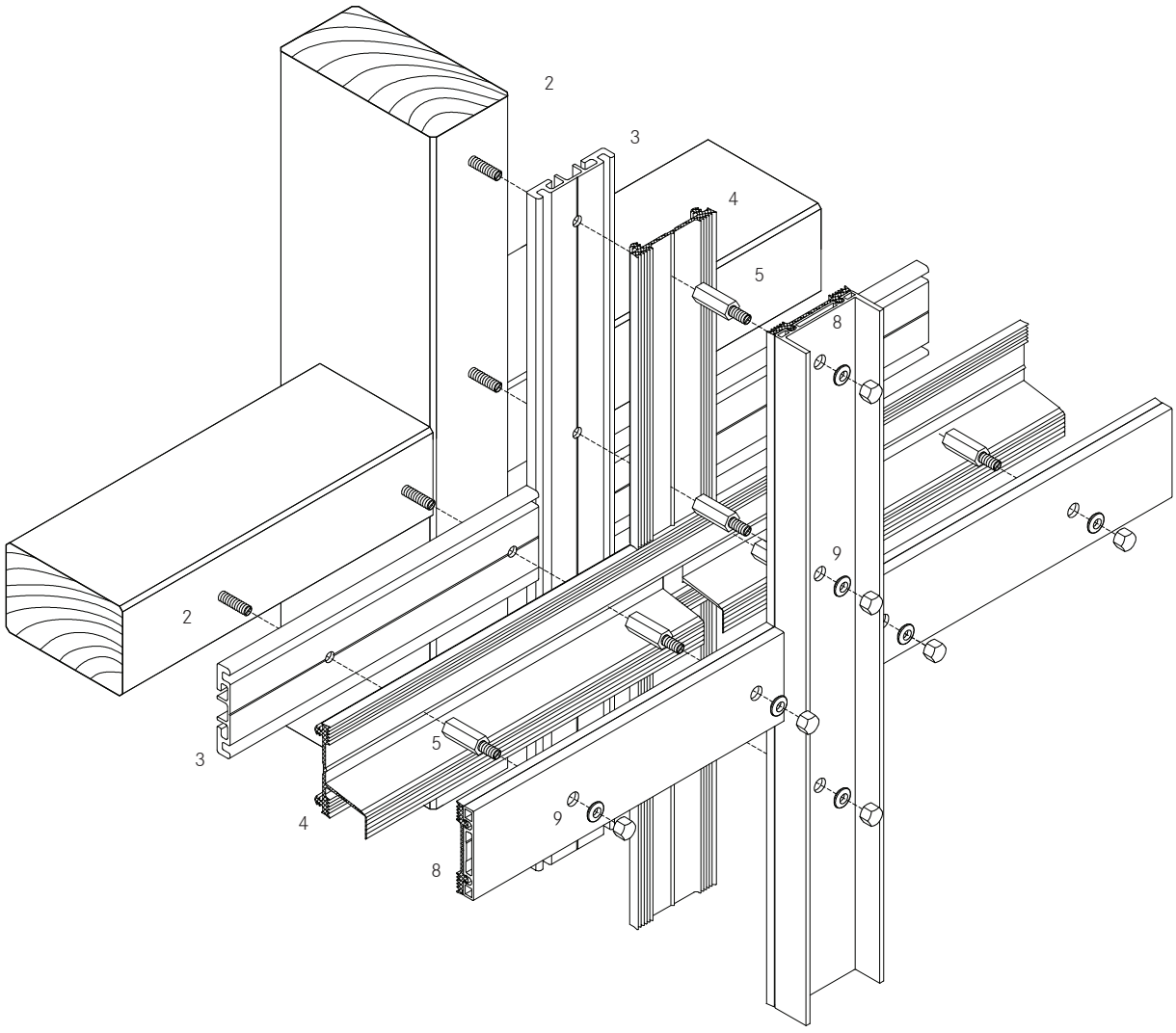
1. Carry out preparatory work on the wood as necessary for statically required glass supports.
2. Insert the hanger bolts, e.g. Z 0113, into the wooden supporting substructure (observe required distances)
3. Place the spacer strip, e.g. ZL 6053, over the hanger bolts (fixing materials). (The spacer strip must be predrilled at regular intervals).
4. Lay the inner seal, e.g. GD 6025.
5. Screw the threaded socket e.g. Z 0032 and threaded bars to the hanger bolts and screw in the threaded bars whilst paying attention to the clamping length.



ZL-H_2.2_006.dwg

Assembly order

6. Attach the glass support e.g. GH 0888 using Z 0372
7. Attaching the filling elements.
8. Lay the outer seal, e.g. GD 6024 together with the clamping strip.
9. Attach the cover profile and pressure profile e.g. DL 6061 using sealing gasket Z 0086 and cap nut Z 0043.
10. Clip on the upper strip with concealed screw fittings.

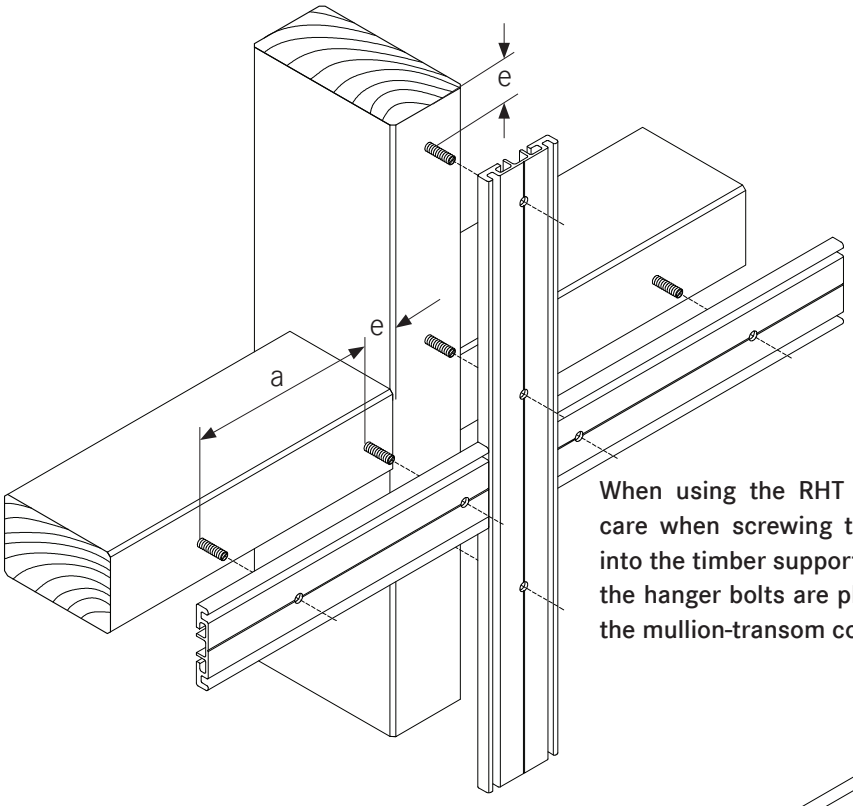


ZL-H_2.2_007.dwg

Attaching the spacer strip

Mounting to the supporting structure

- Carry out any preparatory work on the timbers required for the glass supports before laying the spacer strip.
- The hanger bolts are screwed directly into the supporting structure.
- The spacer strip is pre-drilled at regular intervals of ⌀ 7 mm and placed over the hanger bolts.
- The distance for screw fittings is variable. The maximum distance is a = 250 mm.
- The distance from the edge for the first screw fitting should generally be in the region of 30 mm ≤ e ≤ 80 mm. The placement of the glass supports should also be taken into account. The distance from the edge should also be adapted when installing the RHT connector.
- Lay the spacer strips continuously and uninterrupted vertically and horizontally through over mullions.
- The length of the spacer strip generally corresponds to the length of the substructure for mullions and transoms.



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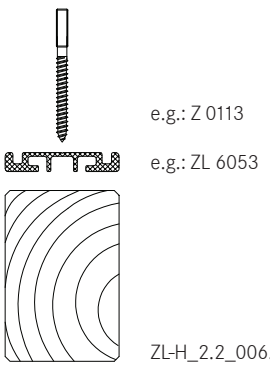
When using the RHT connector, take care when screwing the hanger bolts into the timber supports to ensure that the hanger bolts are placed away from the mullion-transom connection.



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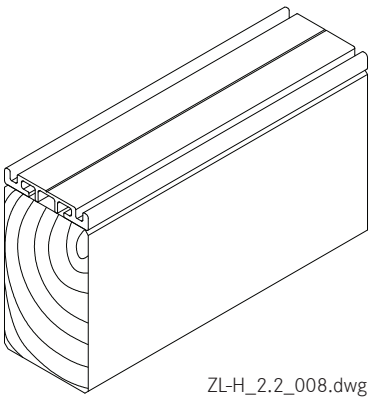
ZL 6053



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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.

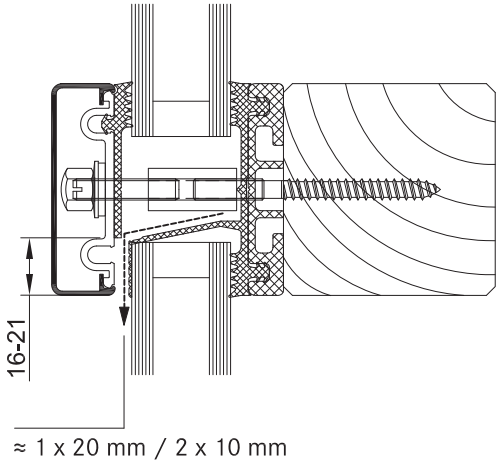
- The inner sealing section acts to protect the inner space, water guiding section and elastic glass supports from moisture and steam.

Both sealing sections must perform this function over a long period of time.

Seals should be adapted on the construction site, but may also be pre-cut to the required length in the factory and pulled into the spacer strips 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 $\ell \geq 2$ 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 facades, water is guided via the seal flap into the mullions. There is a choice between using tested sealing systems with between 1 and 3 levels. With inclined glazing with 2 drainage levels, the higher sealing section of the transom overlaps the lower mullion seal. These principles 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 seals accordingly. It must be ensured that the film will last for a long time.

Tips for laying seals

Inner sealing section

The structure of the inner sealing section is different for vertical facades and facades with an inward incline up to 20° as well as roof glazing.

Inner sealing for vertical glazing and glazing with an inward incline up to 20°:

- 5 mm high butt jointed seals with a drainage section for vertical facades (α=0°)
- 10 mm high seals with two drainage sections 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. These seals can be used for vertical facades and facades with an incline up to 20°.
- 12 mm high seals follow the same principle, but allow an additional third drainage section for an intermediate mullion.
- The shaped seal flap protects the vulnerable area of the rebate and ensures that moisture is drained away via the vertical or up to 20° inwards inclined mullions.

Inner seals for glazed roofs:

- A special seal geometry for glazed roofs also allows for two-level stepped drainage. The 10 mm high seals are laid with overlapping joints.

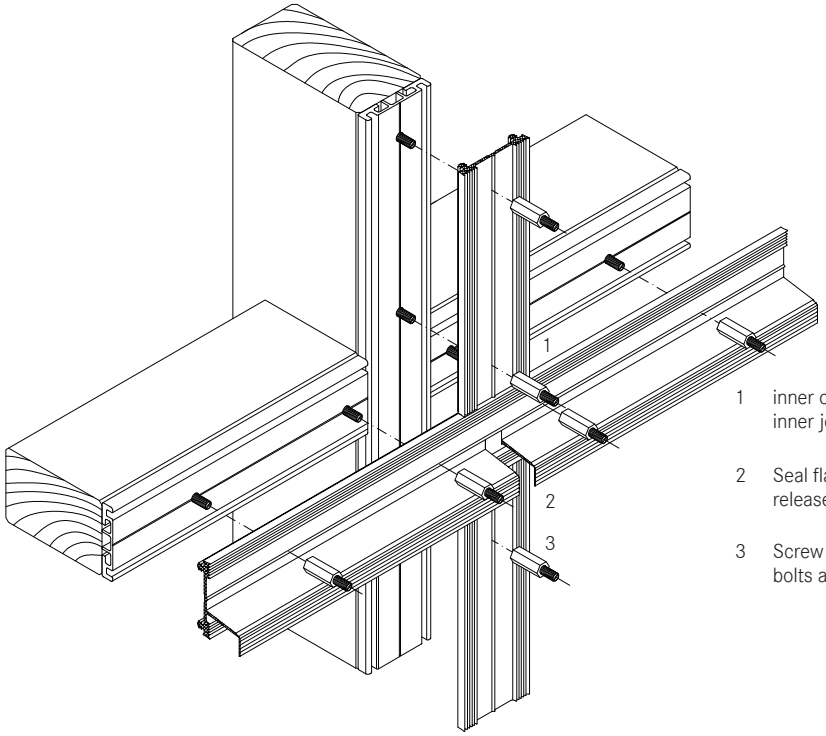
Some basic information for sealing and sticking down Norden Facade seals

- All joints and seal penetrations must be waterproofed. An exception to this is the Norden Facade system screw fittings where the hole diameter of the inner seal is at most the same as the core diameter of the M6 thread of the bolts and the seals are laid close together.
- Gasket joints 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. Pay attention to the directions provid-ed by the manufacturer).
- For difficult to seal places we recommend first using a fixing adhesive such as the Norden Facade quick fixing glue Z 0055.
- Before gluing, ensure all surfaces are free from moisture, dirt and grease.
- 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.

Seals - Facade

Assemble the inner seal on vertical facade glazing - 1 level join

- The horizontal transom seals are laid continuously across the mullion-transom joints. Ensure here that the clamping feet of the horizontal seal are released around the mullion.
- Mullion seals are butt jointed to the transom seals.
- The seal flaps should be released to a width of 10-15 mm at the mullion joint.
- The protruding length of the seal flap should be removed at the perforation once glazing is completed.
- In order to safely drain away moisture from transoms even at the edges of the facade, the inner transom seals must be laid into the released mullion seals. To release and remove the clamping feet we recommend using our release pliers Z 0078 for System 60 and Z 0077 for System 50.
- Ensure all joints are cleanly and solidly sealed. Excess sealant should be removed.



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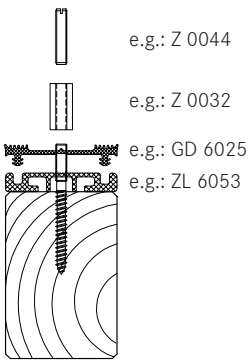
1 inner continuous transom seal, inner jointed mullion seal

2 Seal flap in mullion area released

3 Screw threaded sockets to hanger bolts and threaded bolts



e.g.: Z 0044

e.g.: Z 0032

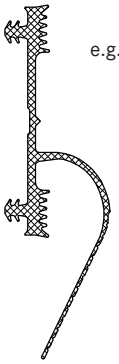
e.g.: GD 6025

e.g.: ZL 6053

Inner seal mullions

e.g. GD 6025

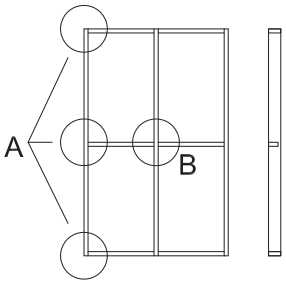
Inner seal transoms



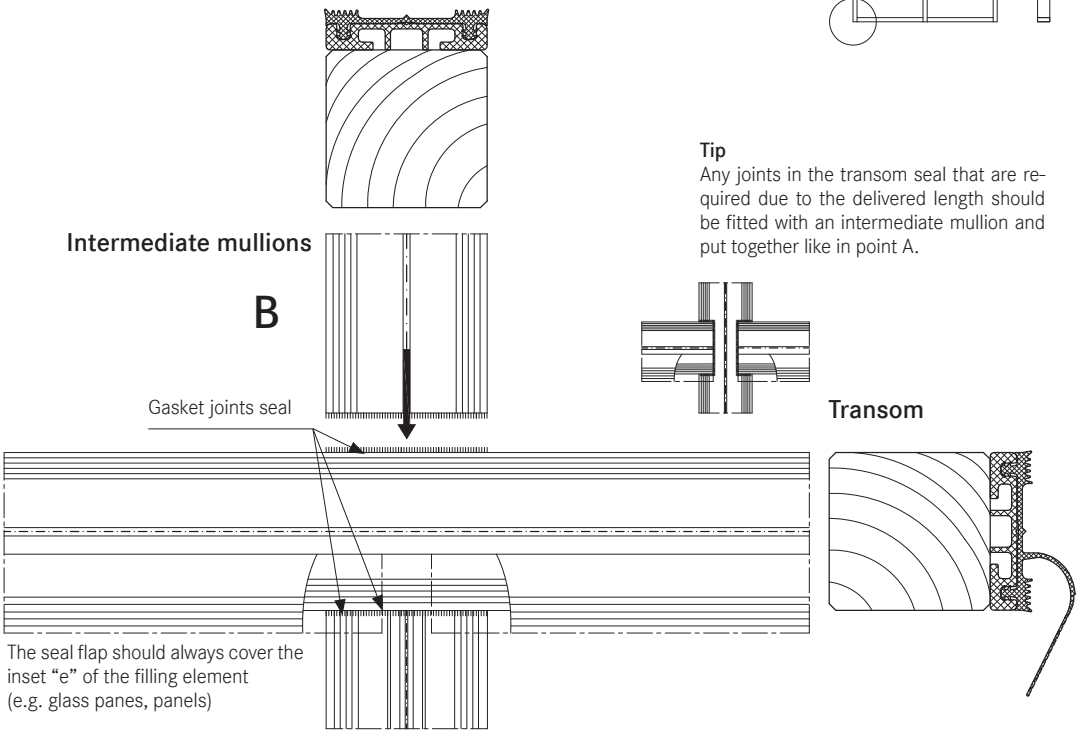
e.g. GD 6030

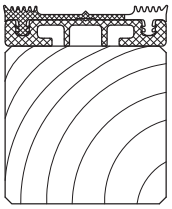
Seals - Facade

Assemble the inner seal on vertical facade glazing - 1 level join

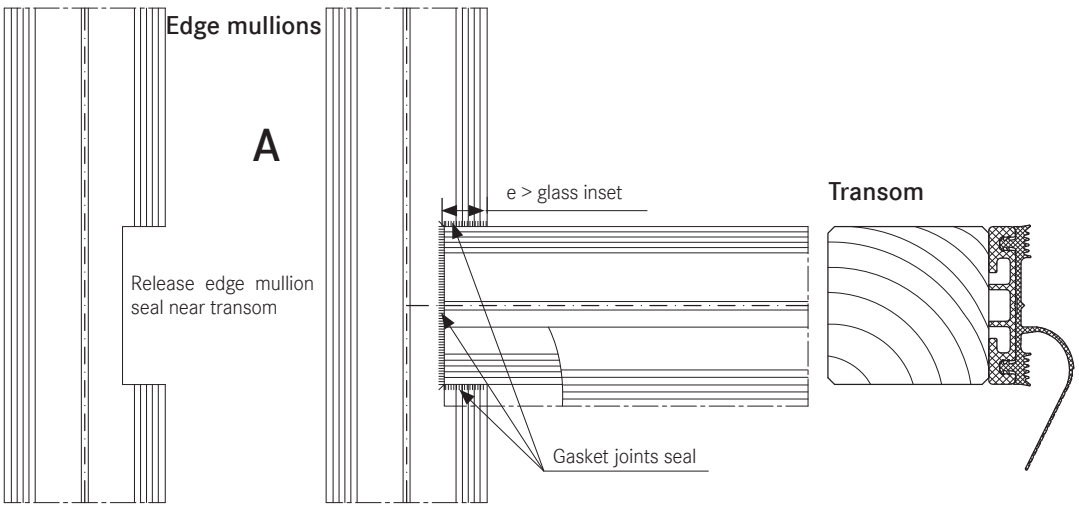


Tip
Any joints in the transom seal that are required due to the delivered length should be fitted with an intermediate mullion and put together like in point A.





edge mullion seal around a transom release



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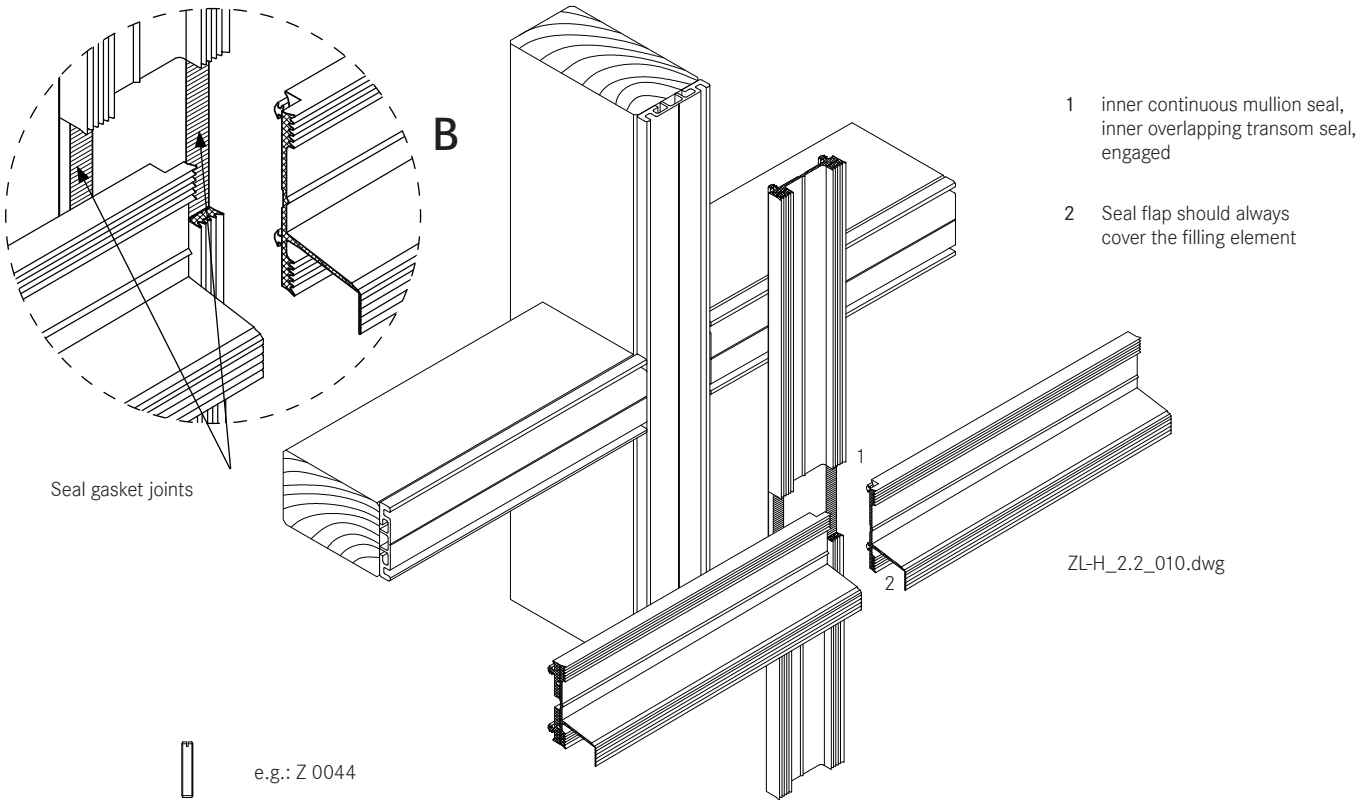
Seals - Facade

Assembly of the inner seal for vertical facade glazing and facade glazing with an incline of up to 20° - 2 overlapping sections

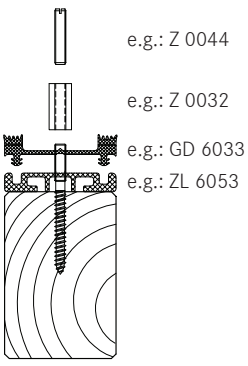
- The 10 mm high seals can be divided across their height to allow a simple overlap at critical transom joints.
- The vertical seals for the mullions (2nd drainage section) are laid continuously.
- The transom seals overlap the mullion seals.
- Moisture and condensation is guided away via the seal flap of the transom seal (1st drainage section) to the main mullion.
- The seal flap must always cover the inset depth of the glass panes and filling element.
- The protruding length of the seal flap should be removed at the perforation once glazing is completed.
- All joints must be sealed. Before laying seals, we recommend completely coating the support surfaces and edges with Norden Facade connection paste.
- Ensure all joints are cleanly and solidly sealed. Excess sealant should be removed. Absolutely no unevenness in the glass support surface must occur from applying sealant too thickly.



1 inner continuous mullion seal, inner overlapping transom seal, engaged

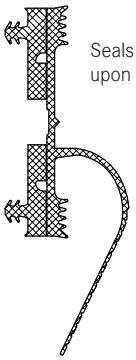
2 Seal flap should always cover the filling element

Seal gasket joints



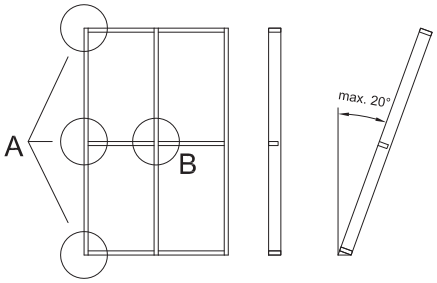
Inner seal mullions

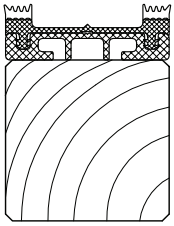
Inner seal transoms



Seals - Facade

Assembly of the inner seal for vertical facade glazing and facade glazing with an incline of up to 20° - 2 overlapping sections





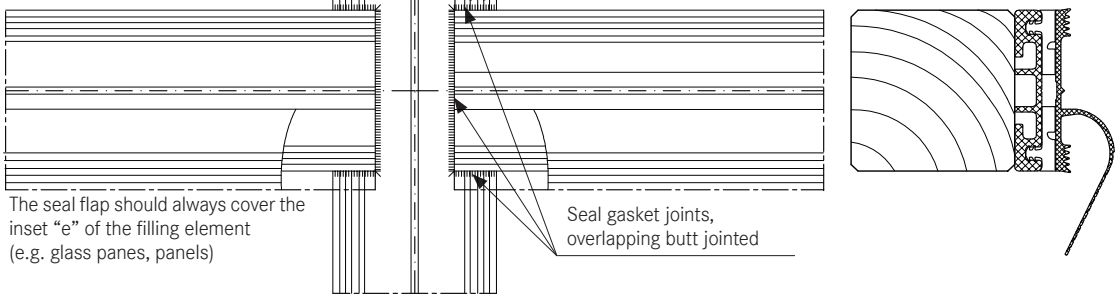
Mullion seals
around a transom upper section
separate at the width of the transom seal

Intermediate mullions

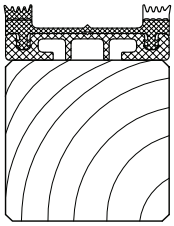
B

Transom

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



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



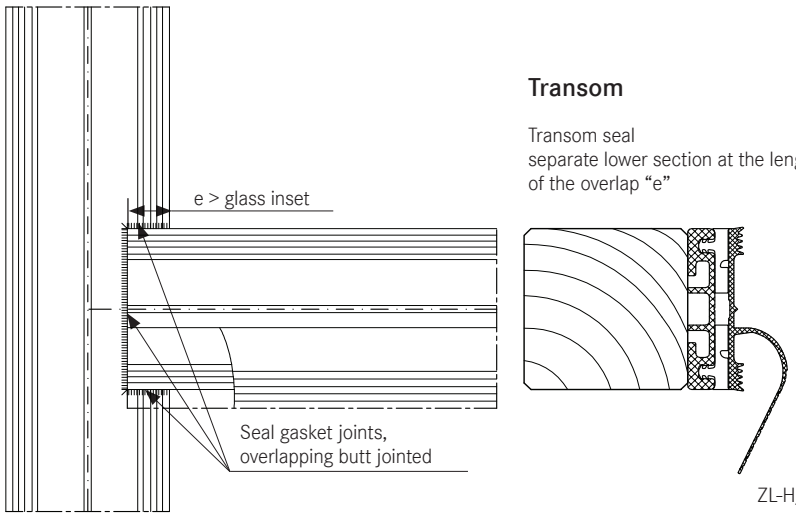
edge mullion seal
around a transom upper section
separate at the width of the transom seal

Edge mullions

A

Transom

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



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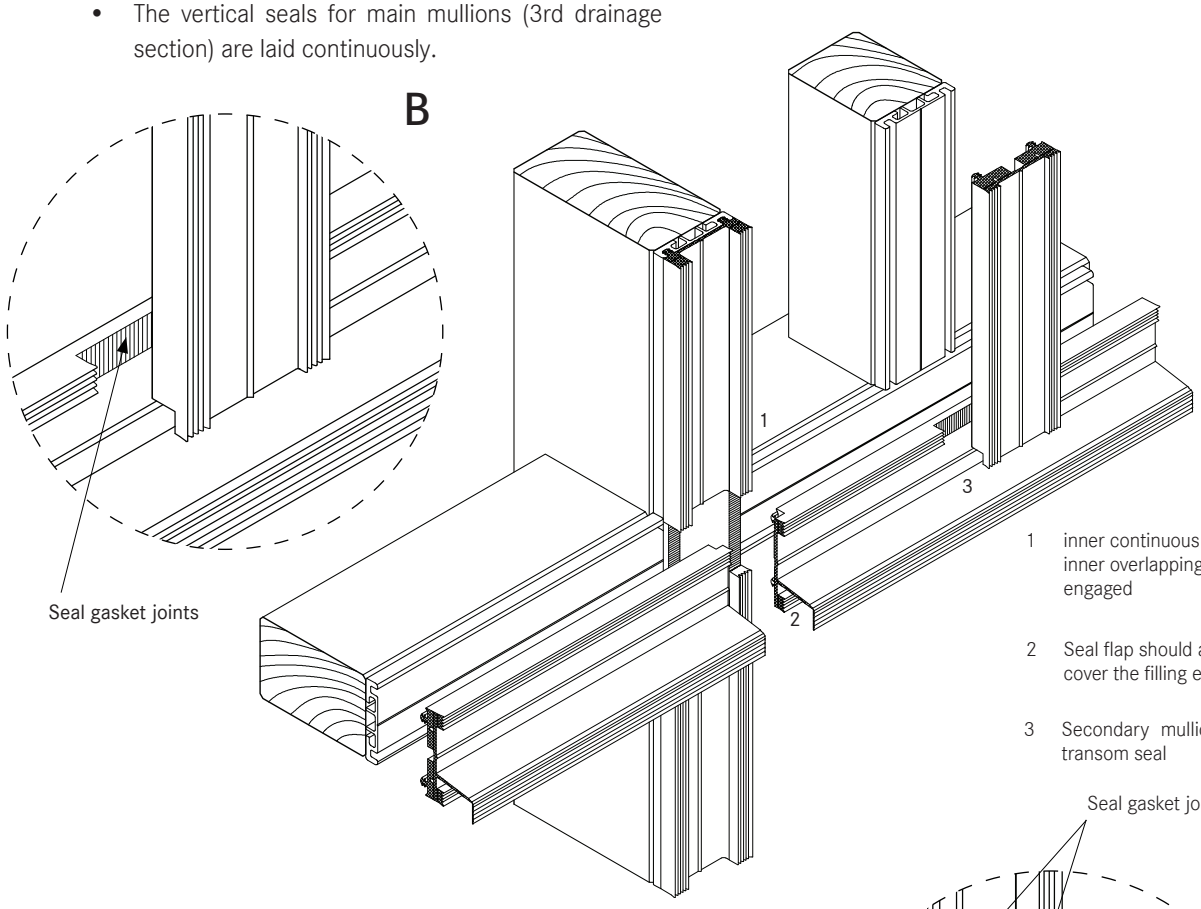
Seals - Facade

Assembly of the inner seal for vertical facade glazing and facade glazing with an incline of up to 20° - 3 overlapping sections

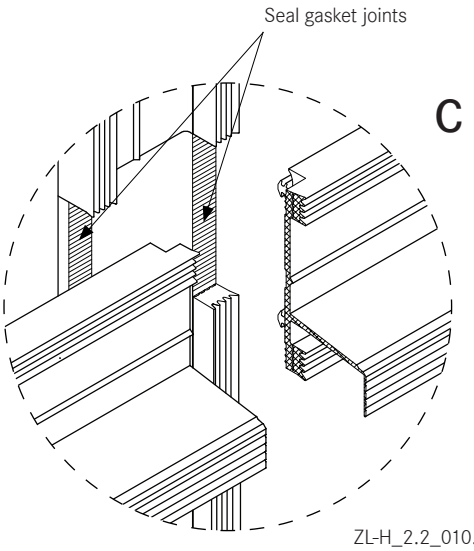
- Optionally, Norden Facade seals with three offset water channels can be used in the facade area which safe-ly drain any moisture or condensation to the outside.
- The 12 mm high seals can be divided across their height to allow a simple overlap at critical secondary mullion/transom joints and/or transom/primary mullion joints.
- The vertical seals for main mullions (3rd drainage section) are laid continuously.
- The transom seals overlap the main mullion seals.
- Along a transom, seals must be laid continuously.
- Moisture and condensation is guided away via the seal flap of the transom seal (2nd drainage section) to the main mullion.



1 inner continuous mullion seal, inner overlapping transom seal, engaged

2 Seal flap should always cover the filling element

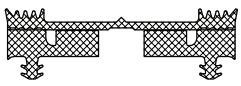
3 Secondary mullion seal overlaps the transom seal



Inner seal main mullion

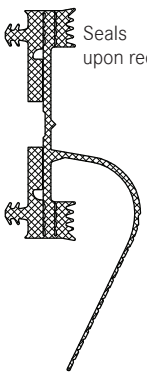
Seals upon request

Inner seal secondary mullion



Seals upon request

Inner seal transoms



Seals upon request

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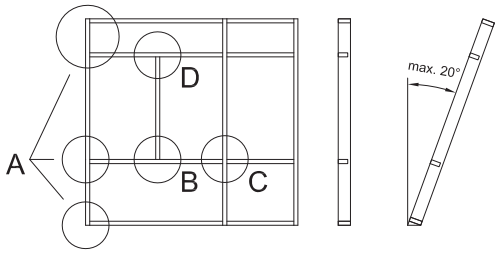
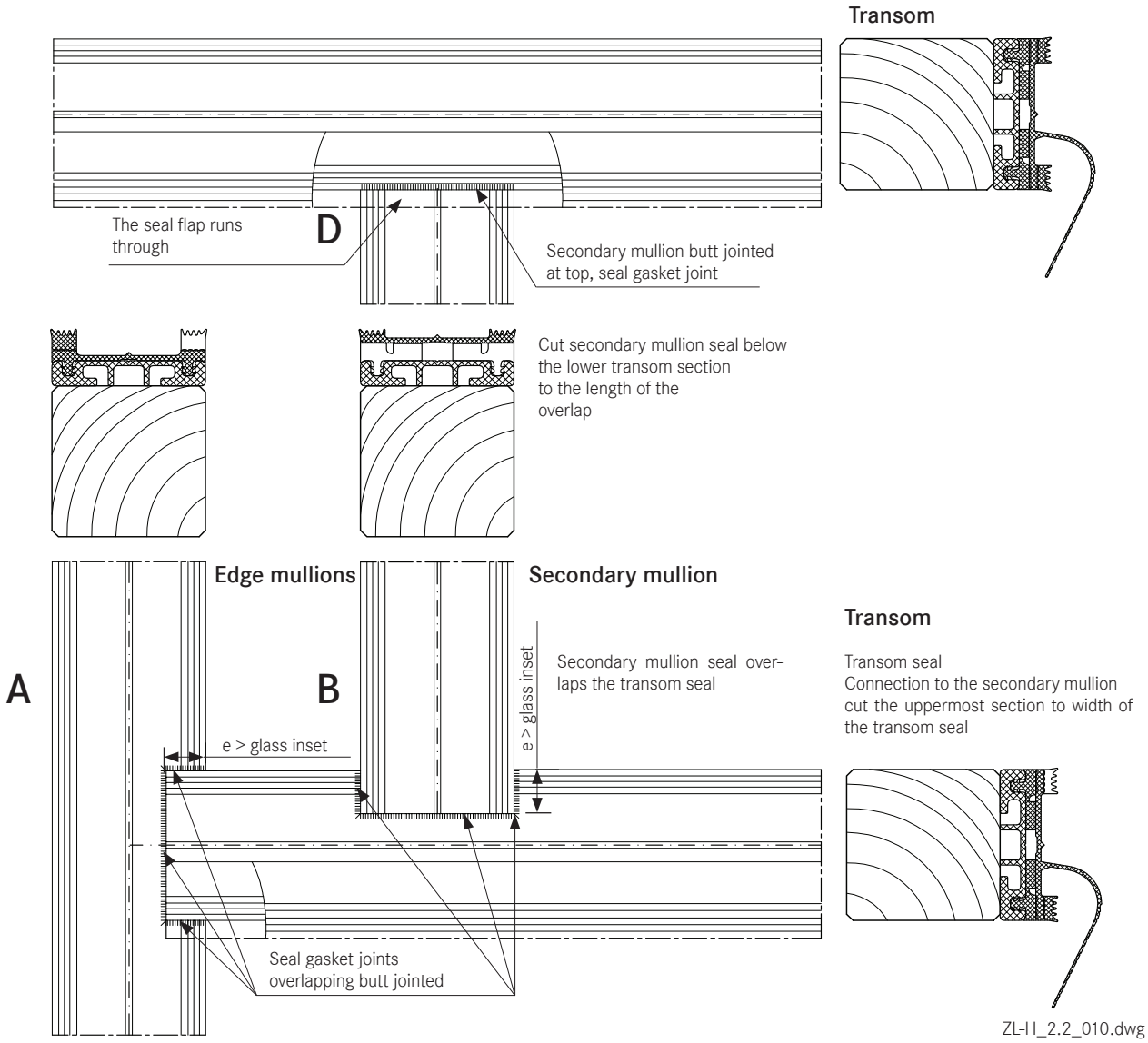
Seals - Facade

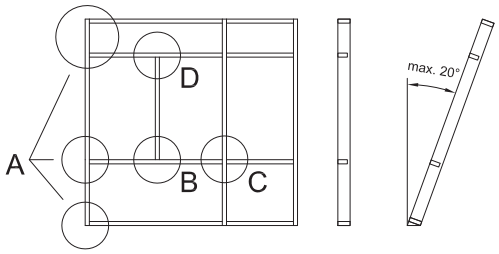
Assembly of the inner seal for vertical facade glazing and facade glazing with an incline of up to 20° - 3 overlapping sections



- The seal flap must always cover the inset depth of the glass panes and filling element.
- The protruding length of the seal flap should be removed at the perforation once glazing is completed.
- Vertical seals on the secondary mullion are butt jointed beneath the upper transom. The seal flap of the upper transom runs continuously in the upper part of the joint.
- Drainage of the secondary mullion (1st drainage section) is achieved by overlapping the seals of the secondary mullion with the seal of the upper transom.

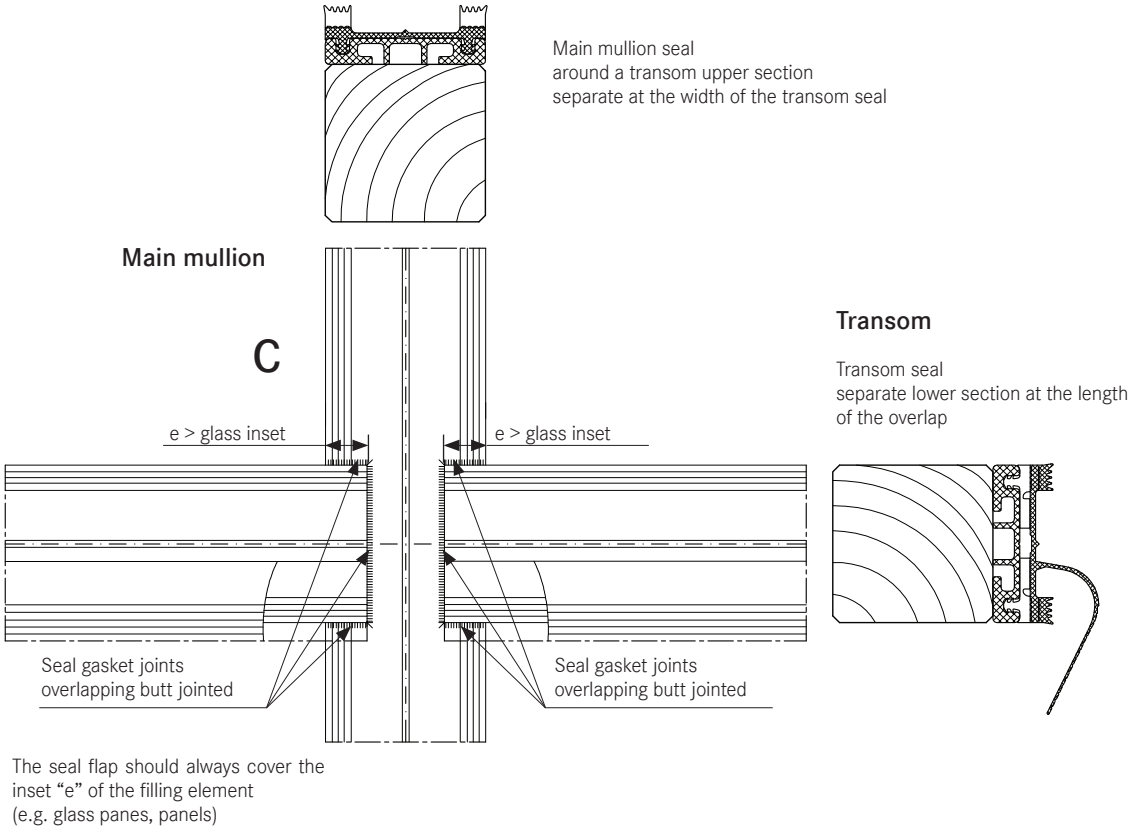


Seals - Facade



Assembly of the inner seal for vertical facade glazing and facade glazing with an incline of up to 20° - 3 overlapping sections

- All joints must be sealed. Before laying seals, we recommend completely coating the support surfaces and edges with Norden Facade connection paste.
- Ensure all joints are cleanly and solidly sealed. Excess sealant should be removed. Absolutely no unevenness in the glass support surface must occur from applying sealant too thickly.



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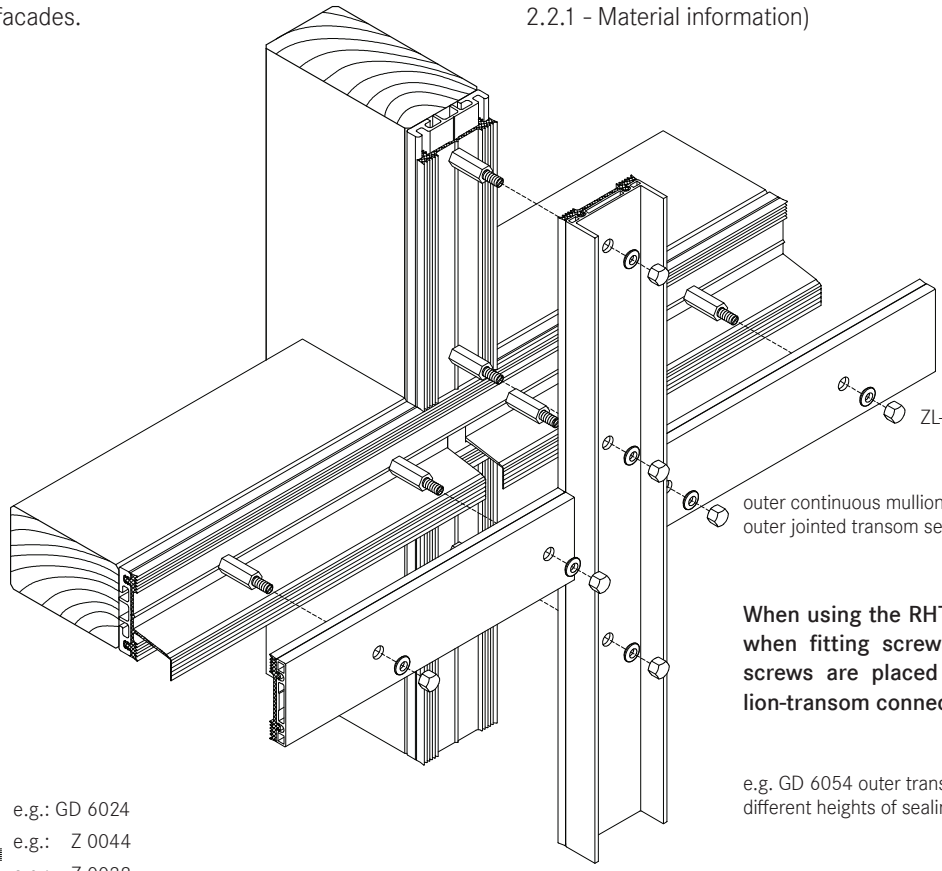
Seals - Facade

Assembly of the outer seal for vertical glass facades

- 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 sealing sections 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.
- 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 seal bridge the height different created by the seal flap in the outer sealing section.
- Differently high, split seals allow a balance between filling elements of different total thickness of up to 6 mm
- When mounting the clamping strip, be aware of aluminium profile expansion (see section 2.2.1 - Material information)



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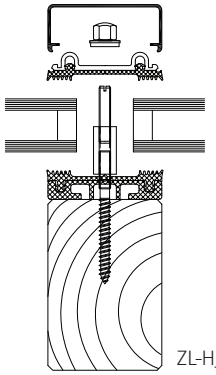
outer continuous mullion seal,
outer jointed transom seal

When using the RHT connector, take care when fitting screws to ensure that the screws are placed away from the mullion-transom connection.



e.g.: GD 6024
e.g.: Z 0044
e.g.: Z 0032
e.g.: GD 6025
e.g.: ZL 6053

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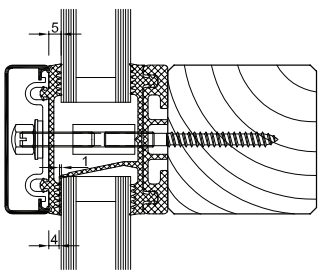
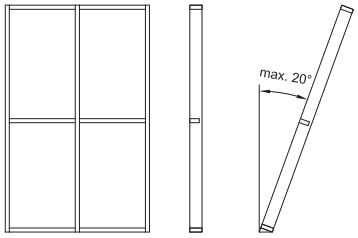
e.g. GD 6054 outer transom seal with different heights of sealing lip

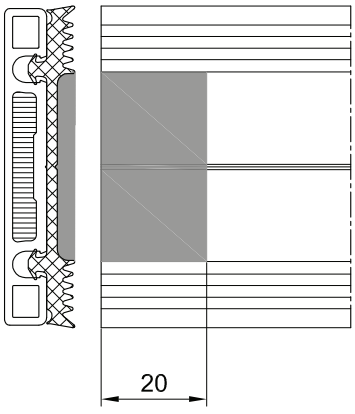


Seals - Facade

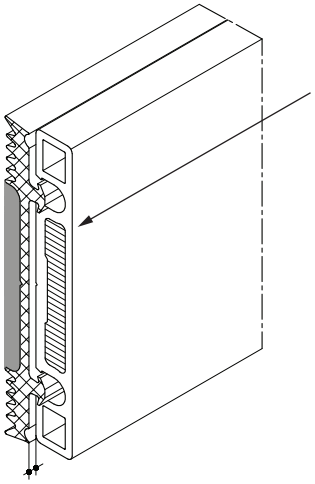
Assembly of the outer seal for facade glazing with an inwards incline up to 20°.

- If the facade is inclined inwards from the vertical (max. permitted incline 20°), the open ends of the outer transom seals must be closed up using Butyl.
- When constructing inwardly inclined facades (up to max. 20°), if flat cover profiles are used in the transoms (e.g. DL 5059, DL 6059, DL 5061, DL 6061, DL 5067, DL 6067, DL 5071, DL 6071, DL 6043, DL 6044) and flat lower and upper strips (e.g. UL 6005 with OL 6066), then the central hollows at each end must be sealed with silicone.





Seal open ends of the transom seals with Butyl on inwardly inclined facades (up to max. 20°).



When using flat cover profiles on inwardly inclined facades (up to max. 20°), the central hollow at each end should be sealed with silicone.

Trim the seal to be slightly larger than required.

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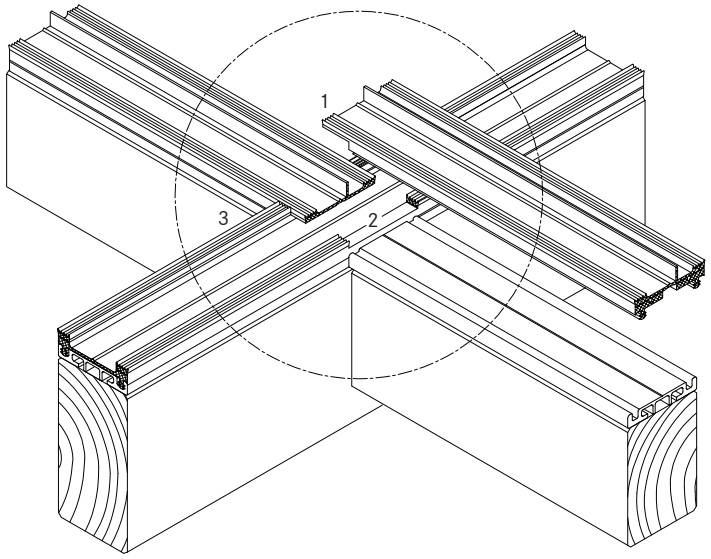
Seals - roof

Assemble the inner seal for roof glazing

- Optionally, Norden Facade seals with offset water channels can be used in the facade area which safely drain any moisture or condensation to the outside.
- The 10 mm high seals can be divided across their height to allow a simple overlap at critical transom joints.
- The transom seals are geometrically shaped so as to create a condensation channel.
- This channel drains from the overlapping transom joint in the rafters.
- Along a transom, seals must be laid continuously.
- All joints must be sealed. Before laying transom seals, we recommend completely coating the support surfaces and edges. Absolutely no unevenness in the glass support surface must occur from applying sealant too thickly.



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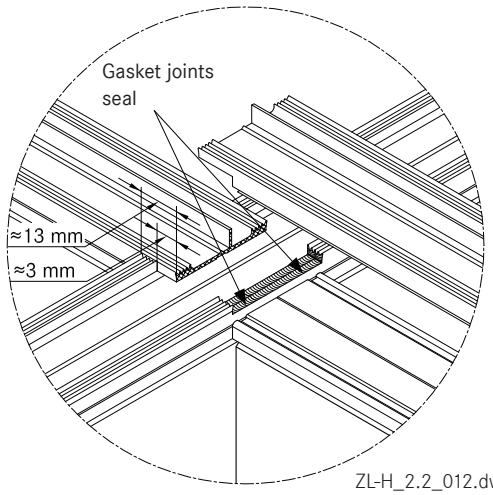

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1 remove the lower perforated part and the clamping foot on the transom seal of the at around 15 mm

2 remove the upper perforated part on the rafter seal

3 length of transom seal = transom length + ~13 mm per side

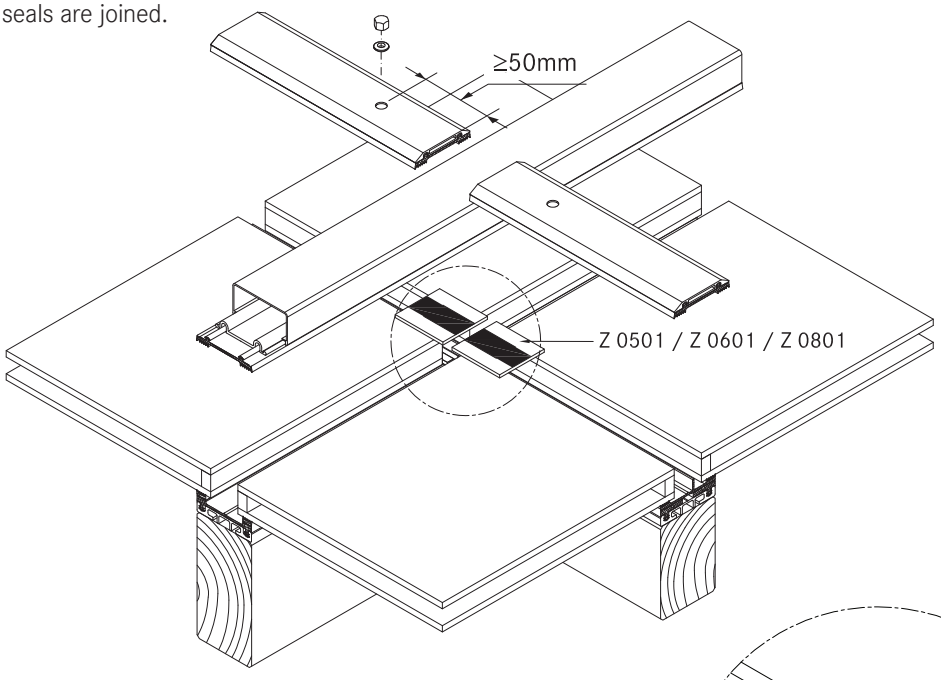
Seals - roof

Assembly of the outer seal for for glazed roofing

- This 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 0801 for the system 80, Z 0601 for System 60 and Z 0501 for System 50. 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.

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.



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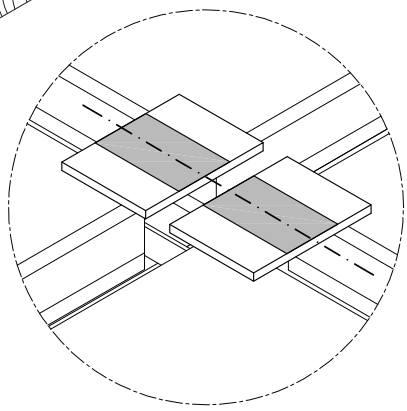

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Detail of sealing plate Z 0501 = 60 x 40 mm
Z 0601 = 60 x 50 mm
Z 0801 = 70 x 70 mm

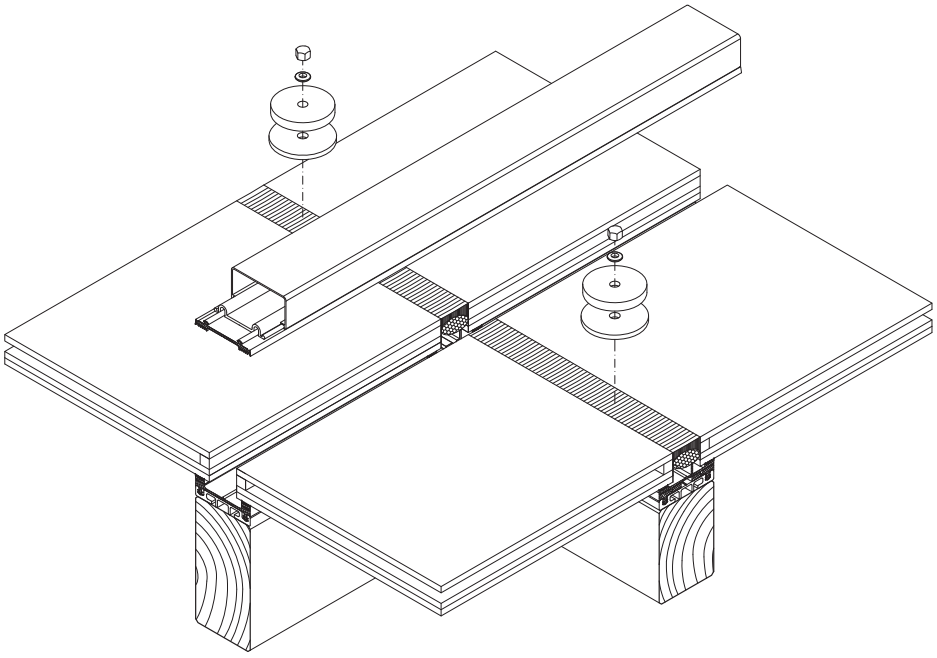
Attention: The sealing plates must be placed central to the transom axis!

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.

Seals - roof

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

- This 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 up to 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 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. (see section 2.2.1 - Material information).

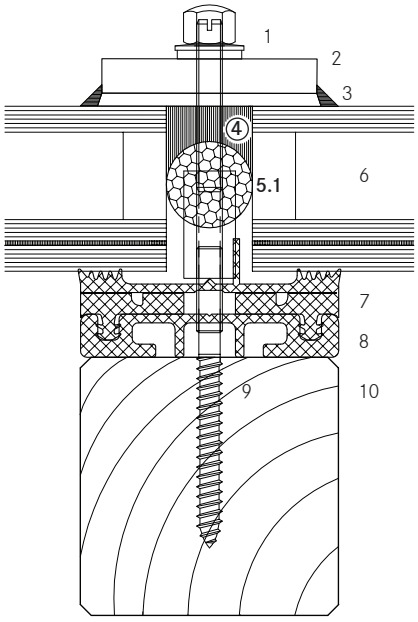
For wide spans we recommend using concealed screw fittings when selecting the clamping strips (lower + upper strip). This is the preferred option for rafters. Unused holes in the pressure profile must be sealed.
Some roof areas, such as the eaves, see the use of several different materials (glass, silicone, 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 up to 2°.

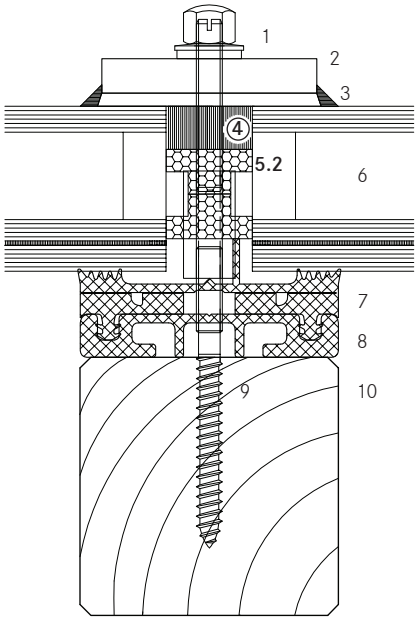
- The compatibility of the materials is particularly important when using all-weather silicone. In this case, the compatibility of the sealant with the edge bonding of the glass and the backfill of the joints. If self-cleaning glass is used, the compatibility must be established in advance.
- Glass sealants 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 up to 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
5.1 Round section rope seal

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



5.2 Slab insulation
6 Glass / filling element
7 Inner seal 10 mm transom
8 Spacer strip
9 System screw fittings
10 Timber profile

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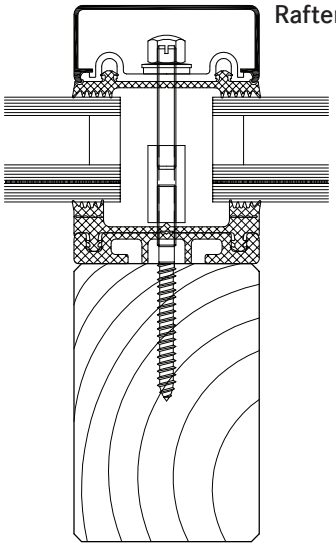
Seals - roof

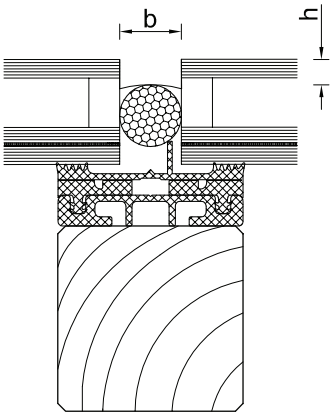
Assembly of the outer seal for for inclined glazed roofing up to 2°.

- Joint widths and heights are set out in the Norden Facade ZL-H System with w x h = 20 mm x 10 mm. These measurements should always checked when select-ing the sealing material and adapted if necessary. 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 profiles.
- 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.

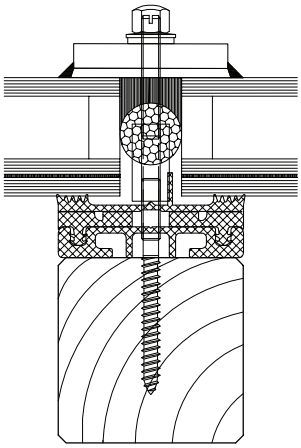
Rafters with clamping strips



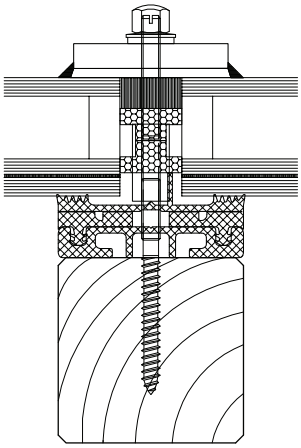
Joint design according to manufacturers specifications! generally:
w : h = 2 : 1 - 3.5 : 1



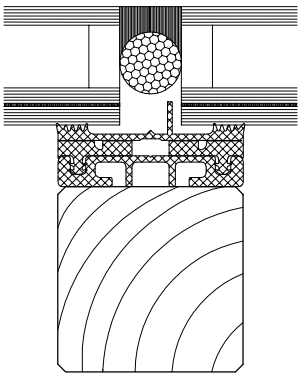
Transom with clamp, All weather silicone seal and round section rope seal



Transom with clamp, All weather silicone seal and slab insulation



Transom with all-weather silicone and round section rope seal



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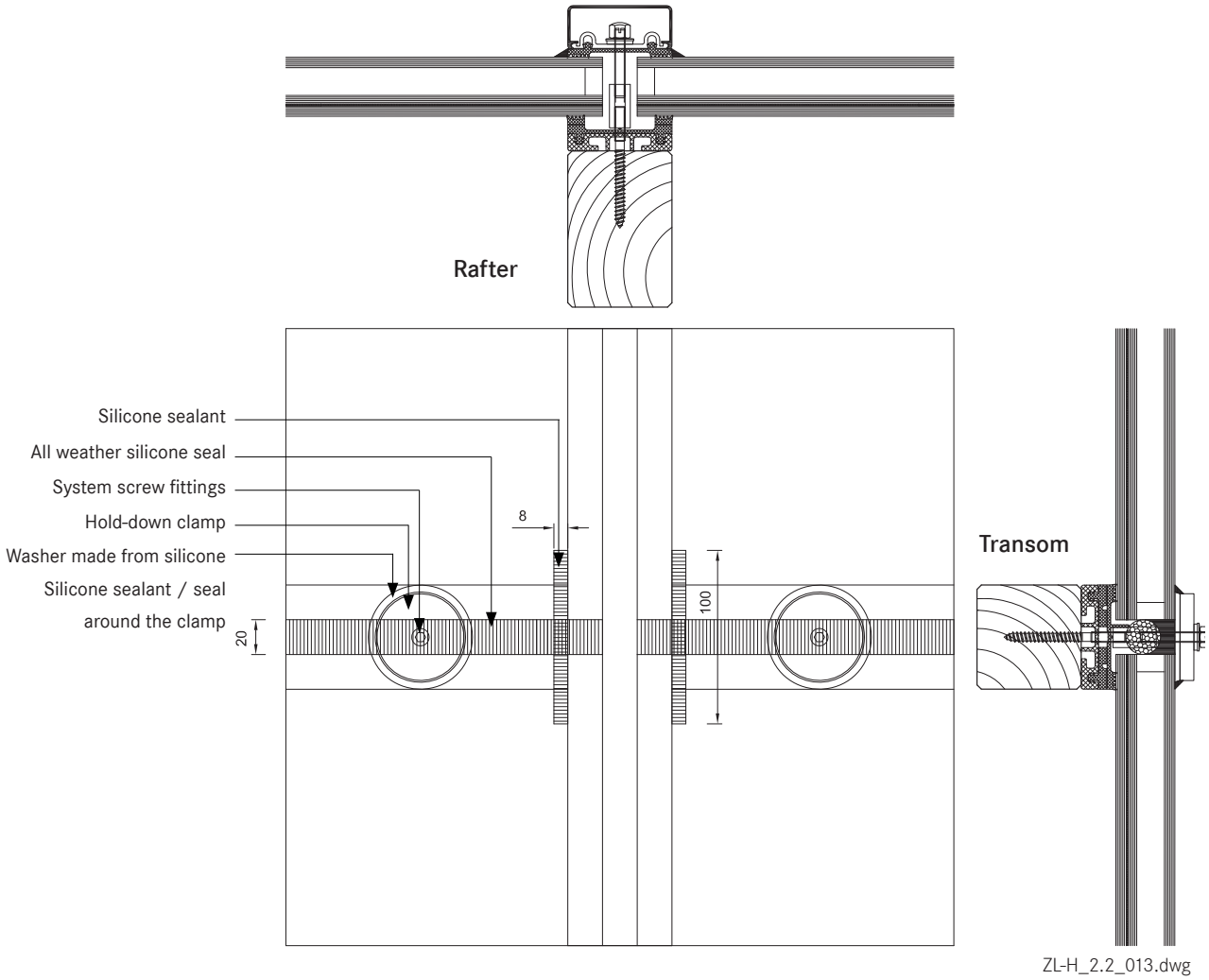
Seals - roof

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.



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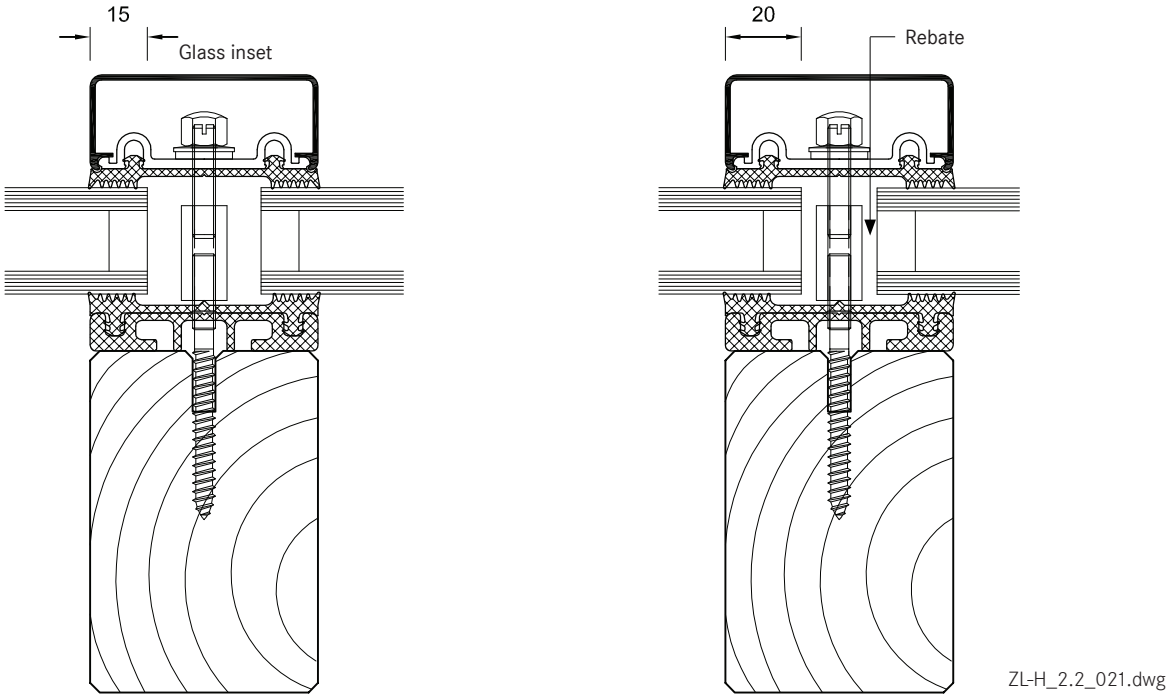
Glass inset and glass support

Glass inset

- Glass industry guidelines must be observed.
- The glass inset is generally 15 mm.
- An increase to 20 mm has a beneficial effect on the heat transfer coefficient U_f of the frame structure.



Glass inset and glass support

Glass support types and choosing the glass support

The Norden Facade ZL-H system uses two different types and techniques for attaching glass supports:

- Glass support GH 5053 and GH 5055 with hanger bolts.
- Glass support GH 5053 and GH 5055 with hardwood cylinders and bolts.

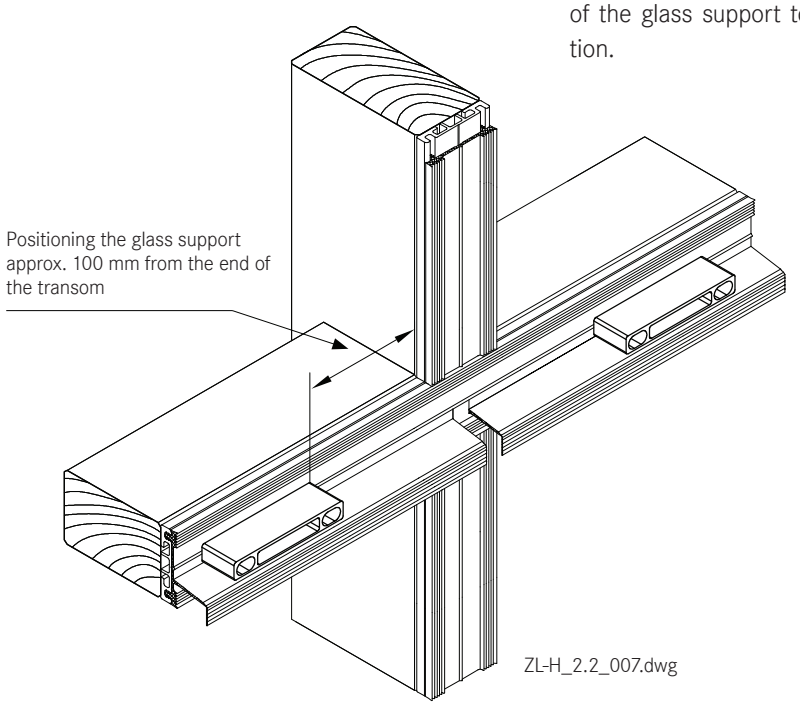
The glass supports used are determined by the type of wood, glass construction and glass weight (see section 9). A rigid mullion-transom connection is required, i.e. no twisting of the transom may occur at the connection that would cause further sinking of the glass support.

Mounting the glass supports

- Positioning the glass supports and glazing according to glass industry guidelines and guidelines of the Institute for Window Technology.
- The weight of the glass panes is distributed via the glass supports attached to the transoms.
- Glass supports should be attached at a distance of 100 mm from the end of the transom. When doing so, avoid a collision with the cover profile screw fittings at the end of the transom.

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 glazing allows sufficient surrounding space for pressure equalisation and that drainage of condensation is not obstructed as well as allowing the glass edges to be offset and 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.

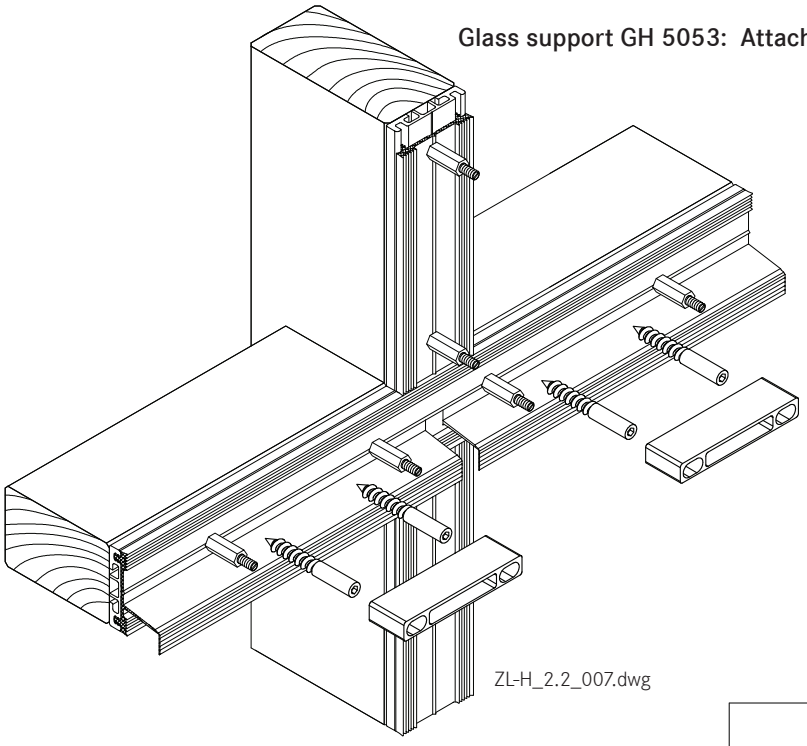


Glass inset and glass support

Glass support GH 5053 with hanger bolts.

- The certified system components consist of the glass support GH 5053 and 2 hanger bolts ⌀ 10 mm with a 45 mm wood thread and a shaft of a different length.
- The hanger bolts are screwed directly into the timber at intervals of 80 mm. A ⌀ 7 mm hole needs to be pre-drilled for this purpose.
- The spacer strip should also be pre-drilled with ⌀ 11 mm holes at the relevant points.
- Screw fittings should be vertical to the transom axis.
- The depth for hanger bolts is at least 45 mm measured from the front edge of the timber.
- For glass support GH 5053, the required depths are delivered corresponding to the thickness of the glass and placed onto the hanger bolts.
- Blocks must be placed under the glass panes along the entire length of the glass supports.
- Details of the approved pane weights, geometries and classification of system components are provided in section 9.

Glass support GH 5053: Attachment with hanger bolts



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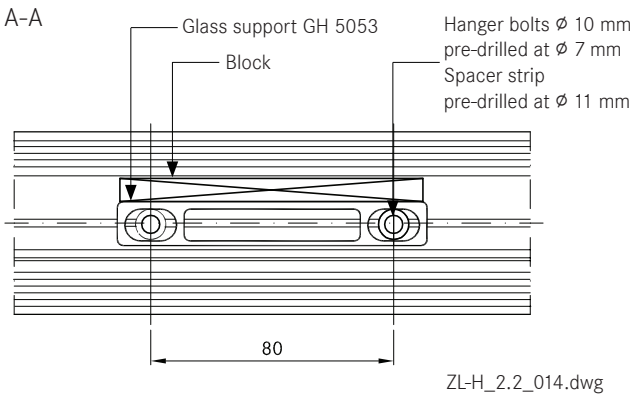

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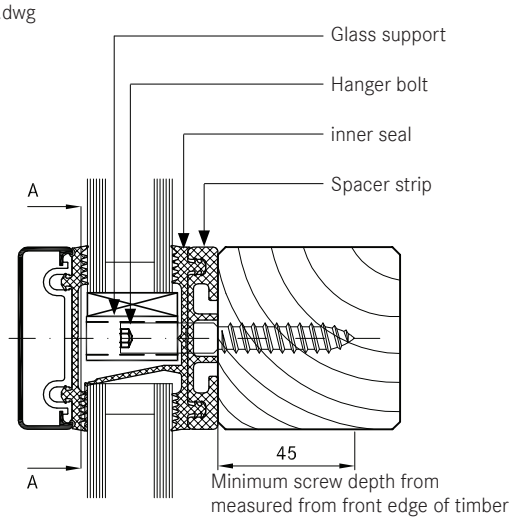
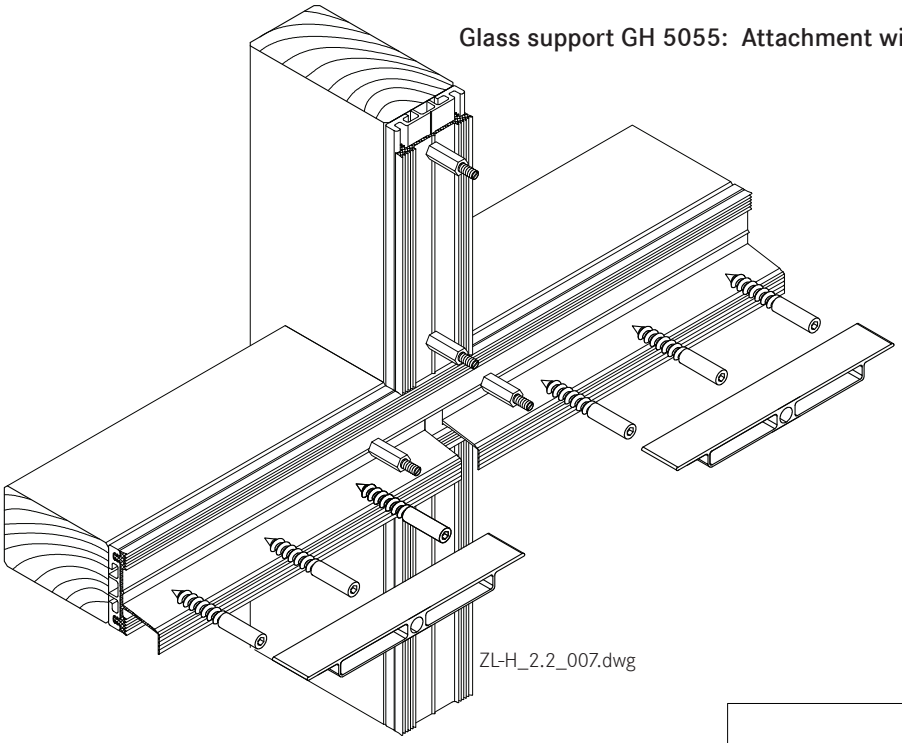


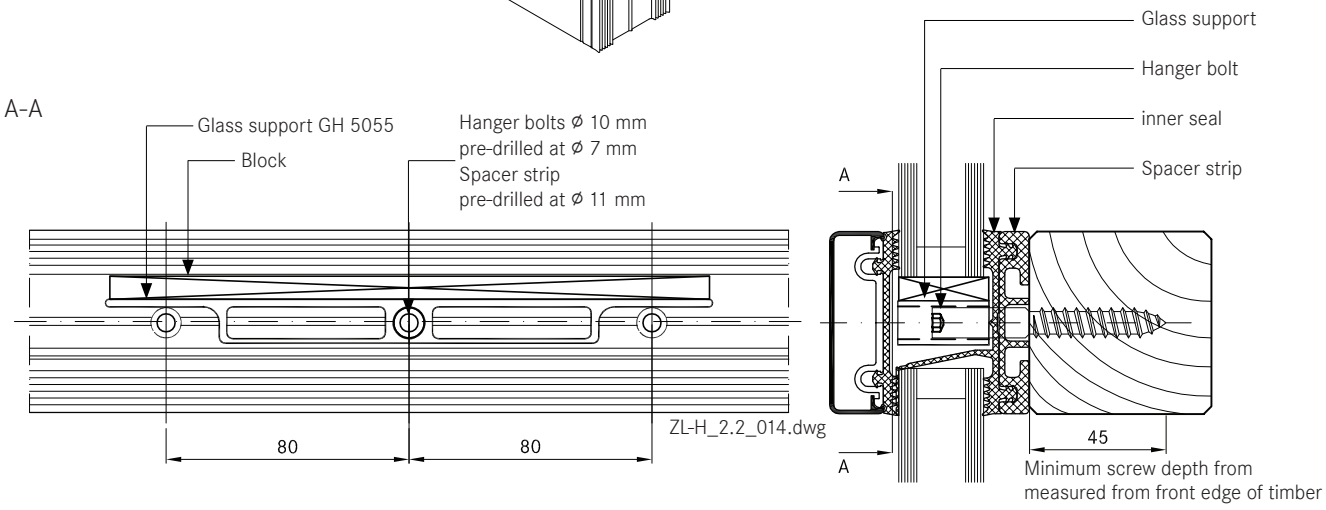
Glass inset and glass support

Glass support GH 5055 with hanger bolts

- Based on the test results for the system component GH 5053, a load bearing model was designed and the suitability of the GH 5055 glass support calculated.
- Installation is done the same way as GH 5053, but using three screws spaced 80 mm apart.
- Details of the approved pane weights, geometries and classification of system components are provided in section 9.

Glass support GH 5055: Attachment with hanger bolts





Glass inset and glass support

Classification of system components

Table 1:

Vertical glazing | System 50, 60, 80 | Hanger bolts

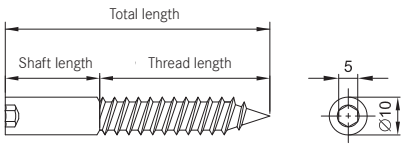
Row	Total glass thickness t_{Glass} (mm) for vertical glazing	Hanger bolts [2]		Glass supports [1]		
		Inner seal height		GH 5053	GH 5055	Depth (mm)
		5 mm	10 mm			
1	4, 5, 6, 7	Z 0371 [3]	Z 0371	GH 0081	Pre-cut	9
2	8, 9	Z 0371	Z 0371	Pre-cut	Pre-cut	12
3	10, 11	Z 0371	Z 0372	Pre-cut	Pre-cut	14
4	12, 13	Z 0371	Z 0372	Pre-cut	Pre-cut	16
5	14, 15	Z 0371	Z 0372	Pre-cut	Pre-cut	18
6	16, 17	Z 0372	Z 0372	Pre-cut	Pre-cut	20
7	18, 19	Z 0372	Z 0372	Pre-cut	Pre-cut	22
8	20, 21	Z 0372	Z 0372	GH 0082	Pre-cut	24
9	22, 23	Z 0372	Z 0372	GH 0083	GH 0851	26
10	24, 25	Z 0372	Z 0373	GH 0084	GH 0852	28
11	26, 27	Z 0372	Z 0373	GH 0085	GH 0853	30
12	28, 29, 30	Z 0373	Z 0373	GH 0886	GH 0854	32
13	31, 32, 33,	Z 0373	Z 0373	GH 0887	GH 0855	35
14	34, 35, 36	Z 0373	Z 0373	GH 0888	GH 0856	38
15	37, 38, 39	Z 0373	-	GH 0889	GH 0857	41
16	40, 41, 42	Z 0373	-	GH 0890	GH 0858	44
17	43, 44	Z 0373	-	GH 0891	GH 0859	47

1) Cut from GH 5053 or GH 5055.

2) Generally: The depth for hanger bolts = 45 mm thread length measured from the front edge of the timber.

3) The depth for hanger bolts = 45 mm thread length + 4 mm shaft length measured from the front edge of the timber.
This represents a visible shaft of 21 mm measured from the front edge of the timber.

Hanger bolts



Item	Total length (mm)	Shaft length (mm)	Thread length (mm)
Z 0371	70	25	45
Z 0372	77	32	45
Z 0373	90	45	45

Glass inset and glass support

Classification of system components

Table 2:

Inclined glazing | System 50, 60, 80 | Hanger bolts

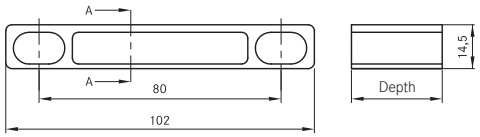
Row	Total glass thickness t_{Glass} (mm) for inclined glazing [1]	Hanger bolts [2]	Glass supports [3]		
			GH 5053	GH 5055	Depth (mm)
1	24, 25, 26	Z 0373	Pre-cut	Pre-cut	18
2	27, 28	Z 0373	Pre-cut	Pre-cut	20
3	29, 30	Z 0373	Pre-cut	Pre-cut	22
4	31, 32	Z 0373	GH 0082	Pre-cut	24
5	33, 34	Z 0373	GH 0083	GH 0851	26

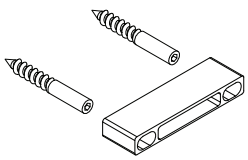
1) Accounting for a 10 mm inner seal.

2) The depth for hanger bolts = 45 mm thread length measured from the front edge of the timber.

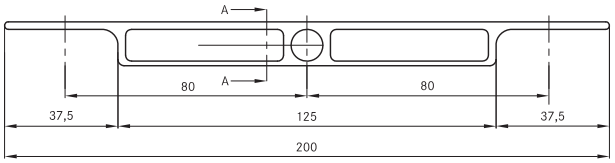
3) Cut from GH 5053 or GH 5055.

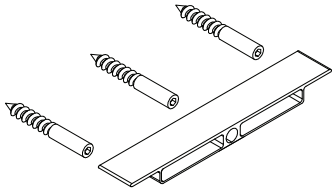
Glass support GH 5053





Glass support GH 5055





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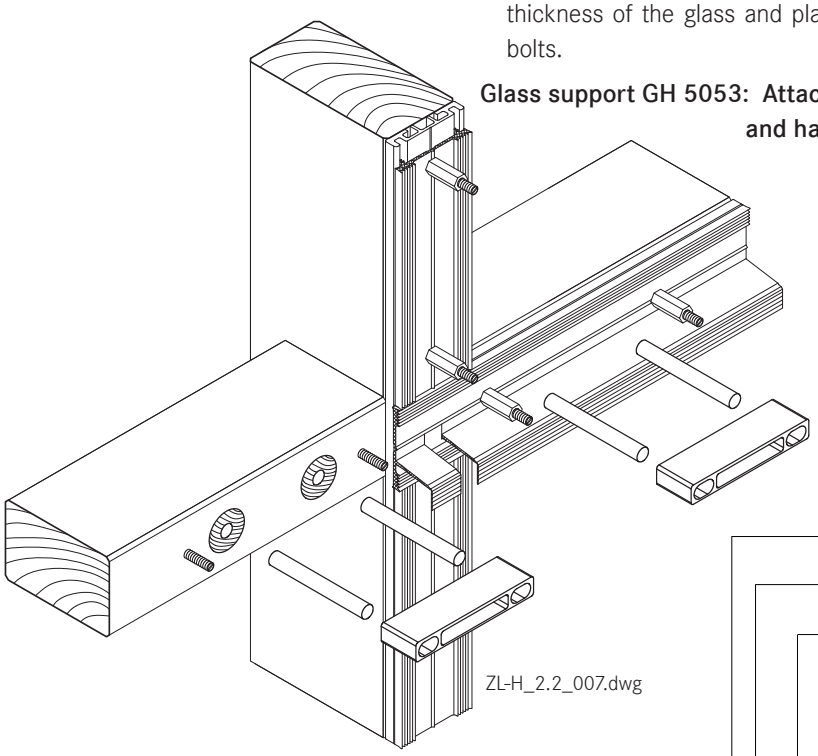
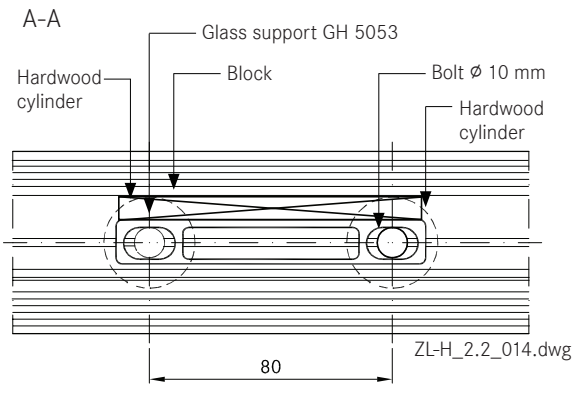
Glass inset and glass support

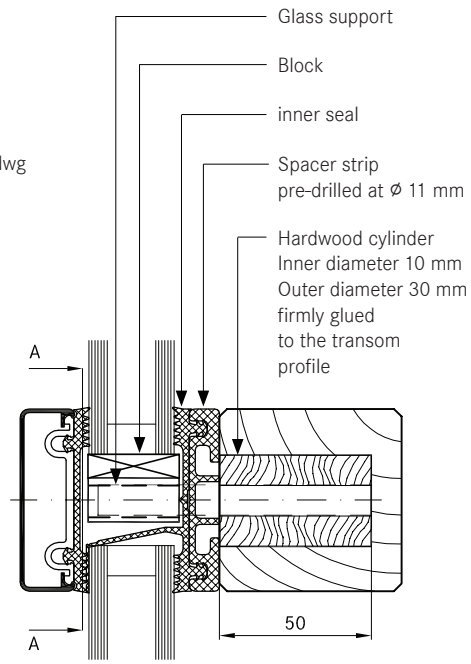
Glass support GH 5053 and GH 5055 with pins and hardwood cylinders

- Certified system components consist of glass support GH 5053 and GH 5055 with pins and hardwood cylinders.
- Depending on the width of supports, 2 or 3 bolts with a diameter of 10 mm are needed.
- The bolt length should be adapted to the thickness of the glass.
- To anchor the bolts in place, 50 mm wooden cylinders with a outer diameter of 30 mm and an axial core of ⌀ 10 mm are solidly glued into the timber.
- Additionally, holes with a depth of 50 mm and diameter of 30 mm are to be drilled into the transom profile vertical to the transom axis with 80 mm spacing.
- The glue or adhesive used must be suitable and must not swell.
- The spacer strip should also be pre-drilled with ⌀ 11 mm holes at the relevant points.
- The bolts should be hammered in along the entire length of the transom.
- For glass supports GH 5053 and GH 5055, the required depths are delivered corresponding to the thickness of the glass and placed onto the hanger bolts.

Glass support GH 5053: Attachment with bolts and hardwood cylinders





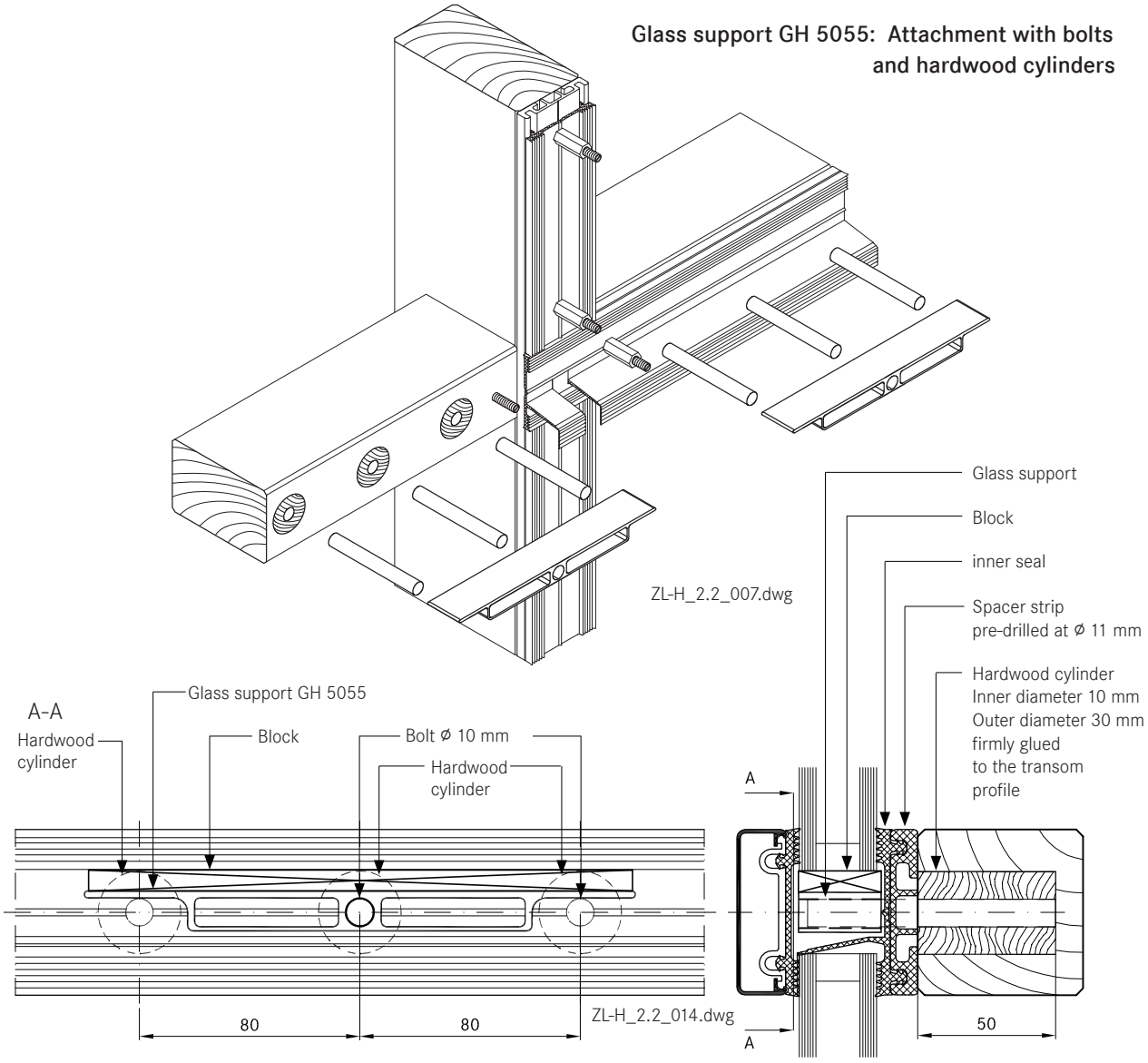


Glass inset and glass support

Glass support GH 5053 and GH 5055 with pins and hardwood cylinders

- Blocks must be placed under the glass panes along the entire length of the glass supports.
- Details of the approved pane weights, geometries and classification of system components are provided in section 9.

Glass support GH 5055: Attachment with bolts and hardwood cylinders



Glass inset and glass support

Classification of system components

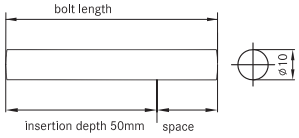
Table 3:

Vertical glazing | System 50, 60, 80 | Hardwood cylinders & bolts

Row	Total glass thickness t_{Glass} (mm) for vertical glazing	Hardwood cylinder	Bolt		Glass supports [1]		
			Inner seal height		GH 5053	GH 5055	Depth (mm)
			5 mm	10 mm			
1	4, 5, 6, 7	Z 0073	Z 0047	-	GH 0081	Pre-cut	9
2	8, 9	Z 0073	Z 0047	-	Pre-cut	Pre-cut	12
3	10, 11	Z 0073	Z 0047	Z 0048	Pre-cut	Pre-cut	14
4	12, 13	Z 0073	Z 0047	Z 0048	Pre-cut	Pre-cut	16
5	14, 15	Z 0073	Z 0048	Z 0048	Pre-cut	Pre-cut	18
6	16, 17	Z 0073	Z 0048	Z 0048	Pre-cut	Pre-cut	20
7	18, 19	Z 0073	Z 0048	Z 0049	Pre-cut	Pre-cut	22
8	20, 21	Z 0073	Z 0048	Z 0049	GH 0082	Pre-cut	24
9	22, 23	Z 0073	Z 0048	Z 0049	GH 0083	GH 0851	26
10	24, 25	Z 0073	Z 0049	Z 0049	GH 0084	GH 0852	28
11	26, 27	Z 0073	Z 0049	Z 0049	GH 0085	GH 0853	30
12	28, 29, 30	Z 0073	Z 0049	Z 0049	GH 0886	GH 0854	32
13	31, 32, 33	Z 0073	Z 0049	Z 0051	GH 0887	GH 0855	35
14	34, 35, 36	Z 0073	Z 0049	Z 0051	GH 0888	GH 0856	38
15	37, 38, 39	Z 0073	Z 0051	-	GH 0889	GH 0857	41
16	40, 41, 42,	Z 0073	Z 0051	-	GH 0890	GH 0858	44
17	43, 44	Z 0073	Z 0051	-	GH 0891	GH 0859	47

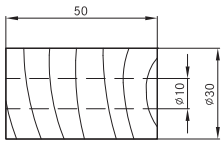
1) Cut from GH 5053 or GH 5055.

Bolt



Item	Bolt length (mm)
Z 0047	70
Z 0048	80
Z 0049	90
Z 0051	100

Hardwood cylinder Z 0073



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Glass inset and glass support

Classification of system components

Table 4:

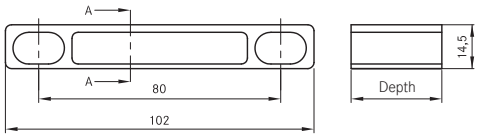
Inclined glazing | System 50, 60, 80 | Hardwood cylinders & bolts

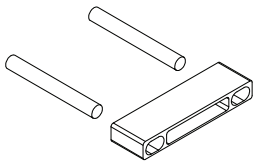
Row	Total glass thickness t_{Glass} (mm) for inclined glazing [1]	Hardwood cylinder	Bolt	Glass supports [2]		
				GH 5053	GH 5055	Depth (mm)
1	20, 21, 22	Z 0073	Z 0049	Pre-cut	Pre-cut	14
2	23, 24	Z 0073	Z 0049	Pre-cut	Pre-cut	16
3	25, 26	Z 0073	Z 0049	Pre-cut	Pre-cut	18
4	27, 28	Z 0073	Z 0049	Pre-cut	Pre-cut	20
5	29, 30	Z 0073	Z 0051	Pre-cut	Pre-cut	22
6	31, 32	Z 0073	Z 0051	GH 0082	Pre-cut	24
7	33, 34	Z 0073	Z 0051	GH 0083	GH 0851	26

1) Accounting for a 10 mm inner seal.

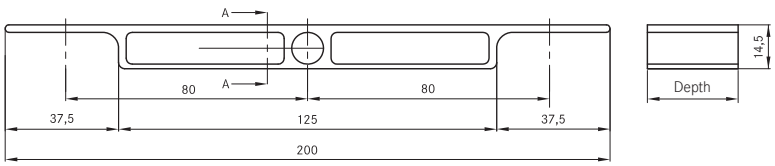
2) Cut from GH 5053 or GH 5055.

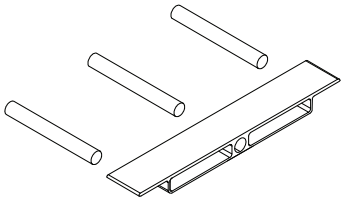
Glass support GH 5053





Glass support GH 5055





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Screw fittings

Fastenings

- The screw fittings used by the system are a combination of basic room-side screw fittings (hanger bolts), a coupling using a threaded socket that allows thermal separation in the rebate and a flexible bolt-nut connection or screw connection on the glazing side.
- The length of the bolts and screws is variable and depends on the height of the inner seal and thickness of the glass. A sufficient screw depth must be ensured.
- Stainless steel 1.4301 DIN EN 10088 is the material used to produce screws for the Norden Facade system.
- Depending on the type of screw fittings selected, special 2 and 4 mm vulcanised EPDM washers are available.
- Screws/threaded bolts of various lengths are available for all common glass thicknesses. The length of bolt required can usually be determined using a table of figures. The combination chosen for the clamp connection will depend on the specific situation.
- The distance for screw fittings is variable. The maximum distance is a = 250 mm.
- The distance from the edge for the first screw fitting should generally be in the region of 30 mm ≤ a ≤ 80 mm. The placement of the glass supports and the choice of mullion-crossbar connection should also be taken into account.
- The clamp connection is exclusively subject to tensile forces. The pressure strips are connected using Norden Facade system components. To determine the stress limit (maximum tensile force) and permitted tensile forces for the connection, the conditions in the relevant general building regulations and the Eu-rocode 5 (DIN EN 1995-1) and Eurocode 3 (DIN EN 1993-3) standards apply.
- 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 when using 4 mm EPDM washers, a washer compression of 1.5 - 1.8 mm is achieved.

Concealed screw fittings

- Choice of pre-drilled pressure strips (UL 5009-L, UL 6009-L and UL 8009-L, slot 7 x 10 mm, a = 125 mm) with clippable upper strips make assembly easier. The remaining pressure 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.

Note:

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. In this case it is recommended that holes for screwing on the clamping strip are created with a diameter of d = 9 mm. Equally, the use of single-piece cover profiles should be carefully considered. Some lower and upper strips (e.g.: UL 6005, OL 6016, OL 6056, OL 6063, OL 6066, OL 6069, OL 5022, OL 5025, DL 5073/DL 6073, OL 50212/OL 60212/ OL 80212) cannot be screwed on using threaded pins, washers and cap nuts as these are too flat. (See item: visible recessed screw fittings)

Visible screw fittings

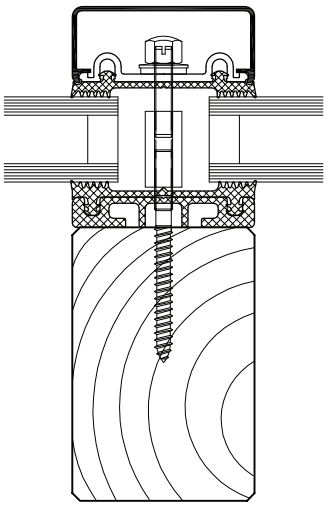
- Cover strips should be drilling with a round hole of d = 8 mm.
  (see **Note** on covered screw fittings)

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.
- The exact use case for the specific project should be checked. Stainless steel cylinder head screws ⌀ 10 mm with a maximum 5 mm head are used here. Screw fittings can only be installed with an internal mount (e.g. inner hex socket). Alternatively, check if the use of direct screw fittings is suitable. It is recommended to install a washer (PA washer, e.g. Z 0033) with all screw fittings.

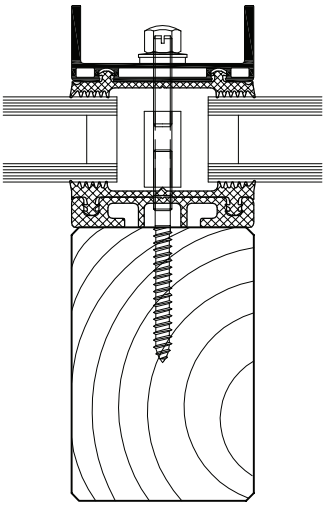
Screw fittings

Fastenings



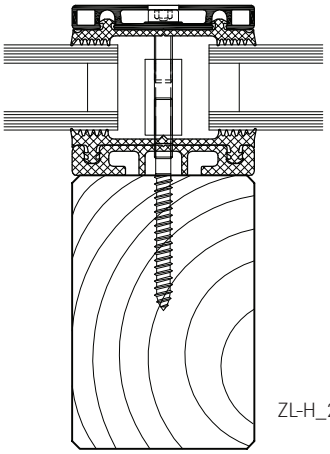
Concealed screw fittings

Hanger bolt M6 e.g. Z 0113;
Threaded socket M6 e.g. Z 0029;
Threaded bolt M6 e.g. Z 0040;
Sealing washer e.g. Z 0086;
Cap nut M6 Z 0043



Visible screw fittings

Hanger bolt M6 e.g. Z 0113;
Threaded socket M6 e.g. Z 0029;
Threaded bolt M6 e.g. Z 0040;
Sealing washer e.g. Z 0086;
Cap nut M6 Z 0043



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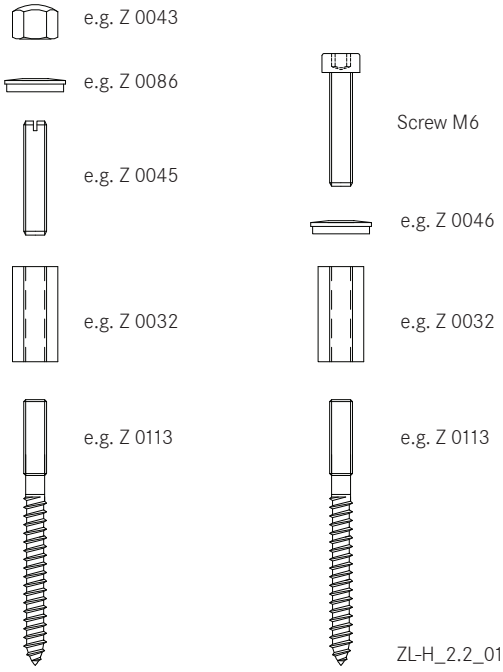
Visible recessed screw fittings

Hanger bolt M6 e.g. Z 0113;
Threaded socket M6 e.g. Z 0029;
Inner hexagonal screw M6 DIN 6912 and
PA washer Z 0033



Note:

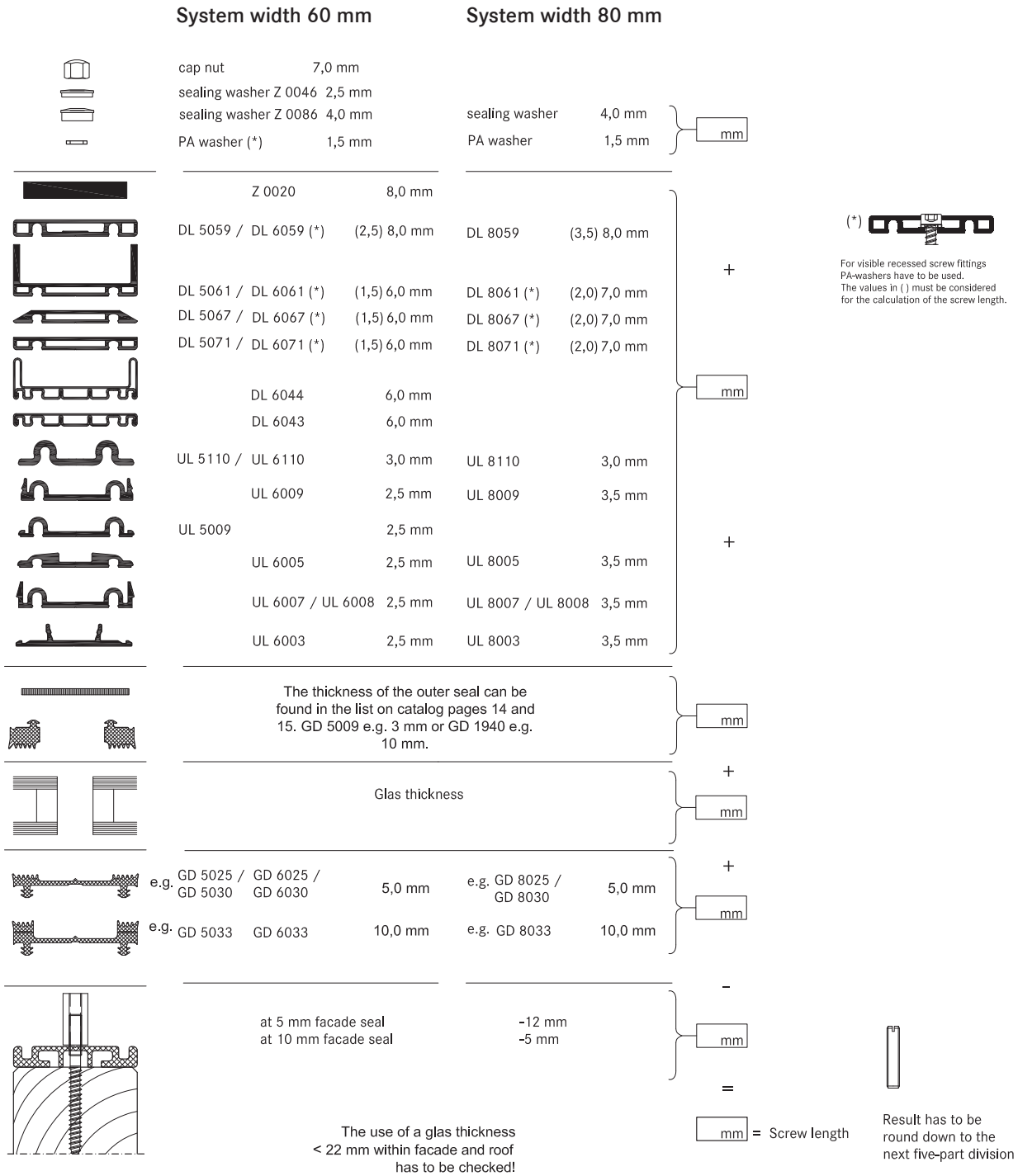
Direct application of screws is also possible. In this case the spacer strip must be appropriately pre-drilled.

According to DIN 6912:

- Screw M6
- Stainless steel 1.4301-A2
- Threaded to the head
- ⌀ 10 mm, ISK 5 mm
- Head height ≤ 5 mm

Screw fittings

Calculating the screw length



Representation and item numbers are examples for System 60. System width 50 are analogous.

1) Use the cap nut without sealing washer for wooden pressure profiles

2) Delivered upon request

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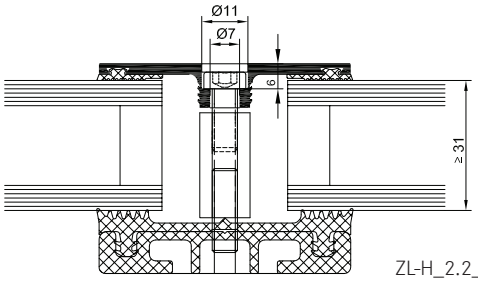
Screw fittings

Calculating the screw length



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Attention!

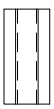
The calculation to determine screw lengths for the special cover profiles DL 5073 / DL 6073 is:

Glass thickness - 14 mm with facade seal (5 mm)
Glass thickness - 9 mm with facade seal (10 mm)
Glass thickness - 7 mm with facade seal (12 mm)

Screw fittings

2.2
10

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



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Cap nut

Z0043	Cap nut Stainless steel M6	

Sealing washers

Z0046	U Washer stainless steel	with 2 mm seal
Z0086	U Washer stainless steel	with 4 mm seal

Threaded bolts

Z0034	threaded bolt stainless steel	M6 x 20 mm
Z0038	threaded bolt stainless steel	M6 x 25 mm
Z0035	threaded bolt stainless steel	M6 x 30 mm
Z0040	threaded bolt stainless steel	M6 x 35 mm
Z0036	threaded bolt stainless steel	M6 x 40 mm
Z0037	threaded bolt stainless steel	M6 x 50 mm
Z0044	threaded bolt stainless steel	M6 x 60 mm
Z0045	threaded bolt stainless steel	M6 x 75 mm
Z0039	threaded bolt stainless steel	M6 x 90 mm
Z0053	threaded bolt stainless steel	M6 x 100 mm
Z0054	threaded bolt stainless steel	M6 x 120 mm

Threaded sockets

Z0029	threaded socket stainless steel	M6 x 25 mm
Z0032	threaded socket stainless steel	M6 x 25 mm

Hanger bolts

Z0113	hanger bolts stainless steel	M6 x 70 mm

Flat cover profile DL 5073 / DL 6073

Tips for laying cover profiles DL 5073 / DL 6073

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. M6 DIN 6912 stainless steel A2 with low head). When covering with a 2 mm cover plug Z 0089, a bore depth of 6 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

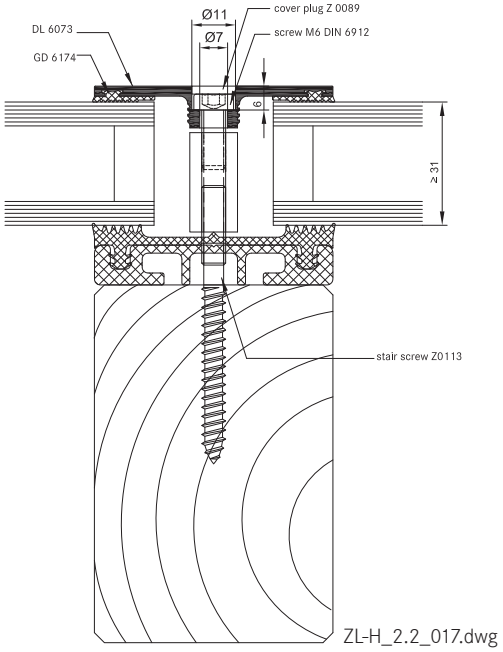
Profile production (aluminium extrusion moulding) with different mass distribution is extremely difficult. Lengthwise shadow formation may result. Resulting actions are to be taken with the agreement of the coater.

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 supports/blocking

Special attention should be given to dimensional proportions. To support the outer pane, a sufficiently large glazing block must be installed that can carry the load to safely ensure the glass load is distributed effectively.



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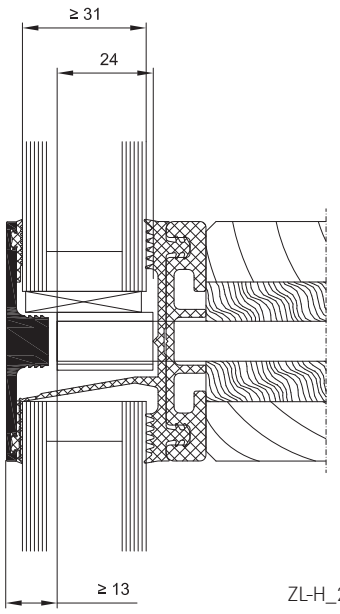

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Slab insulation

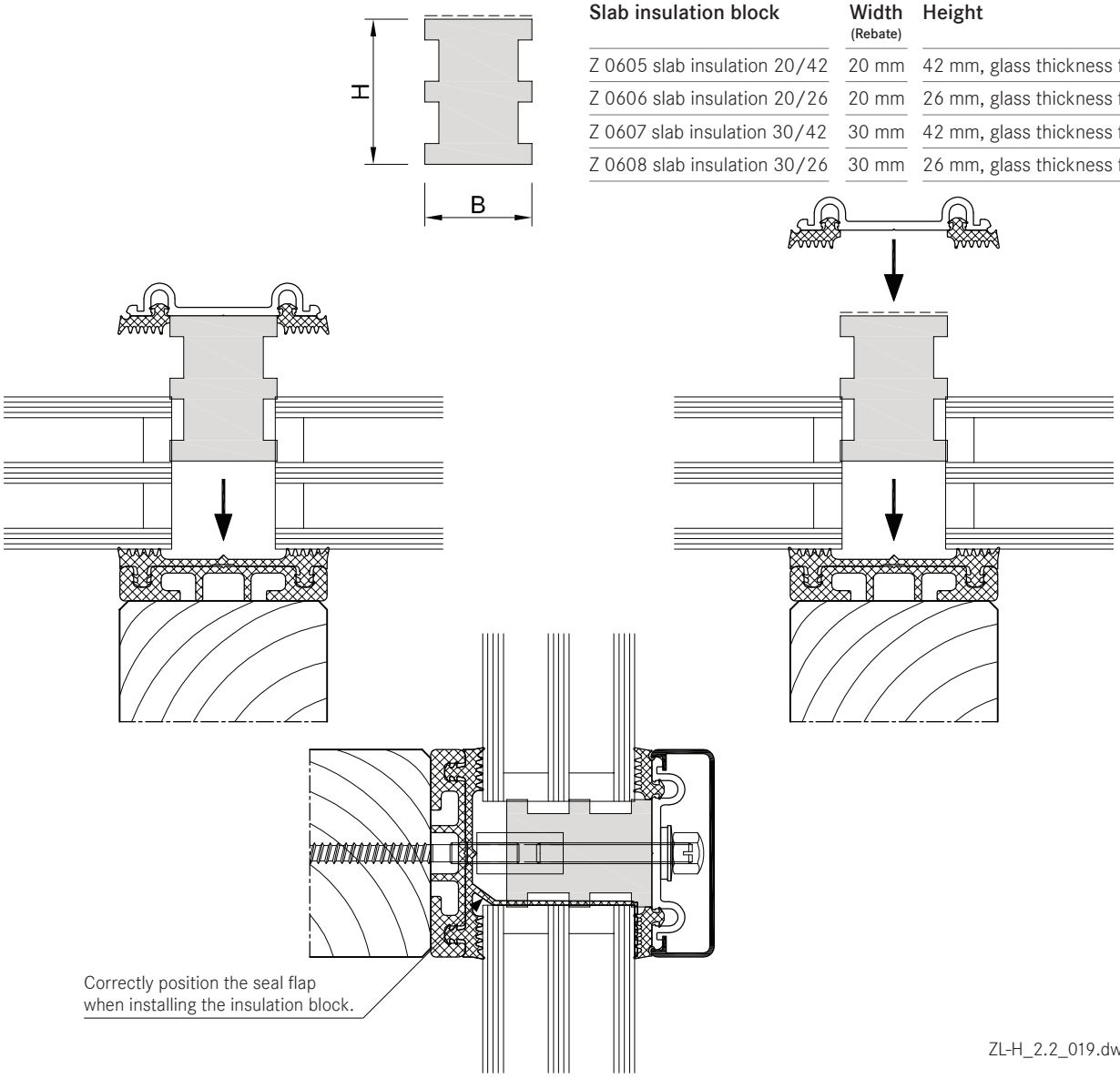
Using slab insulation

- 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, slab insulation can be directly applied to the cover profile/pressure profile (direct screw fittings recommended), or cut into the screw locations, placed into the rebate over the screw fittings and pushed into position using the cover profile/pressure profile.

Note:

- The use of slab insulation with cover profiles DL 5073 / DL 6073 should be tested for each individual situation.
- With system width 80 mm and a 40 mm rebate 2 x 20 mm wide slab insulation blocks can be combined (40 mm wide insulation blocks available upon request).
- 2-piece outer seals are always used with slab insulation blocks:
- for a glass inset of 15 mm, outer seal **GD 1932**
- for a glass inset of 20 mm, outer seal **GD 1932**

Slab insulation block	Width (Rebate)	Height
Z 0605 slab insulation 20/42	20 mm	42 mm, glass thickness from 44 mm
Z 0606 slab insulation 20/26	20 mm	26 mm, glass thickness from 28 mm
Z 0607 slab insulation 30/42	30 mm	42 mm, glass thickness from 44 mm
Z 0608 slab insulation 30/26	30 mm	26 mm, glass thickness from 28 mm



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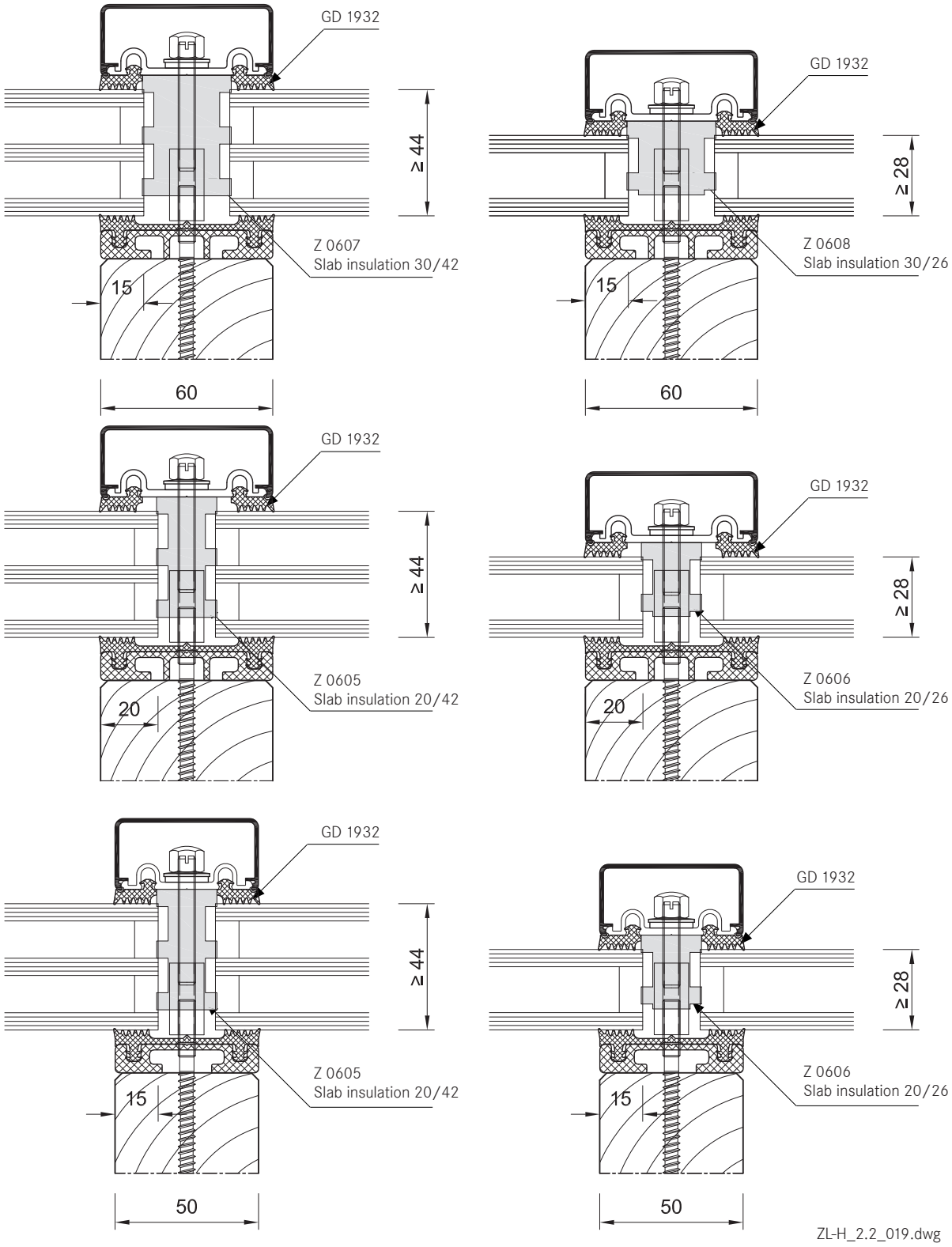
Slab insulation

Examples:



Pane support variants

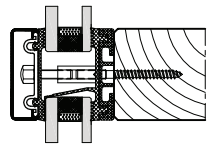
Special design

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

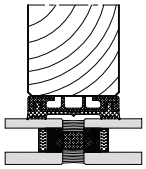
These designs do not conform to the intended uses of the system. No guarantees are made for e.g. quality of seals, durability and structural stability. Responsibility here lies entirely with the company implementing the design.

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

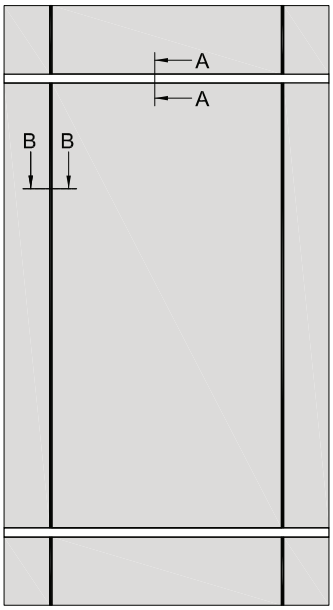


Section A-A



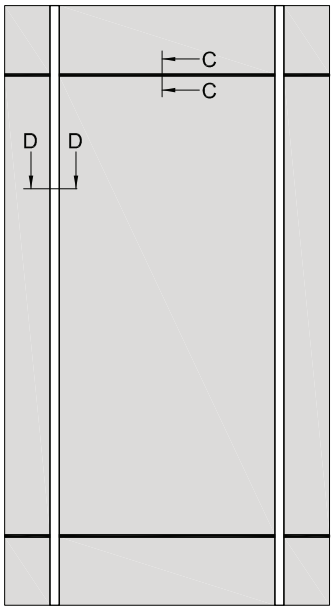
Section B-B

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

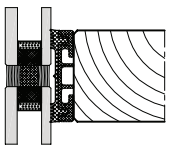


[1)] Seals with 1, 2 or 3 sections are possible

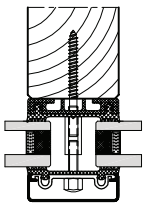
Mullion-transom structure with mullion cover profiles [2)]



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



Section C-C



Section D-D

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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.

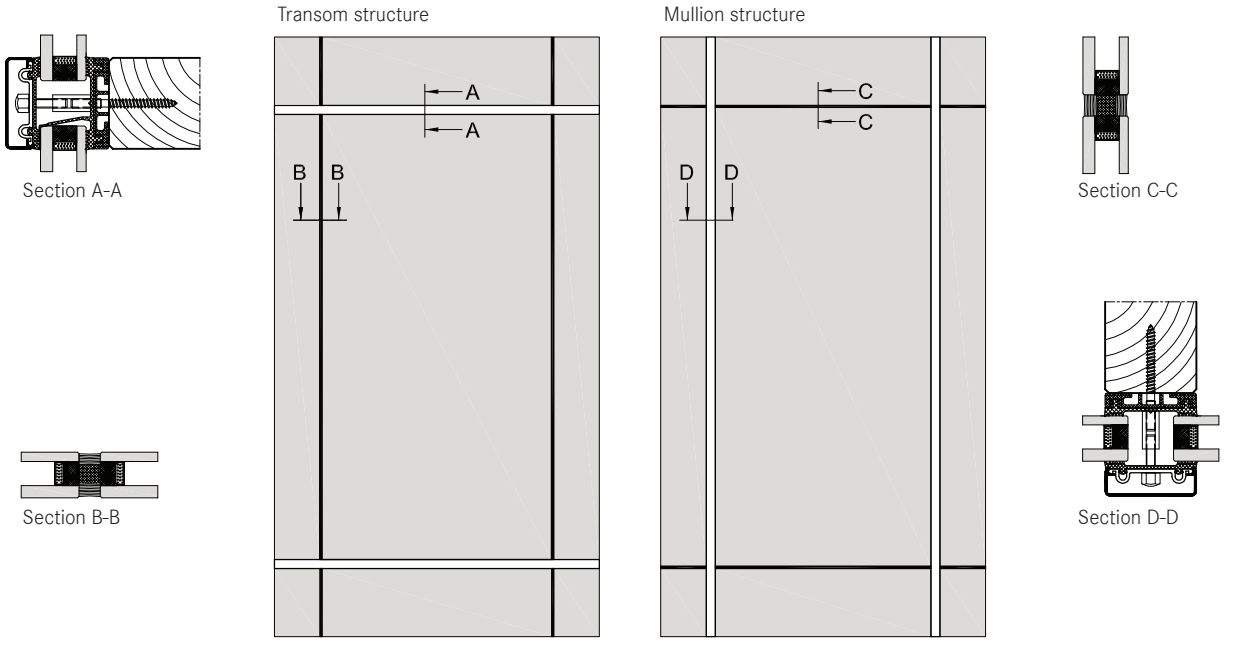
vertical clamping strips:

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



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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

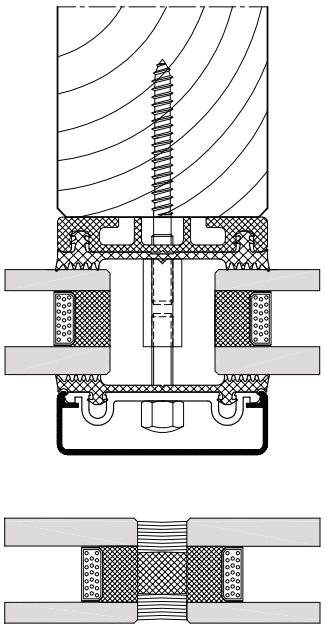
Mechanical distribution of the weight of the glass panes through the structure must be ensured. System glass supports can be used for existing horizontal transoms. Designs using “only” mullions require special glass supports which carry the weight of the glass directly into the mullions.

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.



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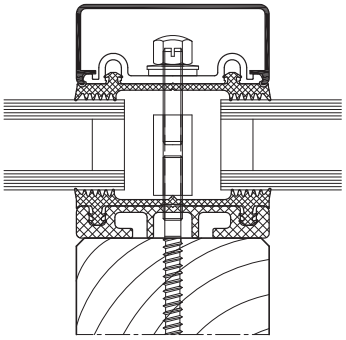
System cross sections

Examples:

1



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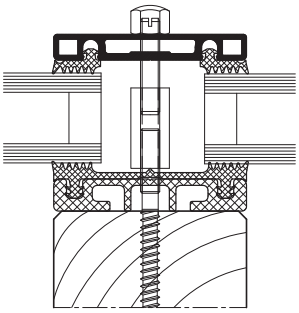

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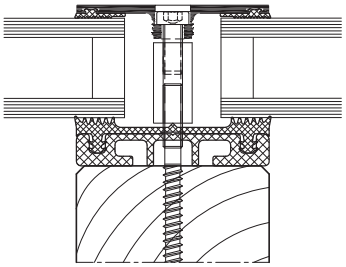

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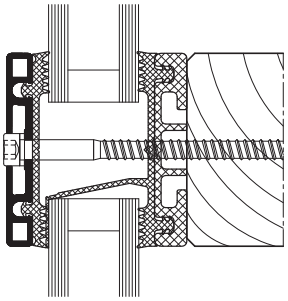

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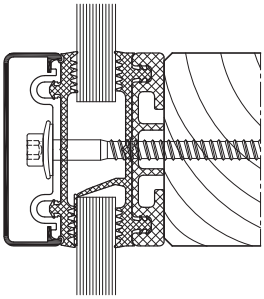

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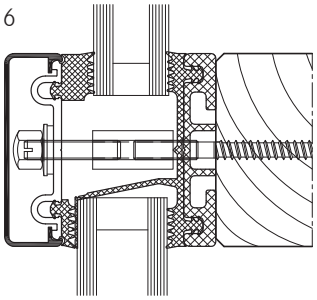

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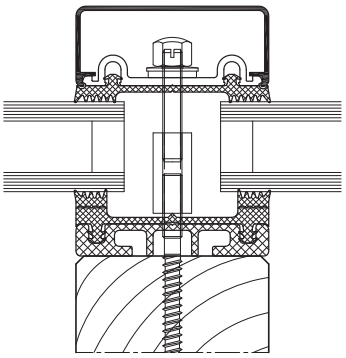

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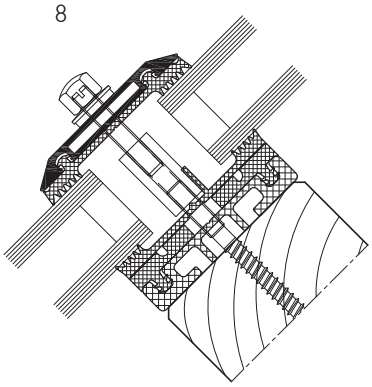

1 Vertical glazing, mullions
concealed screw fittings

2 Vertical glazing, mullions
visible screw fittings

3 Vertical glazing, mullions
Flat cover profile DL 5073 / DL 6073

4 Vertical glazing, transoms
visible recessed screw fittings

5 Vertical glazing, transoms
concealed screw fittings
Single glazing
Direct screw fittings

6 Vertical glazing, transoms
concealed screw fittings
Outer seal for height compensation

7 Inclined glazing, mullions
concealed screw fittings

8 Inclined glazing, transoms
visible screw fittings

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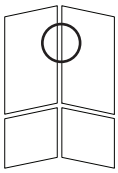
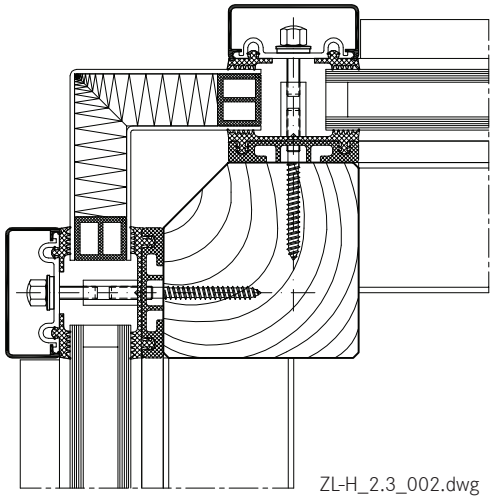
System details

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.

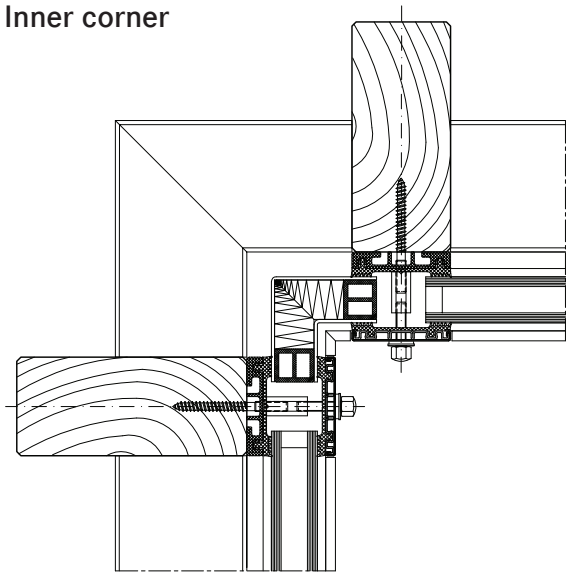


Outer corner



ZL-H_2.3_002.dwg

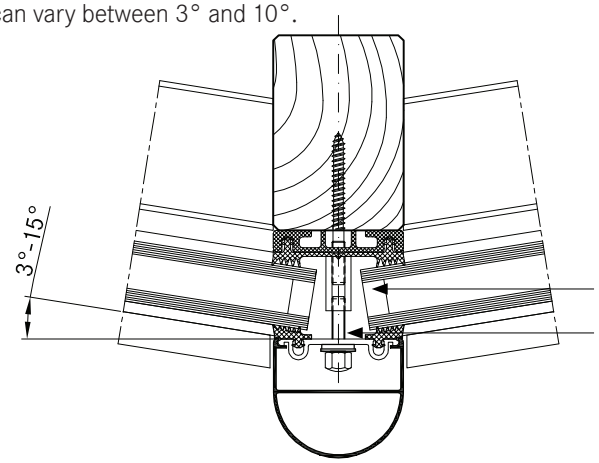
Inner corner



ZL-H_2.3_003.dwg

Facade polygon

Special seal 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!
Geometrically check the feasibility.
Recommendation: Use System 60 at minimum

Determine the threaded bolt length using the angle!

ZL-H_2.3_004.dwg

System details

Eaves with glass roof connection

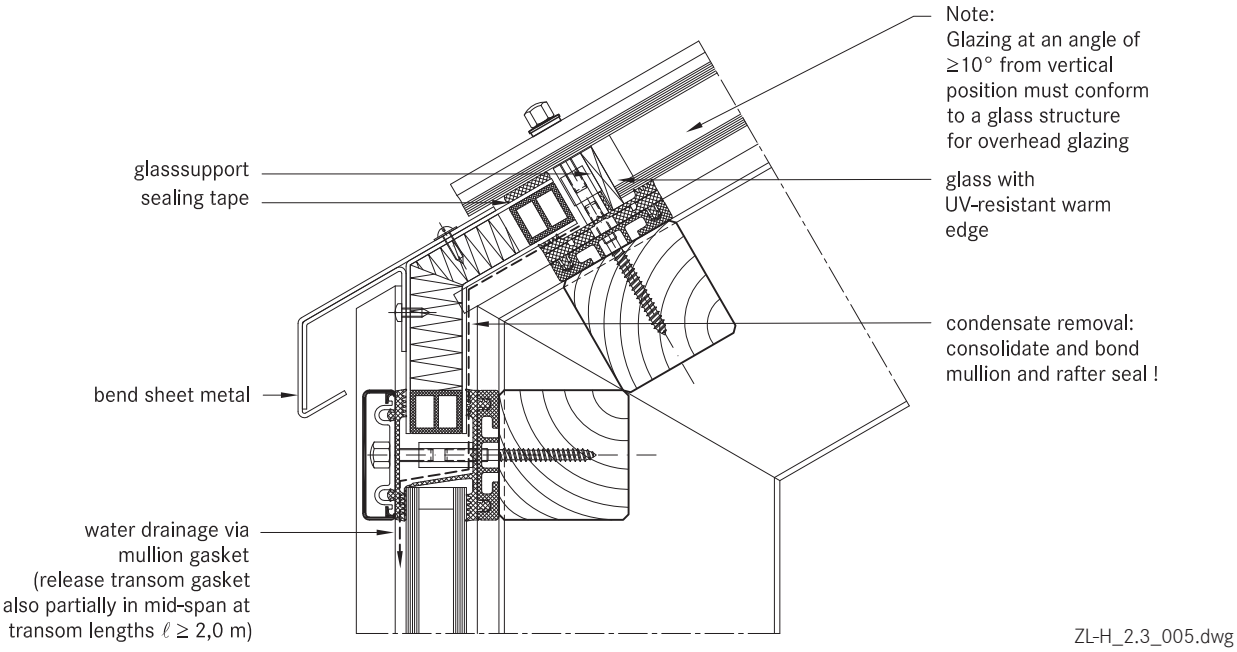
- Depending on the construction of the transoms, a design with or without rain gutters and the choice of stepped glazing or closable cover profiles gives us different variants for implementation.
- All options require condensation and moisture to be drained away at the eaves.

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



ZL-H_2.3_005.dwg

System details

Eaves with glass roof connection
Design using cover profiles

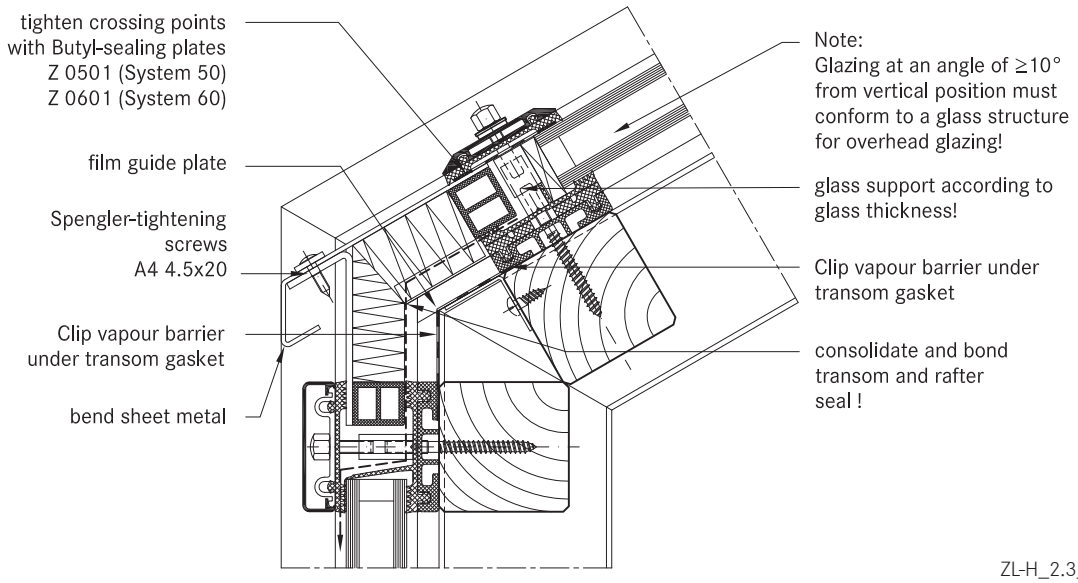
- Horizontal pressure strips prevent the free run off of rain water and dirt.
- Cover strips with angled edges reduce the build up of water in front of the cover profile.
- The outer sealing level on glass roofs must also be thoroughly sealed.
- In combination with our butyl clad stainless steel panels,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



ZL-H_2.3_006.dwg

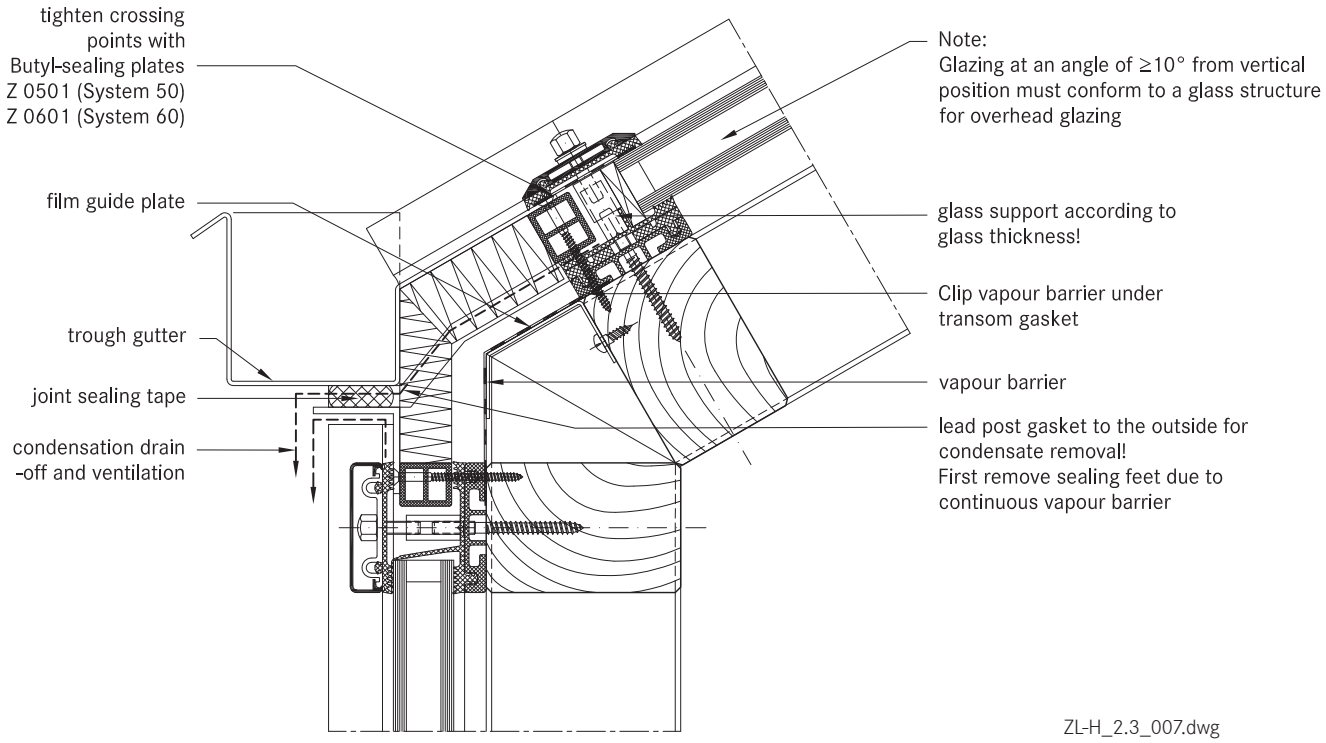
System details

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.

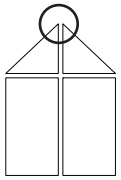
Example 3:

Design with gutter

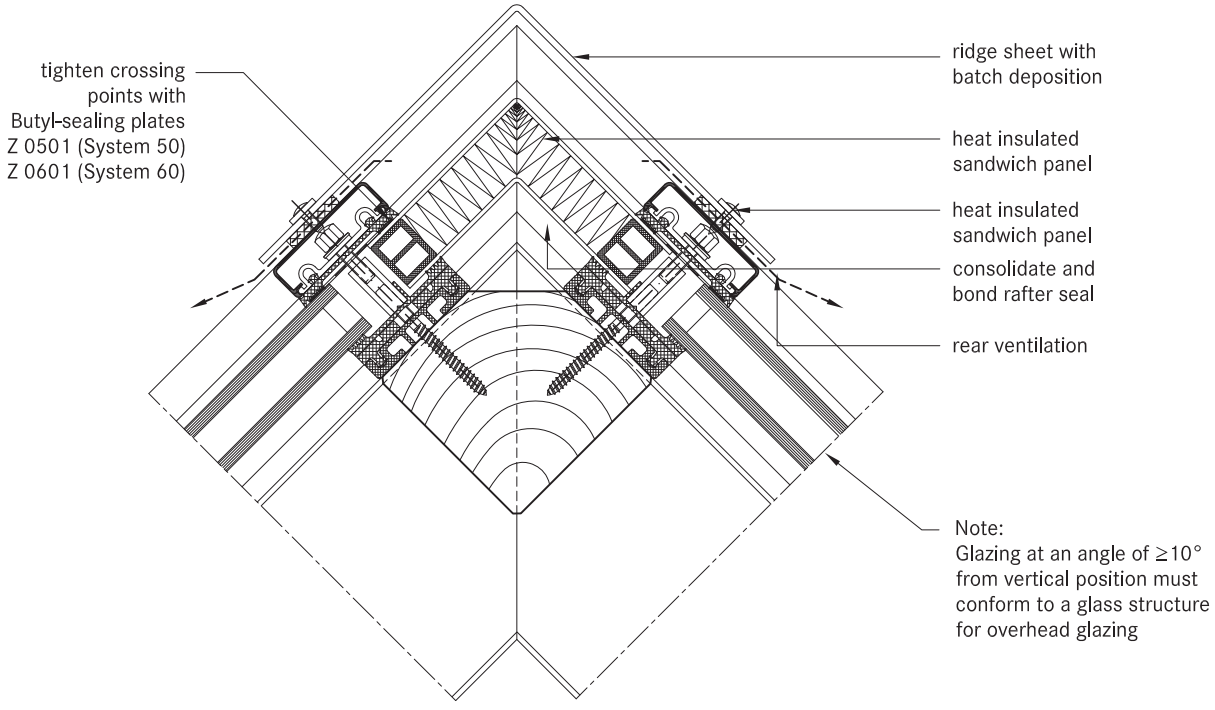


System details

Roof ridge design



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



ZL-H_2.3_008.dwg

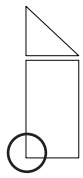
Structural attachments

Structural attachment film baffles

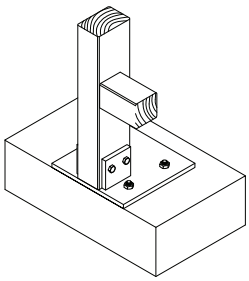
- Attachment of glazing to the building structure requires a well thought out approach.
- Moisture damage can occur if moisture condenses at any thermal bridges.
- Thermal bridges must be avoided and warm air from the inside spaces must not penetrate too deeply into the structure.
- The required moisture 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 μ of max. μ = 3000 can a dry structure be guaranteed in the transition zones.

Structural attachments

Facade base

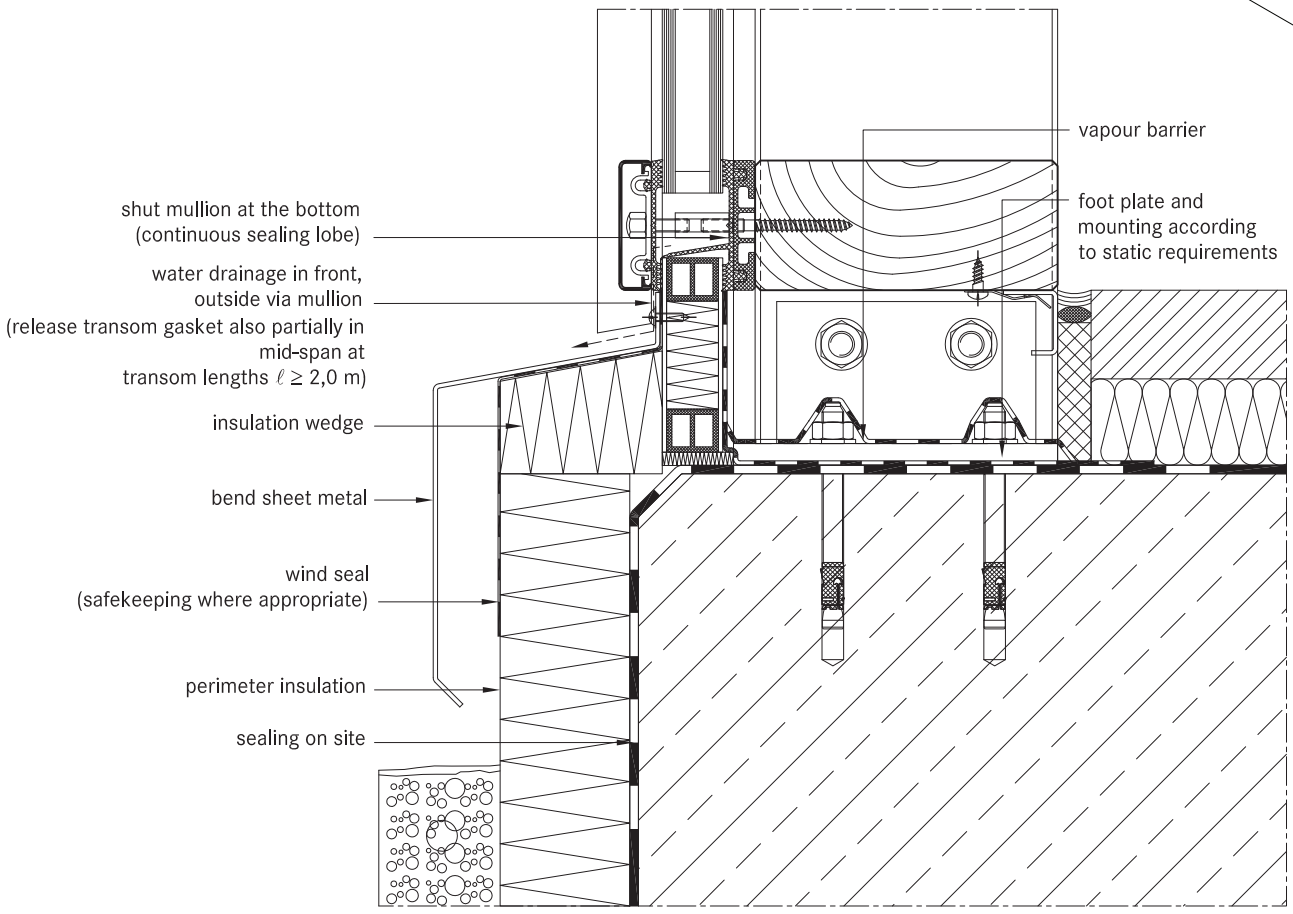


- Controlled drainage of the rebate space can only be ensured if the sealing sections overlap in such a way that no moisture can get under the seals and foils.
- Run foils under the transom seal to act as a moisture barrier and glue to the steel structure. In accordance with DIN 18195 the seal should be run at least 150 mm above the water-guiding layer.
- Attach foil with moisture barrier in accordance with the requirements of DIN 18195.



Example 1:

Mounting intermediate mullion to base plate



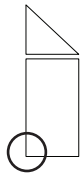
ZL-H_2.3_009.dwg

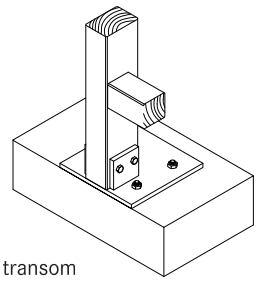
Drainage of the base area is achieved via the seal flap towards the outside. In this case the seal flap around the mullion at the base should not be released. For edge mullions, ensure there is a corresponding seal placed (continuous transom seal up the to the end point) and a constructive design of the drainage section.

Structural attachments

Facade base

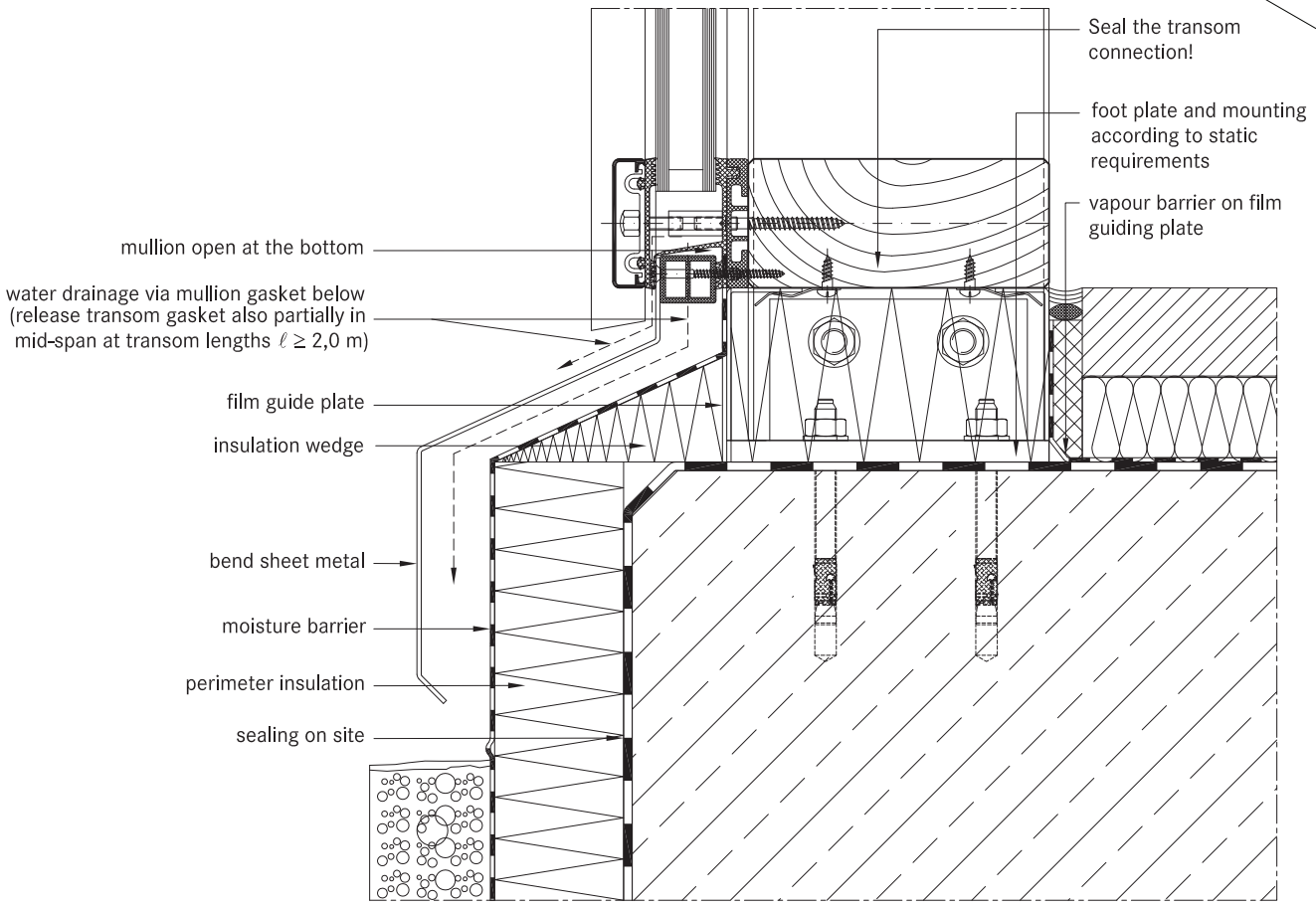
- Rebate space ventilation is achieved via the open end of the vertical cover profiles.
- Ensure the connection is impermeable to vapour.
- Mullion mountings must be sufficiently statically dimensioned. Required centre and edge distances for anchoring with base plates and the building structure must be observed.





Example 2:

Mounting intermediate mullion to base plate

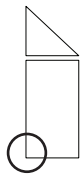


ZL-H_2.3_010.dwg

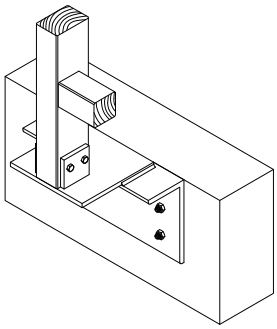
Where seal flaps are interrupted by joints, filler rods in the joint must also be cut.

Structural attachments

Facade base

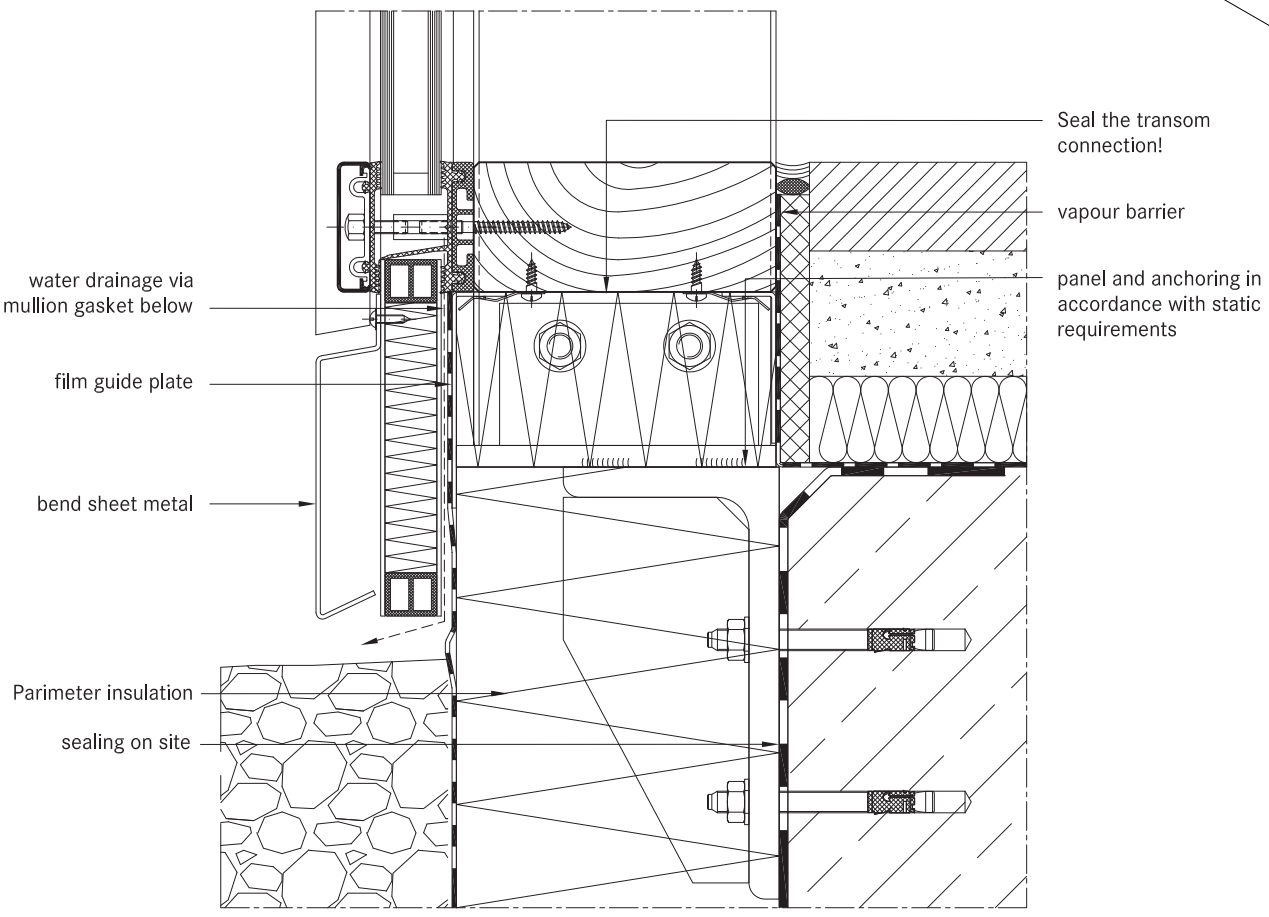


- Heat insulation around the structural connection should be designed in such as way as to prevent cold bridges forming.
- Steel parts should also be provided with sufficient protection against corrosion even in concealed areas.
- Weather-protection sheets should be used depending on the requirements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



Example 3:

Attaching intermediate mullions at base plates

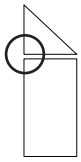


ZL-H_2.3_011.dwg

Structural attachments

Connection before intermediate floors

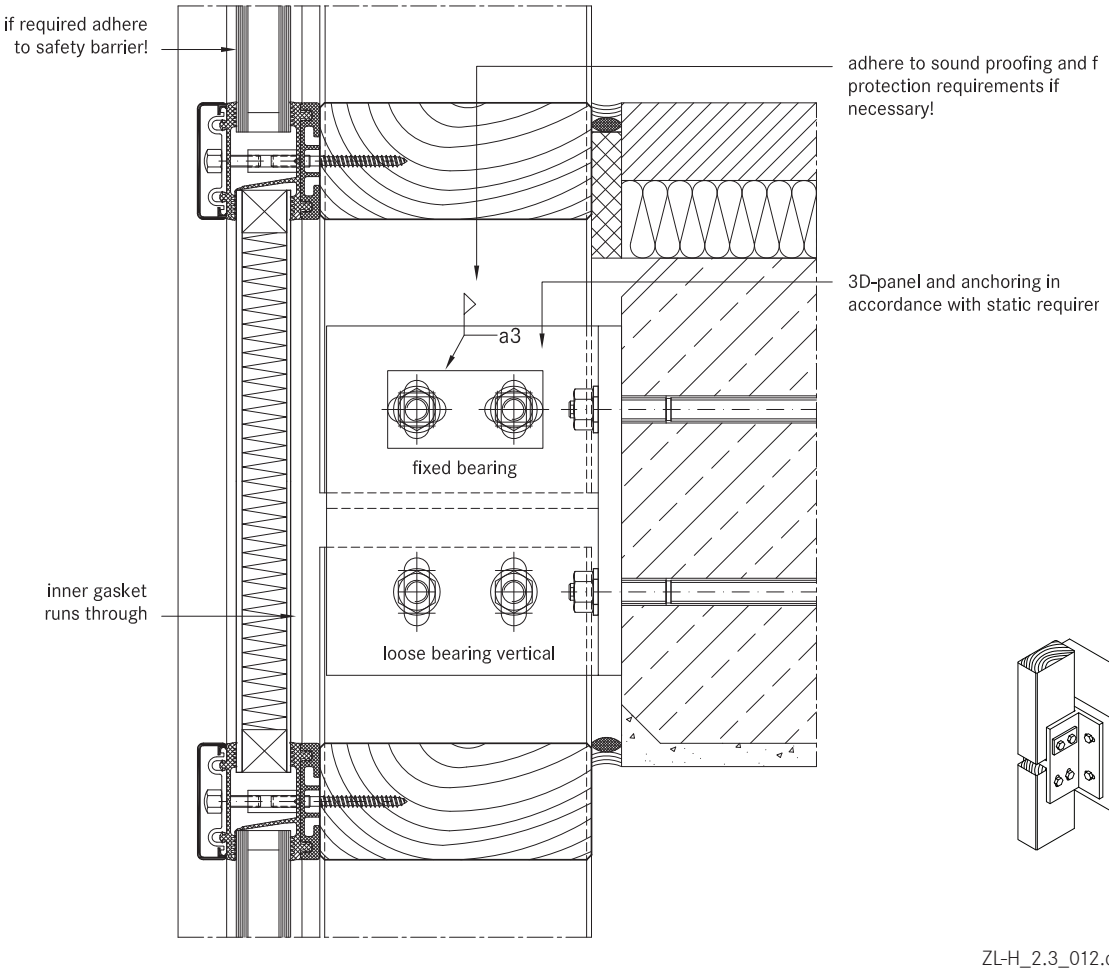
- Depending on requirements, mullions are designed as continuous multi-span transoms or separated at each floor.
- Reasons for separating mullions can include e.g. building settlement, fire protection, sound insulation, etc.
- If the separation joint is intended to absorb expansion, then as well as the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

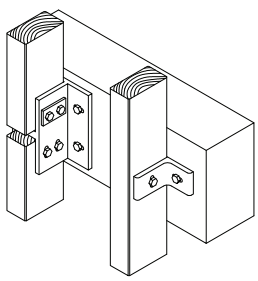


Example:

Mullions separated at each floor

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

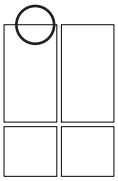




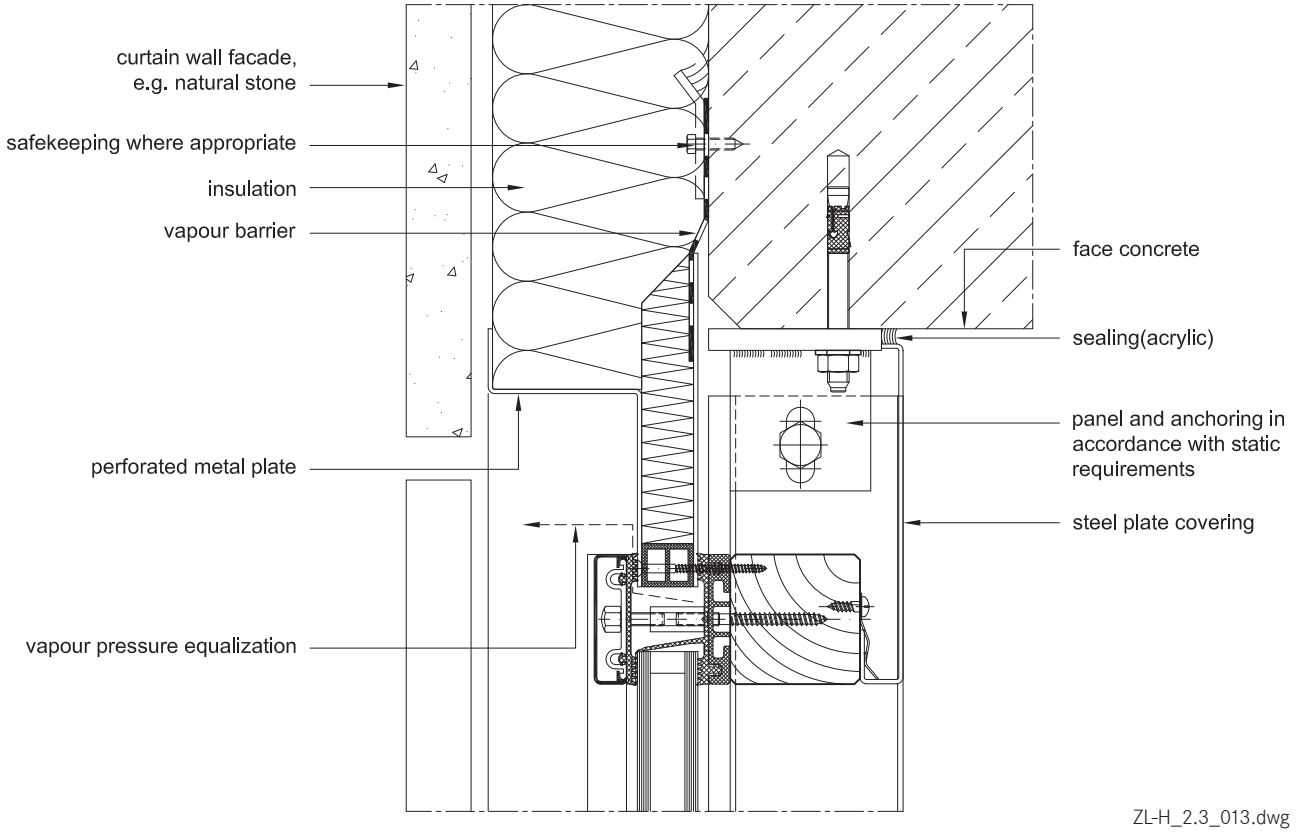
ZL-H_2.3_012.dwg

Structural attachments

Ceiling connection



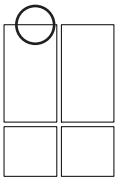
- Structural connections should take account of any movement that may occur.
- As well as temperature induced expansion in the facade, all longitudinal expansions and movements of the affected components must be considered.
- Additional stresses from restraints must be avoided.

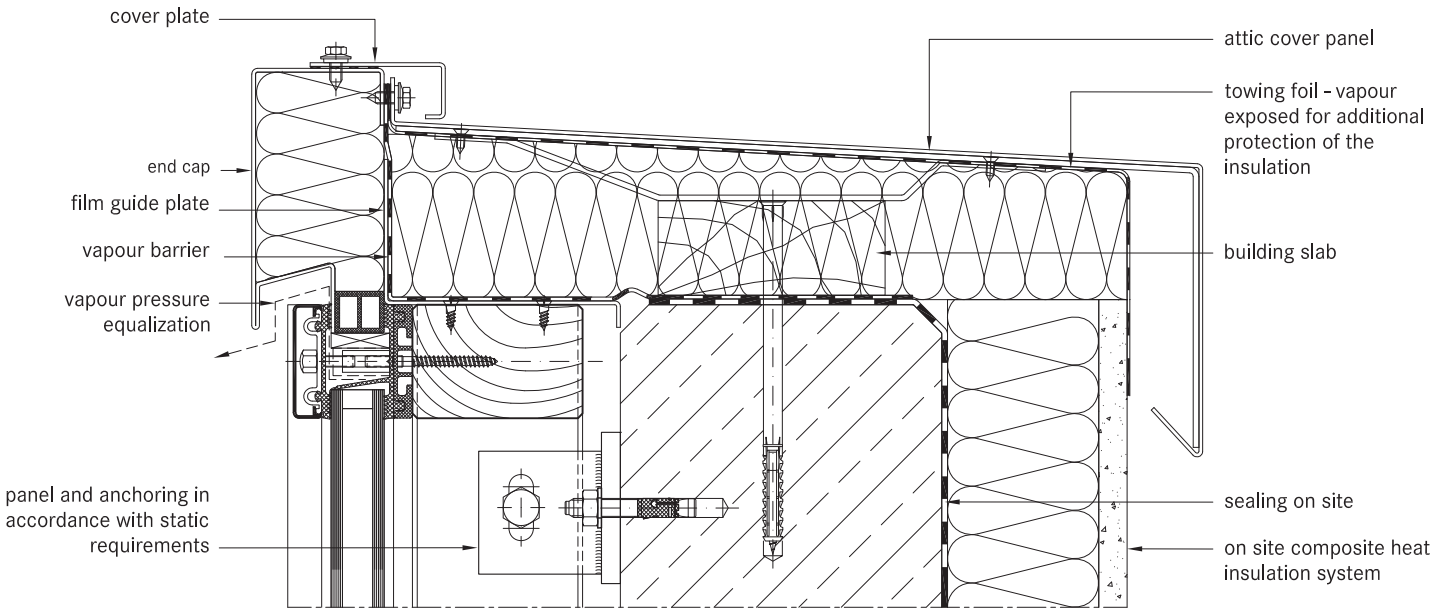


ZL-H_2.3_013.dwg

Structural attachments

Facade connection to parapets



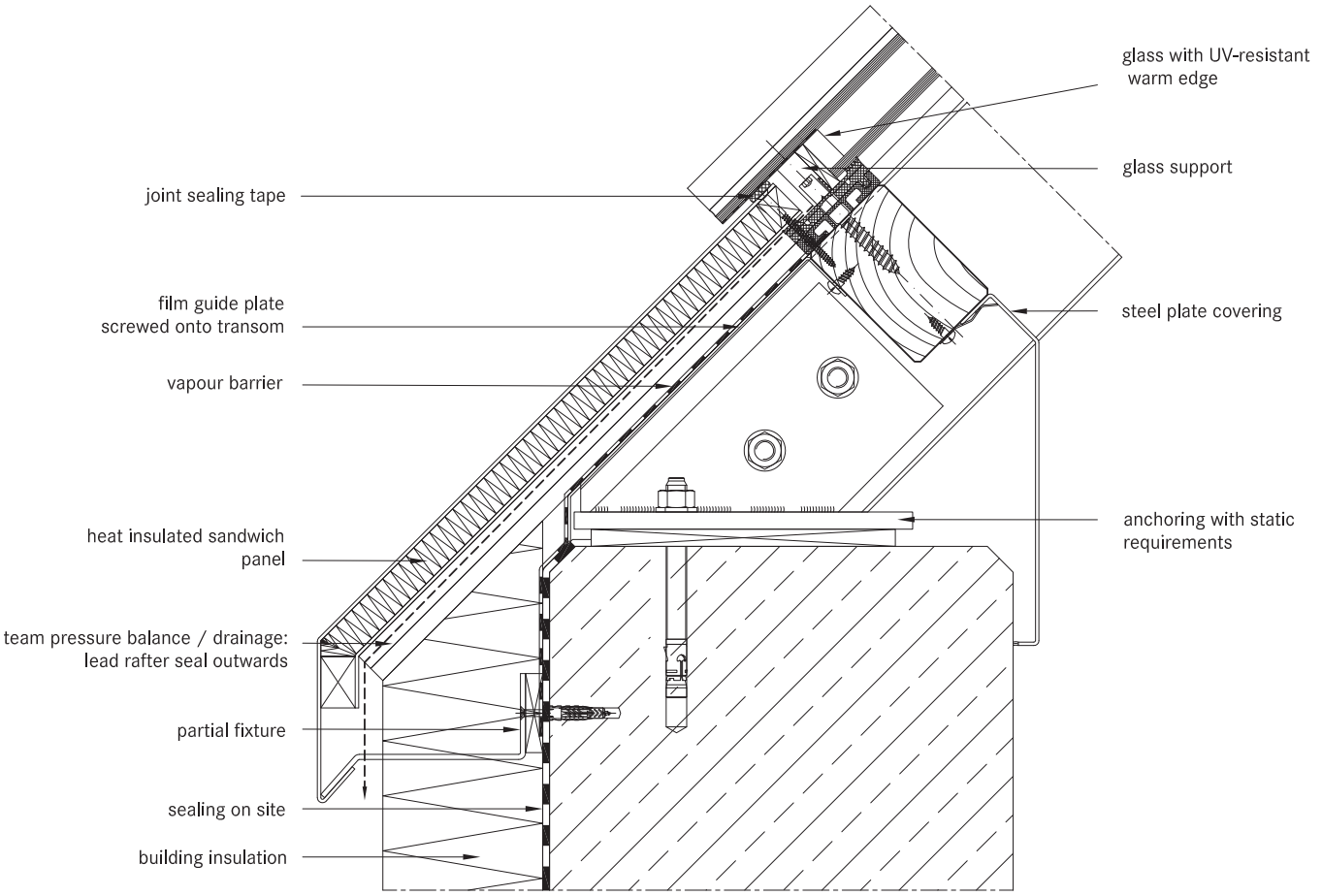


ZL-H_2.3_014.dwg

Structural attachments

Connecting to structural eaves

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

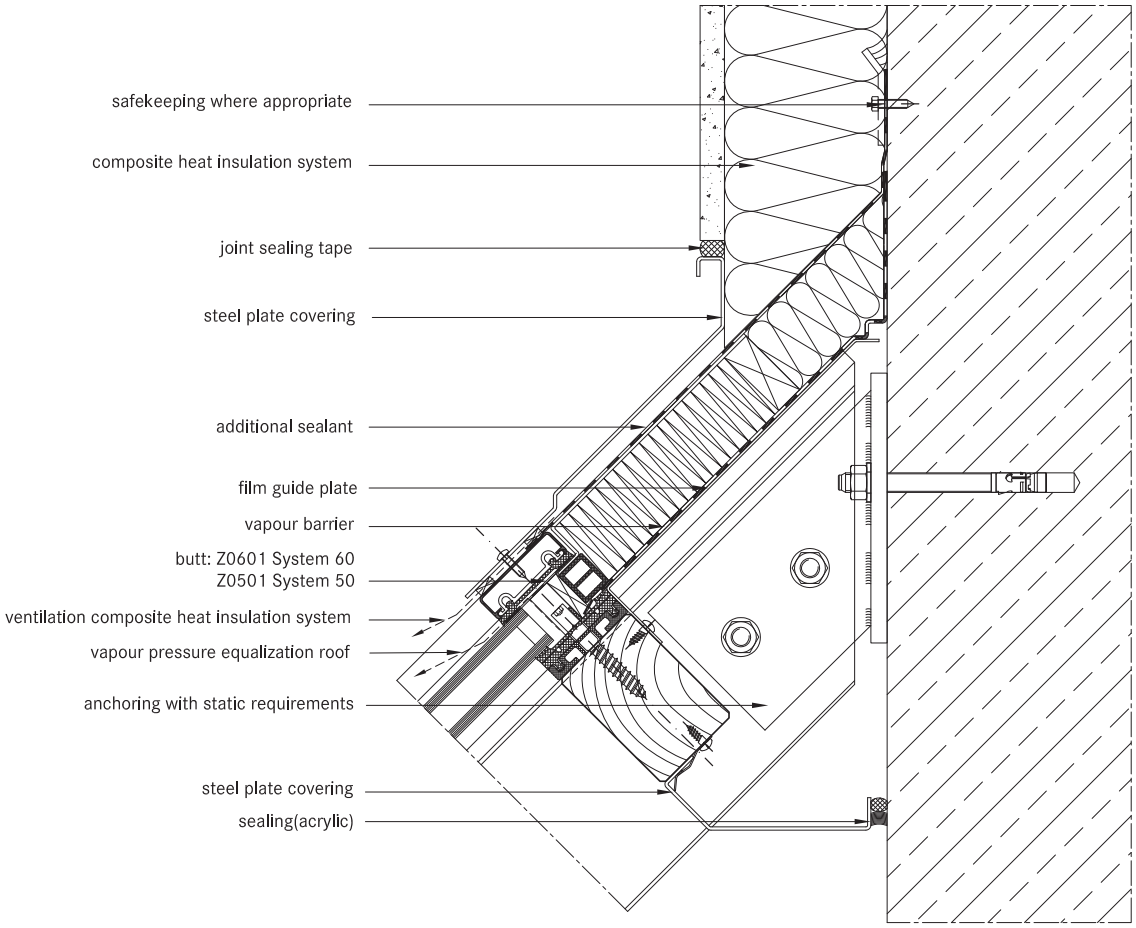


ZL-H_2.3_015.dwg

Structural attachments

Ridge connection to walls

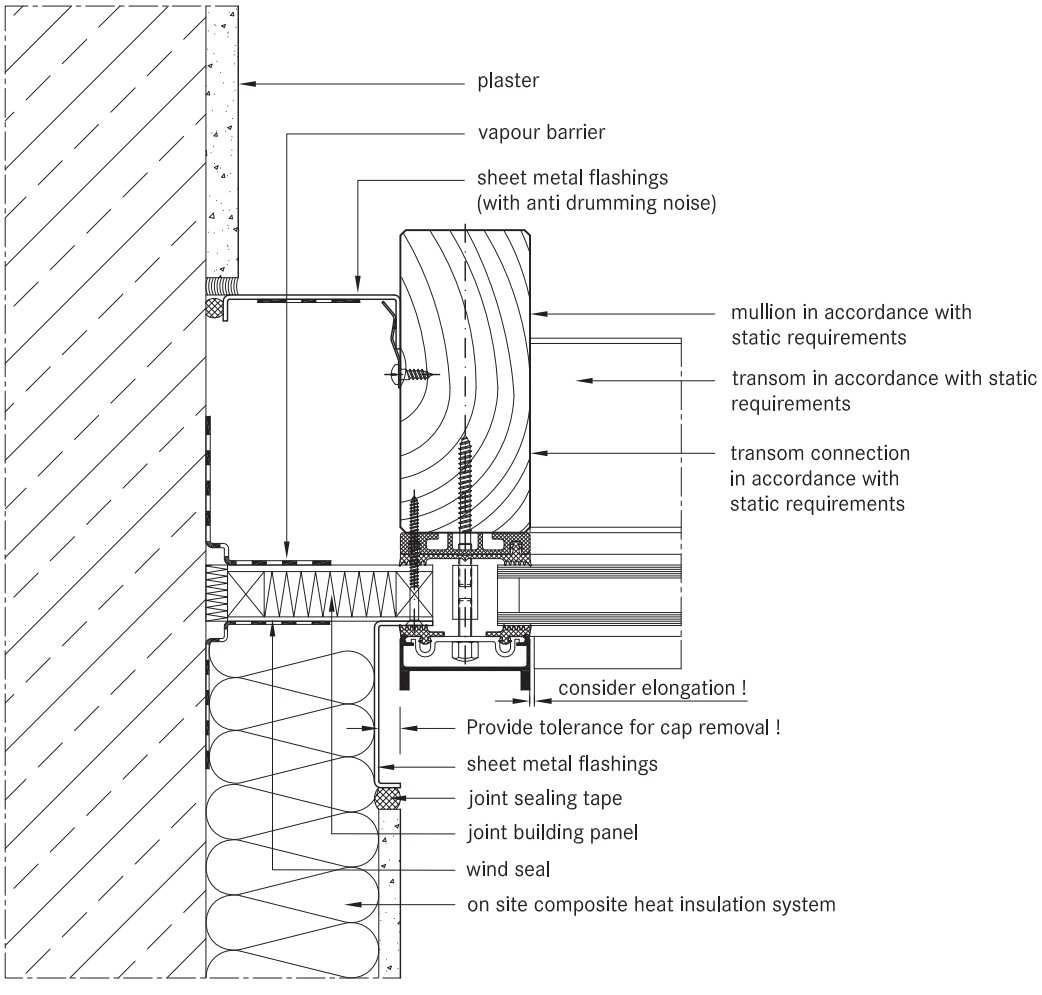
- When making ridge connections to walls, permeability to moisture is particularly important. Warm air with a high level of moisture gets into cooler zones of the inner sealing section where the design is not sufficiently sealed and can cause structural damage from penetrating into the connecting structure.
- Joint seals made from butyl-clad stainless steel plates (Z 0501, Z 0601) must be installed on the outside of joint areas.



ZL-H_2.3_016.dwg

Structural attachments

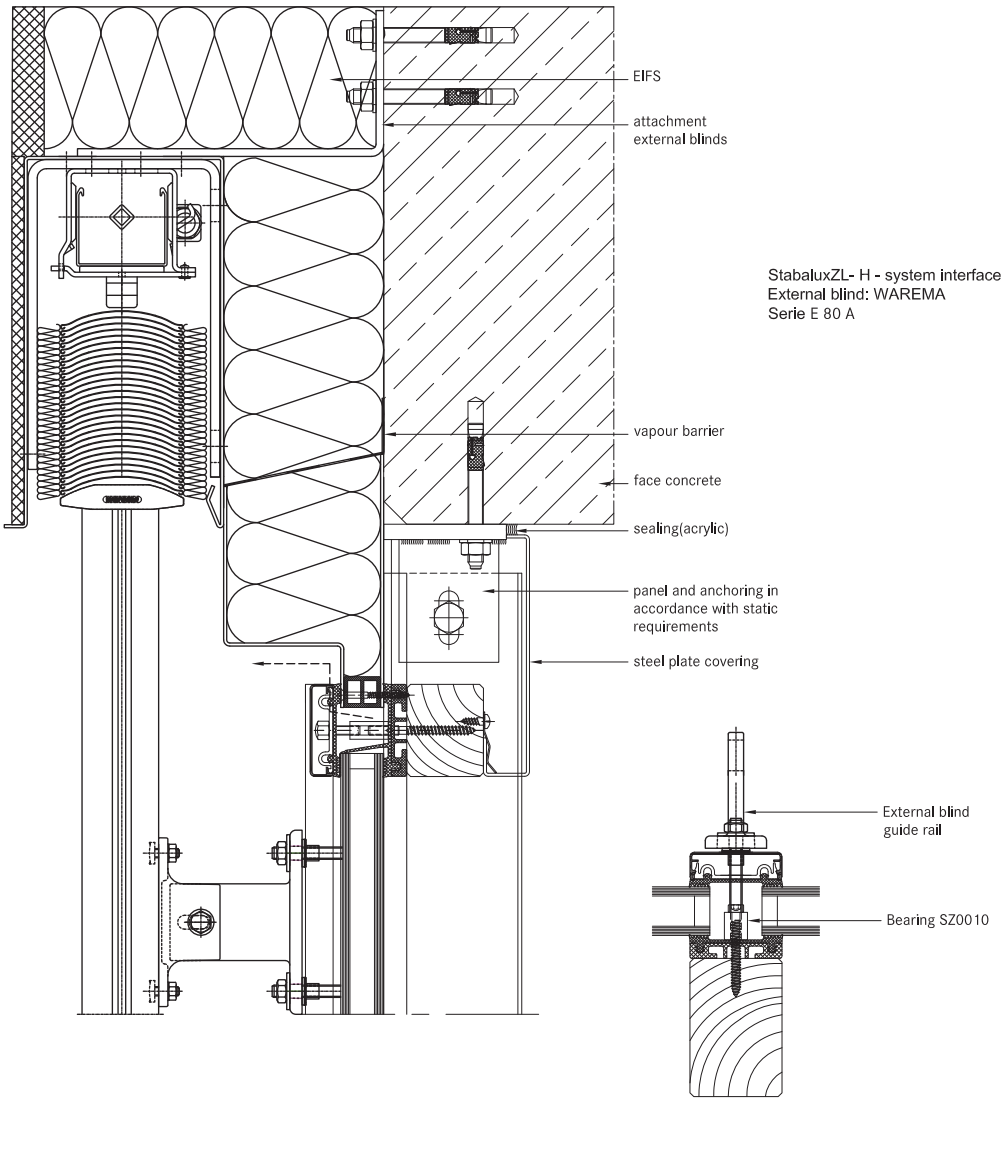
Horizontal wall connection to heat insulation bonding system



ZL-H_2.3_017.dwg

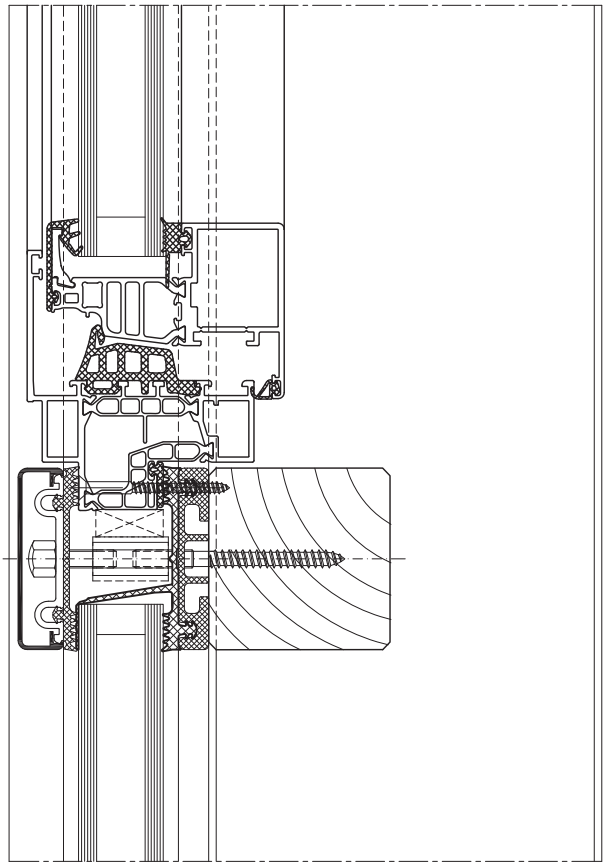
Structural attachments

Ceiling connection including WAREMA external blinds

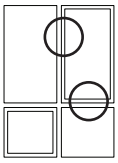


ZL-H_2.3_028.dwg

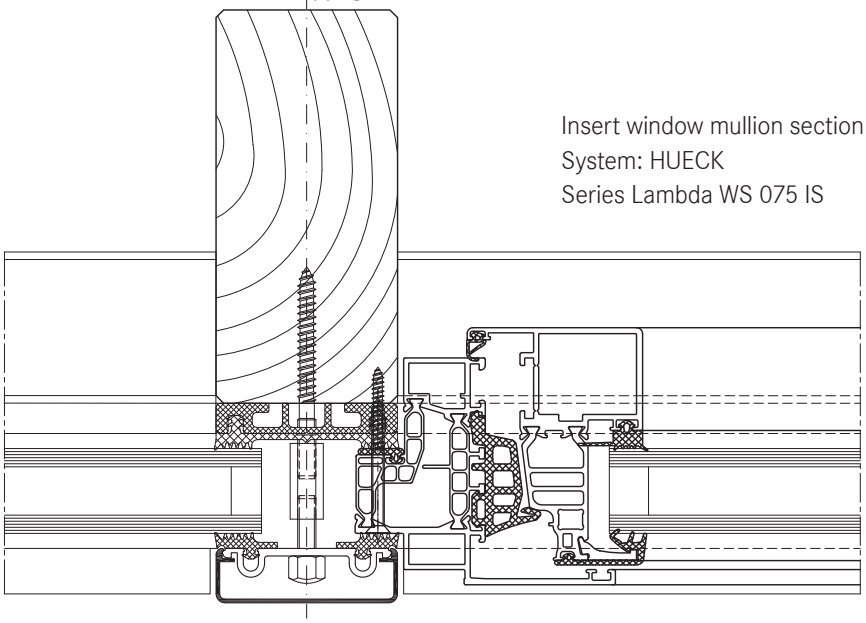
Installing windows and doors



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



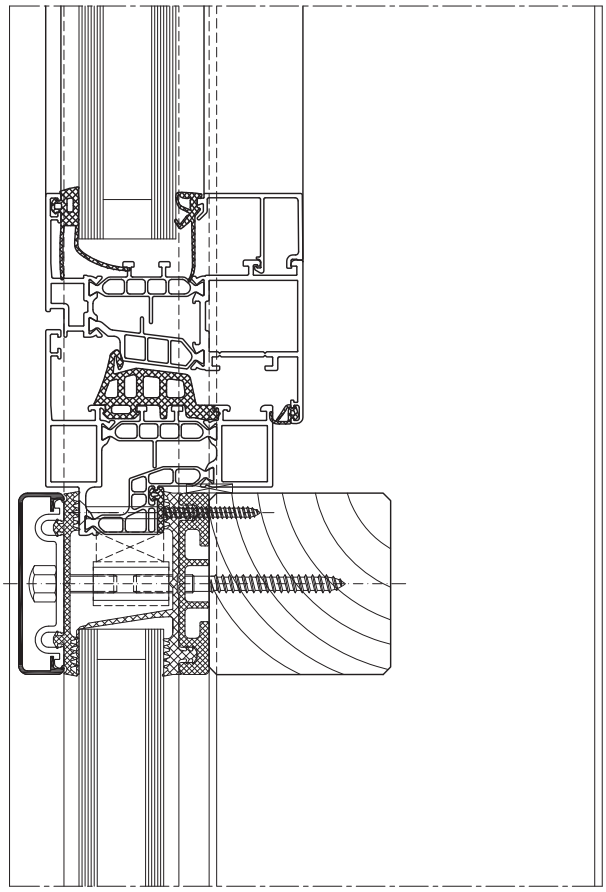
Mullion and transom facades and glass roofs from Norden Facade are neutral with regards to the selection of in-sert elements. All commonly available window and door systems made from steel, aluminium, wood or plastic can be used. Frame profiles from the window and door man-ufacturer's should be selected 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.



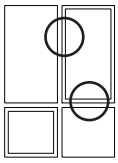
Insert window mullion section
System: HUECK
Series Lambda WS 075 IS

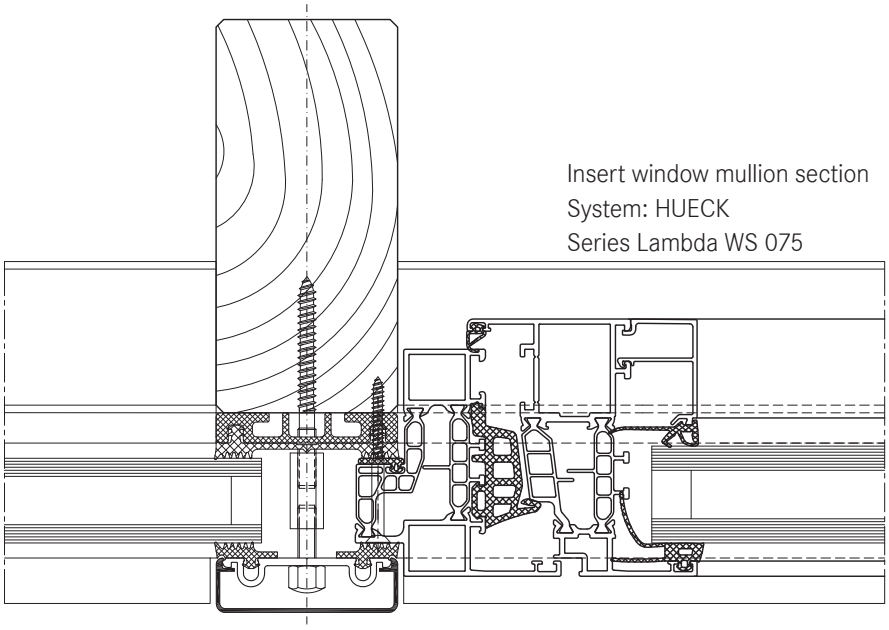
ZL-H_2.3_018.dwg

Installing windows and doors



Insert window transom section
System: HUECK
Series Lambda WS 075

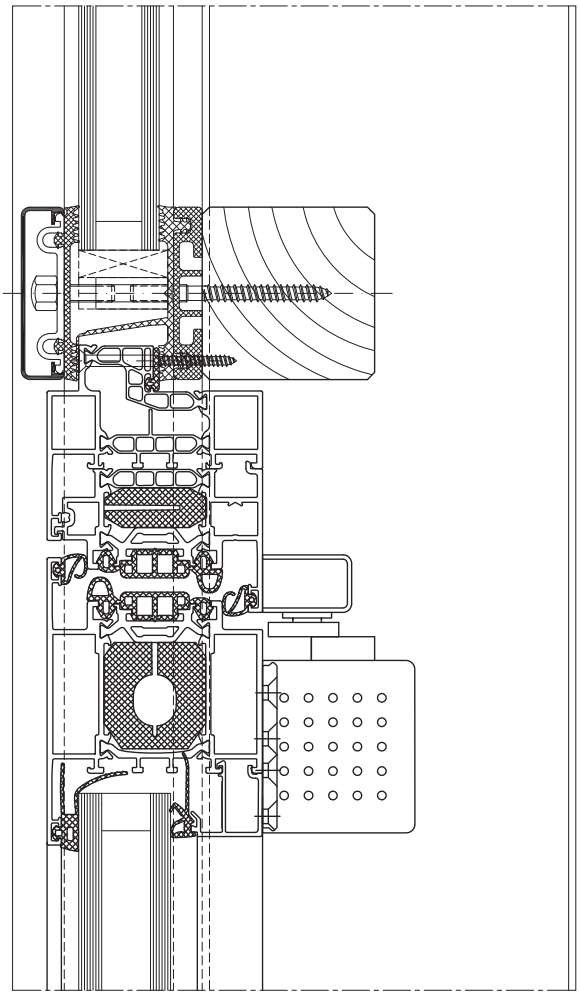




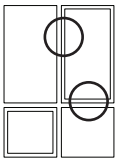
Insert window mullion section
System: HUECK
Series Lambda WS 075

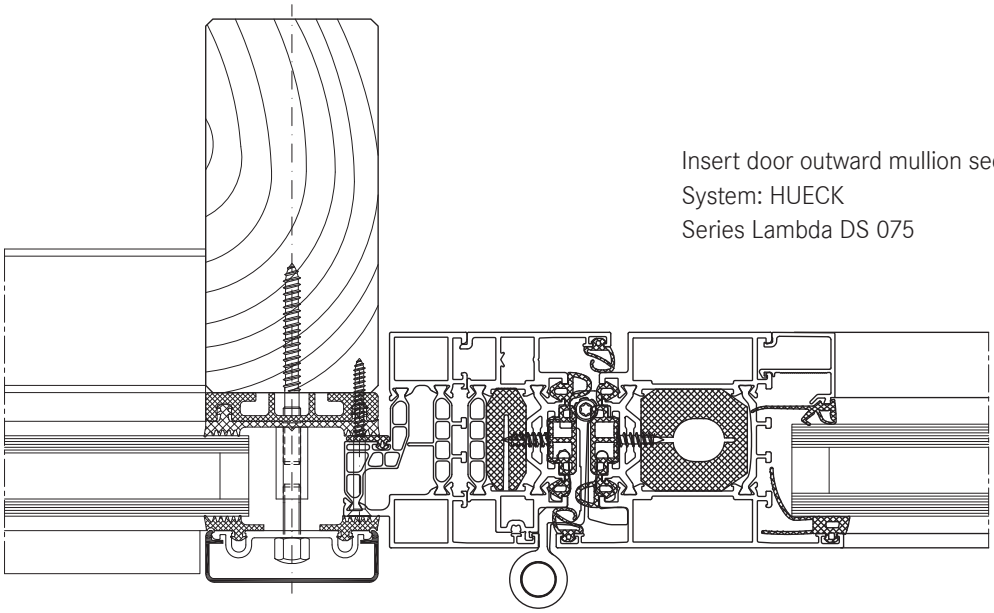
ZL-H_2.3_019.dwg

Installing windows and doors



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

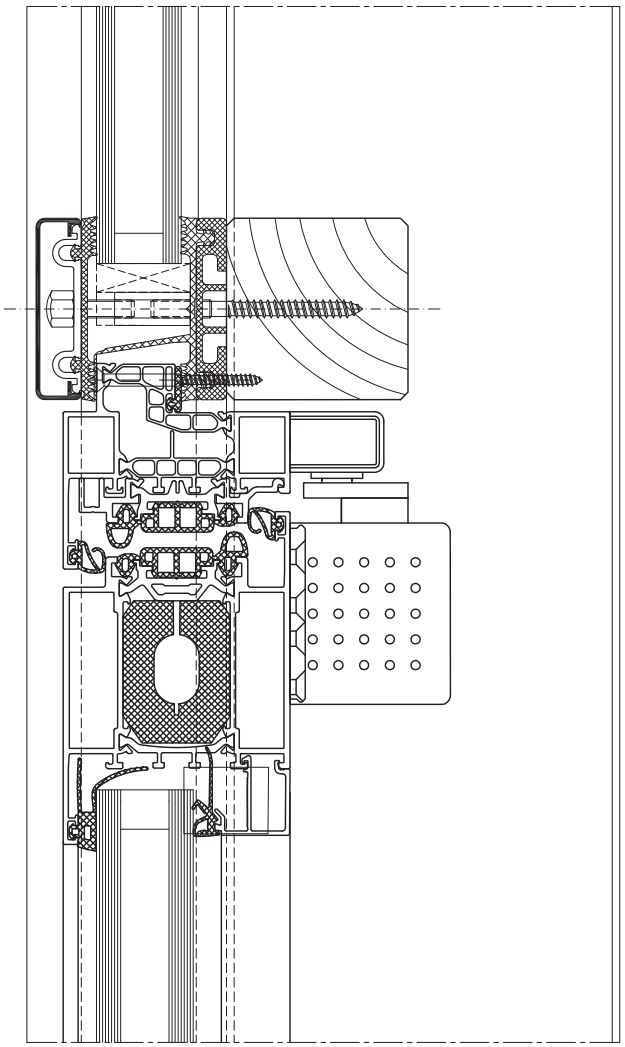




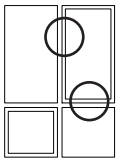
Insert door outward mullion section
System: HUECK
Series Lambda DS 075

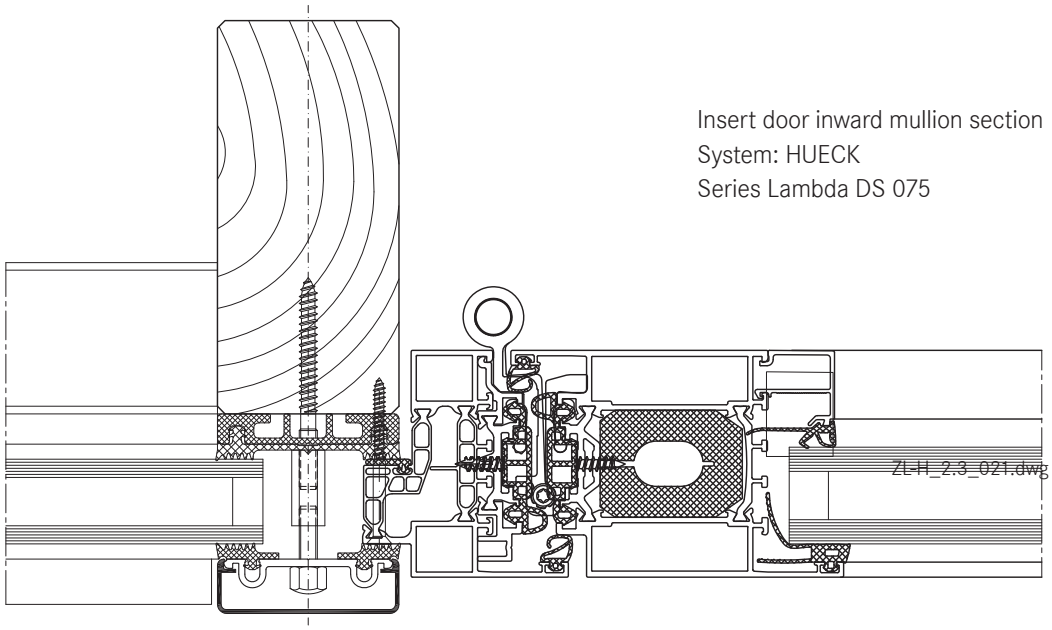
ZL-H_2.3_020.dwg

Installing windows and doors



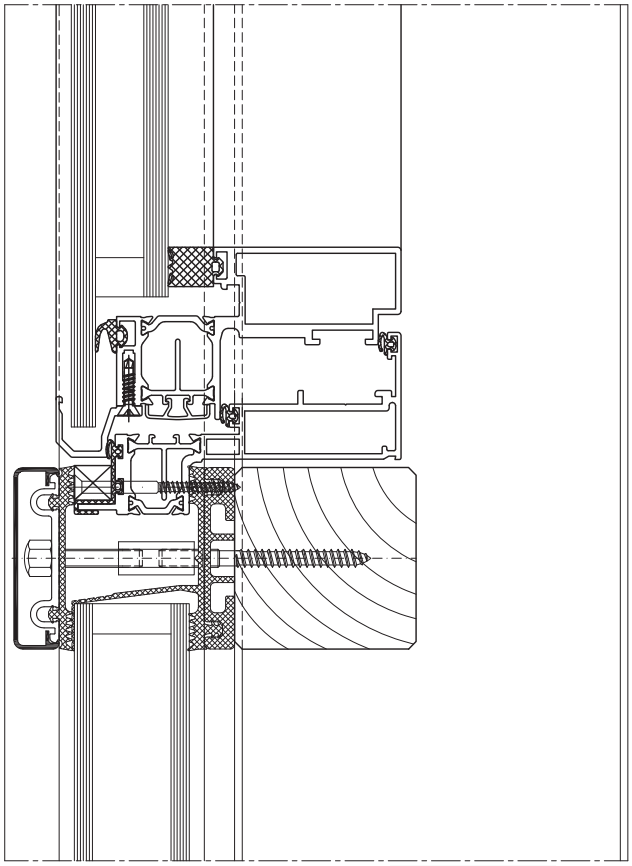
Insert door inward transom section
System: HUECK
Series Lambda DS 075



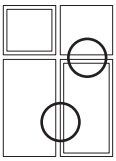


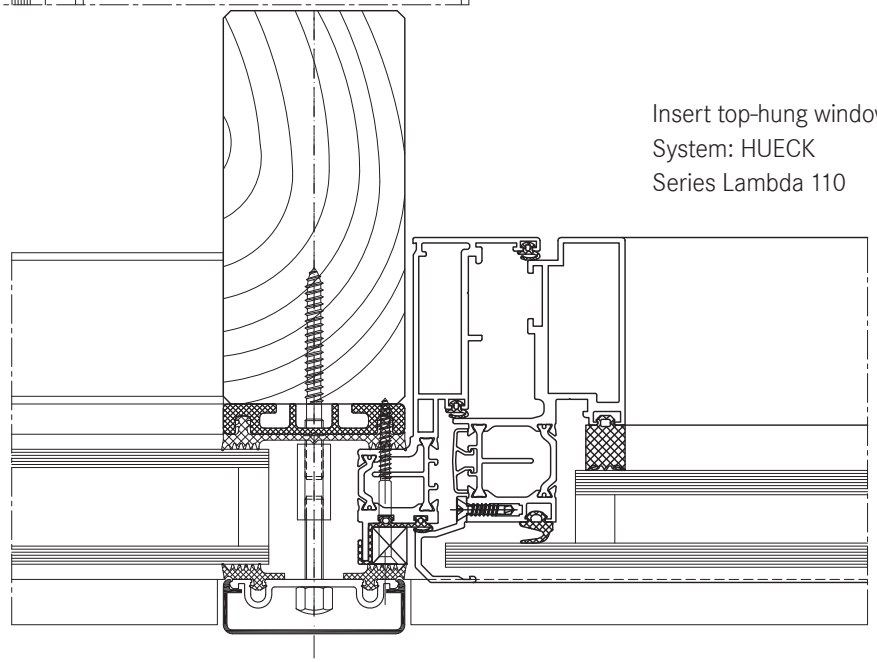
Insert door inward mullion section
System: HUECK
Series Lambda DS 075

Installing windows and doors



Insert top-hung window transom section
System: HUECK
Series Lambda 110

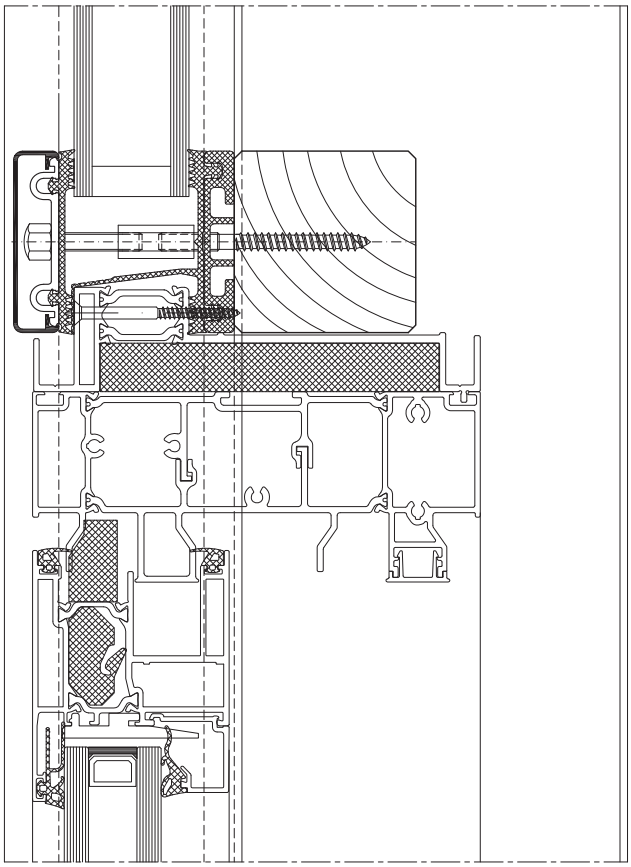




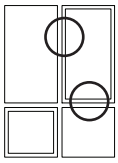
Insert top-hung window mullion section
System: HUECK
Series Lambda 110

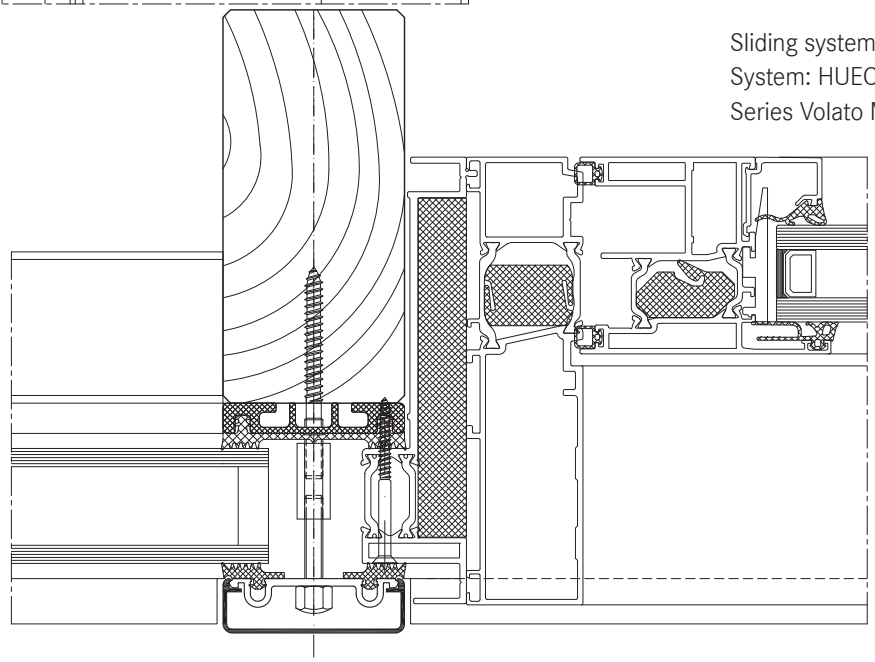
ZL-H_2.3_022.

Installing windows and doors



Sliding system transom section
System: HUECK
Series Volato M



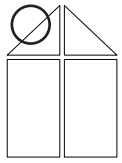


Sliding system mullion section
System: HUECK
Series Volato M

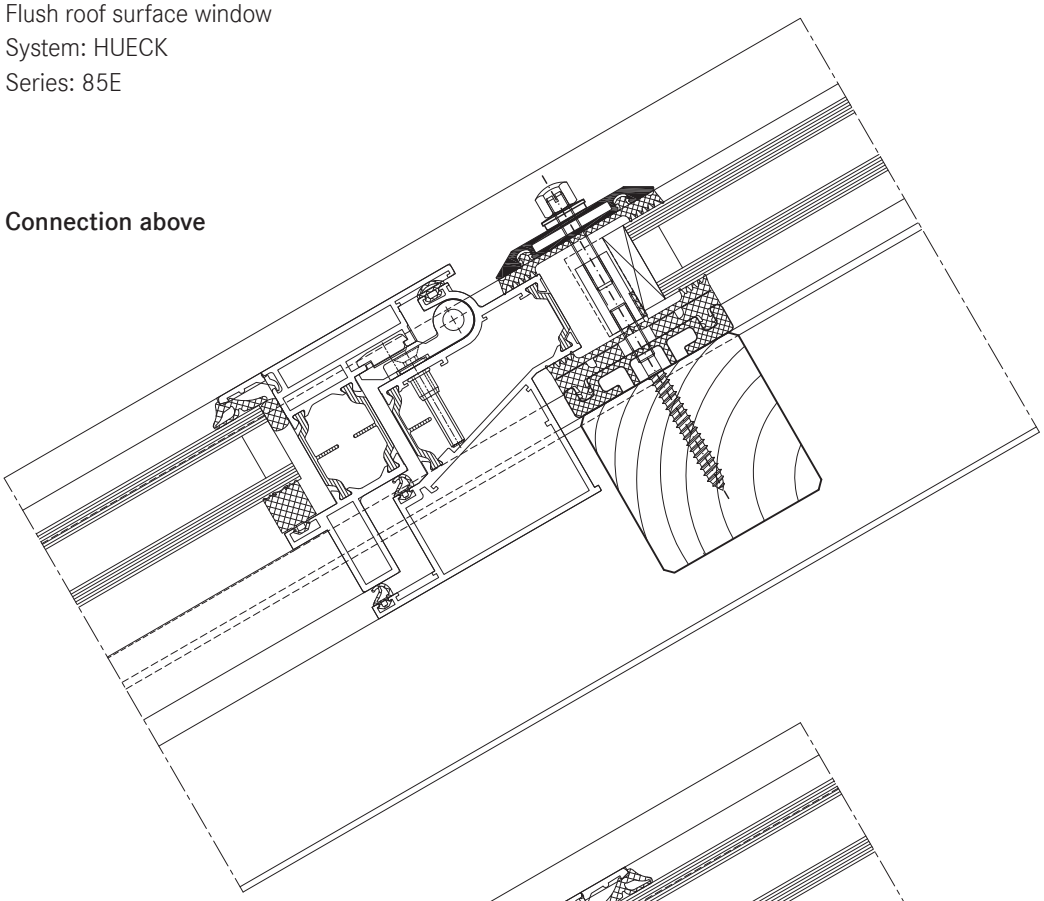
ZL-H_2.3_023.

Installing windows and doors

Flush roof surface window
System: HUECK
Series: 85E



Connection above



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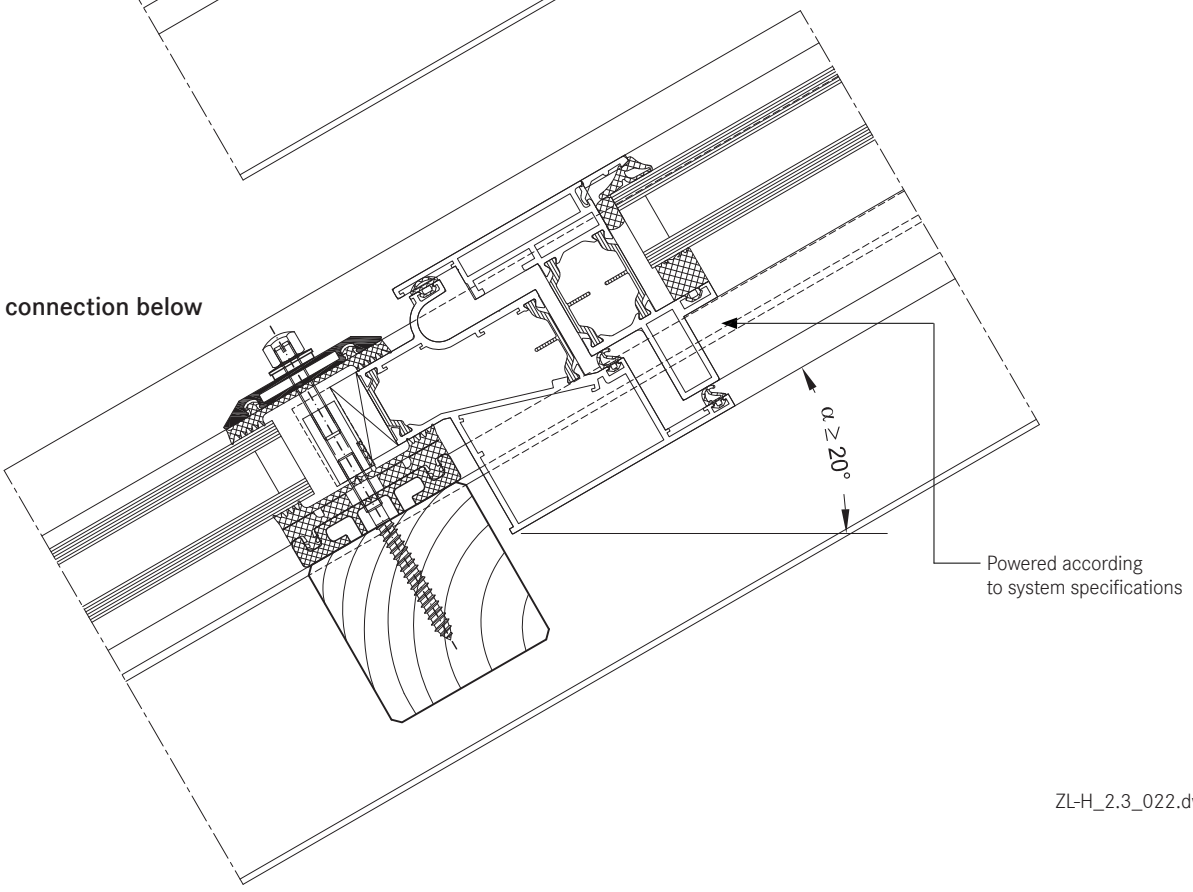
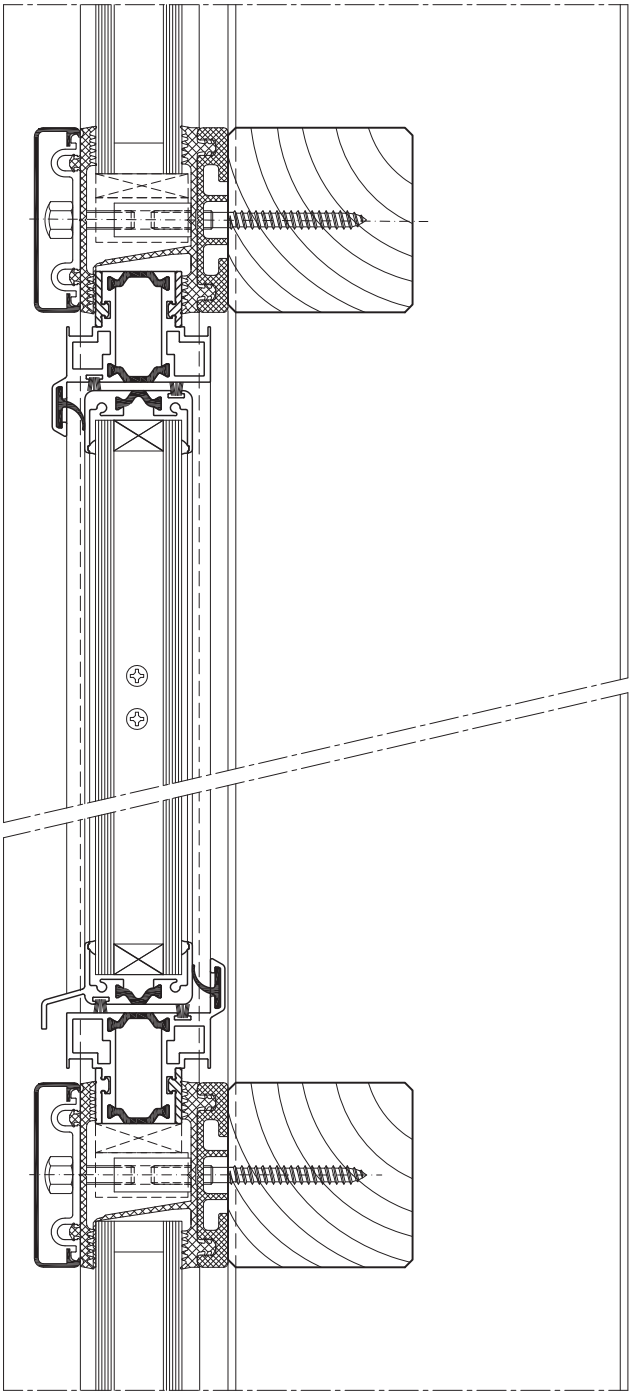
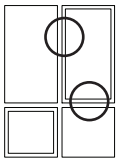


ZL-H_2.3_022.dwg

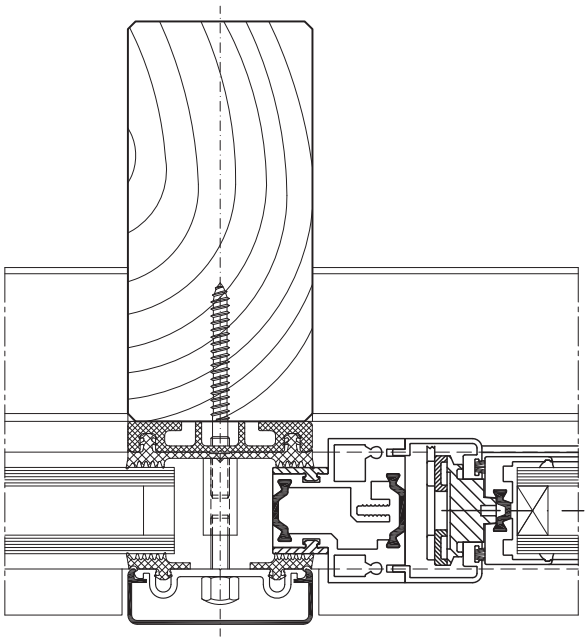
Installing windows and doors



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



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



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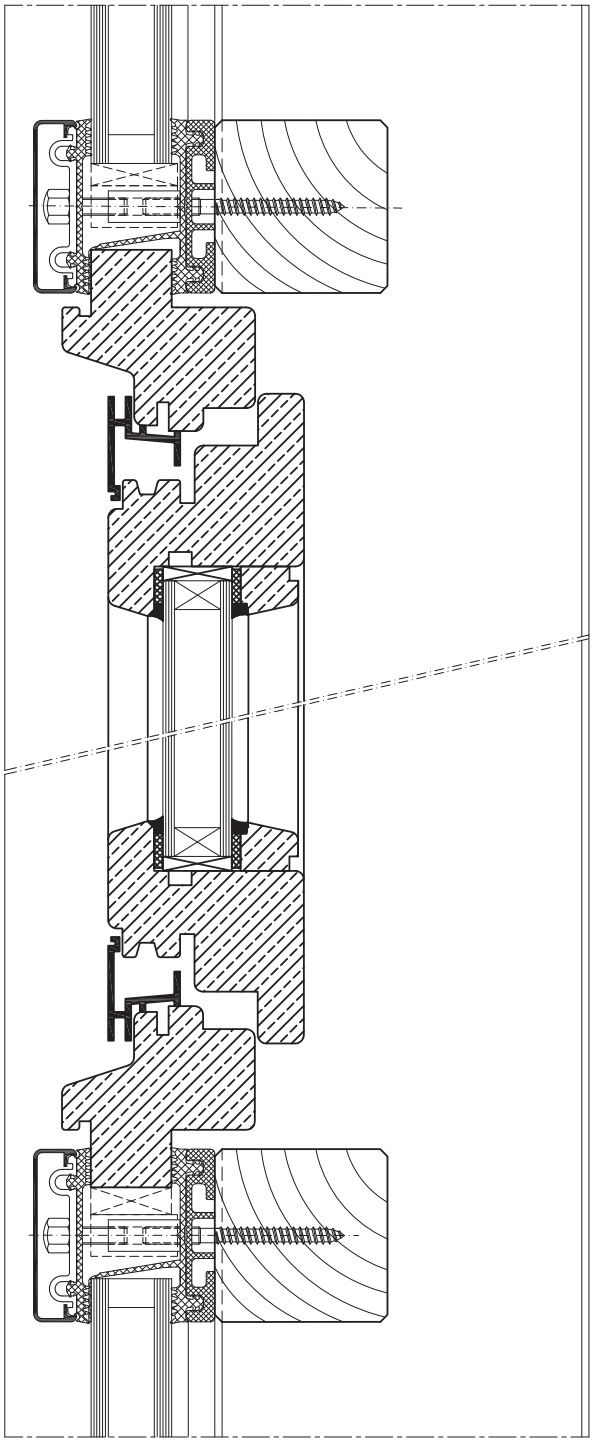
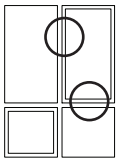
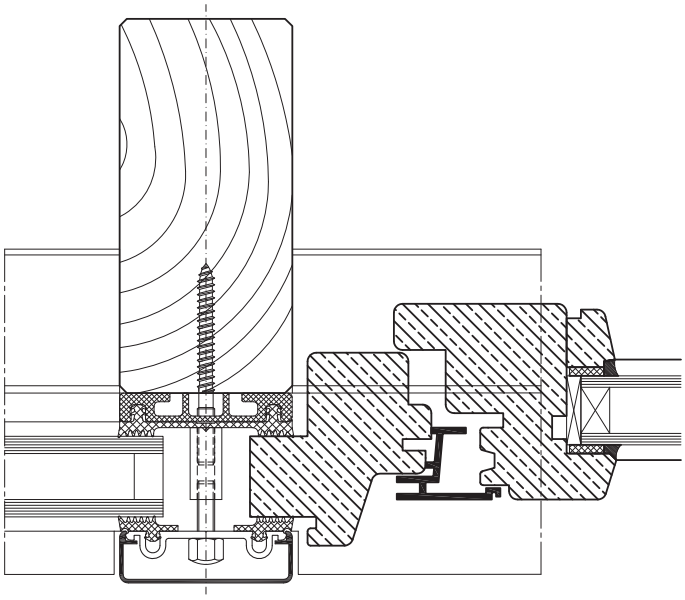
Installing windows and doors



Insert window - transom sections
wood windows



Insert window - mullion section
wood windows



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