TECHNICAL CATALOGUE

CURTAIN - WALL SYSTEM

E 85

ETEM

GENERAL INFORMATION

CONCEPT | ADVANTAGES | CERTIFICATES

ETEM BUILDING SYSTEMS

Concept

E 85 is a 50 mm façade system.
There are several variations of the system:

1 classical façade – with cover caps

2 four sided structural glazing

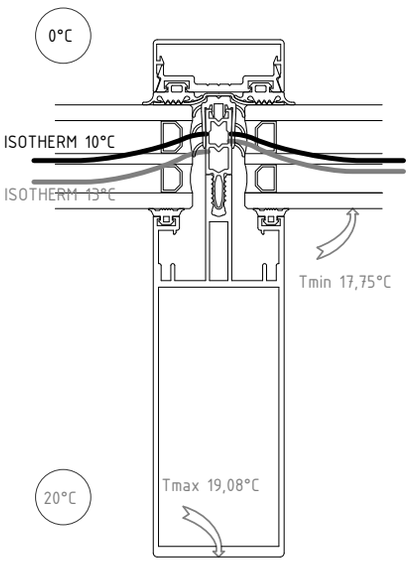
3 two sided structural glazing

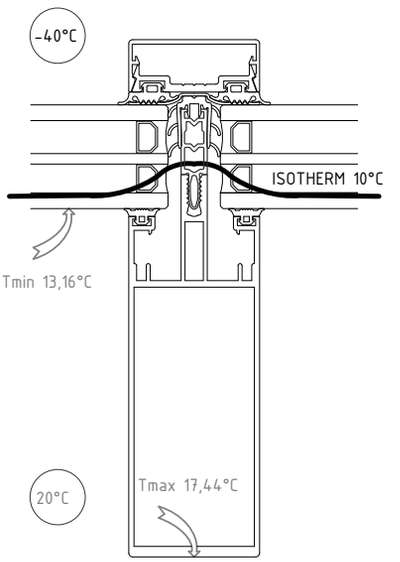
1

2

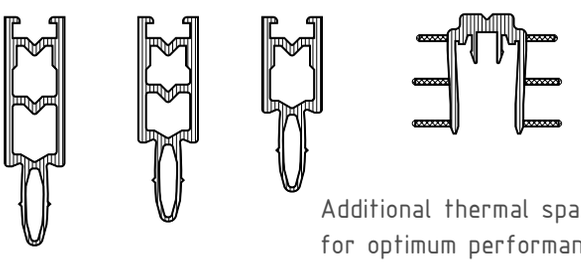
3

- E 85 is a **multifunctional system** which can be combined with any kind of glazing and shape as well as with other materials.
- E 85 enables the execution of **complex constructions** as roofs, cupolas, atriums, pyramids, conservatories.
- This system is **easy for fabrication** in the workshop and effortless to be assembled on site.
- The **high structural stability** of the system is achieved with **lowest weight** of the profiles.
- E 85 has **optimum thermal performance** even in regions with severe weather conditions.





The proper selection of thermal spacer reduces the chances for condensation formation



Additional thermal spacer for optimum performance

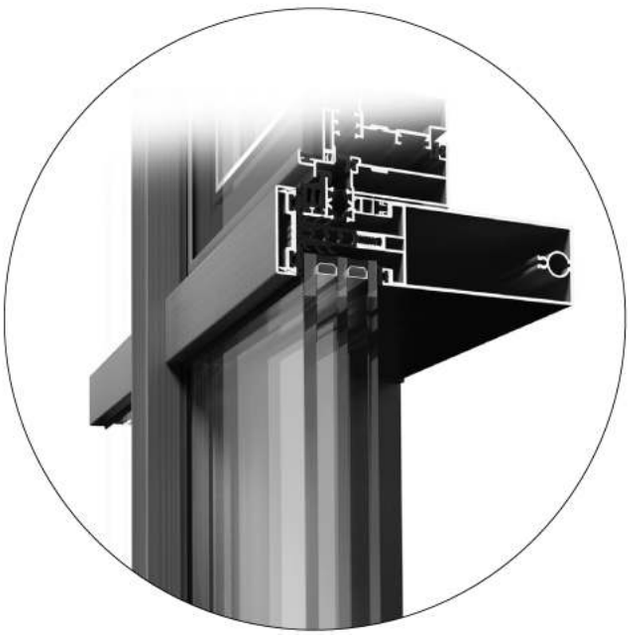
- E 85 has **effective** and proved **airtightness and watertightness**, due to large internal drains on three levels, without discontinuity at the junction of mullions or transoms, carefully designed accessories and specially constructed supplementary profiles for sealing the perimeter of the façade.
- All characteristics of the system are **tested in ift Rosenheim.**

There is option to insert photovoltaic and etalbond composite panels within the façade.

E 85 is also available in anti – burglar version, which is suitable for window displays of bank offices and financial institutions.

Sun protection panels can be easily installed in front of the system.

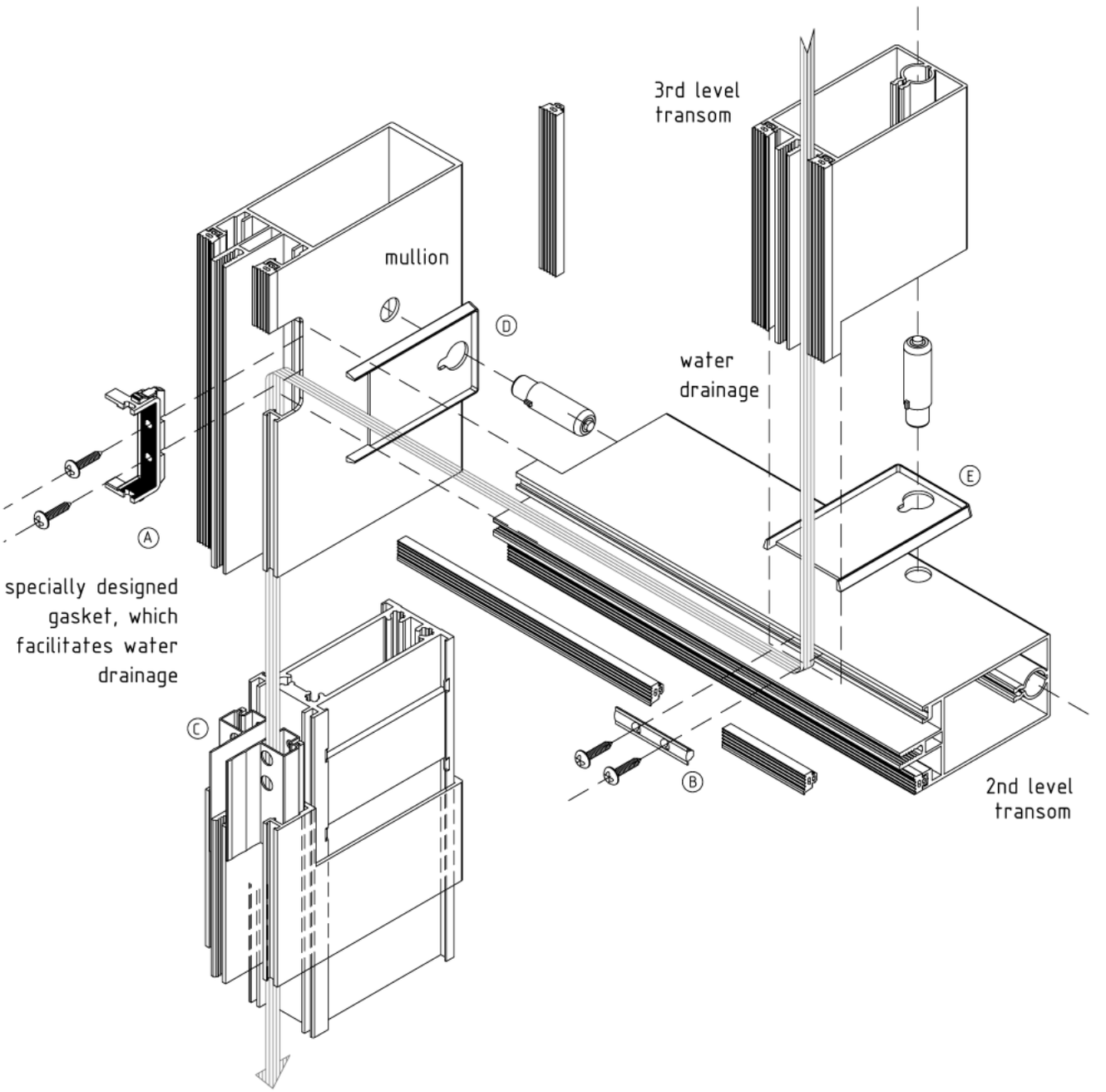
E 85 with inserted openable parts



projected window

parallel opening window

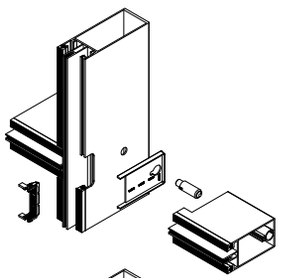
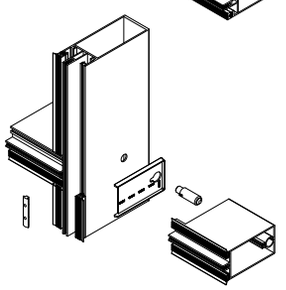
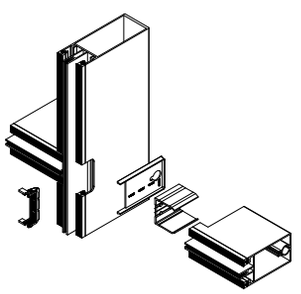
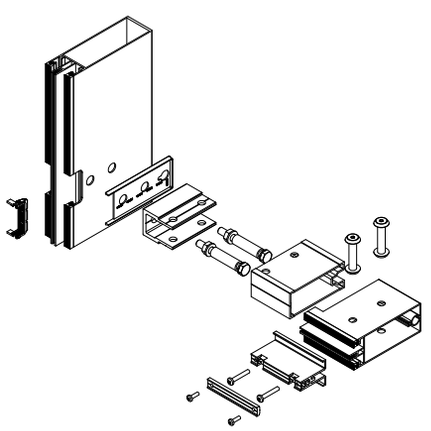
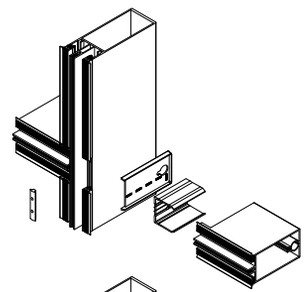
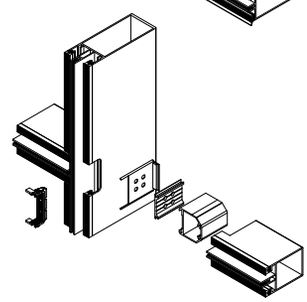
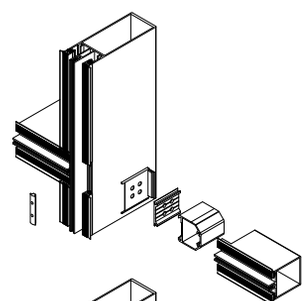
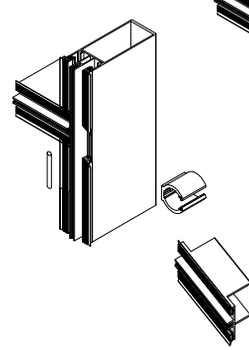
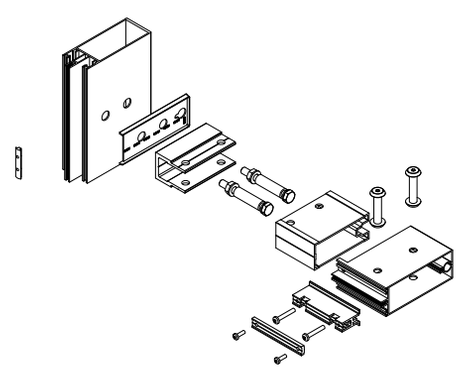
Water drainage principles



- The special geometry of E 85 profiles facilitates water drainage
- The good drainage of this system is achieved by two levels of drainage and by big channels on mullions and transoms.
- Gasket seal (A) and foam seal (B) have firming function and also make water drainage easier. Drainage fitting (C) enables water drainage when connecting two mullions.
- New flanges (D) and (E) permit thermal expansion of the profiles.

There is an extended range of options for joining mullions and transoms according to the applied loads
Additional joints can be used case of severe loads

2nd level drainage	3rd level drainage

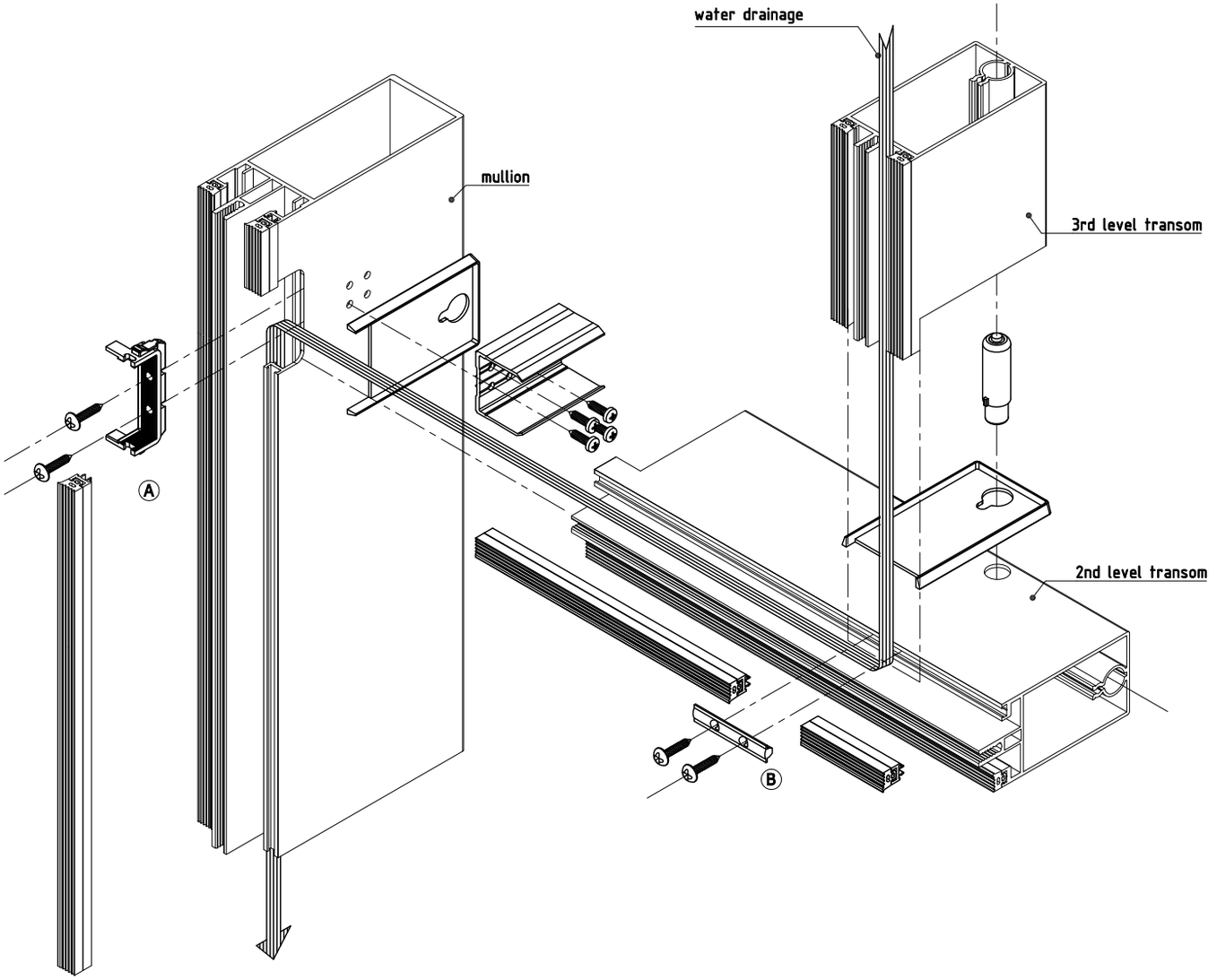
TEST CERTIFICATES SYSTEM E 85

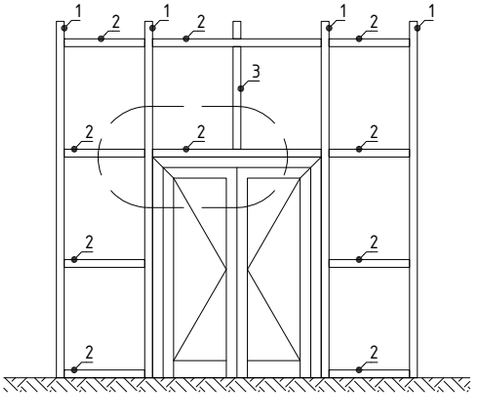
TEST SAMPLE	CHARACTERISTIC	RESULT	STANDARDS	NOTIFIED BODY	CERTIFICATE NUMBER
E85 Structural glazing	Air permeability	AE	EN 12152 EN 12153	ift Rosenheim	108 31925 R1e
	Water tightness static; dynamic	R7 200 Pa/600 Pa	EN 12154 EN 12155 ENV 13050		
	Resistance to wind load design load; safety load	±1,6 kN/m2 ±2,4 kN/m2	EN 13116 EN 12179		
	Impact resistance	I5 / E 5	EN 14019		
E85 with cover caps	Air permeability	AE	EN 12152 EN 12153	ift Rosenheim	108 27811e
	Water tightness static; dynamic	RE 900 200 Pa/600 Pa	EN 12154 EN 12155 ENV 13050		
	Resistance to wind load design load; safety load	±1,6 kN/m2 ±2,4 kN/m2	EN 13116 EN 12179		
	Impact resistance	I4 / E4	EN 14019		
E85 Curtain wall	Dead load ad glass loads	from 0,50 kN to 6,00 kN	EN 13830 ENV 1999-1-1	ift Rosenheim	108 33146e
	Resistance to horizontal loads	0,50 kN/m2 1,00 kN/m2 2,00 kN/m2	EN 13830 ENV 1999-1-1		
E85 2 Sided structural glazing	Thermal transmittance	Uf = 2,1-2,6 W/m2.K	EN ISO 10077-2 EN 12412-2	ift Rosenheim	432 31927 / 1
E85 4 Sided structural glazing	Thermal transmittance	Uf = 2,7-3,2 W/m2.K	EN ISO 10077-2 EN 12412-2	ift Rosenheim	432 31927 / 2
E85 with pressure plate	Thermal transmittance	Uf = 1,6-2,9 W/m2.K	EN ISO 10077-2 EN 12412-2	ift Rosenheim	432 31927 / 3
E85 with additional thermal insulation spacer	Thermal transmittance	Uf = 1,6-2,3 W/m2.K	EN ISO 10077-2 EN 12412-2	ift Rosenheim	432 31927 / 4
E85 with glazing 6-16-4+4 mm	Sound Insulation	Rw = 39 dB	EN ISO 140-3 EN 717-1	Architectural Technology Laboratory - Greece	A5.402.06
E85 with glazing 4-20-6+6 mm	Sound Insulation	Rw = 41 dB	EN ISO 140-3 EN 717-1	Architectural Technology Laboratory - Greece	A5.403.06
E85 with cover cap glazing 6-15-5 mm	Sound Insulation	Rw = 35 dB	EN ISO 140-1 EN 717-1 EN 20140-3	ift Rosenheim	161 30989/V1
E85 with cover cap glazing 13VSG-20-9 VSG	Sound Insulation	Rw = 44 dB	EN ISO 140-1 EN 717-1 EN 20140-3	ift Rosenheim	161 30989/V2

CLASSIFICATION OF CHARACTERISTICS FOR CURTAIN WALLING ACCORDING TO EN 13830

Characteristic / Value / dimension	Classification / Value					
Resistance to wind load (kN/m^2)	npd	Declared values				
Self weight (kN/m^2)	npd	Declared values				
Resistance against Impact Internal Drop height (mm)	npd	I0 (no information)	I1 (200)	I2 (300)	I3 (450)	I4 (700)
External Drop height (mm)	npd	E0 (no information)	E1 (200)	E2 (300)	E3 (450)	E4 (700)
Air permeability Test pressure (Pa)	npd	A1 (150)	A2 (300)	A3 (450)	A4 (600)	AE >600
Watertightness Test pressure (Pa)	npd	R4 (150)	R5 (300)	R6 (450)	R7 (600)	RE >600
Airborne sound insulation Rw (C;Ctr) (dB)	npd	Declared values				
Thermal transmittance Ucw (W/m2.K)	npd	Declared values				
Fire resistance Integrity (E) i→o, o→i, o↔i	npd	E15	E30	E60	E90	
Integrity and insulation (EI) i→o, o→i, o↔i	npd	EI15	EI30	EI60	EI90	
Equipotentiality Ω	npd	Declared values				
Resistance to horizontal loads (kN at m sill height)	npd	Declared values				

transom to transom connection





not to scale

E85M8.21

BUILDING PHYSICS

DIMENSIONING | FORMULAE | EXAMPLES

ETEM BUILDING SYSTEMS

Definition of curtain walling

- Curtain walling usually consists of vertical and horizontal structural members, connected together and anchored to the supporting structure of the building and infilled, to form a lightweight, space enclosing continuous skin, which provides, by itself or in conjunction with the building construction, all the normal functions of an external wall, but does not take on any of the load bearing characteristics of the building structure.
- The curtain walling shall be sufficiently rigid to resist the declared wind loads for serviceability, both positive and negative. It shall transfer the declared wind loads to the building's structure, safely, via the fixings intended for that purpose.
- The stated definition is in accordance with European standards EN 13830 and EN 13119.

Liabilities

- The stated data and methods are provided by ETEM Building Systems as a guideline for calculating wind loads, dead loads, thermal transmittance coefficient, etc.
- The following information does not substitute of all applicable regulations – Eurocodes, harmonized European standards, national or regional building codes.
- The specific conditions and technical details of every particular project have to be taken into consideration.
- The right choice of all façade elements- mullions, transoms, fixing elements, etc as well as any special requirements regarding stability of the façade must always be considered by the structural/ façade engineer responsible for the project.
- The solutions presented in these pages are indicative and can not cover all possible project cases. Because of that every single project has to be evaluated by the structural/façade engineer in charge taking into consideration the specific features, such as climate conditions, location, orientation, etc.
- ETEM Building Systems is not liable for any calculations and conclusions on the basis of the stated information. All calculations and specifications must be estimated, endorsed and guaranteed by architect, engineer, professional or legal entity authorized by law for such activities.

Material properties

Aluminium alloy	EN AW 6063 F22
Ultimate tensile strength	R_m = 210 N/mm^2
Yield strength	$R_{p0,2}$ = 160 N/mm^2
Modulus of elasticity	E_{al} = 70 000 N/mm^2 = 7.10^9 kg/m^2
Coefficient of thermal expansion	α = 0,023 mm/m .K (up to 1,2 mm/m for difference up to 50^{0}C)

Wind actions

- The main influence over the façade is wind action, which depends mainly on the height of the curtain wall and location.
- As a guideline, the wind pressure values with respect to the structure height are given in the table below:

h	v	q		wind pressure	suction in middle zone		suction in edge zone
(m)	(m/s)	(kg/m^2)	(kN/m^2)	c_p = 0,8	c_p = 0,5 h/b ≤ 0,25	c_p = 0,7 h/b ≥ 0,5	c_p = 2,0 b/8 ≤ 2 m
				w_p* = 1,25 x 0,8 x q kN/m^2	w_s = 0,5 x q kN/m^2	w_s = 0,7 x q kN/m^2	w_s = 2,0 x q kN/m^2
0 – 8	28,3	50	0,5	0,5	0,25	0,35	1,0
8 – 20	35,8	80	0,8	0,8	0,4	0,56	1,6
20 – 100	42,0	110	1,1	1,1	0,55	0,77	2,2
> 100	45,6	130	1,3	1,3	0,65	0,91	2,6

where:

h – building height, m

b – building width, m

v – wind velocity, m/s

q – wind load, kg/m^2 / kN/m^2

$w_{p/s}$ – wind pressure / suction, kN/m2

c_p – correction factor

*Note: when calculating wind pressure w_p the load is increased with 25%.

For calculating wind actions, when the wind velocity value is given in m/s, the following formula applies:

$$q = \frac{v^2}{16},\ kg/m^2$$

Allowable deflections

In accordance with EN 13830 and Eurocode 9 the allowable deflections are as follows:

Under the declared wind loads the maximum frontal deflection of the curtain walling's framing members – mullions and transoms – shall not exceed L/200, or 15 mm, whichever is the less, when measured between the points of support or anchorage to the building's structure.
The maximum deflection of any main horizontal framing from vertical loads (dead loads) shall not exceed L/500 or 3 mm, whichever is the less.

For mullions and transoms loaded by wind pressure:

$f = \frac{L}{200}$, or 0,015 m whichever is the less (EN 13830)

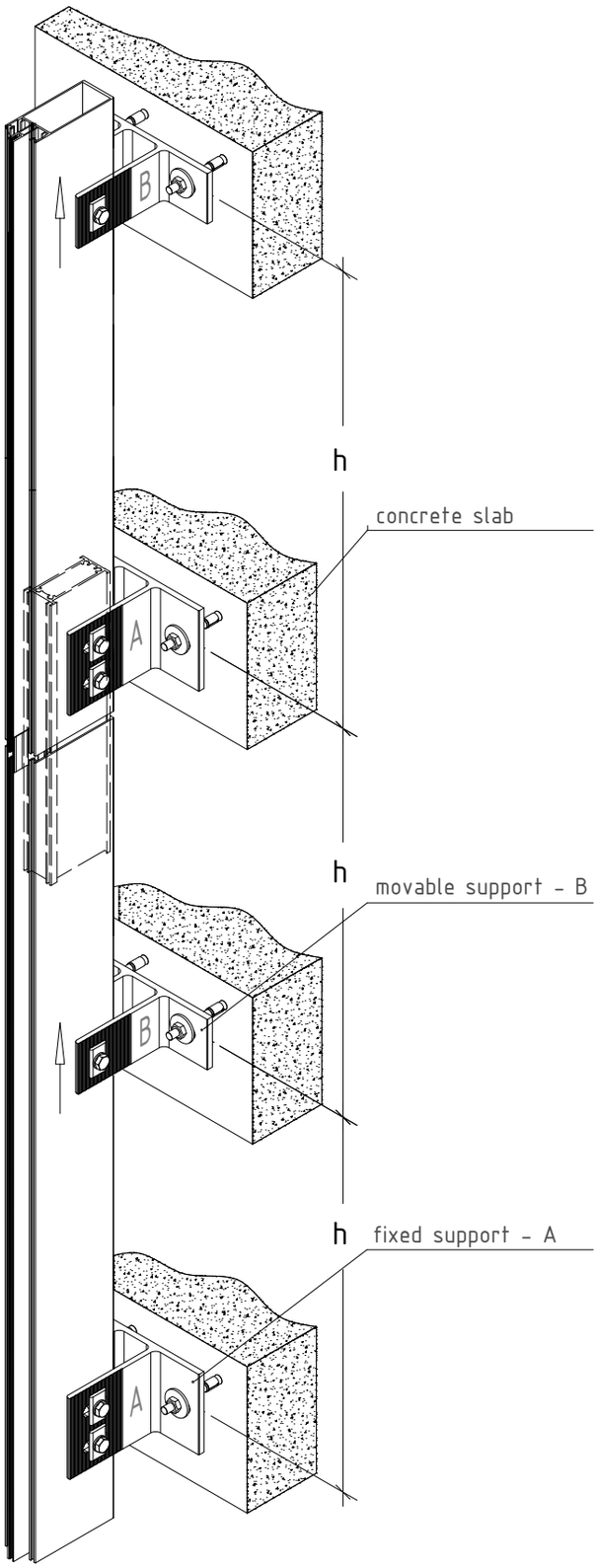
For transoms loaded by dead loads:

$f = \frac{L}{500}$, or 0,003m, whichever is the less (EN 13830)

Fixing brackets

Fixing brackets must fulfill the following criteria:
- Transfer safely all loads from the façade resulting from the wind pressure, weight of mullions and transoms and weight of infill panels
- Permit movement of mullions caused by thermal expansion

fixed support	movable support
y = 0 mm	y = ± 12 mm
z = ±12mm, x = ± 12 mm	x = ±12mm, z = 0 mm



- Mullions must be fixed using at least two fixing brackets, which are mounted onto the backing wall and never on a brick wall.
- Mullion is fixed permanently at one point only – fixed support. The other one or two fixing points of mullion must allow movement – movable support.
- Fixed support ensures steady fixing of mullions to the backing wall. It does not allow any movement of the fixed component after final assembly. Fixed support bears vertical/dead loads as well as wind loads acting on a certain part of the structure.
- Movable support also ensures fixing of mullions to the construction but it allows vertical movement of the mullion caused by temperature changes. Movable support bears only wind loads acting on the structure.

Choosing the appropriate fixing bracket
Simply supported beam with one fixed and one movable support

Fixed support

- Own weight - dead load

$V = g.h.b$

- Wind load-pressure

For determining the maximum permissible wind load the following formulae apply:

$W_p = f_1 . q . c_p . h/2 . b$

- Wind load-suction

$W_s = q . c_p . h/2 . b$

where:

V - load, kN
g - weight of mullions, transoms and infill panels, kN/m^2
W_p - wind pressure, kN
W_s - wind suction, kN
f_1 - correction factor
q - dynamic load, kN/ m^2
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Movable support

- Wind load-pressure

For determining the maximum permissible wind load the following formulae apply:

$W_p = f_1 . q . c_p . h/2 . b$

- Wind load-suction

$W_s = q . c_p . h/2 . b$

Example

Initial data:
H = 0-8 m (middle zone)
g = 0,5 kN/m^2
f_1 = 1,25
q = 0,5 kN/m^2
c_p = 0,8 (wind pressure)
c_p= - 0,5 (wind suction)
h = 3m
b = 1,2m

- Own weight - dead load

$V = g . h . b = 0,3 . 3 . 1,2 =$
$= 1,8$ kN

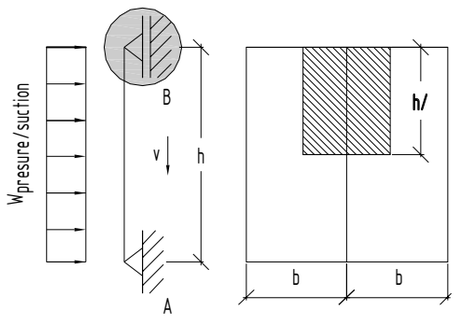
- Wind load

$W_p = f_1 . q . c_p . h/2 . b =$
$= 1,25 . 0,5 . 0,8 . (0,5 . 3) . 1,2 =$
$= 0,9$ kN

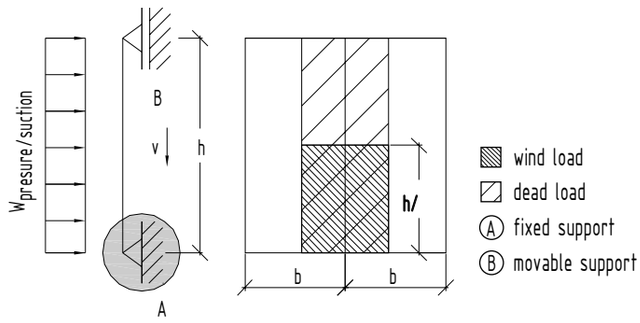
$W_s = q . c_p . h/2 . b =$
$= 0,5 . (-0,5) . (0,5 . 3) . 1,2 =$
$= (-0,45) = 0,45$ kN

- Wind load

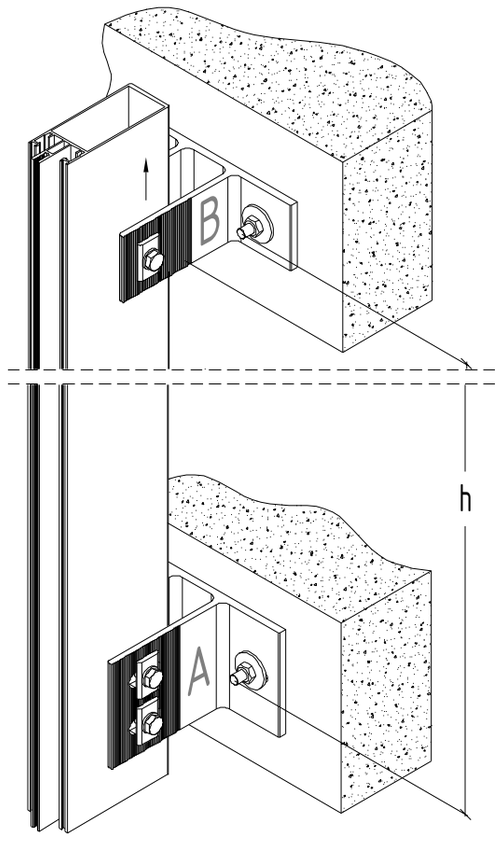
$W_p = f_1 . q . c_p . h/2 . b =$
$= 1,25 . 0,5 . 0,8 . (0,5 . 3) . 1,2 =$
$= 0,9$ kN
$Ws = q . c_p . h/2 . b =$
$= 0,5 . (-0,5) . (0,5 . 3) . 1,2 =$
$= (-0,45) = 0,45$ kN



Movable support

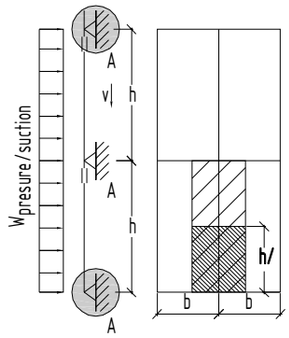


Fixed support

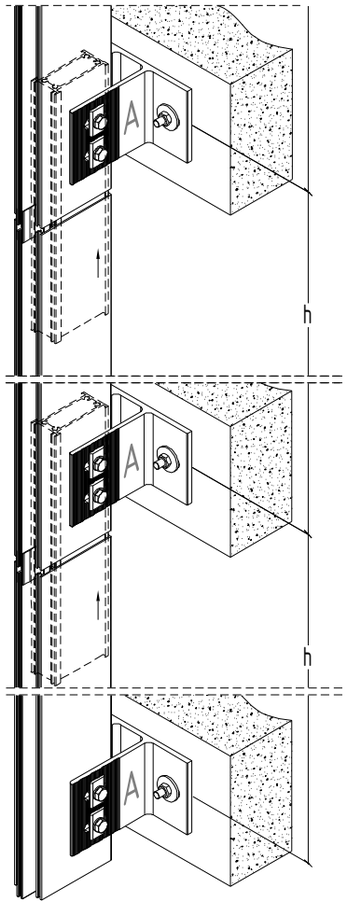


Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.
Fixing bracket for movable support must bear just wind load.

Choosing the appropriate fixing bracket
Continuous simply supported beam



Fixed support



Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.

Fixed support end supports

Own weight - dead load
V = g . h . b

- Wind load-pressure

For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

- Wind load-suction

$W_s = q . c_p . h/2 . b$

where:
V - load, kN
g - weight of mullions, transoms and infill panels, kN/m^2
W_p - wind pressure, kN
W_s - wind suction, kN
f_1 - correction factor
q - dynamic load, kN/ m^2
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Movable support

- Own weight - dead load

V = g . h . b

- Wind load-pressure

For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h . b$

- Wind load-suction

$W_s = q . c_p . h . b$

wind load
dead load
Ⓐ fixed support

Example

Initial data:
H = 8-20 m (middle zone)
g = 0,5 kN/m^2
f_1 = 1,25
q = 0,8 kN/m^2
c_p = 0,8 (wind pressure)
c_p= -0,5 (wind suction)
h = 3,5m
b = 1,0m

- Own weight - dead load

V = g . h . b = 0,5 . 3,5 . 1,0 = 1,75 kN

- Wind load

$W_p = f_1 . q . c_p . h/2 . b =$
$= 1,25 . 0,8 . 0,8 . (0,5 . 3.5) . 1,0 =$
$= 1,4$ kN

$W_s = q . c_p . h/2 . b =$
$= 0,8 . (-0,5) . (0,5 . 3,5) . 1,0 =$
$= (-0,7) = 0,7$ kN

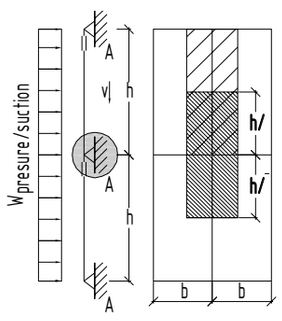
- Own weight - dead load

V = g . h . b =
= 0,5 . 3,5 . 1,0 = 1,75 kN

- Wind load

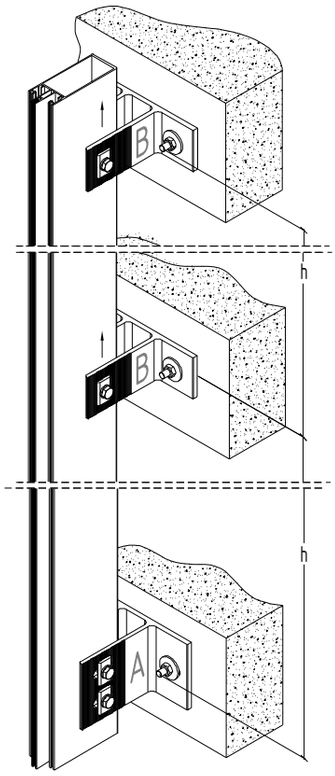
$W_p = f_1 . q . c_p . h . b =$
$= 1,25 . 0,8 . 0,8 . 3,5 . 1,0 = 2,8$ kN

$Ws = q . c_p . h . b =$
$= 0,8 . (-0,5) . 3,5 . 1,0 =$
$= (-1,4) = 1,4$ kN

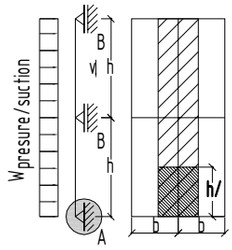


Movable support

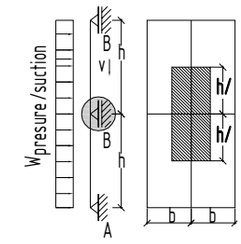
Choosing the appropriate fixing bracket
Continuous beam with one fixed and two movable supports



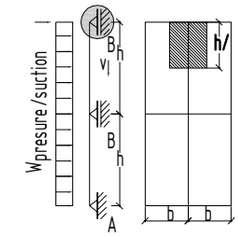
wind load
dead load
Ⓐ fixed support
Ⓑ movable support



Fixed support



Movable support (middle)



Movable support (end)

Movable support (middle)

■ Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . f_2 . q . c_p . h . b$

■ Wind load-suction
$W_s = f_2 . q . c_p . h . b$

where:
f_2 - correction factor

■ Wind load
$W_p = f_1 . f_2 . q . c_p . h . b =$
$= 1,25 . 1,25 . 0,5 . 0,8 . 3,3 . 0,9 =$
$= 1,86$ kN

$Ws = f_2 . q . c_p . h . b =$
$= 1,25 . 0,5 . (-0,5) . 3,3 . 0,9 =$
$= (-0,93) = 0,93$ kN

Fixed support

■ Own weight - dead load
$V = g . 2h . b$

■ Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

■ Wind load-suction
$W_s = q . c_p . h/2 . b$

where:
V - load, kN
g - weight of mullions, transoms and infill panels, kN/m^2
W_p - wind pressure, kN
W_s - wind suction, kN
f 1 - correction factor
q - dynamic load, kN/ m^2
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Example

Initial data:
H = 0-8 m (middle zone)
g = 0,5 kN/m^2
$f_1 = 1,25$
q = 0,5 kN/m^2
$c_p = 0,8$ (wind pressure)
$c_p = -0,5$ (wind suction)
h = 3,3m
b = 0,9m

■ Own weight - dead load
$V = g . 2 . h . b =$
$= 0,5 . 2 . 3,3 . 0,9 =$
$= 2,97$ kN

■ Wind load
$W_p = f_1 . q . c_p . h/2 . b =$
$= 1,25 . 0,5 . 0,8 . (0,5 . 3.3) . 0,9 =$
$= 0,74$ kN

$W_s = q . c_p . h/2 . b =$
$= 0,5 . (-0,5) . (0,5 . 3,3) . 0,9 =$
$= (- 3,7) = 0,37$ kN

Movable support (end)

■ Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

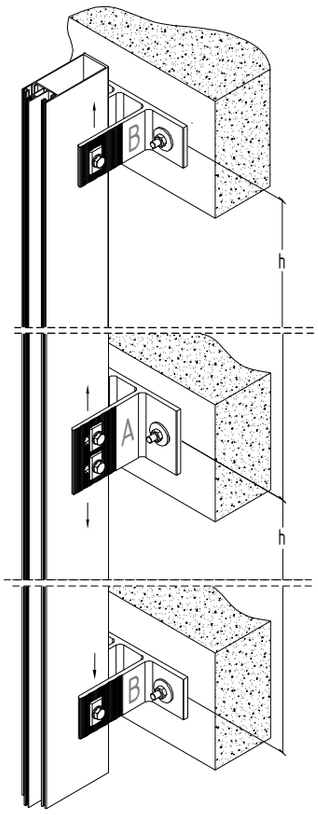
■ Wind load-suction
$W_s = q . c_p . h/2 . b$

■ Wind load
$W_p = f_1 . q . c_p . h/2 . b =$
$= 1,25 . 0,5 . 0,8 . (0,5 . 3,3) . 0,9 =$
$= 0,74$ kN

$Ws = q . c_p . h/2 . b =$
$= 0,5 . (-0,5) . (0,5 . 3,3) . 0,9 =$
$= (-0,37) = 0,37$ kN

Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.
Fixing bracket for movable support must bear just wind load.

Choosing the appropriate fixing bracket
Continuous supported beam with one fixed support in the middle and two movable in the end



Fixed support

- Own weight - dead load

$V = g \cdot 2h \cdot b$

- Wind load-pressure

For determining the maximum permissible wind load the following formulae apply:

$W_p = f_1 \cdot f_2 \cdot q \cdot c_p \cdot h \cdot b$

- Wind load-suction

$W_s = f_2 \cdot q \cdot c_p \cdot h \cdot b$

where:

V - load, kN
g - weight of mullions, transoms and infill panels, kN/m^2
W_p - wind pressure, kN
W_s - wind suction, kN
f_1 - correction factor
f_2 - correction factor
q - dynamic load, kN/ m^2
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Example

Initial data:
H = 0-8 m (middle zone)
g = 0,5 kN/m^2
f_1 = 1,25
q = 0,5 kN/m^2
c_p = 0,8 (wind pressure)
c_p= - 0,5 (wind suction)
h = 3,2m
b = 1,3m

- Own weight - dead load

$V = g \cdot 2h \cdot b =$
$= 0,5 \cdot 2 \cdot 3,2 \cdot 1,3 = 4,16$ kN

- Wind load

$W_p = f_1 \cdot f_2 \cdot q \cdot c_p \cdot h \cdot b =$
$= 1,25 \cdot 1,25 \cdot 0,5 \cdot 0,8 \cdot 3,2 \cdot 1,3 =$
$= 2,6$ kN

$W_s = f_2 \cdot q \cdot c_p \cdot h \cdot b =$
$= 1,25 \cdot 0,5 \cdot (-0,5) \cdot 3,2 \cdot 1,3 =$
$= (-1,3) = 1,3$ kN

Movable support

- Wind load-pressure

For determining the maximum permissible wind load the following formulae apply:

$W_p = f_1 \cdot q \cdot c_p \cdot h/2 \cdot b$

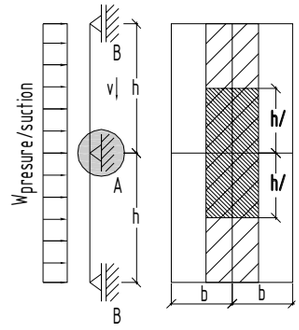
- Wind load-suction

$W_s = q \cdot c_p \cdot h/2 \cdot b$

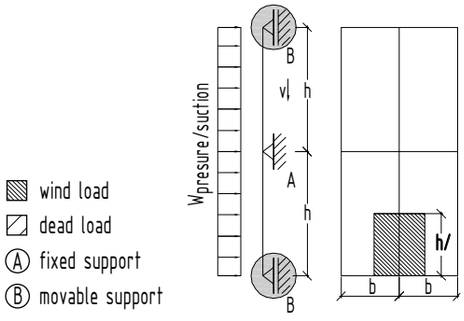
- Wind load

$W_p = f_1 \cdot q \cdot c_p \cdot h/2 \cdot b =$
$= 1,25 \cdot 0,5 \cdot 0,8 \cdot (0,5 \cdot 3,2) \cdot 1,3 =$
$= 1,04$ kN

$W_s = q \cdot c_p \cdot h/2 \cdot b =$
$= 0,5 \cdot (-0,5) \cdot (0,5 \cdot 3,2) \cdot 1,3 =$
$= (-0,52) = 0,52$ kN

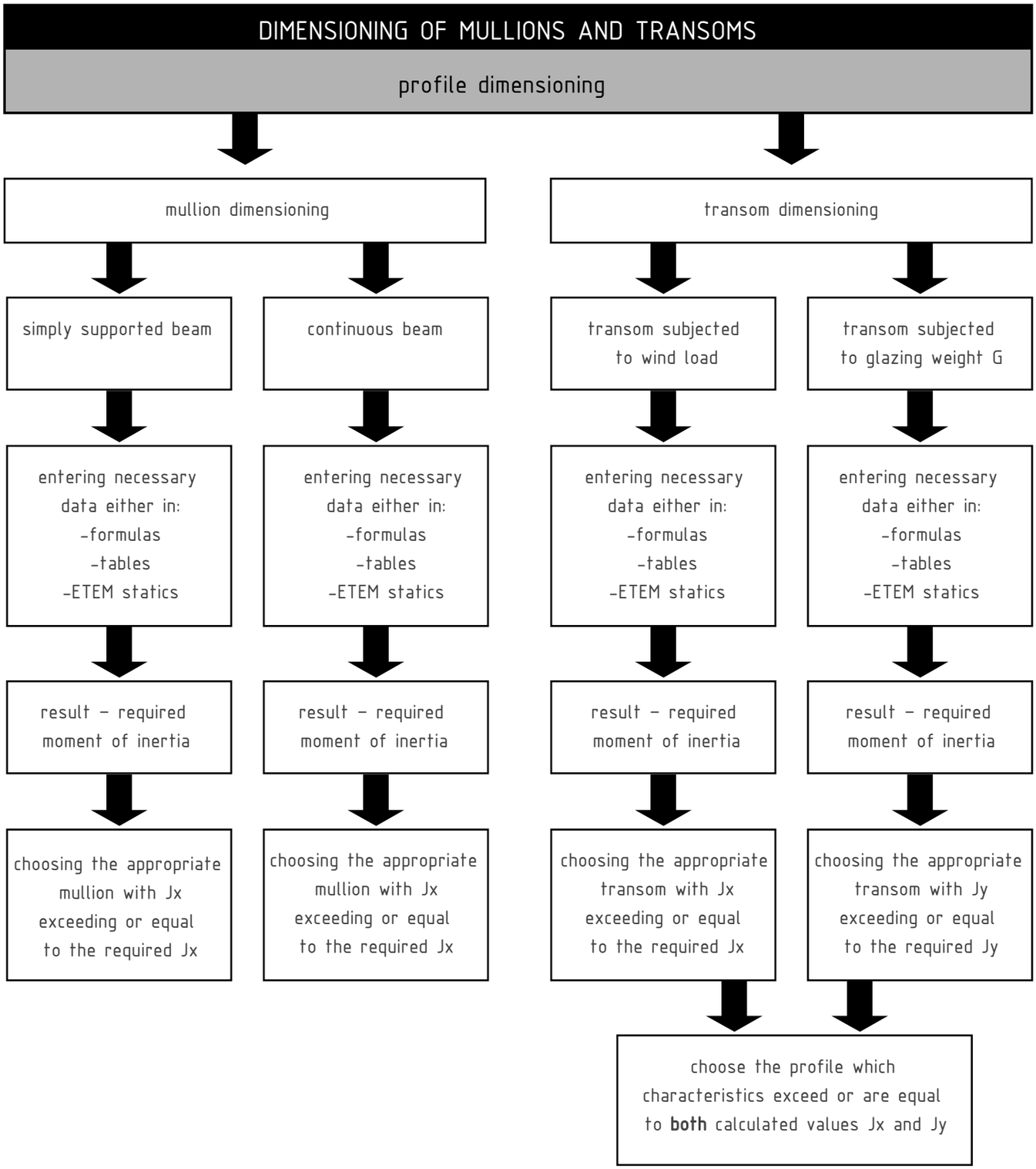


Fixed support



Movable support

Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.
Fixing bracket for movable support must bear just wind load.


DIMENSIONING OF MULLIONS AND TRANSOMS
profile dimensioning
mullion dimensioning
transom dimensioning
simply supported beam
continuous beam
transom subjected to wind load
transom subjected to glazing weight G
entering necessary data either in: -formulas -tables -ETEM statics
entering necessary data either in: -formulas -tables -ETEM statics
entering necessary data either in: -formulas -tables -ETEM statics
entering necessary data either in: -formulas -tables -ETEM statics
result – required moment of inertia
result – required moment of inertia
result – required moment of inertia
result – required moment of inertia
choosing the appropriate mullion with Jx exceeding or equal to the required Jx
choosing the appropriate mullion with Jx exceeding or equal to the required Jx
choosing the appropriate transom with Jx exceeding or equal to the required Jx
choosing the appropriate transom with Jy exceeding or equal to the required Jy
choose the profile which characteristics exceed or are equal to **both** calculated values Jx and Jy

Selection of mullion

▪ Wind load actions

1. Simply supported beam

Trapezoidal load
The moment of inertia of a mullion, supported at two points, subjected to wind load is given by the following equation:

$$J_{x_a} = \frac{w \,.\, (a/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40\,\frac{(a/2)^2}{h^2} + 16\,\frac{(a/2)^2}{h^2}\right]$$

$$J_{x_b} = \frac{w \,.\, (b/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40\,\frac{(b/2)^2}{h^2} + 16\,\frac{(b/2)^2}{h^2}\right]$$

where:
J_x – moment of inertia,cm^4
w – wind pressure, kg/m^2
a, b – distance betweenmullions,m
h – distance between fixing brackets,m
E_{al} – modulus of elasticity, kg/m^2
f – deflection,m

For mullions and transoms loaded by wind pressure:

$$f = \frac{l}{200}$$

or 0,015 m whichever is the less (EN 13830)
Total required moment of inertia:

$$J_x = J_a + J_b$$

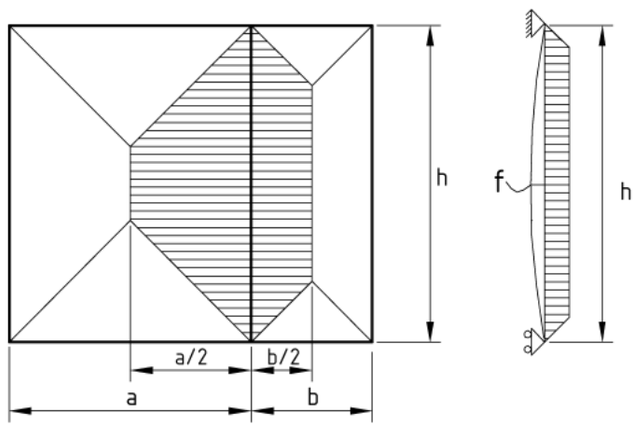
Use ETEM catalogue to choose the appropriate mullion with Jx exceeding or equal to the required Jx.

Example:

Initial data:
a = 1.5 m
b = 1.2 m
h = 4 m
w = 60 kg/m^2
$E_{al} = 7.10^9$ kg/m^2

$$f = \frac{l}{200} = \frac{4}{200} = 0{,}02 > 0{,}015\text{m}$$

$\Rightarrow$ f = 0,015 m in the following formulae :



$$J_{x_a} = \frac{w \,.\, (a/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(a/2)^2}{h^2} + 16 \,.\, \frac{(a/2)^2}{h^2}\right] =$$

$$= \frac{60 \,.\, (1{,}5/2) \,.\, 4^4}{1920 \,.\, 7.\, 10^9 \,.\, 0{,}015} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(1{,}5/2)^2}{4^2} + 16 \,.\, \frac{(1{,}5/2)^2}{4^2}\right] =$$

$= 138{,}0\ cm^4$

$$J_{x_b} = \frac{w \,.\, (b/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(b/2)^2}{h^2} + 16 \,.\, \frac{(b/2)^2}{h^2}\right] =$$

$$= \frac{60 \,.\, (1{,}2/2) \,.\, 4^4}{1920 \,.\, 7.\, 10^9 \,.\, 0{,}015} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(1{,}2/2)^2}{4^2} + 16 \,.\, \frac{(1{,}2/2)^2}{4^2}\right] =$$

$= 111{,}8\ cm^4$

Total required moment of inertia:

$J_x = J_a + J_b = 138{,}0 + 111{,}8 = 249{,}8\ cm^2$

The appropriate mullion is E 85104 with

$J_x = 252{,}5\ cm^4$

2. Continuous beam

Rectangular load
The required moment of inertia of a mullion, supported at three points, subjected to wind load is given by the following equation:

$$J_{x_a} = \frac{w \cdot (a/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f}$$

$$J_{x_b} = \frac{w \cdot (b/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f}$$

where:
J_x – moment of inertia,cm^4
w – wind pressure, kg/m^2
a, b – distance between mullions,m
h – distance between fixing brackets,m
E_{al} – modulus of elasticity, kg/m^2
f – deflection,m

For mullions and transoms loaded by wind pressure:

$$f = \frac{l}{200}$$

or 0,015 m whichever is the less (EN 13830)
Total required moment of inertia:

$$J_x = J_a + J_b$$

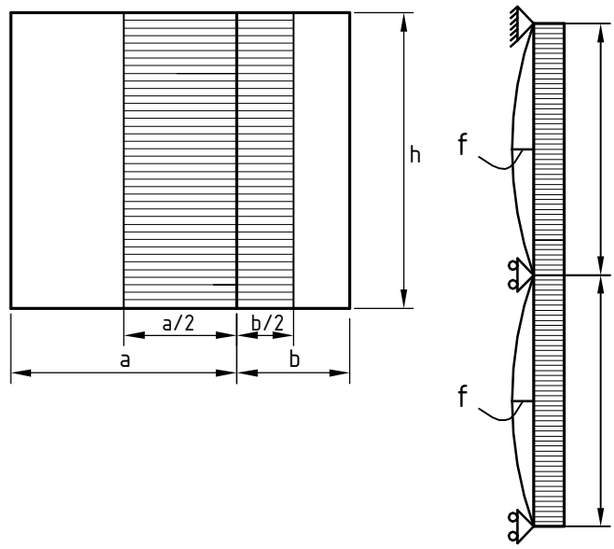
Use ETEM catalogue to choose the appropriate mullion with Jx exceeding or equal to the required Jx.

Example:

Initial data:
a = 1.5 m
b = 1 m
h = 3,3 m
w = 96 kg/m^2
E_{al} = 7.10^9 kg/m^2

$$f = \frac{l}{200} = \frac{3,3}{200} = 0,016 > 0,015 m$$

$\Rightarrow$ f = 0,015 m in the following formulae :



$$J_{x_a} = \frac{w \cdot (a/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f} = \frac{96 \cdot (1,5/2) \cdot 3,3^4 \cdot 10^8}{185 \cdot 7 \cdot 10^9 \cdot 0,015} = 43,9\ cm^4$$

$$J_{x_b} = \frac{w \cdot (b/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f} = \frac{96 \cdot (1/2) \cdot 3,3^4 \cdot 10^8}{185 \cdot 7 \cdot 10^9 \cdot 0,015} = 29,3\ cm^4$$

Total required moment of inertia:

$J_x = J_a + J_b = 43,9 + 29,3 = 73,2\ cm^2$

The appropriate mullion is E 85102 with

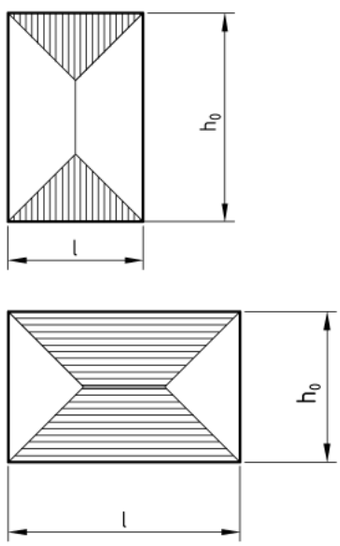
$J_x = 104,1\ cm^4$

Selection of transom

▪ Wind load actions

$$\frac{l}{h_0} \le 1 \qquad J_x = \frac{w \cdot (h_0/2) \cdot l \cdot 10^8}{120 \cdot E_{al} \cdot f}$$

$$\frac{l}{h_0} > 1 \qquad J_x = \frac{w \cdot (h_0/2) \cdot l^4}{1920 \cdot E_{al} \cdot f} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(h_0/2)^2}{l^2} + 16 \cdot \frac{(h_0/2)^2}{l^2}\right]$$



where:
J_x – moment of inertia,cm^4
w – wind pressure, kg/m^2
l – length of transom, m
E_{al} – modulus of elasticity, kg/m^2
f – deflection,m
h_0 – distance between transoms, m

For mullions and transoms loaded by wind pressure:

$$f = \frac{l}{200}$$

or 0,015 m whichever is the less (EN 13830)

Use ETEM catalogue to choose the appropriate transom with Jx exceeding or equal to the required Jx.

Example:

Initial data:
l = 1,2 m
h_0 = 3m
w = 60 kg/m^2
E_{al} = 7.10^9 kg/m^2

$$\frac{l}{h_0} = \frac{1,2}{3} = 0,4 \le 1$$

$$f = \frac{l}{200} = \frac{1,2}{200} = 0,006 > 0,015m$$

$\Rightarrow$ f = 0, 006 m in the following formula :

$$J_x = \frac{w \cdot (h_0/2) \cdot l \cdot 10^8}{120 \cdot E_{al} \cdot f} = \frac{60 \cdot (3/2) \cdot 1.2 \cdot 10^8}{120 \cdot 0,006 \cdot 10^9 \cdot 7} = 2,1\ cm^4$$

The appropriate transom is E 85300 with J_x = 2,7 cm

Initial data:
l = 2 m
h_0 = 1.5 m
w = 60 kg/m^2
E_{al} = 7.10^9 kg/m^2

$$\frac{l}{h_0} = \frac{2}{1,5} = 1,33 > 1$$

$$f = \frac{l}{200} = \frac{2}{200} = 0,01 < 0,015m$$

$\Rightarrow$ f = 0, 01 m in the following formula :

$$J_x = \frac{w \cdot (h_0/2) \cdot l^4}{1920 \cdot E_{al} \cdot f} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(h_0/2)^2}{l^2} + 16 \cdot \frac{(h_0/2)^2}{l^2}\right] =$$

$$= \frac{60 \cdot (1.5/2) \cdot 2^4}{1920 \cdot 7 \cdot 10^9 \cdot 0,01} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(1,5/2)^2}{2^2} + 16 \cdot \frac{(1.5/2)^2}{2^2}\right] =$$

$= 11,6\ cm^4$

The appropriate transom is E 85302 with J_x = 19,5 cm

Important note: This selection of transoms is not final! We choose the appropriate profile which characteristics exceed or are equal to both calculated values Jx and Jy.

Calculation of the required glass pane thickness

- Weight of the glass pane G is calculated as follows:

$$G = t \cdot \varrho_{glass} \cdot l_g \cdot h_g$$

where:
t – minimum theoretical thickness, mm
ϱ_{glass} – specific weight of glass = 2,5 kg/m² x mm
l_g – the smallest dimension of the glass pane,m
h_g – the largest dimension of the glass pane,m

For single glass the minimum thickness is given by the following equations:

$$\frac{h_g}{l_g} \le 3 \qquad t = \sqrt{\frac{10 \cdot l_g \cdot h_g \cdot w}{72}}$$

where:
w – wind pressure,kg/m²

$$\frac{h_g}{l_g} < 3 \qquad t = \frac{l_g \cdot \sqrt{10 \cdot w}}{4,9}$$

For double glazing, the total thickness of both glass panel is equal to the thickness of a single glass pane (evaluated using the above equations) multiplied by 1.5

For triple glazing, the total thickness of both glass panel is equal to the thickness of a single glass pane (evaluated using the above equations) multiplied by 1.7.

Always consult facade engineer or glazing manufacturer when calculating required glazing thickness and maximum allowable dimensions.

Sample

Initial data:
l_g = 2 m
h_g = 1,5 m
w = 60 kg/m²

$$\frac{h_g}{l_g} = \frac{1,5}{2} = 0,75 \le 3$$

$$t = \sqrt{\frac{10 \cdot l_g \cdot h_g \cdot w}{72}} = \sqrt{\frac{10 \cdot 2 \cdot 1,5 \cdot 60}{72}} = 5\text{mm}$$

For double glazing t_{req} = 5 . 1,5 = 7,5 mm

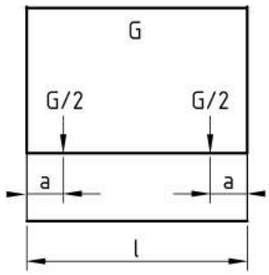
According to ETAG 002 the minimum thickness of the glass panes for curtain walls is 6 mm.
Because of that we choose double glazing 6/14/6.

Glass pane weight

The required moment of inertia of a transom due to the weight of the glass pane is given by:

$$J_{y1} = \frac{G \cdot a \cdot 10^8}{48 \cdot E_{al} \cdot f_1} \cdot (3 \cdot l^2 - 4 \cdot a^2)$$

The distance a of the glazing supports of the glass pane is a= 0.150 m



▪ Self weight

The required moment of inertia of a transom subjected to self weight loading is given by:

$$J_{y2} = \frac{5 \cdot q \cdot l^4 \cdot 10^8}{384 \cdot E_{al} \cdot f_2}$$

where:
G - weight of glass pane, kg
l - length of transom, m
q - weight of transom per linear meter, kg/m

For transoms loaded by dead loads:

$$f = \frac{l}{500}$$

or 0,003m, whichever is the less (EN 13830)

Total required moment of inertia:

$$J_y = J_{y1} + J_{y2}$$

Use ETEM catalogue to choose the appropriate transom with Jy exceeding or equal to the required Jy.

Use ETEM catalogue to choose the appropriate profile which characteristics exceed or are equal to both calculated values Jx and Jy.

Sample

Initial data:
t = 12mm
ρ_{glass} = 2,5 kg/m²x mm
l_g = 2m
h_g = 1,5m
E_{al} = 7.10⁹ kg/m²
a = 0,150 m

$G = t \cdot \rho_{glass} \cdot l_g \cdot h_g = 12 \cdot 2{,}5 \cdot 2 \cdot 1{,}5 = 90$ kg

$$f = \frac{l}{500} = \frac{2}{500} = 0{,}004 > 3 \text{ m}$$

$\Rightarrow$ f = 0,003 m in the following formula:

$$J_{y1} = \frac{G \cdot a \cdot 10^8}{48 \cdot E_{al} \cdot f} \cdot (3 \cdot l^2 - 4 \cdot a^2) =$$

$$= \frac{90 \cdot 0{,}150 \cdot 10^8}{48 \cdot 7 \cdot 10^9 \cdot 0{,}003} \cdot (3 \cdot 2^2 - 4 \cdot 0{,}150^2) =$$

$= 15{,}9 \text{ cm}^4$

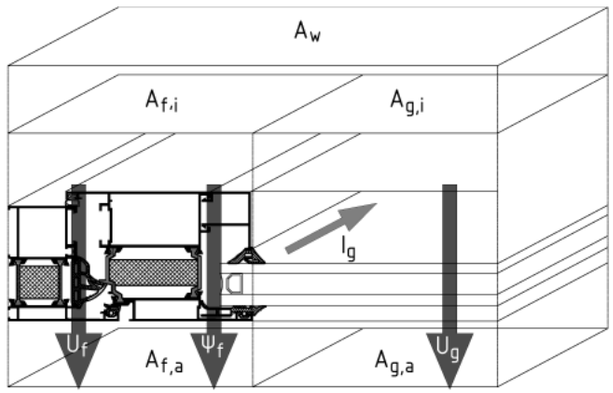
We choose the appropriate profile which characteristics exceed or are equal to both calculated values
J_x = 19,5 cm⁴ and J_y = 15,9 cm⁴

The appropriate transom is E 85303 with
J_x = 45,8 cm⁴ and J_y = 21,5 cm⁴

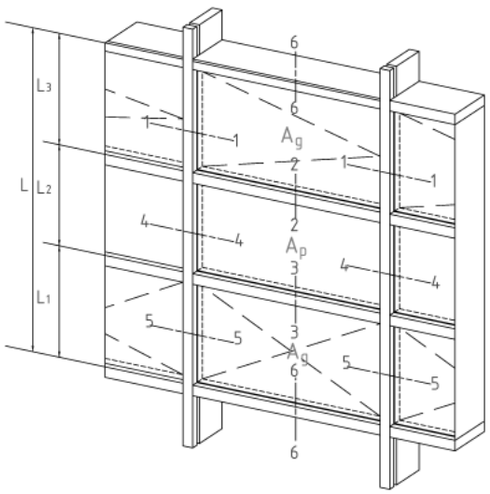
Thermal transmittance coefficient Ucw of curtain wall

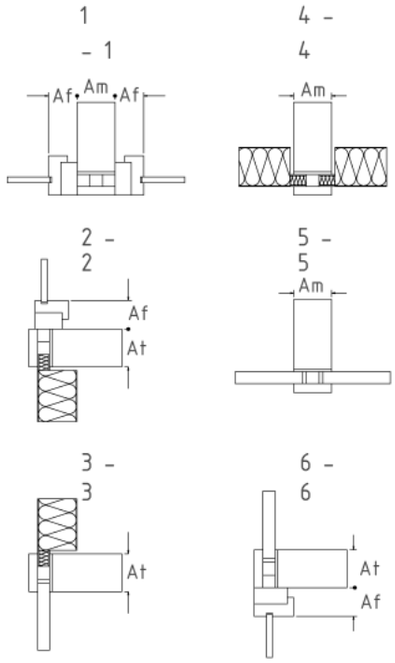
$$U_{cw} = \frac{\sum A_g.U_g + \sum A_p.U_p + \sum A_f.U_f + \sum l_g.\Psi_g + \sum l_p.\Psi_p}{\sum A_g + A_f + A_p} \qquad (1)$$

U_{cw} – thermal transmittance of the curtain wall, (W /m^2.K)
U_g –thermal transmittance of the glass, (W /m^2.K)
U_p – thermal transmittance of the panel, (W /m^2 .K)
U_f – thermal transmittance of the aluminium profile, (W /m^2.K)
l_g – total length of the glass spacer, (m)
l_p – total length of the panel spacer, (m)
Ψ_g –linear thermal transmittance of the glass spacer, (W/m.K)
Ψ_p – linear thermal transmittance of the panel spacer, (W/m.K)
A_g – visible glass area, (m^2)
A_p – visible panel area, (m^2)
A_f – aluminium frame area, (m^2)
U_{cw} – is calculated by formula (1)
U_g – is given by the glass manufacturer
U_f – is given by the manufacturer of the aluminium profiles
U_p – is given by the panel manufacturer
R – thermal resistance, (m^2 .K / W)
d – panel thickness, (m)
l –thermal conductivity, (W/m. K)



$$U = \frac{1}{R} \qquad R = \frac{d}{\lambda}$$





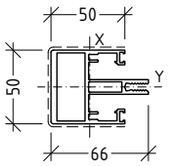
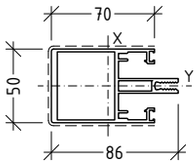
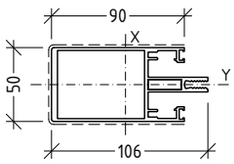
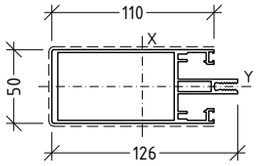
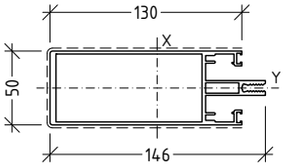
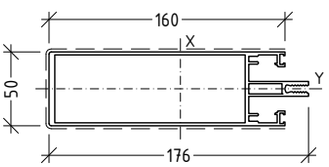
THERMAL TRANSMITTANCE COEFFICIENT OF DIFFERENT PROFILE COMBINATIONS

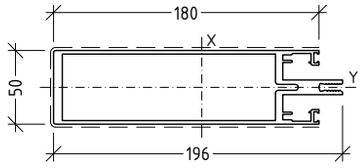
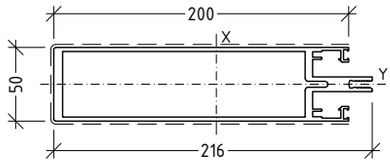
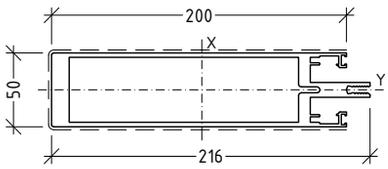
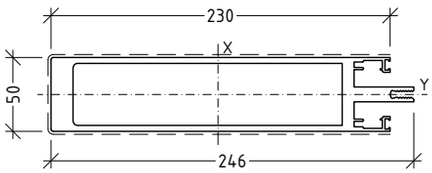
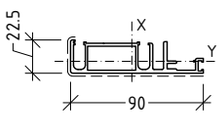
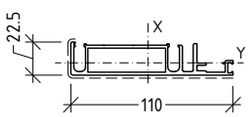
Test specimen ε = 0.9	Profile Number	Beam	Pressure plate	Cover profile	Transom depth (mm)	Uvalue
E 85 SG with press border	1a: 31927- S1-01a	E 85100	E 85700	E 85714	50	2,2
	2a: 31927- S1-02a	E 85103	E 85700	E 85714	110	2,3
	3a: 31927- S1-03a	E 85107	E 85700	E 85714	200	2,3
	4a: 31927- S1-04a	E 85301	E 85700	E 85714	29	1,9
	5a: 31927- S1-05a	E 85303	E 85700	E 85714	69	2,0
	6a: 31927- S1-06a	E 85307	E 85700	E 85714	159	2,1
	7a: 31927- S1-07a	E 85100	E 85700	E 85714	50	2,1
	8a: 31927- S1-08a	E 85107	E 85700	E 85714	200	2,3
	9a: 31927- S1-09a	E 85301	E 85700	E 85714	29	1,9
	10a: 31927- S1-10a	E 85307	E 85700	E 85714	159	2,1
E 85 SG	1a: 31927- S2-01a	E 85100	-	-	50	2,5
	2a: 31927- S2-02a	E 85103	-	-	110	2,7
	3a: 31927- S2-03a	E 85107	-	-	200	2,8
	4a: 31927- S2-04a	E 85301	-	-	29	2,3
	5a: 31927- S2-05a	E 85303	-	-	69	2,4
	6a: 31927- S2-06a	E 85307	-	-	159	2,5
	7a: 31927- S2-07a	E 85100	-	-	50	2,5
	8a: 31927- S2-08a	E 85107	-	-	200	2,7
	9a: 31927- S2-09a	E 85301	-	-	29	2,2
	10a: 31927- S2-10a	E 85307	-	-	159	2,5
E 85	1a: 31927- S3-01a	E 85100	E 85700	E 85714	56	2,5
	2a: 31927- S3-02a	E 85103	E 85700	E 85714	116	2,6
	3a: 31927- S3-03a	E 85107	E 85700	E 85714	206	2,7
	4a: 31927- S3-04a	E 85301	E 85700	E 85714	35	2,2
	5a: 31927- S3-05a	E 85303	E 85700	E 85714	75	2,3
	6a: 31927- S3-06a	E 85307	E 85700	E 85714	165	2,4
	7a: 31927- S3-07a	E 85360	E 85700	E 85714	15	2,0
	8a: 31927- S3-08a	E 85354	E 85700	E 85714	95	2,2
	9a: 31927- S3-09a	E 85359	E 85700	E 85714	205	2,3
	10a: 31927- S3-10a	E 85100	E 85700	E 85714	50	1,9
	11a: 31927- S3-11a	E 85107	E 85700	E 85714	200	2,1
	12a: 31927- S3-12a	E 85301	E 85700	E 85714	29	1,7
	13a: 31927- S3-13a	E 85307	E 85700	E 85714	159	1,9
	14a: 31927- S3-14a	E 85360	E 85700	E 85714	15	1,5
	15a: 31927- S3-15a	E 85359	E 85700	E 85714	205	1,6
E 85 with ET.080173.00	1a: 31927- S4-01a	E 85100	E 85700	E 85714	60	1,9
	2a: 31927- S4-02a	E 85103	E 85700	E 85714	120	2,0
	3a: 31927- S4-03a	E 85107	E 85700	E 85714	210	2,1
	4a: 31927- S4-04a	E 85301	E 85700	E 85714	39	1,9
	5a: 31927- S4-05a	E 85303	E 85700	E 85714	79	1,9
	6a: 31927- S4-06a	E 85307	E 85700	E 85714	169	2,0
	7a: 31927- S4-07a	E 85360	E 85700	E 85714	15	1,8
	8a: 31927- S4-08a	E 85354	E 85700	E 85714	95	2,0
	9a: 31927- S4-09a	E 85359	E 85700	E 85714	205	2,0
	10a: 31927- S4-10a	E 85100	E 85700	E 85714	50	1,5
	11a: 31927- S4-11a	E 85107	E 85700	E 85714	200	1,6
	12a: 31927- S4-12a	E 85301	E 85700	E 85714	29	1,4
	13a: 31927- S4-13a	E 85307	E 85700	E 85714	159	1,5
	14a: 31927- S4-14a	E 85360	E 85700	E 85714	15	1,3
	15a: 31927- S4-15a	E 85359	E 85700	E 85714	205	1,5

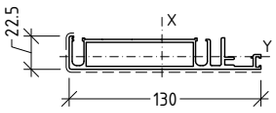
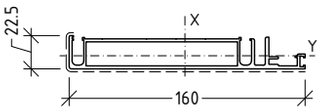
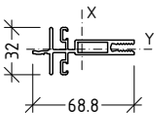
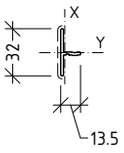
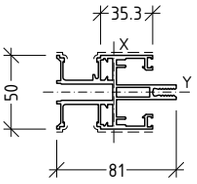
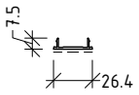
TABLES

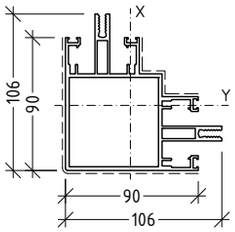
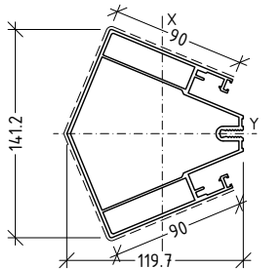
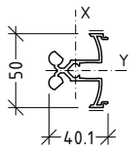
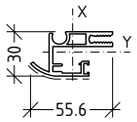
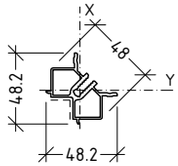
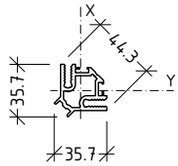
LIST OF PROFILES | CHARACTERISTICS

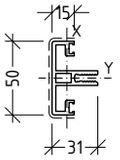
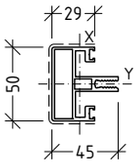
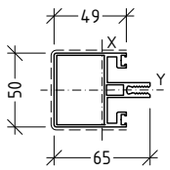
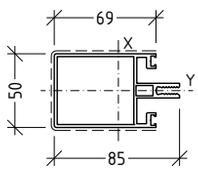
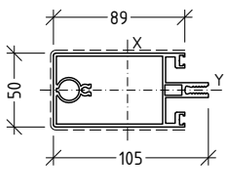
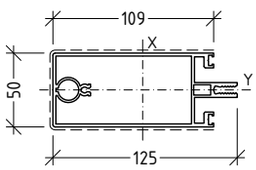
ETEM BUILDING SYSTEMS

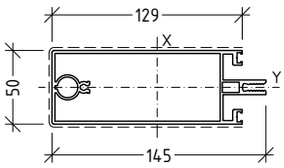
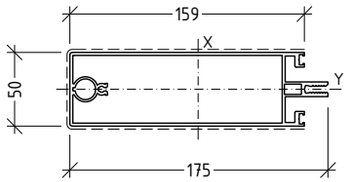
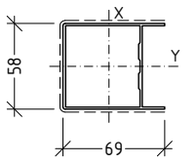
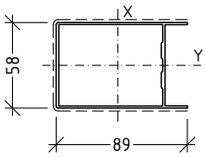
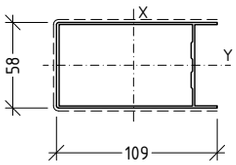
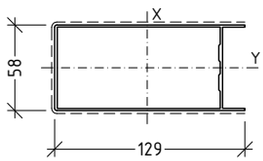
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85100	mullion		6,6 m 2006 g/m 448 mm 149 mm	Ix = 27,70 cm^4 Wx = 6,96 cm^3 ex = 2,50 cm ix = 1,93 cm		Iy = 19,39 cm^4 Wy = 7,75 cm^3 ey = 3,98 cm iy = 1,62 cm	
E 85101	mullion		6,6 m 2211 g/m 488 mm 189 mm	Ix = 58,04 cm^4 Wx = 12,19 cm^3 ex = 2,50 cm ix = 2,66 cm		Iy = 23,79 cm^4 Wy = 9,51 cm^3 ey = 4,76 cm iy = 1,70 cm	
E 85102	mullion		6,6 m 2417 g/m 528 mm 229 mm	Ix = 104,15 cm^4 Wx = 18,65 cm^3 ex = 2,50 cm ix = 3,41 cm		Iy = 28,19 cm^4 Wy = 11,27 cm^3 ey = 5,58 cm iy = 1,78 cm	
E 85103	mullion		6,6 m 2665 g/m 568 mm 269 mm	Ix = 169,00 cm^4 Wx = 26,15 cm^3 ex = 2,50 cm ix = 4,14 cm		Iy = 33,43 cm^4 Wy = 13,37 cm^3 ey = 6,46 cm iy = 1,84 cm	
E 85104	mullion		6,6 m 2881 g/m 608 mm 309 mm	Ix = 252,55 cm^4 Wx = 34,40 cm^3 ex = 2,50 cm ix = 4,87 cm		Iy = 38,03 cm^4 Wy = 15,21 cm^3 ey = 7,34 cm iy = 1,89 cm	
E 85105	mullion		6,6 m 3205 g/m 668 mm 369 mm	Ix = 417,97 cm^4 Wx = 46,90 cm^3 ex = 2,50 cm ix = 5,93 cm		Iy = 44,95 cm^4 Wy = 17,98 cm^3 ey = 8,91 cm iy = 1,95 cm	

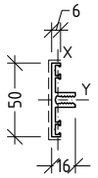
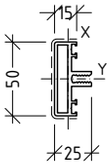
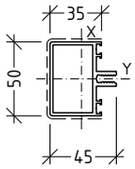
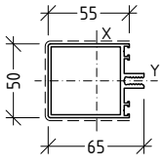
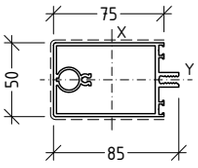
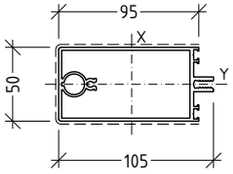
code	description	profile	length weight ext. perimeter vis. perimeter	statical values	
E 85106	mullion		6,6 m 4628 g/m 708 mm 409 mm	I_x = 752,98 cm^4 W_x = 74,89 cm^3 e_x = 2,50 cm i_x = 6,63 cm	I_y = 60,74 cm^4 W_y = 24,30 cm^3 e_y = 10,06 cm i_y = 1,88 cm
E 85107	mullion		6,6 m 5165 g/m 748 mm 449 mm	I_x = 1003,76 cm^4 W_x = 91,01 cm^3 e_x = 2,50 cm i_x = 7,24 cm	I_y = 71,32 cm^4 W_y = 28,53 cm^3 e_y = 11,03 cm i_y = 1,93 cm
E 85108	mullion		6,6 m 6423 g/m 748 mm 449 mm	I_x = 1326,00 cm^4 W_x = 116,21 cm^3 e_x = 2,50 cm i_x = 7,47 cm	I_y = 80,93 cm^4 W_y = 32,37 cm^3 e_y = 11,41 cm i_y = 1,85 cm
E 85109	mullion		6,6 m 8416 g/m 808 mm 509 mm	I_x = 2161,67 cm^4 W_x = 162,85 cm^3 e_x = 2,50 cm i_x = 8,33 cm	I_y = 110,05 cm^4 W_y = 44,02 cm^3 e_y = 13,27 cm i_y = 1,88 cm
E 85152	split mullion		6,6 m 1320 g/m 382 mm 114 mm	I_x = 33,69 cm^4 W_x = 6,96 cm^3 e_x = 1,44 cm i_x = 2,62 cm	I_y = 2,70 cm^4 W_y = 1,87 cm^3 e_y = 4,84 cm i_y = 0,74 cm
E 85153	split mullion		6,6 m 1536 g/m 422 mm 134 mm	I_x = 60,99cm^4 W_x = 10,58 cm^3 e_x = 1,41 cm i_x = 3,27 cm	I_y = 3,40 cm^4 W_y = 2,40 cm^3 e_y = 5,77 cm i_y = 0,77 cm

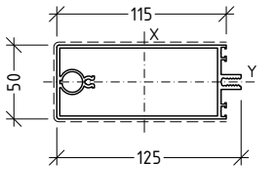
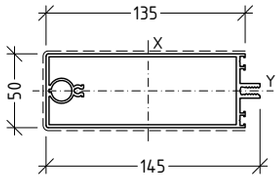
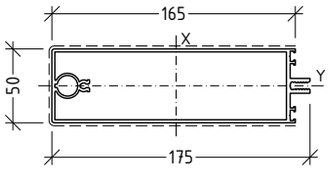
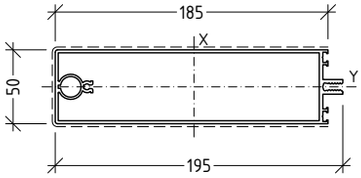
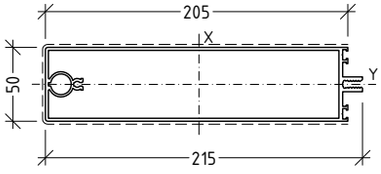
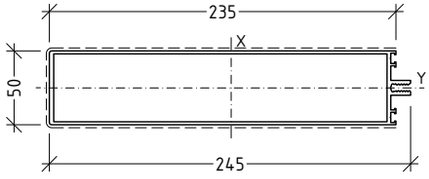
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85154	split mullion		6,6 m 1752 g/m 462 mm 154 mm	I_x = 99,63 cm^4 W_x = 14,85 cm^3 e_x = 1,39 cm i_x = 3,92 cm		I_y = 4,09 cm^4 W_y = 2,94 cm^3 e_y = 6,71 cm i_y = 0,79 cm	
E 85155	split mullion		6,6 m 2076 g/m 523 mm 184 mm	I_x = 182,37 cm^4 W_x = 22,39 cm^3 e_x = 1,37 cm i_x = 4,87 cm		I_y = 5,12 cm^4 W_y = 3,75 cm^3 e_y = 8,15 cm i_y = 0,82 cm	
E 85150	suppl. profile for split mullion		6,6 m 1004 g/m 343 mm 0 mm	I_x = 14,00 cm^4 W_x = 3,95 cm^3 e_x = 1,72 cm i_x = 1,94 cm		I_y = 1,56 cm^4 W_y = 0,90 cm^3 e_y = 3,55 cm i_y = 0,65 cm	
E 85151	suppl. profile for split mullion		6,6 m 230 g/m 91 mm 33 mm	I_x = 0,10 cm^4 W_x = 0,10 cm^3 e_x = 1,62 cm i_x = 0,35 cm		I_y = 0,53 cm^4 W_y = 0,33 cm^3 e_y = 1,07 cm i_y = 0,79 cm	
E 85120	mullion for substructure		6,6 m 2311 g/m 643 mm 94 mm	I_x = 36,82 cm^4 W_x = 8,70 cm^3 e_x = 2,51 cm i_x = 2,08 cm		I_y = 18,31 cm^4 W_y = 7,29 cm^3 e_y = 4,23 cm i_y = 1,46 cm	
E 19641	cover cap		6,6 m 130 g/m 81 mm 26 mm				

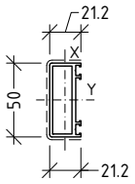
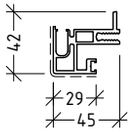
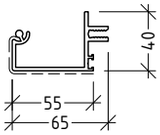
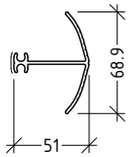
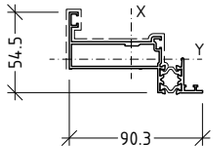
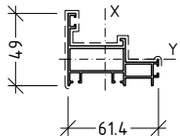
code	description	profile	length weight ext. perimeter vis. perimeter	statical values	
E 85130	mullion 90°		6,6 m 3572 g/m 859 mm 259 mm	I_x = 128,93 cm^4 W_x = 20,80 cm^3 e_x = 6,20 cm i_x = 3,12 cm	I_y = 128,93 cm^4 W_y = 20,80 cm^3 e_y = 6,20 cm i_y = 3,12 cm
E 85135	mullion 135°		6,6 m 3610 g/m 650 mm 333 mm	I_x = 176,02 cm^4 W_x = 27,17 cm^3 e_x = 7,06 cm i_x = 3,63 cm	I_y = 216,12 cm^4 W_y = 30,62 cm^3 e_y = 6,48 cm i_y = 4,02 cm
E 85140	suppl. mullion profile		6,6 m 999 g/m 313 mm 19 mm	I_x = 6,14 cm^4 W_x = 2,79 cm^3 e_x = 2,50 cm i_x = 1,29 cm	I_y = 5,17 cm^4 W_y = 2,07 cm^3 e_y = 2,20 cm i_y = 1,18 cm
E 85141	split rotating mullion		6,6 m 986 g/m 312 mm 42 mm	I_x = 7,26 cm^4 W_x = 2,54 cm^3 e_x = 1,62 cm i_x = 1,41 cm	I_y = 3,89 cm^4 W_y = 2,41 cm^3 e_y = 2,86 cm i_y = 1,03 cm
E 85142	inner suppl. mullion profile 90°		6,6 m 810 g/m 226 mm 29 mm	I_x = 3,50 cm^4 W_x = 1,38 cm^3 e_x = 2,53 cm i_x = 1,08 cm	I_y = 3,50 cm^4 W_y = 1,38 cm^3 e_y = 2,53 cm i_y = 1,08 cm
E 85143	outer suppl. mullion profile 90°		6,6 m 972 g/m 240 mm 0 mm	I_x = 3,38 cm^4 W_x = 1,89 cm^3 e_x = 1,79 cm i_x = 0,97 cm	I_y = 3,38 cm^4 W_y = 1,89 cm^3 e_y = 1,79 cm i_y = 0,97 cm

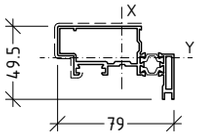
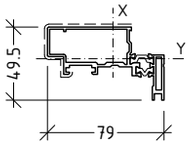
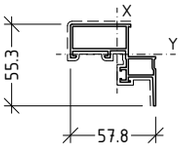
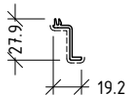
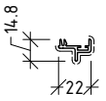
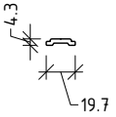
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85300	2nd level transom		6,01 m 1015 g/m 300 mm 79 mm	I_x = 2,78 cm^4 W_x = 1,33 cm^3 e_x = 2,50 cm i_x = 0,86 cm		I_y = 7,64 cm^4 W_y = 3,06 cm^3 e_y = 2,10 cm i_y = 1,43 cm	
E 85301	2nd level transom		6,01 m 1293 g/m 330 mm 107 mm	I_x = 7,12 cm^4 W_x = 2,76 cm^3 e_x = 2,50 cm i_x = 1,22 cm		I_y = 11,55 cm^4 W_y = 4,62 cm^3 e_y = 2,61 cm i_y = 1,55 cm	
E 85302	2nd level transom		6,01 m 1455 g/m 370 mm 147 mm	I_x = 19,52 cm^4 W_x = 6,00 cm^3 e_x = 2,50 cm i_x = 1,90 cm		I_y = 15,08 cm^4 W_y = 6,03 cm^3 e_y = 3,26 cm i_y = 1,67 cm	
E 85303	2nd level transom		6,01 m 1785 g/m 410 mm 187 mm	I_x = 45,83 cm^4 W_x = 10,54 cm^3 e_x = 2,50 cm i_x = 2,64 cm		I_y = 21,60 cm^4 W_y = 8,64 cm^3 e_y = 4,35 cm i_y = 1,81 cm	
E 85304	2nd level transom		6,01 m 2276 g/m 450 mm 227 mm	I_x = 98,87 cm^4 W_x = 18,06 cm^3 e_x = 2,50 cm i_x = 3,42 cm		I_y = 26,45 cm^4 W_y = 10,58 cm^3 e_y = 5,47 cm i_y = 1,77 cm	
E 85305	2nd level transom		6,01 m 2492 g/m 490 mm 267 mm	I_x = 160,52 cm^4 W_x = 25,02 cm^3 e_x = 2,50 cm i_x = 4,17 cm		I_y = 31,06 cm^4 W_y = 12,42 cm^3 e_y = 6,42 cm i_y = 1,83 cm	

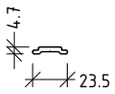
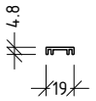
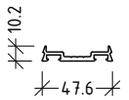
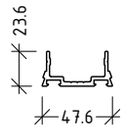
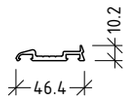
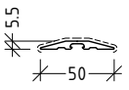
code	description	profile	length weight ext. perimeter vis. perimeter	statical values	
E 85306	2nd level transom		6,01 m 2708 g/m 530 mm 307 mm	I_x = 240,58 cm^4 W_x = 32,66 cm^3 e_x = 2,50 cm i_x = 4,90 cm	I_y = 35,67 cm^4 W_y = 14,27 cm^3 e_y = 7,37 cm i_y = 1,89 cm
E 85307	2nd level transom		6,01 m 3032 g/m 590 mm 367 mm	I_x = 398,72 cm^4 W_x = 45,28 cm^3 e_x = 2,50 cm i_x = 5,96 cm	I_y = 42,59 cm^4 W_y = 17,04 cm^3 e_y = 8,81 cm i_y = 1,95 cm
E 85600	2nd level suppl. transom		6,01 m 1080 g/m 283 mm 195 mm	I_x = 22,08 cm^4 W_x = 5,85 cm^3 e_x = 2,90 cm i_x = 2,35 cm	I_y = 20,50 cm^4 W_y = 7,07 cm^3 e_y = 3,78 cm i_y = 2,27 cm
E 85601	2nd level suppl. transom		6,01 m 1229 g/m 323 mm 235 mm	I_x = 43,64 cm^4 W_x = 9,25 cm^3 e_x = 2,90 cm i_x = 3,10 cm	I_y = 24,98 cm^4 W_y = 8,61 cm^3 e_y = 4,72 cm i_y = 2,34 cm
E 85602	2nd level suppl. transom		6,01 m 1380 g/m 363 mm 275 mm	I_x = 74,28 cm^4 W_x = 13,10 cm^3 e_x = 2,90 cm i_x = 3,81 cm	I_y = 29,47 cm^4 W_y = 10,16 cm^3 e_y = 5,67 cm i_y = 2,40 cm
E 85603	2nd level suppl. transom		6,01 m 1531 g/m 403 mm 315 mm	I_x = 115,13 cm^4 W_x = 17,37 cm^3 e_x = 2,90 cm i_x = 4,50 cm	I_y = 33,95 cm^4 W_y = 11,71 cm^3 e_y = 6,63 cm i_y = 2,45 cm

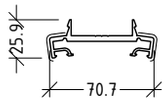
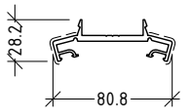
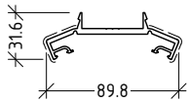
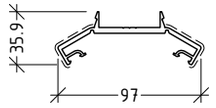
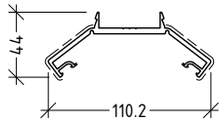
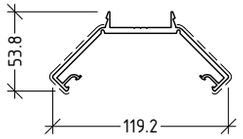
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85350	3rd level transom		6,01 m 605 g/m 204 mm 62 mm	Ix = 0,41 cm^4 Wx = 0,35 cm^3 ex = 2,50 cm ix = 0,43 cm		Iy = 3,78 cm^4 Wy = 1,51 cm^3 ey = 1,18 cm iy = 1,30 cm	
E 85360	3rd level transom		6,01 m 948 g/m 221 mm 79 mm	Ix = 1,49 cm^4 Wx = 0,94 cm^3 ex = 2,50 cm ix = 0,65 cm		Iy = 7,42 cm^4 Wy = 2,97 cm^3 ey = 1,58 cm iy = 1,45 cm	
E 85351	3rd level transom		6,01 m 1164 g/m 261 mm 119 mm	Ix = 8,70 cm^4 Wx = 3,69 cm^3 ex = 2,50 cm ix = 1,42 cm		Iy = 12,03 cm^4 Wy = 4,81 cm^3 ey = 2,36 cm iy = 1,67 cm	
E 85352	3rd level transom		6,01 m 1380 g/m 301 mm 159 mm	Ix = 24,25 cm^4 Wx = 7,37 cm^3 ex = 2,50 cm ix = 2,18 cm		Iy = 16,64 cm^4 Wy = 6,65 cm^3 ey = 3,29 cm iy = 1,80 cm	
E 85353	3rd level transom		6,01 m 1874 g/m 341 mm 199 mm	Ix = 58,19 cm^4 Wx = 12,82 cm^3 ex = 2,50 cm ix = 2,90 cm		Iy = 21,49 cm^4 Wy = 8,60 cm^3 ey = 4,54 cm iy = 1,76 cm	
E 85354	3rd level transom		6,01 m 2090 g/m 381 mm 239 mm	Ix = 102,48 cm^4 Wx = 18,46 cm^3 ex = 2,50 cm ix = 3,64 cm		Iy = 26,10 cm^4 Wy = 10,44 cm^3 ey = 5,55 cm iy = 1,84 cm	

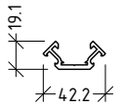
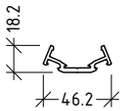
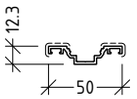
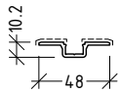
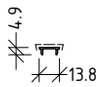
code	description	profile	length weight ext. perimeter vis. perimeter	statical values	
E 85355	3rd level transom		6,01 m 2306 g/m 421 mm 279 mm	I_x = 162,24 cm^4 W_x = 24,72 cm^3 e_x = 2,50 cm i_x = 4,36 cm	I_y = 30,71 cm^4 W_y = 12,29 cm^3 e_y = 6,56 cm i_y = 1,90 cm
E 85356	3rd level transom		6,01 m 2522 g/m 461 mm 319 mm	I_x = 239,09 cm^4 W_x = 31,58 cm^3 e_x = 2,50 cm i_x = 5,06 cm	I_y = 35,32 cm^4 W_y = 14,13 cm^3 e_y = 7,57 cm i_y = 1,95 cm
E 85357	3rd level transom		6,01 m 2846 g/m 521 mm 379 mm	I_x = 389,88 cm^4 W_x = 42,93 cm^3 e_x = 2,50 cm i_x = 6,08 cm	I_y = 42,24 cm^4 W_y = 16,90 cm^3 e_y = 9,08 cm i_y = 2,00 cm
E 85358	3rd level transom		6,01 m 3062 g/m 561 mm 419 mm	I_x = 516,42 cm^4 W_x = 51,19 cm^3 e_x = 2,50 cm i_x = 6,75 cm	I_y = 46,85 cm^4 W_y = 18,74 cm^3 e_y = 10,09 cm i_y = 2,03 cm
E 85359	3rd level transom		6,01 m 3278 g/m 601 mm 459 mm	I_x = 665,65 cm^4 W_x = 60,01 cm^3 e_x = 2,50 cm i_x = 7,41 cm	I_y = 51,46 cm^4 W_y = 20,58 cm^3 e_y = 11,09 cm i_y = 2,06 cm
E 85369	3rd level transom		6,01 m 3448 g/m 661 mm 519 mm	I_x = 882,24 cm^4 W_x = 71,59 cm^3 e_x = 2,50 cm i_x = 8,31 cm	I_y = 58,94 cm^4 W_y = 23,58 cm^3 e_y = 12,32 cm i_y = 2,15 cm

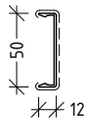
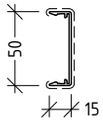
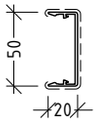
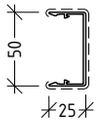
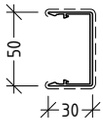
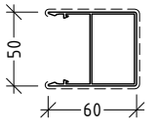
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85380	3rd level hidden transom		6,01 m 820 g/m 175 mm 91 mm	Ix = 1,67 cm^4 Wx = 1,54 cm^3 ex = 2,50 cm ix = 0,74 cm		Iy = 8,74 cm^4 Wy = 3,50 cm^3 ey = 1,09 cm iy = 1,70 cm	
E 85320	2nd level split transom		6,01 m 1131 g/m 312 mm 60 mm	Ix = 7,62 cm^4 Wx = 3,14 cm^3 ex = 2,40 cm ix = 1,35 cm		Iy = 4,98 cm^4 Wy = 2,08 cm^3 ey = 2,43 cm iy = 1,09 cm	
E 85370	3rd level split transom		6,01 m 1061 g/m 341 mm 77 mm	Ix = 19,34 cm^4 Wx = 5,80 cm^3 ex = 2,55 cm ix = 2,22 cm		Iy = 5,21 cm^4 Wy = 2,04 cm^3 ey = 3,34 cm iy = 1,15 cm	
E 85670	suppl. profile for E 85370		6,01 m 791 g/m 294 mm 13 mm	Ix = 8,56 cm^4 Wx = 2,74 cm^3 ex = 3,44 cm ix = 1,71 cm		Iy = 6,26 cm^4 Wy = 1,82 cm^3 ey = 3,12 cm iy = 1,46 cm	
E 85410	frame		6,01 m 1329 g/m 415 mm 186 mm	Ix = 38,50 cm^4 Wx = 7,97 cm^3 ex = 3,19 cm ix = 2,77 cm		Iy = 8,12 cm^4 Wy = 1,33 cm^3 ey = 4,83 cm iy = 1,34 cm	
E 85400	frame		6,01 m 886 g/m 339 mm 185 mm	Ix = 12,87 cm^4 Wx = 3,55 cm^3 ex = 3,10 cm ix = 1,98 cm		Iy = 4,62 cm^4 Wy = 1,49 cm^3 ey = 3,62 cm iy = 1,19 cm	

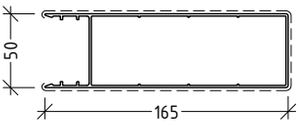
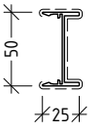
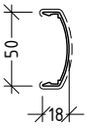
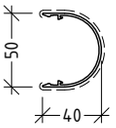
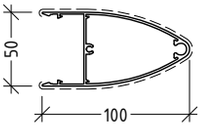
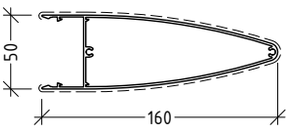
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85210	sash for projected window		6,01 m 1413 g/m 365 mm 105 mm	I_x = W_x = e_x = i_x =	30,66 cm^4 7,63 cm^3 2,81 cm 2,54 cm	I_y = W_y = e_y = i_y =	8,17 cm^4 1,99 cm^3 4,35 cm 1,31 cm
E 85211	sash for parallel window		6,01 m 1416 g/m 357 mm 104 mm	I_x = W_x = e_x = i_x =	30,90 cm^4 7,57 cm^3 2,81 cm 2,53 cm	I_y = W_y = e_y = i_y =	8,15 cm^4 1,92 cm^3 4,44 cm 1,30 cm
E 85200	sash for projected window		6,01 m 934 g/m 287 mm 209 mm	I_x = W_x = e_x = i_x =	11,78 cm^4 3,72 cm^3 3,49 cm 1,84 cm	I_y = W_y = e_y = i_y =	6,71 cm^4 1,92 cm^3 3,17 cm 1,39 cm
E 85614	external glass support		6,01 m 208 g/m 99 mm 43 mm				
E 85615	external glass support		6,01 m 200 g/m 101 mm 46 mm				
E 2308	operating rod		4,4 m 159 g/m 48 mm 0 mm				

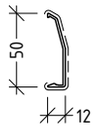
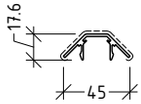
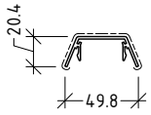
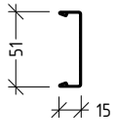
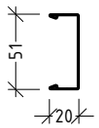
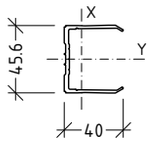
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 2309	operating rod		4,40 m 197 g/m 55 mm 0 mm	
E 85915	spacer		6,01 m 130 g/m 66 mm 0 mm	
E 85700	pressure plate		6,01 m 435 g/m 151 mm 0 mm	
E 85745	pressure plate		6,01 m 655 g/m 205 mm 0 mm	
E 85701	pressure plate for slope > 25°		6,01 m 403 g/m 138 mm 0 mm	
E 85702	pressure plate for slope > 15°		6,01 m 416 g/m 113 mm 54 mm	

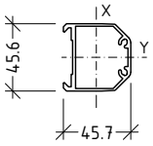
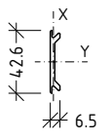
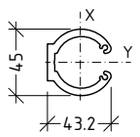
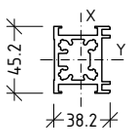
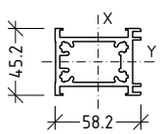
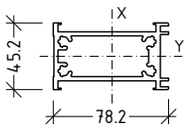
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85703	pressure plate for angle 7.5°		6,01 m 1034 g/m 305 mm 51 mm	
E 85704	pressure plate for angle 15°		6,01 m 1121 g/m 327 mm 63 mm	
E 85705	pressure plate for angle 22.5°		6,01 m 1204 g/m 349 mm 74 mm	
E 85706	pressure plate for angle 30°		6,01 m 1291 g/m 371 mm 86 mm	
E 85707	pressure plate for angle 37.5°		6,01 m 1455 g/m 413 mm 106 mm	
E 85708	pressure plate for angle 45°		6,01 m 1620 g/m 455 mm 128 mm	

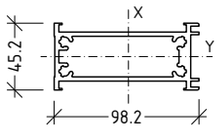
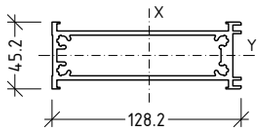
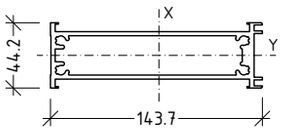
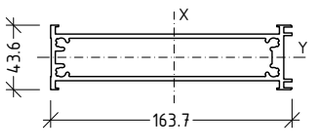
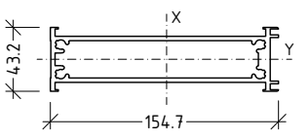
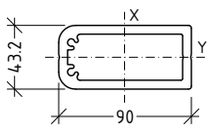
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85740	pressure plate for corner 90°		6,01 m 510 g/m 170 mm 0 mm	
E 85741	pressure plate for corner 135°		6,01 m 508 g/m 169 mm 0 mm	
E 85709	pressure plate		6,01 m 384 g/m 169 mm 41 mm	
E 85719	cover cap for E 85709		6,01 m 126 g/m 87 mm 37 mm	
E 85750	pressure plate		6,01 m 348 g/m 130 mm 42 mm	
E 85751	cover cap for E 85750		6,01 m 54 g/m 45 mm 16 mm	

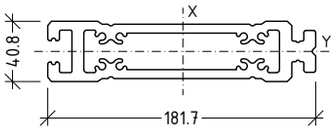
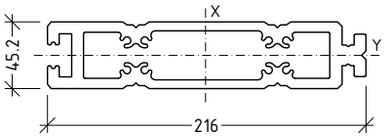
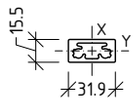
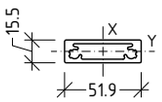
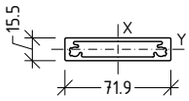
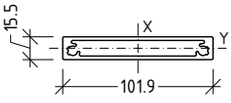
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85711	cover cap		6,01 m 289 g/m 144 mm 75 mm	
E 85712	cover cap		6,01 m 332 g/m 166 mm 81 mm	
E 85713	cover cap		6,01 m 400 g/m 191 mm 91 mm	
E 85714	cover cap		6,01 m 432 g/m 211 mm 101 mm	
E 85715	cover cap		6,01 m 467 g/m 231 mm 111 mm	
E 85716	cover cap		6,01 m 821 g/m 291 mm 171 mm	

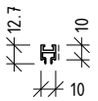
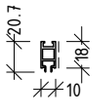
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85718	cover cap		6,01 m 1779 g/m 506 mm 381 mm	
E 85720	cover cap		6,01 m 467 g/m 206 mm 121 mm	
E 85721	cover cap		6,01 m 281 g/m 150 mm 77 mm	
E 85722	cover cap		6,01 m 462 g/m 231 mm 110 mm	
E 85723	cover cap		6,01 m 1207 g/m 337 mm 216 mm	
E 85724	cover cap		6,01 m 1627 g/m 453 mm 333 mm	

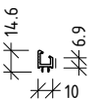
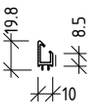
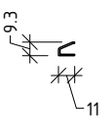
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85730	cover cap		6,01 m 262 g/m 132 mm 67 mm	
E 85731	cover cap corner 90°		6,01 m 373 g/m 171 mm 61 mm	
E 85732	cover cap corner 135°		6,01 m 446 g/m 206 mm 79 mm	
E 85790	cover cap inox		6,01 m - g/m - mm - mm	
E 85791	cover cap inox		6,01 m - g/m - mm - mm	
E 85906	transom connector		6,01 m 724 g/m 251 mm 0 mm	I_x = 3,93 cm^4 I_y = 8,95 cm^4 W_x = 1,39 cm^3 W_y = 3,90 cm^3 e_x = 2,30 cm e_y = 2,83 cm i_x = 1,21 cm i_y = 1,83 cm

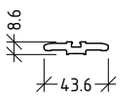
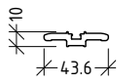
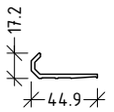
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85907	transom connector		6,01 m 1010 g/m 187 mm 0 mm	I_x = W_x = e_x = i_x =	9,79 cm^4 4,20 cm^3 2,28 cm 1,62 cm	I_y = W_y = e_y = i_y =	10,20 cm^4 4,47 cm^3 2,33 cm 1,65 cm
E 85908	base for transom connector		6,01 m 367 g/m 109 mm 0 mm	I_x = W_x = e_x = i_x =	0,04 cm^4 0,08 cm^3 2,13 cm 0,16 cm	I_y = W_y = e_y = i_y =	2,02 cm^4 0,95 cm^3 0,44 cm 1,22 cm
E 85994	transom connector		2,01 m 1557 g/m 261 mm 0 mm	I_x = W_x = e_x = i_x =	10,31 cm^4 4,25 cm^3 2,25 cm 1,34 cm	I_y = W_y = e_y = i_y =	12,85 cm^4 5,71 cm^3 2,43 cm 1,49 cm
E 85951	insert for E 85101		2,01 m 1739 g/m 240 mm 0 mm	I_x = W_x = e_x = i_x =	9,82 cm^4 4,96 cm^3 2,26 cm 1,24 cm	I_y = W_y = e_y = i_y =	11,31 cm^4 5,01 cm^3 1,98 cm 1,33 cm
E 85952	insert for E 85102		2,01 m 2041 g/m 280 mm 0 mm	I_x = W_x = e_x = i_x =	31,32 cm^4 10,71 cm^3 2,26 cm 2,04 cm	I_y = W_y = e_y = i_y =	13,91 cm^4 6,15 cm^3 2,92 cm 1,36 cm
E 85953	insert for E 85103		2,01 m 2344 g/m 320 mm 0 mm	I_x = W_x = e_x = i_x =	67,86 cm^4 17,02 cm^3 2,26 cm 2,80 cm	I_y = W_y = e_y = i_y =	16,05 cm^4 7,30 cm^3 3,99 cm 1,38 cm

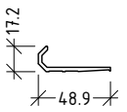
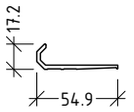
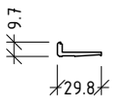
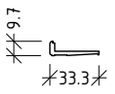
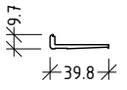
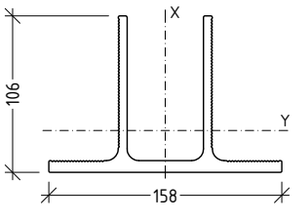
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85954	insert for E 85104		2,01 m 2646 g/m 360 mm 0 mm	I_x = 121,71 cm^4 W_x = 24,17 cm^3 e_x = 2,26 cm i_x = 3,52 cm		I_y = 19,10 cm^4 W_y = 8,45 cm^3 e_y = 5,04 cm i_y = 1,40 cm	
E 85955	insert for E 85105		2,01 m 3100 g/m 420 mm 0 mm	I_x = 239,90 cm^4 W_x = 36,40 cm^3 e_x = 2,26 cm i_x = 4,57 cm		I_y = 22,99 cm^4 W_y = 10,17 cm^3 e_y = 6,59 cm i_y = 1,42 cm	
E 85956	insert for E 85106		2,01 m 3275 g/m 449 mm 0 mm	I_x = 311,58 cm^4 W_x = 42,32 cm^3 e_x = 2,21 cm i_x = 5,07 cm		I_y = 23,06 cm^4 W_y = 10,43 cm^3 e_y = 7,36 cm i_y = 1,38 cm	
E 85957	insert for E 85107		2,01 m 3532 g/m 488 mm 0 mm	I_x = 425,36 cm^4 W_x = 50,82 cm^3 e_x = 2,18 cm i_x = 5,70 cm		I_y = 24,21 cm^4 W_y = 11,11 cm^3 e_y = 8,37 cm i_y = 1,36 cm	
E 85958	insert for E 85108		2,01 m 3499 g/m 469 mm 0 mm	I_x = 368,85 cm^4 W_x = 46,79 cm^3 e_x = 2,16 cm i_x = 5,34 cm		I_y = 23,17 cm^4 W_y = 10,73 cm^3 e_y = 7,88 cm i_y = 1,34 cm	
E 85961	insert for polygonal atriums		2,01 m 3977 g/m 255 mm 0 mm	I_x = 138,19 cm^4 W_x = 30,46 cm^3 e_x = 2,16 cm i_x = 3,06 cm		I_y = 39,69 cm^4 W_y = 18,38 cm^3 e_y = 4,54 cm i_y = 1,64 cm	

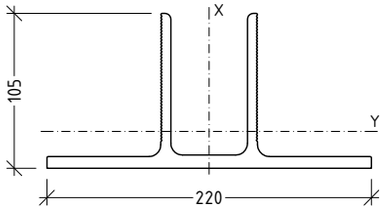
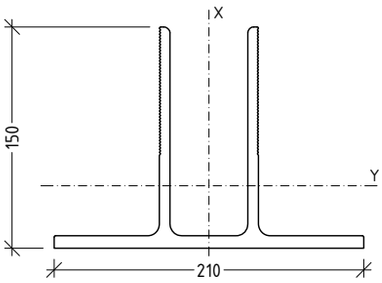
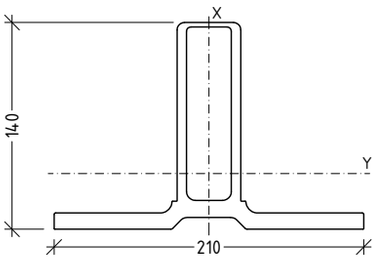
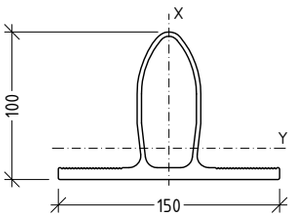
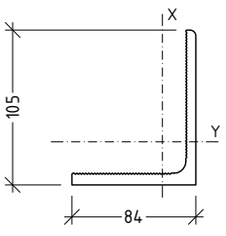
code	description	profile	length weight ext. perimeter vis. perimeter	statical values	
E 85969	roof connector/ insert for E 85109		2,01 m 7680 g/m 545 mm 0 mm	I_x = 1076,08 cm^4 W_x = 117,52 cm^3 e_x = 2,04 cm i_x = 5,80 cm	I_y = 60,25 cm^4 W_y = 32,79 cm^3 e_y = 9,17 cm i_y = 1,45 cm
E 85960	roof connector		2,01 m 10916 g/m 624 mm 0 mm	I_x = 1908,80 cm^4 W_x = 175,48 cm^3 e_x = 2,26 cm i_x = 6,87 cm	I_y = 108,21 cm^4 W_y = 47,88 cm^3 e_y = 10,88 cm i_y = 1,64 cm
E 85972	insert for E 85152		2,01 m 764 g/m 93 mm 0 mm	I_x = 3,26 cm^4 W_x = 2,04 cm^3 e_x = 0,78 cm i_x = 1,07 cm	I_y = 0,81 cm^4 W_y = 1,04 cm^3 e_y = 1,60 cm i_y = 0,54 cm
E 85973	insert for E 85153		2,01 m 1034 g/m 133 mm 0 mm	I_x = 11,95 cm^4 W_x = 4,60 cm^3 e_x = 0,78 cm i_x = 1,77 cm	I_y = 1,24 cm^4 W_y = 1,59 cm^3 e_y = 2,60 cm i_y = 0,57 cm
E 85974	insert for E 85154		2,01 m 1304 g/m 173 mm 0 mm	I_x = 28,29 cm^4 W_x = 7,87 cm^3 e_x = 0,78 cm i_x = 2,42 cm	I_y = 1,67 cm^4 W_y = 2,14 cm^3 e_y = 3,60 cm i_y = 0,59 cm
E 85975	insert for E 85155		2,01 m 1709 g/m 233 mm 0 mm	I_x = 71,55 cm^4 W_x = 14,04 cm^3 e_x = 0,78 cm i_x = 3,36 cm	I_y = 2,31 cm^4 W_y = 2,97 cm^3 e_y = 5,10 cm i_y = 0,60 cm

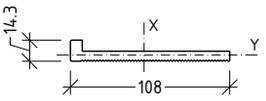
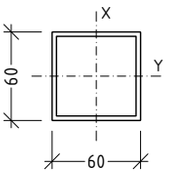
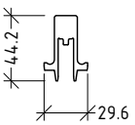
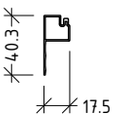
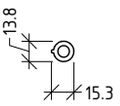
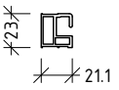
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85640	spacer 6 mm		6,01 m 97 g/m 59 mm 6 mm	
E 8611	spacer 10 mm		6,01 m 130 g/m 82 mm 10 mm	
E 85641	spacer 12 mm		6,01 m 140 g/m 90 mm 12 mm	
E 85642	spacer 18 mm		6,01 m 200 g/m 98 mm 18 mm	
E 85650	spacer 7,5°		6,01 m 101 g/m 61 mm 6 mm	
E 85651	spacer 15°		6,01 m 108 g/m 65 mm 6 mm	

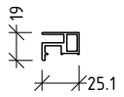
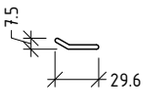
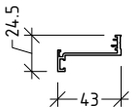
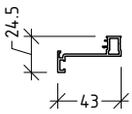
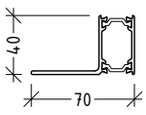
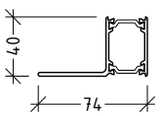
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85652	spacer 22,5°		6,01 m 117 g/m 69 mm 7 mm	
E 85653	spacer 30°		6,01 m 128 g/m 75 mm 7 mm	
E 85654	spacer 37,5°		6,01 m 142 g/m 82 mm 8 mm	
E 85655	spacer 45°		6,01 m 161 g/m 93 mm 9 mm	
33 879	spacer for structural glazing		6,01 m 70 g/m 53 mm 0 mm	

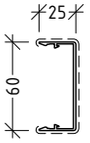
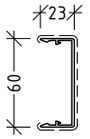
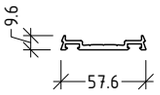
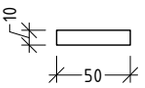
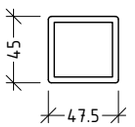
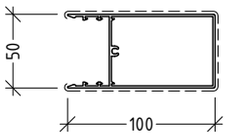
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85990	spacer for structural glazing		6,01 m 229 g/m 138 mm 0 mm	
33 501	spacer for structural glazing		6,01 m 139 g/m 71 mm 0 mm	
33 881	glazing clip for 33 879		6,01 m 307 g/m 68 mm 0 mm	
E 85920	glazing clip		6,01 m 596 g/m 110 mm 0 mm	
E 85921	glazing clip		6,01 m 602 g/m 115 mm 0 mm	
E 85902	glazing support		6,01 m 383 g/m 122 mm 0 mm	

code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85916	glazing support		6,01 m 408 g/m 130 mm 0 mm	
E 85910	glazing support		6,01 m 446 g/m 142 mm 0 mm	
E 85912	glazing support		2,01 m 246 g/m 79 mm 0 mm	
E 85917	glazing support		6,01 m 266 g/m 86 mm 0 mm	
E 85914	glazing support		2,01 m 306 g/m 99 mm 0 mm	
E 85992	fixing bracket		6,01 m 6468 g/m 776 mm 0 mm	I_x = 348,56 cm^4 I_y = 254,56 cm^4 W_x = 44,06 cm^3 W_y = 32,82 cm^3 e_x = 7,76 cm e_y = 7,90 cm i_x = 3,81 cm i_y = 3,26 cm

code	description	profile	length weight ext. perimeter vis. perimeter	statical values	
E 85900	fixing bracket		2,01 m 8397 g/m 871 mm 0 mm	I_x = 822,14 cm^4 W_x = 74,74 cm^3 e_x = 8,00 cm i_x = 5,14 cm	I_y = 279,77 cm^4 W_y = 37,20 cm^3 e_y = 11,00 cm i_y = 3,09 cm
E 85993	fixing bracket		6,01 m 10260 g/m 1032 mm 0 mm	I_x = 836,65 cm^4 W_x = 79,68 cm^3 e_x = 10,76 cm i_x = 4,69 cm	I_y = 842,12 cm^4 W_y = 78,27 cm^3 e_y = 10,50 cm i_y = 4,71 cm
E 85918	fixing bracket		2,01 m 10972 g/m 693 mm 0 mm	I_x = 907,18 cm^4 W_x = 86,40 cm^3 e_x = 10,23 cm i_x = 4,73 cm	I_y = 771,28 cm^4 W_y = 75,39 cm^3 e_y = 10,50 cm i_y = 4,36 cm
E 85913	fixing bracket		2,01 m 4892 g/m 494 mm 0 mm	I_x = 234,00 cm^4 W_x = 31,20 cm^3 e_x = 7,89 cm i_x = 3,59 cm	I_y = 152,96 cm^4 W_y = 19,39 cm^3 e_y = 7,50 cm i_y = 2,91 cm
E 85967	fixing bracket		2,01 m 3458 g/m 415 mm 0 mm	I_x = 85,63 cm^4 W_x = 13,96 cm^3 e_x = 7,58 cm i_x = 2,59 cm	I_y = 135,56 cm^4 W_y = 17,89 cm^3 e_y = 6,13 cm i_y = 3,25 cm
E 85901	suppl. profile for fixing bracket		6,01 m 313 g/m 65 mm 0 mm		

code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85903	suppl. profie for fixing bracket		6,01 m 2036 g/m 271 mm 0 mm	
7528	insert for E 85130		5,00 m 1847 g/m 239 mm 0 mm	I_x = 37,13 cm^4 I_y = 37,13 cm^4 W_x = 12,38 cm^3 W_y = 12,38 cm^3 e_x = 3,00 cm e_y = 3,00 cm i_x = 2,33 cm i_y = 2,33 cm
E 85966	suppl. profile for louvers		6,01 m 1246 g/m 207 mm 0 mm	
E 85911	drainage profile		6,01 m 240 g/m 122 mm 0 mm	
E 85904	profile for spring connector		6,01 m 283 g/m 46 mm 0 mm	
E 85290	spacer for etalbond		6,01 m 448 g/m 126 mm 0 mm	

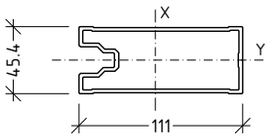
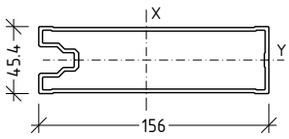
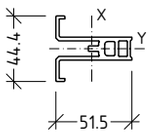
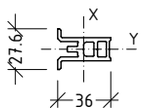
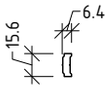
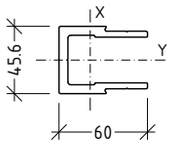
code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 85291	spacer for etalbond		6,01 m 400 g/m 134 mm 0 mm	
E 85610	suppl. profile for sealing membrane		6,01m 176 g/m 65 mm 0 mm	
E 85611	suppl. profile for sealing membrane		6,01 m 346 g/m 176 mm 0 mm	
E 85612	suppl. profile for sealing membrane		6,01 m 381 g/m 170 mm 0 mm	
E 85620	wall attachment profile		6,01 m 984 g/m 277 mm 0 mm	
E 85621	wall attachment profile		6,01 m 999 g/m 285 mm 0 mm	

code	description	profile	length weight ext. perimeter vis. perimeter	statical values
E 8700	cover cap anti-burglar		6,01 m 479 g/m 231 mm 111 mm	
E 8701	cover cap anti-burglar		6,01 m 460 g/m 223 mm 107 mm	
E 8620	pressure plate anti-burglar		6,01 m 554 g/m 168 mm 0 mm	
50009	flat bar anti-burglar		6,01 m 1350 g/m 120 mm 0 mm	
47001	square tube anti-burglar		6,01 m 1816 g/m 182 mm 0 mm	I_x = 21,00 cm^4 I_y = 19,23 cm^4 W_x = 8,84 cm^3 W_y = 8,55 cm^3 e_x = 2,25 cm e_y = 2,38 cm i_x = 1,77 cm i_y = 1,69 cm
E 85727	cover cap		6,01 m 1312 g/m 388 mm 251 mm	

PROFILES

DRAWINGS | SCALE 1:1

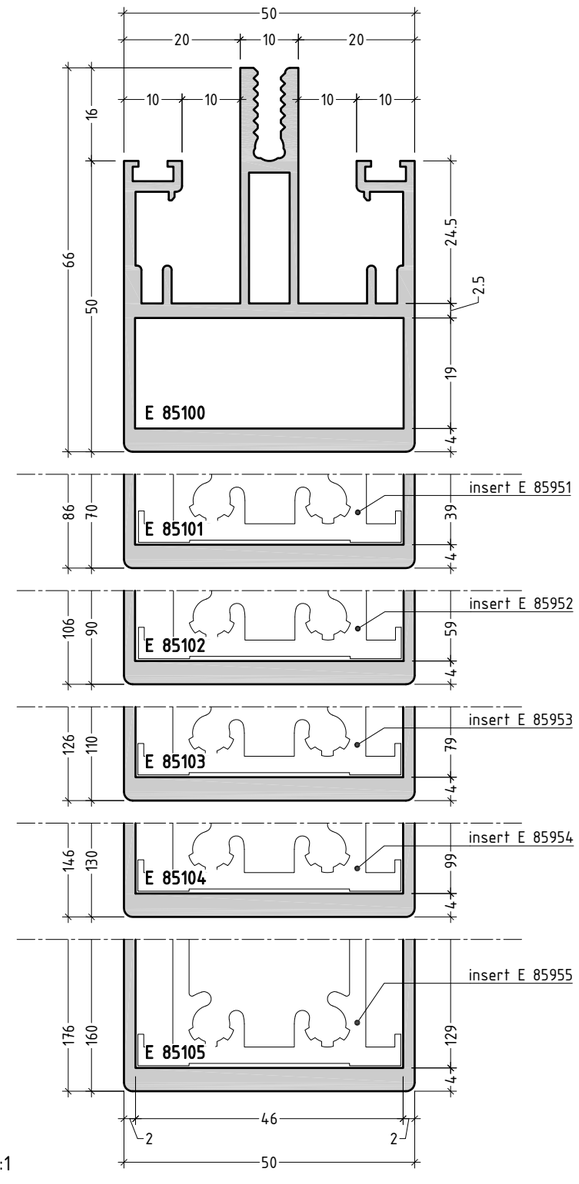
ETEM® BUILDING SYSTEMS

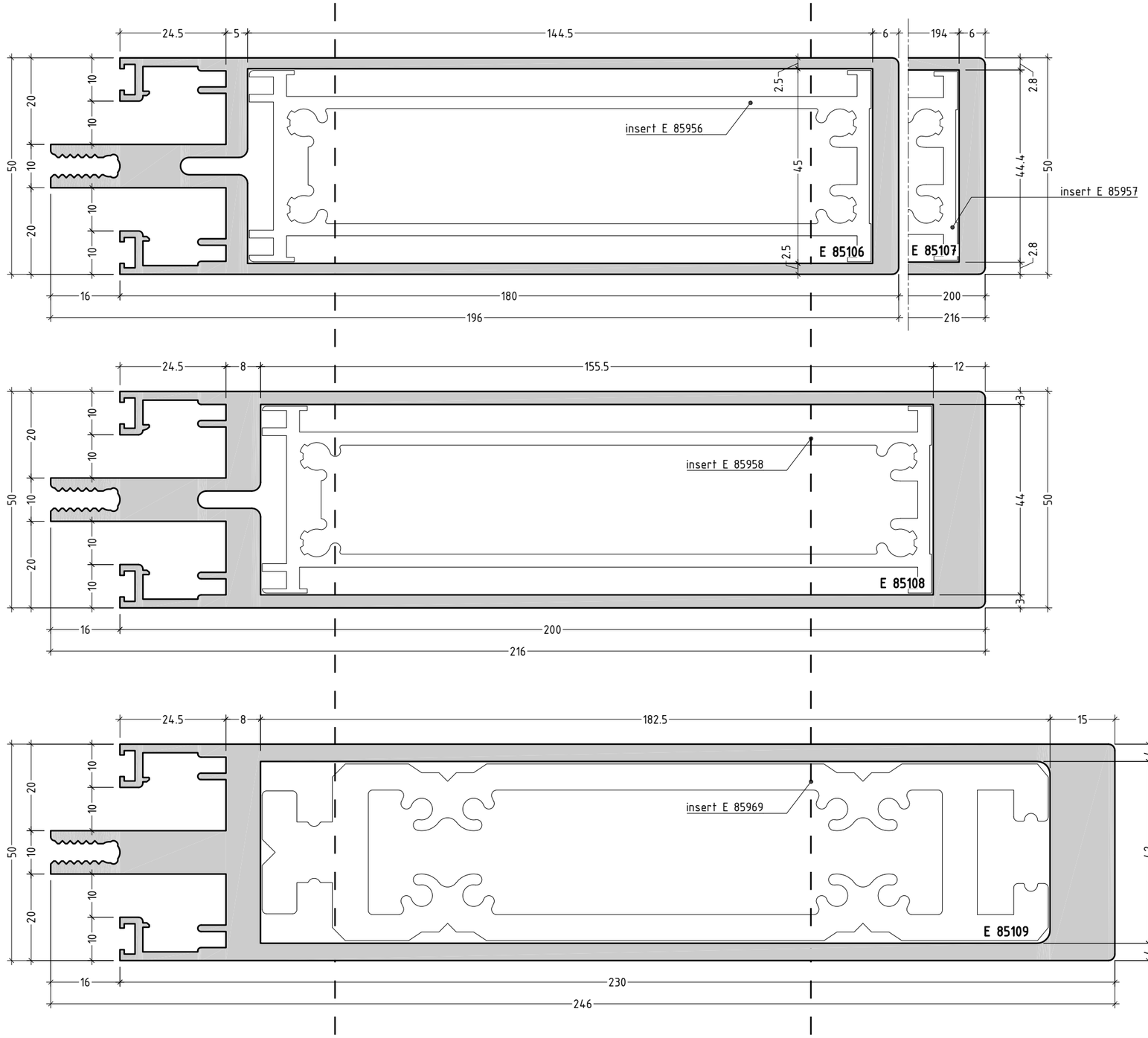
code	description	profile	length weight ext. perimeter vis. perimeter	statical values			
E 85801	reinforcement for transom E 85306		6,01 m 2356 g/m 355 mm 0 mm	I_x = 127,94 cm^4 W_x = 21,57 cm^3 e_x = 2,27 cm i_x = 3,83 cm		I_y = 28,07 cm^4 W_y = 12,36 cm^3 e_y = 5,93 cm i_y = 1,79 cm	
E 85802	reinforcement for transom E 85357		6,01 m 2964 g/m 445 mm 0 mm	I_x = 310,45 cm^4 W_x = 37,33 cm^3 e_x = 2,27 cm i_x = 5,32 cm		I_y = 37,86 cm^4 W_y = 16,68 cm^3 e_y = 8,32 cm i_y = 1,86 cm	
E 85803	reinforced glazing support for 2nd level transom		6,01 m 1250 g/m 276 mm 0 mm	I_x = 12,08 cm^4 W_x = 4,45 cm^3 e_x = 2,22 cm i_x = 1,62 cm		I_y = 3,44 cm^4 W_y = 1,55 cm^3 e_y = 2,72 cm i_y = 0,86 cm	
E 85804	reinforced glazing support for 3rd level transom		6,01 m 889 g/m 165 mm 0 mm	I_x = 3,50 cm^4 W_x = 1,89 cm^3 e_x = 1,38 cm i_x = 1,03 cm		I_y = 1,18 cm^4 W_y = 0,86 cm^3 e_y = 1,84 cm i_y = 0,60 cm	
E 85805	reinforcement additional		6,01 m 210 g/m 44 mm 0 mm				
E 85905	reinforced transom connector		6,01 m 2232 g/m 321 mm 0 mm	I_x = 26,27 cm^4 W_x = 7,76 cm^3 e_x = 2,28 cm i_x = 1,78 cm		I_y = 24,34 cm^4 W_y = 10,68 cm^3 e_y = 3,89 cm i_y = 1,72 cm	

mullions, inserts, connectors and flush transoms 2nd and 3rd level

code	insert	roof connector	2nd level flush transom	2nd level flush transom + suppl. Profile	3rd level flush transom	3rd level flush hidden transom + suppl. profile
E 85100	-	E 85960	E 85302	-	E 85352	-
E 85101	E 85951	E 85960	E 85303	E 85300+E 85600	E 85353	E 85380+E 85600
E 85102	E 85952	E 85960	E 85304	E 85300+E 85601	E 85354	E 85380+E 85601
E 85103	E 85953	E 85960	E 85305	E 85300+E 85602	E 85355	E 85380+E 85602
E 85104	E 85954	E 85960	E 85306	E 85300+E 85603	E 85356	E 85380+E 85603
E 85105	E 85955	E 85960	E 85307	-	E 85357	-
E 85106	E 85956	E 85969	-	-	E 85358	-
E 85107	E 85957	E 85969	-	-	E 85359	-
E 85108	E 85958	E 85969	-	-	E 85359	-
E 85109	E 85969	E 85969	-	-	E 85369	-

mullions





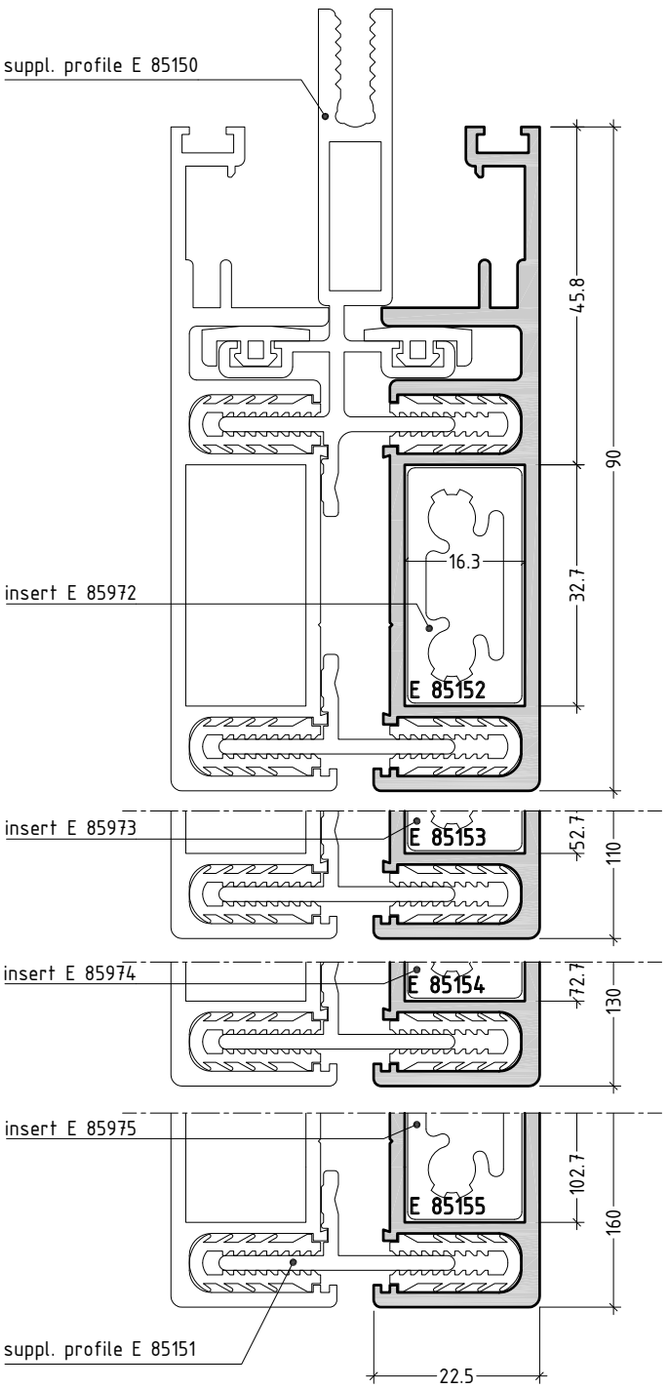
scale 1:1

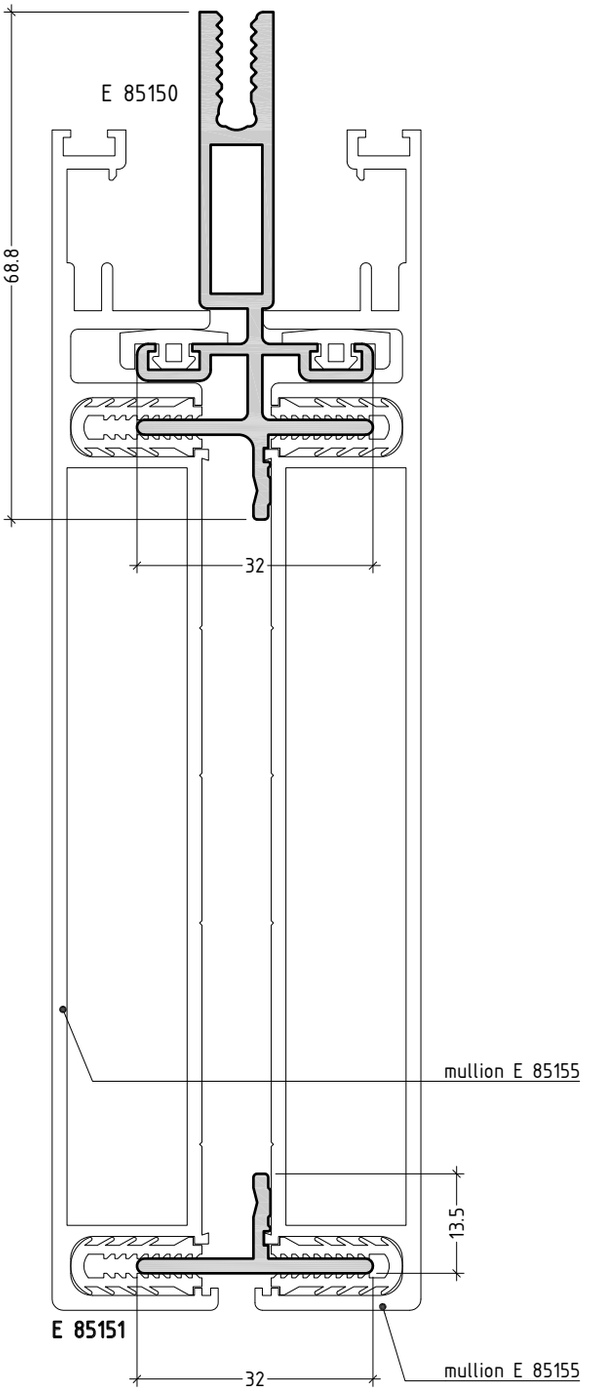
split mullions, inserts and flush transoms 2nd and 3rd level

code	insert	2nd level flush transom	2nd level flush transom + suppl. Profile	3rd level flush transom	3rd level flush hidden transom + suppl. profile
E 85152	E 85972	E 85304	E 85300+E 85601	E 85354	E 85380+E 85601
E 85153	E 85973	E 85305	E 85300+E 85602	E 85355	E 85380+E 85602
E 85154	E 85974	E 85306	E 85300+E 85603	E 85356	E 85380+E 85603
E 85155	E 85975	E 85307	-	E 85357	-

split mullions

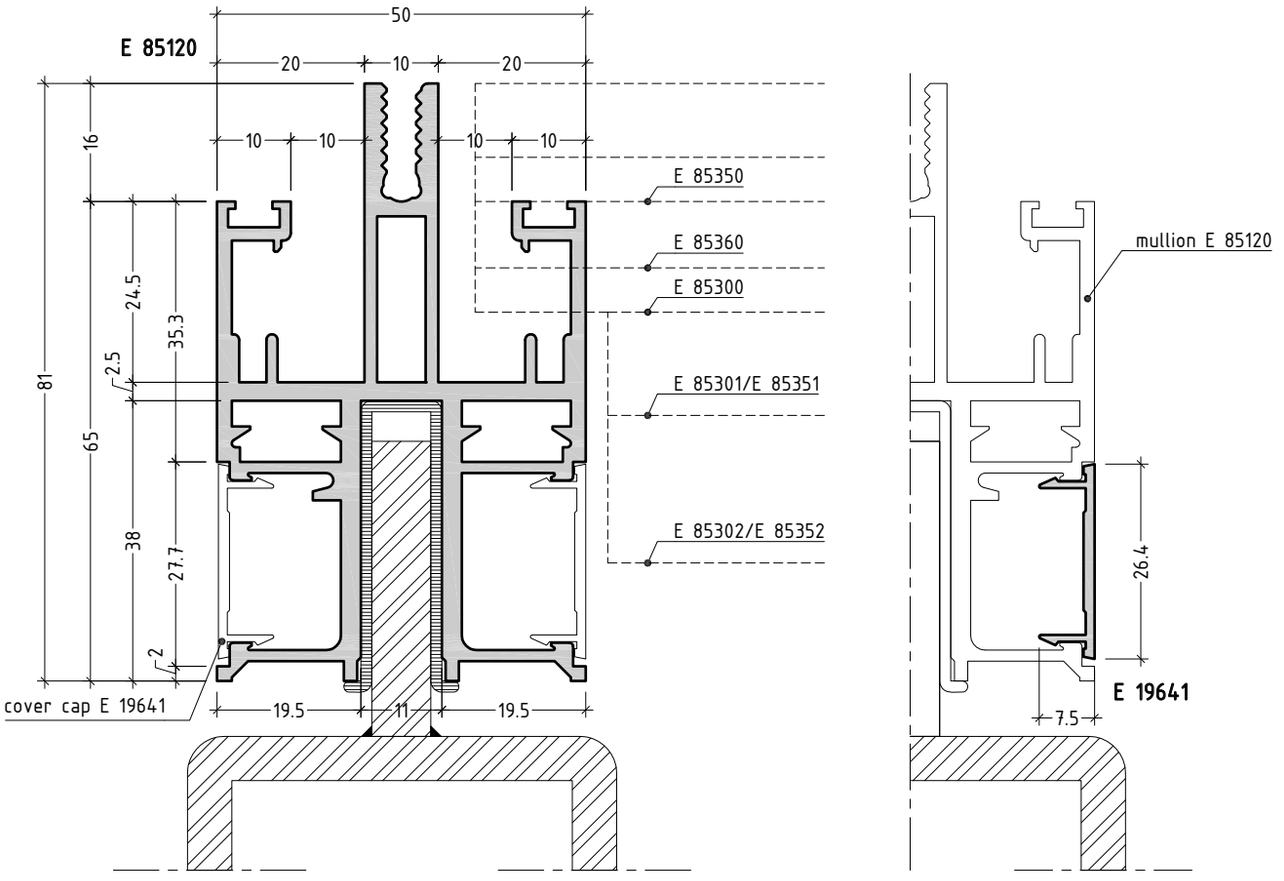
supplementary profiles for split mullions





scale 1:1

mullion for substructure & cover cap

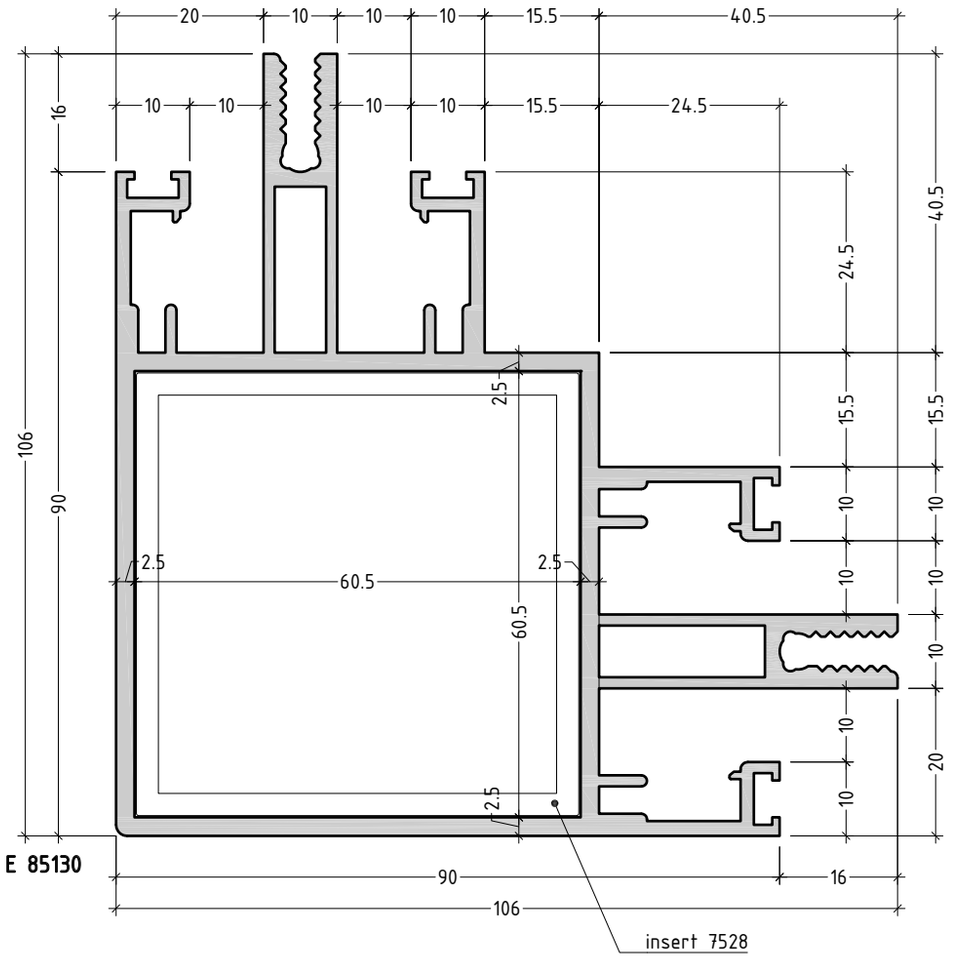


appropriate transom 2nd and 3rd level

code	2nd level transom	3rd level transom
E 85120	E 85300	E 85350/E 85360
	E 85301	E 85351
	E 85302	E 85352

scale 1:1

mullion 90°

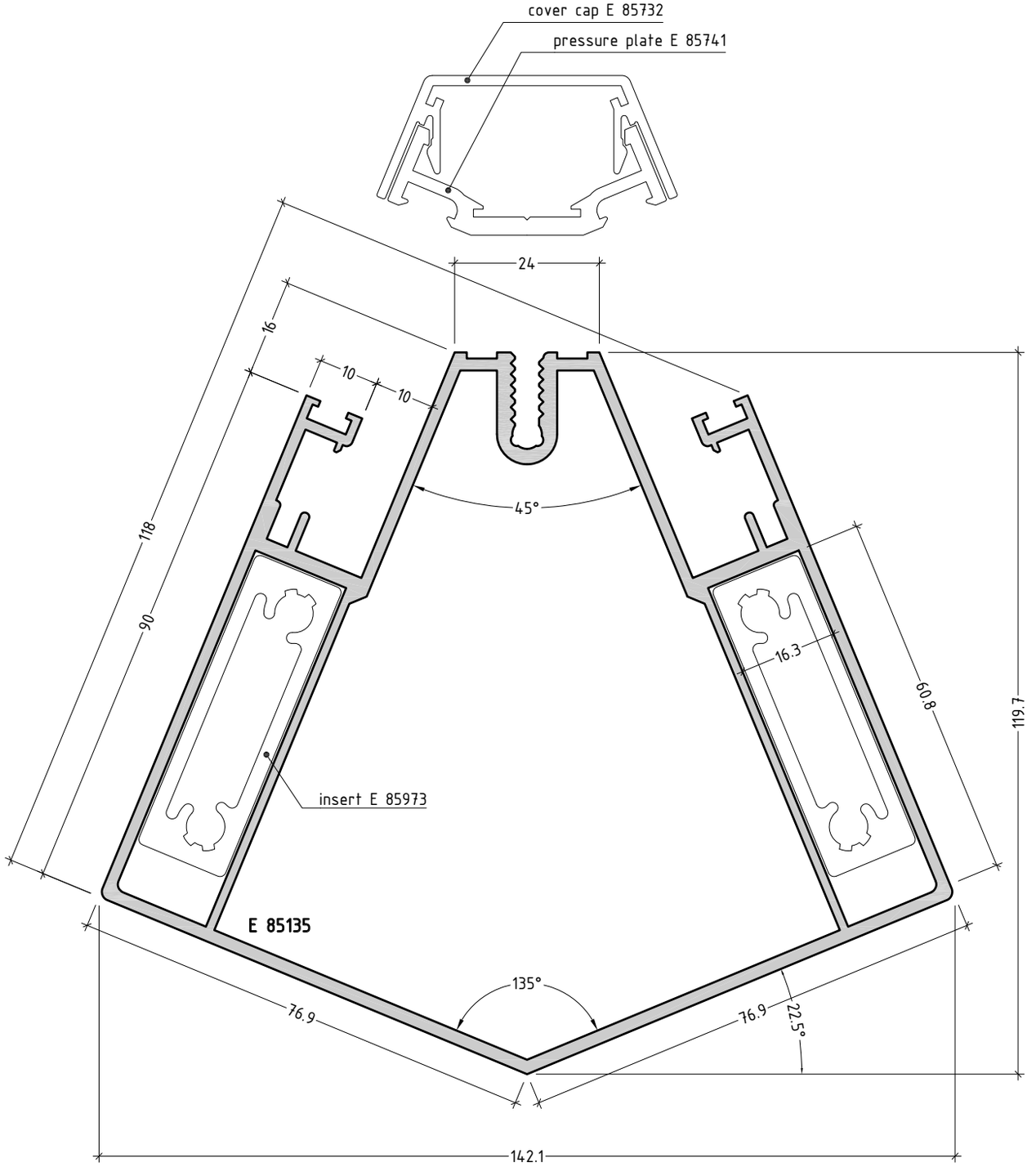


insert and flush transoms 2nd and 3rd level

code	insert	2nd level flush transom	2nd level flush transom + suppl. profile	3rd level flush transom	3rd level flush hidden transom + suppl. Profile
E 85130	7528	E 85304	E 85300+E85601	E 85354	E 85380+E 85601

scale 1:1

mullion 135°

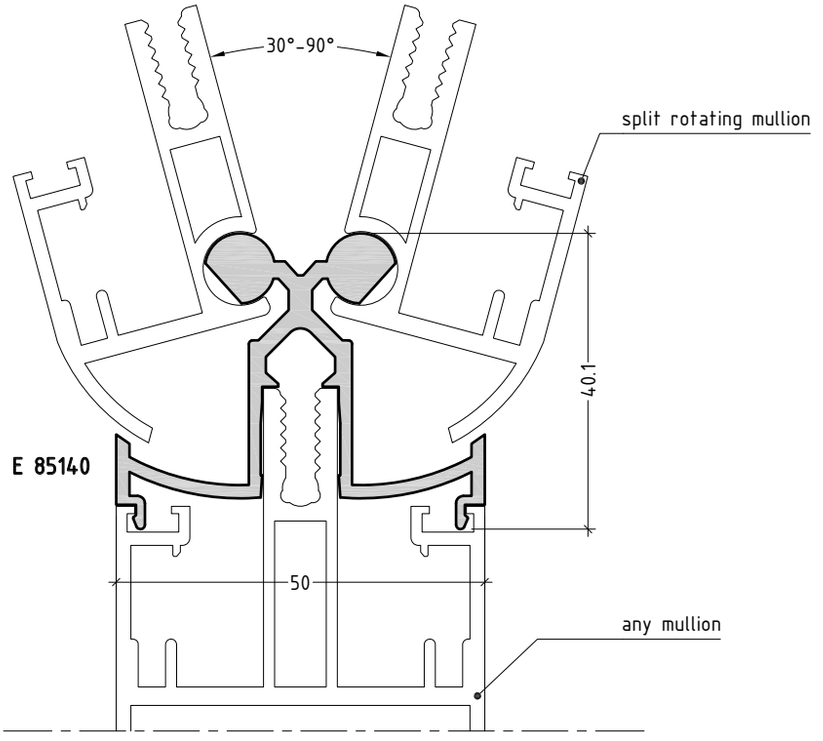


insert and flush transoms 2nd and 3rd level

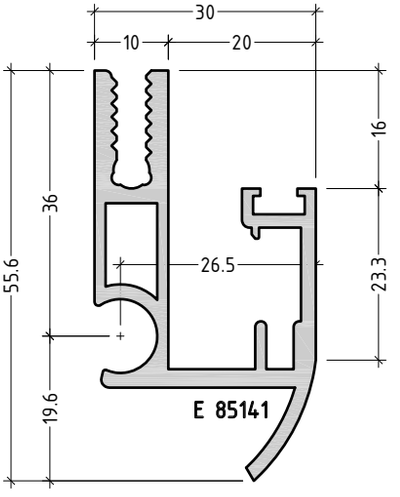
code	insert	2nd level flush transom	2nd level flush transom + suppl. Profile	3rd level flush transom	3rd level flush hidden transom + suppl. profile
E 85135	E 85973	E 85304	E 85300+E85601	E 85354	E 85380+E 85601

scale 1:1

supplementary mullion profile



split rotating mullion with E 85140

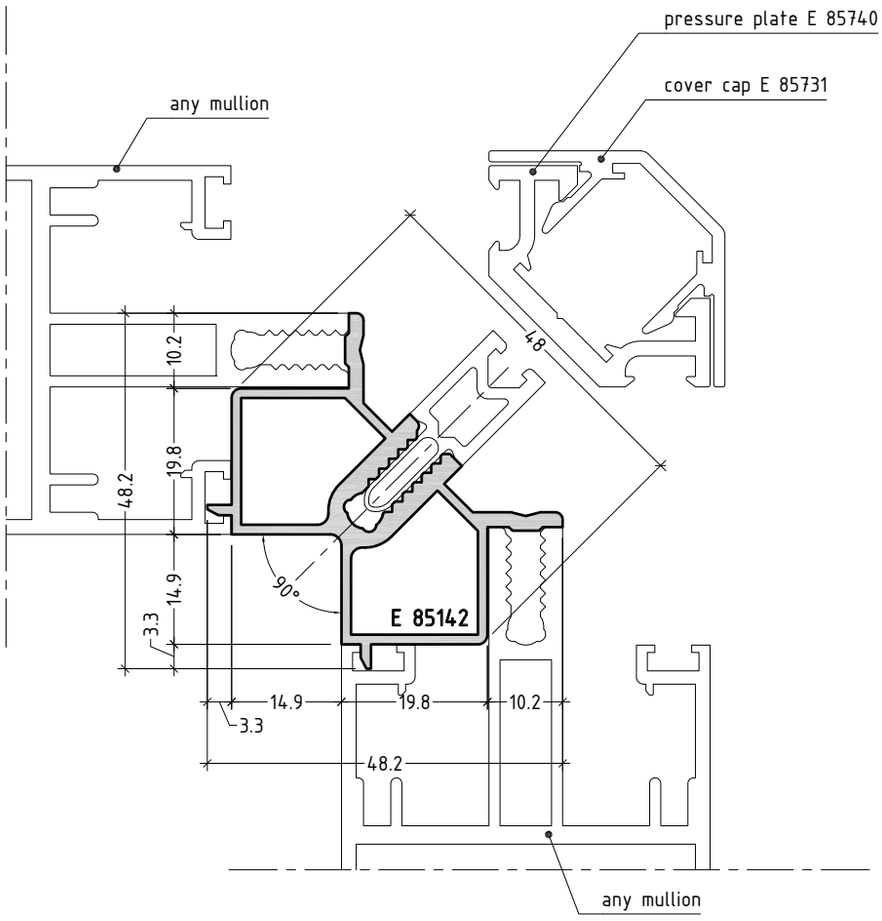


Appropriate transoms 2nd and 3rd level for E 85141

code	2nd level transom	3rd level transom
E 85141	E 85300	E 85350/E 85360

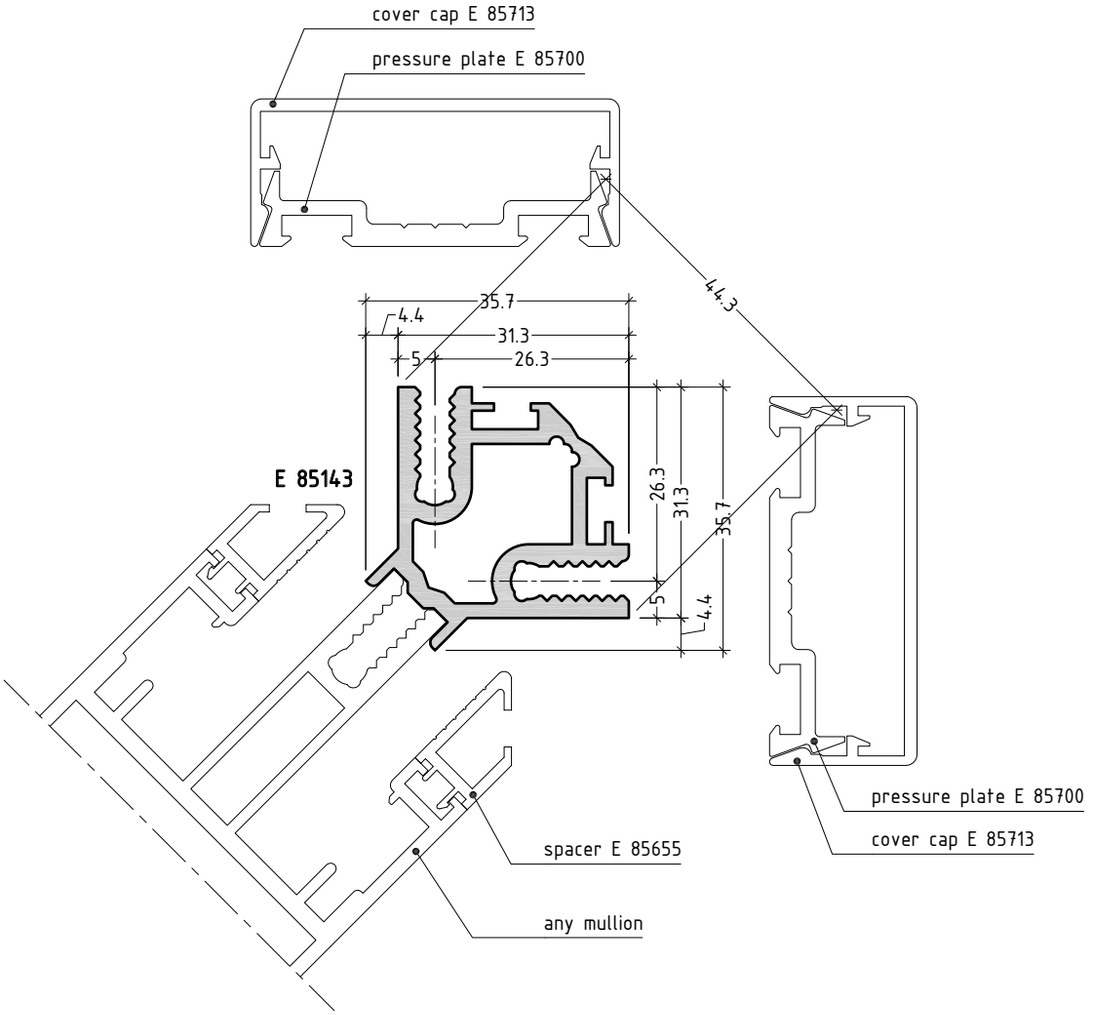
scale 1:1

inner supplementary mullion profile 90°



scale 1:1

outer supplementary mullion profile 90°

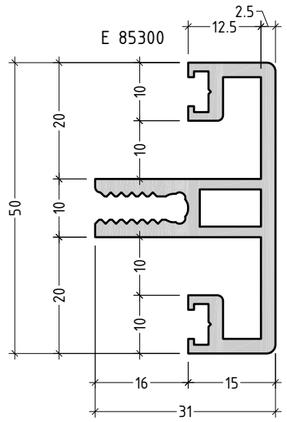


scale 1:1

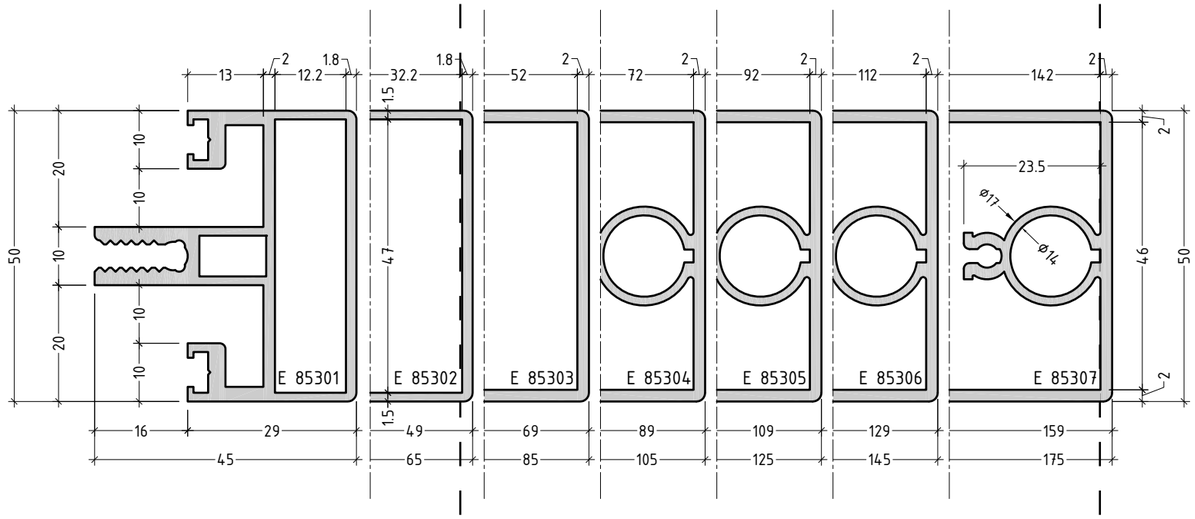
flush transoms 2nd and 3rd level

code	3rd level flush transom	2nd level flush transom + suppl. profile	3rd level flush hidden transom + suppl. profile
E 85300	–	–	–
E 85301	E 85351	–	–
E 85302	E 85352	–	–
E 85303	E 85353	E 85300+E 85600	E 85380+E 85600
E 85304	E 85354	E 85300+E 85601	E 85380+E 85601
E 85305	E 85355	E 85300+E 85602	E 85380+E 85602
E 85306	E 85356	E 85300+E 85603	E 85380+E 85603
E 85307	E 85357	–	–

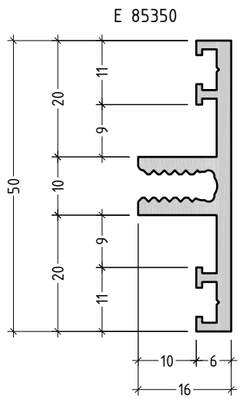
2nd level transom



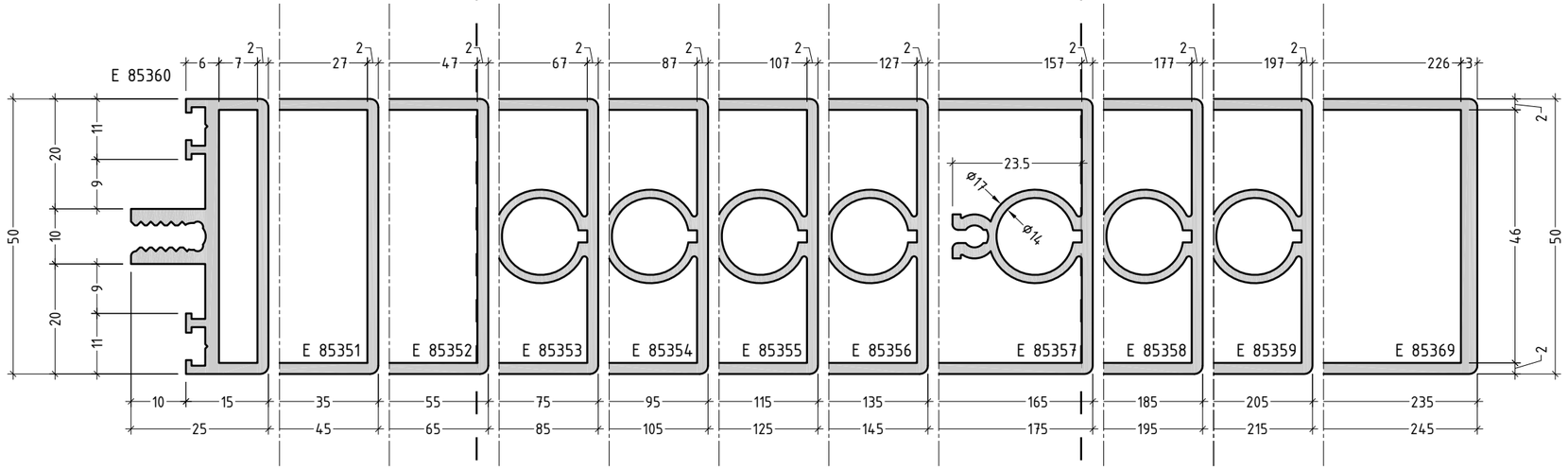
2nd level transoms



3rd level transom

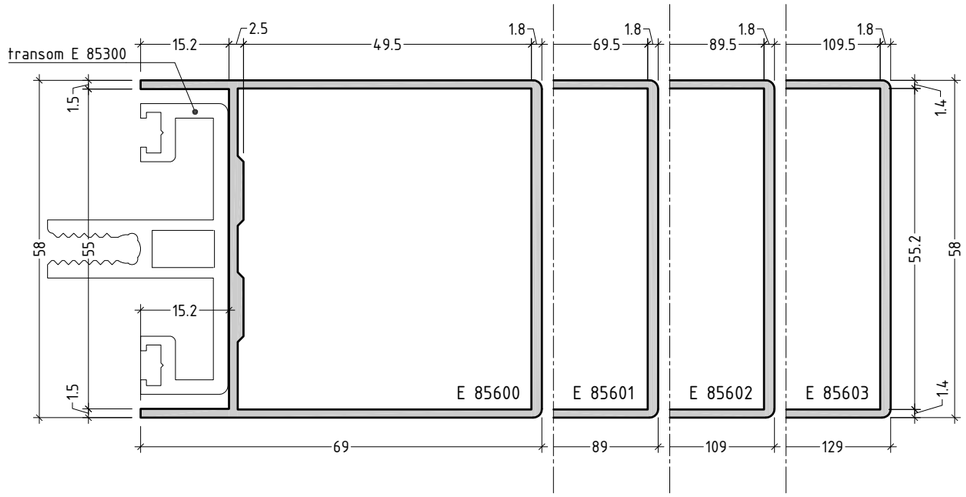


3rd level transoms

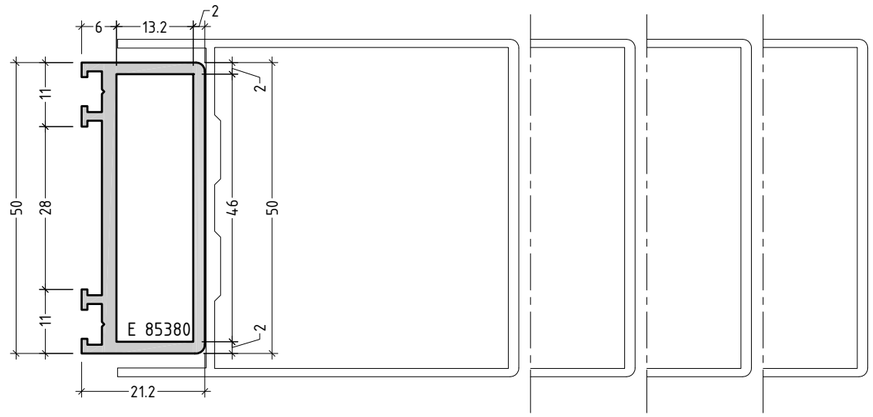


scale 1:1

2nd level supplementary transoms

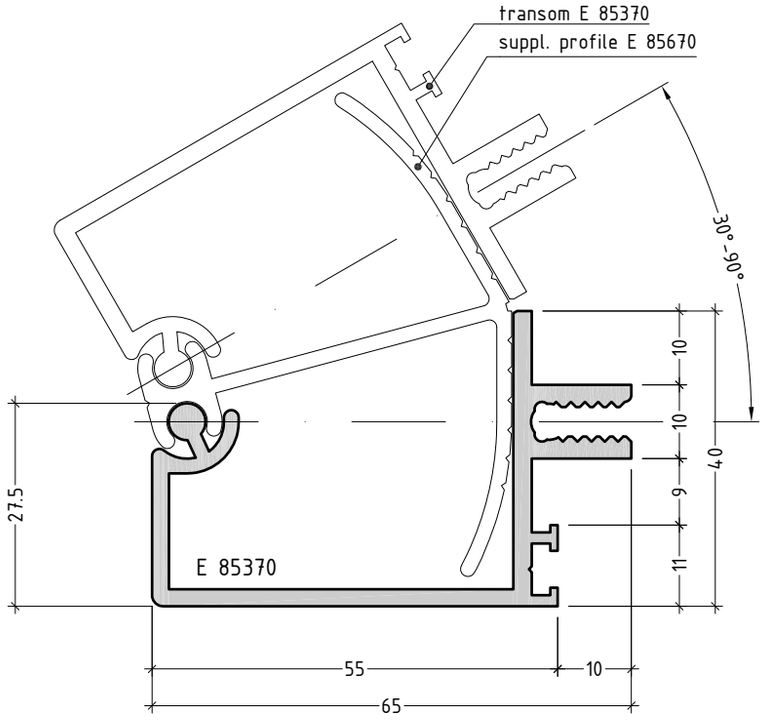


3rd level hidden transom

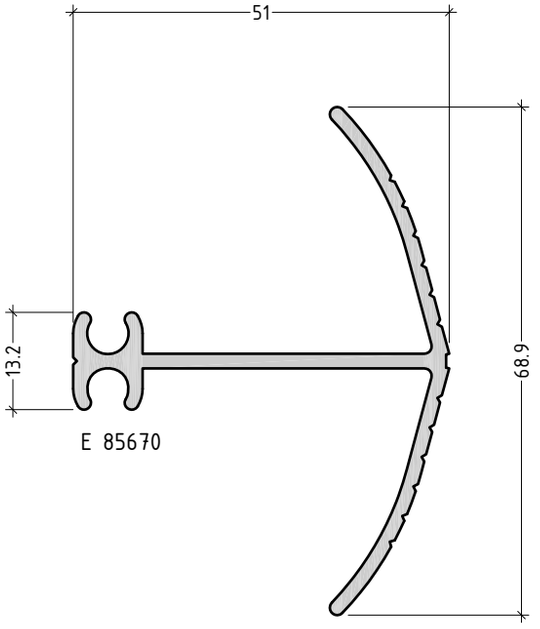


scale 1:1

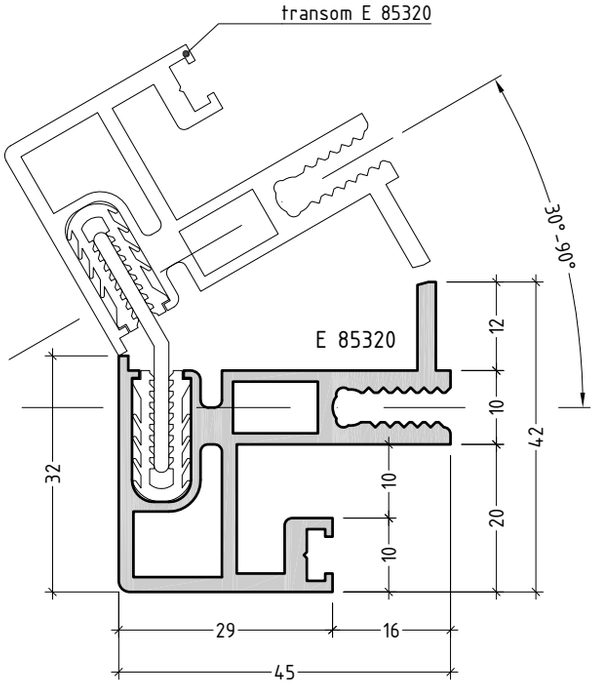
3rd level split transom for conservatory



supplementary profile for E 85370

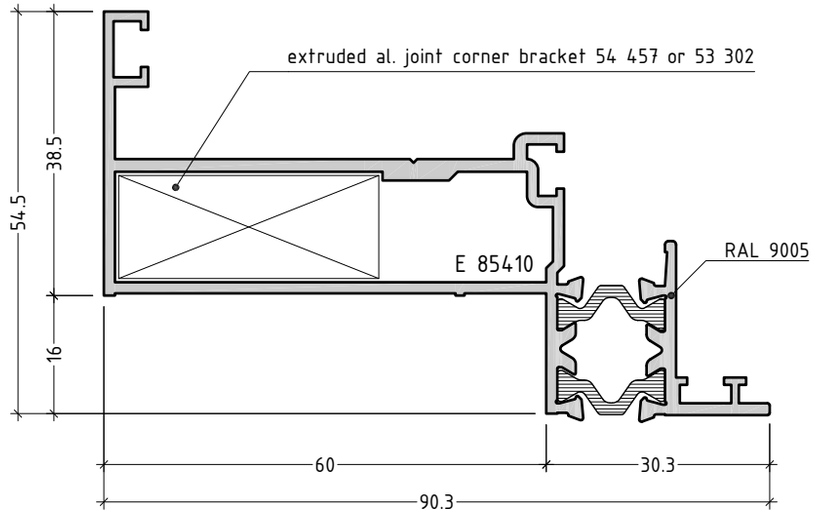


2nd level split transom for conservatory



scale 1:1

frame for thermo-break projected and parallel opening windows

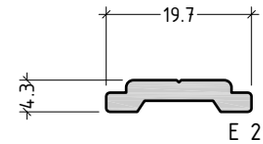


appropriate transom 2nd and 3rd level for frame

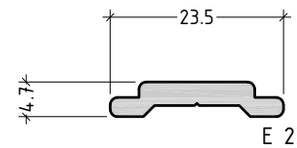
code	2nd level transom	3rd level transom
E 85410	E 85303	E 85353
	E 85304	E 85354
	E 85305	E 85355
	E 85306	E 85356
	E 85307	E 85357
	-	E 85358
	-	E 85359
	-	E 85369

note: frame E 85410 is suitable for
sashes E 85210 and E 85211

operating rods

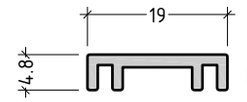


E 2308



E 2309

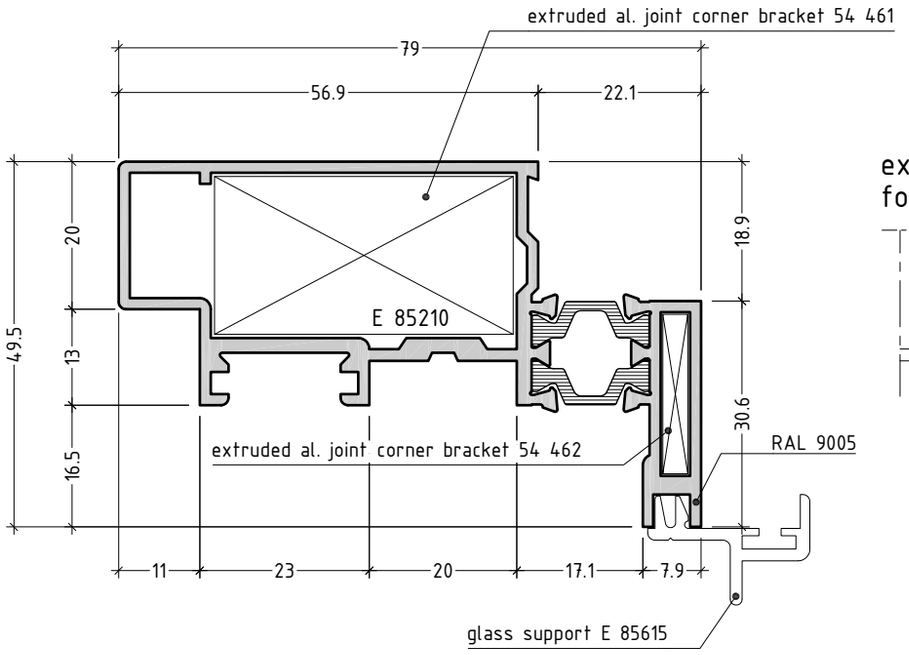
spacer



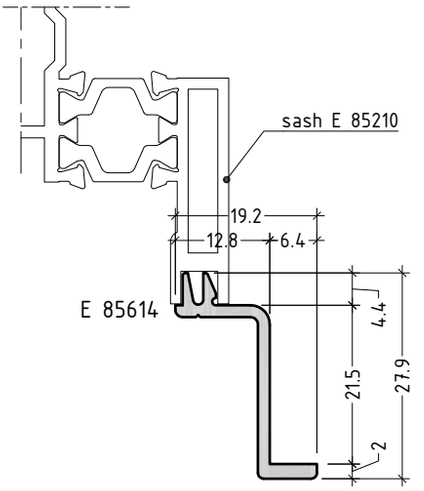
E 85915

scale 1:1

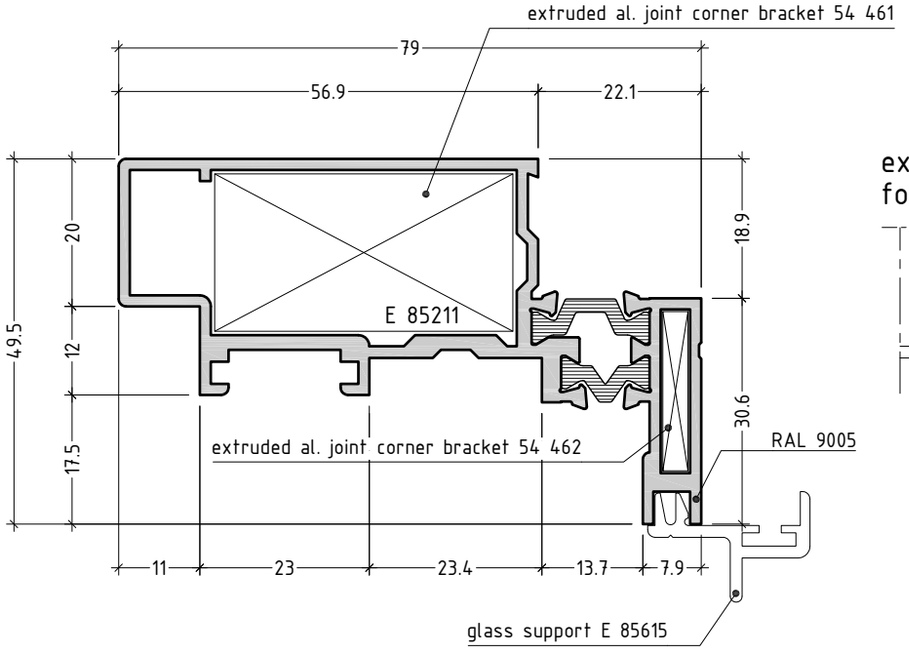
sash for thermo-break projected window



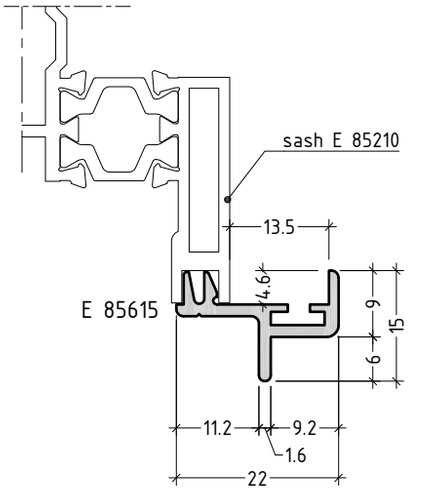
external glass support
for structural glazing



sash for thermo-break parallel opening window

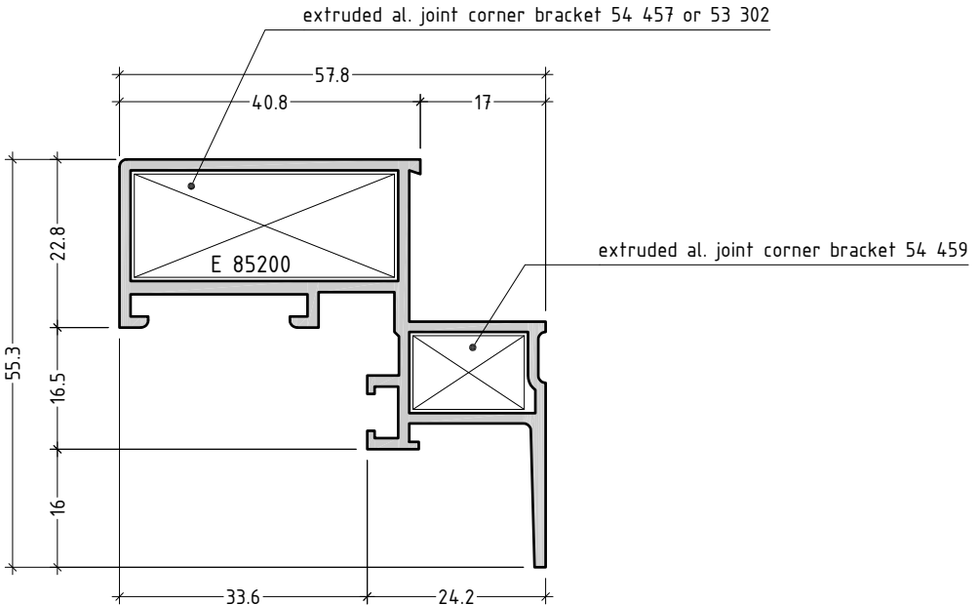


external glass support
for cover cap

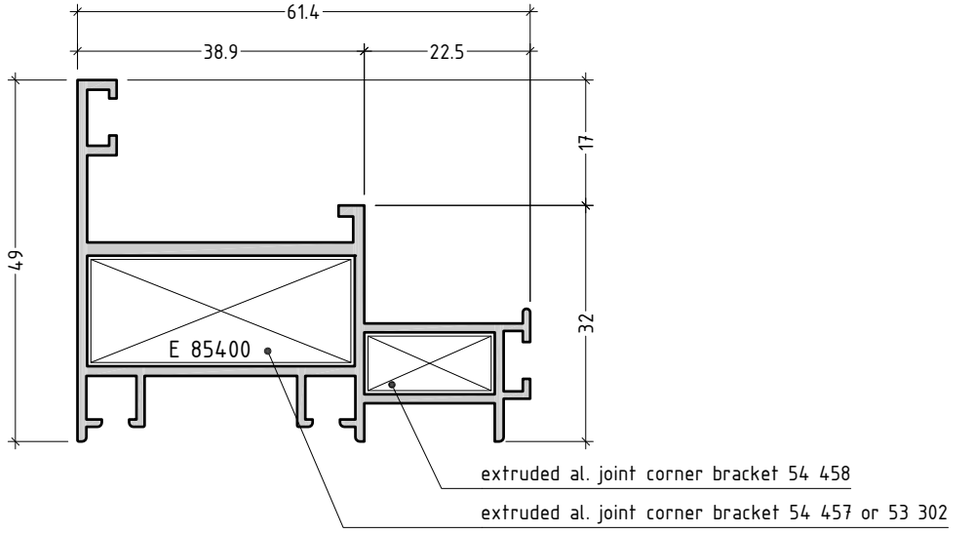


scale 1:1

sash profile for projected window

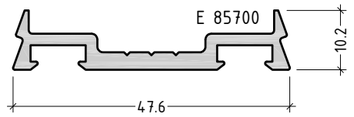


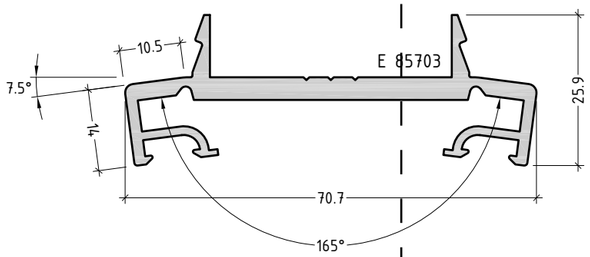
frame for projected window

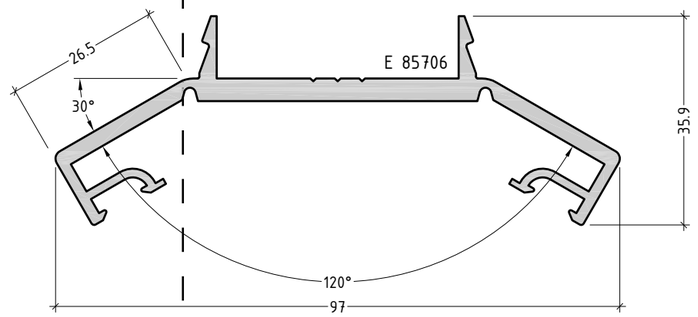


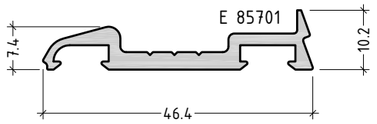
scale 1:1

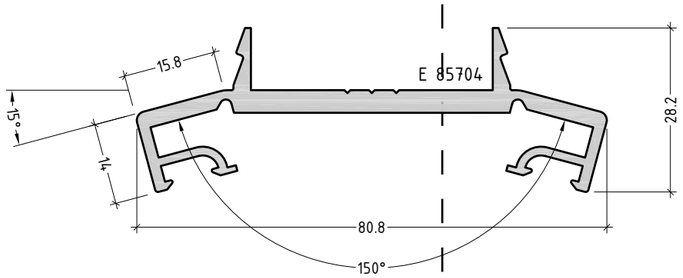
pressure plates

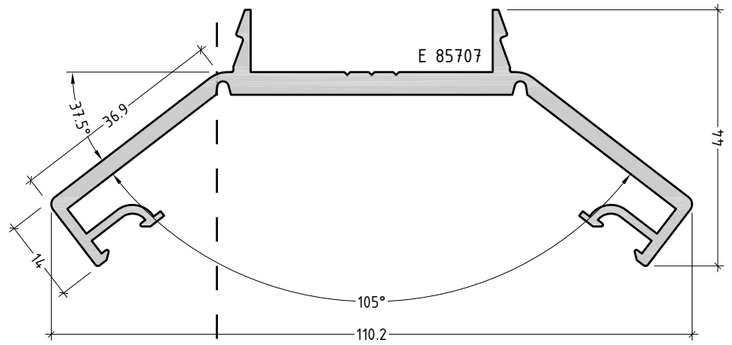


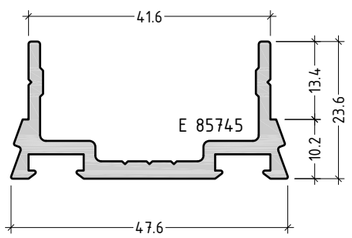


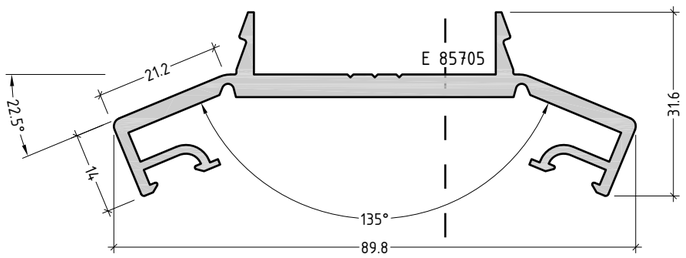


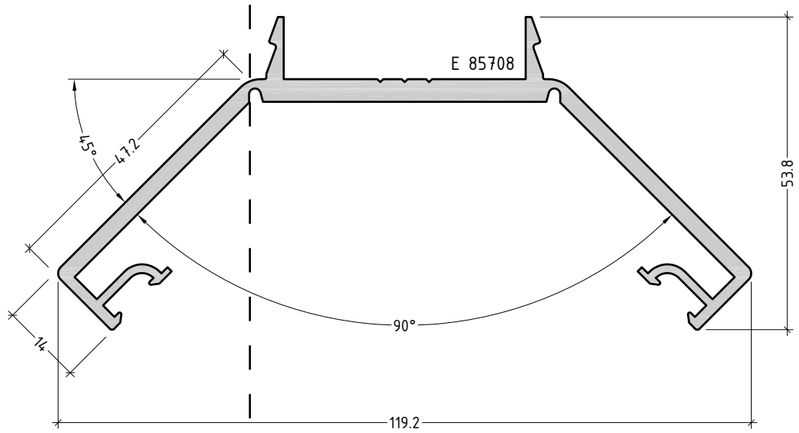






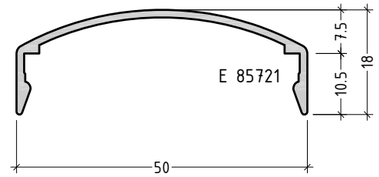


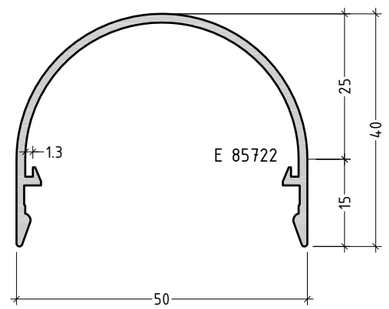


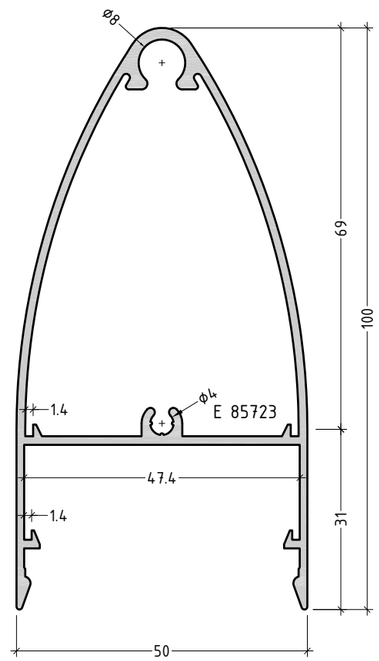


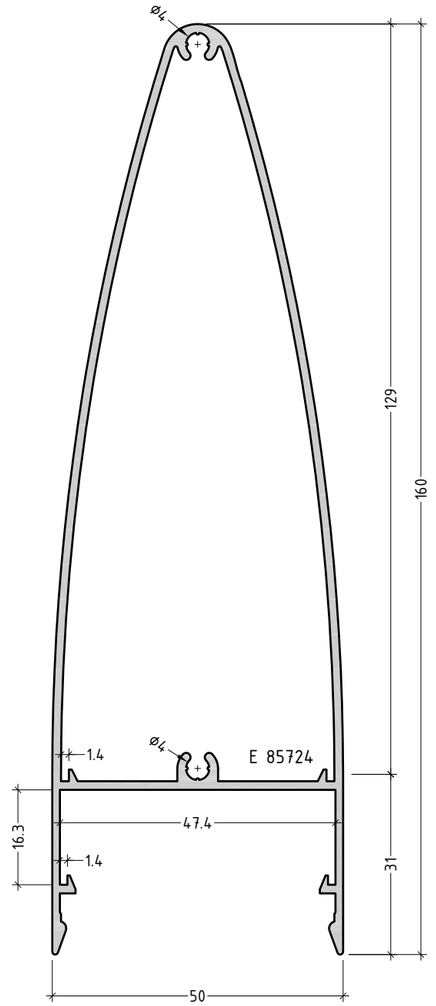
scale 1:1

cover caps



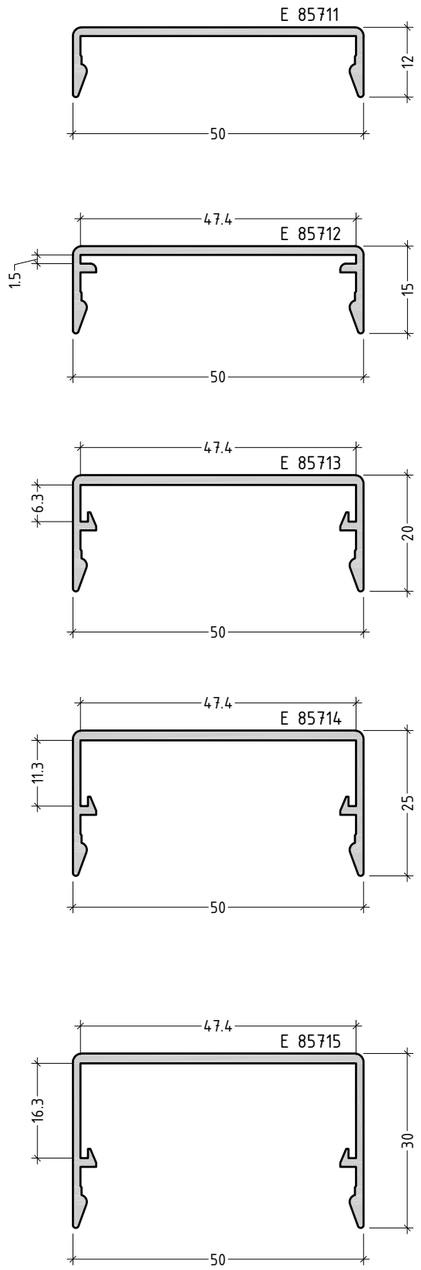


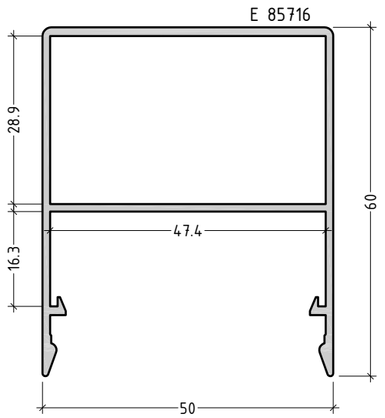


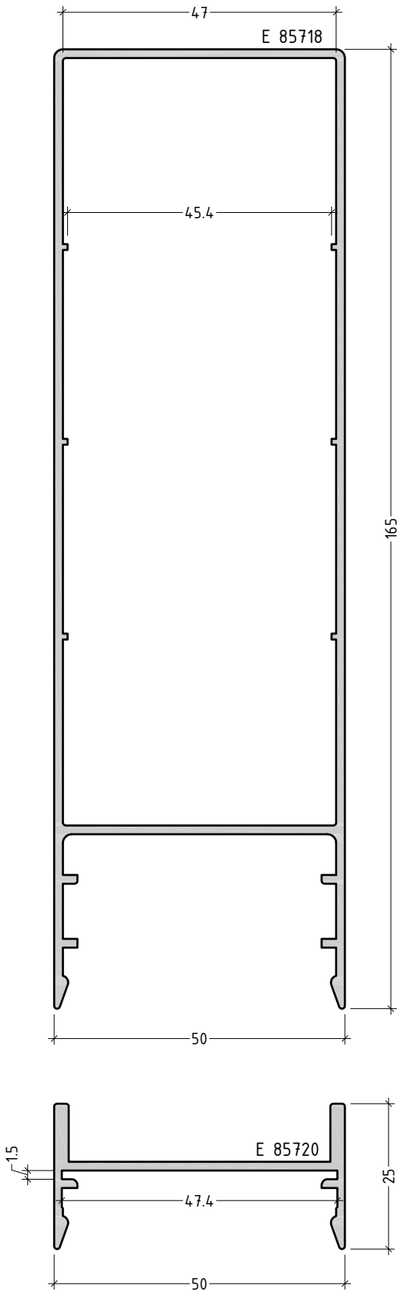


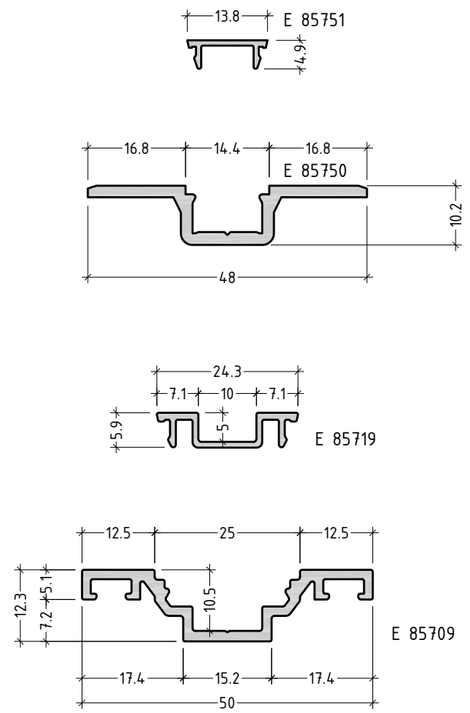
scale 1:1

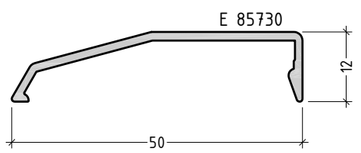
cover caps

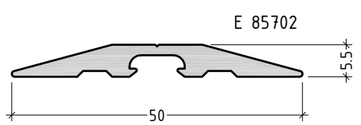






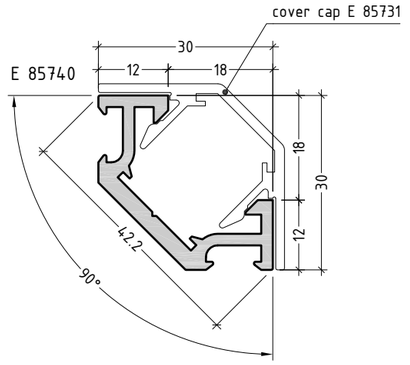


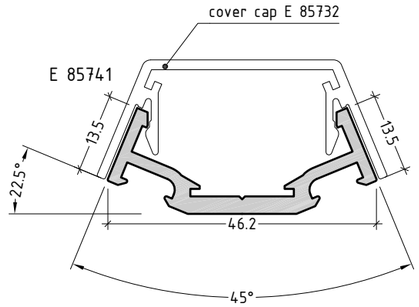


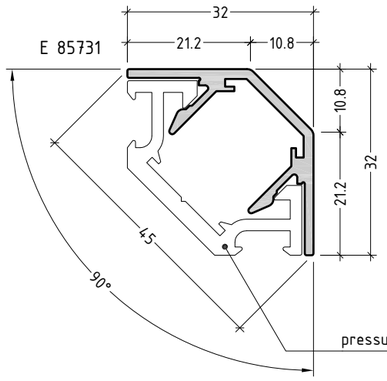


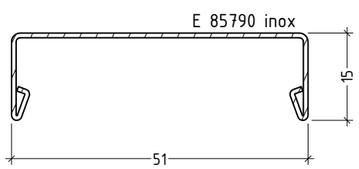
scale 1:1

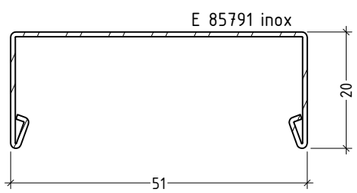
cover caps & pressure plates







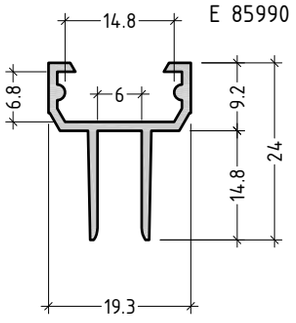




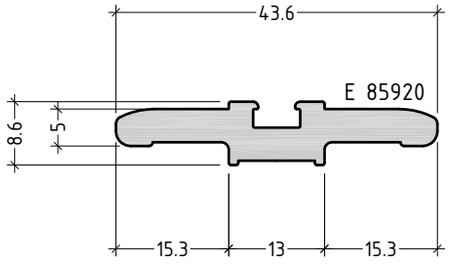
note: cover caps E 85790 and E 85791 have to be used with special pressure plate!

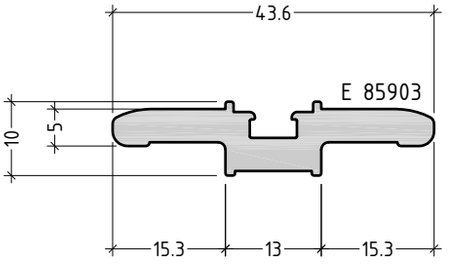
scale 1:1

spacers for structural glazing

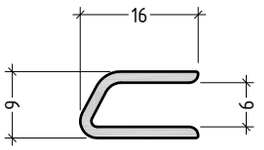


glazing clips

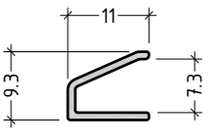




spacers for structural glazing

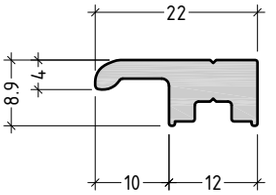


33 501



33 879

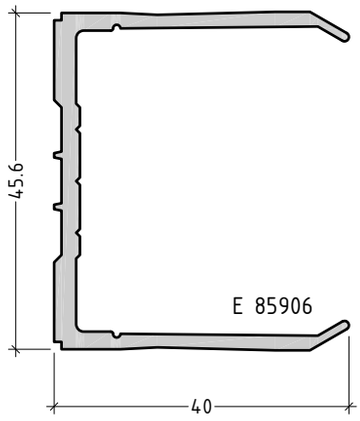
glazing clip for 33 879

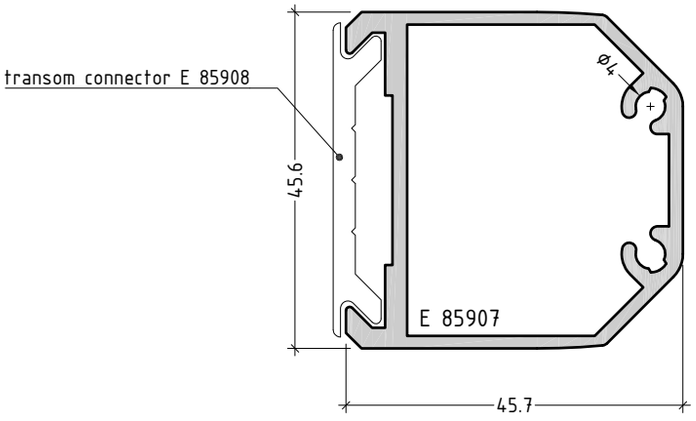


33 881

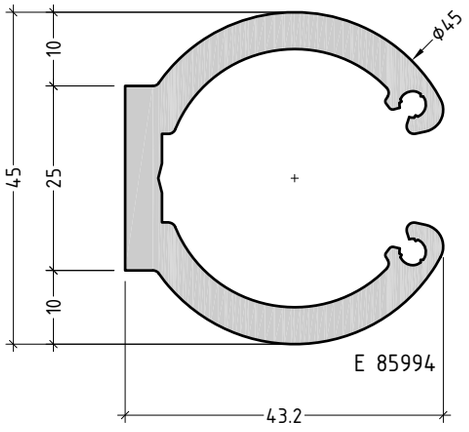
scale 1:1

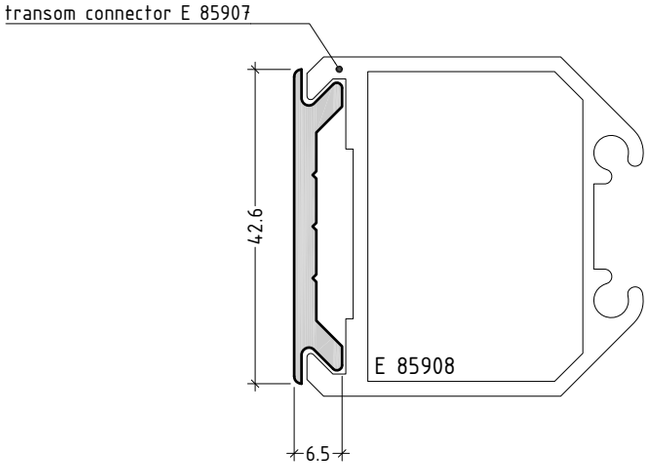
transom connectors



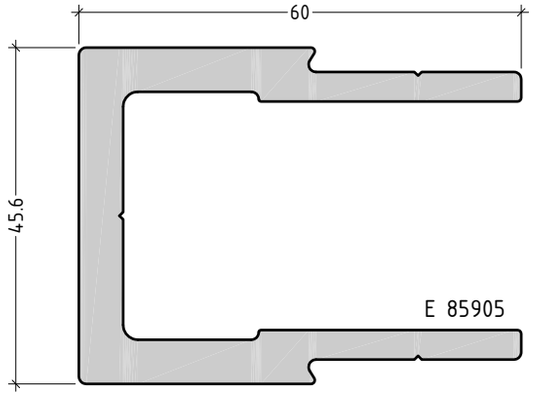


base for transom connectors

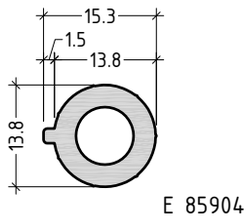




reinforced transom connector

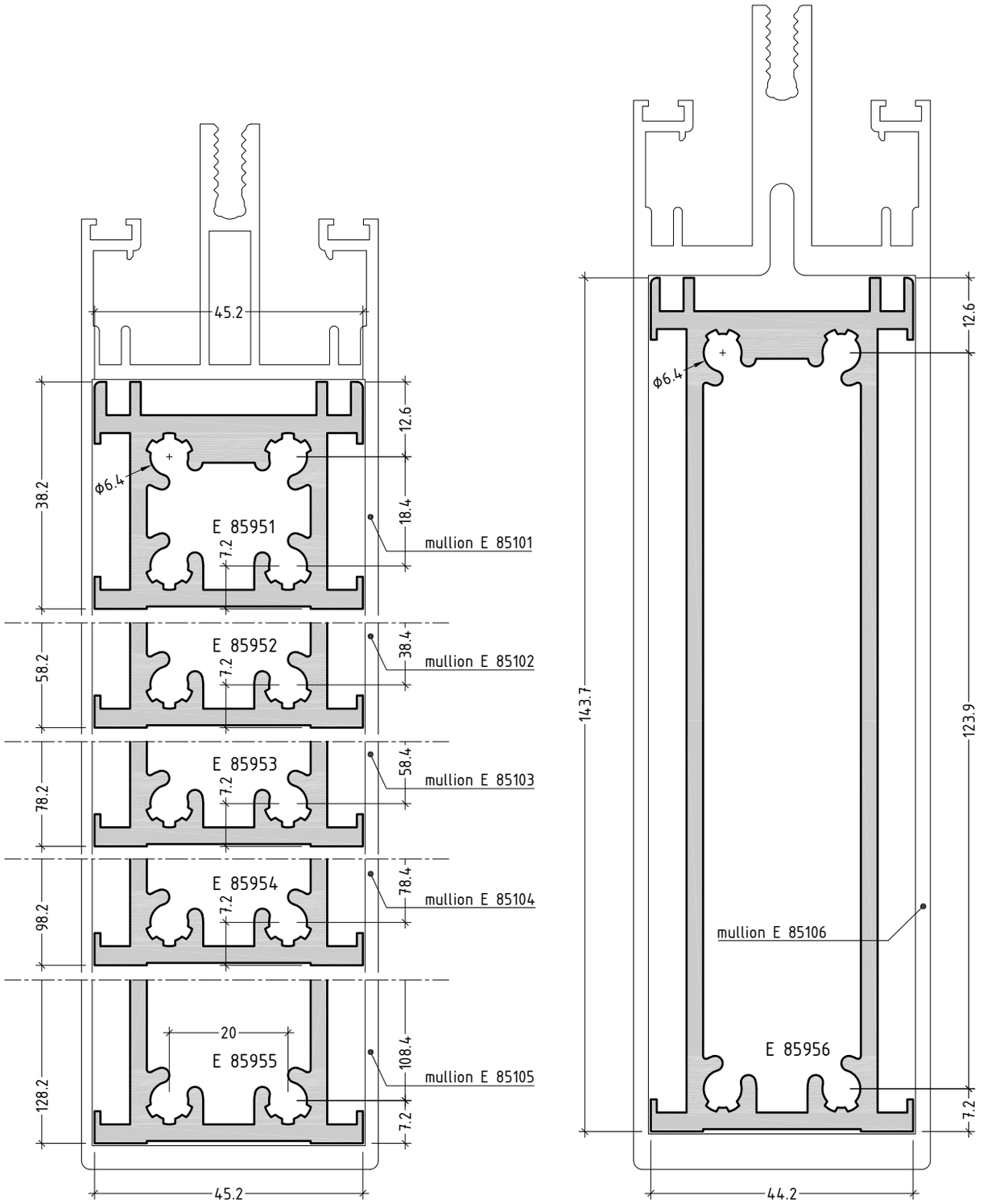


profile for spring connector



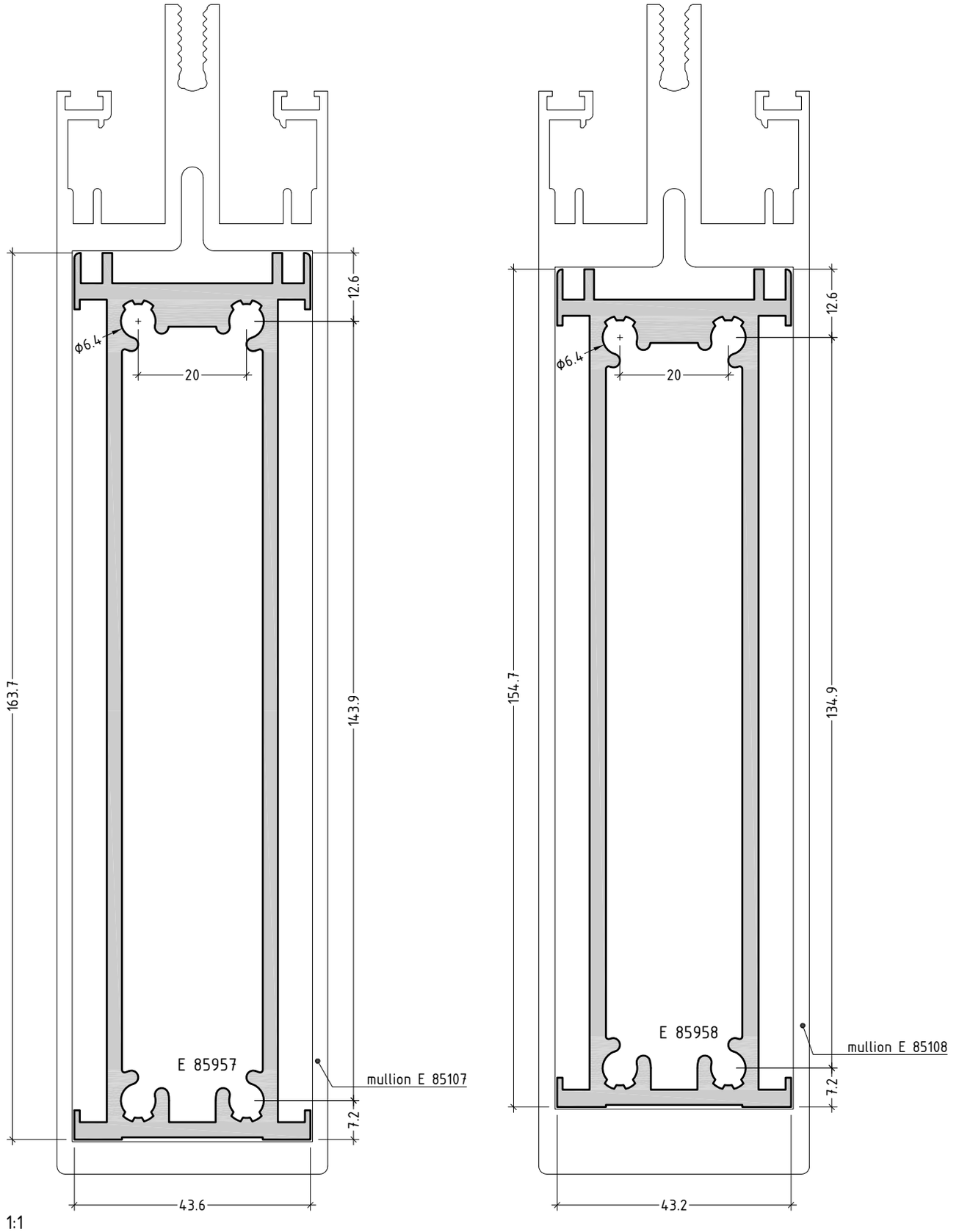
scale 1:1

inserts



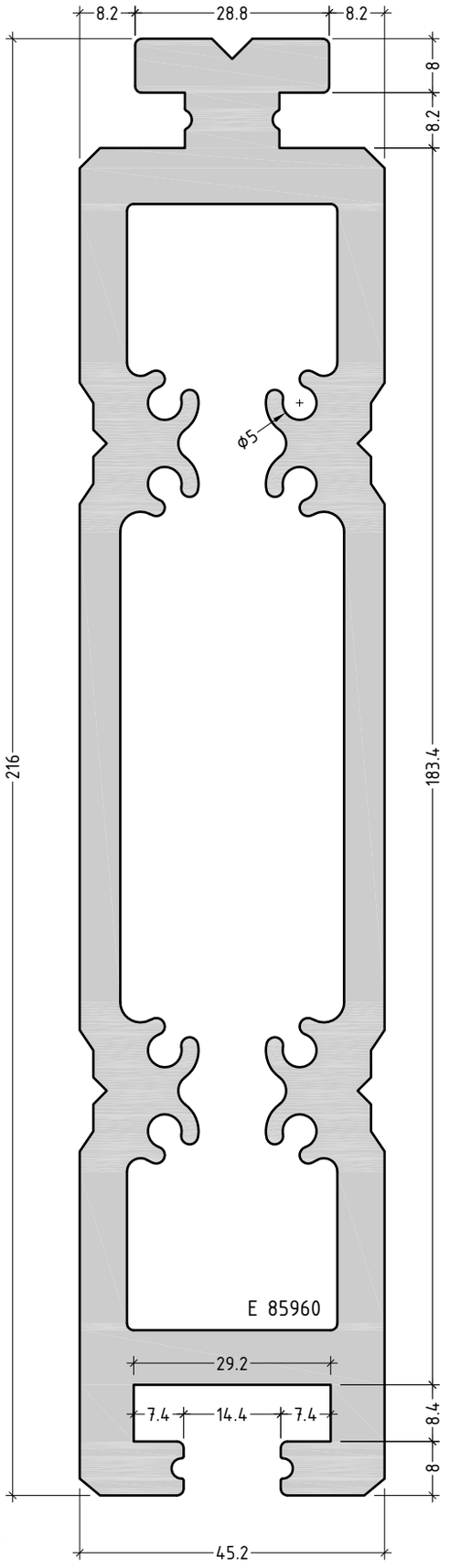
scale 1:1

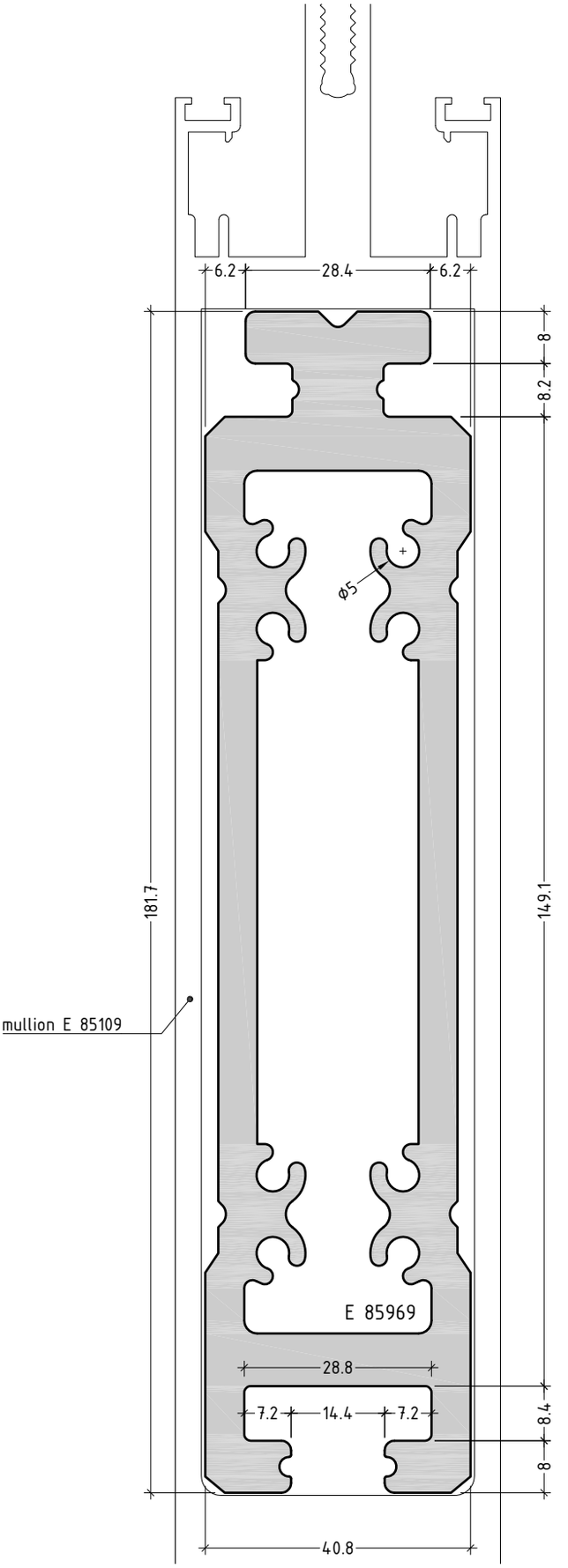
inserts



scale 1:1

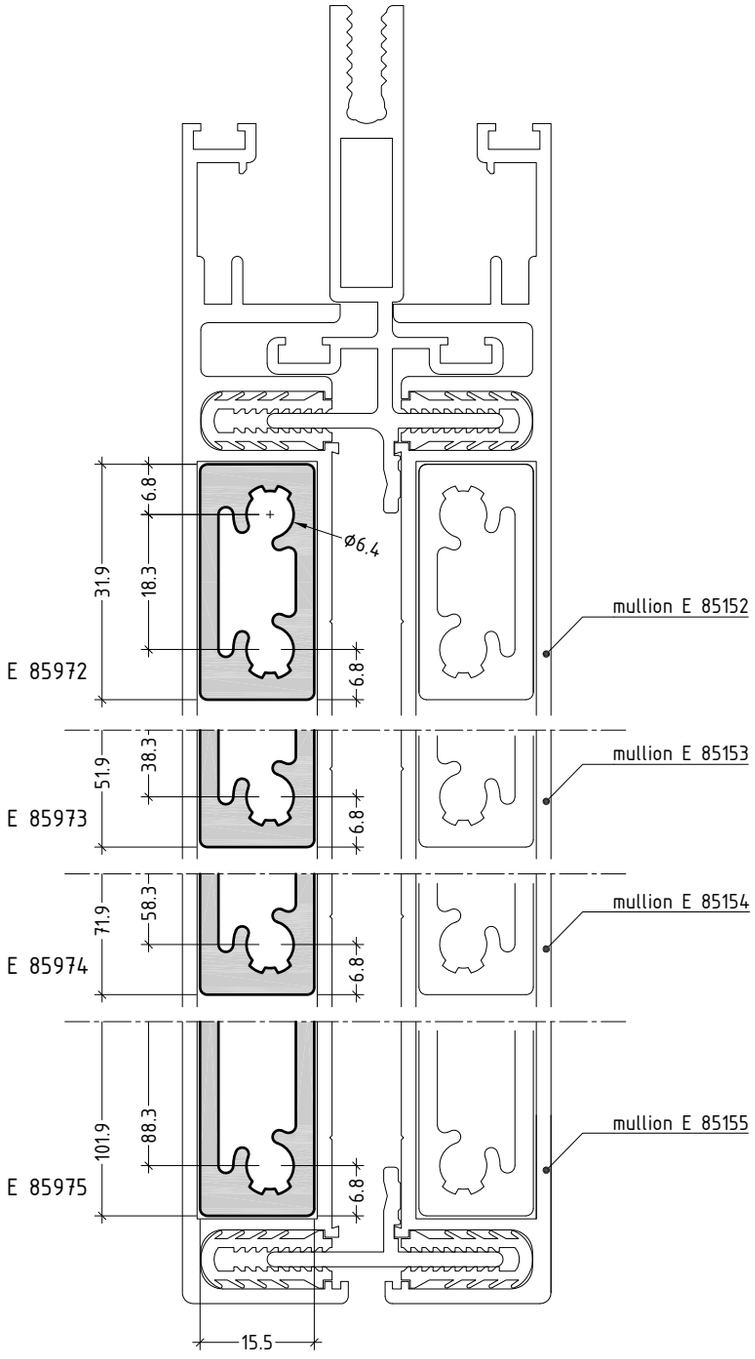
roof connectors / insert for E 85109





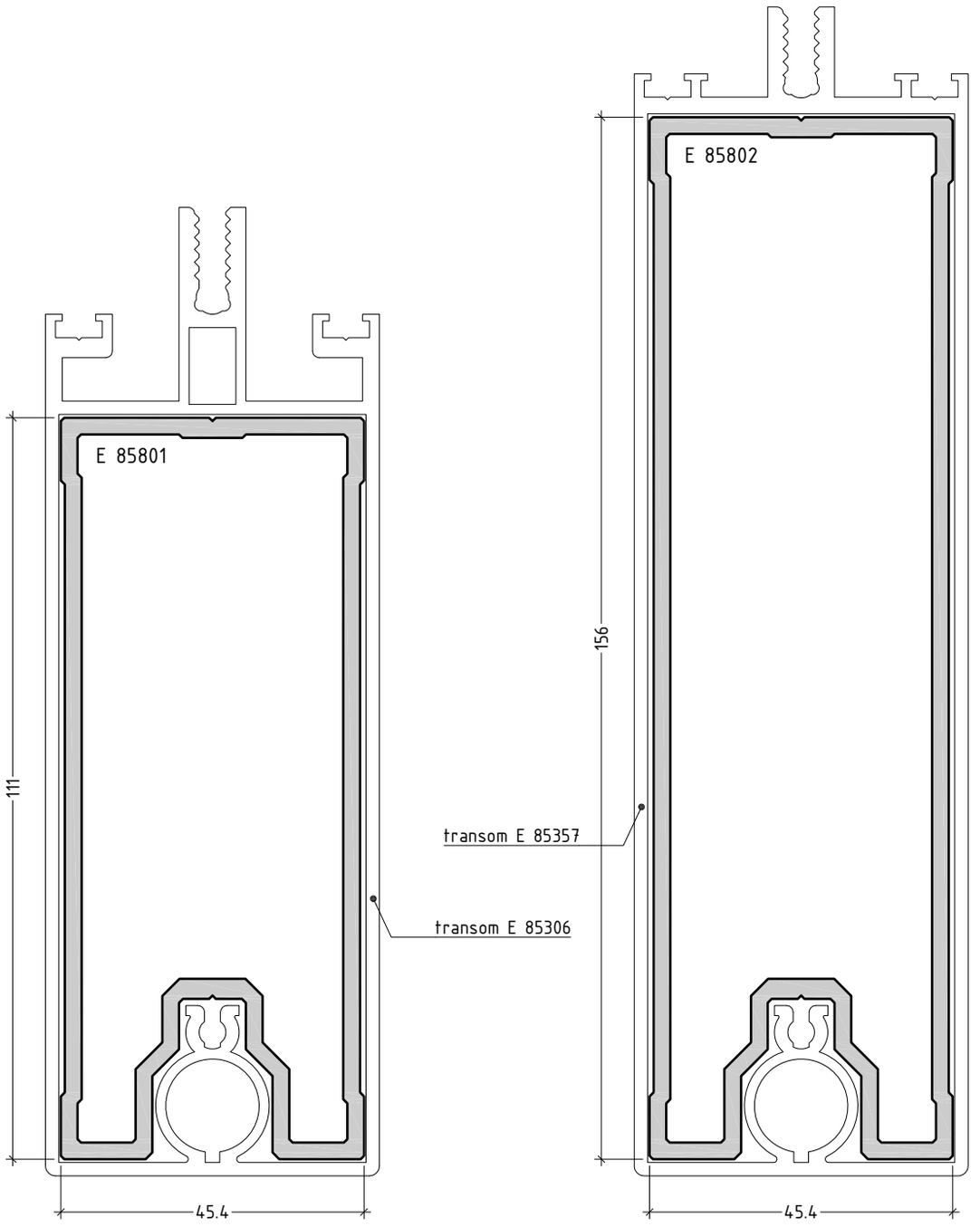
scale 1:1

inserts for half mullions



scale 1:1

reinforcement for transoms



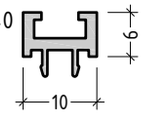
for transom E 85306 only!

for transom E 85357 only!

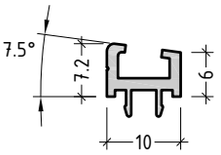
scale 1:1

spacers

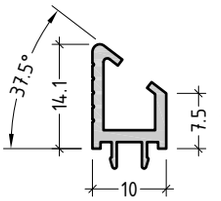
E 85640



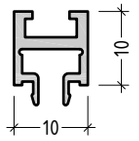
E 85650



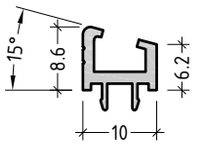
E 85654



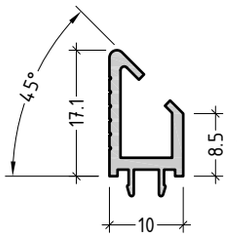
E 8611



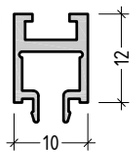
E 85651



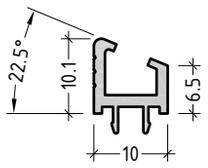
E 85655



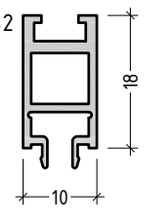
E 85641



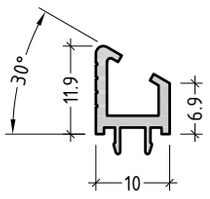
E 85652



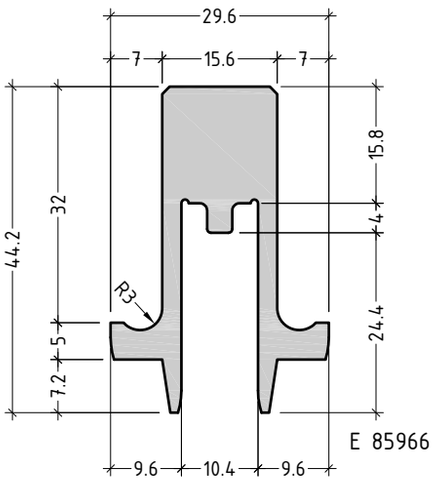
E 85642



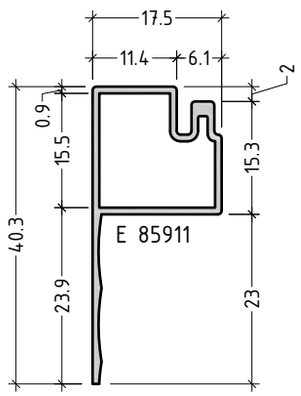
E 85653



supplementary profile for louvers

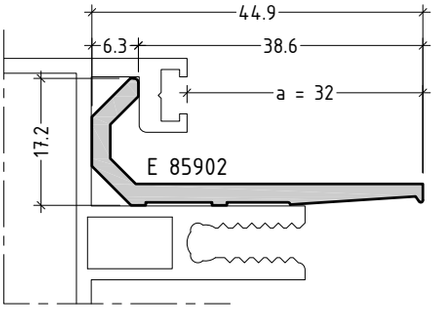


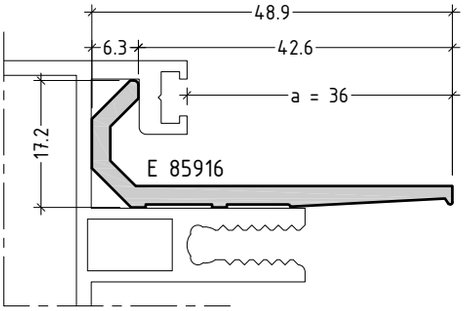
drainage profile

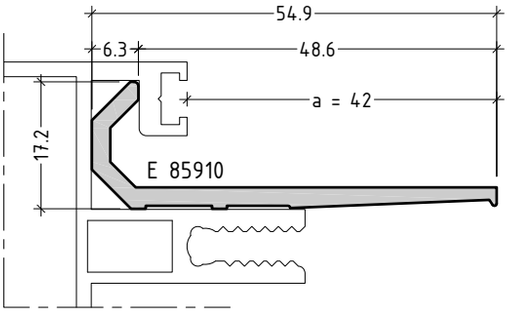


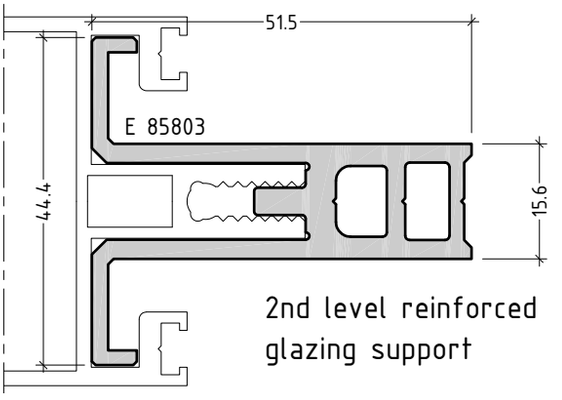
scale 1:1

2nd level glazing supports



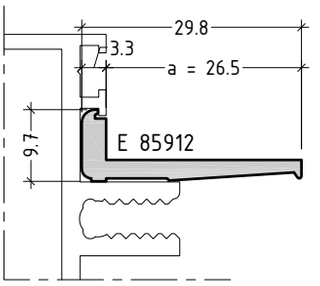


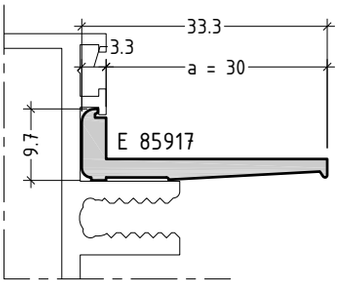


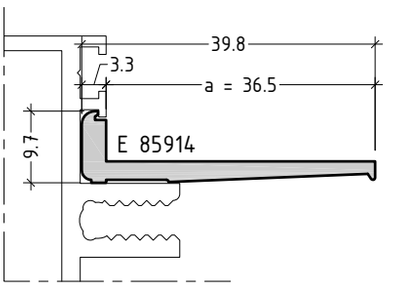


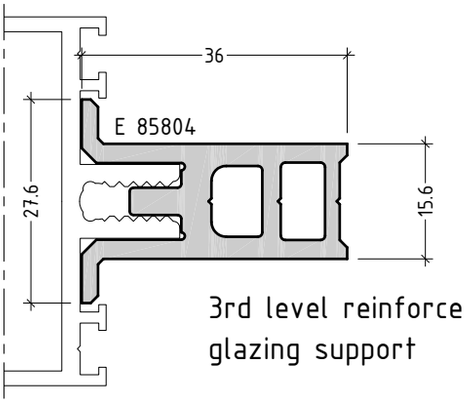
2nd level reinforced glazing support

3rd level glazing supports





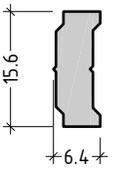




3rd level reinforced glazing support

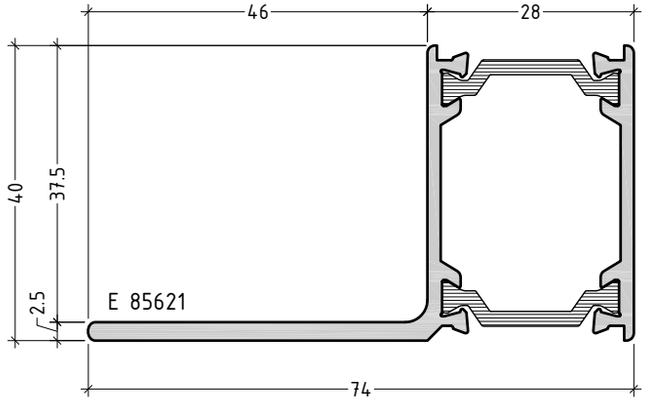
code	accsessory code	utility lenght **a**	loadbearing capacity
E 85902	071 182	32 mm	1530 N
E 85916	071 184	36 mm	1200 N
E 85910	071 183	41 mm	650 N
E 85912	071 180	26,5 mm	1175 N
E 85917	071 185	30 mm	910 N
E 85914	071 181	36,5 mm	740 N

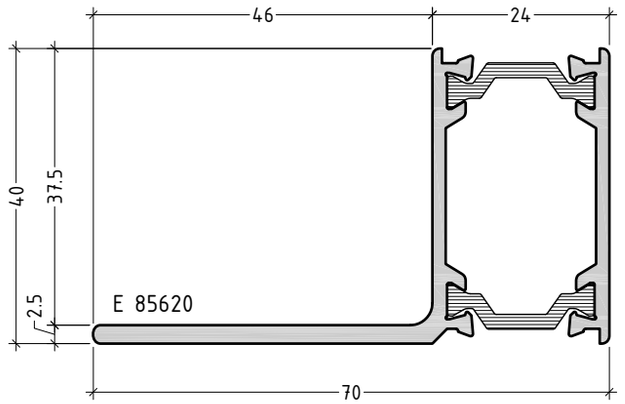
E 85805



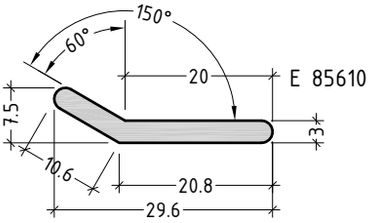
scale 1:1

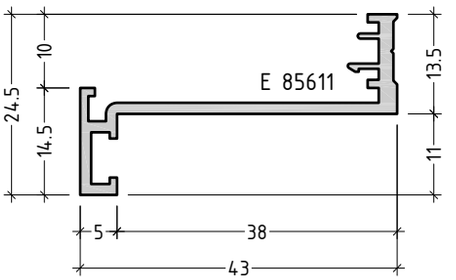
wall attachment profiles

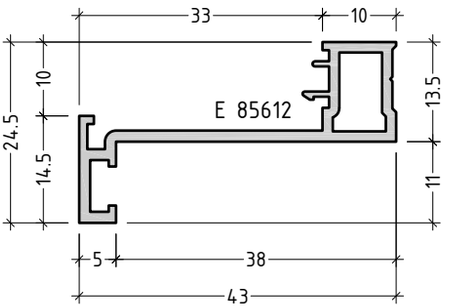




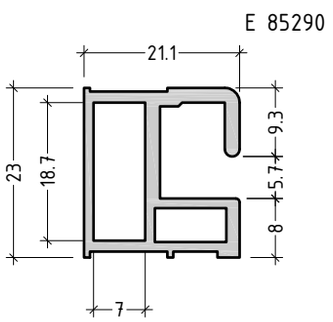
supplementary profile for holding sealing membrane

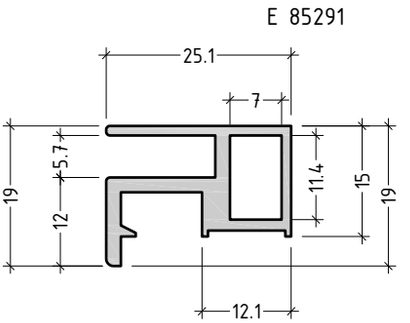






spacers for etalbond structural glazing





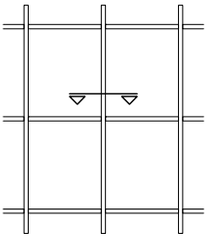
scale 1:1

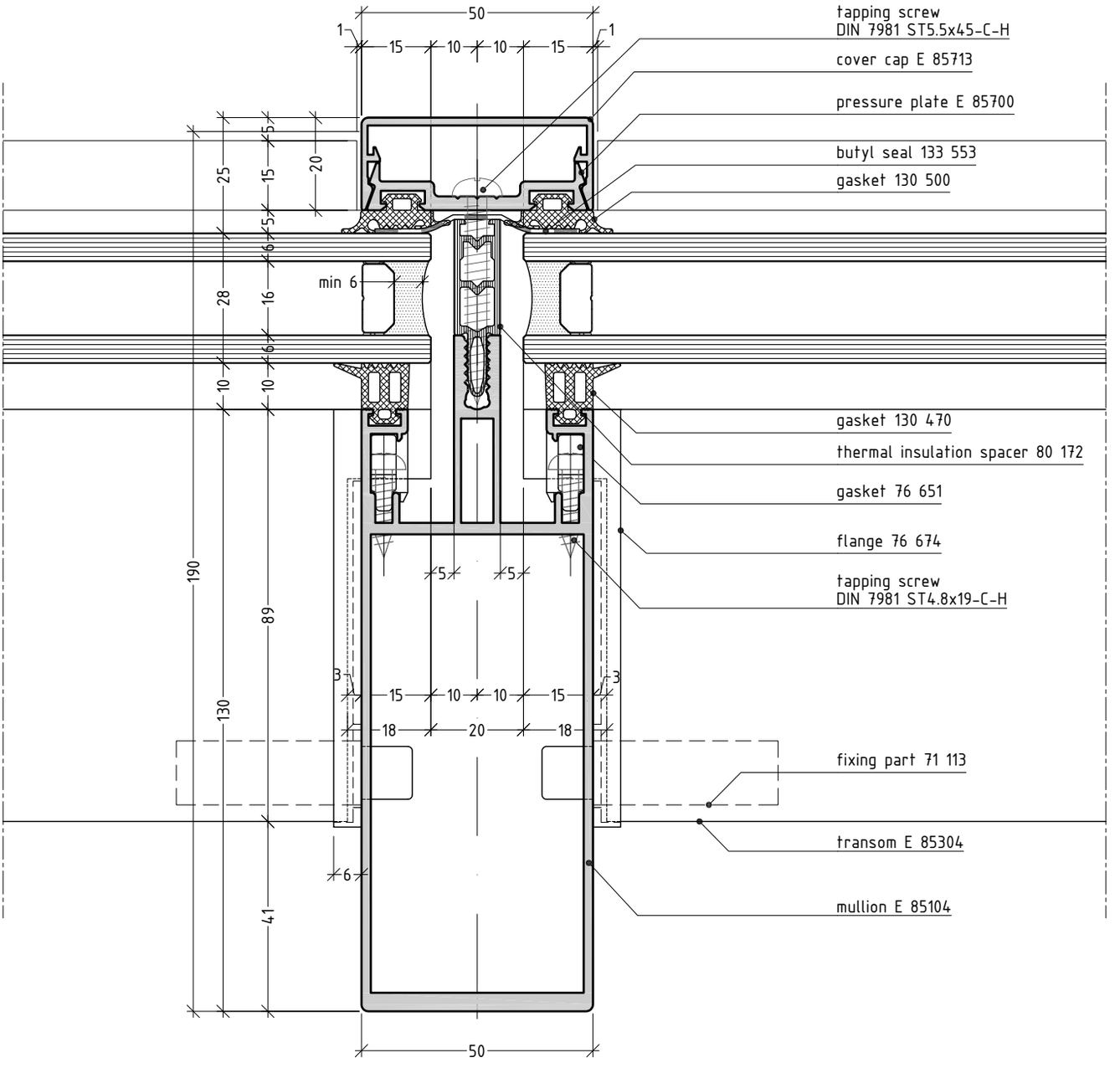
COVER CAP

SECTIONS | DETAILS

ETEM BUILDING SYSTEMS

mullion with 2nd level transom

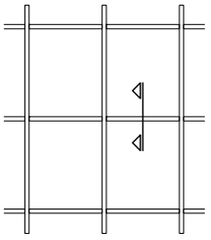


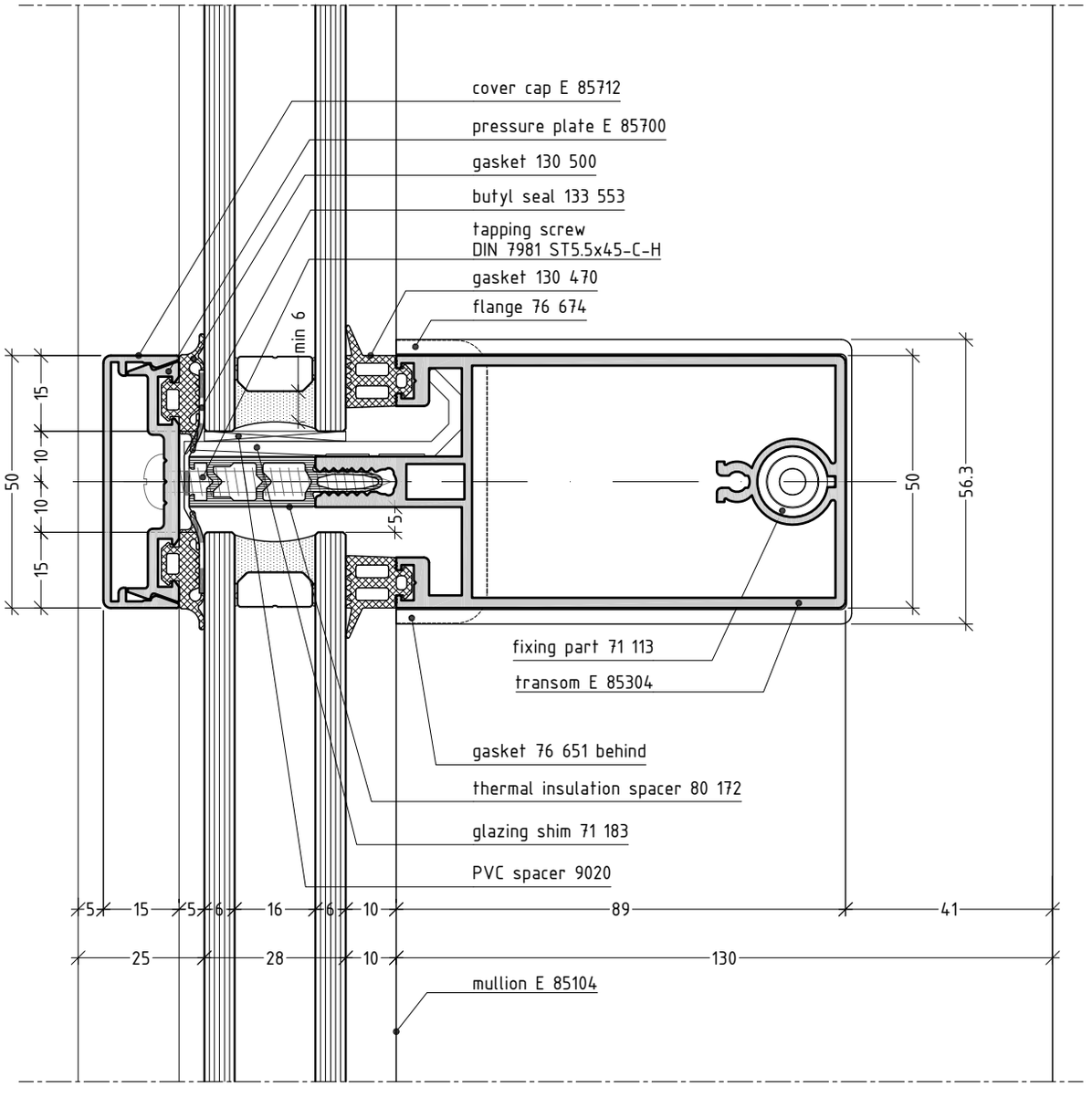


E85CP5.1

scale 3/4

transom 2nd level drainage



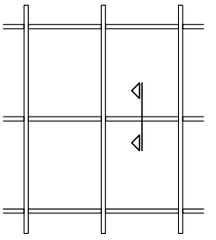


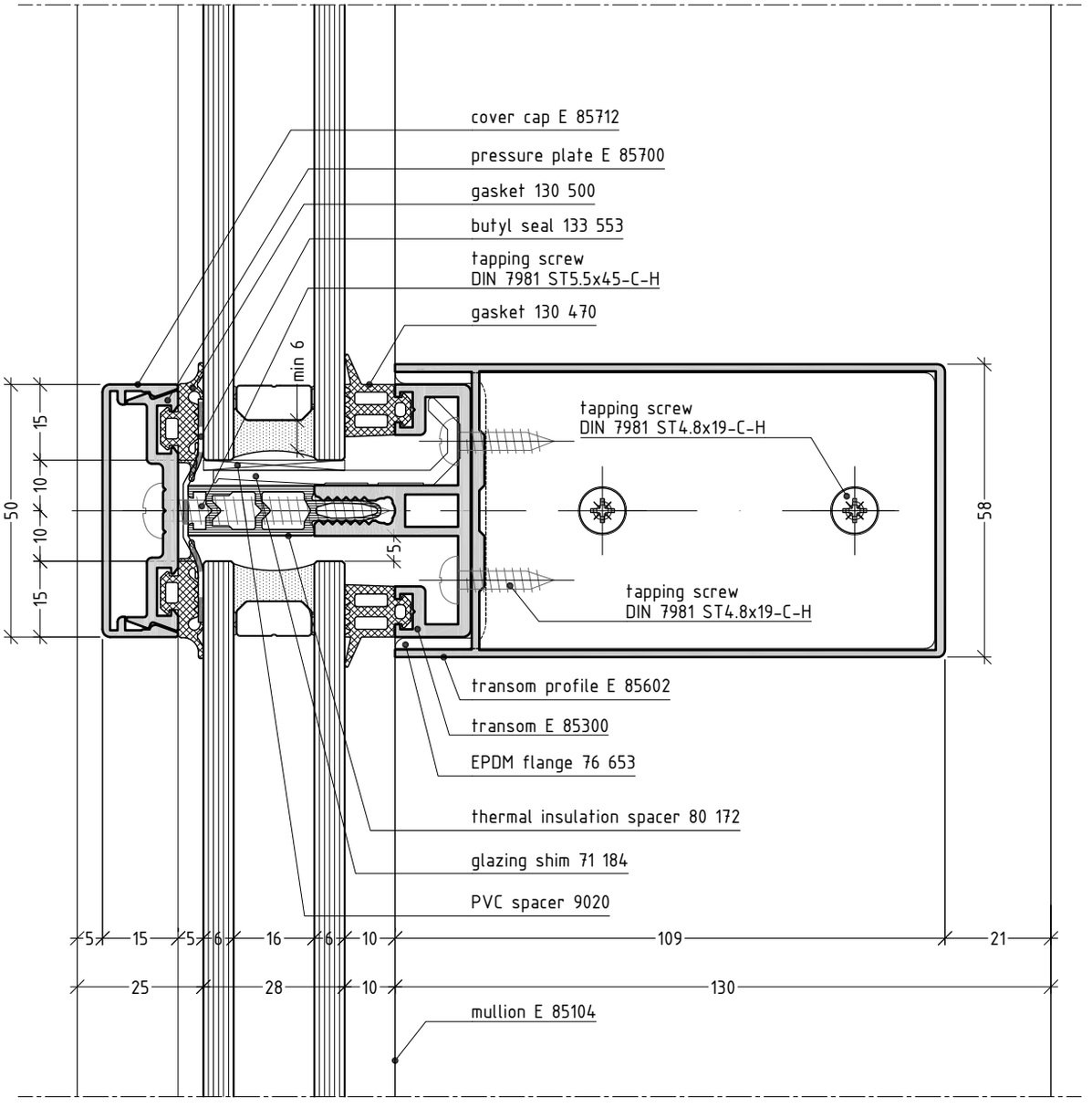
note:
1. in case of 2nd level drainage, it is obligatory to use 150 mm butyl seal tape in both directions of the cross zone. see detail E85M8.29 / 8.29
2. in case of roof constructions, conservatories, facades with inclinations and polygonal facades with 2nd level drainage, it is obligatory to use butyl seal tape in both directions.

E85CP5.2

scale 3/4

transom 2nd level drainage with supplementary transom



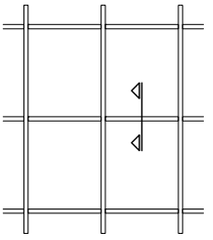


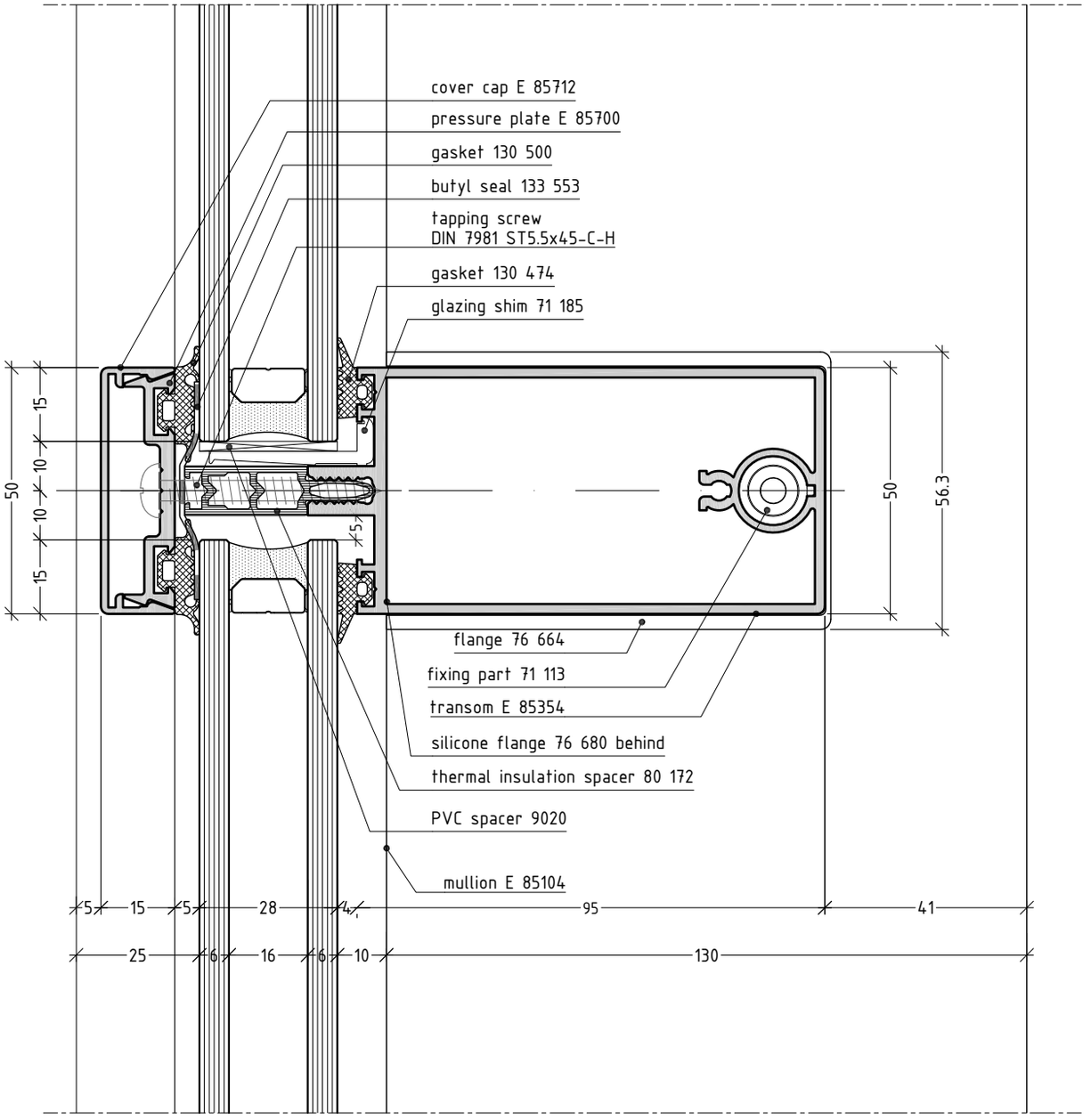
note:
1. in case of 2nd level drainage, it is obligatory to use 150 mm butyl seal tape in both directions of the cross zone. see detail E85M8.29 / 8.29
2. in case of roof constructions, conservatories, facades with inclinations and polygonal facades with 2nd level drainage, it is obligatory to use butyl seal tape in both directions.

scale 3/4

E85CP5.3

transom 3rd level drainage



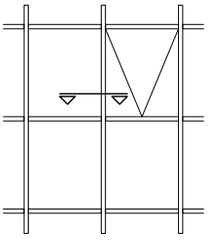


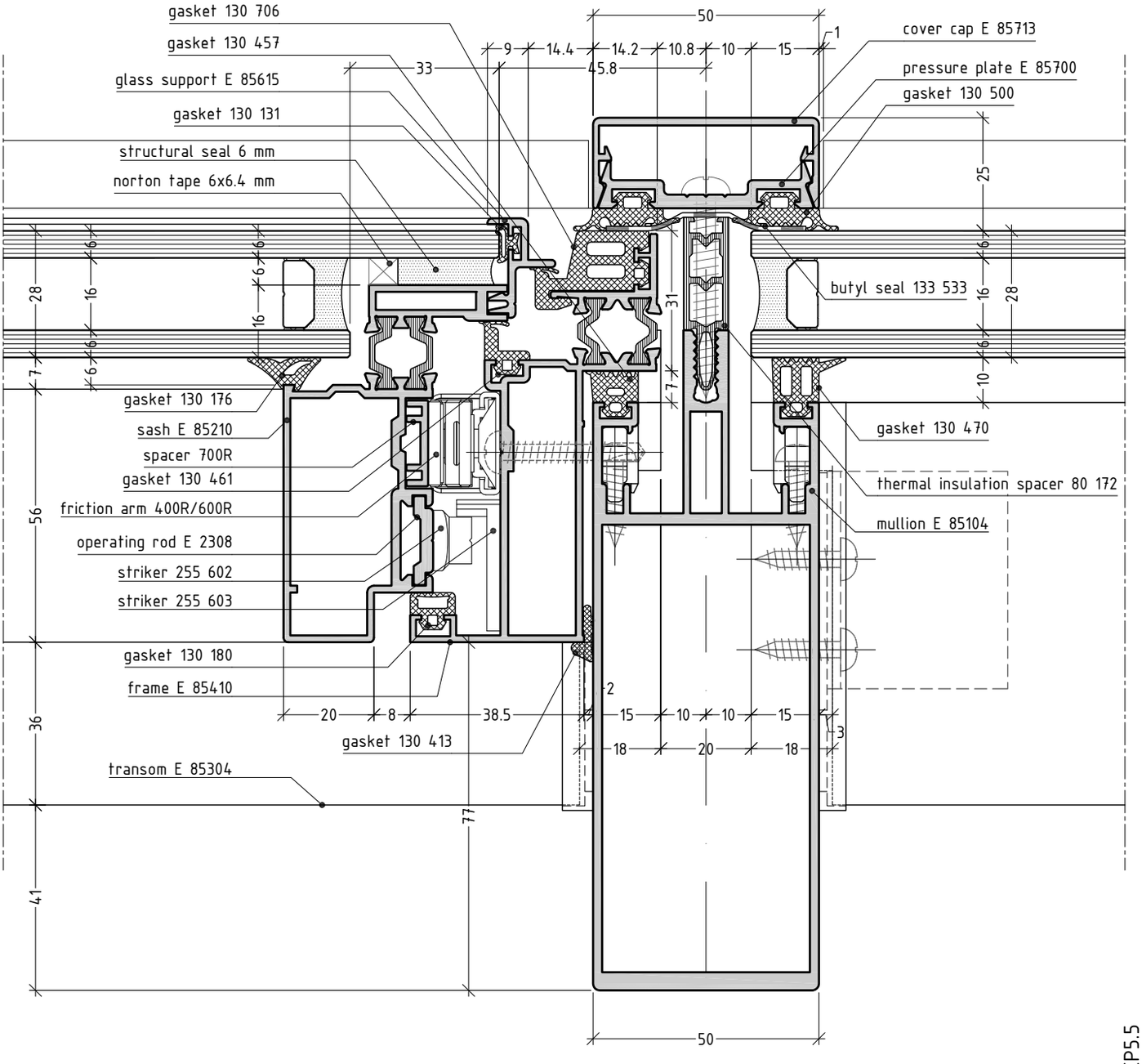
note:
in case of 3rd level drainage, it is obligatory to use butyl seal tape in both directions.

scale 3/4

E85CP5.4

projected thermo-break window

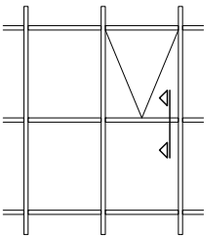


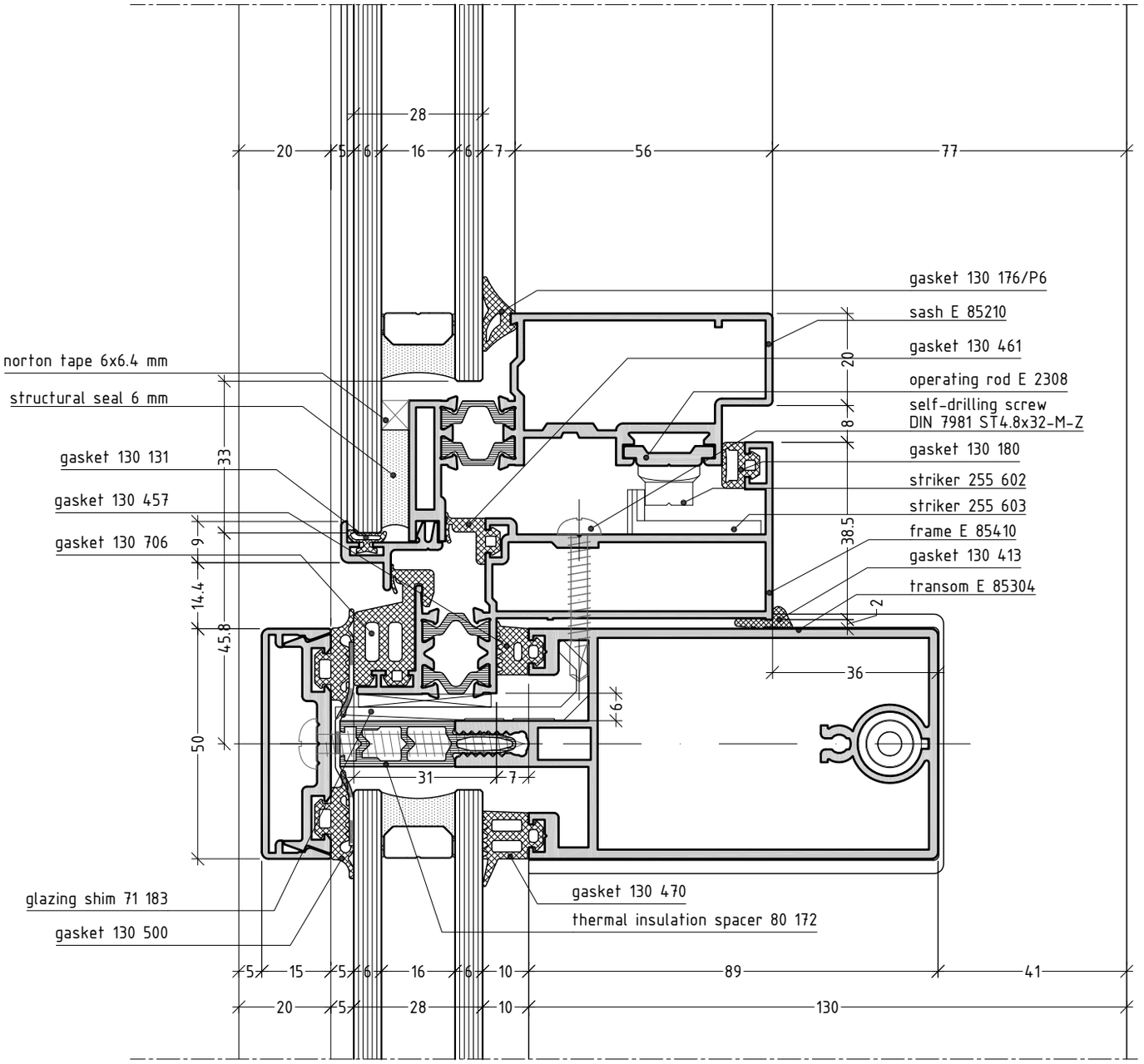


E85CP5.5

scale 3/4

projected thermo-break window with 2nd level transom

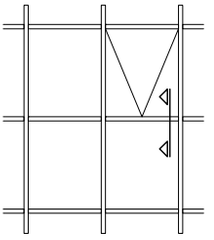


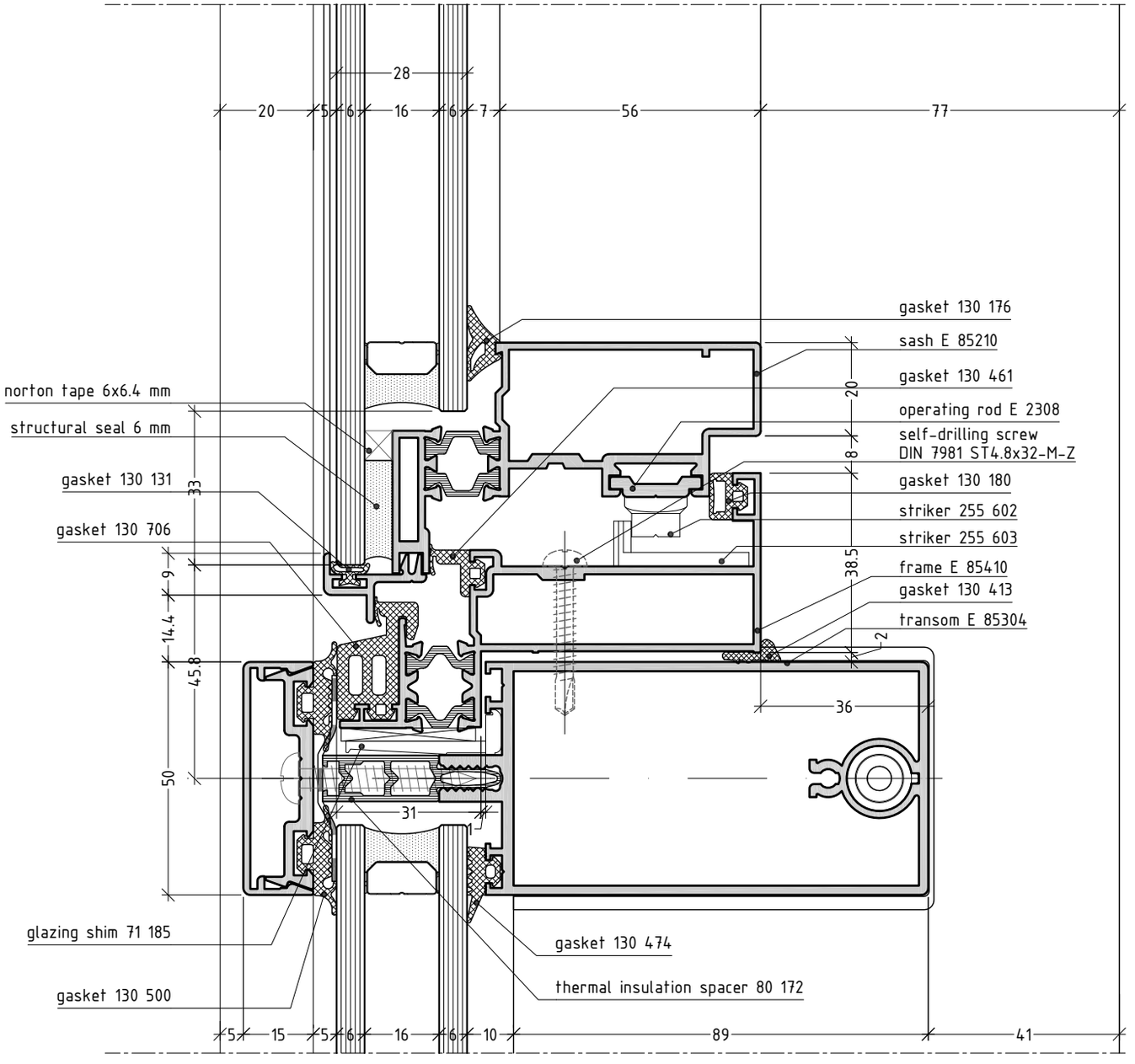


E85CP5.6

scale 3/4

projected thermo-break window with 3rd level transom

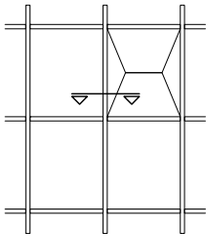


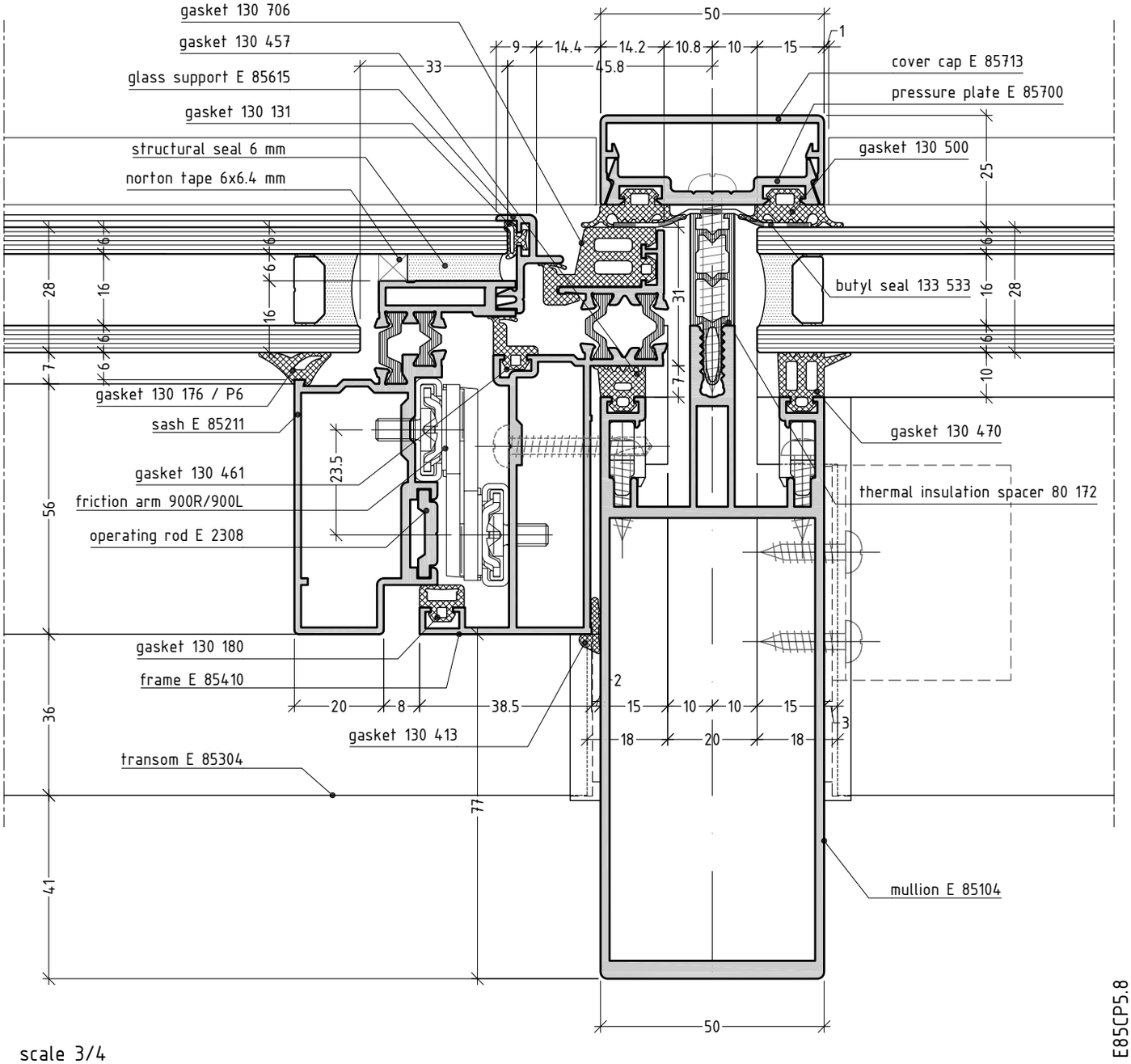


E85CP5.7

scale 3/4

parallel opening thermo-break window

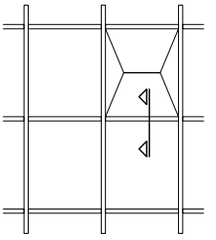


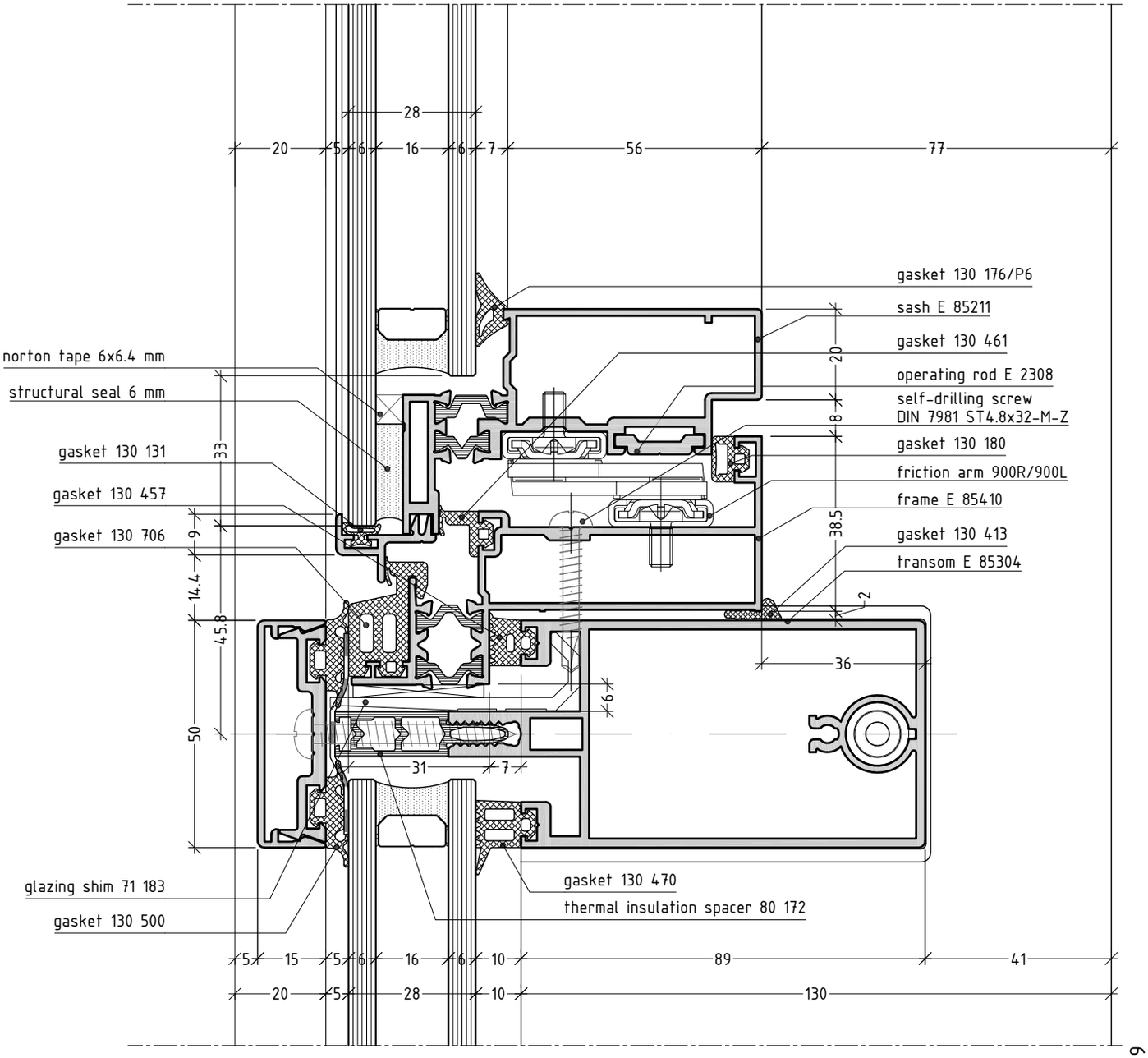


scale 3/4

E85CP5.8

parallel opening thermo-break window with 2nd level transom

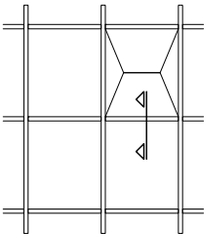


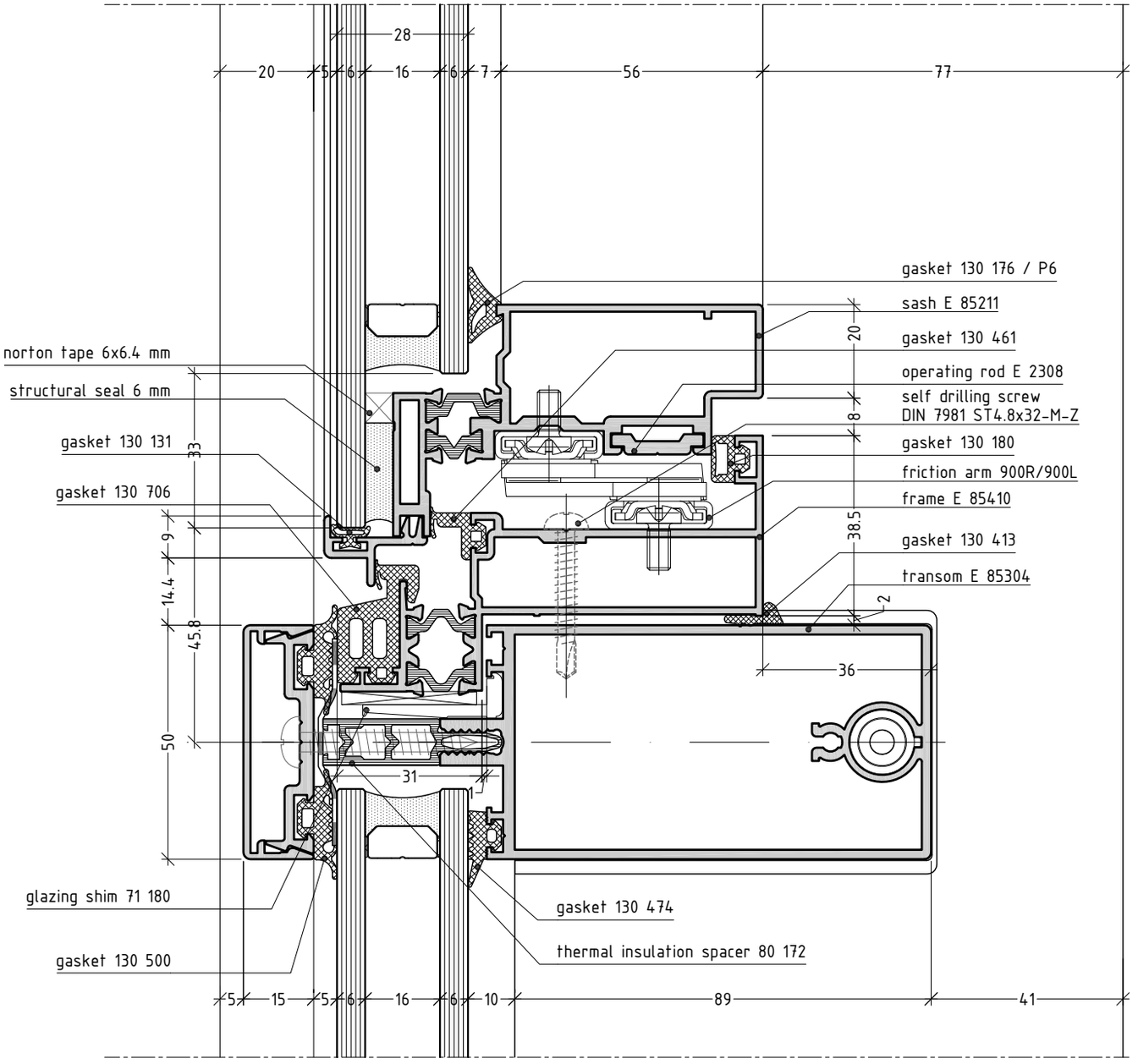


E85CP5.9

scale 3/4

parallel opening thermo-break window with 3rd level transom

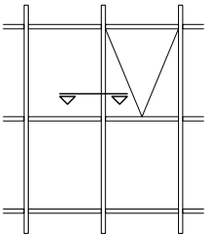


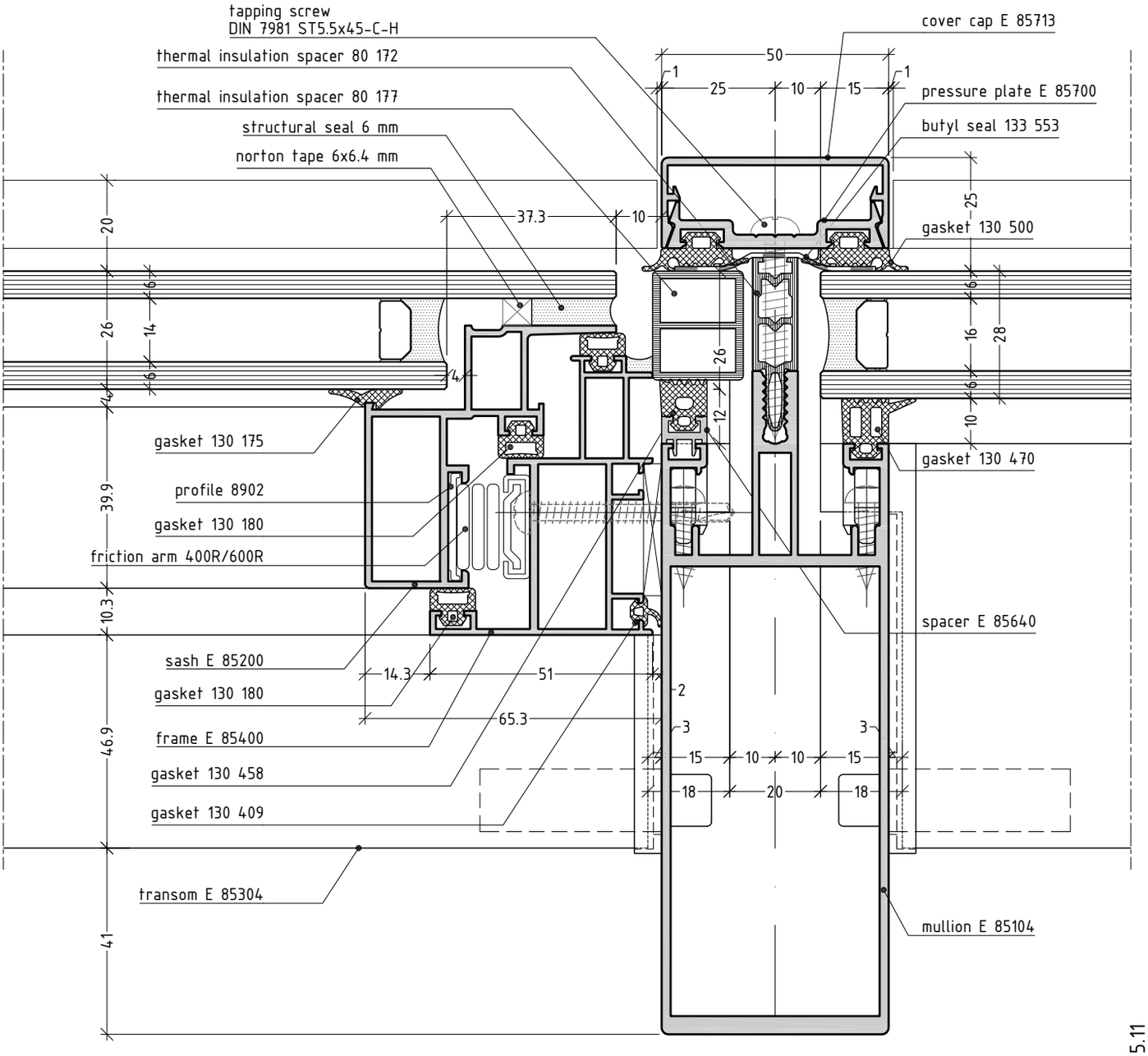


scale 3/4

E85CP5.10

projected window

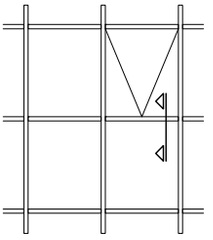


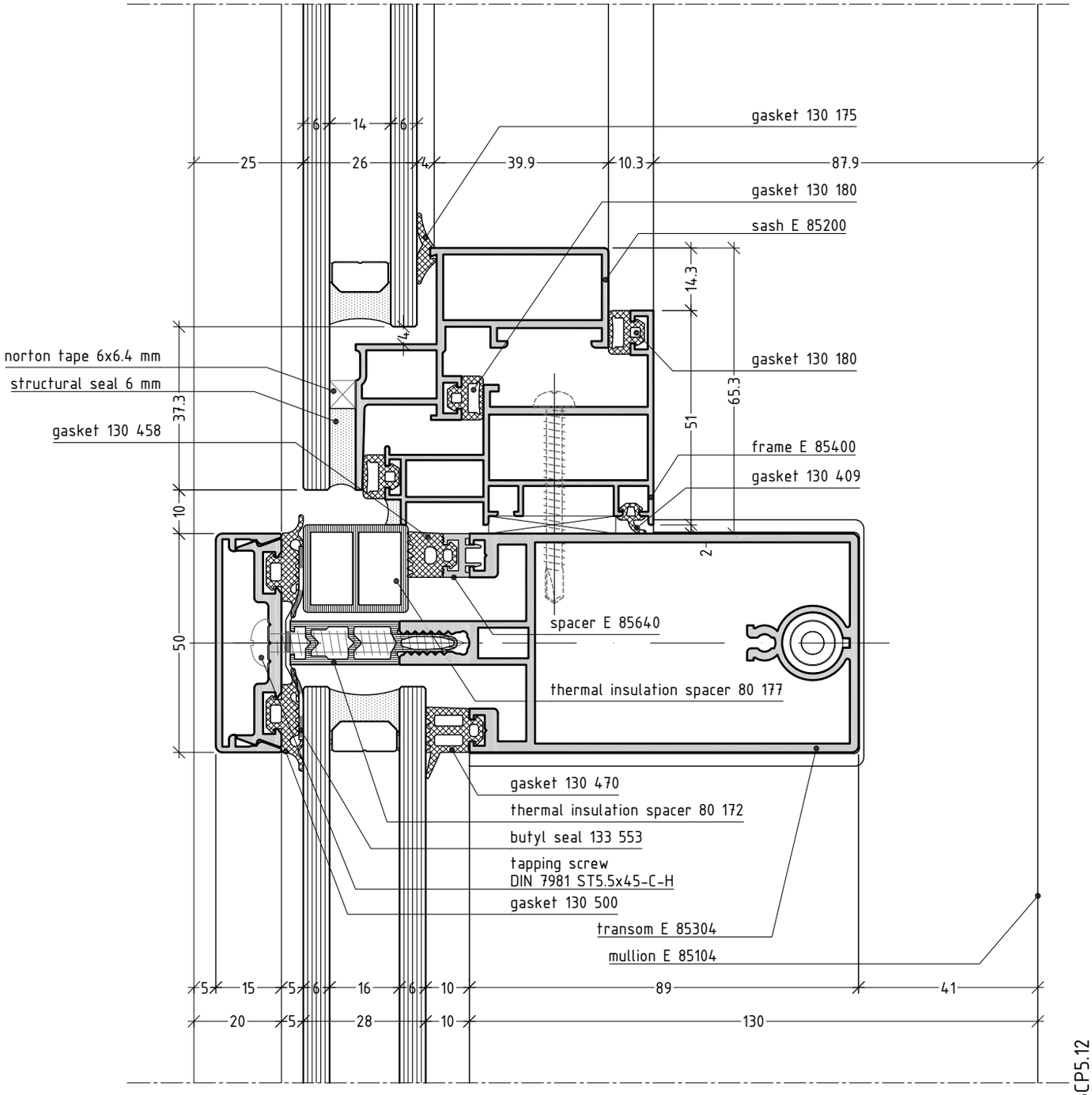


scale 3/4

E85CP5.11

projected window with 2nd level transom

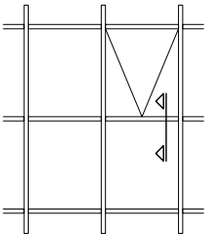


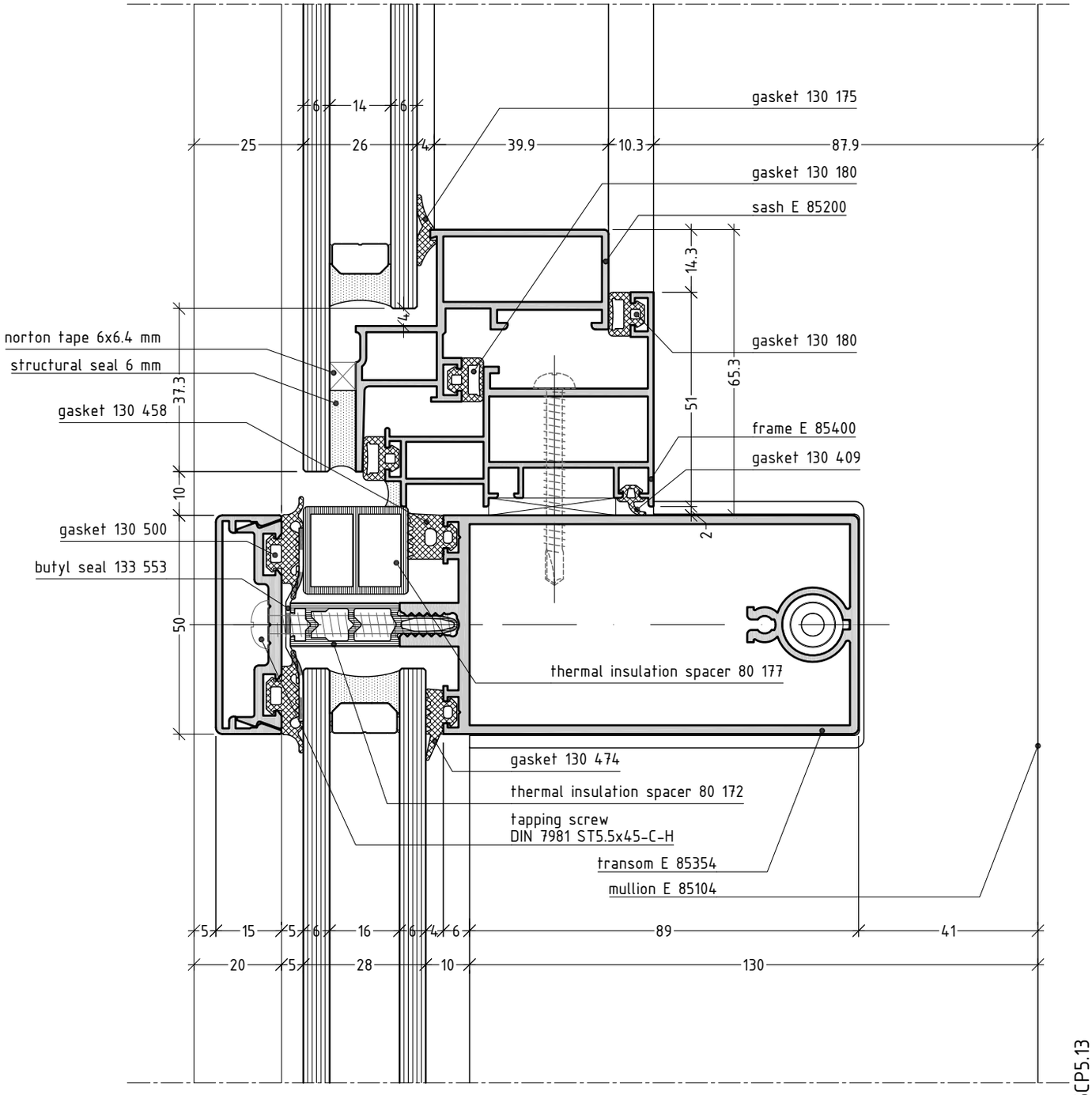


E85CP5.12

scale 3/4

projected window with 3rd level transom

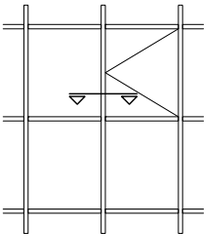


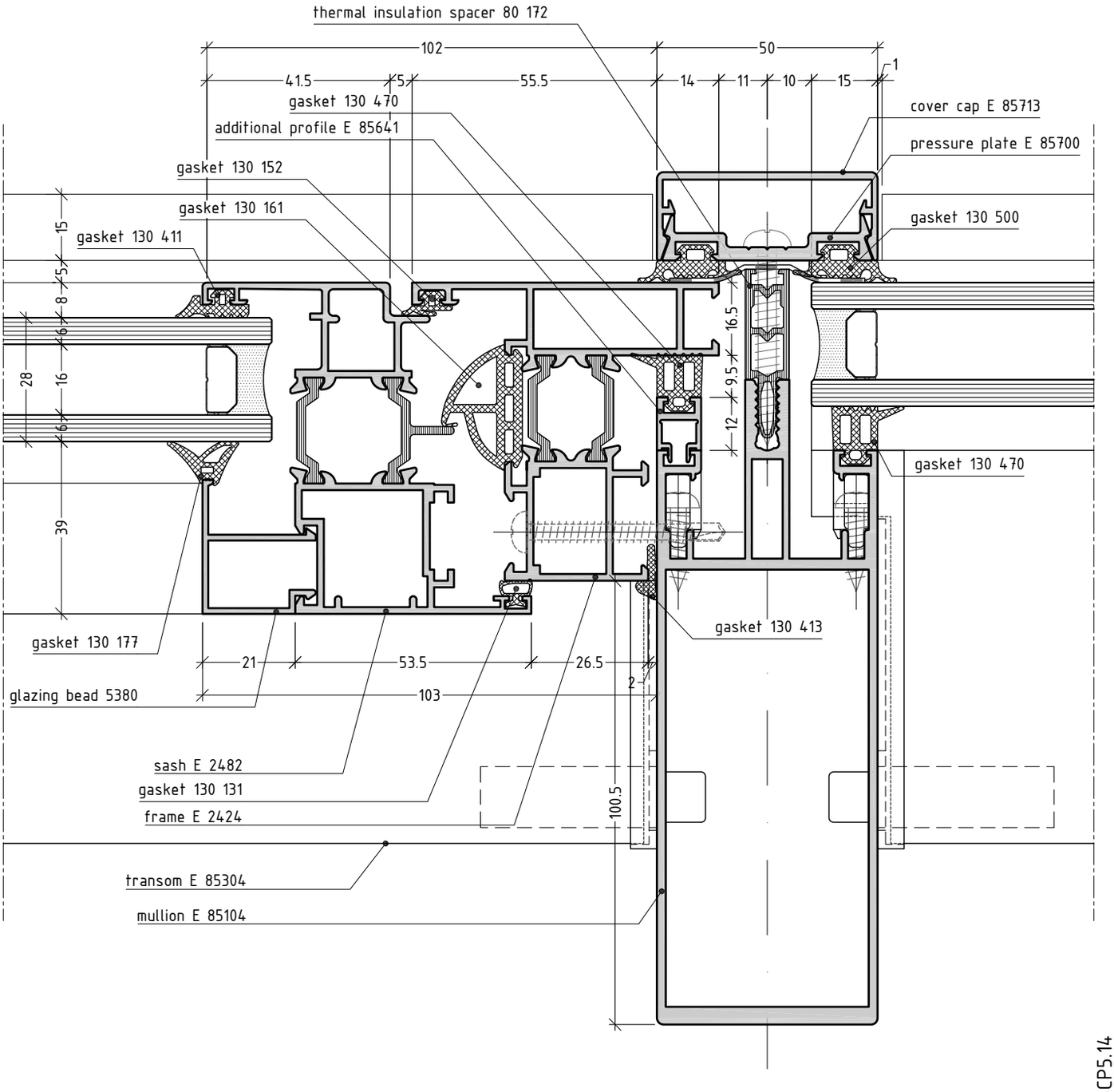


E85CP5.13

scale 3/4

window in curtain wall

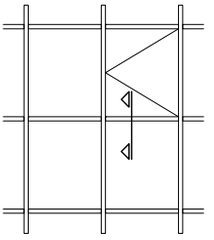


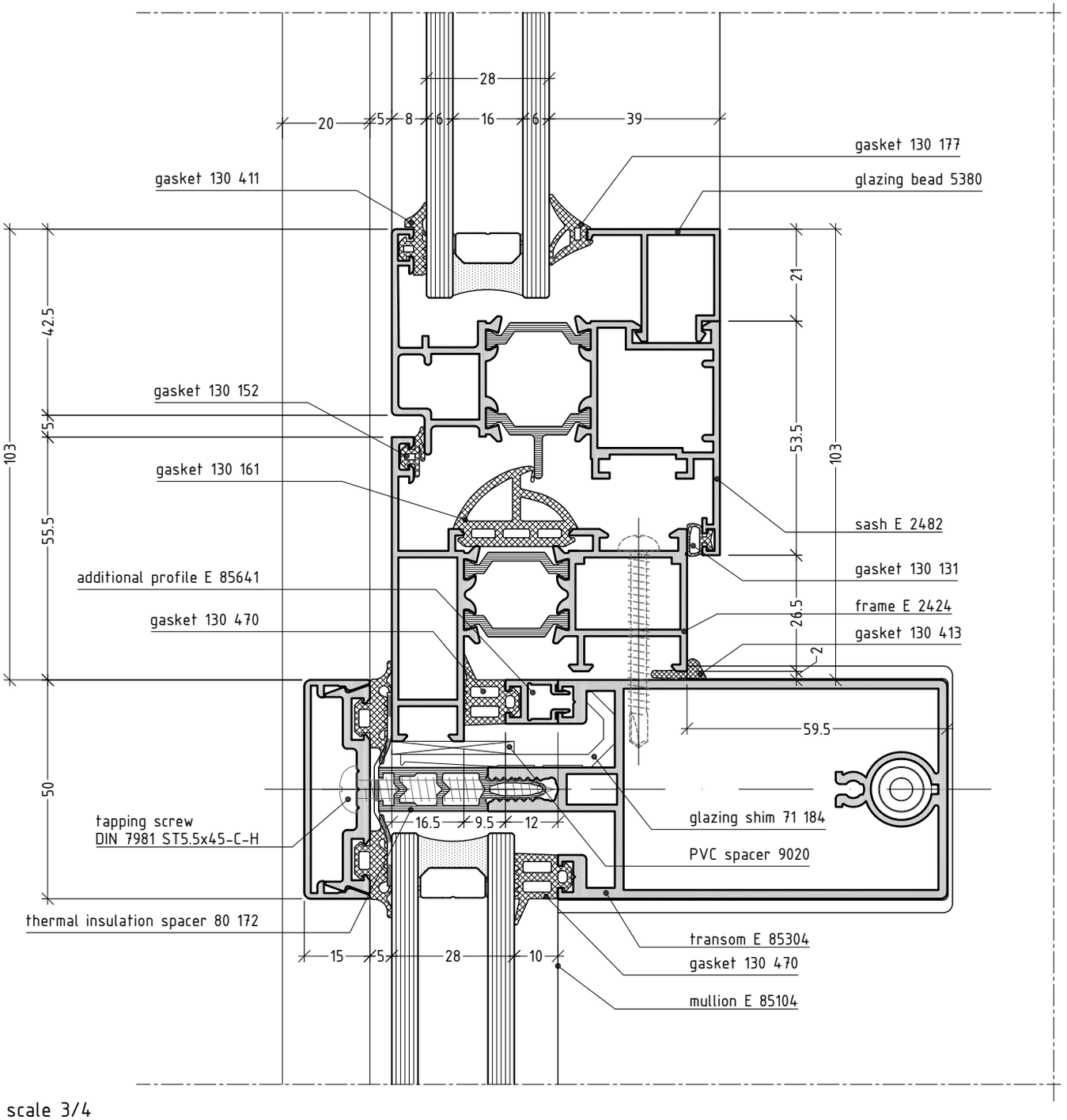


scale 3/4

E85CP5.14

window in curtain wall with 2nd level transom

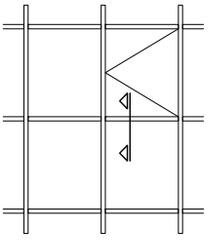


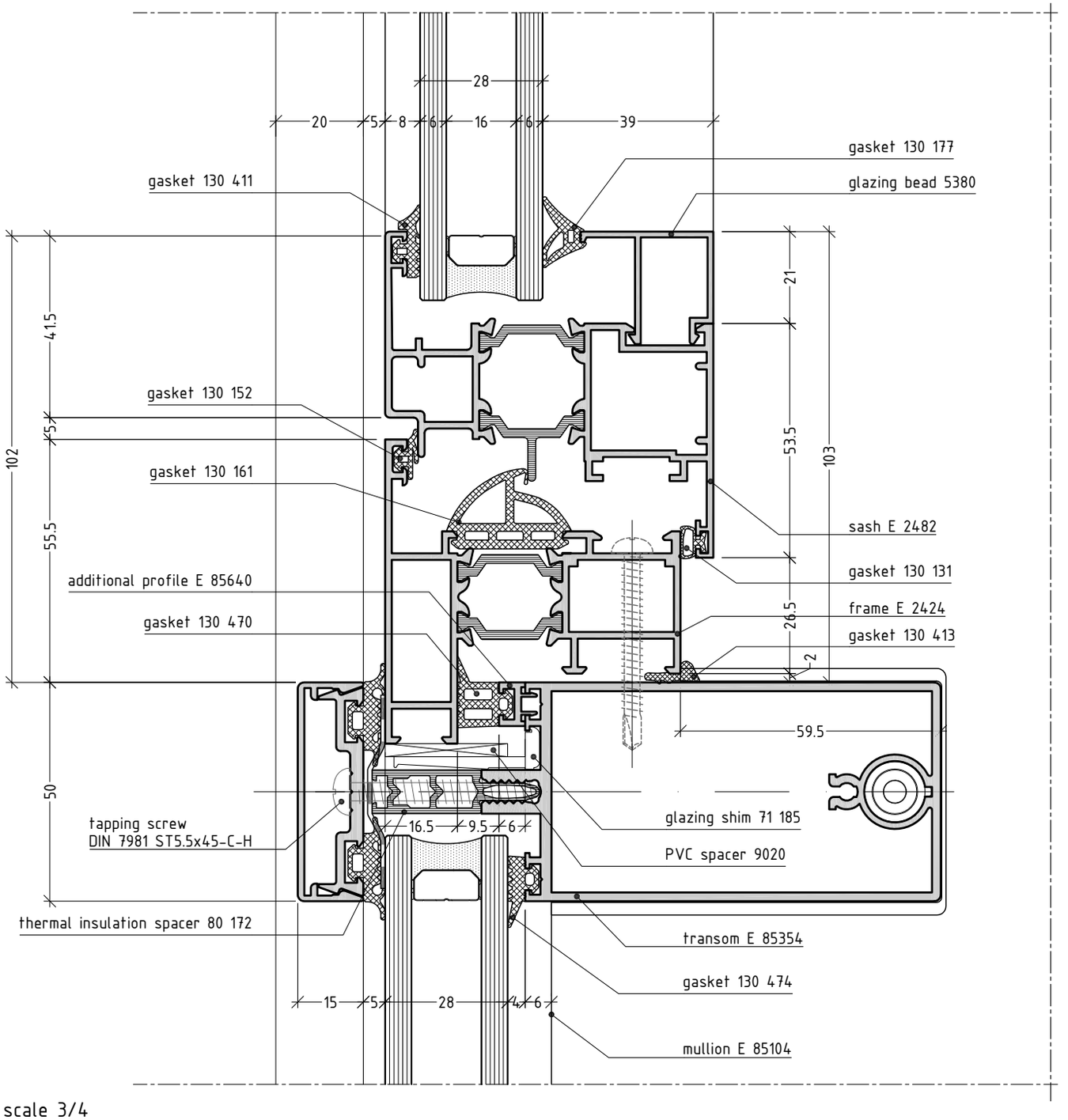


E85CP5.15

scale 3/4

window in curtain wall with 3rd level transom

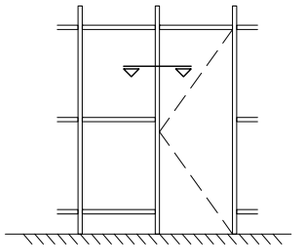


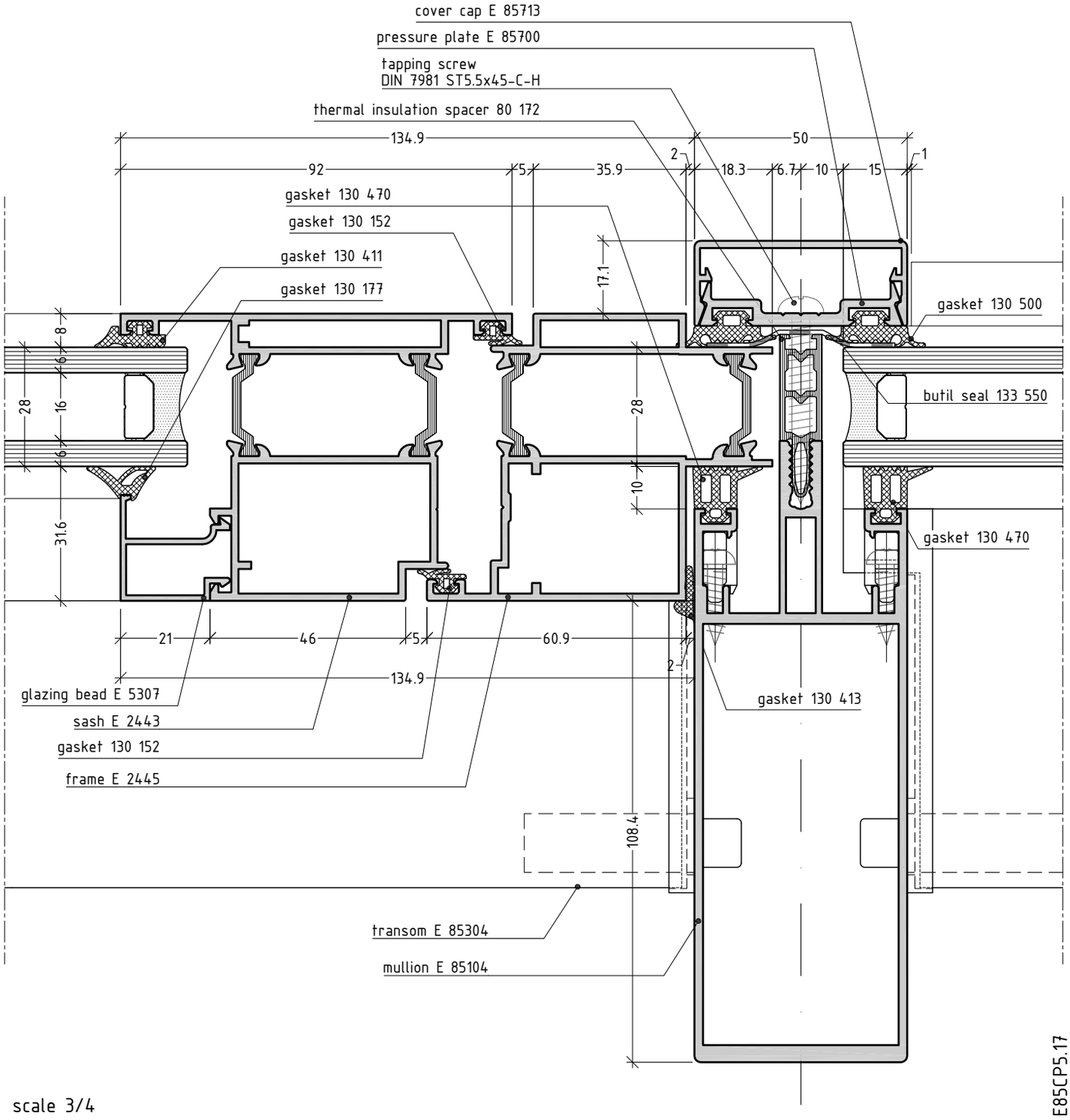


E85CP5.16

scale 3/4

door in curtain wall

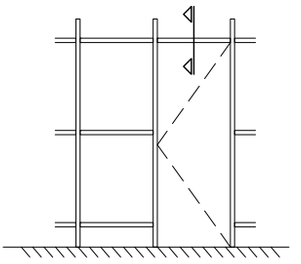


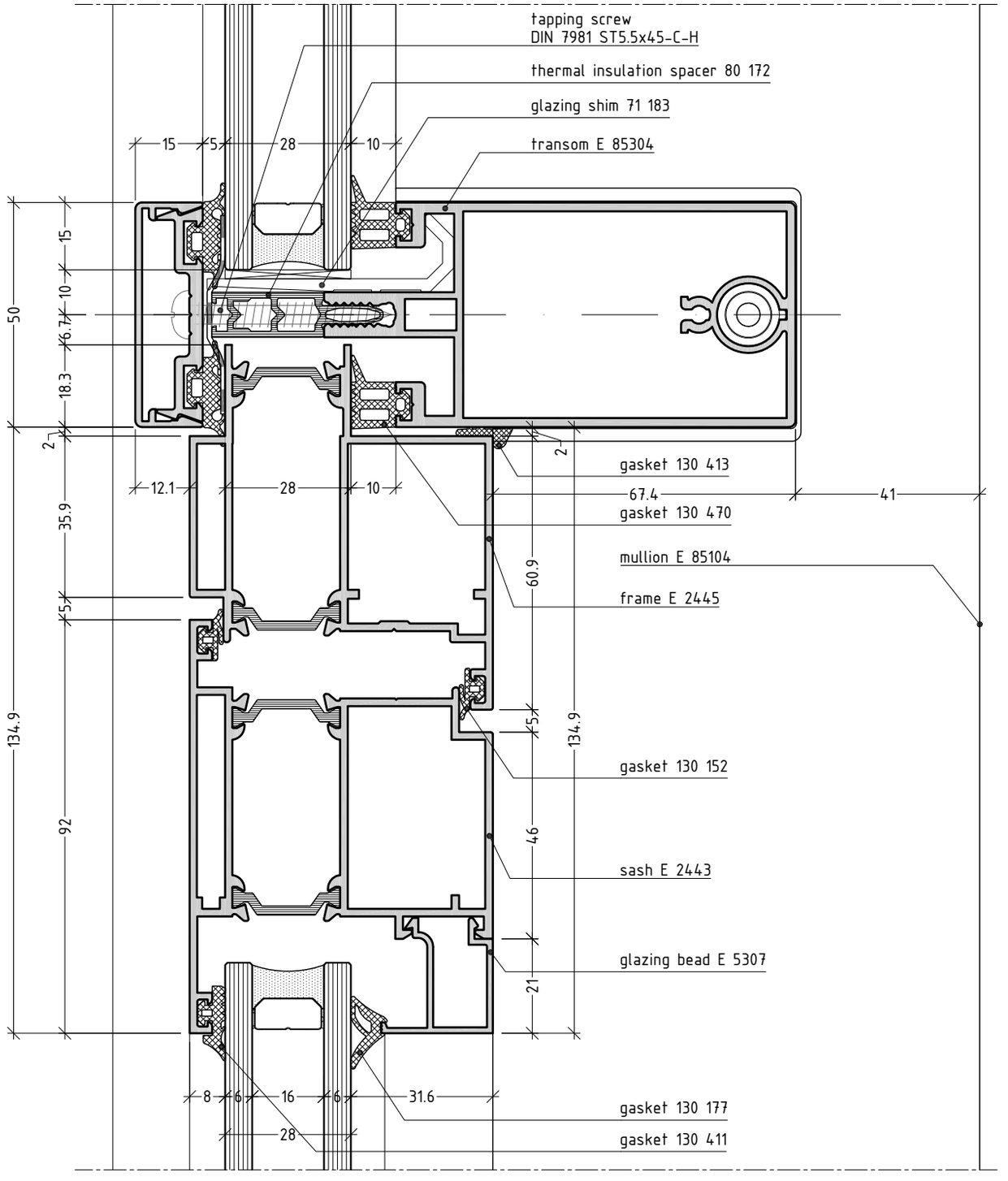


scale 3/4

E85CP5.17

door in curtain wall with 2nd level transom

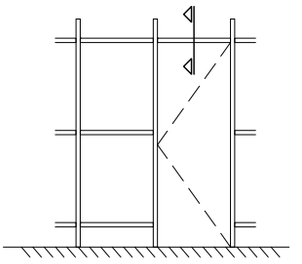


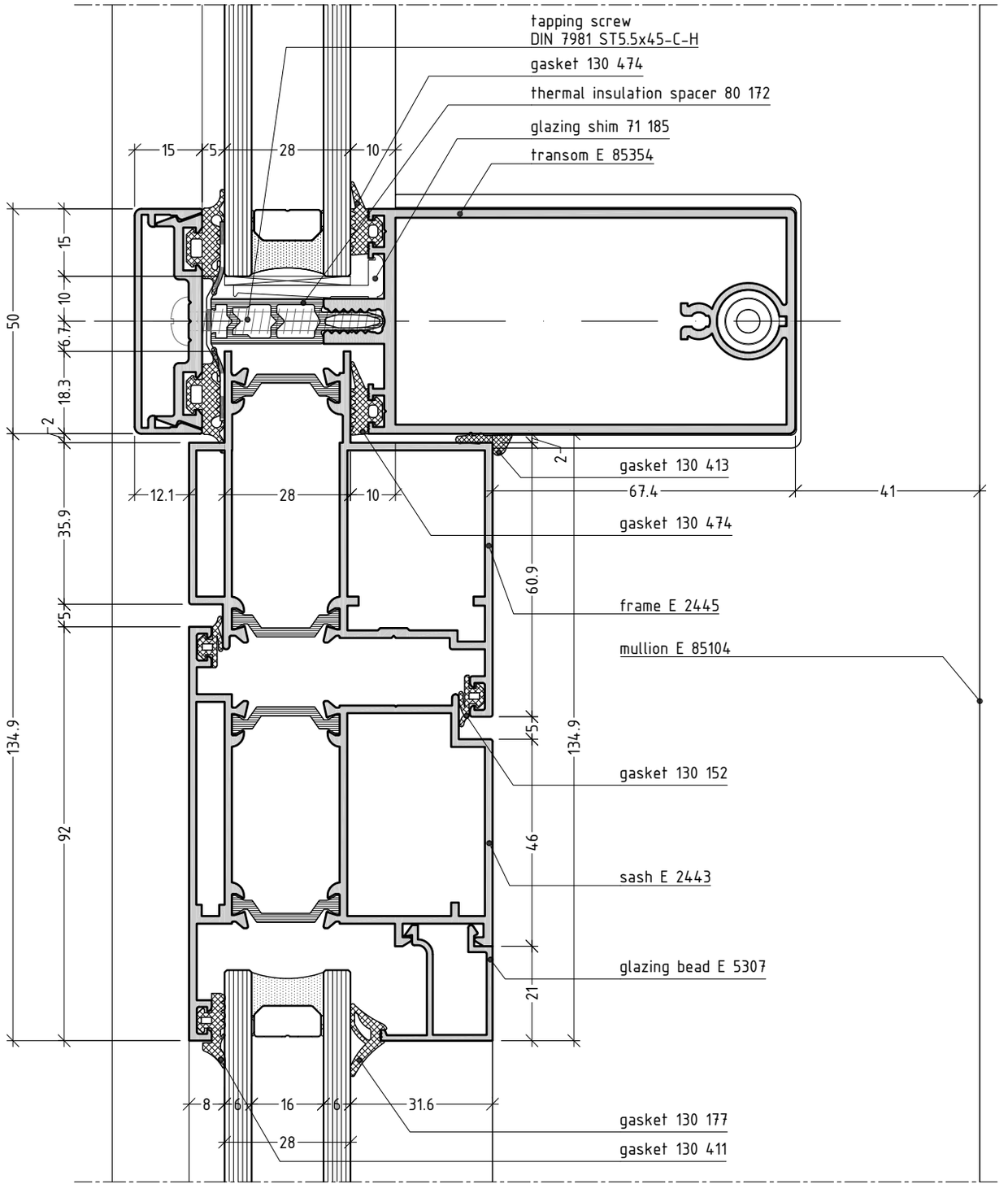


scale 3/4

E85CP5.18

door in curtain wall with 3rd level transom

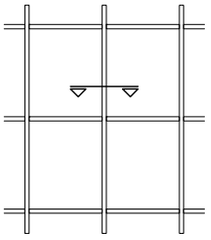


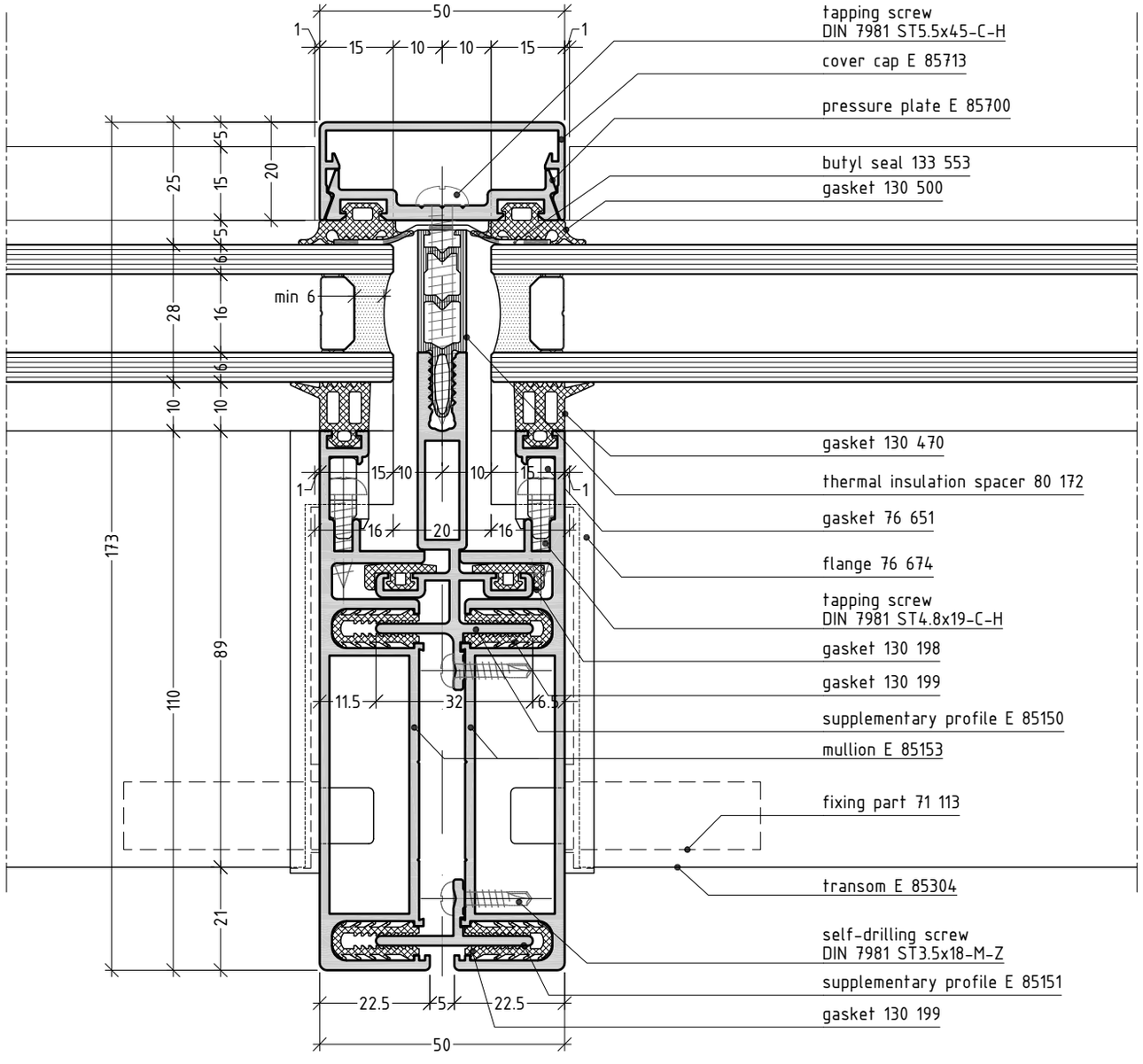


scale 3/4

E85CP5.19

split mullion

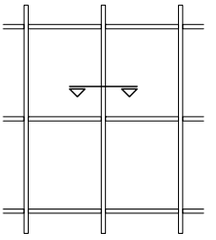


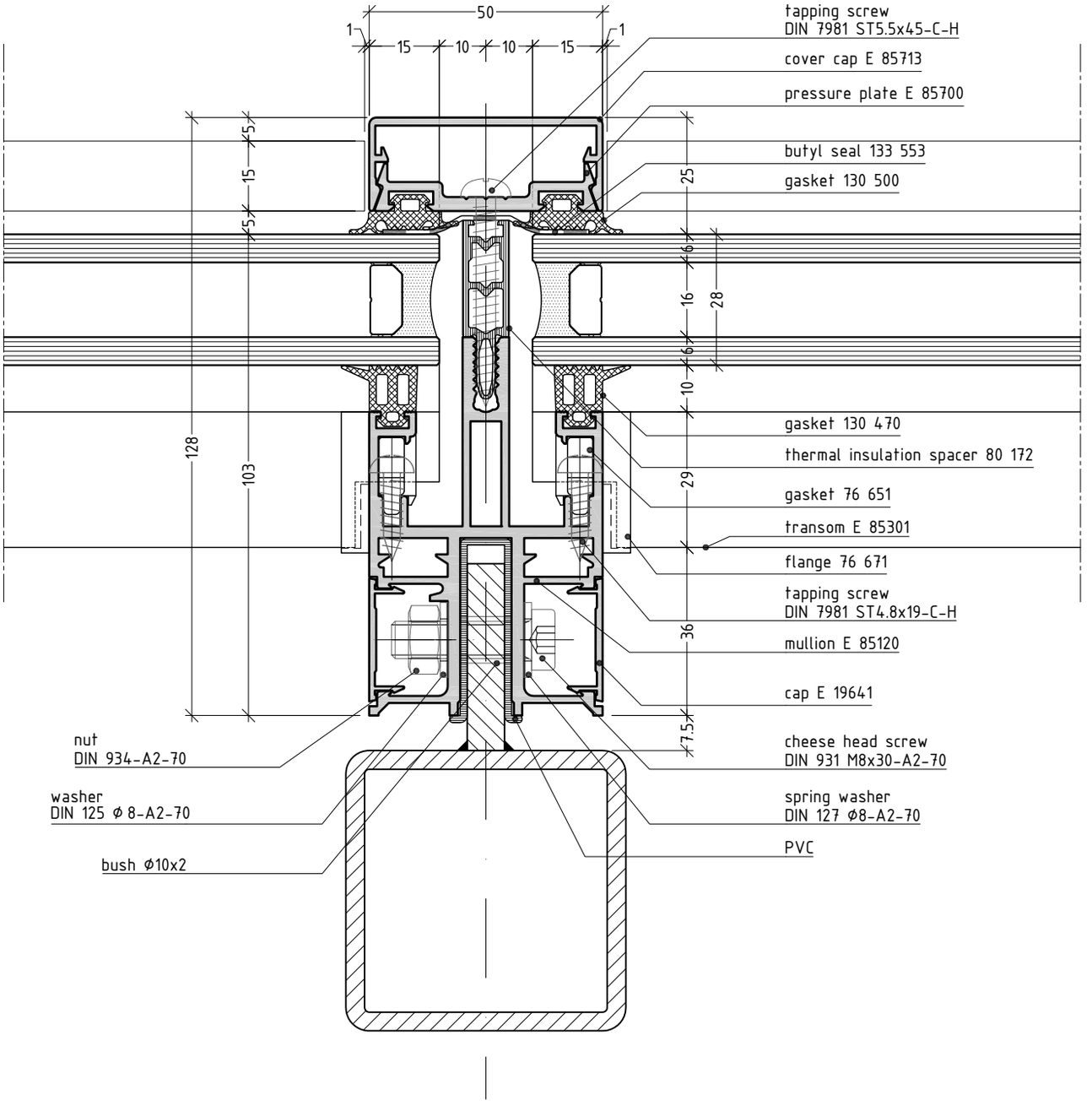


scale 3/4

E85CP5.20

mullion for substructure

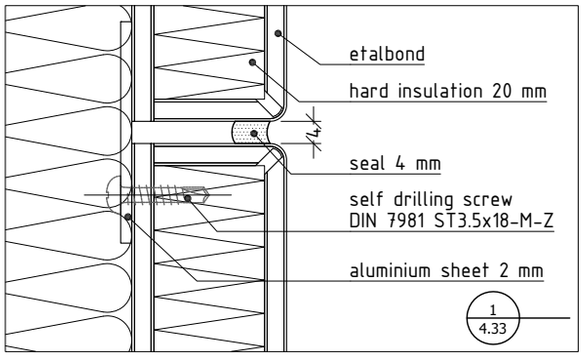


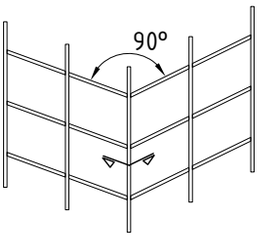


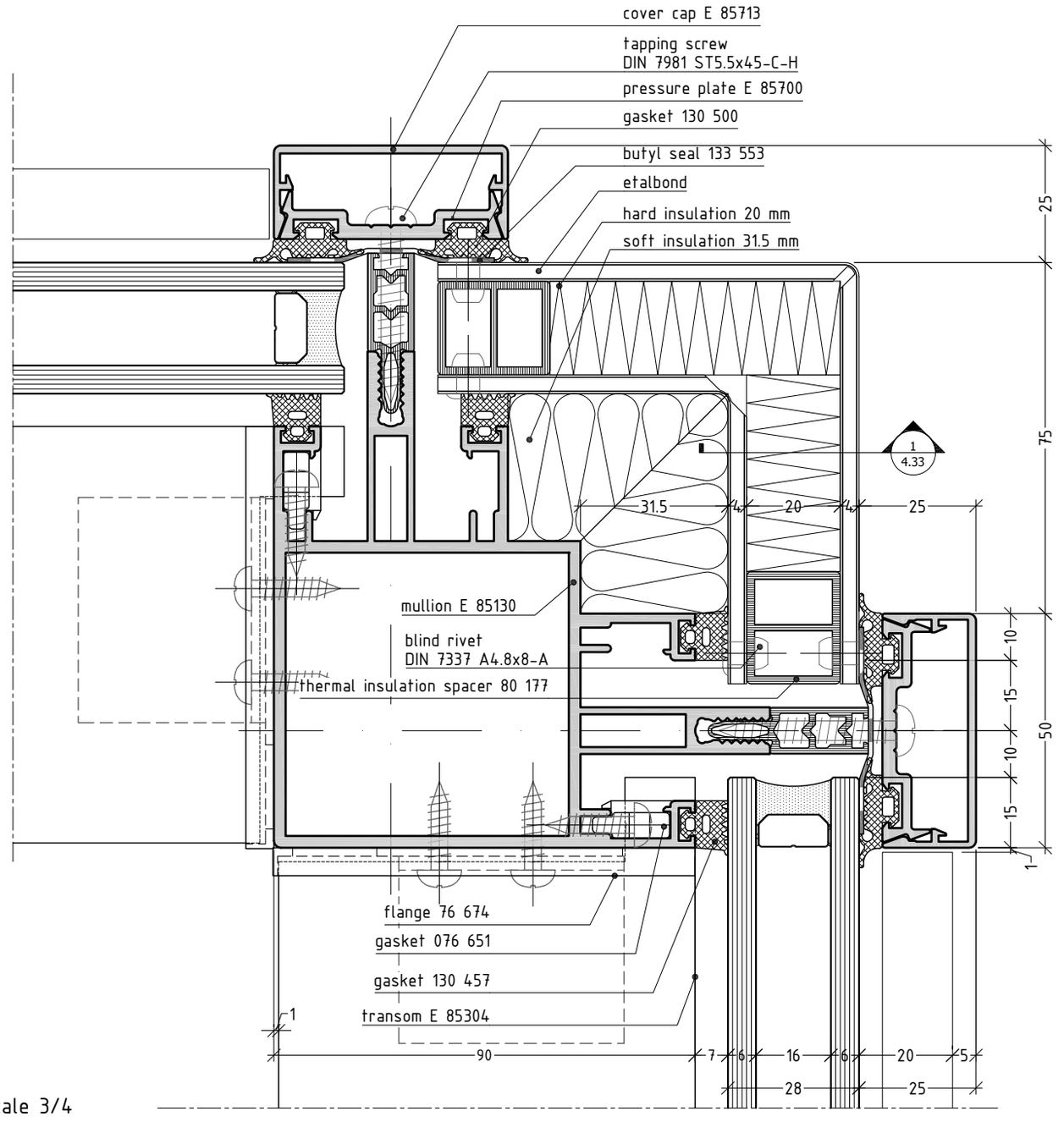
scale 3/4

E85CP5.21

outer corner 90°



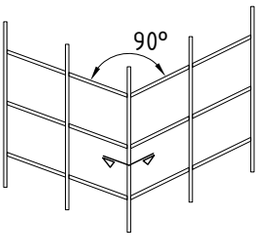


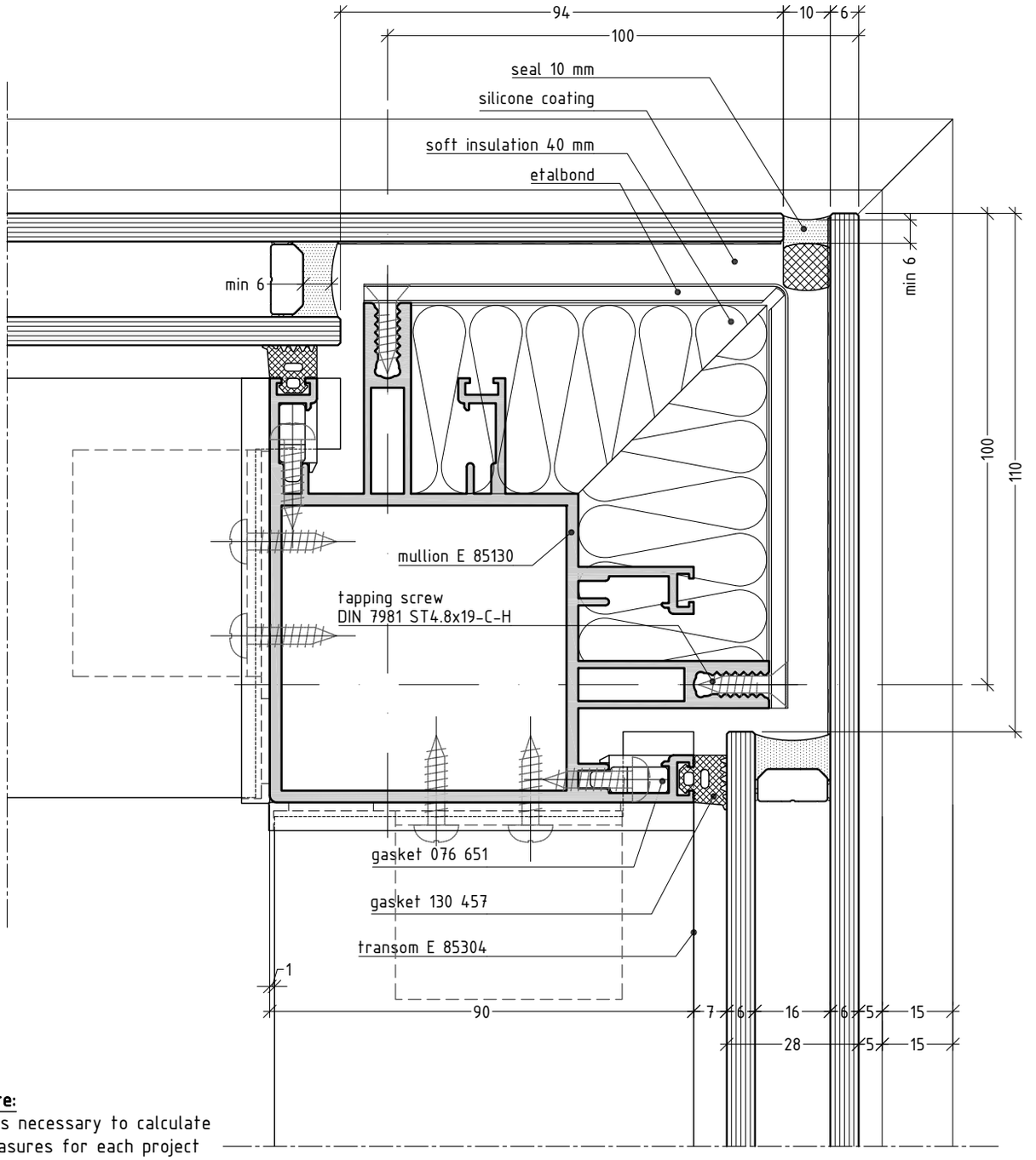


scale 3/4

E85CP5.22

outer corner 90°



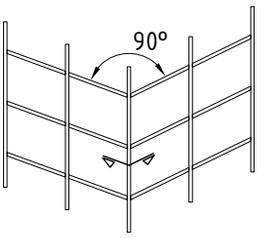


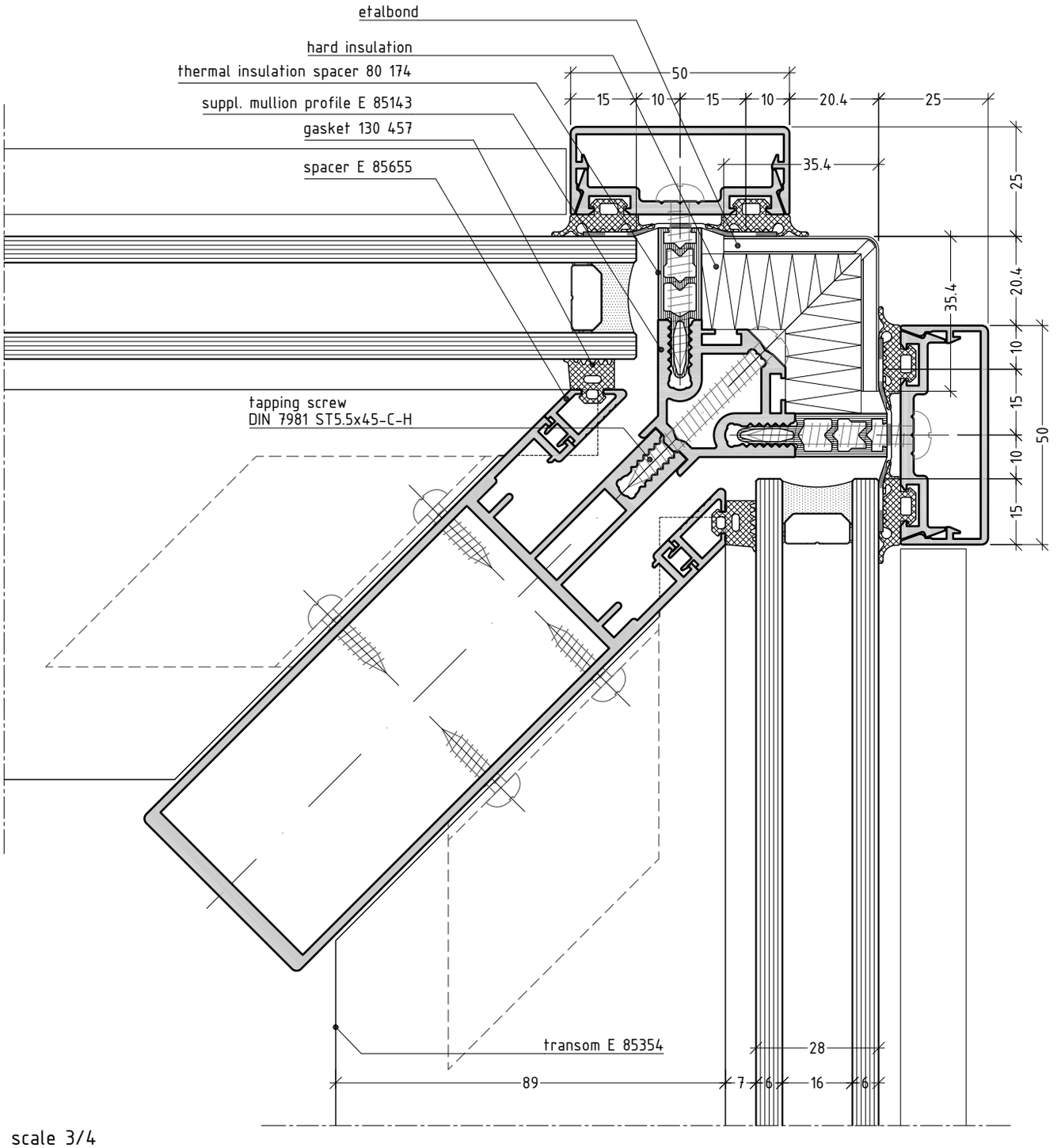
note:
it is necessary to calculate measures for each project

scale 3/4

E85CP5.23

outer corner 90°

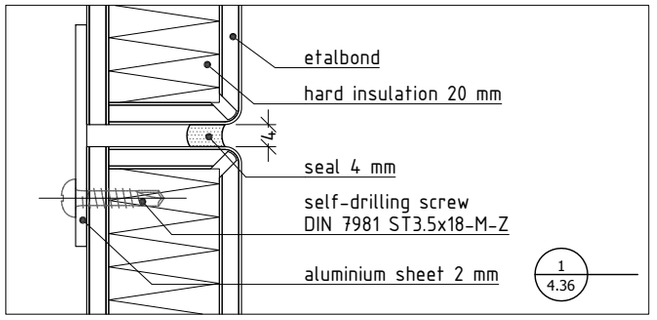


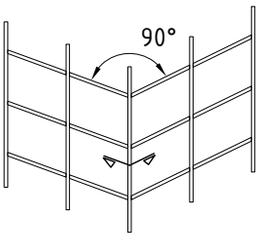


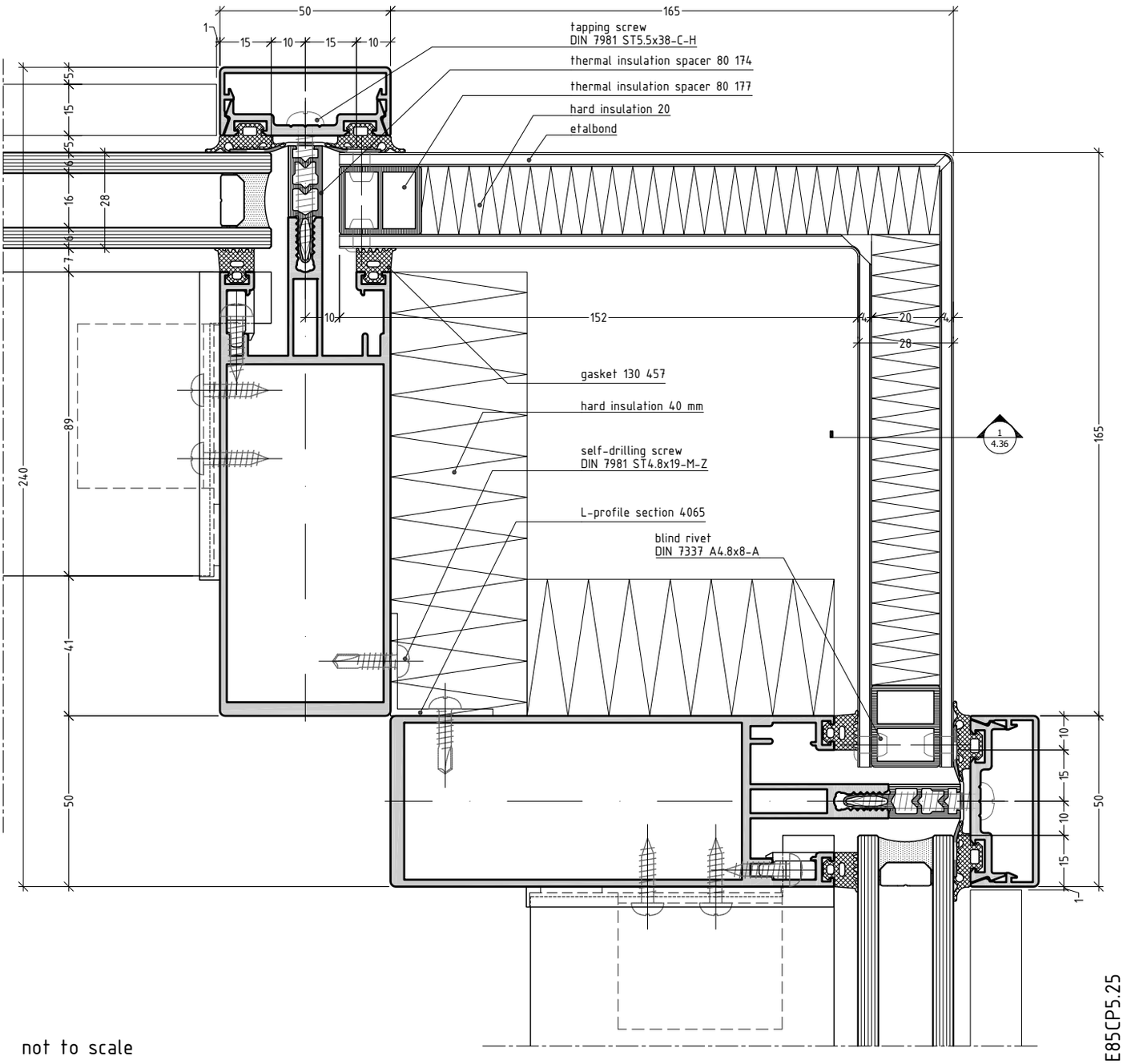
scale 3/4

E85CP5.24

outer corner 90°



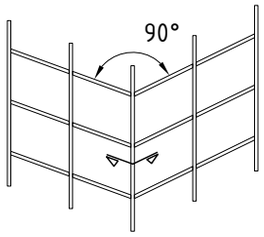


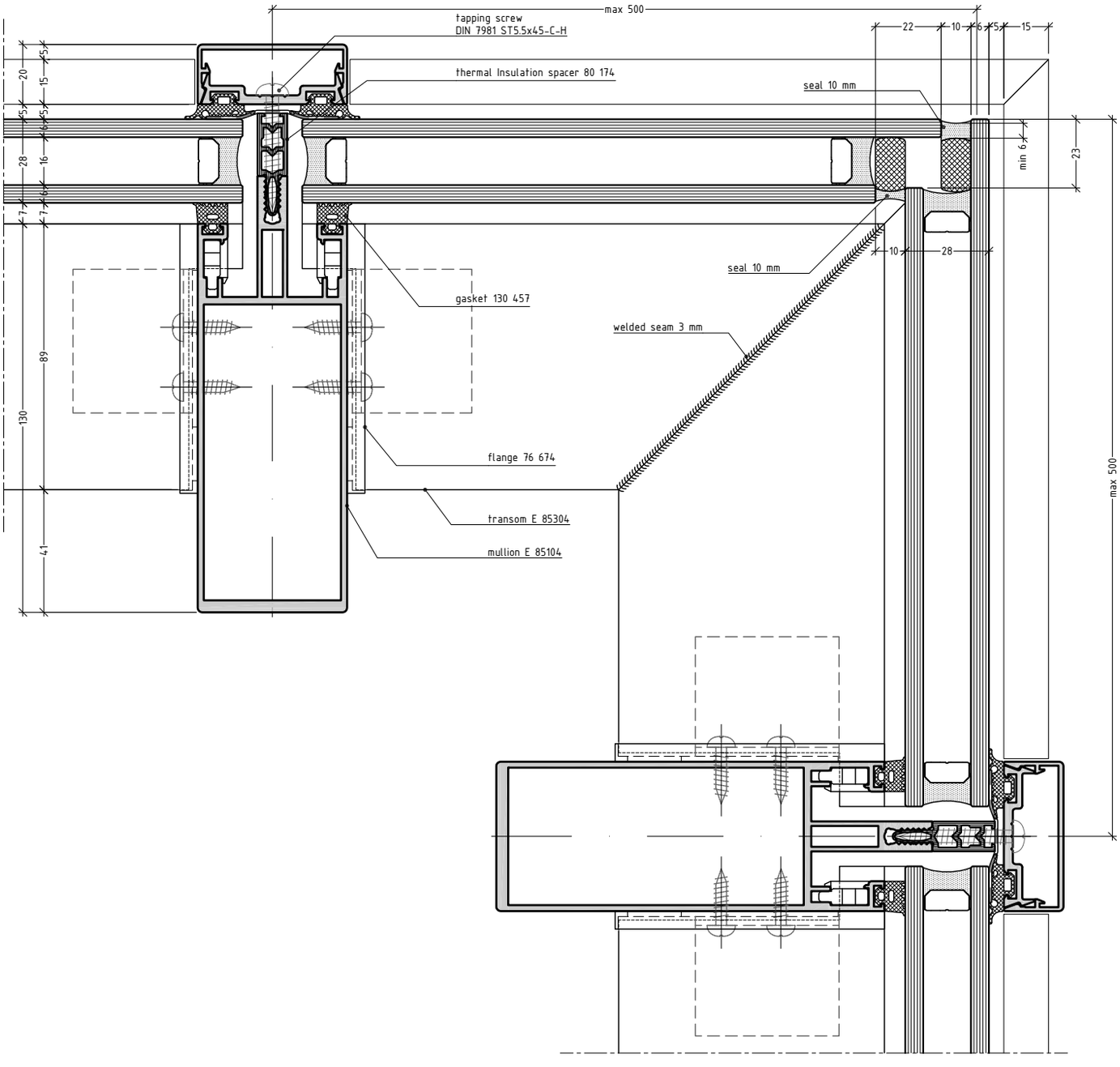


not to scale

E85CP5.25

outer corner 90°



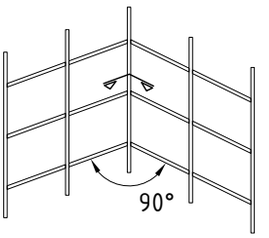


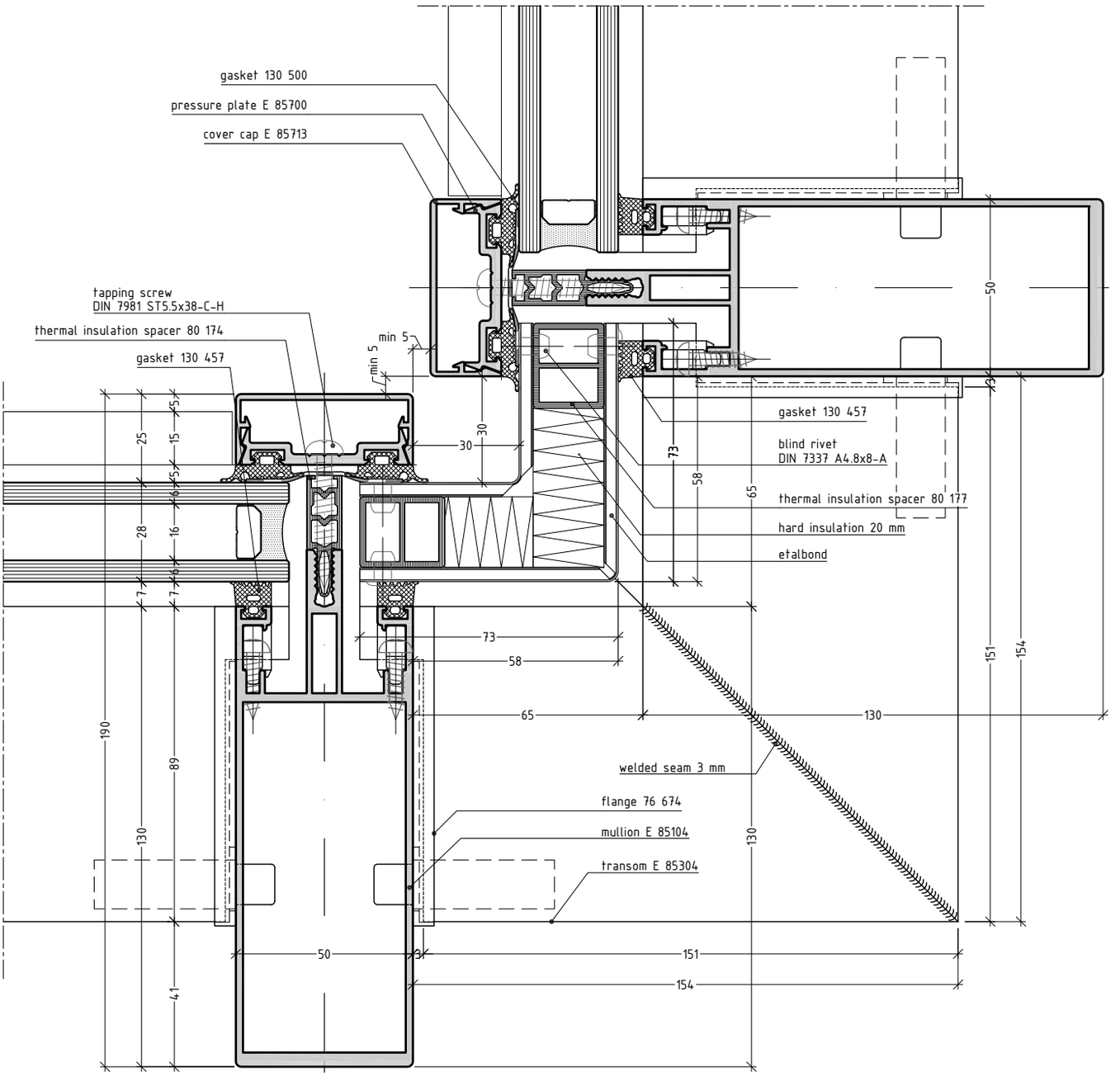
note:
the glass thickness should be
checked by the facade engineer

not to scale

E85CP5.26

inner corner 90°

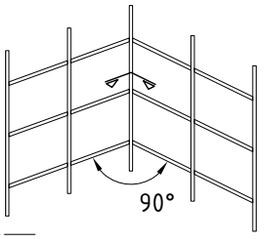


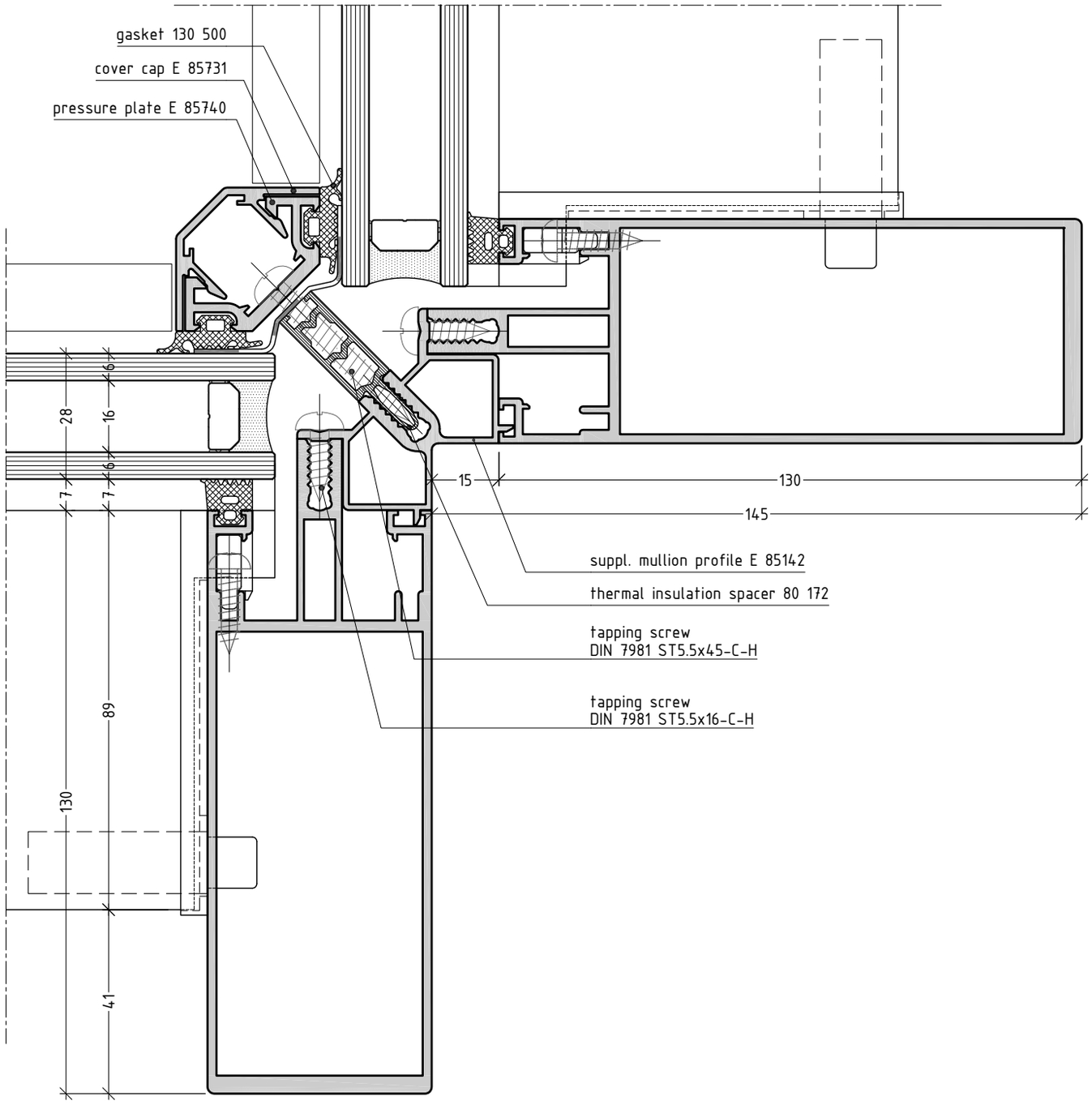


not to scale

E85CP5.27

inner corner 90°

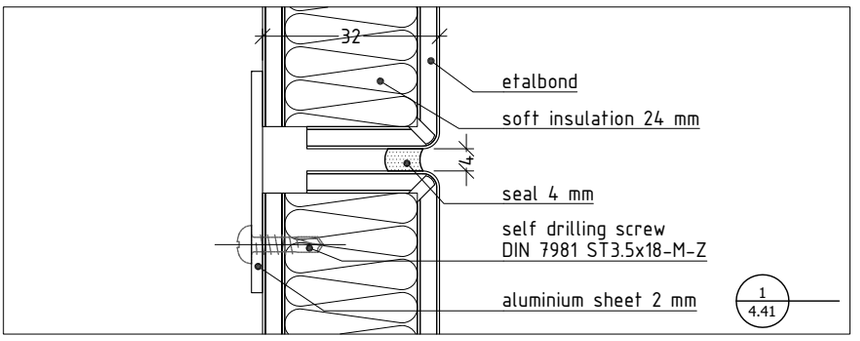


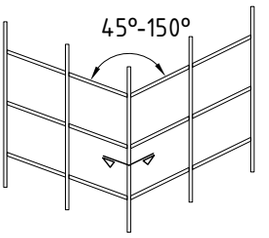


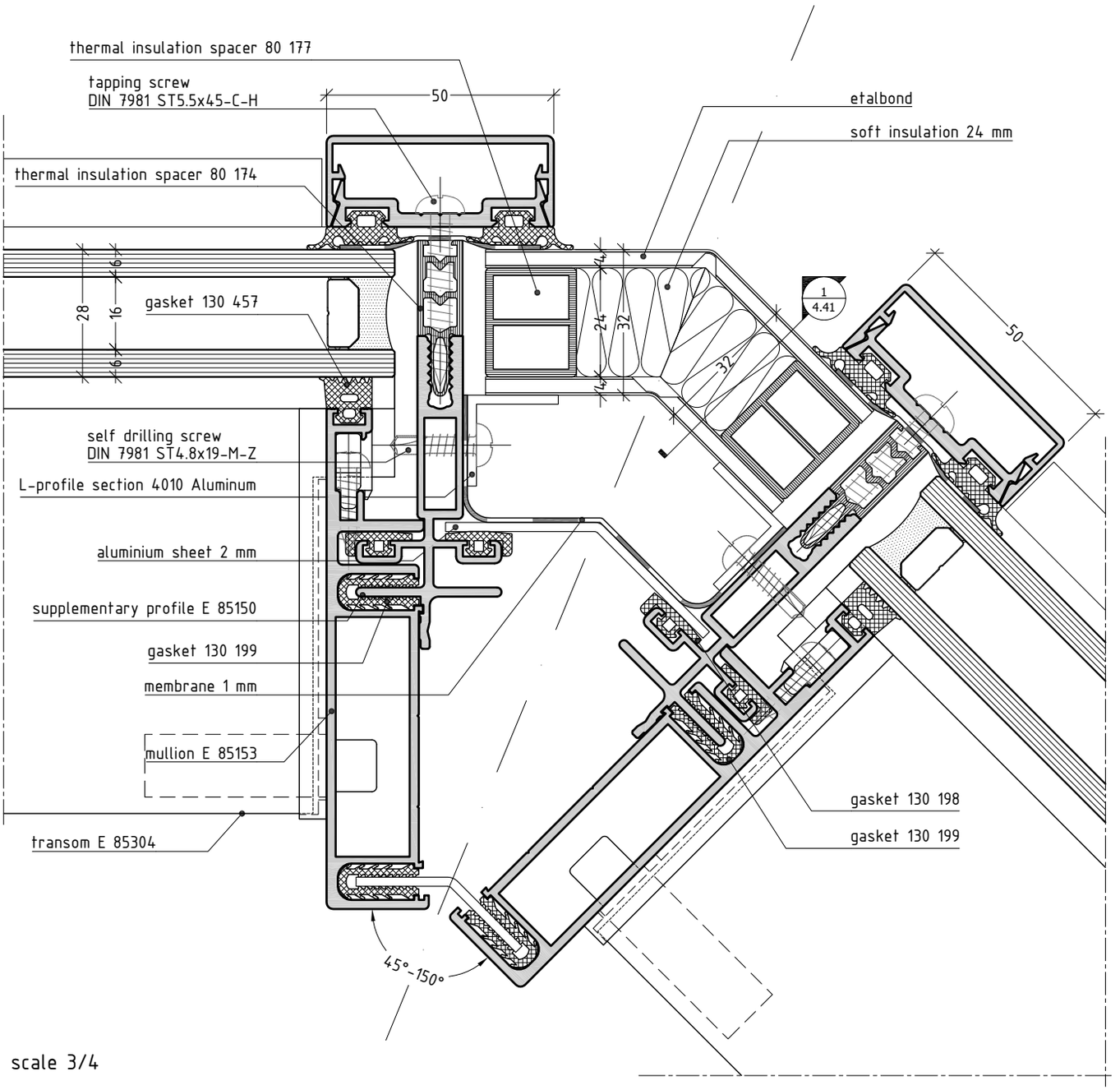
scale 3/4

E85CP5.28

outer corner 45° - 150°



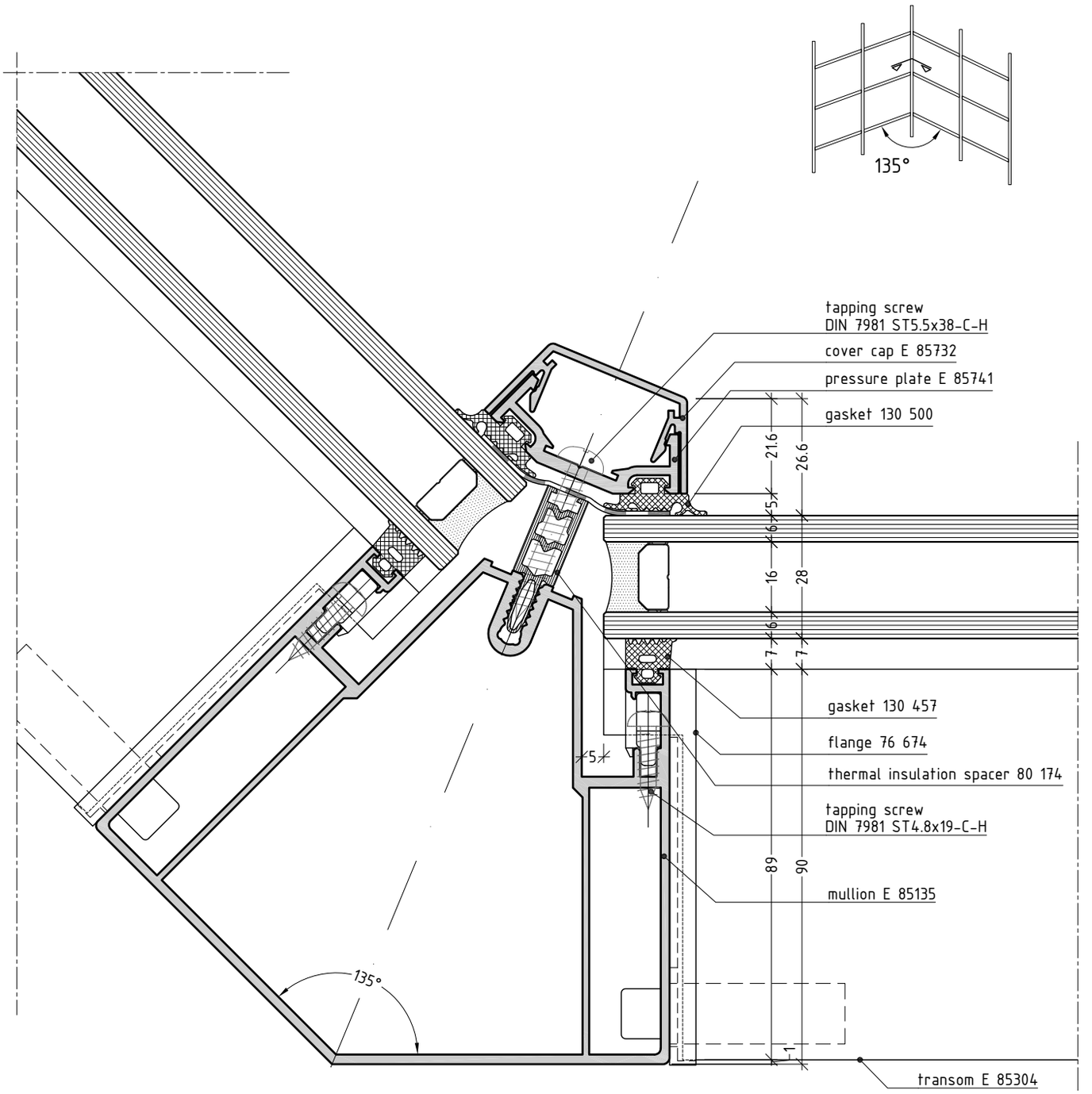




scale 3/4

E85CP5.29

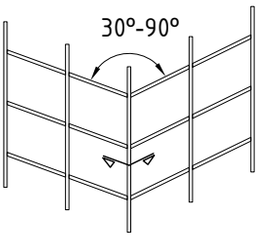
inner corner 135°

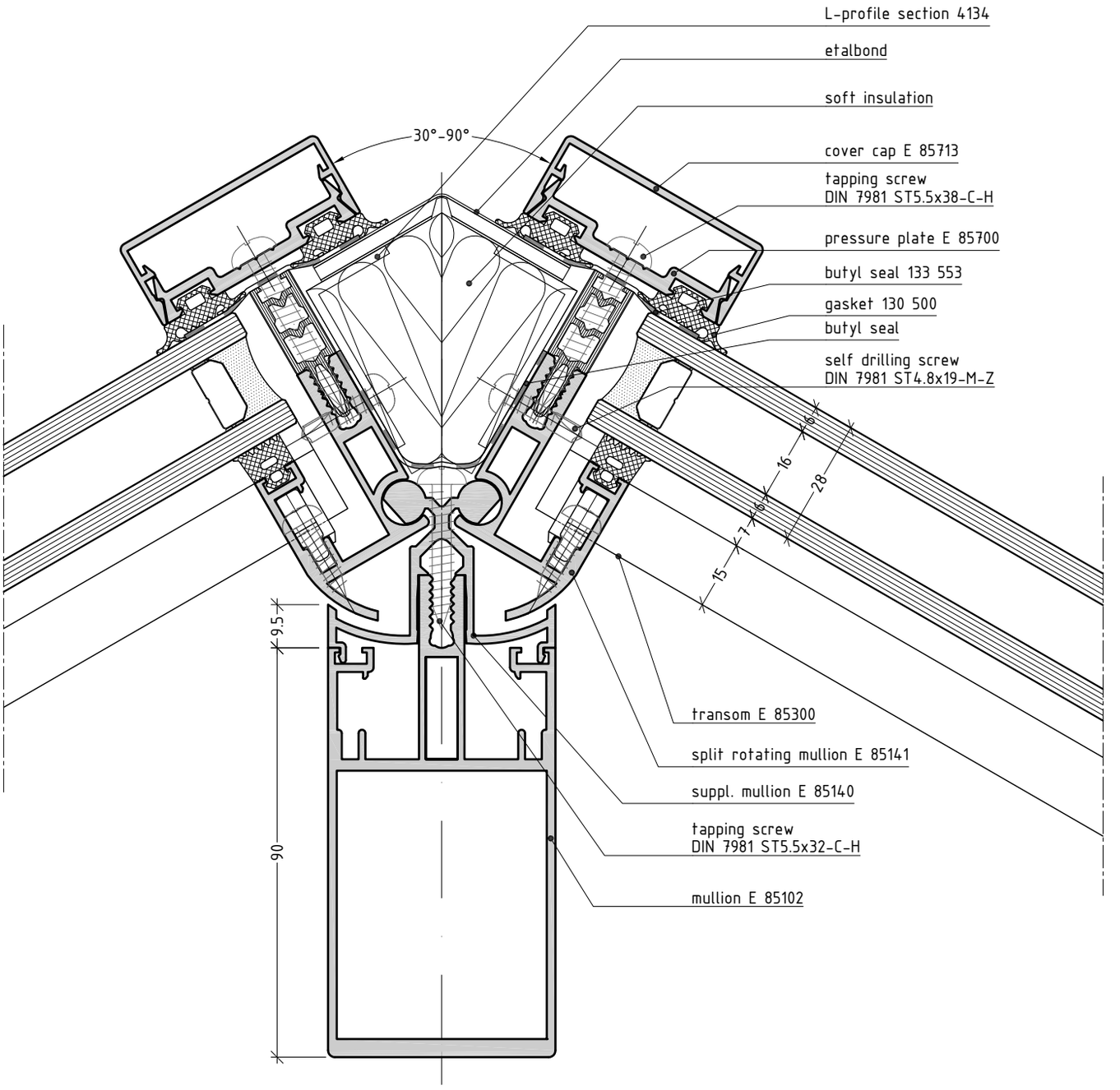


scale 3/4

E85CP5.30

outer corner 30°-90°

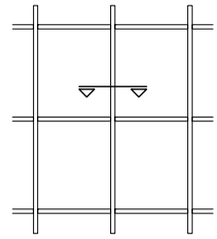


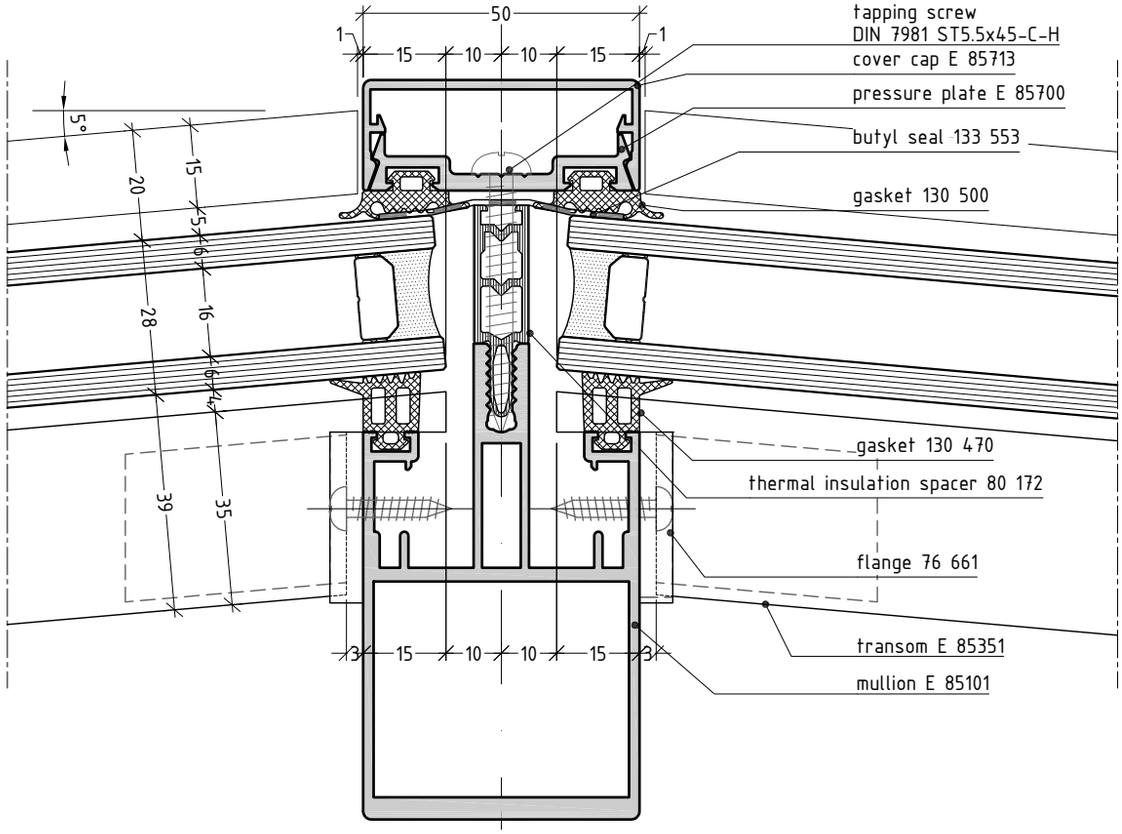


scale 3/4

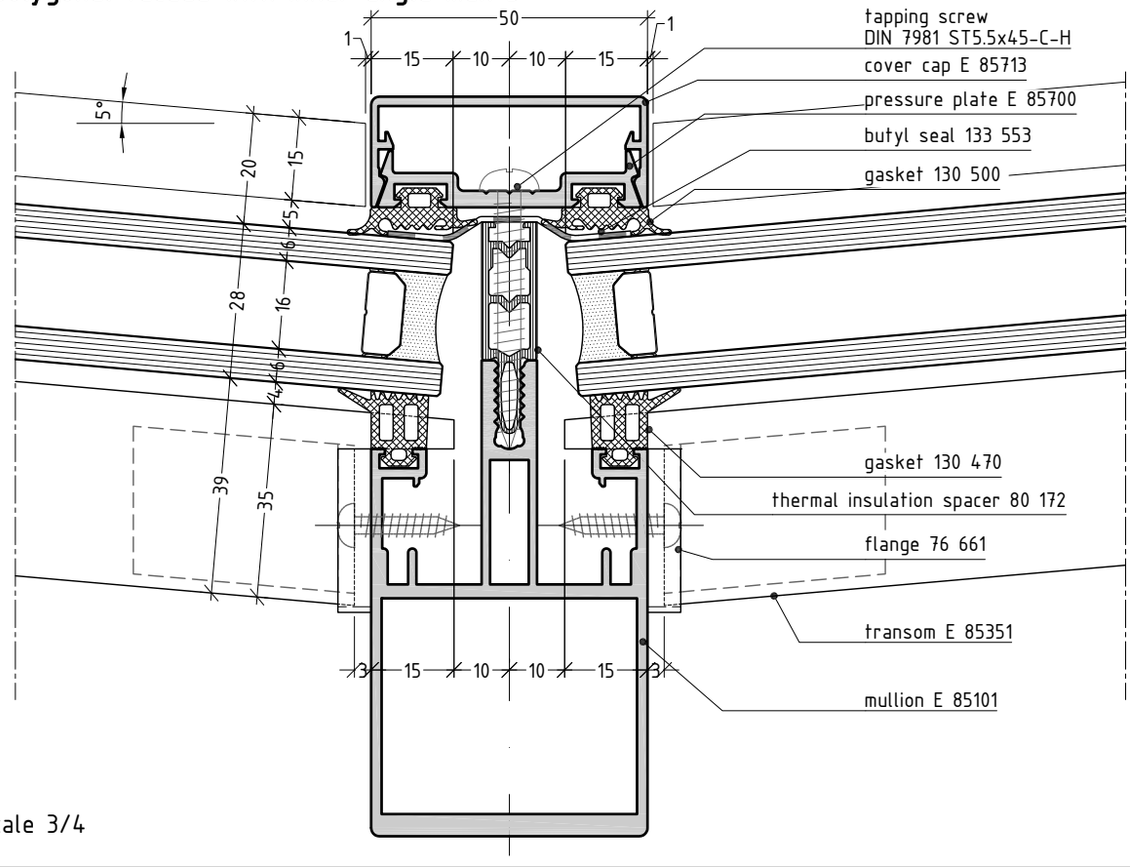
E85CP5.31

polygonal facade with outer angle max 5°





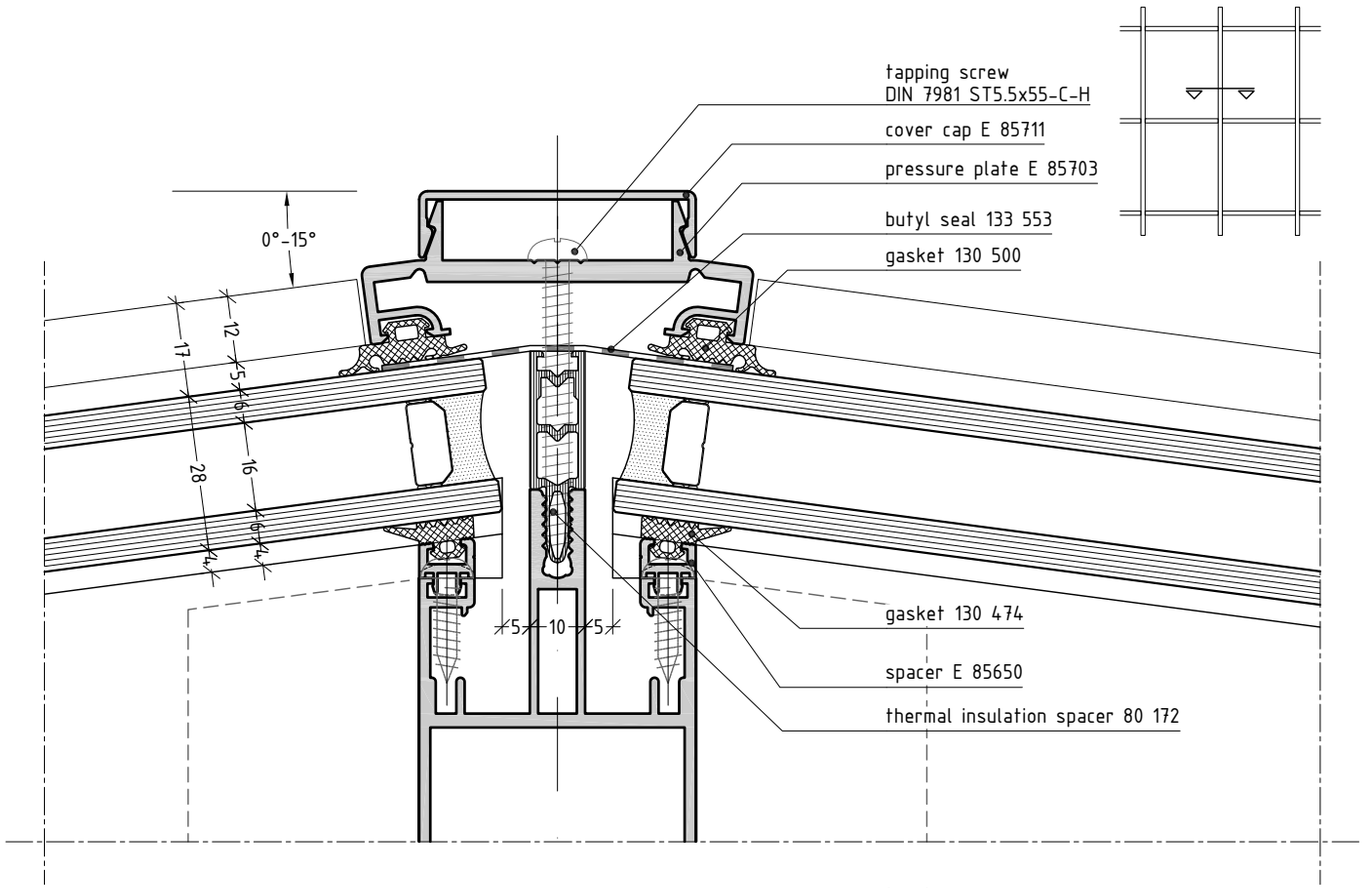
polygonal facade with inner angle max 5°



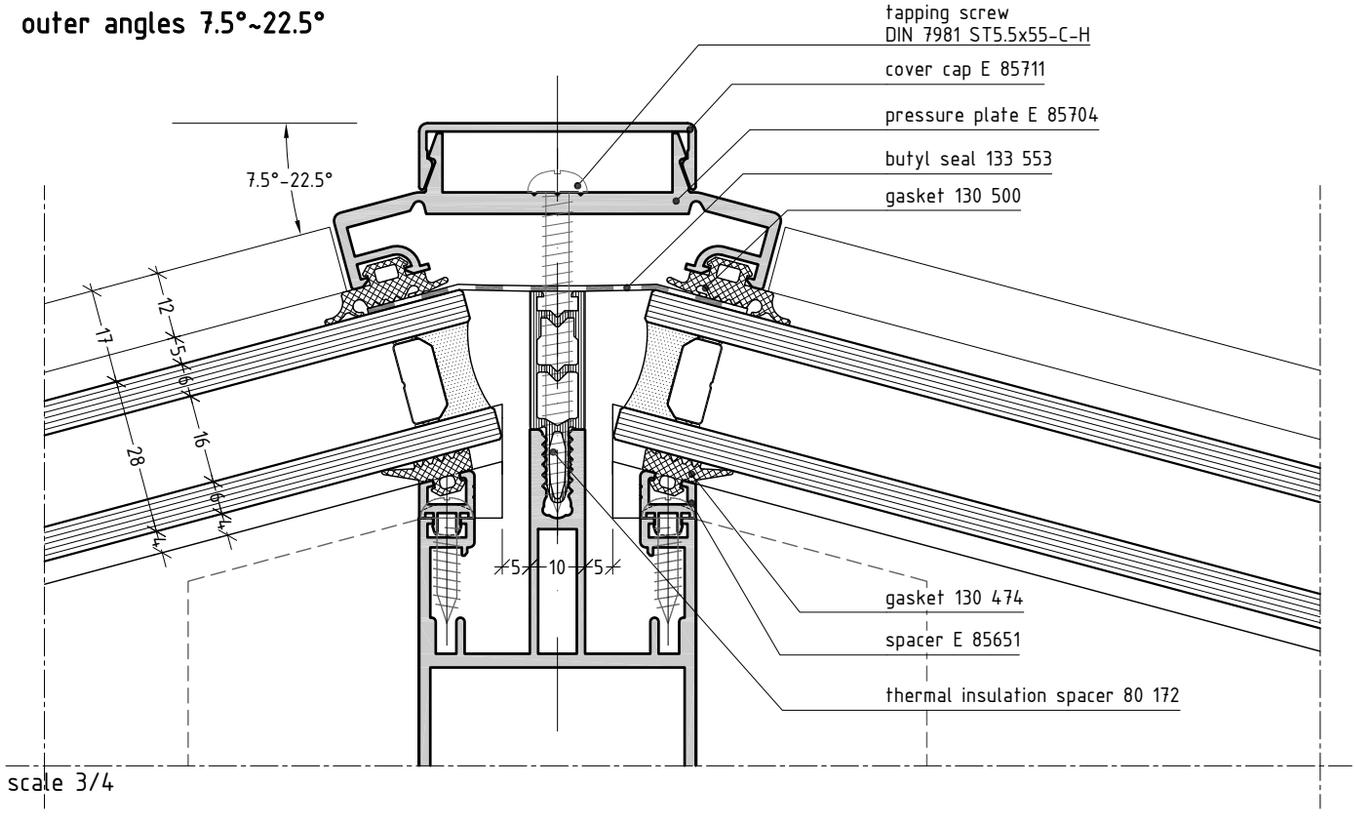
scale 3/4

E85CP5.32

outer angles 0°~15°



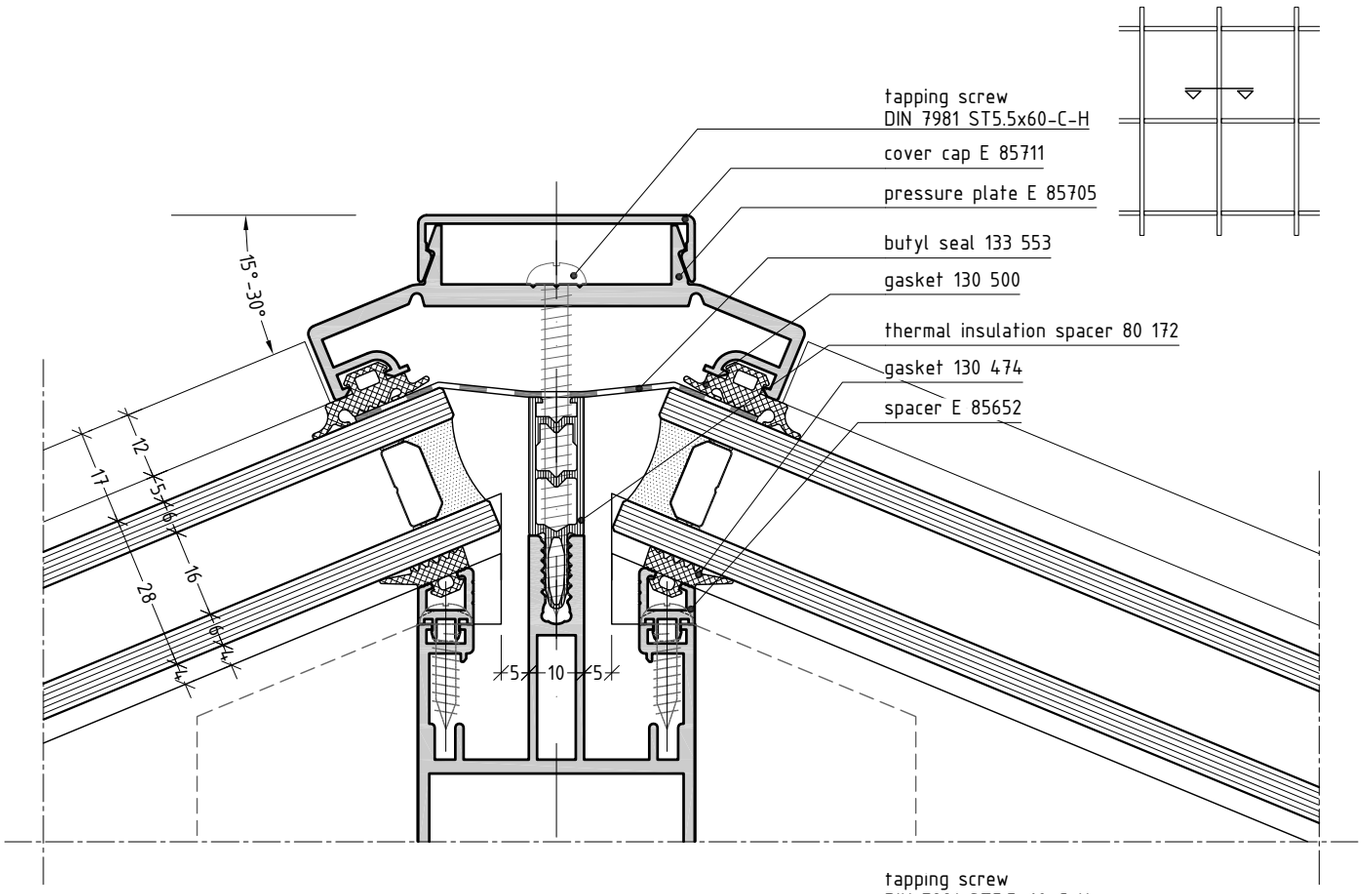
outer angles 7.5°~22.5°



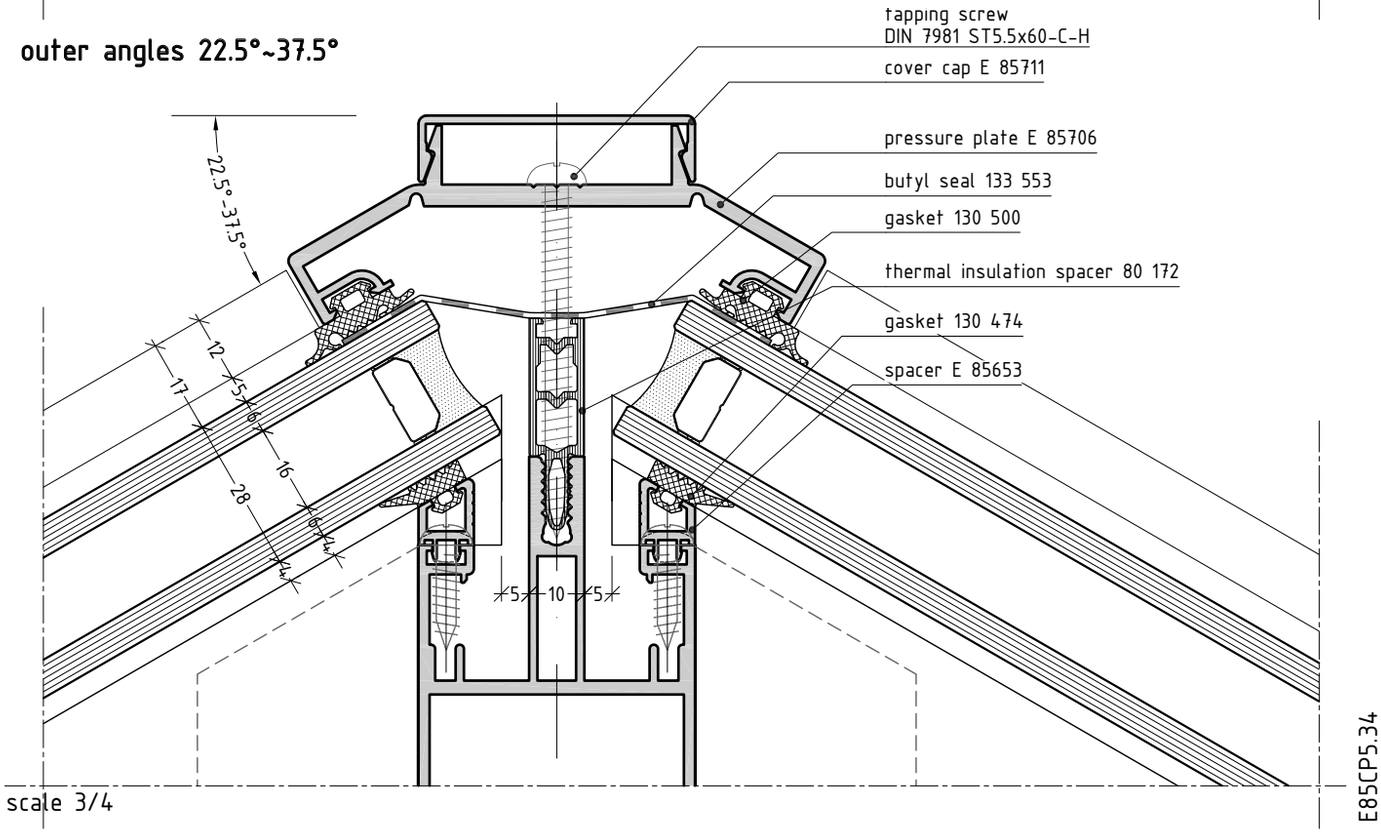
scale 3/4

E85CP5.33

outer angles 15°~30°



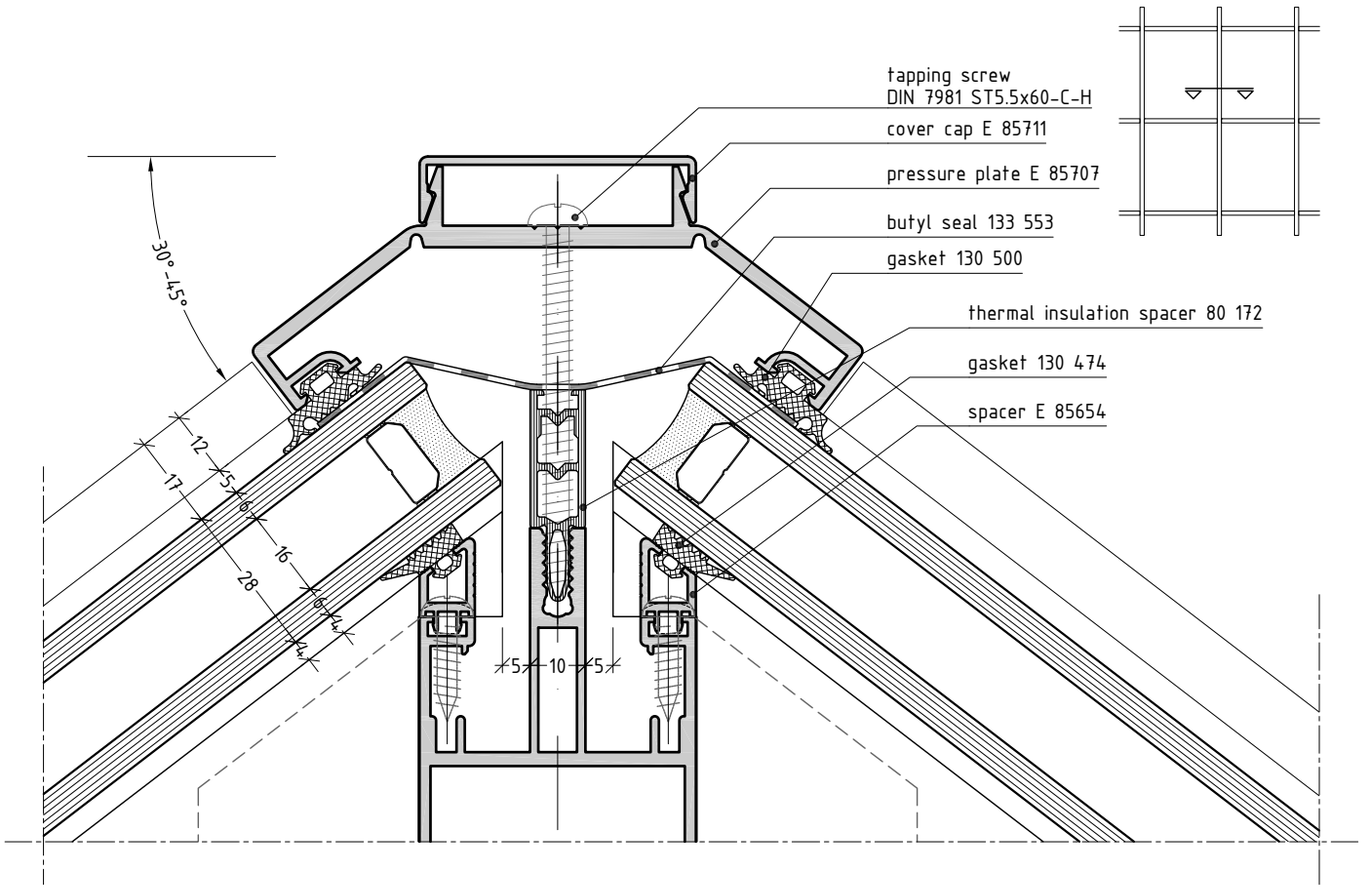
outer angles 22.5°~37.5°



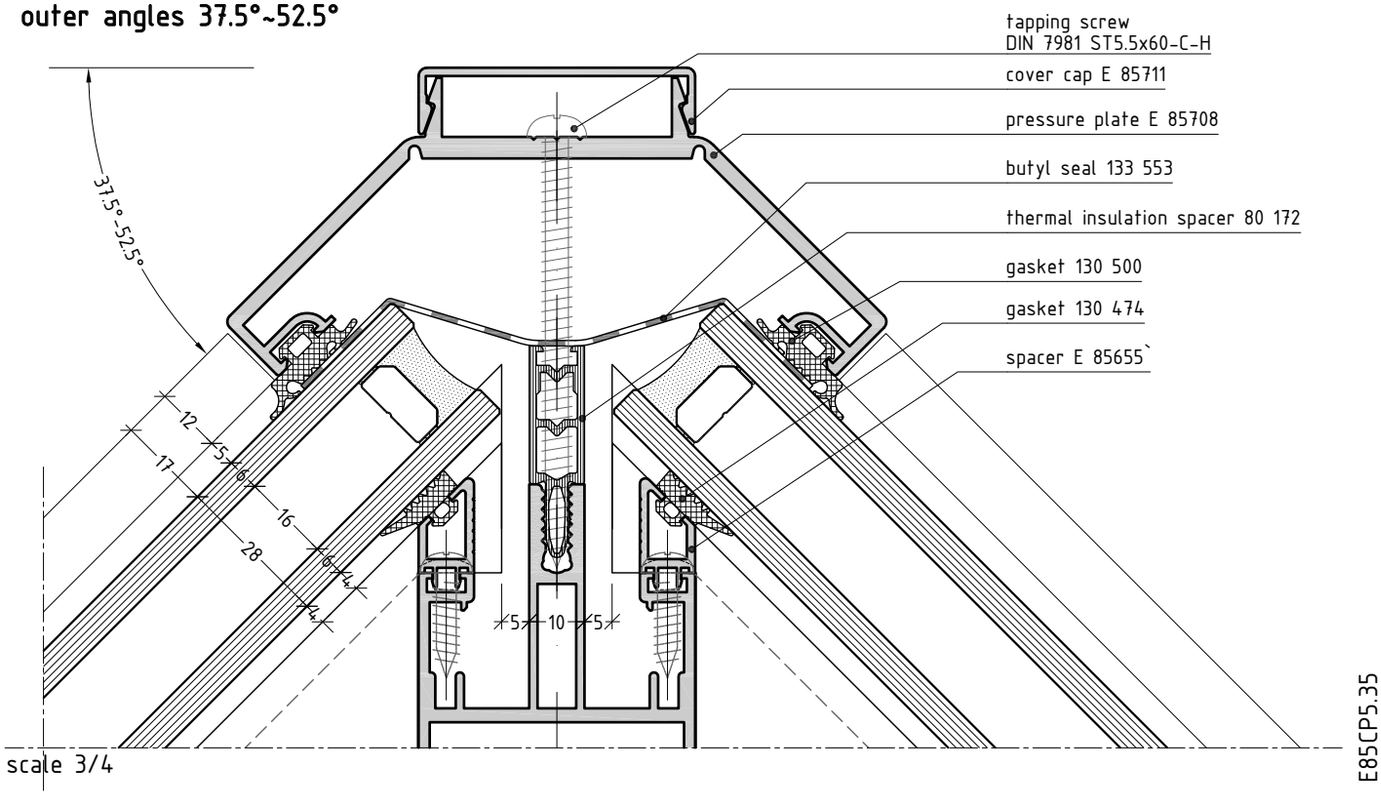
scale 3/4

E85CP5.34

outer angles 30°~45°



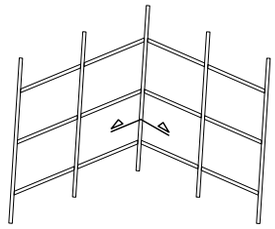
outer angles 37.5°~52.5°

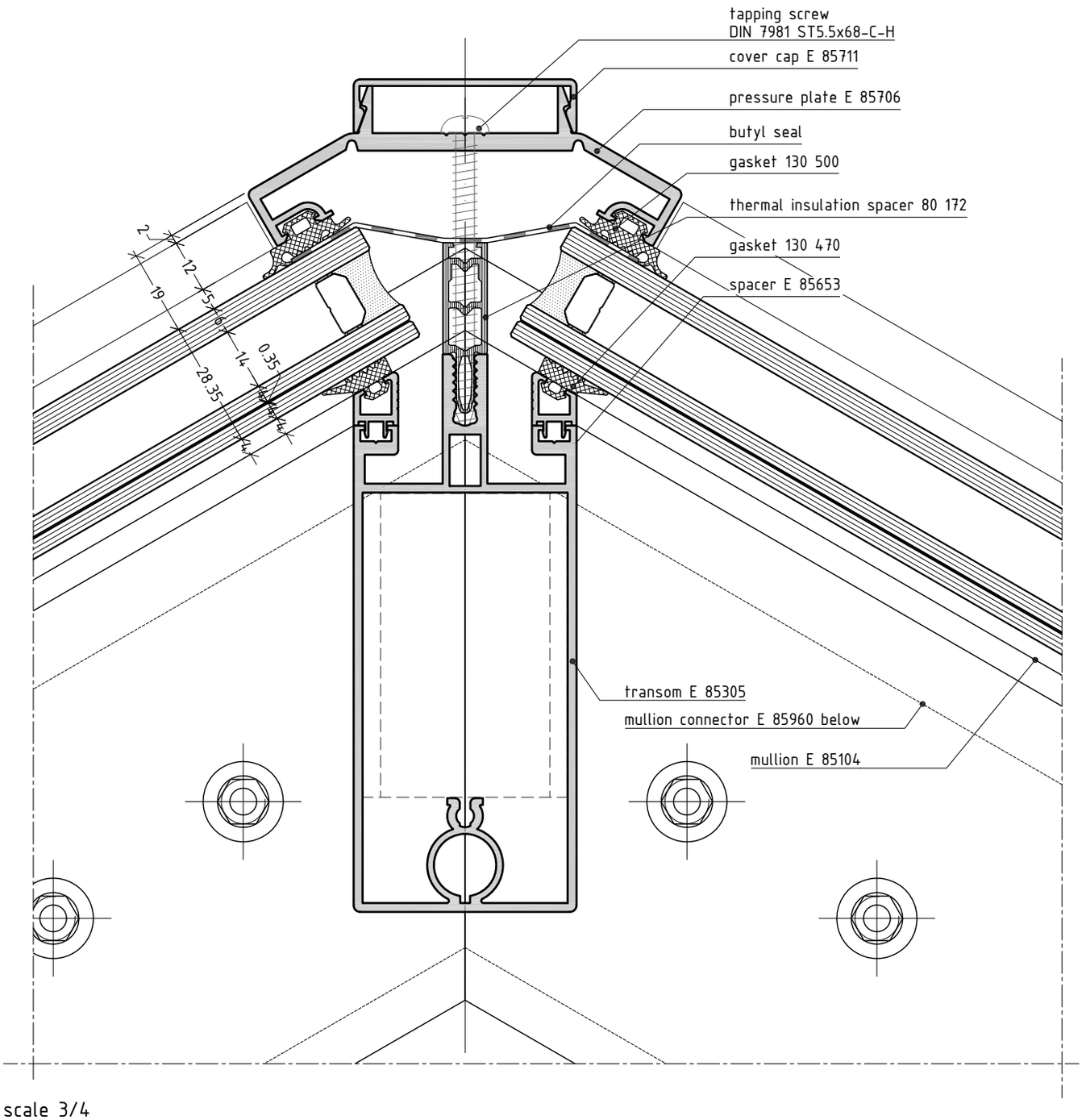


scale 3/4

E85CP5.35

roof connector

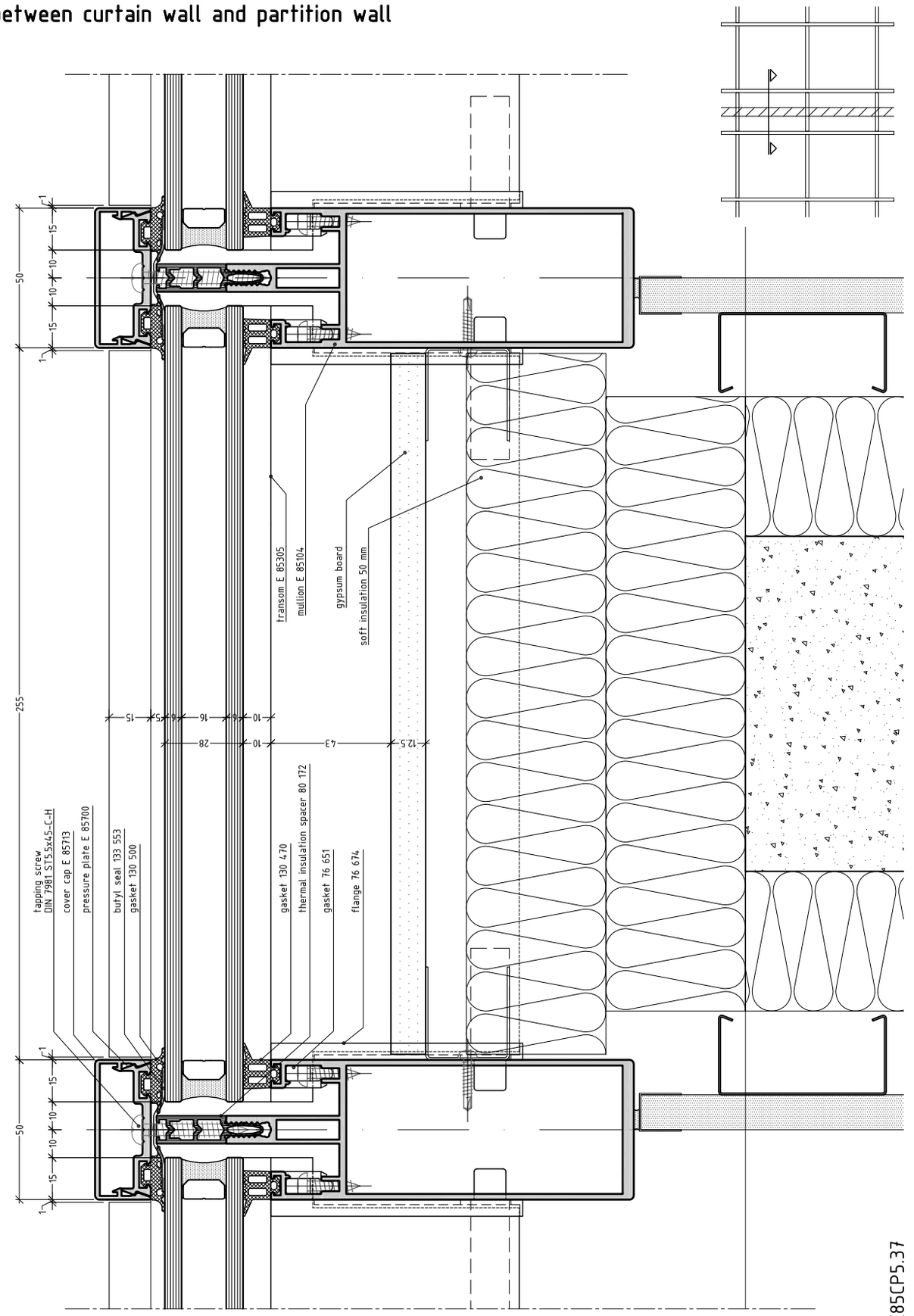




scale 3/4

E85CP5.36

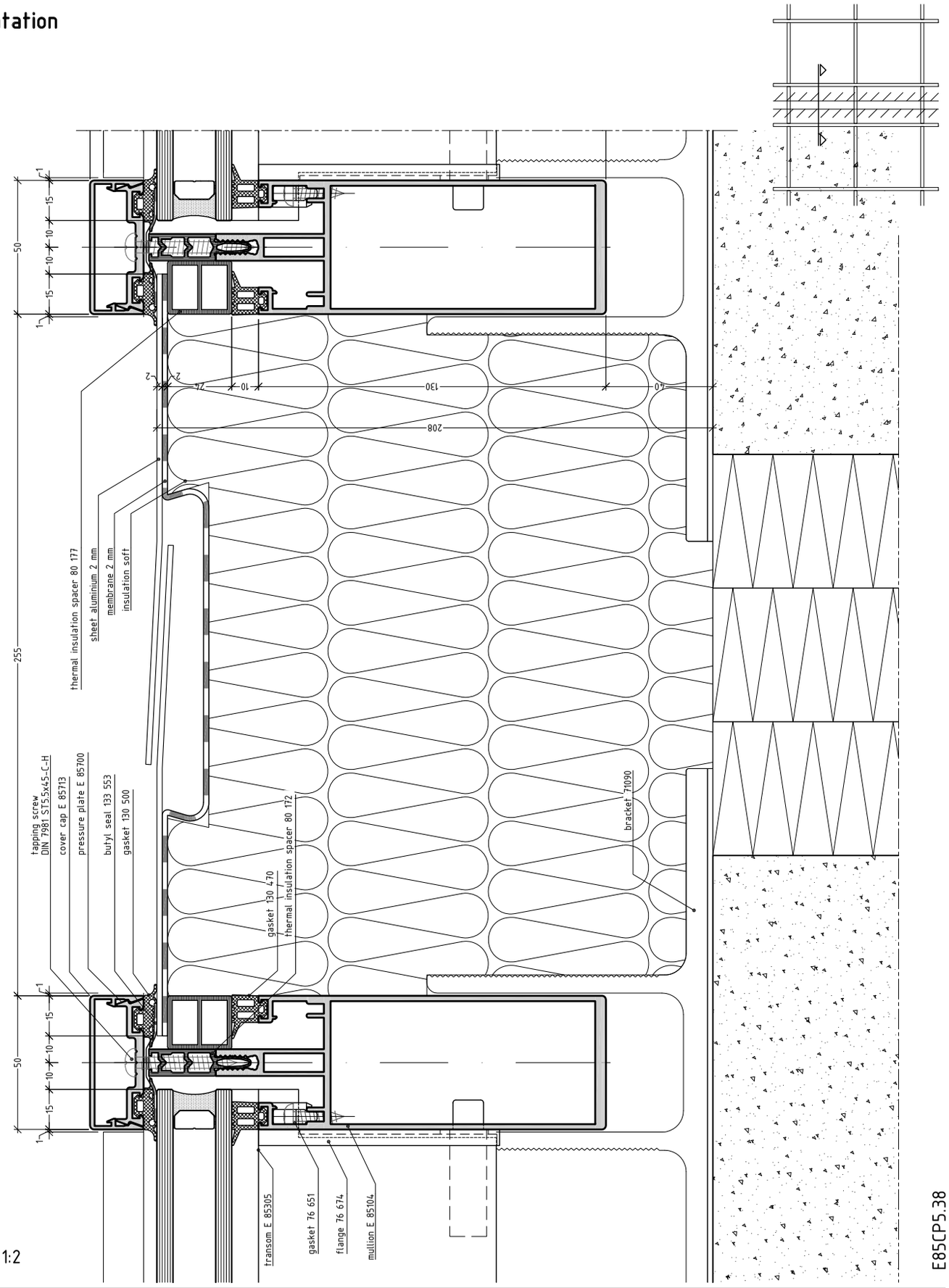
connection between curtain wall and partition wall



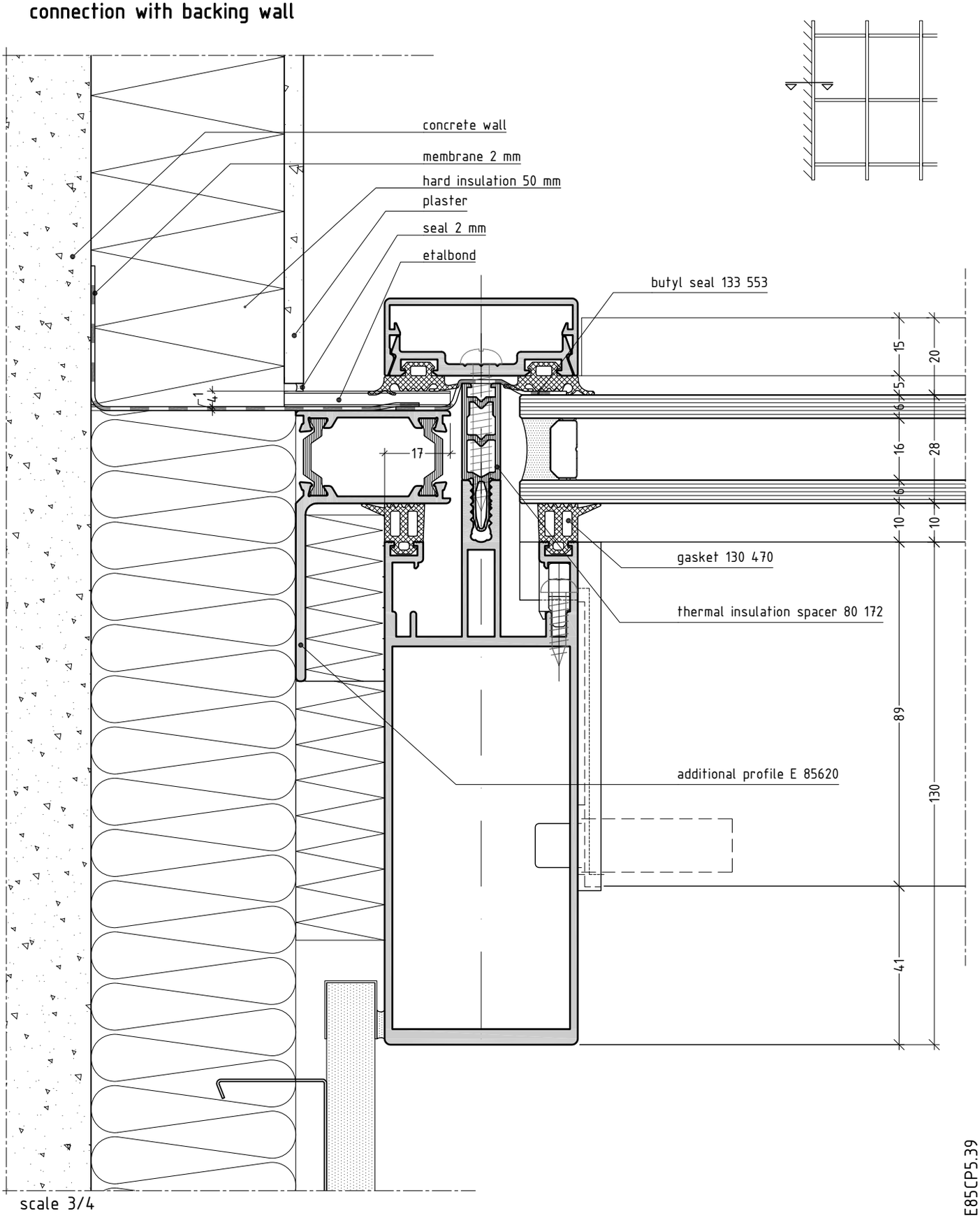
scale 1:2

E85CP5.37

delatation


thermal insulation spacer 80 177
sheet aluminium 2 mm
membrane 2 mm
insulation soft
tapping screw DIN 7981 ST5.5x45-C-H
cover cap E 85713
pressure plate E 85700
butyl seal 133 553
gasket 130 500
gasket 130 470
thermal insulation spacer 80 172
bracket 71090
transom E 85305
gasket 76 651
flange 76 674
mullion E 85104
255
50
208
130
40
10
2
scale 1:2
E85CP5.38

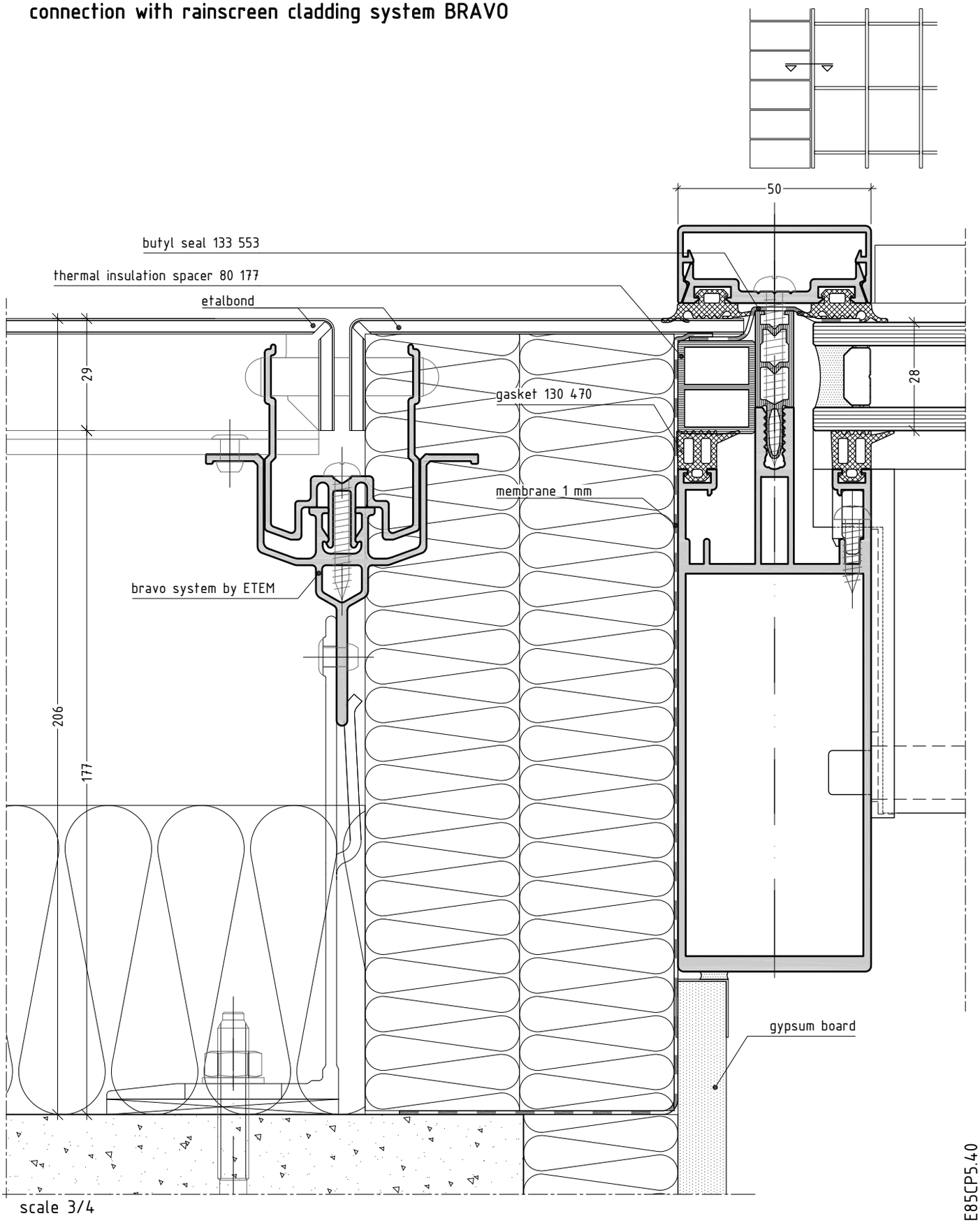
connection with backing wall



scale 3/4

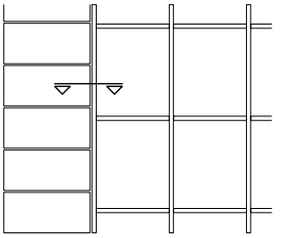
E85CP5.39

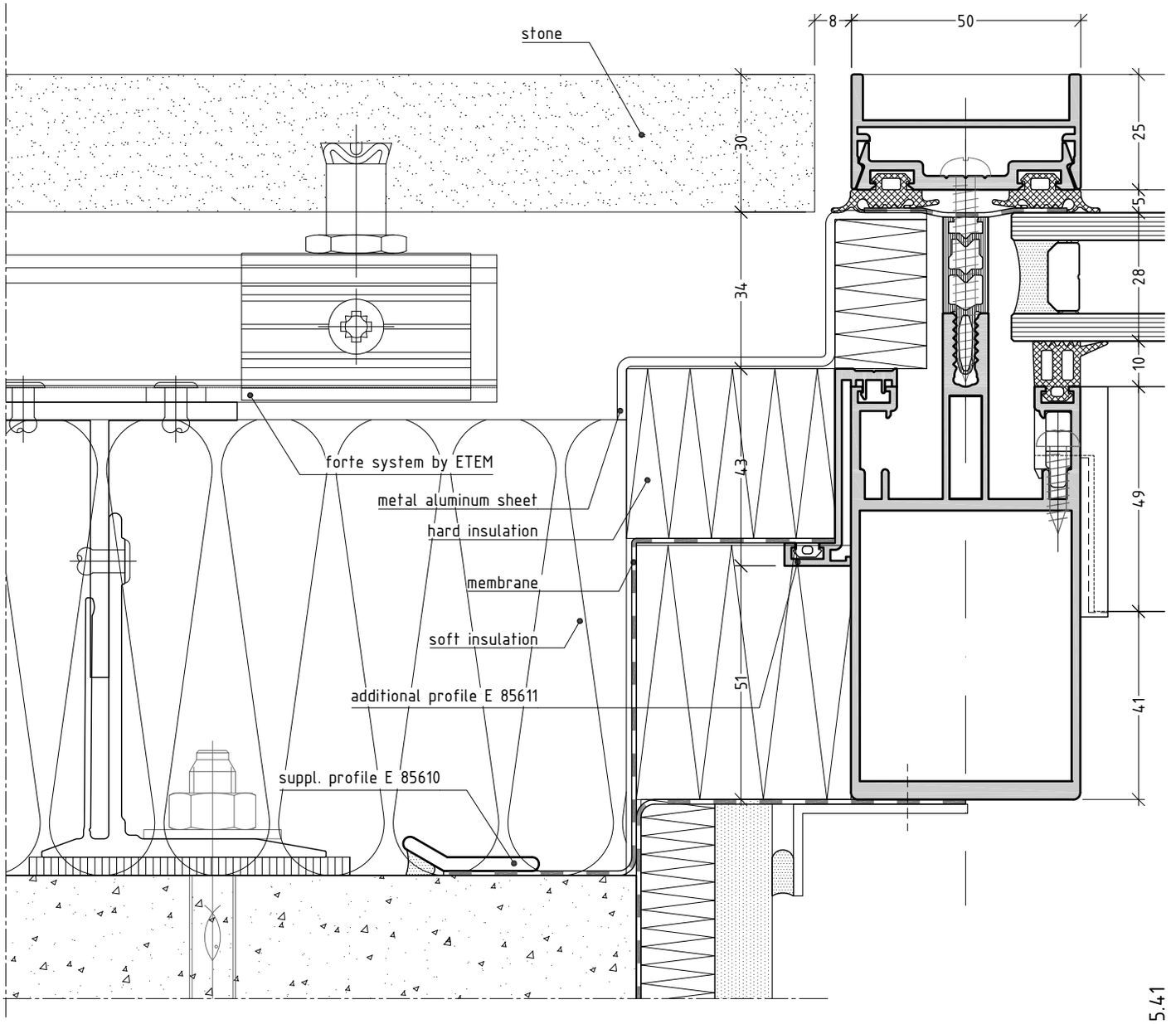
connection with rainscreen cladding system BRAVO



E85CP5.40

connection with rainscreen cladding system Forte

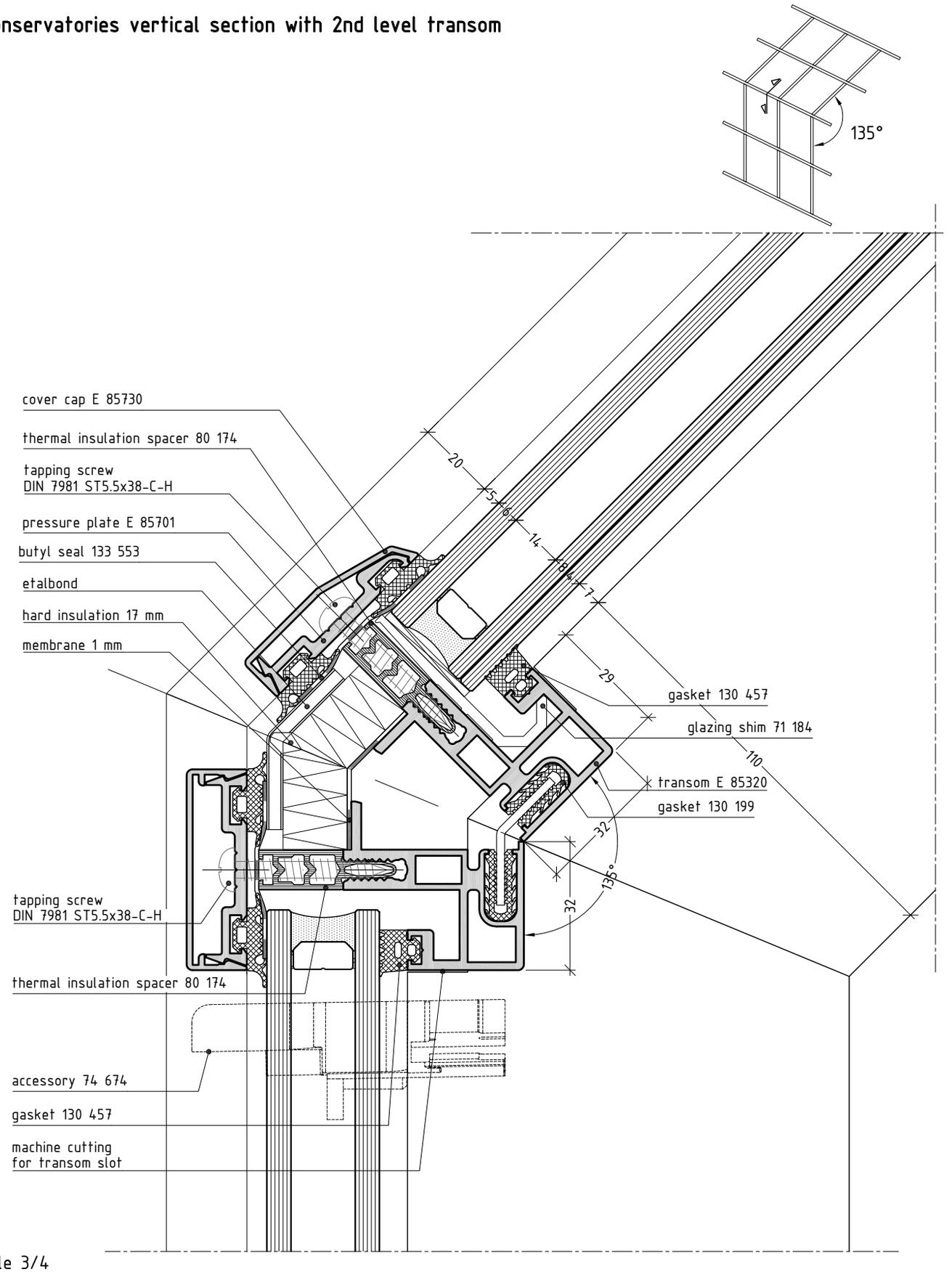




scale 3/4

E85CP5.41

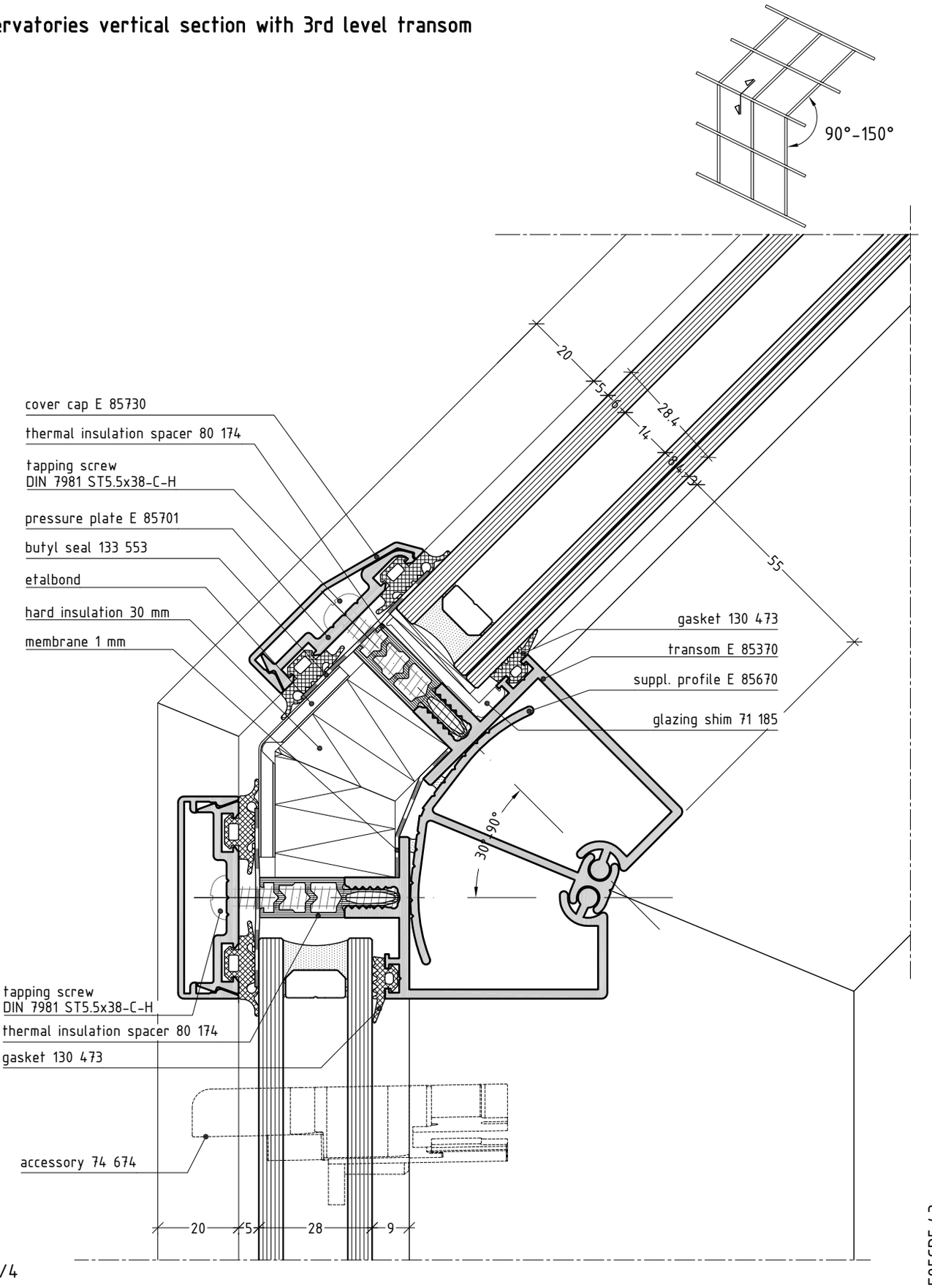
conservatories vertical section with 2nd level transom



scale 3/4

E85CP5.42

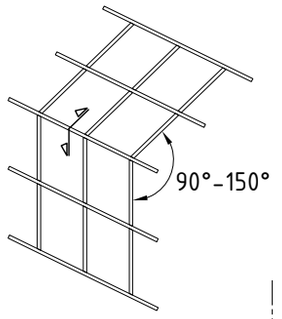
conservatories vertical section with 3rd level transom

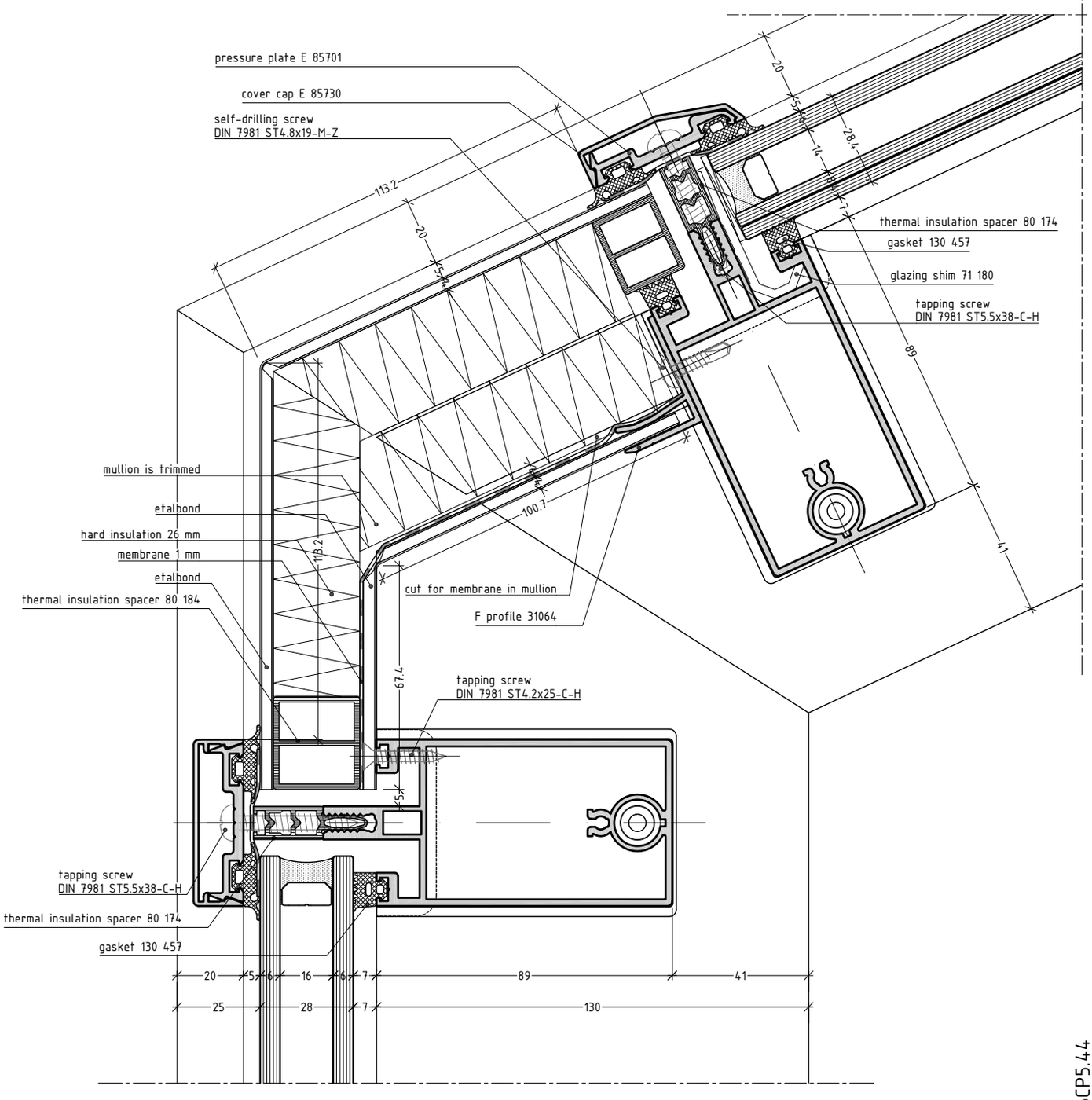


scale 3/4

E85CP5.43

conservatories vertical section

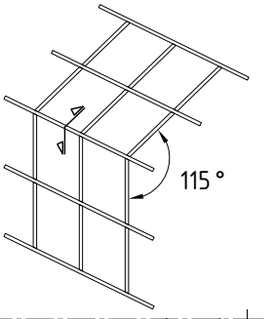


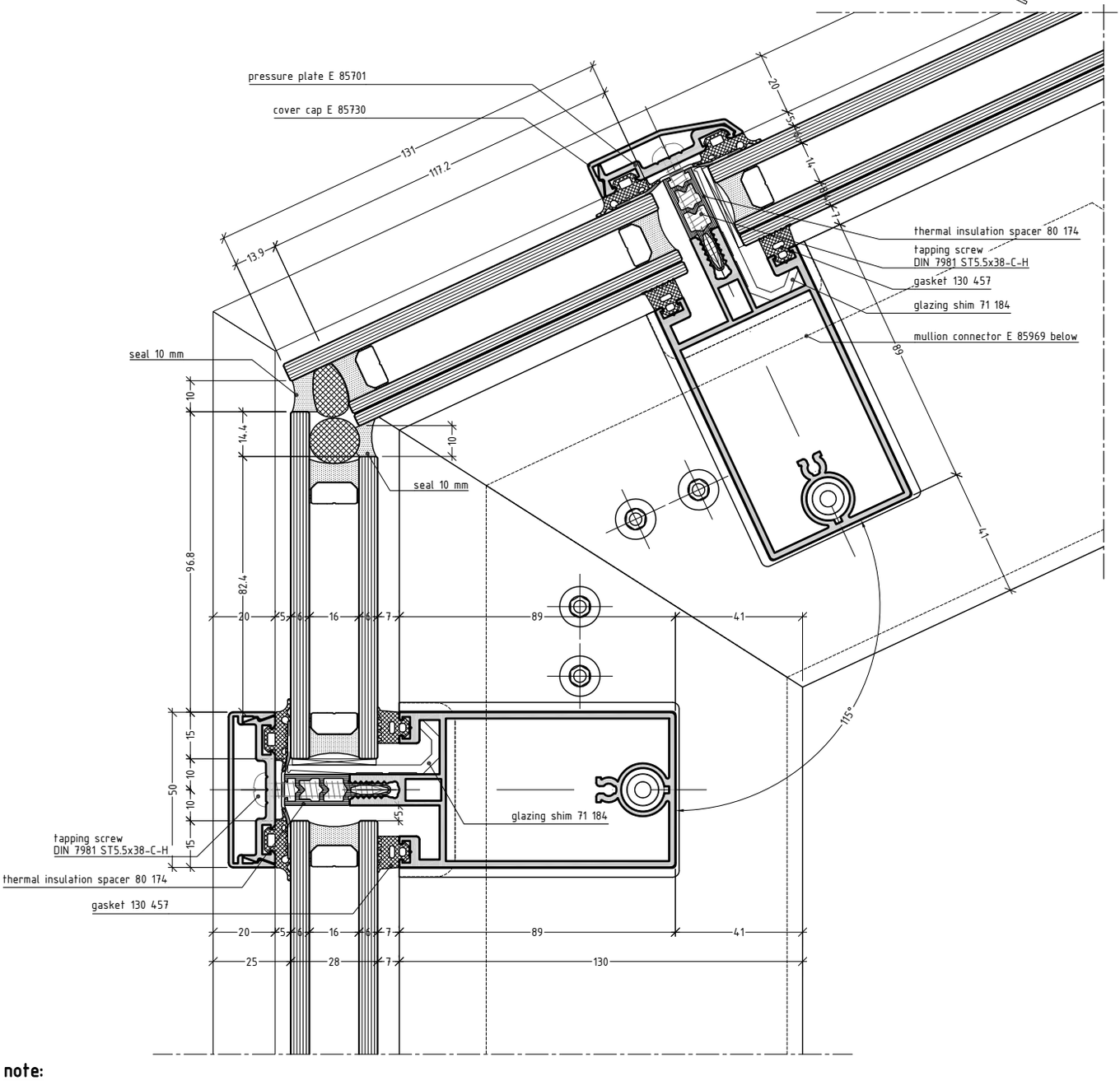


not to scale

E85CP5.44

conservatories vertical section



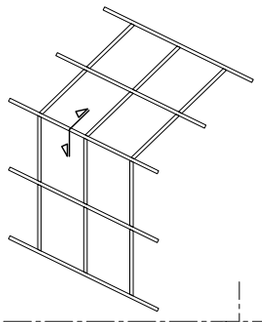


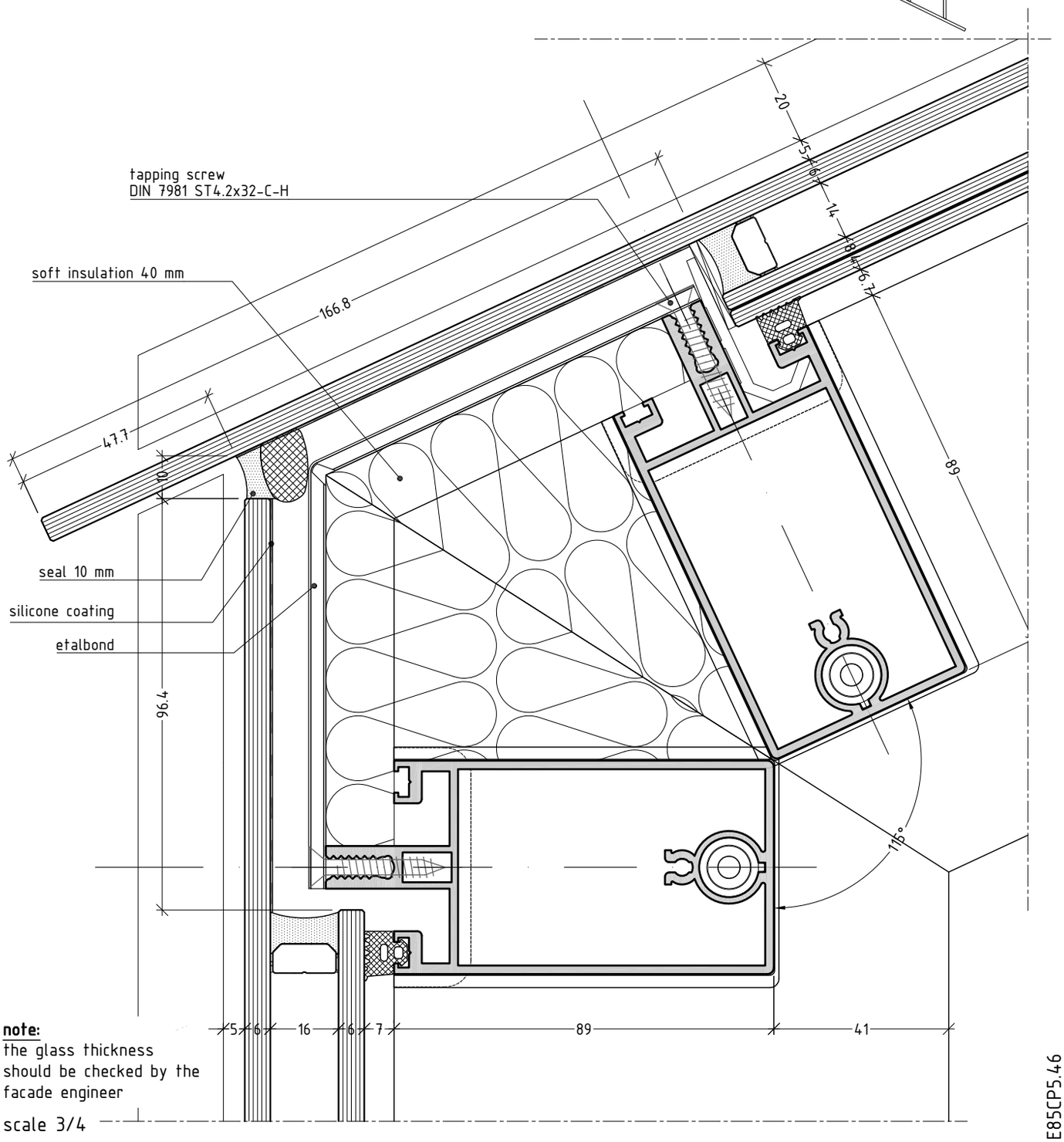
note:
the glass thickness should be
checked by the facade engineer

scale 3/4

E85CP5.45

conservatories vertical section



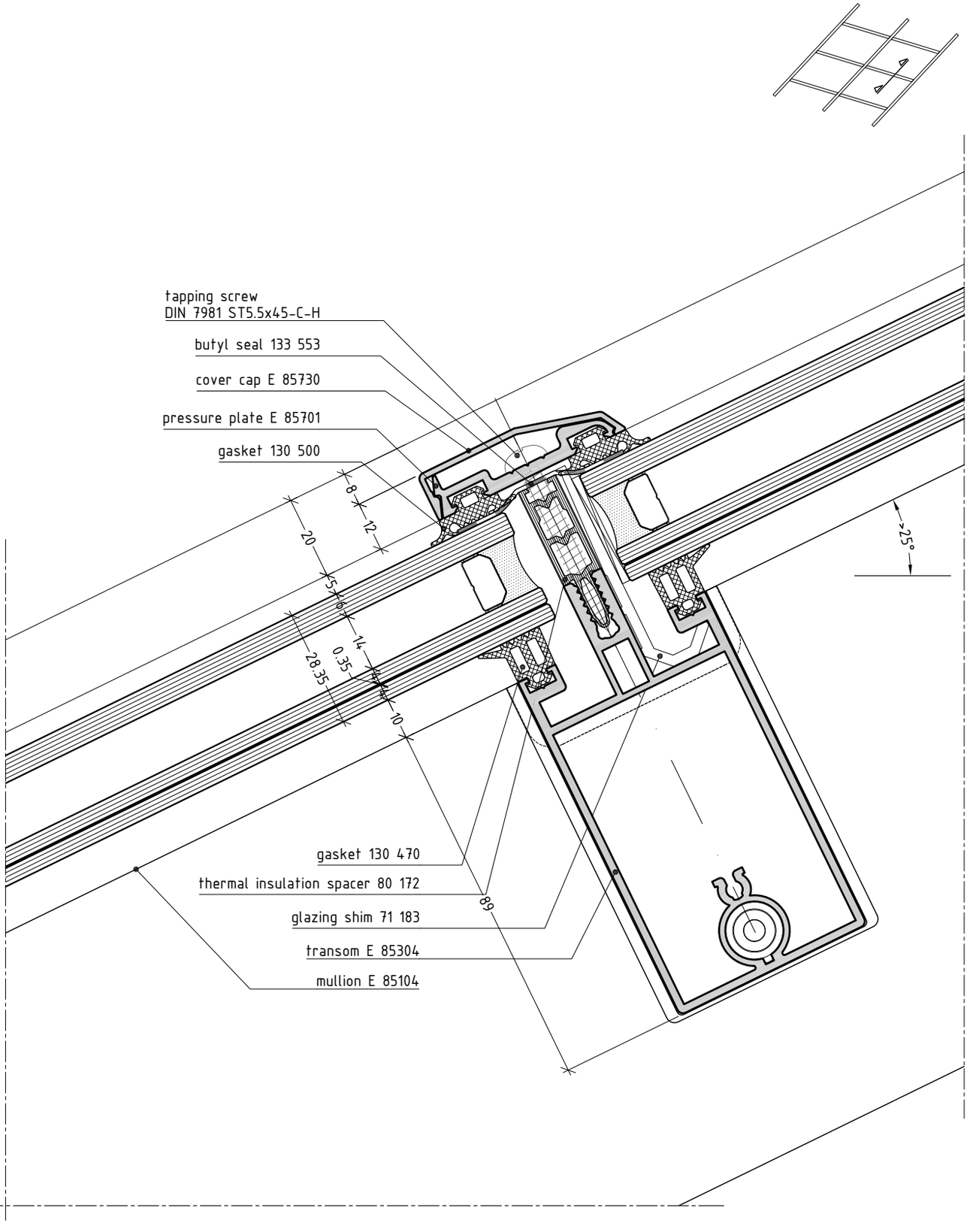


note:
the glass thickness
should be checked by the
facade engineer

scale 3/4

E85CP5.46

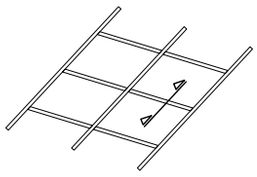
slope > 25°

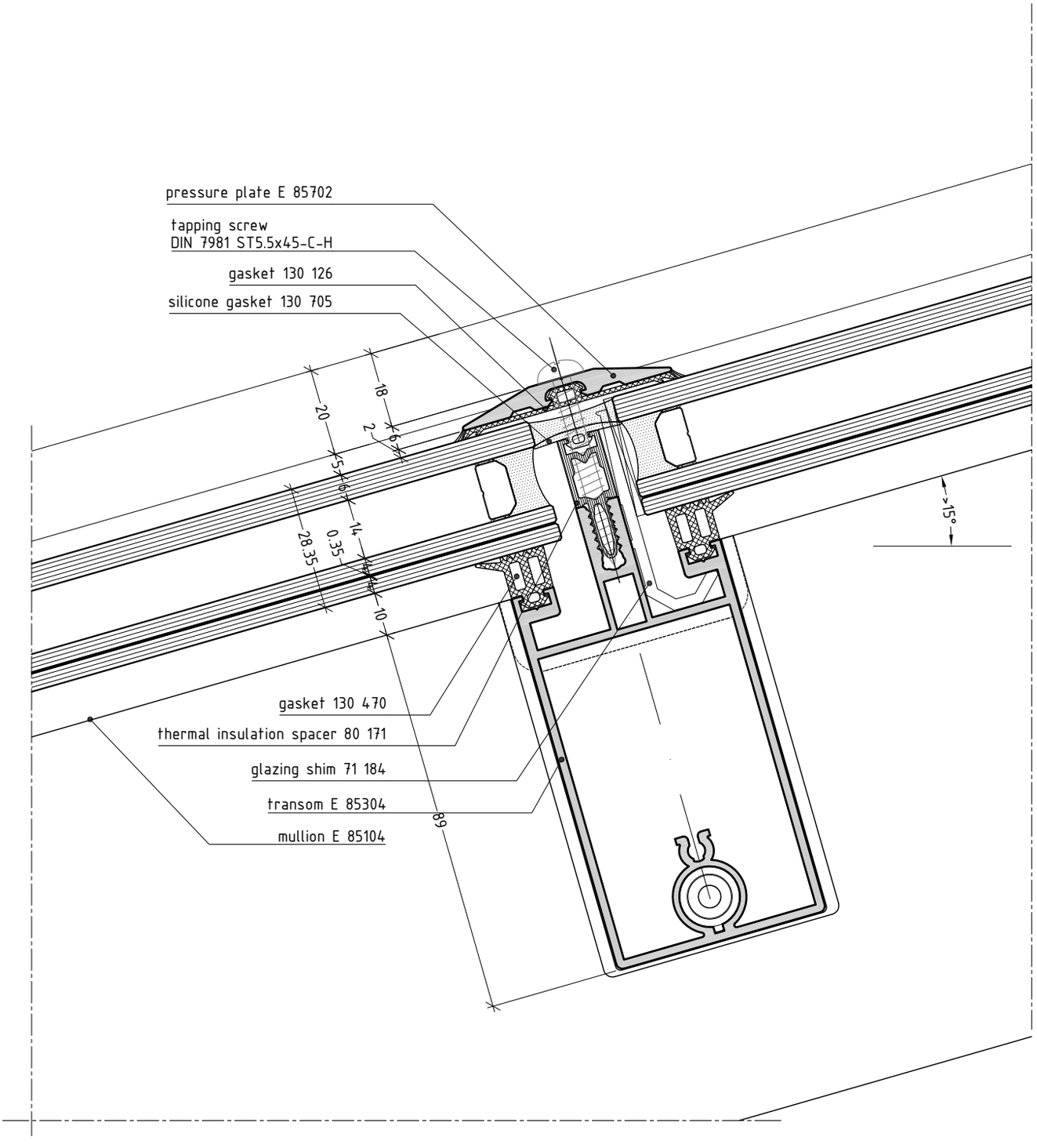


scale 3/4

E85CP5.47

slope > 15°

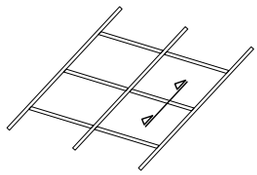


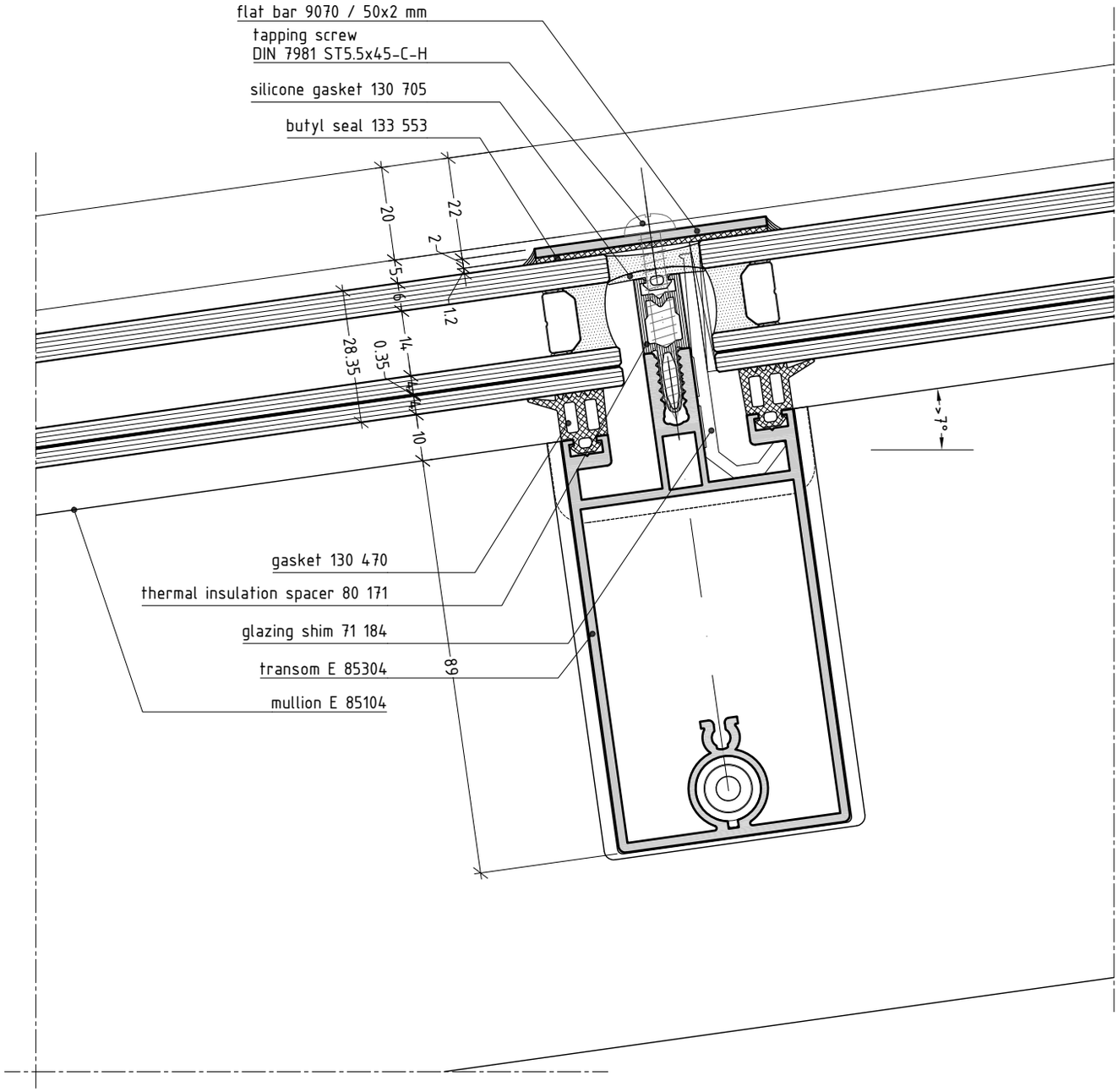


scale 3/4

E85CP5.48

slope > 7°

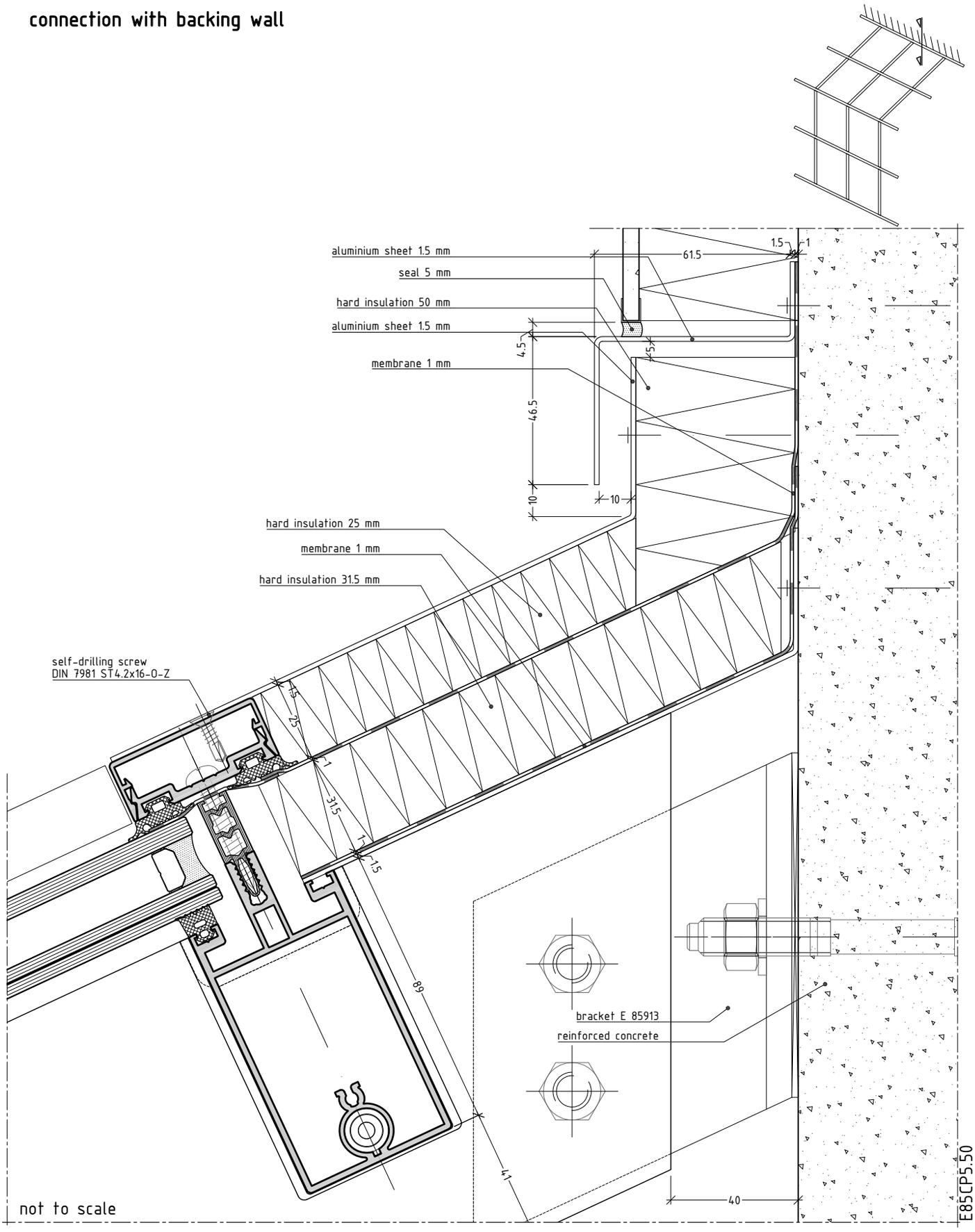




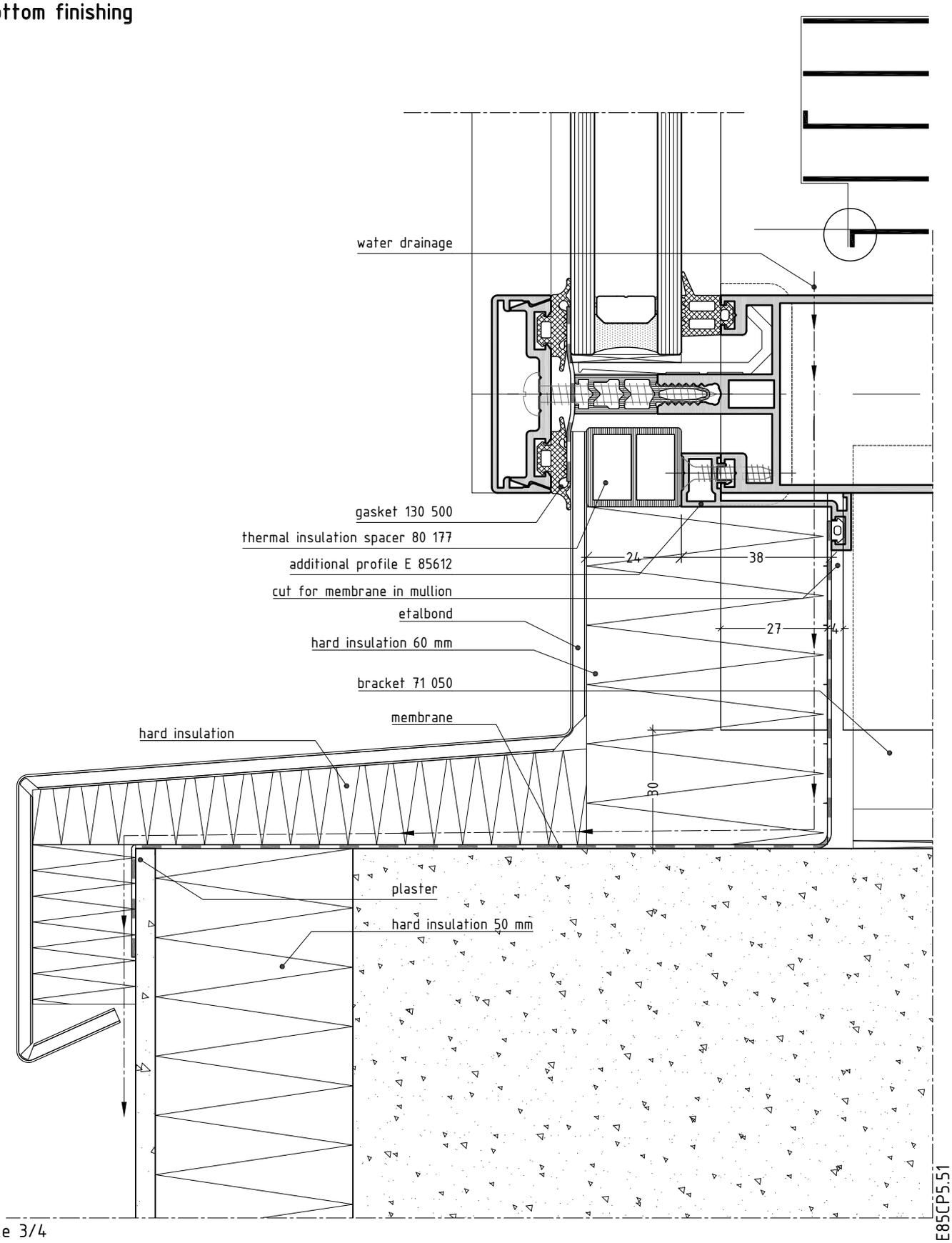
scale 3/4

E85CP5.49

connection with backing wall

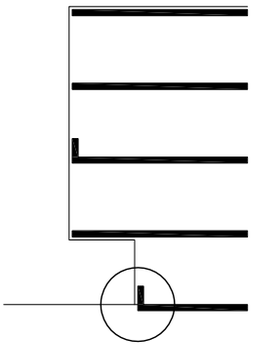


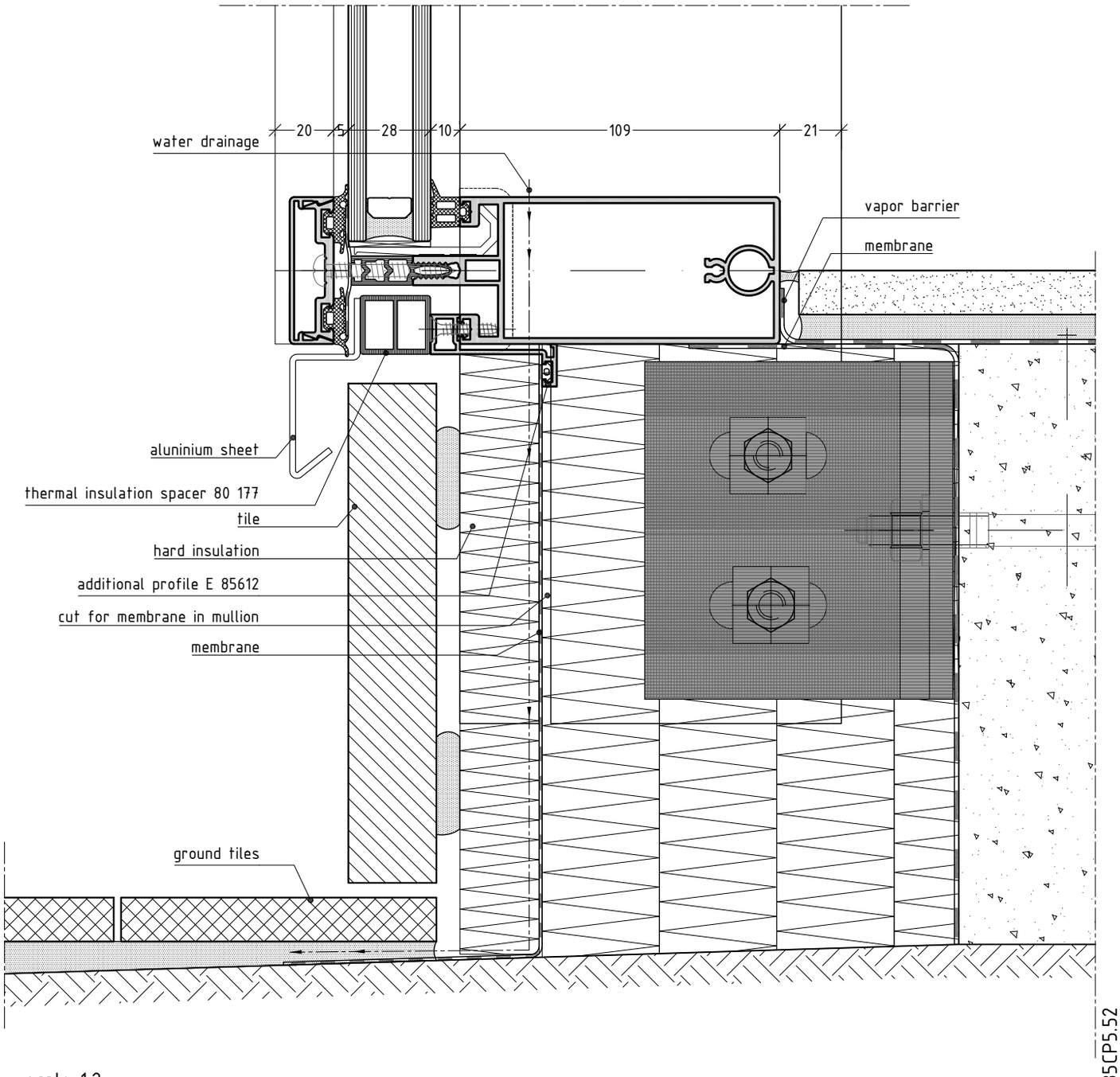
bottom finishing



scale 3/4

bottom finishing

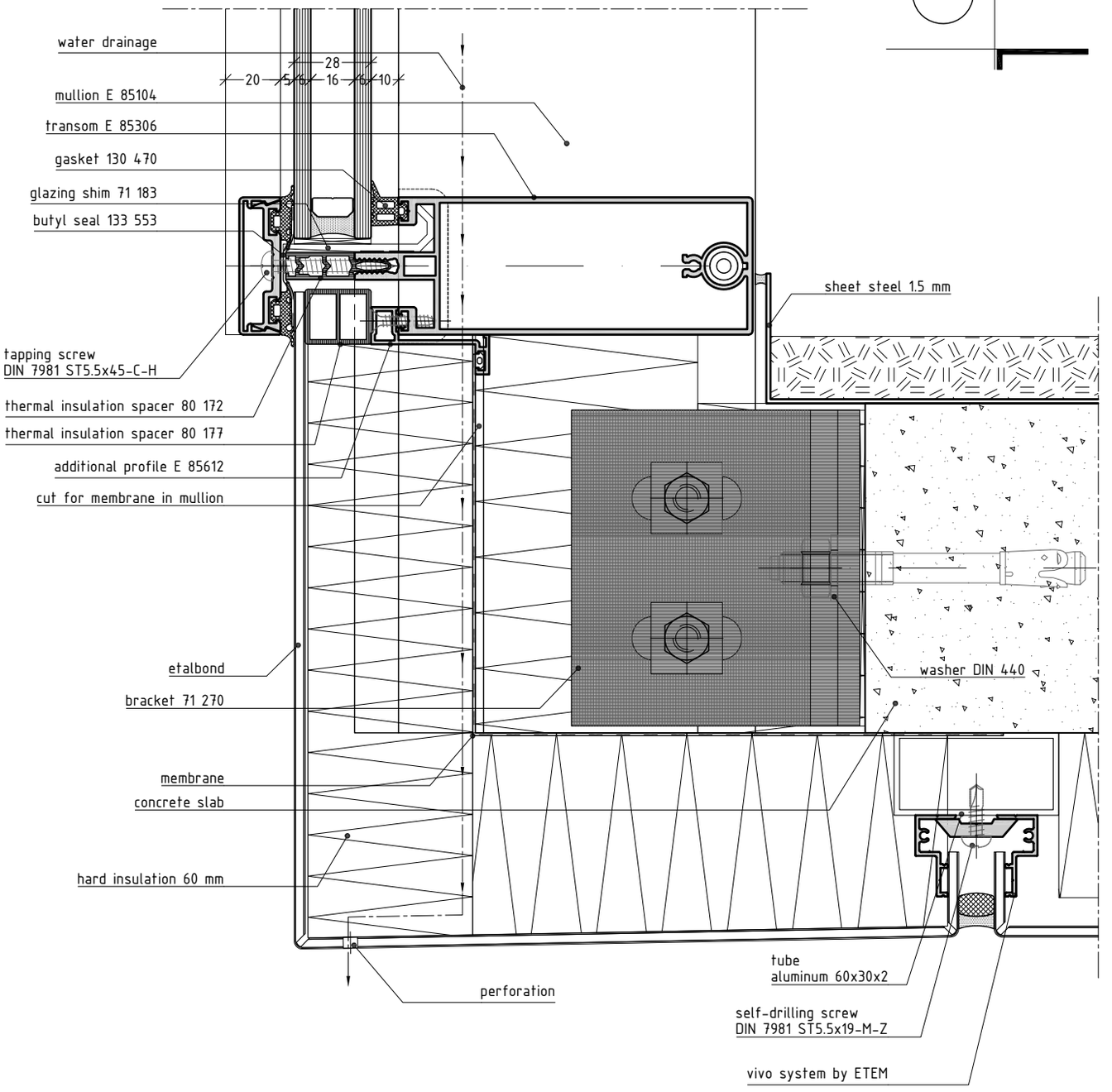




E85CP5.52

scale 1:2

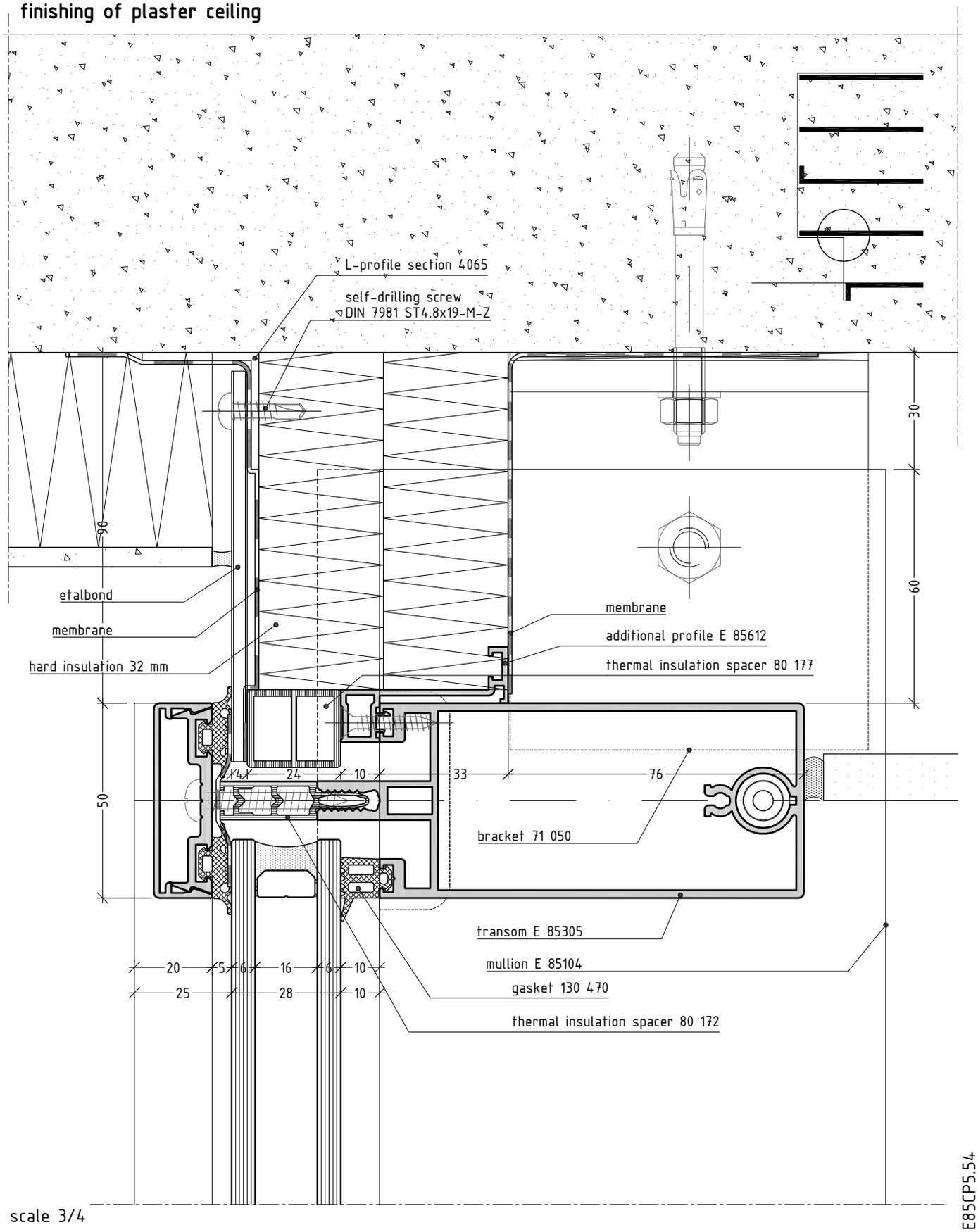
finishing to suspended ceiling



not to scale

E85CP5.53

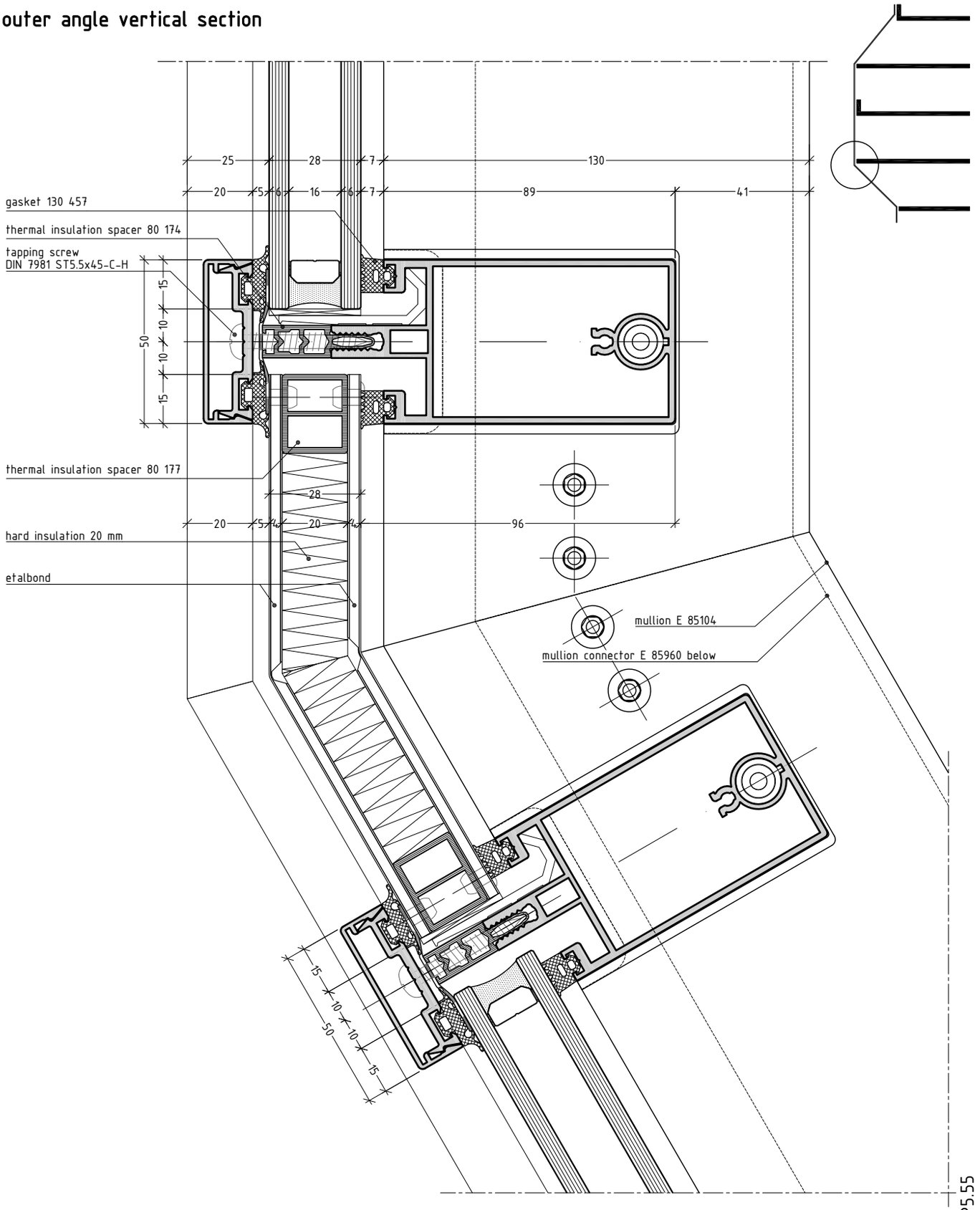
finishing of plaster ceiling



scale 3/4

E85CP5.54

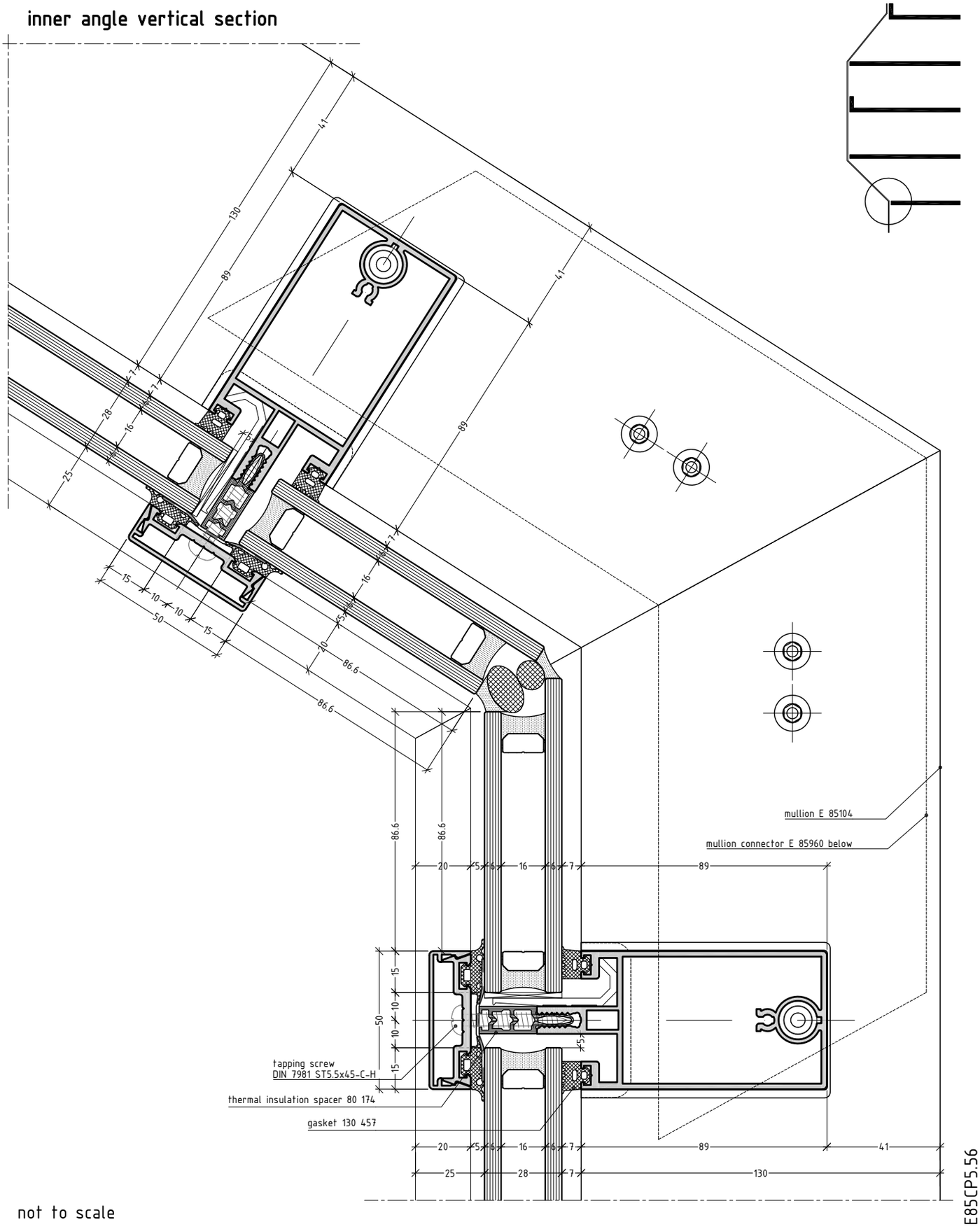
outer angle vertical section



E85CP5.55

not to scale

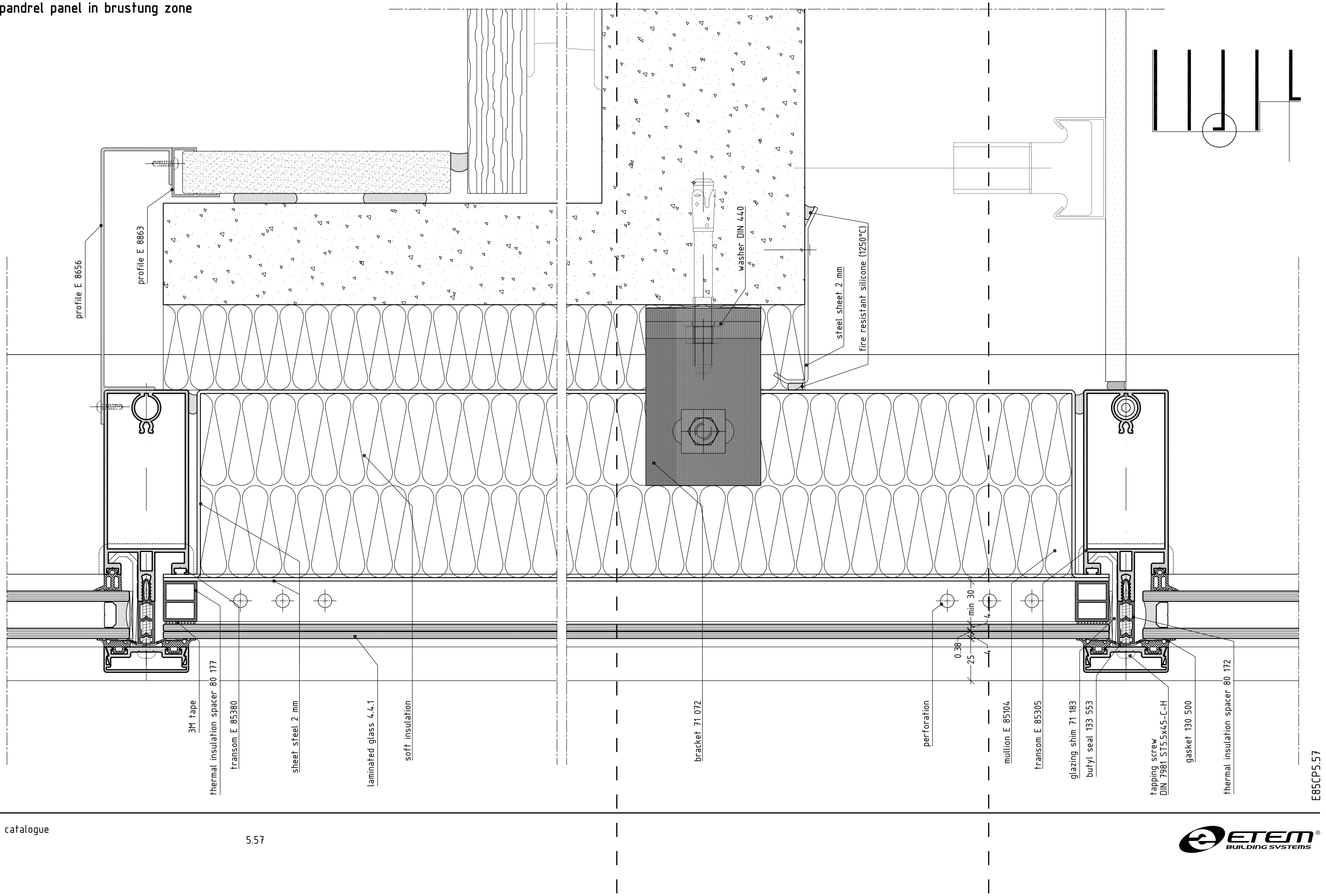
inner angle vertical section



not to scale

E85CP5.56

glass spandrel panel in brustung zone

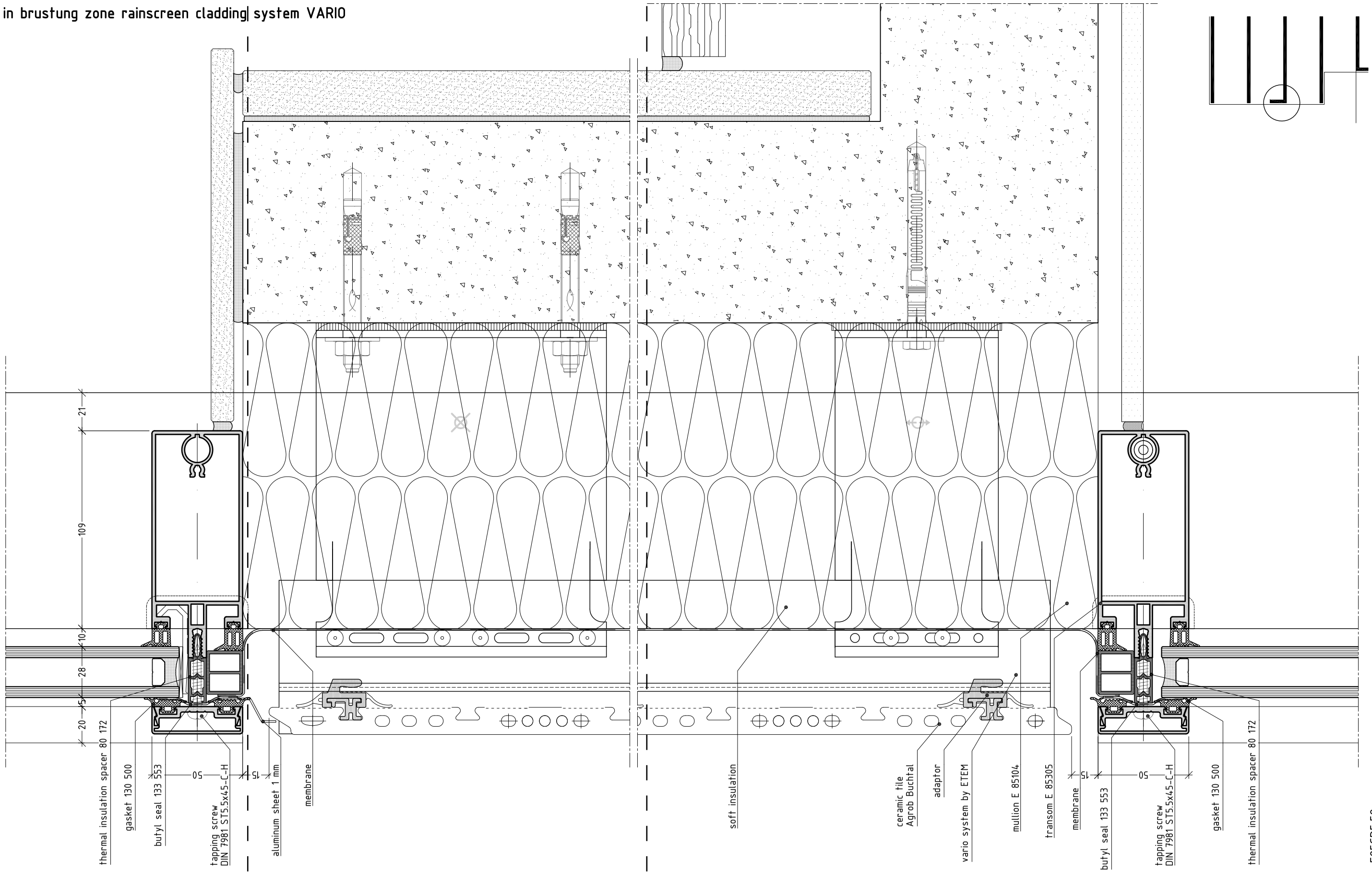


scale 1:2

curtain wall system

E85

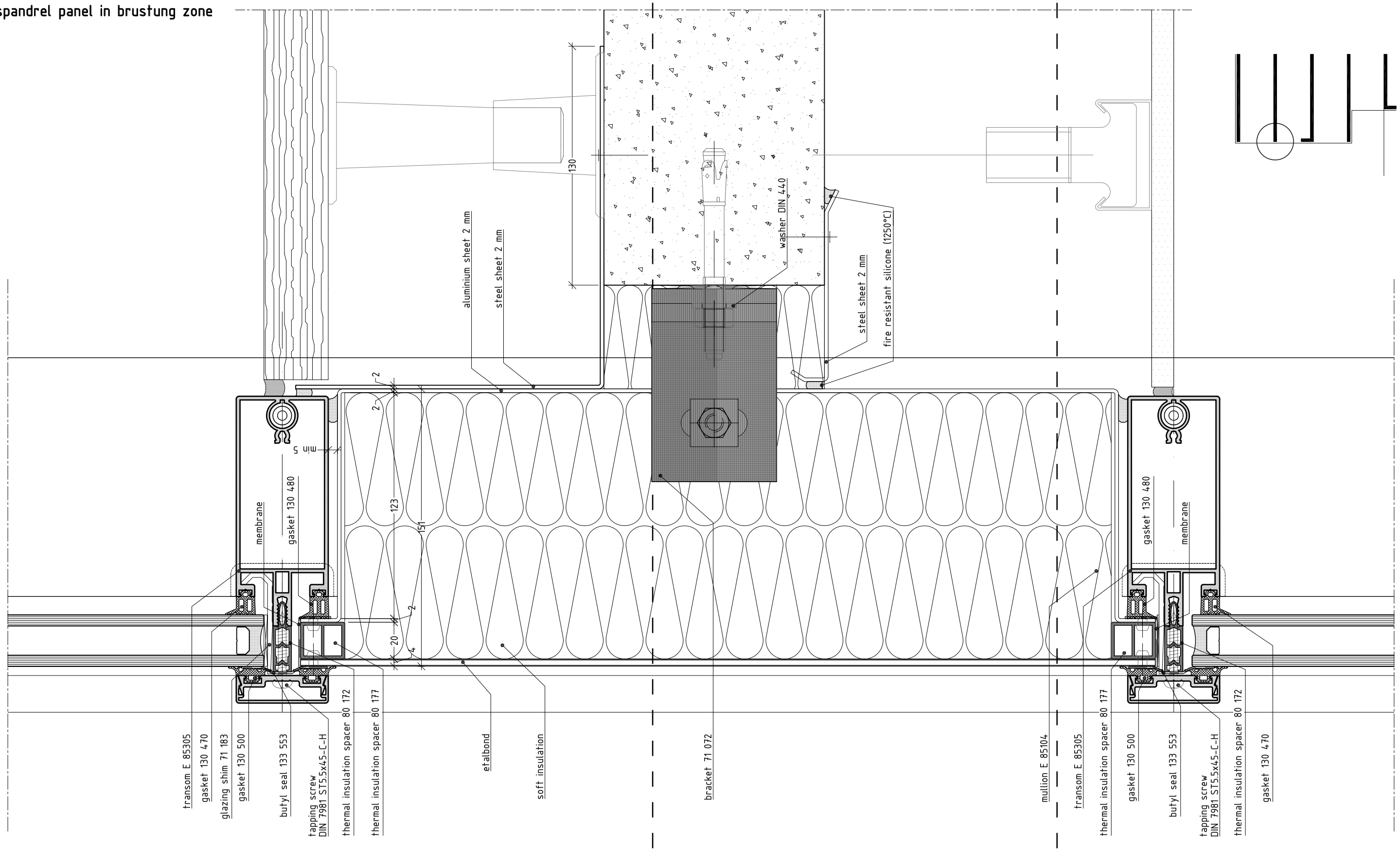
ceramic tiles in brustung zone rainscreen cladding| system VARIO



scale 1:2

E85CP5.58

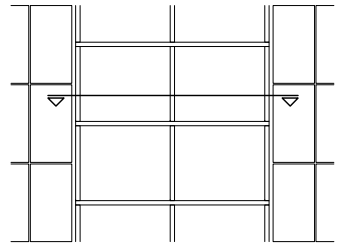
etalbond spandrel panel in brustung zone



scale 1:2

E85CP5.59

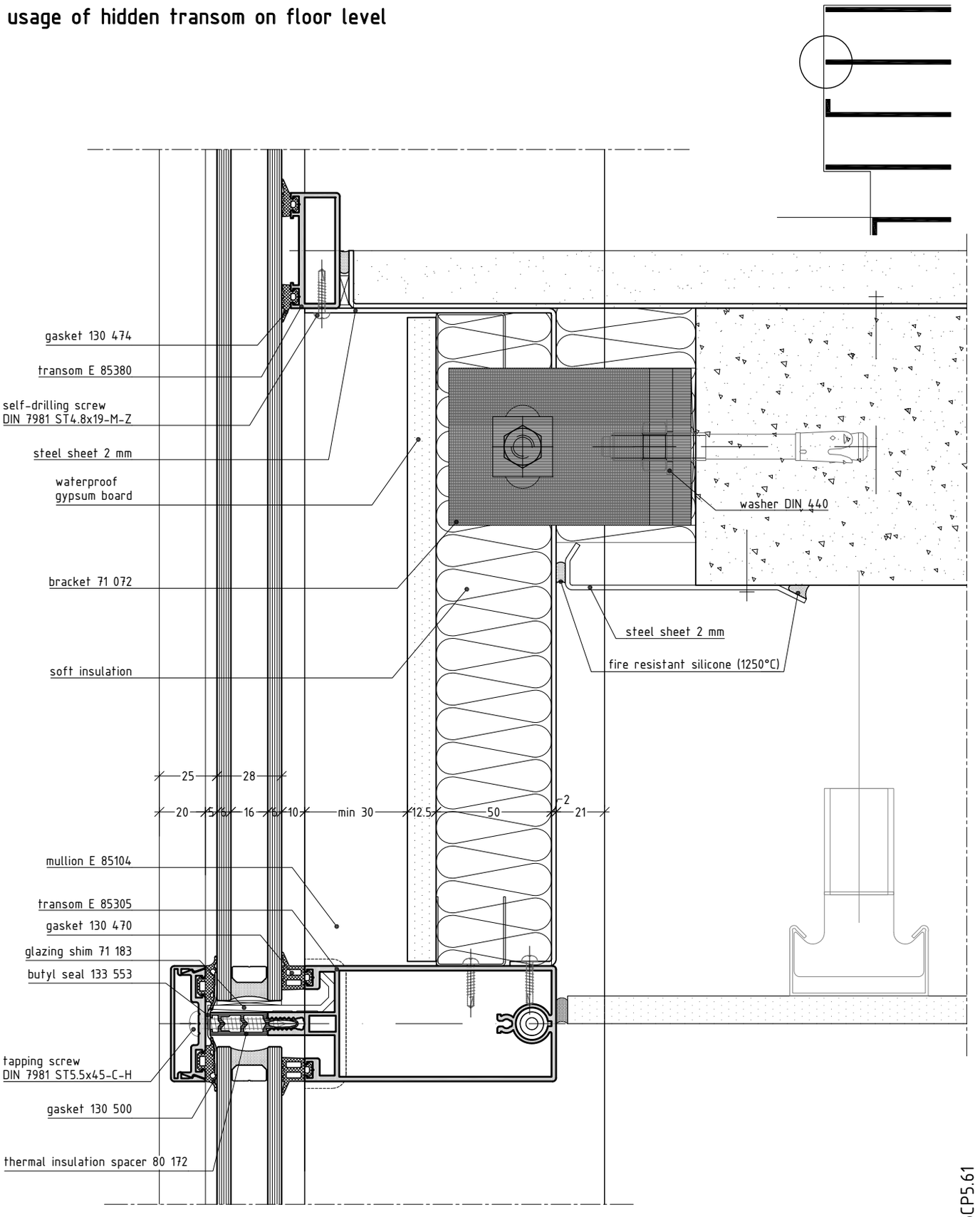
connection with rainscreen system Forte



scale 1:2

E85CP5.60

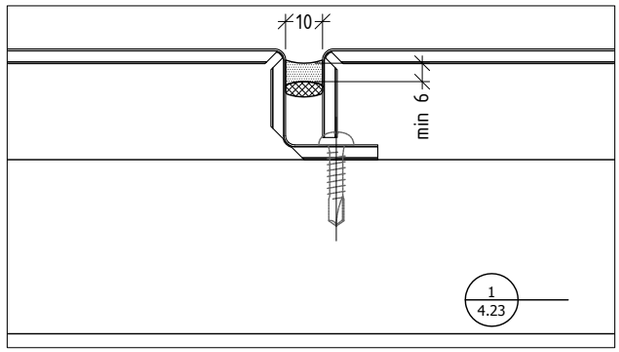
usage of hidden transom on floor level

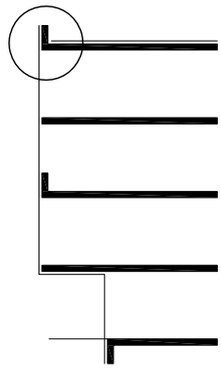


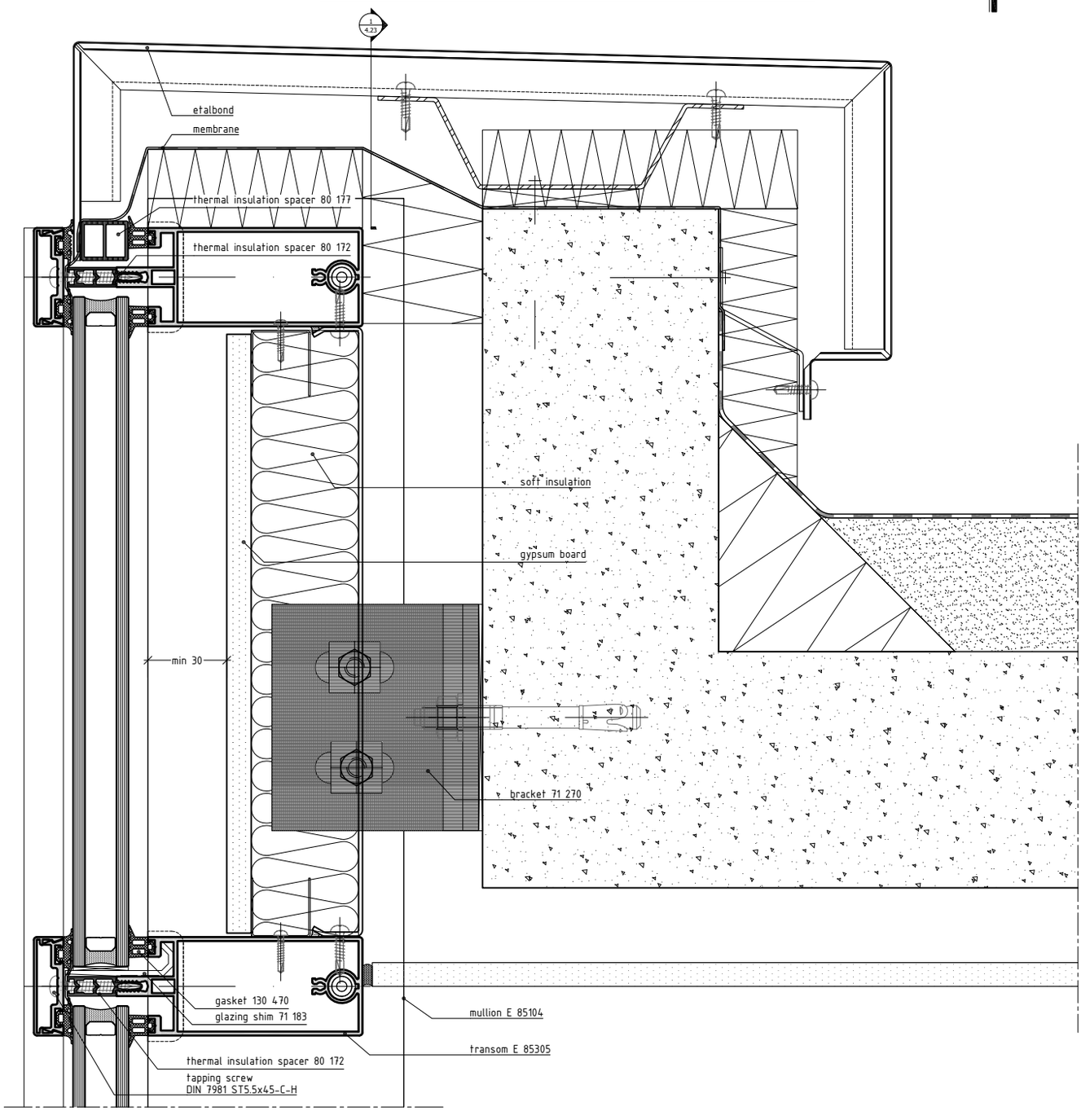
not to scale

E85CP5.61

upper finishing with etalbond







not to scale

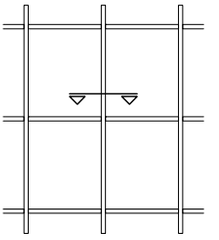
E85CP5.62

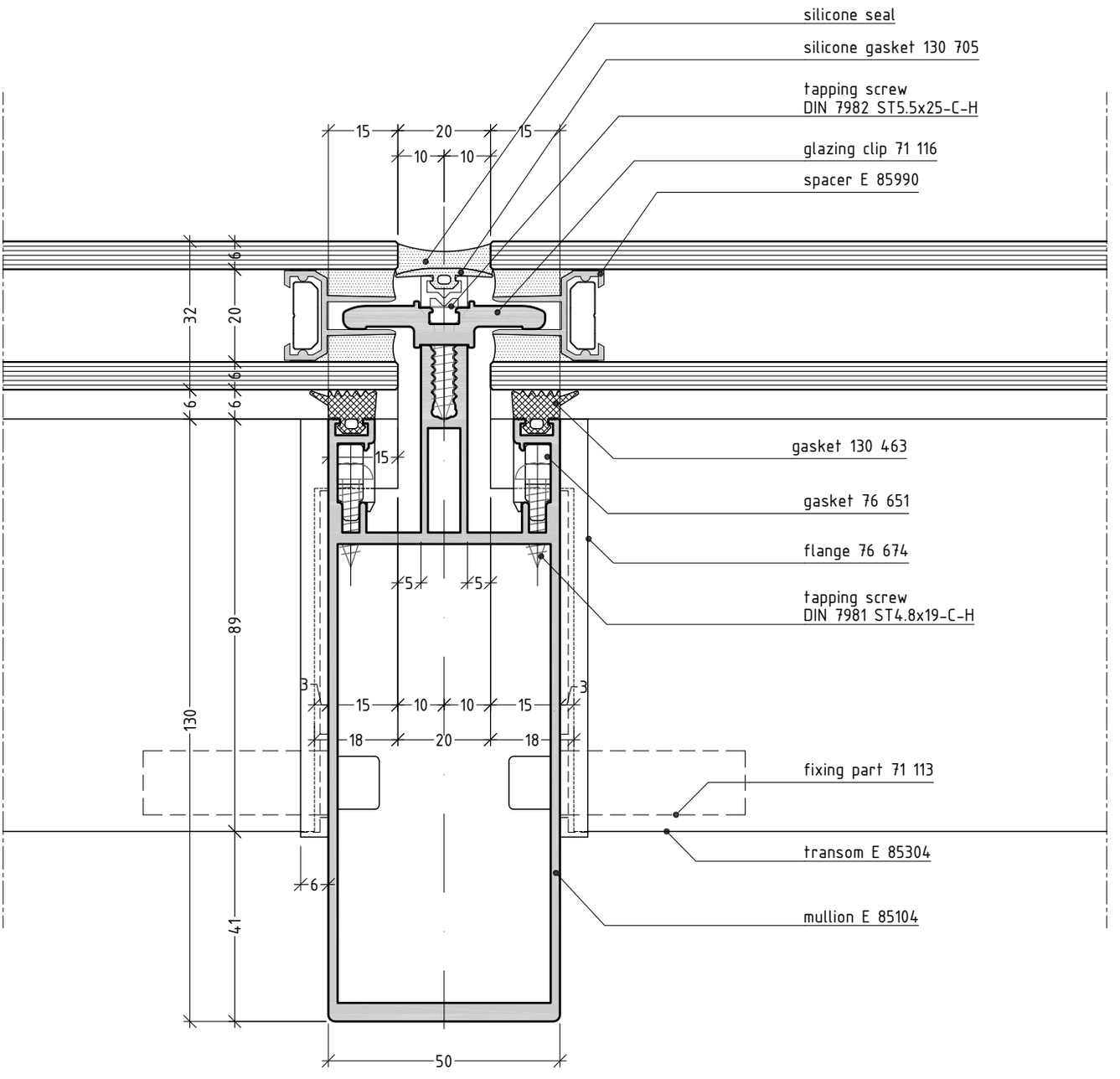
STRUCTURAL GLAZING

SECTIONS | DETAILS

ETEM BUILDING SYSTEMS

mullion with 2nd level transom

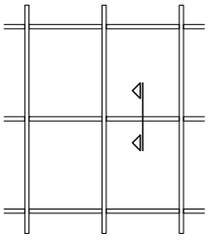


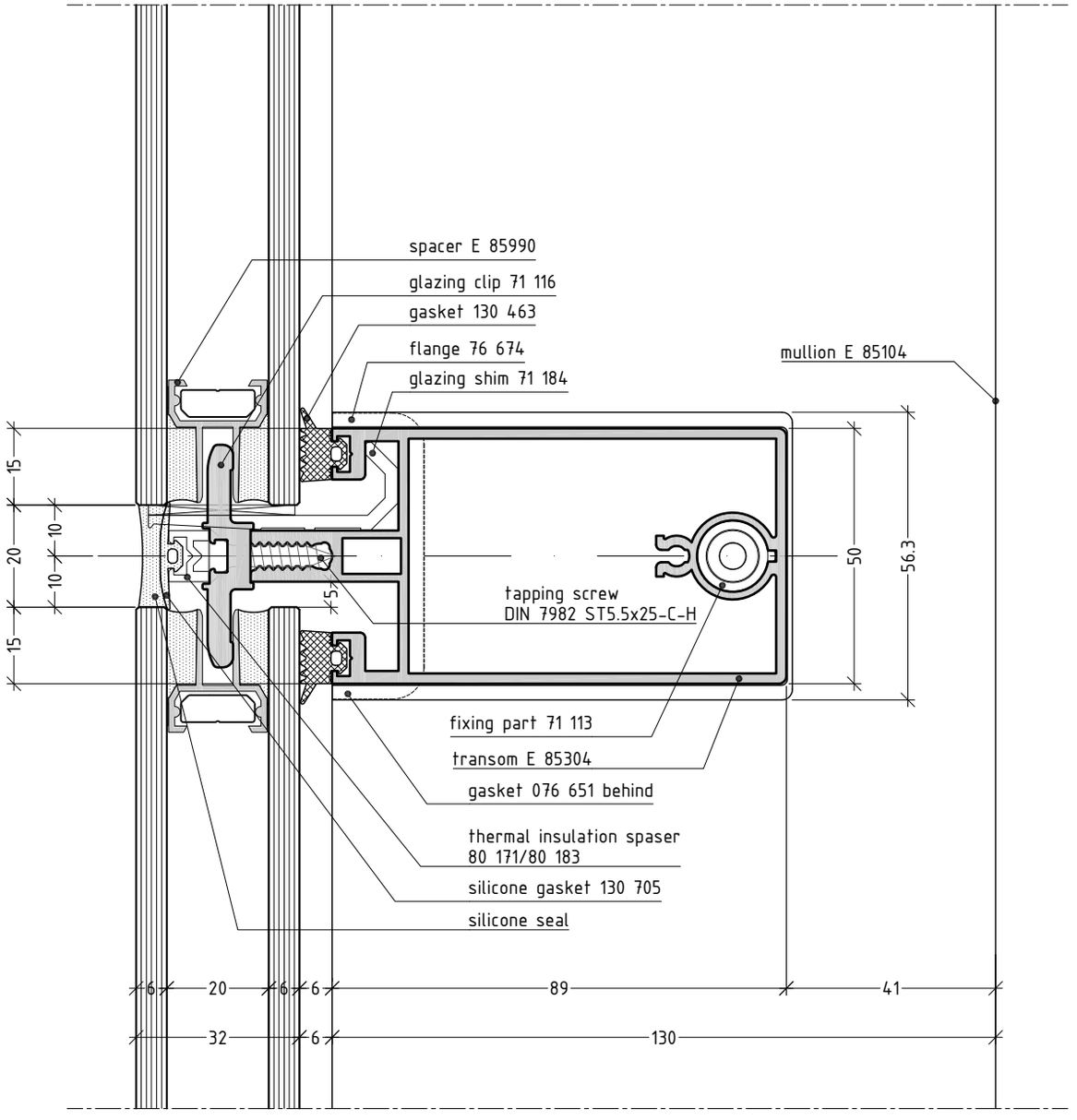


E85SG6.1

scale 3/4

transom 2nd level drainage



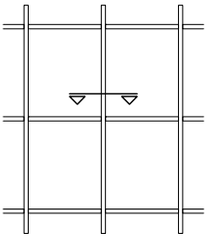


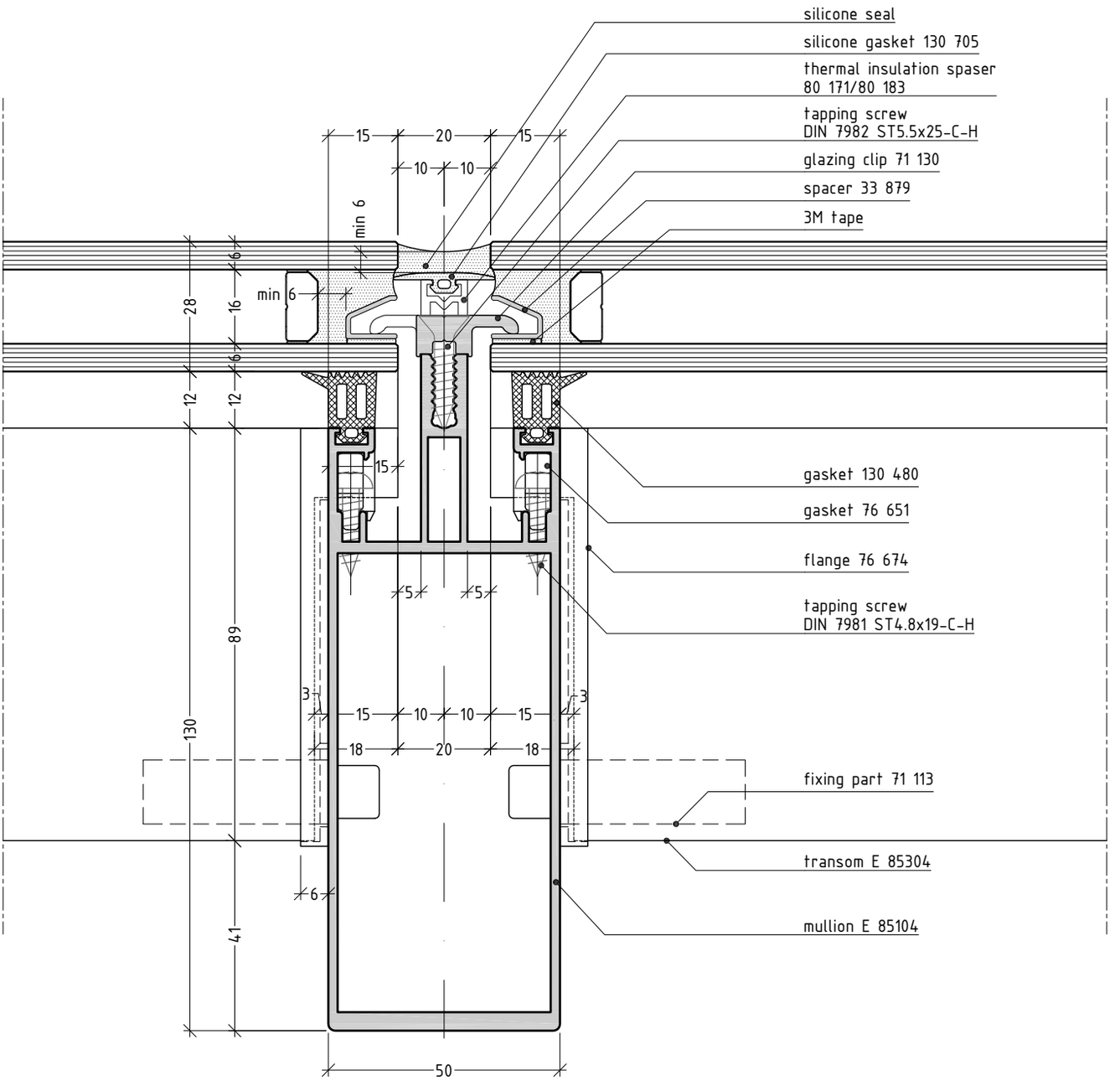
note:
spacer E 85990 has to be used only with 2nd level transoms

scale 3/4

E85SG6.2

mullion with 2nd level transom

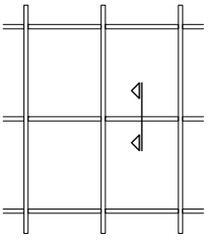


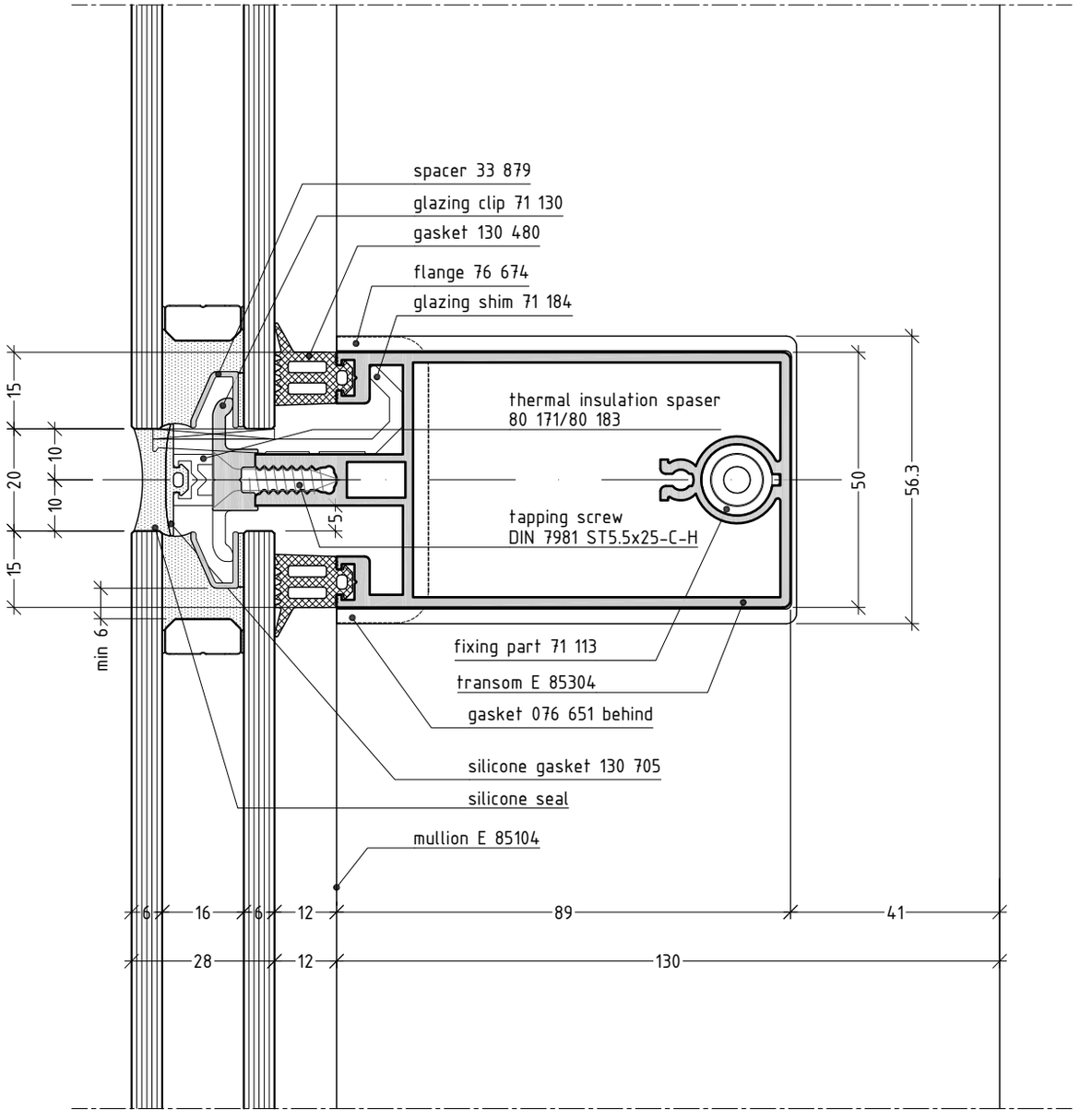


E85SG6.3

scale 3/4

transom 2nd level drainage

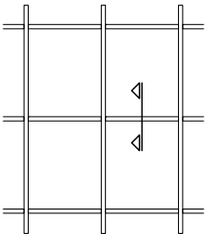


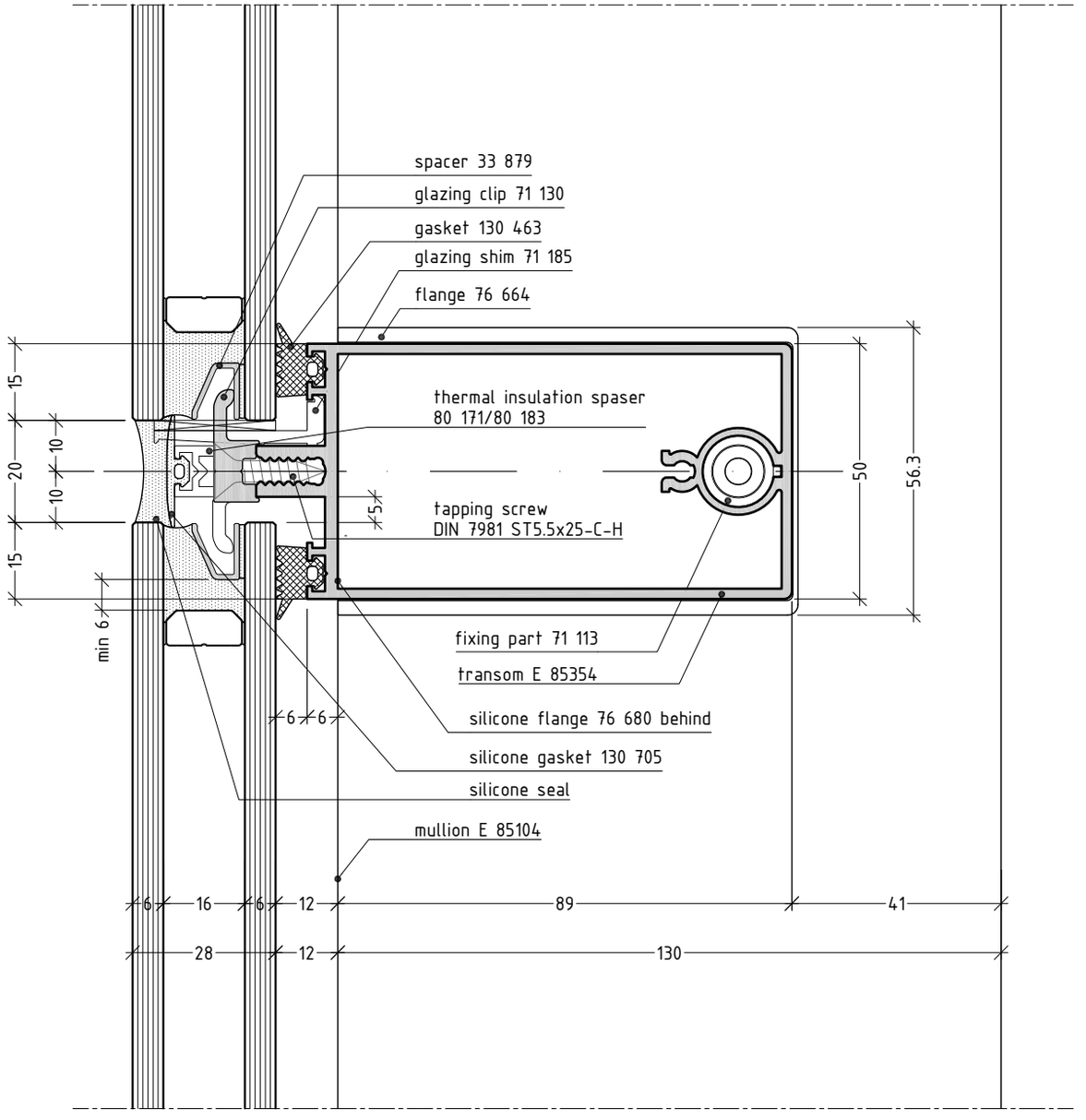


scale 3/4

E85SG6.4

transom 3rd level drainage

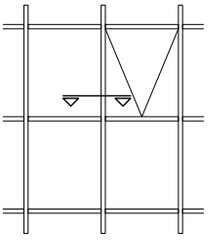


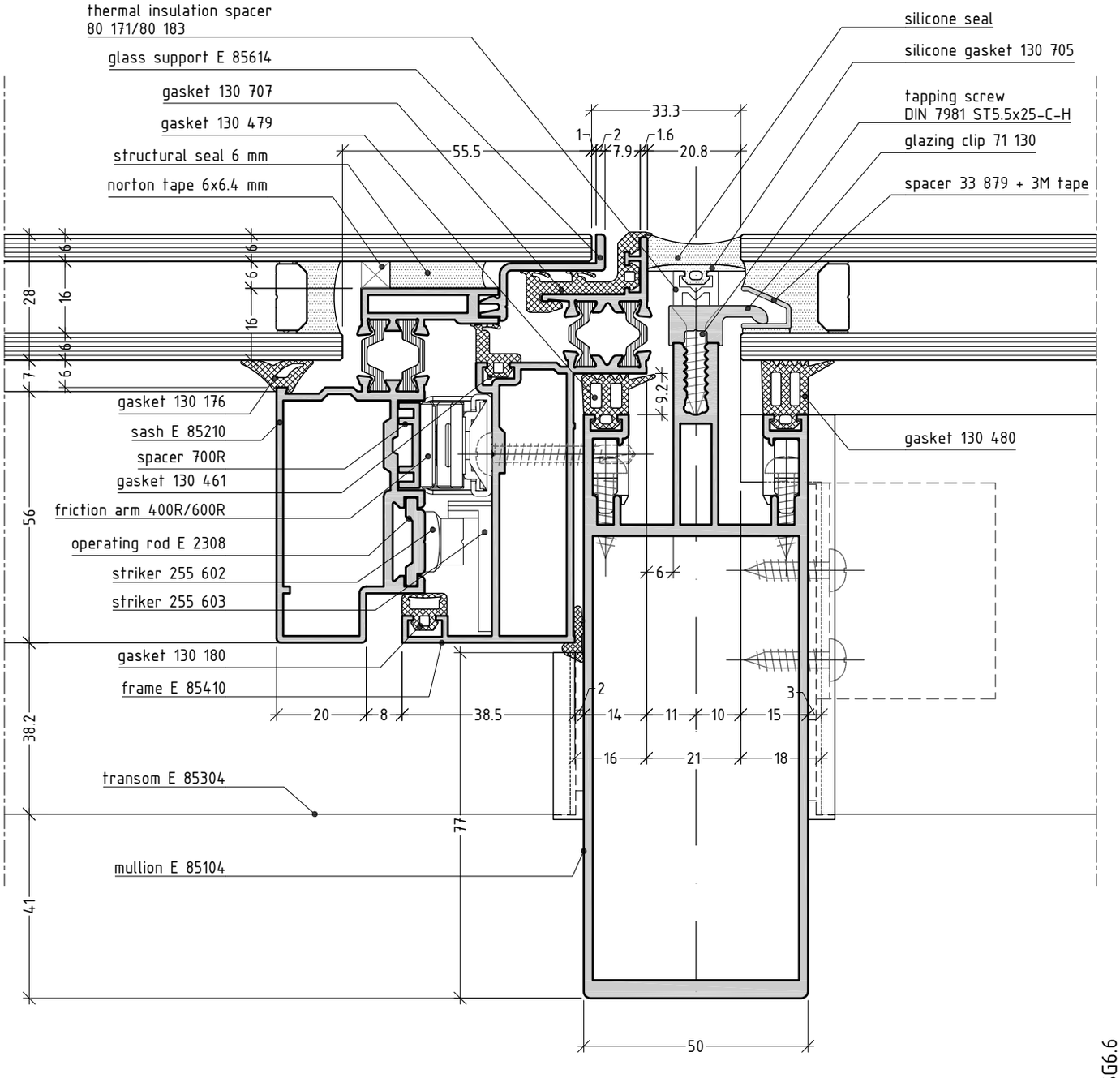


scale 3/4

E85SG6.5

projected thermo-break window

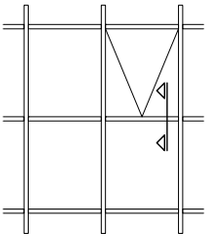


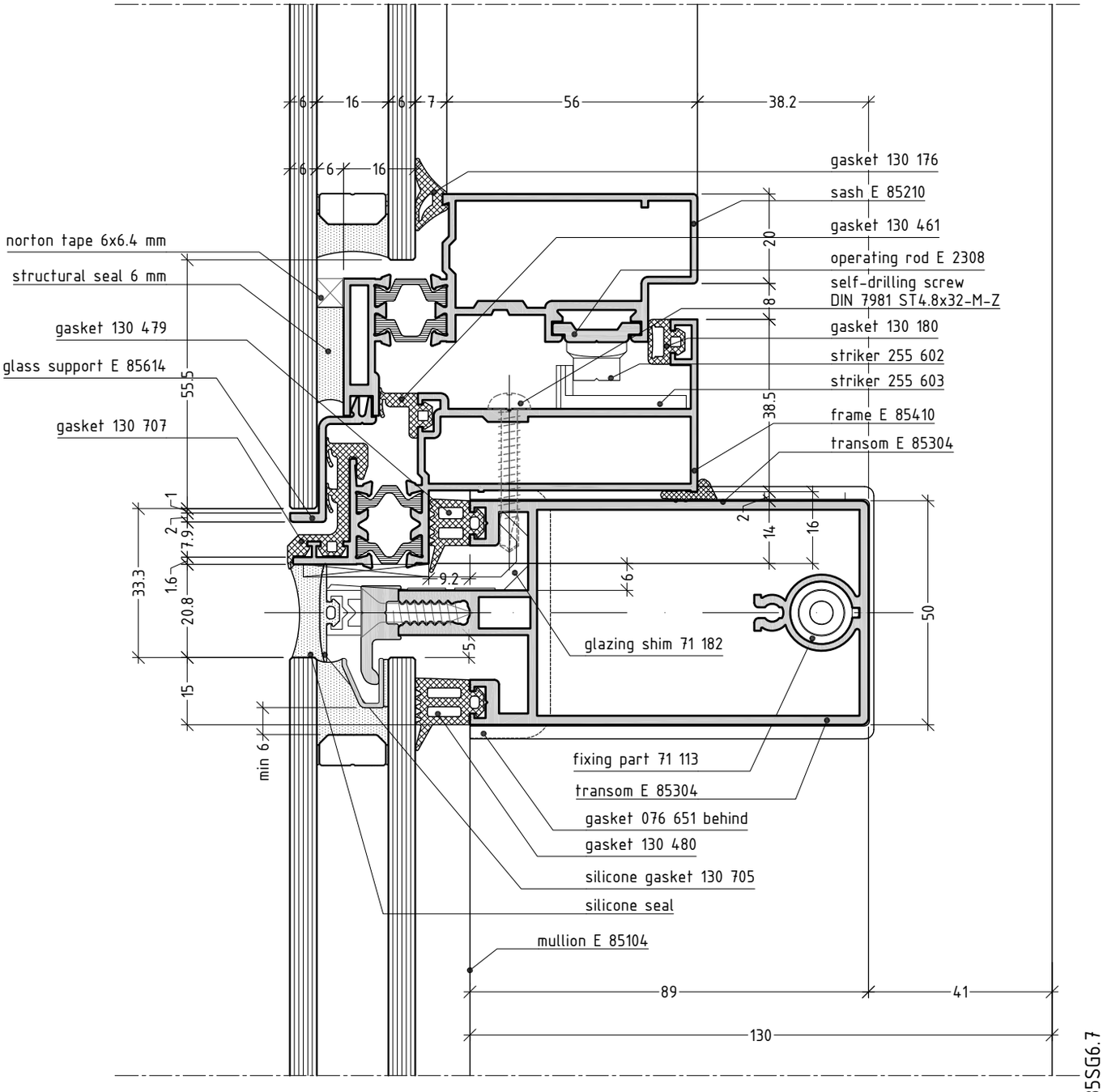


scale 3/4

E85SG6.6

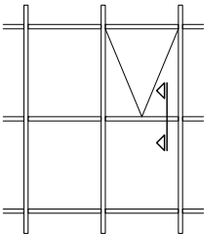
projected thermo-break window with 2nd level transom

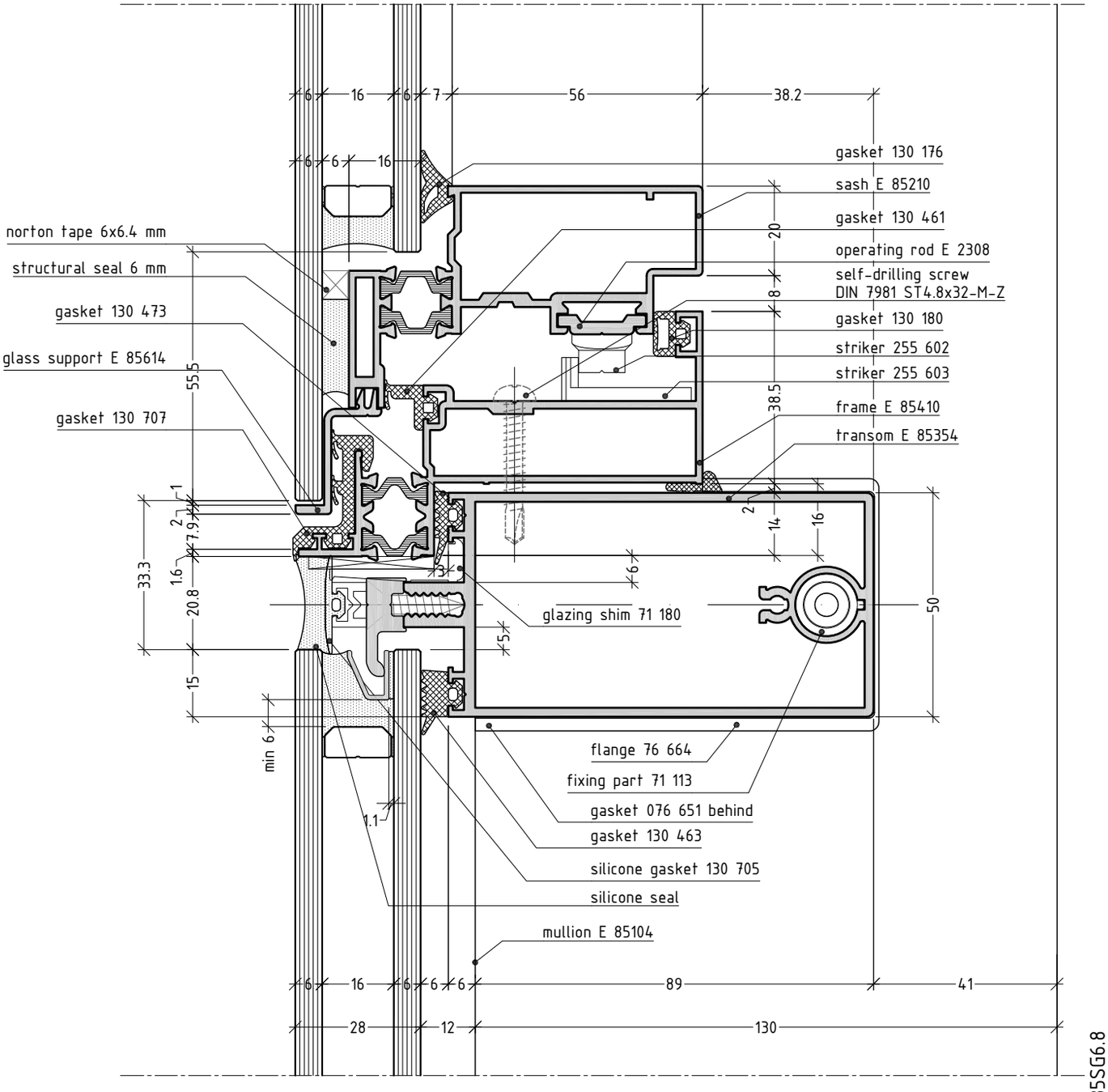




scale 3/4

projected thermo-break window with 3rd level transom

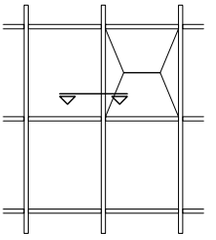


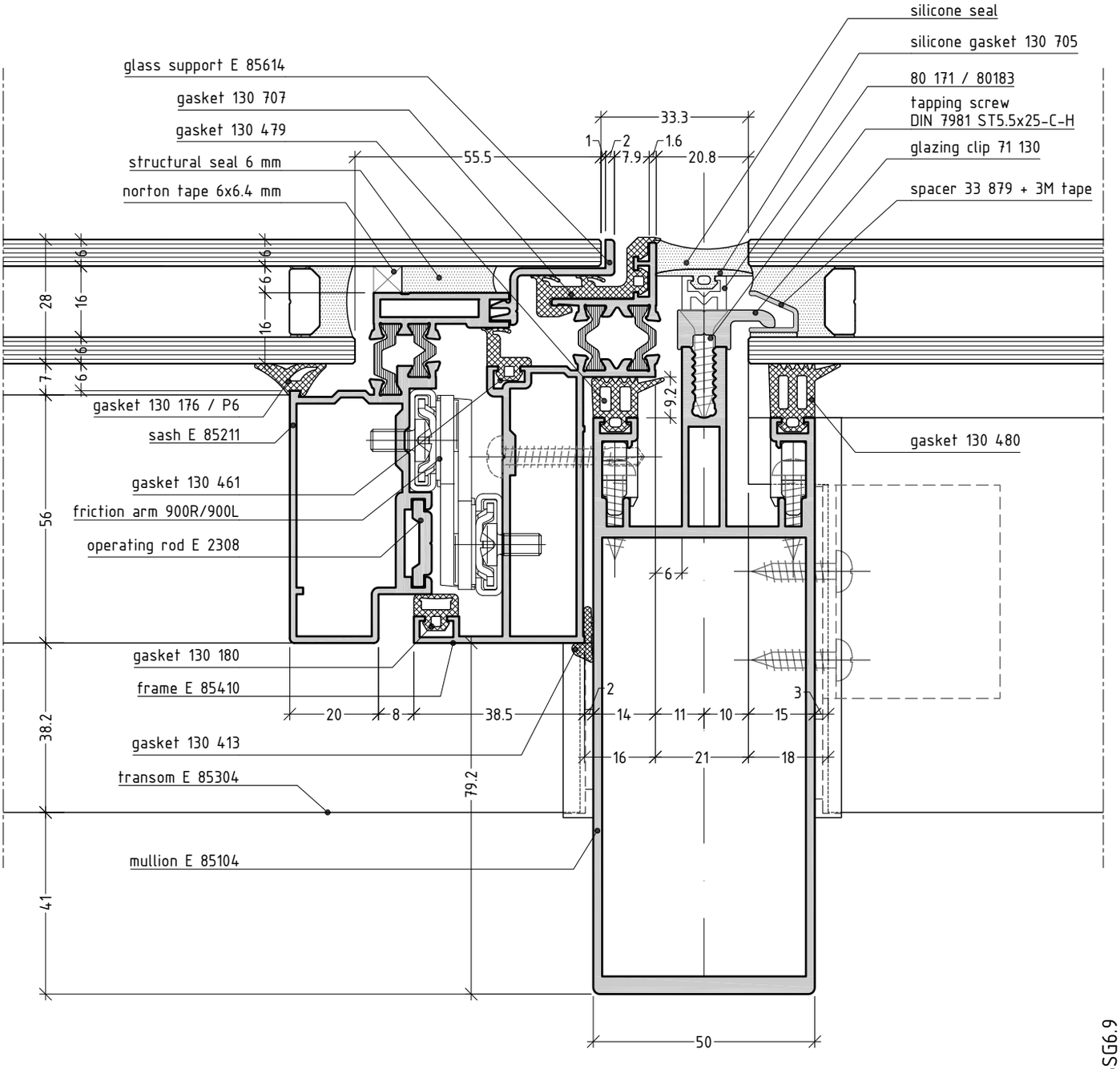


E85SG6.8

scale 3/4

parallel opening thermo-break window

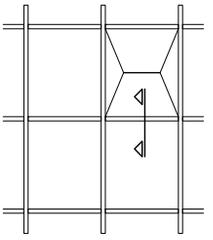


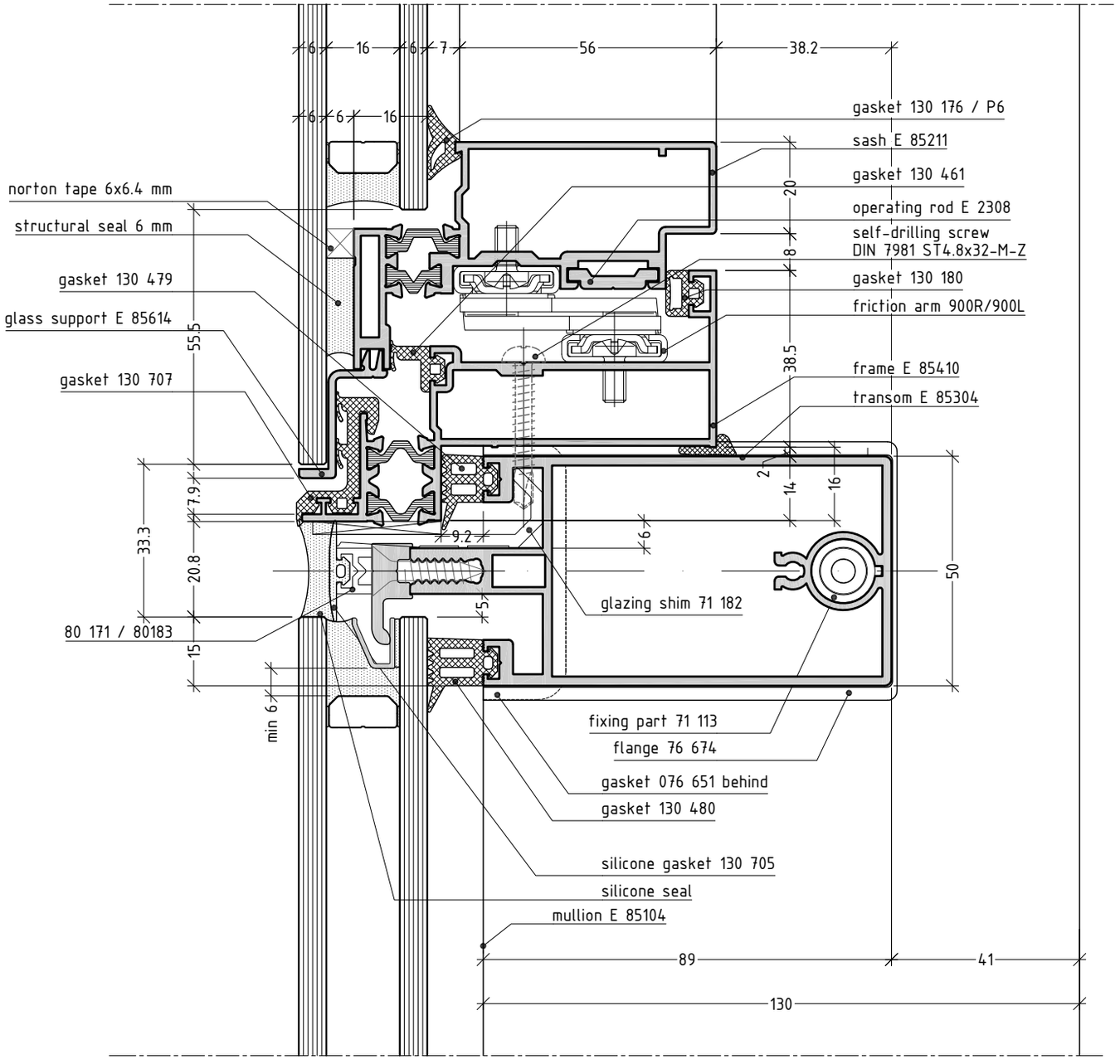


scale 3/4

E85SG6.9

parallel opening thermo-break window with 2nd level transom

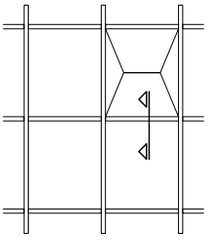


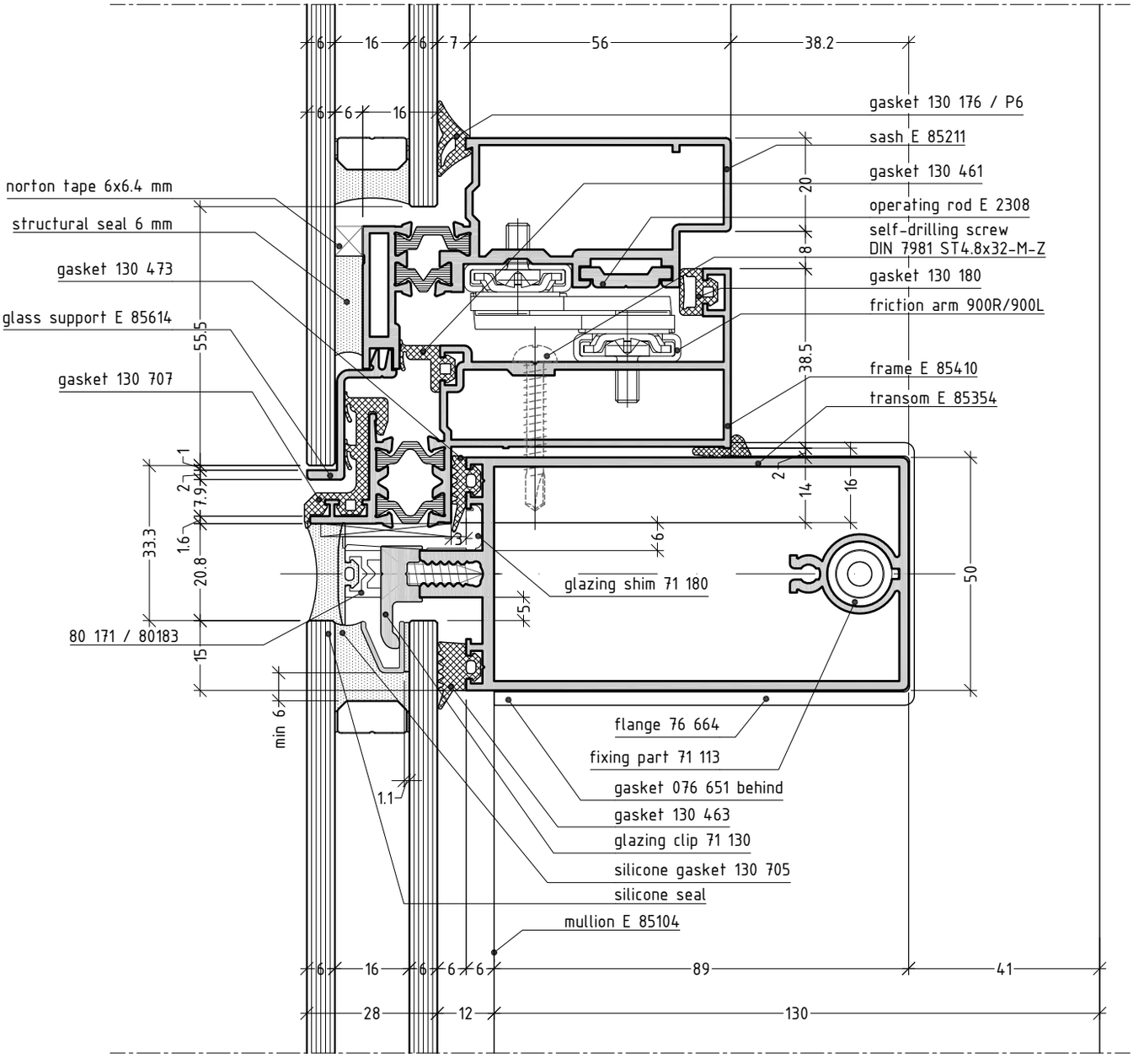


scale 3/4

E85SG6.10

parallel opening thermo-break window with 3rd level transom

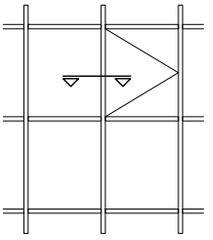


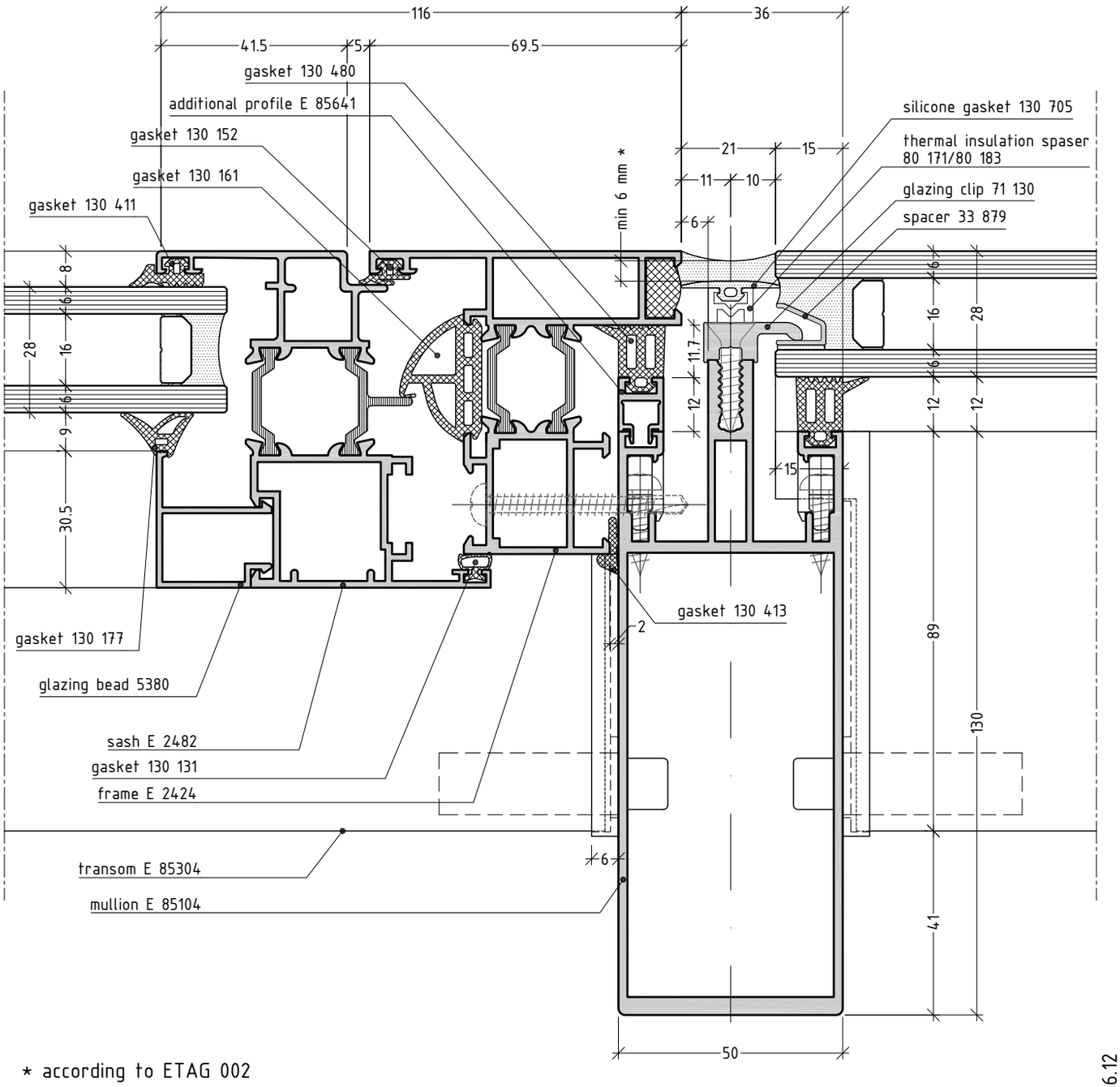


E85SG6.11

scale 3/4

window in curtain wall



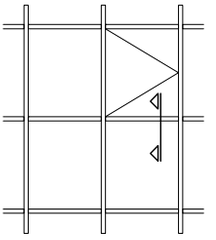


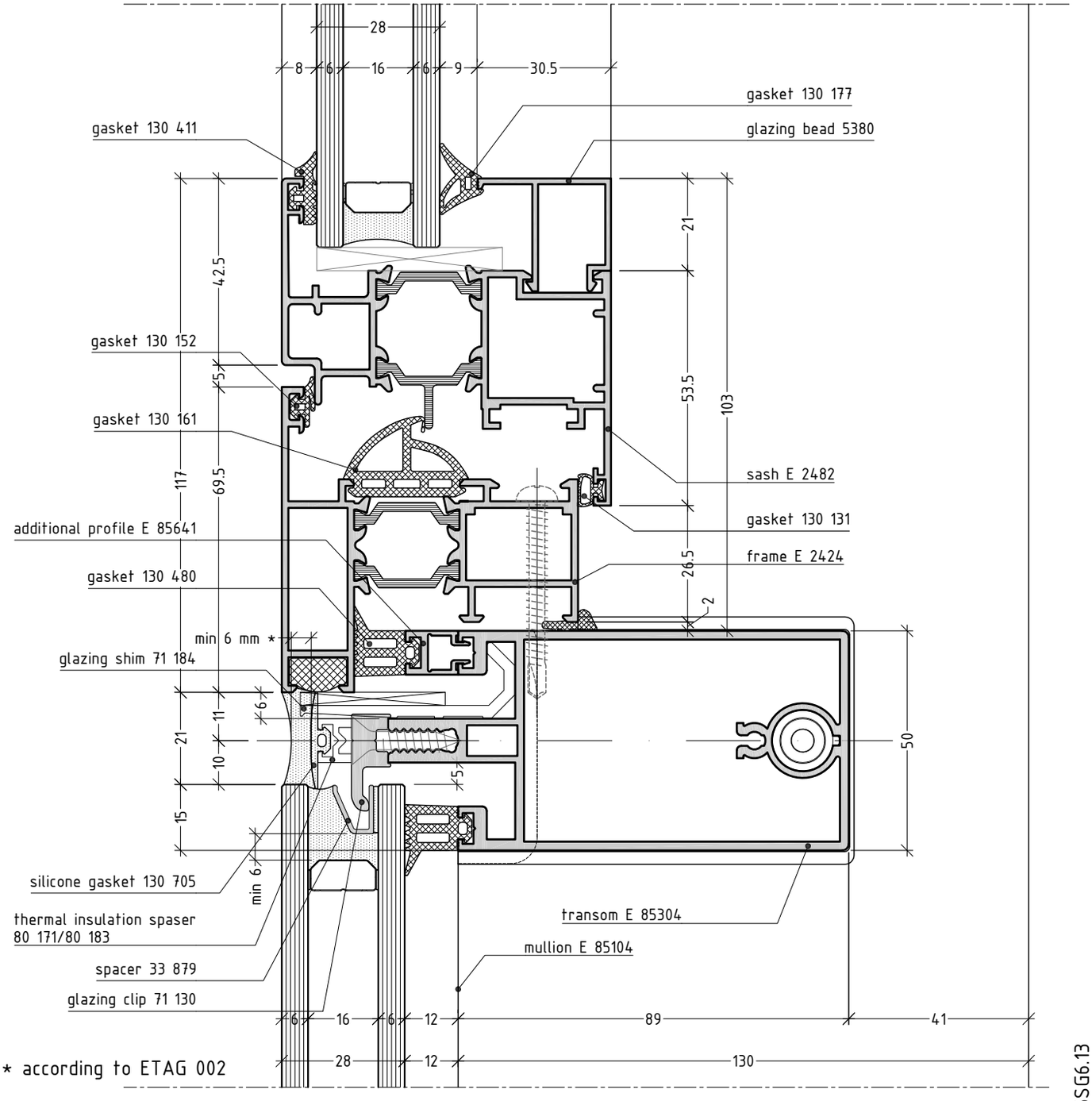
* according to ETAG 002

scale 3/4

E85SG6.12

window in curtain wall



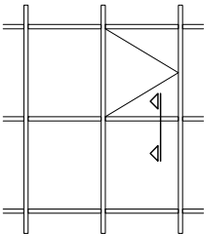


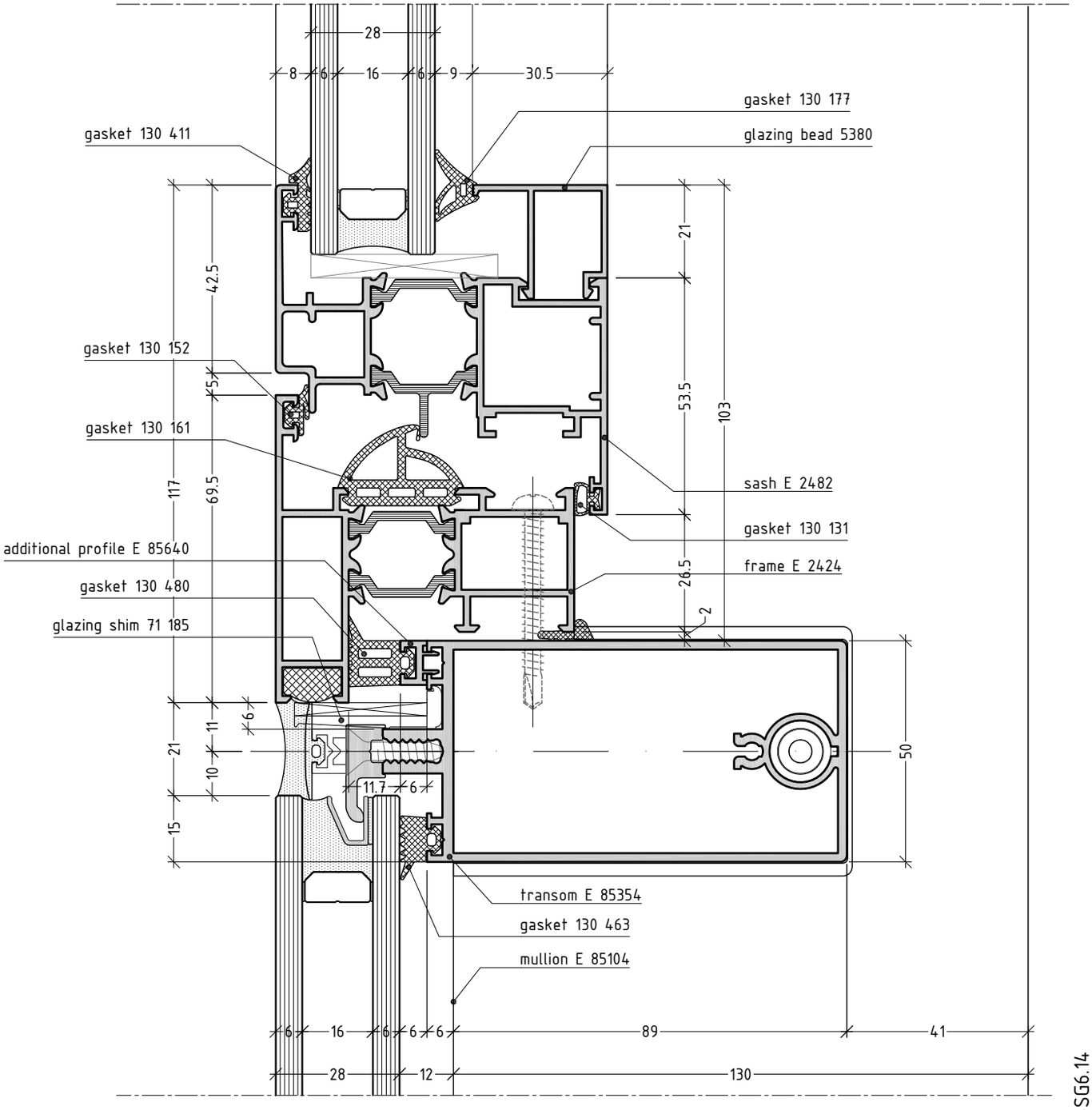
* according to ETAG 002

scale 3/4

E85SG6.13

window in curtain wall

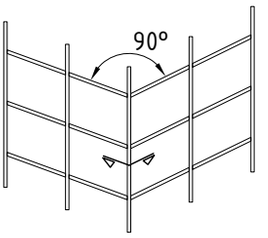


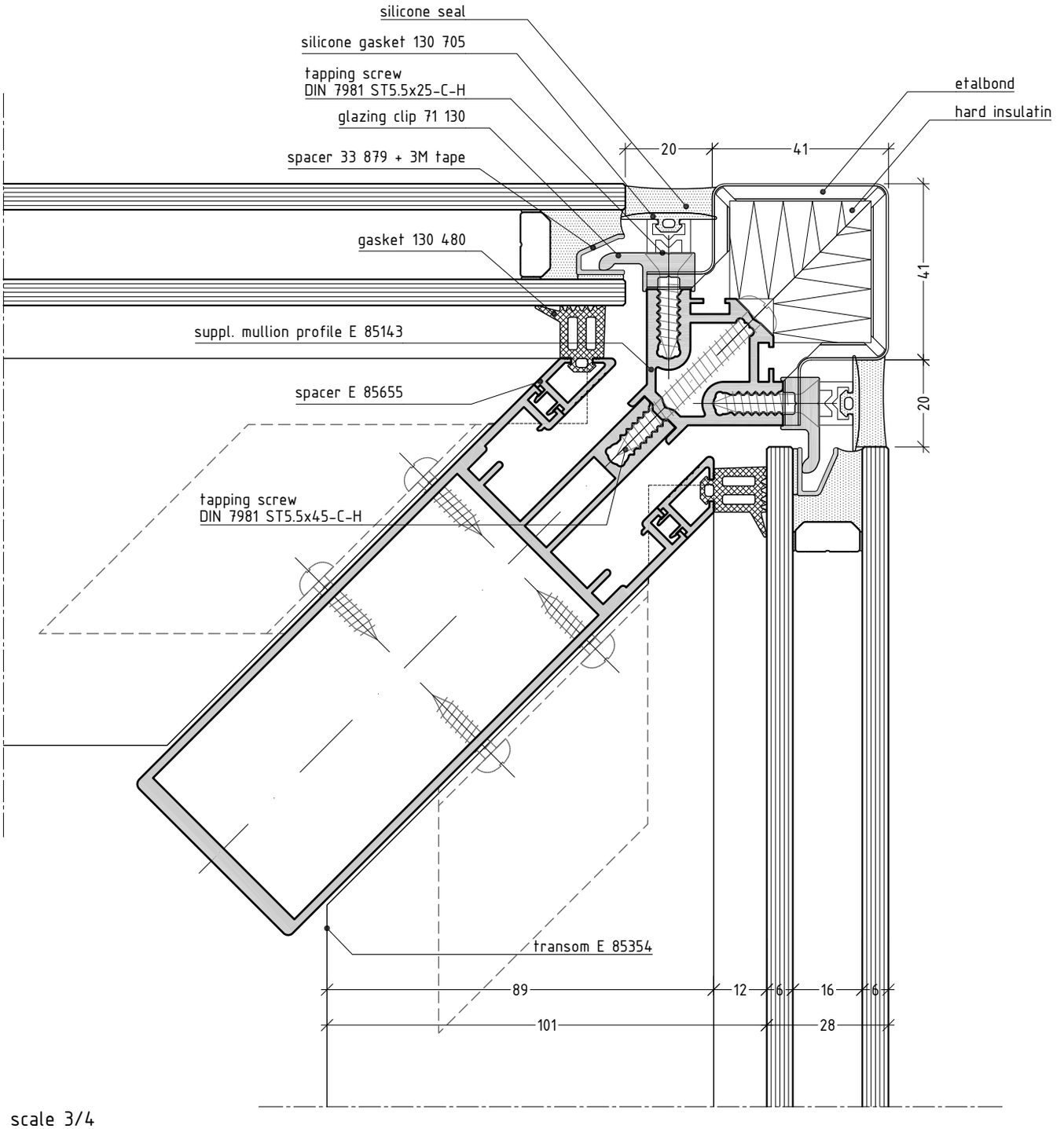


E85SG6.14

scale 3/4

outer corner 90°

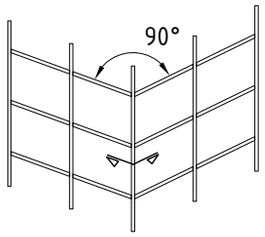


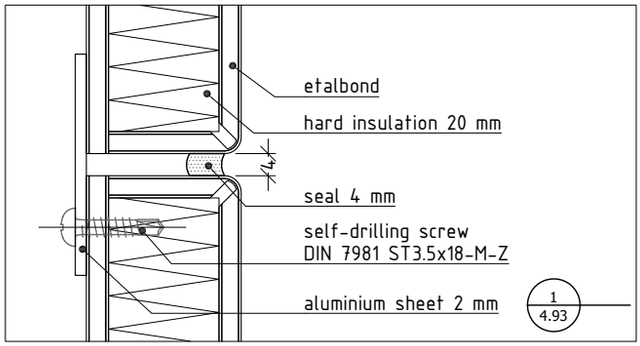


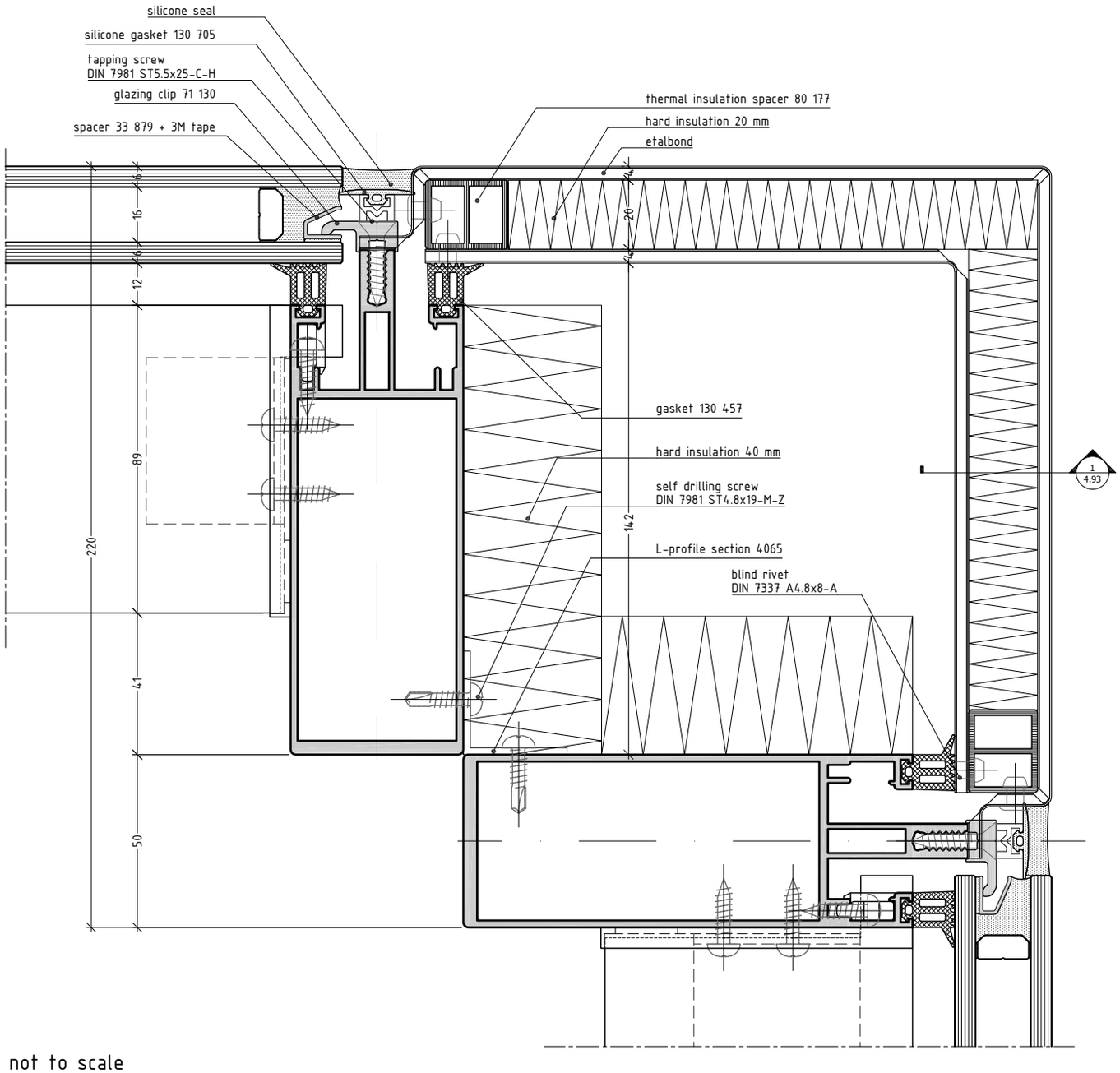
scale 3/4

E85SG6.15

outer corner 90°



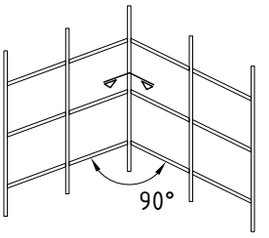


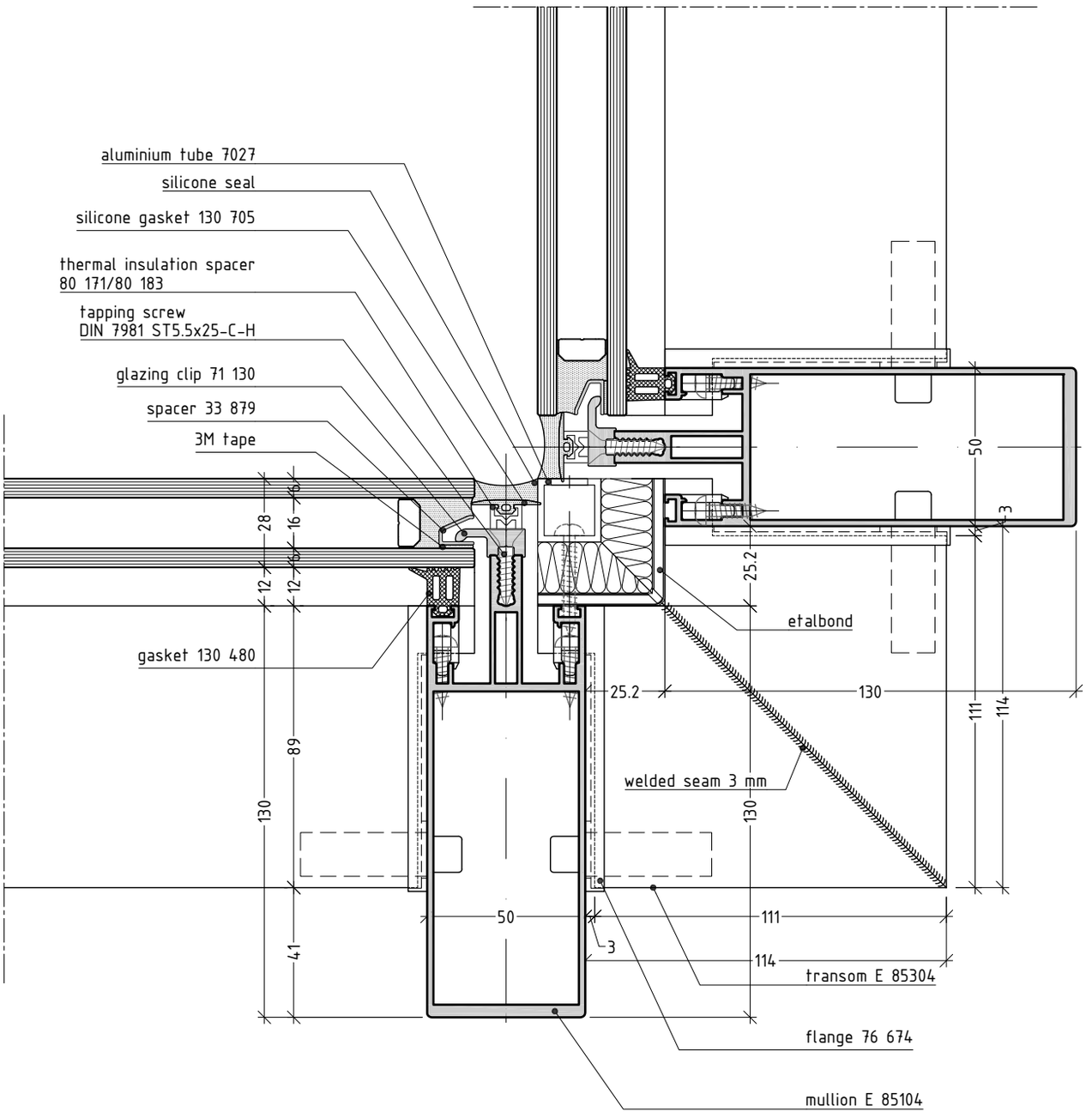


not to scale

E85SG6.16

inner corner 90°

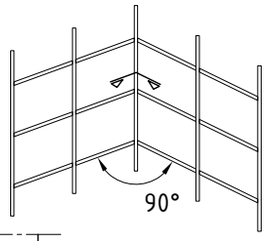


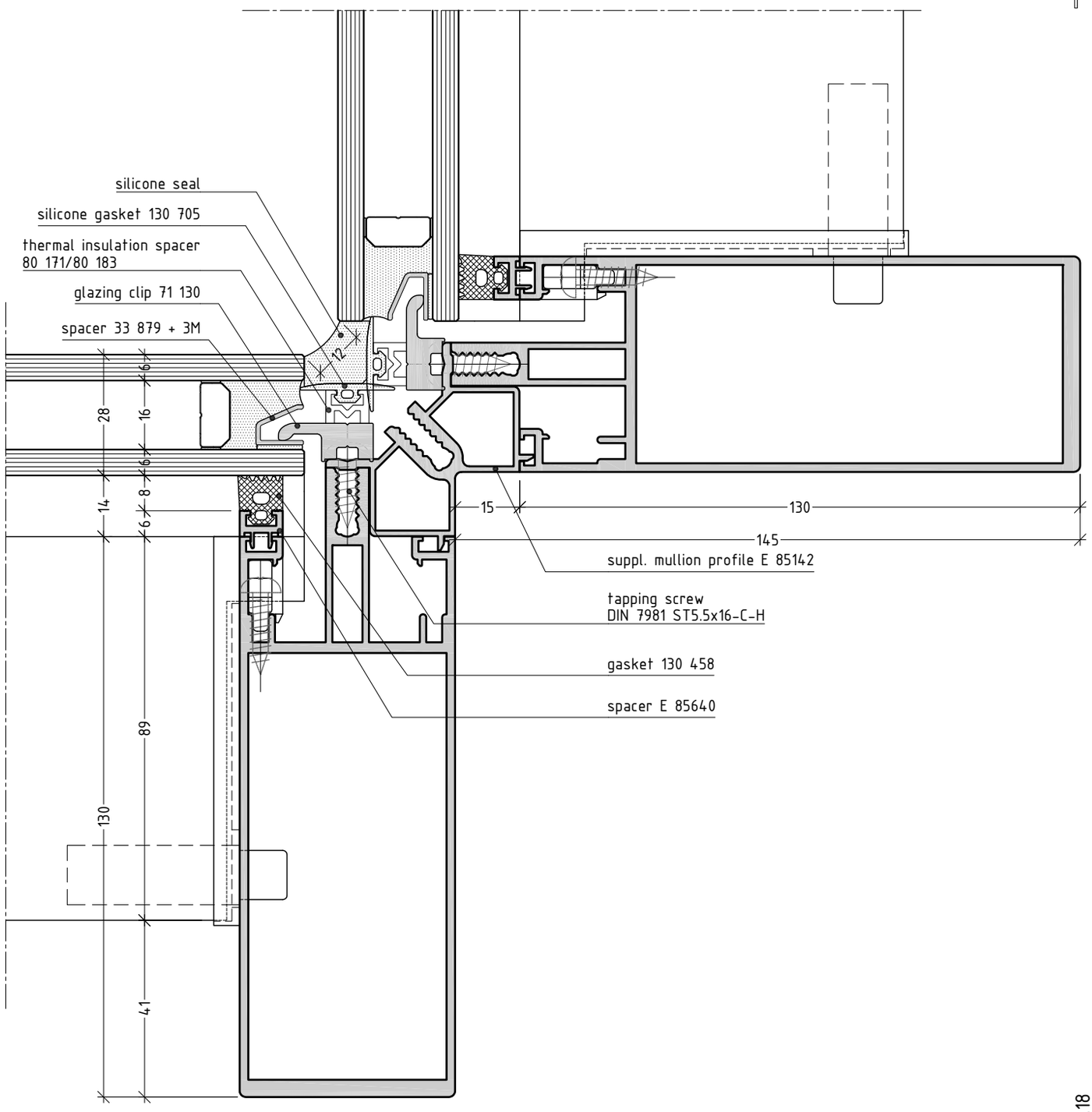


scale 1:2

E85SG6.17

inner corner 90°

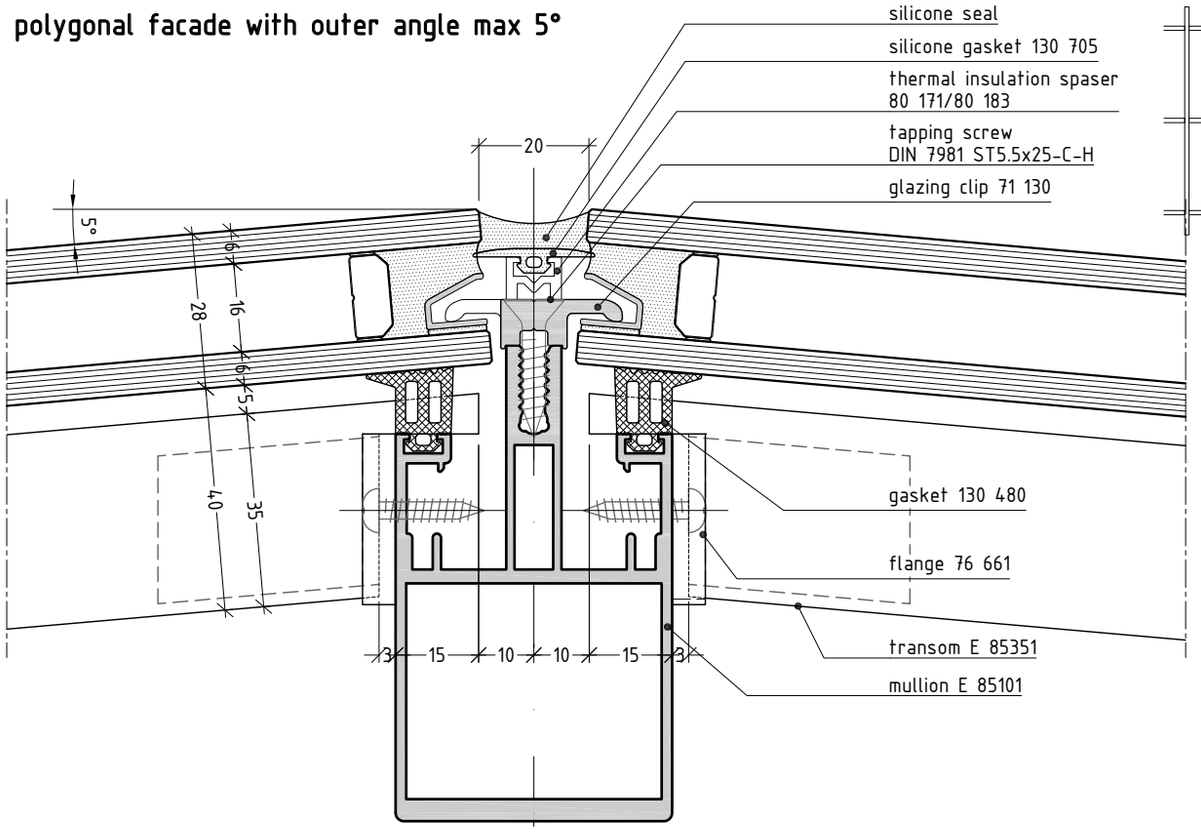




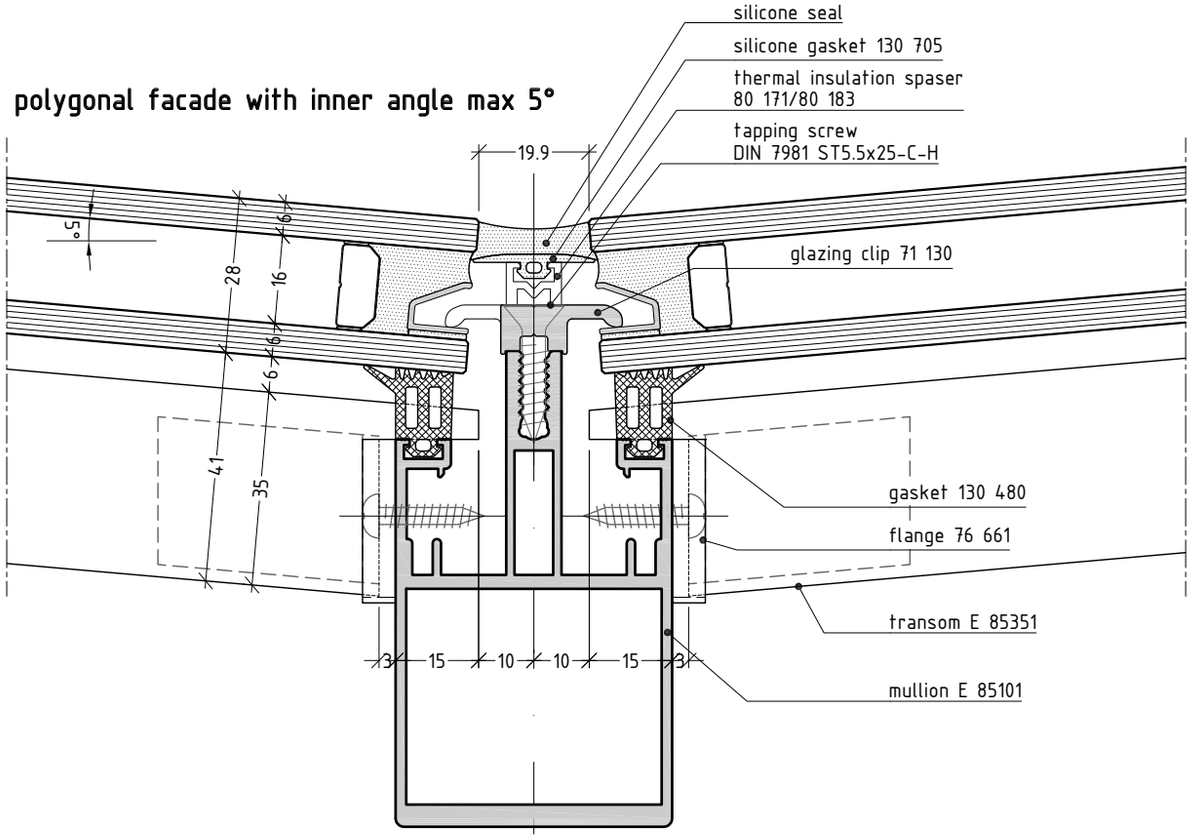
scale 3/4

E85SG6.18

polygonal facade with outer angle max 5°



polygonal facade with inner angle max 5°

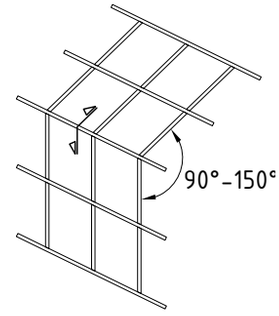


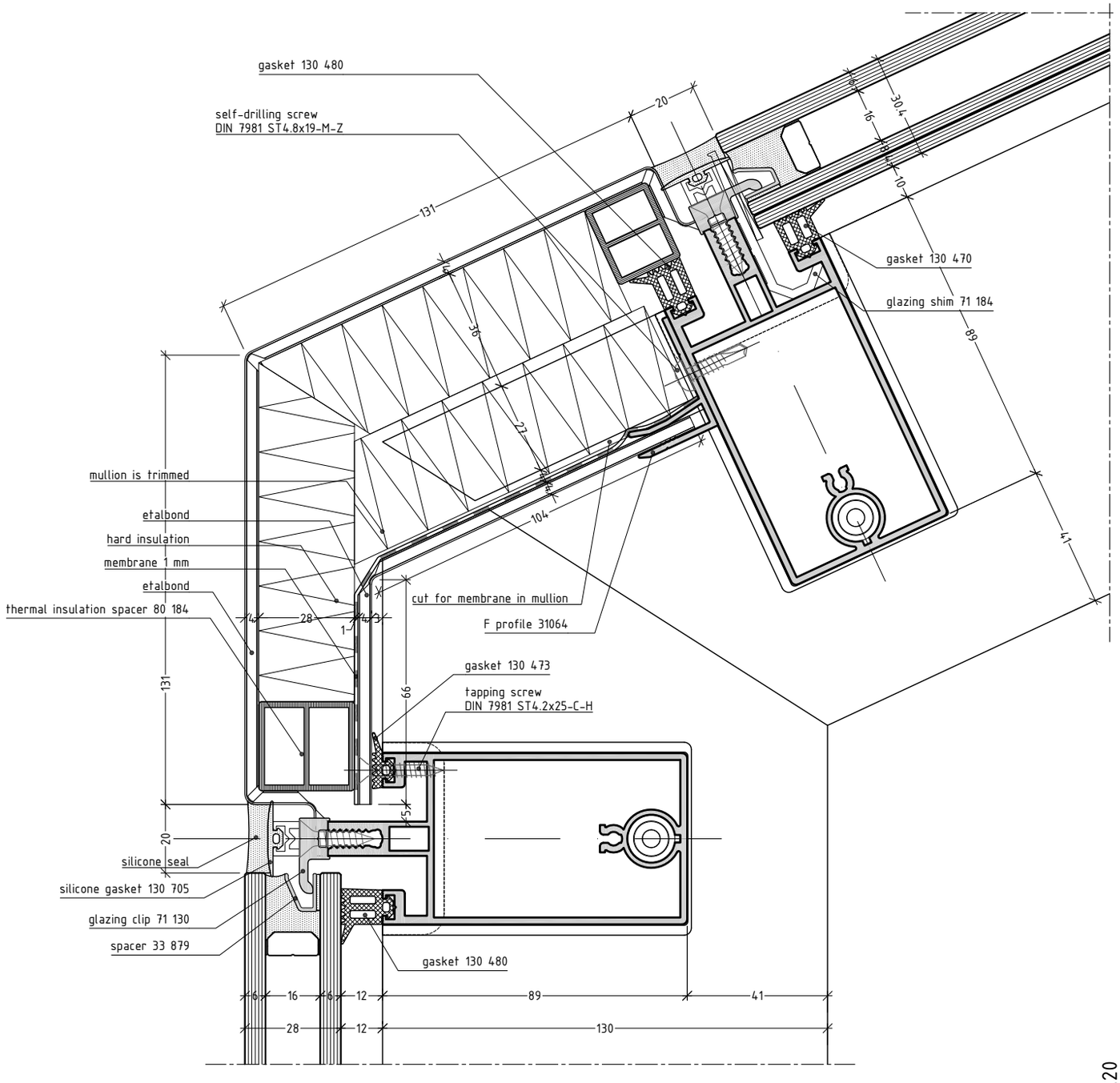
note: 1. if the angle is less than 10°, 2nd and 3rd level transoms could be used with glazing clip 71 130; 2. if the angle is between 10° and 20°, 3rd level transom could be used with angle spacers and glazing clip 71 130; 3. if the angle is greater than 20°, 2nd and 3rd level transoms could be used with bended metal sheet instead of glazing clip;

scale 3/4

E85SG6.19

conservatories vertical section

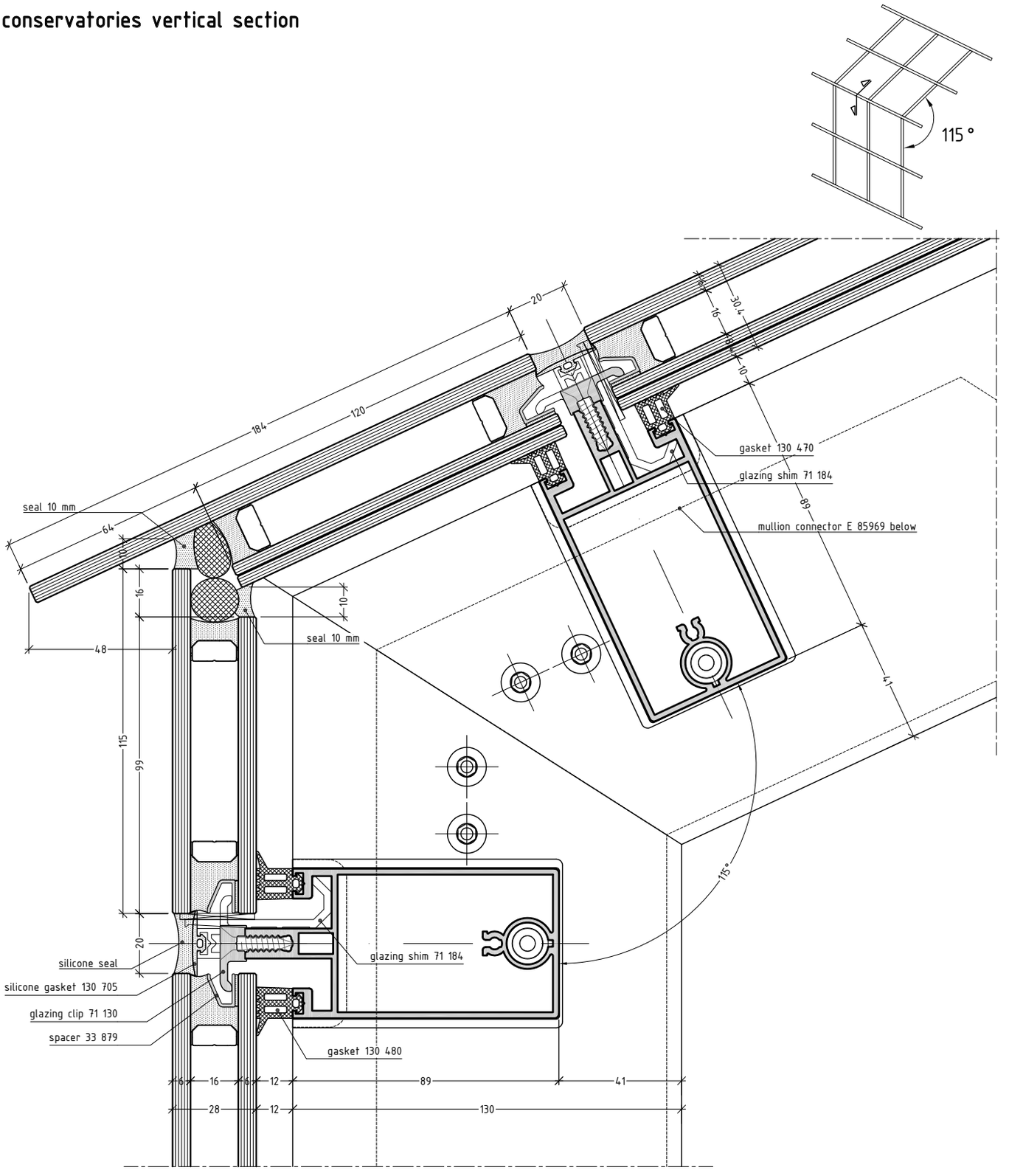




not to scale

E85SG6.20

conservatories vertical section

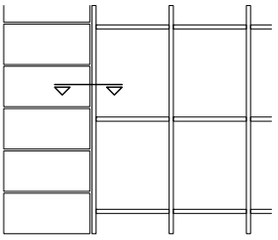


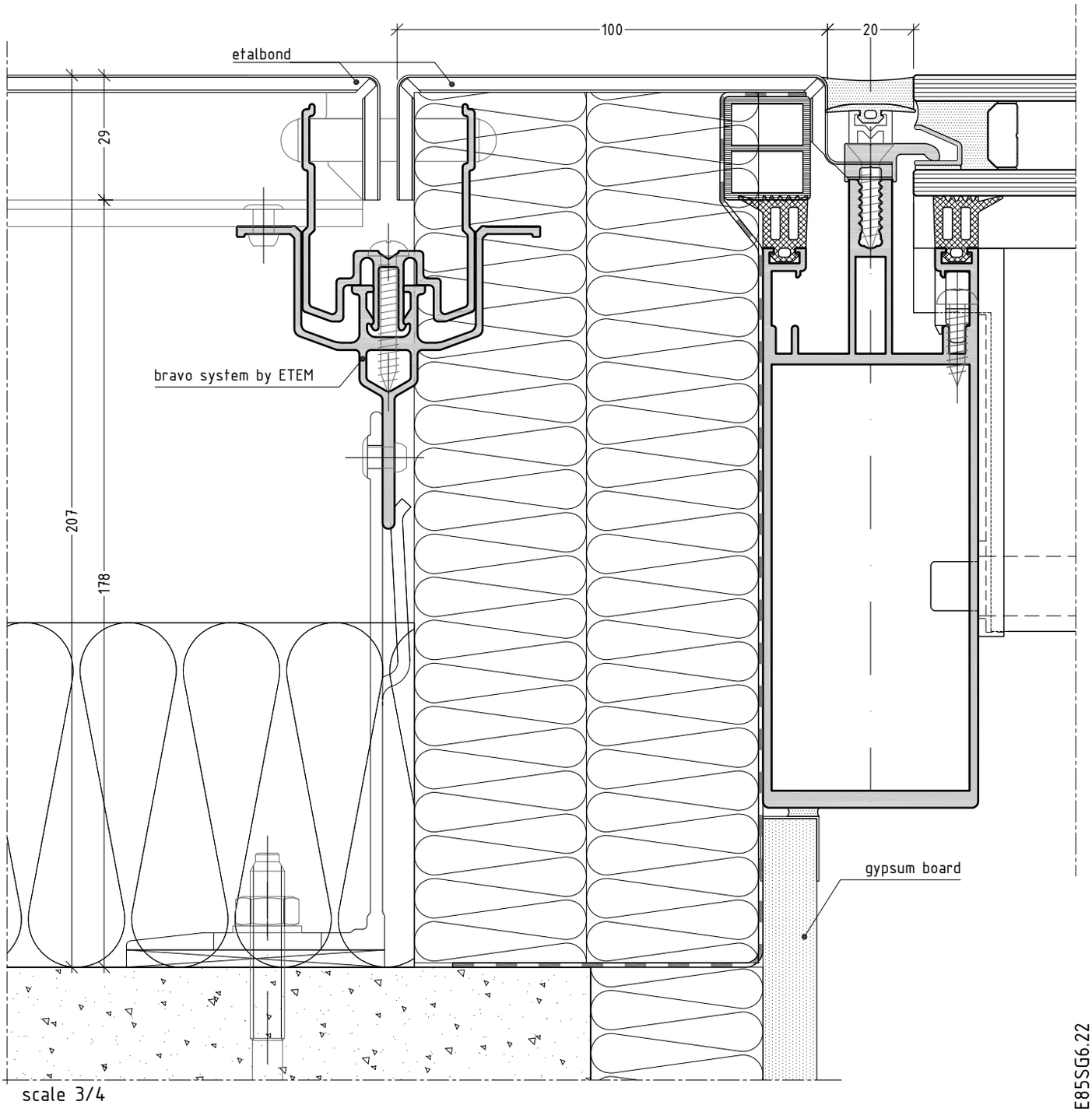
note:
the glass thickness should be
checked by the facade engineer

not to scale

E85SG6.21

connection with rainscreen cladding system BRAVO

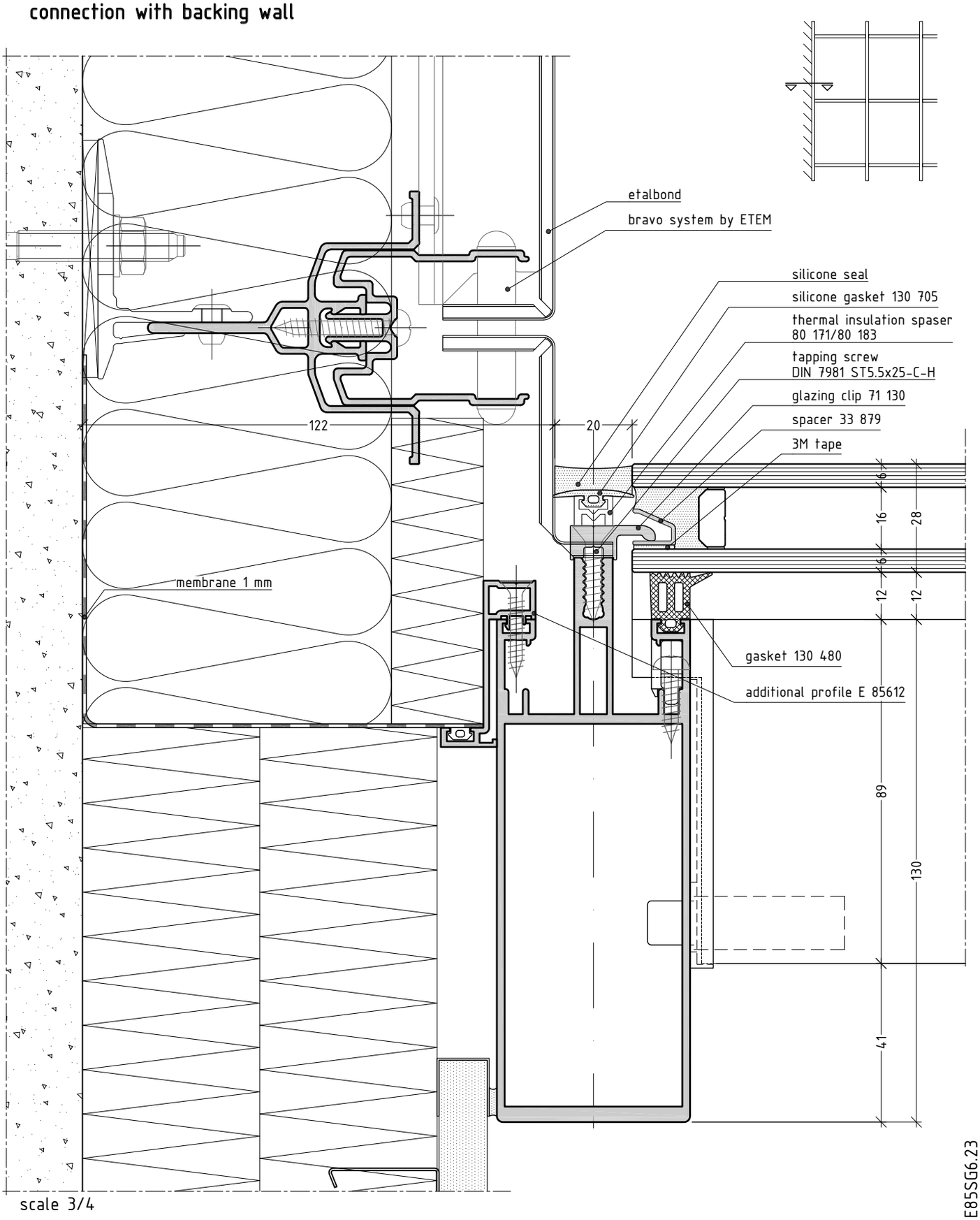




scale 3/4

E85SG6.22

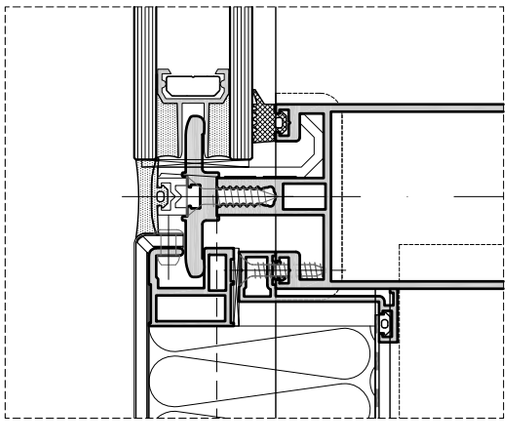
connection with backing wall

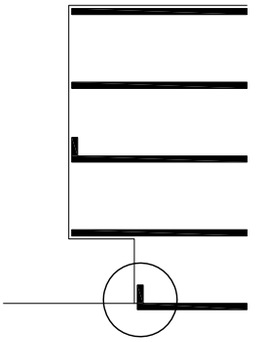


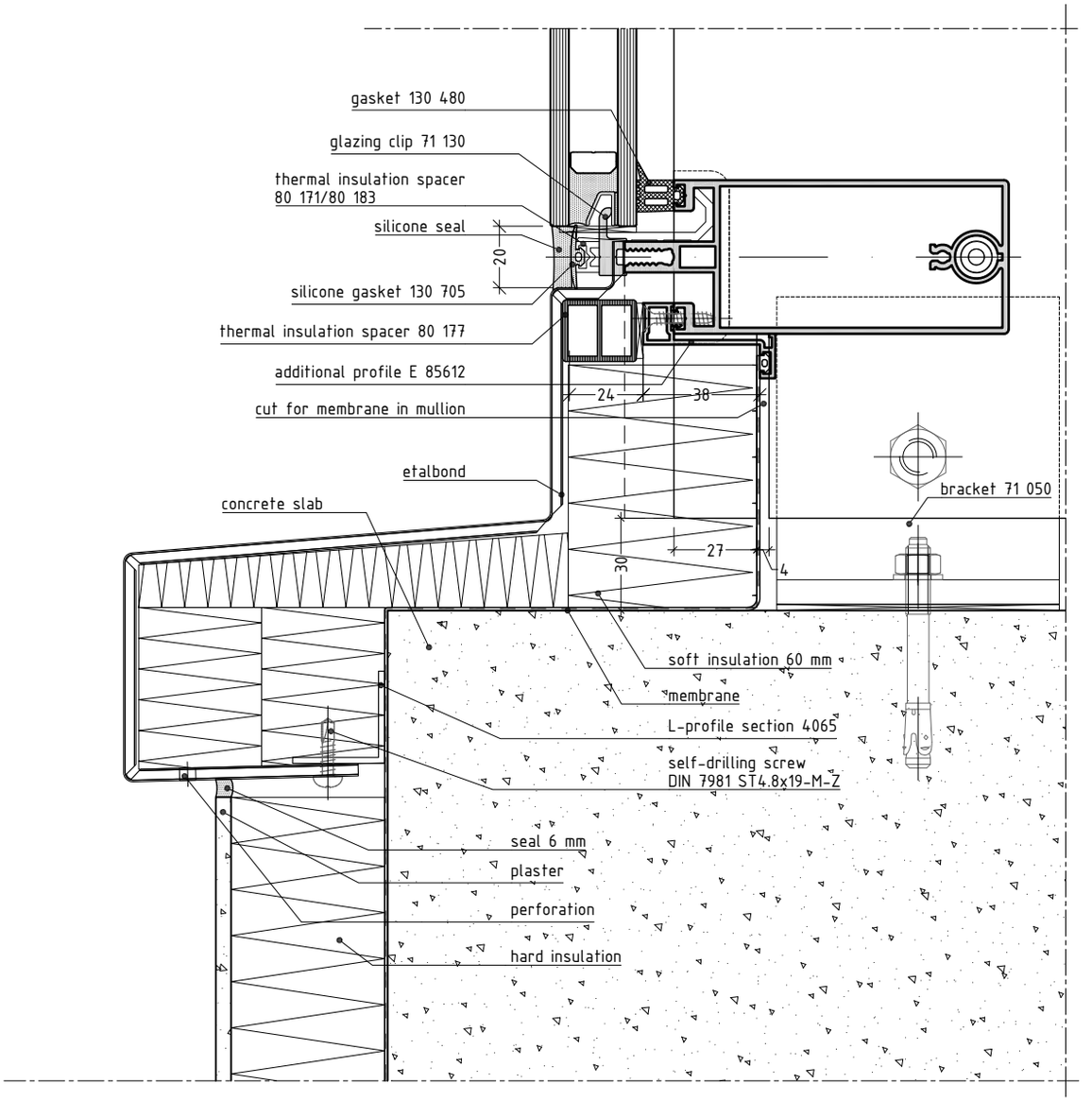
scale 3/4

E85SG6.23

bottom finishing



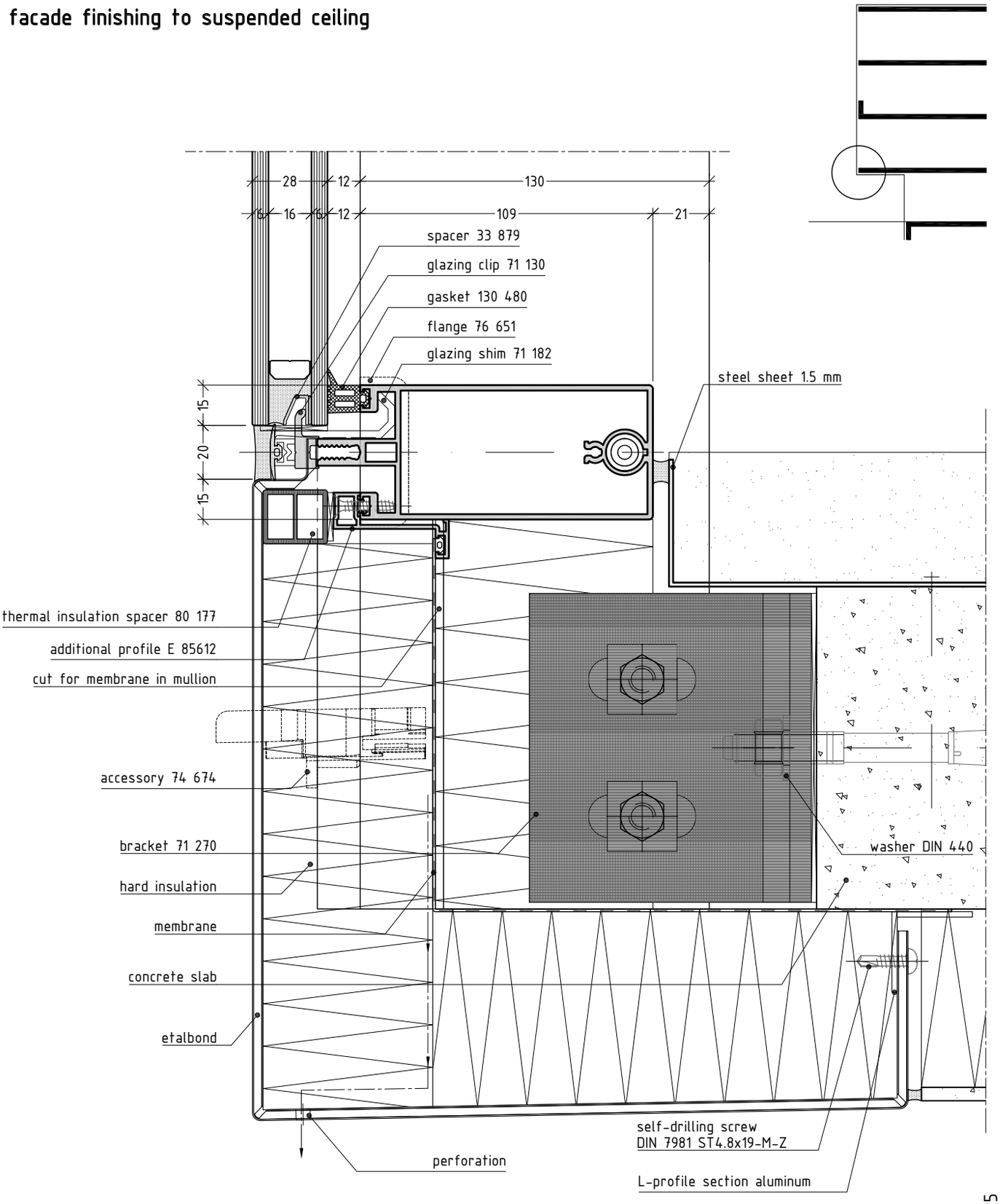




E85SG6.24

scale 1:2

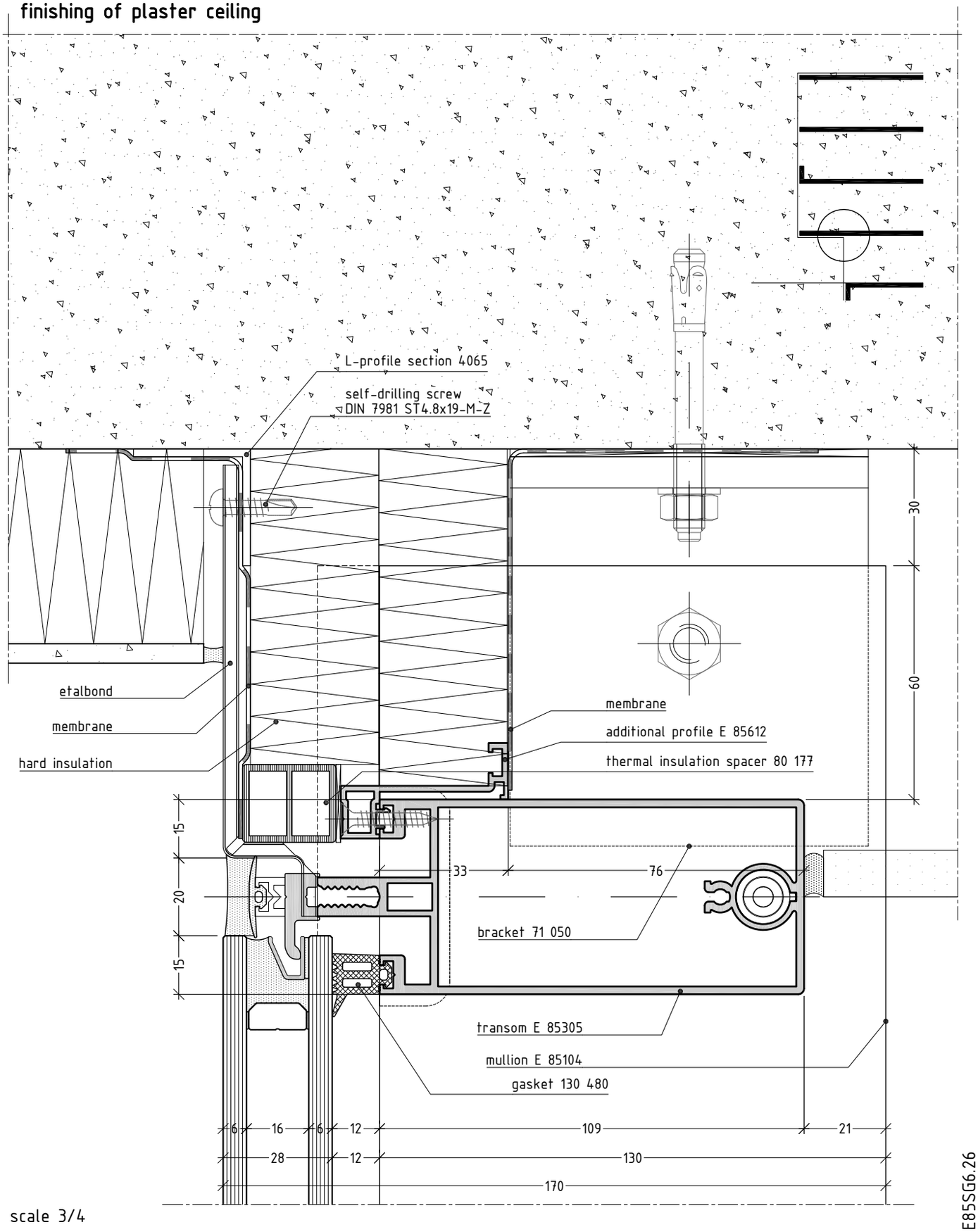
facade finishing to suspended ceiling



not to scale

E85SG6.25

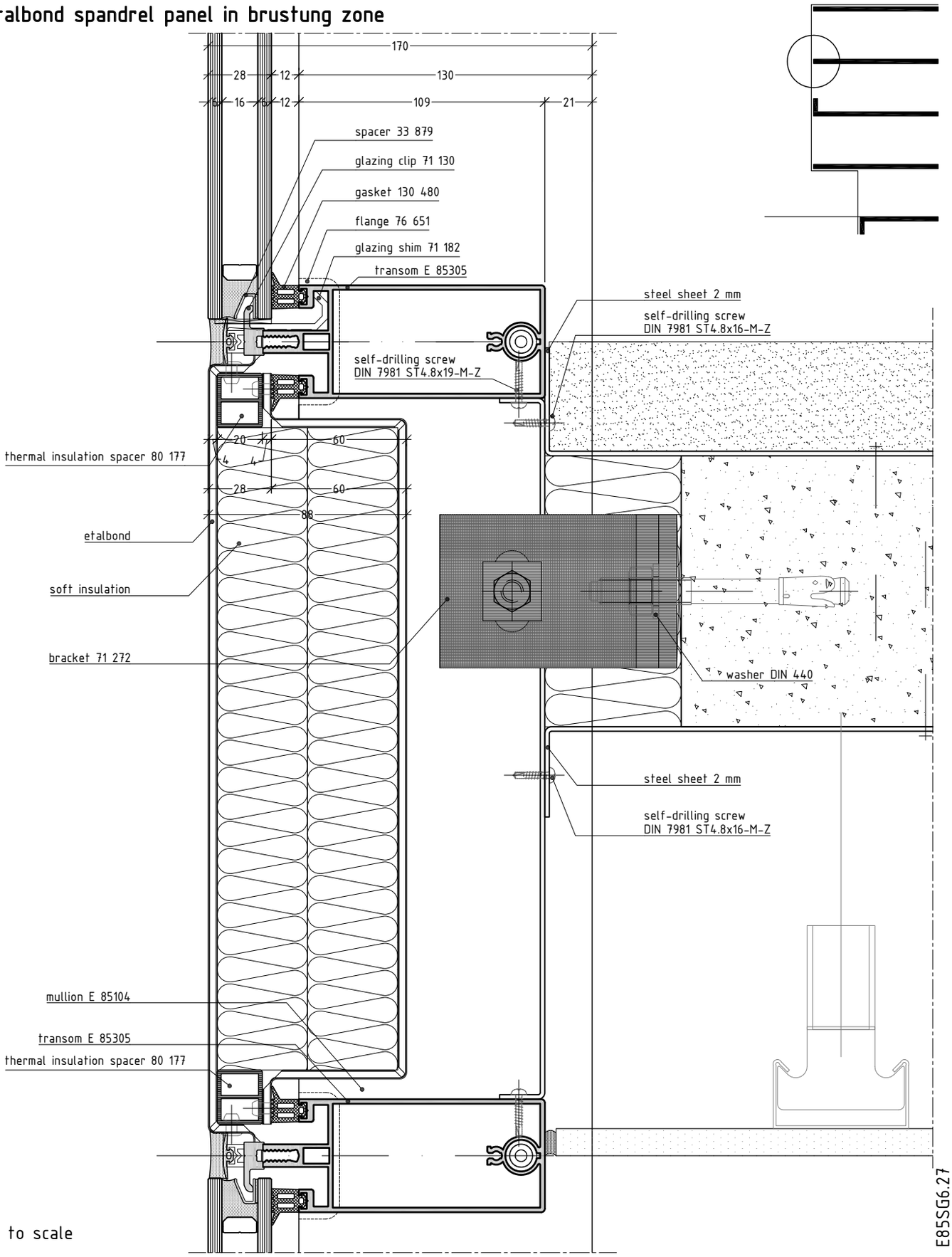
finishing of plaster ceiling



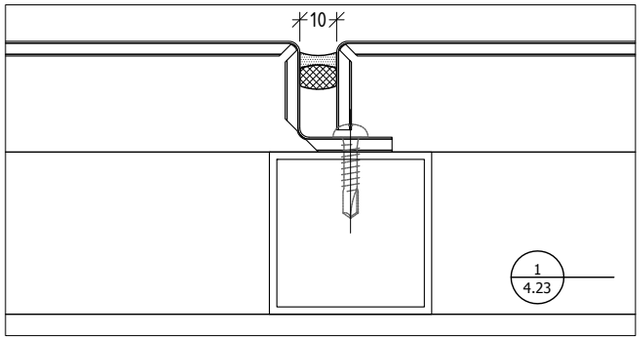
scale 3/4

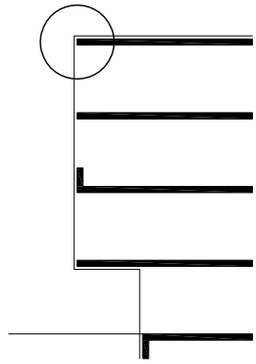
E85SG6.26

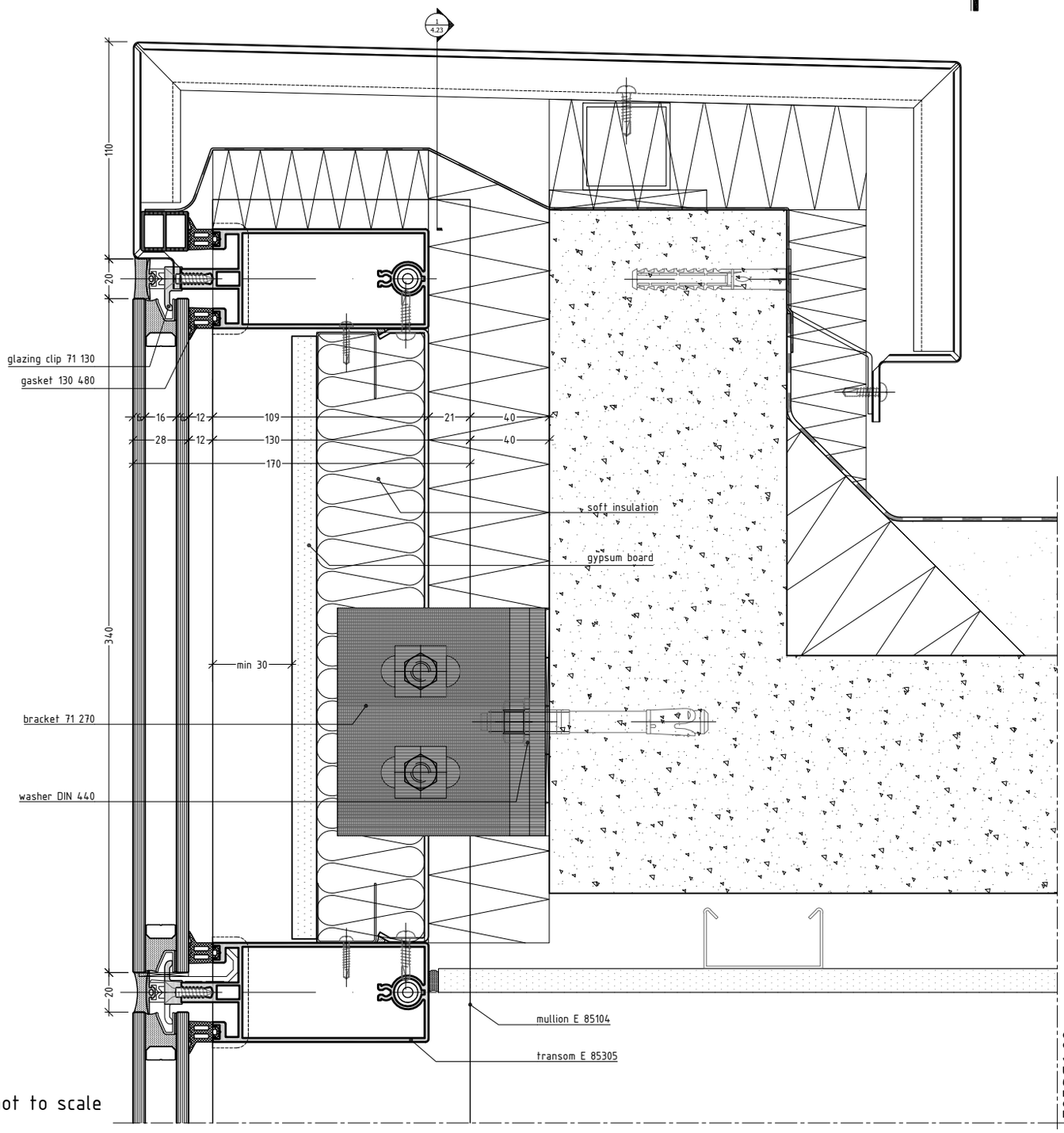
etalbond spandrel panel in brustung zone



upper finishing with etalbond







not to scale

E85SG6.28

COMBINATIONS

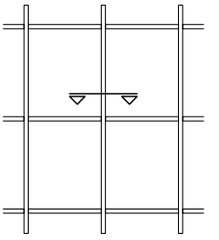
SECTIONS | DETAILS

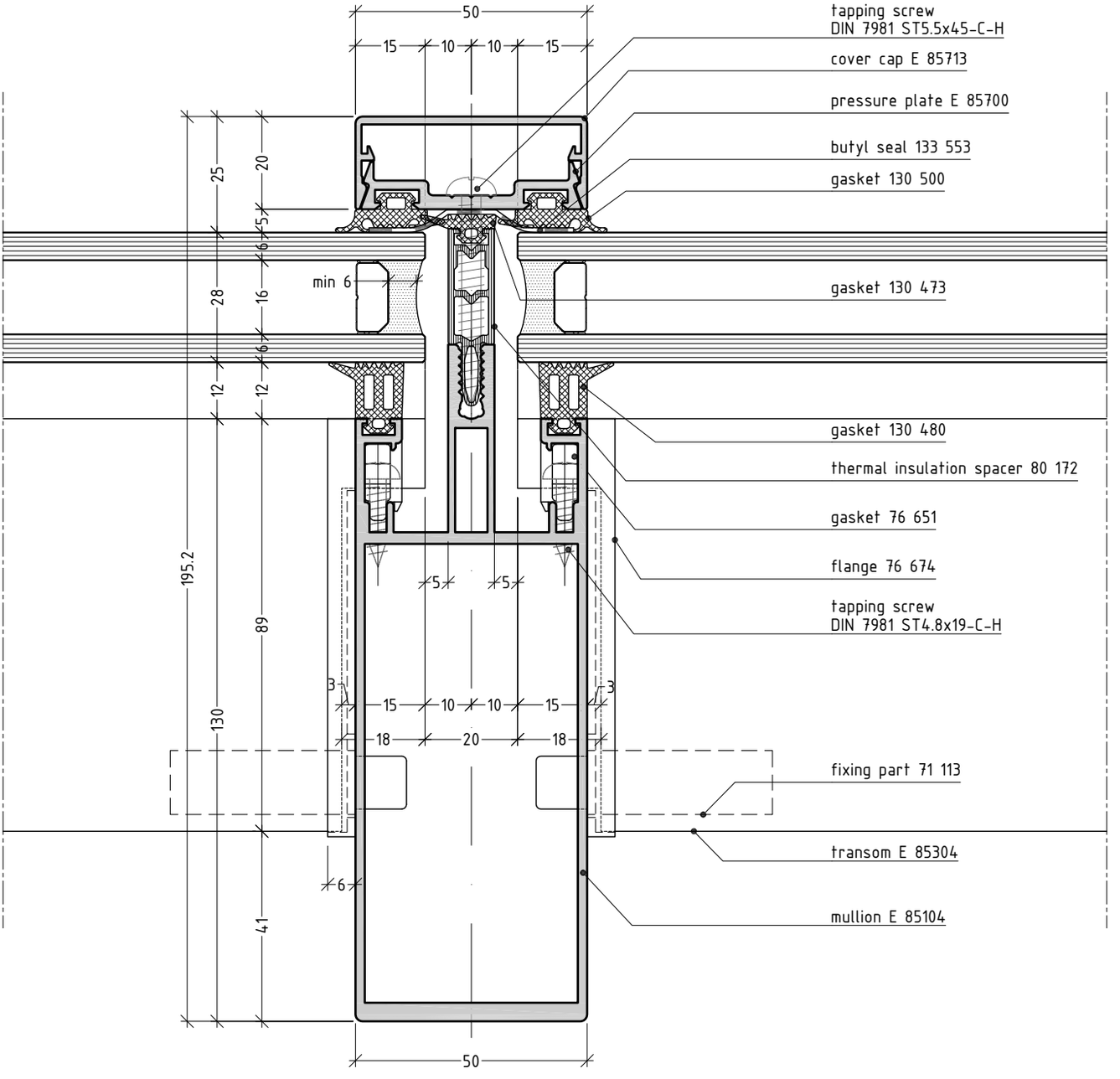
ETEM BUILDING SYSTEMS®

curtain wall system

E 85

combined facade with vertical cap and horizontal silicone joint

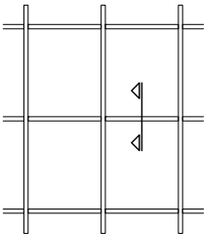


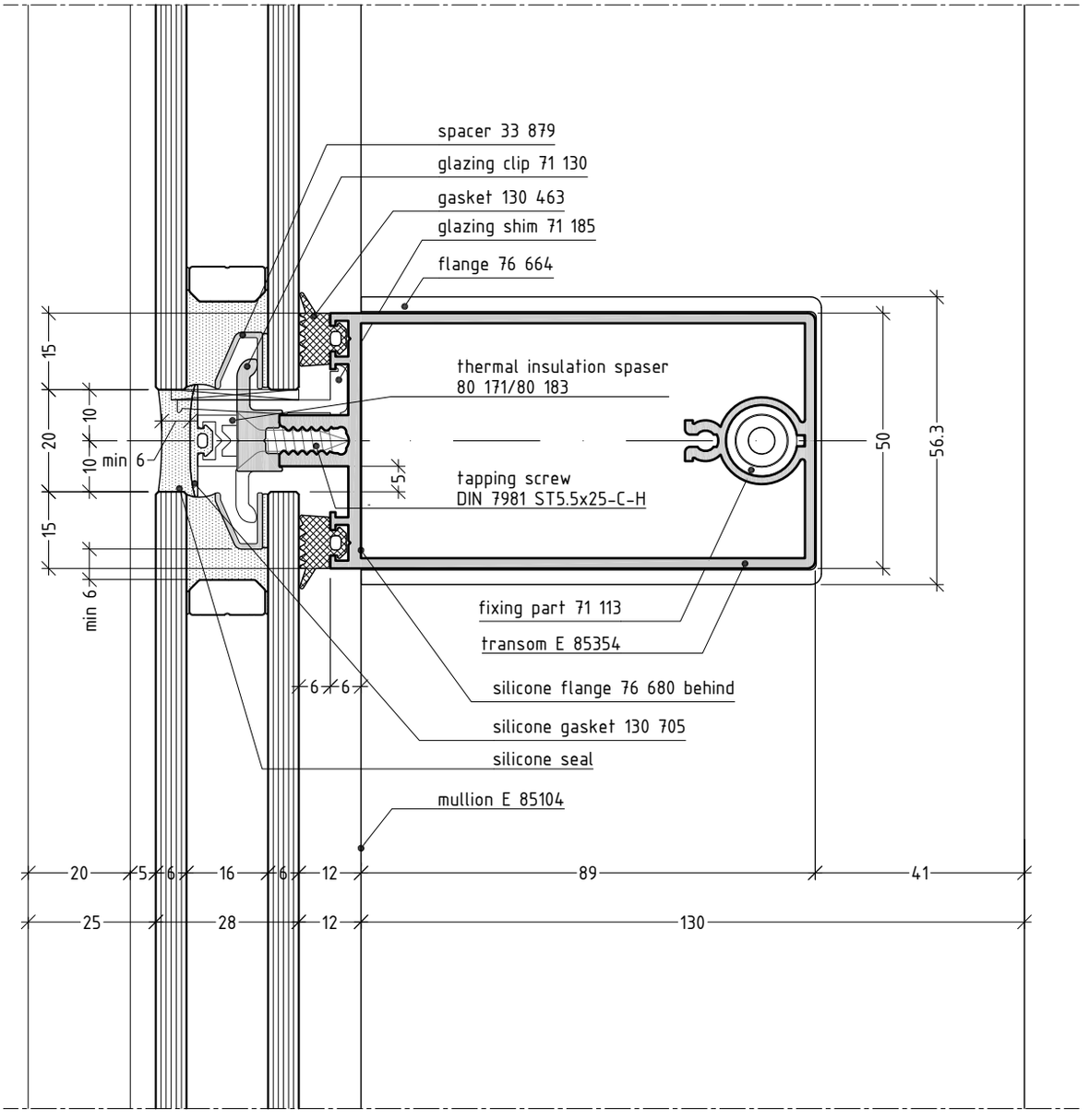


E85K7.1

scale 3/4

combined facade with vertical cap and horizontal silicone joint

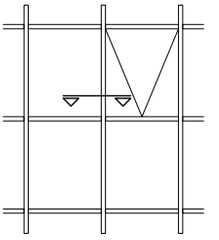


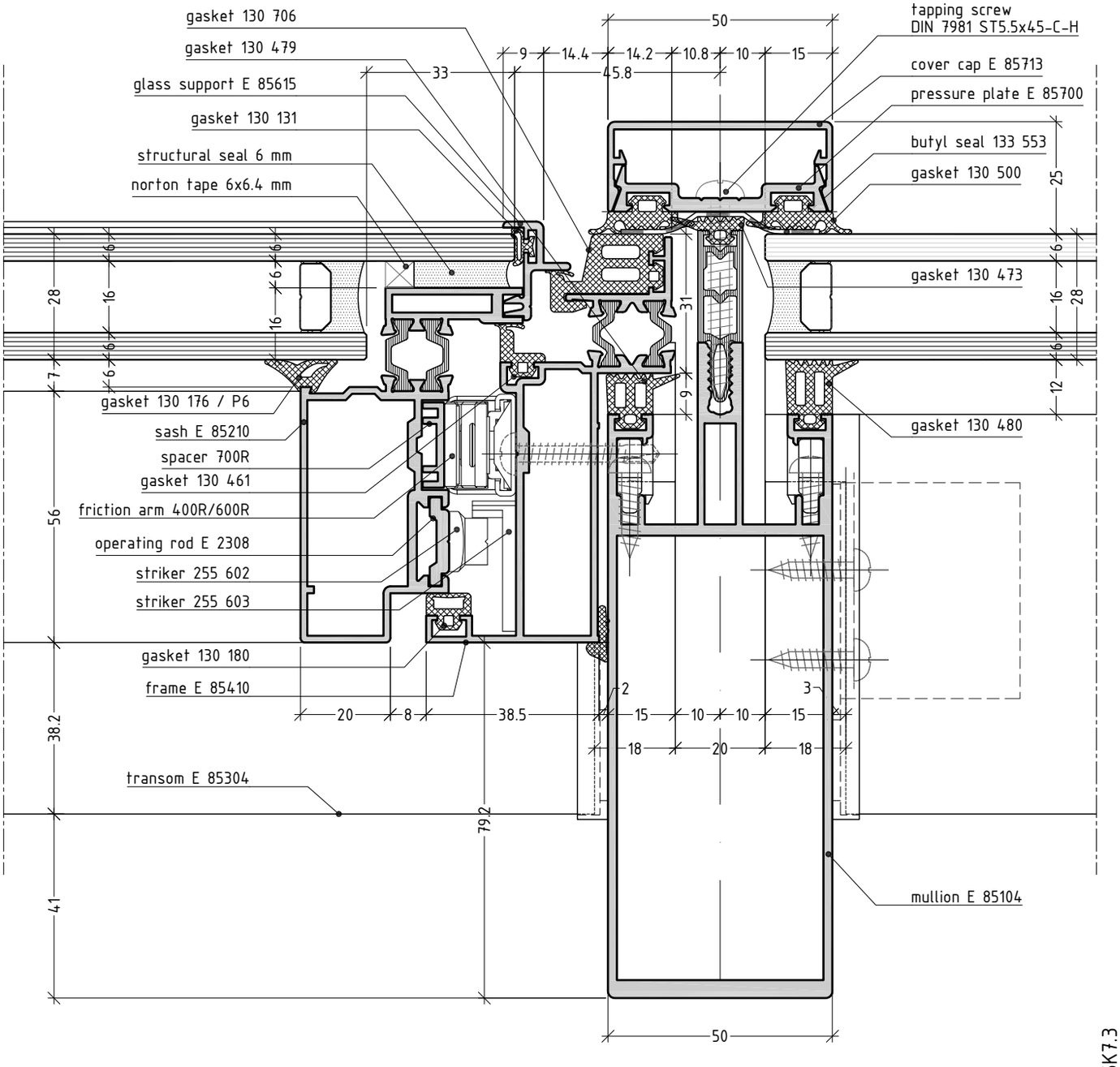


E85K7.2

scale 3/4

combined facade with vertical cap and horizontal silicone joint with projected thermo-break window

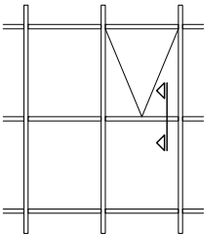


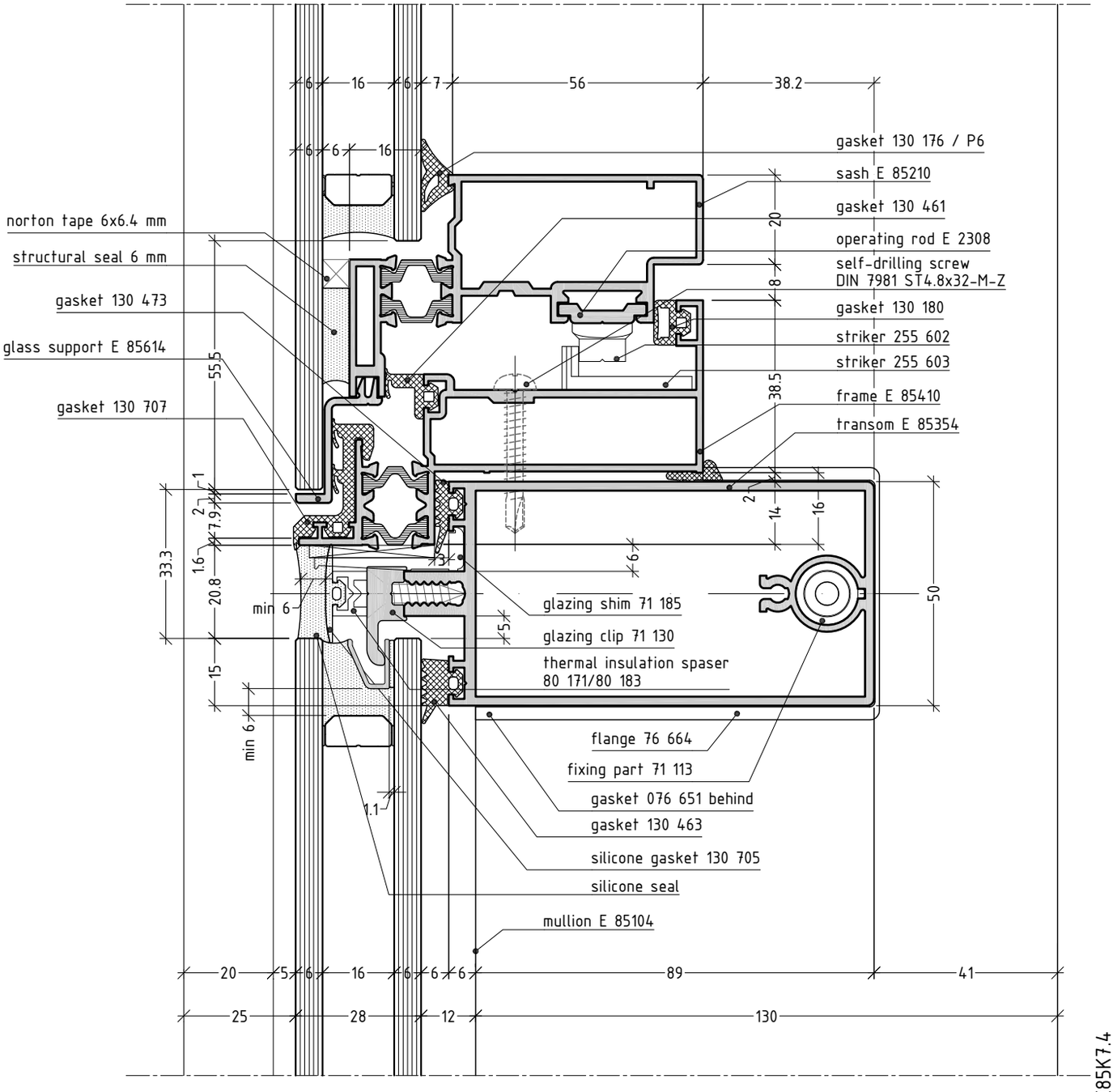


E85K7.3

scale 3/4

combined facade with vertical cap and horizontal silicone joint with 3rd level transom and projected thermo-break window

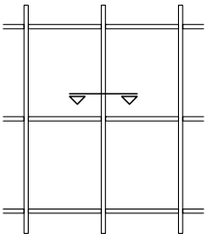


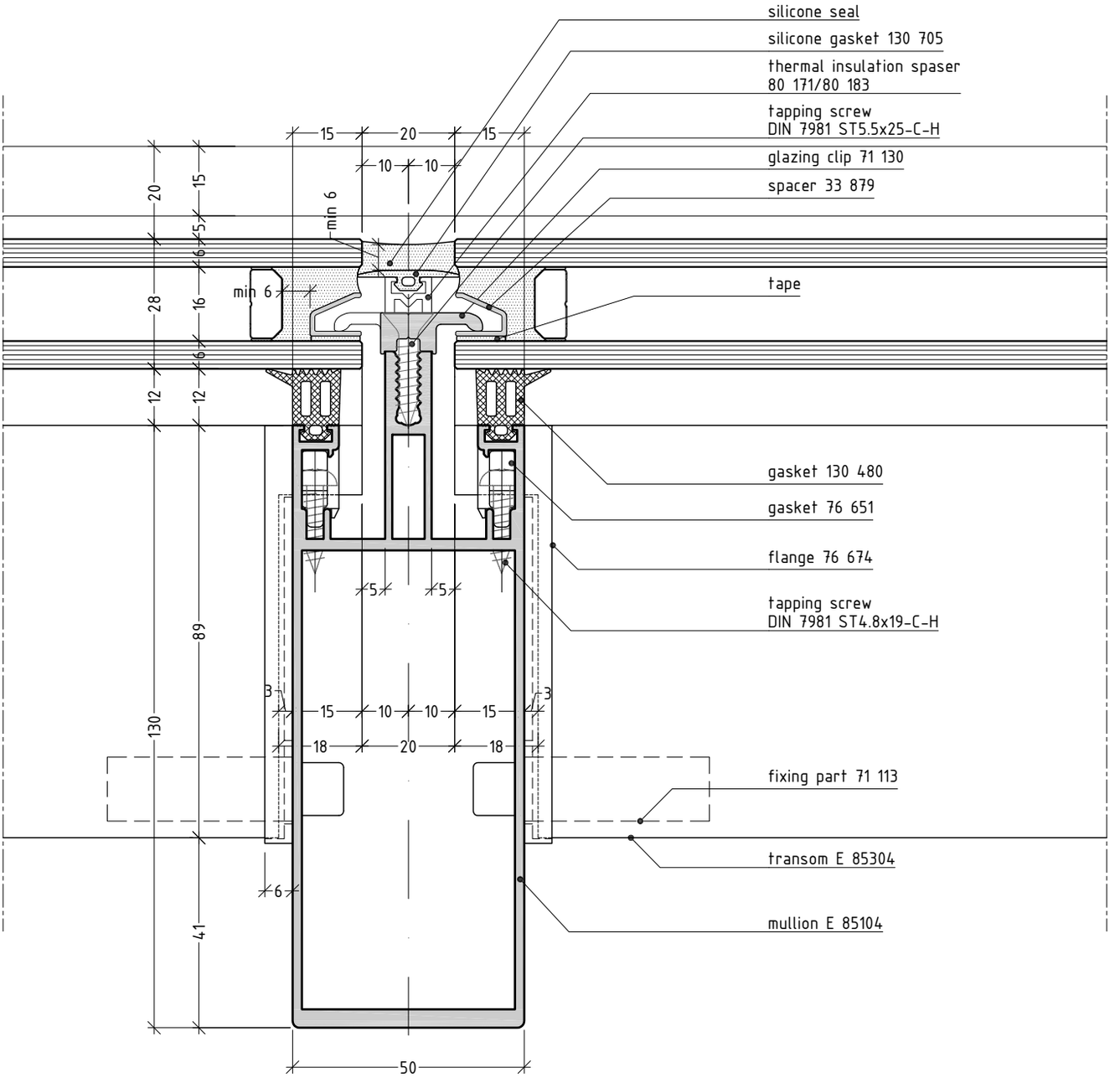


E85K7.4

scale 3/4

combined facade with vertical silicone joint and horizontal cap

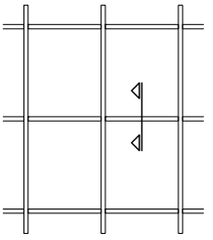


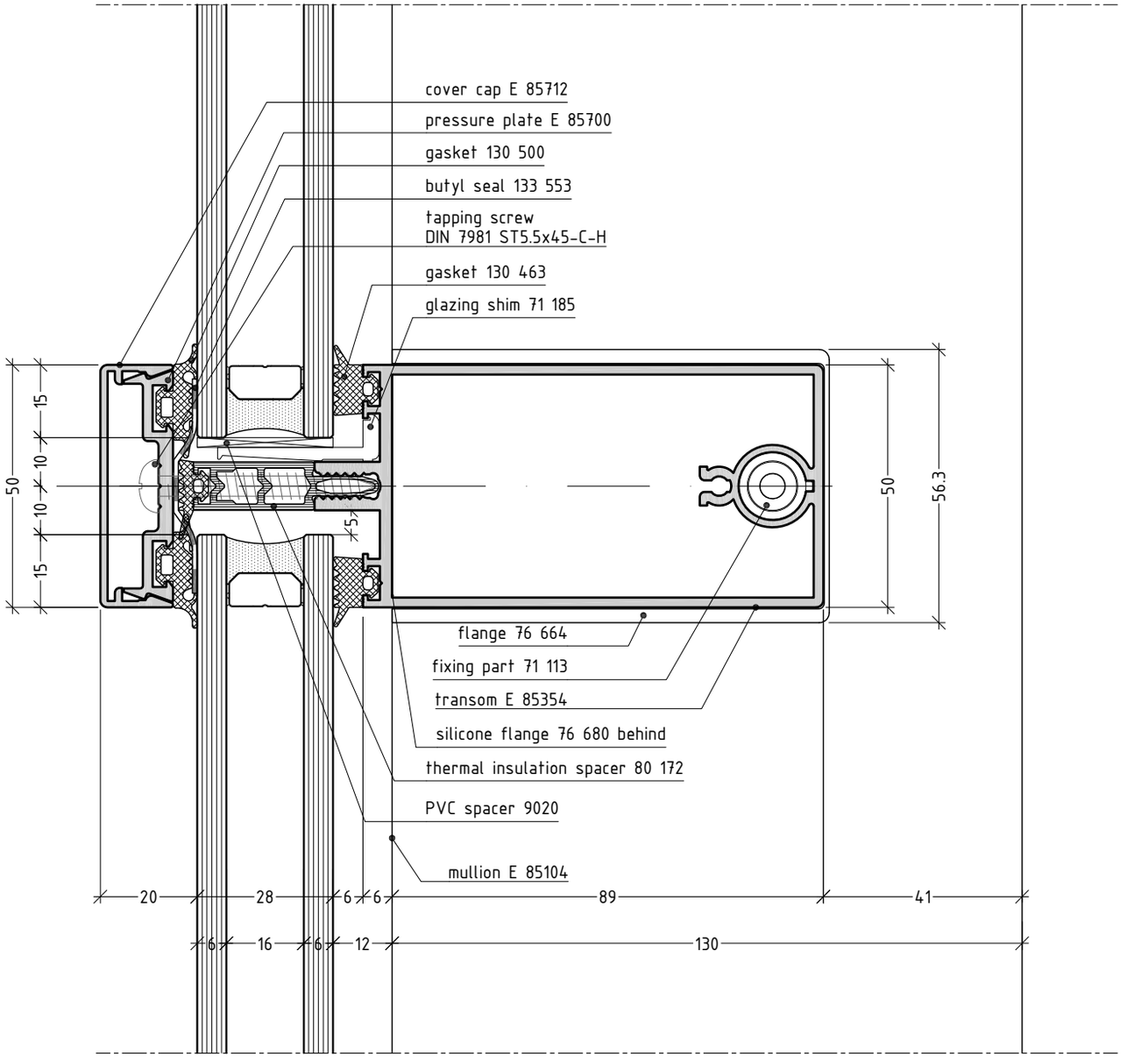


E85K7.5

scale 3/4

combined facade with vertical silicone joint and horizontal cap

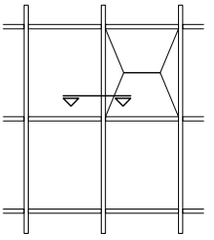


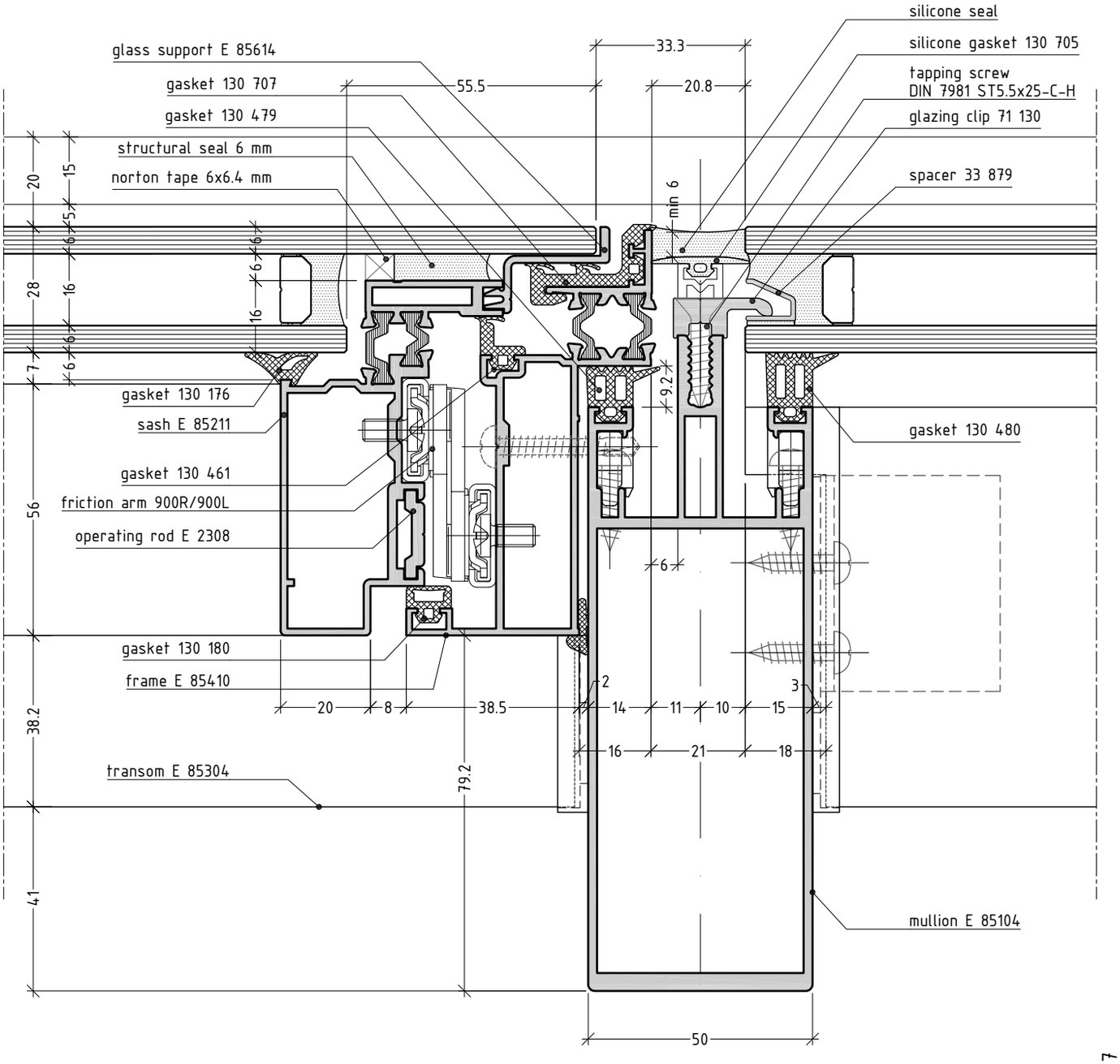


E85K7.6

scale 3/4

combined facade with vertical silicone joint and horizontal cap with parallel opening thermo-break window

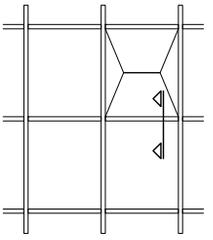


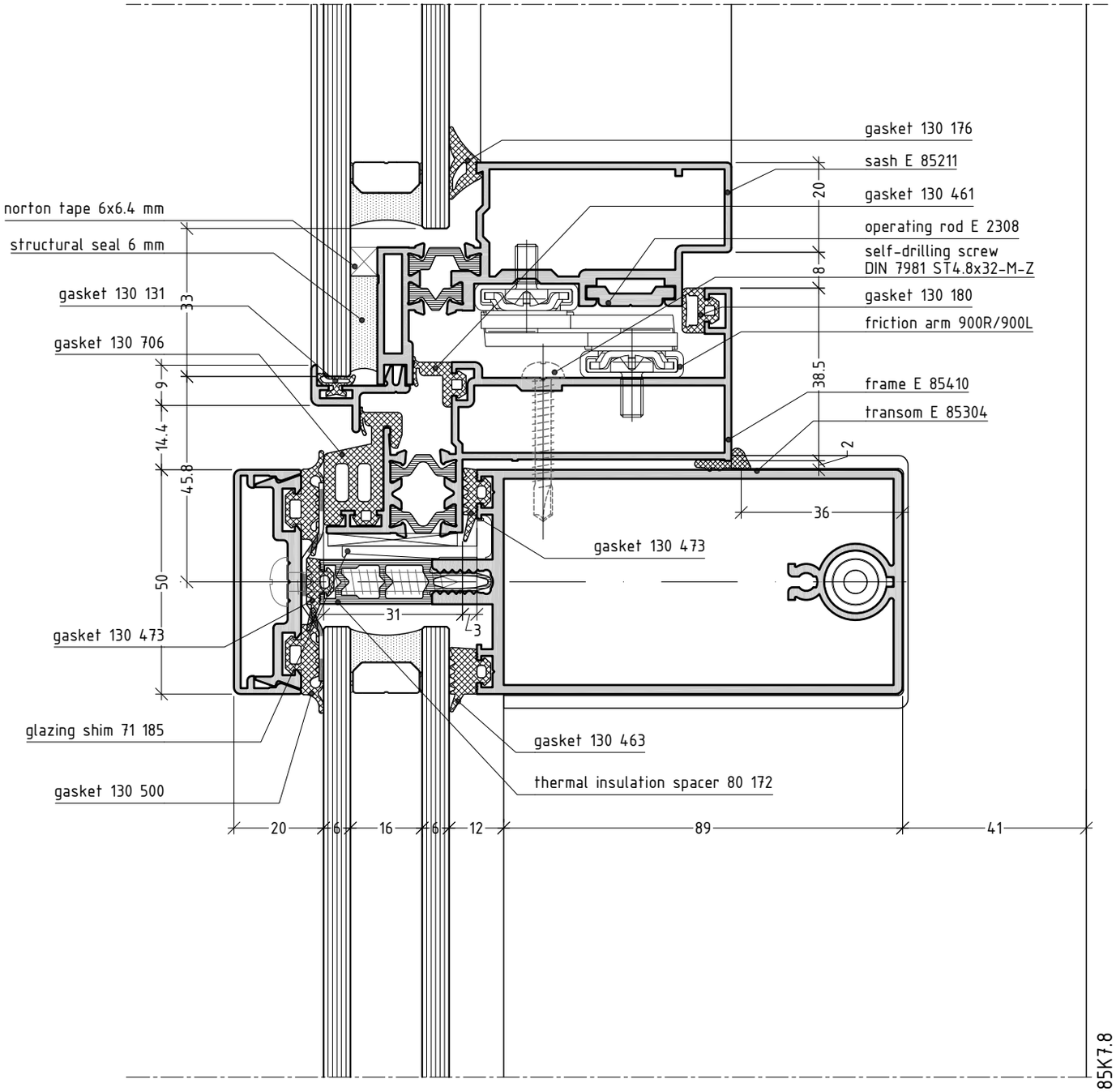


E85K7.7

scale 3/4

combined facade with vertical silicone joint and horizontal cap with 3rd level transom and parallel opening thermo-break window

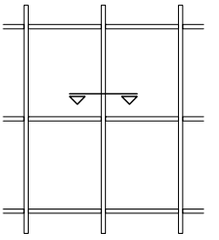


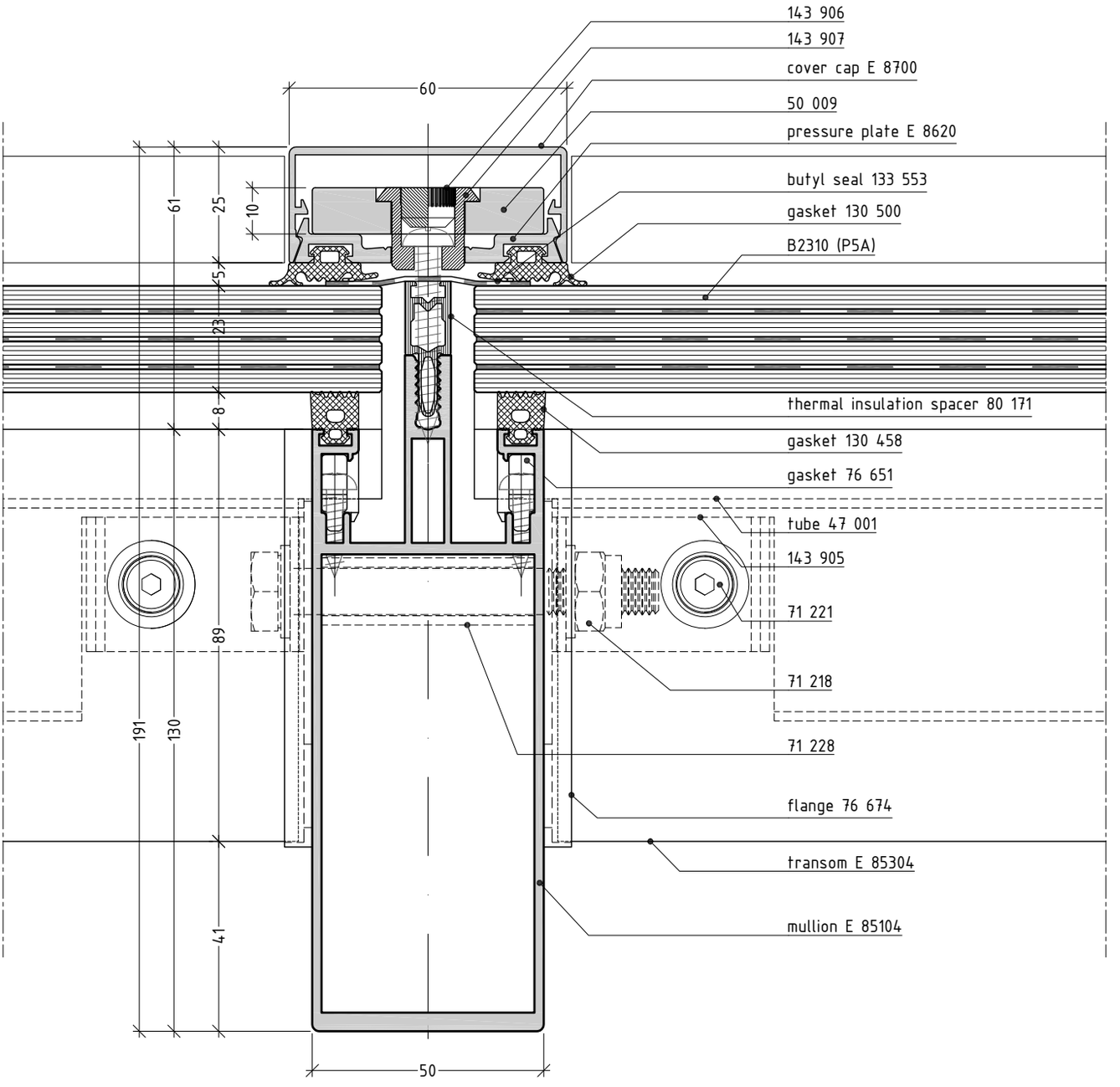


E85K7.8

scale 3/4

anti-burglar system
mullion with 2nd level transom

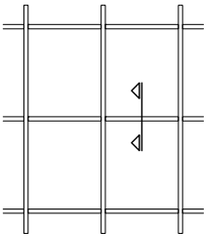


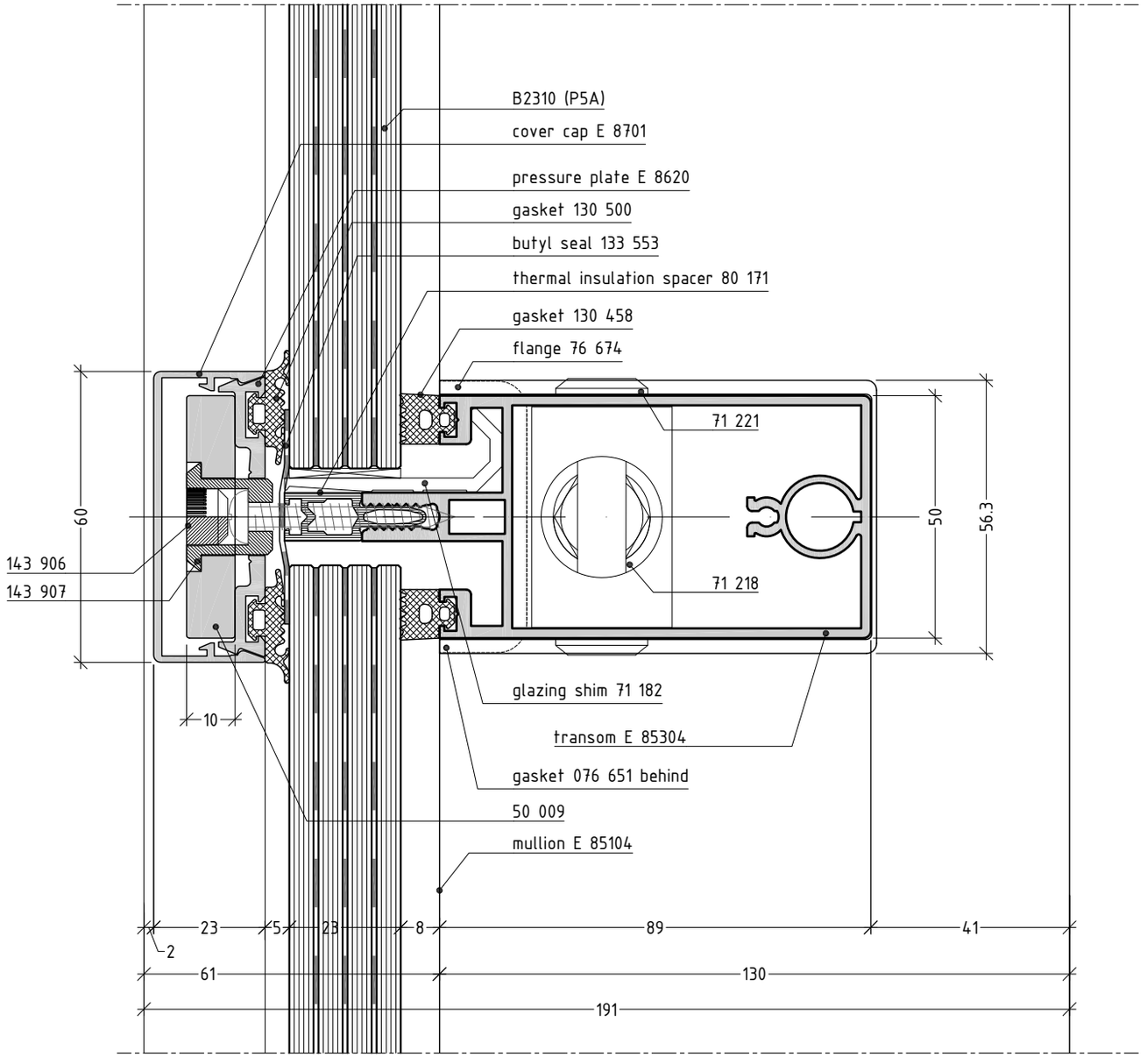


E85K7.9

scale 3/4

anti-burglar system
transom 2nd level drainage





scale 3/4

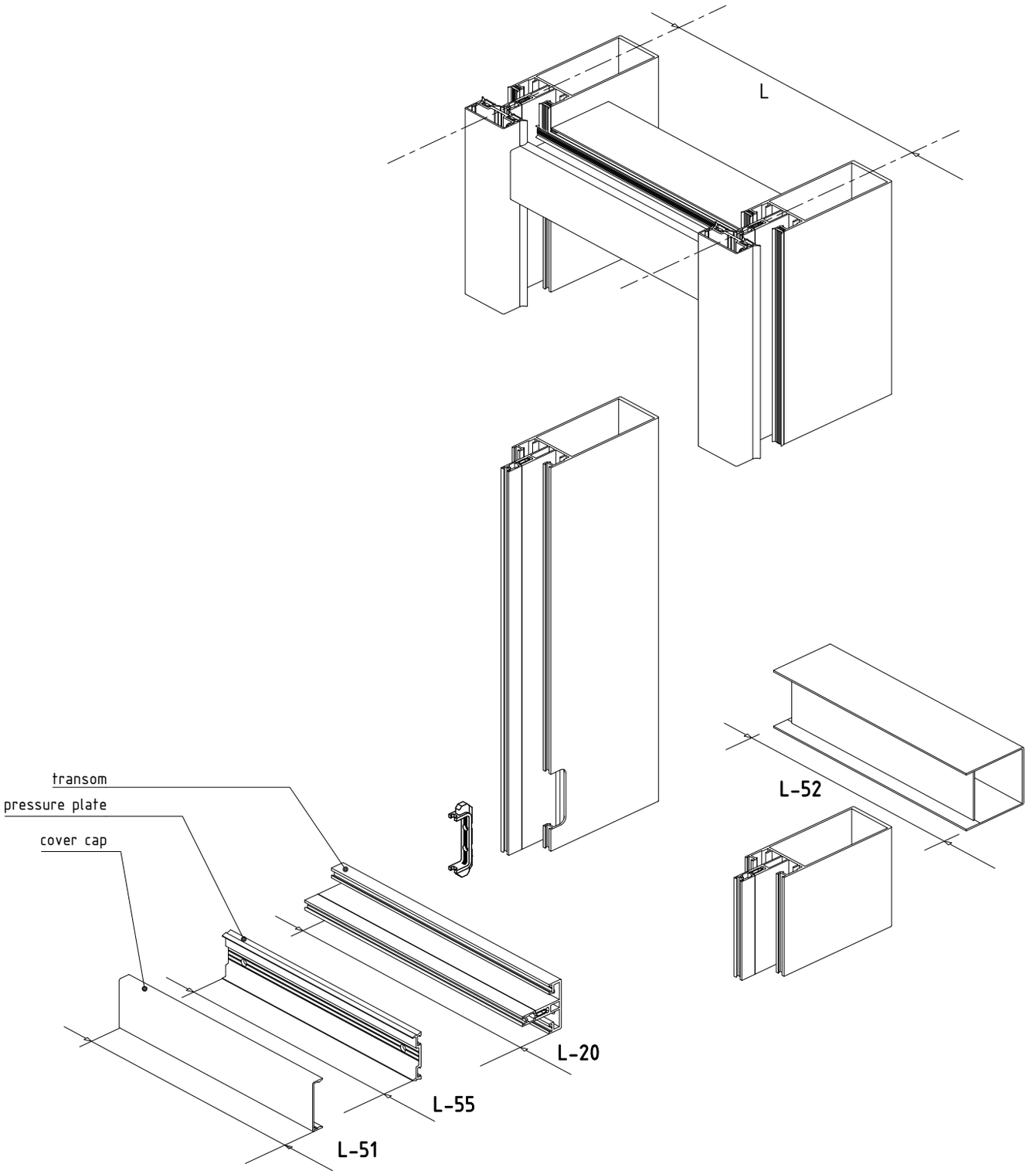
E85K7.10

MACHININGS

MACHINING | PROCESSING

ETEM BUILDING SYSTEMS

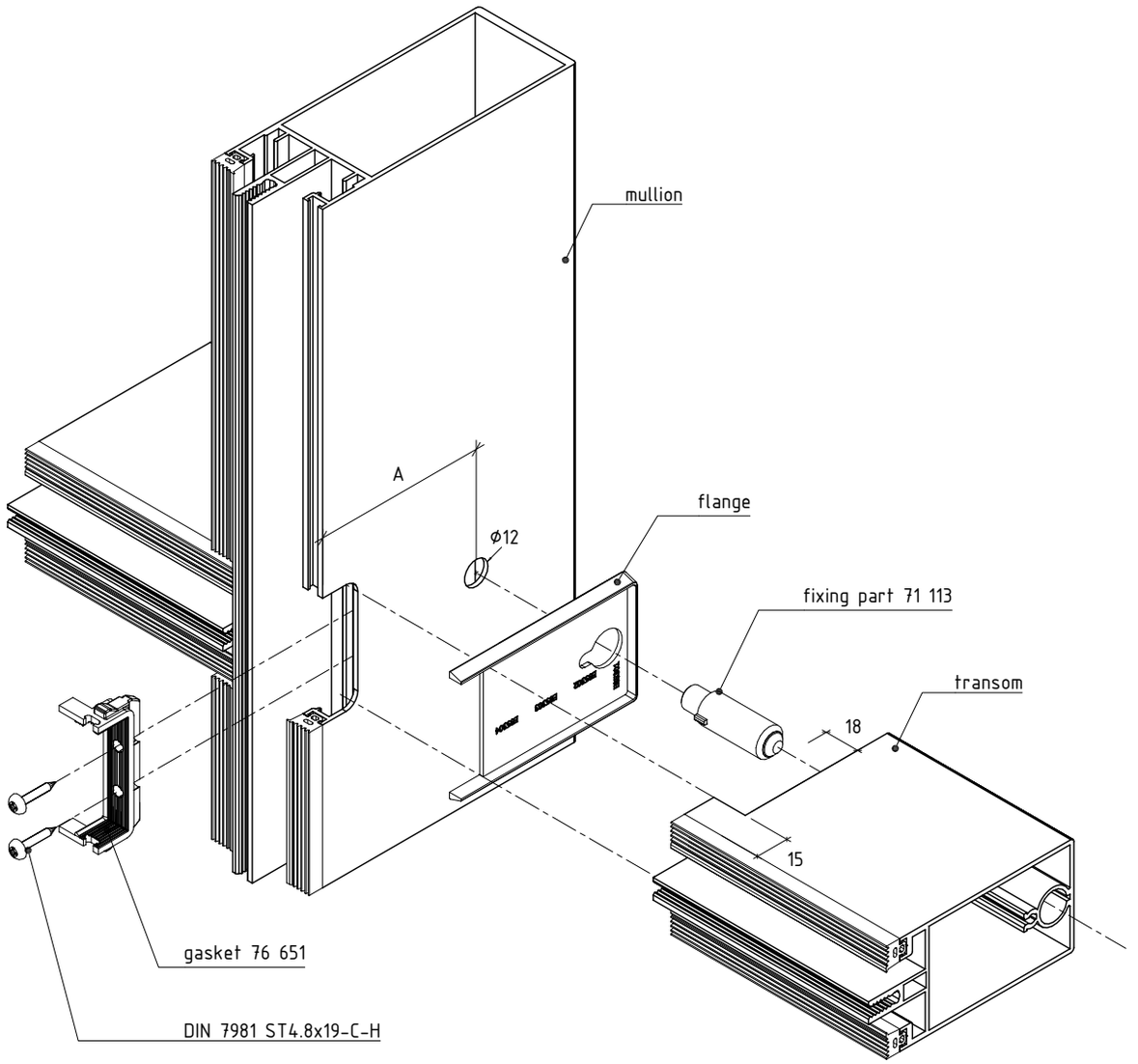
cutting lengths



E85M8.1

not to scale

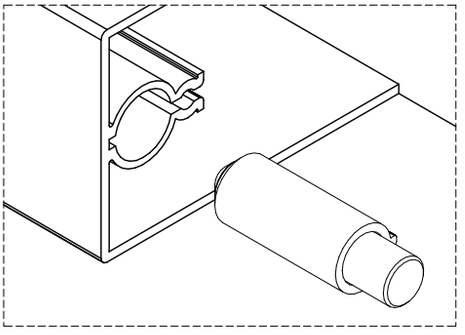
machinings of transom 2nd level drainage with spring t-joint and flange



transom	flange	A mm
E 85301	76 671	--
E 85302	76 672	--
E 85303	76 673	--
E 85304	76 674	78,5
E 85305	76 675	98,5
E 85306	76 676	118,5
E 85307	76 677	148,5

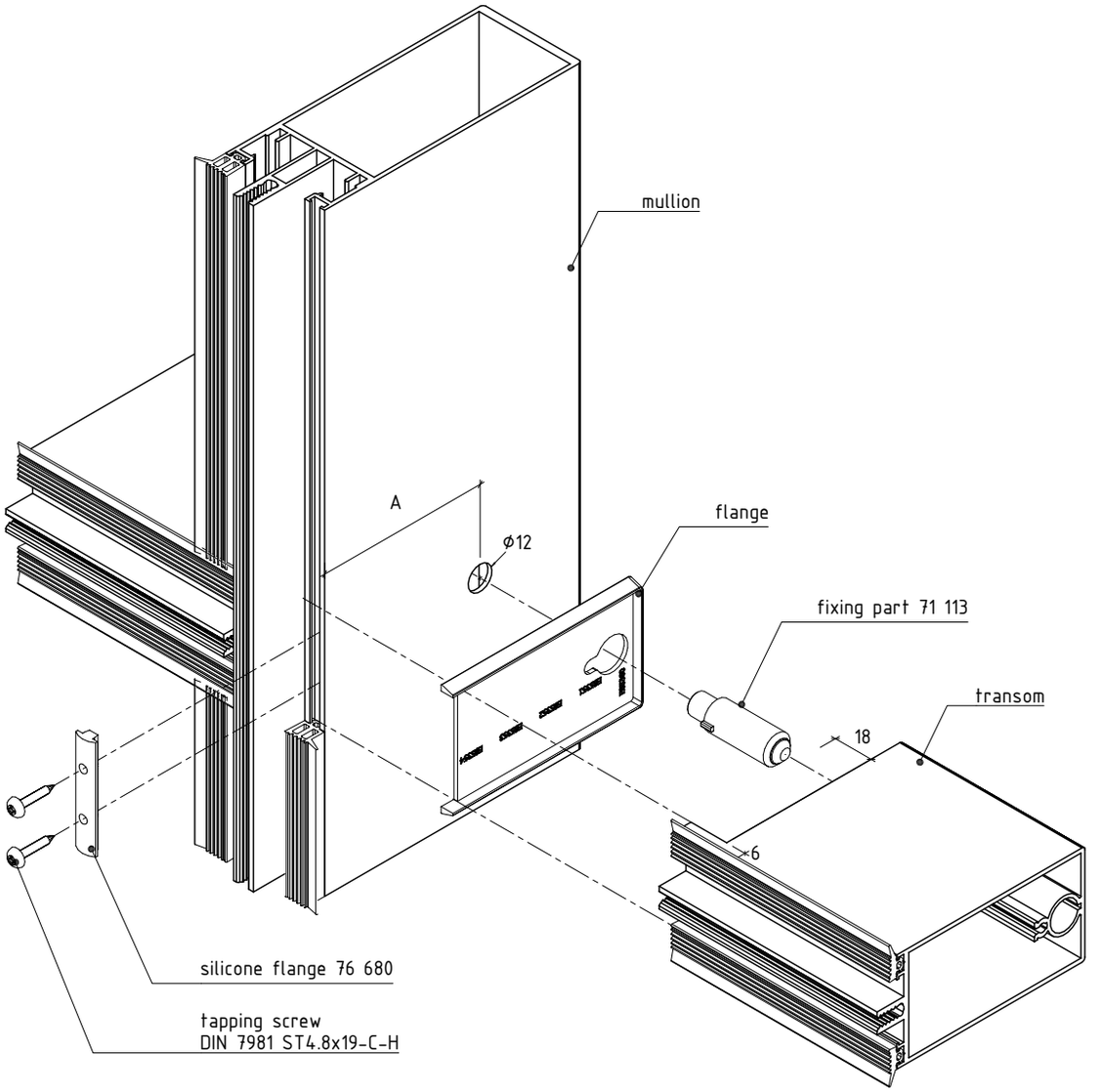
not to scale

additional machining of transom for the spring t-joint



E85M8.2

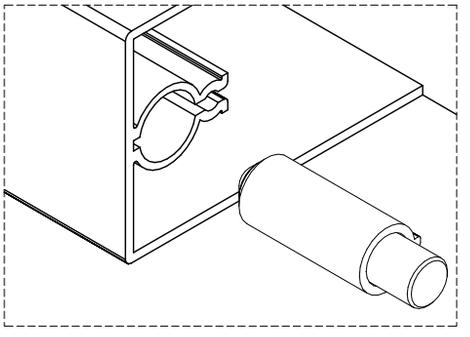
machinings of transom 3rd level drainage with spring t-joint and flange



transom	flange	A mm
E 85360	76 660	--
E 85351	76 661	--
E 85352	76 662	--
E 85353	76 663	58,5
E 85354	76 664	78,5
E 85355	76 665	98,5
E 85356	76 666	118,5
E 85357	76 667	148,5
E 85358	76 668	168,5
E 85359	76 669	188,5

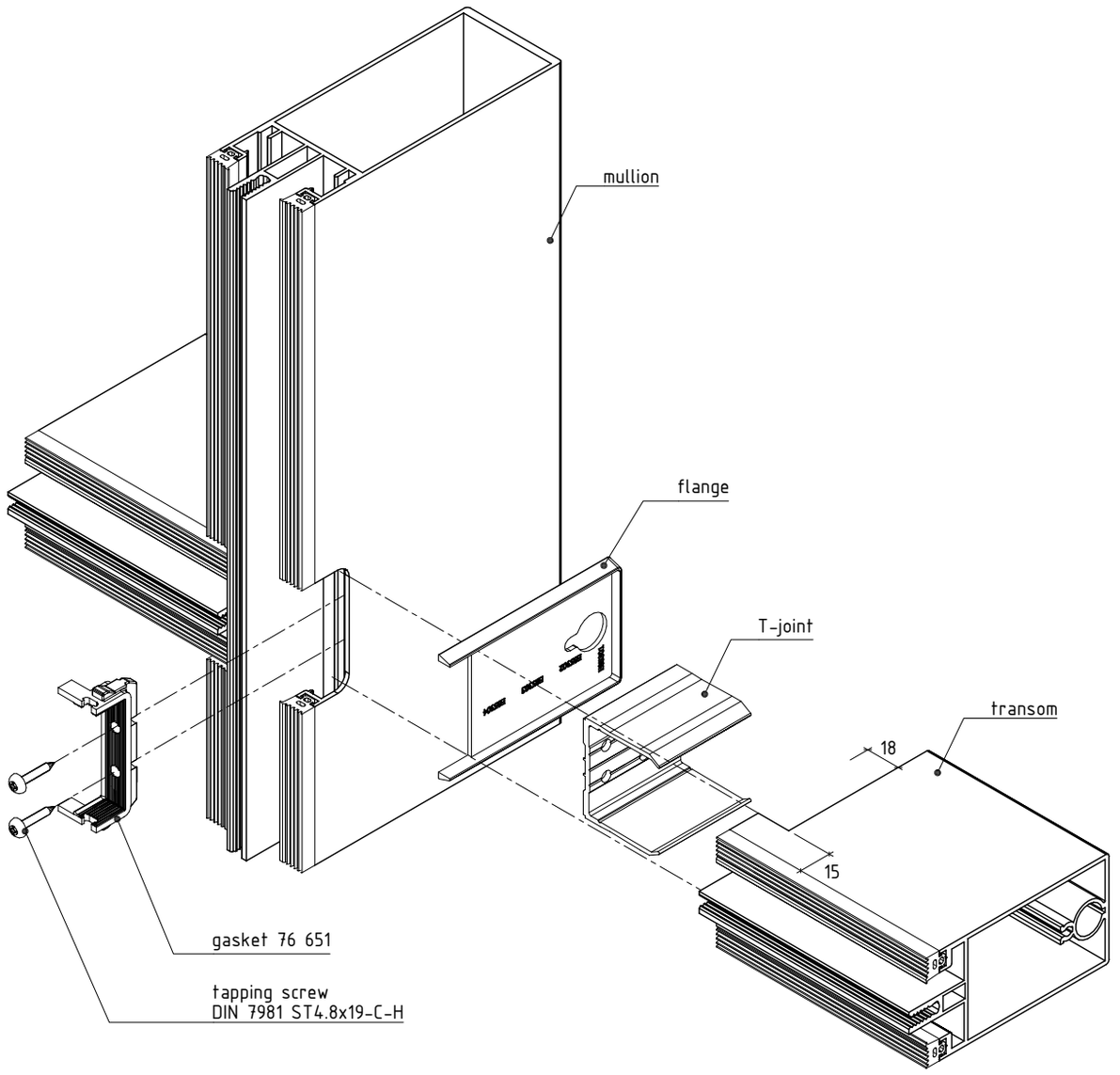
not to scale

additional machining of transom for the spring t-joint



E85M8.3

machinings of transom 2nd level drainage with T-joint and flange

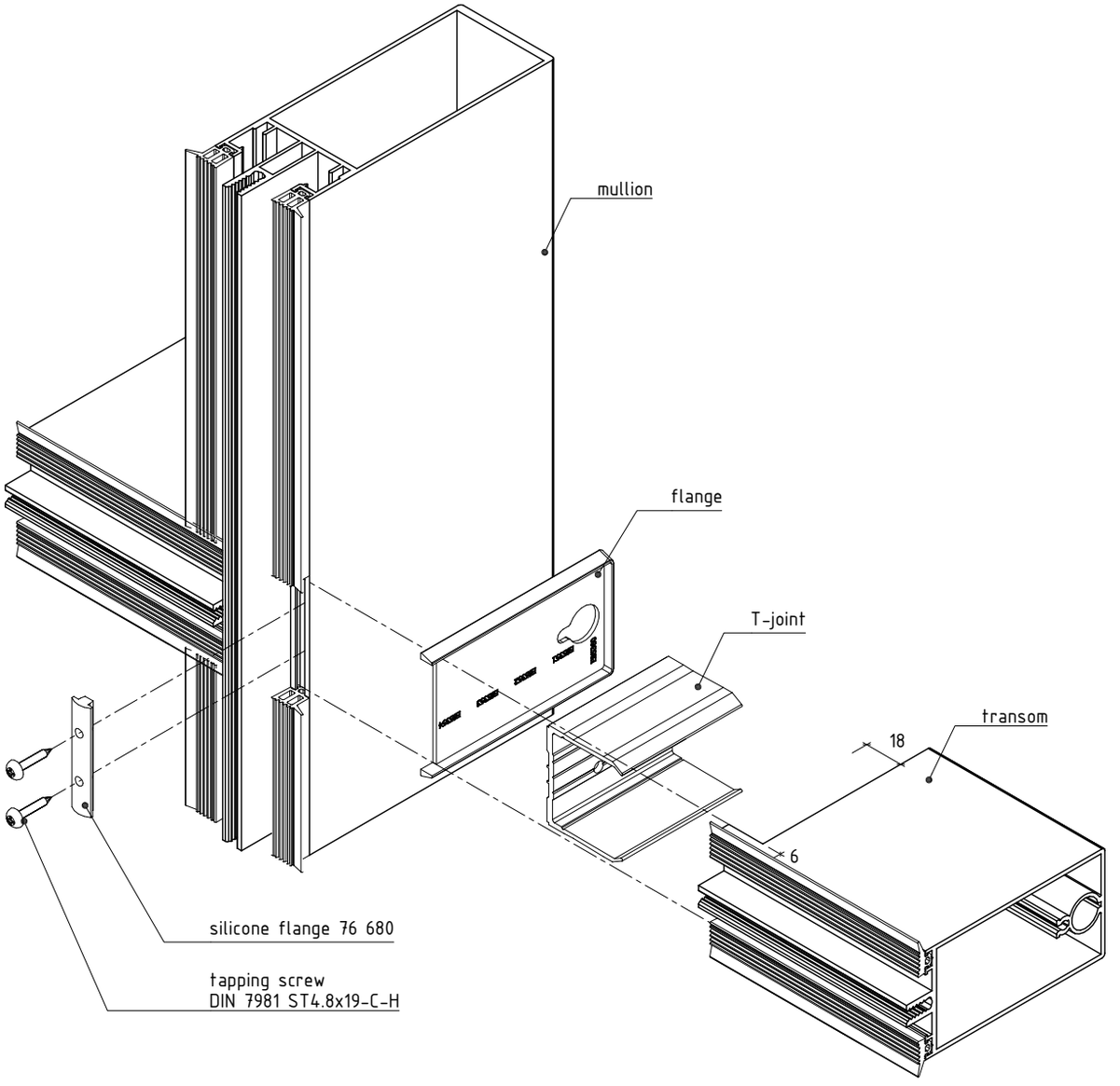


transom	flange	T-joint
E 85302	76 672	71 122
E 85303	76 673	71 123
E 85304	76 674	71 124
E 85305	76 675	71 125
E 85306	76 676	71 126
E 85307	76 677	71 127

not to scale

E85M8.4

machinings of transom 2nd level drainage with T-joint and flange

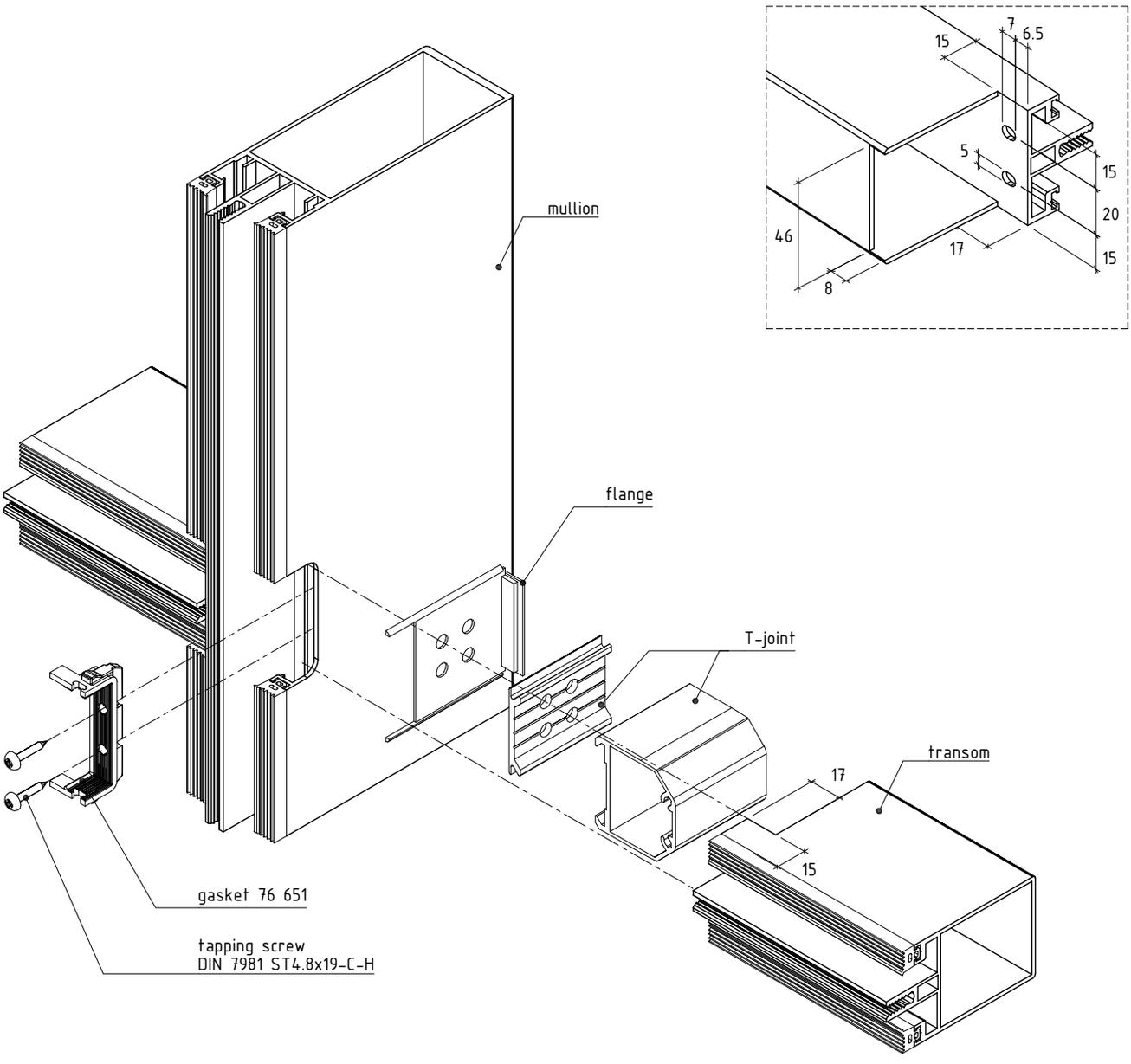


transom	flange	T-joint
E 85351	76 661	71 131
E 85352	76 662	71 132
E 85353	76 663	71 133
E 85354	76 664	71 134
E 85355	76 665	71 135
E 85356	76 666	71 136
E 85357	76 667	71 137
E 85358	76 668	71 138
E 85359	76 669	71 139
E 85369	76 670	71 144

not to scale

E85M8.5

machinings of transom 2nd level drainage with transom connectors

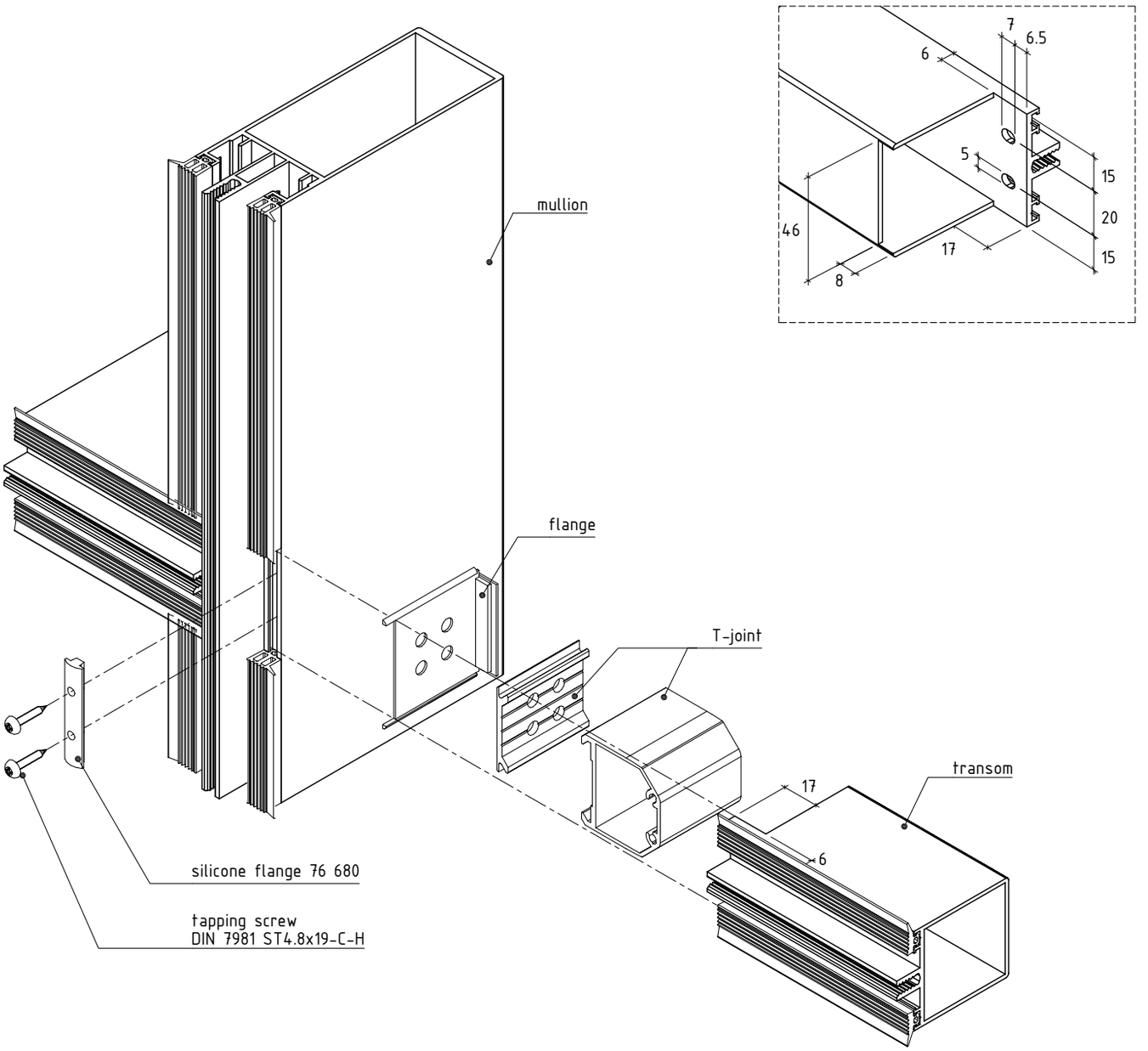


transom	flange	T-joint
E 85302	76 622	71 152
E 85303	76 623	71 153

not to scale

E85M8.6

machinings of transom 3rd level drainage with transom connectors

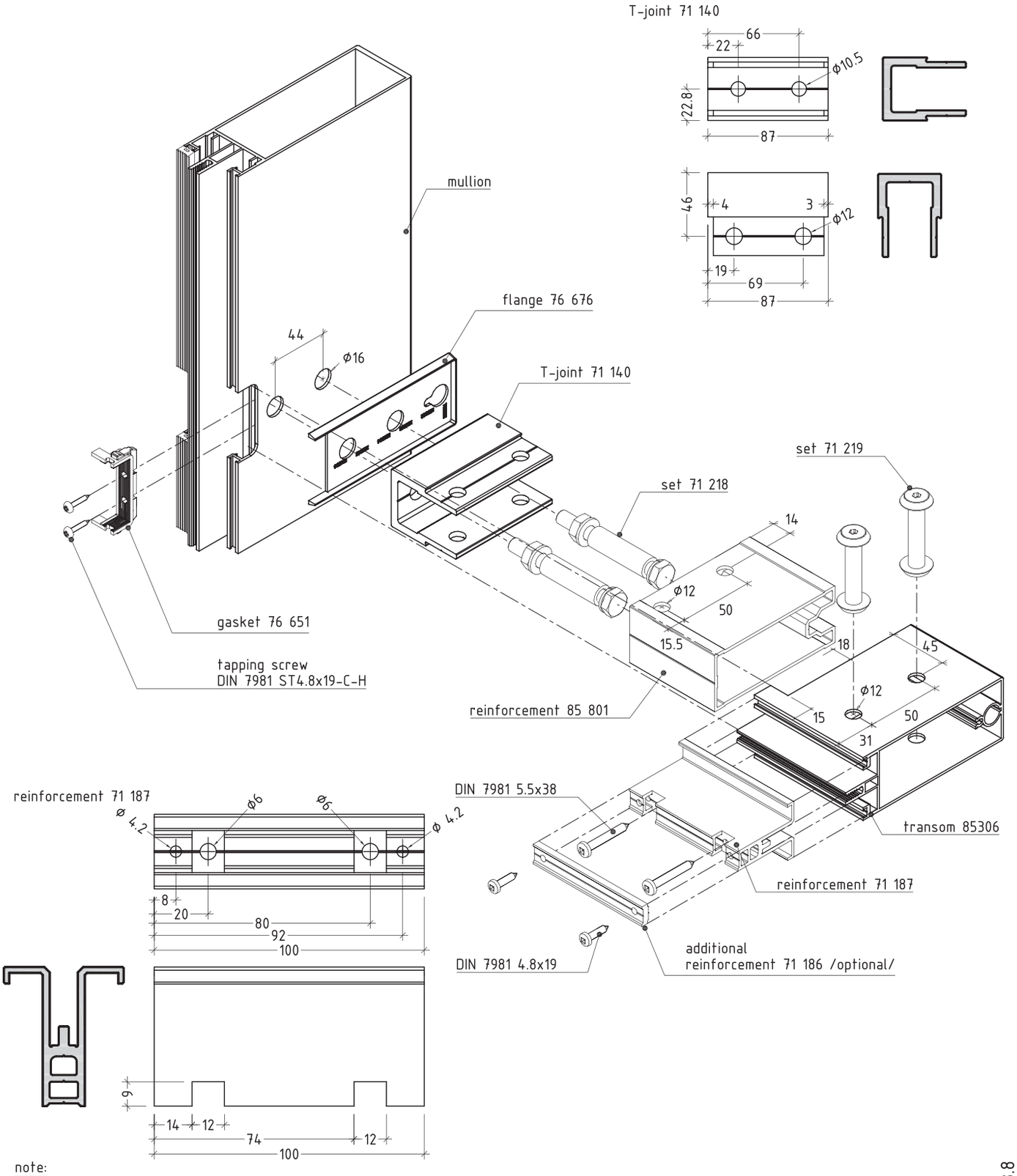


transom	flange	T-joint
E 85351	76 624	71 141
E 85352	76 625	71 142

not to scale

E85M8.7

machinings of transom 2nd level drainage with reinforcement

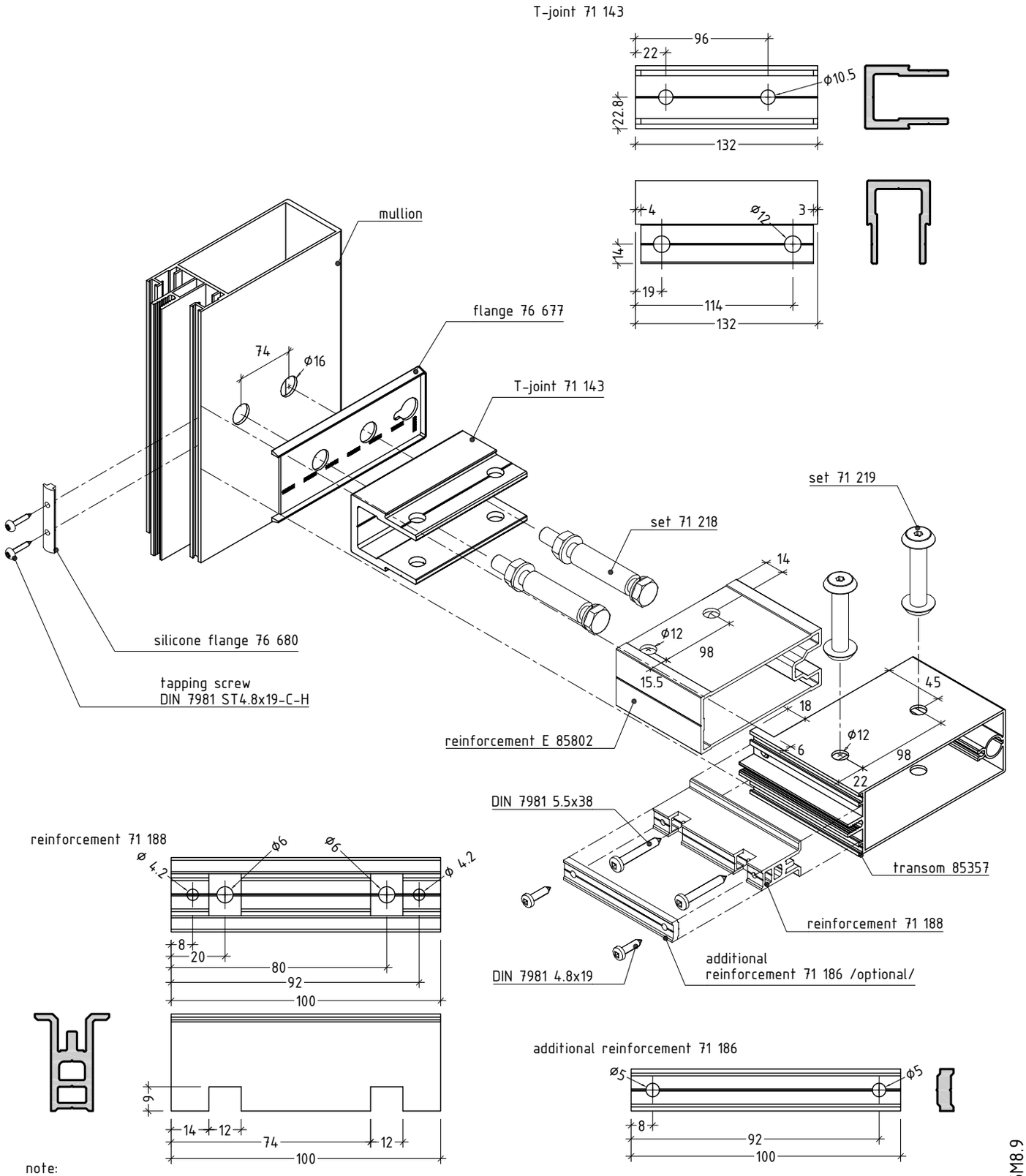


note:
In case of 2nd level transom, glazing shim reinforcement should be placed before connecting transom and mullion.
Additional reinforcement 71 186 has to be used in case of thicker glazings.

not to scale

E85M8.8

machinings of transom 3rd level drainage with reinforcement

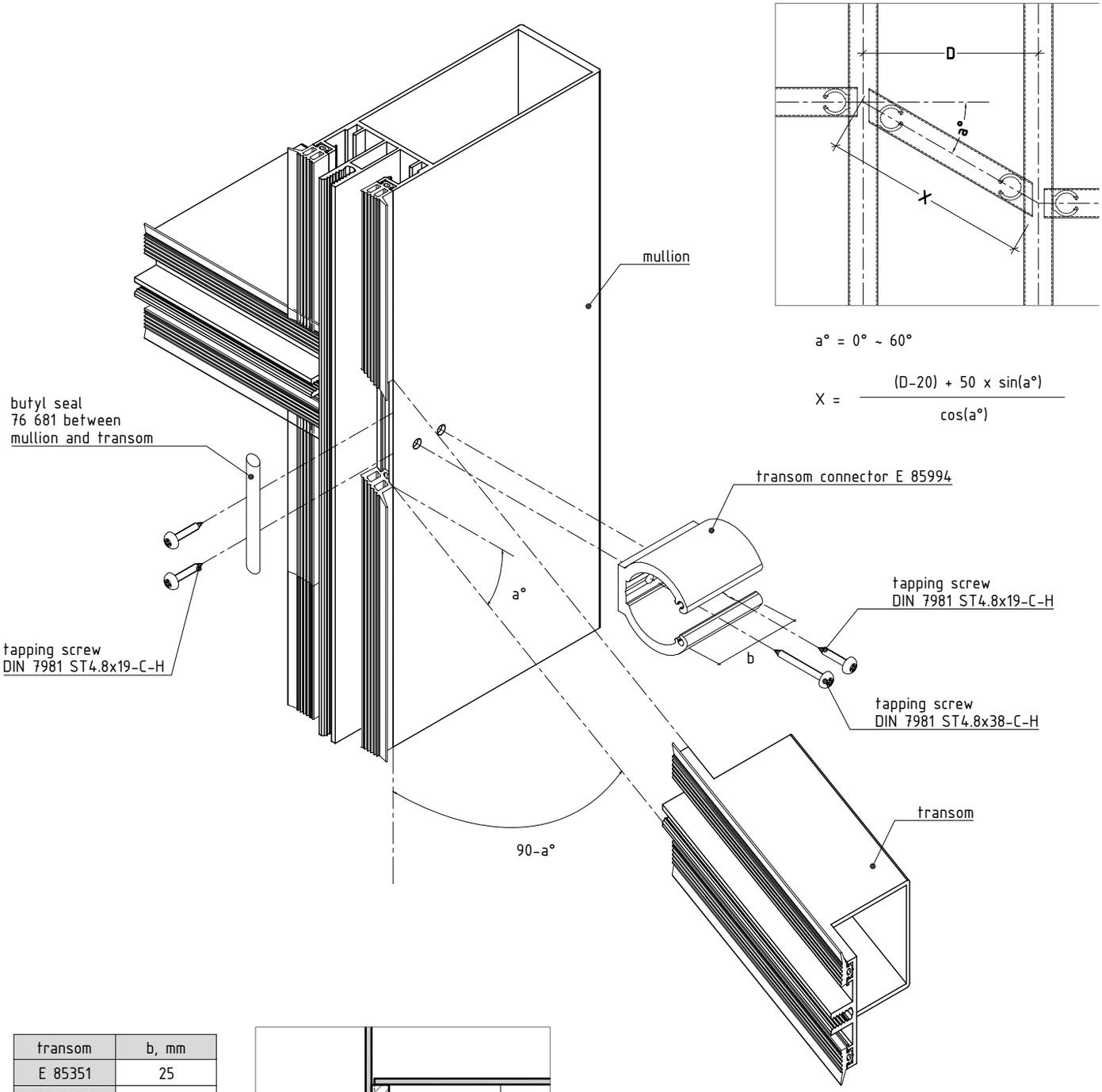


note:
Additional reinforcement 71 186 has to be used in case of thicker glazings.

not to scale

E85M8.9

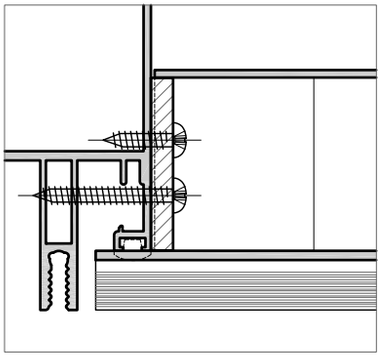
fixing of 3rd level transom using transom connector E 85994 at angle ≥ 90°



a° = 0° ~ 60°

$$X = \frac{(D-20) + 50 \times \sin(a°)}{\cos(a°)}$$

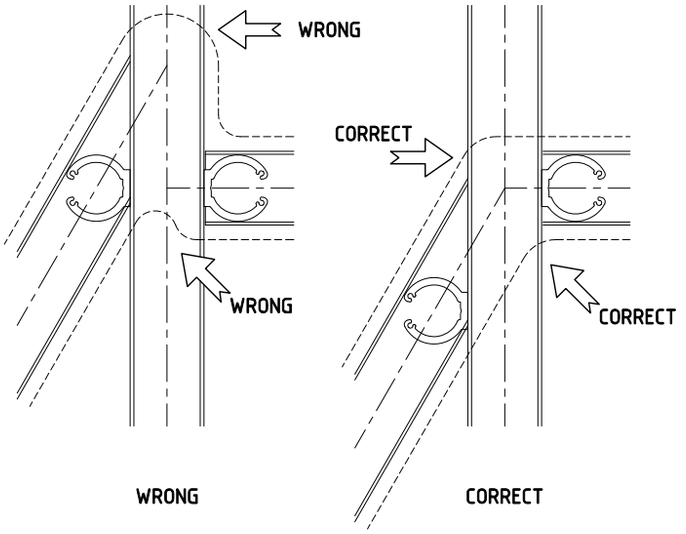
transom	b, mm
E 85351	25
E 85352	45
E 85353	43
E 85354	63
E 85355	83
E 85356	103
E 85357	133
E 85358	153
E 85359	173
E 85369	224

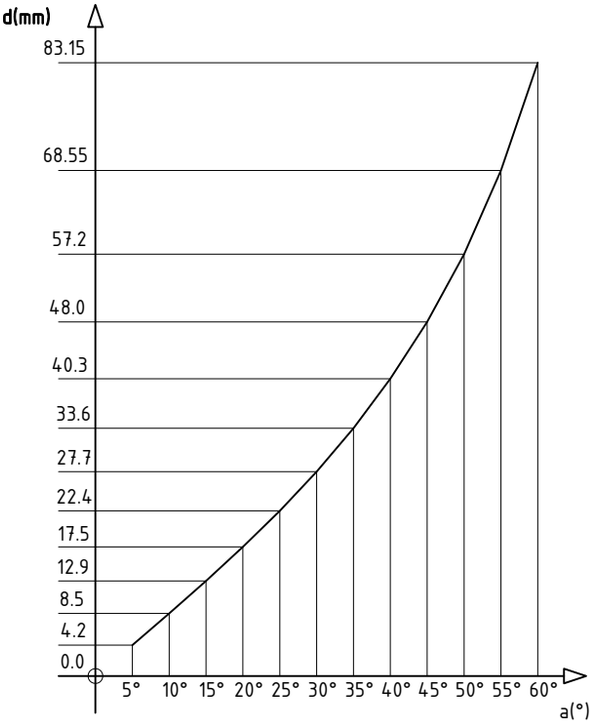


not to scale

E85M8.10

transom connector E 85994

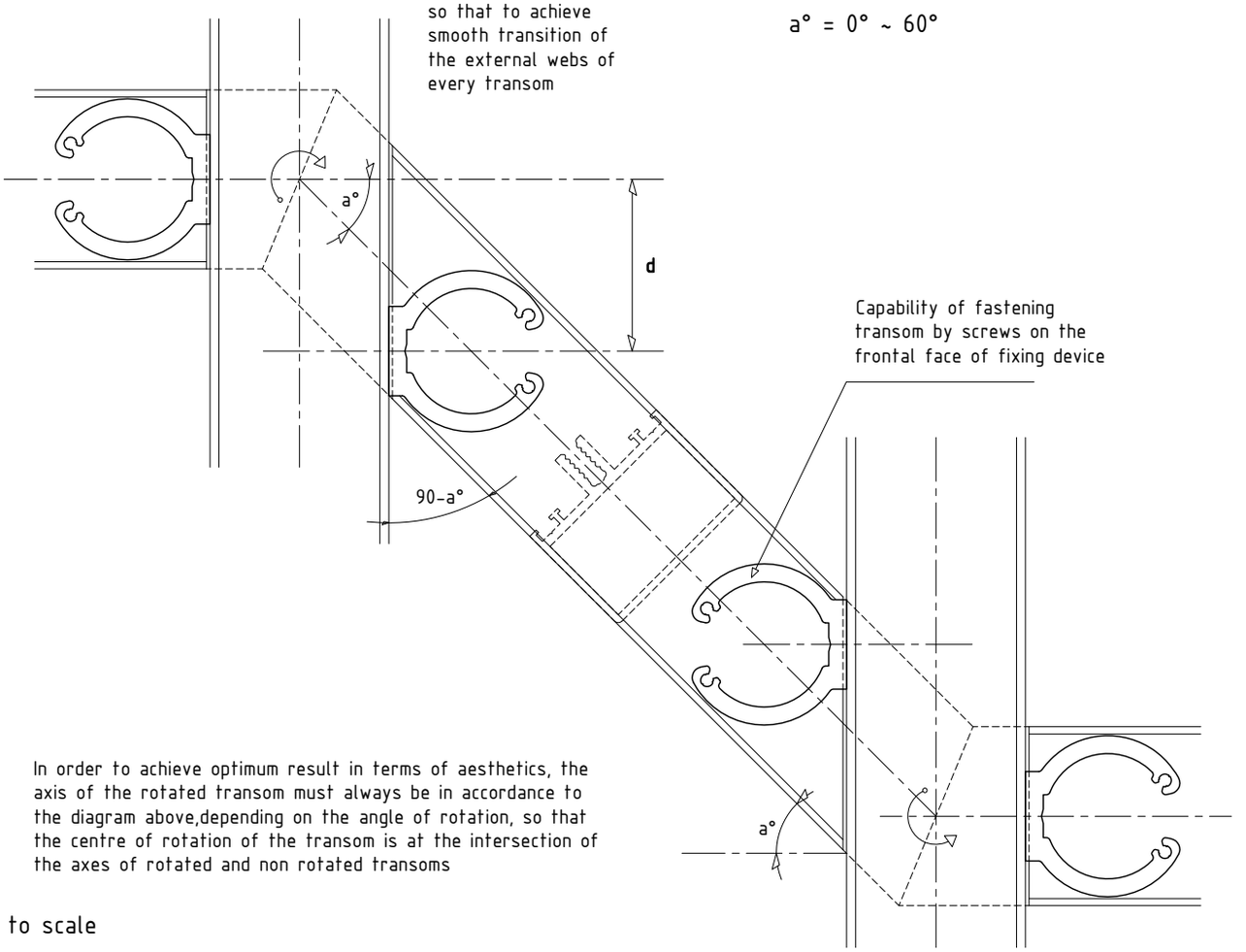




a° = 0° ~ 60°

Fixing devices have to be placed coaxially even though transoms are not parallel.

Distance between fixing devices must be evaluated according to the following diagram, so that to achieve smooth transition of the external webs of every transom



In order to achieve optimum result in terms of aesthetics, the axis of the rotated transom must always be in accordance to the diagram above,depending on the angle of rotation, so that the centre of rotation of the transom is at the intersection of the axes of rotated and non rotated transoms

not to scale

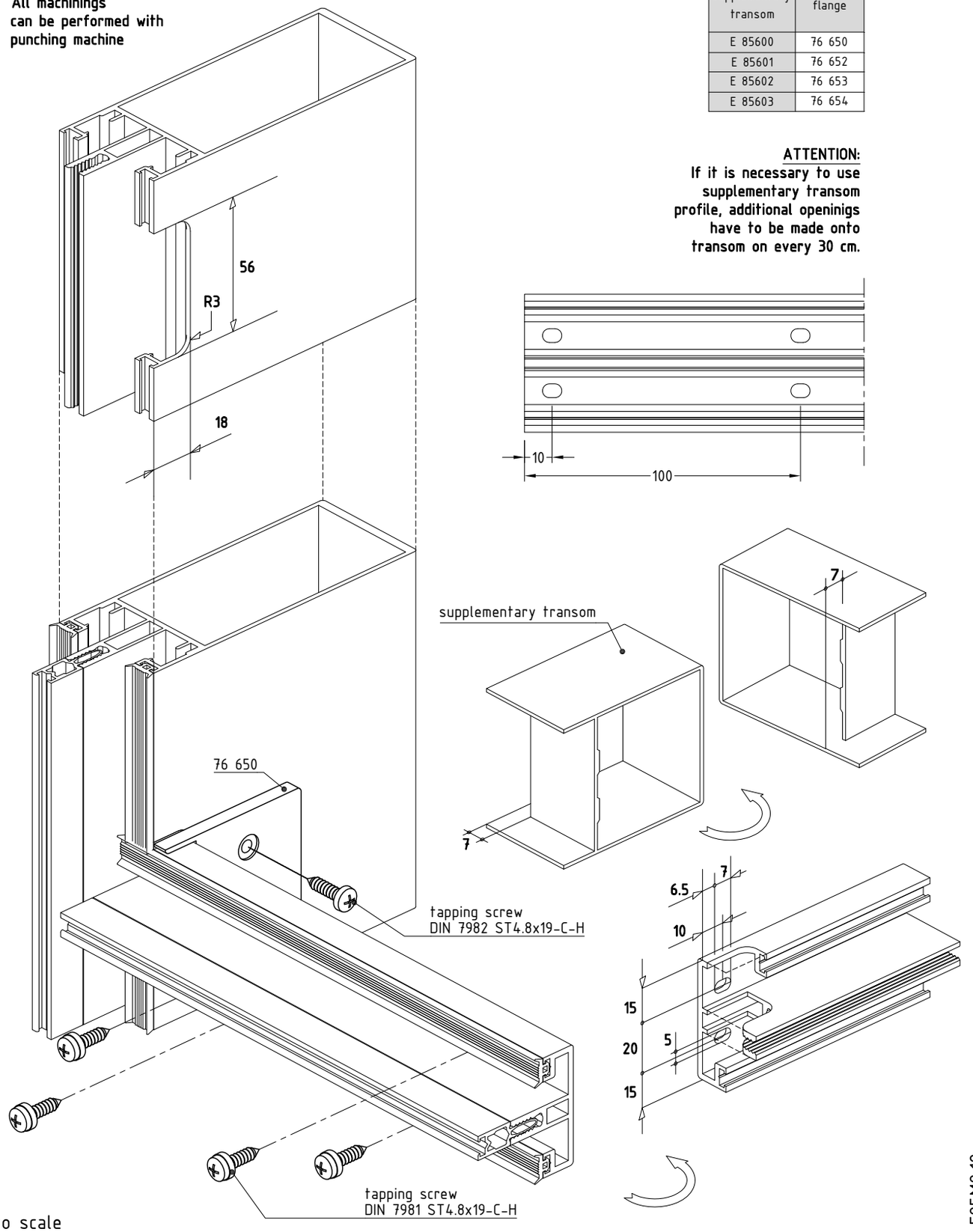
E85M8.11

connection between transom E 85300 and supplementary transom to mullion

All machinings
can be performed with
punching machine

supplementary transom	flange
E 85600	76 650
E 85601	76 652
E 85602	76 653
E 85603	76 654

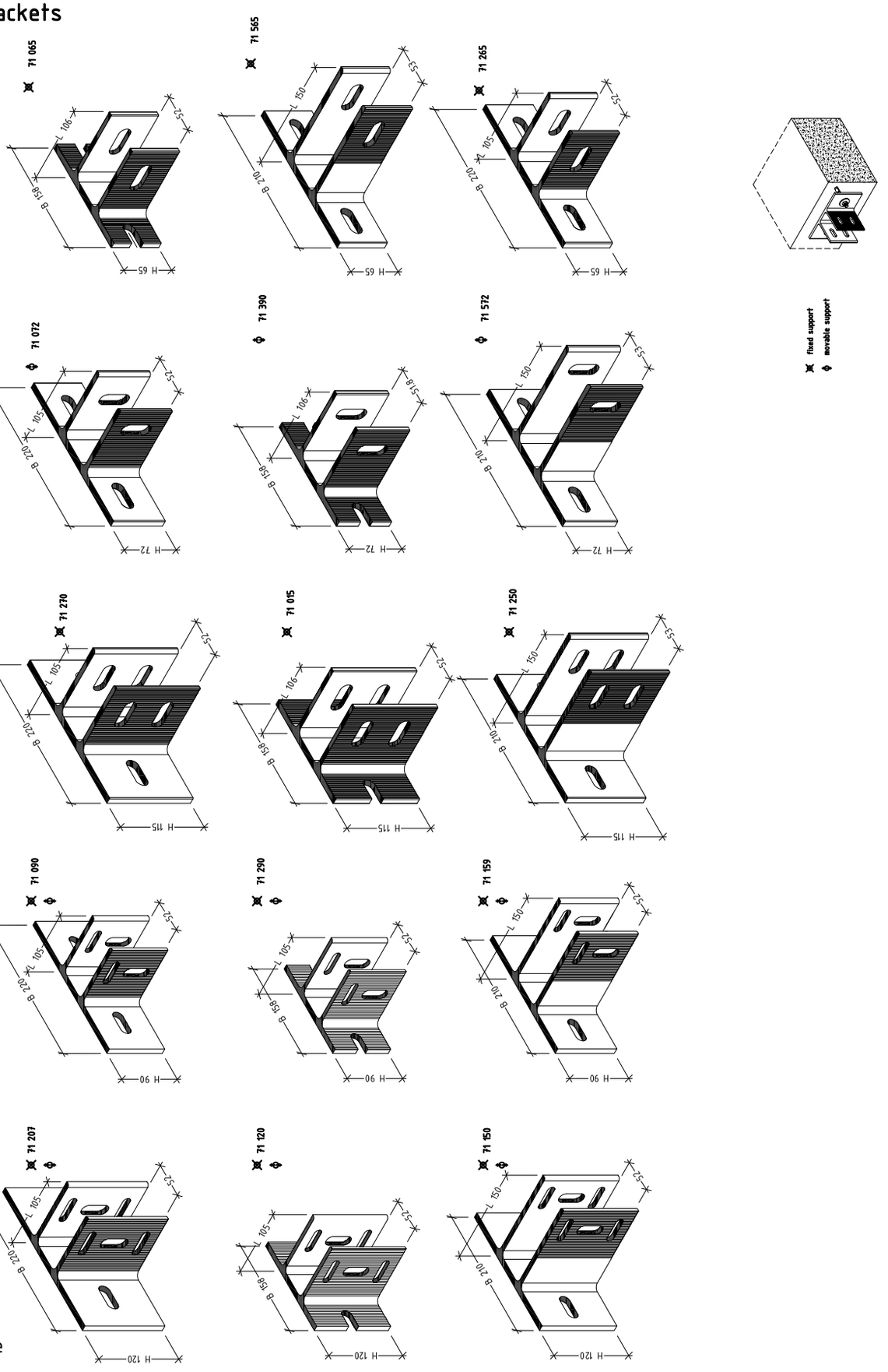
ATTENTION:
If it is necessary to use supplementary transom profile, additional openinigs have to be made onto transom on every 30 cm.



not to scale

E85M8.12

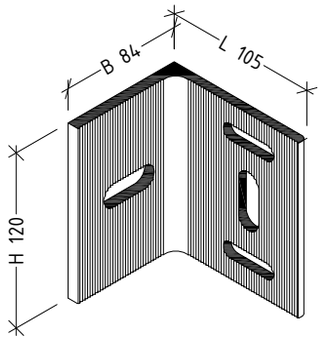
fixing brackets



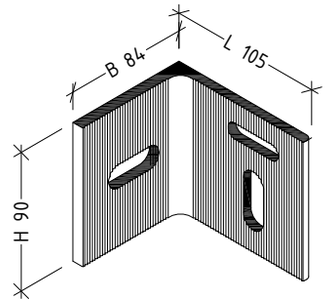
not to scale

E85M8.13

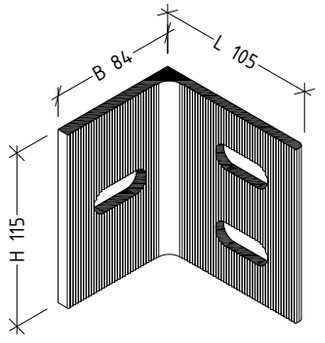
fixing brackets



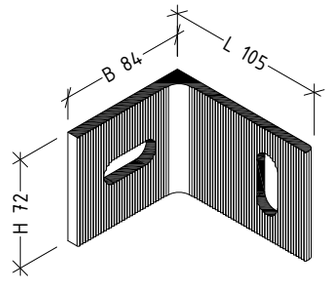
71 121



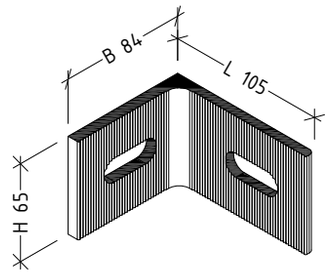
71 091



71 172



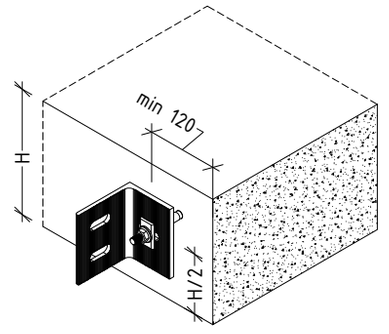
71 372



71 165

fixed support

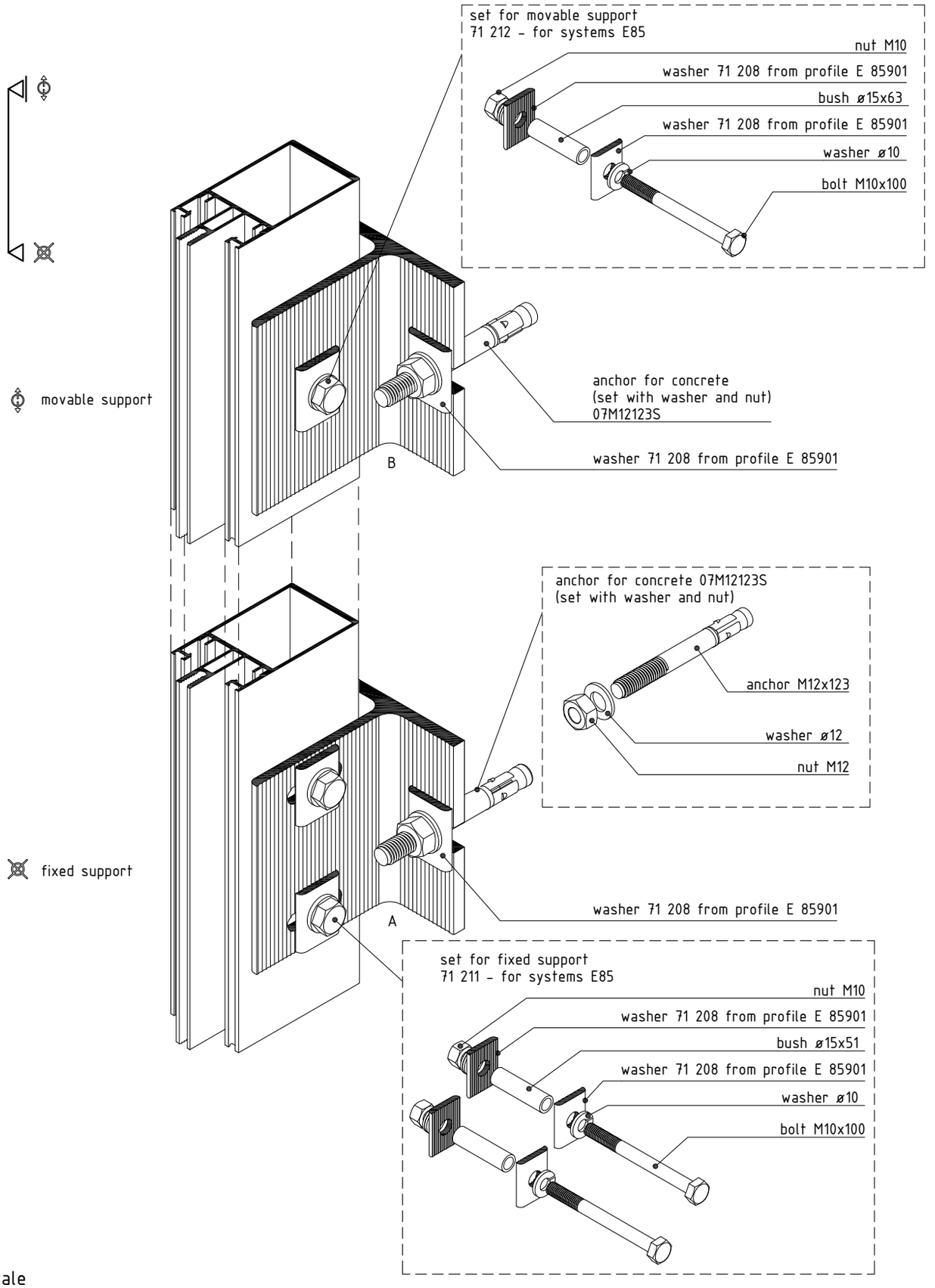
movable support



not to scale

E85M8.14

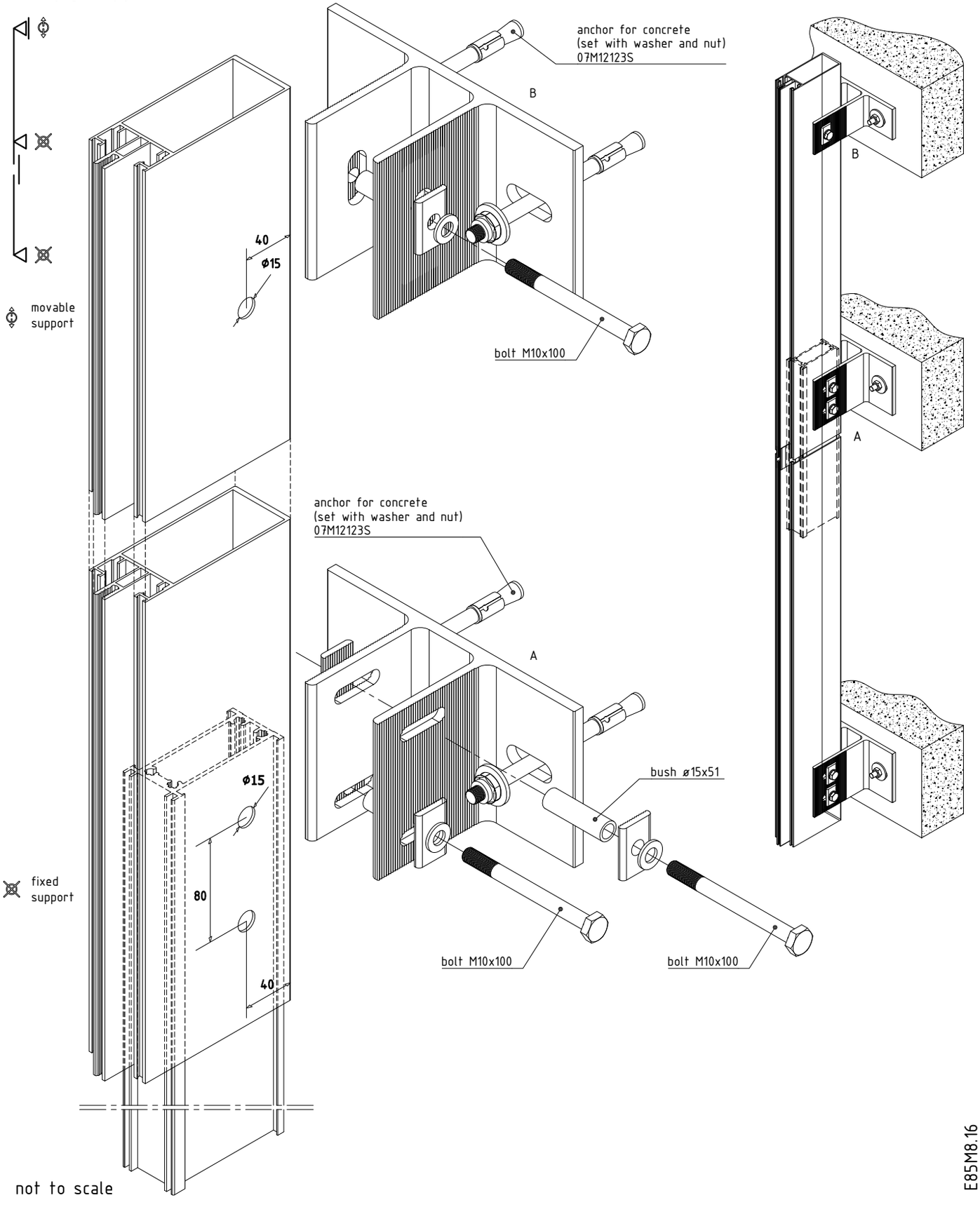
anchoring elements for fixing brackets



not to scale

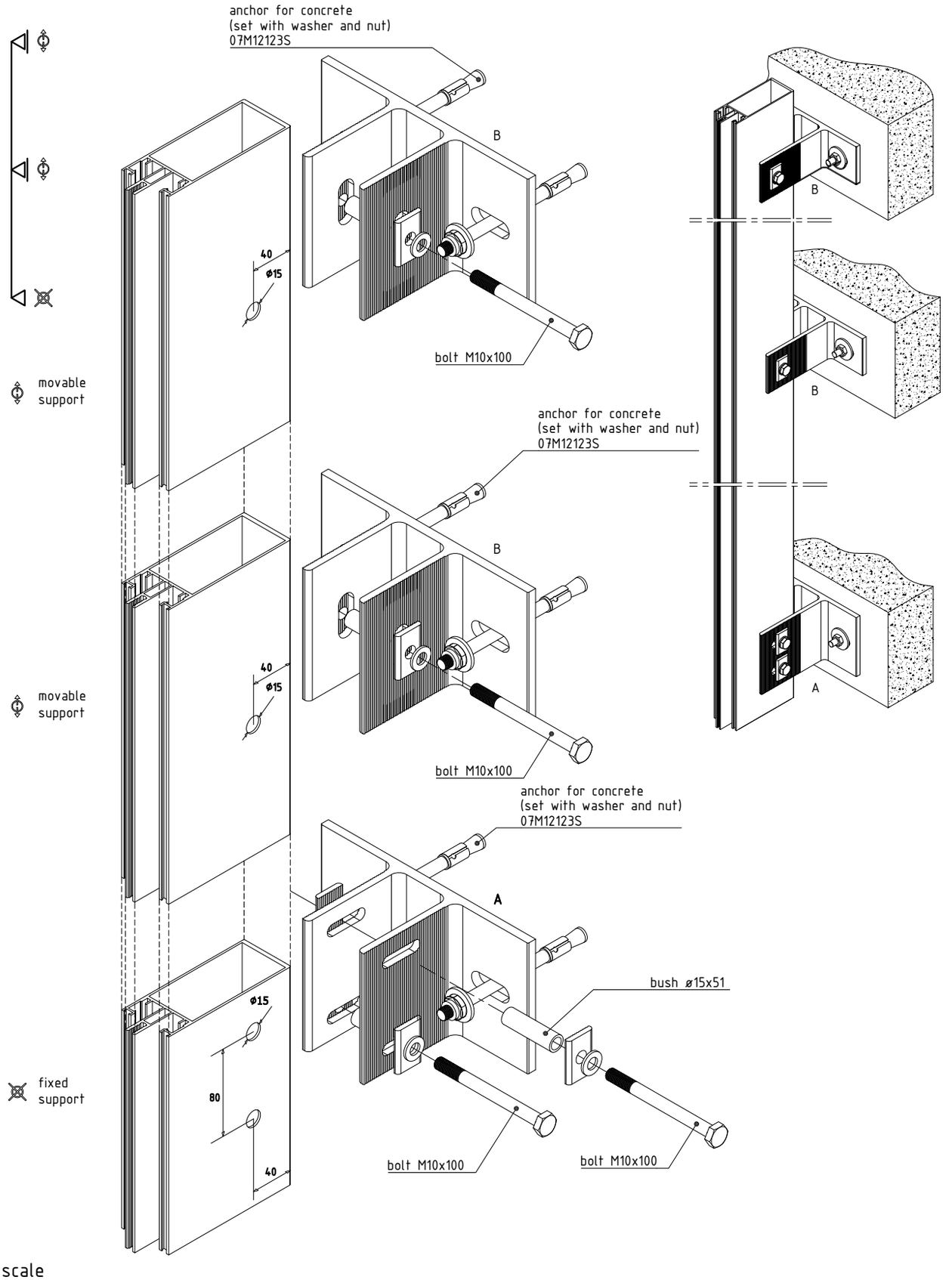
E85M8.15

simply supported beams



E85M8.16

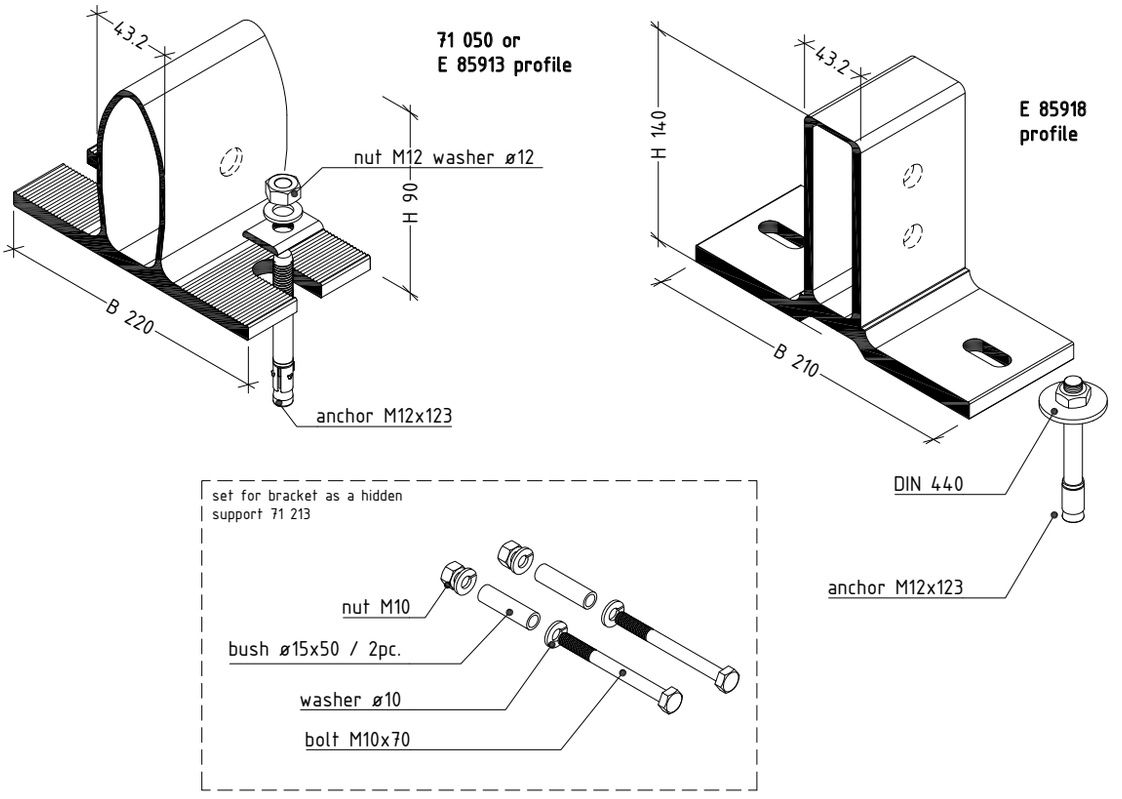
beam supported at three points

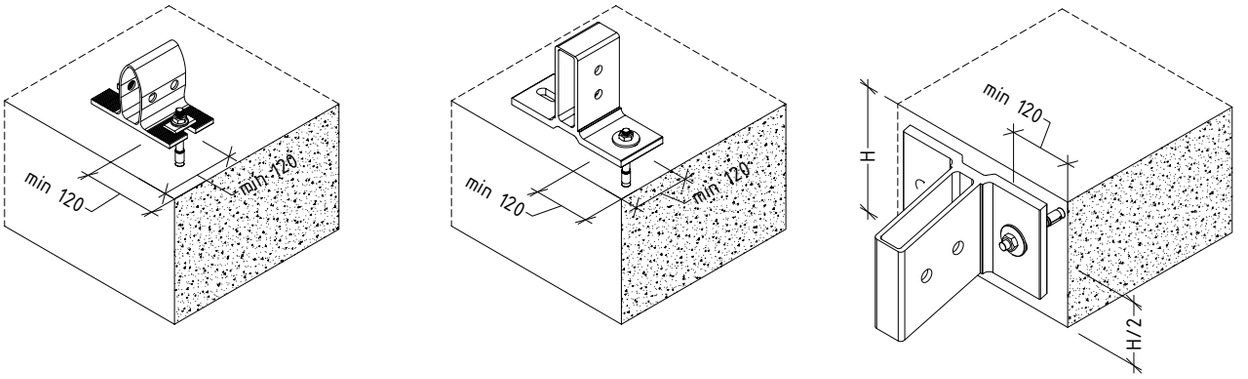


not to scale

E85M8.17

fixing brackets



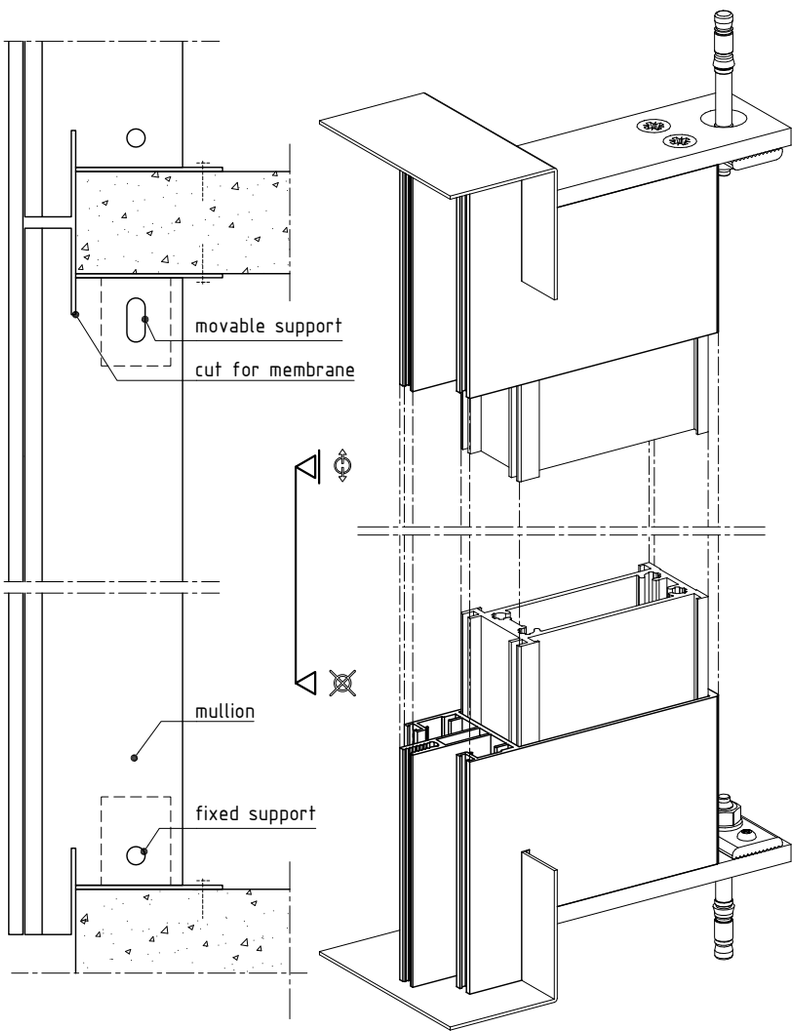


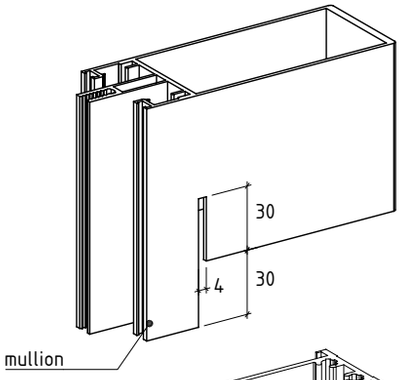
note:
accessories from profiles E 85913 and E 85918 can be produced and delivered with the machinings, after ordering and specifing the mullion.

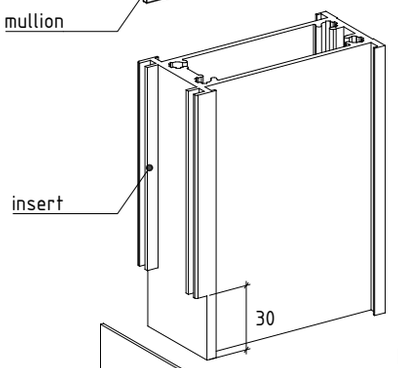
not to scale

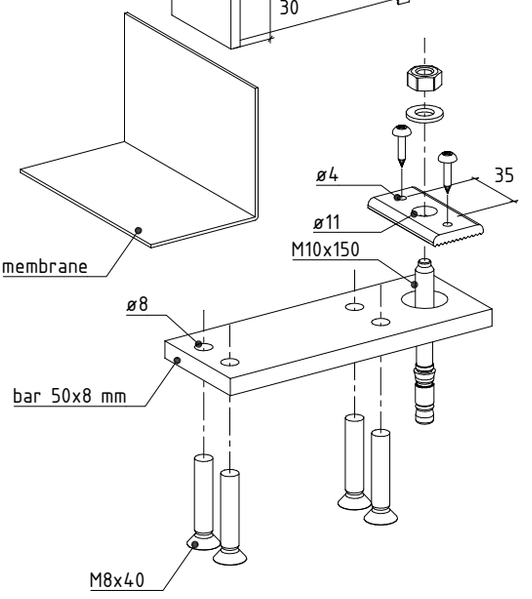
E85M8.18

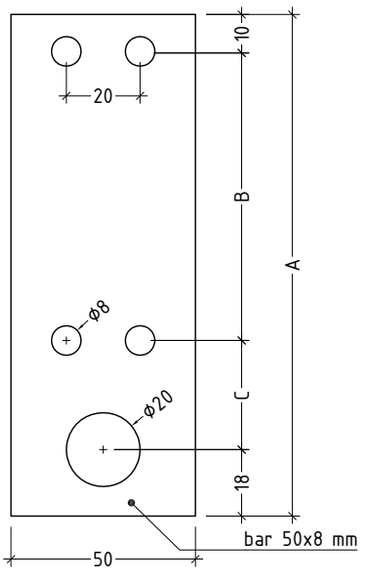
combinations and machinings











transom	insert	A, mm	B, mm min	C, mm min
E 85102	E 85952	96,0	38,4	29,6
E 85103	E 85953	116,0	58,4	29,6
E 85104	E 85954	136,0	78,4	29,6
E 85105	E 85955	166,0	108,4	29,6
E 85106	E 85956	183,5	123,9	31,6
E 85107	E 85957	203,5	143,9	31,6
E 85108	E 85958	200,5	134,9	37,6

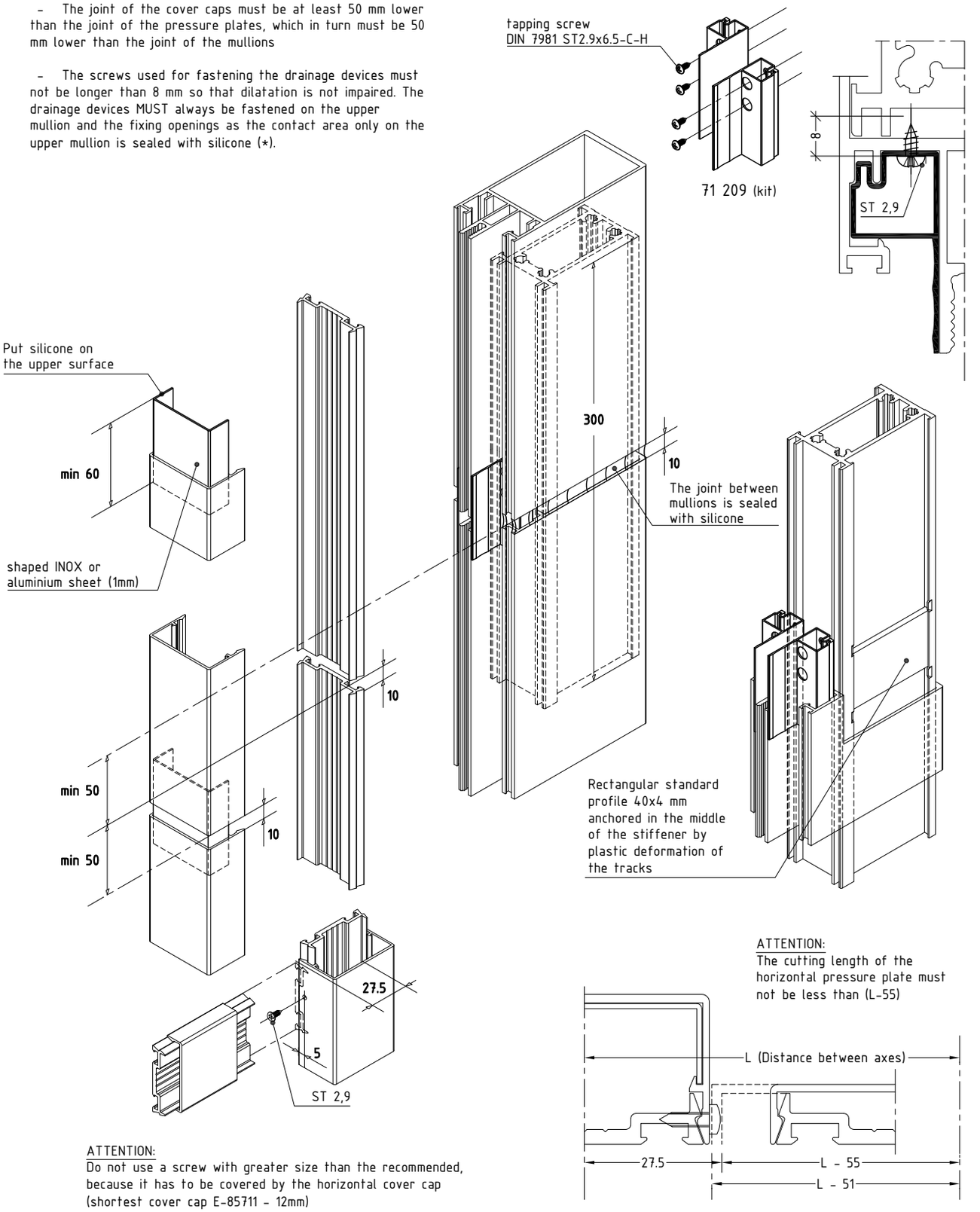
not to scale

E85M8.19

connection between two mullions with insert

- The joint of the cover caps must be at least 50 mm lower than the joint of the pressure plates, which in turn must be 50 mm lower than the joint of the mullions

- The screws used for fastening the drainage devices must not be longer than 8 mm so that dilatation is not impaired. The drainage devices MUST always be fastened on the upper mullion and the fixing openings as the contact area only on the upper mullion is sealed with silicone (*).

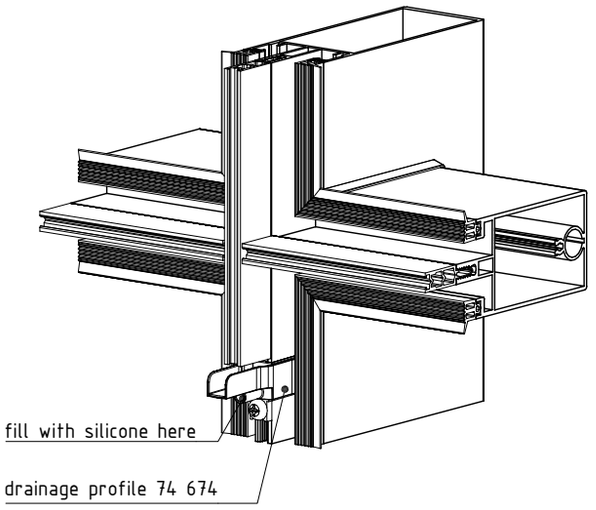


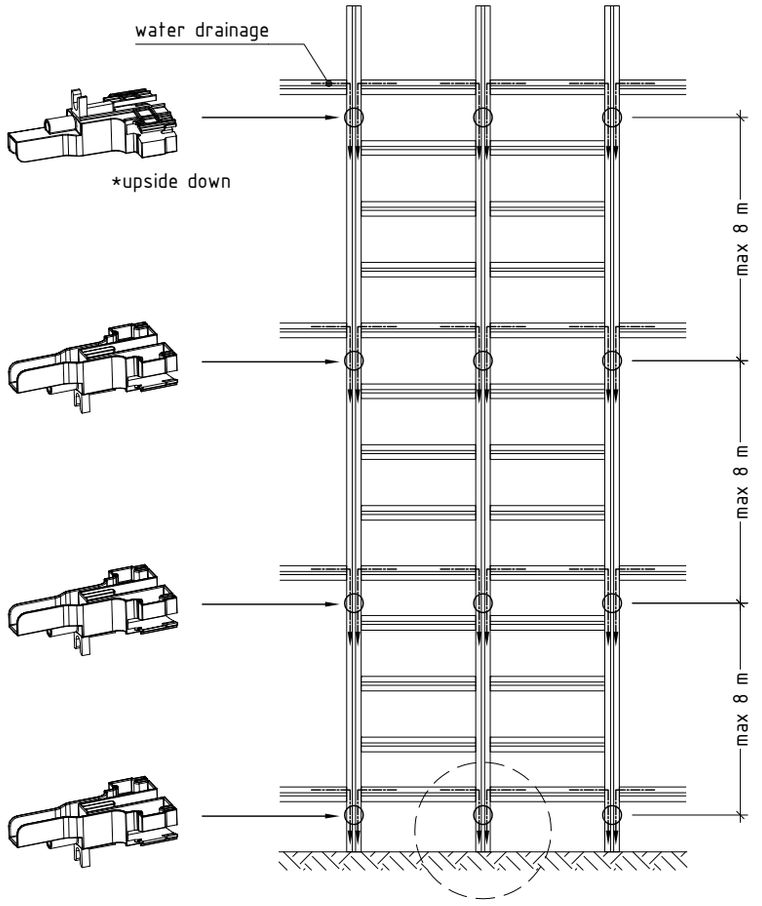
ATTENTION:
Do not use a screw with greater size than the recommended, because it has to be covered by the horizontal cover cap (shortest cover cap E-85711 - 12mm)

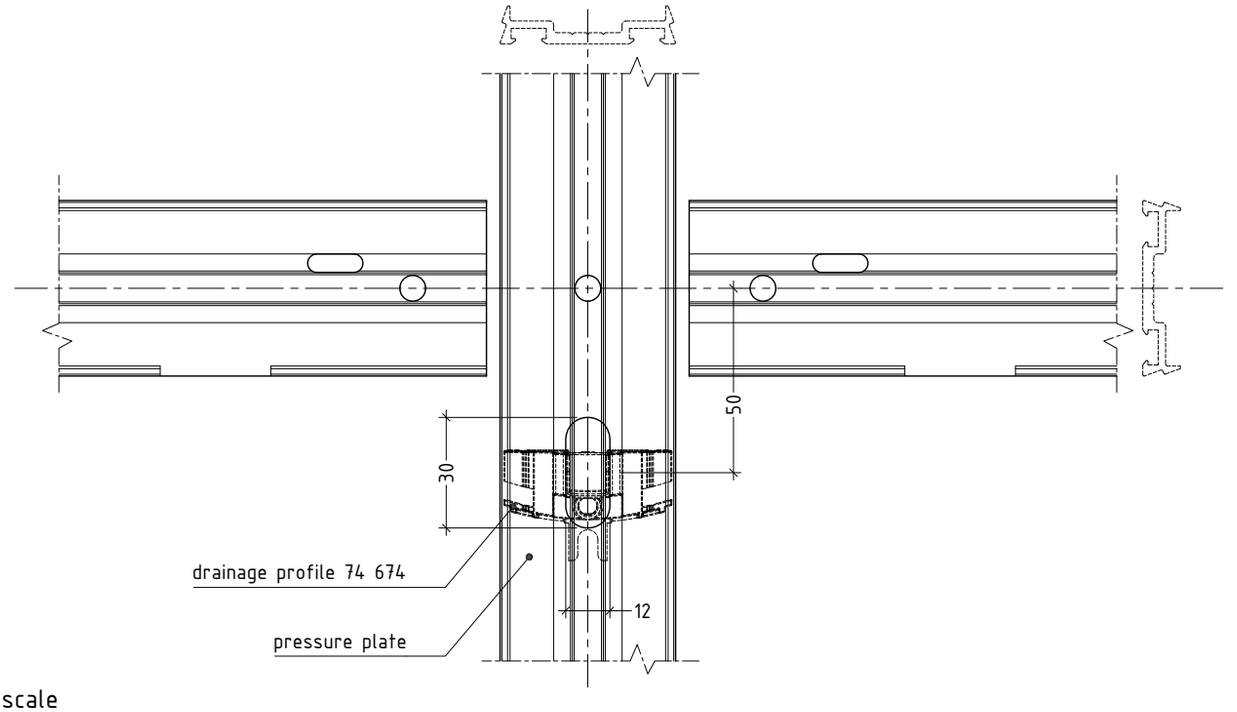
not to scale

E85M8.20

condensation water drainage



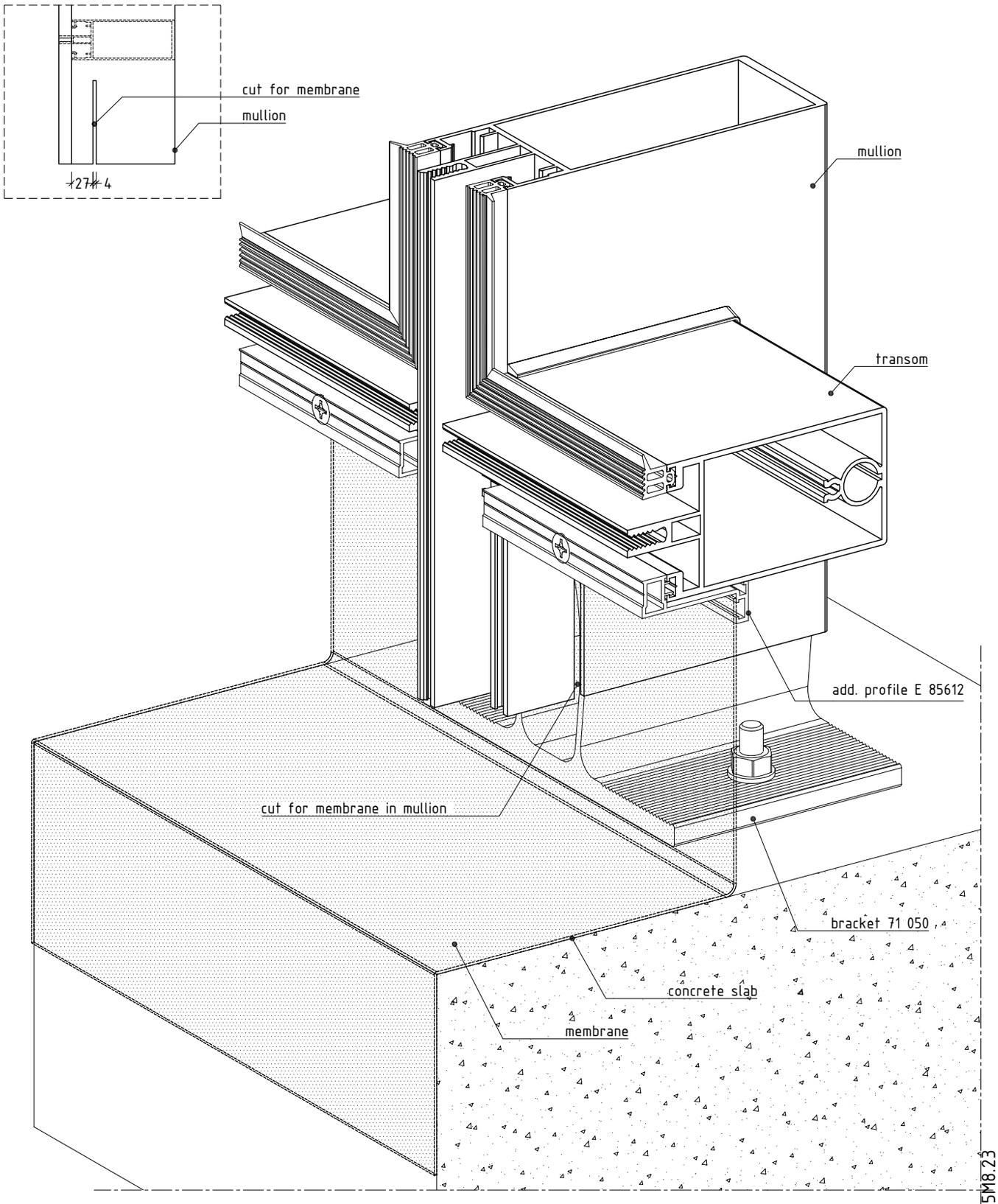




not to scale

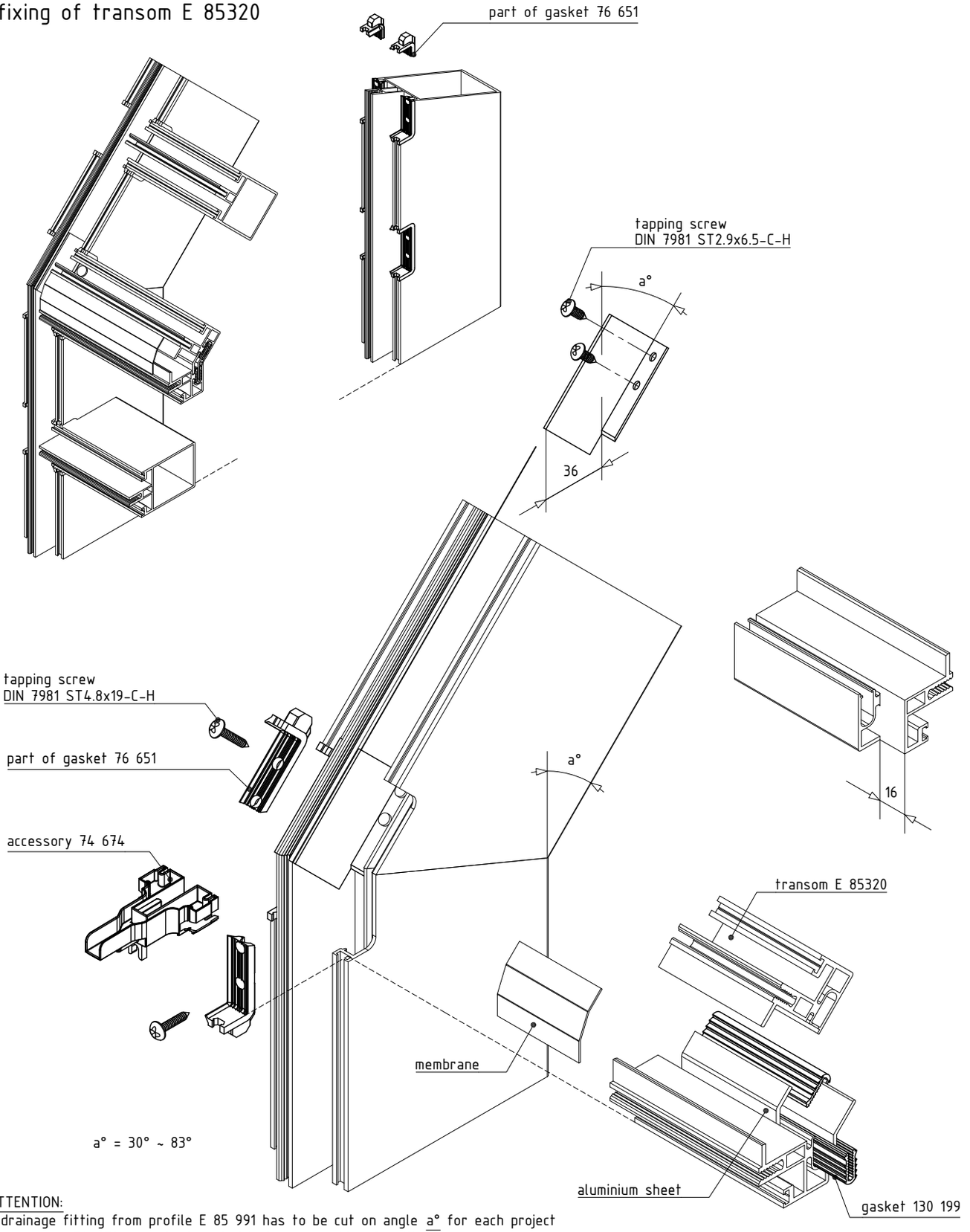
E85M8.22

bottom finishing



not to scale

fixing of transom E 85320

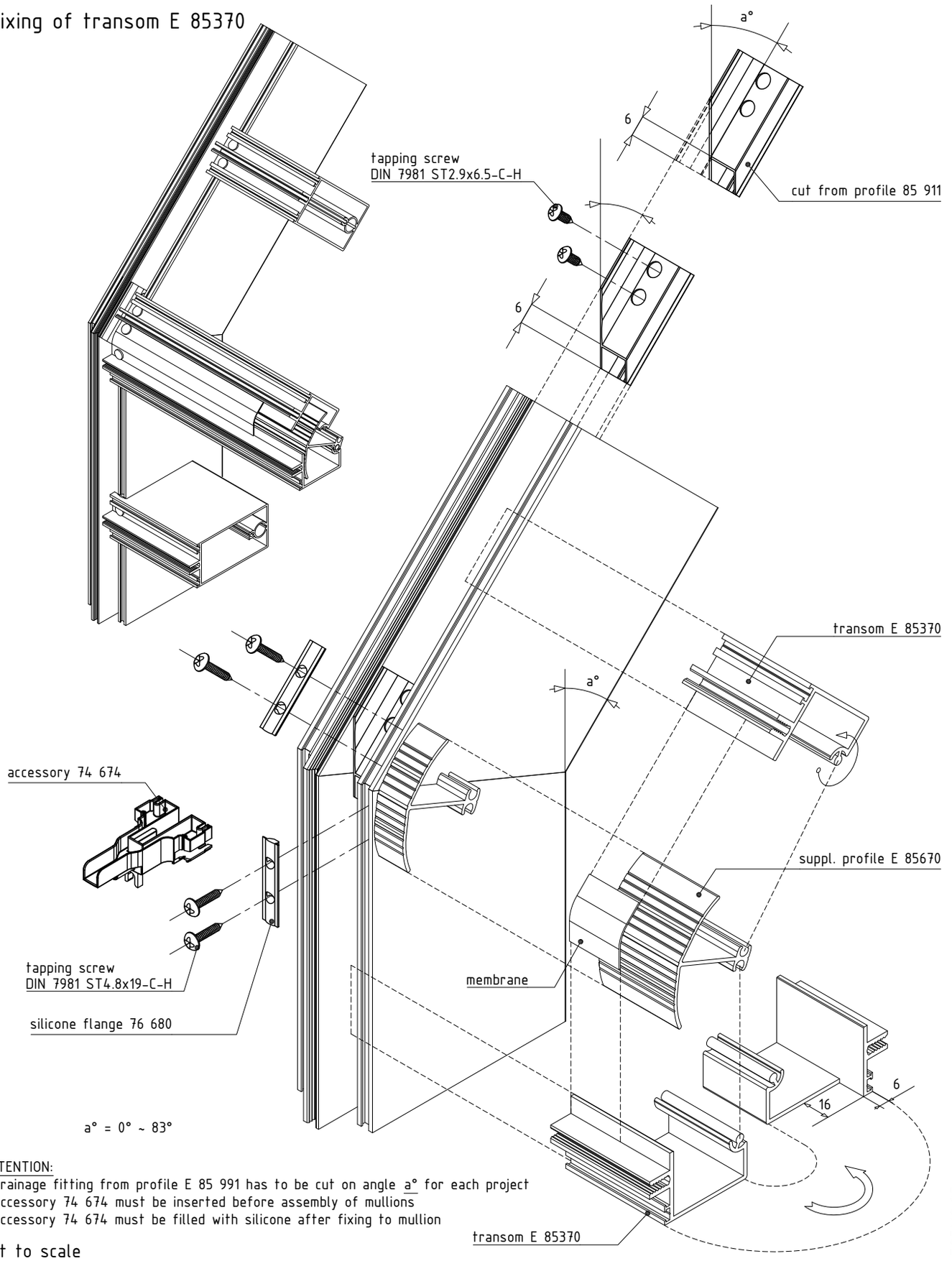


ATTENTION:
- drainage fitting from profile E 85 991 has to be cut on angle a° for each project
- accessory 74 674 must be inserted before assembly of mullions
- accessory 74 674 must be filled with silicone after fixing to mullion

not to scale

E85M8.24

fixing of transom E 85370

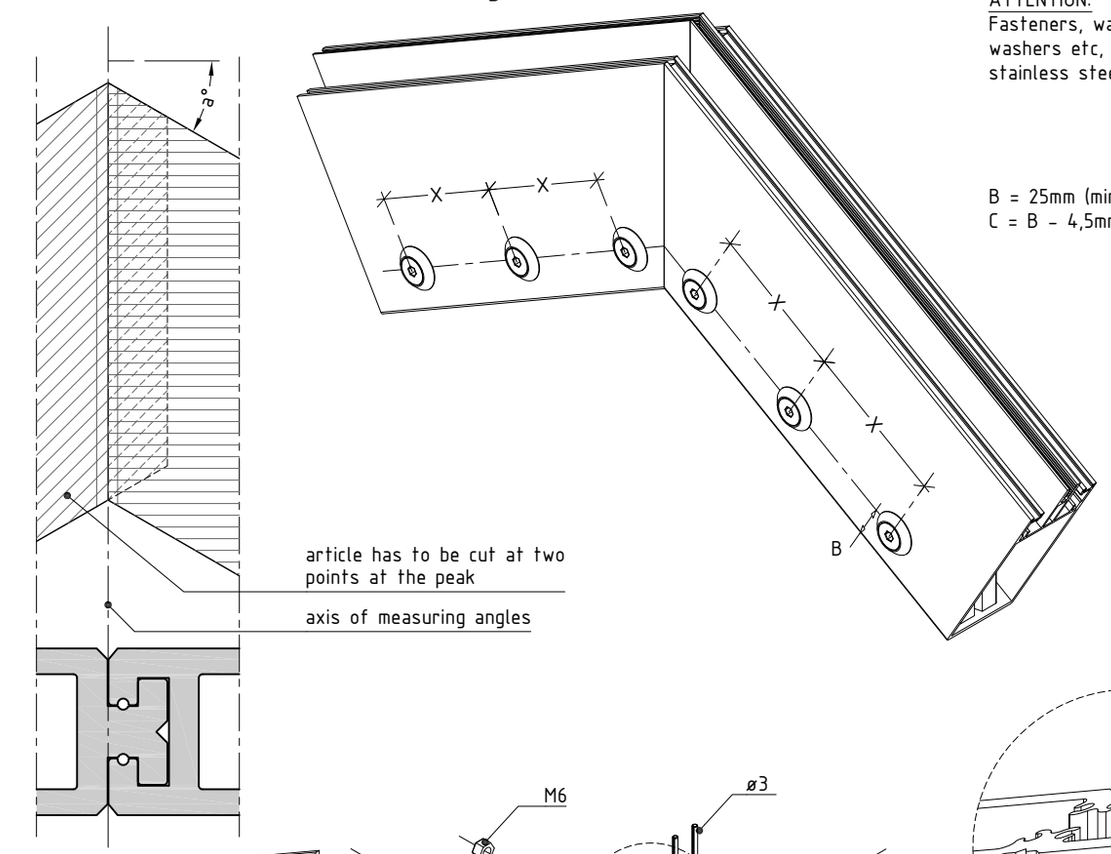


ATTENTION:
- drainage fitting from profile E 85 991 has to be cut on angle a° for each project
- accessory 74 674 must be inserted before assembly of mullions
- accessory 74 674 must be filled with silicone after fixing to mullion

not to scale

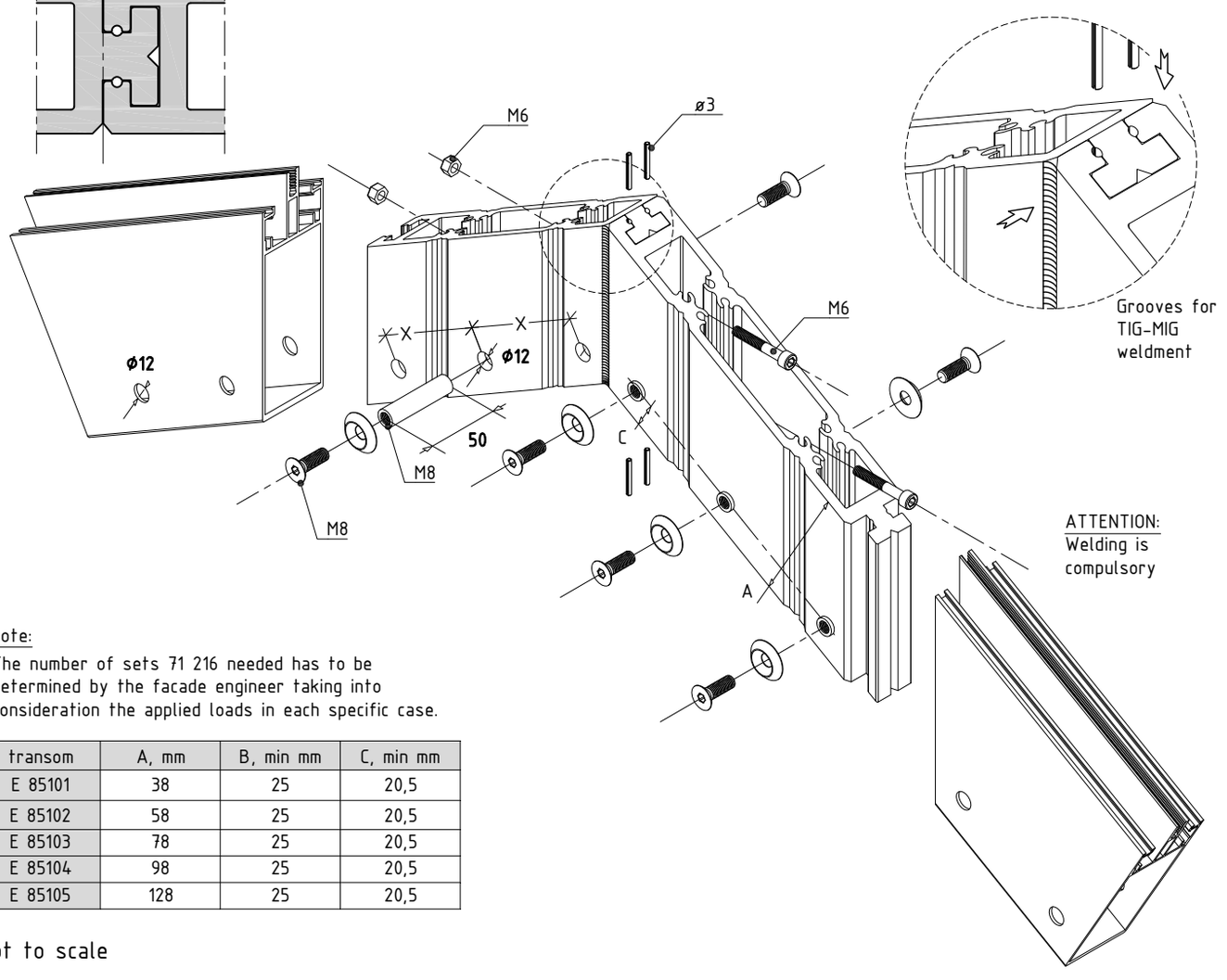
E85M8.25

roof connection of two mullions using E 85960



ATTENTION:
Fasteners, washers, spring washers etc, must be made of stainless steel A2.

B = 25mm (min)
C = B – 4,5mm



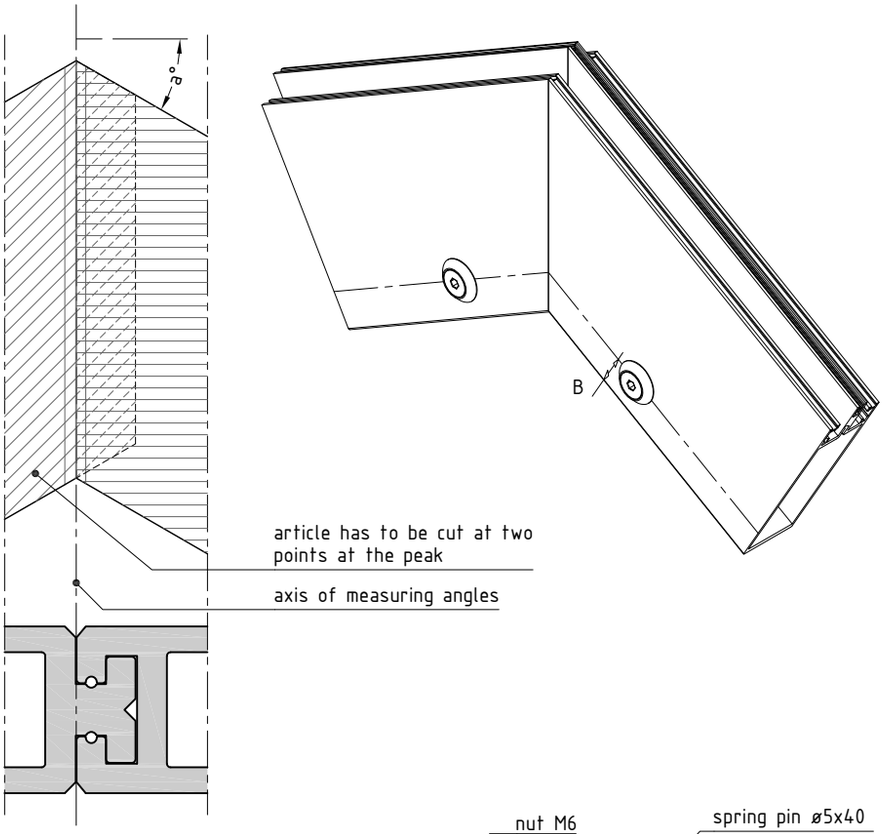
note:
The number of sets 71 216 needed has to be determined by the facade engineer taking into consideration the applied loads in each specific case.

transom	A, mm	B, min mm	C, min mm
E 85101	38	25	20,5
E 85102	58	25	20,5
E 85103	78	25	20,5
E 85104	98	25	20,5
E 85105	128	25	20,5

not to scale

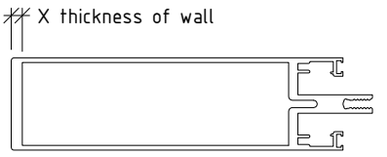
E85M8.26

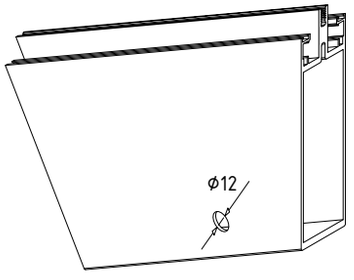
roof connection of two mullions using E 85969

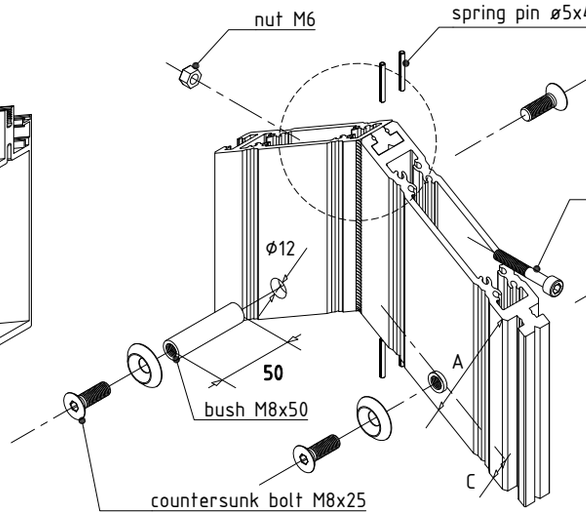


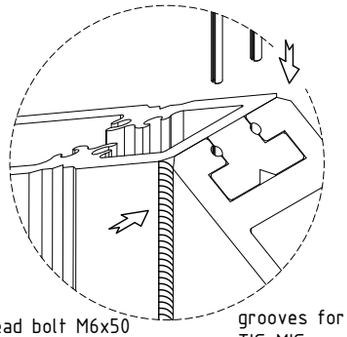
ATTENTION:
Fasteners, washers, spring washers etc, must be made of stainless steel A2.

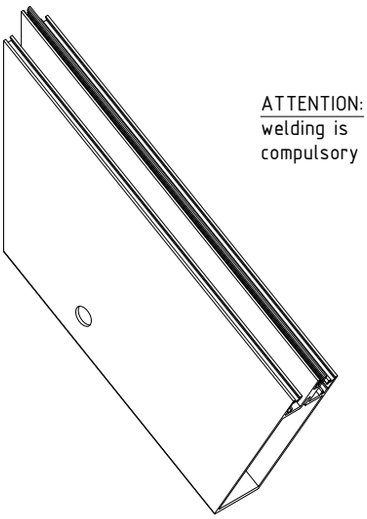
$B = C_{min} + X$











ATTENTION:
welding is compulsory

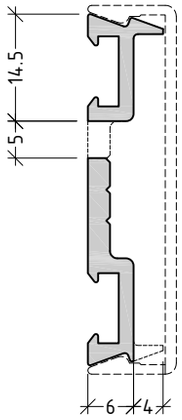
note:
all fixings are included in set 71 216 for roof connection

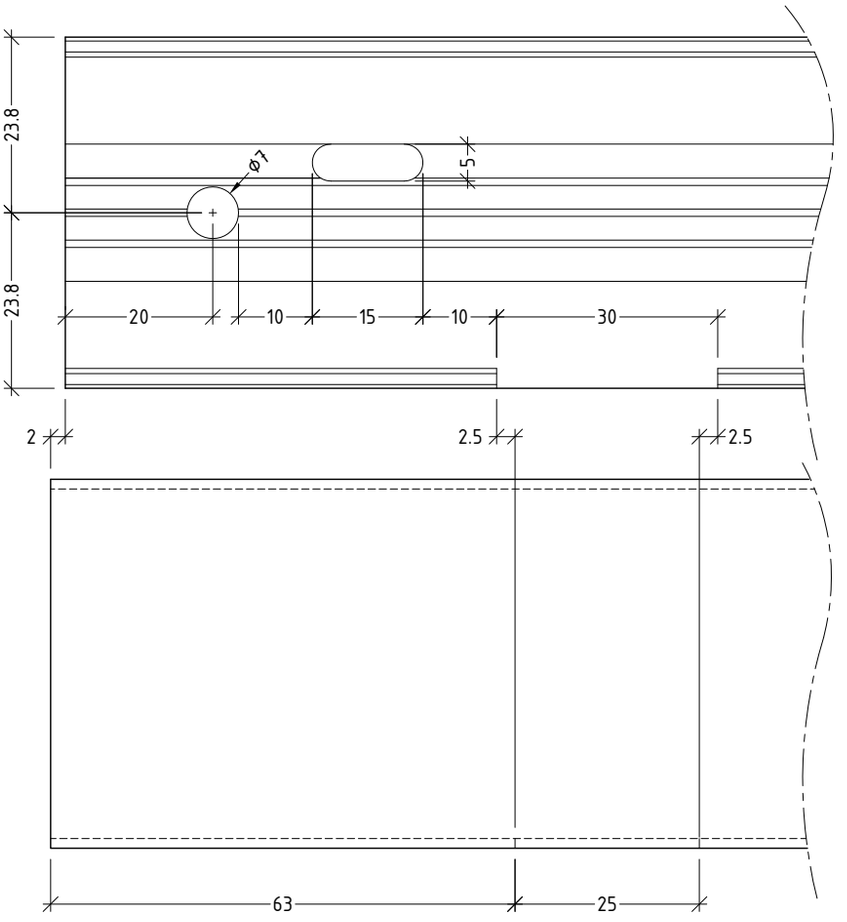
transom	A, mm	B, mm min	C, mm min
E 85109	182	35,5	20,5

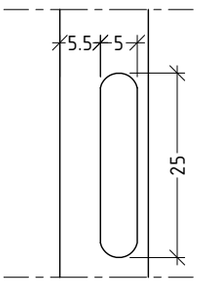
not to scale

E85M8.27

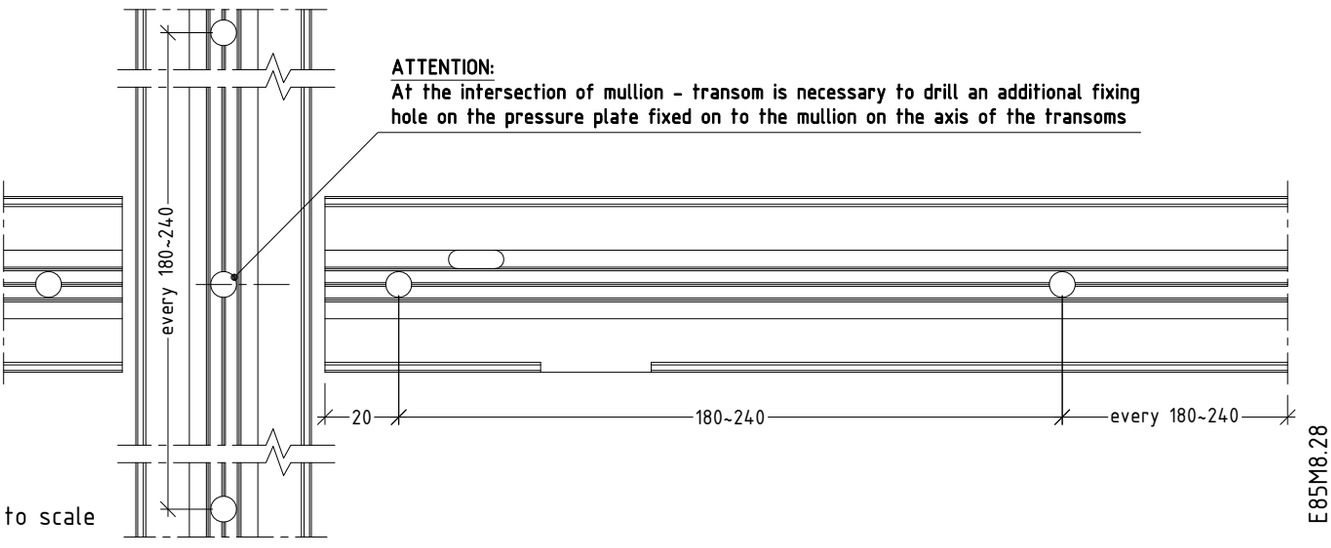
machinings







ATTENTION:
Apart from the submarginal drainage holes which have to be opened in any case both on the pressure plate and cover cap, additional holes have to be opened in the middle, in case that the length of the transom is greater than 1.25 m or if the surface of the glass pane is greater than 2 m^2

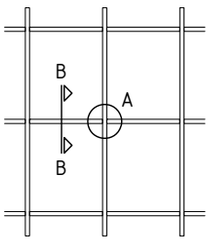


ATTENTION:
At the intersection of mullion – transom is necessary to drill an additional fixing hole on the pressure plate fixed on to the mullion on the axis of the transoms

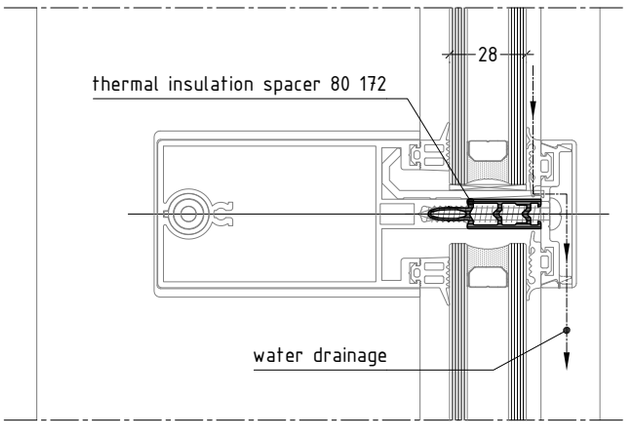
not to scale

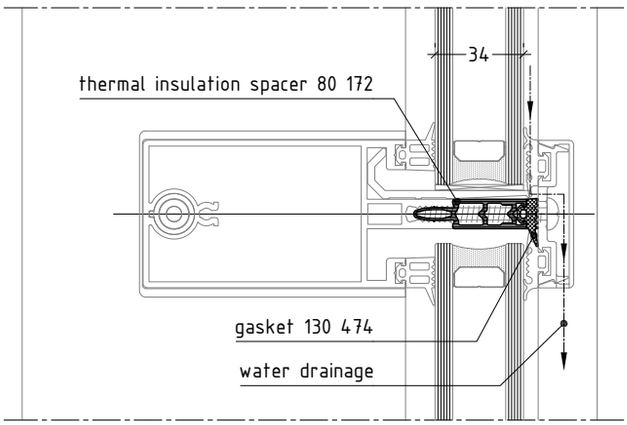
E85M8.28

water drainage with 2nd level transom

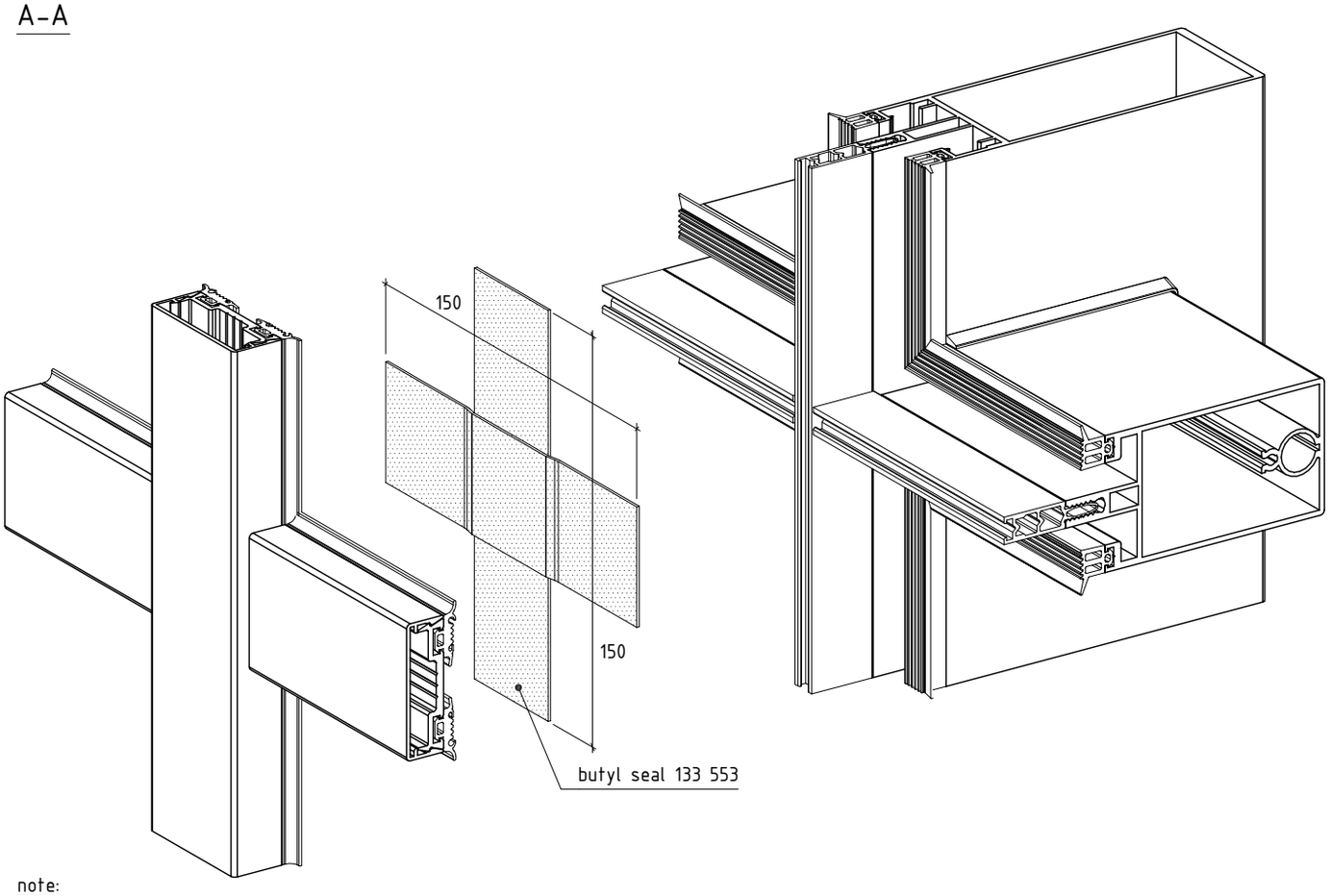


B-B





A-A

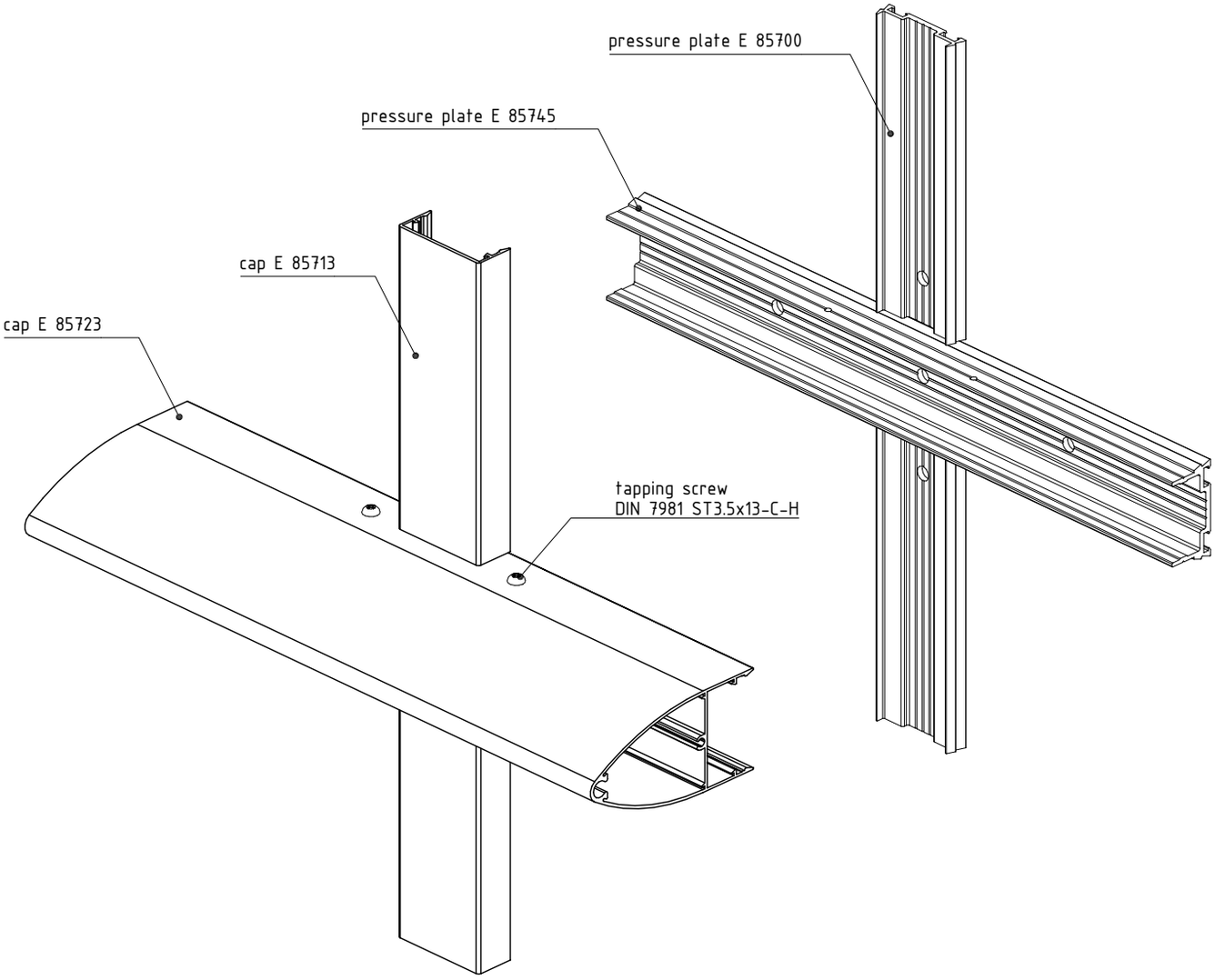


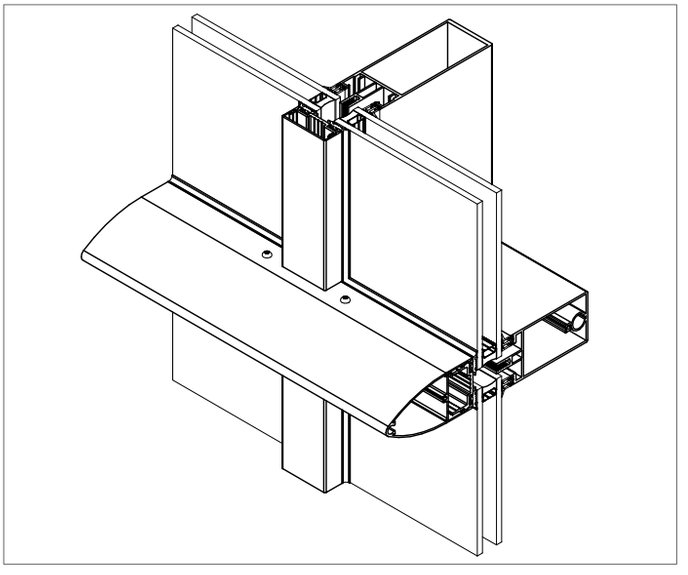
note:
1. In case of 2nd level drainage, it is obligatory to use 150 mm butyl seal tape in both directions of the cross zone.
2. In case of roof constructions, conservatories, facades with inclinations and polygonal facades with 2nd level drainage, it is obligatory to use butyl seal tape in both directions.

not to scale

E85M8.29

fixing of E 85723 to E 85745



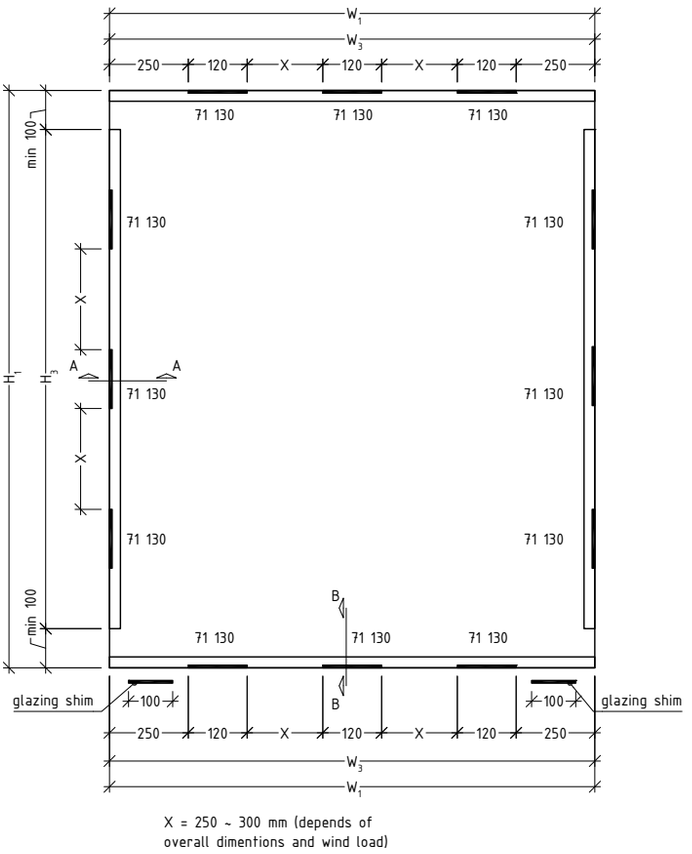


note:
all big cover caps (E 85723, E85724, E85716, E85718) have to be used with pressure plate E85745 and to be fastened with screws

not to scale

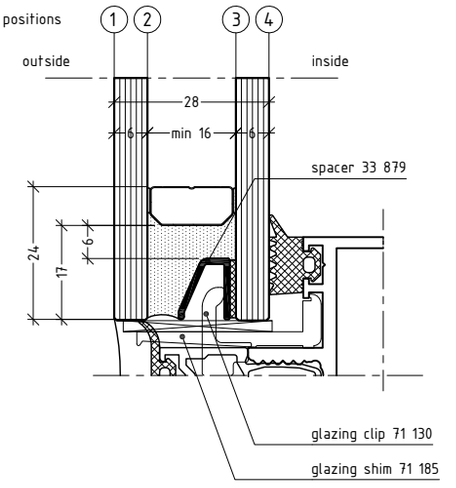
E85M8.30

assembling of spacer for structural glazing

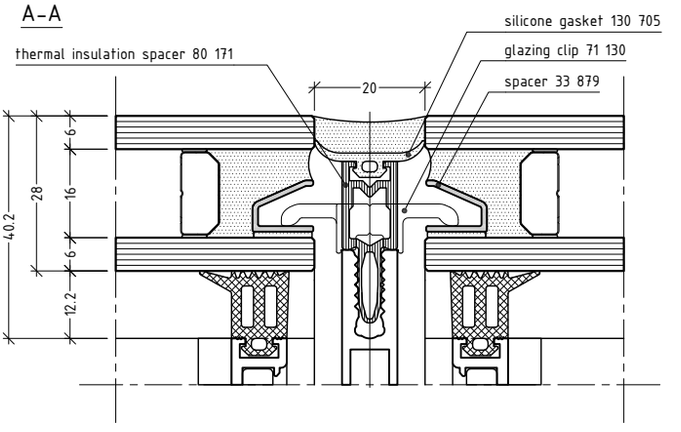


X = 250 ~ 300 mm (depends of overall dimentions and wind load)

B-B



A-A

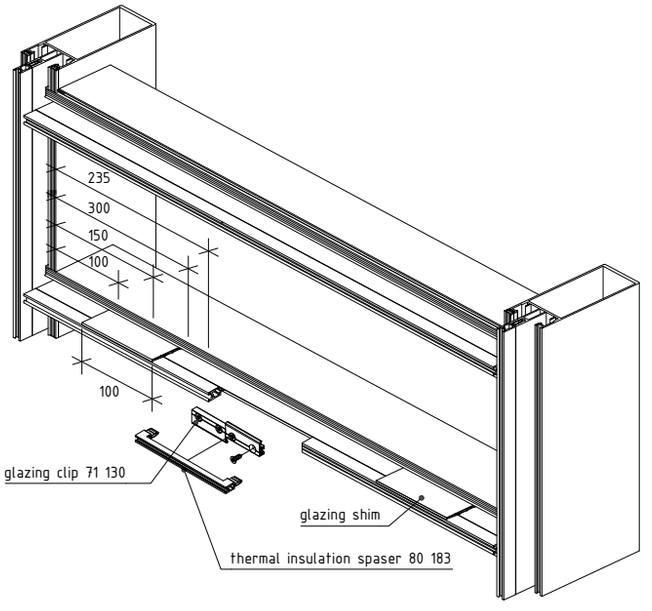


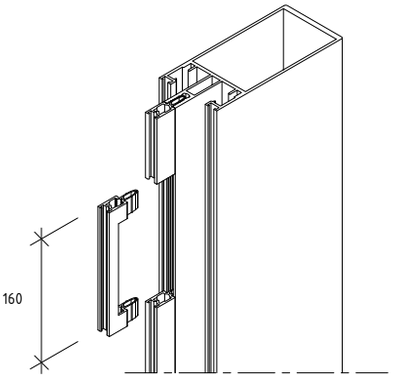
cutting of spacer

width of spacer	$W_1 = W_2 - 34$
height of spacer	$H_1 = H_2 - 34$

cutting of spacer 33 879

width of spacer	$W_3 = W_1$
height of spacer	$H_3 = H_1 - 200$

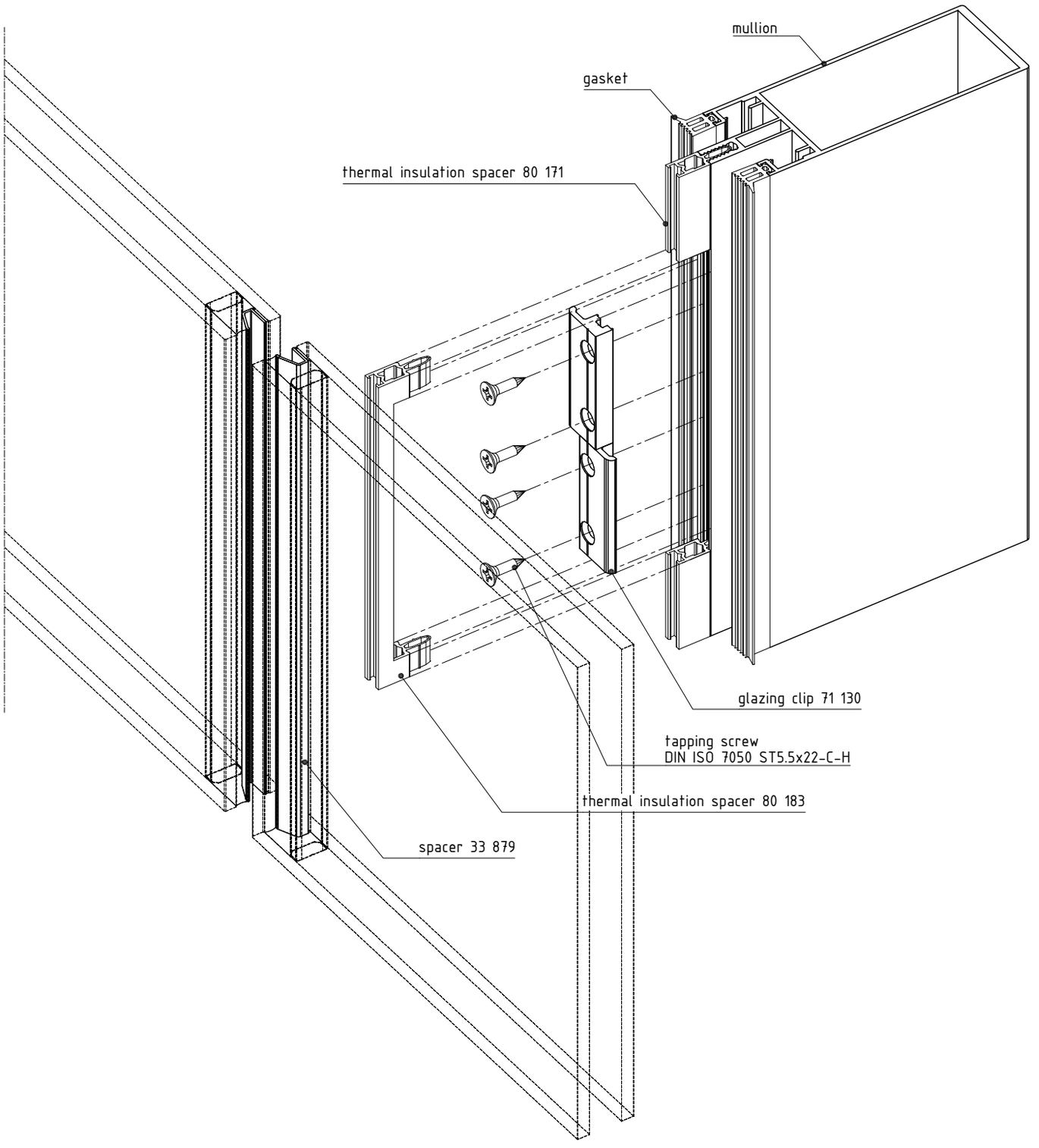




not to scale

E85M8.31

structural glazing assembly

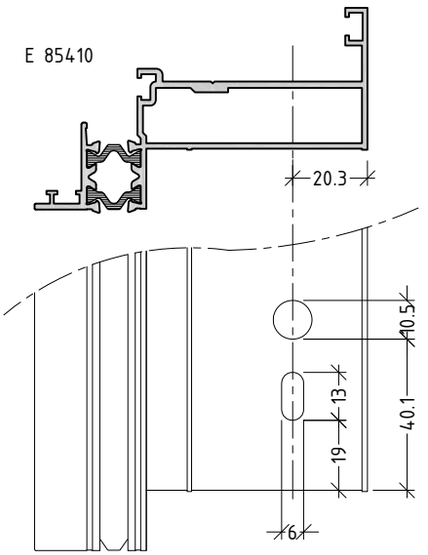


not to scale

E85M8.32

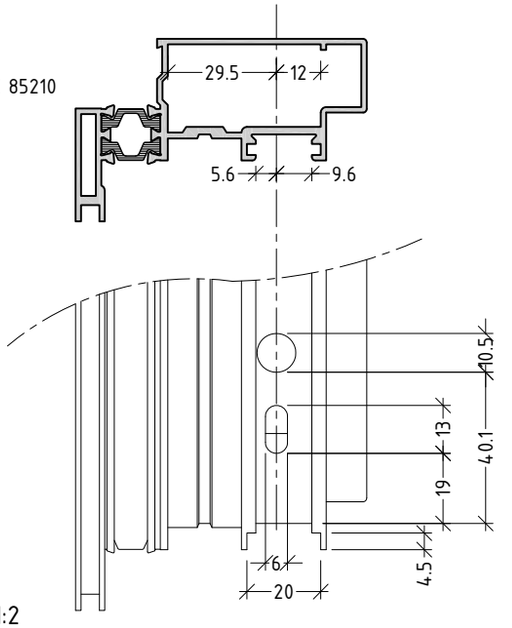
projected window fixings and machinings

E 85410

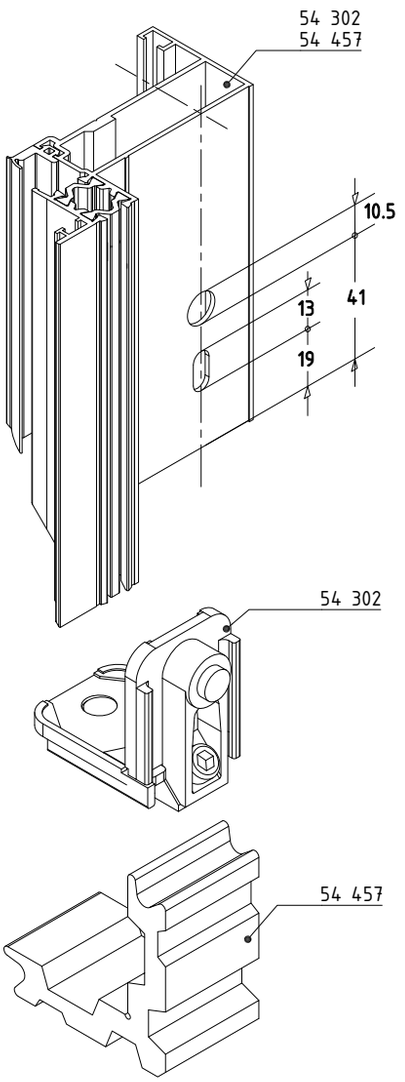


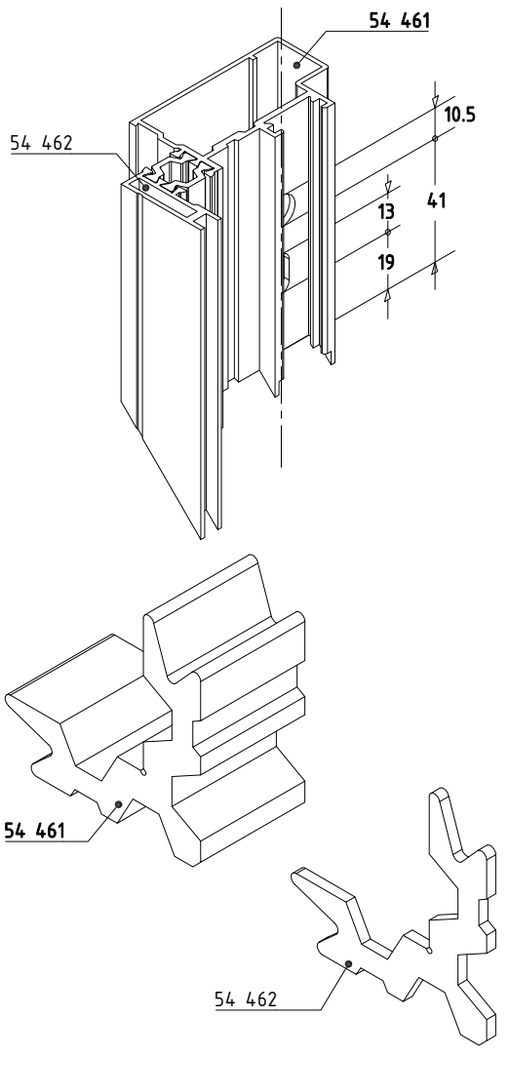
scale 1:2

E 85210



scale 1:2

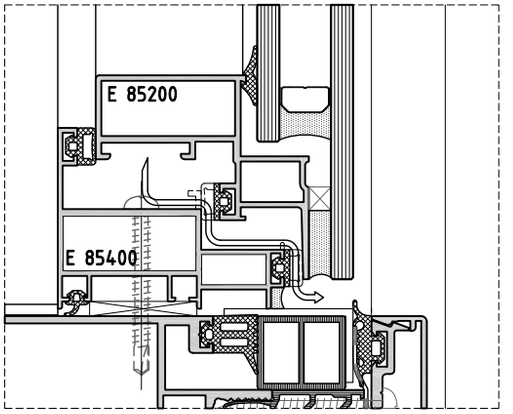


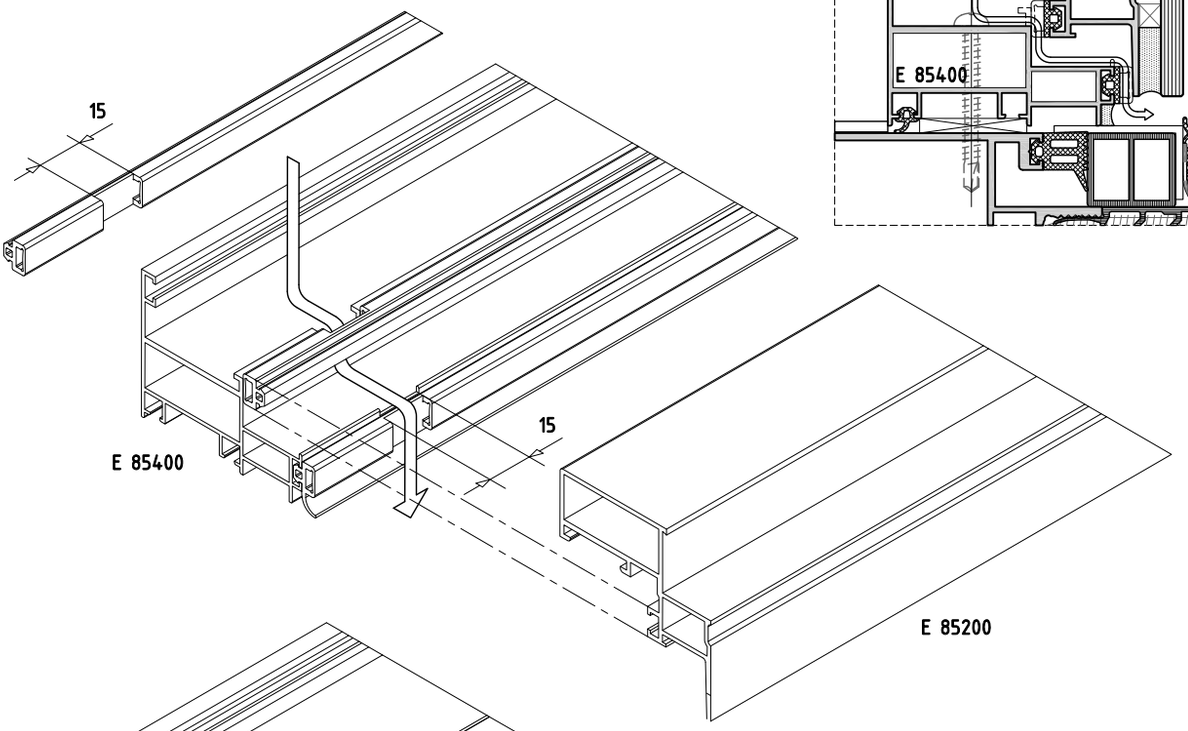


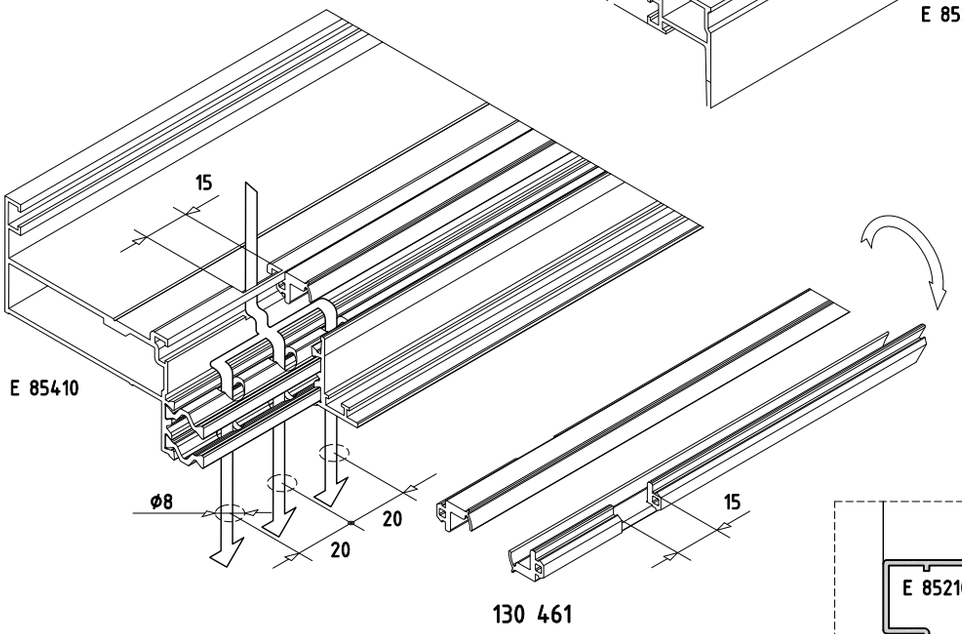
not to scale

E85M8.33

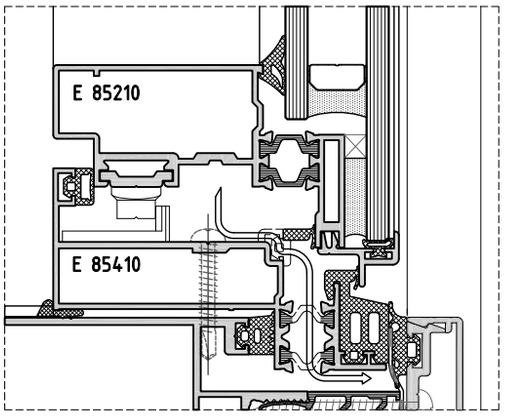
machining of drainage opening







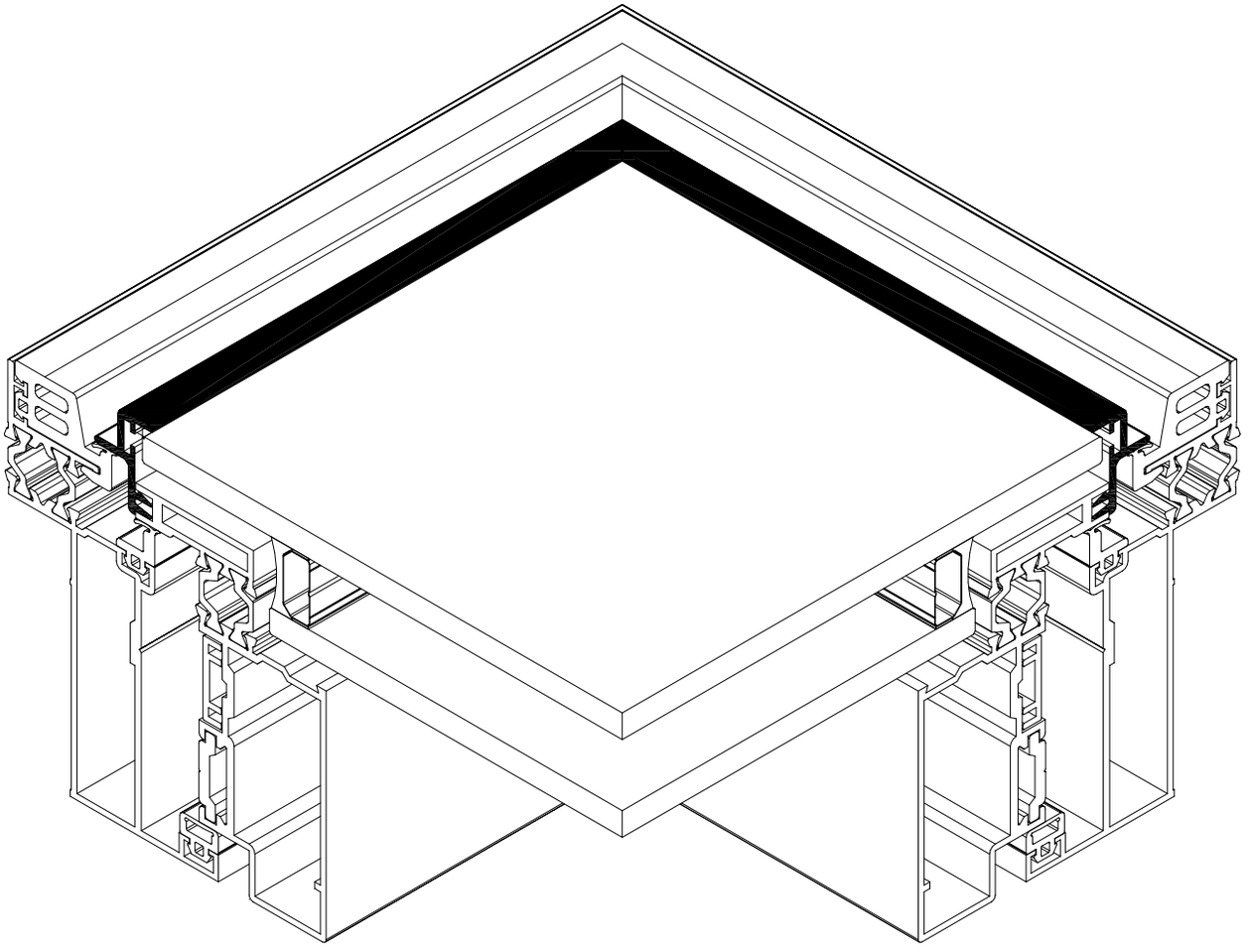
130 461

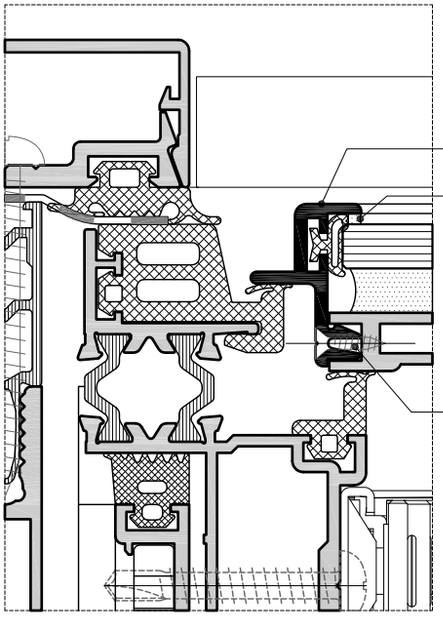


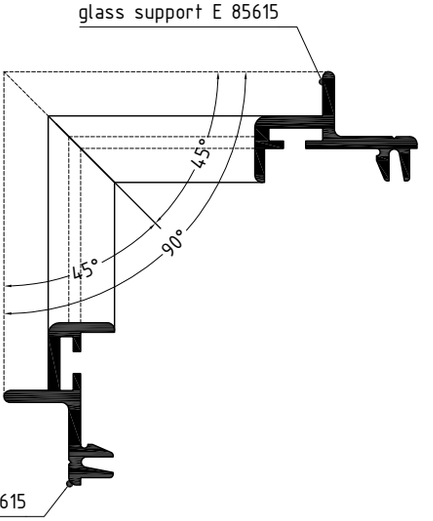
not to scale

E85M8.34

machining of glass support E 85615





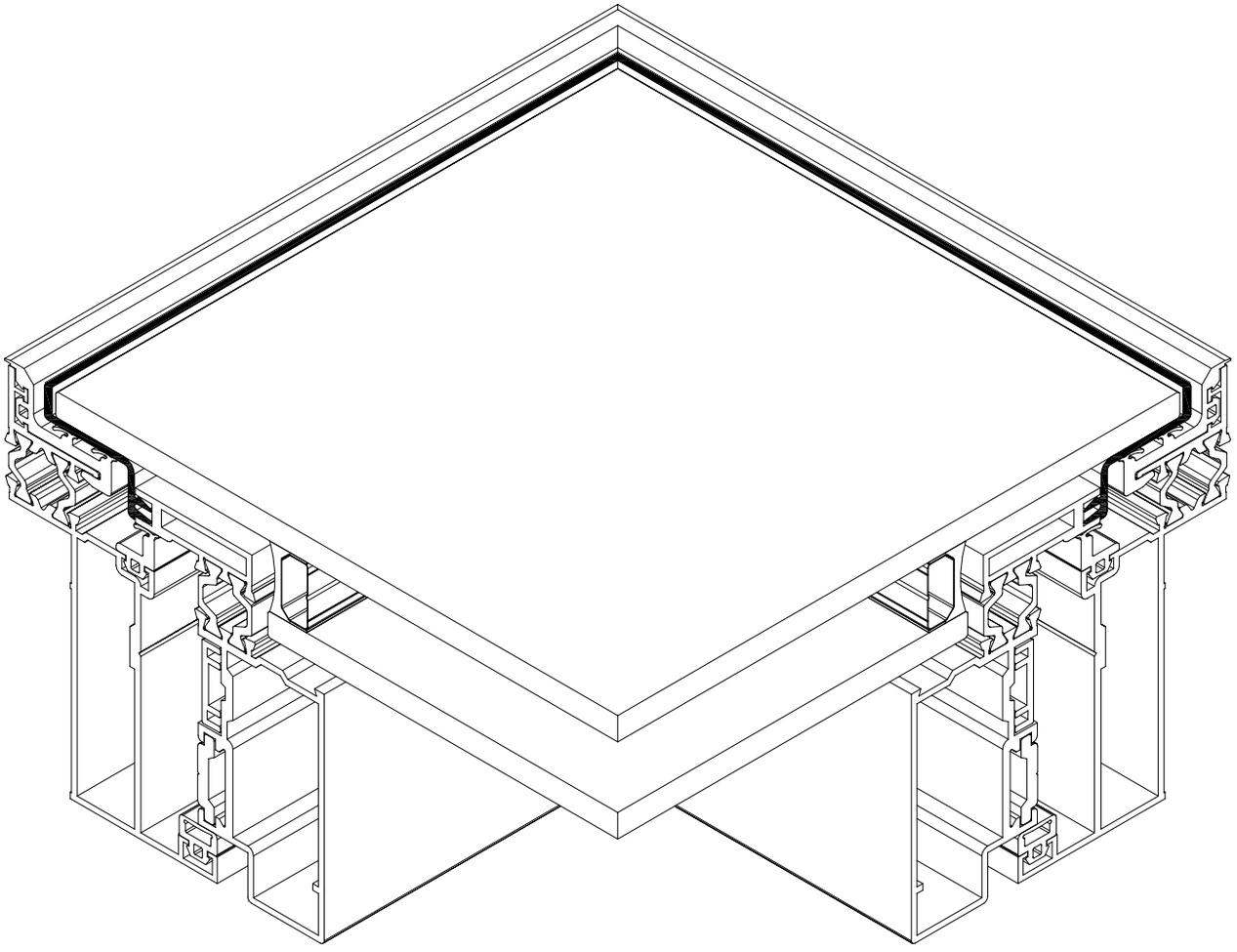


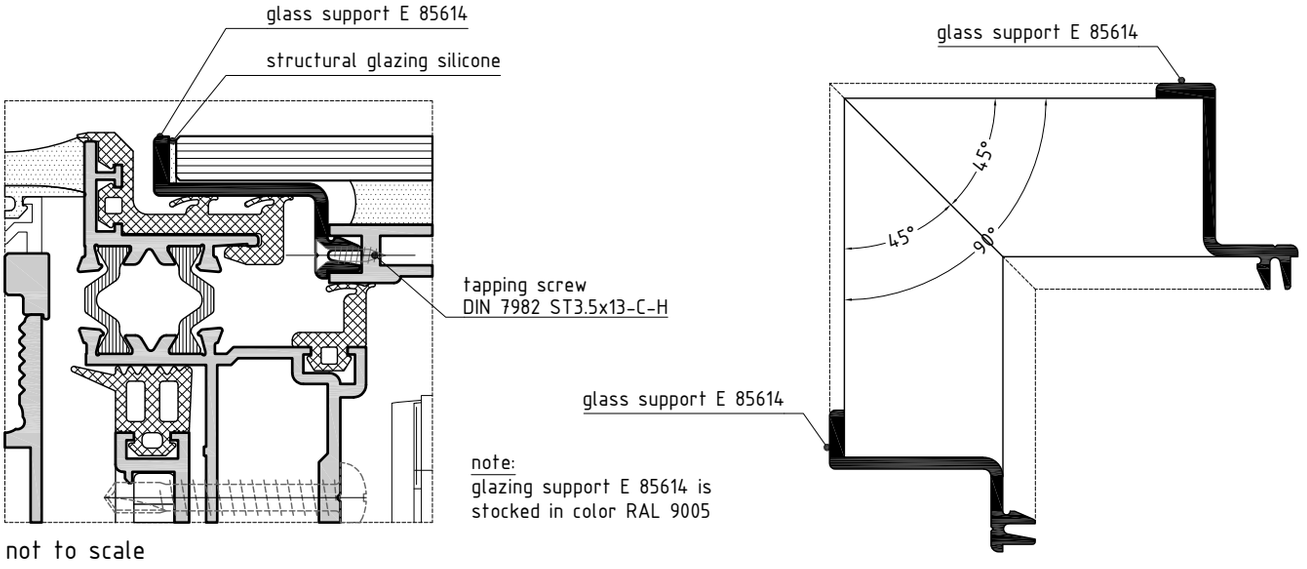
note:
glazing support E 85615 is stocked in color RAL 9005

not to scale

E85M8.35

machining of glass support E 85614



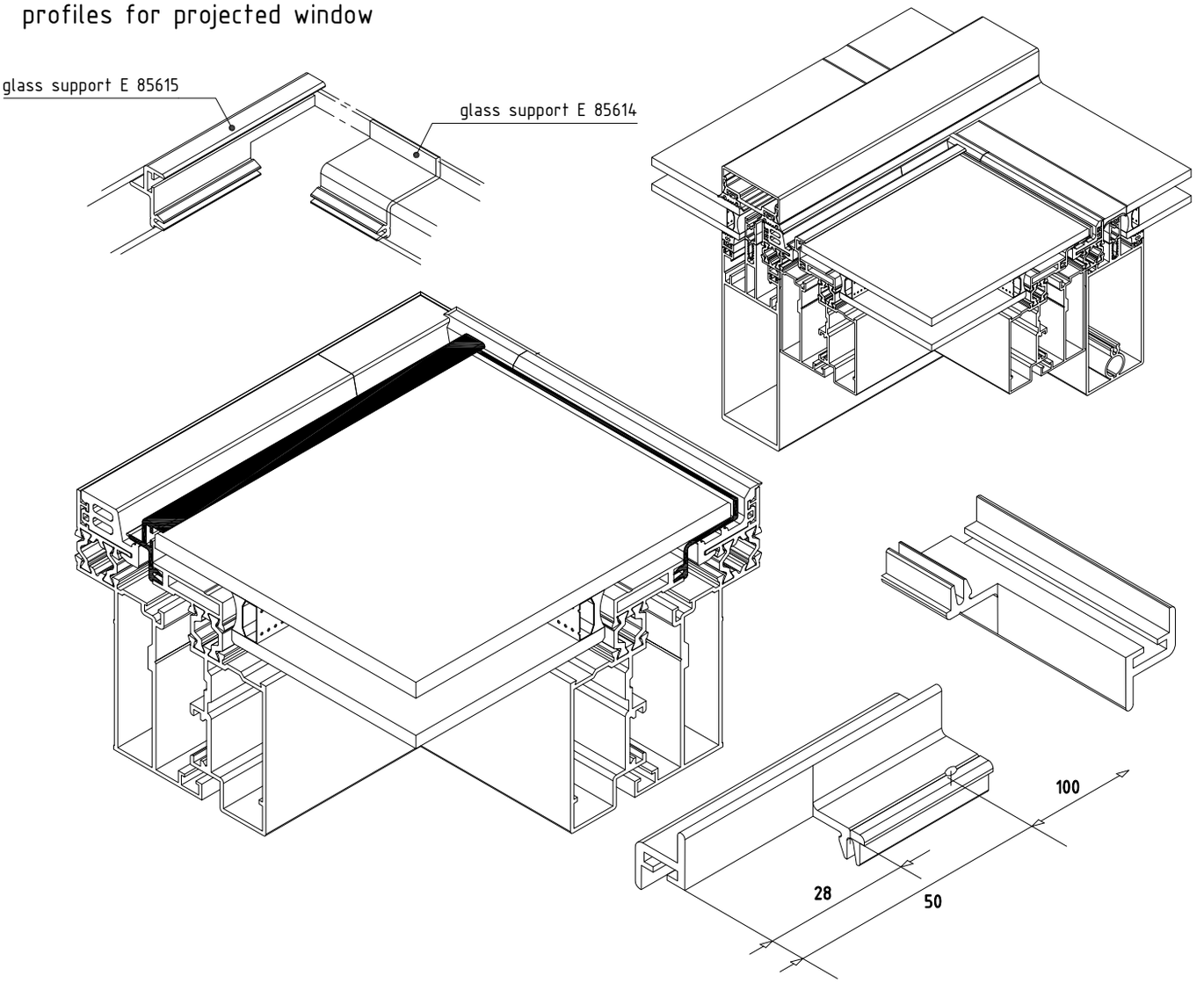


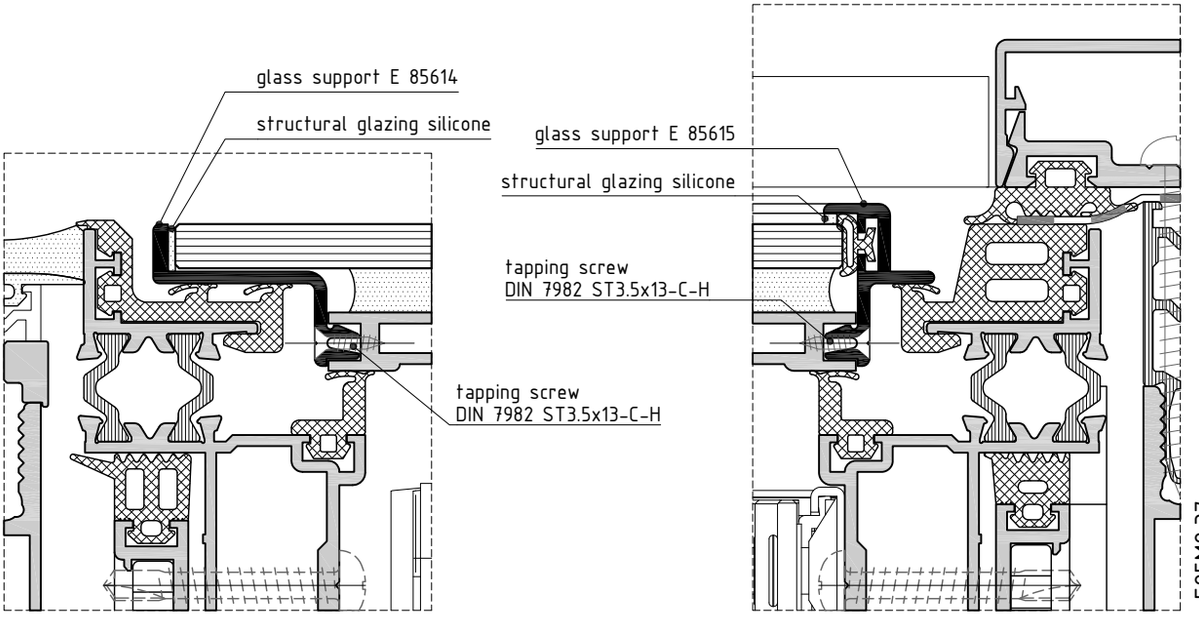
note:
glazing support E 85614 is
stocked in color RAL 9005

not to scale

E85M8.36

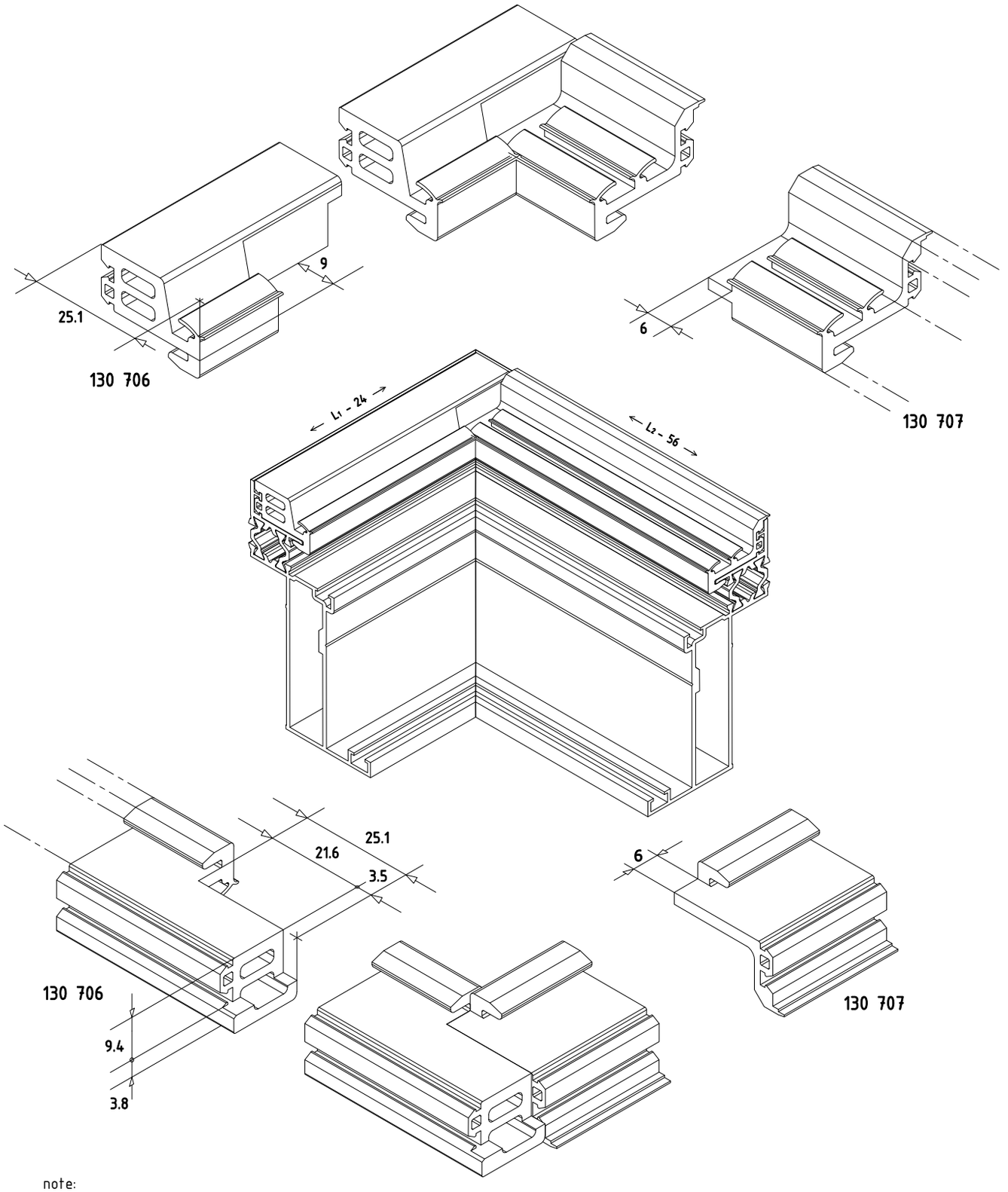
profiles for projected window





not to scale

required machinings of gaskets 130 706 and 130 707 for
projected window used in two sided curtain wall

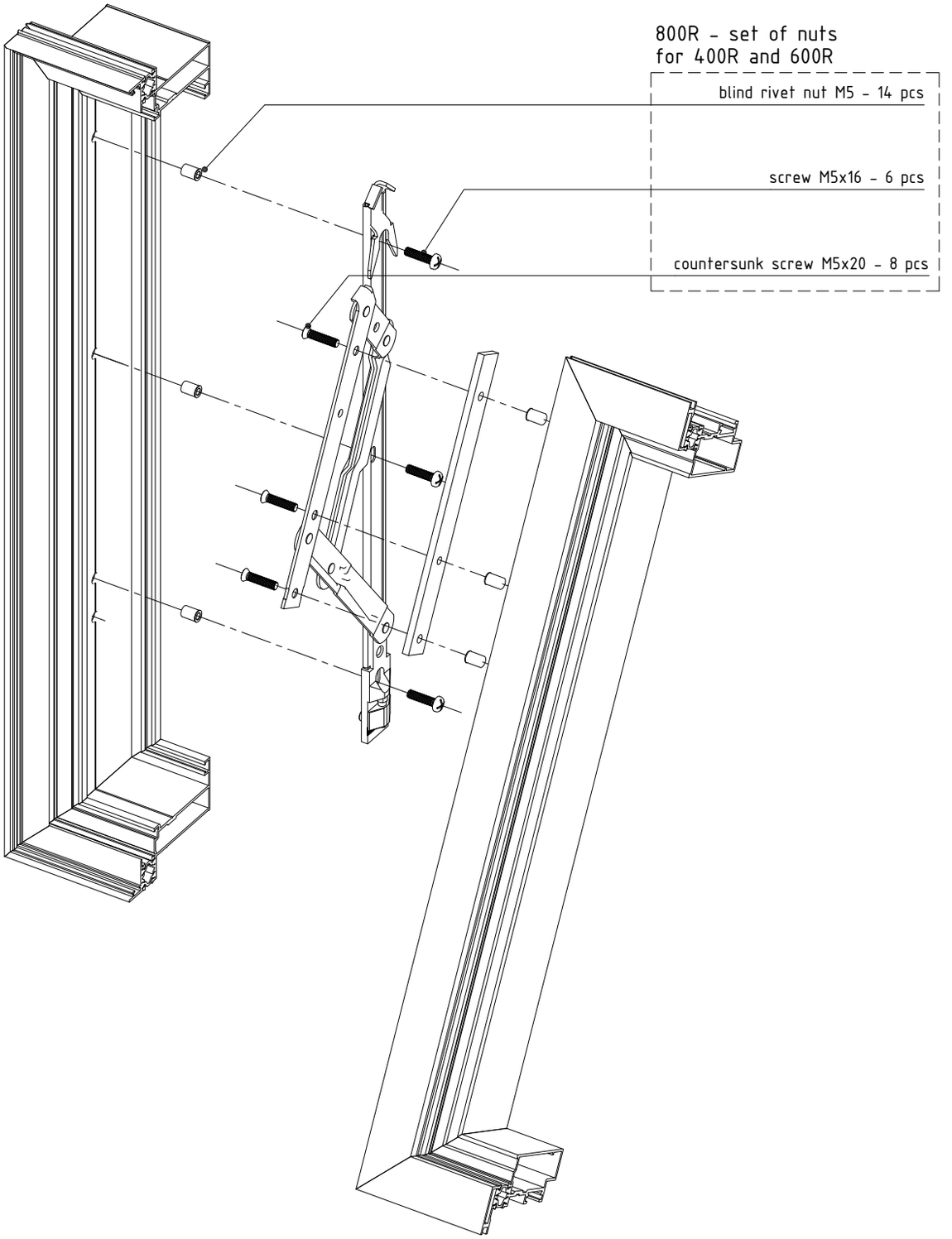


note:
cutting of EPDM 130 706 and 130 707 has to be performed with patterns 990 522 and 130 521

not to scale

E85M8.38

projected opening window



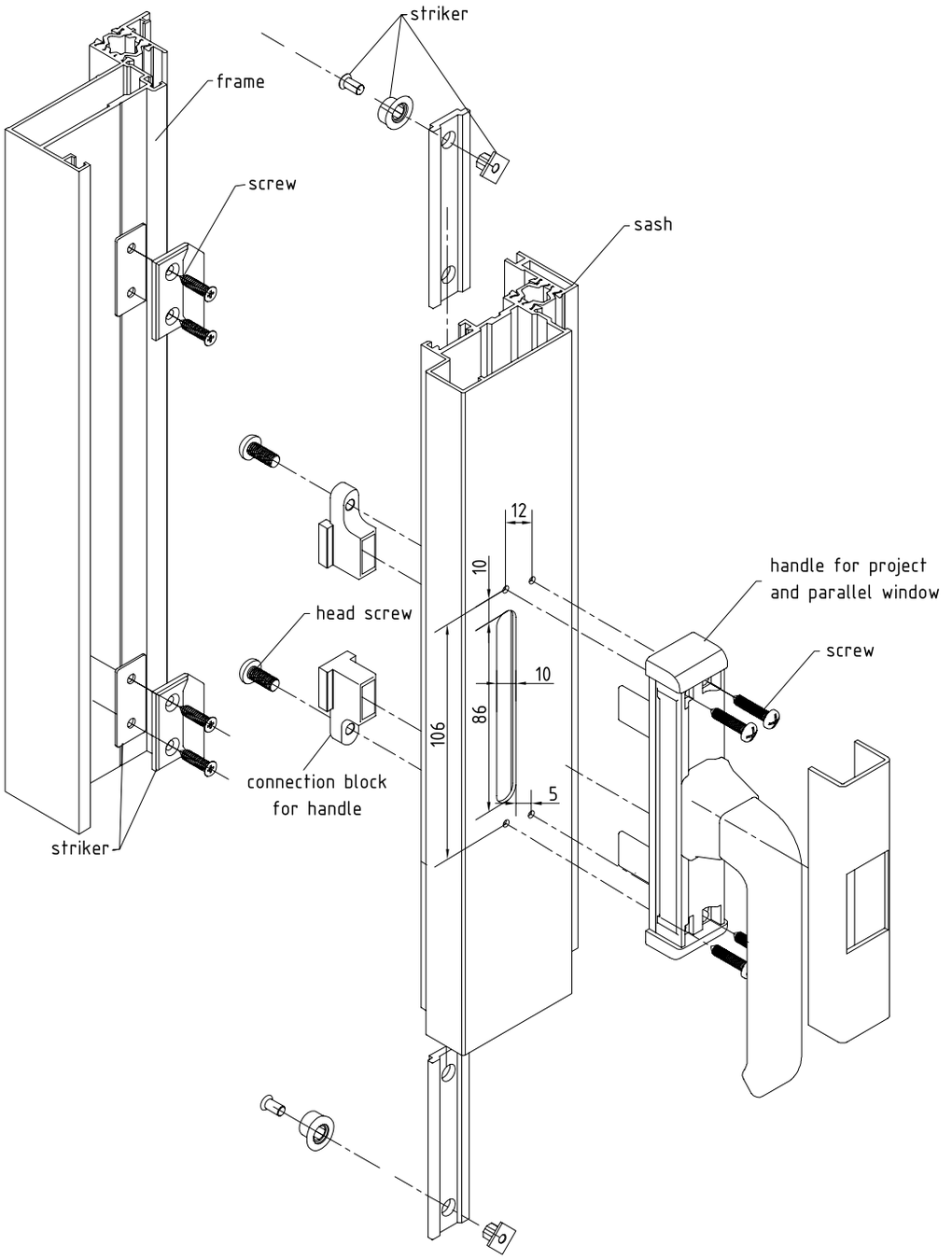
arm for projected window

code	type	length, mm	angle of opening, °	height of frame, mm	load, kg
400 R	adjustable	405	25	500–1200	80
600 R	adjustable	665	15	1201–2000	130

not to scale

E85M8.39

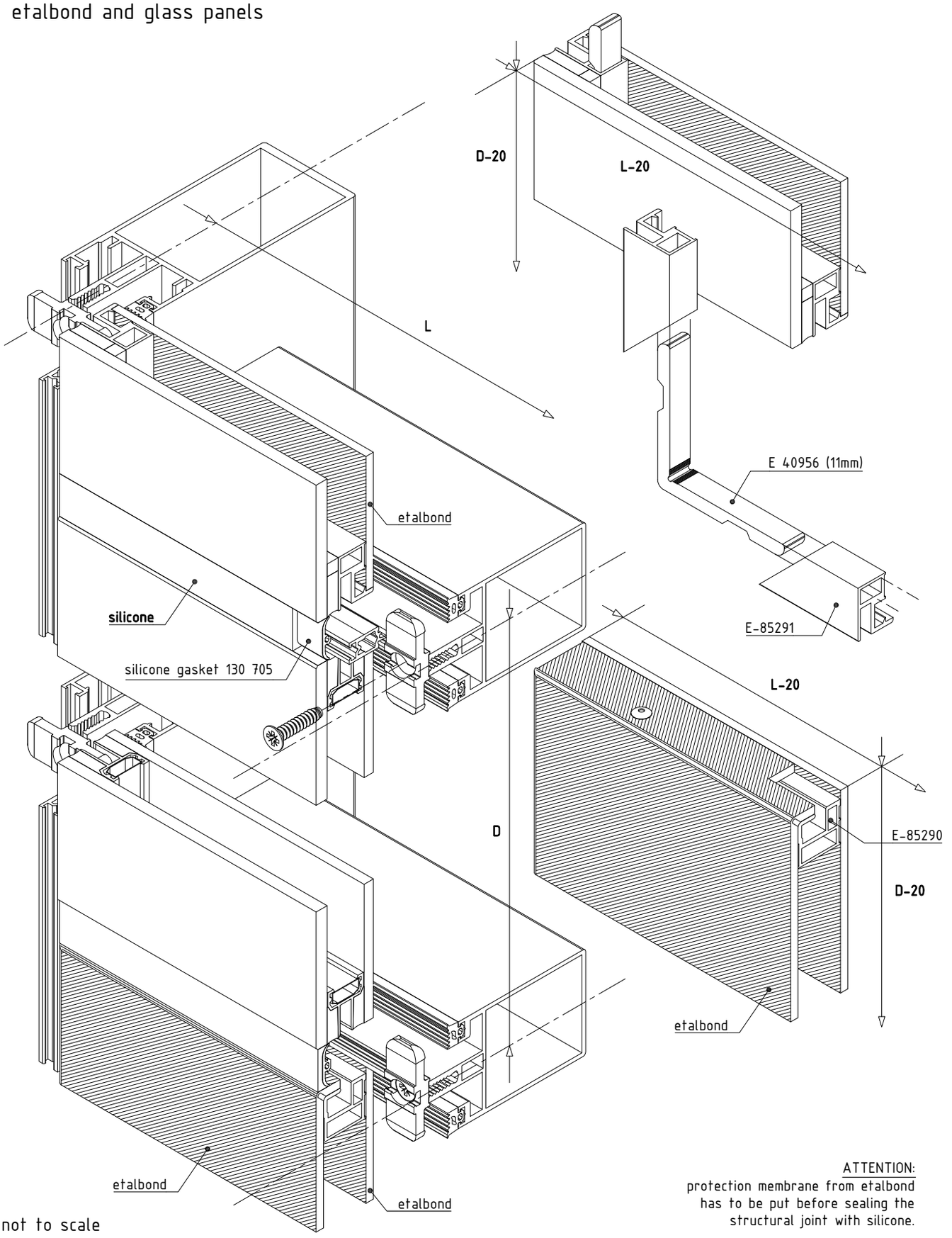
hardware assembly scheme



not to scale

E85M8.40

etalbond and glass panels



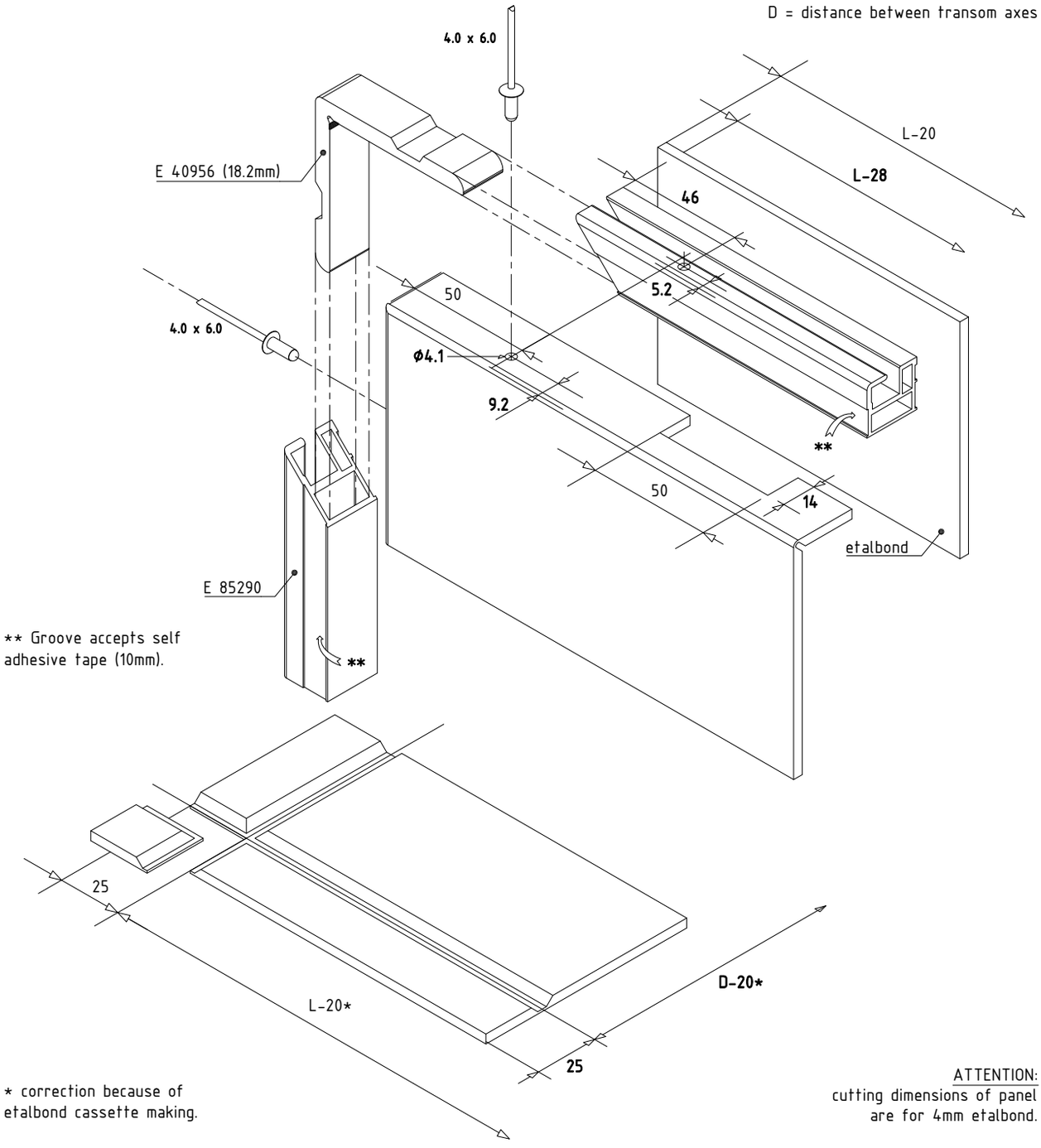
not to scale

ATTENTION:
protection membrane from etalbond has to be put before sealing the structural joint with silicone.

E85M8.41

etalbond panels

L = distance between mullion axes
D = distance between transom axes



ATTENTION:
cutting dimensions of panel are for 4mm etalbond.

not to scale

E85M8.42

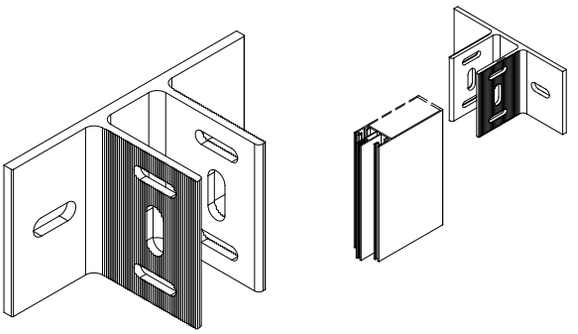
ACCESSORIES

IMAGES | DESCRIPTIONS

ETEM BUILDING SYSTEMS

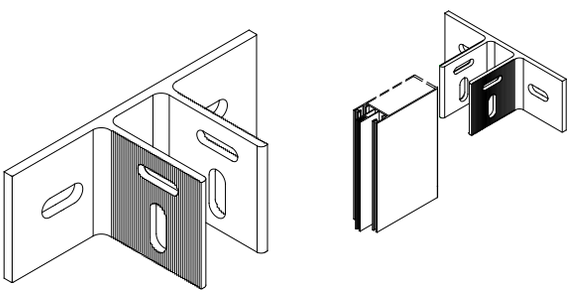
code/description	package/pcs	colour	mullion
ET071207	1	MF	

fixing bracket 120 mm



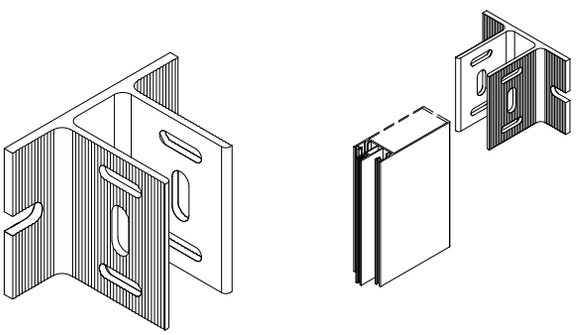
ET071090	1	MF	

fixing bracket 90 mm



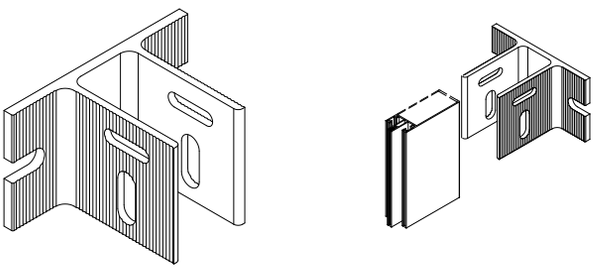
ET071120	1	MF	

fixing bracket 120 mm



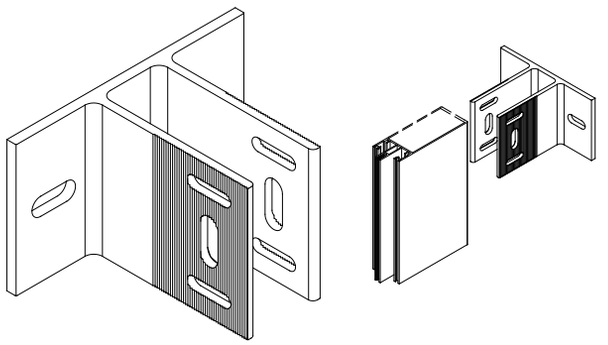
ET071290	1	MF	

fixing bracket 90 mm



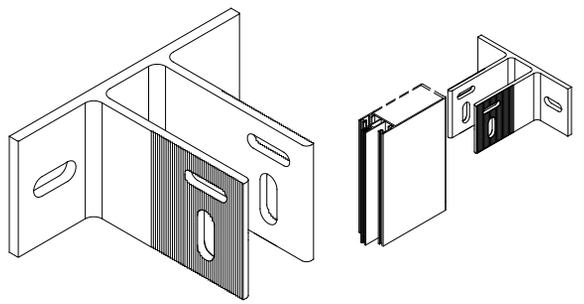
code/description	package/pcs	colour
ET071150	1	MF

fixing bracket 120 mm



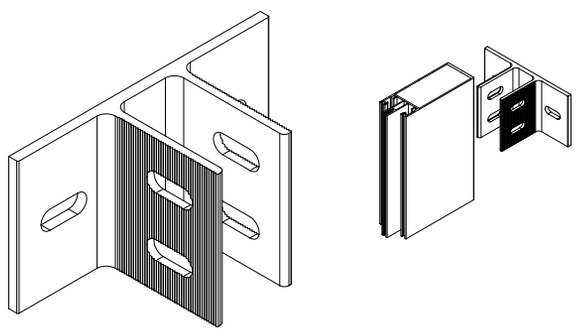
ET071159	1	MF

fixing bracket 90 mm



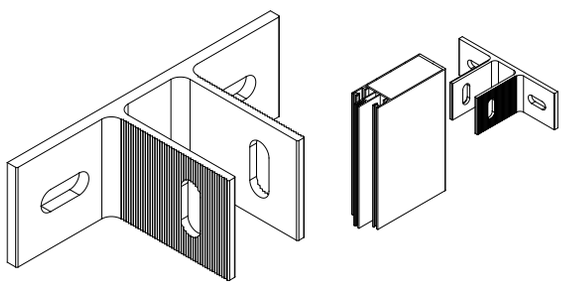
ET071270	1	MF

fixing bracket 115 mm



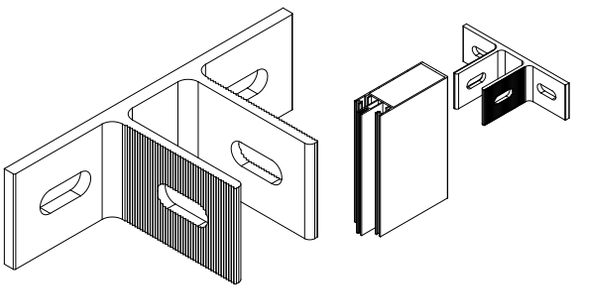
ET071072	1	MF

fixing bracket 72 mm



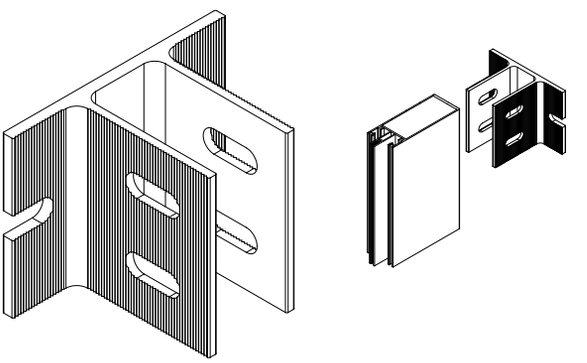
code/description	package/pcs	colour
ET071265	1	MF

fixing bracket 65 mm



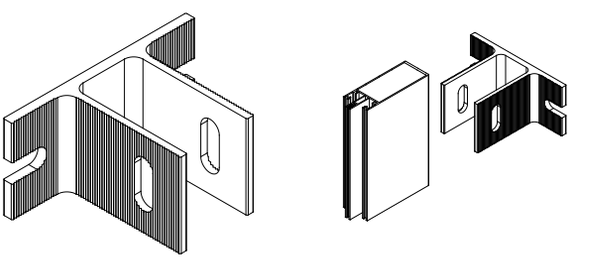
ET071015	1	MF

fixing bracket 115 mm



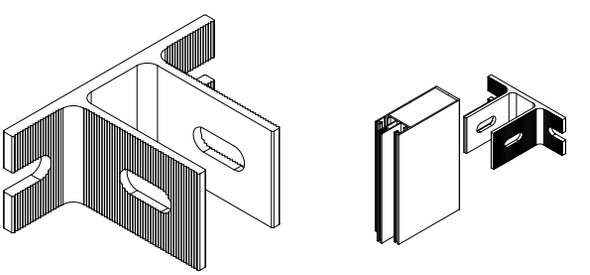
ET071390	1	MF

fixing bracket 72 mm



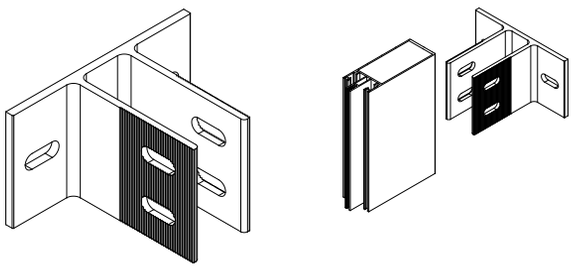
ET071065	1	MF

fixing bracket 65 mm



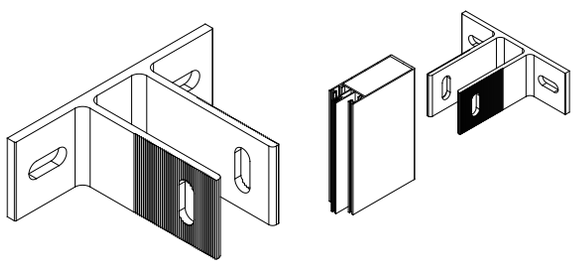
code/description	package/pcs	colour
ET071250	1	MF

fixing bracket 115 mm



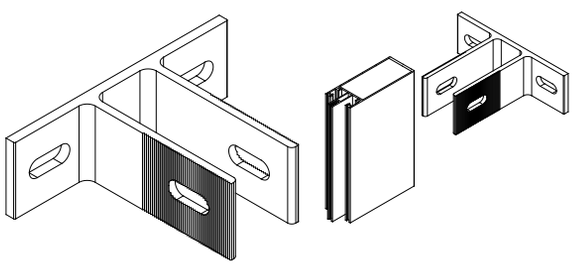
ET071572	1	MF

fixing bracket 72 mm



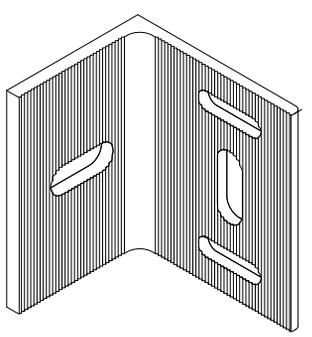
ET071565	1	MF

fixing bracket 65 mm



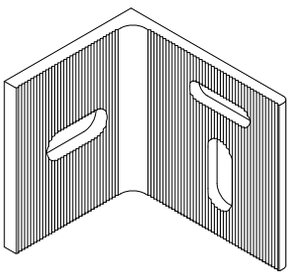
ET071121	1	MF

fixing bracket 120 mm



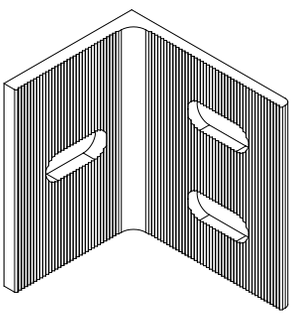
code/description	package/pcs	colour
ET071091	1	MF

fixing bracket 90 mm



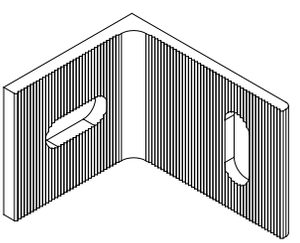
ET071172	1	MF

fixing bracket 115 mm



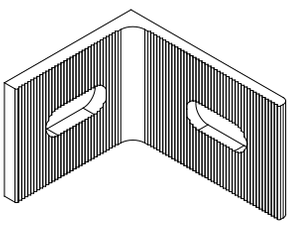
ET071372	1	MF

fixing bracket 72 mm



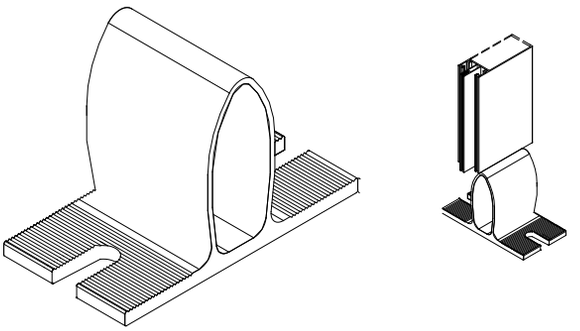
ET071165	1	MF

fixing bracket 65 mm



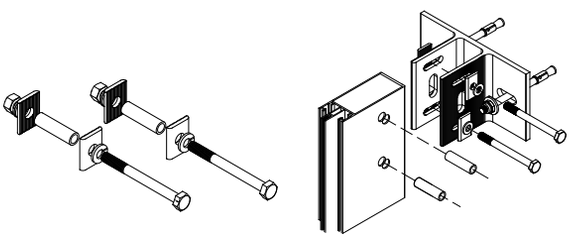
code/description	package/pcs	colour
ET071050	1	MF

hidden fixing bracket 50 mm



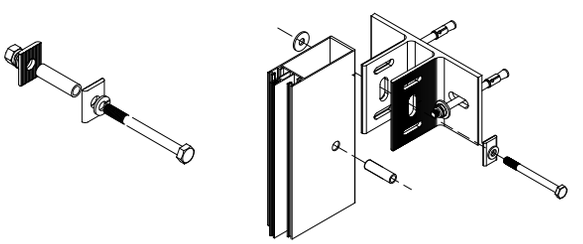
ET071211	1	MF

set for bracket as a fixed support



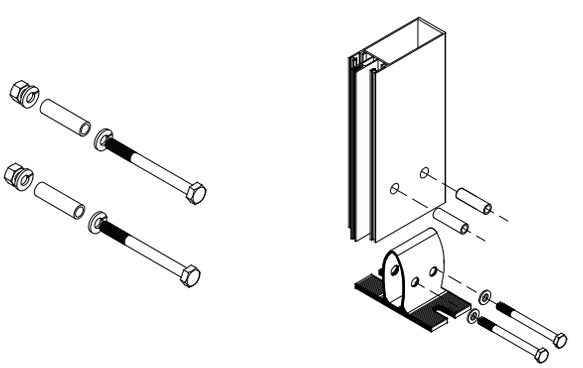
ET071212	1	MF

set for movable support



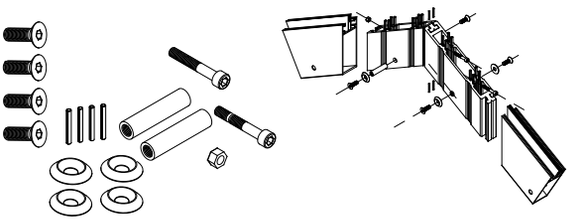
ET071213	1	MF

set for hidden fixed support



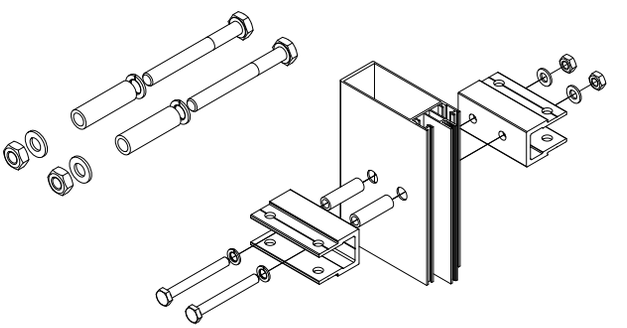
code/description	package/pcs	colour
ET071216	1	MF

set for roof connector



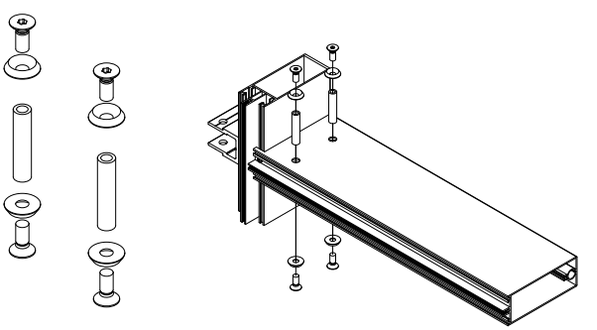
ET071218	1	MF

set for reinforced T-joint



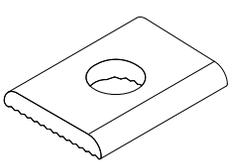
ET071219	1	MF

fixing set transom mullion



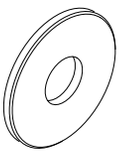
ET071208	1	MF

washer



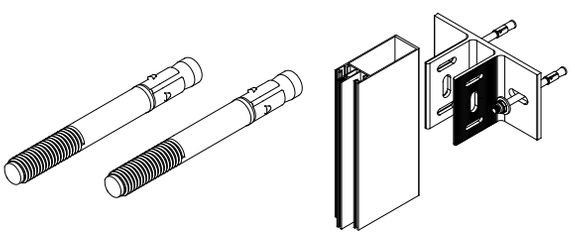
code/description	package/pcs	colour
DIN440		MF

washer



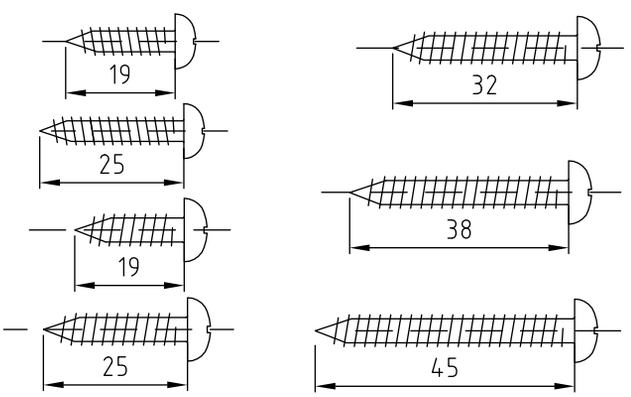
07M12123S	1	MF

galvanized anchor M12x123



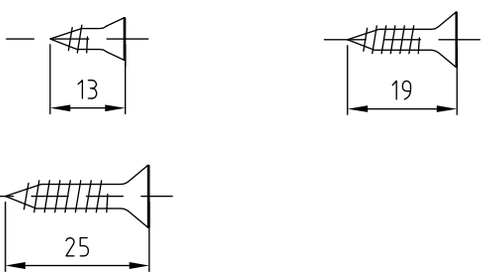
DIN 7981	100	MF

tapping screw ST4.8x19-C-H
ST4.8x25-C-H
ST5.5x19-C-H
ST5.5x25-C-H
ST5.5x32-C-H
ST5.5x38-C-H
ST5.5x45-C-H



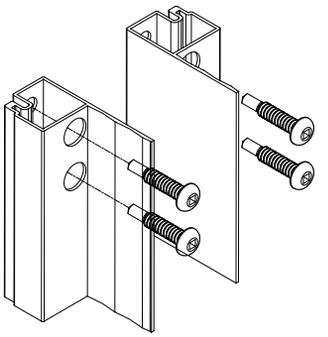
DIN 7982	100	MF

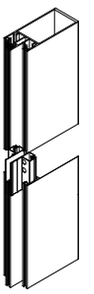
tapping screw ST3.5x13-C-H
ST4.8x19-C-H
ST5.5x25-C-H



code/description	package/pcs	colour
ET071209	50	MF

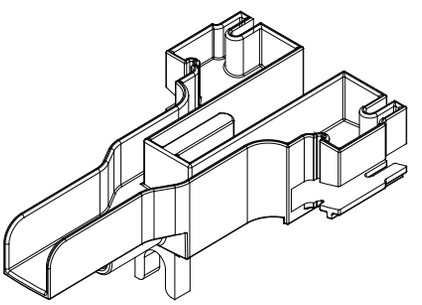
drainage fitting between mullions





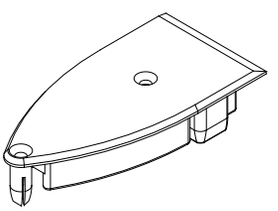
ET074674	50	●

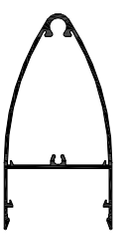
drainage for mullion



ET074657	50	●

plastic plug for profile
E85723

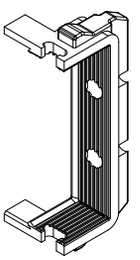


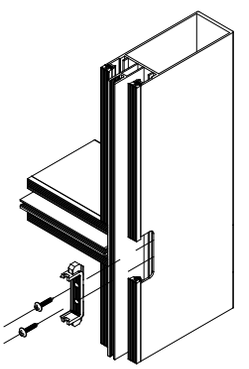


E85723

ET076651	50	●

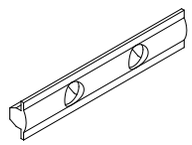
EPDM flange between
mullion and transom
2nd level drainage

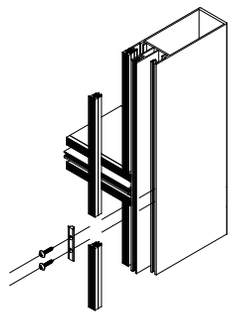




code/description	package/pcs	colour
ET076680	200	●

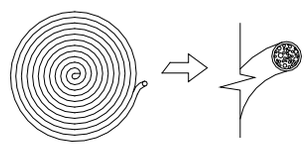
seal between mullion
and transom
3rd level drainage

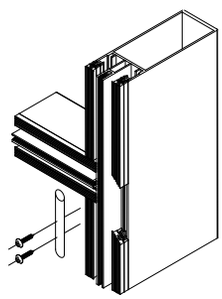




ET076681	6 m	●

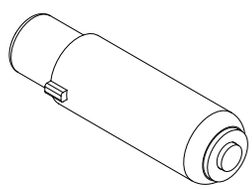
butyl seal between mullion
and transom III level drainage

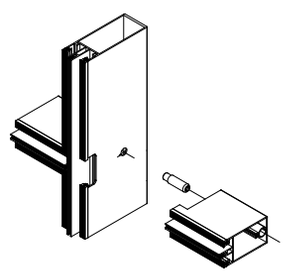




ET071113	100	MF

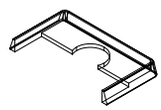
fixing part between transom
and mullion with spring

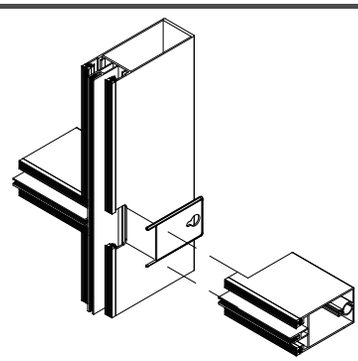




ET076671	800	●

PVC flange for transom

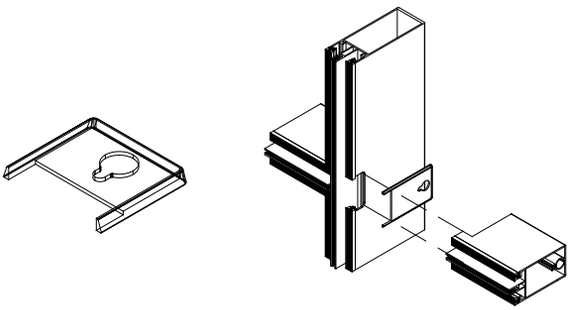




E-85 301

code/description	package/pcs	colour
ET076672	600	●

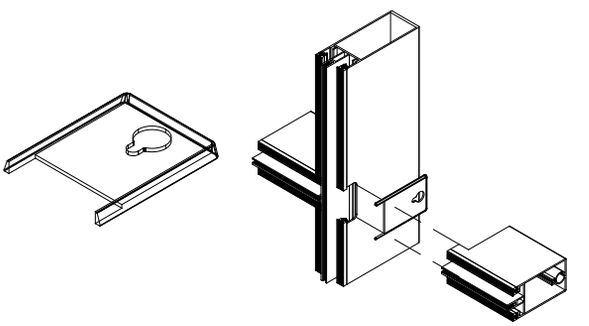
PVC flange for transom



E-85 302

ET076673	600	●

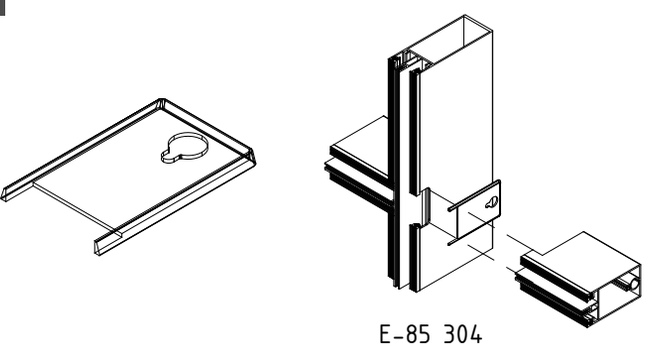
PVC flange for transom



E-85 303

ET076674	400	●

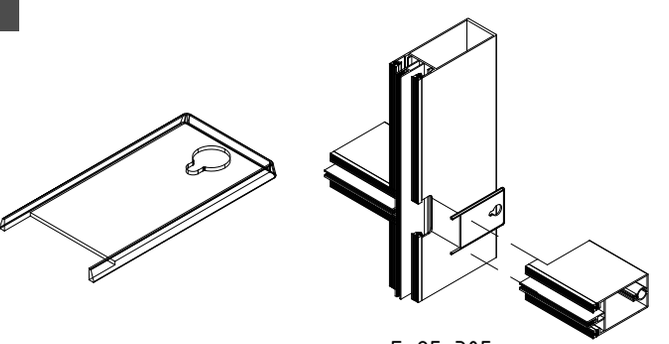
PVC flange for transom



E-85 304

ET076675	350	●

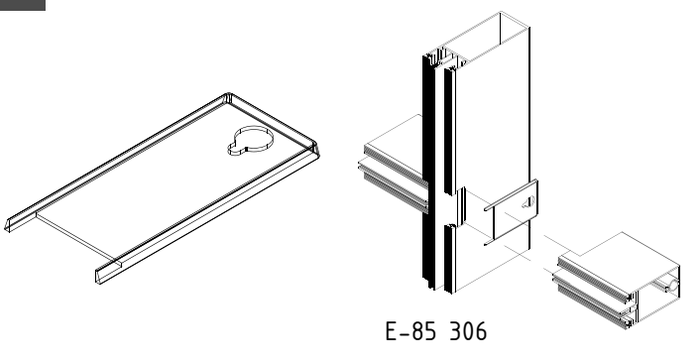
PVC flange for transom



E-85 305

code/description	package/pcs	colour
ET076676	440	●

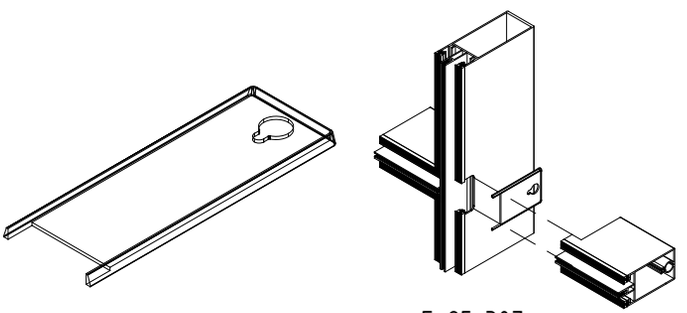
PVC flange for transom



E-85 306

ET076677	400	●

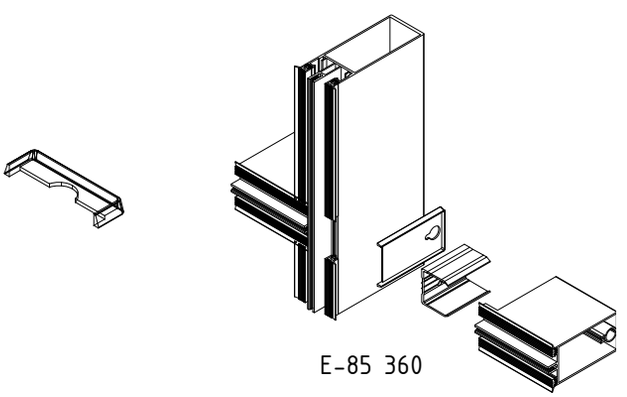
PVC flange for transom



E-85 307

ET076660	100	●

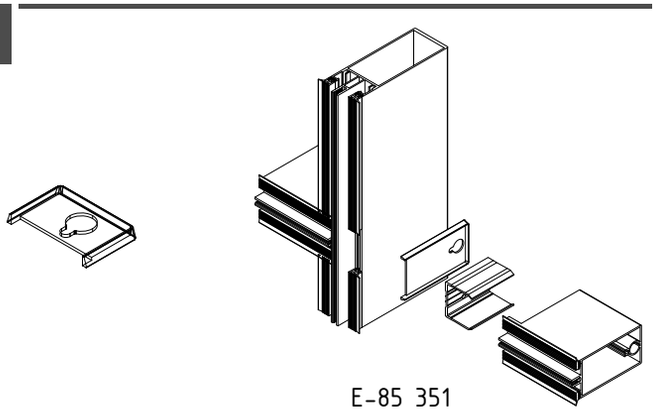
PVC flange for transom



E-85 360

ET076661	100	●

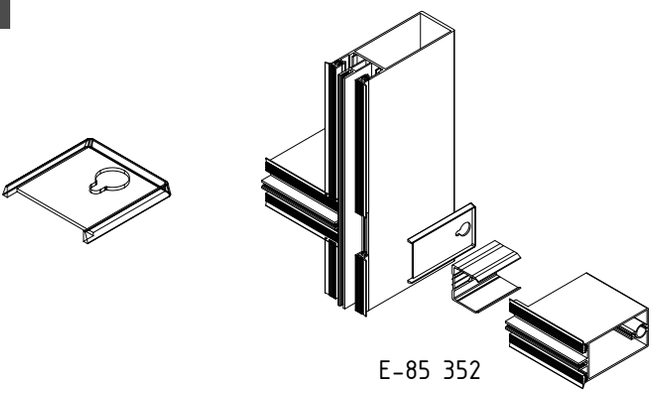
PVC flange for transom



E-85 351

code/description	package/pcs	colour
ET076662	100	●

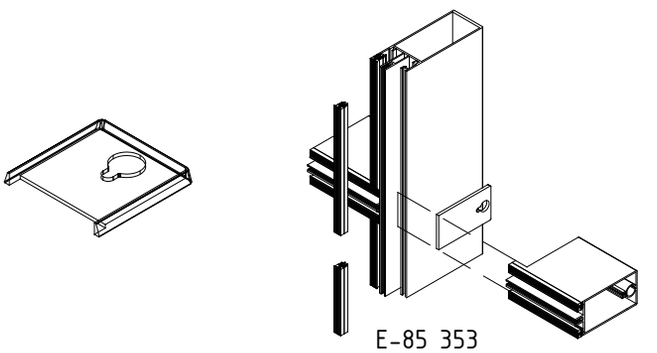
PVC flange for transom



E-85 352

ET076663	100	●

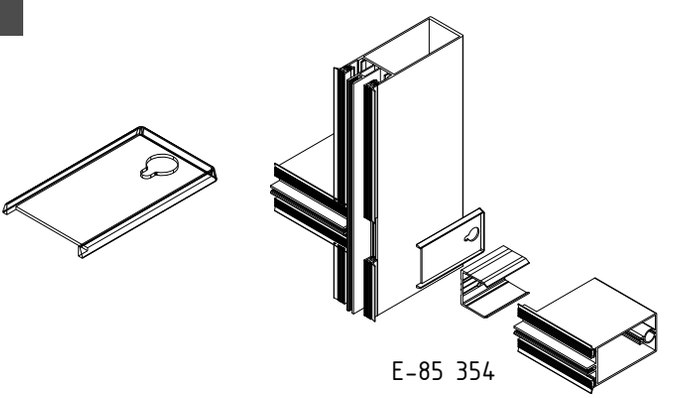
PVC flange for transom



E-85 353

ET076664	100	●

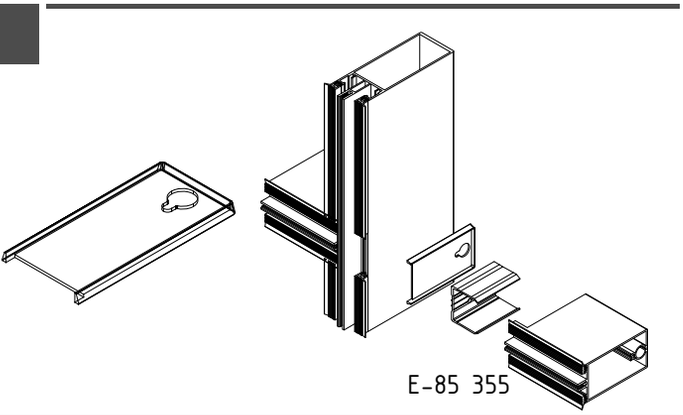
PVC flange for transom



E-85 354

ET076665	100	●

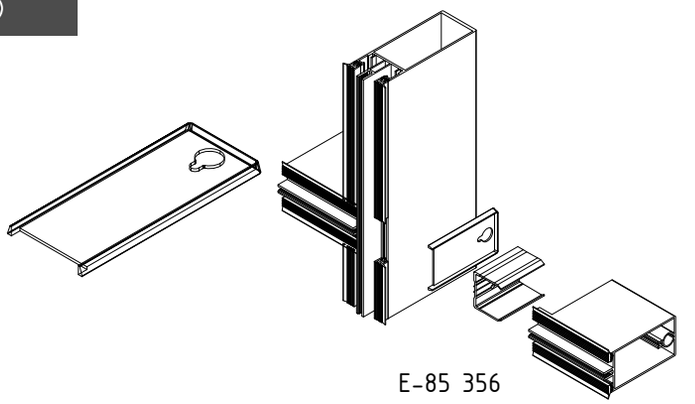
PVC flange for transom



E-85 355

code/description	package/pcs	colour
ET076666	100	●

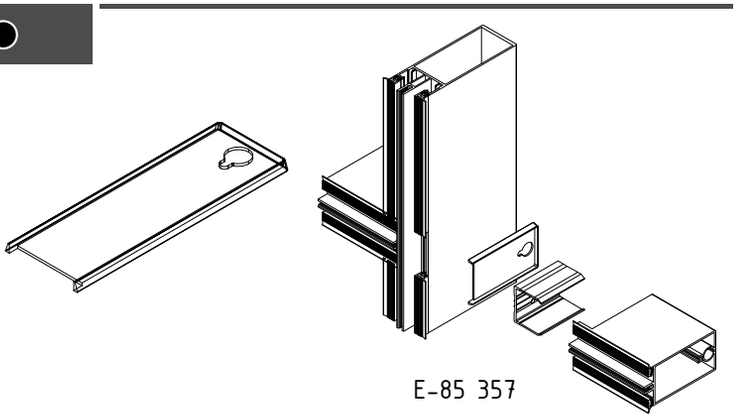
PVC flange for transom



E-85 356

ET076667	100	●

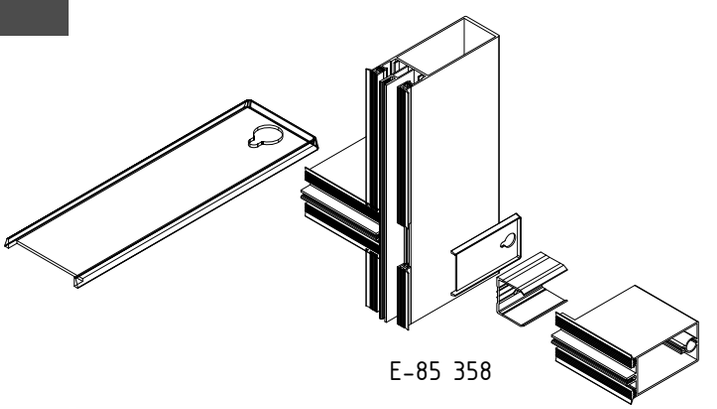
PVC flange for transom



E-85 357

ET076668	100	●

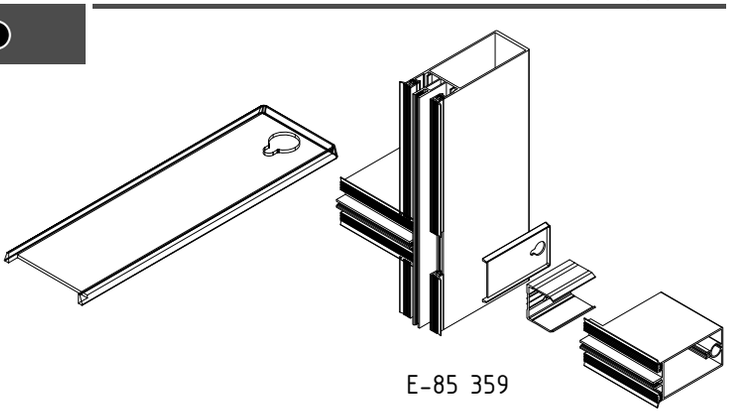
PVC flange for transom



E-85 358

ET076669	100	●

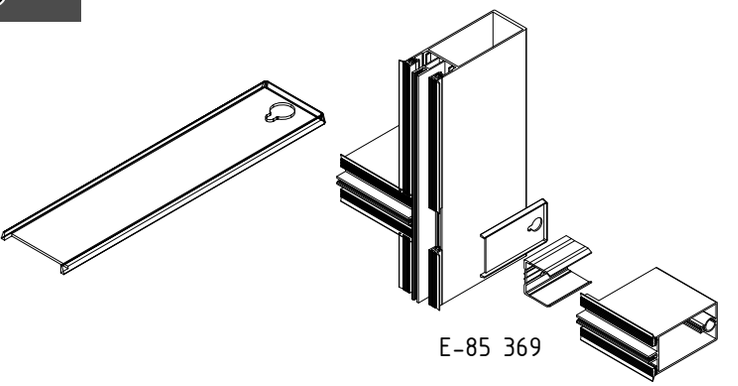
PVC flange for transom



E-85 359

code/description	package/pcs	colour
ET076670	100	●

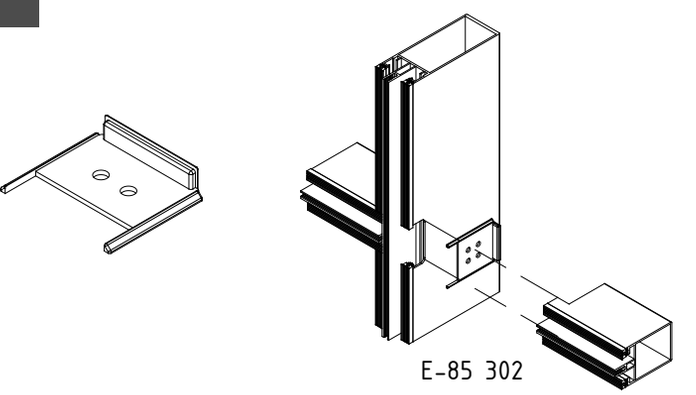
PVC flange for transom



E-85 369

ET076622	200	●

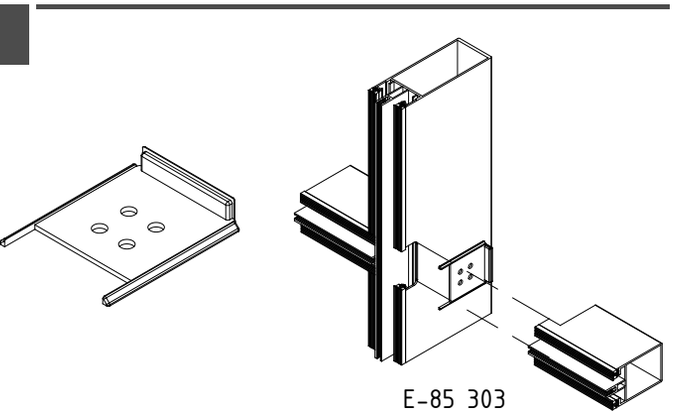
L type flange for ET071152
for transom



E-85 302

ET076623	200	●

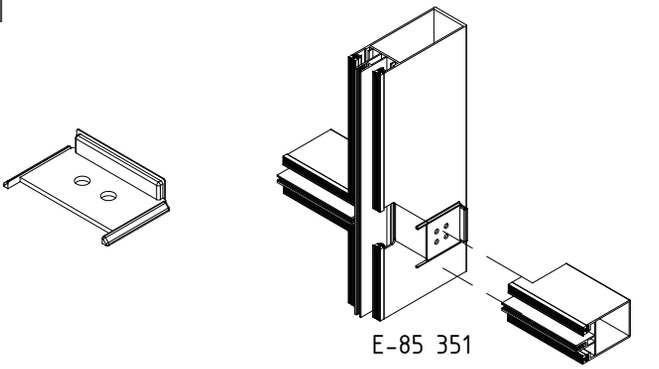
L type flange for ET071153
for transom



E-85 303

ET076624	200	●

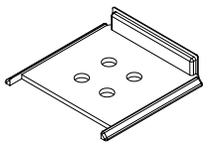
L type flange for ET071141
for transom

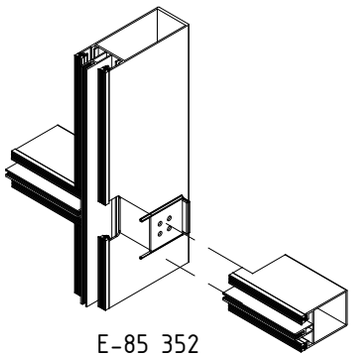


E-85 351

code/description	package/pcs	colour
ET076625	200	●

L type flange for ET071142
for transom

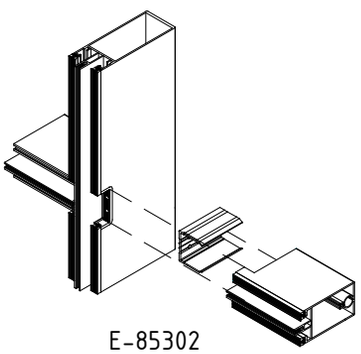




E-85 352

ET071122	300	MF

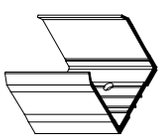
T-joint for transom

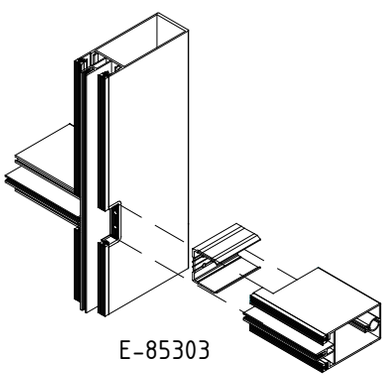


E-85302

ET071123	350	MF

T-joint for transom

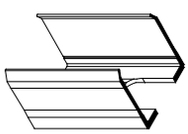


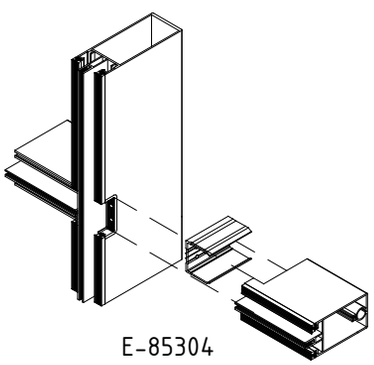


E-85303

ET071124	280	MF

T-joint for transom

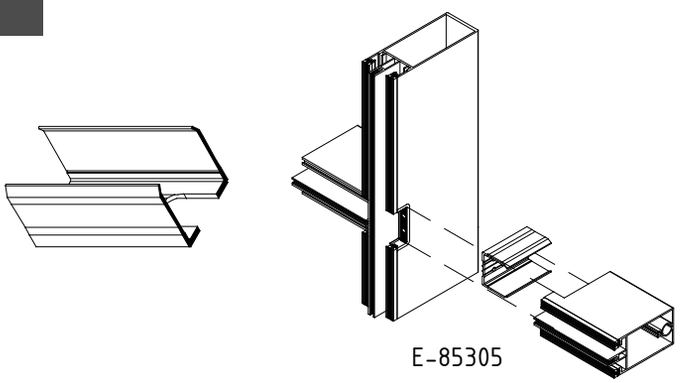




E-85304

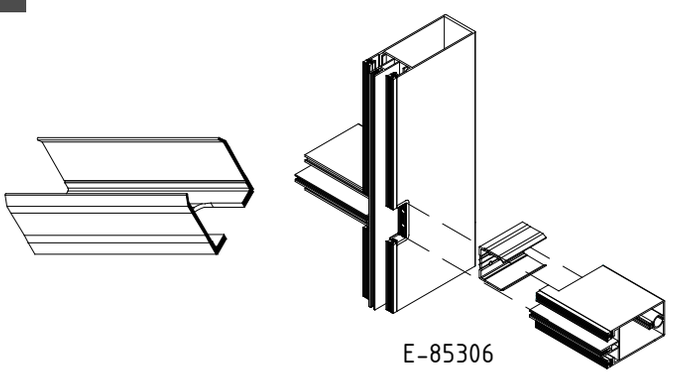
code/description	package/pcs	colour
ET071125	200	MF

T-joint for transom



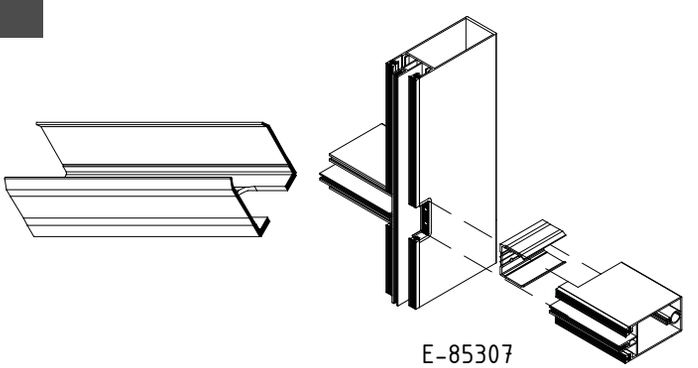
ET071126	170	MF

T-joint for transom



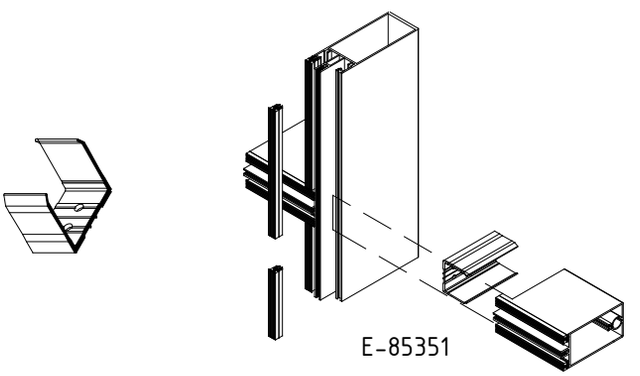
ET071127	140	MF

T-joint for transom



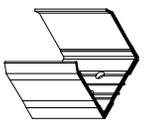
ET071131	320	MF

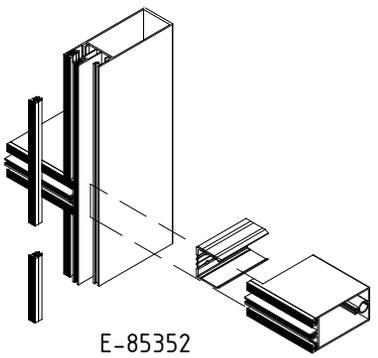
T-joint for transom



code/description	package/pcs	colour
ET071132	300	MF

T-joint for transom

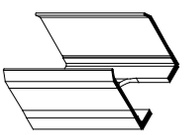


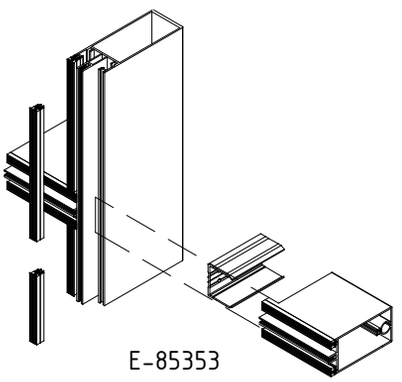


E-85352

ET071133	280	MF

T-joint for transom

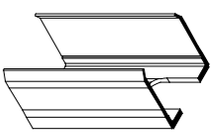


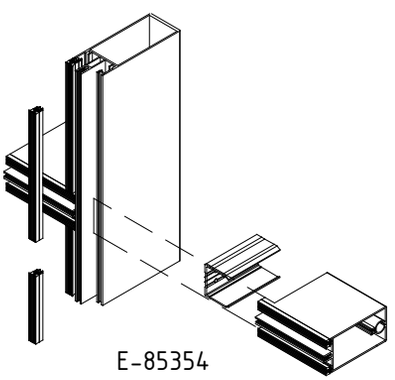


E-85353

ET071134	210	MF

T-joint for transom

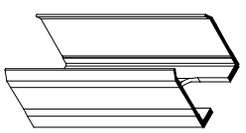


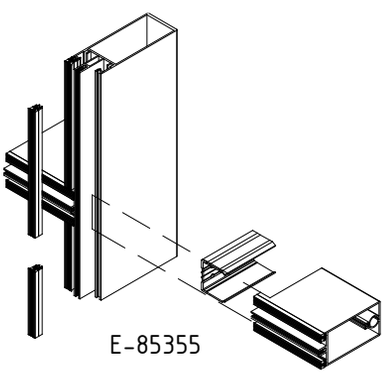


E-85354

ET071135	180	MF

T-joint for transom

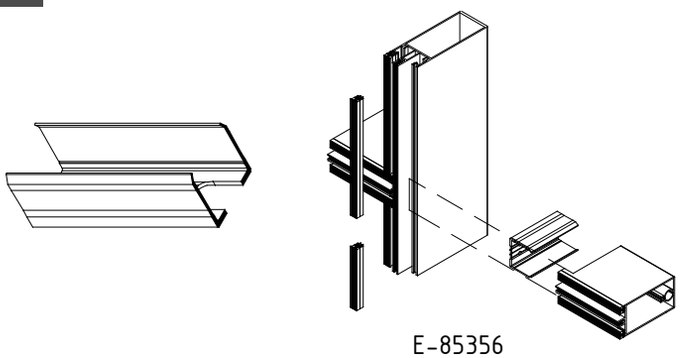




E-85355

code/description	package/pcs	colour
ET071136	156	MF

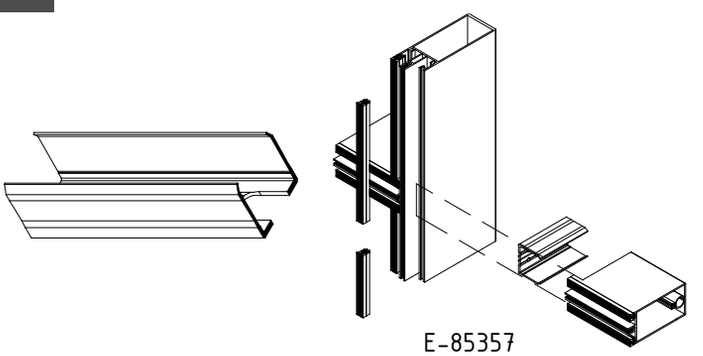
T-joint for transom



E-85356

ET071137	110	MF

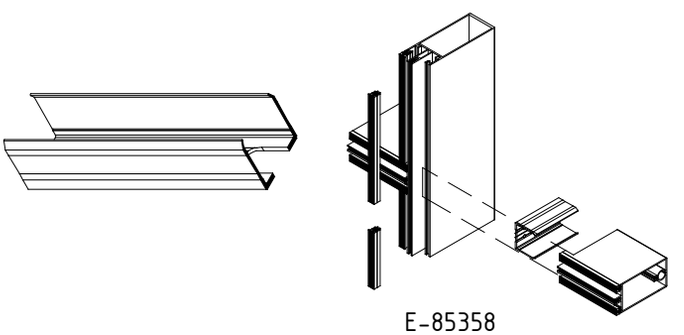
T-joint for transom



E-85357

ET071138	100	MF

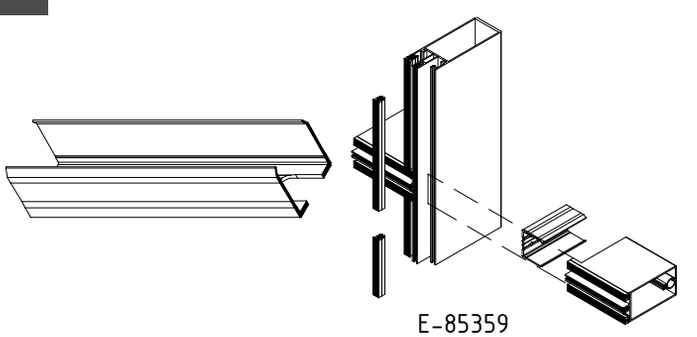
T-joint for transom



E-85358

ET071139	96	MF

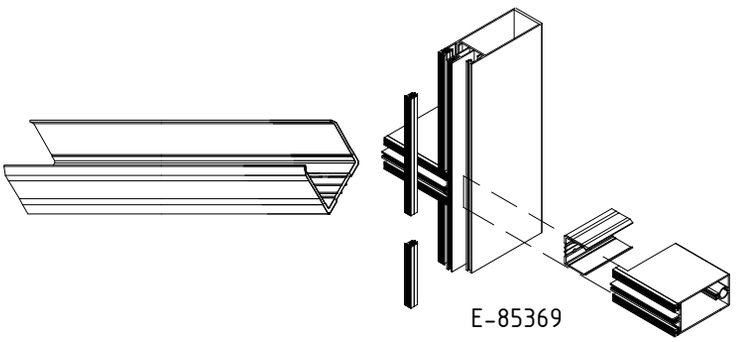
T-joint for transom



E-85359

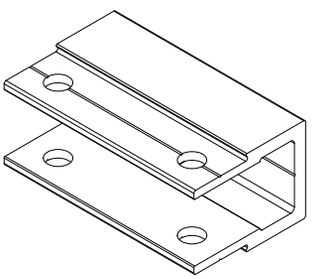
code/description	package/pcs	colour
ET071144	50	MF

T-btacket for transom 85369



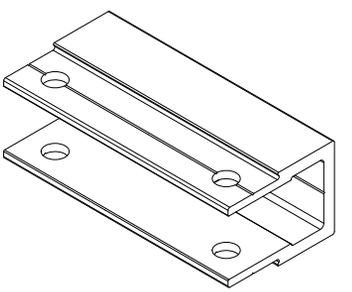
ET71140	100	MF

reinforced T-joint 105 mm
for transom 85 306
2nd level drainage



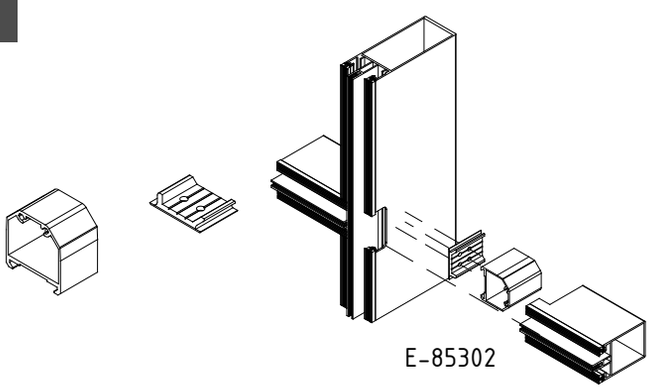
ET71143	80	MF

reinforced T-joint 150 mm
for transom 85 357
3rd level drainage



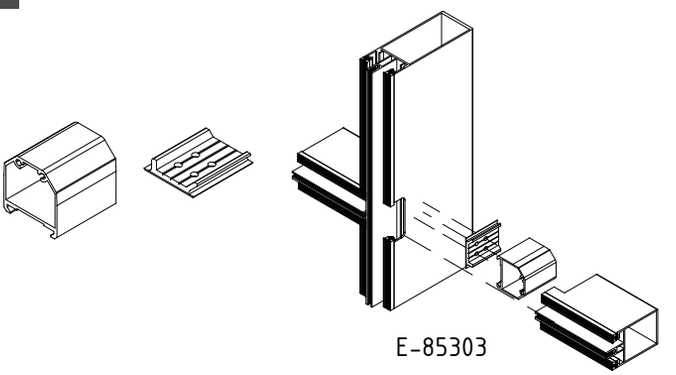
ET071152	250	MF

complex fixing part
for transom



code/description	package/pcs	colour
ET071153	150	MF

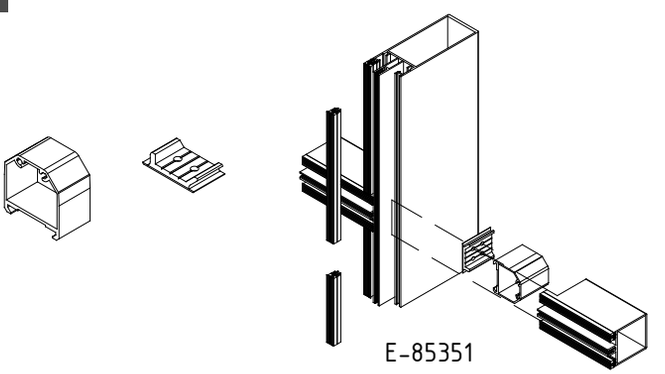
complex fixing part
for transom



E-85303

ET071141	300	MF

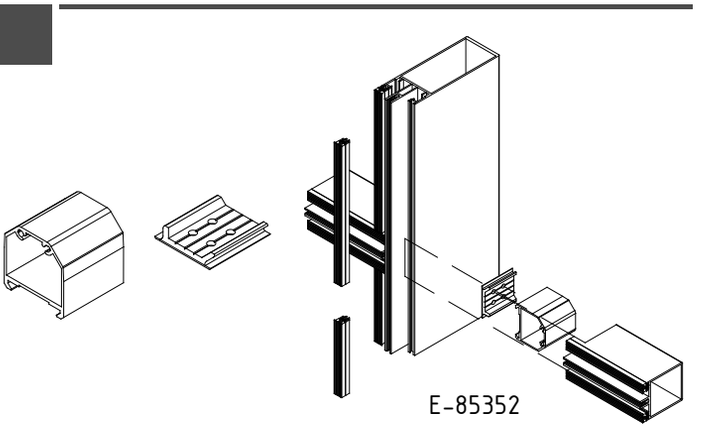
complex fixing part
for transom



E-85351

ET071142	150	MF

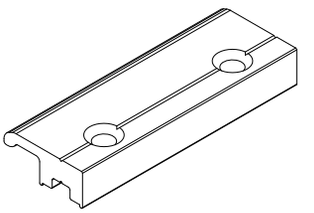
complex fixing part for transom



E-85352

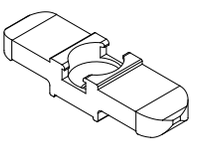
code/description	package/pcs	colour	frame
ET071130	100	MF	

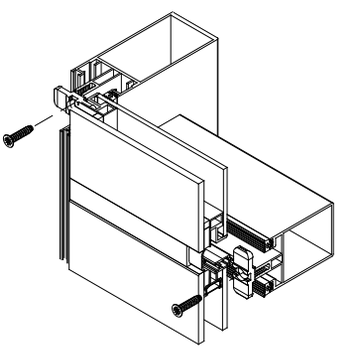
fixing part for structural
glazing 60 mm



ET071109	200	MF	

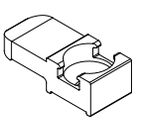
double fixing part combined
with glazing bead E85990

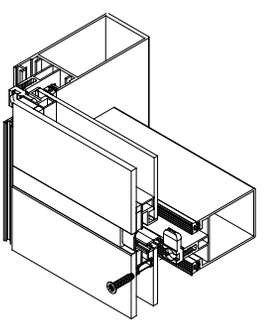




ET071110	100	MF	

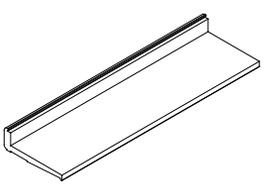
single fixing part combined
with glazing bead 85990

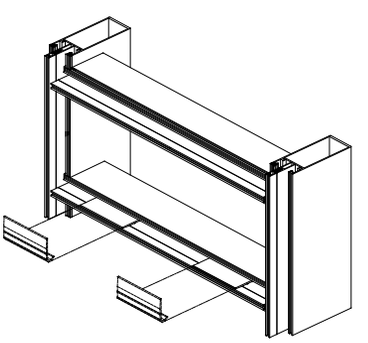




ET071180	500	MF	

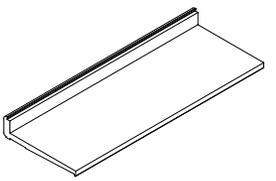
aluminium glazing shim
26.5 mm for transoms
3rd level drainage

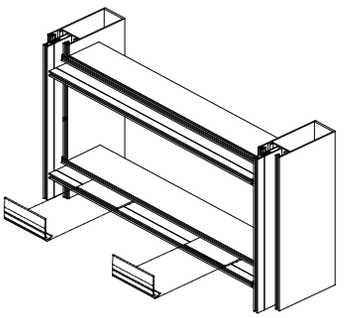




code/description	package/pcs	colour
ET071181	200	MF

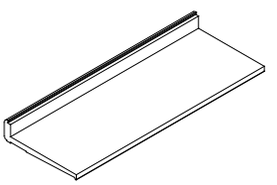
aluminium glazing shim
36.5 mm for transoms
3rd level drainage

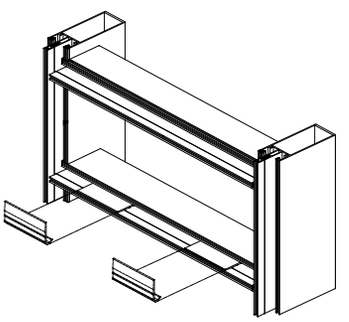




ET071185	200	MF

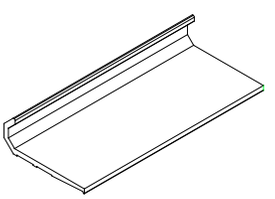
aluminium glazing shim
30 mm for transoms
3rd level drainage

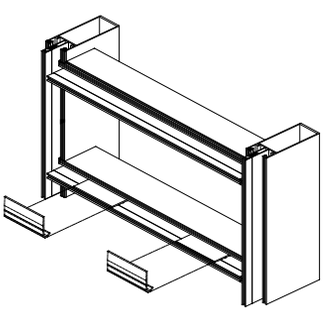




ET071182	350	MF

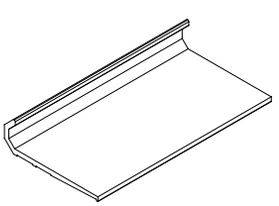
aluminium glazing shim
32 mm for transoms
2nd level drainage

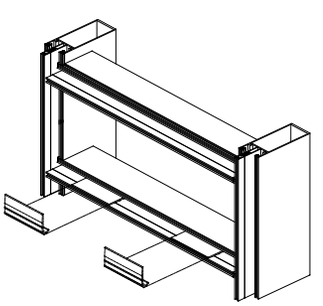




ET071183	300	MF

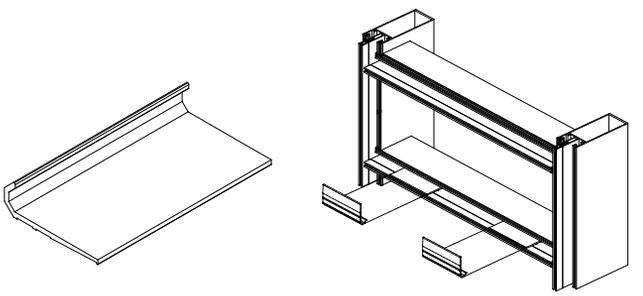
aluminium glazing shim
41 mm for transoms
2nd level drainage





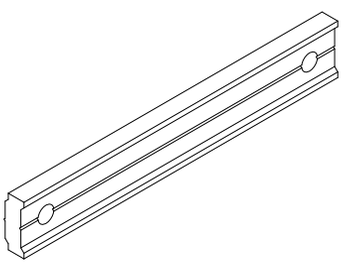
code/description	package/pcs	colour
ET071184	350	MF

aluminium glazing shim
36 mm for transoms
2nd level drainage



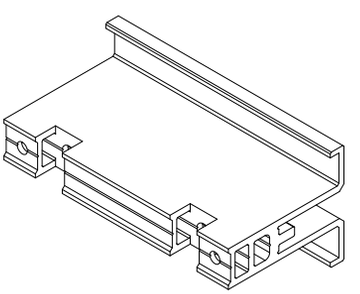
ET071186	200	MF

additional aluminium glazing shim for heavy glass panels



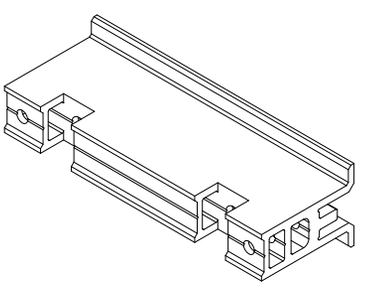
ET071187	100	MF

aluminium glazing shim for heavy glass panels, for transom
2nd level drainage



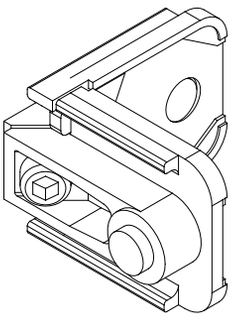
ET071188	100	MF

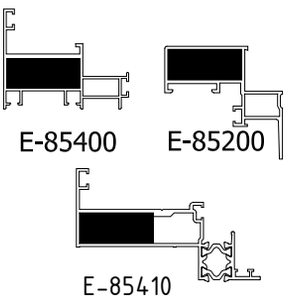
aluminium glazing shim for heavy glass panels, for transom
3rd level drainage



code/description	package/pcs	colour	projected window
ET053302	250	MF	

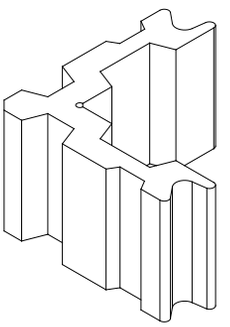
die custed aluminium
joint corner bracket

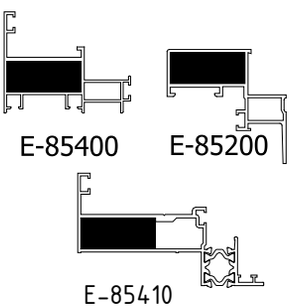




ET054457	180	MF	

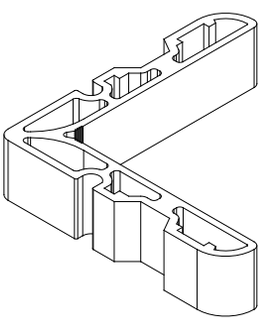
extruded aluminium joint
corner bracket 35,8 mm

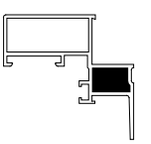




ET054459	200	MF	

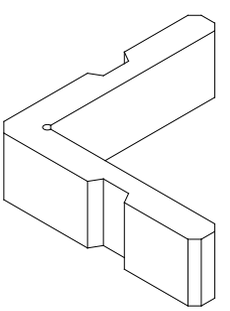
extruded aluminium joint
corner bracket 15,6 mm

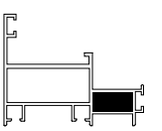




ET054458	250	MF	

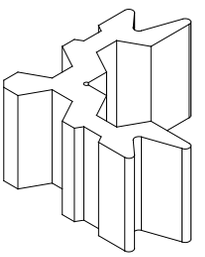
extruded aluminium joint
corner bracket 17,2 mm

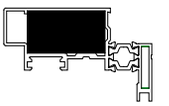




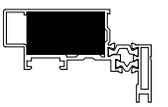
code/description	package/pcs	colour
ET054461	100	MF

extruded aluminium joint
corner bracket 40 mm





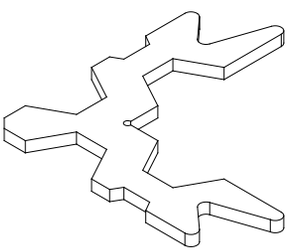
E-85210

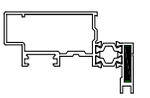


E-85211

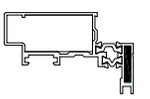
ET054462	300	MF

extruded aluminium joint
corner bracket 3.5 mm





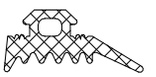
E-85210

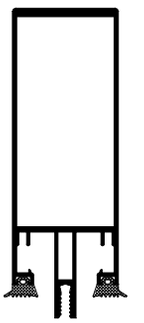


E-85211

code/description	package/pcs	colour	gaskets
ET130473	80	●	

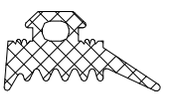
EPDM gasket
for glazing 3 mm

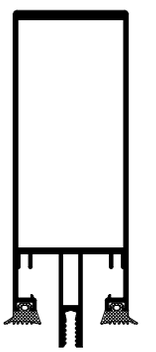




ET130474	100	●	

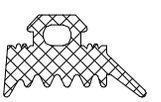
EPDM gasket for
glazing 4 mm

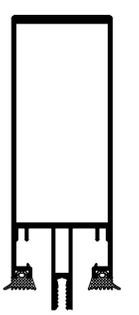




ET130462	100	●	

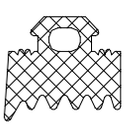
EPDM gasket for
glazing 4 mm

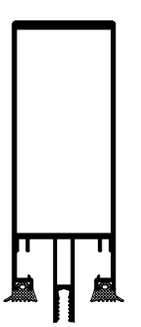




ET130455	100	●	

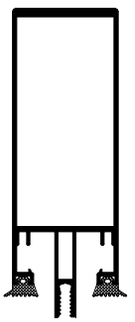
EPDM gasket for
glazing 5 mm





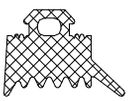
code/description	package/pcs	colour
ET130181	200	●

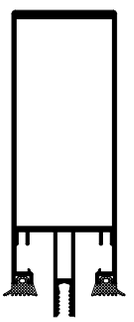
EPDM gasket for
glazing 5 mm



ET130463	80	●

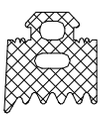
EPDM gasket for
glazing 6 mm

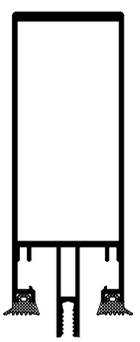




ET130457	110	●

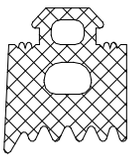
EPDM gasket for
glazing 7 mm

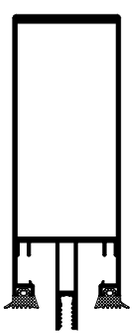




ET130458	100	●

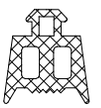
EPDM gasket for
glazing 8 mm

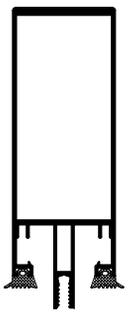




code/description	package/pcs	colour
ET130167	120	●

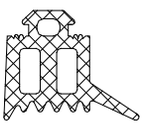
EPDM gasket for glazing 8 mm

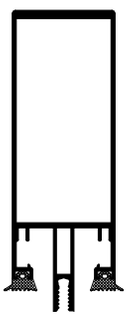




ET130479	100	●

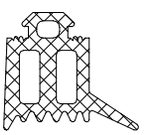
EPDM gasket for glazing 9 mm

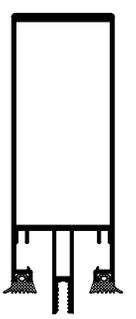




ET130470	100	●

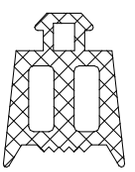
EPDM gasket for glazing 10 mm

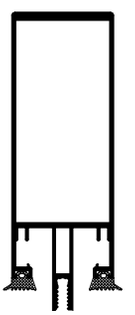




ET130182	100	●

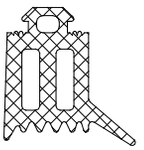
EPDM gasket for glazing 10 mm

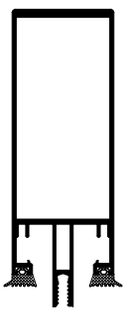




code/description	package/pcs	colour
ET130480	100	●

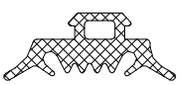
EPDM gasket for
glazing 12 mm

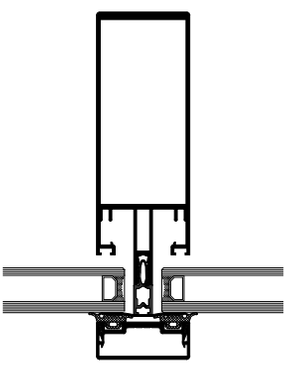




ET130500	140	●

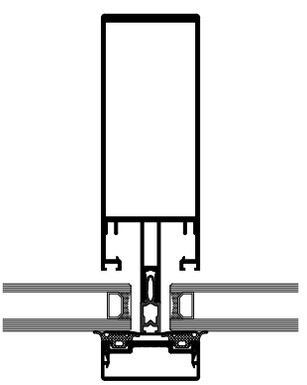
EPDM gasket for
pressure plate





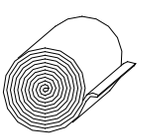
ET130553	160	●

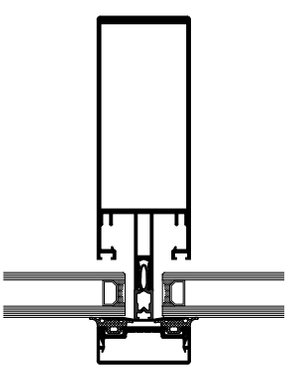
one side butyl seal
tape 45 mm



ET130551	160	●

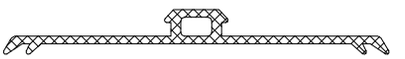
two side butyl seal
tape 50 mm

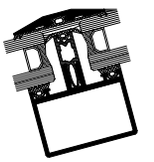




code/description	package/pcs	colour
ET130126	110	●

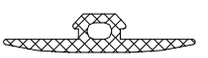
silicone gasket for
pressure plate E85702

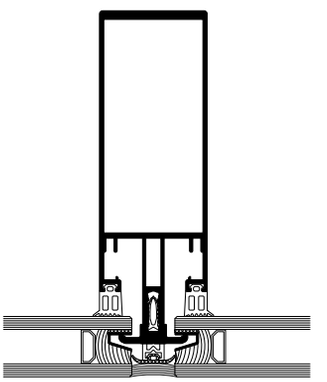




ET130705	120	●

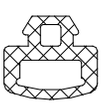
silicone gasket for
structural glazing

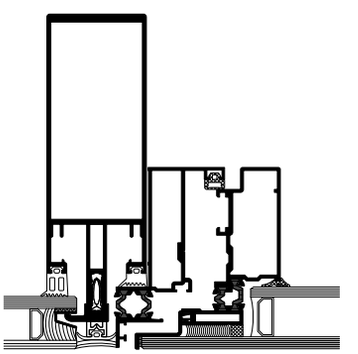




ET130180	350	●

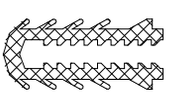
EPDM gasket for
projected window

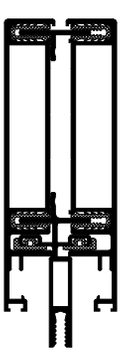




ET130199	100	●

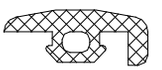
EPDM expansion joint gasket

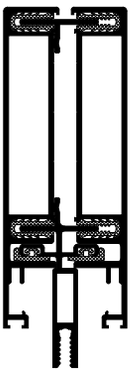




code/description	package/pcs	colour
ET130198	200	●

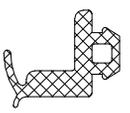
EPDM gasket for E85152,
E85153, E85154, E85155

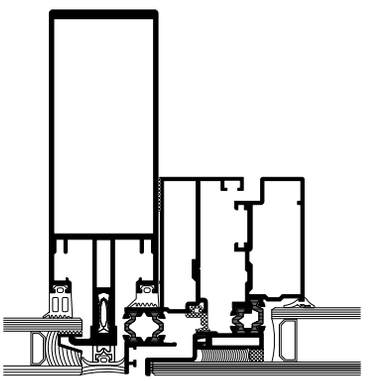




ET130461	110	●

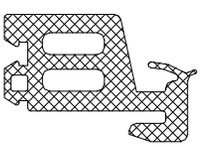
EPDM gasket for projected
window for profile E85410

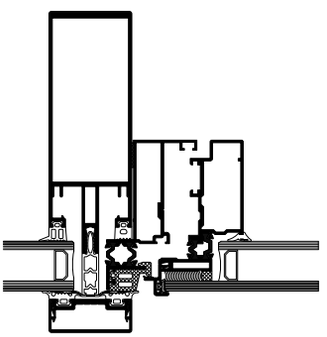




ET130706	45	●

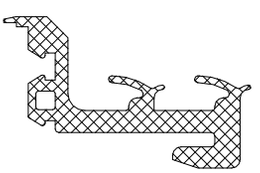
EPDM external gasket for
projected façade with cover plate

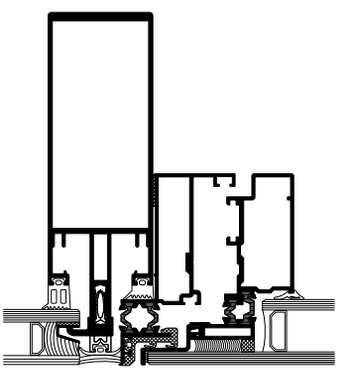




ET130707	110	●

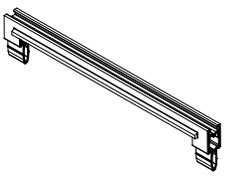
EPDM external gasket for projected
façade window structural glazing

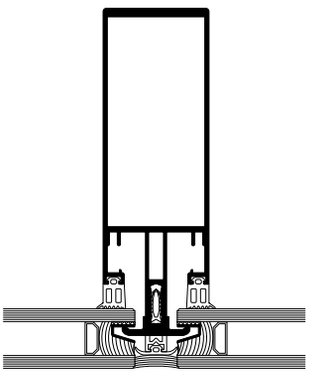




code/description	package/pcs	colour
ET080183	100 δp/pcs	●

polyamide joint



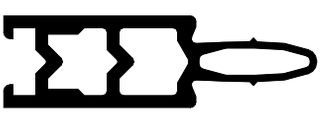


code/description	package/m	colour	thermal insulation spacers
ET080171	6	●	

thermal insulation
PVC spacer 16 mm

ET080174	6	●	

thermal insulation
PVC spacer 21 mm

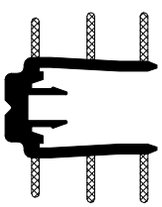


code/description	package/pcs	colour
ET080172	6	●

thermal insulation
PVC spacer 25 mm

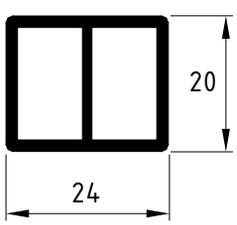
ET080173	6	●

additional (optional) thermal
insulation PVC spacer



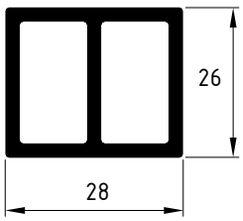
ET080177	6	●

thermal insulation spacer
PVC 20x24 mm



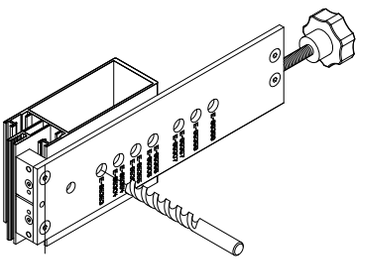
ET080184	6	●

thermal insulation
spacer PVC 26x28 mm



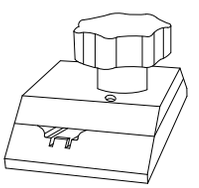
code/description	package/pcs	colour	tools
ET162 058	1	○	

jig for opening the fixing holes on mullion for the spring operated fixing part ET 071113.00 between transom-mullion



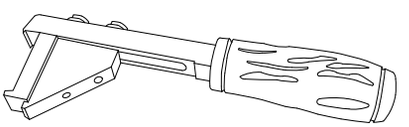
ET990 520	1	●	

jig for cutting the gasket ET 130500.00, placed on the pressure plate for the horizontal members



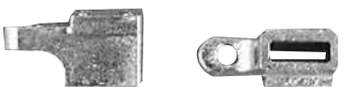
ET990 523	1	●	

jig for removing decorative caps



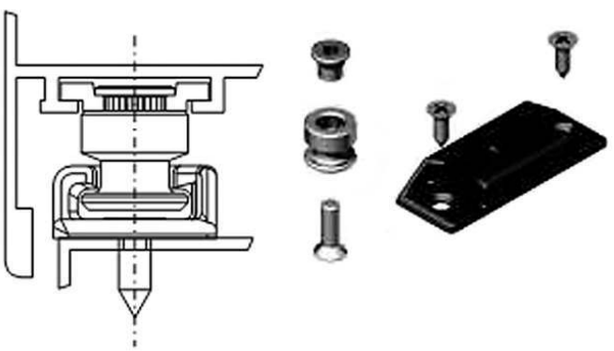
code/description	package/pcs	colour	projected window
GI2236	10	MF	

connection block for handle
for projected window "NOVA" GI255601
for sash 85 210; 85 211



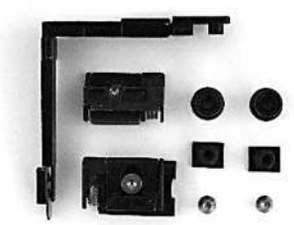
GI04041	20	●	

antibreack dispositive



GI4020	10	●	

additional locking for projected
window E85 and E8000



BE400R	10	MF	

pair of arms for projected window
80 kg for E85

code/description	package/pcs	colour
BE600R	10	MF

pair of arms for projected window
130 kg for E85

BE900R	10	MF

pair of arms for parallel opening
for projected window 120 kg
for E85

BE700R	100	MF

spacers for arms
400R and 600R for E85

BE800R	100	MF

set of nuts for
400R and 600R

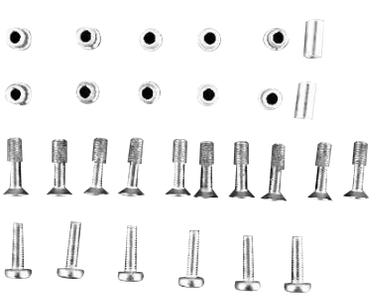
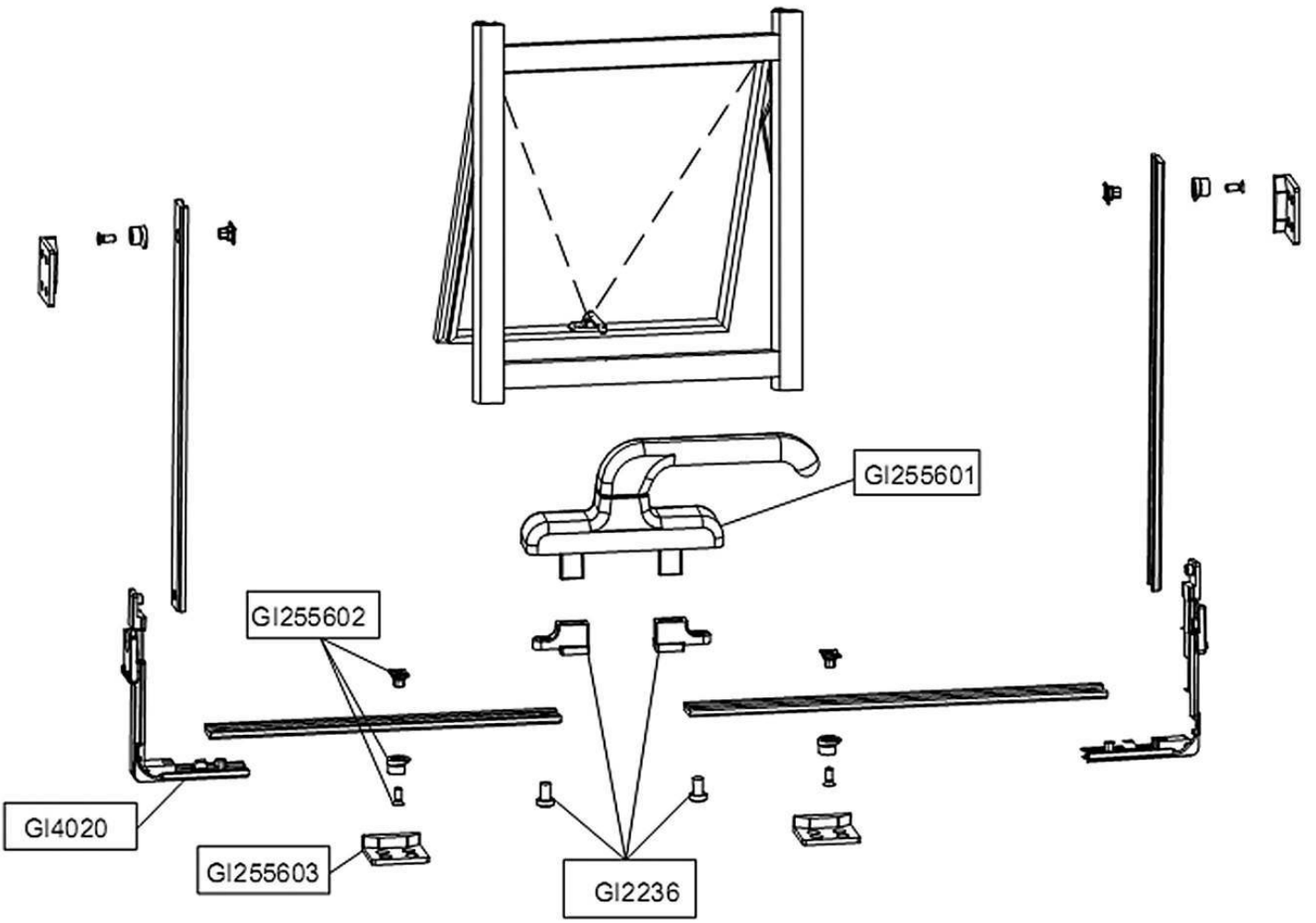
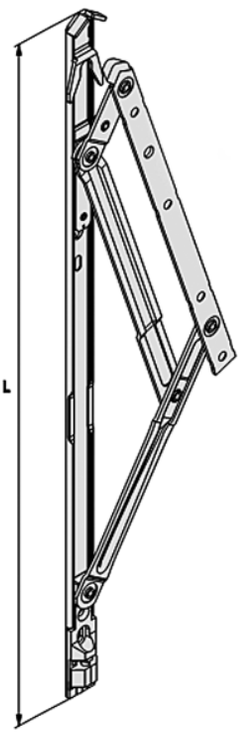


FIG 1



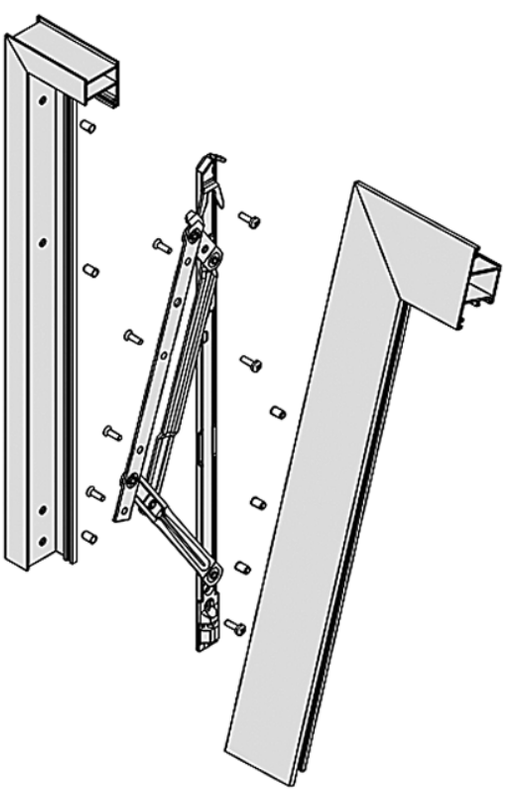
scheme

number	model	length L	opening angle	height of sash	weight, kg
BE400R 80 kg	adjustable	405 mm	25º	500 to 1200 mm	
BE600R 130 kg	adjustable	665 mm	15º	1500 to 2000 mm	



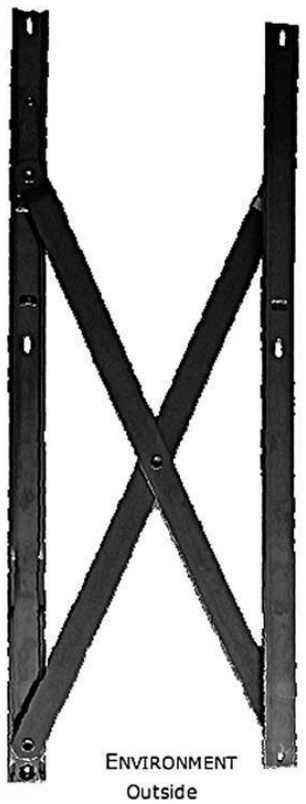
BE800R

installation on friction arms with nuts



scheme

BE900R



width, mm	height, mm	weight, kg	number of scissors
1200	1000	60	3
2000	1500	100	5
1500	2000	120	5

CE MARKING

ALUMINIUM AS MATERIAL | STANDARDS | REQUIREMENTS

ETEM BUILDING SYSTEMS

Aluminium as material

- Aluminium is a very young metal, extracted for the first time in 1854. Commercially produced as a precious metal from 1886, its industrial production for civil applications only achieved wide use in the 1950's.
- Now aluminium plays a key role for the sustainability of new buildings and the renovation of existing ones. Thanks to its performance properties aluminium contributes to the energy performance, safety and comfort of new buildings.

Alloys

Aluminium in its pure form is a very soft metal. Thanks to the addition of alloying elements such as copper, manganese, magnesium, zinc, etc. and thanks to suitable production processes, the physical and mechanical properties can be varied in a wide range to satisfy the requirements of a large number of different applications.

ETEM profiles are extruded from the following alloys:

EN AW-1050 [Al 99.5]
EN AW-6060 [Al Mg Si]
EN AW-6063 [Al Mg0,7 Si]
EN AW-6061 [Al Mg1 Si Cu]
EN AW-6005 [Al Si Mg]
EN AW-6082 [Al Si1 Mg Mn]

Extrusion process

ETEM profiles are obtained through extrusion process, which consists of pushing a hot cylindrical billet of aluminium through a shaped die. The extrusion process offers almost infinite range of forms and sections,
allowing our designers to integrate numerous functions into one single profile.

Finishing

POWDER COATING – it is a type of paint that is applied as a dry powder. Coating is applied on ETEM profiles electrostatically and then is cured under heat
to allow it to flow and form a ''skin''.

ETEM is authorized to use the quality sign QUALICOAT
for powder coatings on aluminium for architectural applications. A wide range of colors and gloss levels can be achieved.

ETEM also offers timber imitations painting, in addition to all RAL colors. The technology EZY provides the following colors: Golden Oak, Acero, Betulla, Mogano, Verde Scuro, Wenge, Noce Fiammato, Noce Chiaro, Ciliegio Rosso, Acacia Scuro, Ciliegio Antico, Noce Reale, Ciliegio Reale.

ANODIZING – it is an electrochemical process whereby to reinforce the natural oxide film on the aluminium surface, increasing hardness, corrosion and abrasion resistance. Anodizing gives a very decorative silver matt surface finish, and colored can also be obtained by
sealing metallic dyes into the anodized layer.

Maintenance

Apart from routine cleaning for aesthetic reasons, ETEM aluminium profiles do not require any maintenance which translates into a major cost and ecological advantage over lifetime of the product.

Standards

▪ General

EN 12020 (1÷2) - Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and
EN AW-6063
EN 755 (1÷9)- Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles
EN 573 (1÷4) - Aluminium and aluminium alloys - Chemical composition and form of wrought products
EN 15088 - Aluminium and aluminium alloys - Structural products for construction works - Technical conditions for inspection and delivery
EN 1990 Eurocode - Basis of structural design
EN 1991 Eurocode 1 - Actions on structures
EN 1998 Eurocode 8 - Design of structures for earthquake resistance
EN 1999 Eurocode 9 - Design of aluminium structures

▪ Curtain walling

1/ EN 13830 - Curtain walling - Product standard
2/ EN 13119 - Curtain walling - Terminology
3/ CWCT Standard for Systemized Building Envelopes
4/ EN 12152 - Curtain walling - Air permeability - Performance requirements and classification
5/ EN 12153 - Curtain walling - Air permeability - Test method
6/ EN 1026 - Windows and doors - Air permeability - Test method
7/ EN 12154 -Curtain walling - Watertightness - Performance requirements and classification
8/ EN 12155 - Curtain walling - Watertightness - Laboratory test under static pressure
9/ ENV 13050 - Curtain walling - Watertightness - Laboratory test under dynamic condition of air pressure and water spray
10/ EN 1027 - Windows and doors - Watertightness - Test method
11/ EN 13116 - Curtain walling - Resistance to wind load - Performance requirements
12/ EN 12179 - Curtain walling - Resistance to wind load - Test method
13/ EN 14019 - Curtain Walling - Impact resistance - Performance requirements
14/ EN ISO 10077 (1÷2) - Thermal performance of windows, doors and shutters - Calculation of thermal transmittance
15/ EN 12412-2 - Thermal performance of windows, doors and shutters - Determination of thermal transmittance by hot box method - Part 2: Frames
16/ ISO 140 (part 1 and 3) - Acoustics - Measurement of sound insulation in buildings and of building elements
17/ EN 20140 - Acoustics - Measurement of sound insulation in buildings and of building elements
18/ EN ISO 717-1 - Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (ISO 717-1:1996)

Curtain wall

I. Definition

Curtain walling is a form of predominantly vertical building envelope which supports no load other than its own weight and the environmental forces which act upon it.

In this context non-loadbearing means that, unlike a conventional brick or masonry wall, a curtain wall is not intended to assist in maintaining the structural integrity of the building. Dead and live loads are not intended to be transmitted to it from the supporting structure and thus transmitted to the foundations.

II. Requirements

1. Resistance to wind load

The curtain walling shall be sufficiently rigid to resist the declared wind loads for serviceability, both positive and negative. It shall transfer the declared wind loads to the building's structure, safely, via the fixings for that purpose.

2. Dead load (Self-weight)

The curtain wall shall sustain its self-weight plus any attachments incorporated into it by original design. It shall transfer the weight to the building structure, safely, via the fixings intended for that purpose.

Self-weights shall be determined in accordance with EN 1991-1-1 (Eurocode 1).

3. Resistance against impact

Where specifically required tests shall be performed in accordance with the corresponding European standard.

4. Air permeability

An air permeability test shall be carried out in accordance with the corresponding European standard.

5. Watertightness

A watertightness test shall be carried out in accordance with the corresponding European standard.

6. Airborne sound insulation

Where specifically required, sound insulation index shall be determined by test.

7. Thermal transmittance

Methods of assessment / calculation of thermal transmittance of curtain walling and appropriate methods of test are defined in EN 13947.

8. Fire resistance

Where specifically required the fire resistance shall be classified in accordance with the corresponding European standard.

9. Reaction to fire

Where specifically required the reaction to fire shall be classified in accordance with the corresponding European standard.

10. Fire propagation

Where specifically required the curtain wall shall incorporate such fire and smoke stops as are necessary to prevent the transmission of fire or smoke through voids in the curtain wall construction at its abutment at all levels with structural floor slabs.

11. Durability

Durability of performance of any characteristics of curtain walling is not tested, but is related to the results of the conformance of the constituting materials and finishes to the state of the art, or, where available to European technical specifications specifying the material or finish.

12. Water vapour permeability

Vapour control layers which conform to the appropriate European Standard shall take into account the specified hydro-thermal conditions of the building.

13. Equipotentiality

Where specifically required the metal component parts of the curtain wall shall be mechanically connected together with the building structure to provide an equipotential bond to the earth circuit of the building. This is a requirement for all metal based curtain walling installed into buildings with a height greater than 25 m. The electrical resistance of the bond of the curtain wall shall not exceed 10 Ω when tested in accordance with EN 13830, Annex A.

14. Seismic shock resistance

Where specifically required, seismic shock resistance shall be determined in accordance with technical specifications or other provisions valid in the place of use.

15. Thermal shock resistance

Where it is determined that a glass resistant to thermal shock is required, a suitable strengthened or toughened glass shall be chosen which conforms to the appropriate European Standard(s).

16. Building and thermal movement

The design of curtain wall shall accommodate thermal and specified building movements without inducing damage to the components or performance. The façade engineer shall specify the building movements which the curtain wall will be required to accommodate, including movements at joints within the structure.

17. Resistance to live horizontal loads

The curtain wall shall resist a horizontal live load at sill height as specified in EN 1999-1-1 (Eurocode 1).

NOTE:

The beforementioned definition of curtain wall is extract from CWCT Standard for systemized building envelopes.
The listed requirements for curtain walls are in accordance with harmonized European standard EN 13830.

CE marking

What does the sign CE mean?

It is an abbreviation of the French "Conformite Europeene"– i.e. European Conformity. By placing the CE marking the manufacturer declares that the product complies with general safety requirements set out in CE marking directives.

What is the purpose of CE marking?

The CE mark represents "the European passport" of the product, its main objectives are:

- CE is a declaration by the manufacturer that the product meets the essential requirements of relevant European legislation relating to health, safety and environmental protection;

- CE indicates to officials in relevant ministries and departments that the product can be put on the market lawfully in the country;

- CE ensures free movement of goods within the EU and the European Free Trade Association (EFTA);

- CE permits the withdrawal of products that do not meet
the standards by monitoring and custom authorities;

- Marking with the CE mark is necessary in cases where the product is distributed within the internal market.

What are the requirements for the CE marking?

Curtain walls, not concerned with uses subject to regulations on reaction to fire, are covered by Attestation of conformity system 3 (AoC System 3). This system sets the following duties:

Tasks to be performed by the manufacturer	Tasks to be performed by Notified Body	Conformity accessment (the basis for CE marking, which is set by the final producer)
Factory production control – FPC	Initial Type Testing – ITT	EC declaration of conformity issued by the manufacturer or his authorized representative based on the protocol / s from the initial type testing of the product – ITT

▪ Methods for obtaining the results from initial type testing of a product ITT

According to European legislation, the opportunities for the acquisition of ITT results are three[1]:

Manufacturers ITT	Shared ITT	Cascading ITT
The manufacturer selects a sample for testing	Partner (e.g. second Manufacturer), industry (e.g. hardware producers) or designer, selects a sample for testing and imposes a system of production control	The system supplier selects samples for testing and imposes a system of production control
⬇	⬇	⬇
Notified Body tests the sample	Notified Body tests the sample	Notified Body tests the sample
⬇	⬇	⬇
The manufacturer owns the ITT test report	The partner owns the ITT test report	The system supplier owns the ITT test report
	⬇	⬇
	The manufacturer is allowed to use the ITT of his partner.	The manufacturer is allowed to use the ITT of the system supplier
	⬇	⬇
	The Notified Body checks that the product is identical	-Agreement between the manufacturer and the system supplier -Instructions for assembling and installation of the system supplier relevant for FPC of the manufacturer -No reduction of performance level of product -System supplier audits activities of the manufacturer
	⬇	⬇
	The manufacturer owns the ITT test report	ITT of the system supplier as verification for the manufacturer

[1] Euro Windoor Guidance sheet, CE marking of windows and pedestrian doors, ©EuroWindoor, Frankfurt 2007

▪ What is the cascading initial type testing of the product?

The procedure for cascading ITT that ETEM Building Systems as a system supplier offers to the manufacturers is as follows:

-The system supplier conducts an initial inspection of FPC of the manufacturer and all accompanying documents;

-Based on the inspection carried out a contract is concluded with the system supplier;

-Ratification of the contract permits the manufacturer to use the results from the ITT of the system supplier; Based on the factory production control system and results from the ITT, the manufacturer can certify that the product complies with current regulations and may affix CE marking;

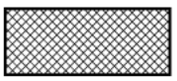
-The manufacturer undertakes to comply unconditionally with all instructions of the system supplier for the product assembly and the method of assembly should be identical to the method of assembling of the sample tested by the system supplier. The finished product must have the same technical characteristics as the test sample, otherwise the manufacturer must test his own product;

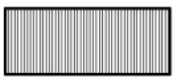
-The system supplier conducts periodic audits of the manufacturer, provides technical assistance and training of the staff of the manufacturer, ongoing consultations and information.

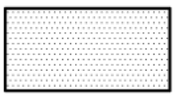
▪ Legal acts

- 89/106/EEC Construction Products Directive;
- Product standard for curtain walling – EN 13830:2004.

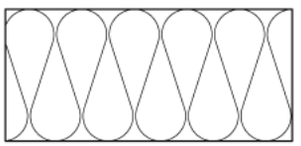
Hatches for different materials


EPDM


PVC


gypsum board


silicone seal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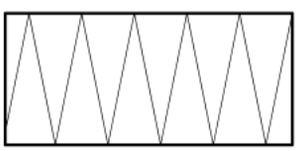
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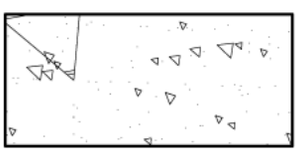
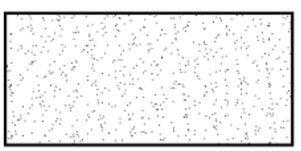
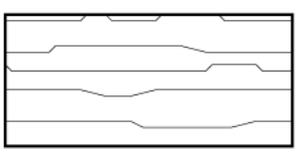
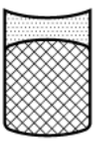

concrete wall


plaster


wood

butyl seal

membrane


silicone seal

backer rod

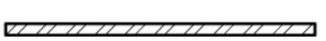

PVC spacer


etalbond

sheet aluminium


glass

aluminium profile


steel

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