

GENERAL

MATERIAL CHARACTERISTICS

Aluminium profiles

AW-6060 T6	
Breaking strenght f_u (Rm)	190 N/mm ²
Yield strenght f_y (Rp 0,2)	150 N/mm ²
Elasticity modulus E	70 000 N/mm ²
Sliding factory G	27 000 N/mm ²
Density	2700 kg/m ³
Thermal expansion coefficient	23 · 10 ⁻⁶ /°C
Thermal conductivity	209 W/m ² K

Thermal breaks

Recycled-PVC	
Tensile strenght	50 N/mm ²
Elasticity modulus E	2500 N/mm ²
Density	1400 kg/m ³
Thermal expansion coefficient	0,8 · 10 ⁻⁶ /°C
Thermal conductivity	0,19 W/m ² K

Gaskets

EPDM/cellular-EPDM	
Tensile strenght	80±5 °Sh
Elasticity modulus	10 N/mm ²
Breaking strain	150 % min
Compression (22h/70°C)	25 % (max)

Screws

Delta coating	DT-DS 600 (DIN 50021)
or	
Stainless steel	A4

CROSS SECTION VALUES

Profile	I _x [cm ⁴]	W _x [cm ³]	I _y [cm ⁴]	W _y [cm ³]	A [mm ²]	Kg/m
R54-40	19,28	5,39	14,04	5,61	621	1,68
R54-60	42,58	9,84	18,78	7,51	710	1,92
R54-80	82,64	15,90	23,29	9,32	800	2,16
R54-100	141,58	22,99	29,19	11,68	911	2,46
R54-120	221,48	30,80	34,94	13,97	1018	2,75
R54-140	326,94	39,98	42,17	16,87	1151	3,11
R54-160	464,98	50,53	49,58	19,83	1292	3,49
R54-180	617,12	60,12	55,02	22,01	1387	3,75
R54-200	876,48	77,21	66,64	26,66	1651	4,46
R54-38	12,09	4,30	12,72	5,09	488	1,32
R54-48	20,00	6,22	15,19	6,07	531	1,44
R54-68	43,82	10,32	20,11	8,04	617	1,67
R54-88	82,40	15,45	26,23	10,49	737	1,99
R54-108	130,10	20,15	29,96	11,98	789	2,13
R54-128	196,22	26,05	34,89	13,96	875	2,36
R54-148	289,19	33,82	41,94	16,78	1013	2,73
R54-168	396,02	41,26	47,18	18,87	1105	2,98
R54-188	529,99	51,40	52,45	20,98	1353	3,65
R54-208	740,39	65,91	60,27	24,11	1444	3,90

N50si

Technical information

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1.1

LOADS AND STRUCTURAL REQUIREMENTS

LOADS

The loads are determined according to the Eurocodes EN 1190, EN1991-1-1, EN1991-1-3 and EN 1991-1-4

WIND LOAD

The wind load can be on flat terrain determined using the formula:

$$q_b = \frac{1}{2} \cdot \rho \cdot v_b^2 \quad (\text{EN 1991-1-4, formula 4.10})$$

q_b = Basic velocity pressure

= air density (recommended 1,25 kg/m³)

v_b = Fundamental value of the wind velocity (mainland 21m/s)

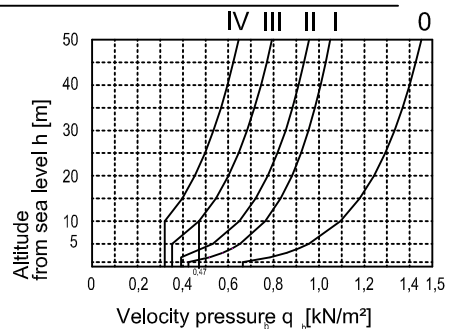
Note! The shape of building or terrain can bring different factors. Here presented as simply as possible.

$$q_{w,k} = C_{p,net} \cdot q_b$$

$q_{w,k}$ = Wind load

$C_{p,net}$ = Net pressure coefficient. See table below

Outer walls Load area	Negative pressure at corners		Negative pressure at center		Pressure inwards	
	$A \geq 10 \text{ m}^2$	$A < 1 \text{ m}^2$	$A \geq 10 \text{ m}^2$	$A < 1 \text{ m}^2$	$A \geq 10 \text{ m}^2$	$A < 1 \text{ m}^2$
$C_{p,net}$	-1,5	-1,7	-1,1	-1,4	+1,1	+1,3



- 0 Open sea
- I Wide, open area
- II Farm land, occasional obstacles
- III Suburban or Industrial areas, forests
- IV City centres

Example

Altitude of facade from sea level 10 m

Location on continent: graph III

Velocity pressure $q_b = 0,47 \text{ kN/m}^2$

Loading width 2 m

Span 3 m

=> Loaded area 6 m²

Structure in the middle of wall (not in corner)

Net pressure coefficient $C_{p,net} = -1,22$ (interpolated from table)

Wind load $q_{w,k} = -1,22 \times 0,47 = 0,57 \text{ kN/m}^2$

OTHER LOADS

In some cases building regulations also state further loads affecting the facade, see RakMK B1 (1998).

Horizontal line load (RakMK B1:3.2.7):

$q_k = 0,4 \text{ kN/m}$ (normal and full capacity load) or

$q_k = 1,5 \text{ kN/m}$ (maximum capacity load),

which affect the walls towards the outside on the lower edge of the window or one meter from the floor.

Vertical point load (RakMK B1:3.2.9):

a structure that a human might load with his weight must be checked for a vertical load $F_k = 1,0 \text{ kN}$.

Line and point loads do not usually affect the dimensioning of the facade structure normatively, as the deflection caused by the wind load determines the structure, and the profiles have a great strength reserve.

STRUCTURAL REQUIREMENTS

- The permitted tensions for the AW-6060 T6 alloy, of which the N50si-series profiles are made, are $\sigma \leq 100 \text{ N/mm}^2$
- The permitted deflection for a facade structure according EN 13830 is $y \leq l/200$, max. 15 mm
- To ensure the durability of insulation glass, deflection along the glass panel's side length L must be limited to the value $y \leq l/300$
- The deflection under the glass load on the wall level so that the profile does not touch the glass beneath at the base of the rebate (play 5 mm) must not exceed. $f \leq 3 \text{ mm}$
- The vertical profile above a window that can be opened must bend a maximum of 1 mm.

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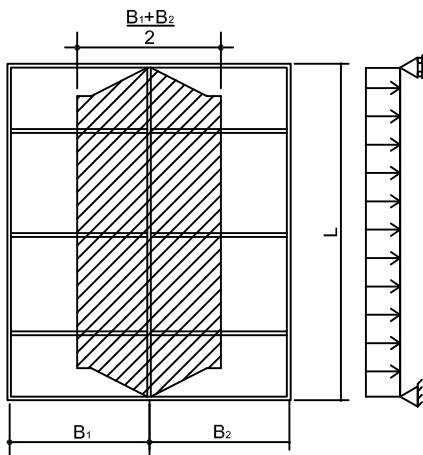
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Technical information

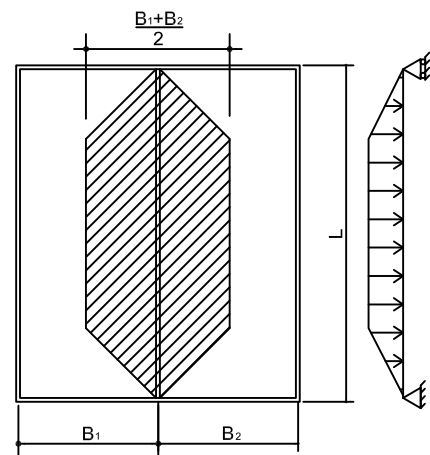
VERTICAL FRAME

WIND LOAD

Span divided into sections

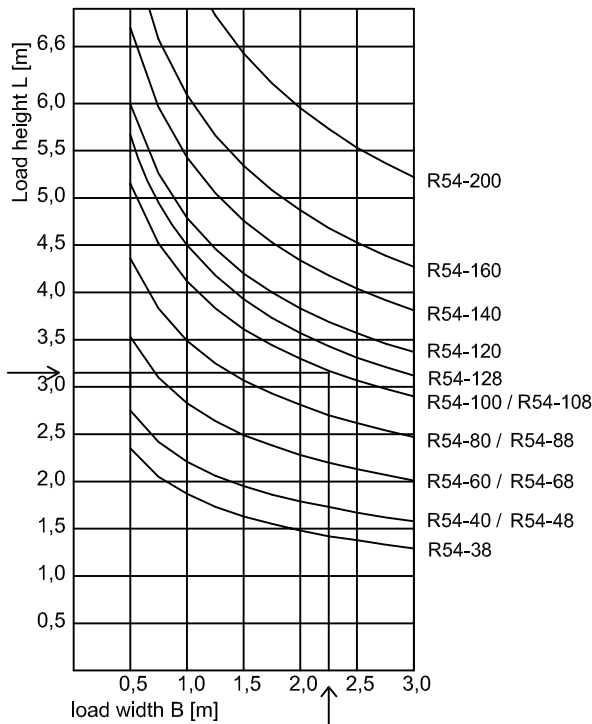


Span not divided into sections



Dimensioning graph L/200

Wind load $q = 0,5 \text{ kN/m}^2$
Tension $< 100 \text{ N/mm}^2$
Maximum deflection $L/200$



Design example

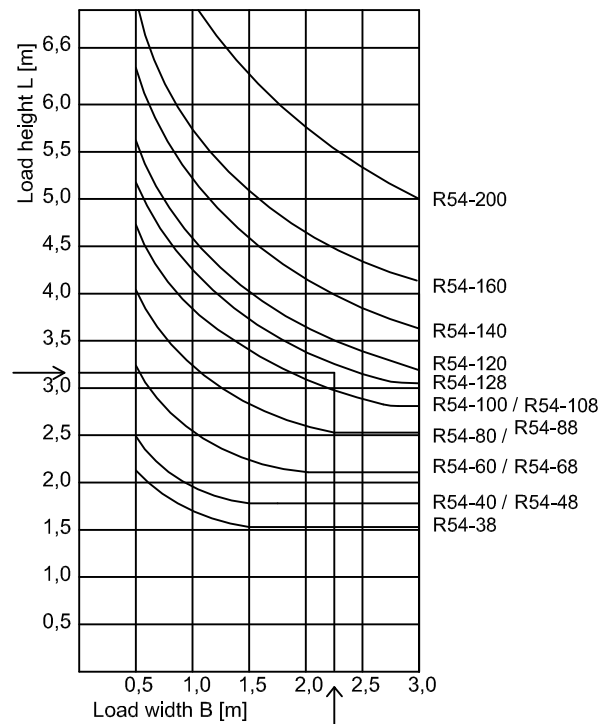
WIND LOAD:
Industrial area, terrain glass III
Structure height 10 m
-->wind load $q = 0,5 \text{ kN/m}^2$
 $B_1 = 2,5 \text{ m}$, $B_2 = 2,0 \text{ m}$, $L = 3,3 \text{ m}$
Load width --> $\frac{B_1+B_2}{2} = 2,25 \text{ m}$

Dimensioning graph of vertical frame (L/200)

--> Vertical frame R54-100

Dimensioning graph L/300

Wind load $q = 0,5 \text{ kN/m}^2$
Tension $< 100 \text{ N/mm}^2$
Maximum deflection $L/300$



Design example

WIND LOAD:
Industrial area, terrain glass III
Structure height 10 m
-->wind load $q = 0,5 \text{ kN/m}^2$
 $B_1 = 2,5 \text{ m}$, $B_2 = 2,0 \text{ m}$, $L = 3,3 \text{ m}$
Load width --> $\frac{B_1+B_2}{2} = 2,25 \text{ m}$

Dimensioning graph of vertical frame (L/300)

--> Vertical frame R54-120

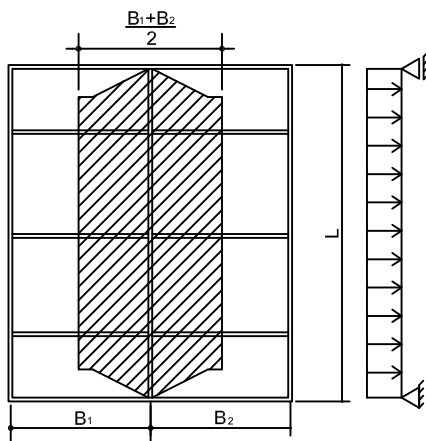
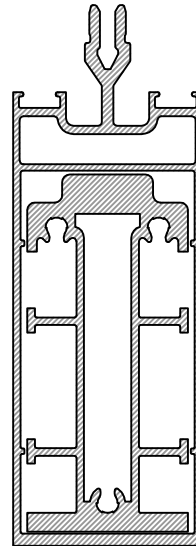
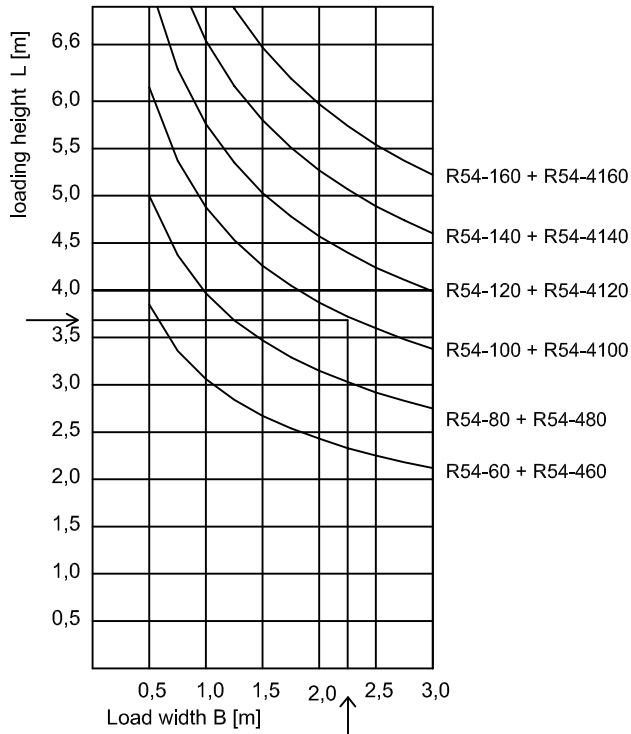
VERTICAL FRAME + REINFORCEMENT

WIND LOAD

Span divided into sections

Dimensioning graph L/200

Wind load $q = 0,5 \text{ kN/m}^2$
Tension $< 100 \text{ N/mm}^2$
Maximum deflection $L/200$



Design example

WIND LOAD:

Industrial area, terrain class III

Structure height 10 m

--> wind load $q = 0,5 \text{ kN/m}^2$

$B_1 = 2,5 \text{ m}$, $B_2 = 2,0 \text{ m}$, $L = 3,7 \text{ m}$

Load width --> $\frac{B_1+B_2}{2} = 2,25 \text{ m}$

Dimensioning graph of vertical frame (L/200)

--> Vertical frame R54-100 + R54-4100

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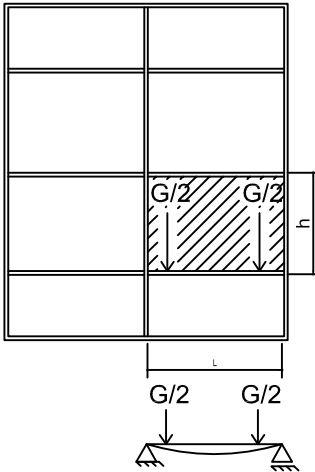
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N50si

Technical information

HORIZONTAL FRAME

WEIGHT OF GLASS



Positioning glass pads and support pieces

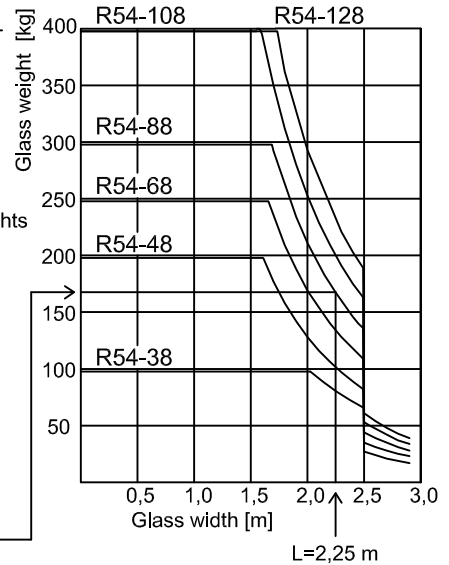
Length of horizontal frame profile:
 $L < 2,5\text{m}$; pads 100 mm from corners
 $L > 2,5\text{m}$; pads $L/8$ from corners
 A maximum of 4 support pieces

Deflection

deflection of horizontal profile $< 3\text{ mm}$

Max. glass weight Glass package weights

Profile	kg	Type	kg/m ²
R54-38	100	2K-4	20
R54-48	150	2K-5	25
R54-68	250	2K-6	30
R54-88	300	3K-4	30
R54-108	400	3K-5	38
R54-128	400	3K-6	45



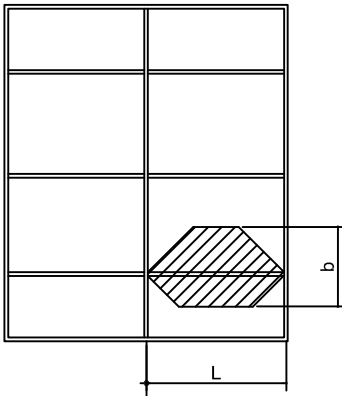
Design example

$L = 2,25\text{ m}$, $h = 1,95\text{ m}$
 3K-8 glass package $\rightarrow 60\text{ kg/m}^2 \times 2,25\text{ m} \times 1,95\text{ m} = 263\text{ kg}$
 Dimensioning graph of horizontal frame (glass weight)
 \rightarrow horizontal frame R54-88
 R54-88 max. glass weight
 $\rightarrow 300\text{ kg} > 263\text{ kg}$ ok
 R54-LT63 max. load = $390/2 = 195\text{ kg}$
 $\rightarrow 263\text{ kg}/195\text{ kg/piece} = 1,35\text{ piece} \Rightarrow 2\text{ pieces OK.}$

Support piece capacity

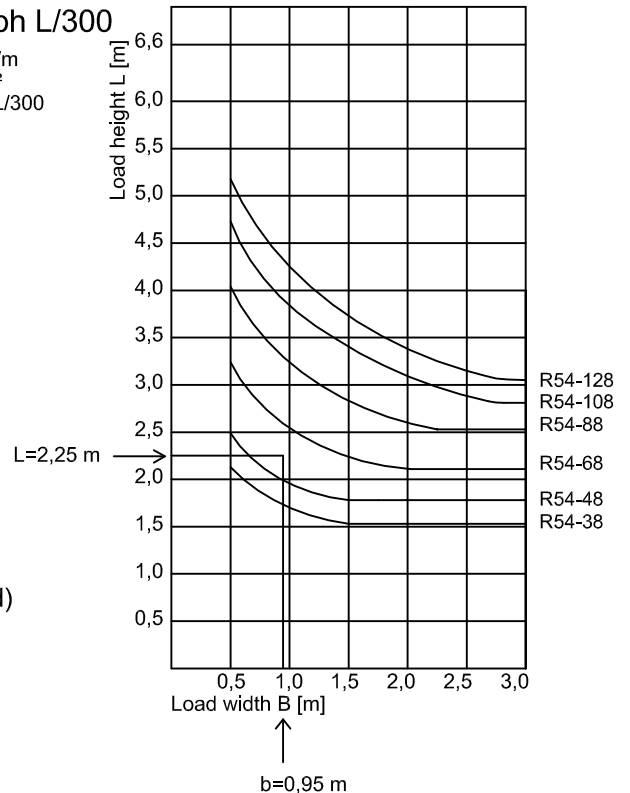
Support piece	Max. load per piece kg
N50si-LT63	390
N50si-LT63+screws	400
N50si-LT350T	620

WIND LOAD



Dimensioning graph L/300

Wind load $q = 0,5\text{ kN/m}$
 Tension $< 100\text{ N/mm}^2$
 Maximum deflection $L/300$



Design example

Industrial area, terrain class III
 Structure height 10 m
 \rightarrow wind load $q = 0,5\text{ kN/m}$
 $L = 2,25\text{ m}$, $b = 0,95\text{ m}$
 Dimensioning graph of horizontal frame (wind load)
 \rightarrow Horizontal frame R54-68

Dimensioning load glass weight \Rightarrow R54-88

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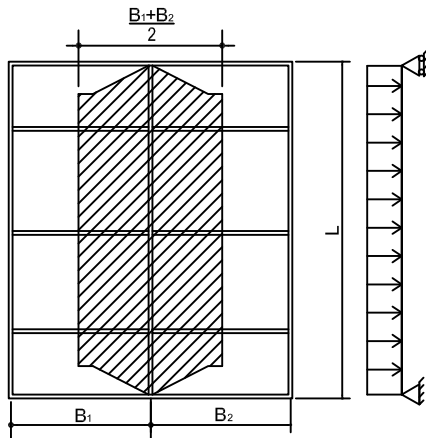
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1.5

PARTITION WALL

VERTICAL FRAME

Span divided into sections



Design example A

Horizontal load $q = 0,2 \text{ kN/m}^2$

$B_1 = 2,5 \text{ m}$, $B_2 = 2,0 \text{ m}$, $L = 3,7 \text{ m}$

Load width $\rightarrow \frac{B_1+B_2}{2} = 2,25 \text{ m}$

Dimensioning graph of frame (L/100)

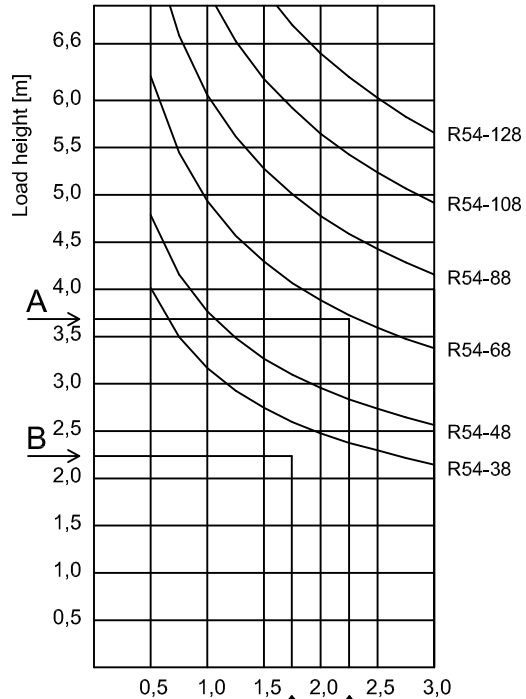
\rightarrow Vertical frame R54-68

Dimensioning graph L/100

Horizontal load $q = 0,2 \text{ kN/m}^2$

Tension $< 100 \text{ N/mm}^2$

Maximum deflection L/100



HORIZONTAL FRAME

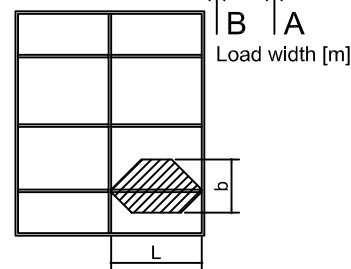
Design example B

Horizontal load $q = 0,2 \text{ kN/m}^2$

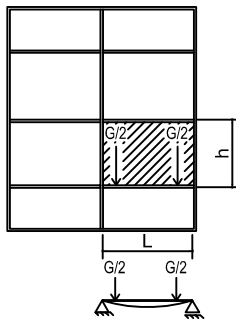
$b = 1,75 \text{ m}$, $L = 2,25 \text{ m}$

Dimensioning graph of frame (L/100)

\rightarrow Horizontal frame R54-38



GLASS WEIGHT



Max. glass weight		Glass weights	
Profile	kg	Type	kg/m ²
R54-38	100	4 mm	10
R54-48	150	5 mm	12.5
R54-68	250	6 mm	15
R54-88	300	7 mm	17.5
R54-108	400	8 mm	20
R54-128	400	9 mm	22.5

Design example

$L = 2,25 \text{ m}$, $h = 1,95 \text{ m}$,

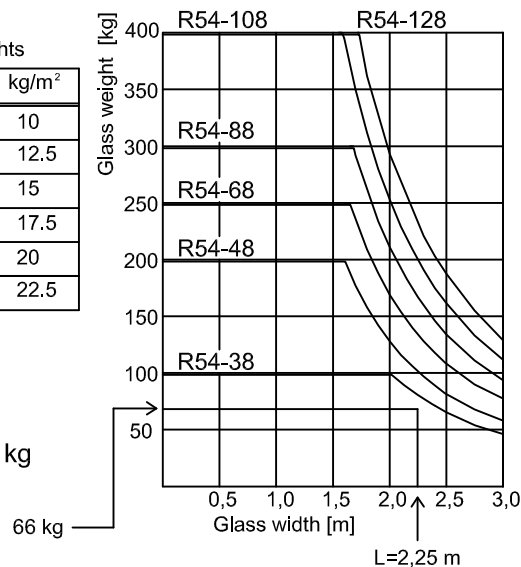
6 mm glass $\rightarrow 15 \text{ kg/m}^2 \times 2,25 \text{ m} \times 1,95 \text{ m} = 66 \text{ kg}$

Dimensioning graph glass weight

\rightarrow Horizontal frame R54-38

R54-38 max. glass weight

$\rightarrow 100 \text{ kg} > 66 \text{ kg}$ ok



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Technical information

U-VALUE

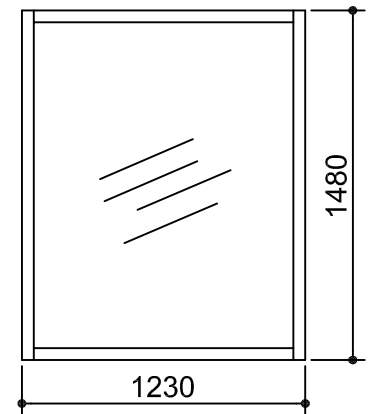
Requirements

RakMK C3 requirements

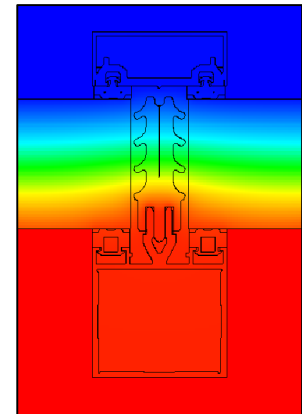
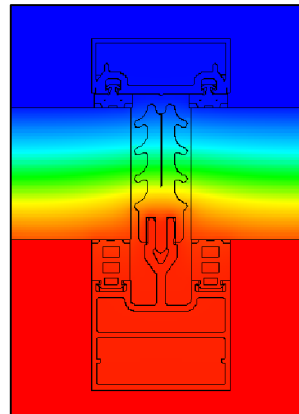
Part of window or door	U-value/W/m ² K	
	Heated space	Semi-heated space
Window	1,8	2,8
Window or door	-	2,8

U-values

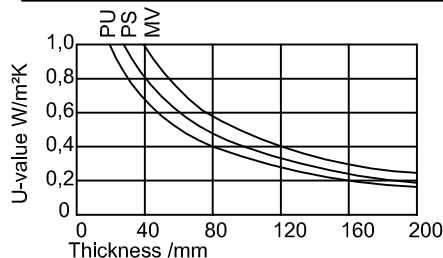
R54 window 1230 x 1480 Edge spacer, Superspacer, $\psi=0,03$ W/m	U-value/W/m ² K	
	Glass Ug-value	Window Uw-value
8-16Ar-4-16Ar-S(3)6	0,86	1,00
4-18Ar-4-18Ar-S(1)4	0,81	0,97
6KN-20Ar-4-20Ar-S(1)N4	0,59	0,77
6S(1)N-18Ar-4-18Ar-S(1)6	0,48	0,67
6S(1)N-20Ar-4-20Ar-S(1)4	0,47	0,66
6S(1)N-16Kr-4-16Kr-S(1)6	0,44	0,64
4S(1)N-12Kr-4-12Kr-S(3)4w-12Kr-S(1)4	0,31	0,53



U-value/W/m ² K	
Mullion	Transome
0,755	0,752



Blind section U-value



Mineralwool, MV
 $\lambda = 0,050$ W/m²K

Polystyrene, PS
 $\lambda = 0,041$ W/m²K

Polyurethane, PU
 $\lambda = 0,033$ W/m²K

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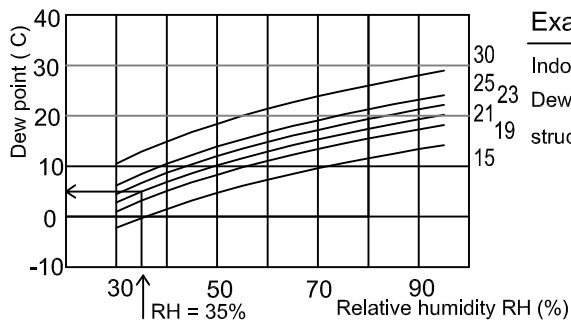
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1.7

CONDENSATION AND THERMAL MOVEMENT

DEW POINT

If the temperature of the inner surface of the window drops below the saturation temperature of the air inside, i. e. the dew point, the water vapour indoors will condense on this surface. The dew point is dependent on the indoor air temperature and relative humidity, and can be obtained using the following graph.



Example

Indoor air temperature $T_s = 21^\circ\text{C}$, relative humidity = 35%.
Dew point from graph $T_k = 5^\circ\text{C}$. As long as the surface temperature of the structure exceeds $+4^\circ\text{C}$, no condensation will take place.

SURFACE TEMPERATURE

The surface temperature of the structure can be estimated using the formula:

$$T_p = T_u + \theta(T_s - T_u)$$

T_p = Temperature of inner surface

T_s = Indoor air temperature

T_u = Ambient temperature

T_k = Dew point temperature

θ = Relative surface temperature, i.e. inner surface temperature = 0 and air temperature +1

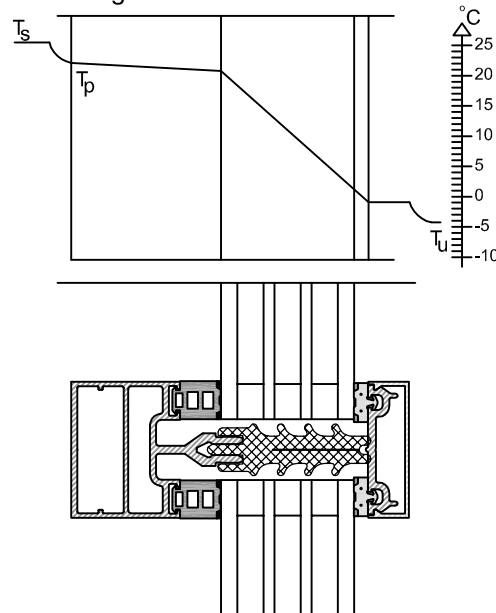
The N50 system's relative surface temperature θ is about 0,7

Example

Indoor air temperature $T_s = 20^\circ\text{C}$, ambient temperature $T_u = -10^\circ\text{C}$

$$T_p = -10 + 0,7(20 - (-10)) = 11^\circ\text{C}$$

$T_p > T_k$ No danger of condensation.



THERMAL MOVEMENT

Thermal expansion coefficient of aluminium length

$$a = 23 \cdot 10^{-6} / \text{K}$$

Thermal movement can be calculated using the formula

$$\varepsilon = \alpha \Delta T; \Delta T = \text{Temperature difference}$$

Extreme values of ambient temperature in Finland are

$$-45^\circ\text{C} < T_u < +35^\circ\text{C}$$

Tension if thermal expansion is prevented

$$\sigma = E \cdot \varepsilon = E \cdot \alpha \cdot \Delta T$$

Maximum values of thermal movement and tension

	Frame	Glazing and cover beads
Temperature		
Tmax	+ 33°C	+ 45°C
Tmin	± 0°C	- 35°C
Thermal movement		
max.	+ 0,3 mm/m	+ 0,6 mm/m
min.	- 0,5 mm/m	- 1,3 mm/m
Tension ¹⁾		
max.	+ 32 N/mm ²	+ 89 N/mm ²
min.	- 21 N/mm ²	- 40 N/mm ²

Values have been calculated from the manufacturing temperature of $+20^\circ\text{C}$

1) If thermal movement is prevented

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1.8

N50si

Technical information

SG-GLAZING METHOD

GENERAL

The SG-glazing can be built as two- or four-sided construction.
Triple- or four-glazed insulated glass
The insulation glass used in SG glazing is specially manufactured.

GLASS

Tempered safety glasses with TSH cut edges, min. thickness 6 mm.

GLASS PACKAGE

- Inner glass 6 mm (minimum)
- Intermediate outer moulding min. 15 mm (aluminium)
The edge foaming of SG insulation glasses is performed with a two-component silicone-based adhesive foam suitable for glazing without mouldings. The foam must be developed to endure the warmth of the sun, and the strain caused by the UV radiation of the short-wave radiation of the sun.
In addition, an anodised U profile is attached to the SG insulation glass element at the factory during manufacturing.

ATTACHING THE GLASS PACKAGE TO THE BUILDING FRAME

The glass packages are attached mechanically from the U profiles to the actual frame of the N50si with the system's own fixing pieces.
THE NUMBER OF FIXING PIECES AND U PROFILES IS DETERMINED ACCORDING TO THE GLASS SIZE AND THE LOADS.

SEAM BETWEEN GLASSES

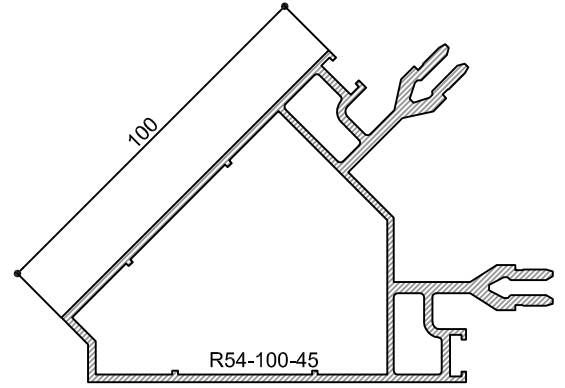
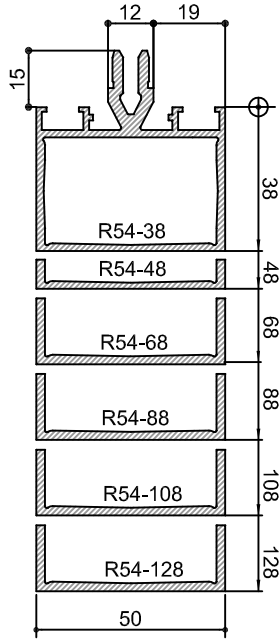
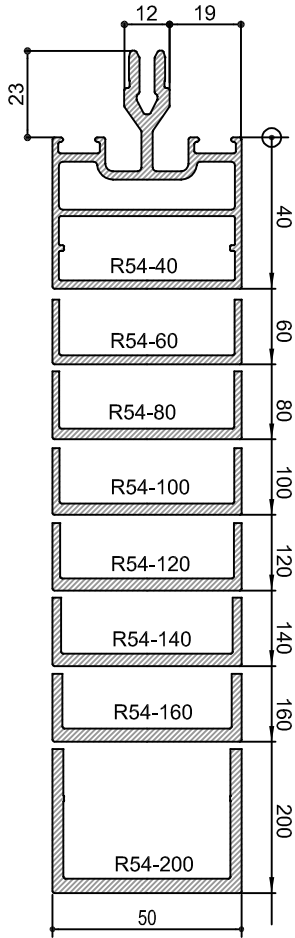
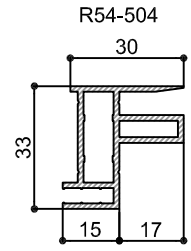
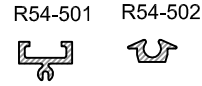
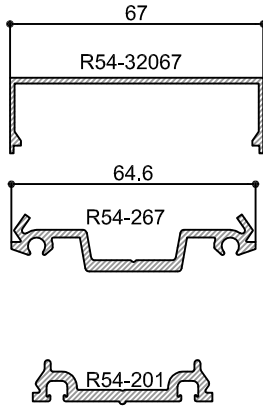
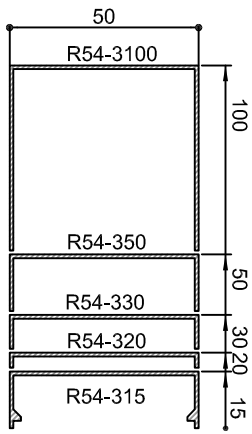
The weather-proofing SG glue seam between the glasses must be compatible with the SG foam of the glass packages.

SG FOAM

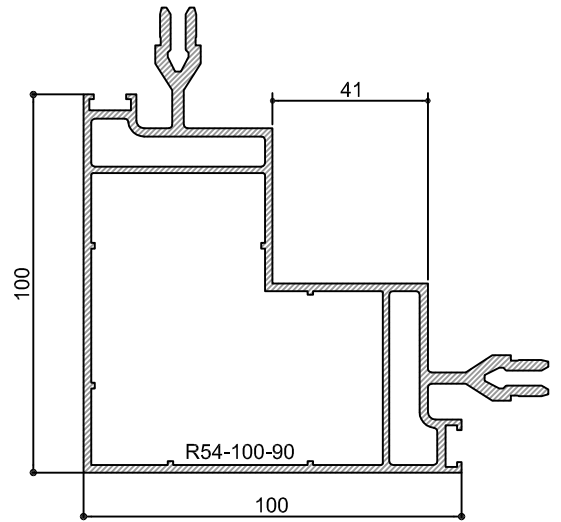
Proglaze II Oy Tremco Finland Ltd
Spectrem 2 Oy Tremco Finland Ltd
When using foams by another manufacturer, the manufacturer and Nokian Profiles must be contacted

MAXIMUM SIZE OF THE GLASS PACKAGE

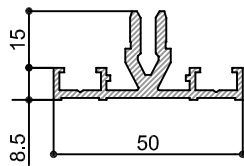
The maximum size of the glass package is 2000 mm x 3000 mm.



R54-32067



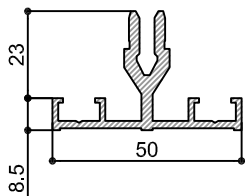
R54-0



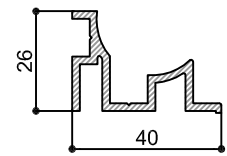
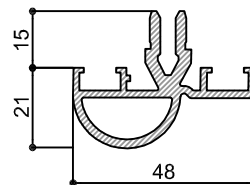
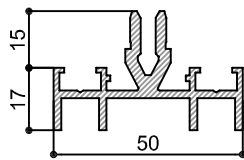
R54-0-V

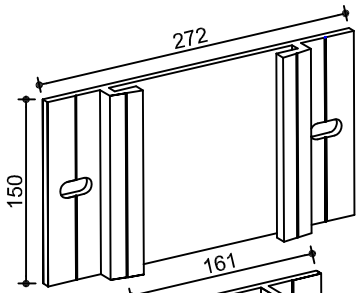
R54-0-S1

R54-0-S2

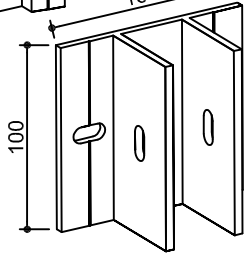


R54-0-P



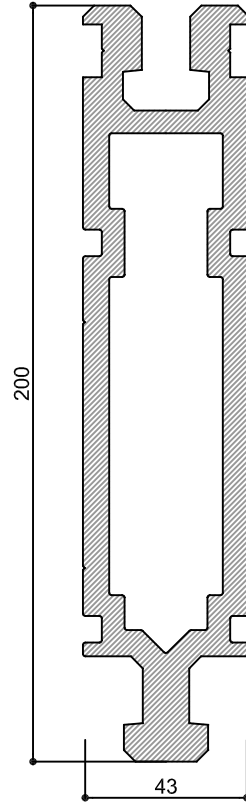
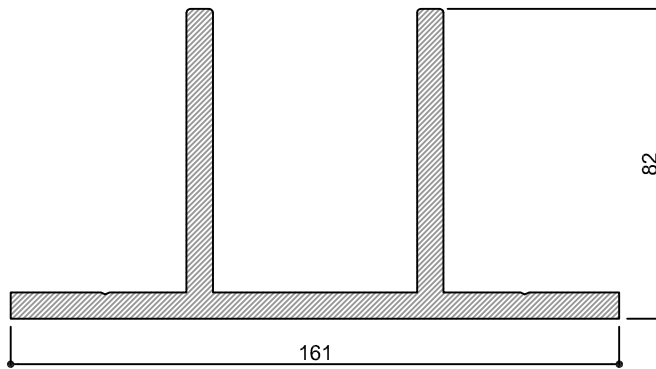


R54-702
Bed for fixing piece

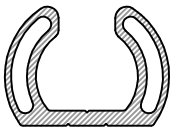


R54-701
Wall fixing piece

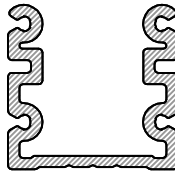
R54-504
Wall fixing profile



R54-402
Optional angle joint profile 90-180°
length 6,6 m



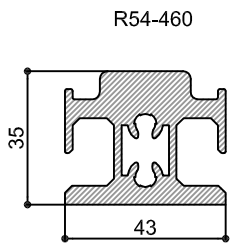
R54-428
Optional angle T-joint profile
length 6,6 m



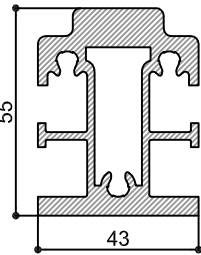
R54-401
Connection profile
length 6,6 m

R54-4160

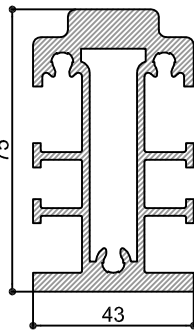
Reinforcement / joint profiles
length 3,3 m



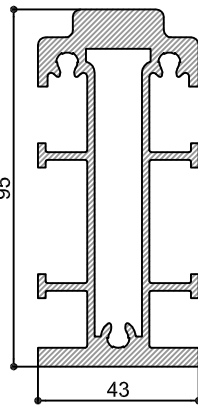
R54-460



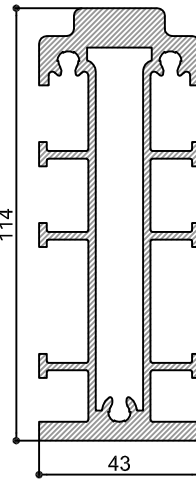
R54-480



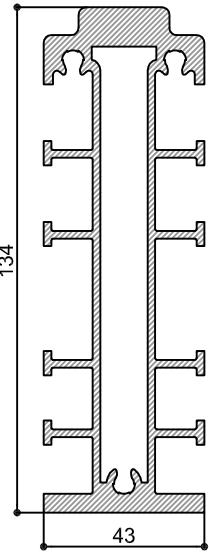
R54-4100



R54-4120



R54-4140

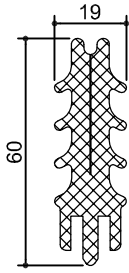


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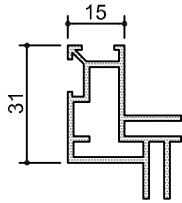
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2.2

NOKIAN
PROFILES

N50si
Profiles

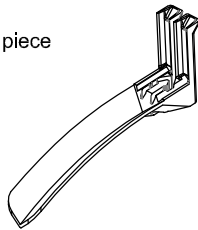


N50si-L50
Thermal break profile
length 3,3 m plastic

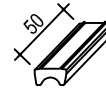


R54-KJL
Frame profile
length 6,6 m plastic

R54-TK
Ventilation piece
rubber



U5 Outer gasket
EPDM



TL50 Lap joint gasket
EPDM



TJL Blind part gasket
EPDM



TKT Corner sealing gasket
EPDM



TSG SG - gasket
EPDM



TSG3 SG - gasket
EPDM



P15 Inner gasket
EPDM



P13 Inner gasket
EPDM



P11 Inner gasket
EPDM



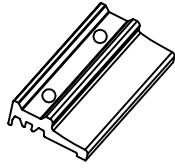
V7 Inner gasket
EPDM



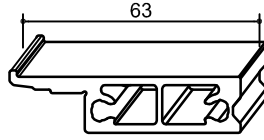
V5 Inner gasket
EPDM



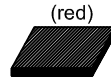
V3 Inner gasket
EPDM



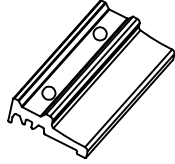
R54-SG
SG-fixing piece, normal



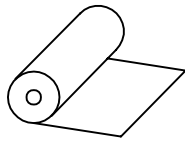
N50si-LT63 Glass support piece
L=100 mm



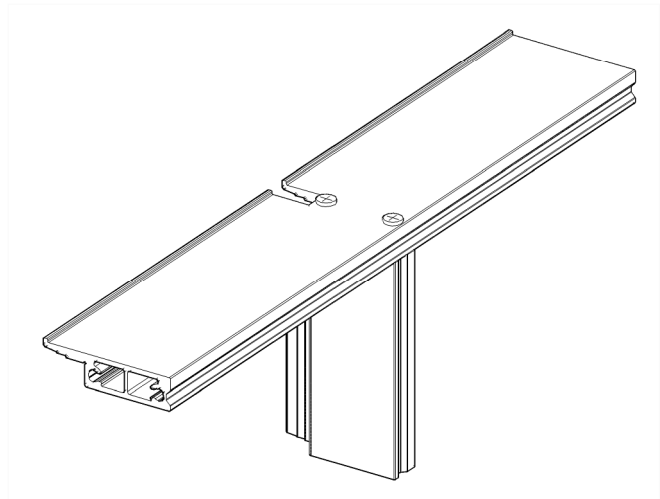
(red)
R54-K26 Glazing pad



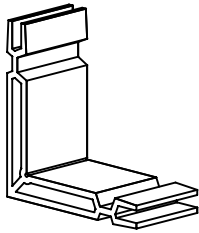
R54-SG-JL
SG-fixing piece, facade glass



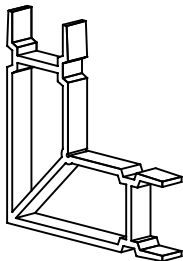
R54-TR
Sealing strip EPDM
B x L = 1 x 25 m



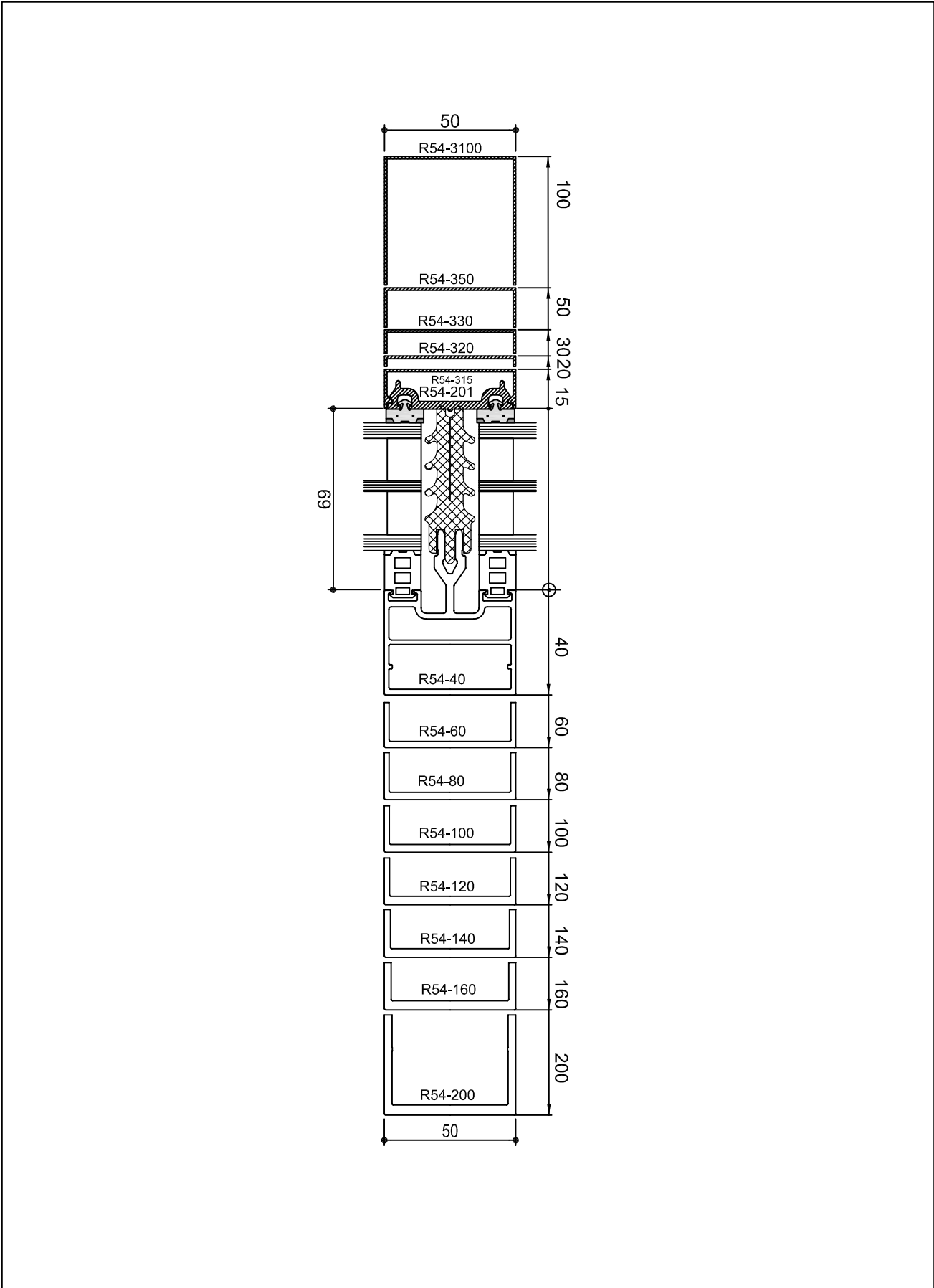
N50si-T T-glass support



R54-802
Joint piece for rim profile (triple glazing)

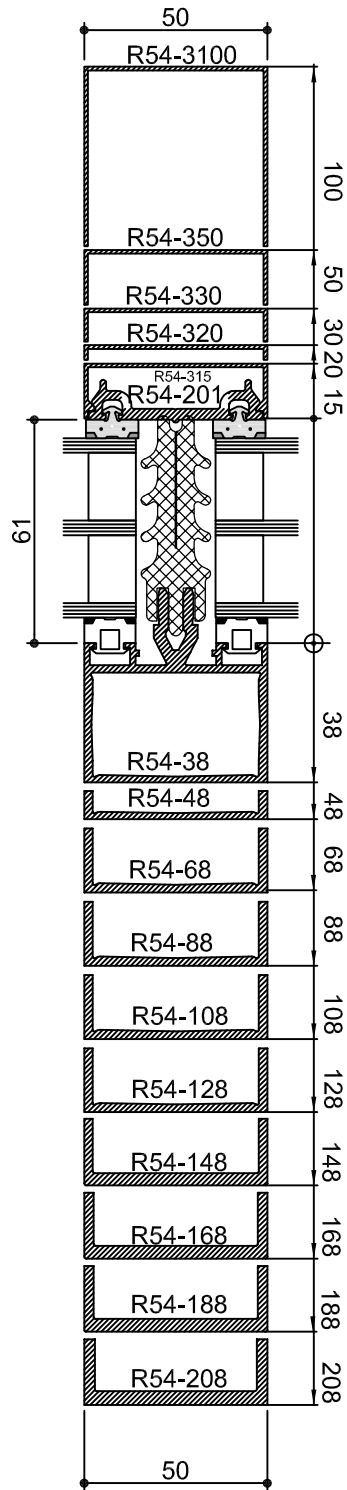


R54-803
Joint piece for rim profile (double glazing)



N50_{SI}

Lap-joint vertical frame



NOTE: The butt-joint is mentioned separately in the designs

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NOKIAN
PROFILES

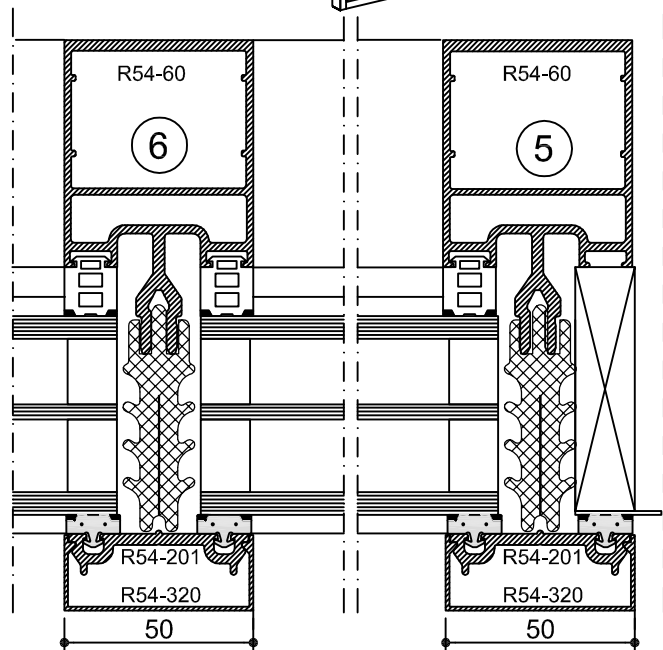
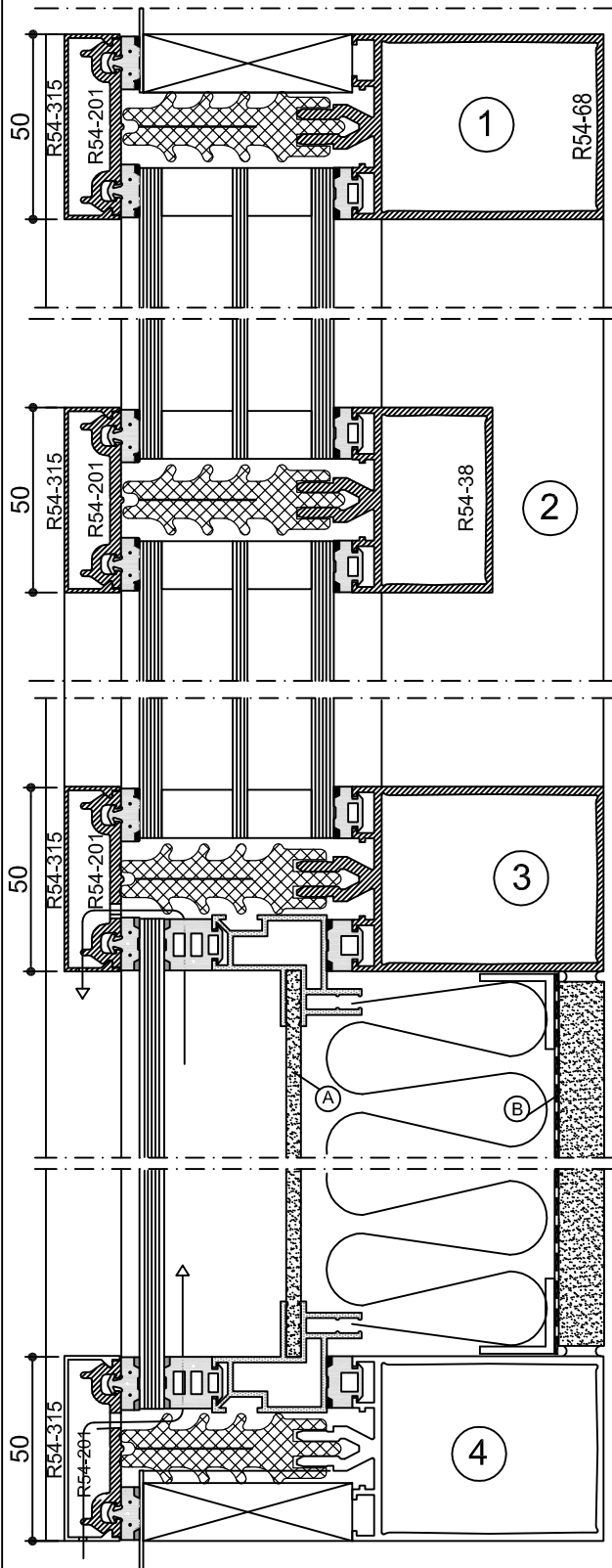
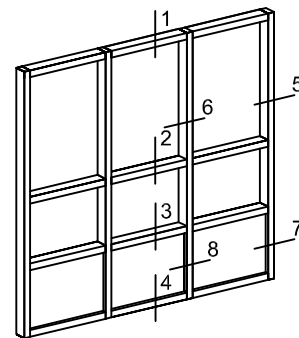


R54

3.2

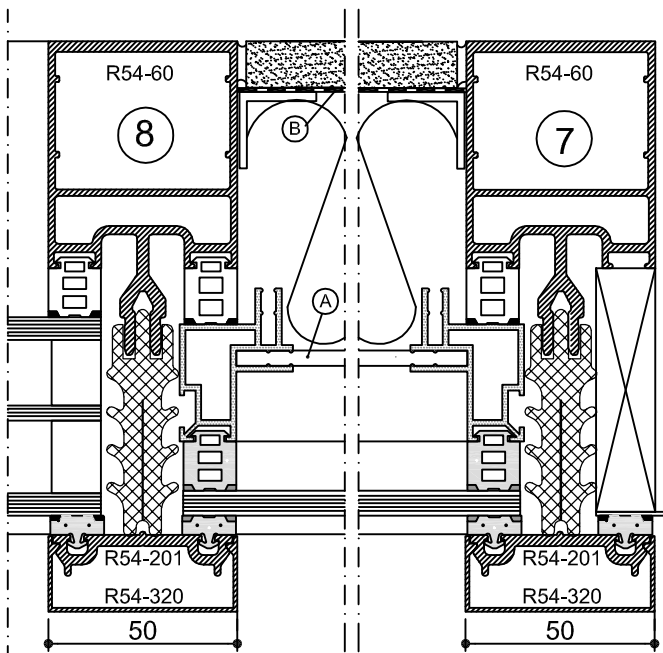
Lap-joint horizontal frame; But-joint vertical and horizontal frame

Note. Facade background painted or otherwise opaque.
Ventilation according to machine-shop folder instructions.



A = Luja wind barrier board (3.2 mm)

B = Vapour barrier



N50si

Lap-joint facade

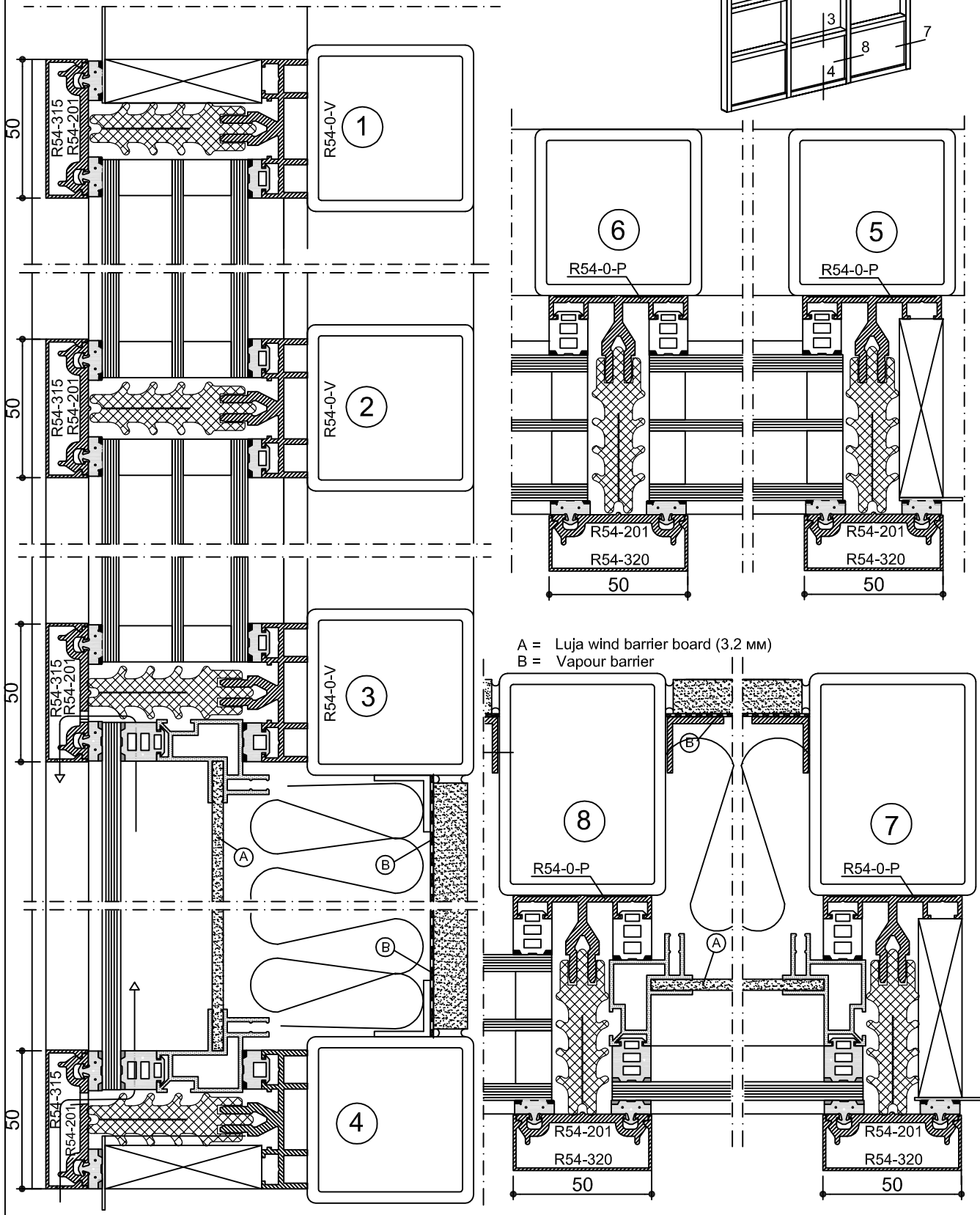
NOKIAN
PROFILES

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4.1

Note. Facade background painted or otherwise opaque.
Ventilation according to machine-shop folder instructions.



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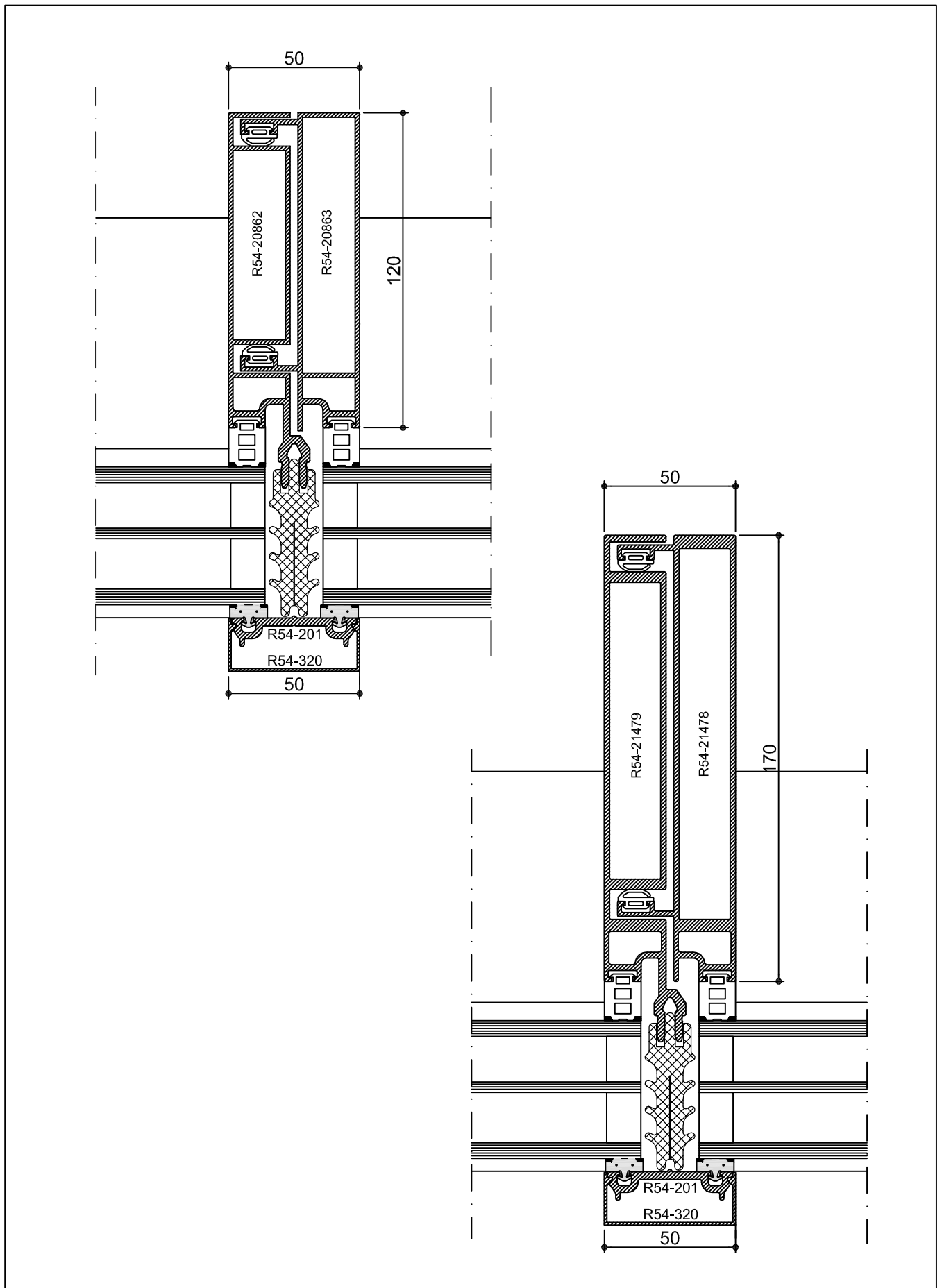
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**NOKIAN
PROFILES**

4.2

N50si

Lap-joint facade; with primary frame



N50si

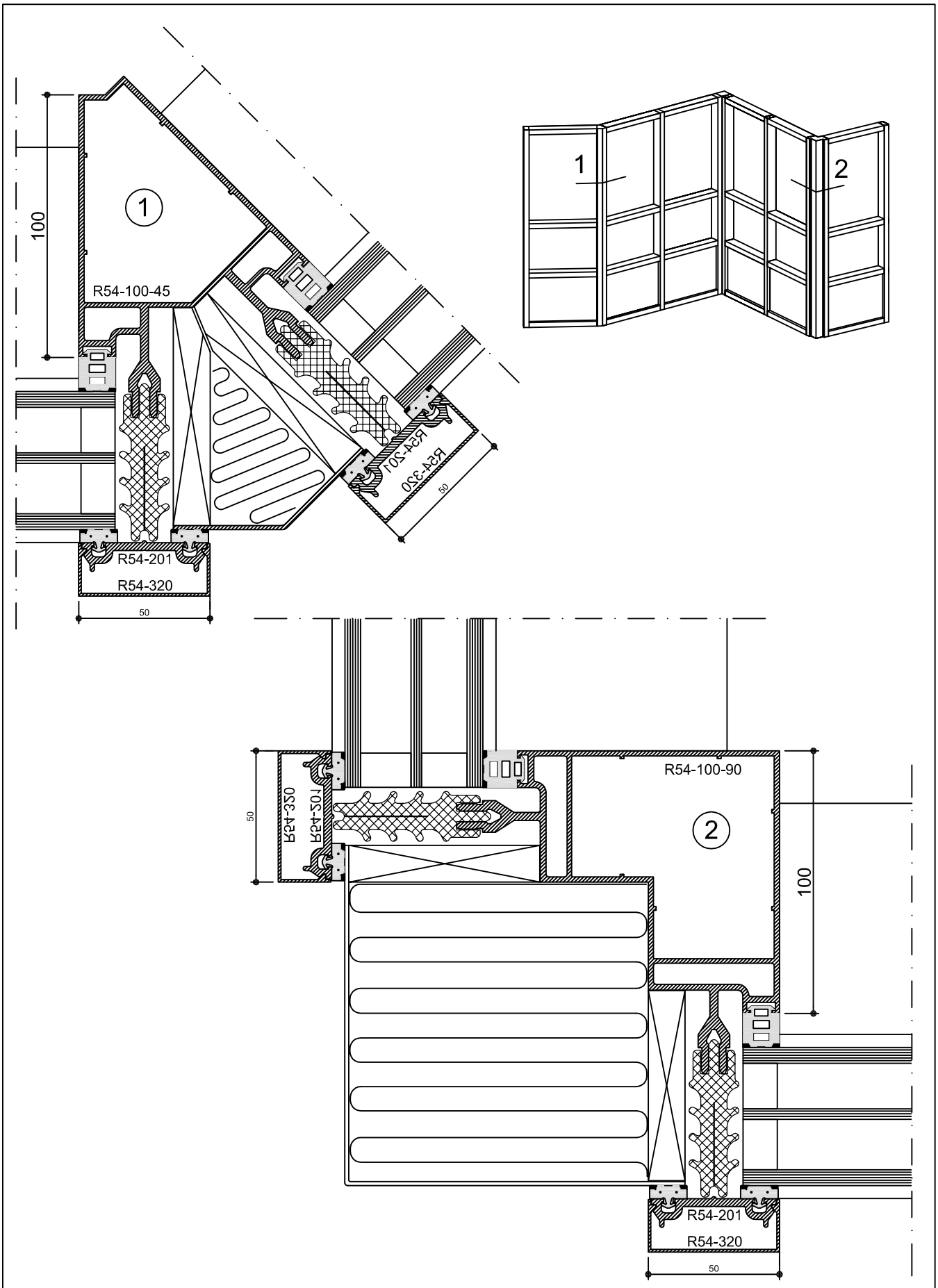
Joint of element profiles

NOKIAN
PROFILES

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4.3



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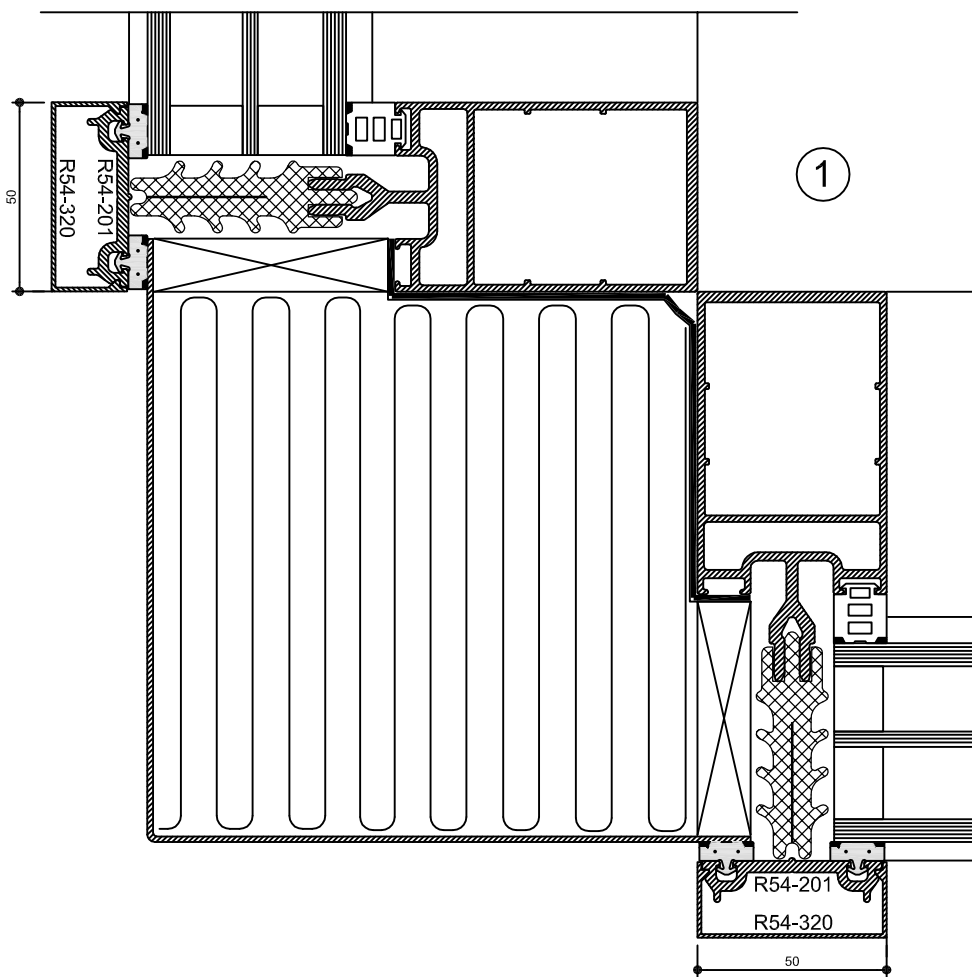
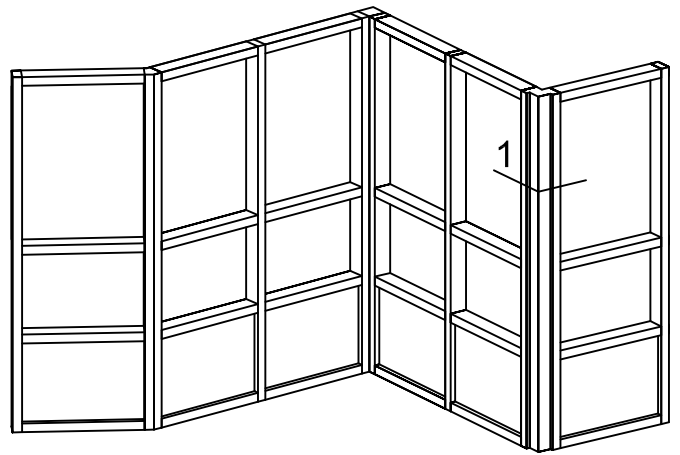
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NOKIAN
PROFILES

N50si

5.1

Lap-joint 45° and 90° external angles



N50si

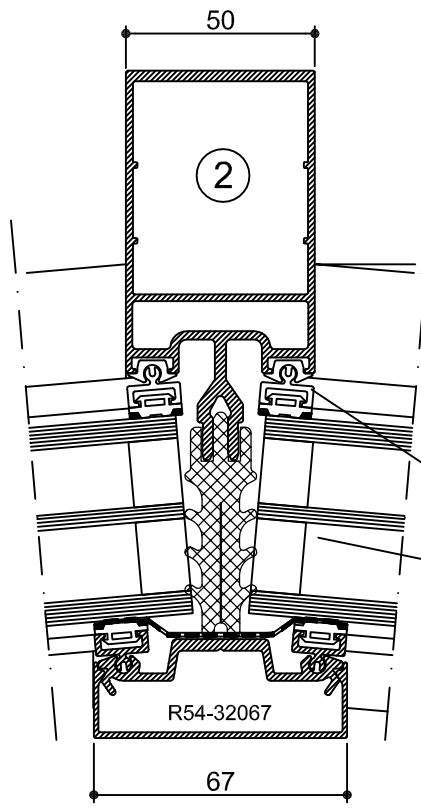
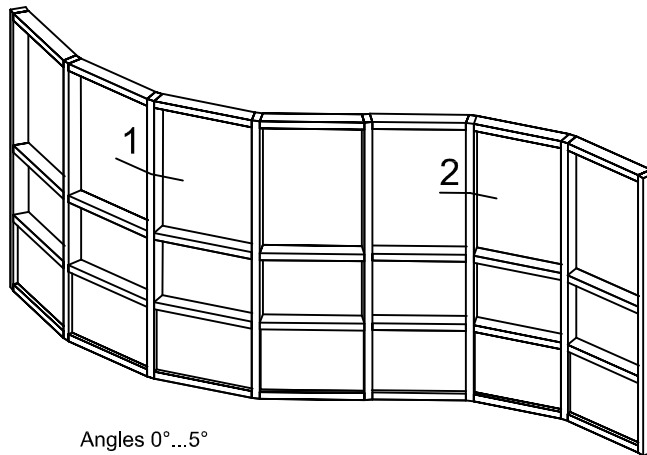
Lap-joint 90° external angle with 2 profiles



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5.2



Angles 0°...5°
Must be checked according to glass thickness
See glazing instructions

R54-502+R54-501
R54-267+R54-501

R54-32067

67

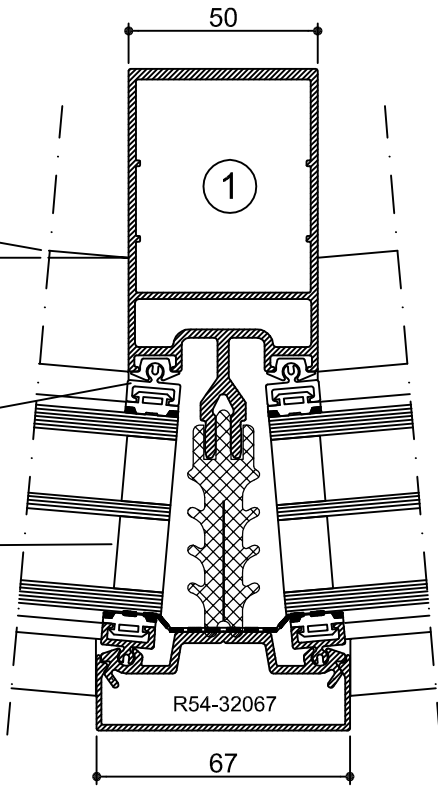
Angles 0°...10°
Must be checked according to glass thickness
See glazing instructions

R54-502+R54-501

R54-267+R54-501

R54-32067

67



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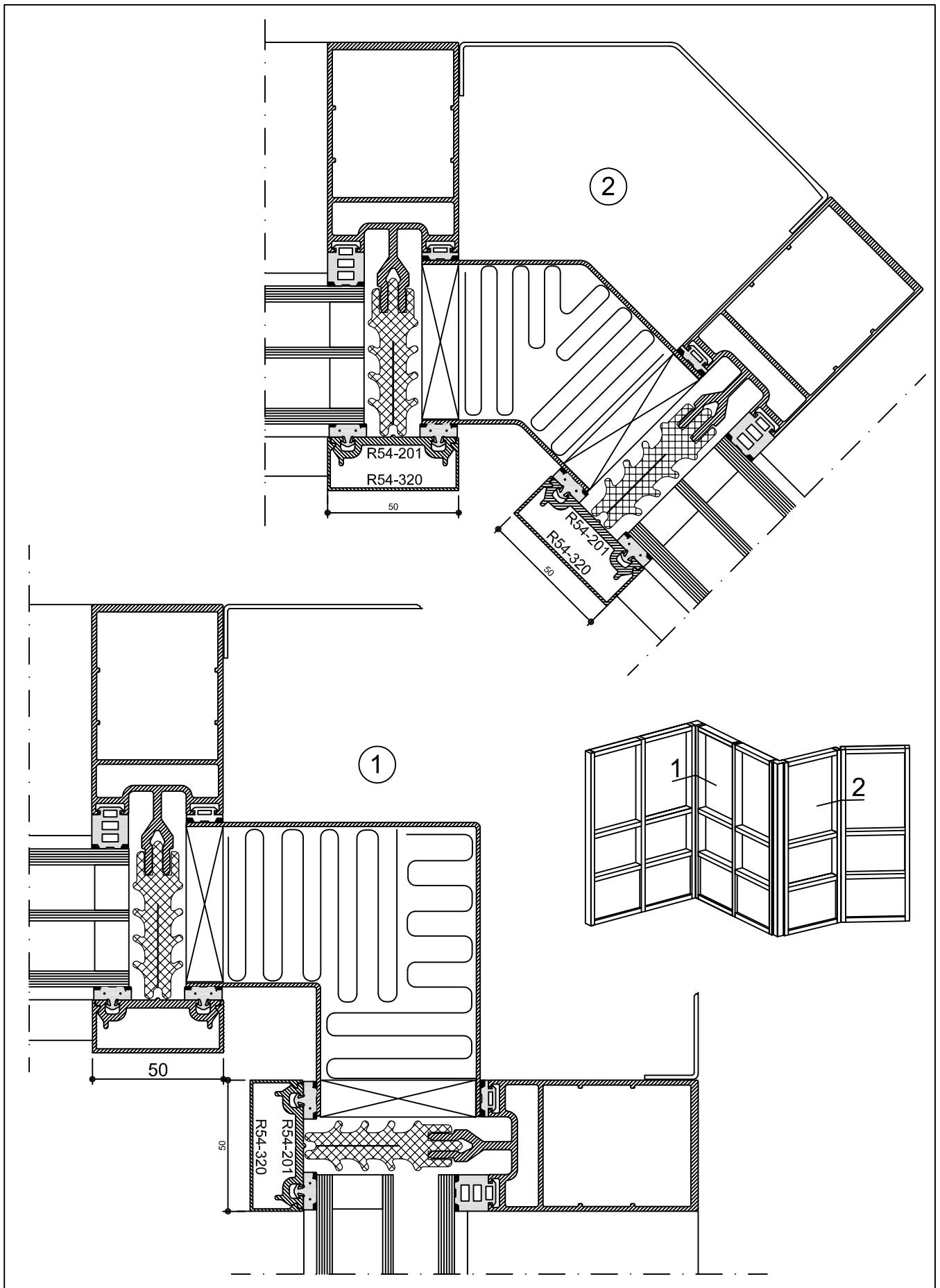
10



N50si

5.3

Triple glazed facade with lap-joint



N50si

Lap-joint 45° and 90° internal angles

NOKIAN
PROFILES

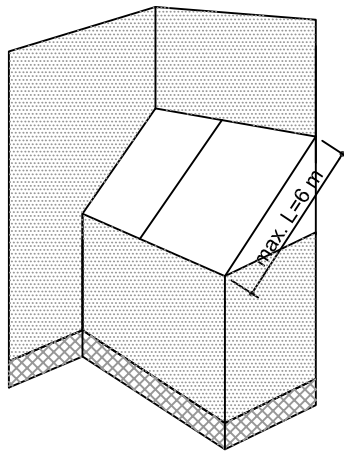
01.07.2014

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5.4

N50si LIGHT ROOF

- possible roof shapes: desk and ridge roof
- N50si light roof does not have inside condensation grooves
- roof max. length: 6 m
- all profile connections must be made with lap-joint
- R54 0-frames can not be used for light roofs
- all grooves in vertical profile **MUST** be brought outside from the eaves
- for outside sealing glazing bead R53-206 with gasket 611 or 619 together with butyl tape must be used
- DIN 7981 A2 stainless steel screws with EPDM sealing plate must be used for fastening glazing beads



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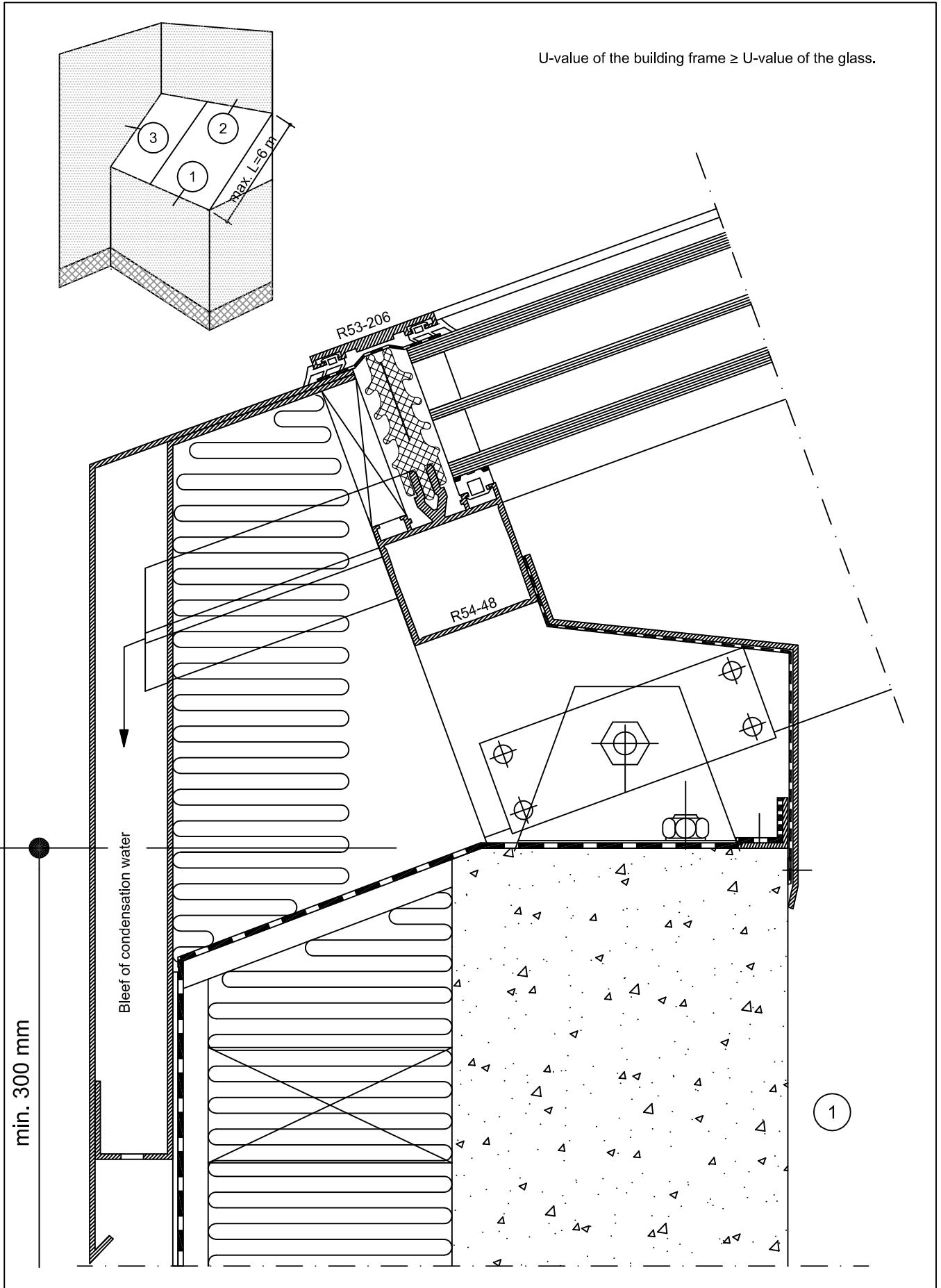
10 **NOKIAN**
PROFILES

6.1

N50si

N50si light roof

U-value of the building frame \geq U-value of the glass.



N50si

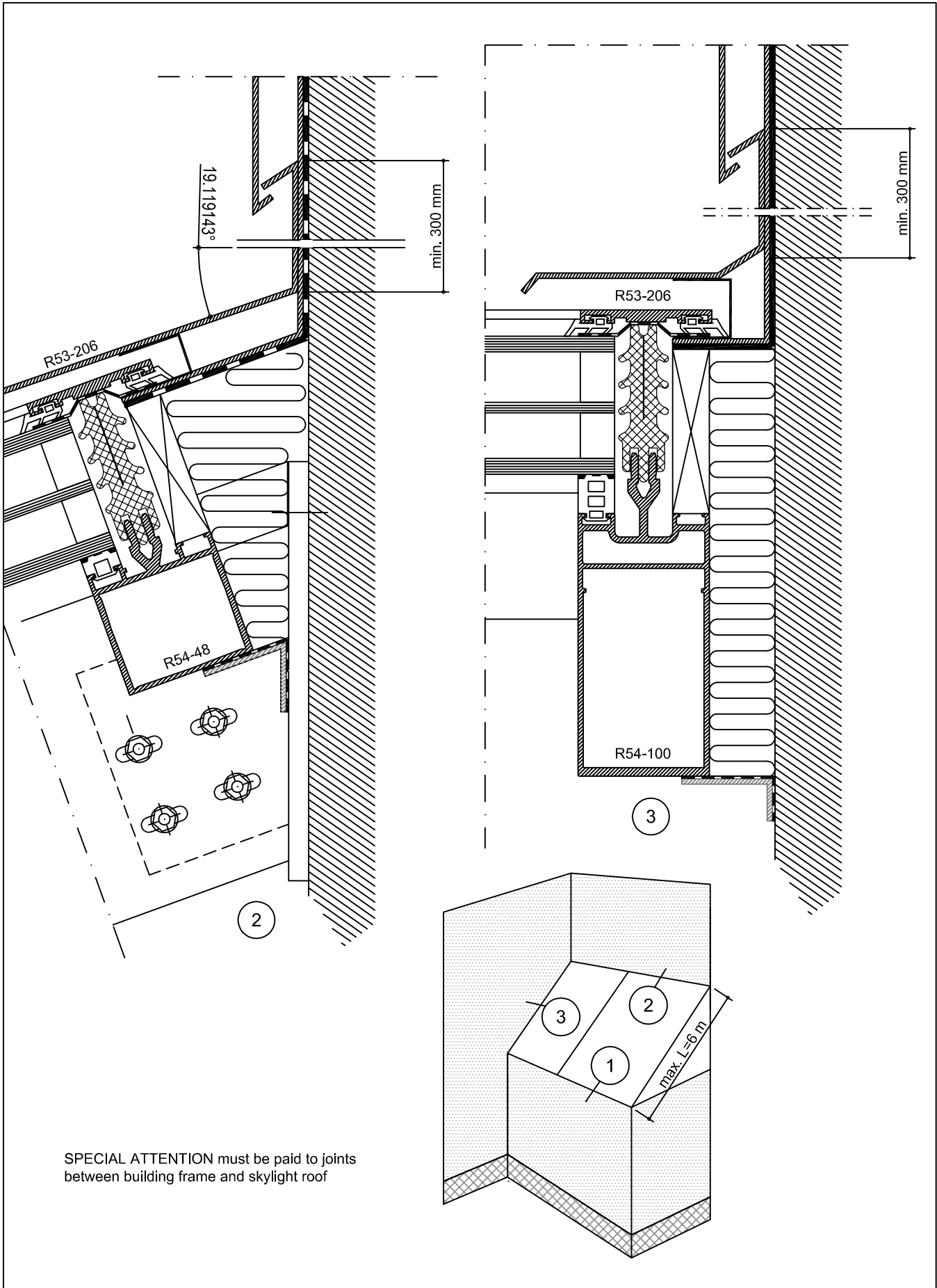
Joining to building frame details

NOKIAN
PROFILES

01.07.2014

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6.2



01.07.2014

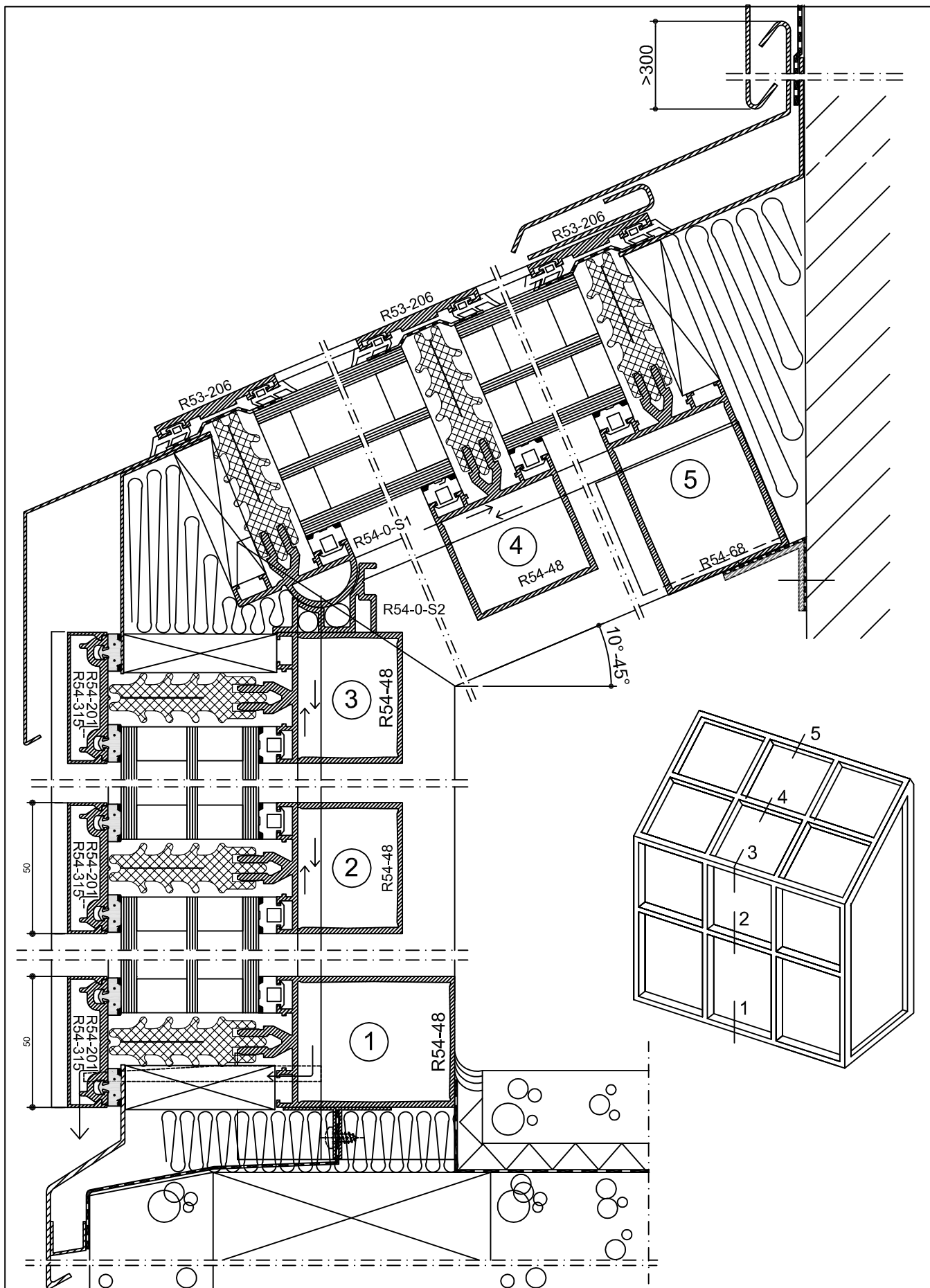
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NOKIAN
PROFILES

6.3

N50si

Joining to building frame details



N50si

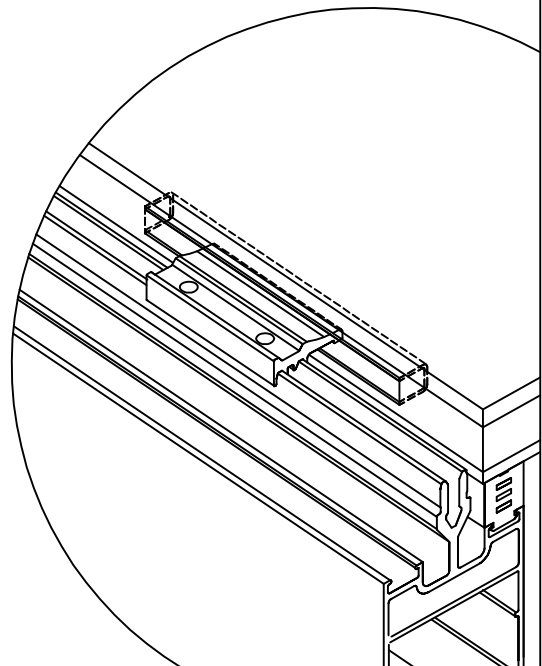
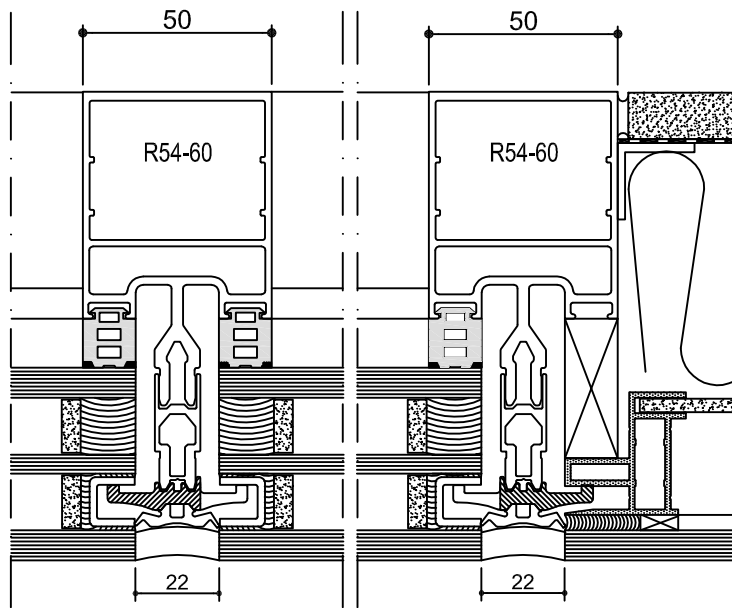
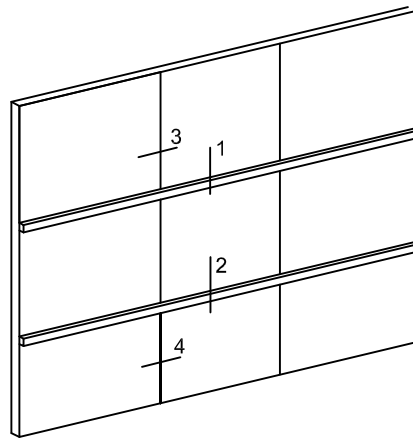
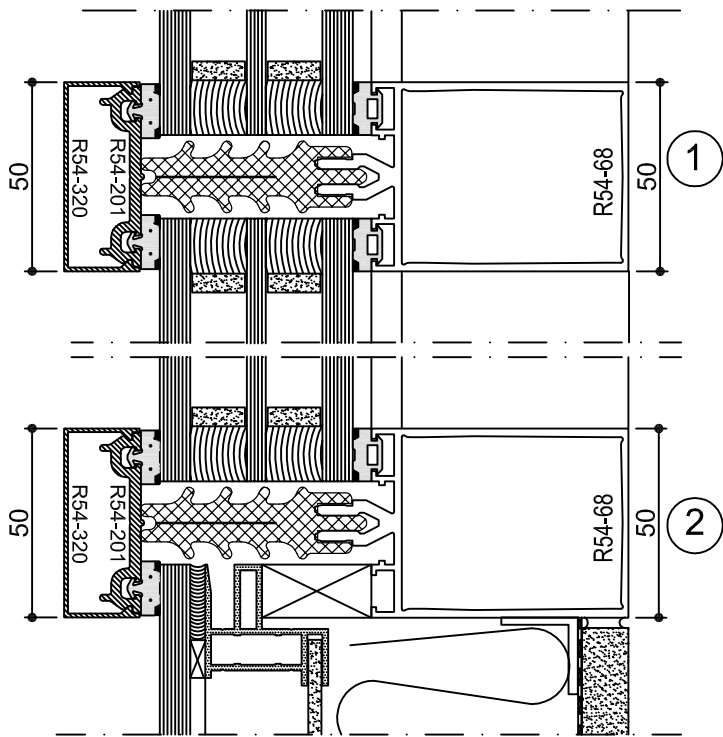
Facade and light roof joint



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6.4



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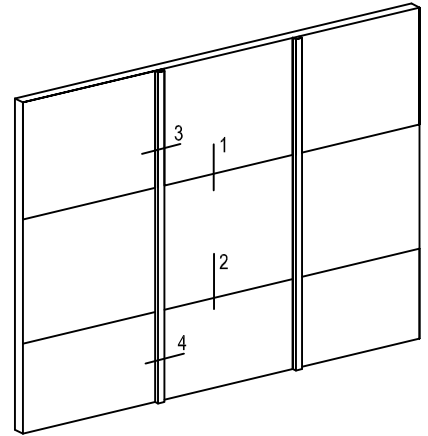
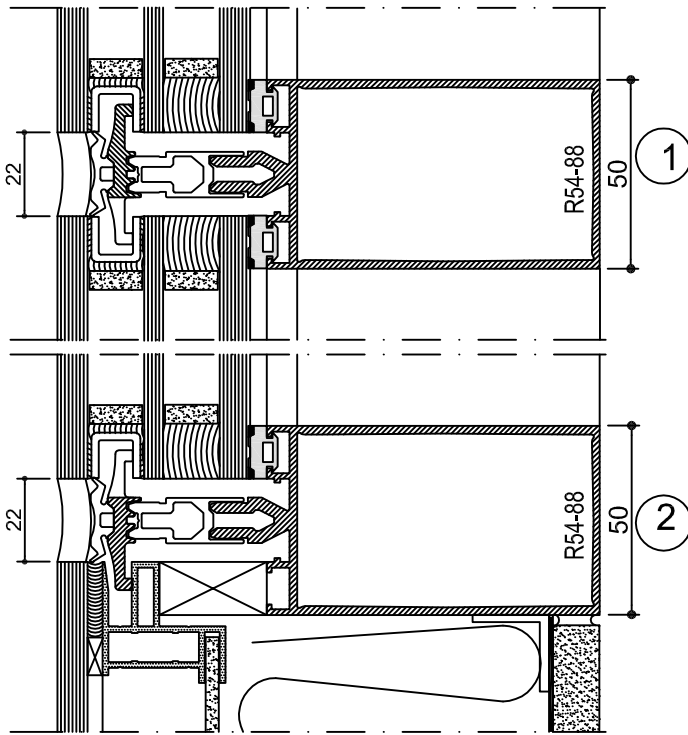
NOKIAN
PROFILES



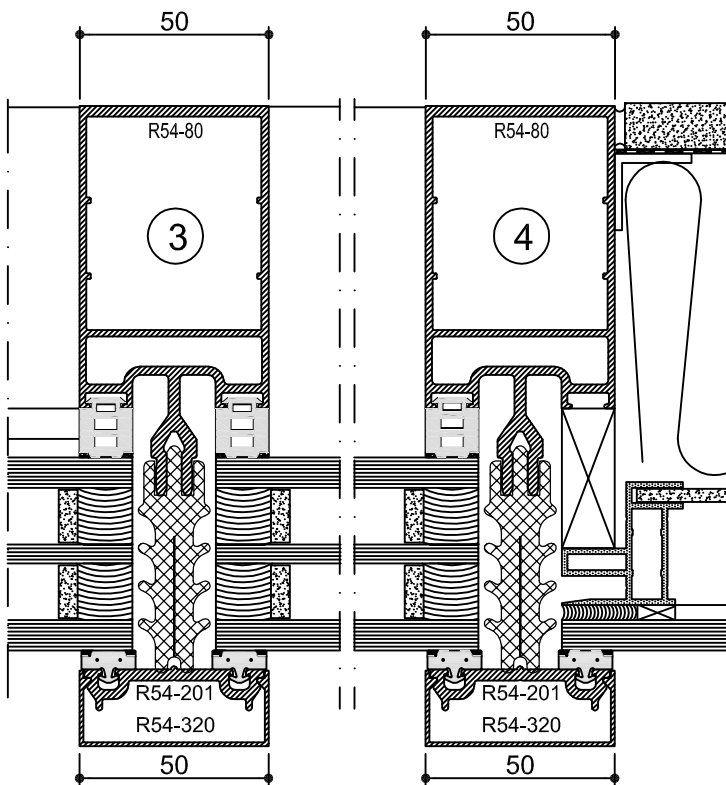
7.1

N50_{SI} SG

Facade without surface beads, 2-sides (vertical)



- Structural design, see design criteria
- Ventilation according to machine-shop folder instructions
- Gaskets and glass dimensions, see glazing instruction



Pat. pend.

N50si SG

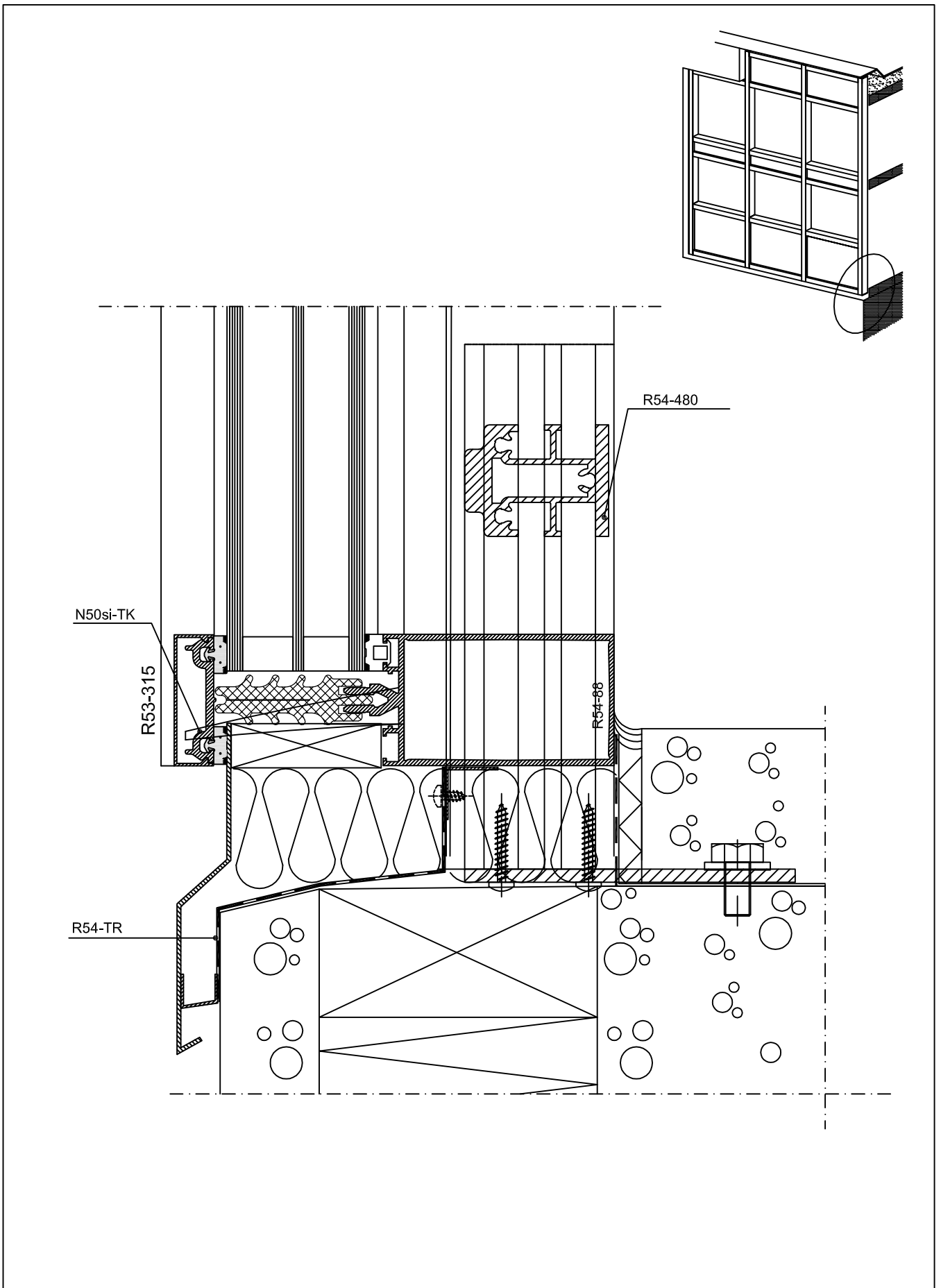
Facade without surface beads, 2-sides (horizontal)



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7.2



N50si

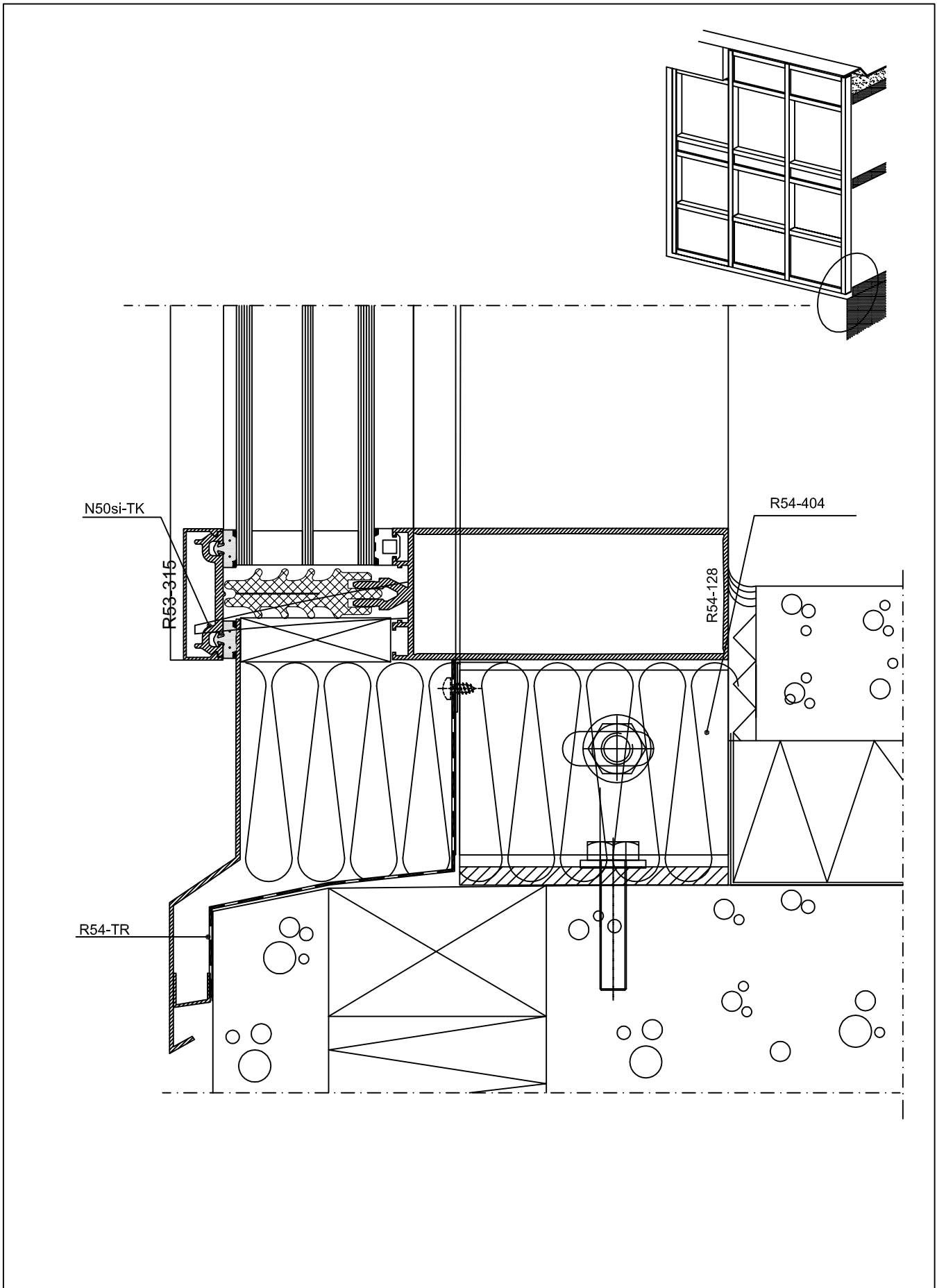
Connection of lower end to building frame

NOKIAN
PROFILES

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8.1



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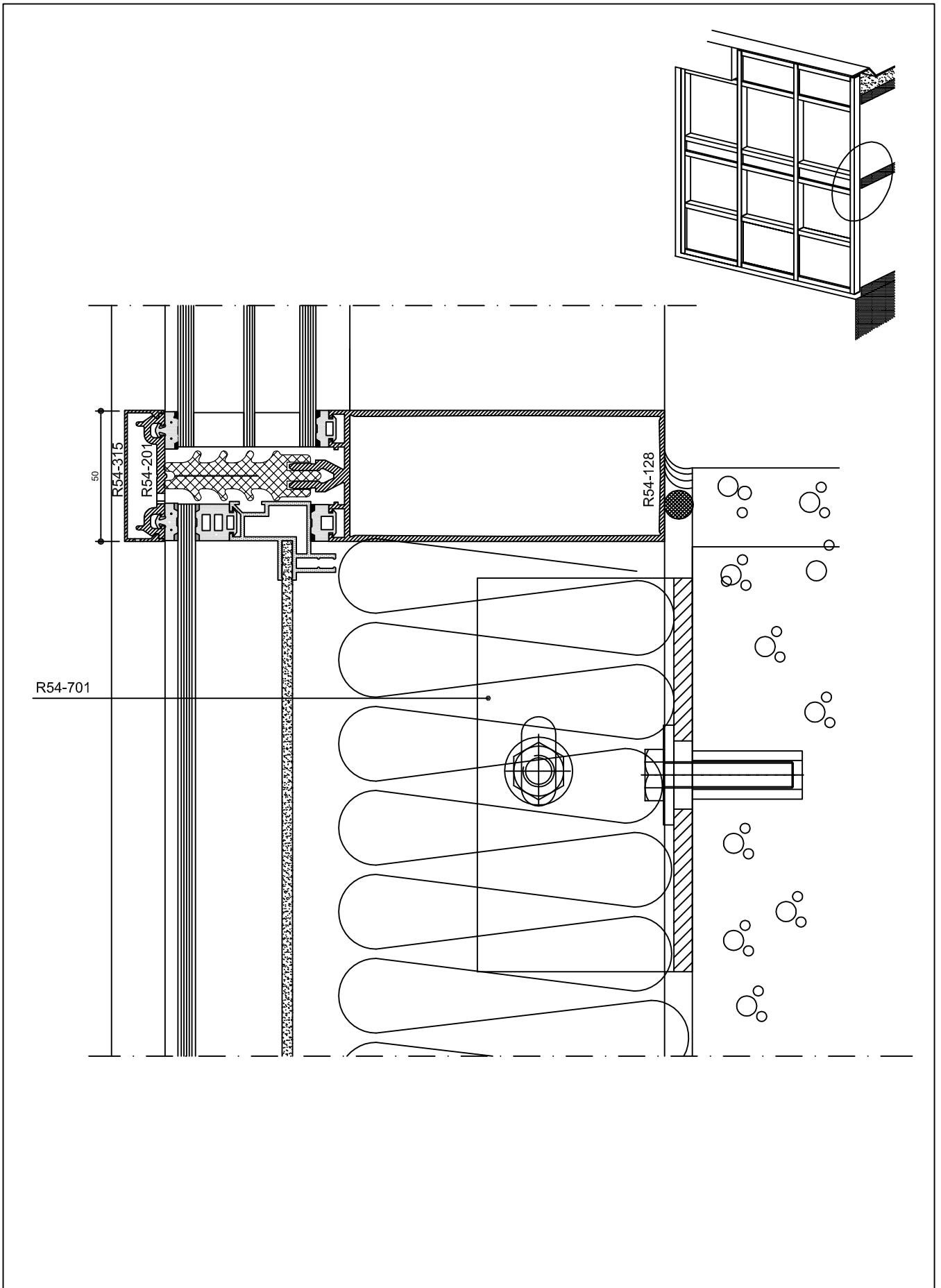
NOKIAN
PROFILES



N50si

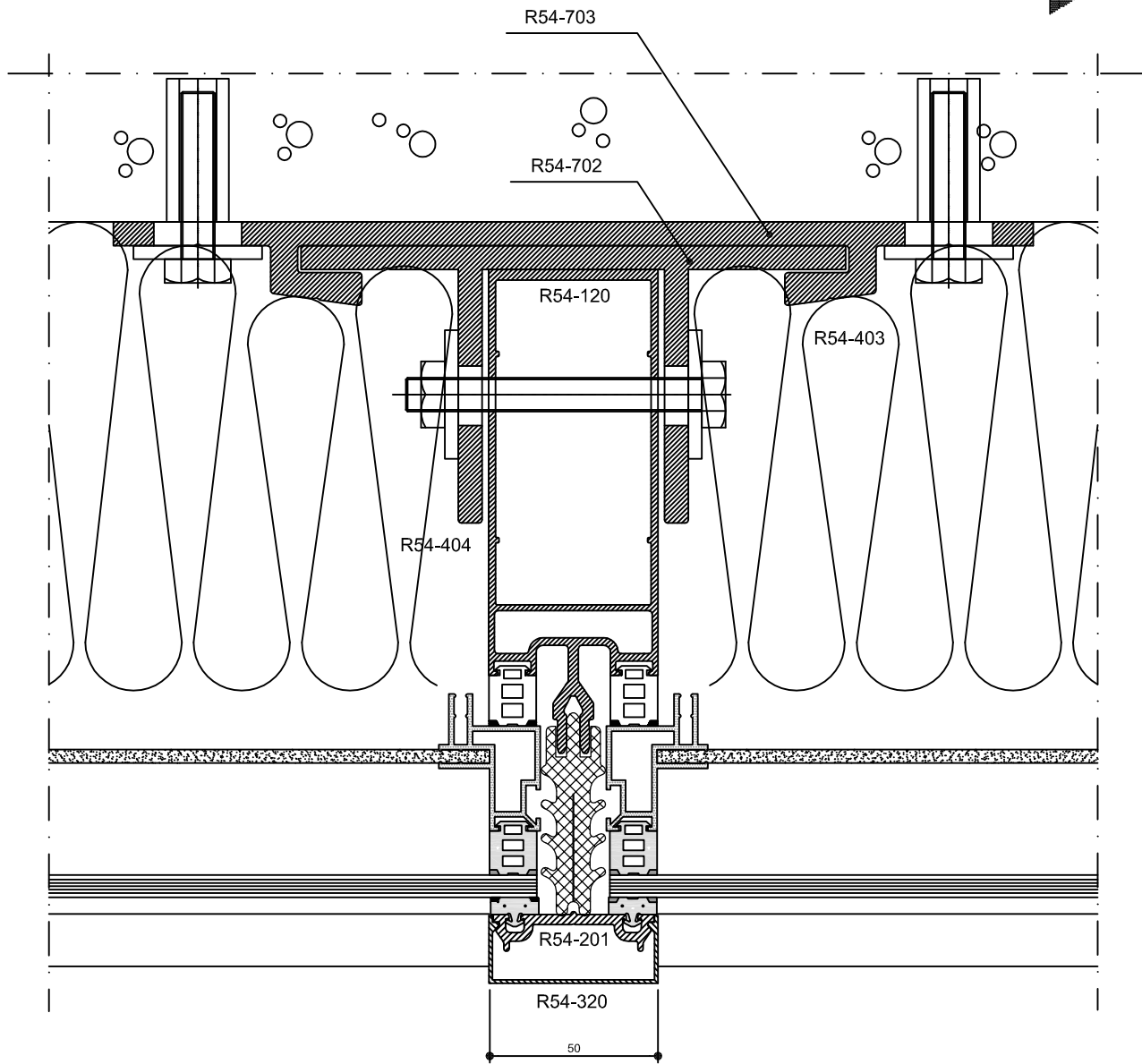
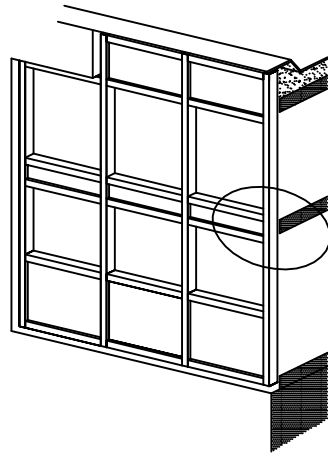
8.2

Connection of lower end to building frame



N50si

Fixing of wall to building frame



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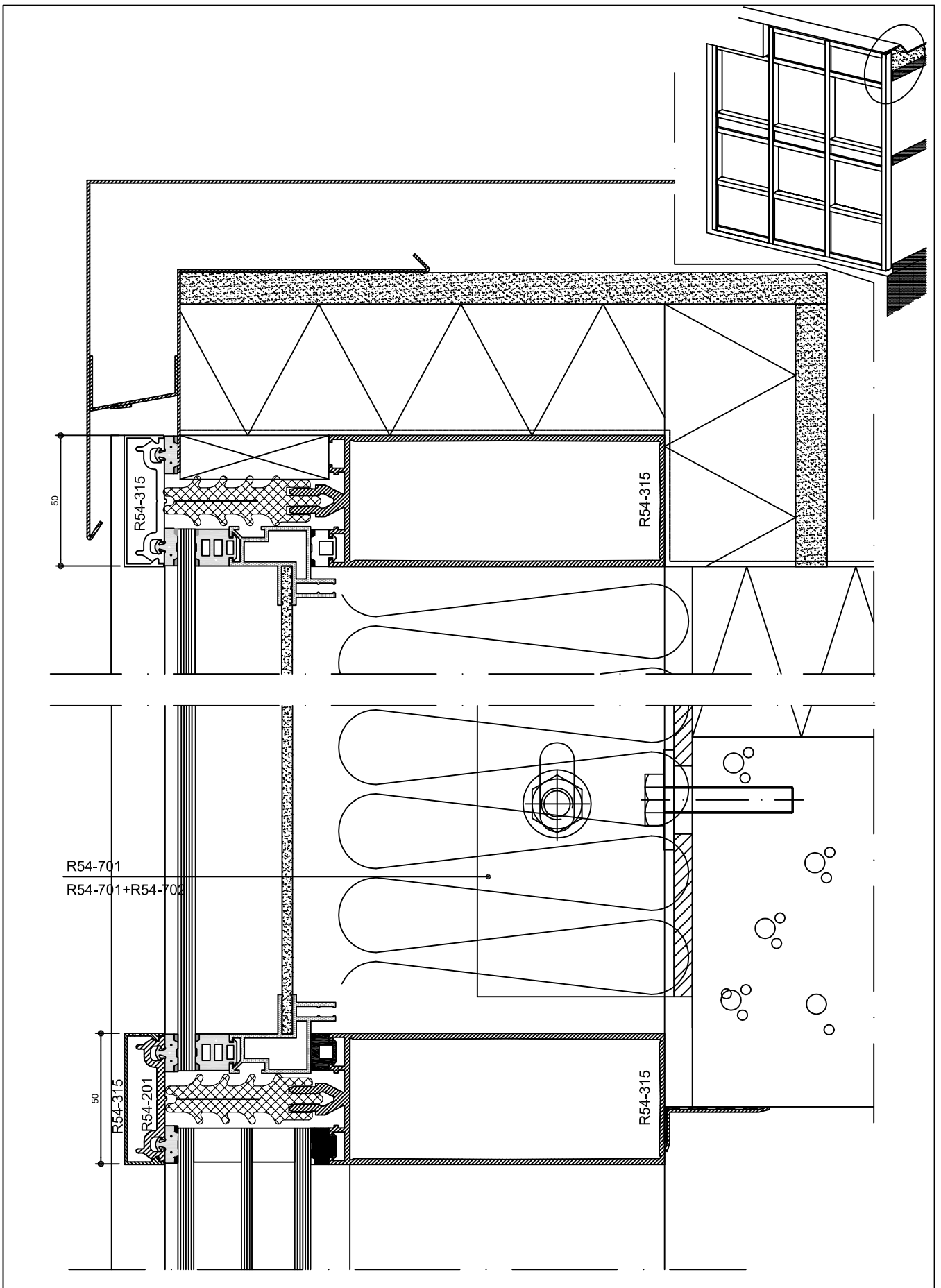
NOKIAN
PROFILES



N50si

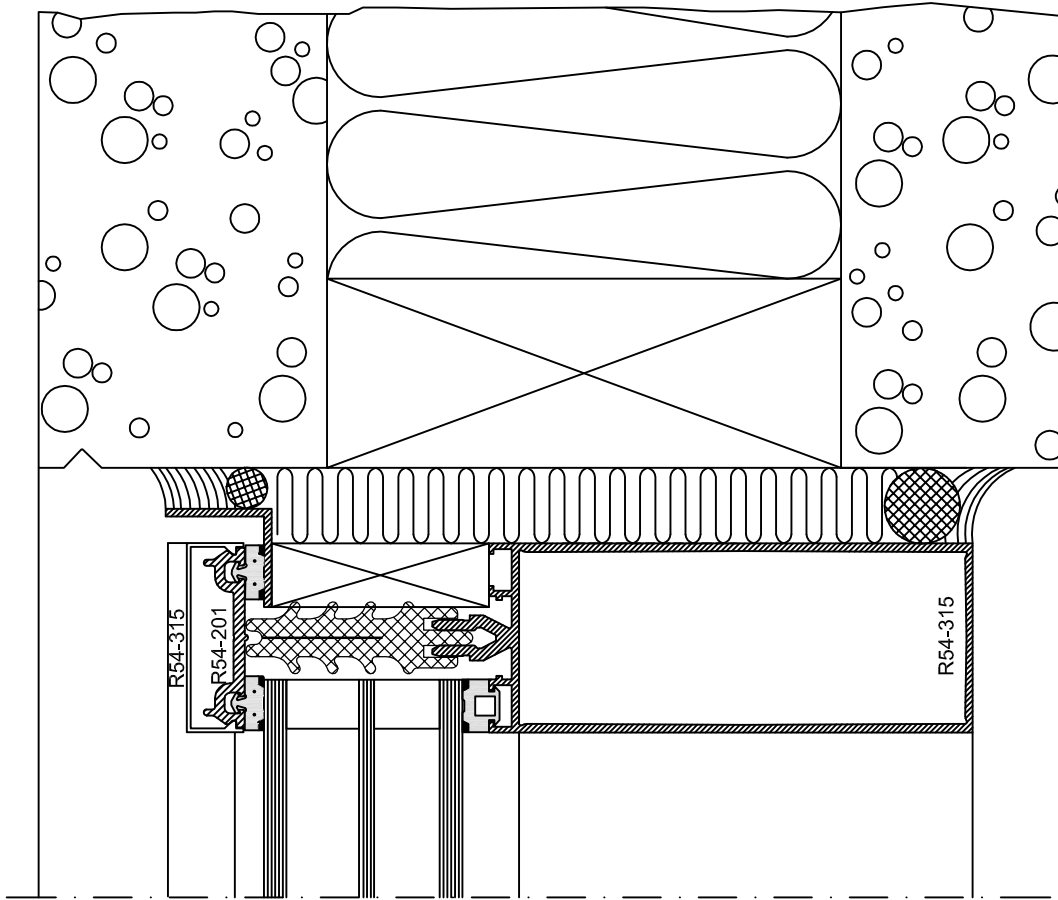
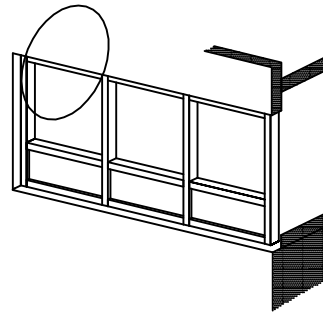
Fixing of wall to building frame, flexible fixing

8.4



N50si

Fixing of wall upper end of wall to frame



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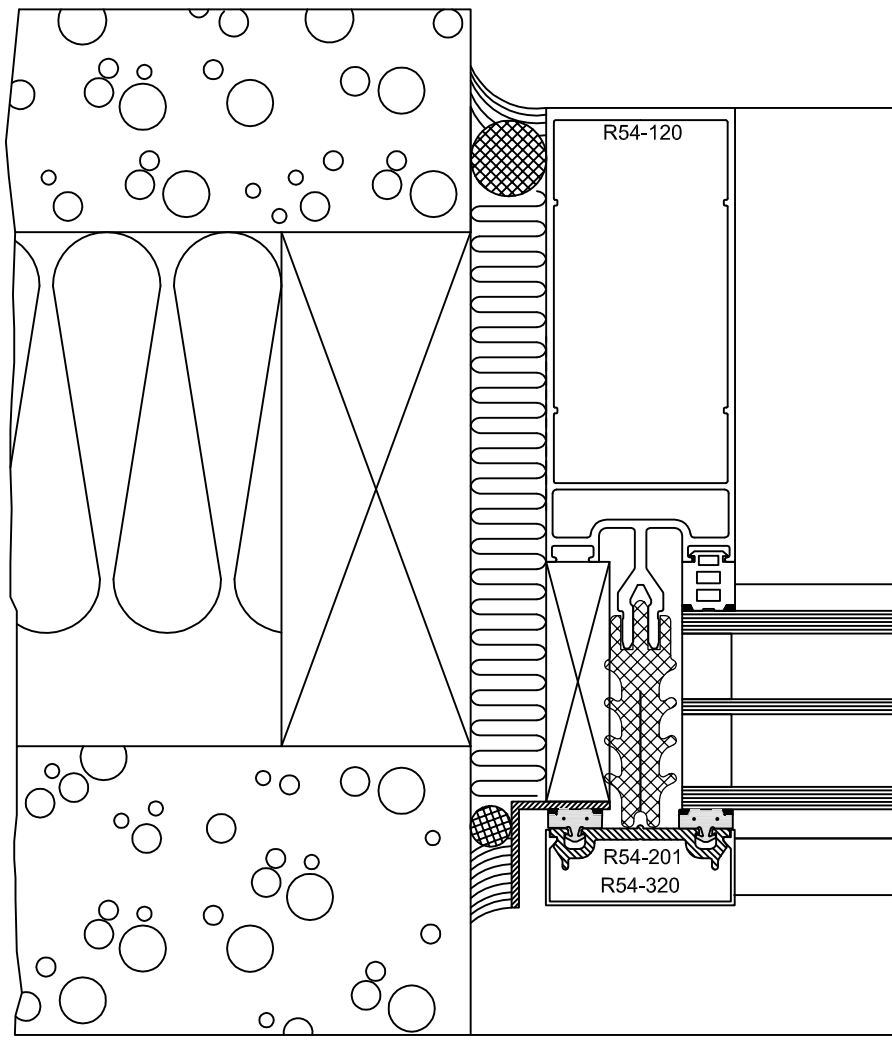
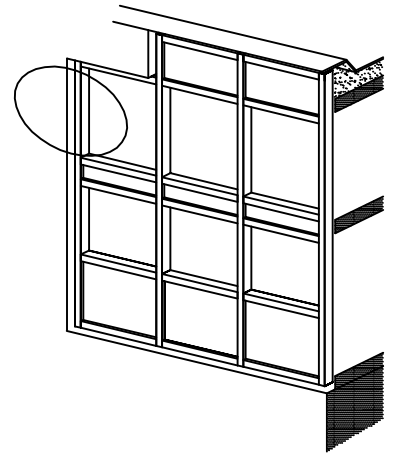
NOKIAN
PROFILES



N50si

Fixing of wall upper end of wall to frame

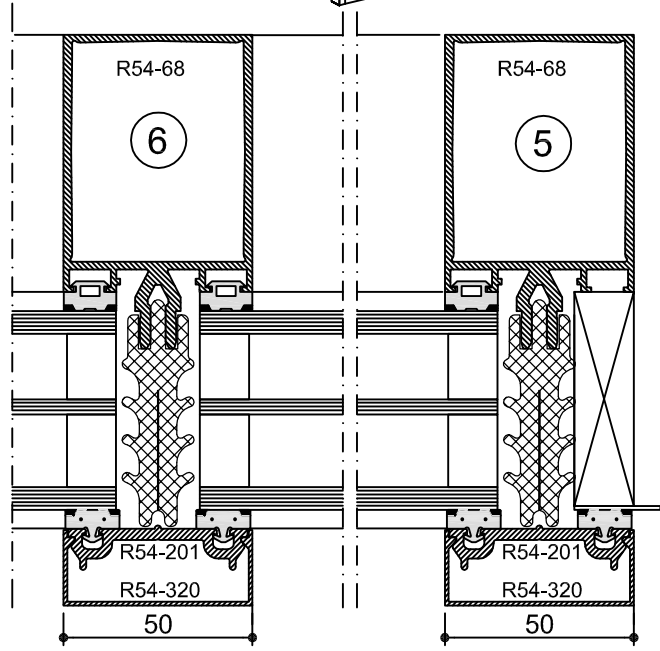
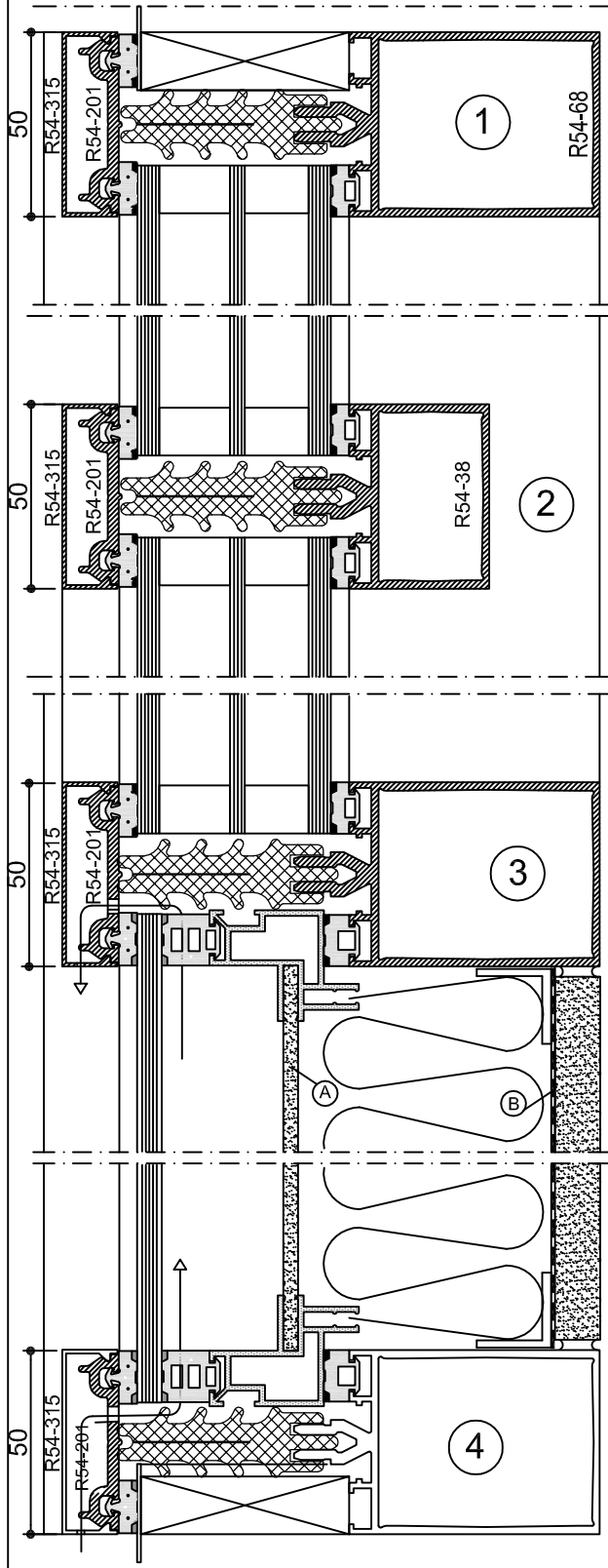
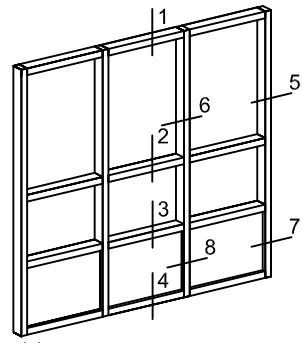
8.6



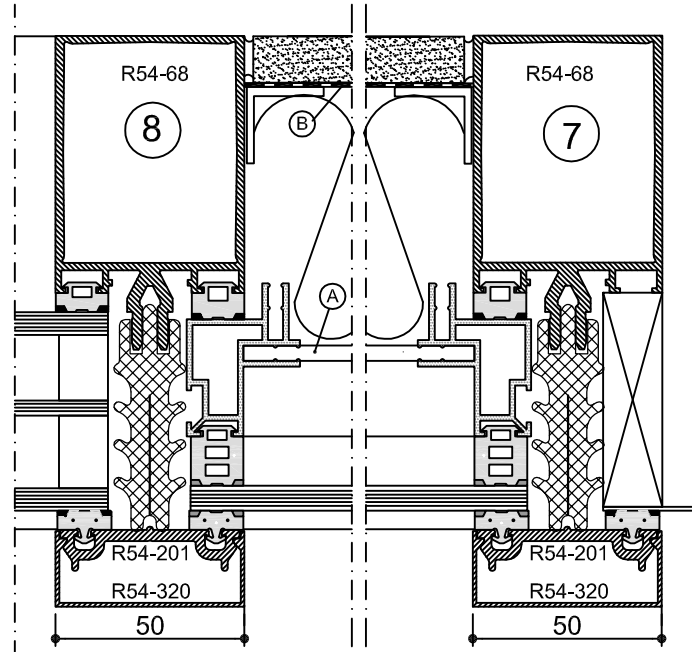
N50si

Fixing of wall to building frame

Note. Facade background painted or otherwise opaque.
Ventilation according to machine-shop folder instructions.



A = Luja wind barrier board (3.2 mm)
B = Vapour barrier

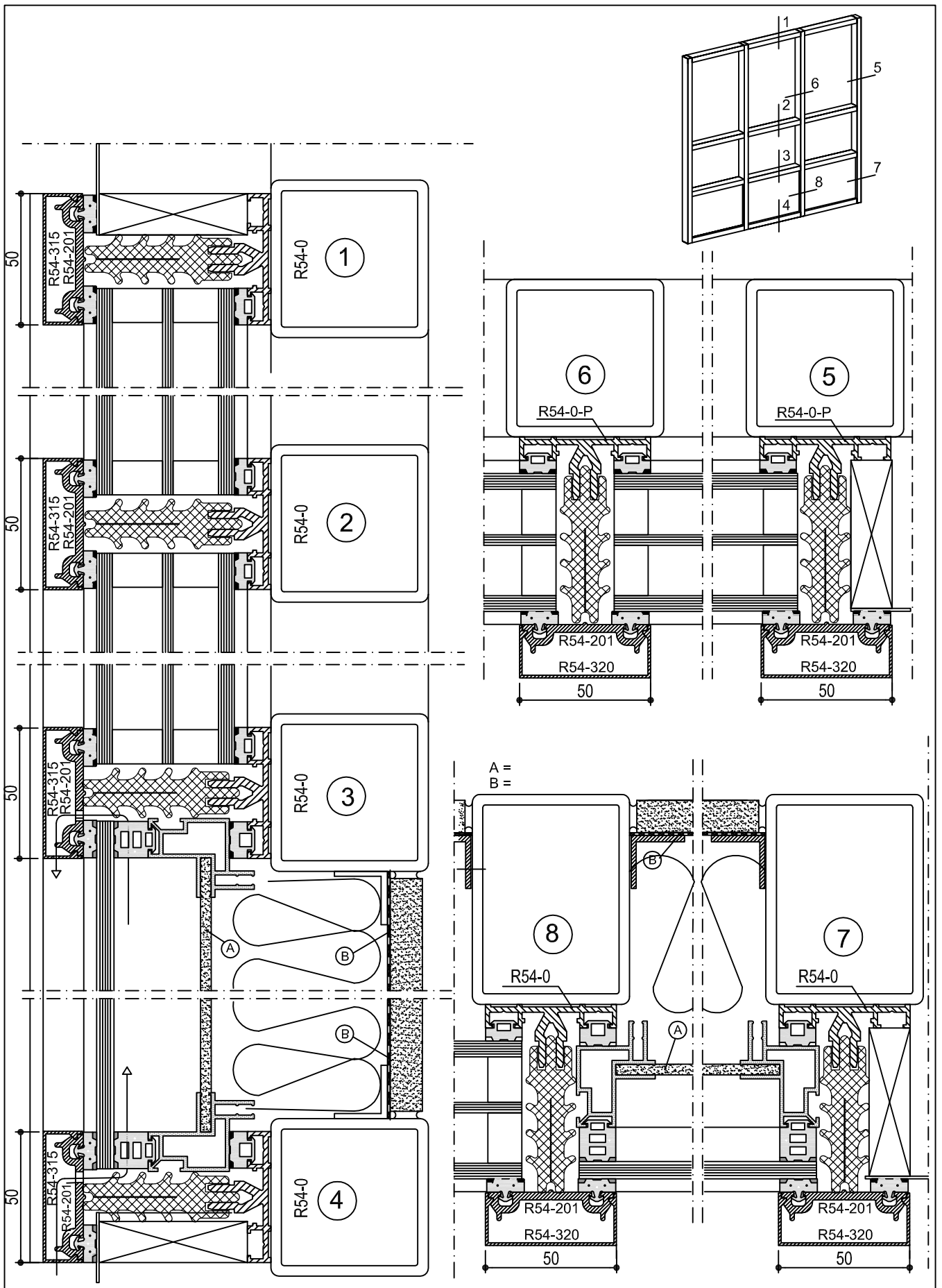


01.07.2014



9.1

N50si
Butt-joint facade



N50si

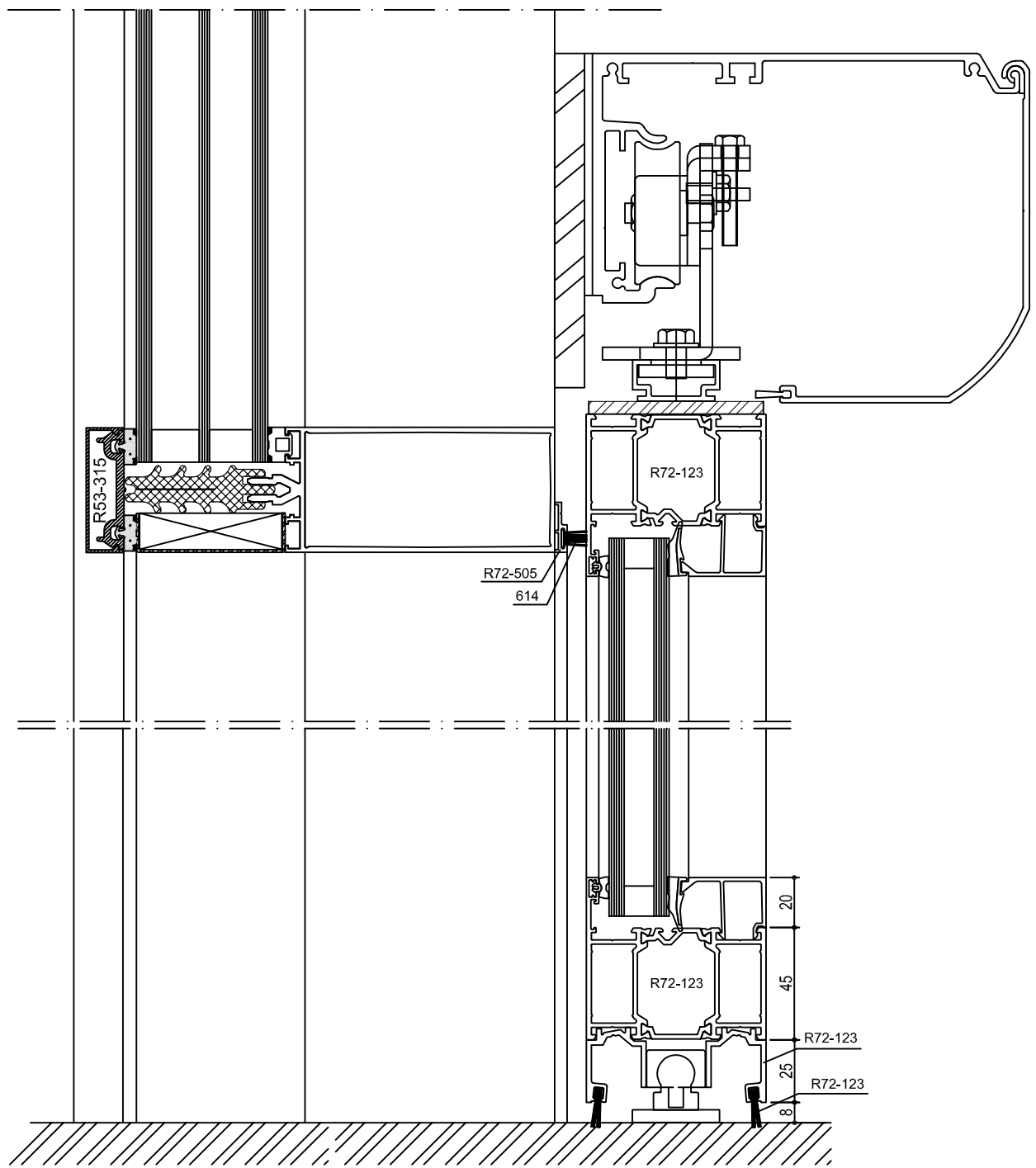
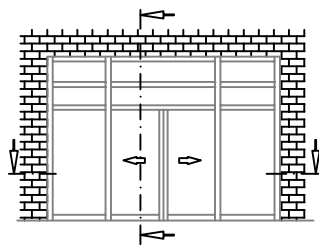
Butt-joint facade, with primary structure

NOKIAN
PROFILES

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9.2



01.07.2014

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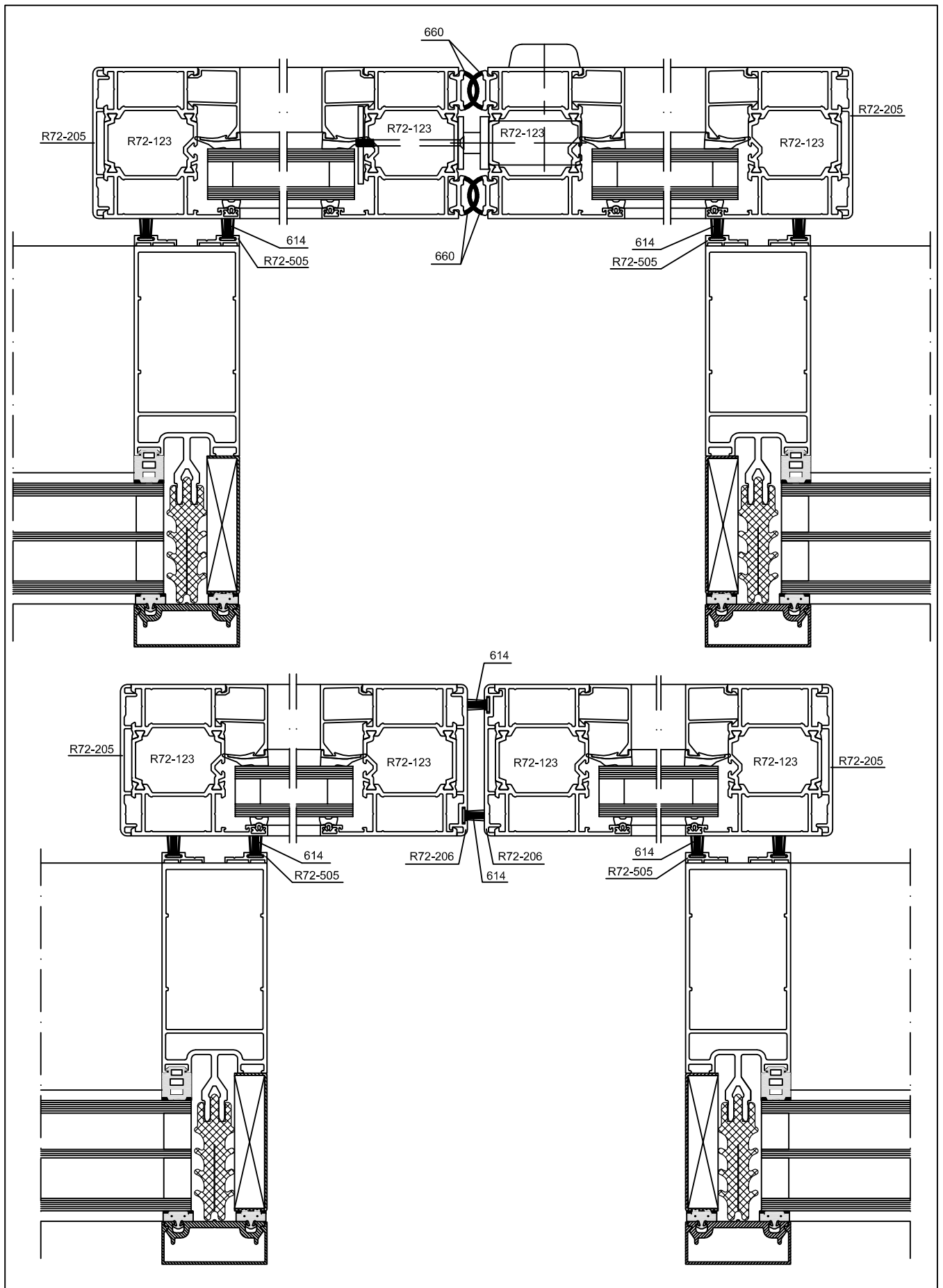
NOKIAN
PROFILES



9.3

N50si

Sliding door



N50si

Sliding door, horizontal section

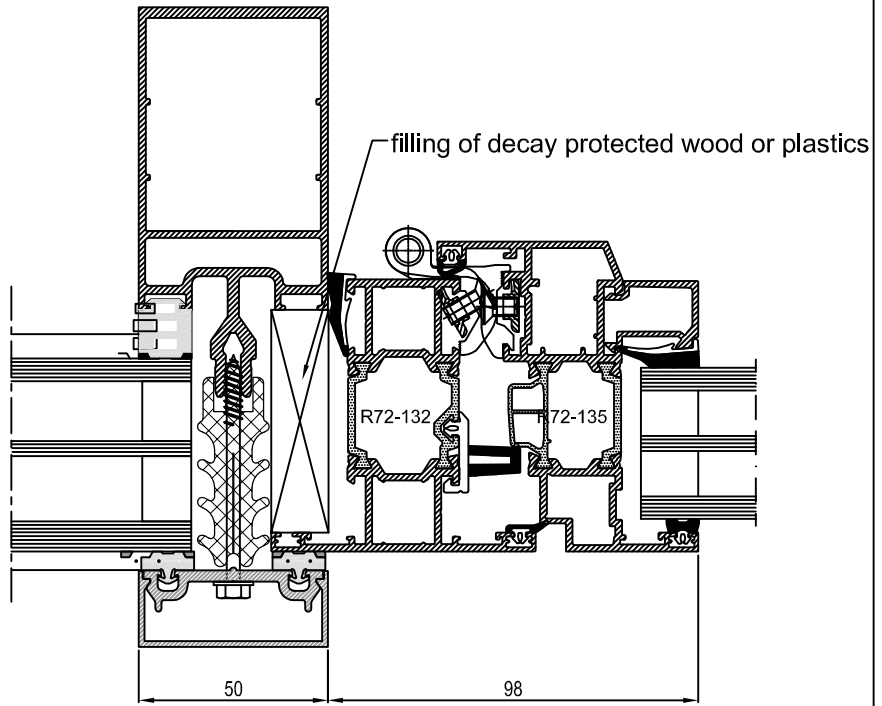
NOKIAN
PROFILES

01.07.2014

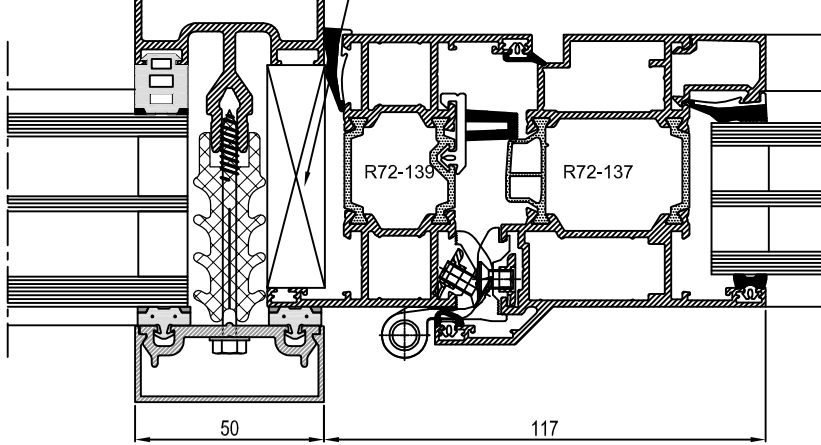
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9.4

R72 inwards opening window



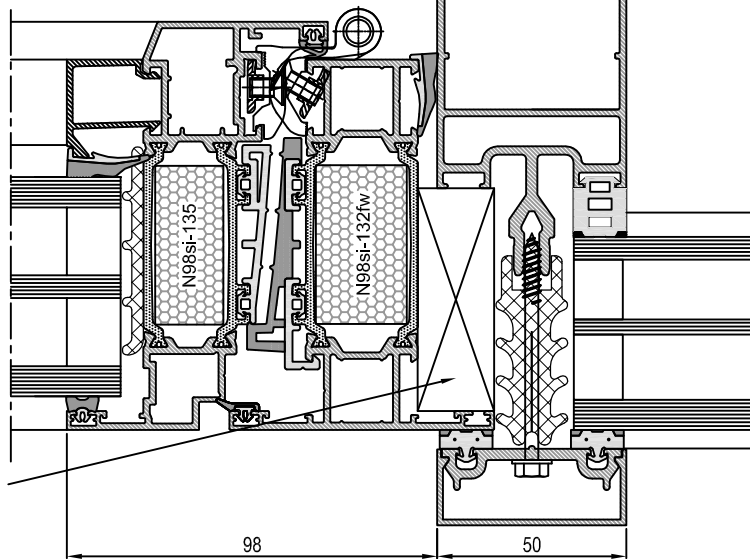
filling of decay protected wood or plastics



R72 outwards opening window

N98si inwards opening window

filling of decay protected wood or plastics



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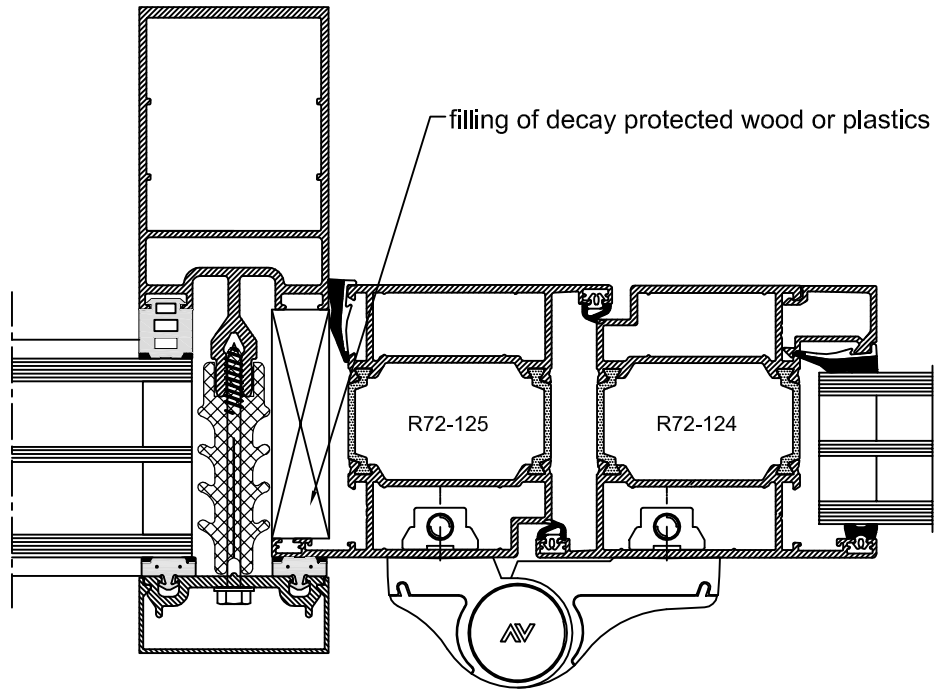
10 **NOKIAN**
PROFILES

10.1

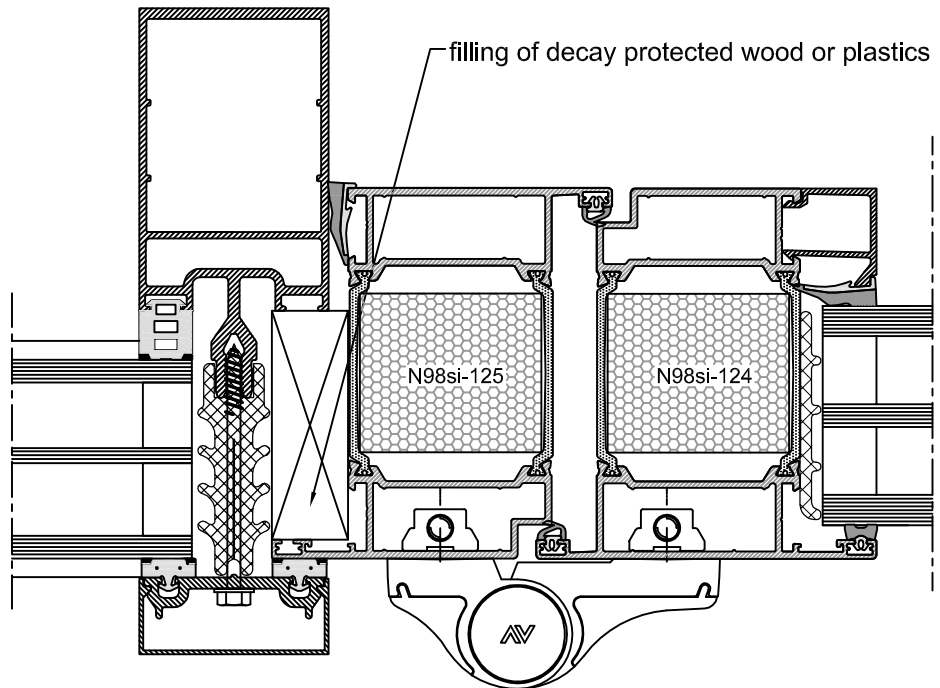
N50si

Attachment of windows

R72 door



N98si door



N50si

Attachment of doors

NOKIAN
PROFILES

01.07.2014

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10.2

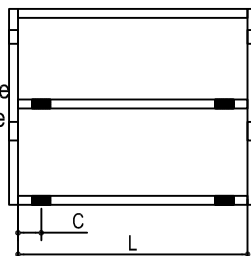
GENERAL

When starting the glazing, make sure that the rabbets, glazing beads and glass is clean.
The installation base must be completely straight. The sealing materials used in the installation must be compatible with each other and must not create any adverse chemical reactions.

GLAZING

PAD TYPES

- Bearing pads, which transfer the weight of the pane to the frame
- Support pads, which prevent the pane from moving when in use



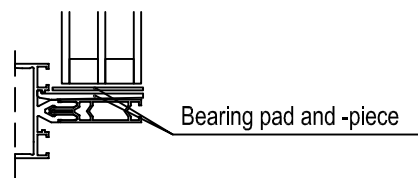
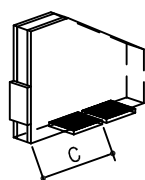
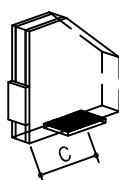
- Support pad
- Bearing pad

Bearing pads

Bearing pads must be R54 system bearing pads R54-K26...K42. Under the bearing pad is always used AINA glass support pieces R54-LT34...LT56, except in partition walls. Selecting support pads and pieces is shown more detailed at picture pages of glazing. Placement of support pads is shown in attached figure.

Capacity of bearing pads:

Support pieces	Max. weight of glass element [kg]
R54-LT34	180
R54-LT40	160
R54-LT50	120
R54-LT56	80



When $L < 2500$ mm, $C = 100$ mm
When $L > 2500$ mm, $C = L/8$ mm

Support pads

The length of the supporting pads can be 50-100 mm depending on the size of the pane, and the width the same as the bearing pads. Supporting pads must be made out of flexible material, and they must not impede the function of the bearing pads.

Gaskets

When cutting the glazing sealing, a shrinkage allowance of 0,5% must be observed.
Corners and joints of gaskets must be sealed from joint surfaces by sealing mass.
When installing the gaskets, amount of joints must be minimized.
All materials which are used in sealing must be approved by Nokian Profiles Ltd.

Butyle tapes

At variable angled walls and sky lights is butyle tape always used under the outer gaskets.
At variable angled walls butyle tape is used in vertical frames and in sky lights in vertical and horizontal frames.
The overlap between butyle tape and glass must be at least 5 mm. The surface of the glasses must be absolutely dry and clean during the fastening. In skylights continuous butyle tape is installed across the crossings.
Open the holes in the butyl tape at the glazing bead screw positions to prevent rotation of butyl tape around glazing screws.

Glazing beads

Installing the glazing beads according to machine-shop folder instructions.

These glazing introductions are in principal only. We accept no responsibility for actual glazing work that we are not personally supervising.

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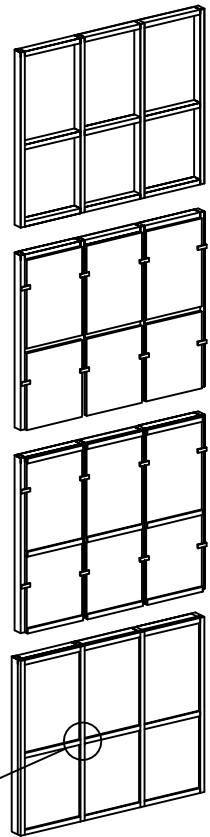
N50si

Glazing instructions

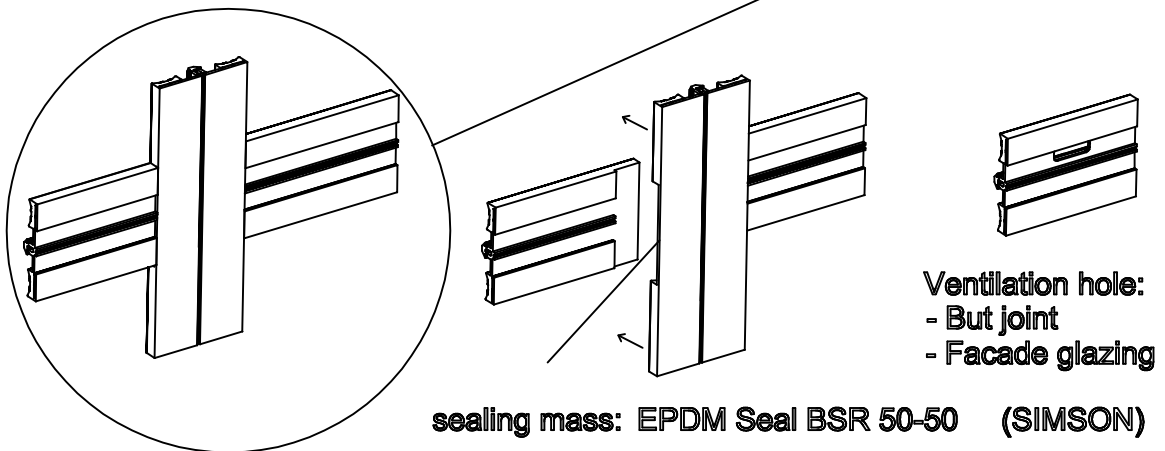
11.1

INSTALLATION ORDER

- ① Inner gaskets, thermal brakes and glass bearing pieces and -pads
- ② Overlapping glasses/glass elements are fixed with temporal fixing pieces (you can also move on straight to place 3.)
- ③ Install the outer horizontal gaskets and glazing beads.
- ④ Remove the temporal fixing pieces.
- ⑤ Install the outer vertical gaskets and glazing beads.



SEALING



Gasket joints are cut by special scissors:

SWR-33-04 Cross joints



WL-33-04 ventilation holes to gaskets



TI-58-04 Straight cutting of gaskets



N50si

Glazing instructions

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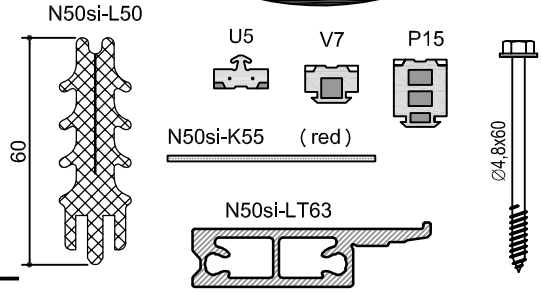
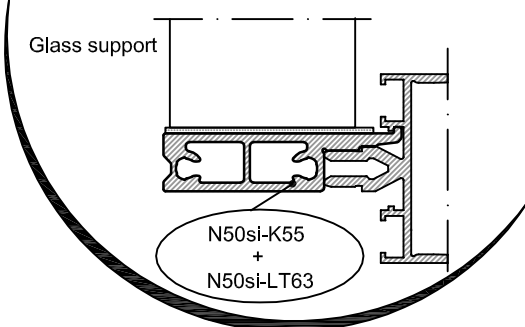
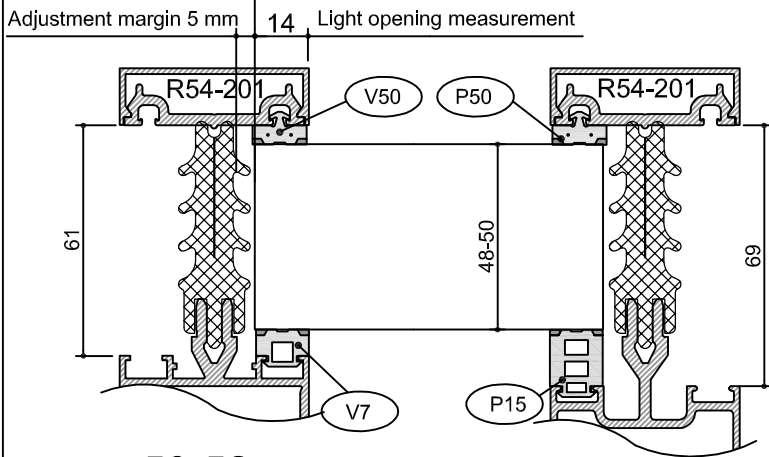
01.07.2014

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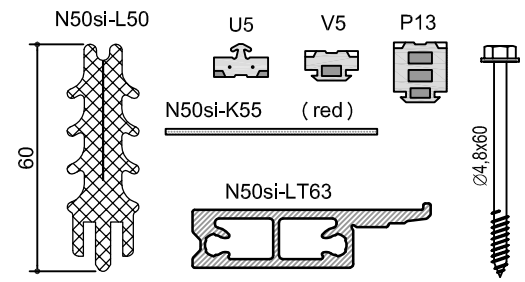
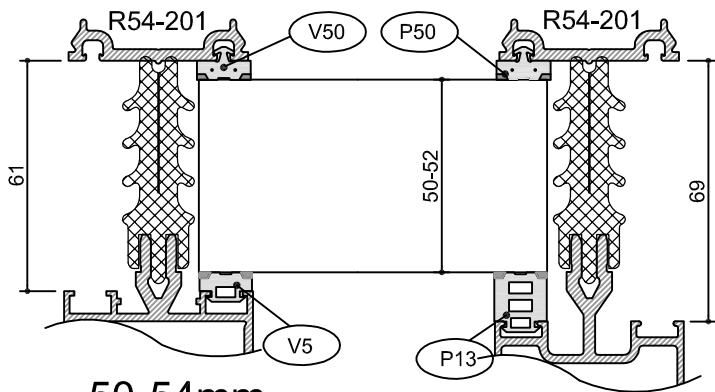
11.2

48-50 mm

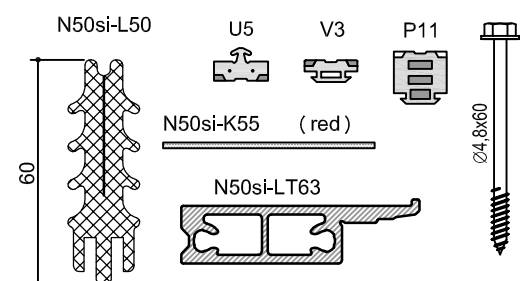
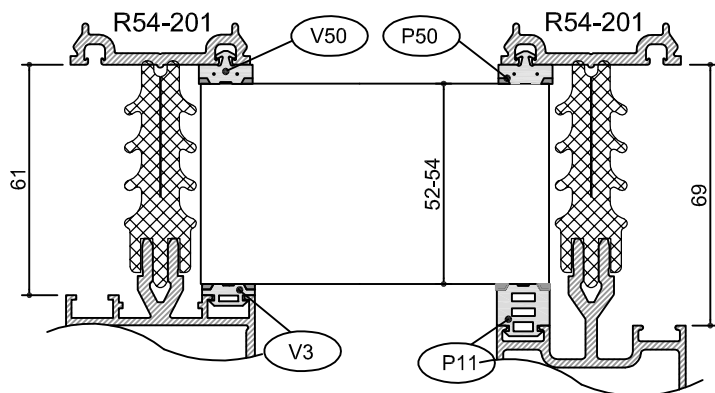
Measures of glass = light opening area measures+28



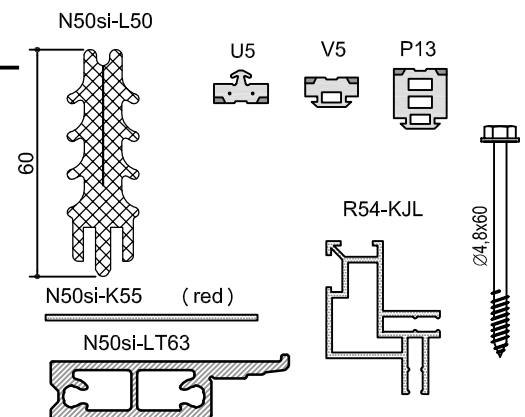
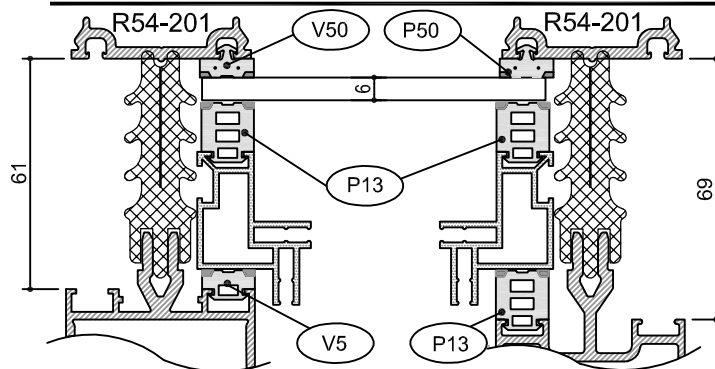
50-52 mm



50-54mm



Facade glazing



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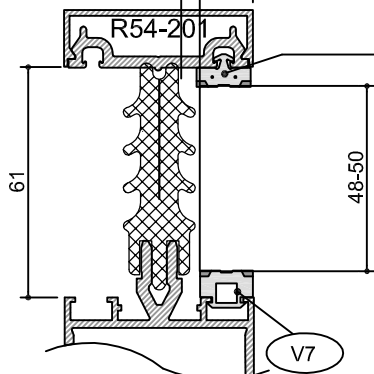
N50si

Lap-joint, triple glazed 48-54 mm

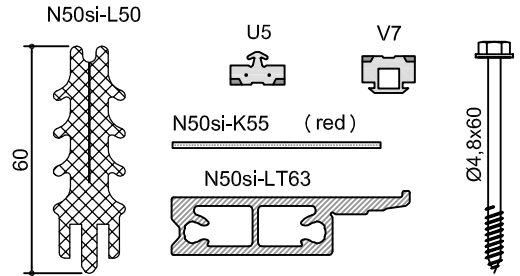
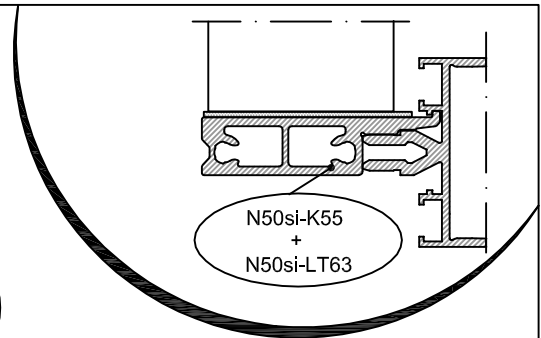
12.1

48-50 mm

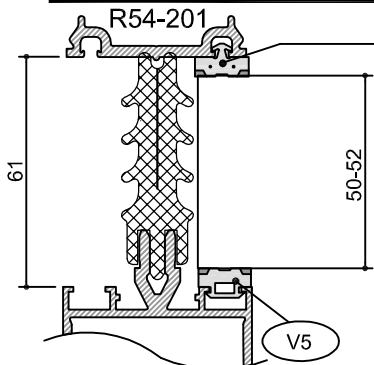
Adjustment margin 5 mm
 Measures of glass = light opening area measures+28
 14 Light opening measurement



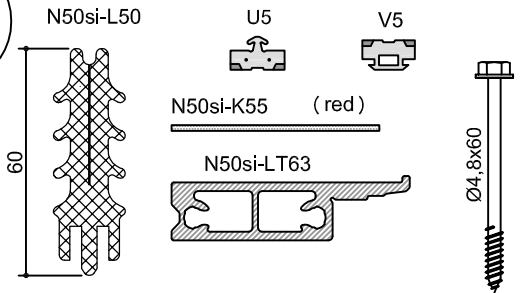
Vertical: U5 Horizontal: U5



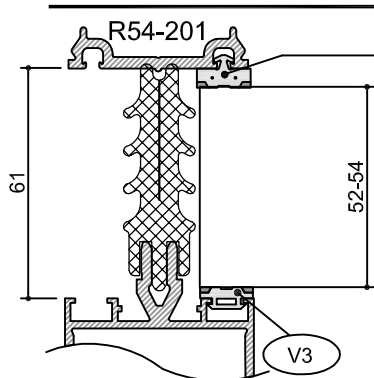
50-52 mm



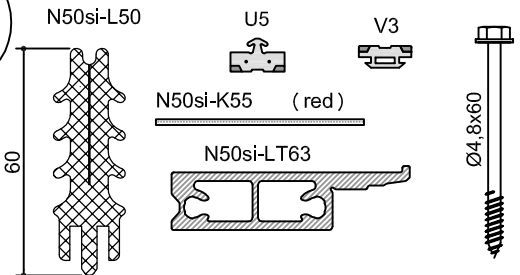
Vertical: U5 Horizontal: U5



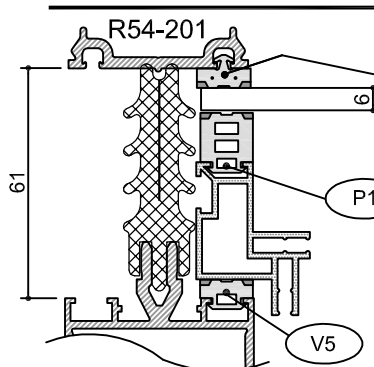
50-54 mm



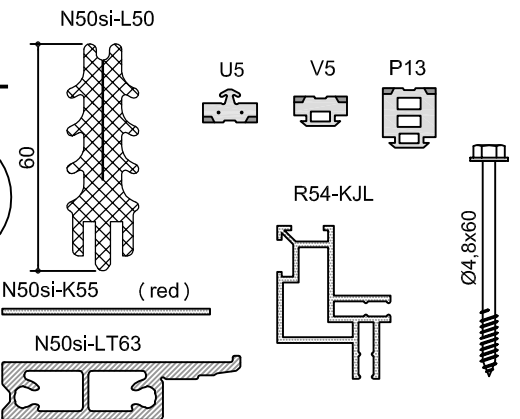
Vertical: U5 Horizontal: U5



Facade glazing



Vertical: U5 Horizontal: U5



N50si

Butt joint, double glazed 48-54 mm

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13.1

N50 Facade system Specification

1. Type

Thermally insulated aluminium-framed N50 facades are built according to the N50 instructions, either with a lap joint technique or an end-to-end joint technique. The end-to-end joint must be separately mentioned in the plans.)

2. Materials

- Profiles AW-6060 T6
- Gaskets EPDM-rubber
- Thermal breaks, recycled PVC
- Screws DT-DS 600 DIN 50021 or A4

3. Surface finishing

Anodising

The aluminium profiles can be surface-treated by anodising, which is a light- and weather-proof method.

Colour.....

Painting

Polyester powder coating in desired colour, baked, base treatment by chromating

Colour.....

4. Glazing

The glazing type is..... the selections regarding glazing and related materials are performed according to glazing instruction N50. Only gaskets approved by Nokian Profiles are used for the sealing.

5. Configuration

The N50 structures are built according to instructions given by Nokian Profiles. (Machine-shop folder)

6. Connection to the building frame

The structures are attached to the building frame so that the loads on the structures are reliably transmitted to the frame, and that the deformations of the building frame and the thermal movements do not harm the structures. The fixing elements are either N50 fixing pieces, or elements made from stainless material.

The seam between the N50 structure and the building frame is sealed appropriately.

7. Construction time shielding

When needed, the aluminium profile surfaces must be shielded from moulding, plastering and welding splashes and spatter, and from mechanical damages occurring during construction.

8. Functional requirements

The structure must withstand all loads defined in the regulations, and convey them to the building frame. The structure must be implemented so that the finished structure functions in a controllable manner in all respects.

9. Facade maintenance

The facade is washed with clean water and a sponge. A mild detergent with a neutral pH value (5 to 7) can be used. Alkaline detergents MUST NOT BE USED.

10. Environmental specifications

The R54 environmental specification is available at the Rakennustietosäätiö. (www.rts.fi)

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N50si

14.1

N50si Specification

SYSTEM: N50 Facade system

MATERIALS: Alloy EN AW-6060 (AlMgSi)
EN 573
EN 755 and DIN 1748

PROFILE MEASUREMENTS: EN 755 or DIN 1748
EN 12020 or DIN 17615

SURFACE TREATMENTS: Anodizing
Layer thickness SFS-EN ISO 2360
Sealing SFS-EN 12373-5 or ISO 2932

Powder coating
Layer thickness SFS-EN ISO 2360
Cross-cut test SFS-EN ISO 2409

QUALITY MANAGEMENT: Nokian Profiles processes are following the standard ISO 9001.

ENVIRONMENTAL MANAGEMENT: Nokian Profiles processes are following the standard ISO 14001.

Architectural systems Nokian Profilit Oy has a 40 years history. Based on our experience we can note that the life expectancy of the material as well as of the surface treatment with regular and proper service are expected to be 50 years.

Nokian Profilit Oy
Architectural systems