TECHNICAL CATALOGUE

OPENING WINDOW AND DOOR SYSTEM WITH THERMAL BREAK

E19 E1600 E52 E40 E68 Q72 E75 E8000 E2300 E70 E85 Q60

ETEM

E68
WINDOW AND DOOR SYSTEM WITH THERMAL BREAK

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ETEM HISTORY

ETEM is a leading aluminium extrusion company. It was founded in 1971 as a part of the largest metal manufacturing holding on the Balkans. With over 40 years of experience ETEM is a fully integrated designer and producer of architectural systems and aluminium profiles for industrial applications.

Our mission is to listen and promptly respond to our customers' requests and design and manufacture aluminium products and systems, taking into consideration technical and aesthetic requirements.

ETEM focuses on sustainable development and has proven its concern about the protection of the natural environment by making considerable investments in anti-pollution measures and by optimizing production processes following the applicable standards of the European Union.

SERVICES WE PROVIDE

ETEM supports you with the following:

⊳ design of conventional and bespoke architectural system solutions

⊳ innovative engineering in the field of curtain walls, ventilated facades, doors, windows

⊳ professional consultation and adequate technical advices ensured by our engineering team with wide experience in the field of profile extrusion as well as architectural systems' engineering

⊳ reliable customer care constant support trainings, technical support and audits on site

⊳ high quality engineering which guarantees offering the best solution according to the specific features of every single project

⊳ managing the process of certification in accordance with the applicable European standards in Notified Bodies

⊳ production of non-standard length profiles and non-standard processing

⊳ high quality powder coating

ETEM PRODUCTS AND SUSTAINABLE DEVELOPMENT

SUSTAINABLE DEVELOPMENT IS DEVELOPMENT THAT MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS.*

For many, sustainable development is about environmental conservation. This is true but it also includes two other aspects: a social aspect and an economic aspect.

Sustainable development means striking the right balance between economic development, social equity and environmental protection.

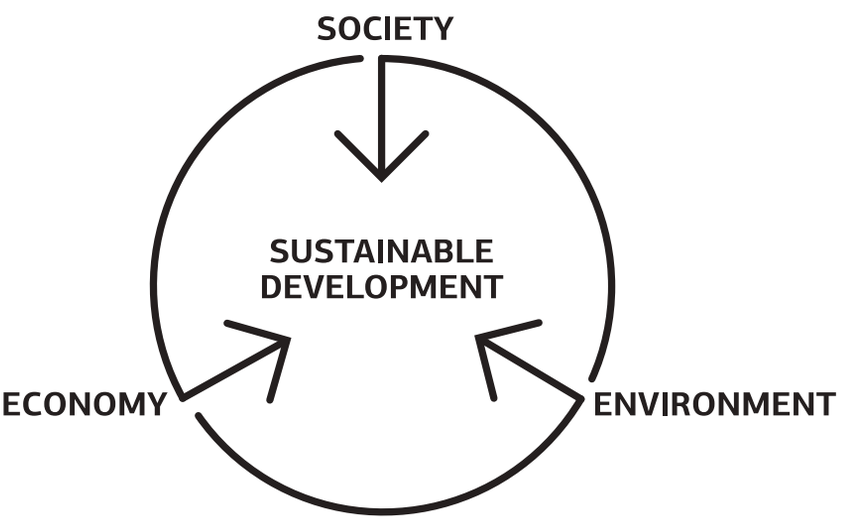
For us meeting this objective translates into the challenge of satisfying market demands at the lowest economic, social and environmental cost possible.

ETEM has always designed architectural systems which are in compliance with all requirements for achieving high energy efficiency.

In order to assure the comfort of the building inhabitants, ETEM systems adapt their functions to the changing environment.

As a moderator between outside and inside our systems provide:

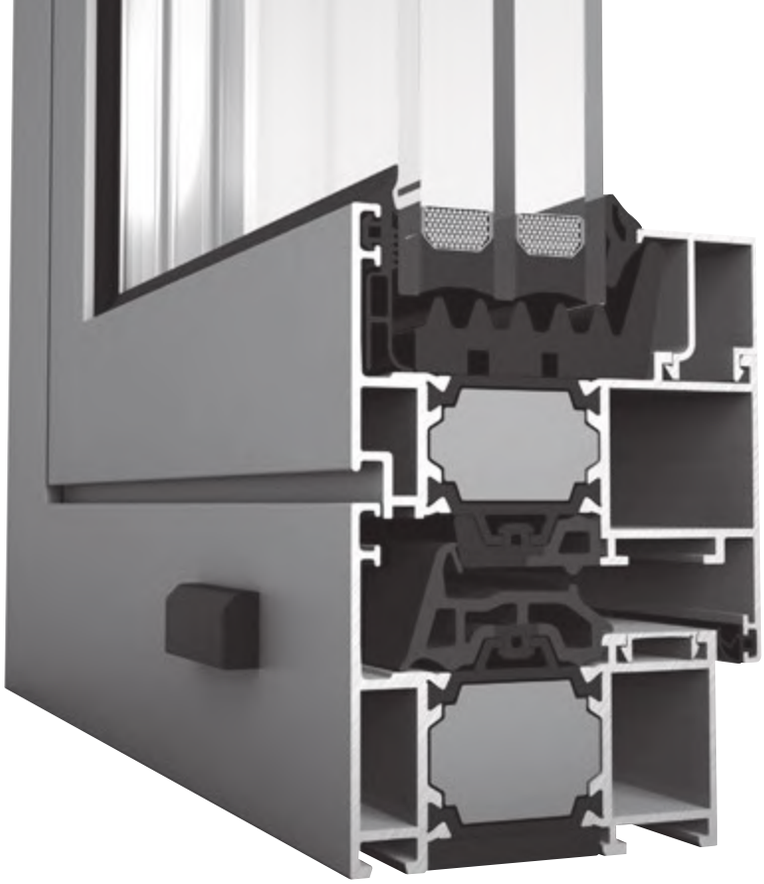
› ENERGY EFFICIENCY
› DAYLIGHT
› SUN-SHADING
› VENTILATION AND GOOD AIR QUALITY
› SAFETY AND SECURITY



* Extract from Brundtland Report, from the United Nations World Commission on Environment and Development WCED

GENERAL INFORMATION

CONCEPT / ADVANTAGES / CERTIFICATES



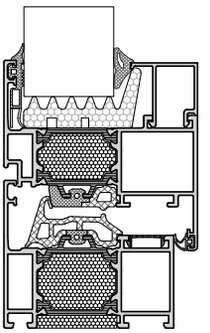
E68 CONCEPT

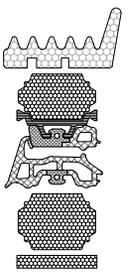
E68 IS A SYSTEM CORRESPONDING TO THE MOST STRINGENT REQUIREMENTS FOR THERMAL INSULATION, FUNCTIONALITY AND AESTHETICS.

- Elegant straight design
- 68 mm system width allowing usage of triple glazing
- Excellent thermal insulation from Uf = 1.6 $W/m^2.K$
- Additional insulator in the thermal-break chamber
- Additional insulator around the glazing
- Effective drainage
- Excellent water-tightness and air-permeability
- Co-extruded central gaskets
- Possibility for mounting anti-burglar hardware for good security performance
- Extruded corners for crimping machine with glue allowing reliable joint
- Variety of Thermal insulation typologies
- Compatible with ETEM Curtain wall systems

HIGH +

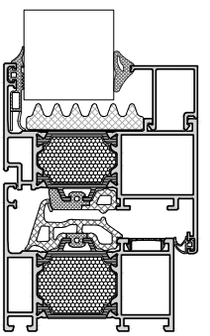
Uf≈1.6

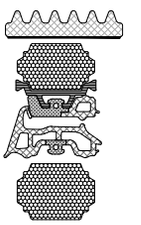




HIGH

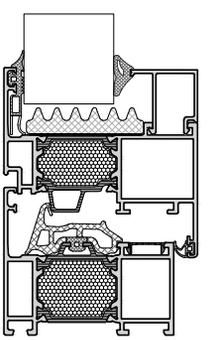
Uf≈1.7

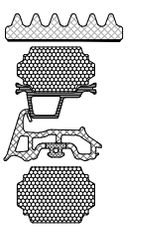




STANDARD +

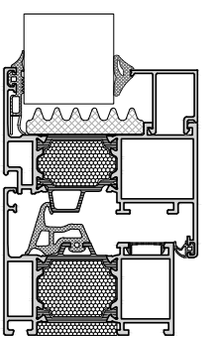
Uf≈1.8

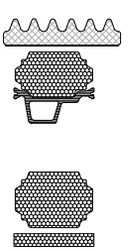




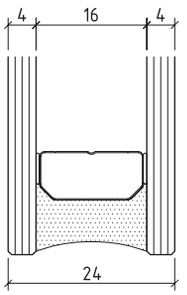
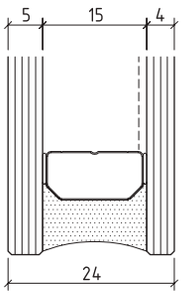
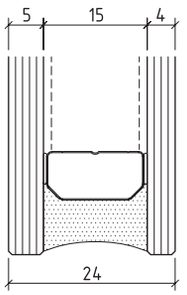
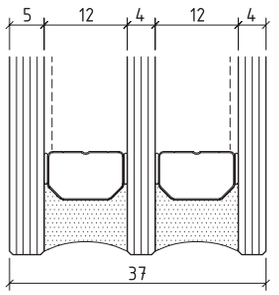
STANDARD

Uf≈1.9





ADVANTAGES AND COMBINATIONS

PERFORMANCE CHARACTERISTICS	Type ot glazing			
	Double Glazing	Double Glazing	Double Glazing	Triple Glazing
	4/16/4 Low Emission	5/15/4 Low Emission Argon	5 Sun Guard/15/4 Low Emission	5 Sun Guard/12/4/12/4 Low Emission
				
Uglass	1,4	1,1	1,0	0,6
Uwindow[1] hight	1,6	1,4	1,3	1,1
g value[2]	0,6	0,6	0,5	0,46

ADVANTAGES					
Energy Efficiency		*	**	***	****
Sound Insulation		*	**	***	****
Ventilation		□	□	□	□
Daylight		****	***	**	*
Sunshading	**E 66**	*	**	***	****
Automation		□	□	□	□
Safety and security		□	□	□	□

Notes:
1. Uw value is calculated by using warm edge spacer.
2. g value is calculated without external sunshading.
* good
** better
*** the best
**** excellent
□ compatible

COMPLIANCE WITH APPLICABLE REGULATIONS
Production management

Quality Management system is certified in accordance with EN ISO 9001:2008.

Environmental management system is certified in accordance with EN ISO 14001.

Factory production control system is certified according to the requirements of EN 15088. All ETEM profiles are CE marked and in compliance with applicable European Standards.

ETEM is authorized to use the QUALICOAT quality sign for paint, lacquer and powder coating on aluminium for architectural applications.

Occupational Health & Safety Management System is certified in accordance with OHSAS 18001.

PERFORMANCE CHARACTERISTICS OF E68

Characteristic	Classification / value	Standard
Air permeability	class 4	EN 1026 / EN 12207
Watertightness	Under testing	EN 1027 / EN 12208
Resistance to wind load	class 5C	EN 12211 / EN 12210
Thermal transmittance	from 1,6 $W/m^2.K$	EN 12412-2 / EN ISO 10077-2
Acoustic performance	38 dB*	EN ISO 717-1

*calculation result according to Annex B of EN 14351-1

CLASSIFICATION OF CHARACTERISTICS

for windows without resistance to fire and/or smoke leakage characteristics according to EN 14351-1

Characteristic / value / dimension	Classification / Value										
Resistance to wind load Test pressure P1 (Pa)	npd	1 (400)		2 (800)		3 (1200)		4 (1600)		5 (2000)	Exxxx (>2000)
Resistance to wind load Frame deflection	npd	A (≤1/150)				B (≤1/200)				C (≤1/300)	
Resistance to snow and permanent load	npd	Declared information on the infill (e.g. type and thickness of glass)									
Reaction to fire	npd	F		E		D		C		B	A2	A1
External fire performance	npd	According to EN 13501-5									
Watertightness Non-shielded (A) Test pressure (Pa)		1A (0)	2A (50)	3A (100)	4A (150)	5A (200)	6A (250)	7A (300)	8A (450)	9A (600)	Exxxx (>600)
Watertightness Shielded (B) Test pressure (Pa)	npd	1B (0)		2B (50)		3B (100)		4B (150)	5B (200)	6B (250)	7B (300)
Dangerous substances	npd	As required by regulations									
Impact resistance Drop height (mm)	npd	200		300		450		700		950	
Load-bearing capacity of safety devices	npd[a]	Threshold value									
Acoustic performance Sound insulation R_w ($C;C_{tr}$) (dB)	npd	Declared values									
Thermal transmittance U_w ($W/(m^2.K)$)	npd	Declared values									
Radiation properties Solar factor (g)	npd	Declared values									
Radiation properties Light transmittance (τv)	npd	Declared values									
Air permeability Max. test pressure (Pa) Reference air permeability at 100 Pa ($m^3/(h \cdot m^2)$ or $m^3/(h \cdot m)$)	npd	1 (150) (50 or 12.50)			2 (300) (27 or 6.75)			3 (600) (9 or 2.25)		4 (600) (3 or 0.75)	
Operating forces[b]	npd	1						2			
Mechanical strength	npd	1			2			3		4	
Ventilation Air flow exponent n Air flow characteristic K Air flow rates	npd	Declared values									
Bullet resistance	npd	FB1	FB2		FB3	FB4		FB5	FB6	FB7	FSG
Explosion resistance Shock tube	npd	EPR1			EPR2			EPR3		EPR4	
Explosion resistance Range test	npd	EXR1			EXR2		EXR3		EXR4		EXR5
Resistance to repeated opening and closing Number of cycles	npd	5000				10 000				20 000	
Behaviour between different climates	npd	Under development									
Burglar resistance	npd	1		2		3		4		5	6

NOTE 1: npd: no performance determined
NOTE 2: The figures in brackets are for information

[a] Only if safety device(s) is(are) not provided

[b] Manually operated windows only

BUILDING PHYSICS

DIMENSIONING / FORMULAS / EXAMPLES

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.

ADVANTAGES

DESIGN FLEXIBILITY

The extrusion process offers an almost infinite range of forms and sections, allowing designers to integrate numerous functions into one profile

LONG SERVICE LIFE

Aluminium building products are made from alloys that are weatherproof, corrosion-resistant and immune to the harmful effects of UV rays, ensuring optimal performance over a very long period of time

HIGH STRENGTH-TO-WEIGHT RATIO

Thanks to the metal's inherent strength and stiffness, aluminium window and curtain wall frames can be very narrow. Material's light weight makes it easier to transport and handle on-site, reducing the risk of work-related injury

HIGH-REFLECTIVITY

This characteristic feature makes aluminium a very efficient material for light management. Aluminium shading devices can be used to reduce the need for air conditioning in summer

FIRE SAFETY

Aluminium does not burn and therefore is classified as a non-combustible construction material (European Fire Class A1). Aluminium alloys will nevertheless melt at around 6500 C, but without releasing harmful gases

NO RELEASE OF DANGEROUS SUBSTANCES

Several studies have proved that aluminium building products do not present a hazard to occupants or the surrounding environment. Aluminium building products have no negative impact, either on indoor air quality or on soil, surface and groundwater

OPTIMAL SECURITY

Where high security is required, specially designed, strengthened aluminium frames can be used. While the glass for such applications may well be heavy, the overall weight of the structure remains manageable thanks to the light weight of the aluminium frames.

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]

The most common aluminium alloy which is used by ETEM is EN AW 6060.
Here are the properties of this alloy:

MATERIAL PROPERTIES	
Aluminium alloy	EN AW 6060 T66
Ultimate tensile strength	R_m = 215 N/mm^2
Yield strength	$R_{p0,2}$=160 N/mm^2
Modulus of elasticity	E_{al} = 70 000 N/mm^2
Coefficient of thermal expansion	α = 23.4 x 10^{-6}/°K

EXTRUSION PROCESS

ETEM profiles are obtained through extrusion process, which consists of pushing a hot cylindrical bullet 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.

RECYCLING

Aluminium scrap can be repeatedly recycled without any loss of value or properties.
In many instances, aluminium is combined with other materials such as steel or plastics, which are most frequently mechanically separated from aluminium before being molten.

WIND LOAD

Wind action

The main influence over the facade is wind action, which depends mainly on the heigh 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:

Building Height	Wind Velocity	Wind Load		Wind Pressure		Wind Suction in a middle zone				Wind Suction in an edge zone	
h	v	$q = \frac{V^2}{16}$		$Wp^* = 1.25 \times cp \times q$ $c_p = 0.8$		$h/b \le 0.25$ $W_s = c_p \times q$ $c_p = 0.5$		$h/b \ge 0.5$ $W_s = c_p \times q$ $c_p = 0.7$		$b/8 \le 2$ m $W_s = c_p \times q$ $c_p = 2.0$	
m	m/s	kg/m2	kg/m2	kg/m2	kg/m2	kg/m2	kg/m2	kg/m2	kg/m2	kg/m2	kg/m2
0 - 8	28.3	50	0.5	50	0.5	25	0.25	35	0.35	100	1.0
8 - 20	35.8	80	0.8	80	0.8	40	0.40	56	0.56	160	1.6
20 - 100	42.0	110	1.1	110	1.1	55	0.55	77	0.77	220	2.2
> 100	45.6	130	1.3	130	1.3	65	0.65	91	0.91	260	2.6

where:

h - building height, m
b - building width, m
v - wind velocity, m/s
q - wind load, kg/m^2 and kN/m^2
$w_{p/s}$ - wind pressure / suction, kN/m^2
c_p - correction factor

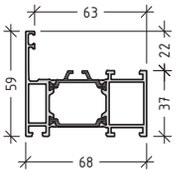
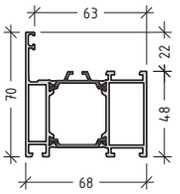
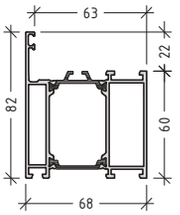
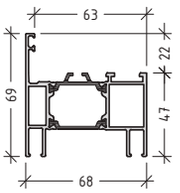
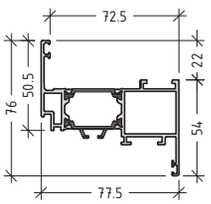
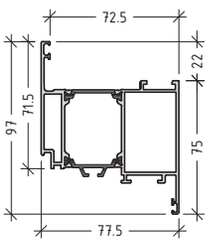
*Note: When calculating wind pressure w_p the load is increased with 25%

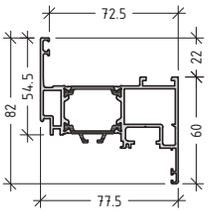
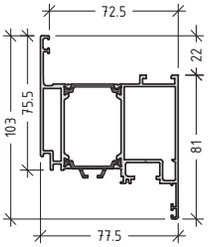
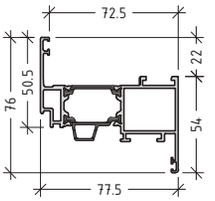
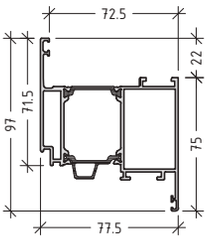
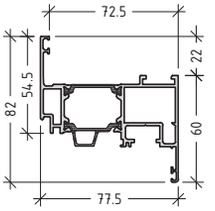
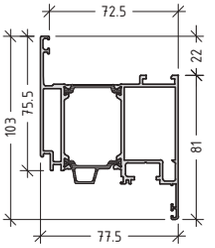
UNITS CONVERTER

1 m = 100 cm = 1000 mm

1 kg = 10 N
1 kN = 100 kg = 1000 N

1 kg/m^2 = 0.01 kN/m^2
1 Pa = 1 N/m^2 = 0.1 kg/m^2
1 kPa = 1000 Pa = 1 kN/m^2 =100 kg/m^2
1 MPa = 1000 kPa = 1 000 000 Pa
1 MPa = 1 N/mm^2 = 0.1 kN/cm^2 =100 000 kg/m^2

code	profile	weight length moment of inertia
E68100 frame		1477.5 g/m L=6.01 m Ix=9.76 cm^4 Iy=30.15 cm^4
E68101 frame		1680.5 g/m L=6.01 m Ix=17.5 cm^4 Iy=35.21 cm^4
E68102 frame		1901.5 g/m L=6.01 m Ix=29.78 cm^4 Iy=40.73 cm^4
E68105 frame		1612.5 g/m L=6.01 m Ix=13.43 cm^4 Iy=35.07 cm^4
E68200 sash		1528.8 g/m L=6.01 m Ix=11.8 cm^4 Iy=41.63 cm^4
E68201 sash		1944.5 g/m L=6.01 m Ix=30.95 cm^4 Iy=54.2 cm^4

code	profile	weight length moment of inertia
E68220 sash PVC groove		1716.5 g/m L=6.01 m Ix=14.86 cm^4 Iy=45.54 cm^4
E68221 sash PVC groove		2101.5 g/m L=6.01 m Ix=37.2 cm^4 Iy=58.18 cm^4
E68205 sash		1561 g/m L=6.01 m Ix=11.8 cm^4 Iy=41.63 cm^4
E68206 sash		1945 g/m L=6.01 m Ix=30.95 cm^4 Iy=54.2 cm^4
E68225 sash PVC groove		1718 g/m L=6.01 m Ix=14.86 cm^4 Iy=45.54 cm^4
E68226 sash PVC groove		2103 g/m L=6.01 m Ix=30.95 cm^4 Iy=54.2 cm^4

L68-01

TRANSOM SELECTION

*Dead load actions:

*Glass pane self weight:

Weight of the glass pane G is calculated as follows:

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

$$I_{x1} \geq \frac{G \cdot a \cdot 10^8}{48 \cdot E_{al} \cdot f_{max}} \cdot (3 \cdot L^2 - 4 \cdot a^2) \text{ ,cm}^4$$

Where:
G – Weight of glass pane, kg
t – Glass pane thickness, mm
ρ_{glass} – Density of glass material, kg/m^2/mm
l_g – Horizontal dimension of the glass pane, m
h_g – Vertical dimension of the glass pane, m

*Transom self weight:

The required moment of inertia of a transom due to its self weight is given by:

$$I_{x2} \geq \frac{5 \cdot q \cdot L^4 \cdot 10^8}{384 \cdot E_{al} \cdot f_{max}} \text{ ,cm}^4$$

Total of required moment of inertia:
$I_x = I_{x1} + I_{x2}$,cm^4

Where:
a=0,15 – Distance of a glazing supports of the glass pane, m
I_x – Moment of inertia of a transom, cm^4
q – Self weight of a transom per linear meter, kg/m
E_{al} – Modulus of Elasticity of aluminium, kg/m^2
f_{max} – Maximum transom deflection, m
L – Length of a transom, m

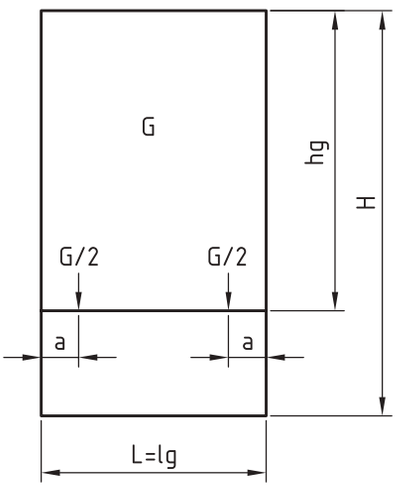
Maximum transom deflection f max by dead load:

$$f = \frac{L}{500} \text{ ,m} \quad \text{or 0.003 m – whichever is less (EN 14351-1)}$$

Use ETEM Catalogue to choose the appropriate transom with I_y exceeding or equal to the required I_y.

Use ETEM Catalogue to choose the appropriate profile which characteristics exceed or are equal to both calculated values I_x and I_y.

Example: $G = t \cdot \rho_{glass} \cdot l_g \cdot h_g$



Initial data:

t = 10 mm	E_{al} = 7.10^9 kg/m^2
l_g = 1,5 m	ρ_{glass} = 2,5 kg/m^2/mm
h_g = 2,0 m	q = 2 kg/m
a = 0,15 m	

$G = t \cdot \rho_{glass} \cdot l_g \cdot h_g = 10 \cdot 2{,}5 \cdot 1{,}5 \cdot 2{,}0 = 75$ kg

$$\Longrightarrow f_{max} = \frac{L}{500} = \frac{1{,}5}{500} = 0{,}003 \text{ m} \quad \text{or 0,003 m (EN 14351-1)}$$

$\Longrightarrow f_{max}$ = 0,003m in the following formulas:

$$I_{x1} \geq \frac{G \cdot a \cdot 10^8}{48 \cdot E_{al} \cdot f_{max}} \cdot (3 \cdot L^2 - 4 \cdot a^2) \text{ ,cm}^4$$

$$I_{x1} \geq \frac{75 \cdot 0{,}15 \cdot 10^8}{48 \cdot 7 \cdot 10^9 \cdot 0{,}003} \cdot (3 \cdot 1{,}5^2 - 4 \cdot 0{,}15^2) \text{ ,cm}^4$$

$$I_{x1} \geq \frac{75 \cdot 0{,}15 \cdot 10^8}{48 \cdot 7 \cdot 10^9 \cdot 0{,}003} \cdot (3 \cdot 1{,}5^2 - 4 \cdot 0{,}15^2), \text{ cm}^4 \Longrightarrow I_{x1} \geq 7{,}43 \text{cm}^4$$

$$I_{x2} \geq \frac{5 \cdot q \cdot L^4 \cdot 10^8}{384 \cdot E_{al} \cdot f_{max}} \text{,cm}^4 \quad I_{x2} \geq \frac{5 \cdot 2 \cdot 1{,}5^4 \cdot 10^8}{384 \cdot 7 \cdot 10^9 \cdot 0{,}003} \text{,cm}^4 \Longrightarrow I_{x1} \geq 0{,}63 \text{cm}^4$$

$I_x = I_{x1} + I_{x2}$,cm^4

$I_x = 7{,}43 + 0{,}63 = 8{,}06$ cm^4

Use ETEM Catalogue to choose the appropriate transom with $I_x \geq 8{,}06$ cm^4
We choose transom E68300 with $I_x = 14{,}17$ cm^4
and $I_y = 33{,}25$ cm^4

TRANSOM SELECTION

*Wind load actions:

The required moment of inertia of a transom due to the wind action is given by:

a) triangle load

$$\text{If } \frac{L}{a} \le 1, \quad I_{ya} \ge \frac{w \cdot (L/2) \cdot L^4 \cdot 10^8}{120 \cdot E_{al} \cdot f_{max}} \ ,cm^4$$

or

b) trapezoid load

$$\text{If } \frac{L}{a} > 1, \quad I_{ya} \ge \frac{w \cdot (a/2) \cdot L^4}{1920 \cdot E_{al} \cdot f_{max}} \cdot 10^8 \cdot \left[25-40 \cdot \frac{(a/2)^2}{L^2} + 16 \cdot \frac{(a/2)^4}{L^4}\right], cm^4$$

Use the same method to calculate I_{xb}

Total of required moment of inertia:
$I_y = I_{ya} + I_{yb}$, cm^4

Where:
I_y – Moment of inertia of a transom, cm^4
w – Wind pressure, kg/m^2
E_{al} – Modulus of Elasticity of aluminium, kg/m^2
f_{max} – Maximum transom deflection, m
L – Length of a transom, m
a,b – Distance between transoms, m

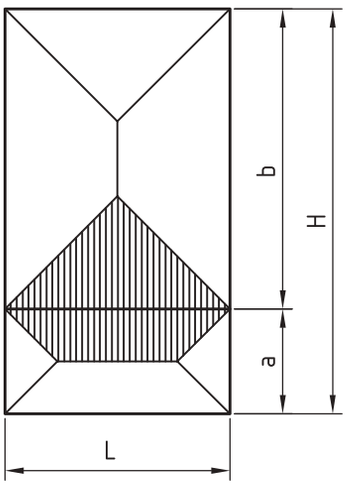
Maximum transom deflection f_{max} by wind load:

$$f = \frac{L}{200}, m \quad \text{or } 0.015 \text{ m – whichever is less (EN 14351-1)}$$

Use ETEM Catalogue to choose the appropriate transom with I_x exceeding or equal to the required I_x.

Use ETEM Catalogue to choose the appropriate profile which characteristics exceed or are equal to both calculated values I_x and I_y.

Example:



Initial data:
L = 1,5 m w = 60 kg/m^2
a = 0,7 m E_{al} = 7.10 kg/m^2
b = 2,0 m

$$f = \frac{L}{200} = \frac{1,5}{200} = 0,0075 \text{ m or } 0,015 \text{ m (EN 14351-1)}$$

$\Longrightarrow f_{max} = 0,0075$ m in the following formulas:

$$\frac{L}{a} = \frac{1,5}{0,7} = 2,14 > 1$$

$$I_{ya} \ge \frac{w \cdot (a/2) \cdot L^4}{1920 \cdot E_{al} \cdot f_{max}} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(a/2)^2}{L^2} + 16 \cdot \frac{(a/2)^4}{L^4}\right], cm^4$$

$$I_{ya} \ge \frac{60 \cdot (0,7/2) \cdot 1,5^4}{1920 \cdot 7 \cdot 10^9 \cdot 0,0075} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(0,7/2)^2}{1,5^2} + 16 \cdot \frac{(0,7/2)^4}{1,5^4}\right], cm^4$$

$I_{ya} \ge 2,41 \ cm^4$

$$\frac{L}{b} = \frac{1,5}{2,0}, = 0,75 < 1$$

$$I_{yb} \ge \frac{w \cdot (L/2) \cdot L^4 \cdot 10^8}{120 \cdot E_{al} \cdot f_{max}}, cm^4 \quad \Longrightarrow I_{yb} \ge \frac{60 \cdot (1,5/2) \cdot 1,5^4 \cdot 10^8}{120 \cdot 7 \cdot 10^9 \cdot 0,0075}, cm^4$$

$\Longrightarrow I_{yb} \ge 3,62 \ cm^4$

$I_y = I_{ya} + I_{yb}, cm^4$

$\Longrightarrow I_y = 2,41 + 3,62 = 6,03 \ cm^4$

Use ETEM Catalogue to choose the appropriate mullion with $I_y \ge 6,03 \ cm^4$
We choose mullion E68300 with $I_y = 33,25 \ cm^4$
and $I_x = 14,17 \ cm^4$

CALCULATION OF GLASS PANE THICKNESS

*Glazing thickness:

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

a) If $\frac{h_g}{l_g} \leq 3$, $t = \sqrt{\frac{10 \cdot l_g \cdot h_g \cdot w}{72}}$,mm

or

b) If $\frac{h_g}{l_g} > 3$, $t = \frac{l_g \cdot \sqrt{10 \cdot w}}{72}$,mm

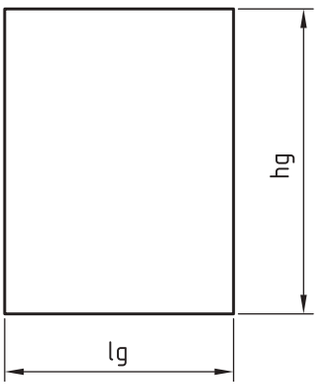
Where:
t – Minimum theoretical glass thickness, mm
w – Wind pressure, kg/m^2
l_g – The smallest dimension of the glass pane, m
h_g – The largest dimension of the glass pane, m

For double glazing, the total thickness of both glasses in the 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 all glasses in the 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 for required glazing thickness and maximum allowable dimensions.

Example:



Initial data:
l_g = 1,5 m
h_g = 2,0 m
w = 60 kg/m^2

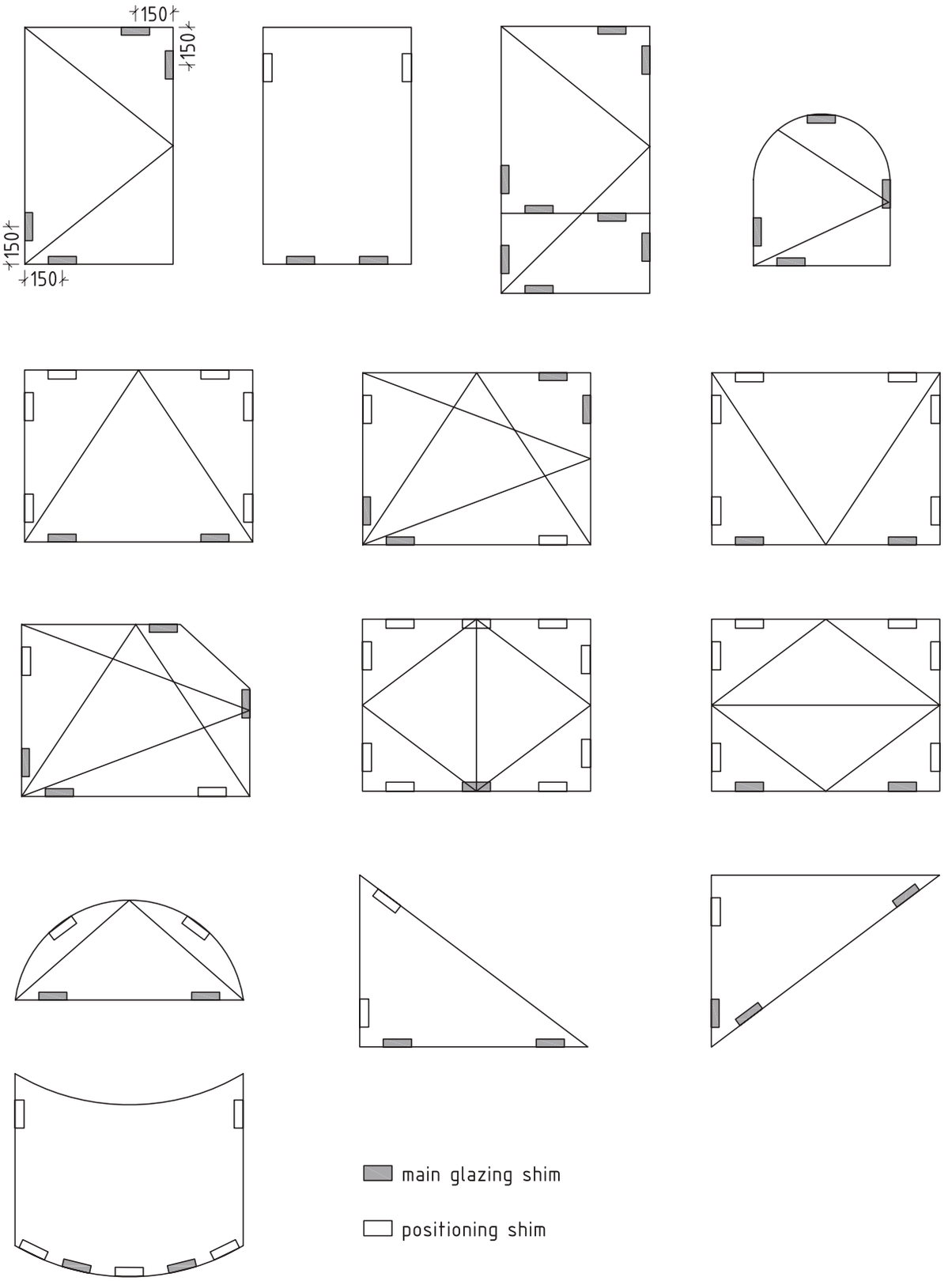
$$\frac{h_g}{l_g} = \frac{2}{1,5} = 1,33 \leq 3$$

$$t = \sqrt{\frac{10 \cdot l_g \cdot h_g \cdot w}{72}} = \sqrt{\frac{10 \cdot 1,5 \cdot 2 \cdot 60}{72}} = \sqrt{\frac{1800}{72}} = 5 \text{ mm}$$

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

We choose double glazing 5/14/5

GLAZING SHIMS



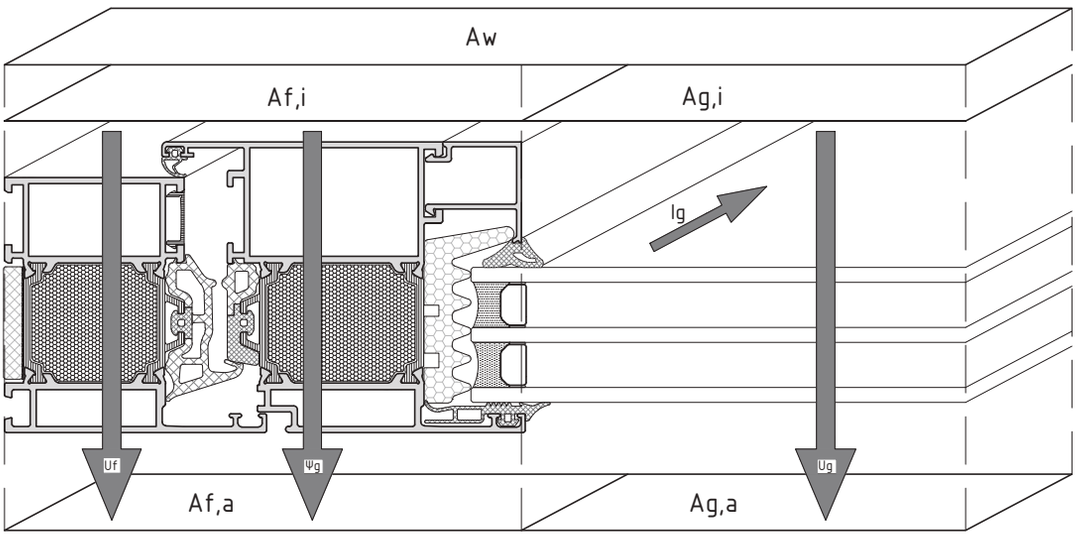
Note:
Main glazing shims should be positioned on 150 mm distance from the glazing edge.
Positioning shims do not have exactly defined position.

METHOD FOR CALCULATION OF THERMAL TRANSMITTANCE ACCORDING to EN ISO 10077-2

$$U_w = \frac{A_g \times U_g + A_f \times U_f + l_g \times \Psi_g}{A_g + A_f} \qquad (1)$$

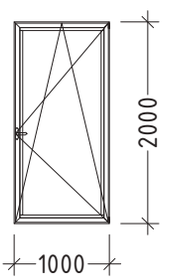
U_w – thermo-transmittance coefficient of the whole structure
U_g – glass thermal transmittance coefficient
U_f – thermo-transmittance coefficient of the aluminium frame (frame and sash)
Ψ_g – spacer linear thermal transmittance
l_g – total length of the spacer
A_g – glass area
A_f – aluminium frame area (frame and sash)

U_w – is calculated by formula (1)
U_g – is given by the glass manufacturer
U_f – is given by the manufacturer of the aluminium profiles



EXAMPLE FOR CALCULATING THERMAL TRANSMITTANCE COEFFICIENT

frame:	E68	U_f	1.6	W/(m²K)
spacer:	warm edge	Ψ_g	0.051	W/(m²K)
glass:	triple glazing	U_g	1.00	W/(m²K)
window width:		1.00 m		
window height:		2.00 m		
length of glass edge lg:		4,89 m		

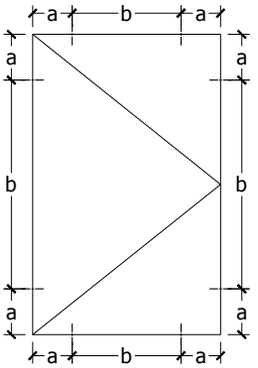


$A_g = 1.24\ m^2$; $A_f = 0.76\ m^2$

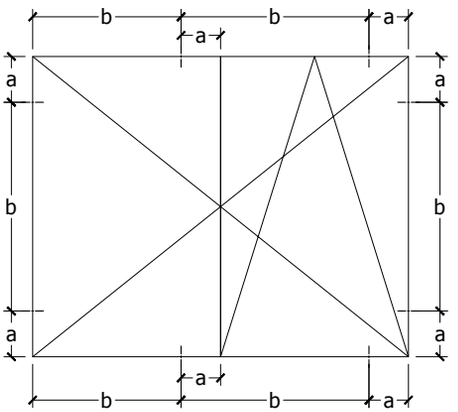
$$U_w = \frac{1.24 \times 1 + 0.76 \times 1.6 + 4.89 \times 0.051}{1.24 + 0.76}$$

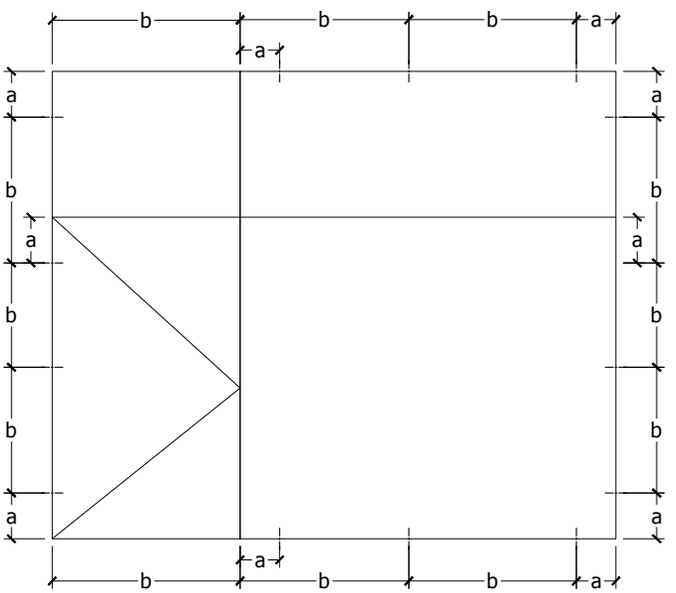
$U_w \approx 1{,}4\ W/(m^2K)$

POSITION OF ANCHORS



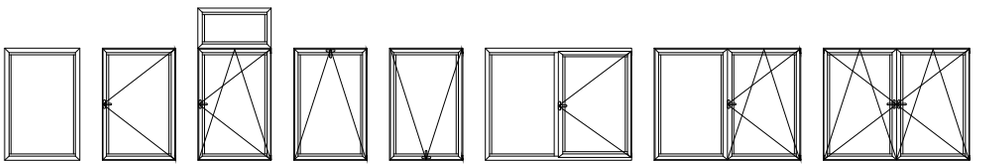
a = 150 ÷ 200 mm
b ≤ 800 mm

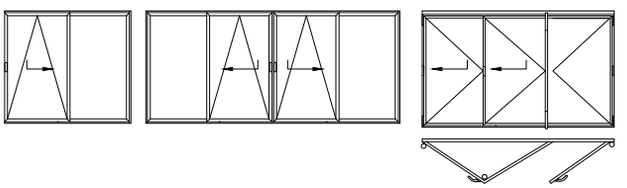




TABLES

TYPOLOGIES / LIST OF PROFILES / CHARACTERISTICS

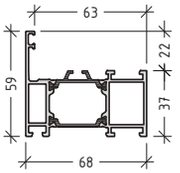
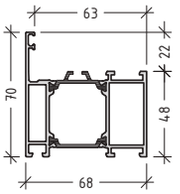
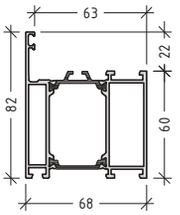
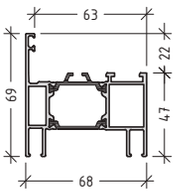
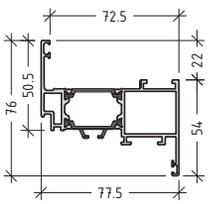
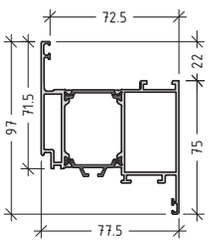


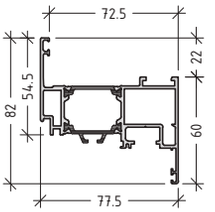
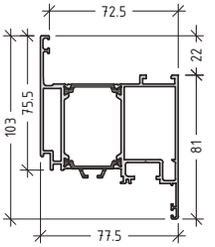
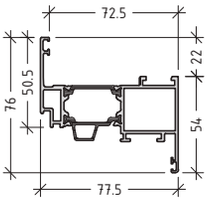
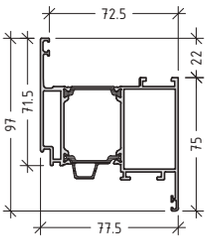
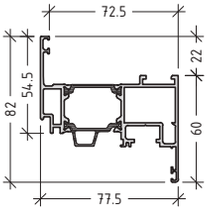
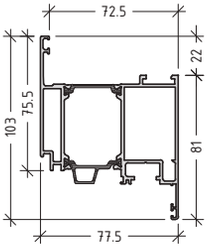


opening schemes:

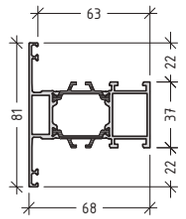
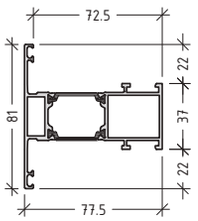
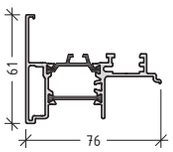
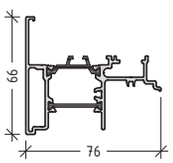
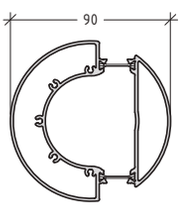
321;330;431;541;550;
532;651;633;761;770;743

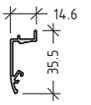
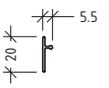
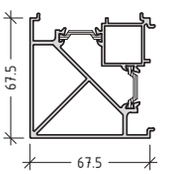
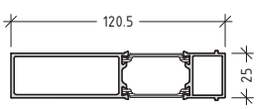
G68-1

code	profile	weight length moment of inertia
E68100 frame		1477.5 g/m L=6.01 m Ix=9.76 cm^4 Iy=30.15 cm^4
E68101 frame		1680.5 g/m L=6.01 m Ix=17.5 cm^4 Iy=35.21 cm^4
E68102 frame		1901.5 g/m L=6.01 m Ix=29.78 cm^4 Iy=40.73 cm^4
E68105 frame		1612.5 g/m L=6.01 m Ix=13.43 cm^4 Iy=35.07 cm^4
E68200 sash		1528.8 g/m L=6.01 m Ix=11.8 cm^4 Iy=41.63 cm^4
E68201 sash		1944.5 g/m L=6.01 m Ix=30.95 cm^4 Iy=54.2 cm^4

code	profile	weight length moment of inertia
E68220 sash PVC groove		1716.5 g/m L=6.01 m Ix=14.86 cm^4 Iy=45.54 cm^4
E68221 sash PVC groove		2101.5 g/m L=6.01 m Ix=37.2 cm^4 Iy=58.18 cm^4
E68205 sash		1561 g/m L=6.01 m Ix=11.8 cm^4 Iy=41.63 cm^4
E68206 sash		1945 g/m L=6.01 m Ix=30.95 cm^4 Iy=54.2 cm^4
E68225 sash PVC groove		1718 g/m L=6.01 m Ix=14.86 cm^4 Iy=45.54 cm^4
E68226 sash PVC groove		2103 g/m L=6.01 m Ix=30.95 cm^4 Iy=54.2 cm^4

L68-01

code	profile	weight length moment of inertia
E68300 T profile		1596 g/m L=6.01 m Ix=14.17 cm^4 Iy=33.25 cm^4
E68340 T profile		1617 g/m L=6.01 m Ix=14.65 cm^4 Iy=44.64 cm^4
E68500 overhung secondary Sash profile Euro groove		1359 g/m L=6.01 m Ix=7.44 cm^4 Iy=25.38 cm^4
E68540 overhung secondary Sash profile PVC groove		1443 g/m L=6.01 m Ix=9.66 cm^4 Iy=26.95 cm^4
E75603		L=6.01 m 2231.5 g/m Ix=56.34 cm^4 Iy=55.75 cm^4

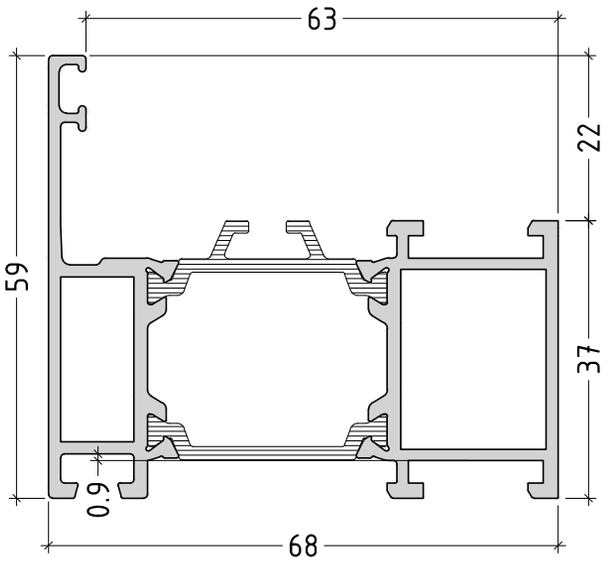
code	profile	weight length moment of inertia
E75602		L=6.01 m 722.3 g/m
E62600		84.5 g/m L=6.01 m
E2408		2194 g/m L=6.01 m Ix=38.44 cm^4 Iy=38.43 cm^4
E50690		1550 g/m L=6.01 m Ix=5.03 cm^4 Iy=79.15 cm^4

L68-02

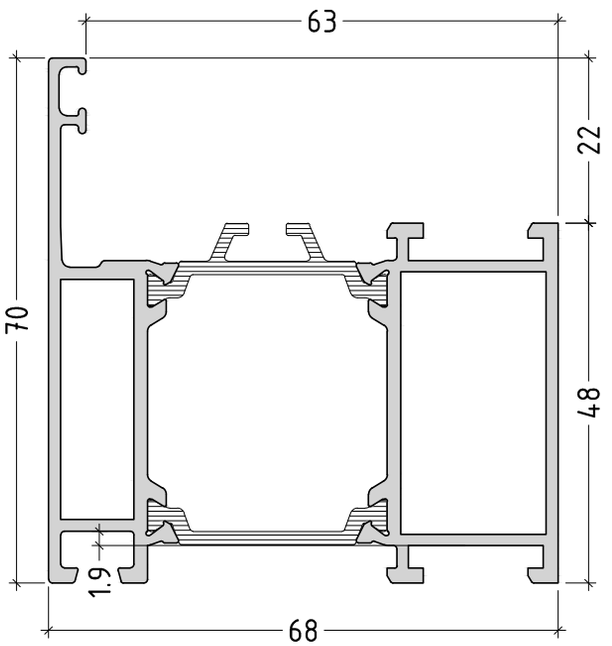
PROFILES

DRAWINGS / SCALE 1:1

E68100
frame
1477.5 g/m



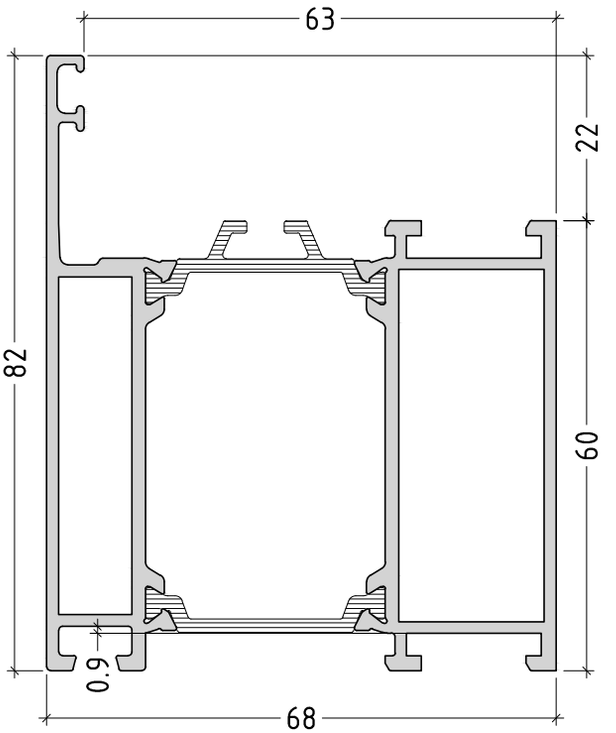
E68101
frame
1680.5 g/m



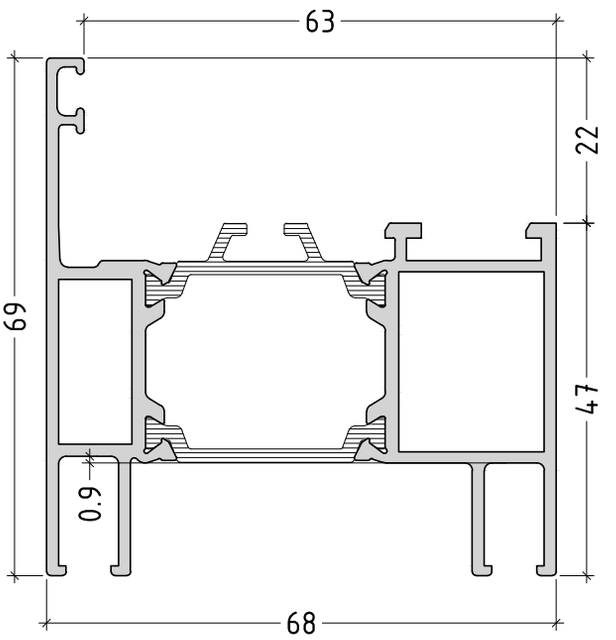
scale : 1:1

P68-01

E68102
frame
1901.5 g/m



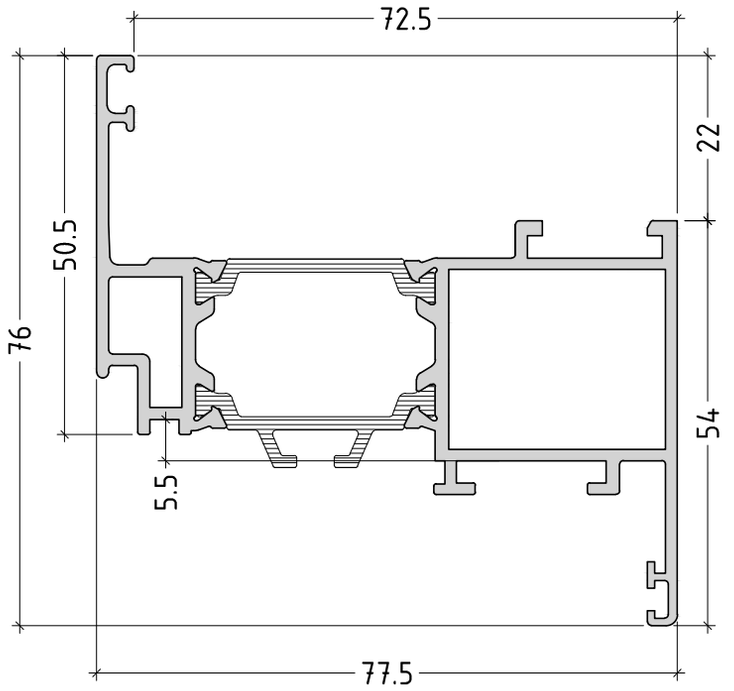
E68105
frame
1612.5 g/m



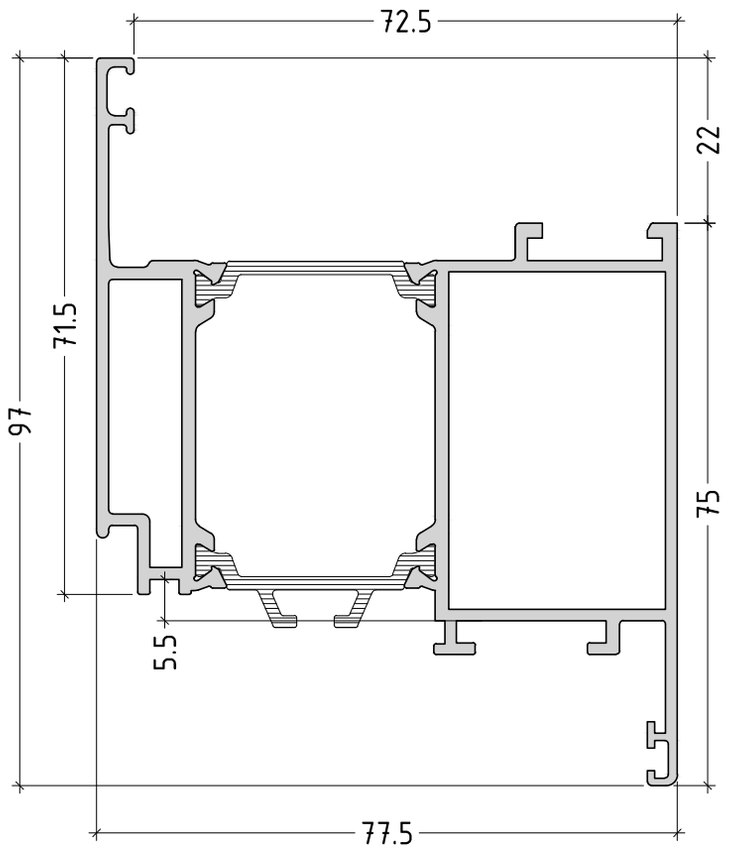
scale : 1:1

P68-02

E68200
sash
1528.8 g/m



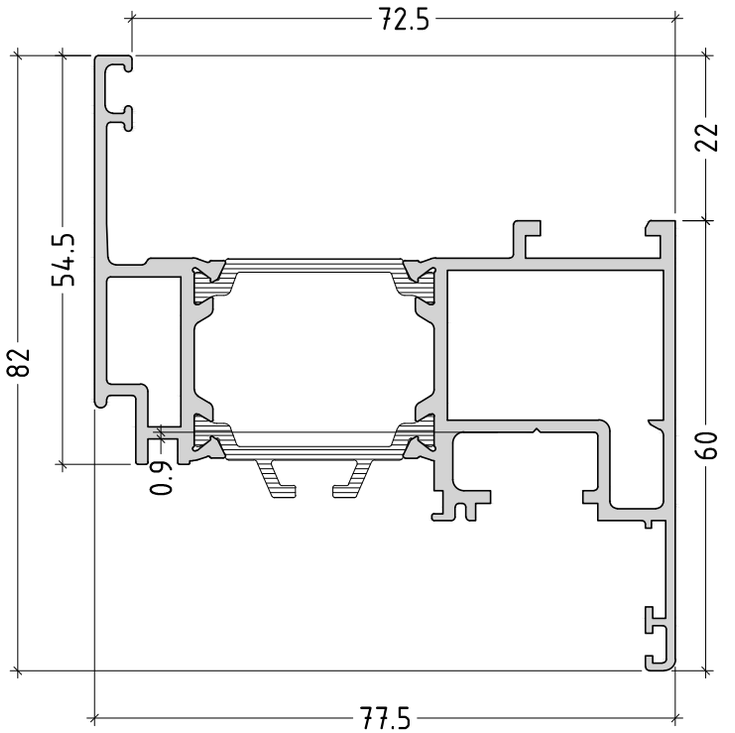
E68201
sash
1844.5 g/m



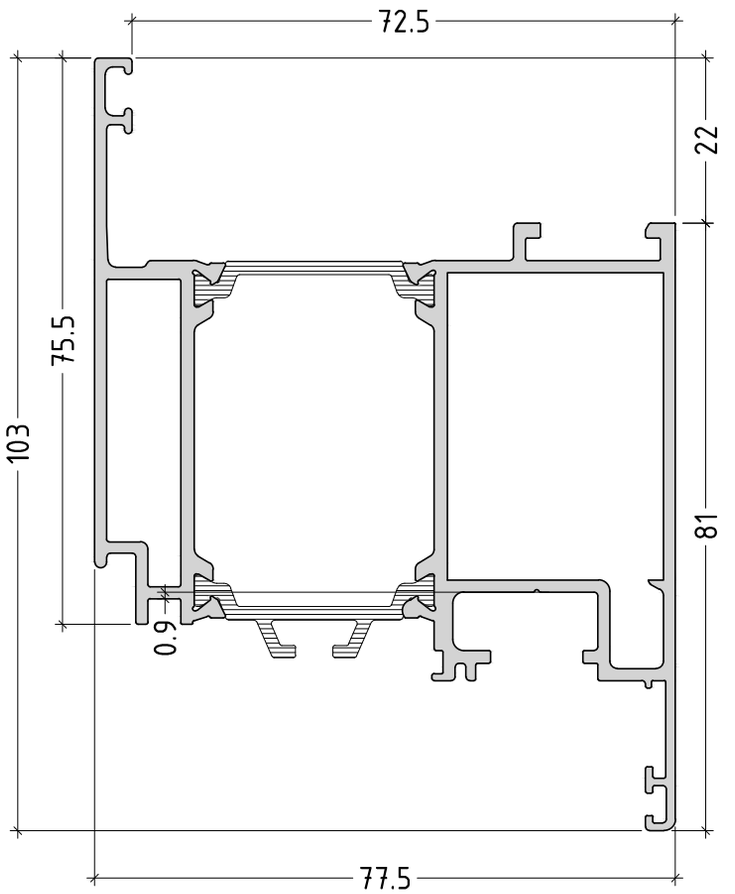
scale : 1:1

P68-03

E68220
sash PVC groove
1716.5 g/m



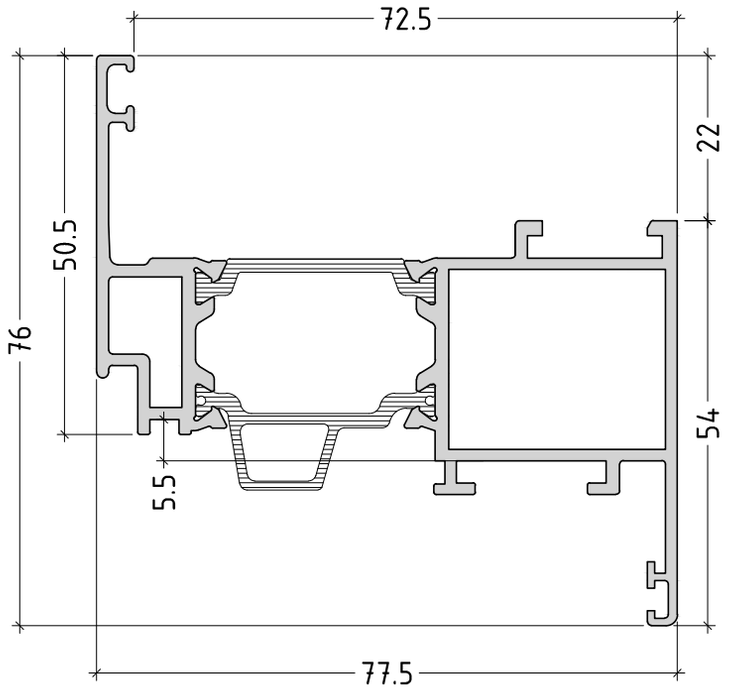
E68221
sash PVC groove
2101.5 g/m



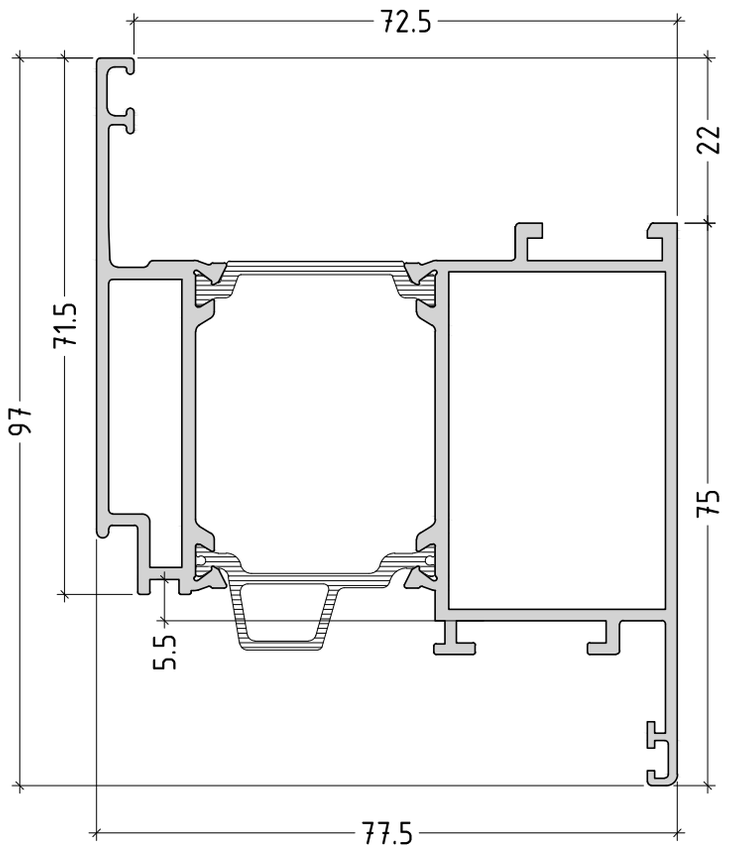
scale : 1:1

P68-04

E68205
sash
1561 g/m



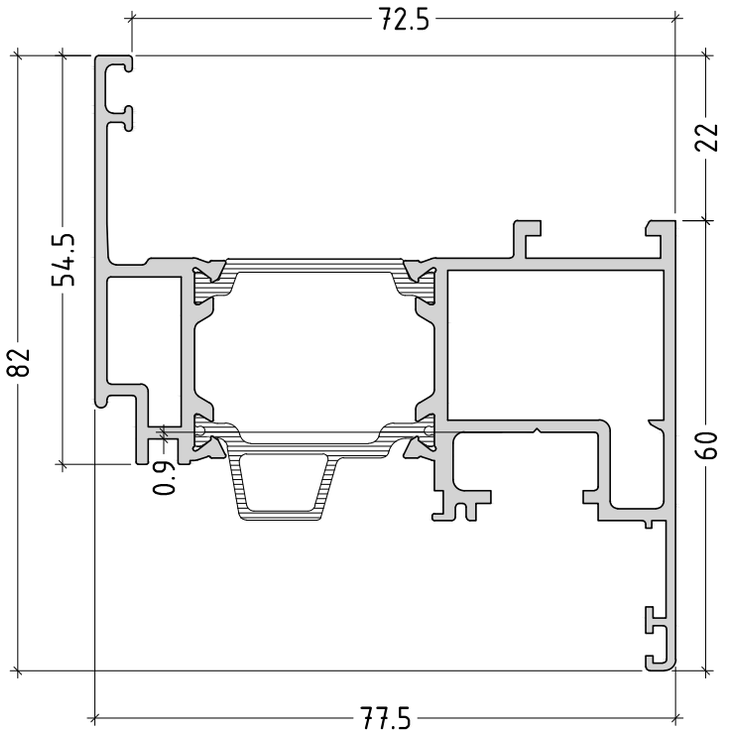
E68206
sash
1945 g/m



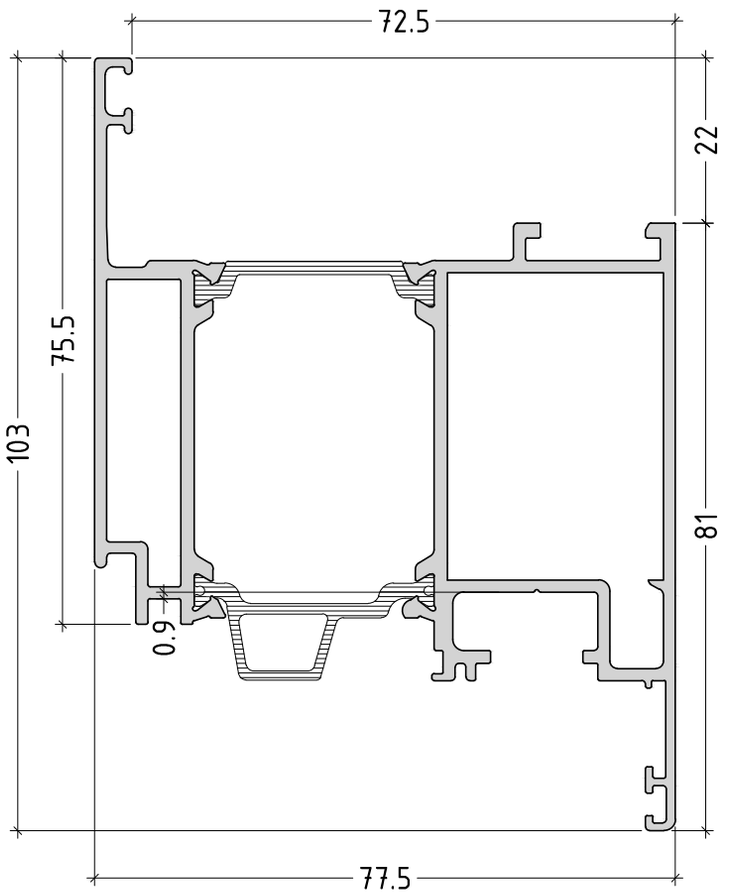
scale : 1:1

P68-05

E68225
sash PVC groove
1718 g/m



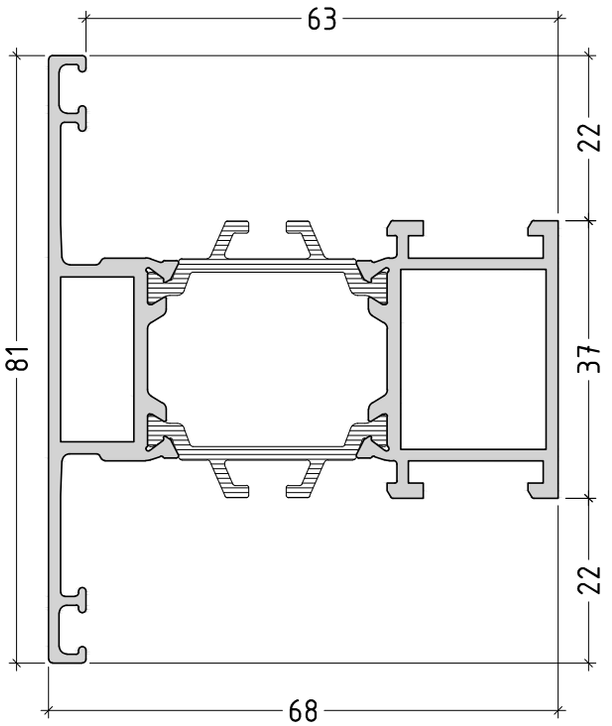
E68226
sash PVC groove
2103 g/m



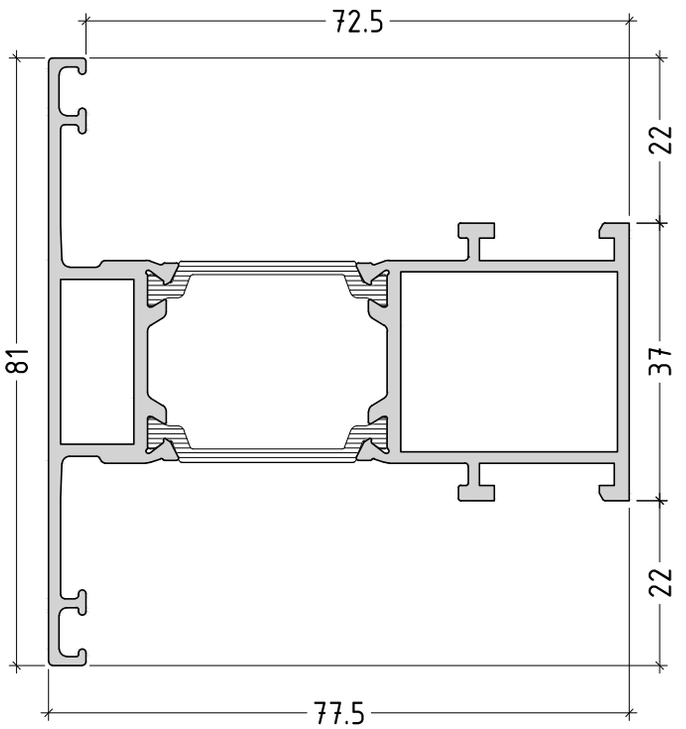
scale : 1:1

P68-06

E68300
T profile
1596 g/m



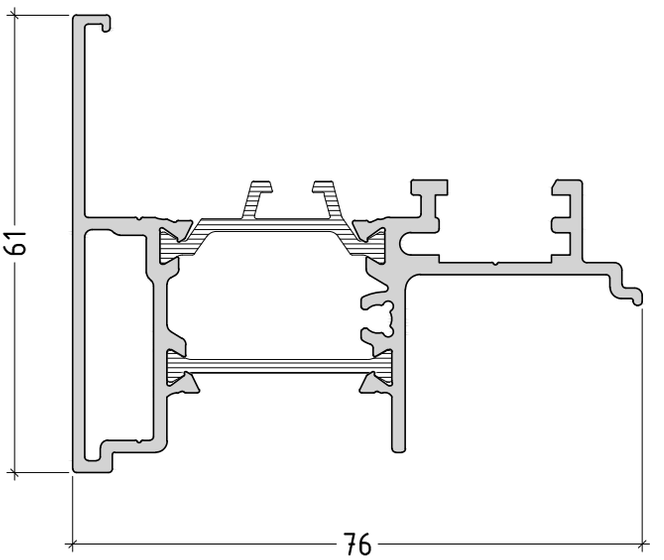
E68340
T profile
1617 g/m



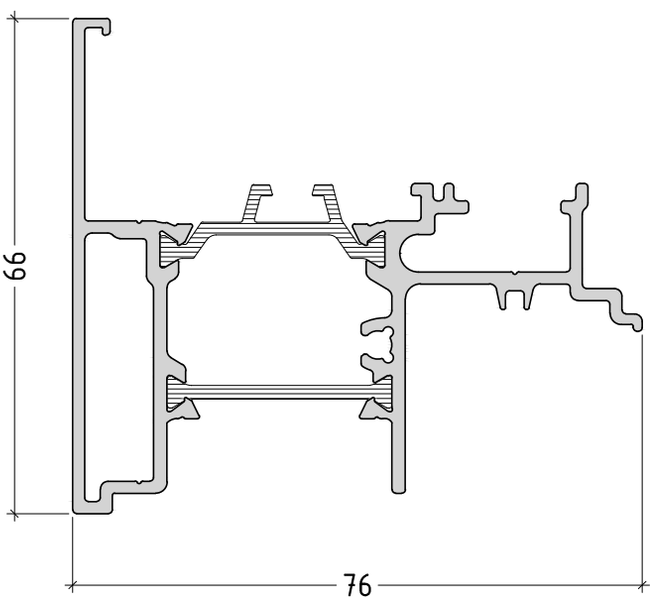
scale : 1:1

P68-07

E68500
overhung
secondary
Sash profile
Euro groove
1359 g/m



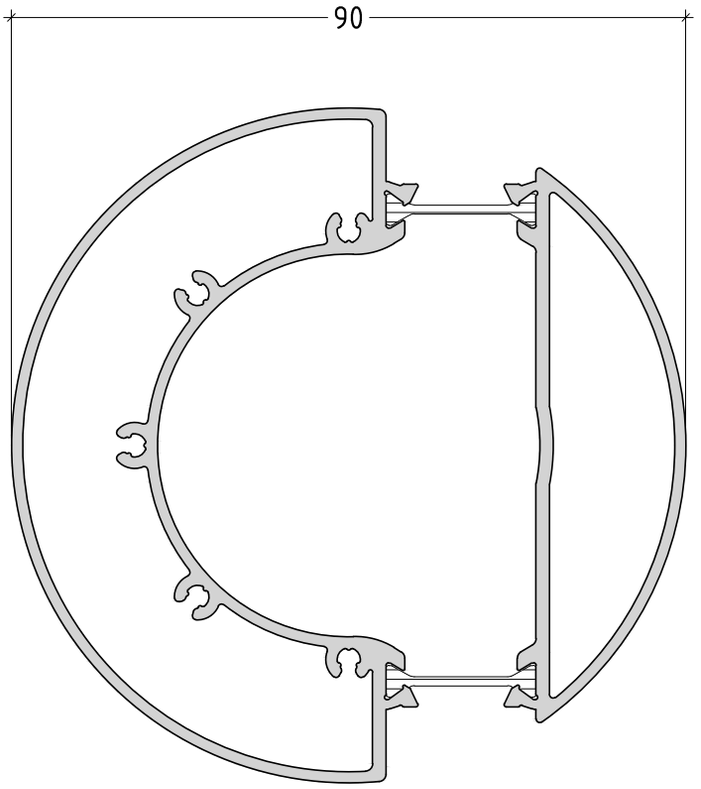
E68540
overhung
secondary
Sash profile
PVC groove
1443 g/m



scale : 1:1

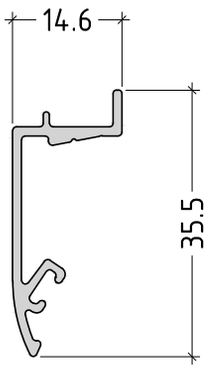
P68-08

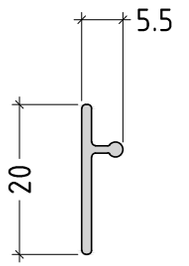
E75603
2231.5 g/m



E75602
722.3 g/m

E62600
84.5 g/m

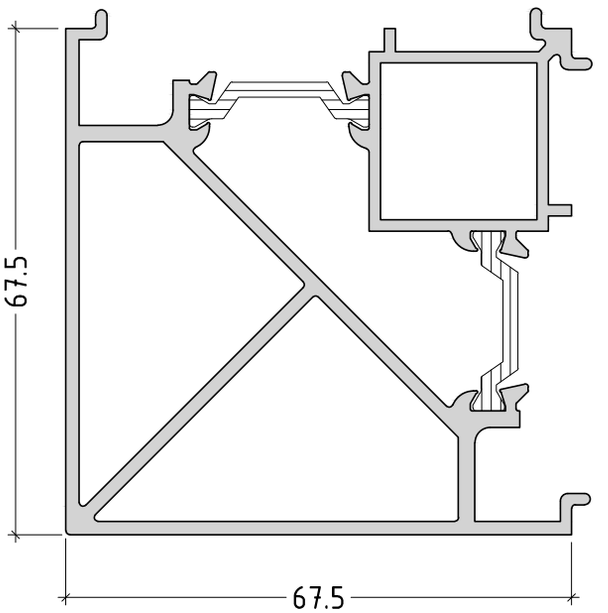




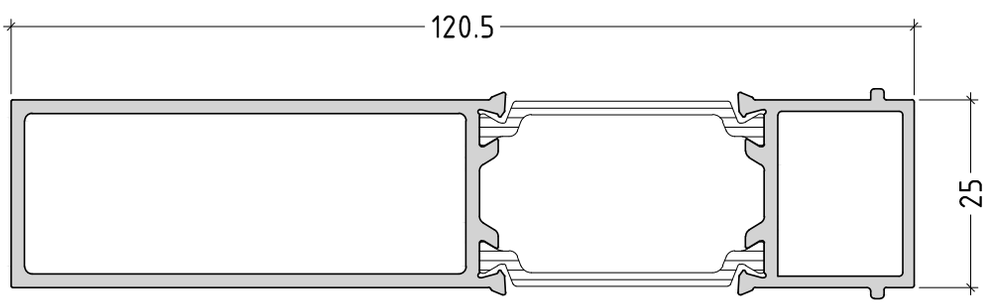
scale : 1:1

P68-09

E2408
2194 g/m



E50690
1550 g/m



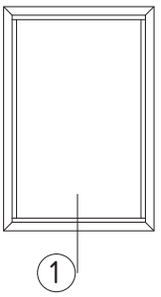
scale : 1:1

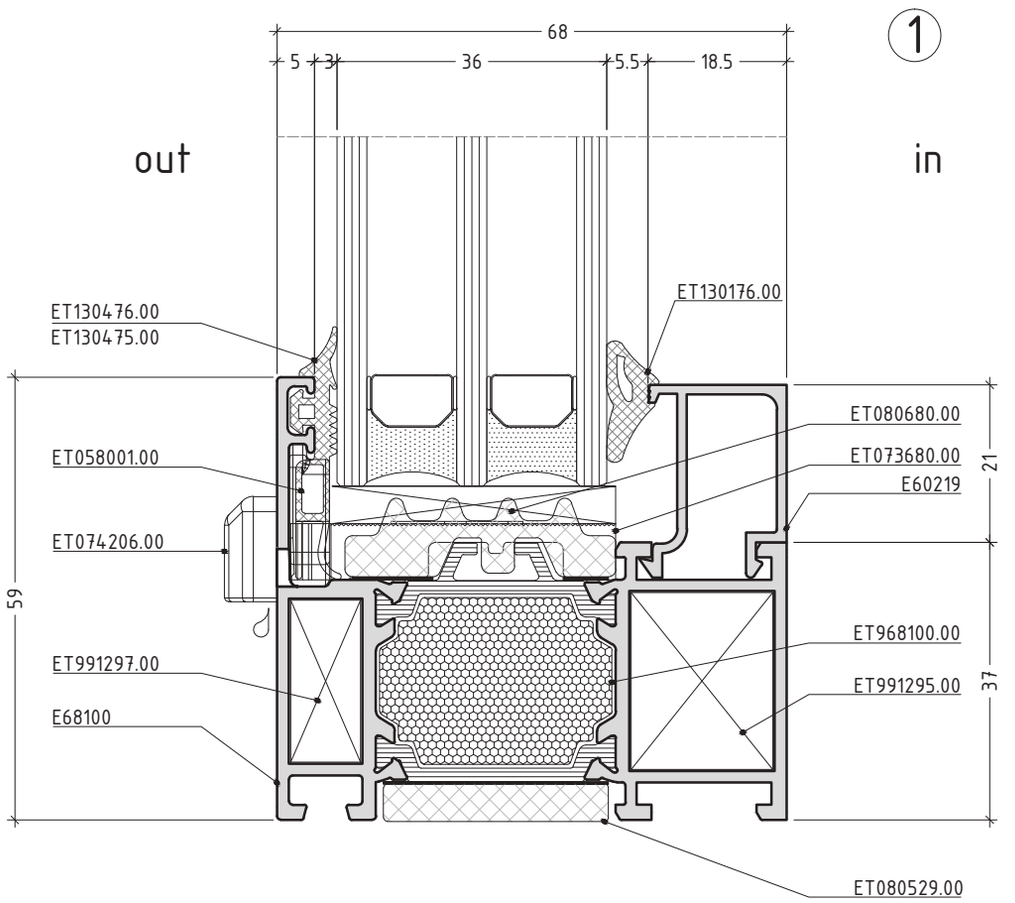
P68-10

SECTIONS

SECTIONS / DETAILS

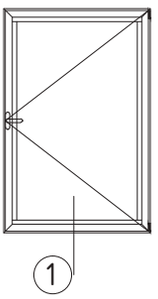
SECTIONS
HIGH +

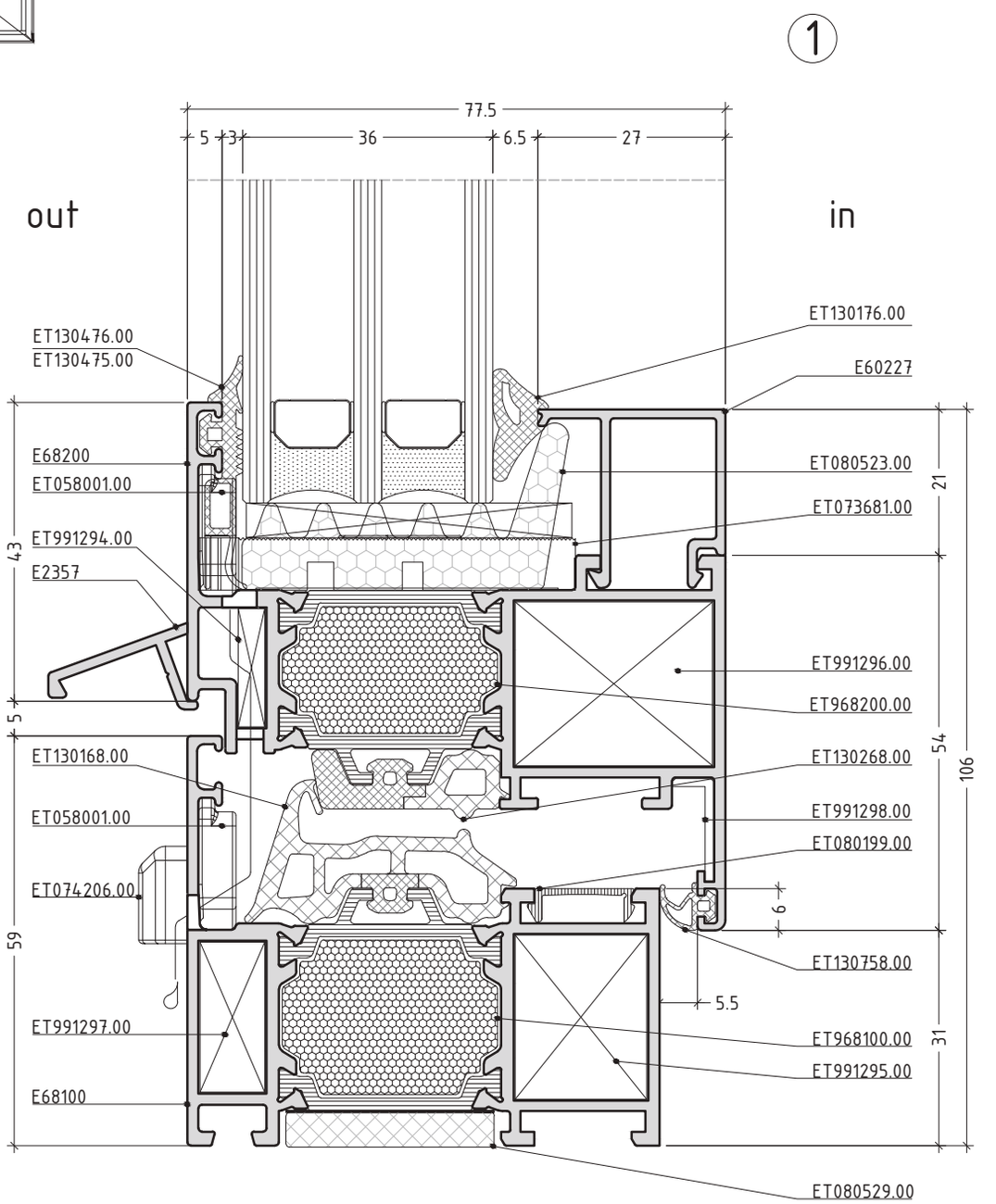




scale : 1:1

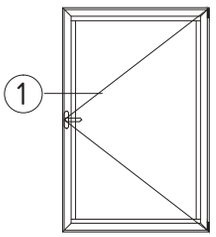
D68-1





scale : 1:1

D68-2



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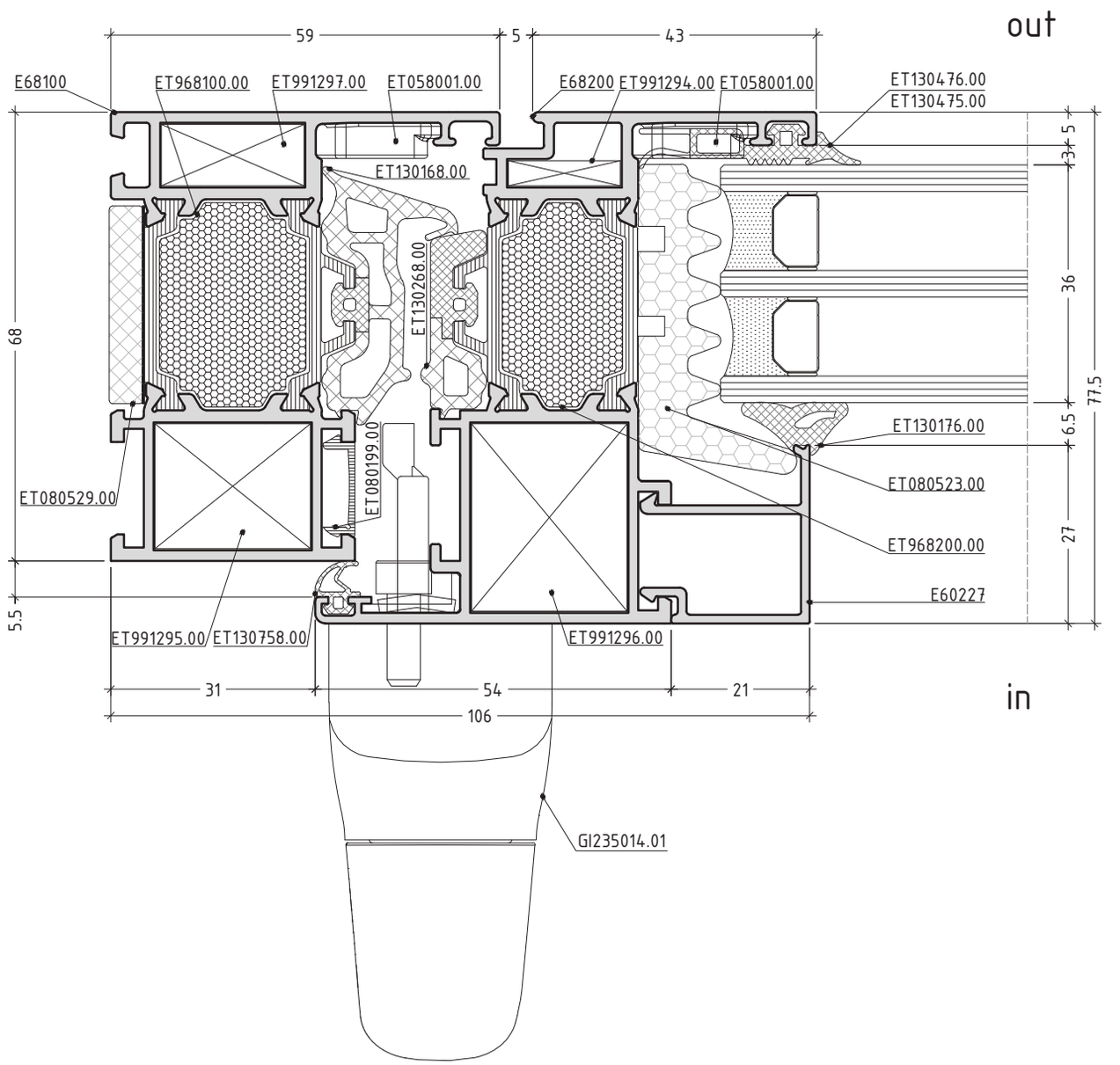
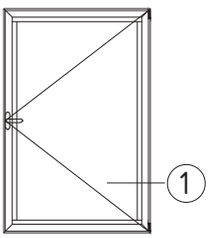


scale : 1:1

D68-3



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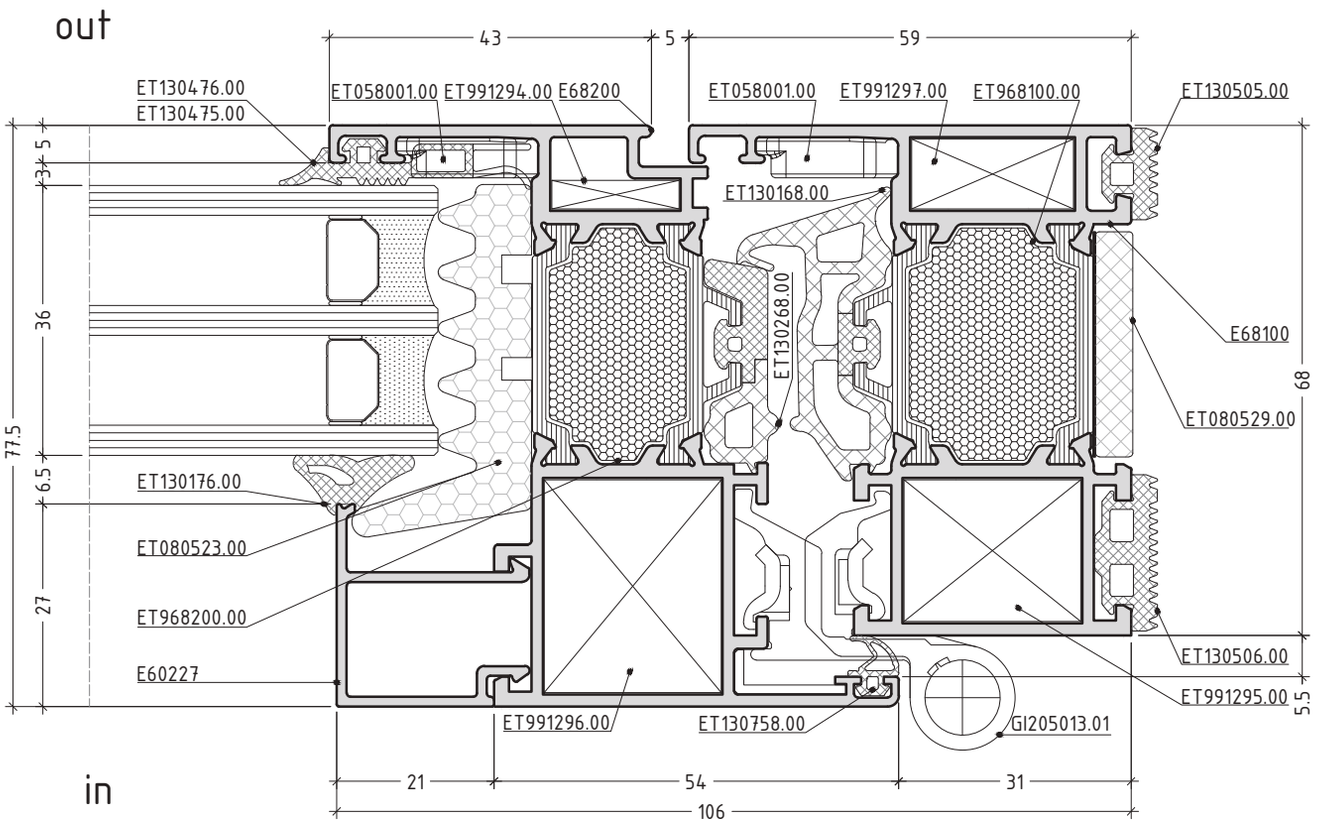
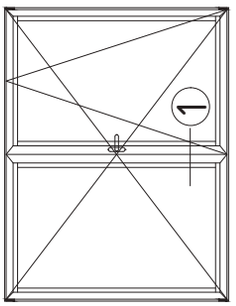
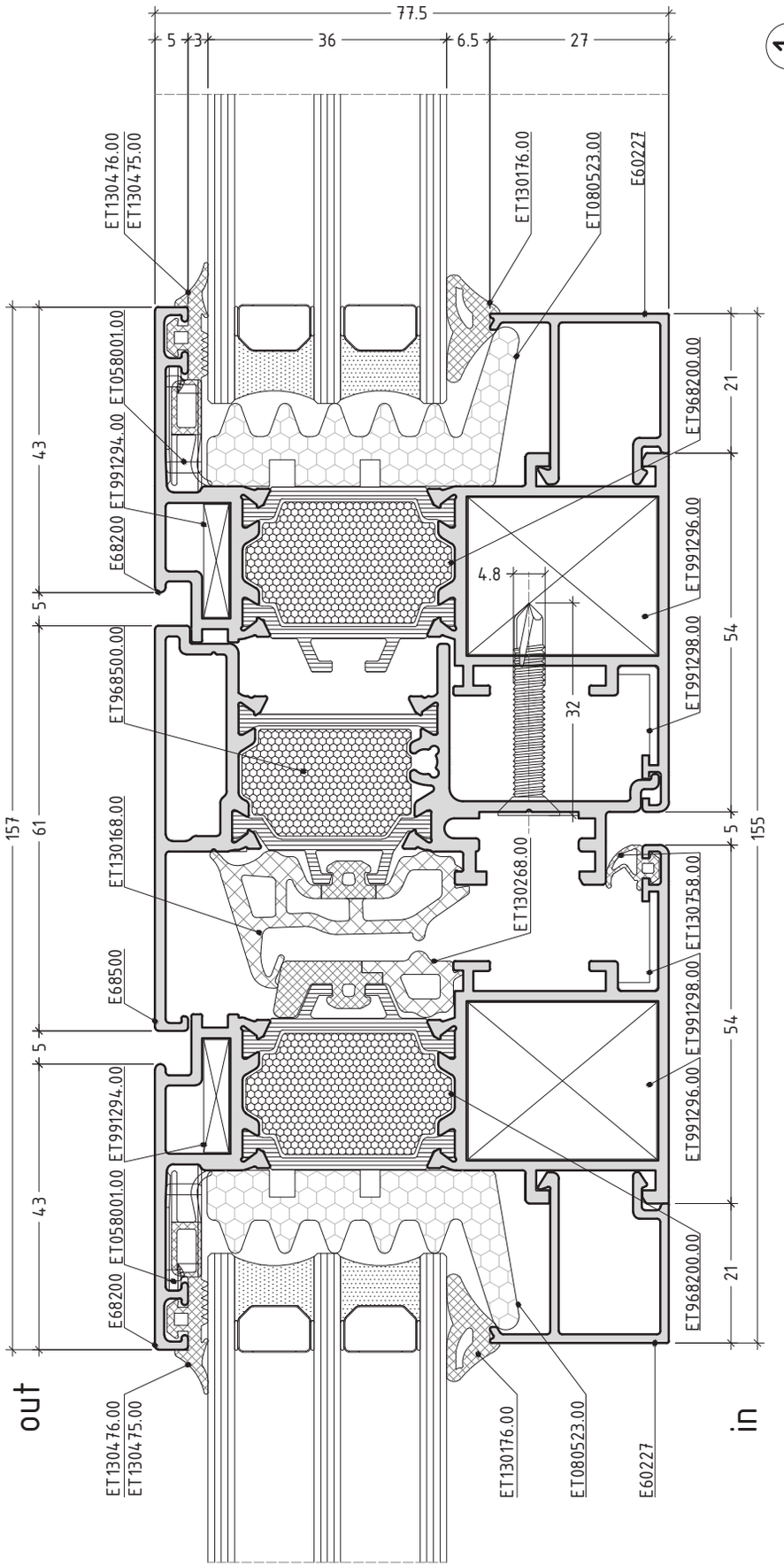


scale : 1:1

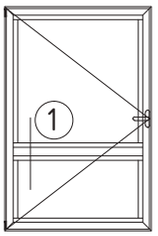
D68-4





scale : 1:1

D68-5



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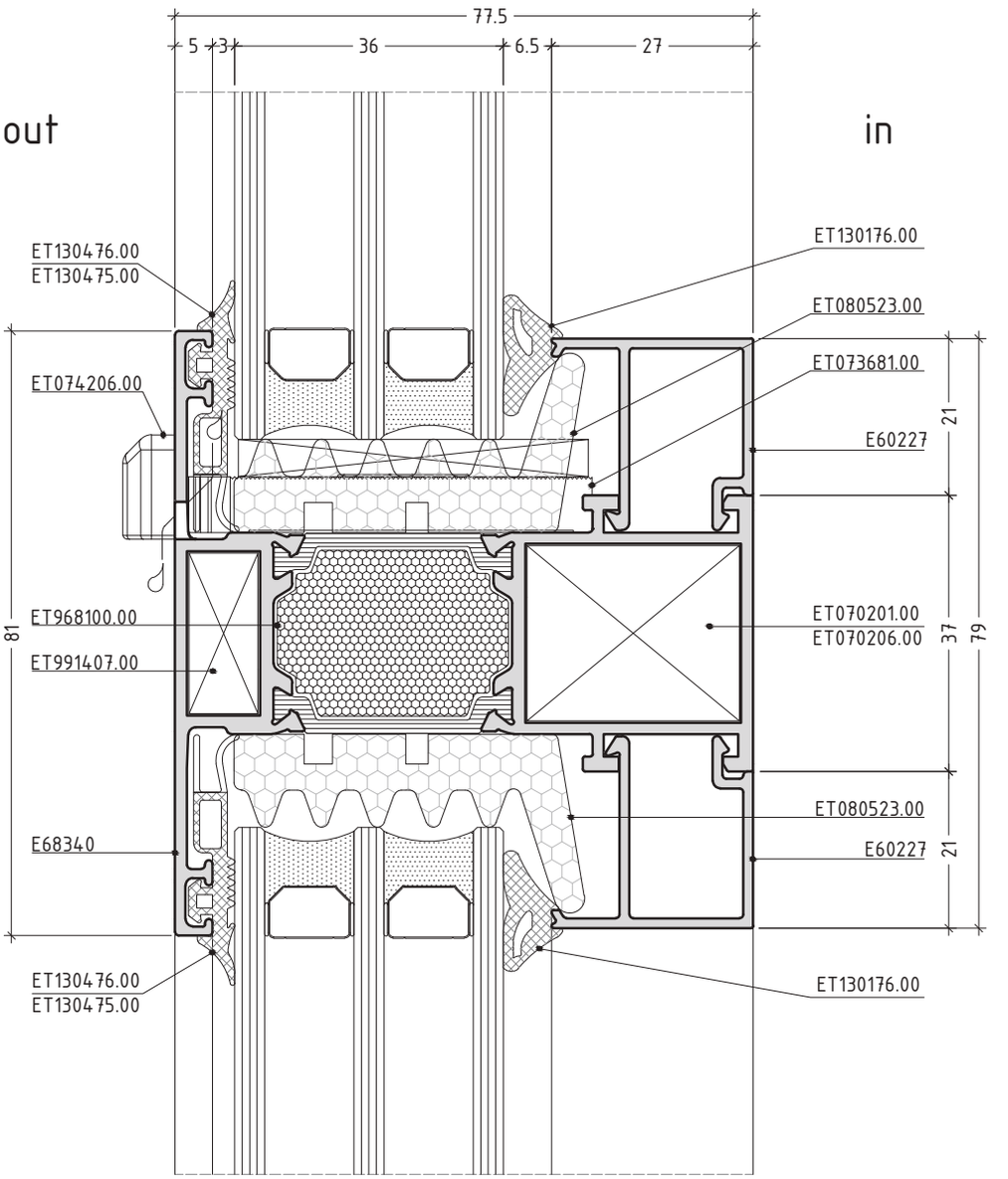
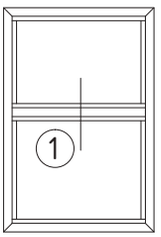
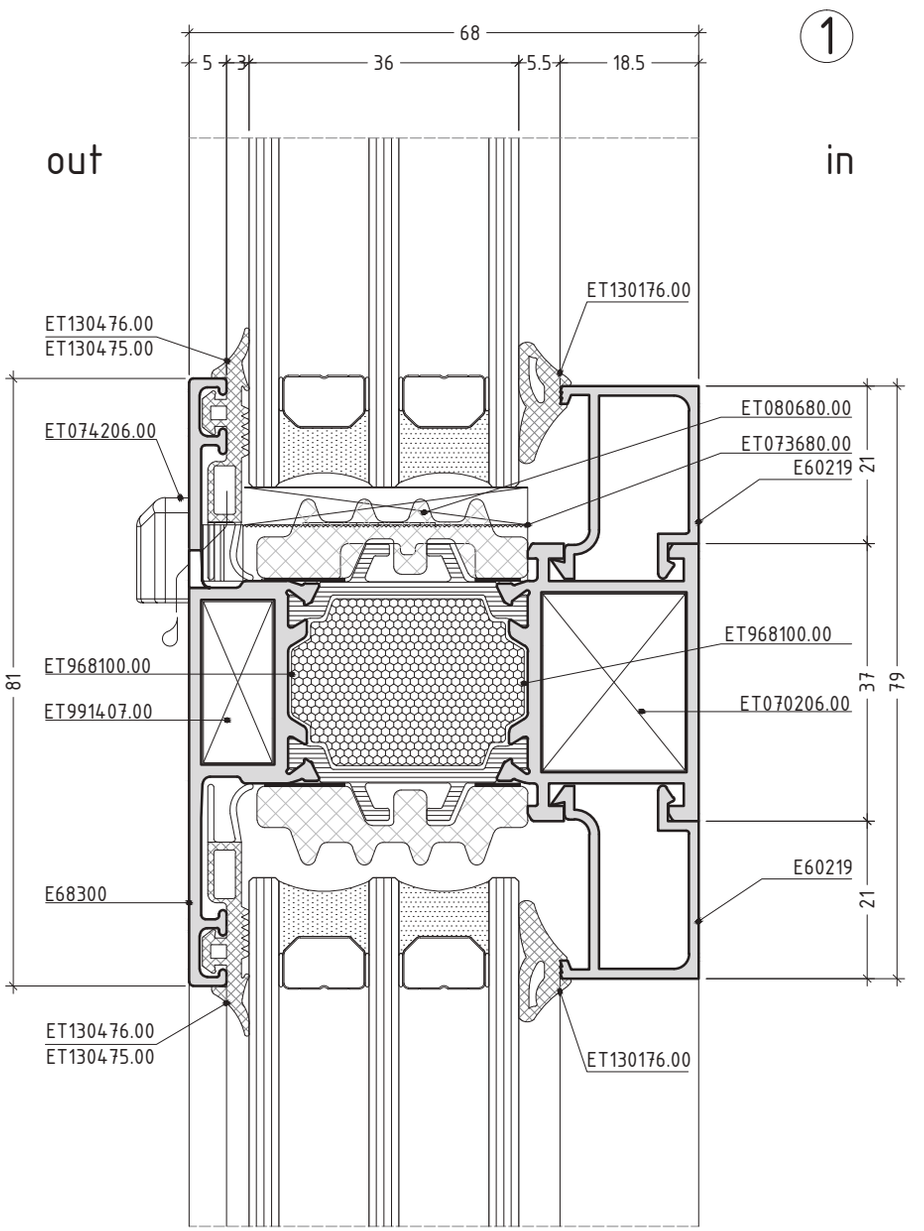


scale : 1:1

D68-6





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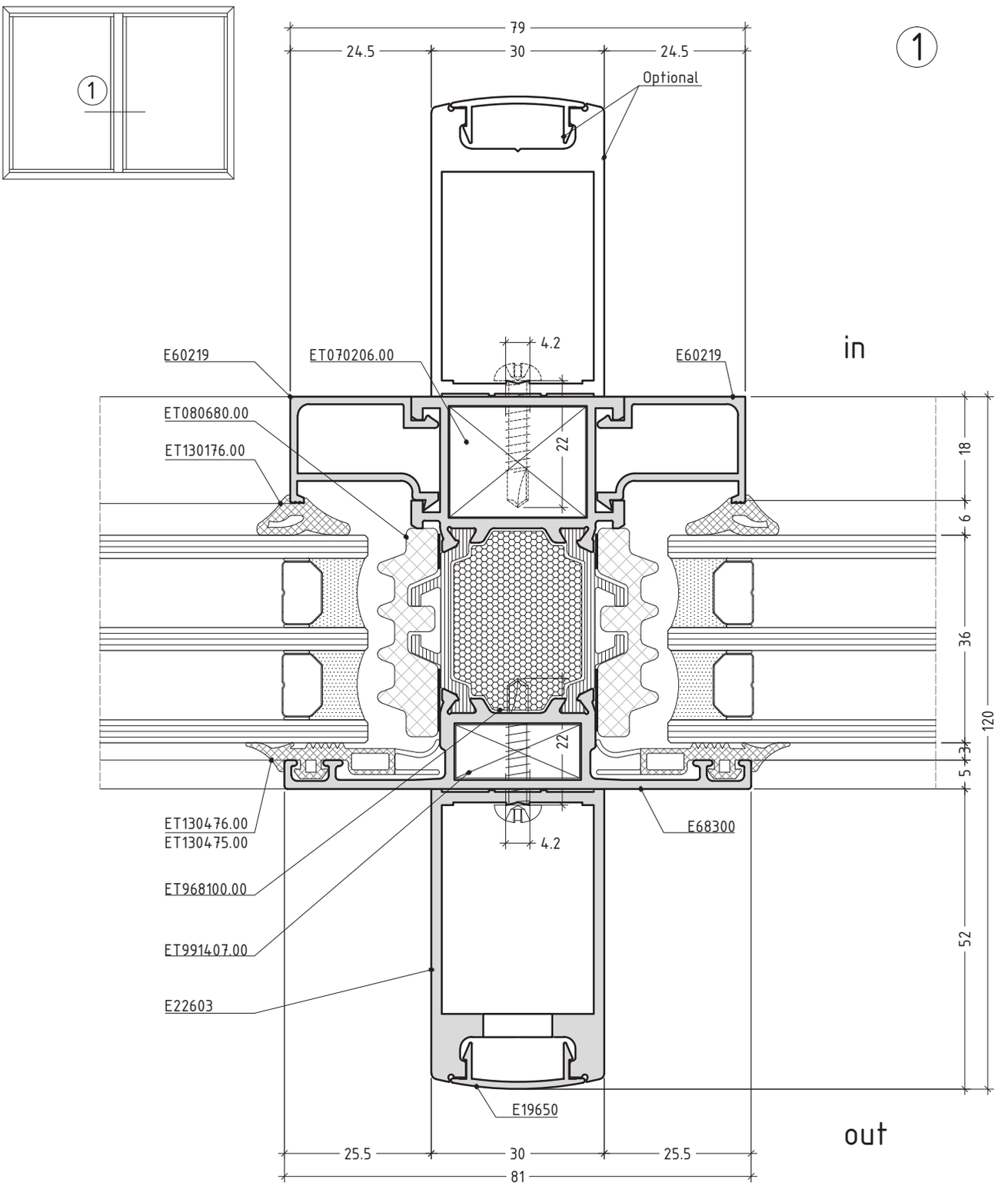
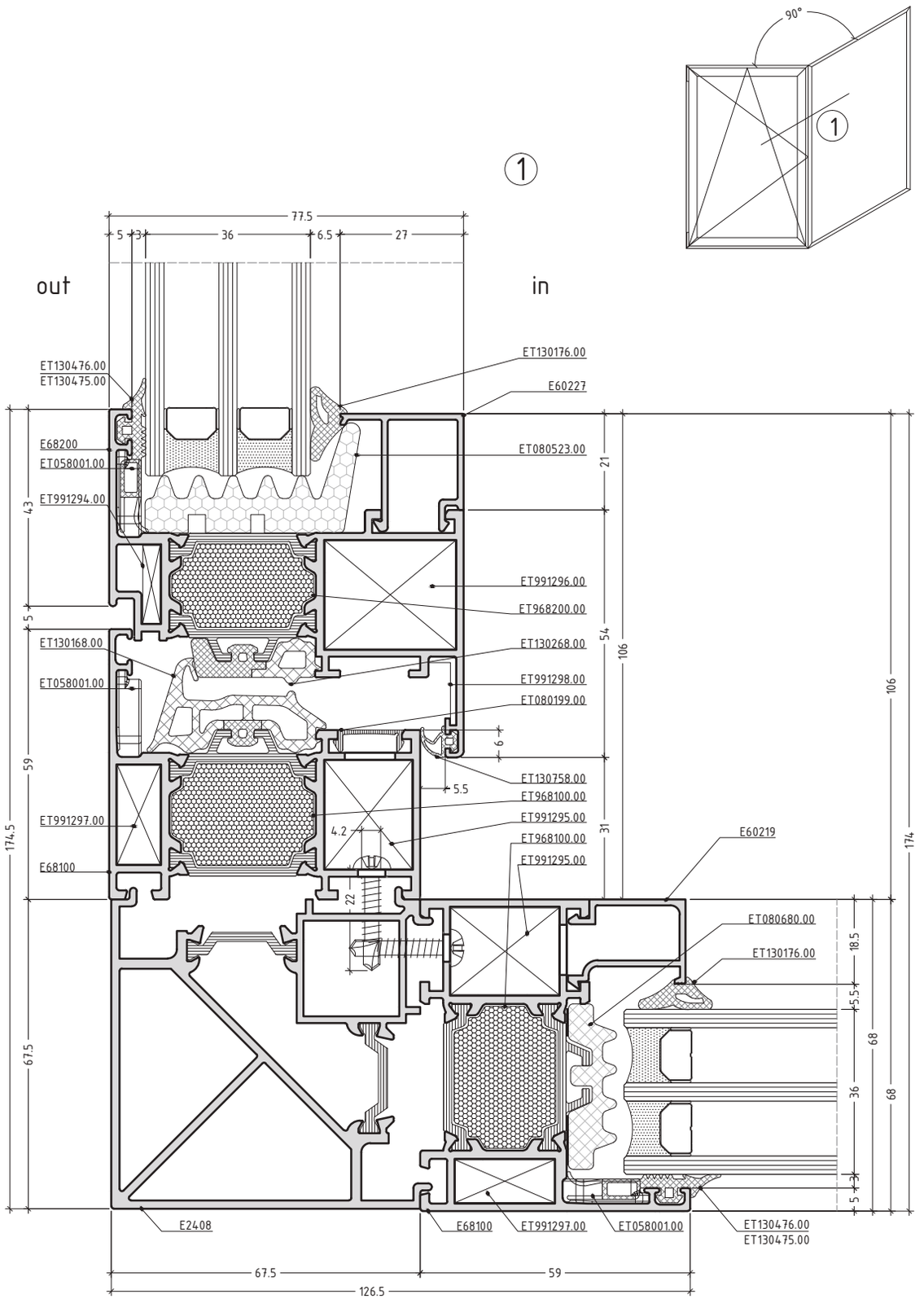
D68-7



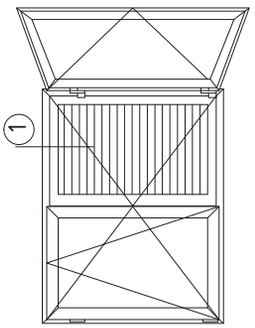
scale : 1:1

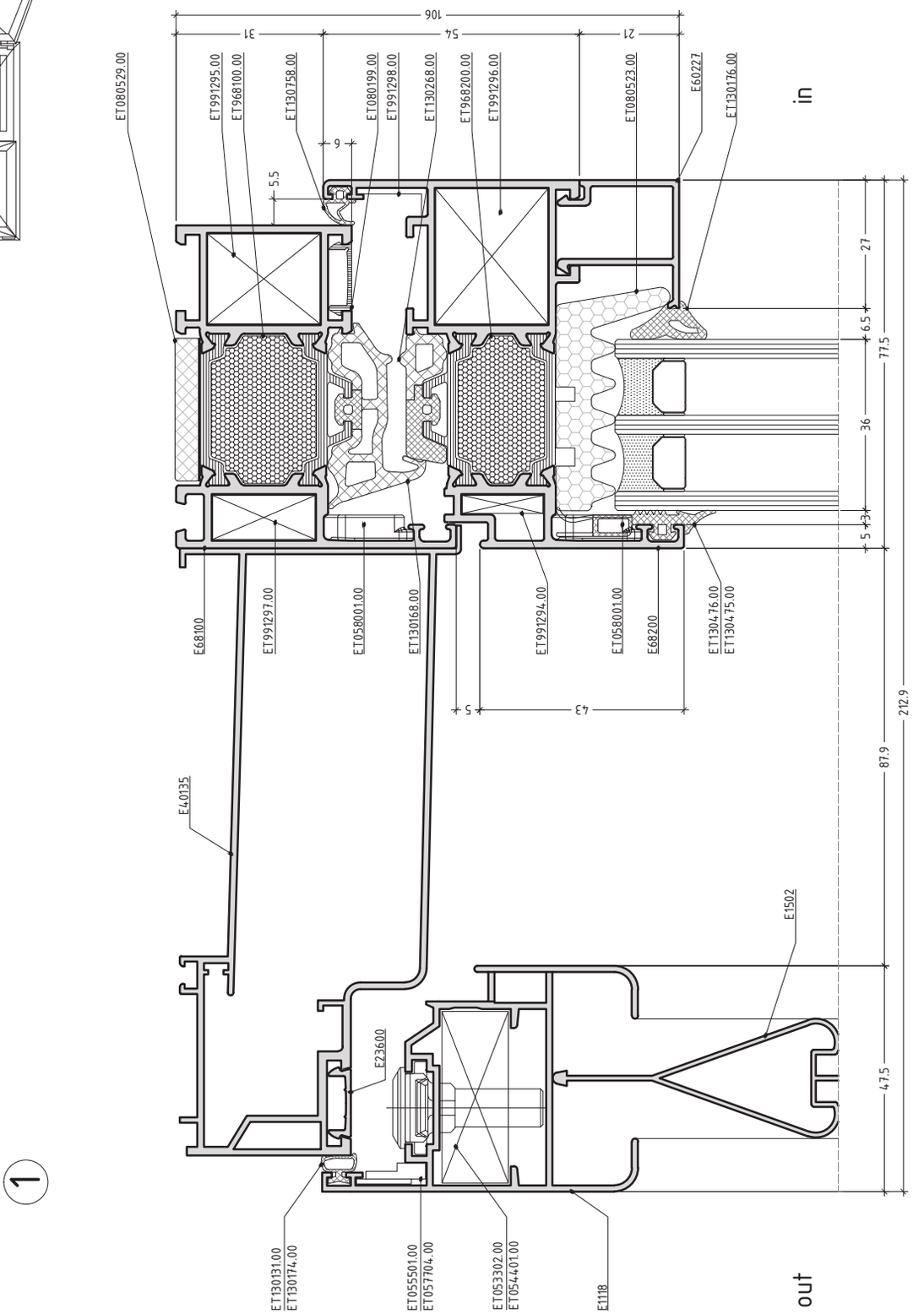
D68-8



scale : 3/4

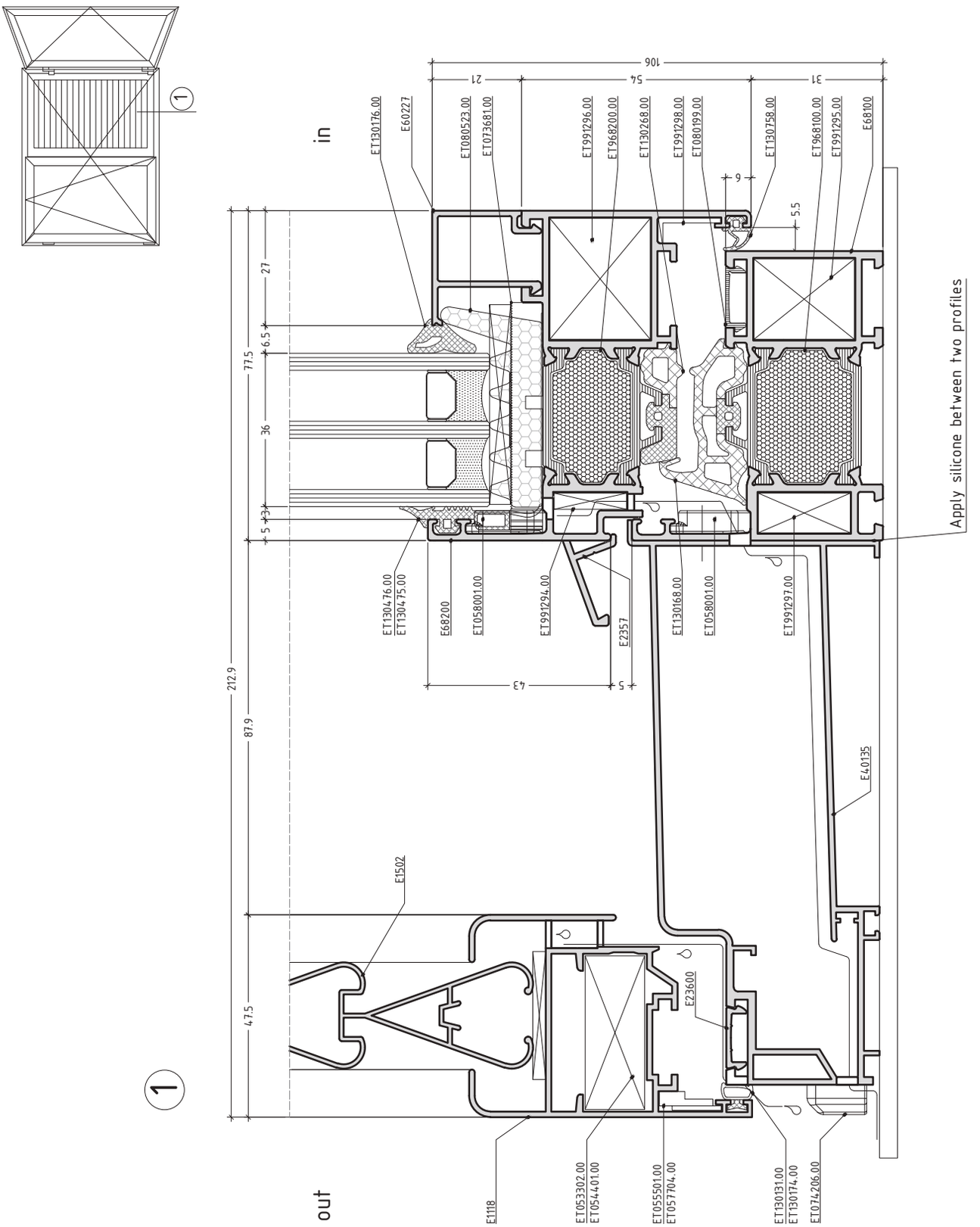
D68-9





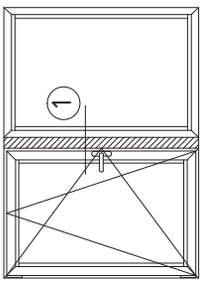
scale : 3/4

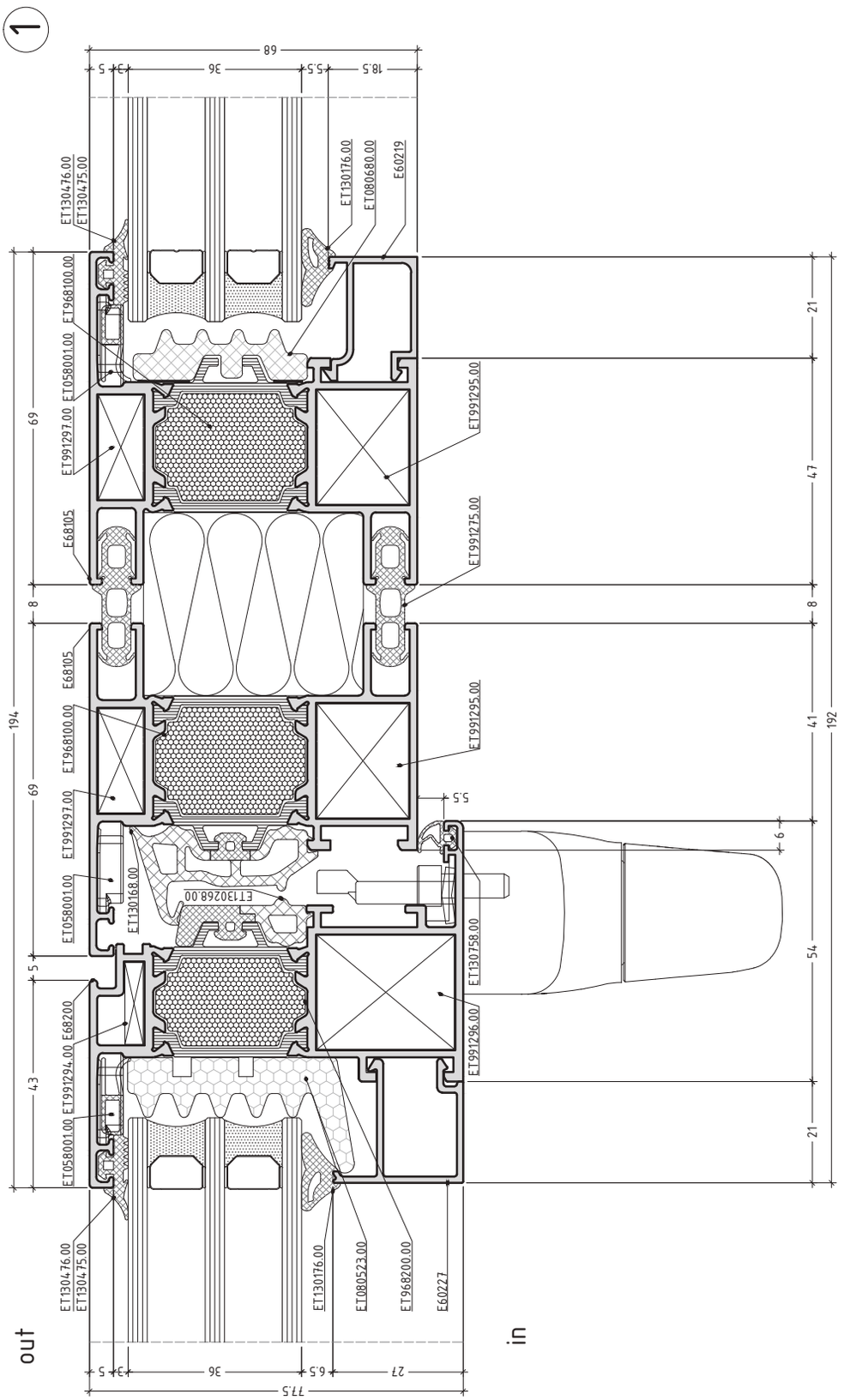
D68-10



scale : 3/4

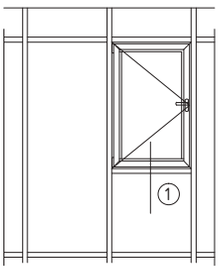
D68-11





scale : 3/4

D68-12



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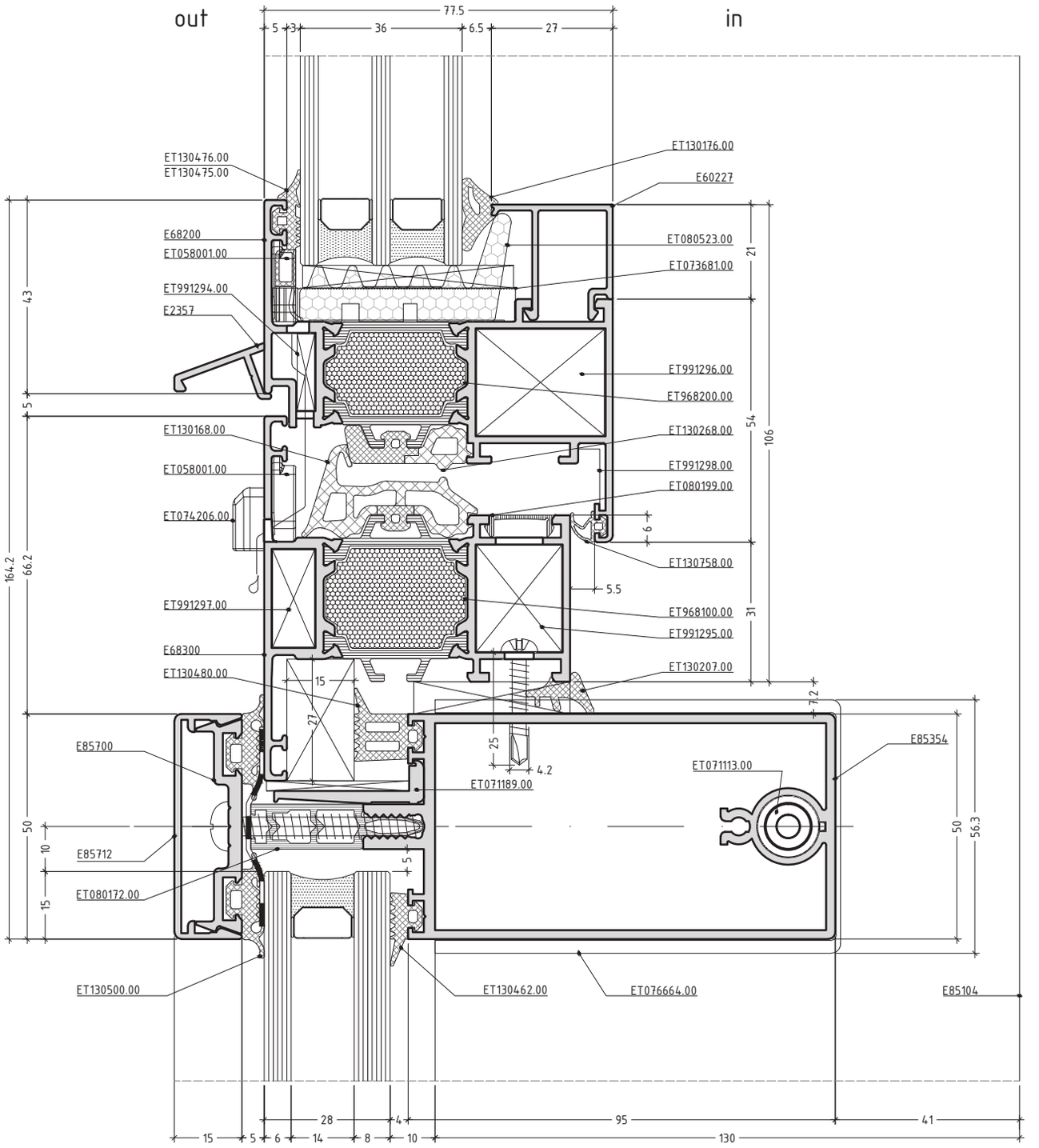
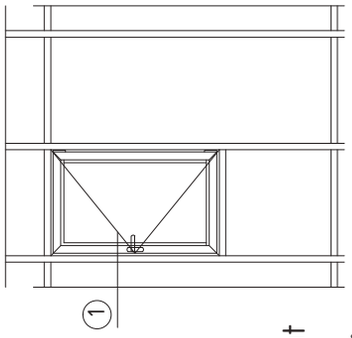
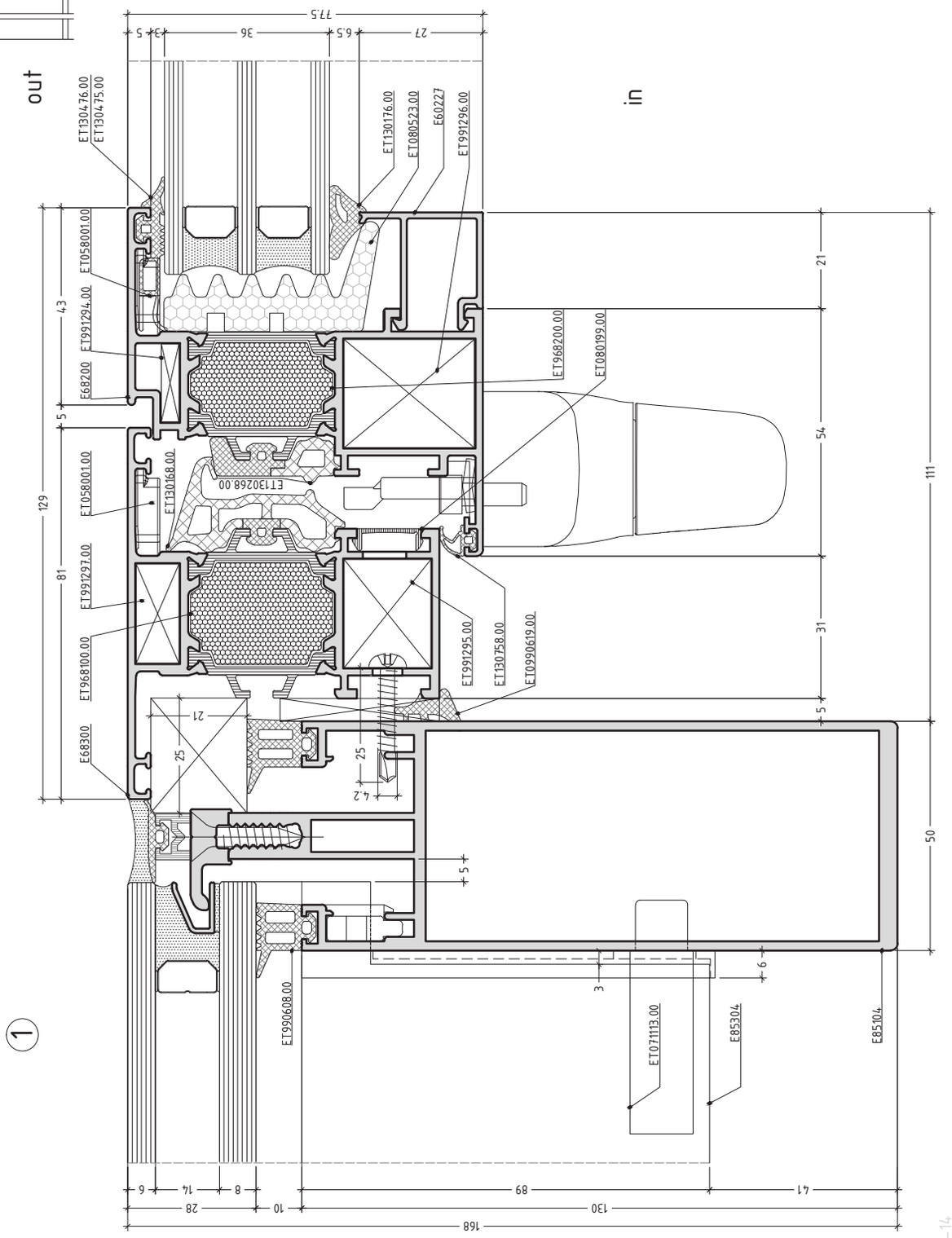


scale : 3/4

D68-13

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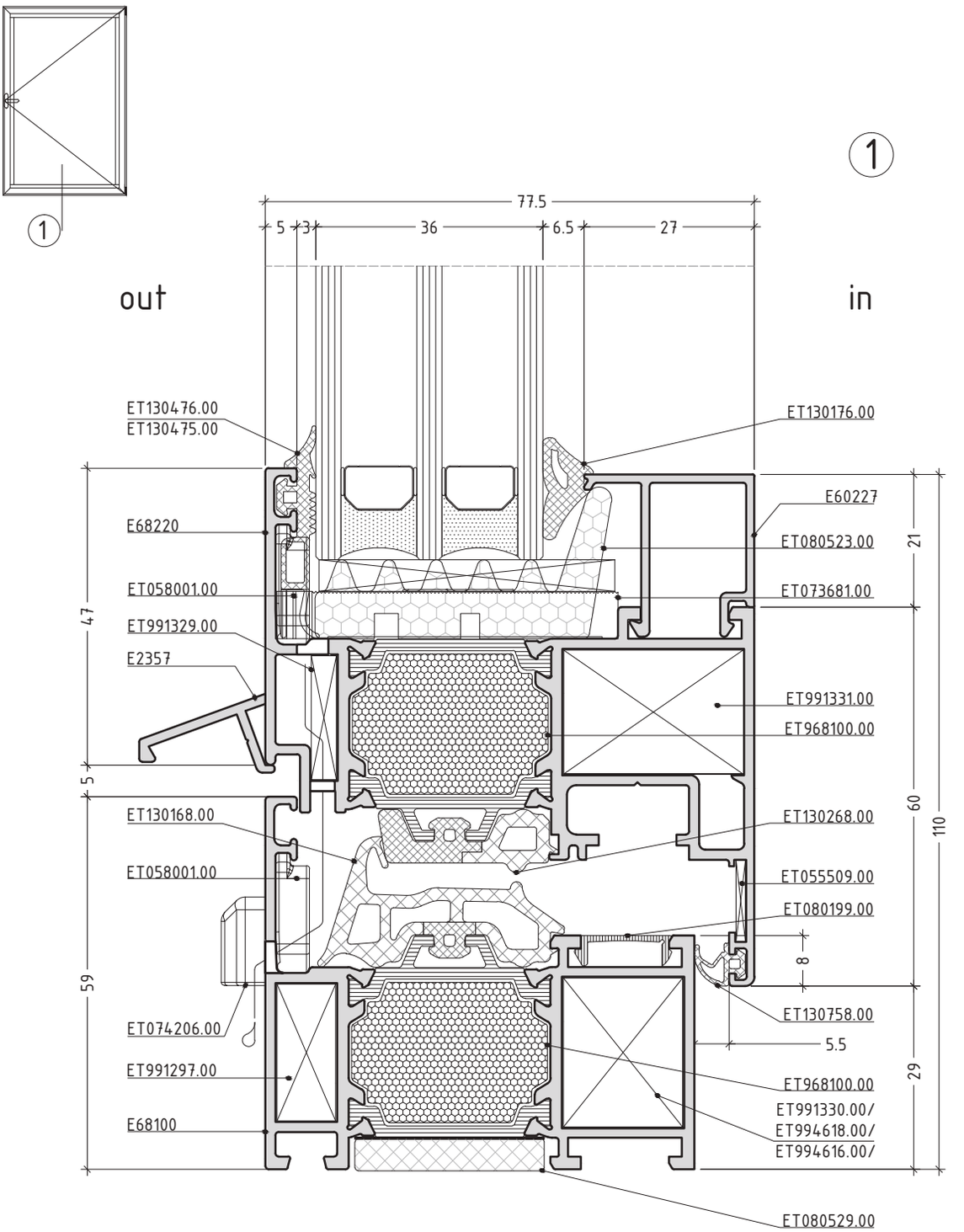
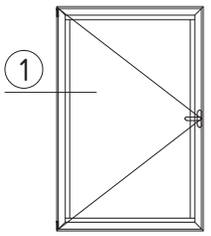
14
8
89
41
28
10
130
168

scale : 3/4



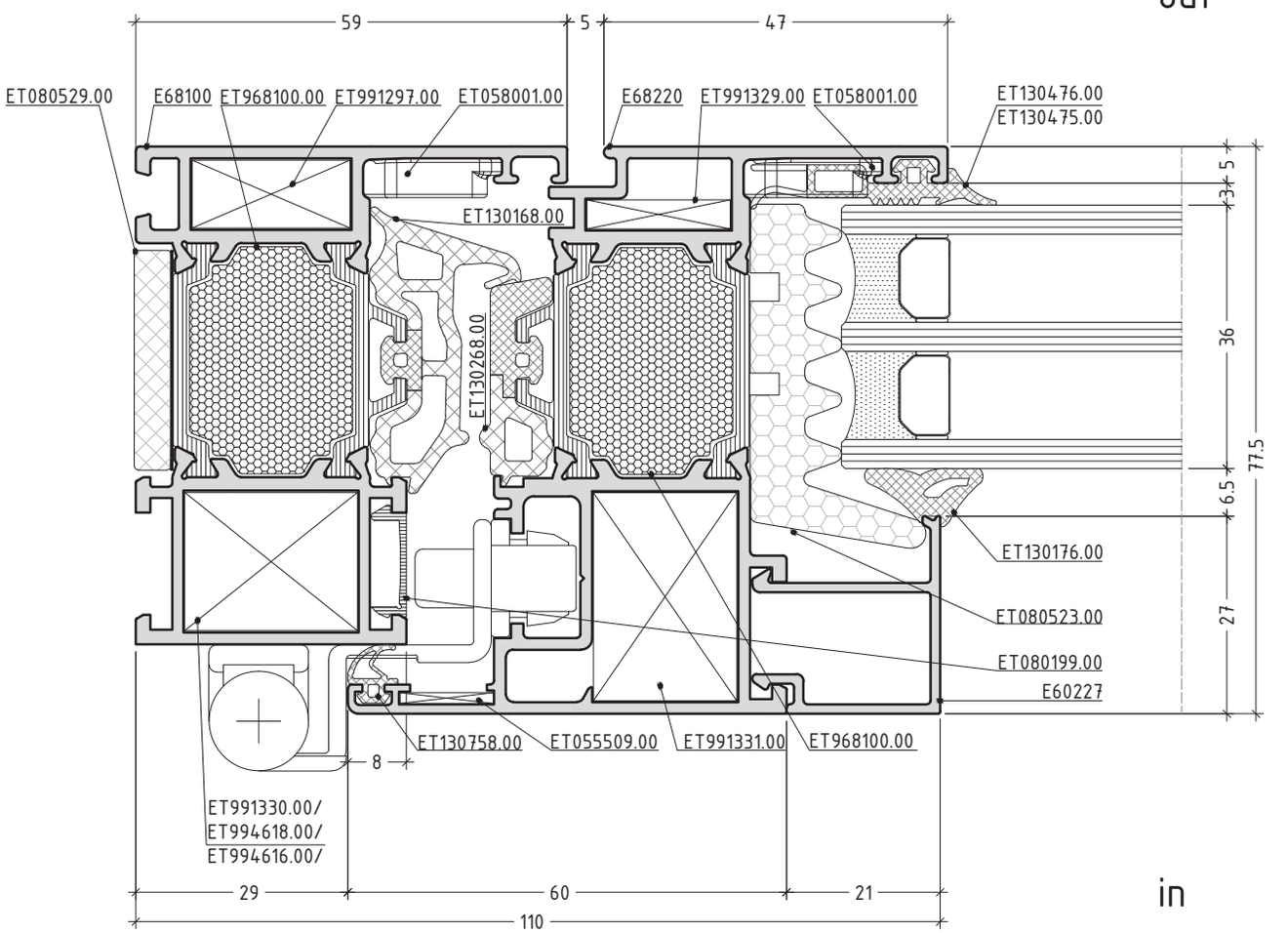
scale : 1:1

D68-15



1

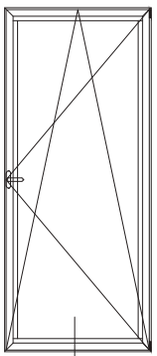
out

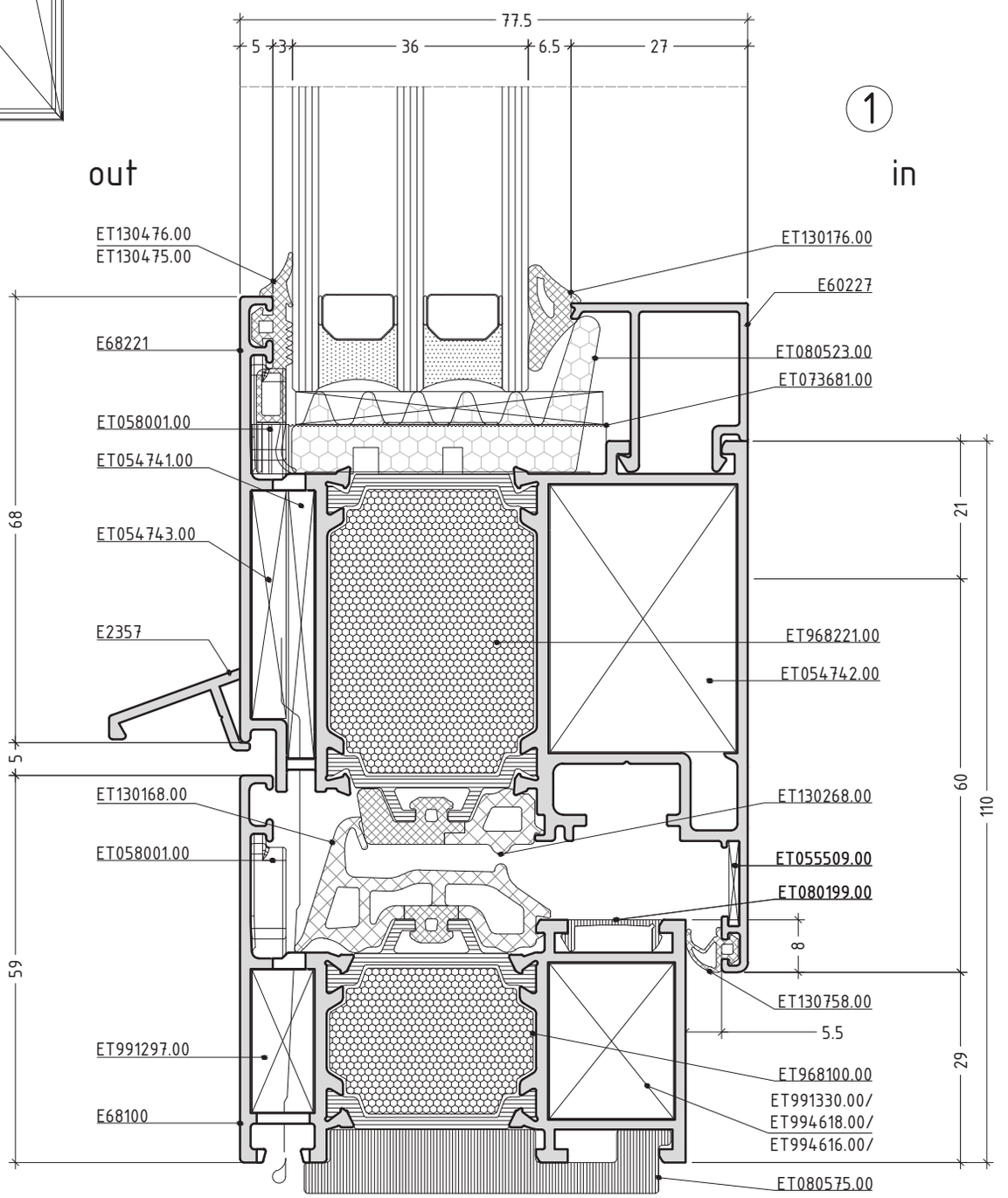


in

scale : 1:1

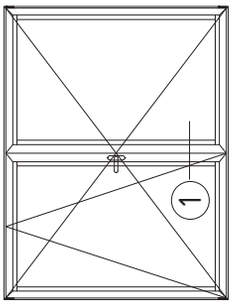
D68-16

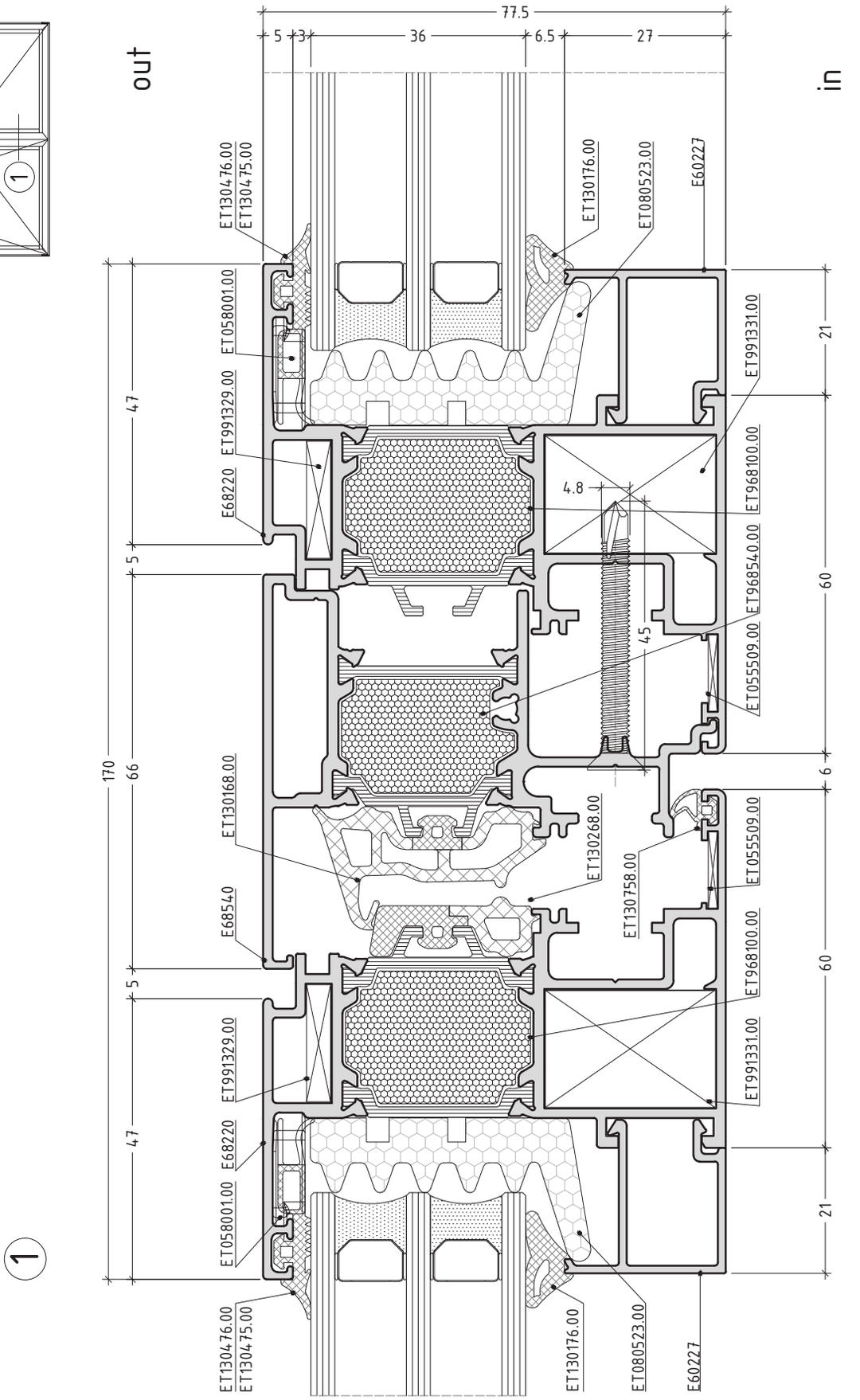




scale : 1:1

D68-17





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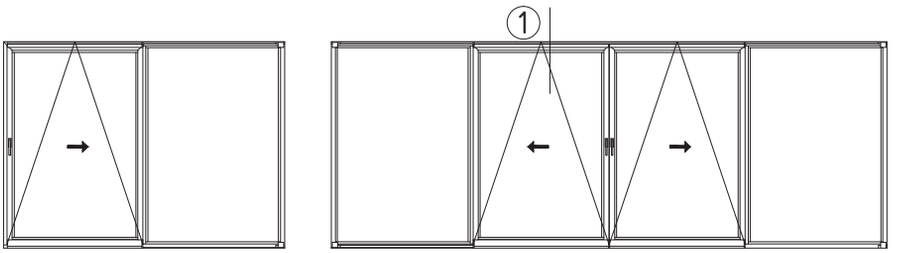
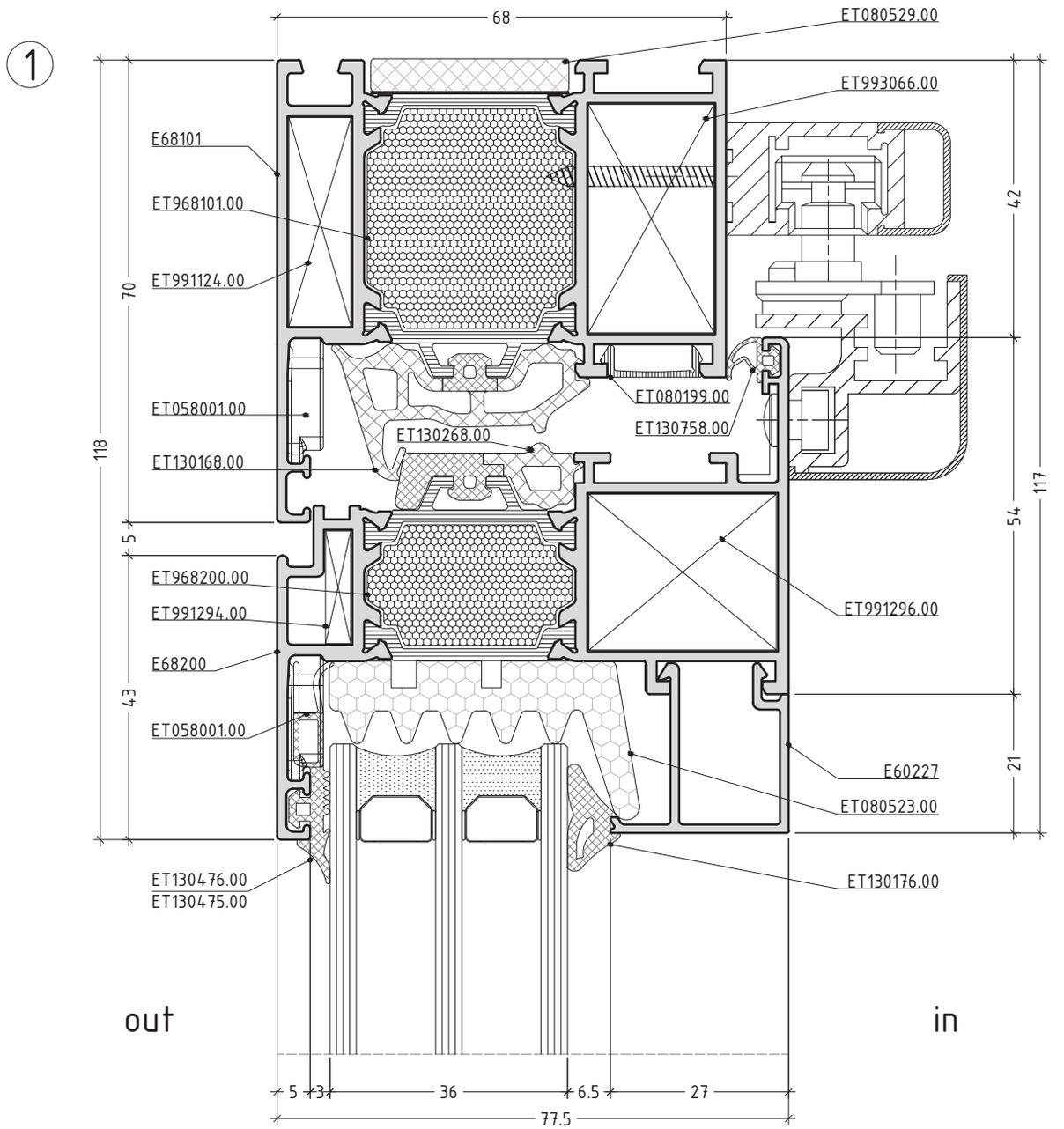
D68-18



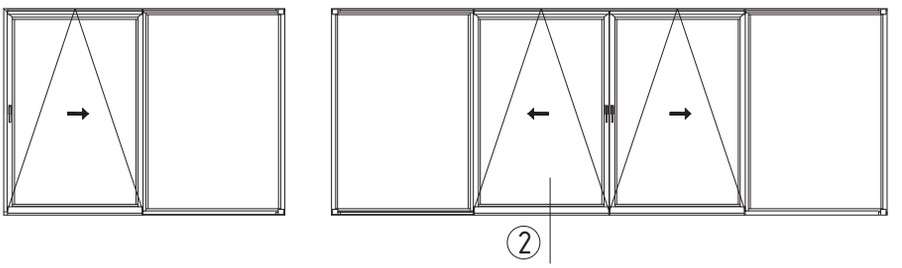
GU OZ/MZ - 150kg

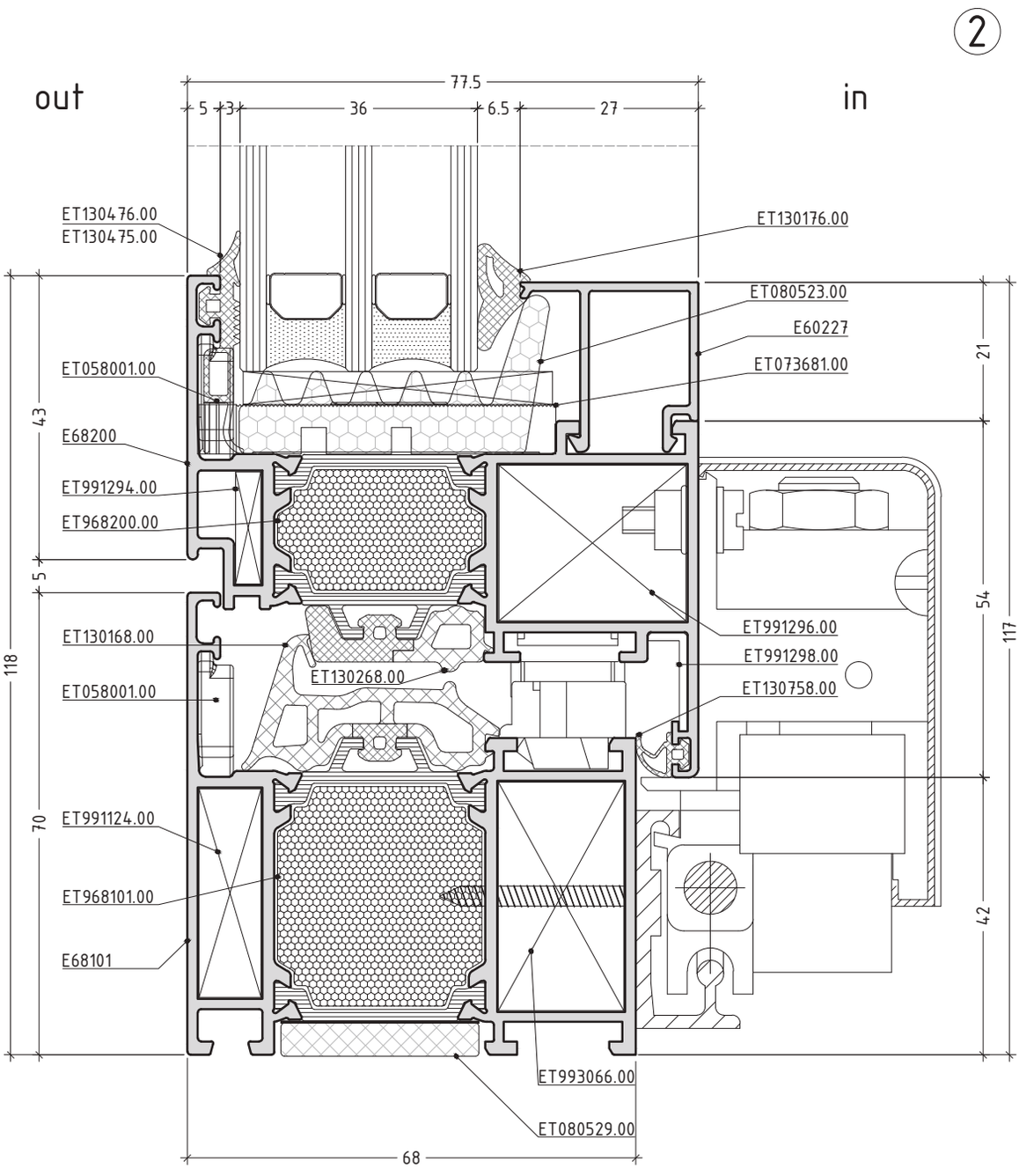


scale : 1:1

D68-19

GU OZ/MZ - 150kg





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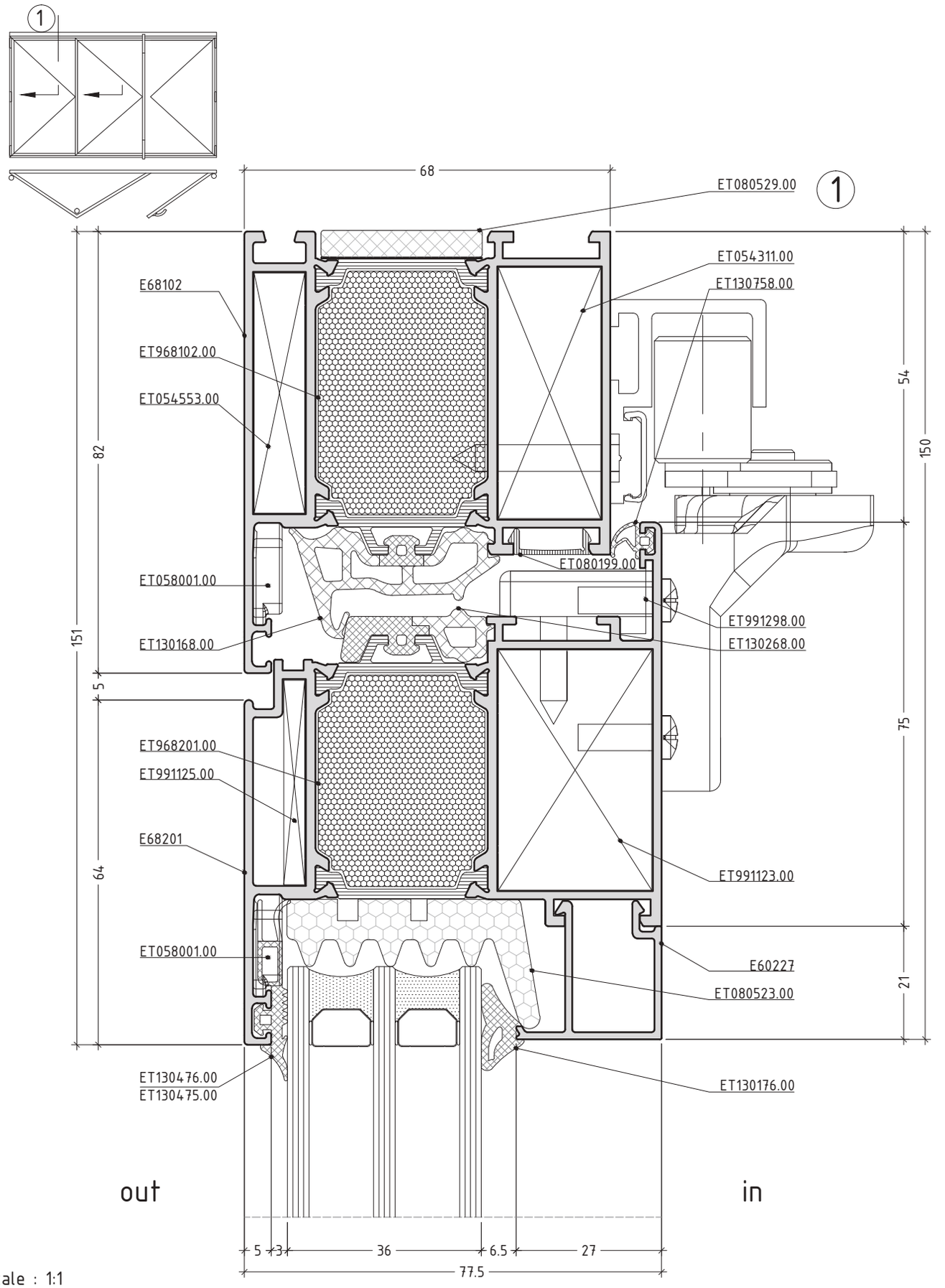
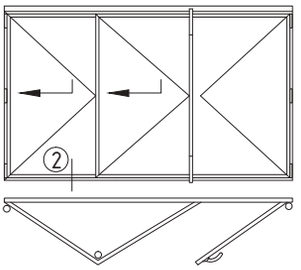
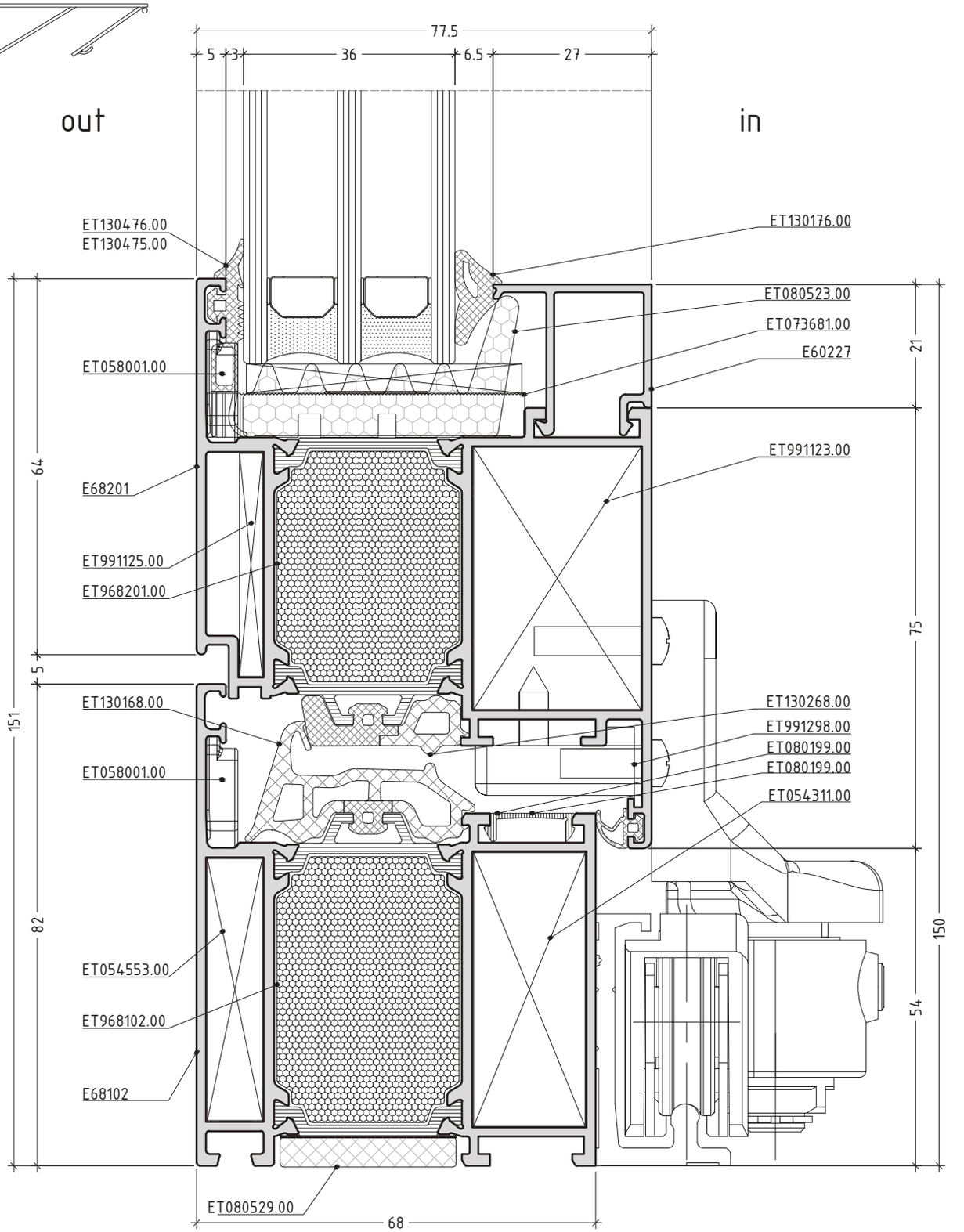
D68-20



scale : 1:1

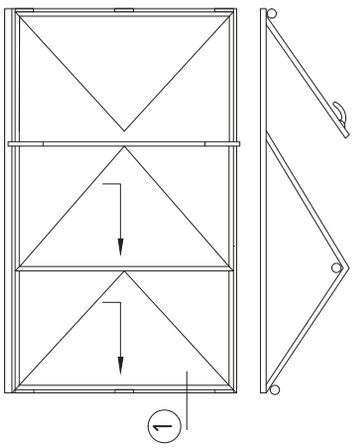
D68-21

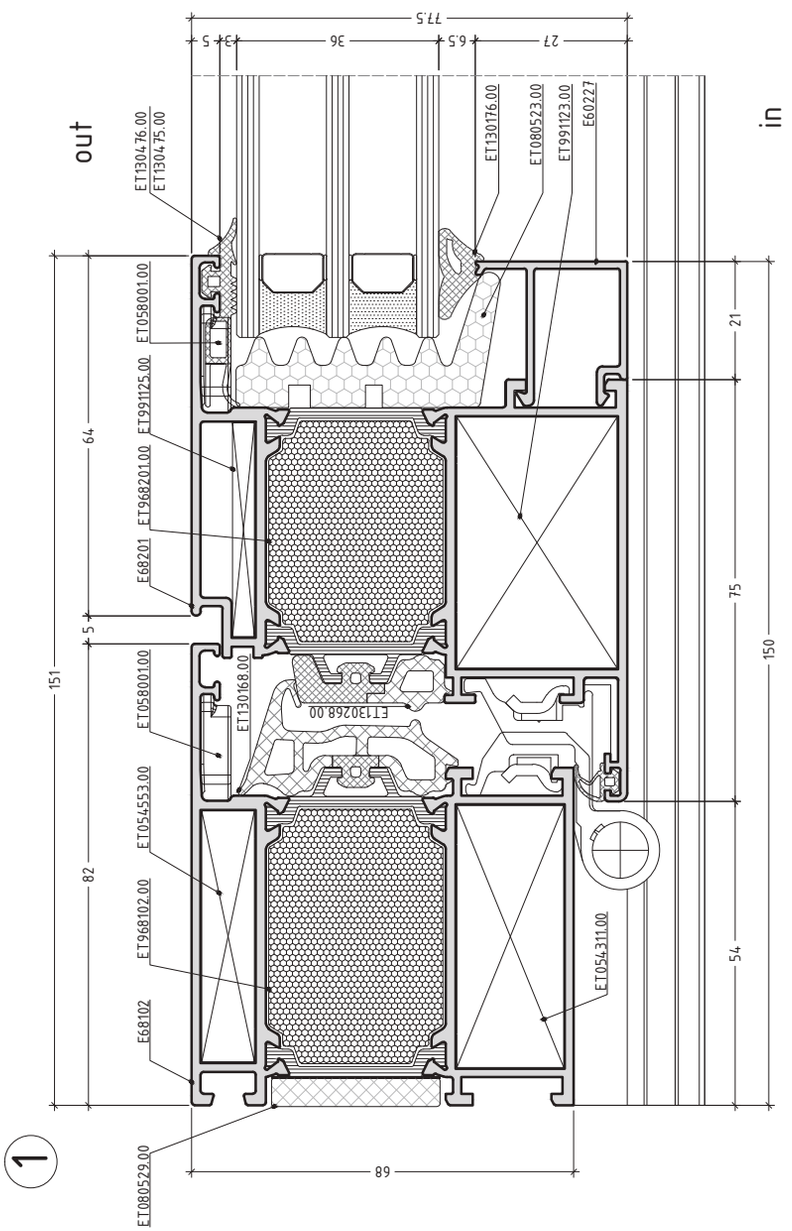




scale : 1:1

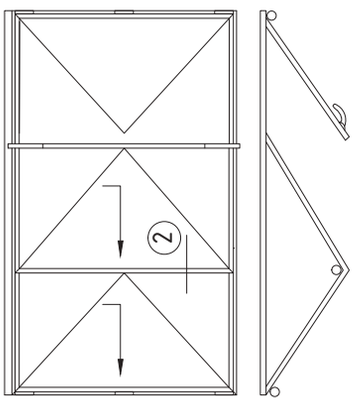
D68-22

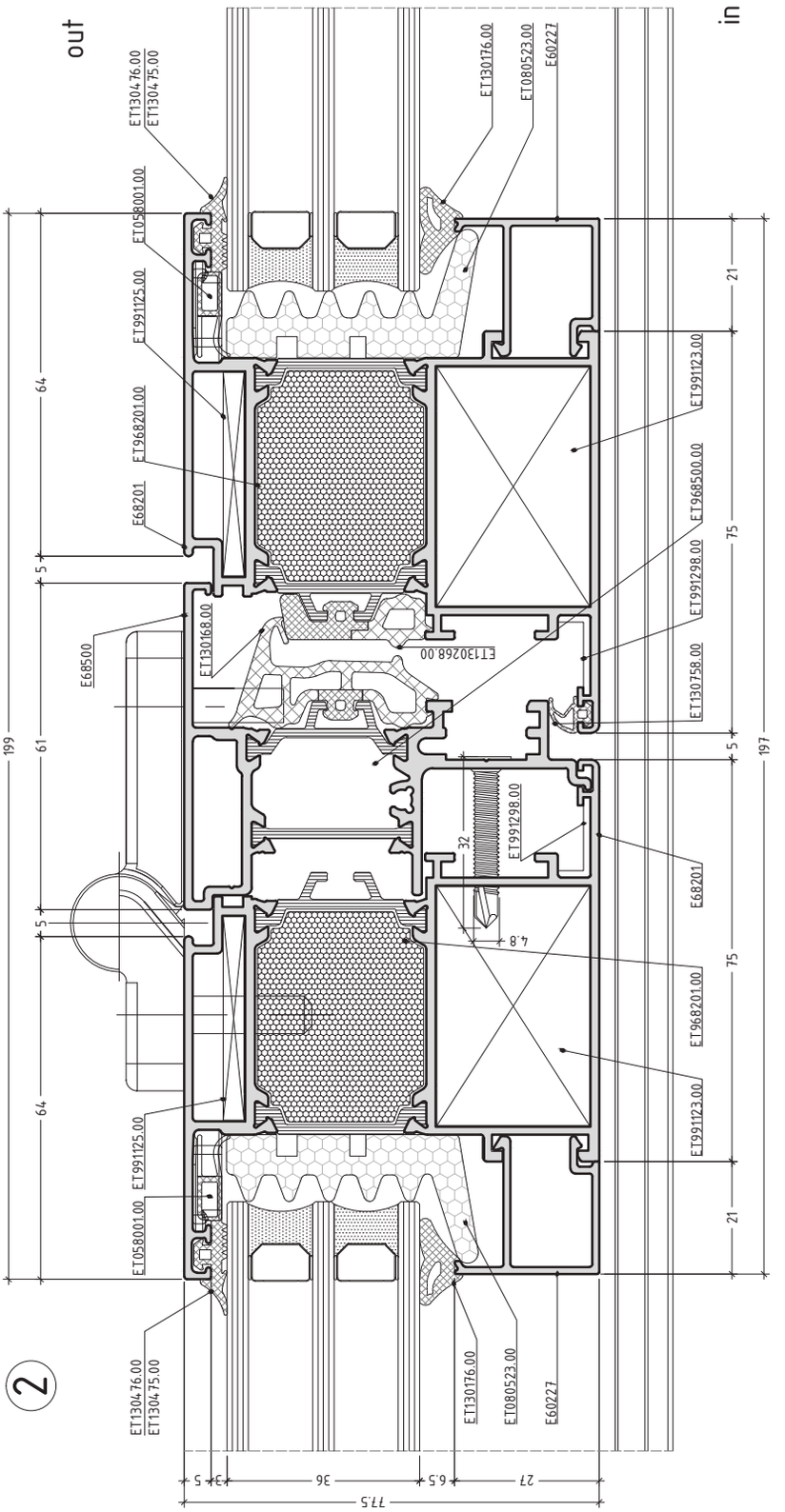




scale : 3/4

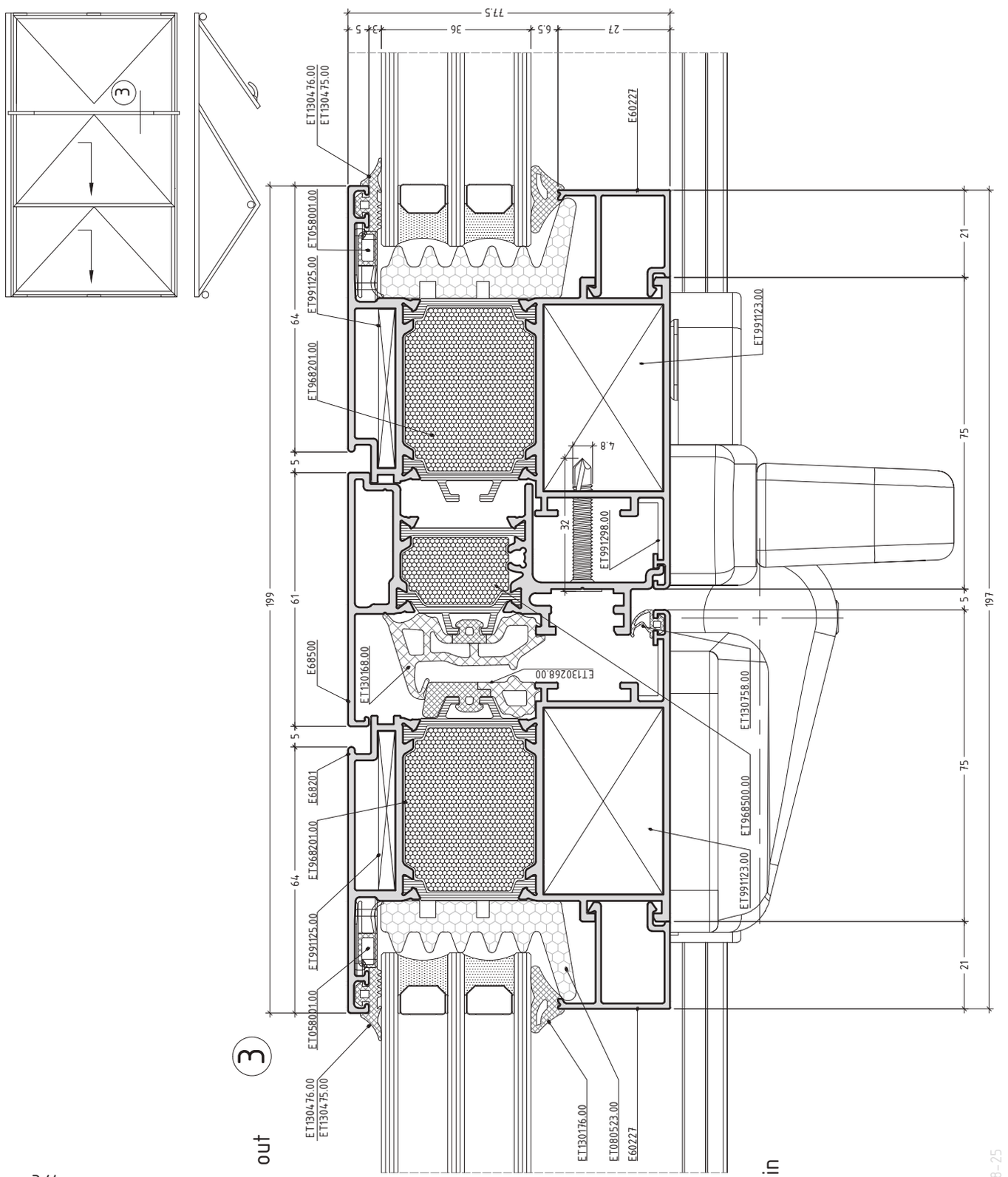
D68-23





scale : 3/4

D68-24


3
out
in
117.5
5
13
36
6.5
27
ET130476.00
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E60227
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ET968201.00
64
5
199
61
E68500
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E68201
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4.8
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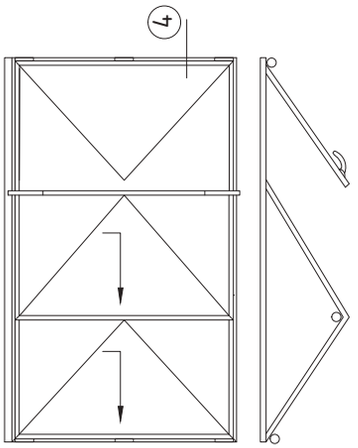
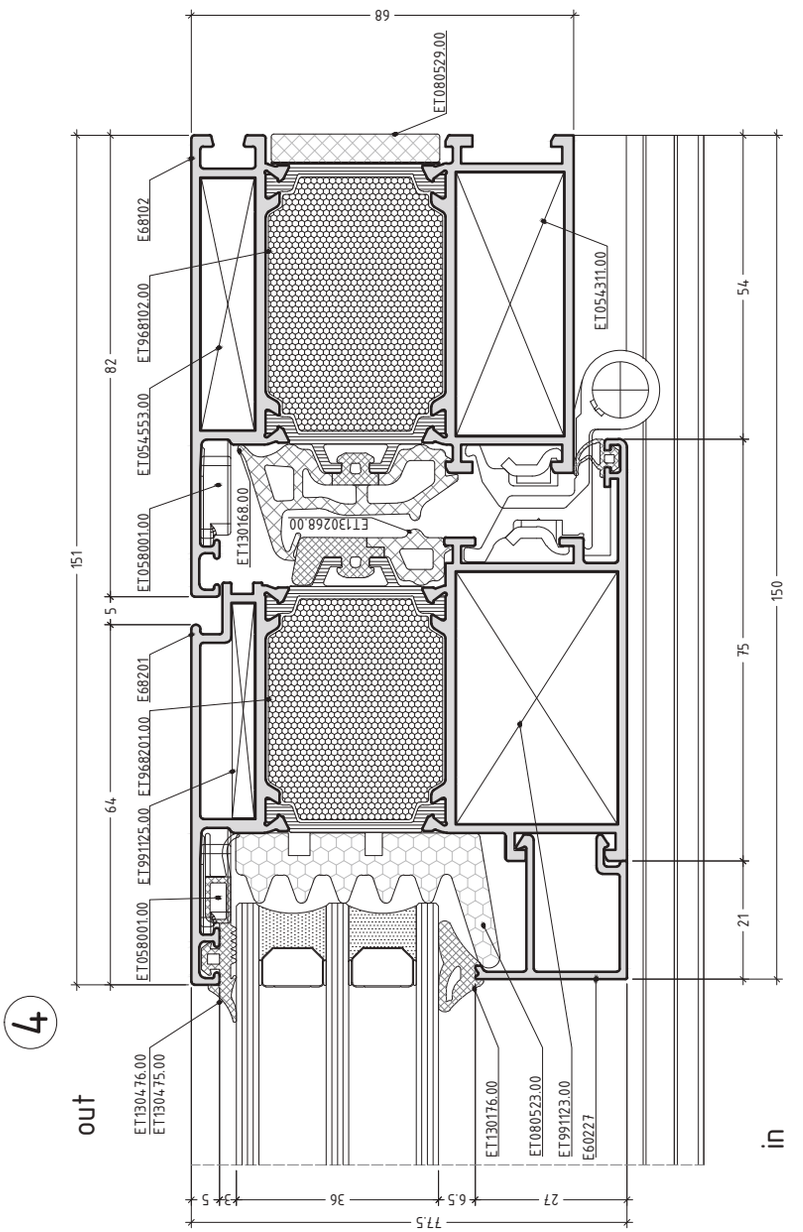
21
75
5
197
D68-25

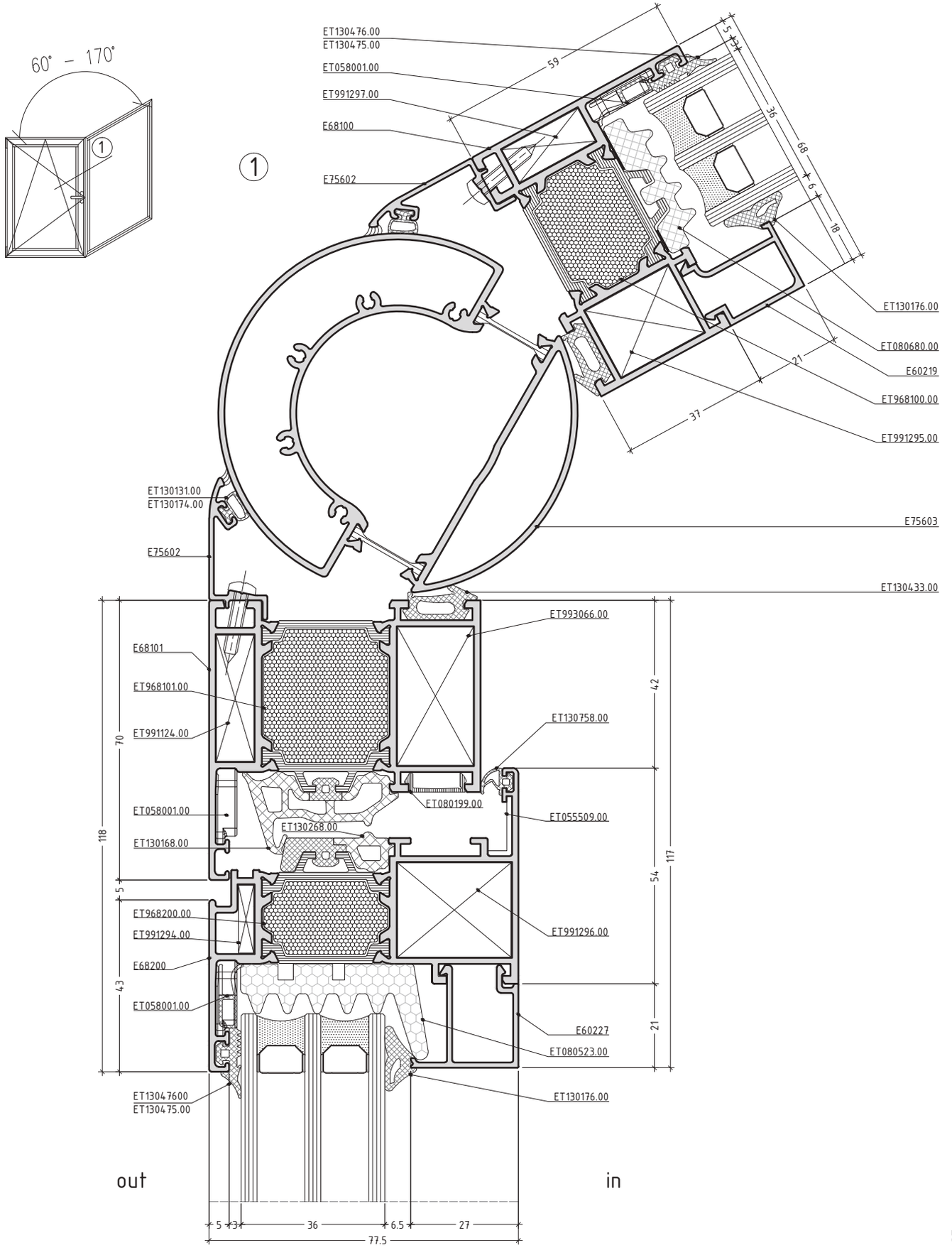
scale : 3/4





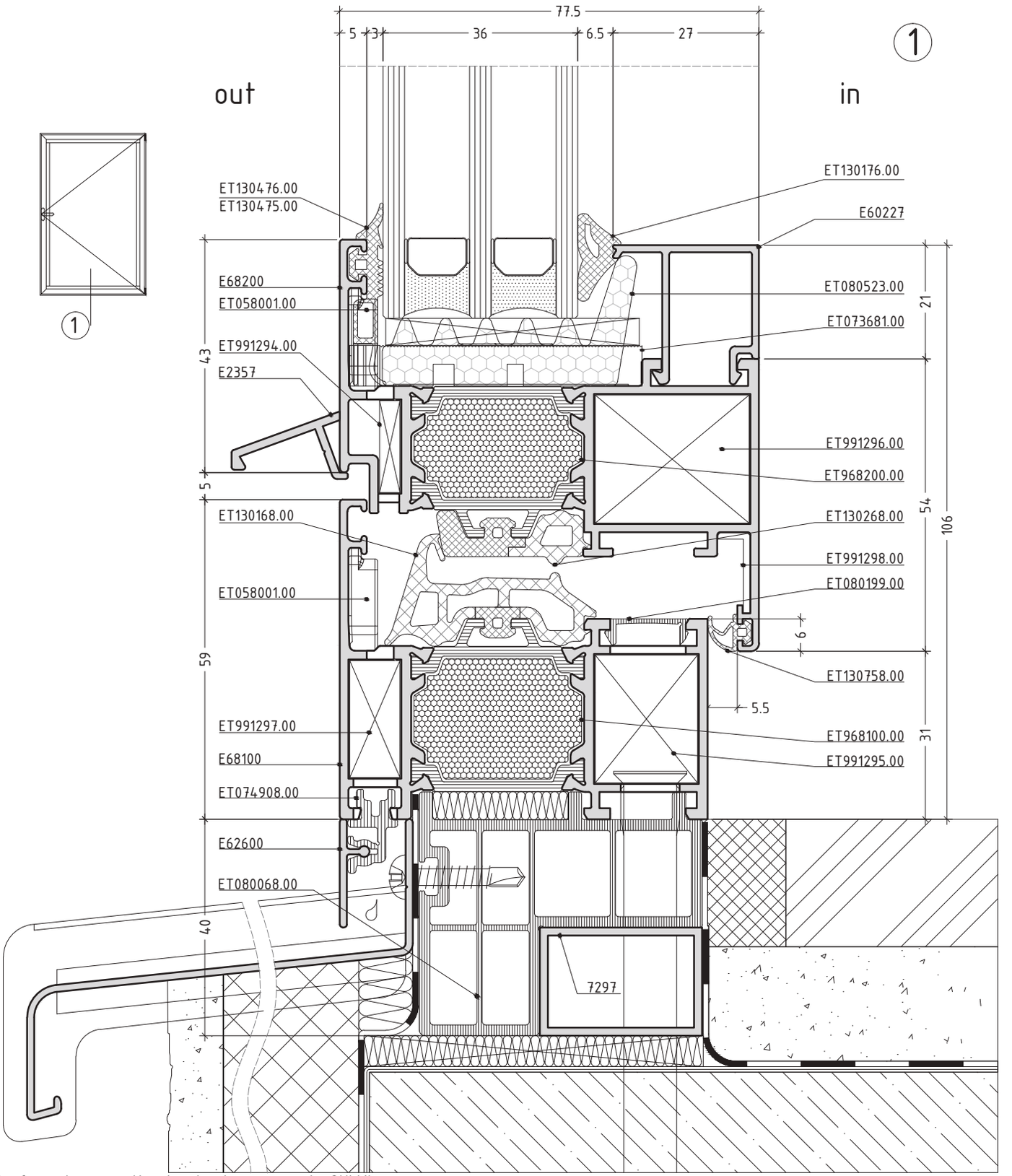
scale : 3/4

D68-26



scale : 3/4

D68-27

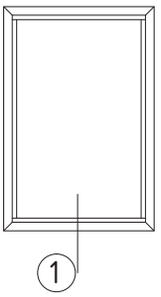


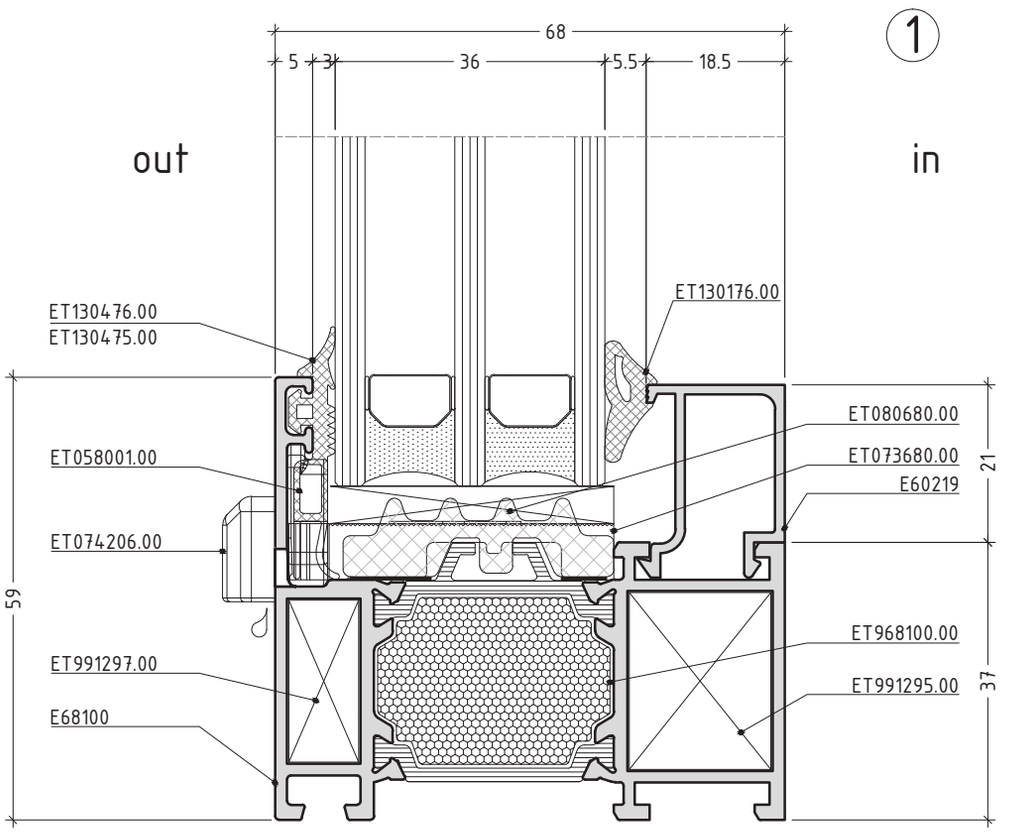
Interface shown on the drawing is an example ONLY!
Connection between backing wall and frame is specific for each single project. It is obligatory to observe different projects' features. All final decisions about materials used, interface finishing, etc. should be approved by the structural / façade engineer responsible for the specific project.

scale : 1:1

D68-28

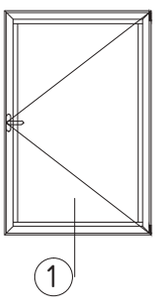
SECTIONS STANDARD +

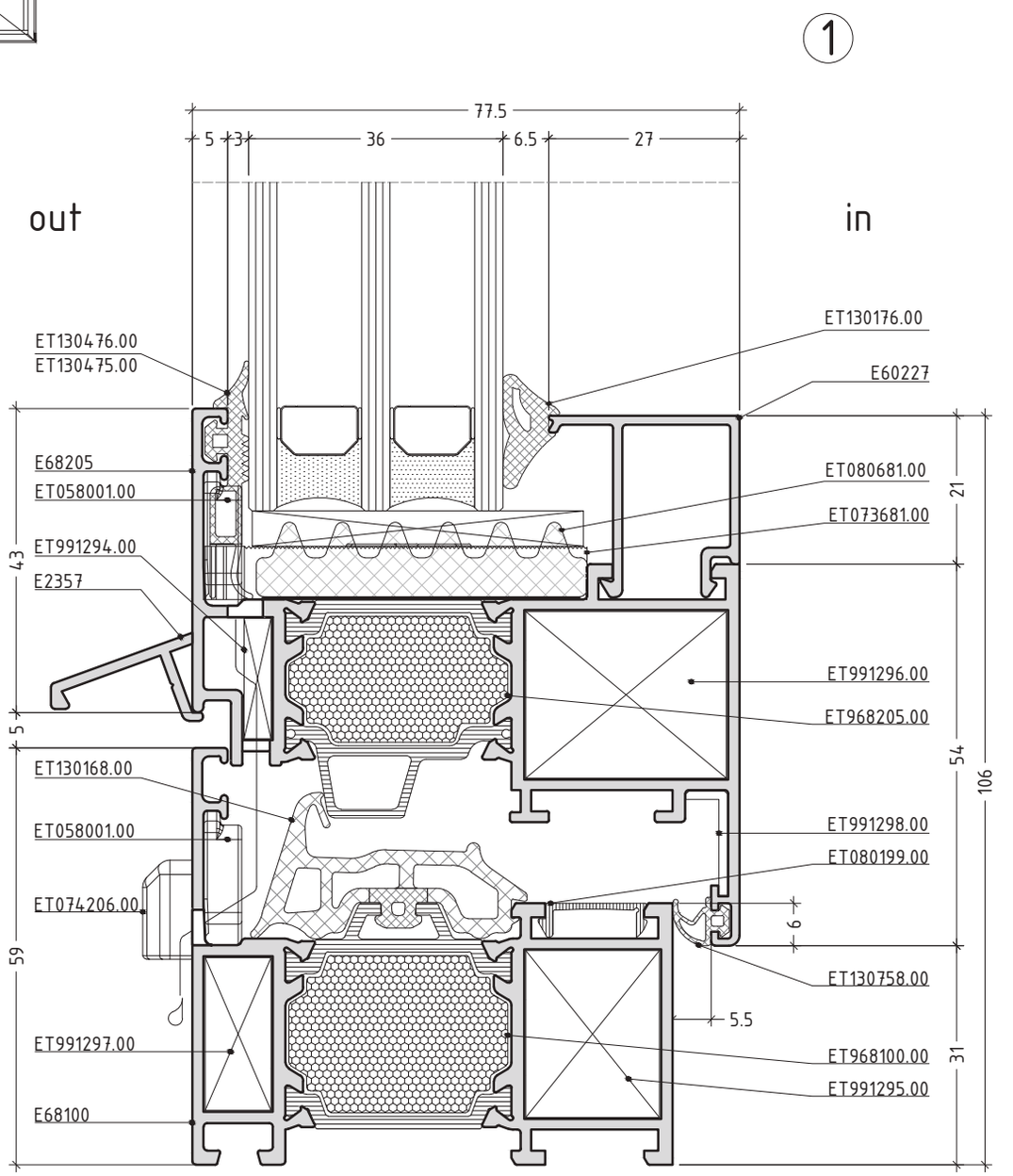




scale : 1:1

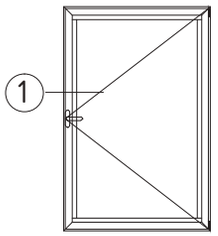
D68S-1





scale : 1:1

D68S-2



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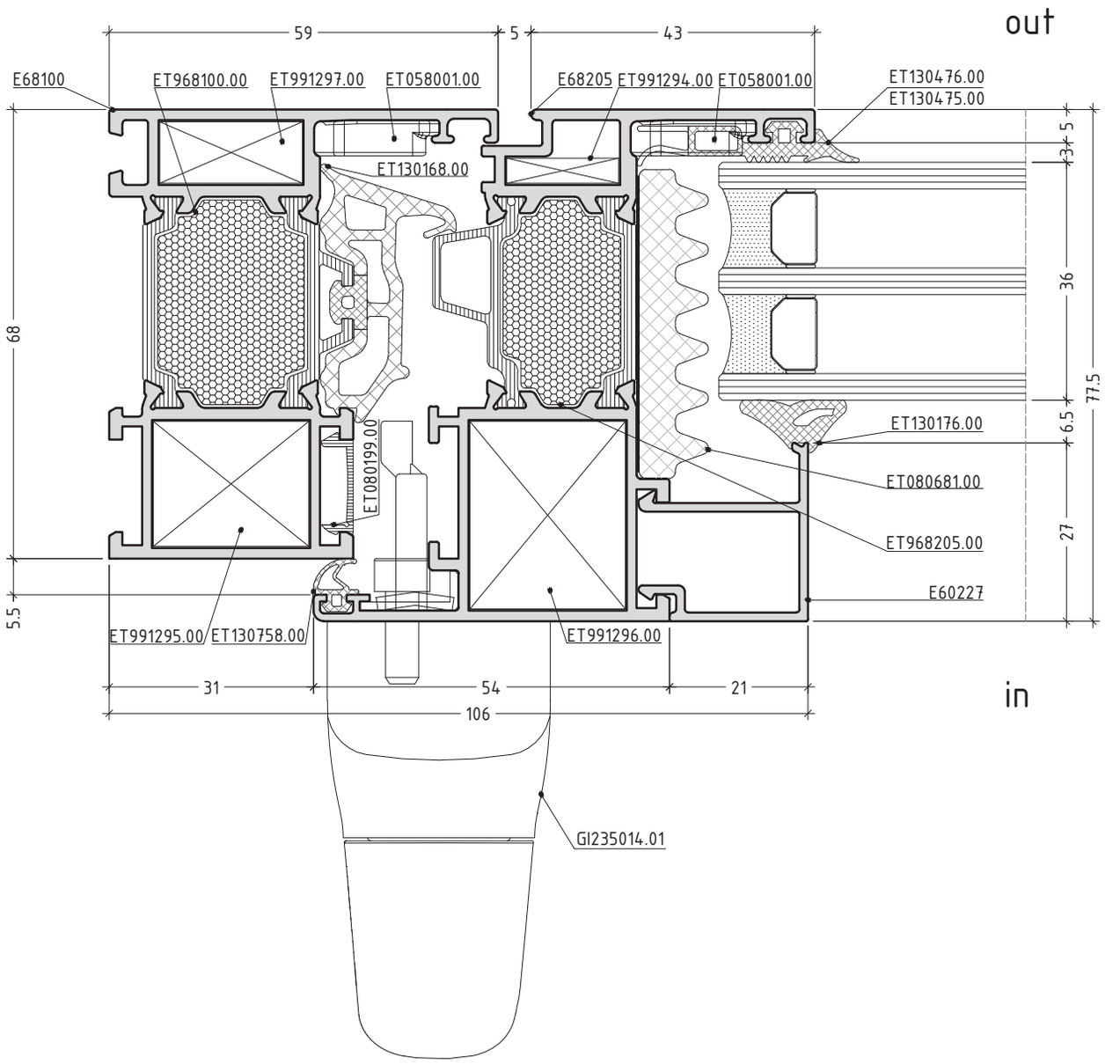
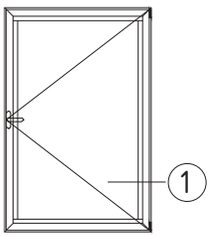


scale : 1:1

D68S-3



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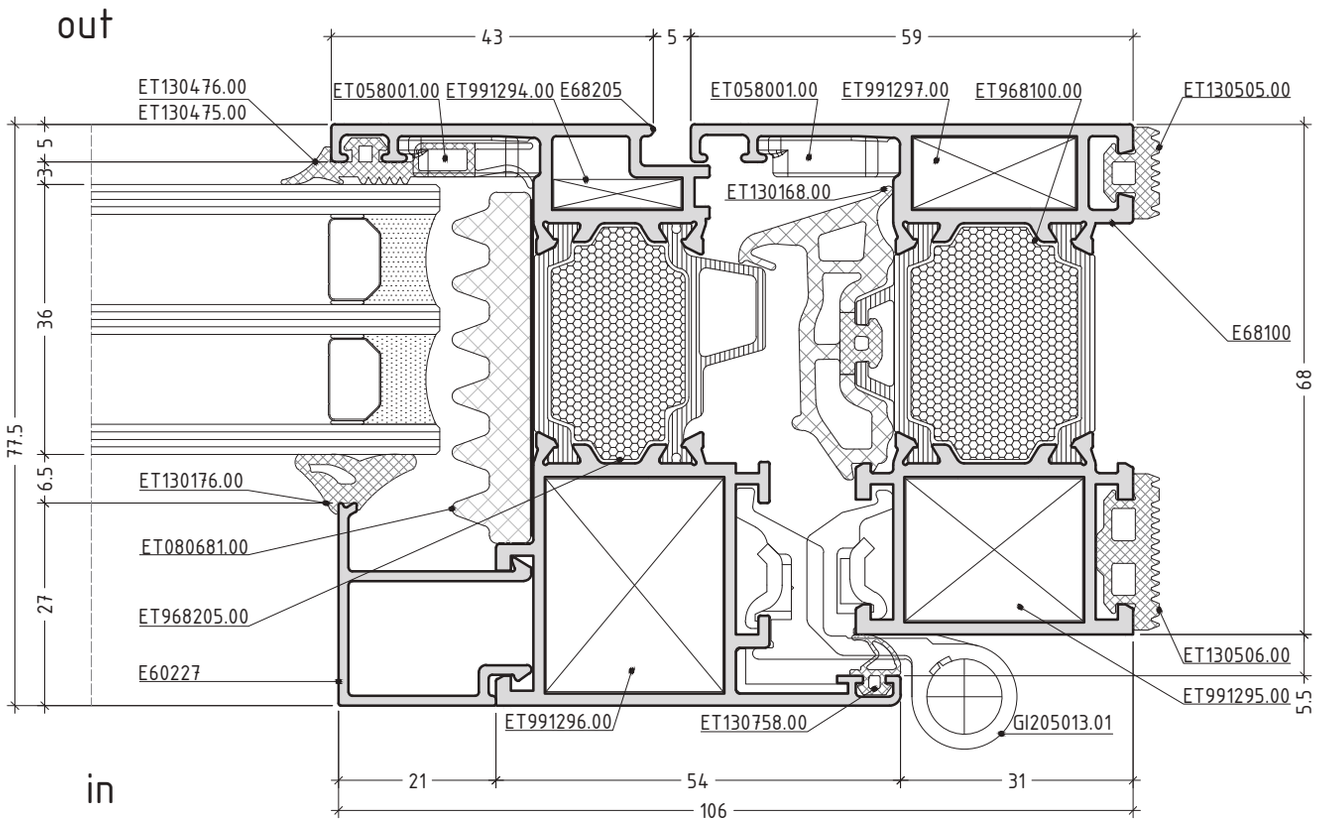
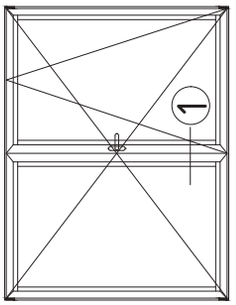
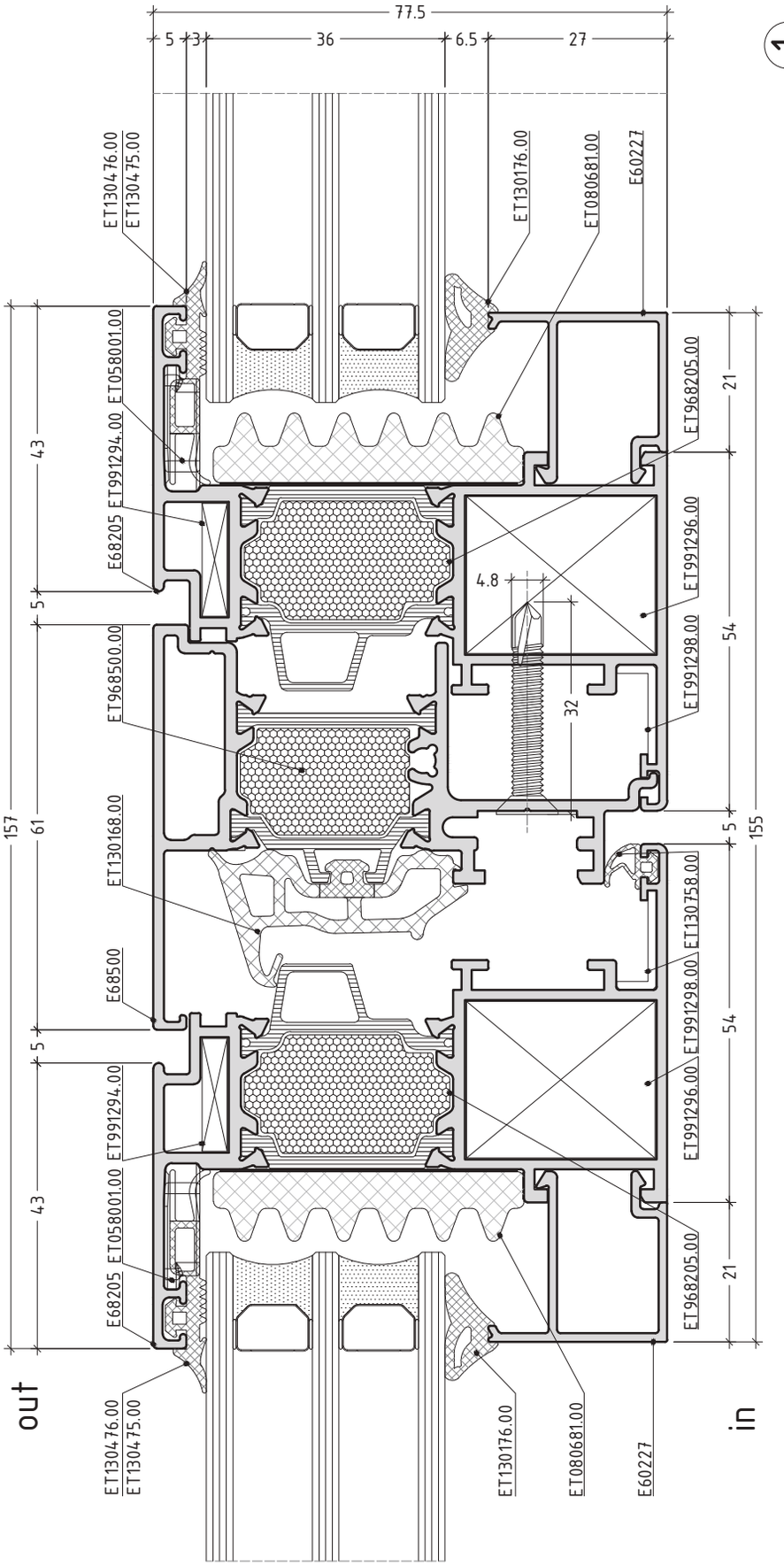


scale : 1:1

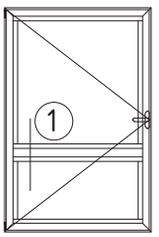
D68S-4





scale : 1:1

D68-5



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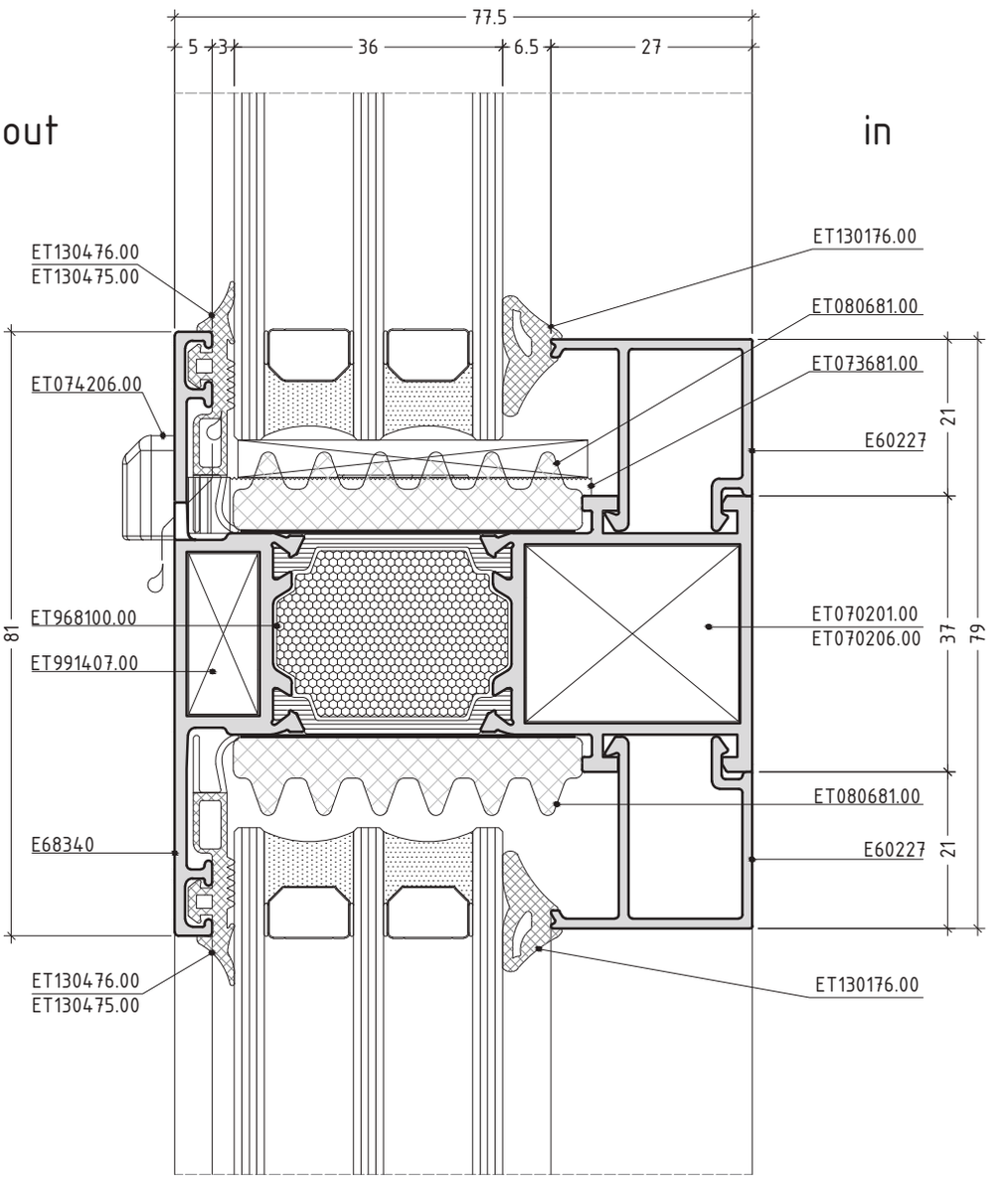
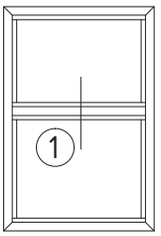
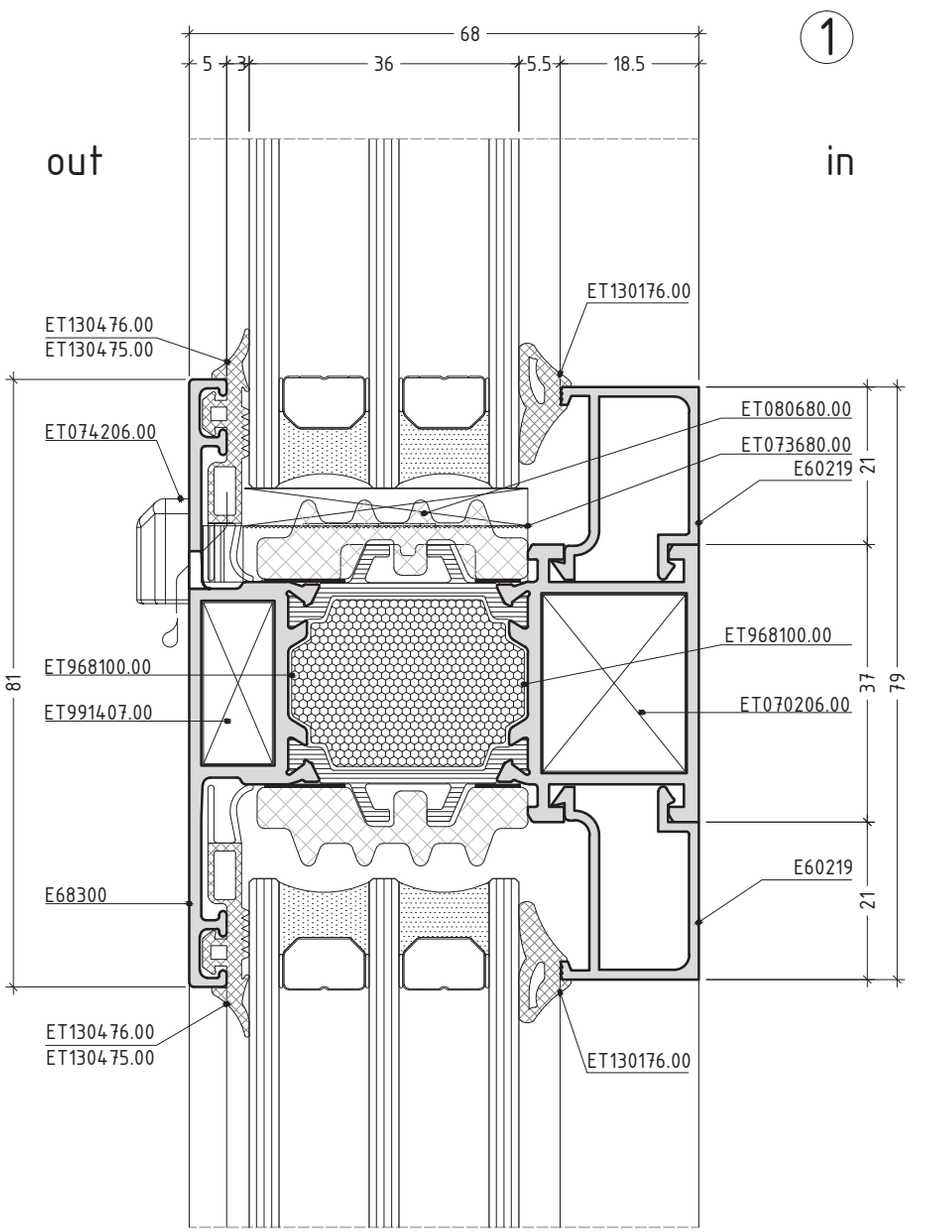


scale : 1:1

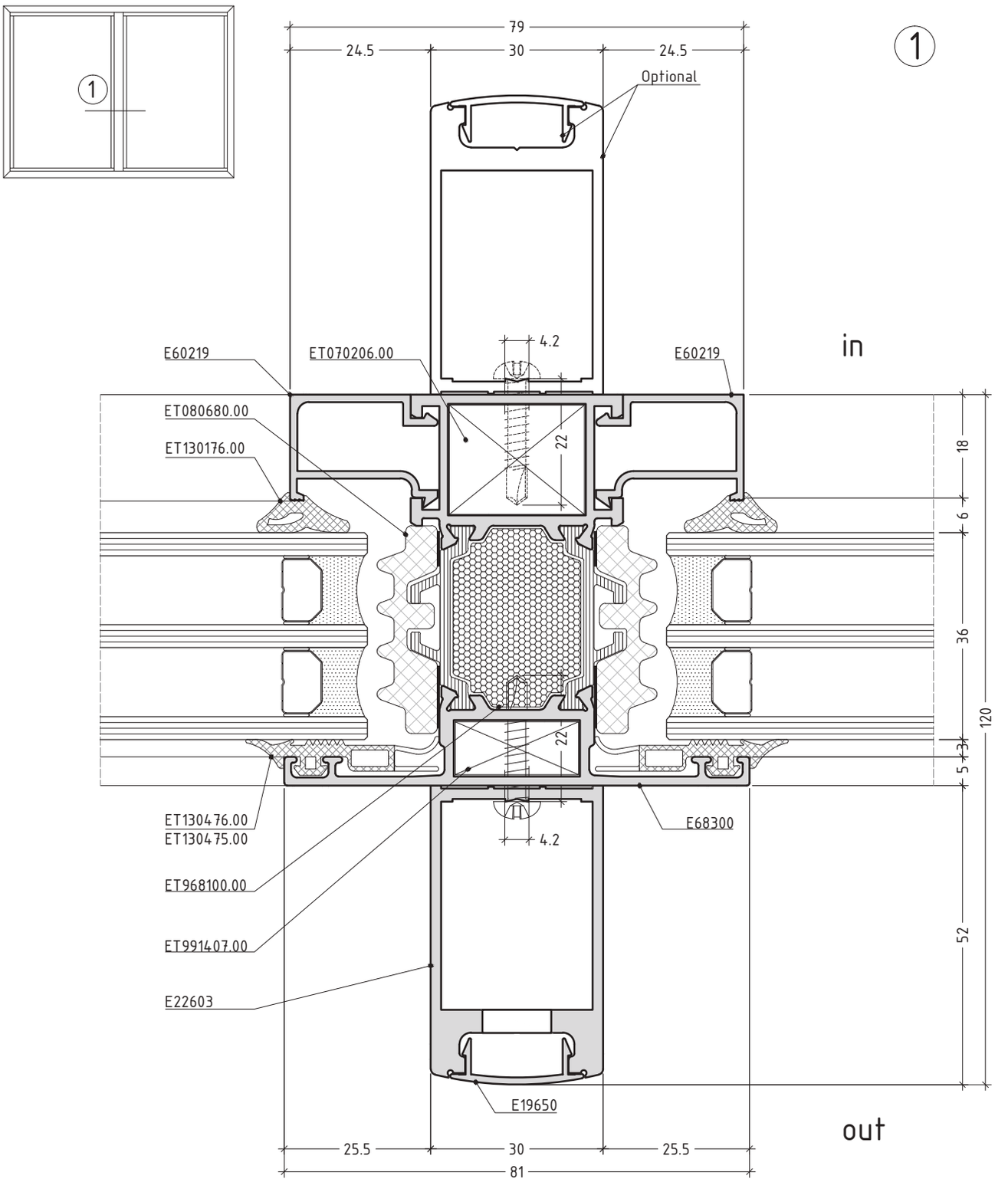
D68S-6





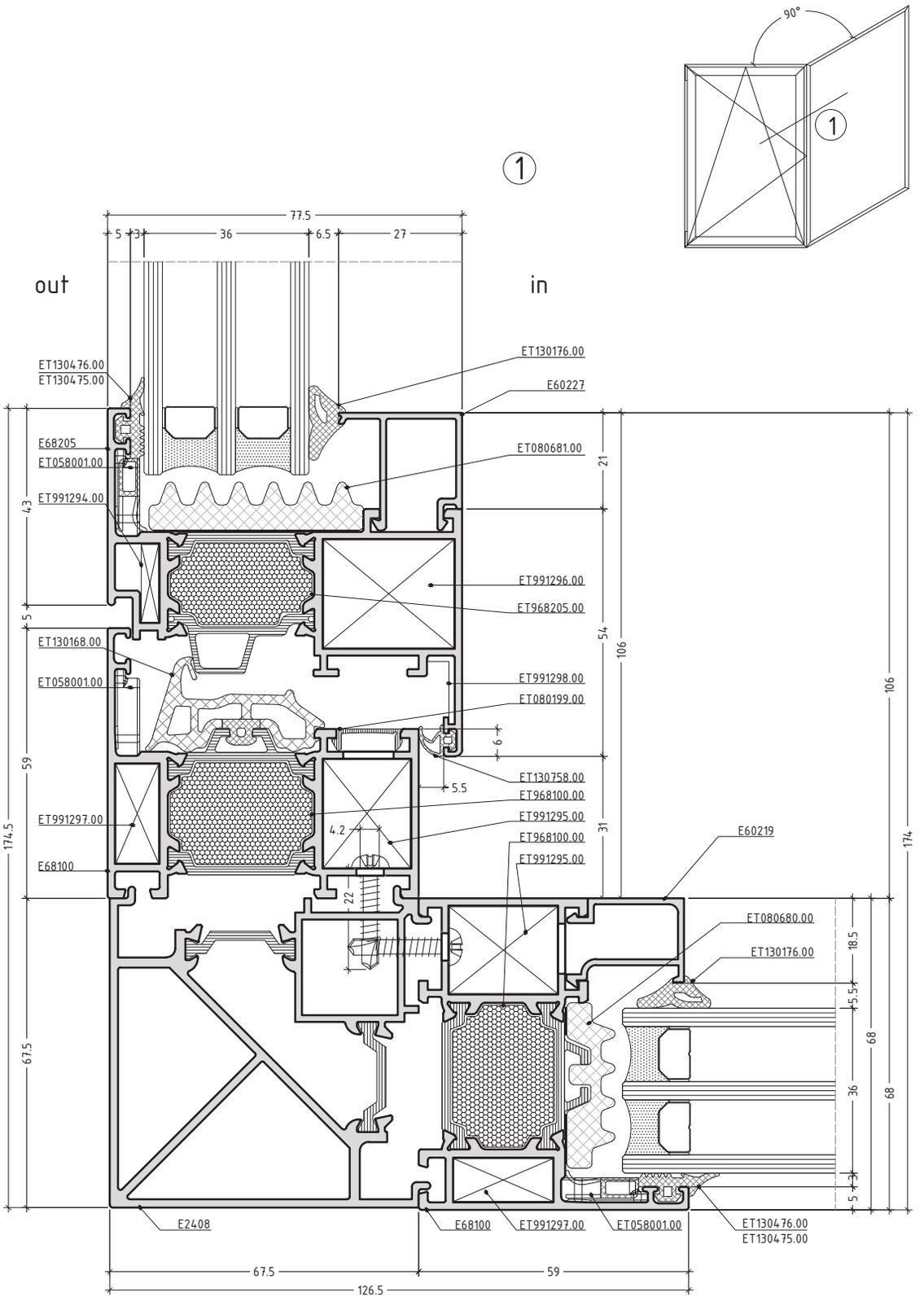
scale : 1:1

D68S-7



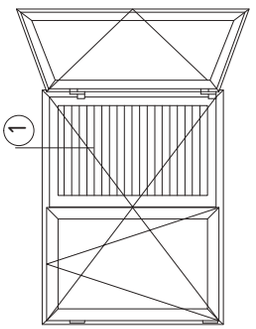
scale : 1:1

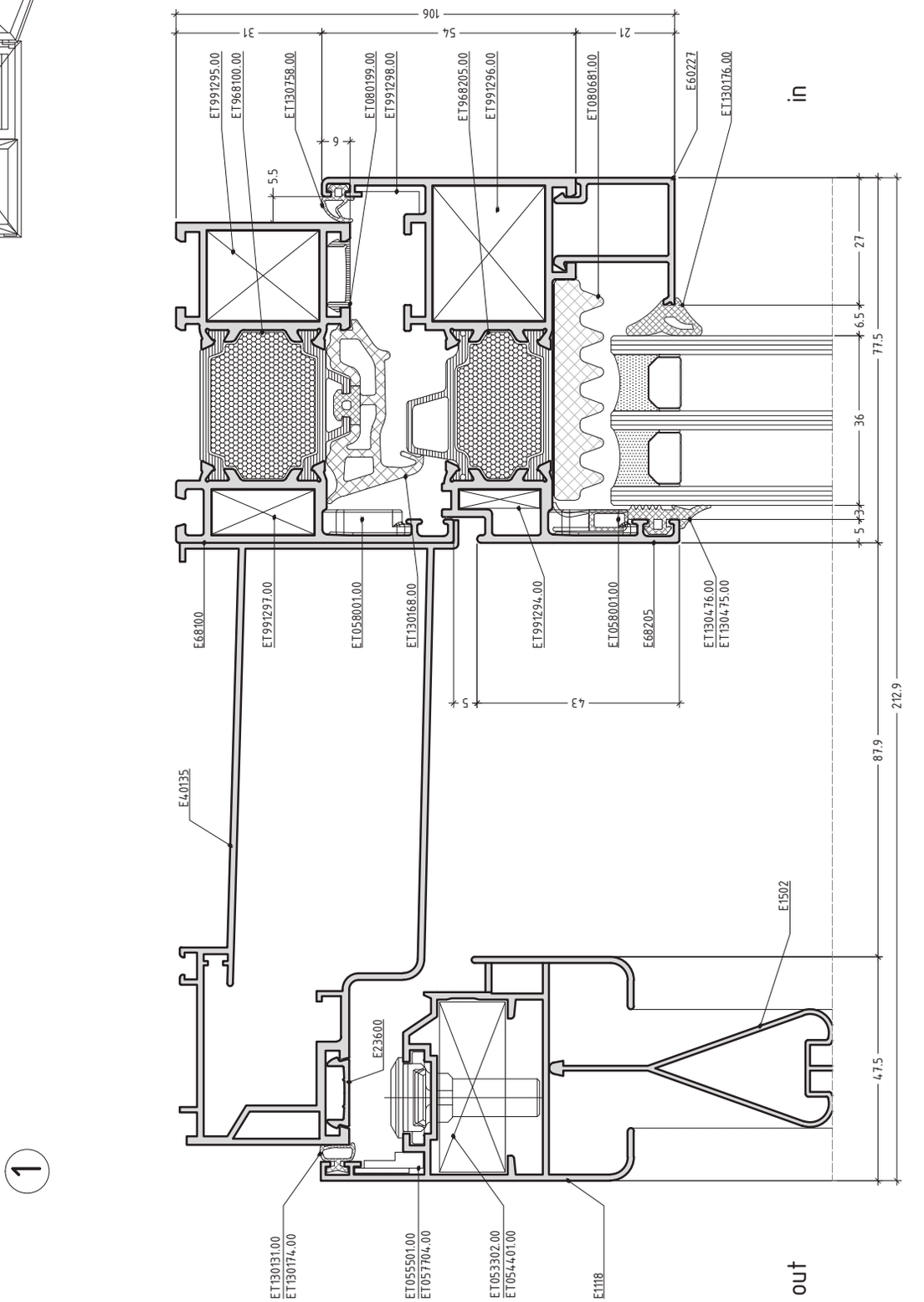
D68S-8



scale : 3/4

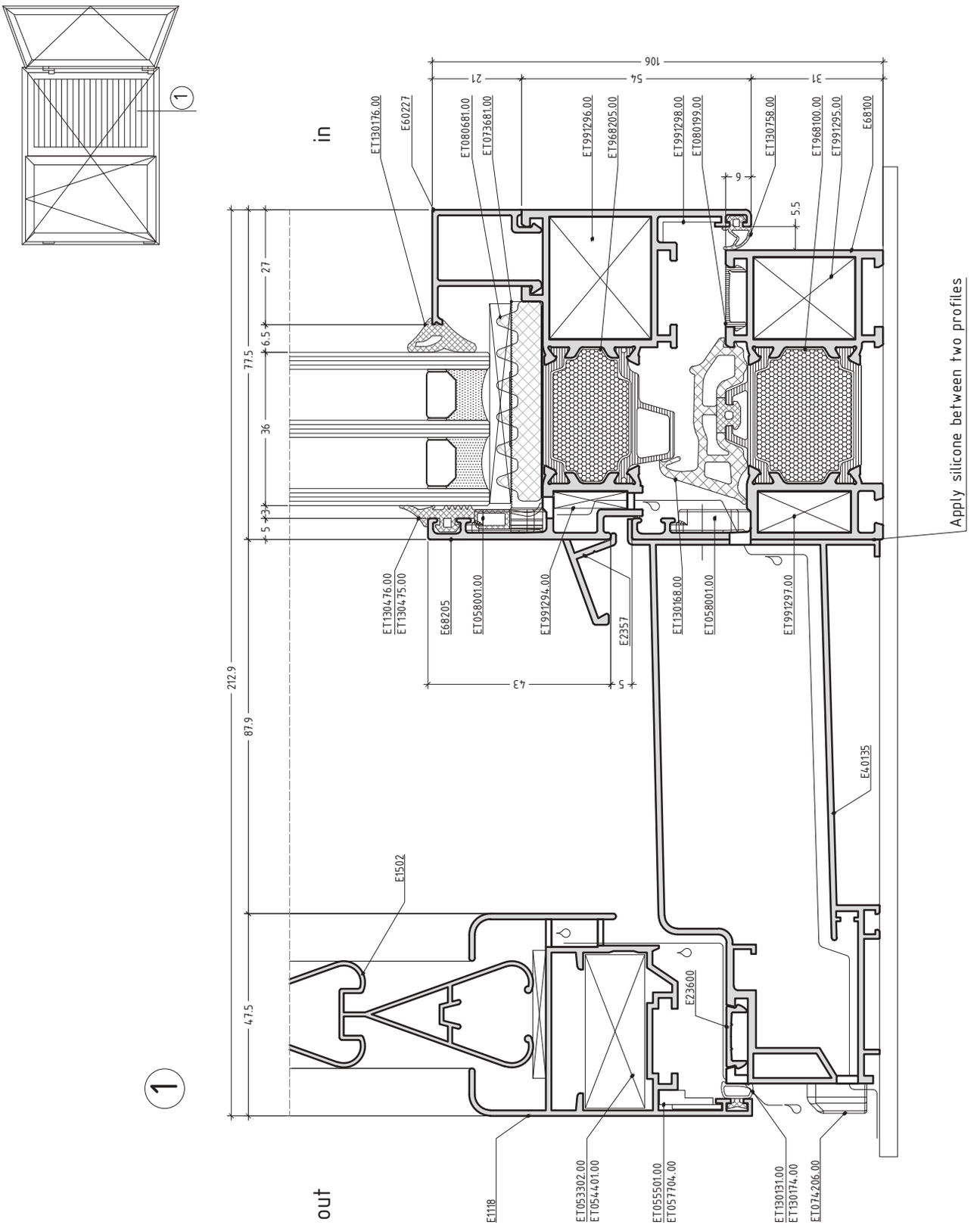
D68S_9





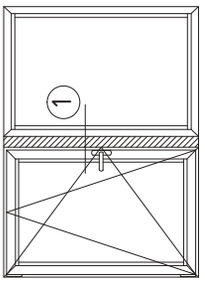
scale : 3/4

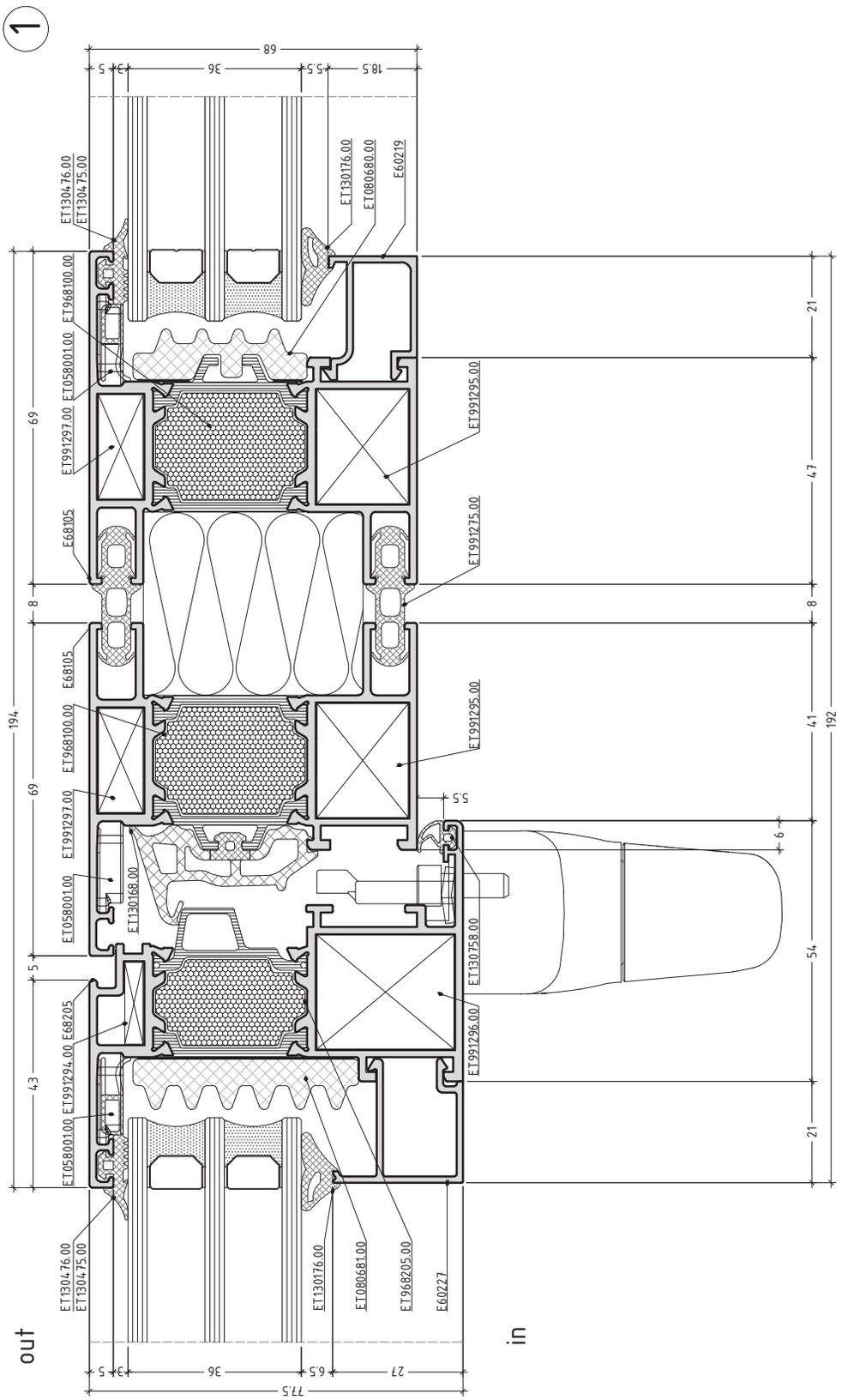
D68S-10



scale : 3/4

D68S-11





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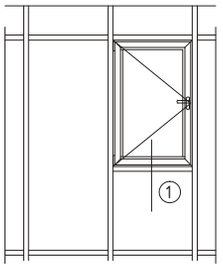
D68S-12



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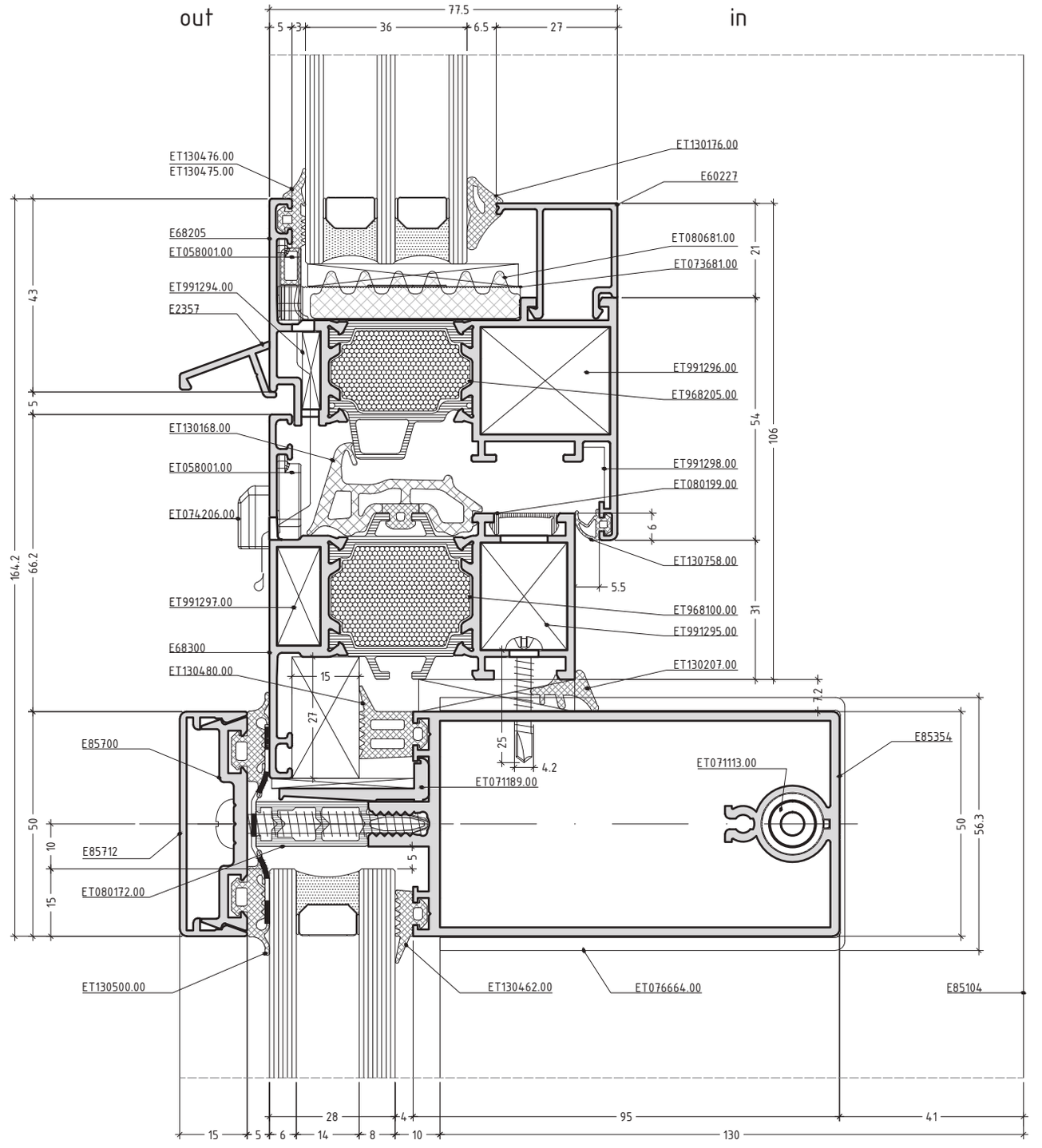
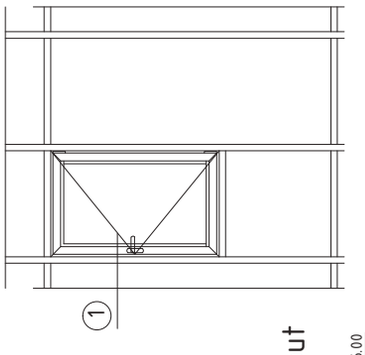
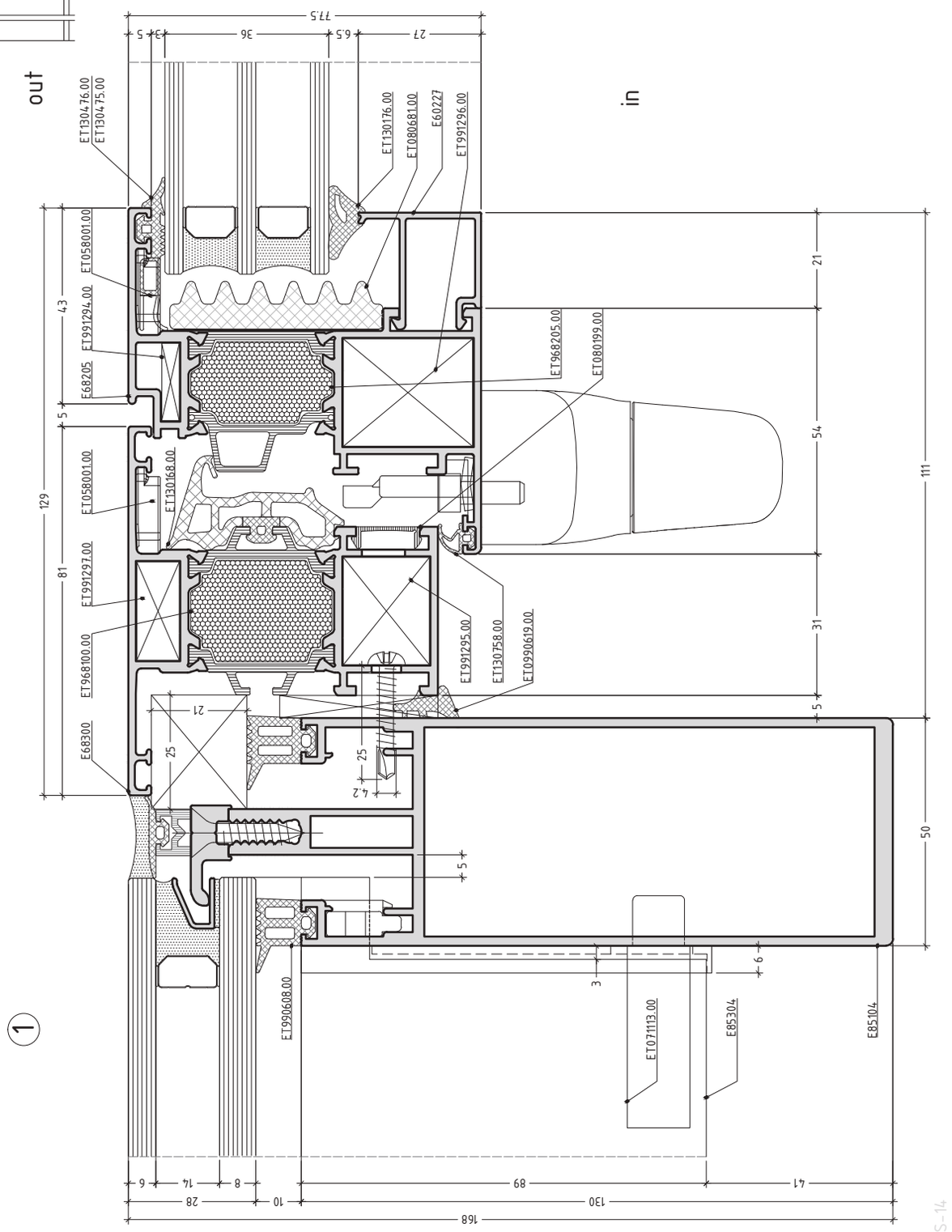


scale : 3/4

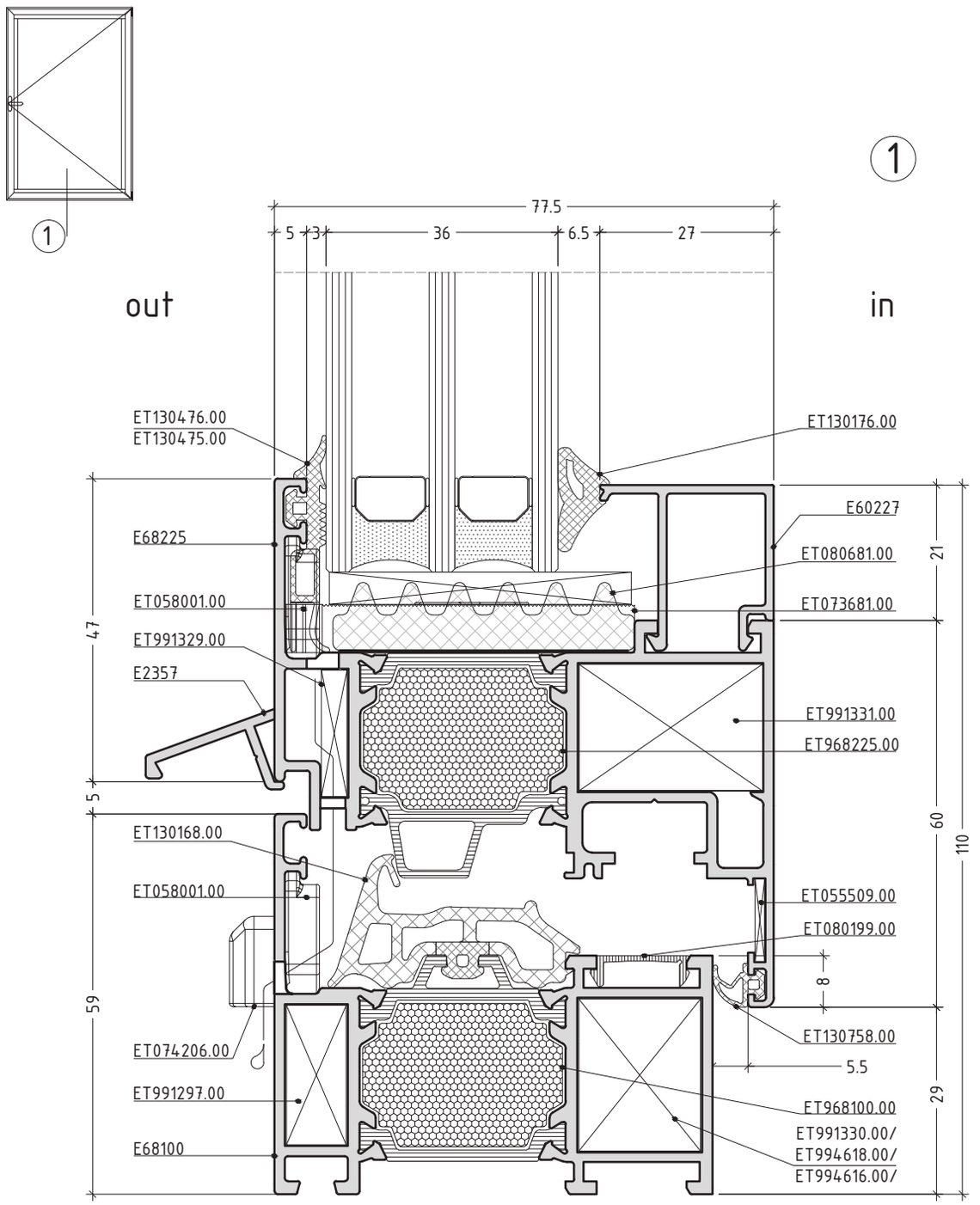
D68S-13





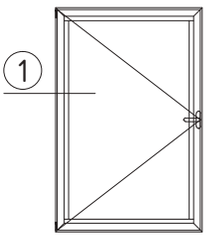
scale : 3/4

D68S-14



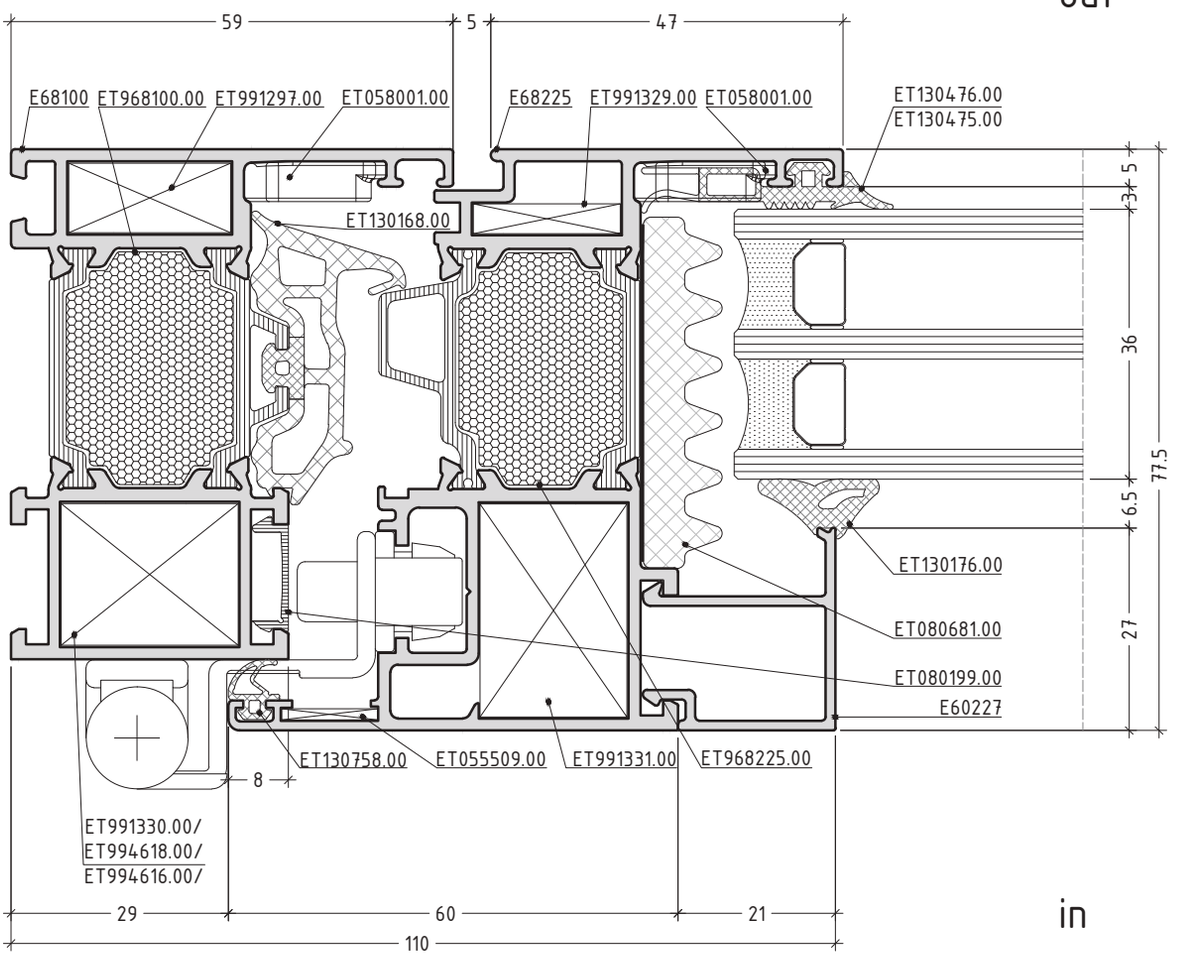
scale : 1:1

D68S-15



1

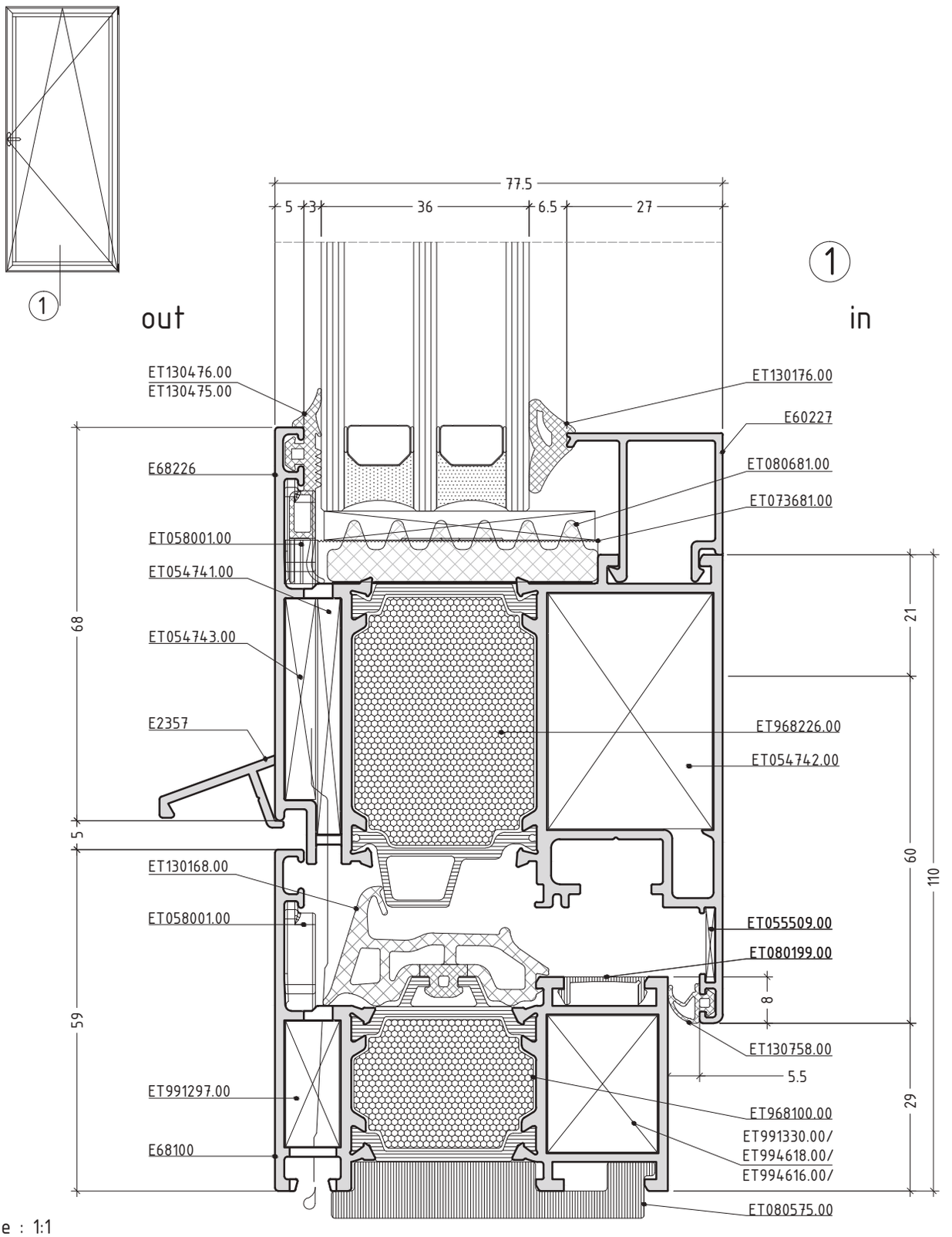
out



in

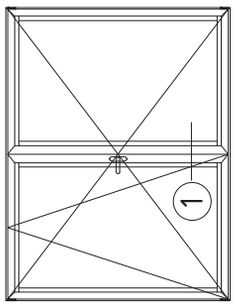
scale : 1:1

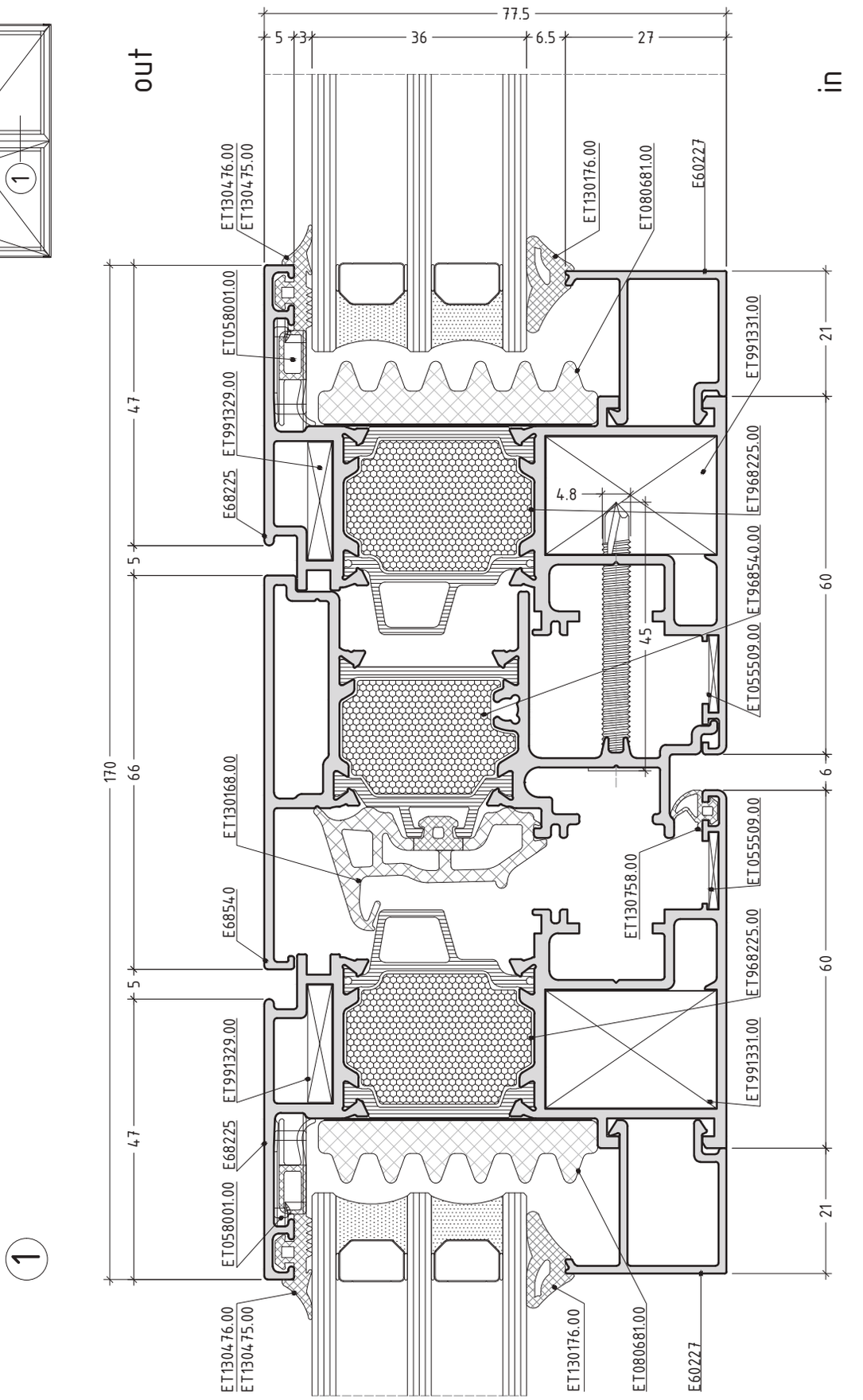
D68S-16



scale : 1:1

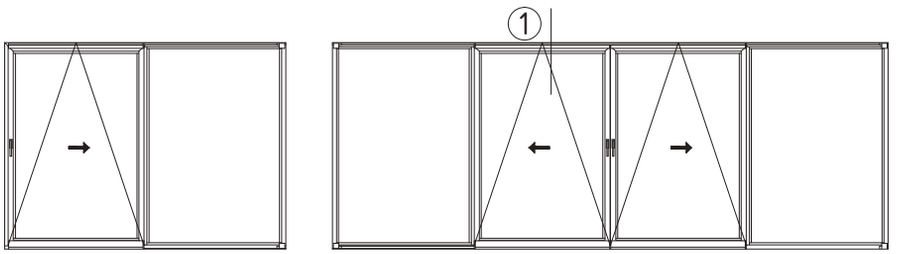
D68S-17



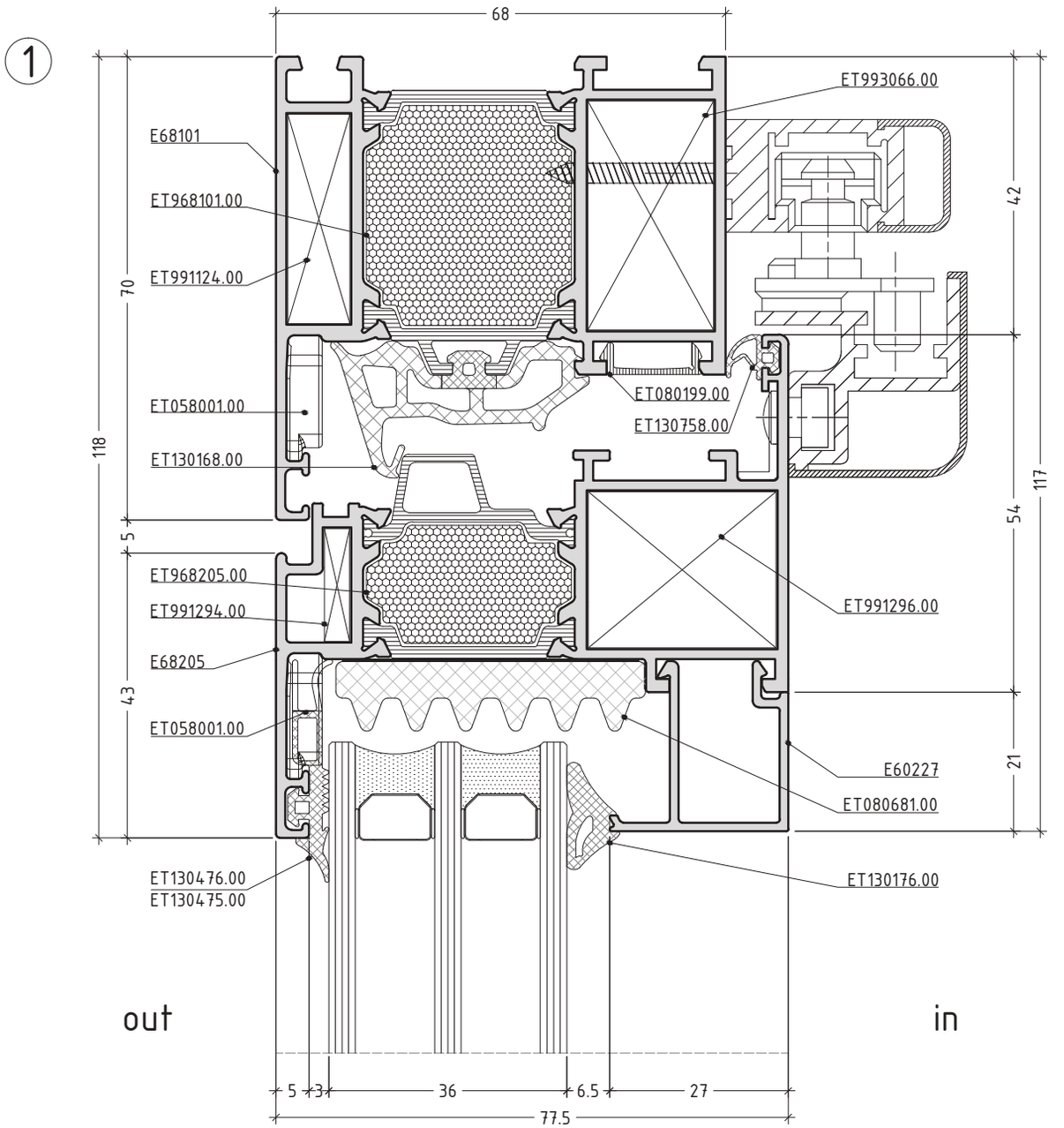


scale : 1:1

D68S-18



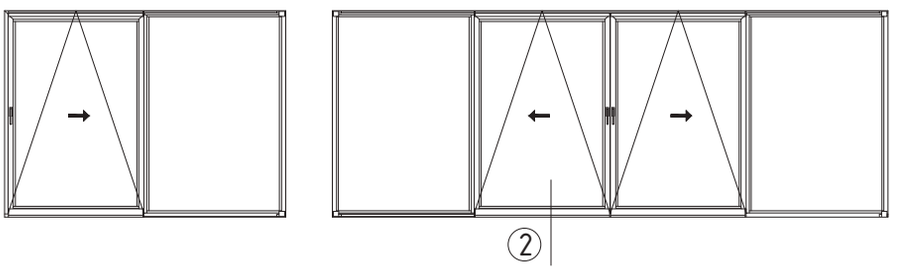
GU OZ/MZ - 150kg



scale : 1:1

D68S-19

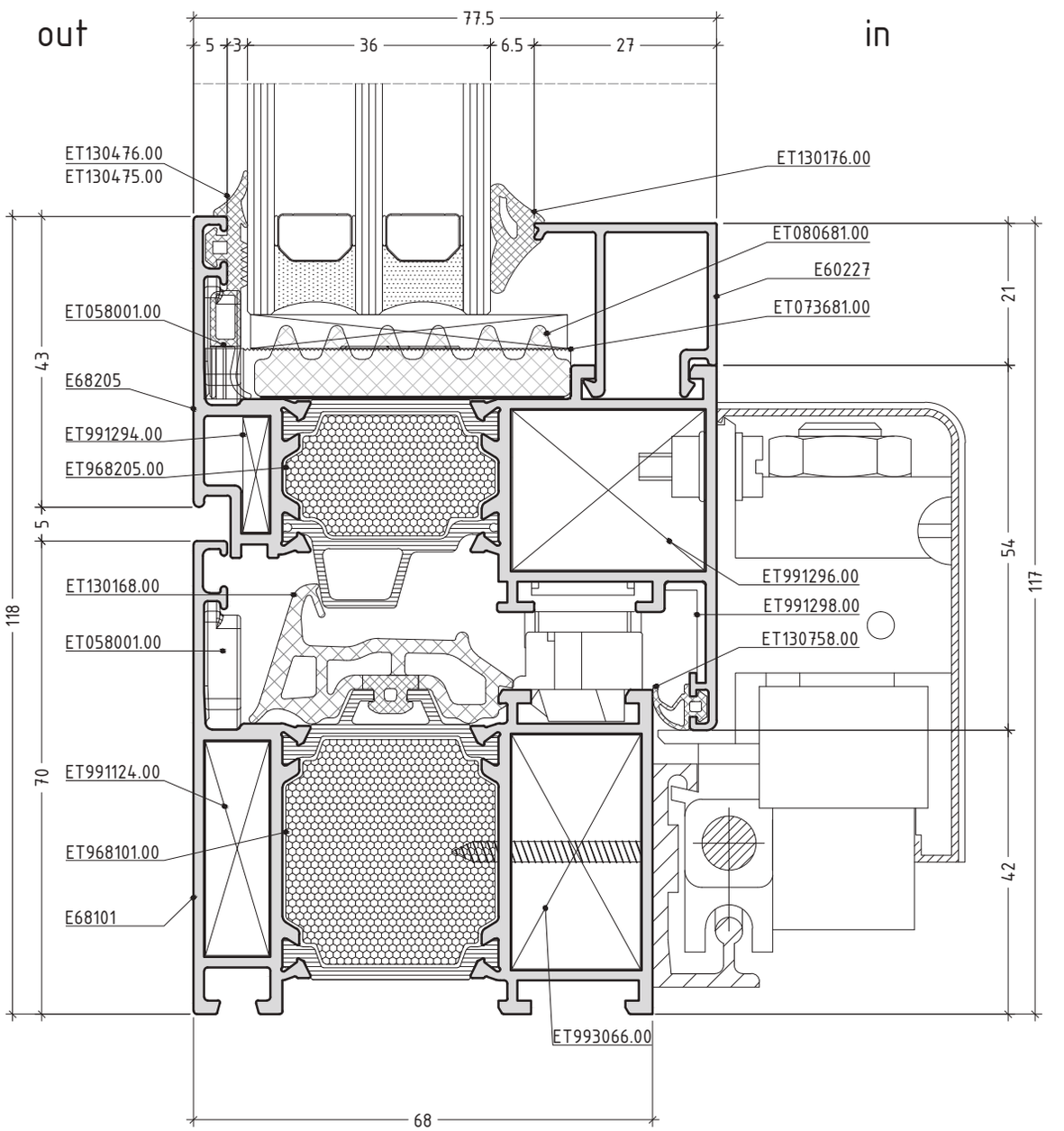
GU OZ/MZ - 150kg



2

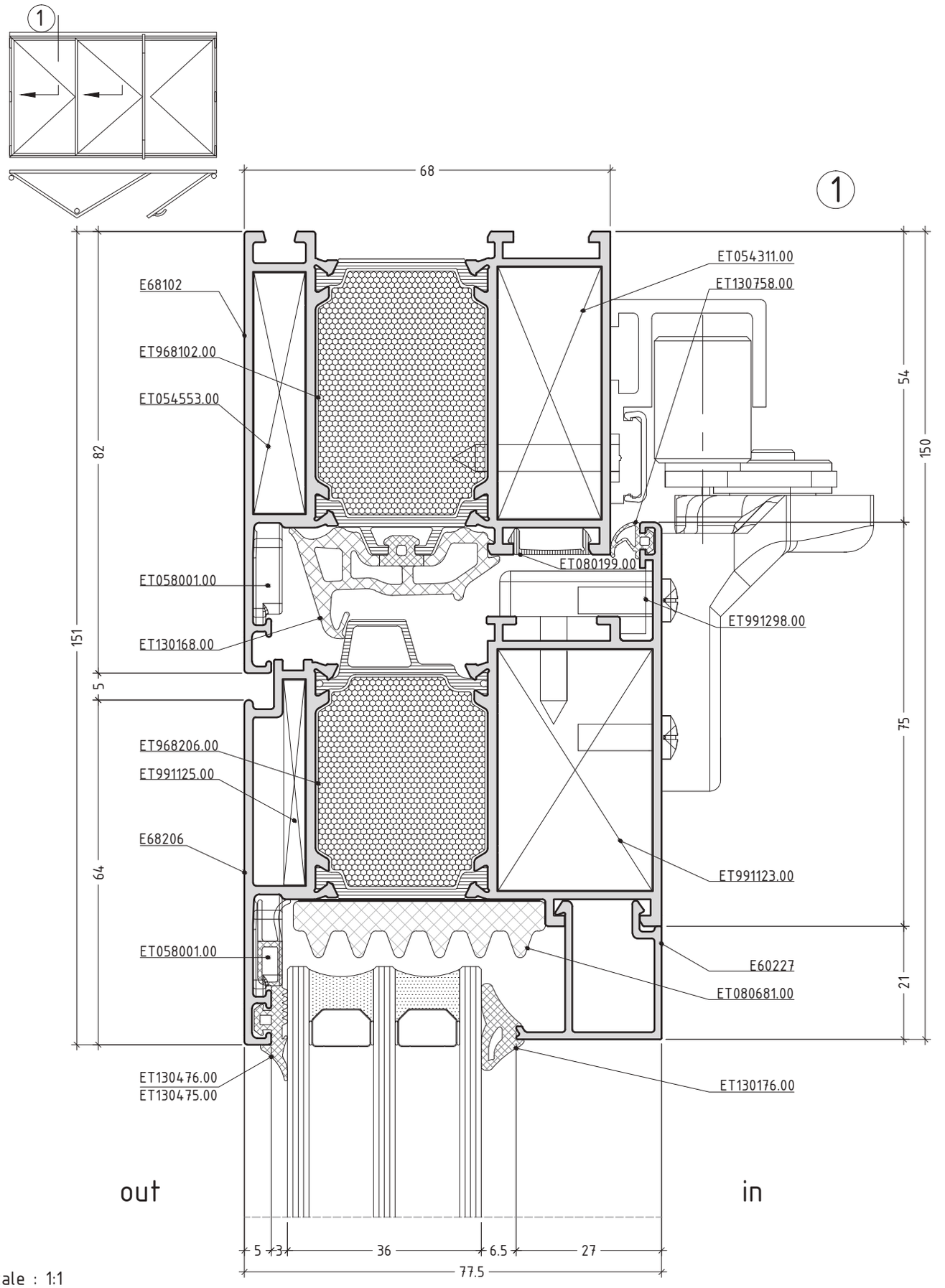
out

in



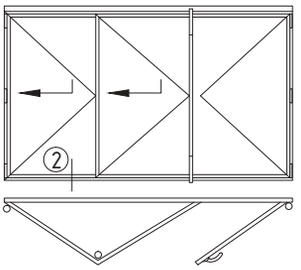
scale : 1:1

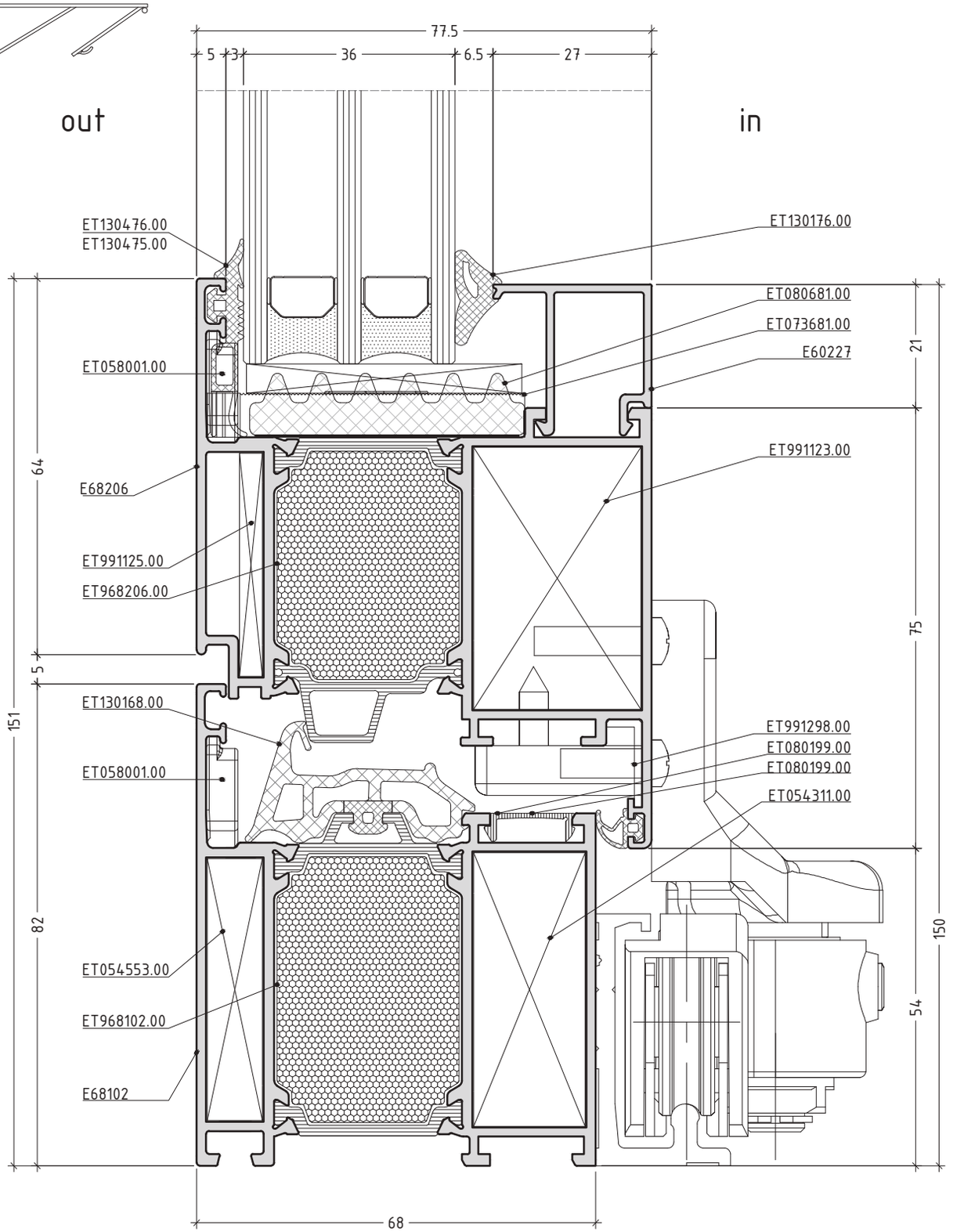
D68S-20



scale : 1:1

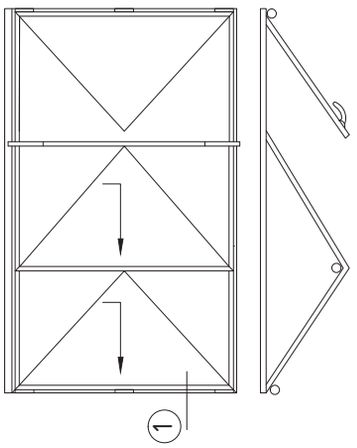
D68S-21

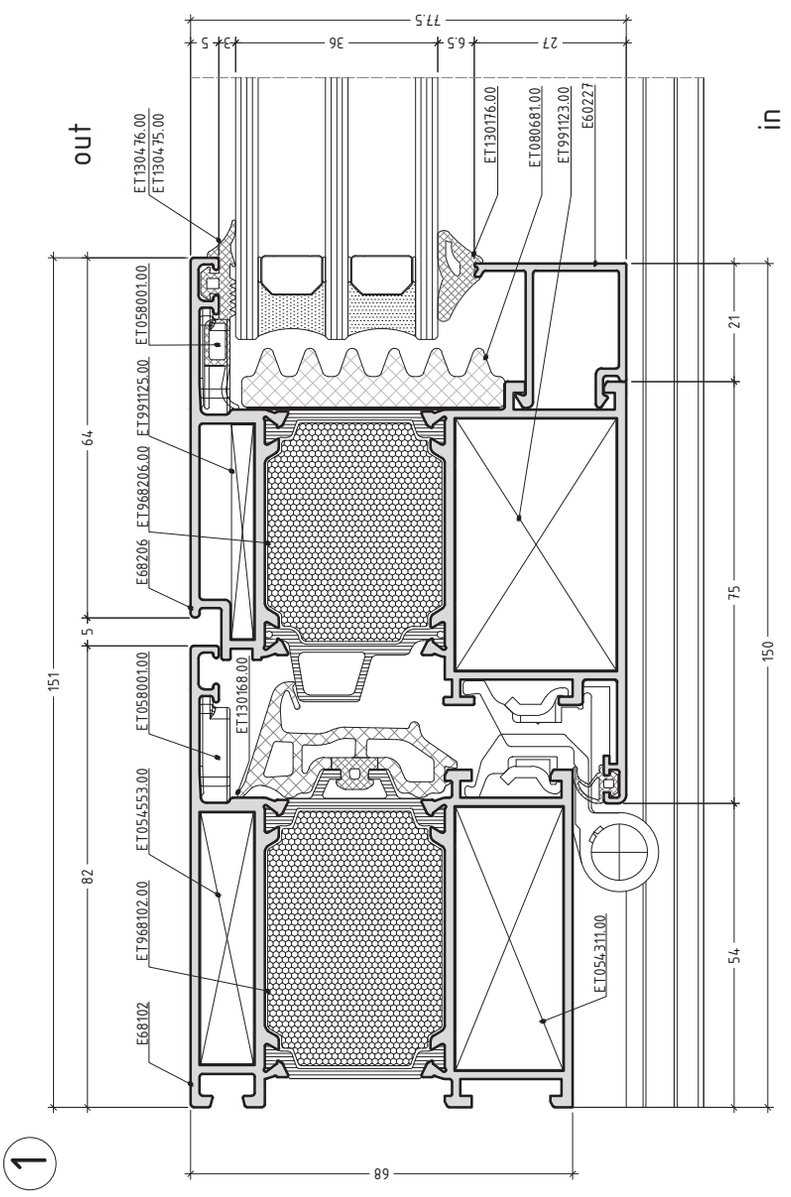




scale : 1:1

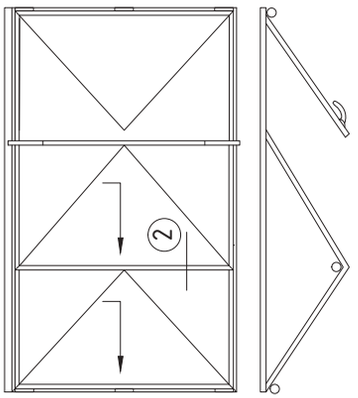
D68S-22

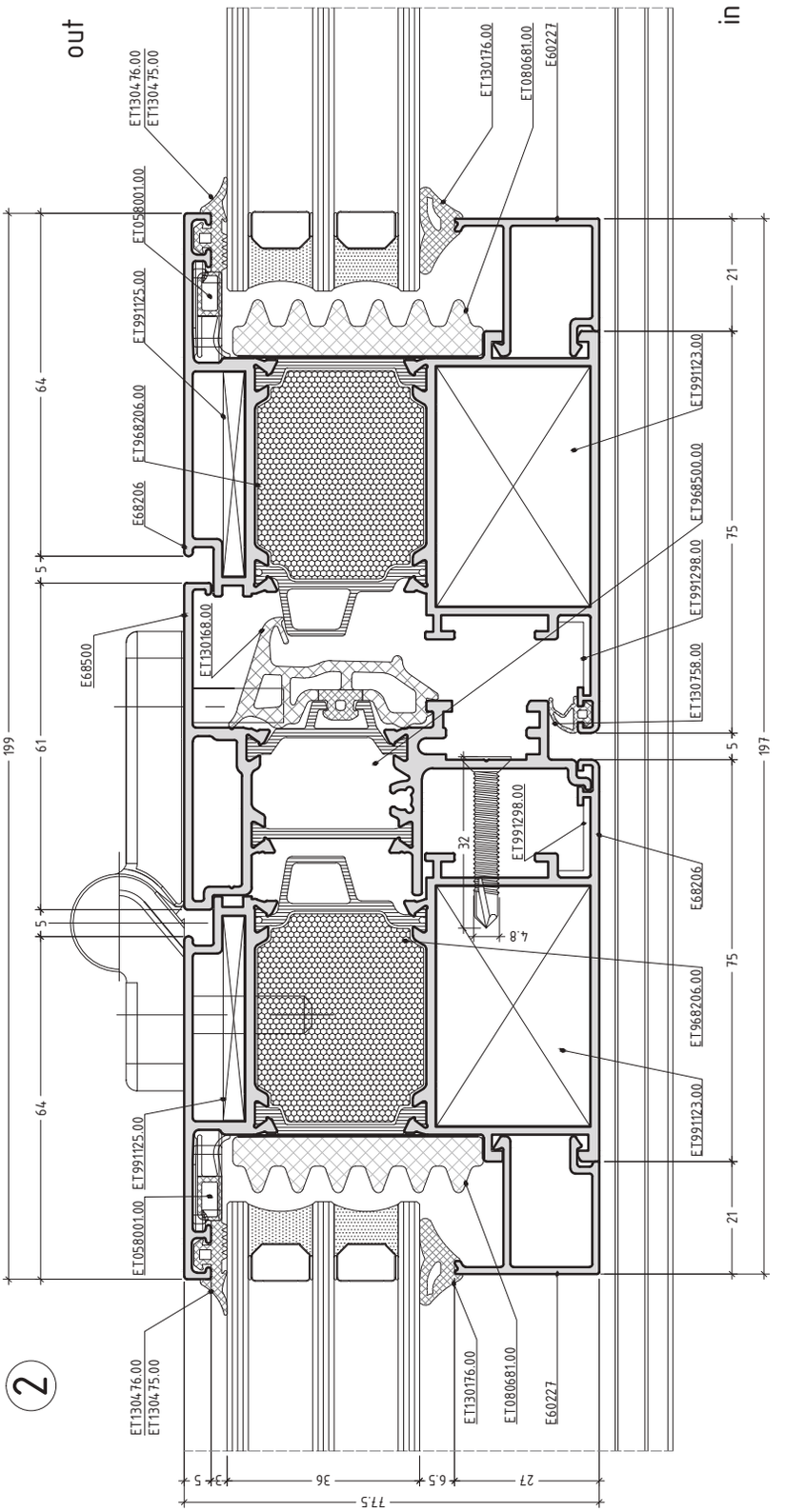




scale : 3/4

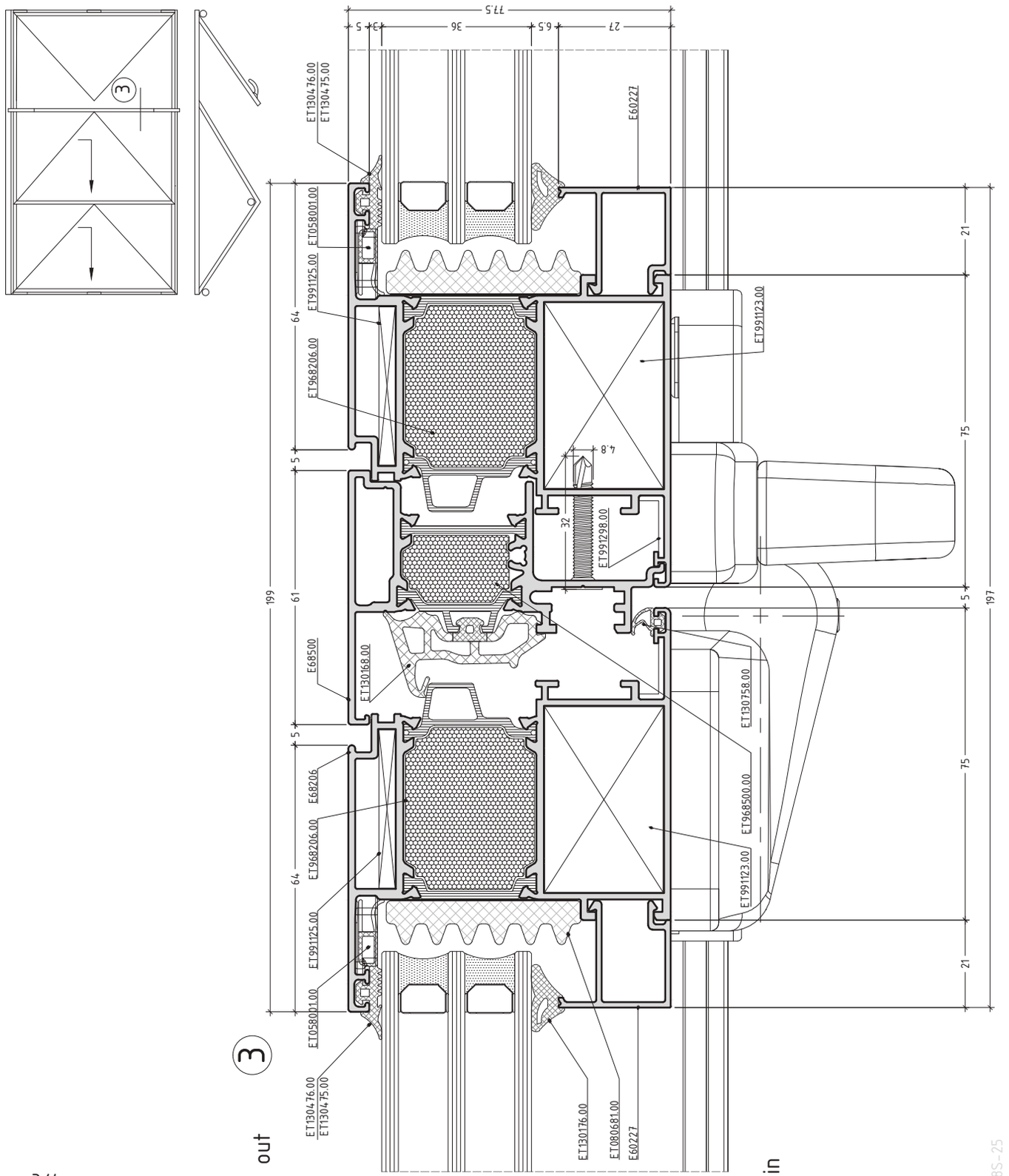
D68S-23





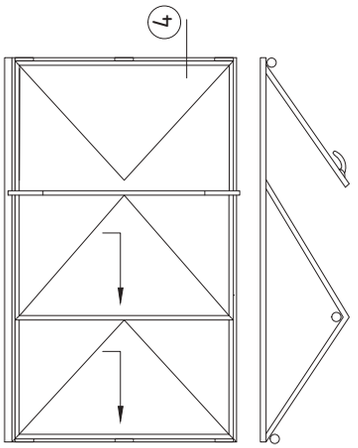
scale : 3/4

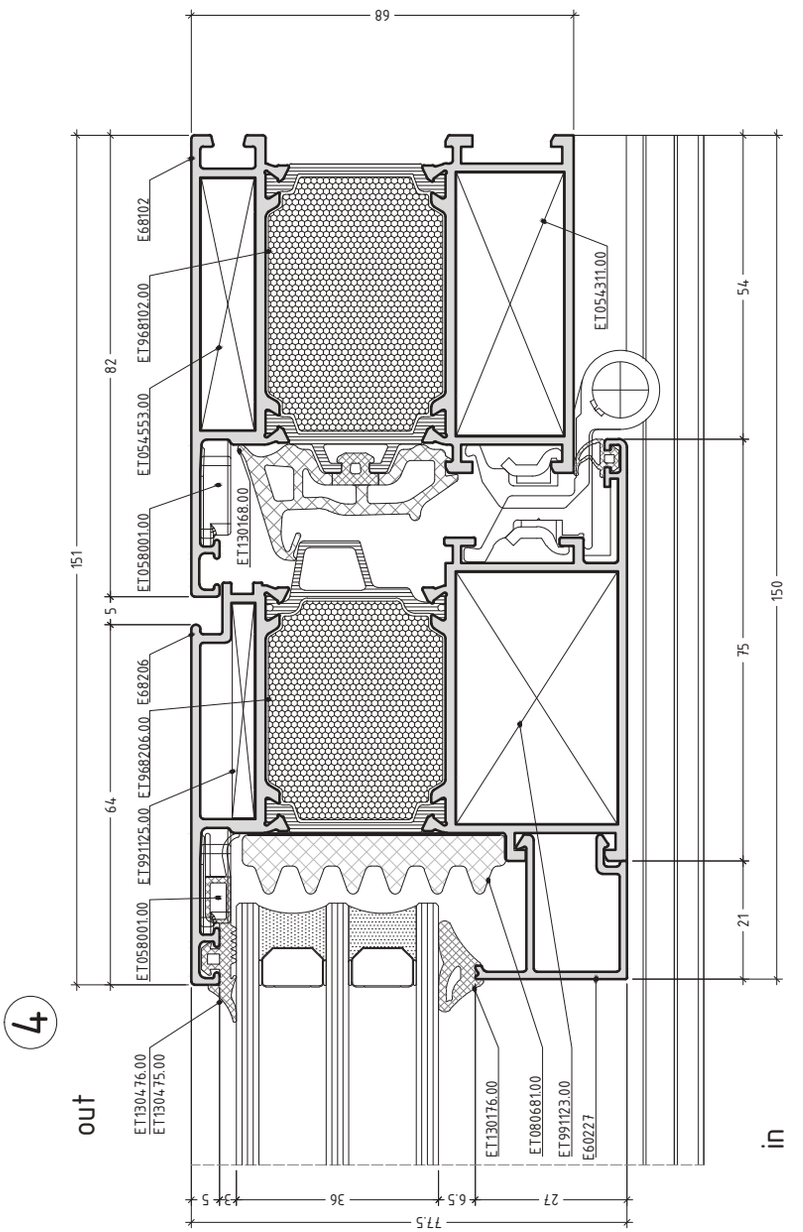
D68S-24



scale : 3/4

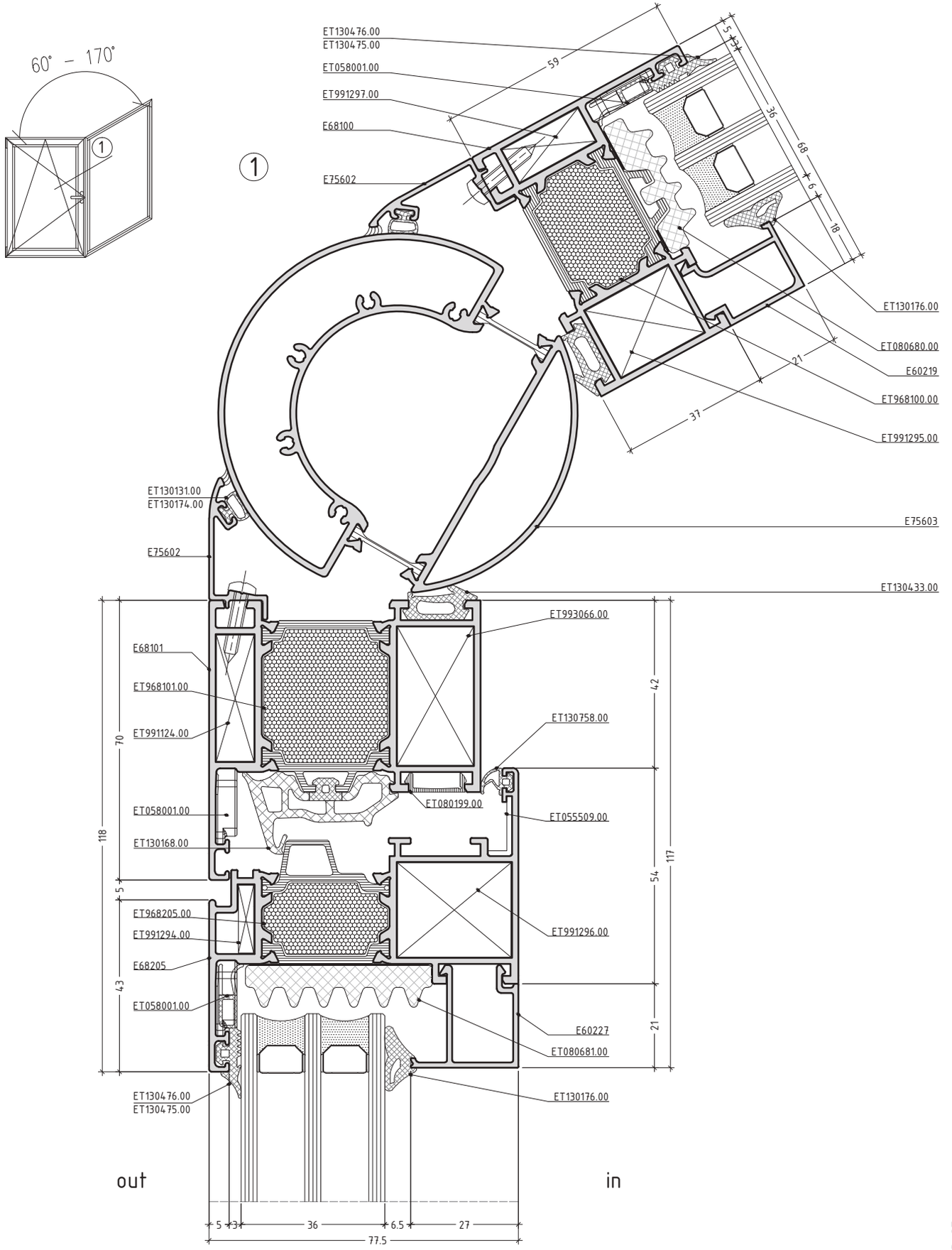
D68S-25





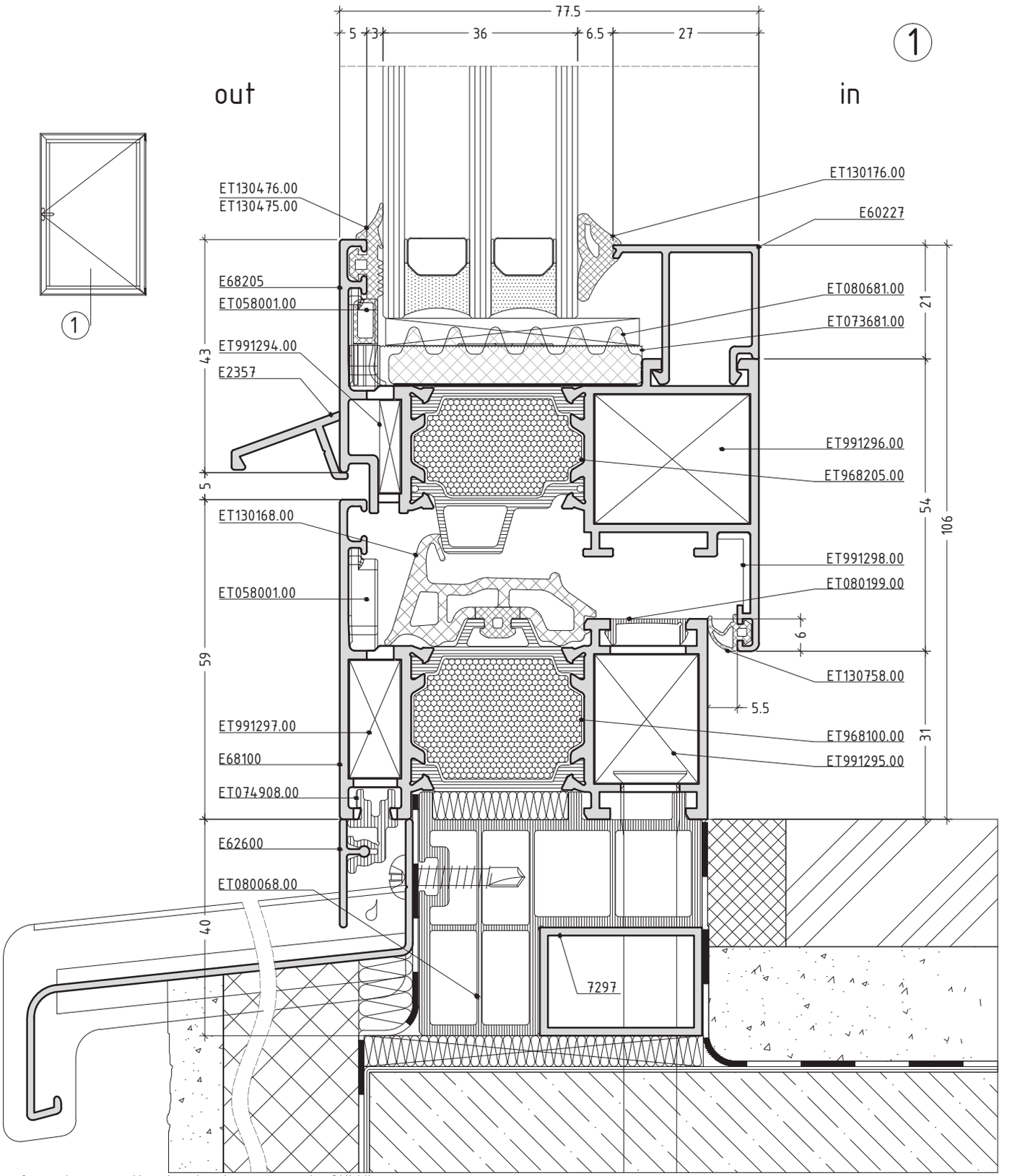
scale : 3/4

D68S-26



scale : 3/4

D68S-27

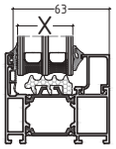


Interface shown on the drawing is an example ONLY!
Connection between backing wall and frame is specific for each single project. It is obligatory to observe different projects' features. All final decisions about materials used, interface finishing, etc. should be approved by the structural / façade engineer responsible for the specific project.

scale : 1:1

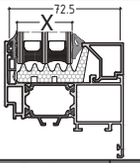
D68S-28

GLAZING OPTIONS

GLAZING OPTIONS										
external gaskets	INTERNAL GASKETS					GLAZING BEADS				
3 mm 130476	5 - 6 mm 130176		7 - 8 mm 130177							
	5 mm 130205	6 mm 130206	7 mm 130207	8 mm 130208	10 mm 130210					
	X mm					E601xx	E602xx	E604xx	E605xx	E607xx
130476	48	47	46	45	43	E60107 old code E1114	E60207 old code E1144			
130476	45	44	43	42	40	E60110		E60410 old code E1160	E60510 old code E1130	
130476	43	42	41	40	38	E60112 old code E5317	E60212			E60712
130476	41	40	39	38	36		E60215			
130476	38	37	36	35	33	E60117 old code E5311				
130476	36	35	34	33	31	E60119 old code E5314	E60219 old code E5304	E60419 old code E5394		
130476	33	32	31	30	28	E60122 old code E5312	E60222 old code E1113	E60422		E60722
130476	30	29	28	27	25		E60225 old code E5307	E60425 old code E5308		E60725 old code E5348
130476	28	27	26	25	23	E60127 old code E5325	E60227			
130476	25	24	23	22	20		E60230	E60430		
130476	23	22	21	20	18	E60132				
130476	20	19	18	17	15		E60235	E60435		
130476	18	17	16	15	13	E60137	E60237			
130476	13	12	11	10	8		E60242 old code E75701			
130476	8	7	6	-	-		E60247 old code E75700			

Note:
Tolerance in dimension chain ±0.5mm

T68-1

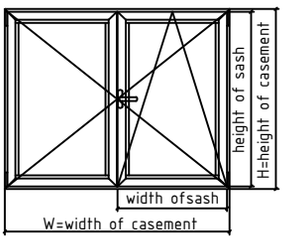
GLAZING OPTIONS										
external gaskets	INTERNAL GASKETS					GLAZING BEADS				
3 mm 130476 	 5 - 6 mm 130176		 7 - 8 mm 130177							
	5 mm 130205 	6 mm 130206 	7 mm 130207 	8 mm 130208 	10 mm 130210 					
	X mm					E601xx	E602xx	E604xx	E605xx	E607xx
130476	50	49	48	47	45		E60215 14.5			
130476	47	46	45	44	42	E60117 old code E5311 17				
130476	46	45	44	43	41	E60119 old code E5314 18.5	E60219 old code E5304 18.5	E60419 old code E5394 18.5		
130476	42	41	40	39	37	E60122 old code E5312 22	E60222 old code E1113 22	E60422 22		E60722 22
130476	39	38	37	36	34		E60225 old code E5307 25	E60425 old code E5308 25		E60725 old code E5348 25
130476	37	36	35	34	32	E60127 old code E5325 27	E60227 27			
130476	35	34	33	32	30		E60230 29.5	E60430 29.5		
130476	32	31	30	29	27	E60132 32				
130476	30	29	28	27	25		E60235 34.5	E60435 34.5		
130476	27	26	25	24	22	E60137 37	E60237 37			
130476	23	22	21	20	18		E60242 old code E75701 41.5			
130476	17	16	15	14	12		E60247 old code E75700 47			

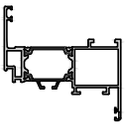
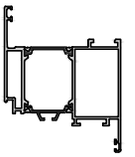
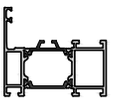
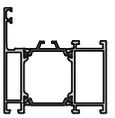
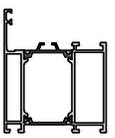
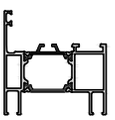
Note:
Tolerance in dimension chain ±0.5mm

T68-2

CUTTING LISTS

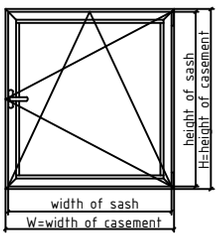
calculation of cutting length for two leaf window



frame profile selection		sash profile selection	E68200/E68205 	E68201/E68206 
E68100 	width of sash		$\frac{W - 68}{2}$	$\frac{W - 68}{2}$
	height of sash		H - 63	H - 63
	height of secondary sash profile		H - 135	H - 135
E68101 	width of sash		$\frac{W - 90}{2}$	$\frac{W - 90}{2}$
	height of sash		H - 85	H - 85
	height of secondary sash profile		H - 157	H - 157
E68102 	width of sash		$\frac{W - 114}{2}$	$\frac{W - 114}{2}$
	height of sash		H - 109	H - 109
	height of secondary sash profile		H - 181	H - 181
E68105 	width of sash		$\frac{W - 88}{2}$	$\frac{W - 88}{2}$
	height of sash		H - 83	H - 83
	height of secondary sash profile		H - 155	H - 155

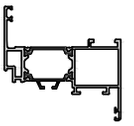
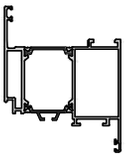
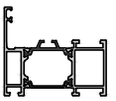
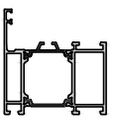
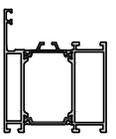
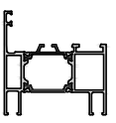
T68-1

calculation of cutting length for one leaf window



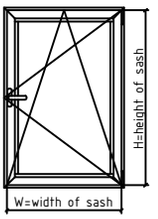
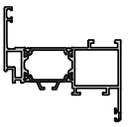
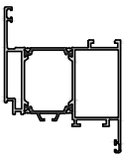
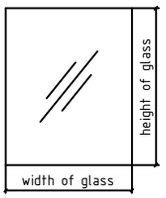
sash profile selection

frame profile selection

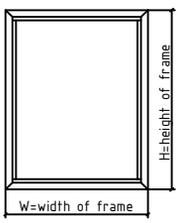
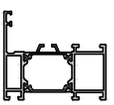
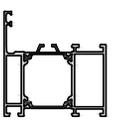
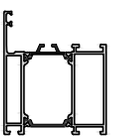
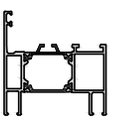
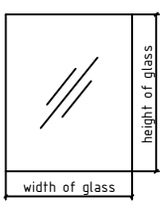
		E68200/E68205 	E68201/E68206 
E68100 	width of sash	W - 63	W - 63
	height of sash	H - 63	H - 63
E68101 	width of sash	W - 85	W - 85
	height of sash	H - 85	H - 85
E68102 	width of sash	W - 109	W - 109
	height of sash	H - 109	H - 109
E68105 	width of sash	W - 83	W - 83
	height of sash	H - 83	H - 83

T68-2

calculation of cutting length for glass unit

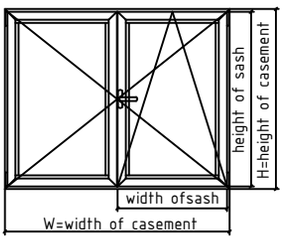
 dimension of glass unit		sash profile E68200/E68205 	sash profile E68201/E68206 
	width of glass unit	W - 123	W - 165
	height of glass unit	H - 123	H - 165

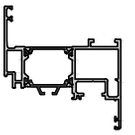
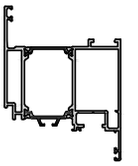
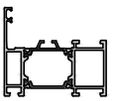
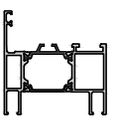
calculation of cutting length for glass unit

 dimension of glass unit		frame profile E68100 	frame profile E68101 	frame profile E68102 	frame profile E68105 
	width of glass unit	W - 88	W - 110	W - 134	W - 109
	height of glass unit	H - 88	H - 110	H - 134	H - 88

T68-3

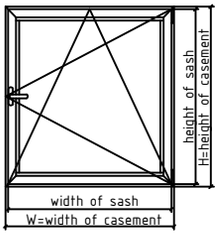
calculation of cutting length for double leaf window

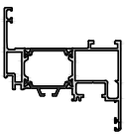
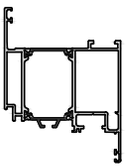
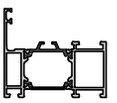
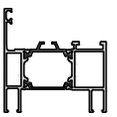


frame profile selection		sash profile selection: E68220/E68225 	E68221/E68226 
E68100 	width of sash	$\frac{W - 64}{2}$	$\frac{W - 64}{2}$
	height of sash	H - 58	H - 58
	height of secondary sash profile	H - 134	H - 134
E68105 	width of sash	$\frac{W - 83}{2}$	$\frac{W - 83}{2}$
	height of sash	H - 78	H - 78
	height of secondary sash profile	H - 154	H - 154

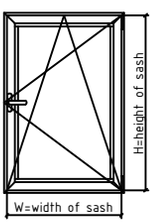
T68-4

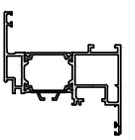
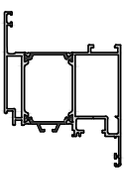
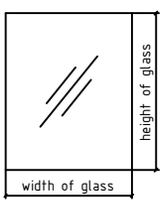
calculation of cutting length for one leaf window



frame profile selection		sash profile selection: E68220/E68225 	E68221/E68226 
E68100 	width of sash	W - 58	W - 58
	height of sash	H - 58	H - 58
E68105 	width of sash	W - 78	W - 78
	height of sash	H - 78	H - 78

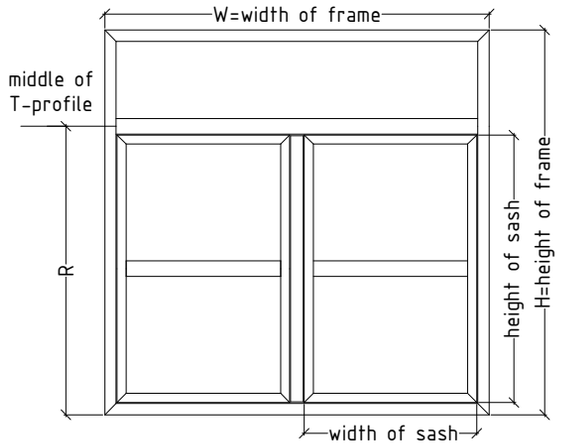
calculation of cutting length for glass unit



dimension of glass unit		sash profile: E68220/E68225 	E68221/E68226 
	width of glass unit	W - 135	W - 177
	height of glass unit	H - 135	H - 177

T68-5

MACHINING



Sample for manufacturing E68 position
with combination of profile:

E68100 Frame

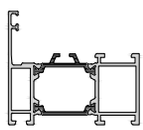
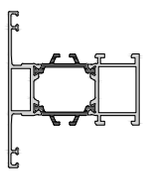
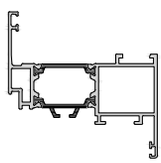
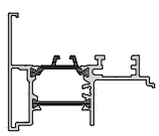
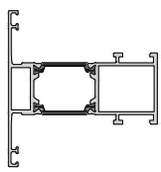
E68300 T profile for frame

E68200 Sash

E68500 overhung secondary sash profile Euro groove

E68340 T profile for sash

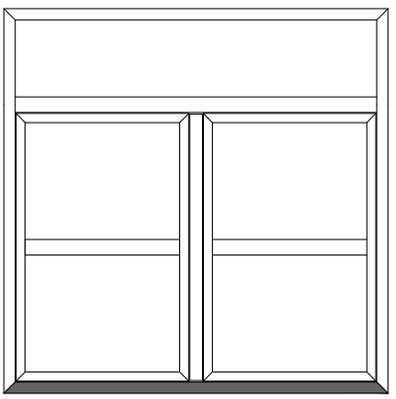
calculation of cutting length and angle for E68 profile

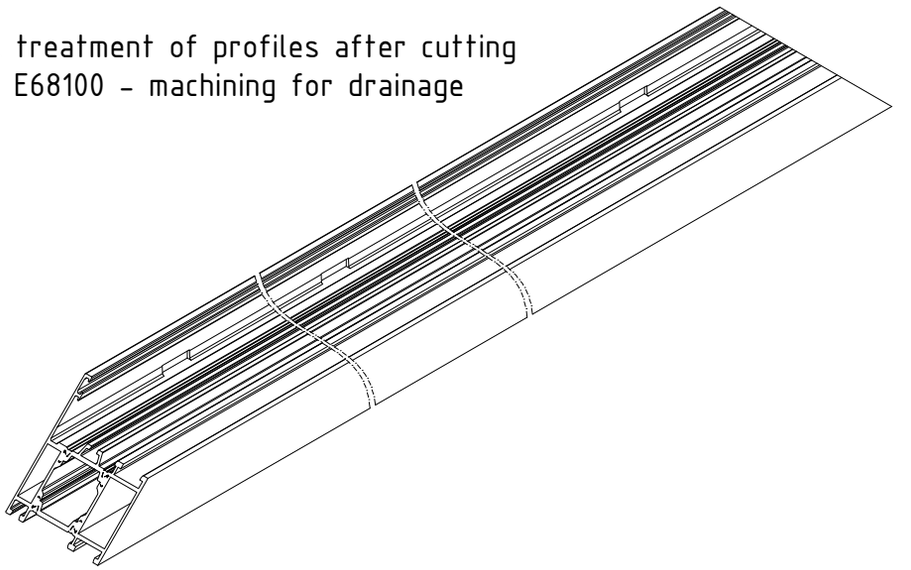
profile selection		pieces	cutting formula	cutting angles
E68100 frame 	width of frame	2	W	2x45°
	height of frame	2	H	2x45°
E68300 T profile 	width of T profile	1	W - 65.5	2x90°
E68200 sash 	width of sash	4	$\frac{W - 68}{2}$	2x45°
	height of sash	4	R - 44.5	2x45°
E68500 overhung secondary Sash profile Euro groove 	height of overhung	1	height of sash - 72	2x90°
E68340 T profile 	width of T profile	2	width of sash - 99.5	2x90°

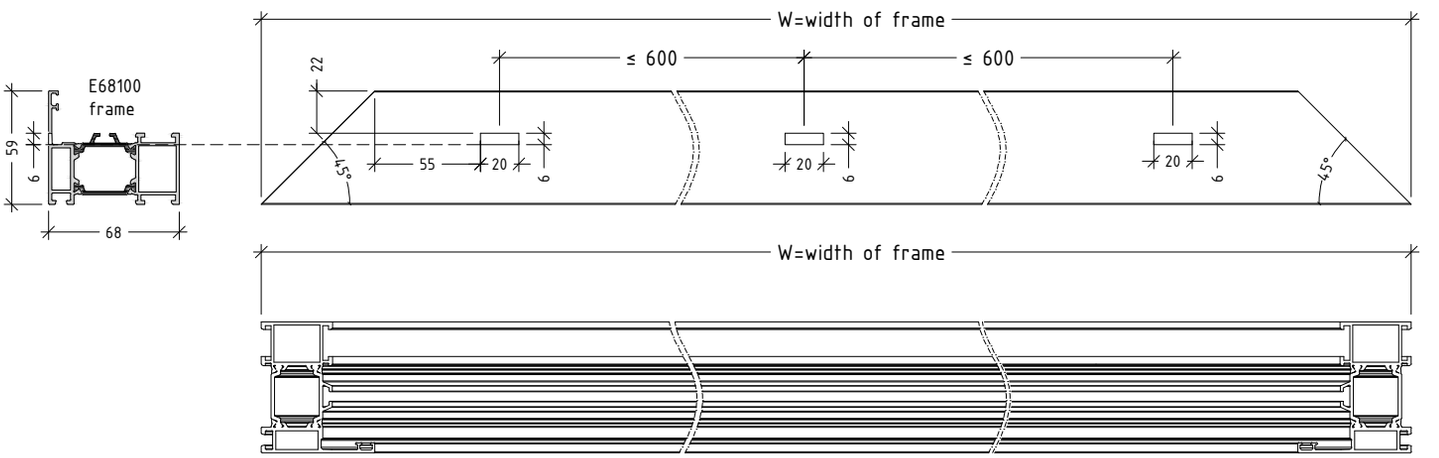
M68-1

Additional treatment of profiles after cutting
Frame E68100 – machining for drainage

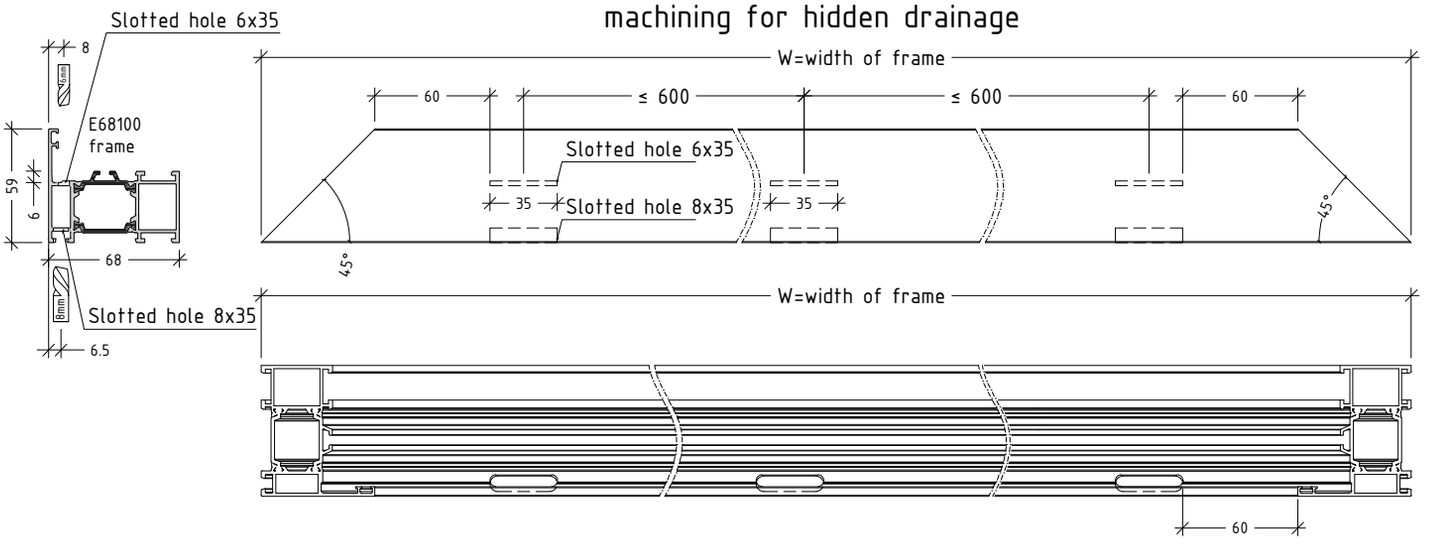
exterior view







Optional
machining for hidden drainage

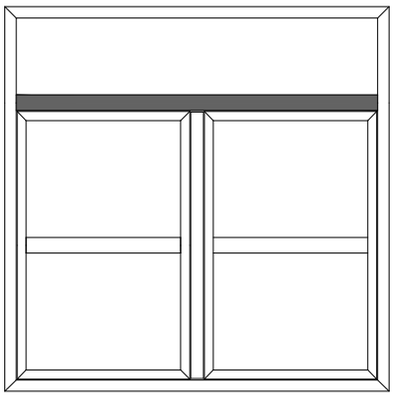


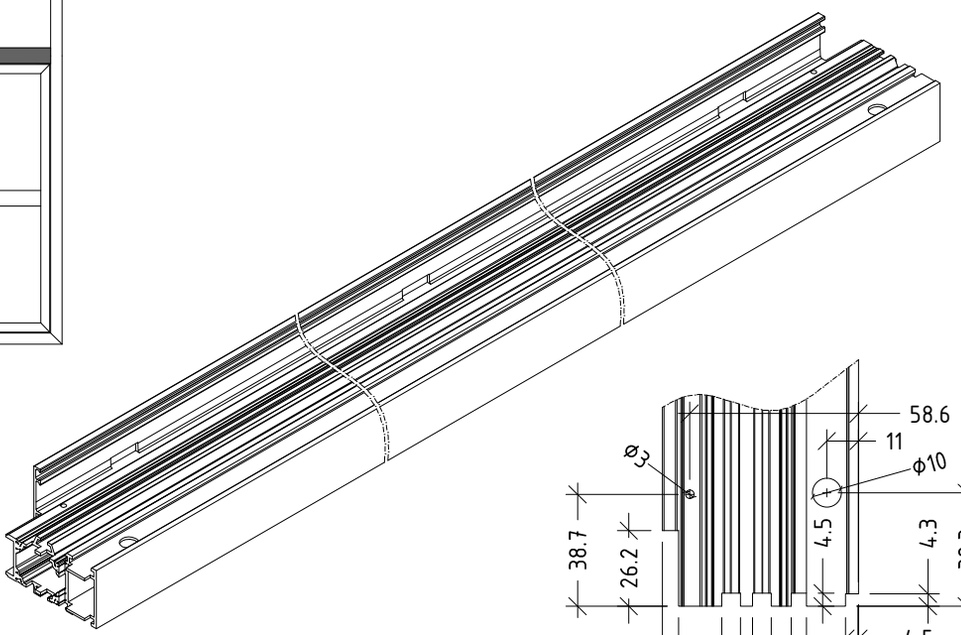
Note:
This machining is valid for all the frame profiles of the system

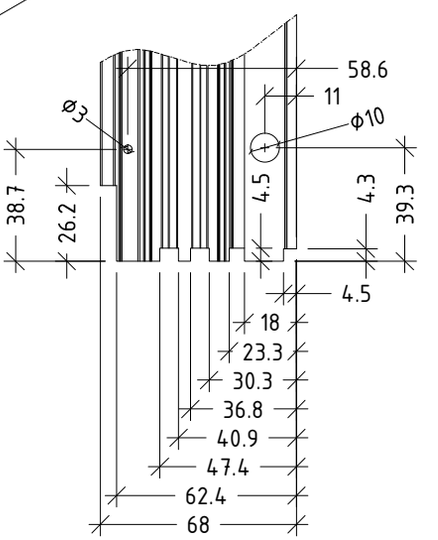
M68-2

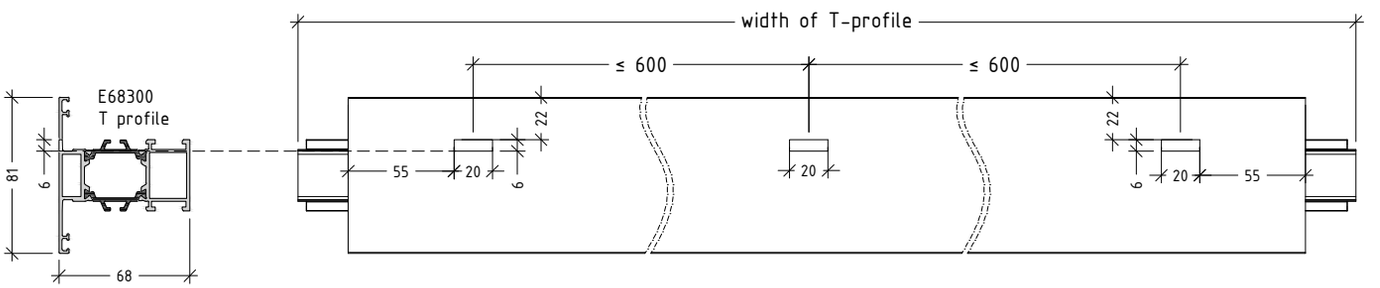
Additional treatment of profiles after cutting
T profile E68300 – machining for visible visible drainage and connecting to the frame

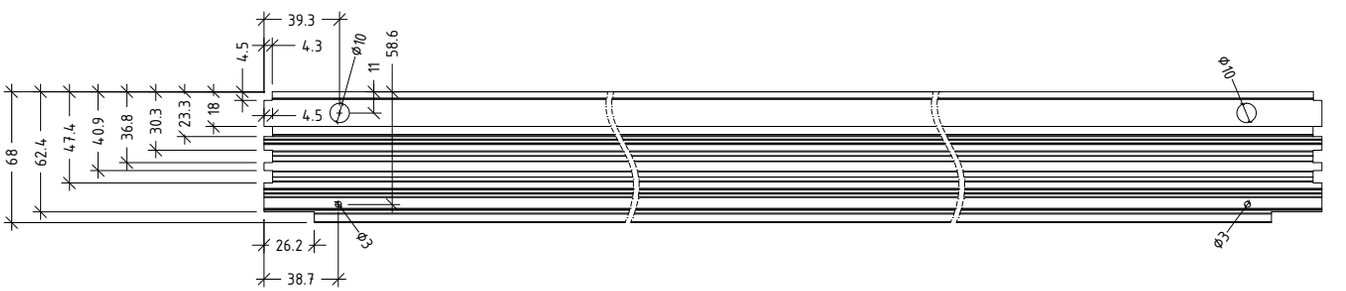
exterior view







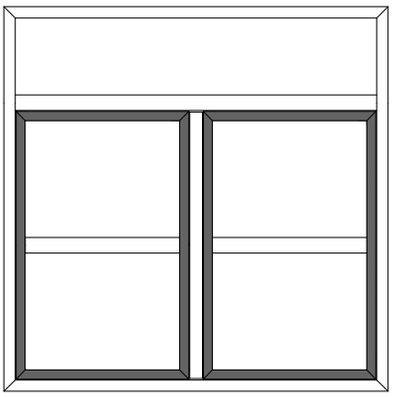


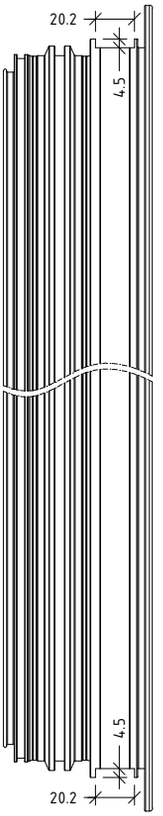


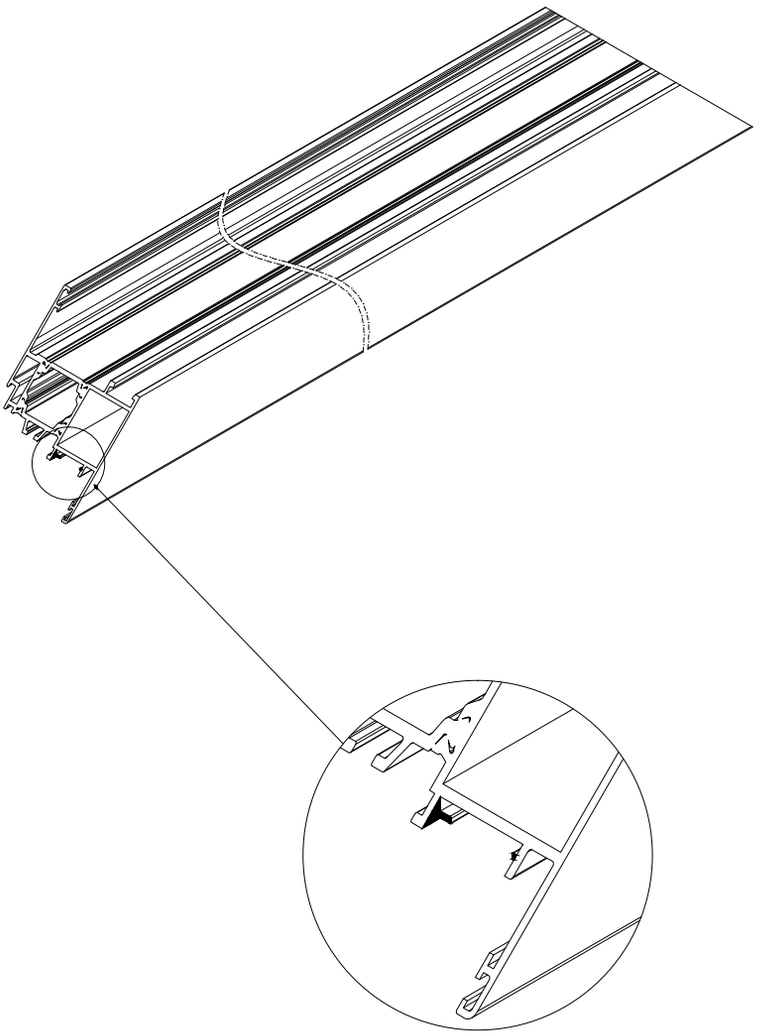
M68-3

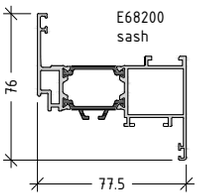
Additional treatment of profiles after cutting
Sash E68200 – machining for connecting rod E2308

exterior view







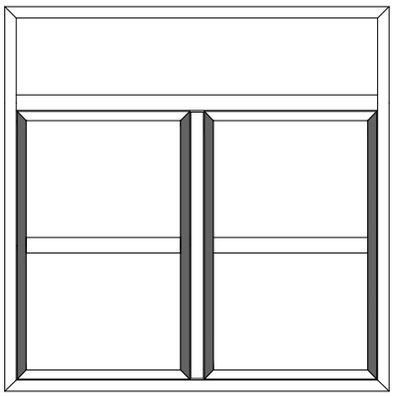


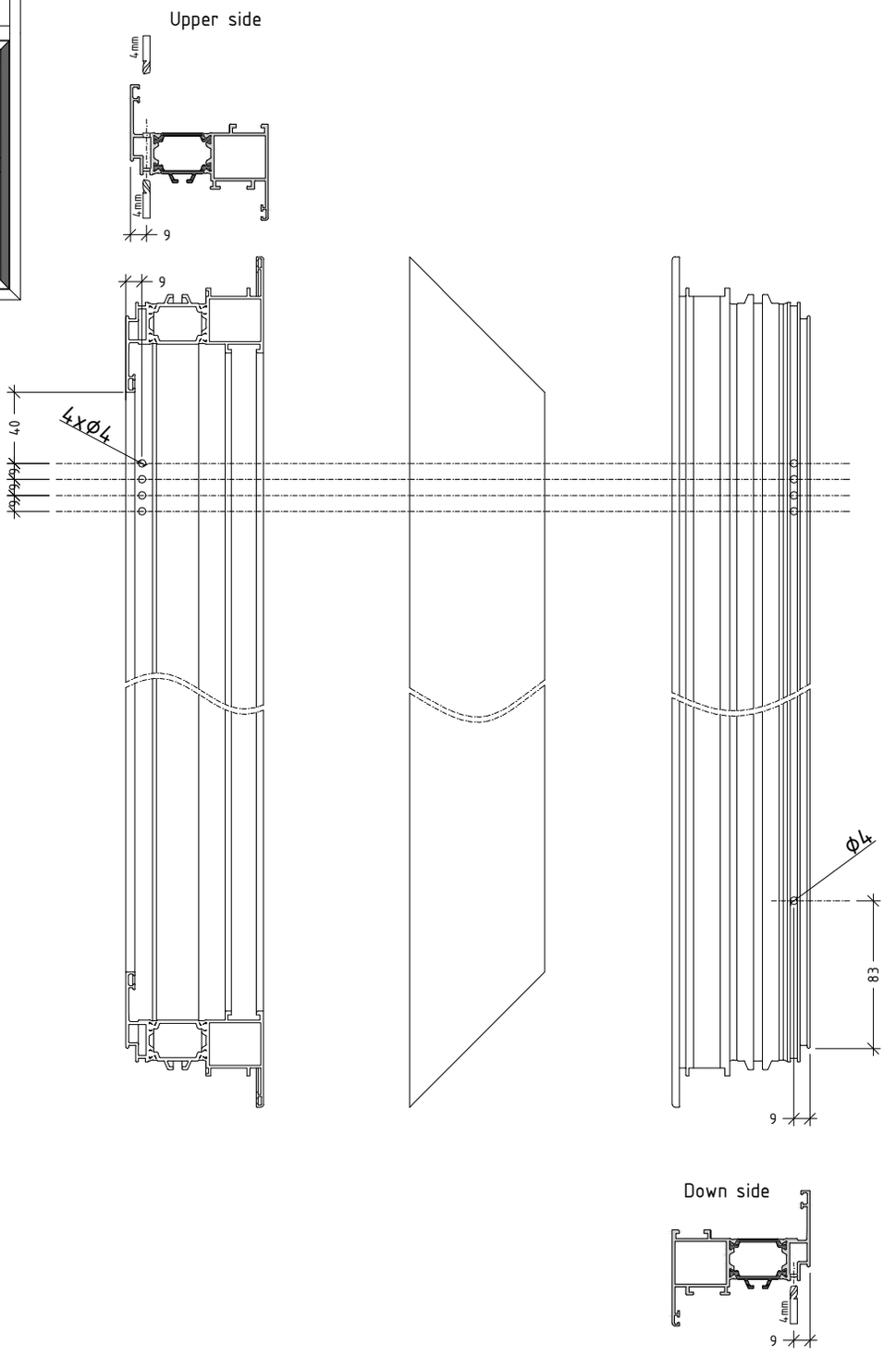
Note:
This machining's is valid for all the sash profiles with Euro groove in the system

M68-4

Additional treatment of profiles after cutting
Sash E68200 – machining for ventilation

exterior view



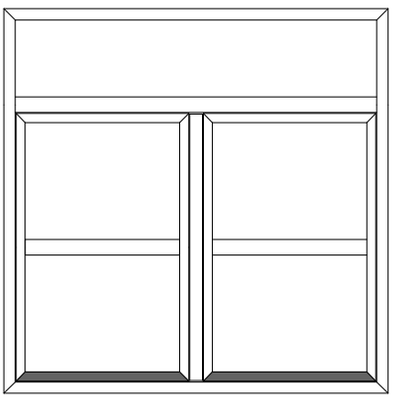


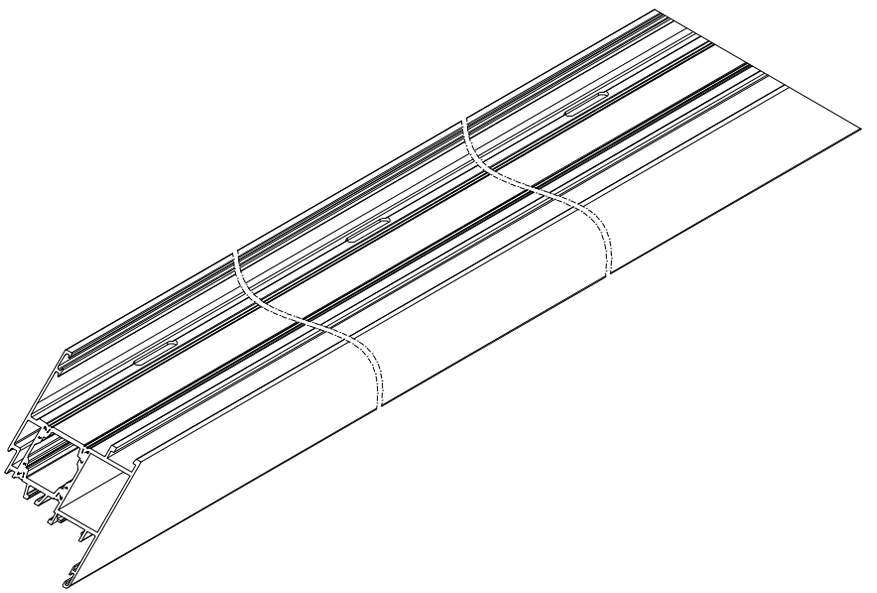
Note:
This machining's is valid for all the sash profiles with Euro groove in the system

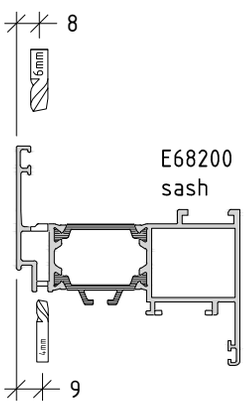
M68-4.1

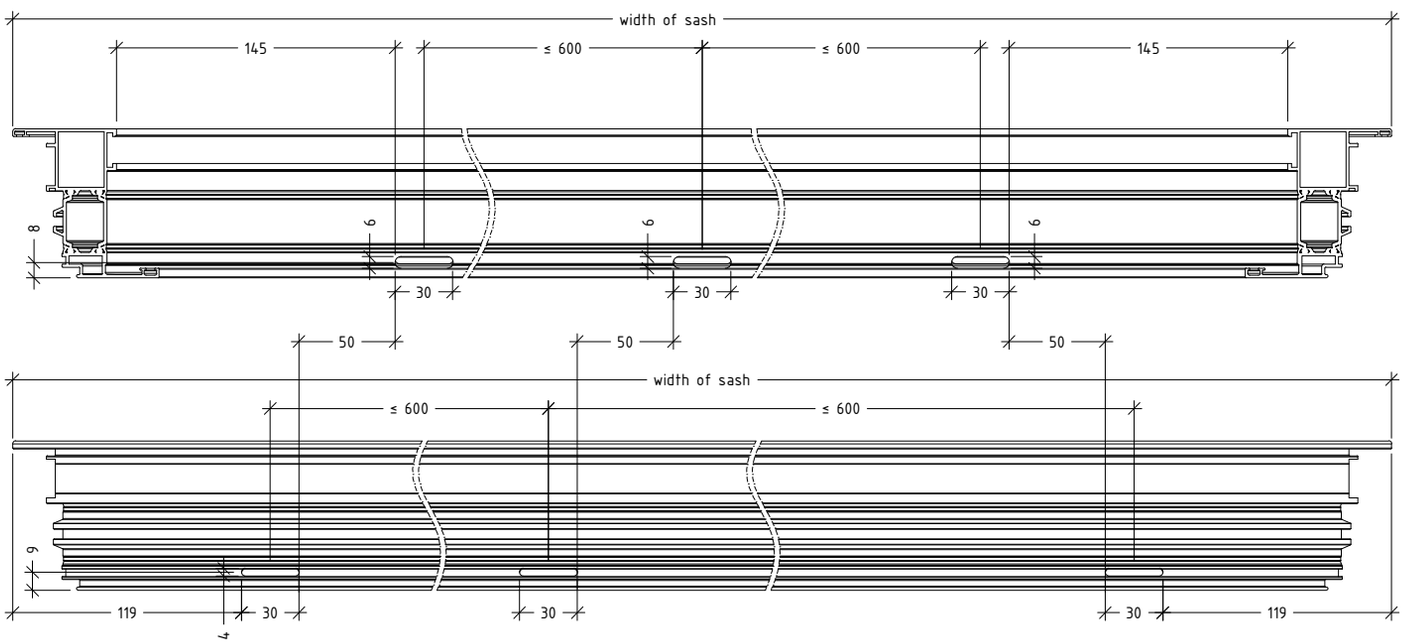
Additional treatment of profiles after cutting
Sash E68200 - machining for drainage

exterior view







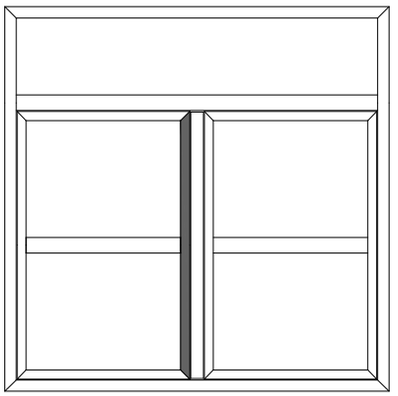


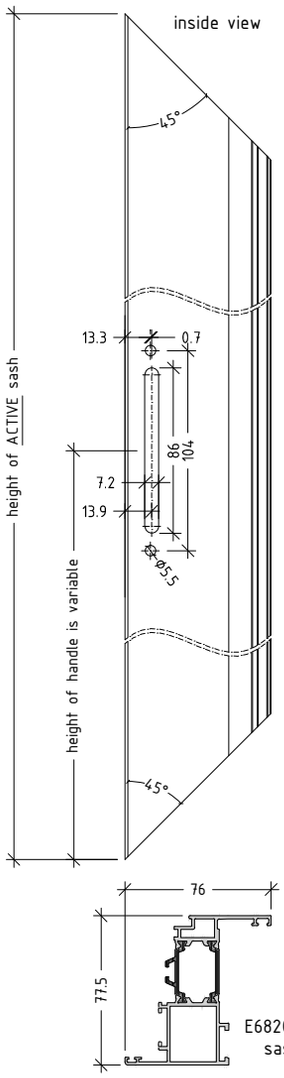
Note:
This machining is valid for all the sash profiles in the system

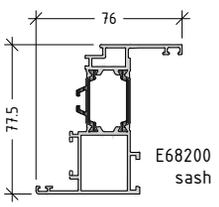
M68-5

Additional treatment of profiles after cutting
Sash E68200 – machining for handle on active sash

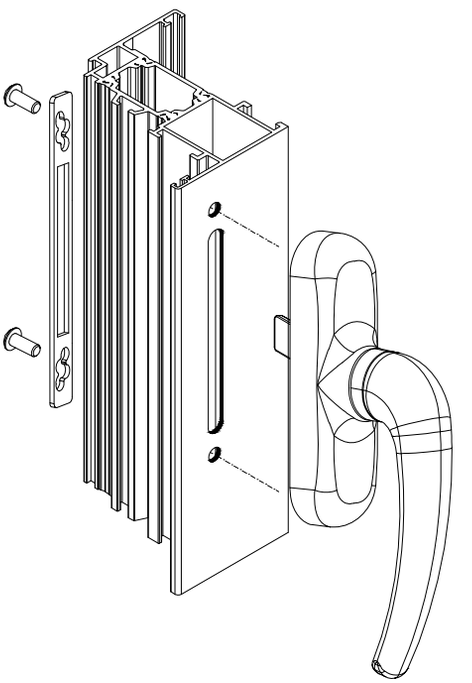
exterior view







machining's to fix T/T handle



NOTE:

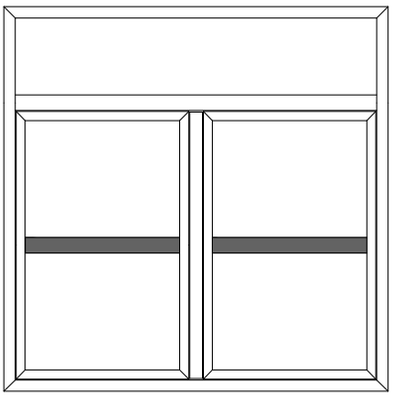
- For different cases active and passive sash positions varied!
- For different hardware the machining for handle may not fit! (use mounting scheme for hardware supplier!!)

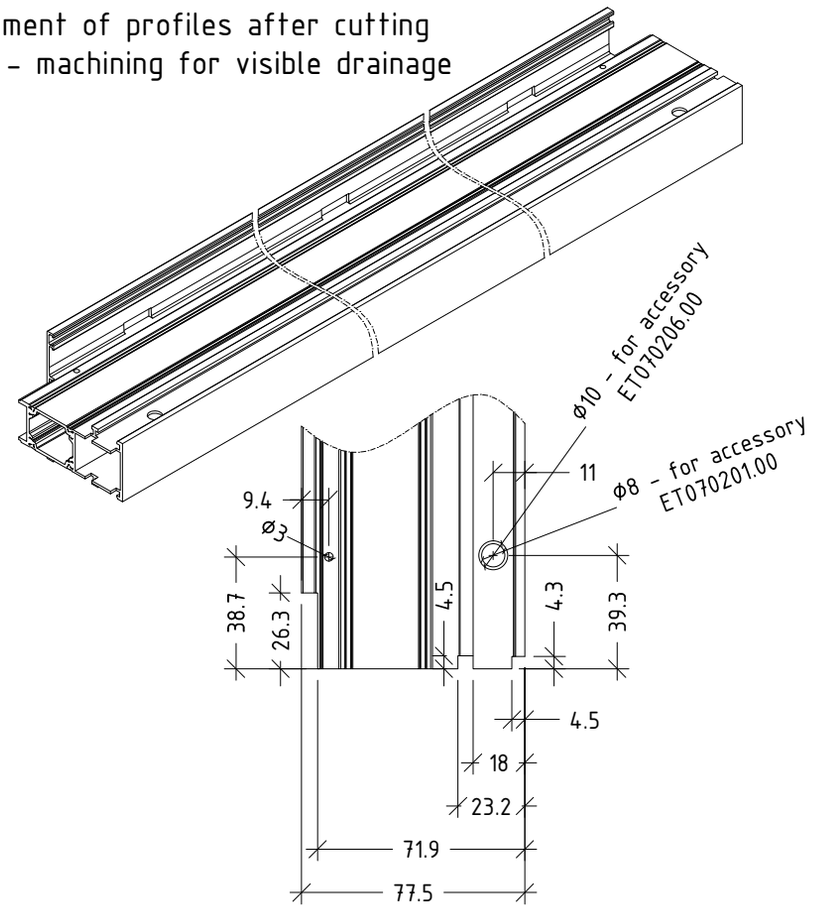
Note:
This machining is valid for all the sash profiles with Euro groove in the system

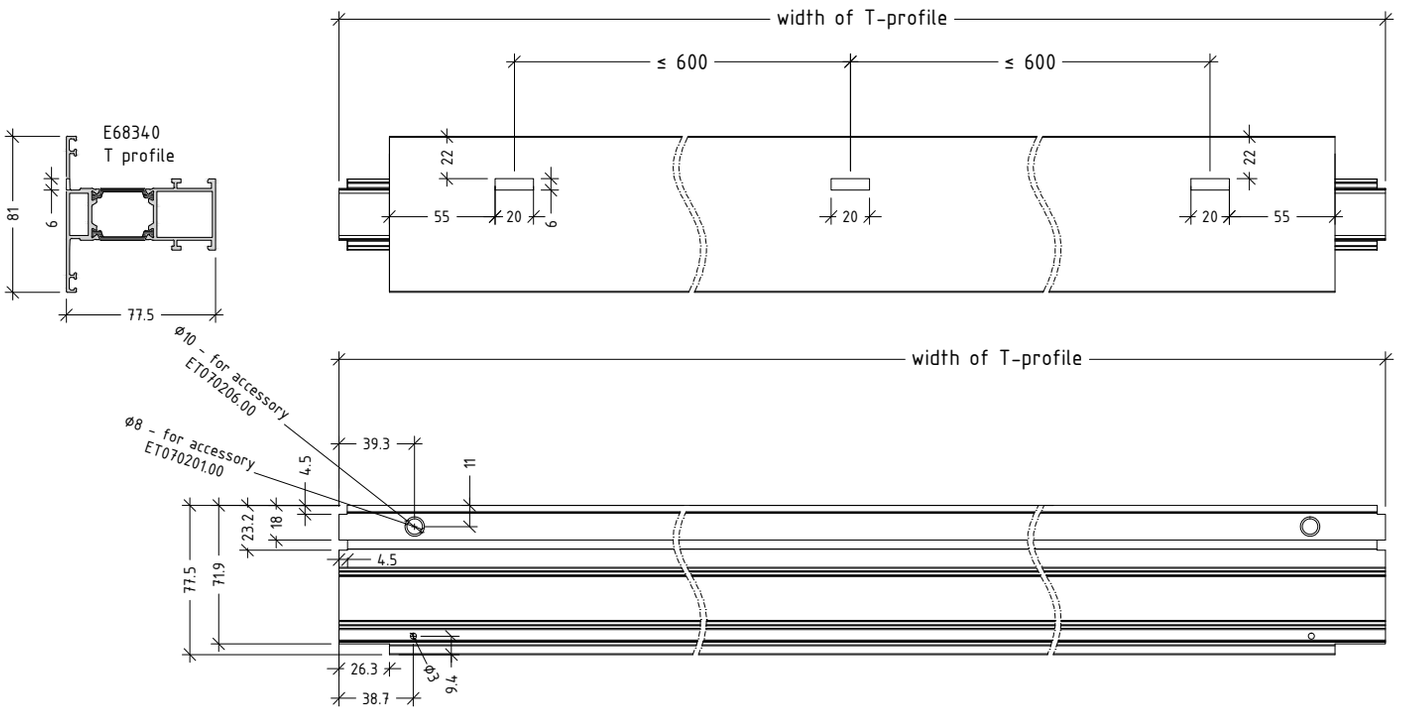
M68-6

Additional treatment of profiles after cutting
T-profile E68340 – machining for visible drainage

exterior view

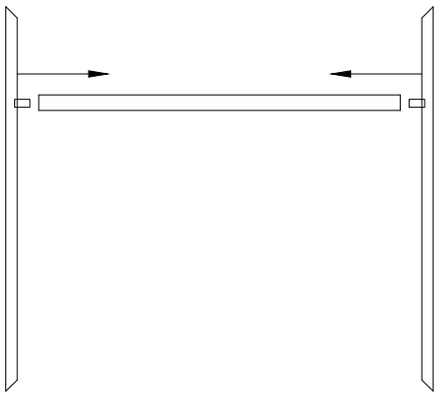


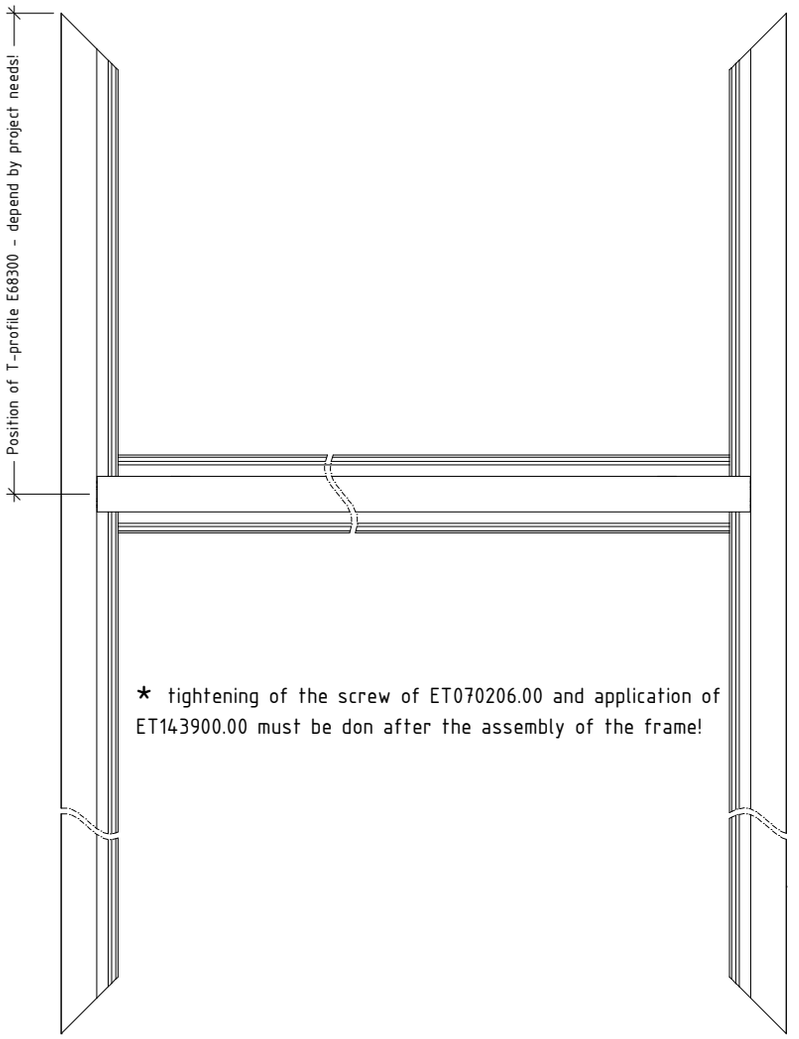




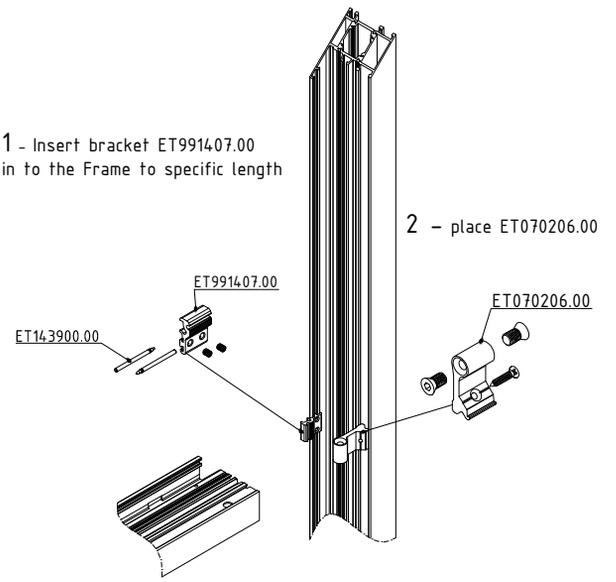
M68-7

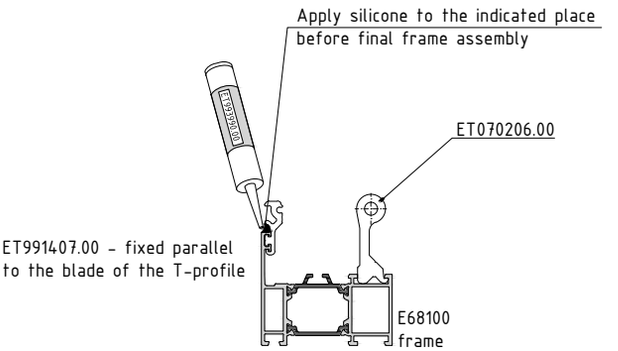
Sequence for mounting of T-profile E68300 to the frame E68100

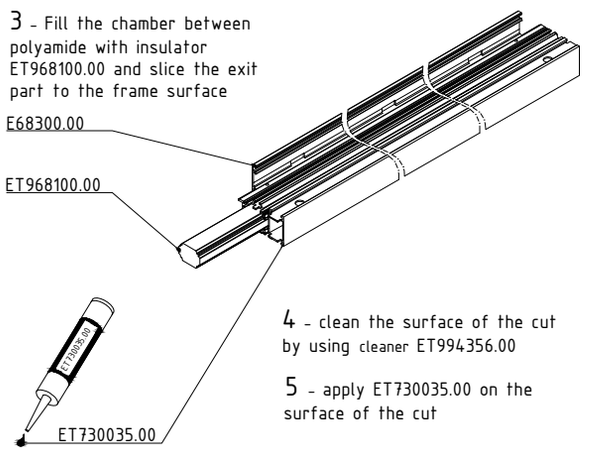




* tightening of the screw of ET070206.00 and application of ET143900.00 must be don after the assembly of the frame!



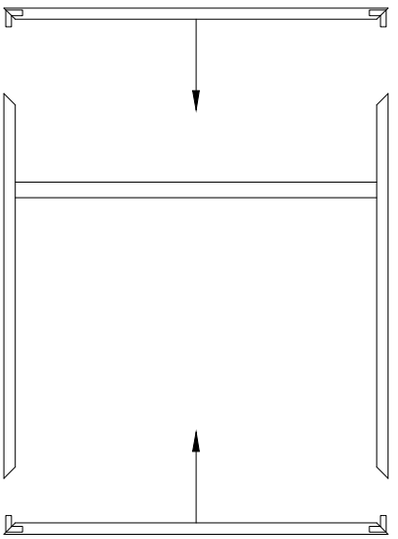




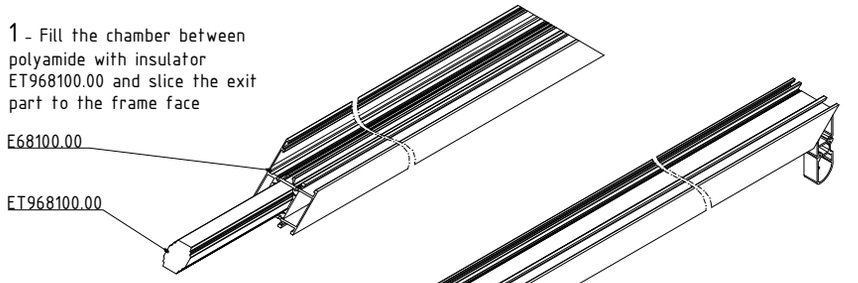
Note:
This mounting sequence is valid for all the frames in the system

M68-8

Sequence for assembly the frame E68100



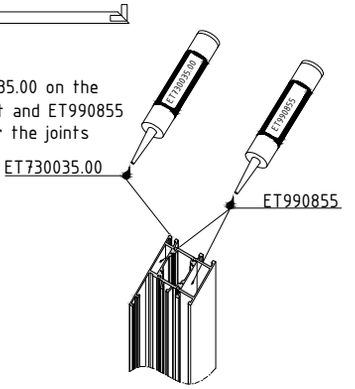
1 - Fill the chamber between polyamide with insulator ET968100.00 and slice the exit part to the frame face



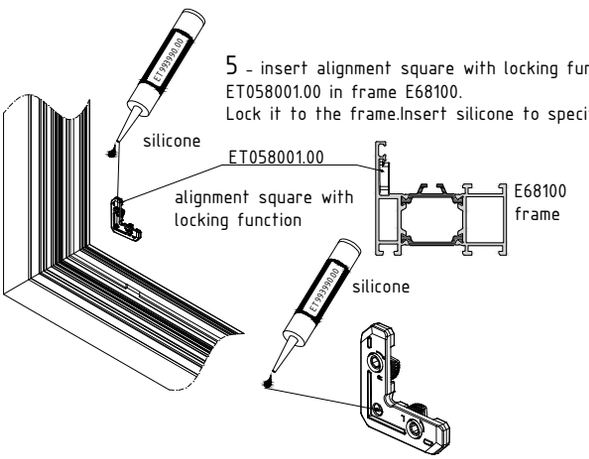
2 - clean the surface of the cut and the grooves for the joints by using cleaner ET994356.00

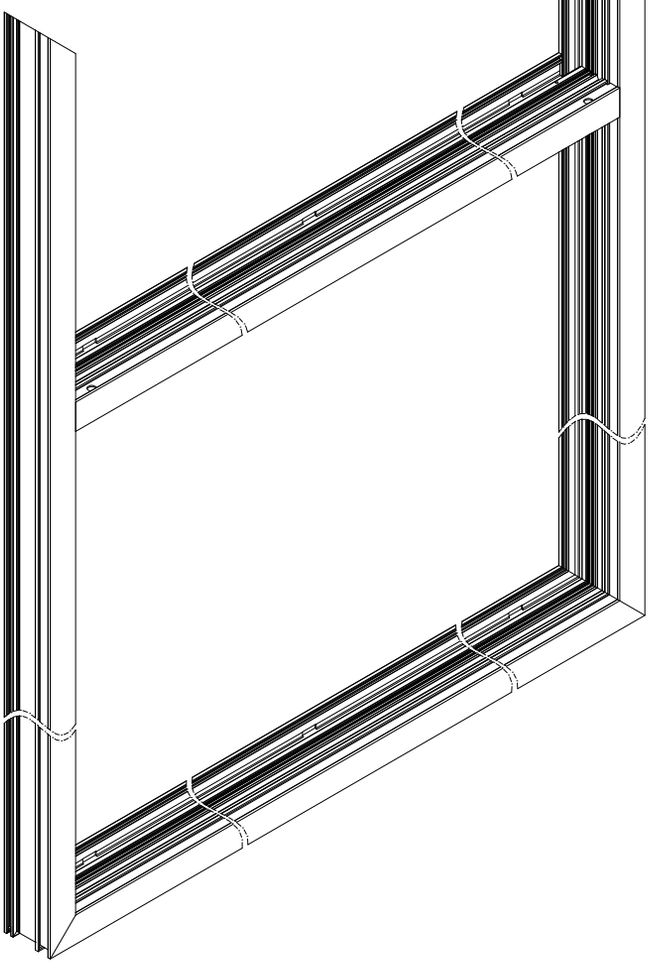
4 - put the joints in the chambers of frame E68100

3 - apply ET730035.00 on the surface of the cut and ET990855 in the grooves for the joints



5 - insert alignment square with locking function ET058001.00 in frame E68100.
Lock it to the frame.Insert silicone to specific point

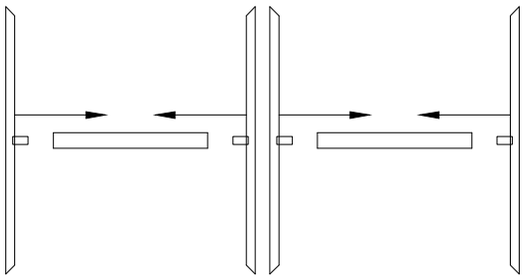




Note:
* This mounting sequence is valid for all the frame profiles in the system by using corresponding joint corners and insulators
* Clean the joints before application

M68-9

Sequence for mounting of T-profile E68340 to the sash E68200

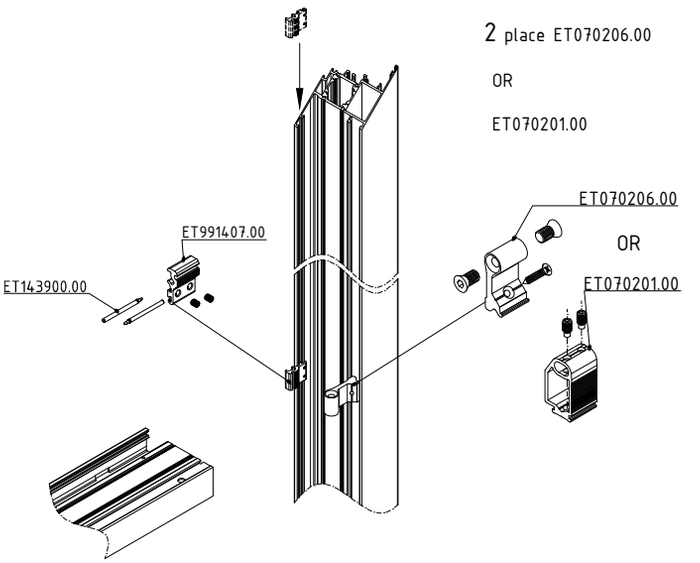


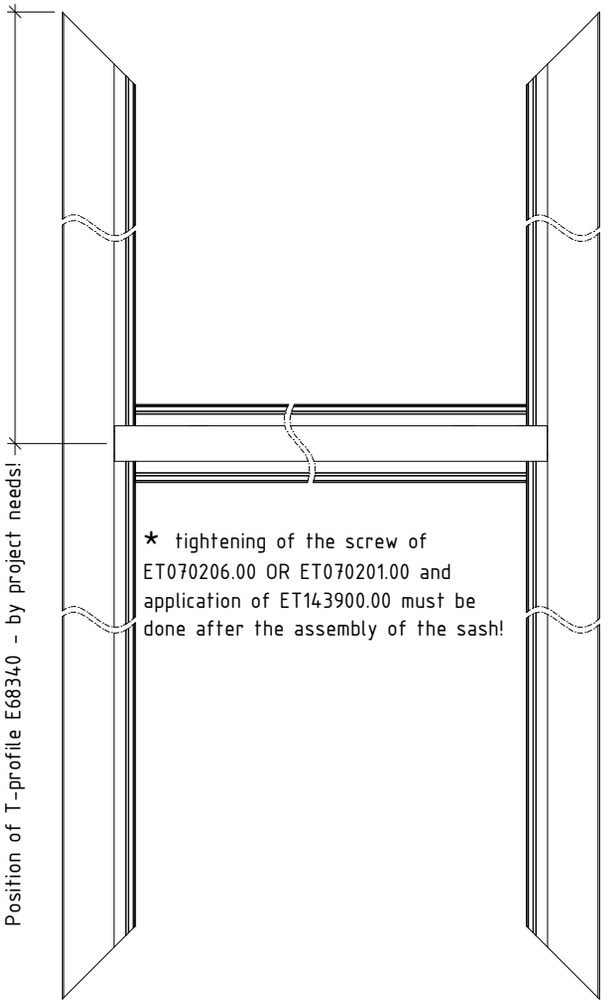
1 Insert bracket ET991407.00 in to the sash to specific length

2 place ET070206.00

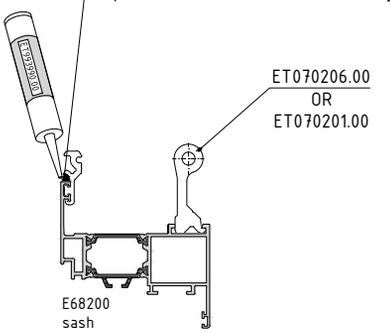
OR

ET070201.00

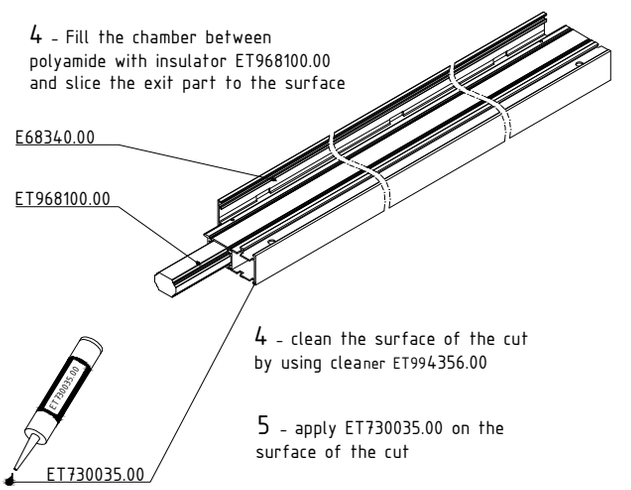




3 Apply silicone to the indicated place before final frame assembly



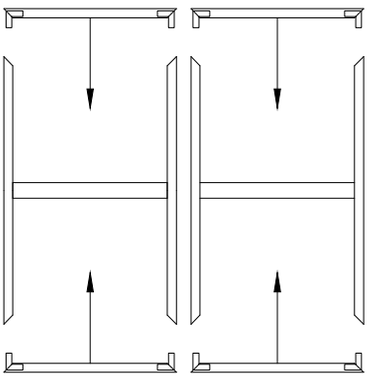
4 - Fill the chamber between polyamide with insulator ET968100.00 and slice the exit part to the surface



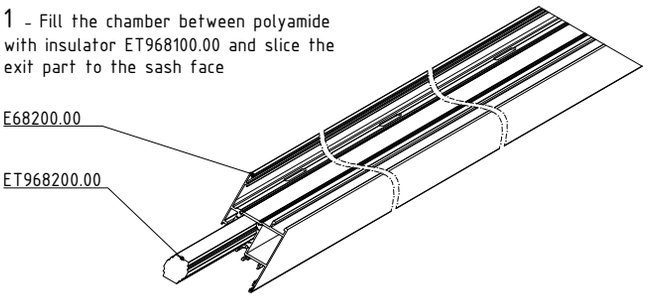
Note:
* This mounting sequence is valid for all sash profile with Euro groove in the system

M68-10

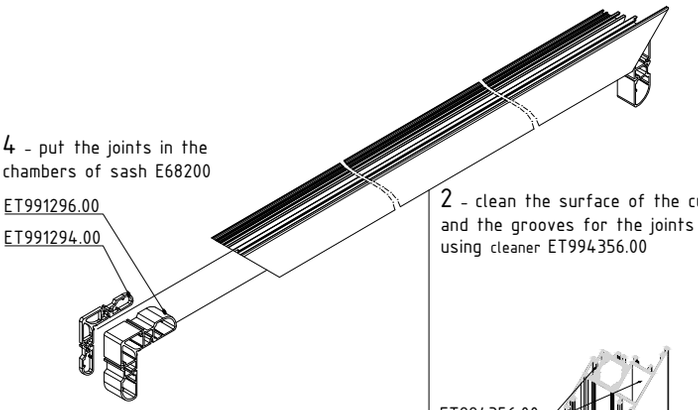
Sequence for assembly the sash E68200



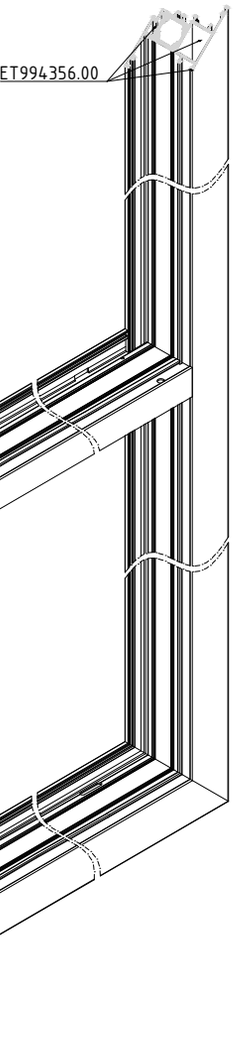
1 - Fill the chamber between polyamide with insulator ET968100.00 and slice the exit part to the sash face



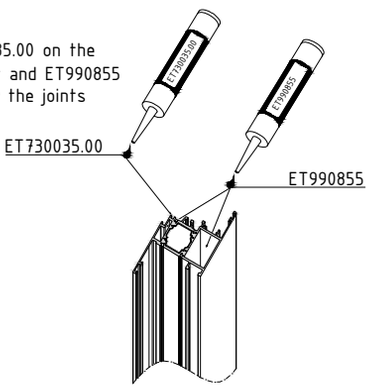
4 - put the joints in the chambers of sash E68200



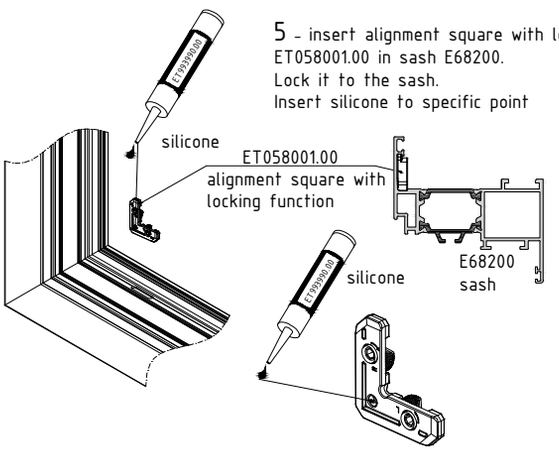
2 - clean the surface of the cut and the grooves for the joints by using cleaner ET994356.00



3 - apply ET730035.00 on the surface of the cut and ET990855 in the grooves for the joints



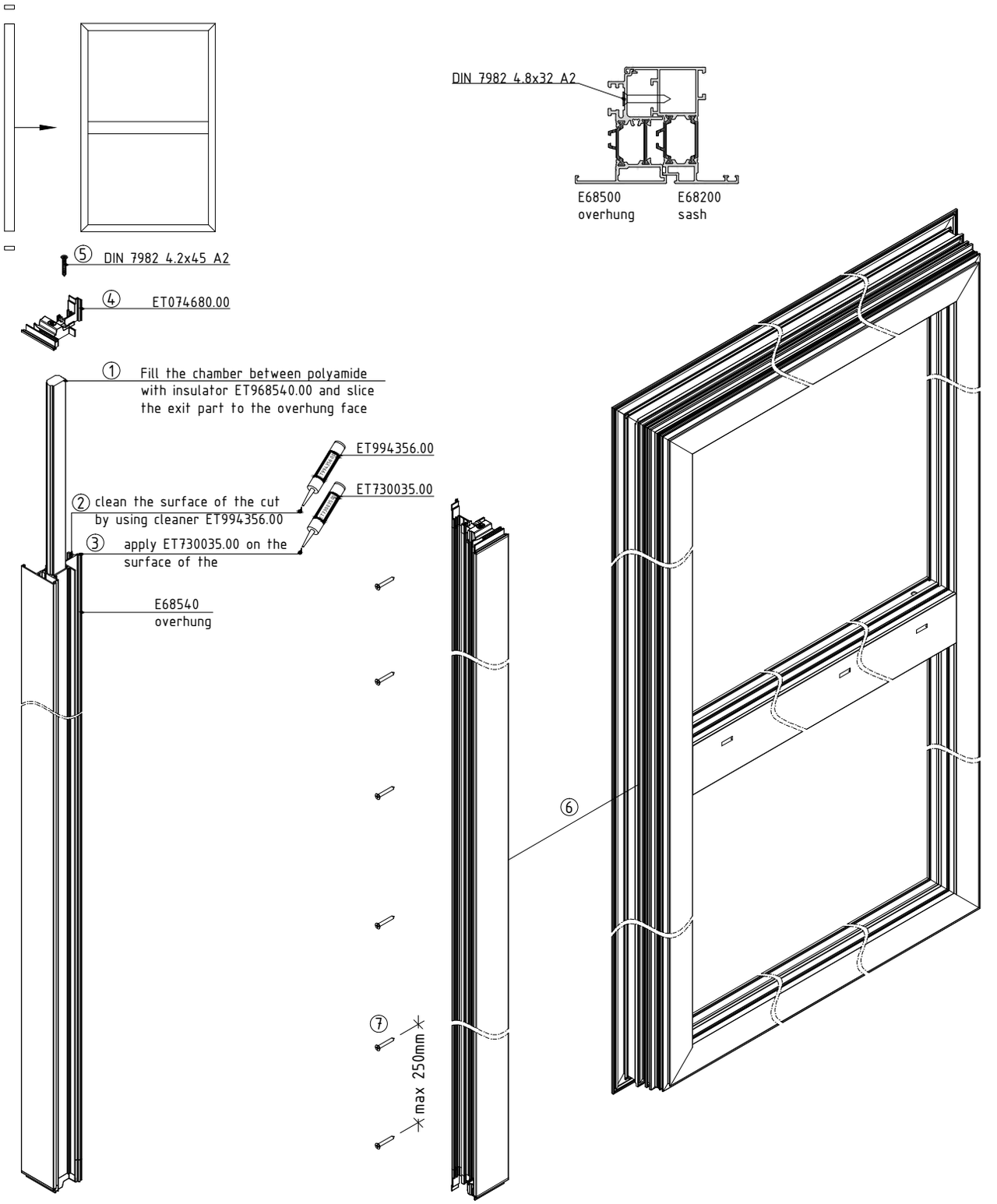
5 - insert alignment square with locking function ET058001.00 in sash E68200.
Lock it to the sash.
Insert silicone to specific point



Note:
* This mounting sequence is valid for all the sash profiles in the system by using corresponding joint corners and insulators
* Clean the joints before application

M68-11

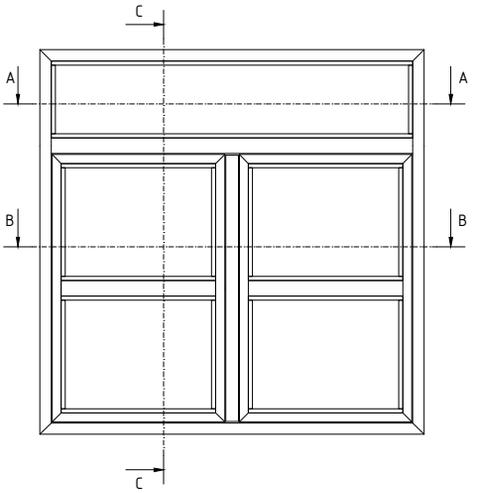
Sequence for assembly the E68500 overhung and mounting to the sash E68200



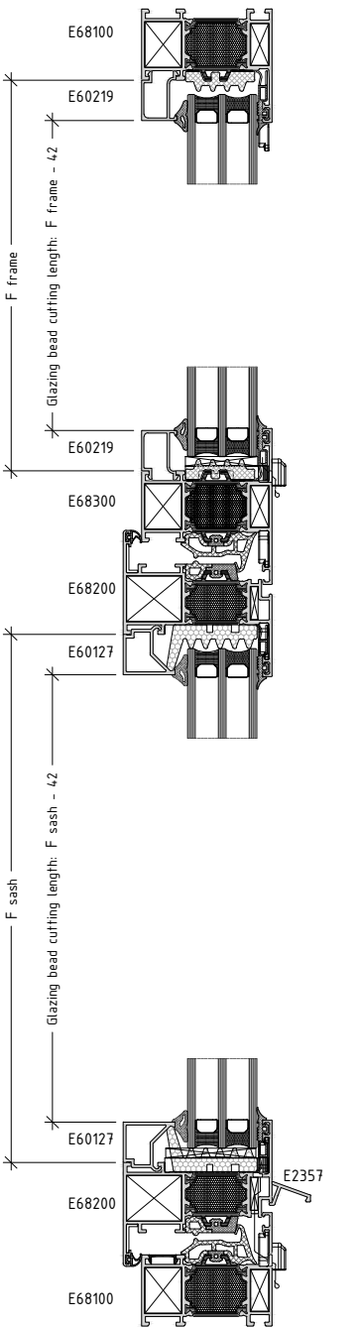
M68-12

Sequence for cutting of glazing bead

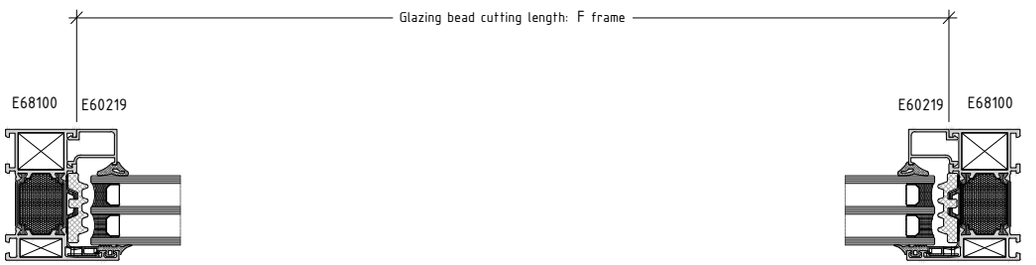
interior view



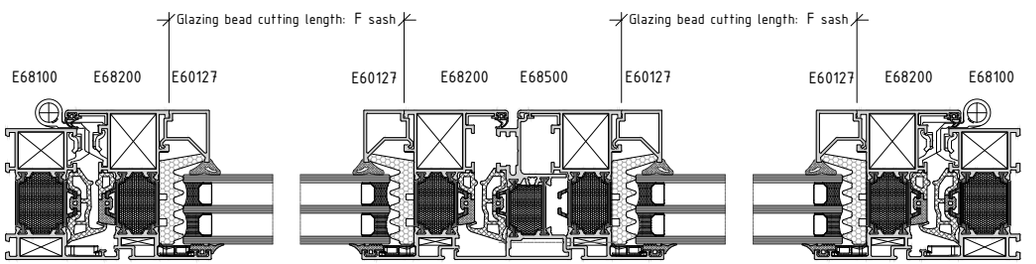
C - C



A - A

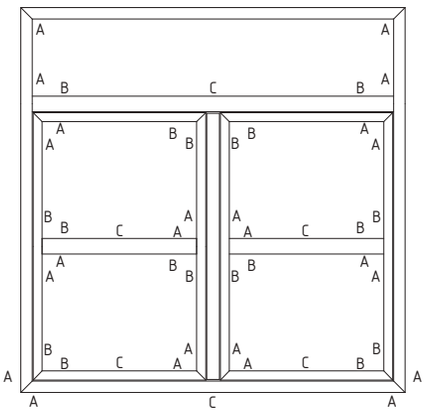


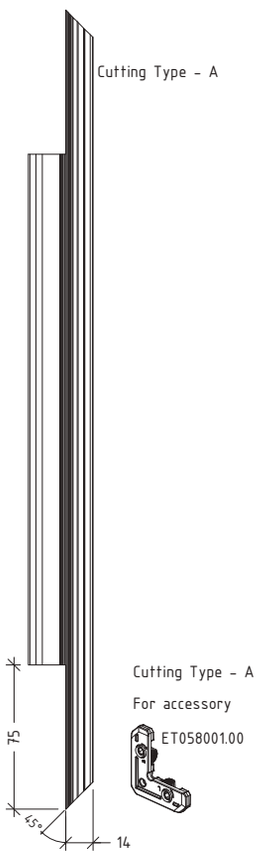
B - B

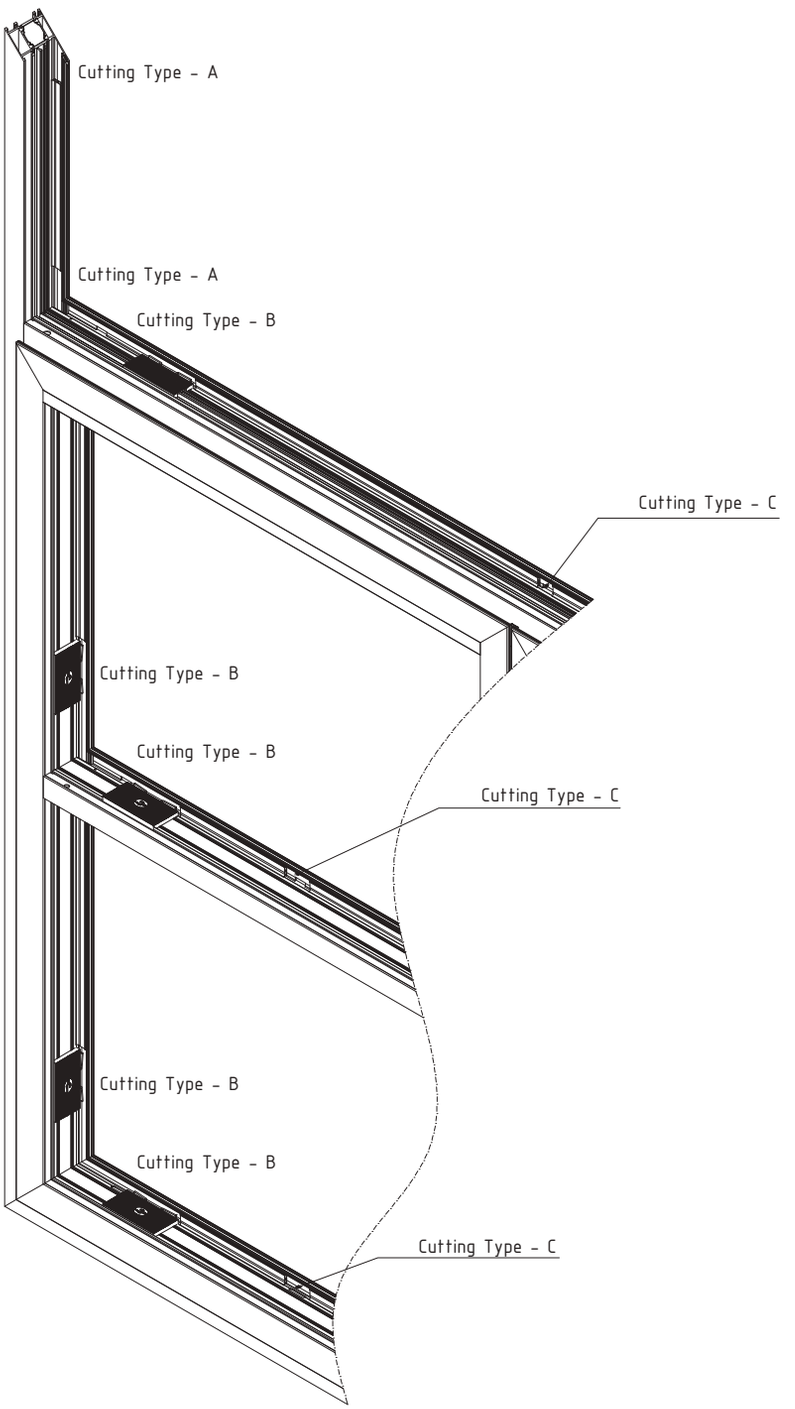


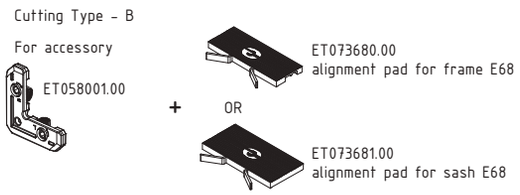
M68-13

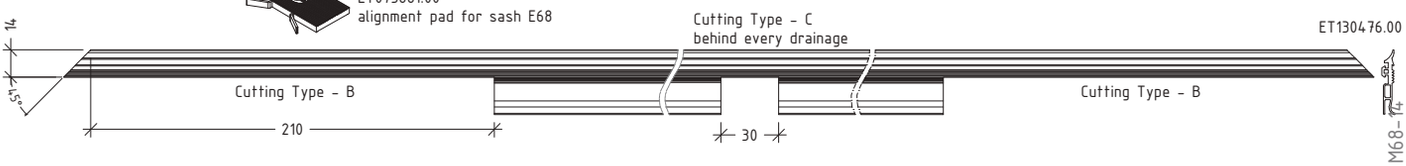
Sequence for cutting of gasket ET130476.00





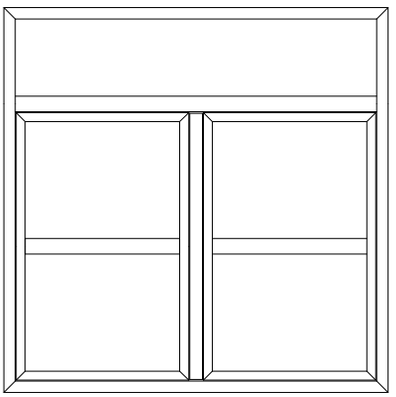


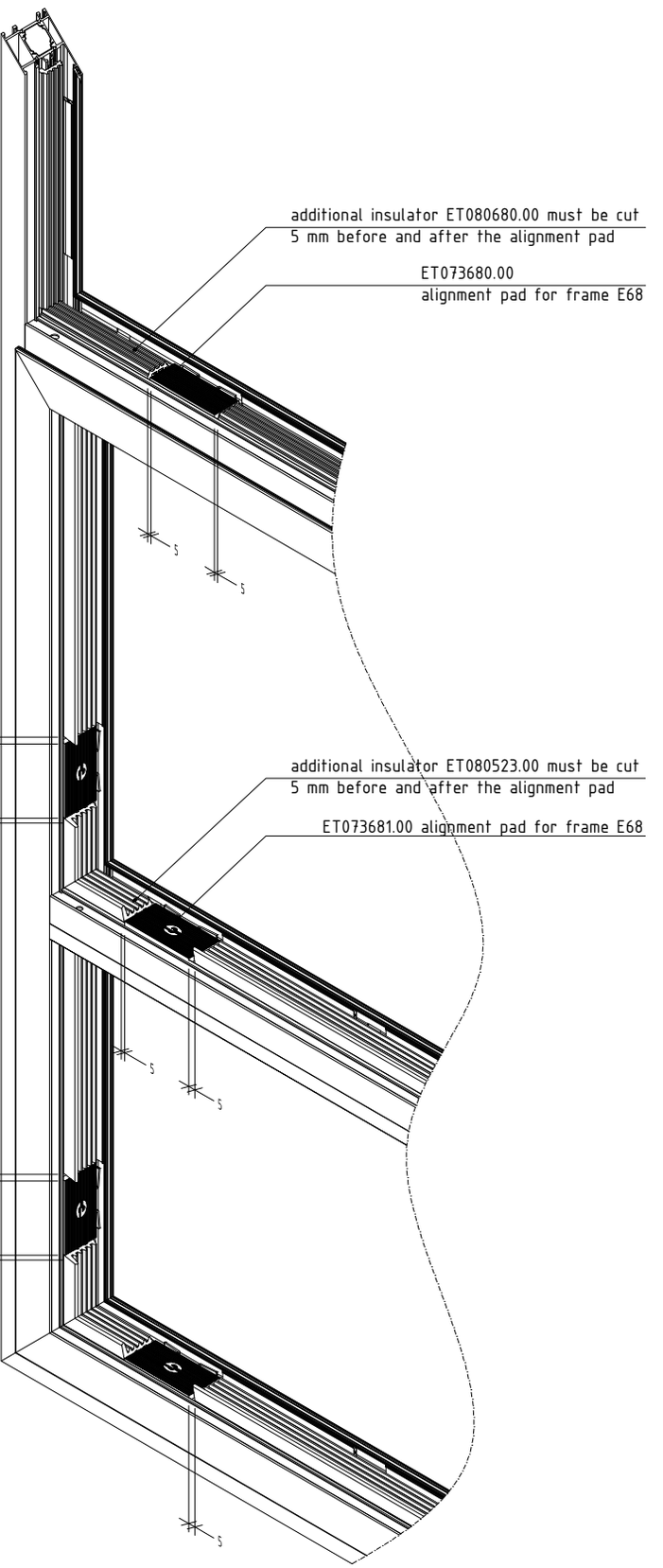




Sequence for cutting of additional insulators

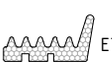
exterior view






ET080680.00


ET073680.00
alignment pad for frame E68

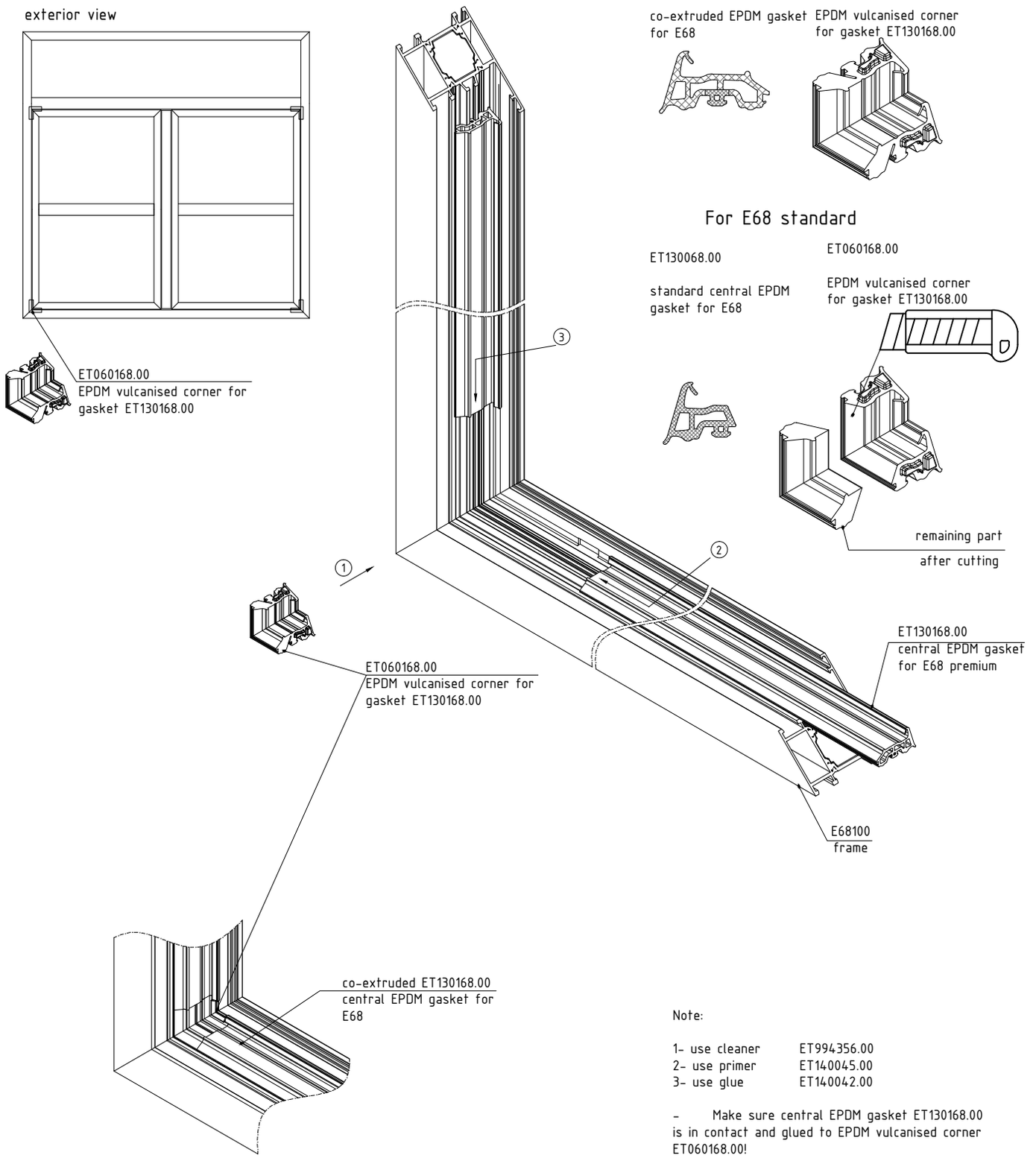

ET080523.00


ET073681.00
alignment pad for sash E68

* ET080680.00 or ET080523.00 is applied after the application of the glazing pane

M68-15

Sequence for mounting central EPDM gasket to the frame for E68



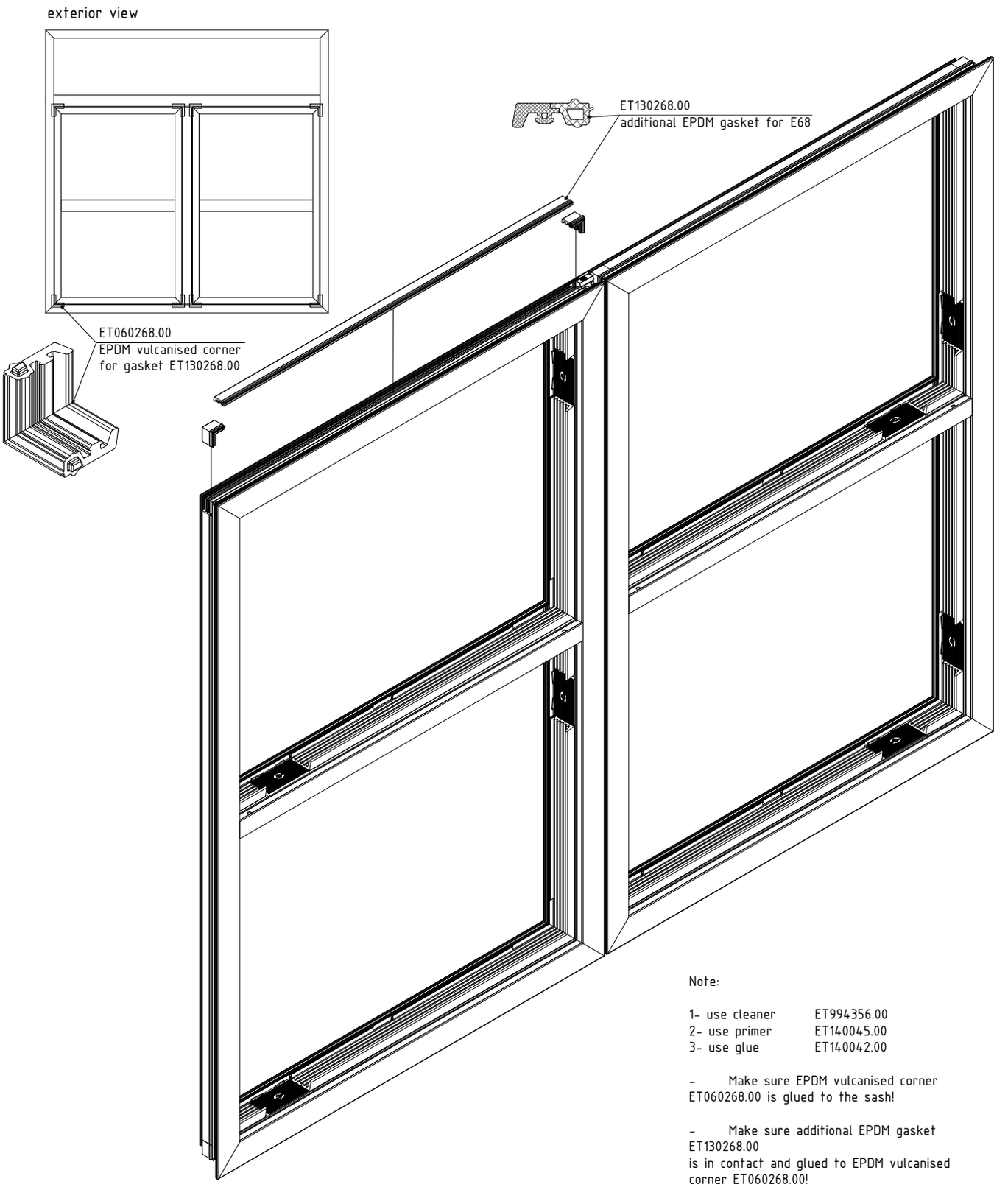
Note:

1- use cleaner ET994356.00
2- use primer ET140045.00
3- use glue ET140042.00

- Make sure central EPDM gasket ET130168.00 is in contact and glued to EPDM vulcanised corner ET060168.00!

M68-16

Sequence for mounting additional EPDM gasket to the sash for E68



Note:

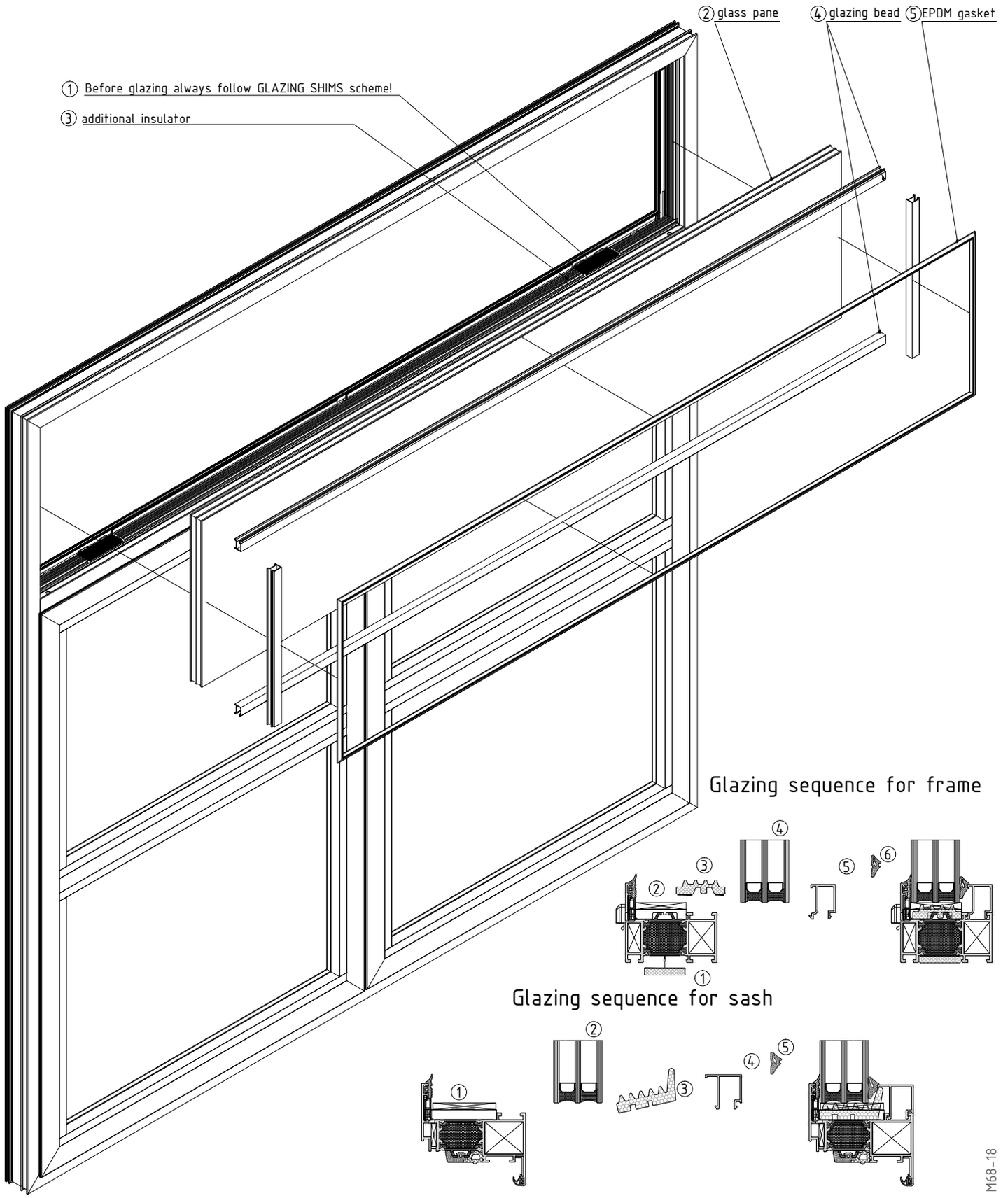
1- use cleaner ET994356.00
2- use primer ET140045.00
3- use glue ET140042.00

- Make sure EPDM vulcanised corner ET060268.00 is glued to the sash!

- Make sure additional EPDM gasket ET130268.00 is in contact and glued to EPDM vulcanised corner ET060268.00!

M68-17

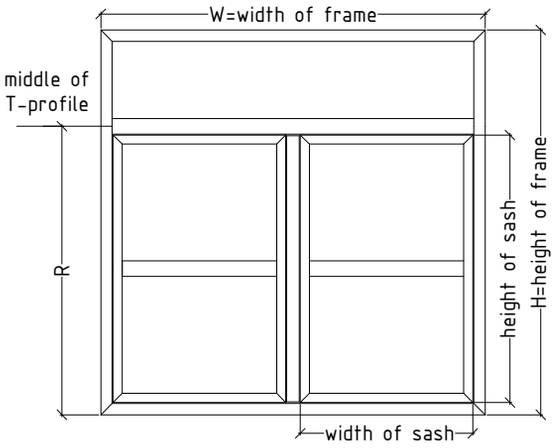
Sequence for mounting glass pane; glazing bead and gasket



Glazing sequence for frame

Glazing sequence for sash

M68-18



Sample for manufacturing E68 position
with combination of profile:

E68100 Frame

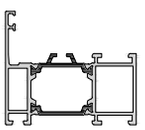
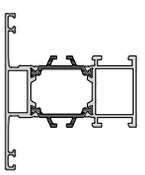
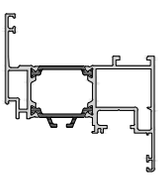
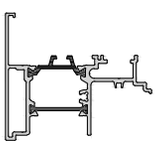
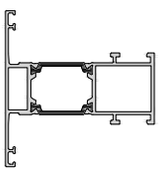
E68300 T profile for frame

E68220 Sash

E68540 overhung secondary sash profile PVC groove

E68340 T profile for sash

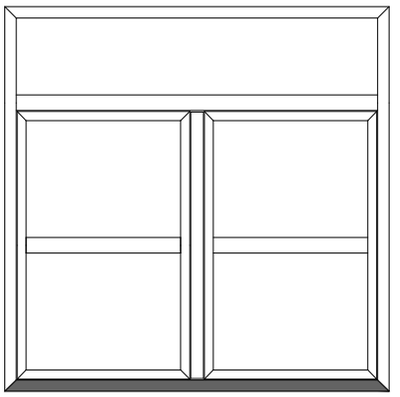
calculation of cutting length and angle for E68 profile

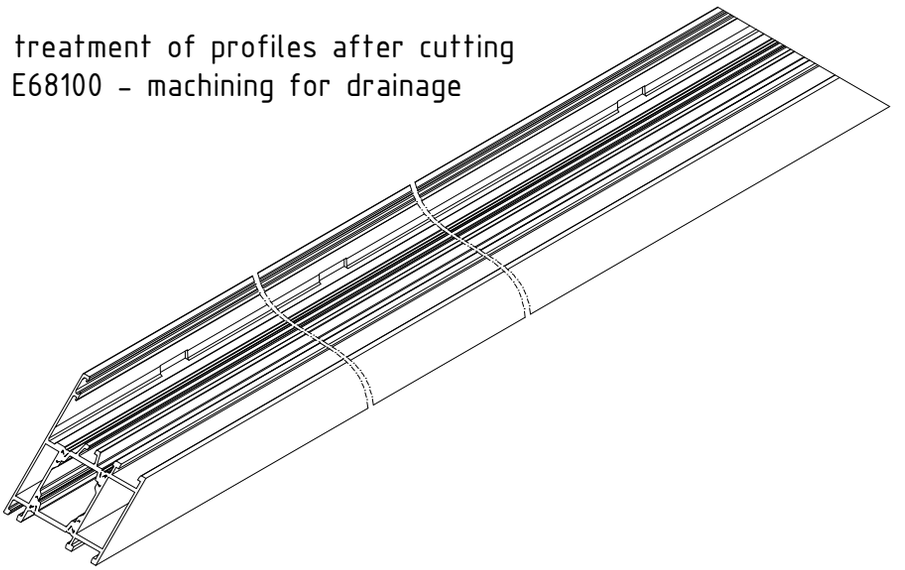
profile selection		pieces	cutting formula	cutting angles
E68100 frame 	width of frame	2	W	2x45°
	height of frame	2	H	2x45°
E68300 T profile 	width of T profile	1	W - 65.5	2x90°
E68220 sash 	width of sash	4	$\frac{W - 64}{2}$	2x45°
	height of sash	4	R - 39.5	2x45°
E68540 overhung secondary Sash profile PVC groove 	height of overhung	1	height of sash - 76	2x90°
E68340 T profile 	width of T profile	2	width of sash - 111.5	2x90°

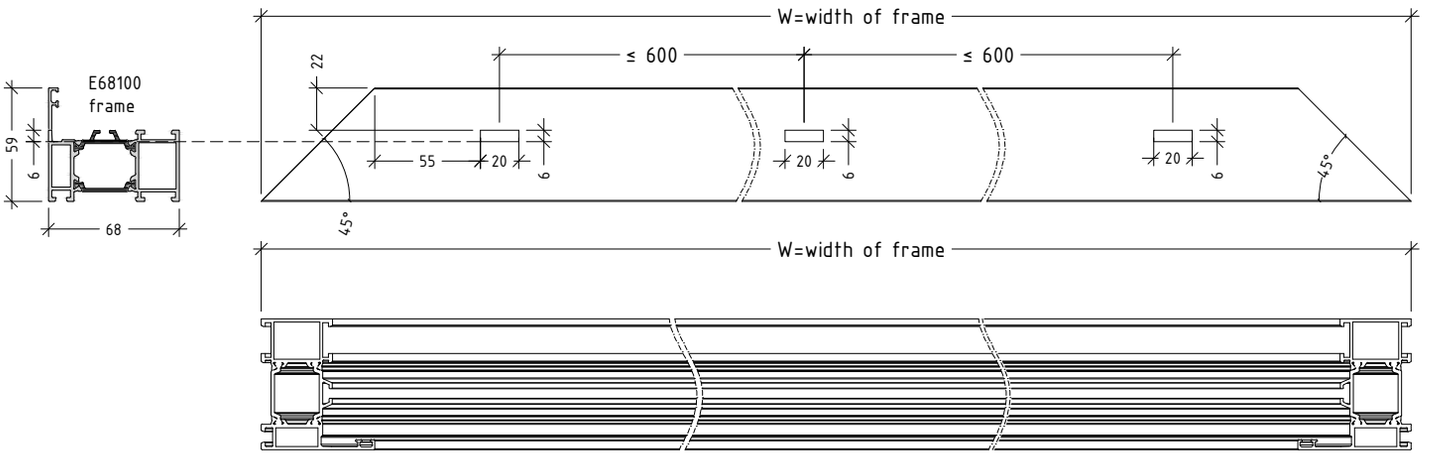
M68-P1

Additional treatment of profiles after cutting
Frame E68100 – machining for drainage

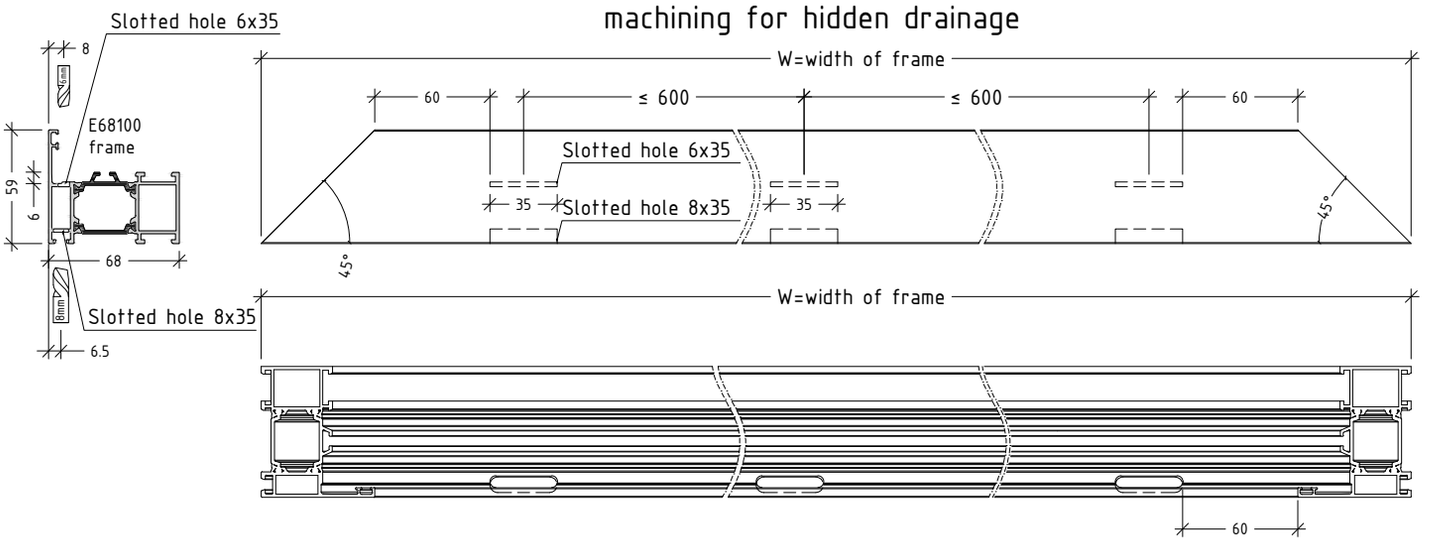
exterior view







Optional
machining for hidden drainage

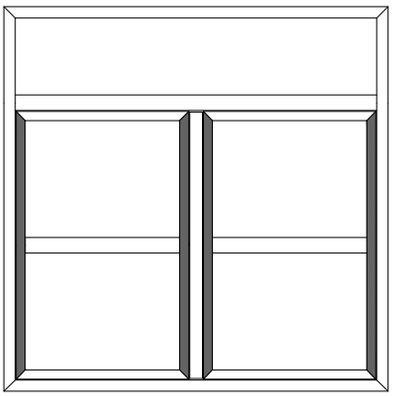


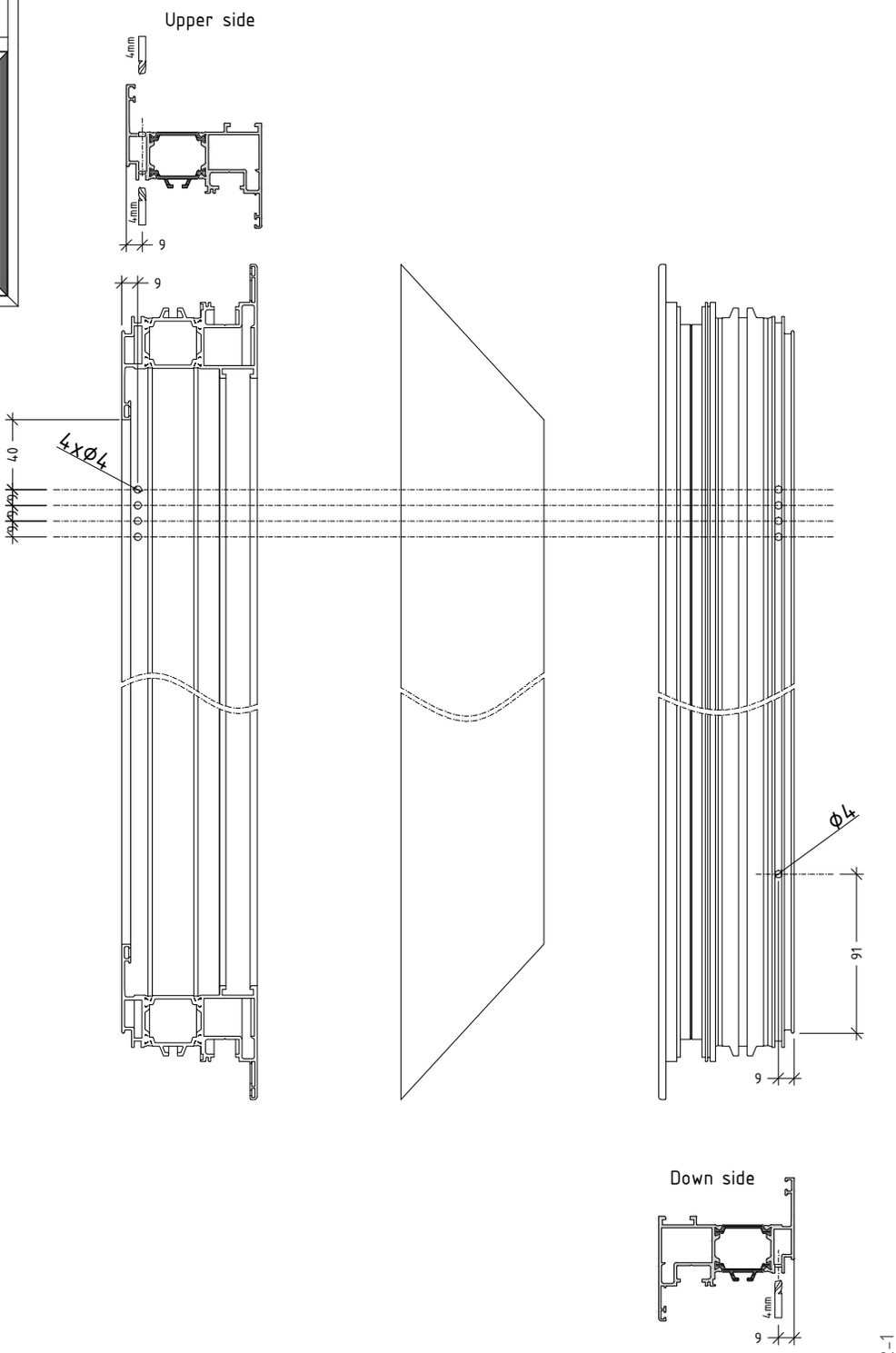
Note:
This machining is valid for all the frame profiles of the system

M68-P2

Additional treatment of profiles after cutting
Sash E68220 – machining for ventilation

exterior view



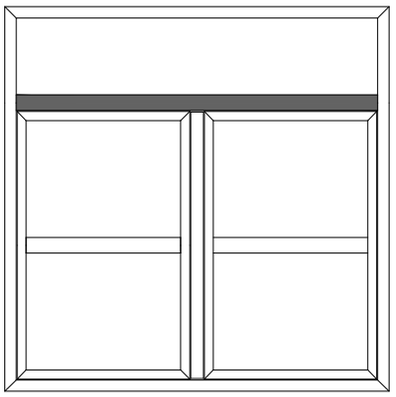


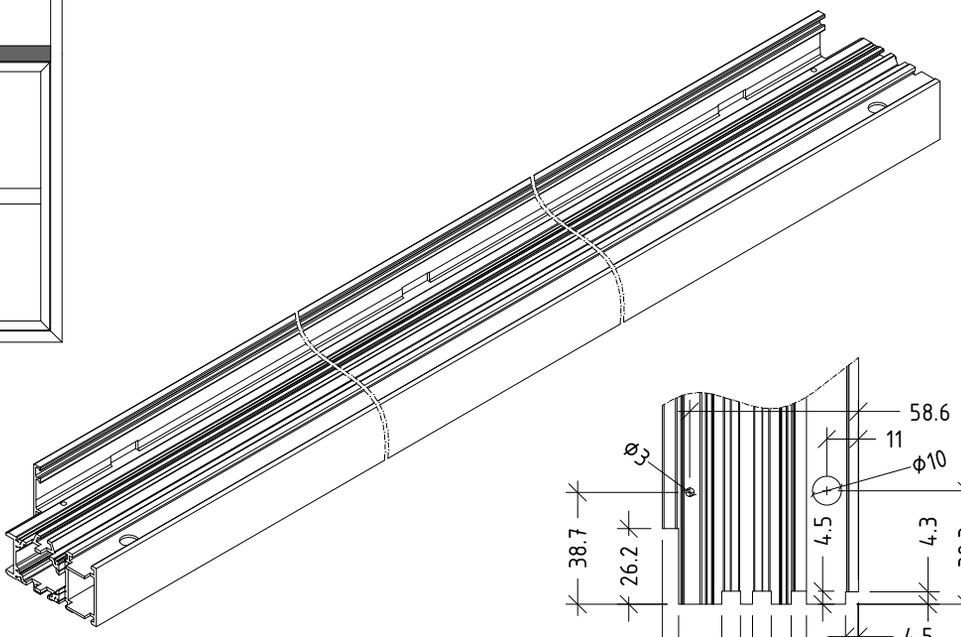
Note:
This machining is valid for all the sash profiles in the system with PVC groove!

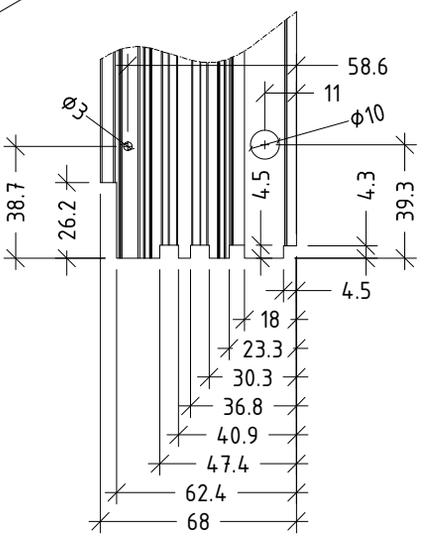
M68-P2-1

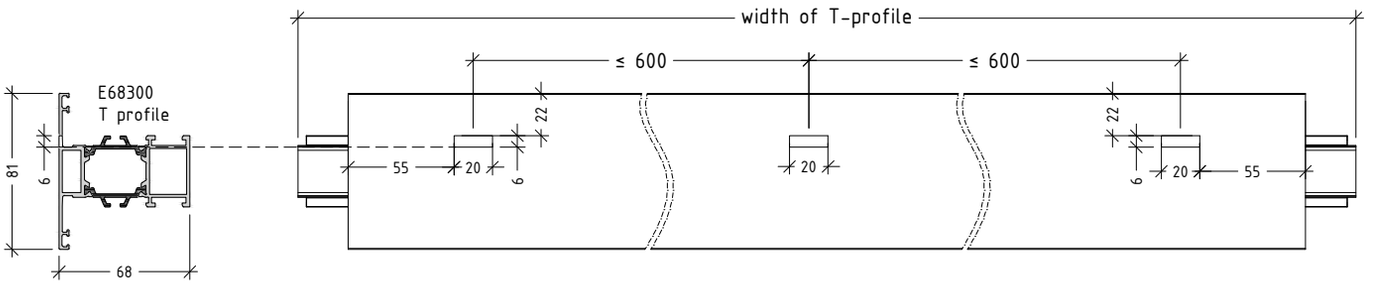
Additional treatment of profiles after cutting
T profile E68300 – machining for visible visible drainage and connecting to the frame

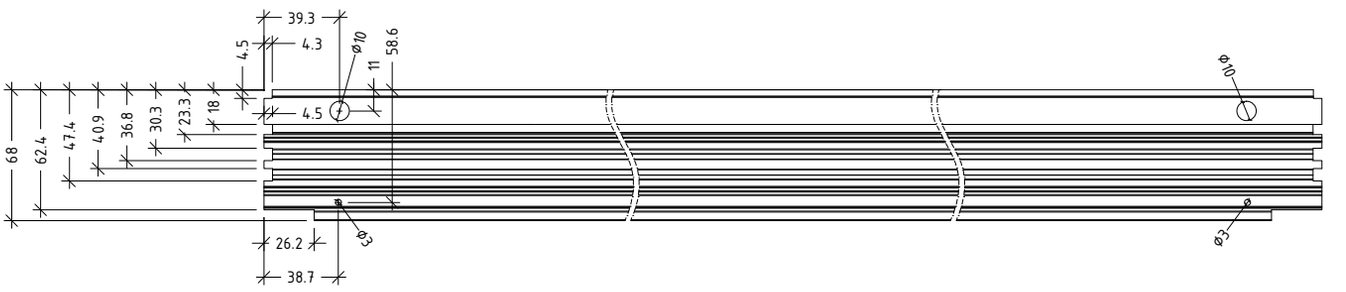
exterior view







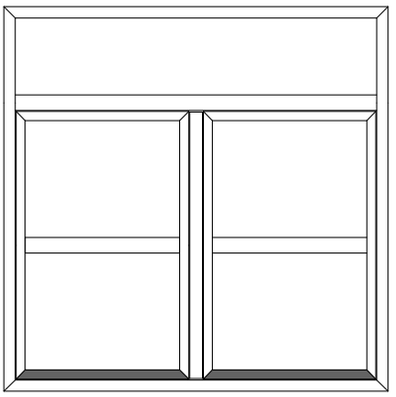


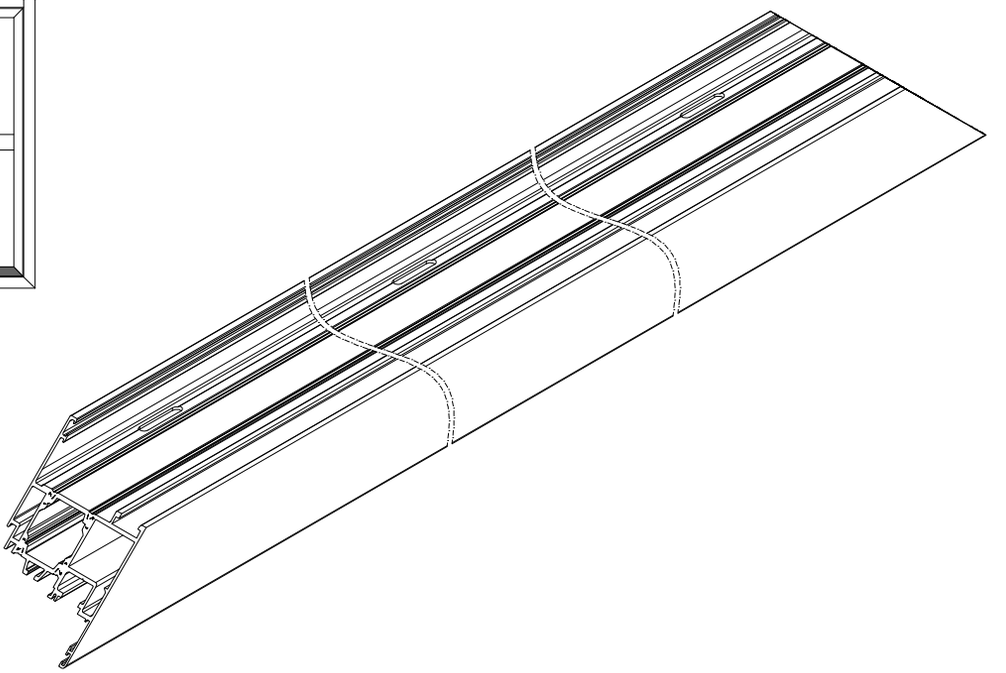


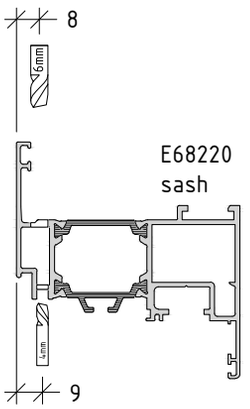
M68-P3

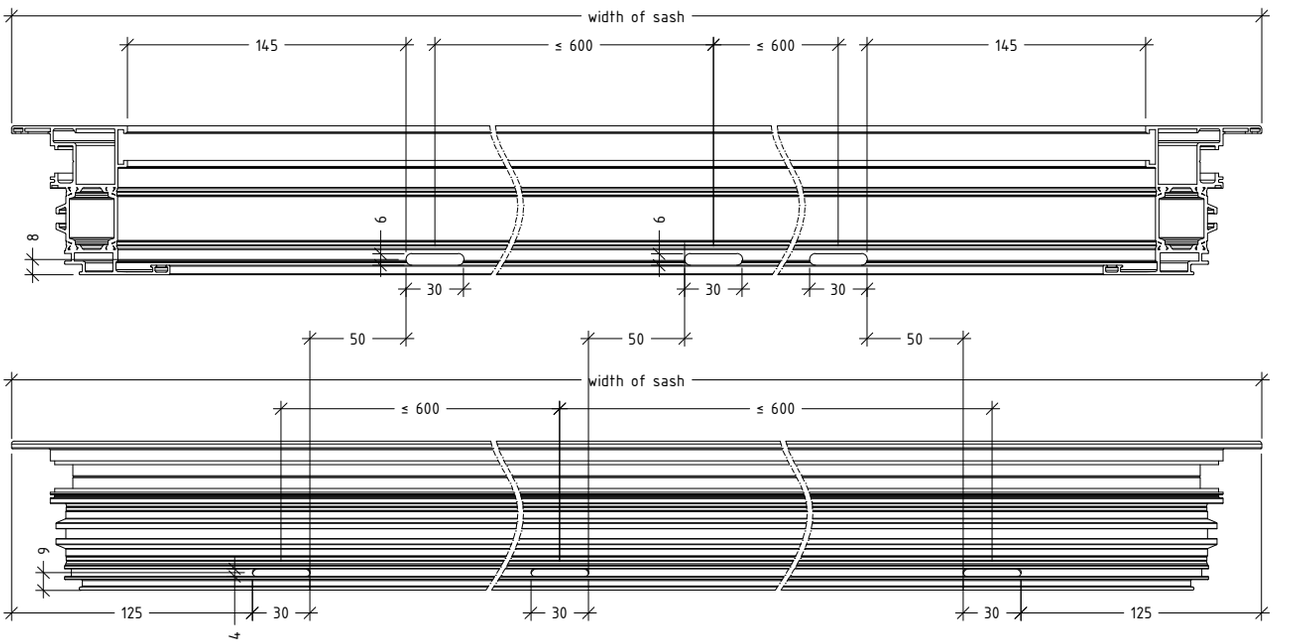
Additional treatment of profiles after cutting
Sash E68220 – machining for drainage

exterior view







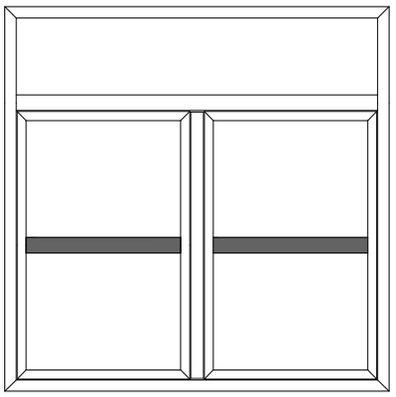


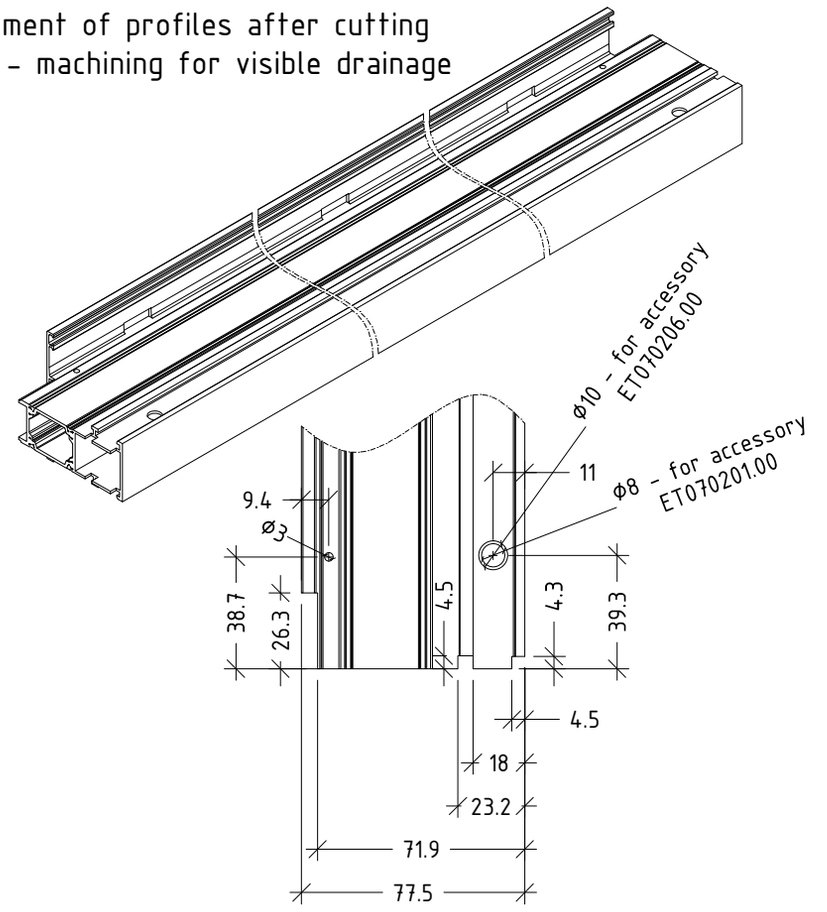
Note:
This machining is valid for all the sash profiles in the system with PVC groove!

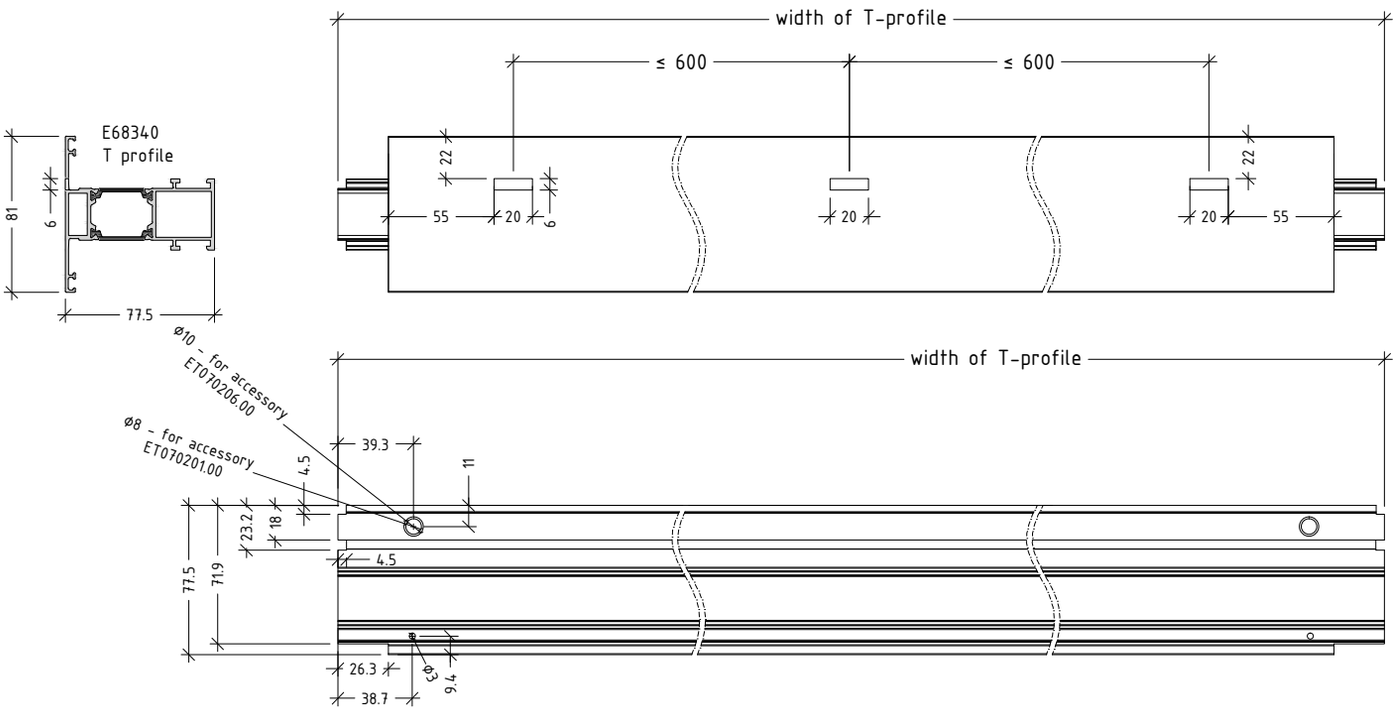
M68-P4

Additional treatment of profiles after cutting
T-profile E68340 - machining for visible drainage

exterior view



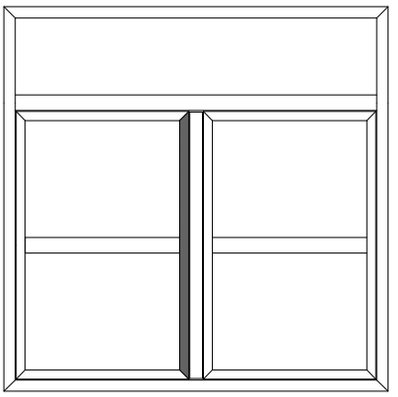




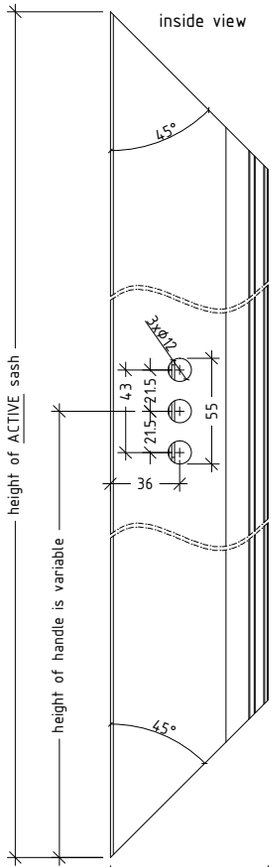
M68-P5

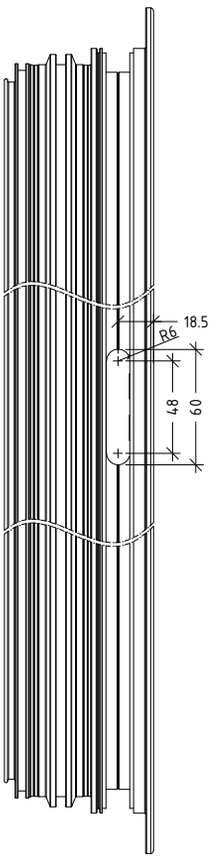
Additional treatment of profiles after cutting
Sash E68220 – machining for handle on active sash

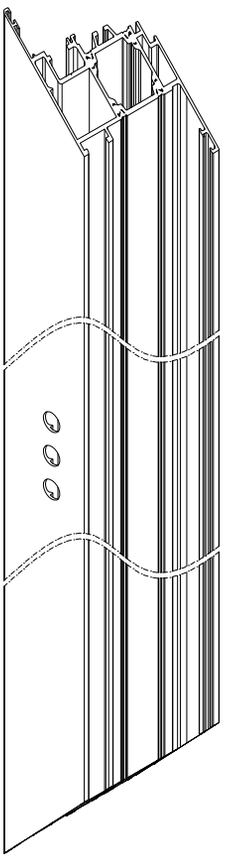
exterior view



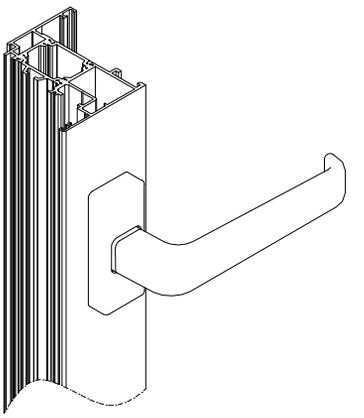
inside view





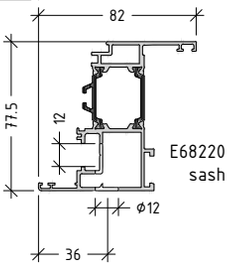


machining for GU mechanism



NOTE:

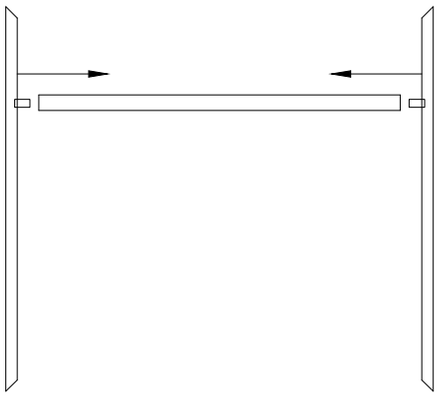
- For different cases active and passive sash positions varied!
- For different hardware the machining for handle may not fit!
(use mounting scheme for hardware supplier!!)

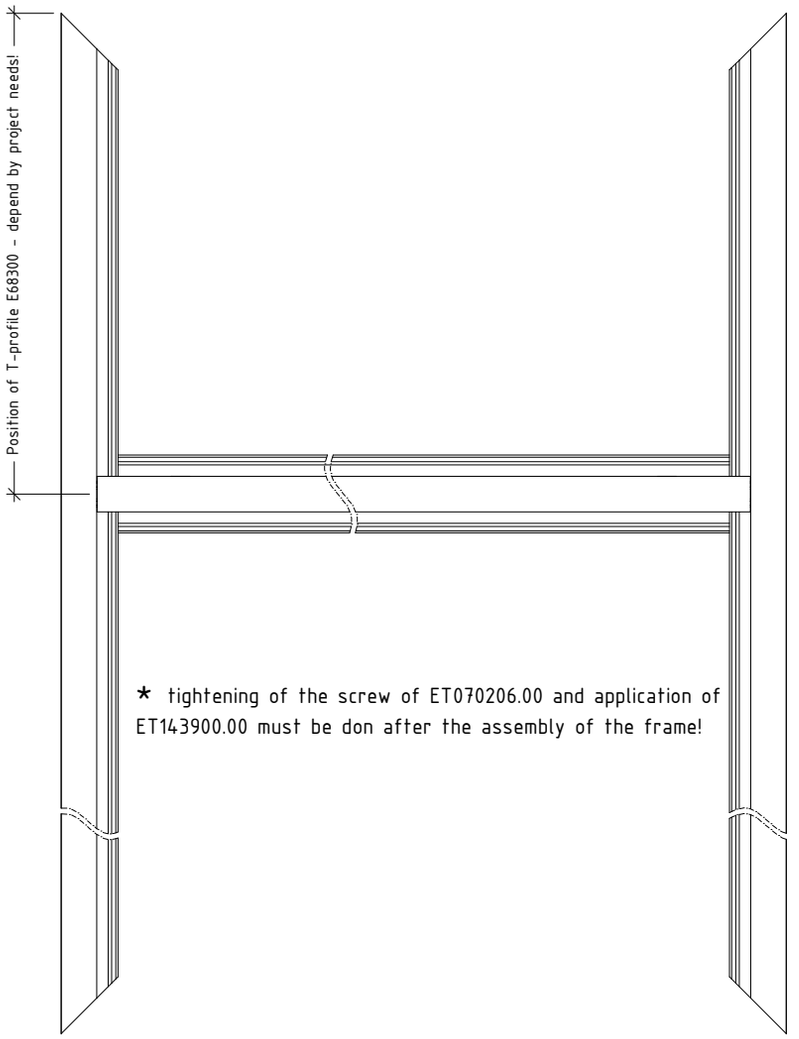


Note:
This machining is valid for all the sash profiles with PVC groove in the system

M68-P6

Sequence for mounting of T-profile E68300 to the frame E68100

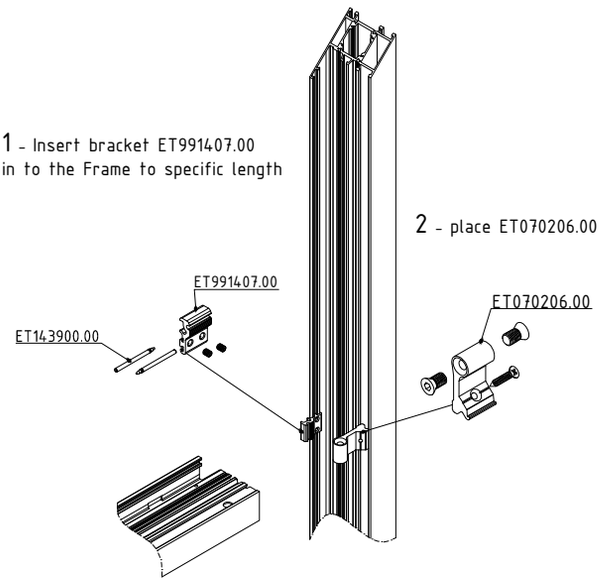




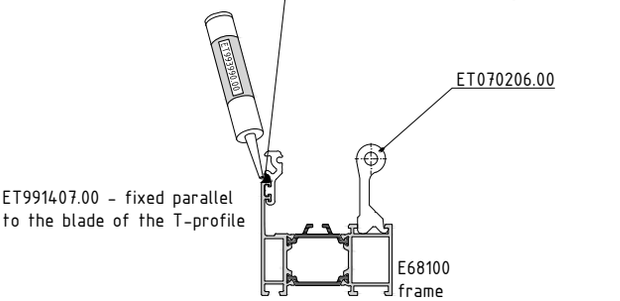
* tightening of the screw of ET070206.00 and application of ET143900.00 must be don after the assembly of the frame!

1 - Insert bracket ET991407.00 in to the Frame to specific length

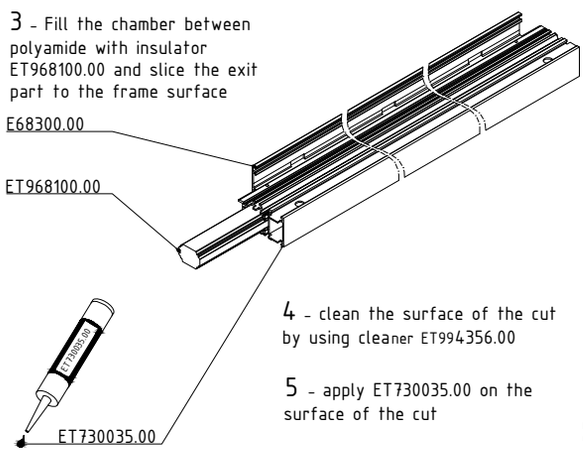
2 - place ET070206.00



Apply silicone to the indicated place before final frame assembly



3 - Fill the chamber between polyamide with insulator ET968100.00 and slice the exit part to the frame surface



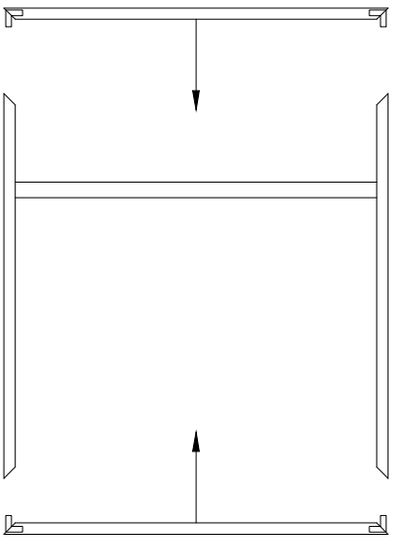
4 - clean the surface of the cut by using cleaner ET994356.00

5 - apply ET730035.00 on the surface of the cut

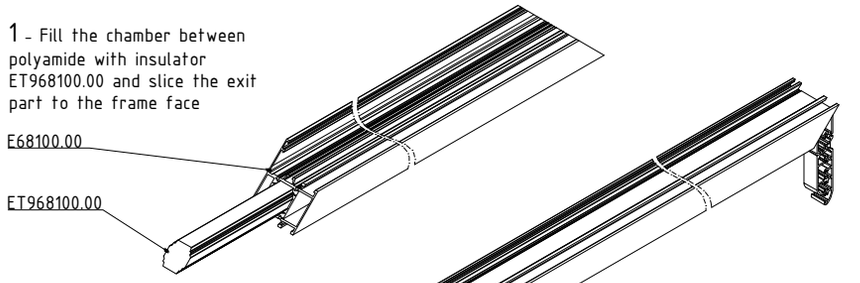
Note:
This mounting sequence is valid for all the frames in the system

M68-P7

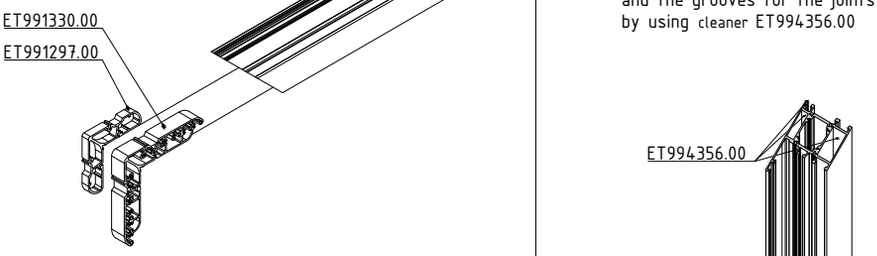
Sequence for assembly the frame E68100



1 - Fill the chamber between polyamide with insulator ET968100.00 and slice the exit part to the frame face

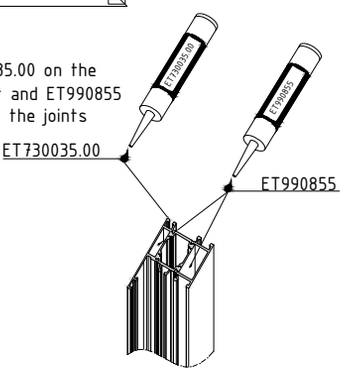


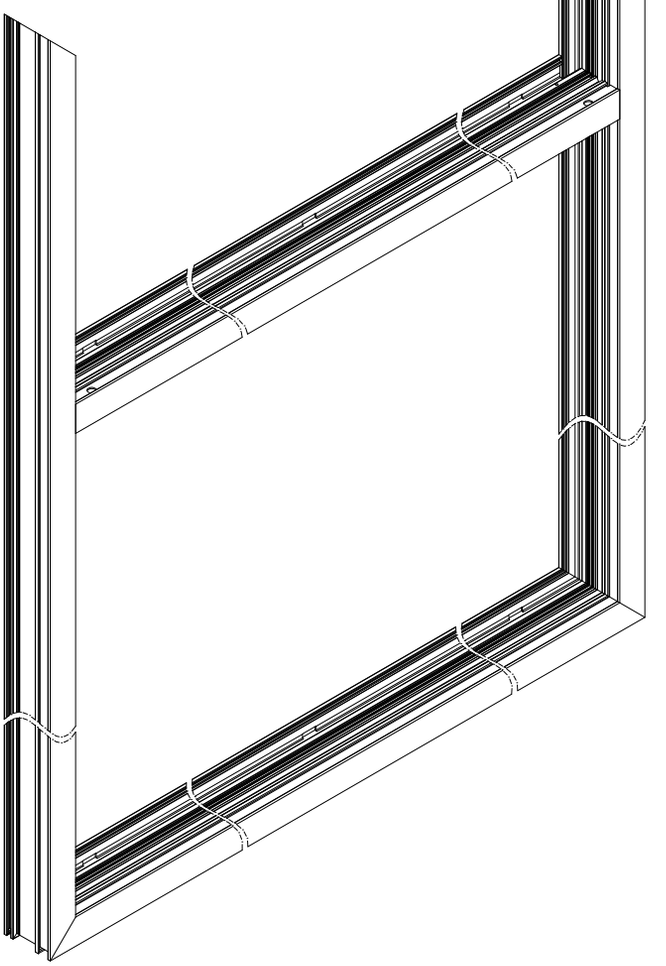
4 - put the joints in the chambers of frame E68100



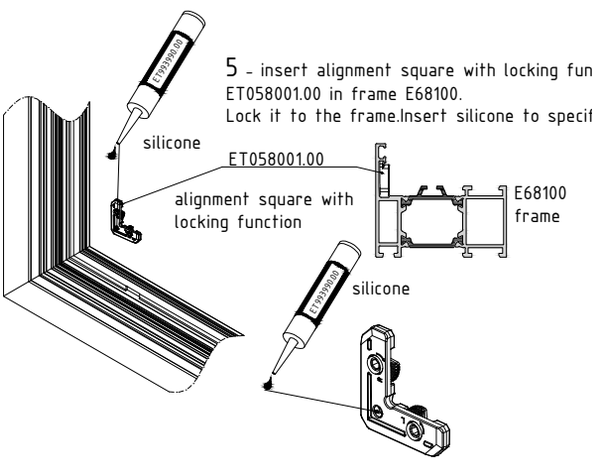
2 - clean the surface of the cut and the grooves for the joints by using cleaner ET994356.00

3 - apply ET730035.00 on the surface of the cut and ET990855 in the grooves for the joints





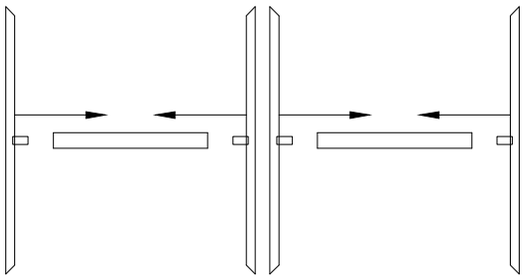
5 - insert alignment square with locking function ET058001.00 in frame E68100.
Lock it to the frame.Insert silicone to specific point

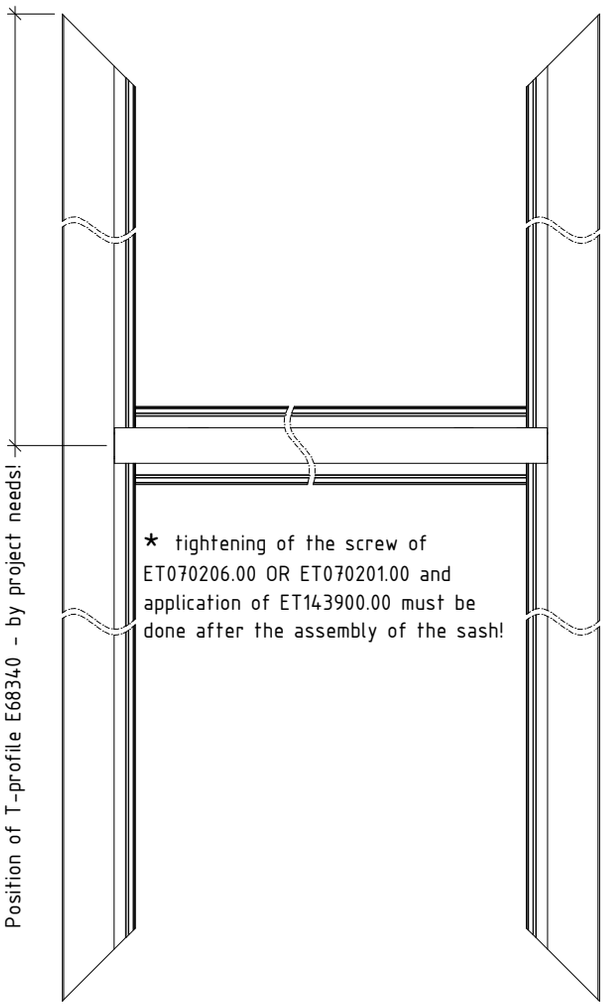


Note:
* This mounting sequence is valid for all the frame profiles in the system
by using corresponding joint corners FOR PVC HARDWARE and insulators
* Clean the joints before application

M68-P8

Sequence for mounting of T-profile E68340 to the sash E68220



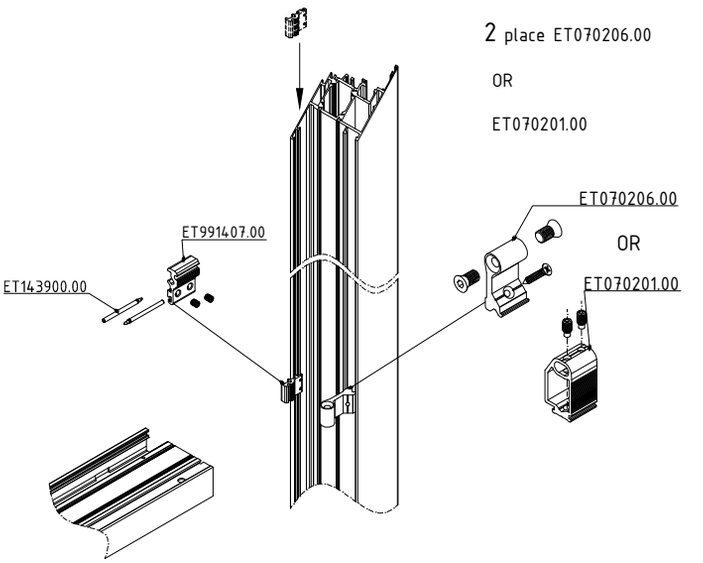


1 Insert bracket ET991407.00 in to the sash to specific length

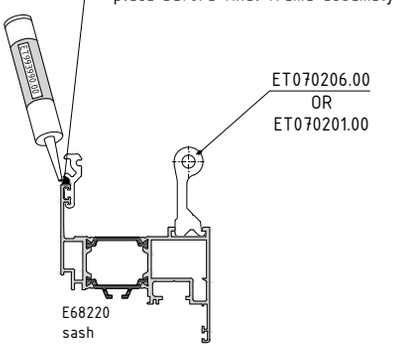
2 place ET070206.00

OR

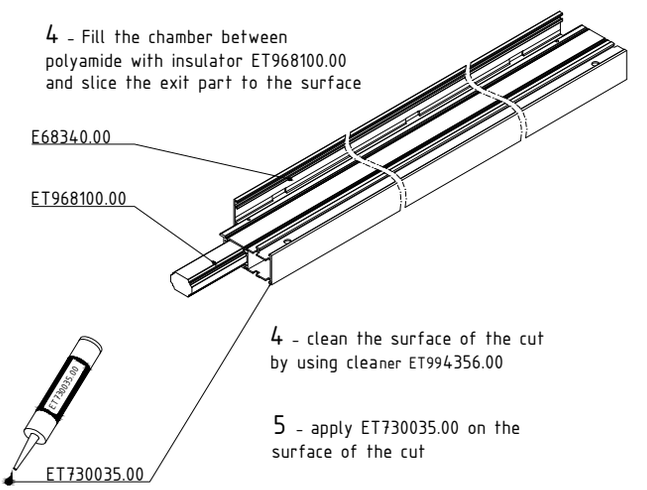
ET070201.00



3 Apply silicone to the indicated place before final frame assembly



4 - Fill the chamber between polyamide with insulator ET968100.00 and slice the exit part to the surface



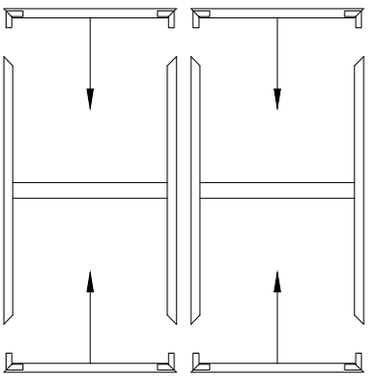
4 - clean the surface of the cut by using cleaner ET994356.00

5 - apply ET730035.00 on the surface of the cut

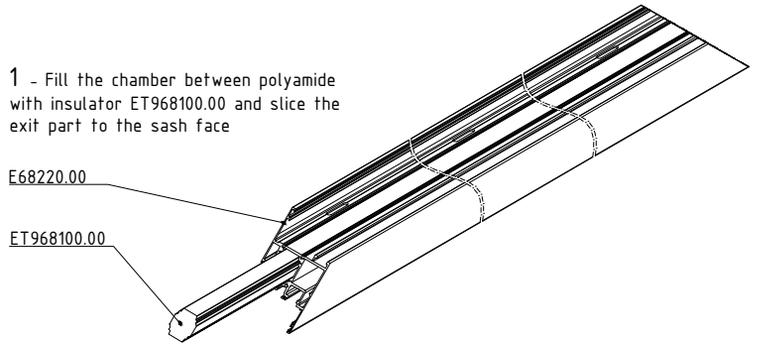
Note:
This mounting sequence is valid for all sash profile with Euro groove in the system

M68-P9

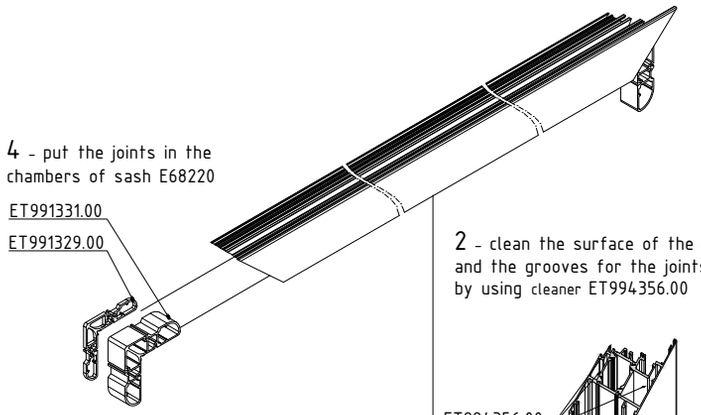
Sequence for assembly the sash E68220



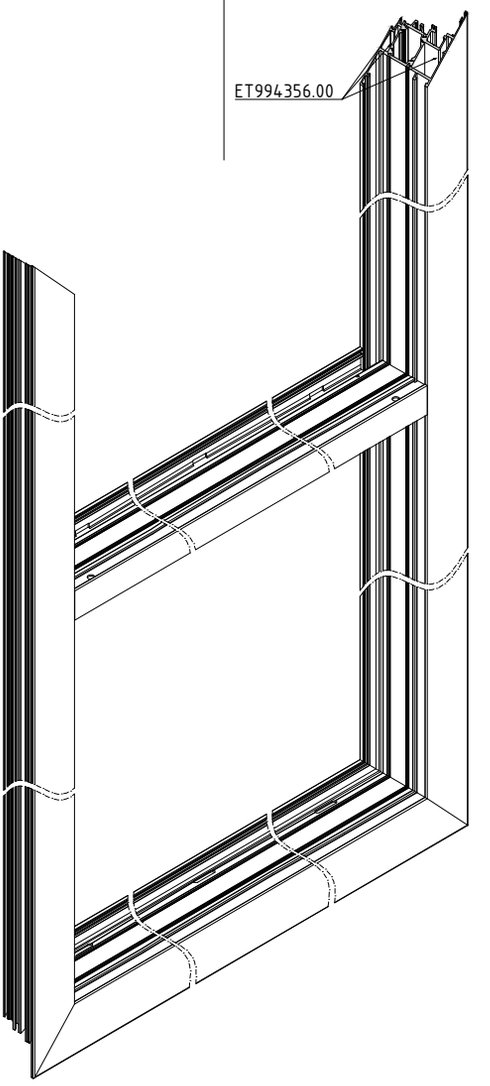
1 - Fill the chamber between polyamide with insulator ET968100.00 and slice the exit part to the sash face



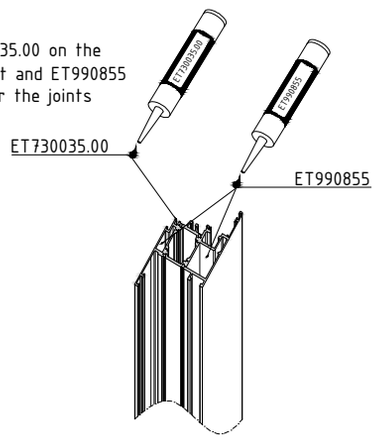
4 - put the joints in the chambers of sash E68220



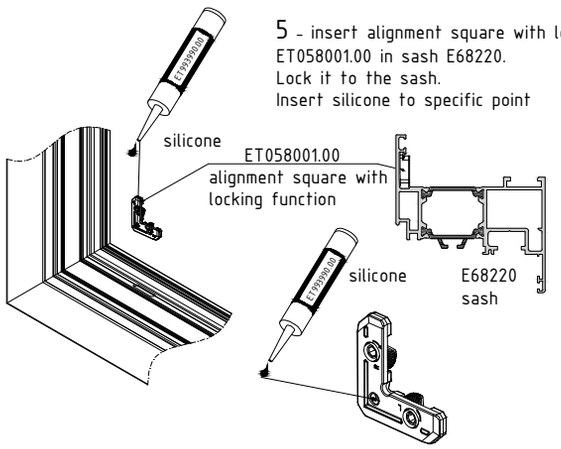
2 - clean the surface of the cut and the grooves for the joints by using cleaner ET994356.00



3 - apply ET730035.00 on the surface of the cut and ET990855 in the grooves for the joints



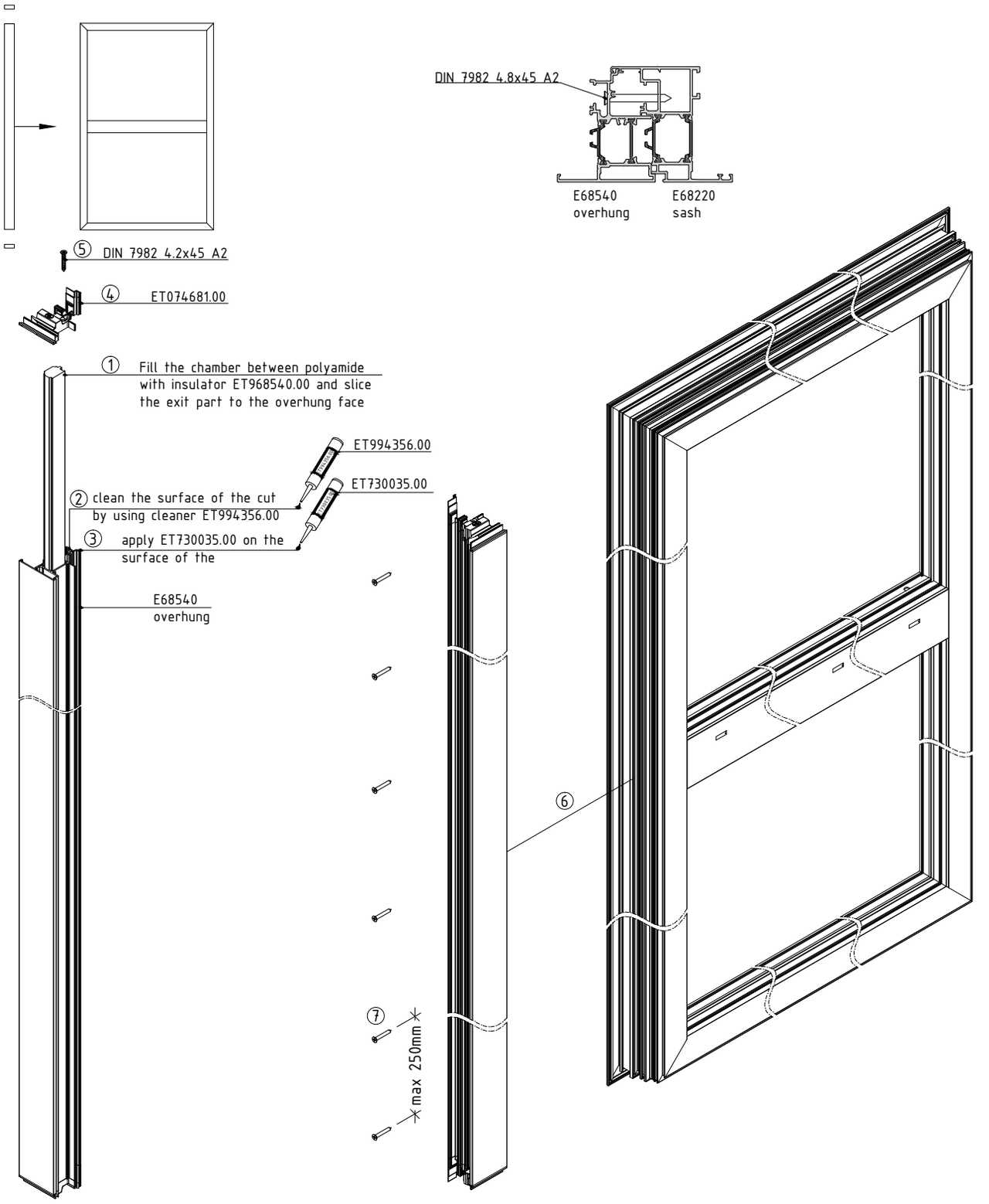
5 - insert alignment square with locking function ET058001.00 in sash E68220.
Lock it to the sash.
Insert silicone to specific point



Note:
* This mounting sequence is valid for all the sash profiles in the system by using corresponding joint corners and insulators
* Clean the joints before application

M68-P10

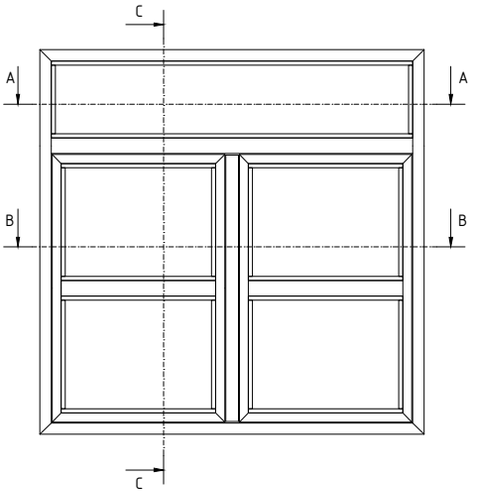
Sequence for assembly the E68540 overhung and mounting to the sash E68220



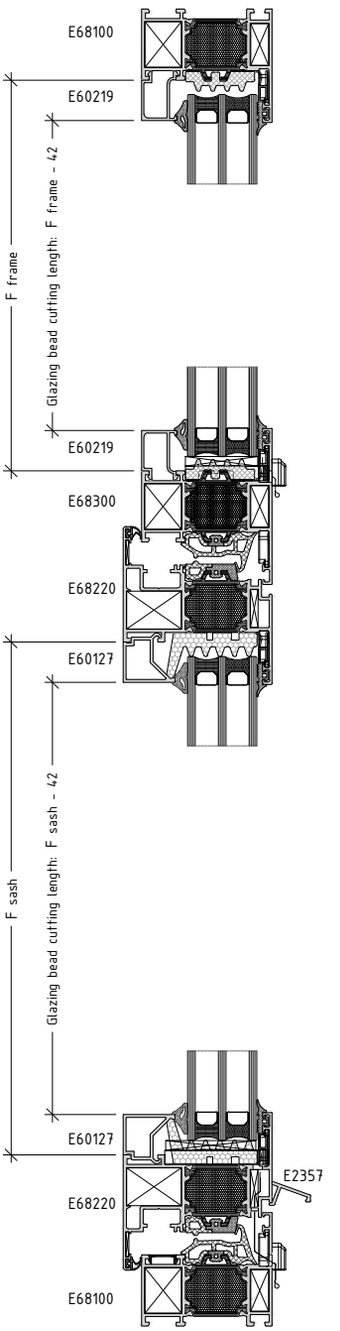
M68-P11

Sequence for cutting of glazing bead

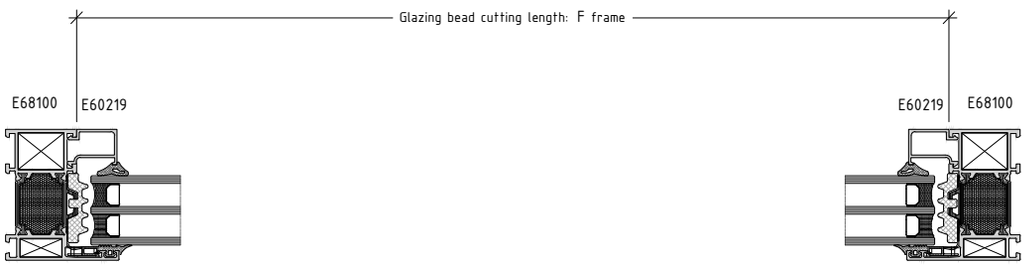
interior view



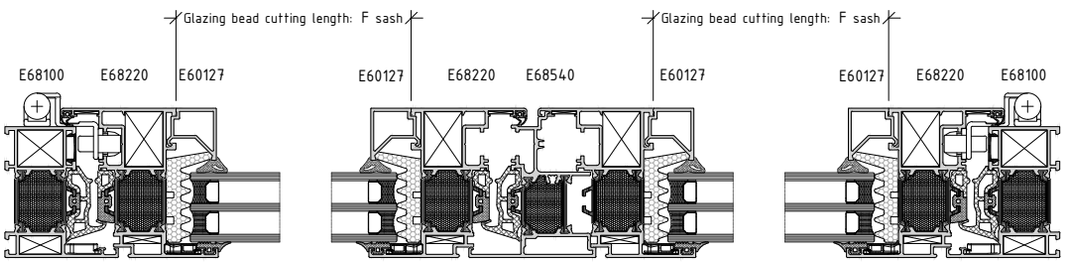
C - C



A - A

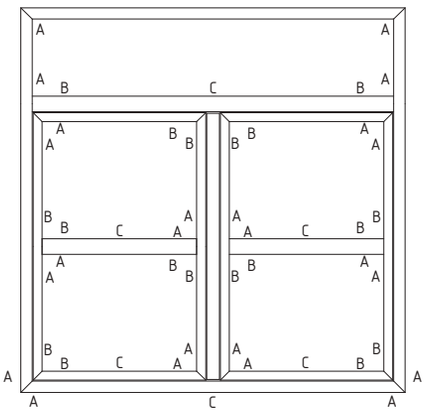


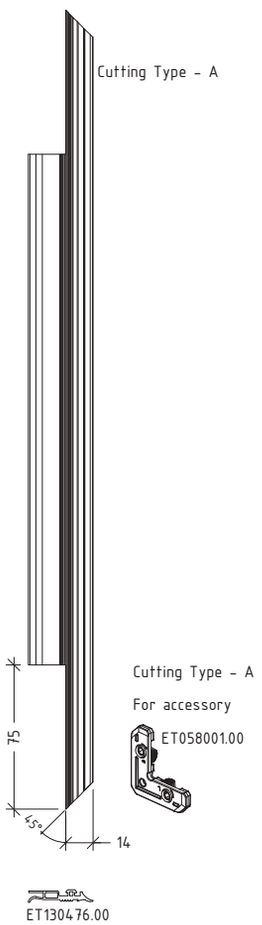
B - B

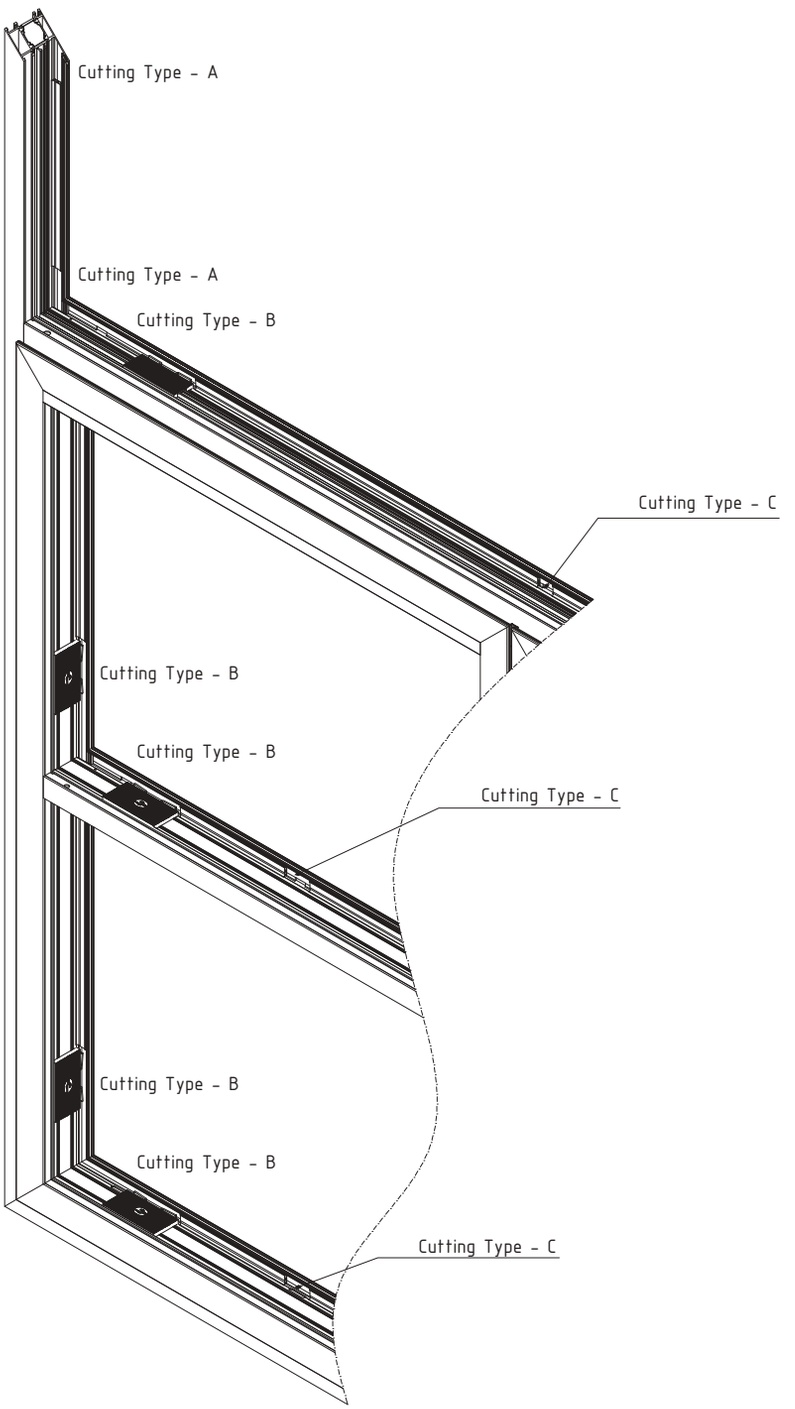


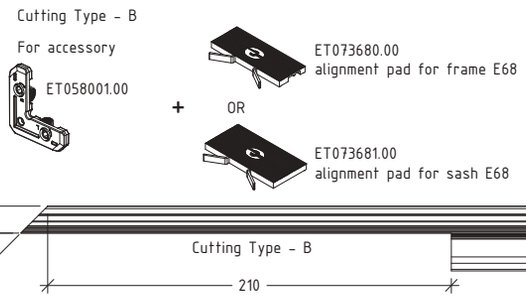
M68-P12

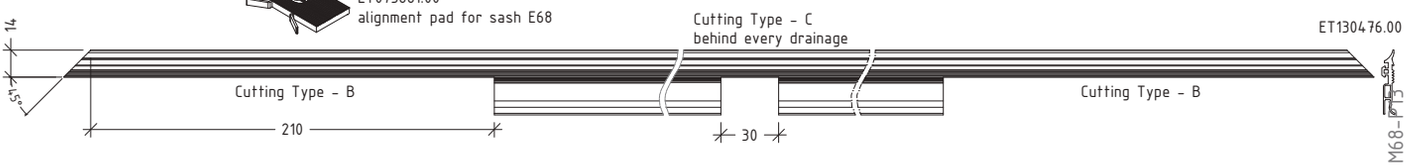
Sequence for cutting of gasket ET130476.00





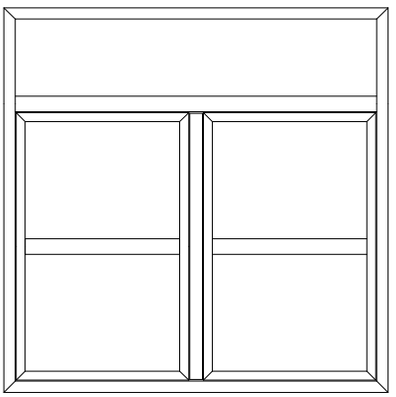


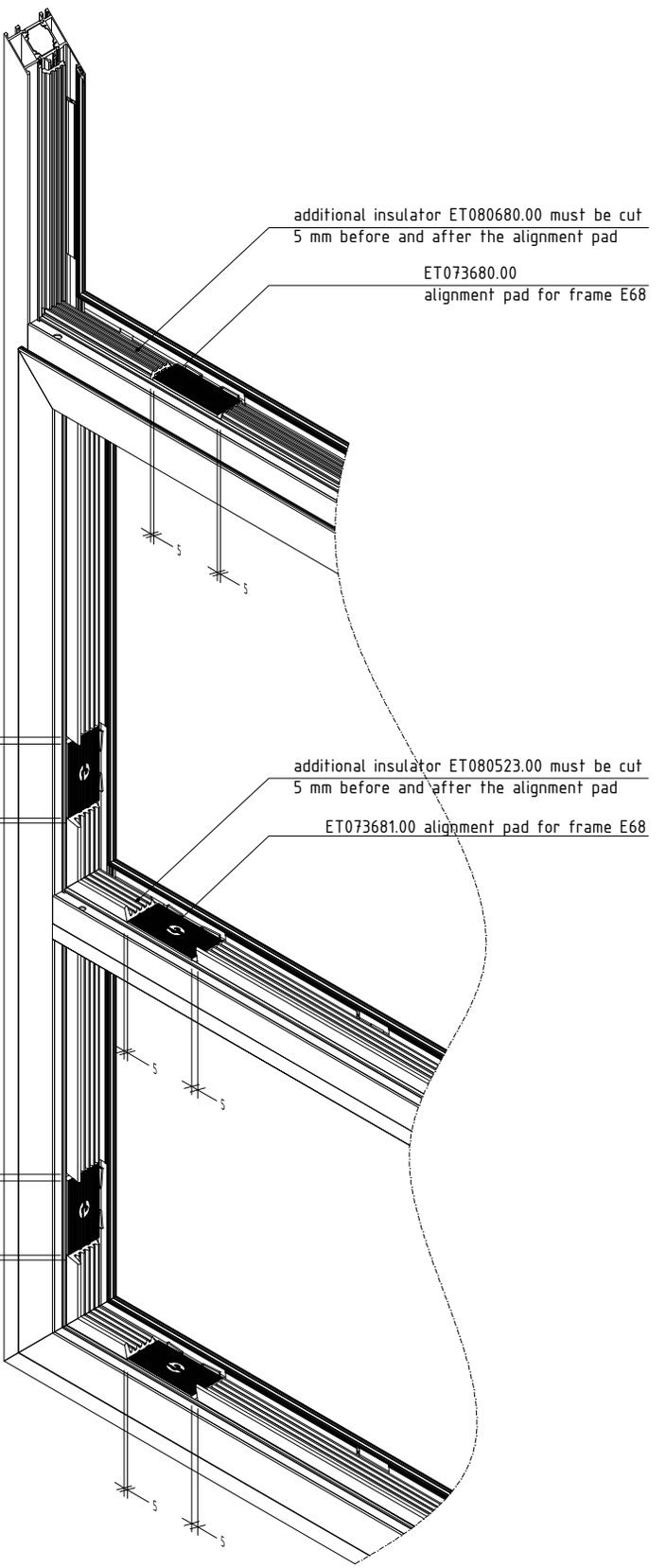




Sequence for cutting of additional insulators

exterior view





ET080680.00

ET073680.00
alignment pad for frame E68

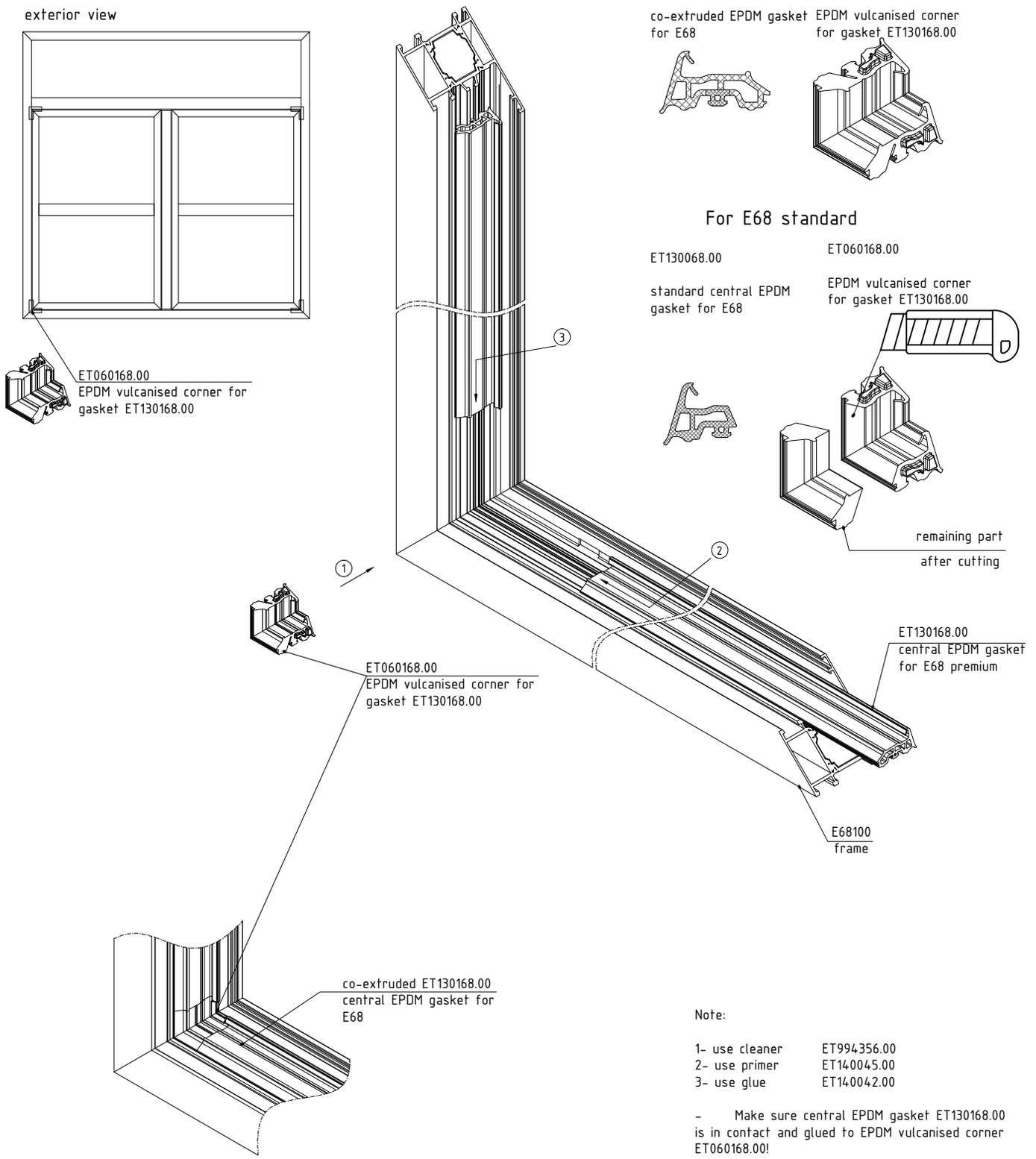
ET080523.00

ET073681.00
alignment pad for sash E68

* ET080680.00 or ET080523.00 is applied after the application of the glazing pane

M68-P14

Sequence for mounting central EPDM gasket to the frame for E68



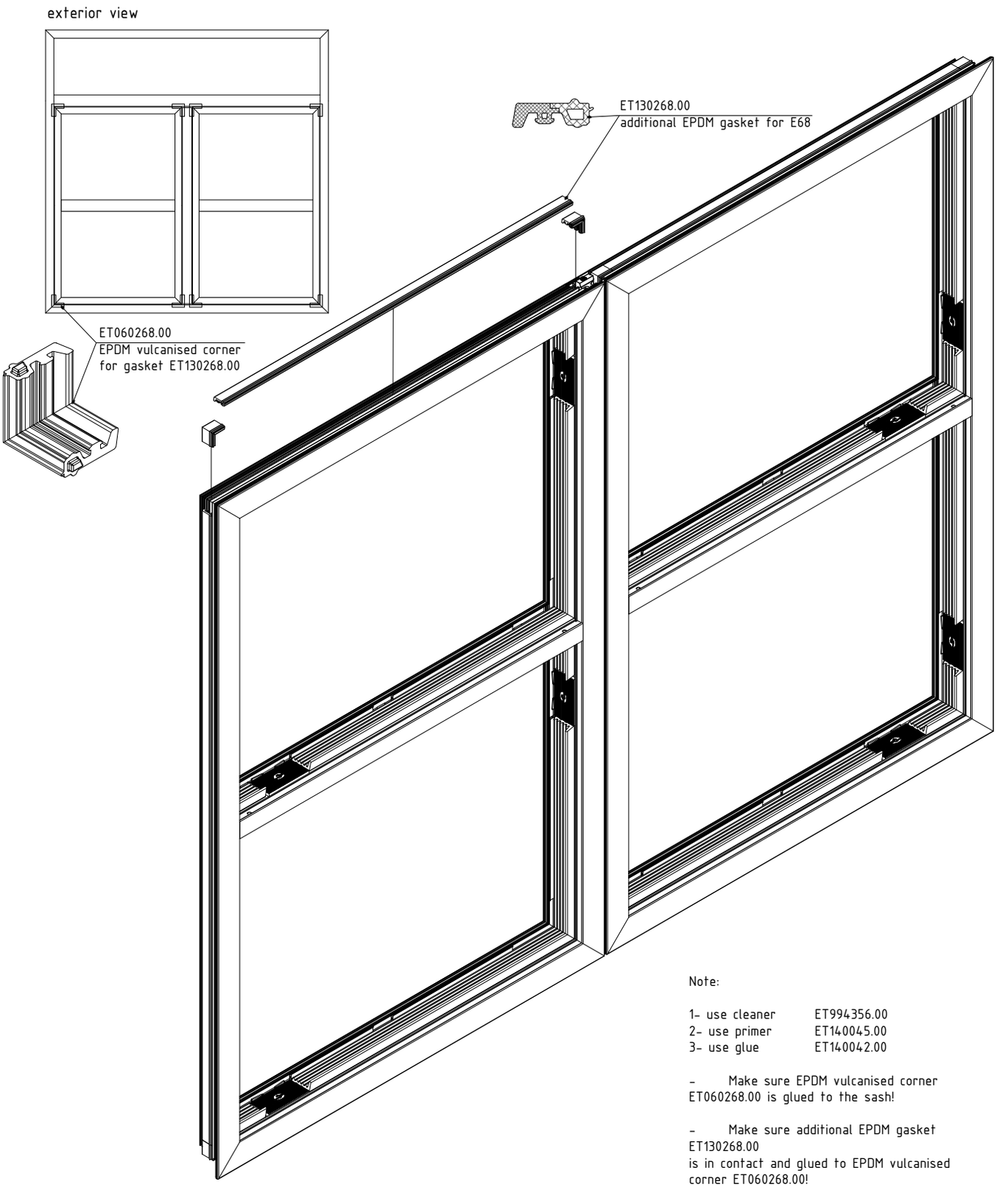
Note:

1- use cleaner	ET994356.00
2- use primer	ET140045.00
3- use glue	ET140042.00

- Make sure central EPDM gasket ET130168.00 is in contact and glued to EPDM vulcanised corner ET060168.00!

M68-P15

Sequence for mounting additional EPDM gasket to the sash for E68



Note:

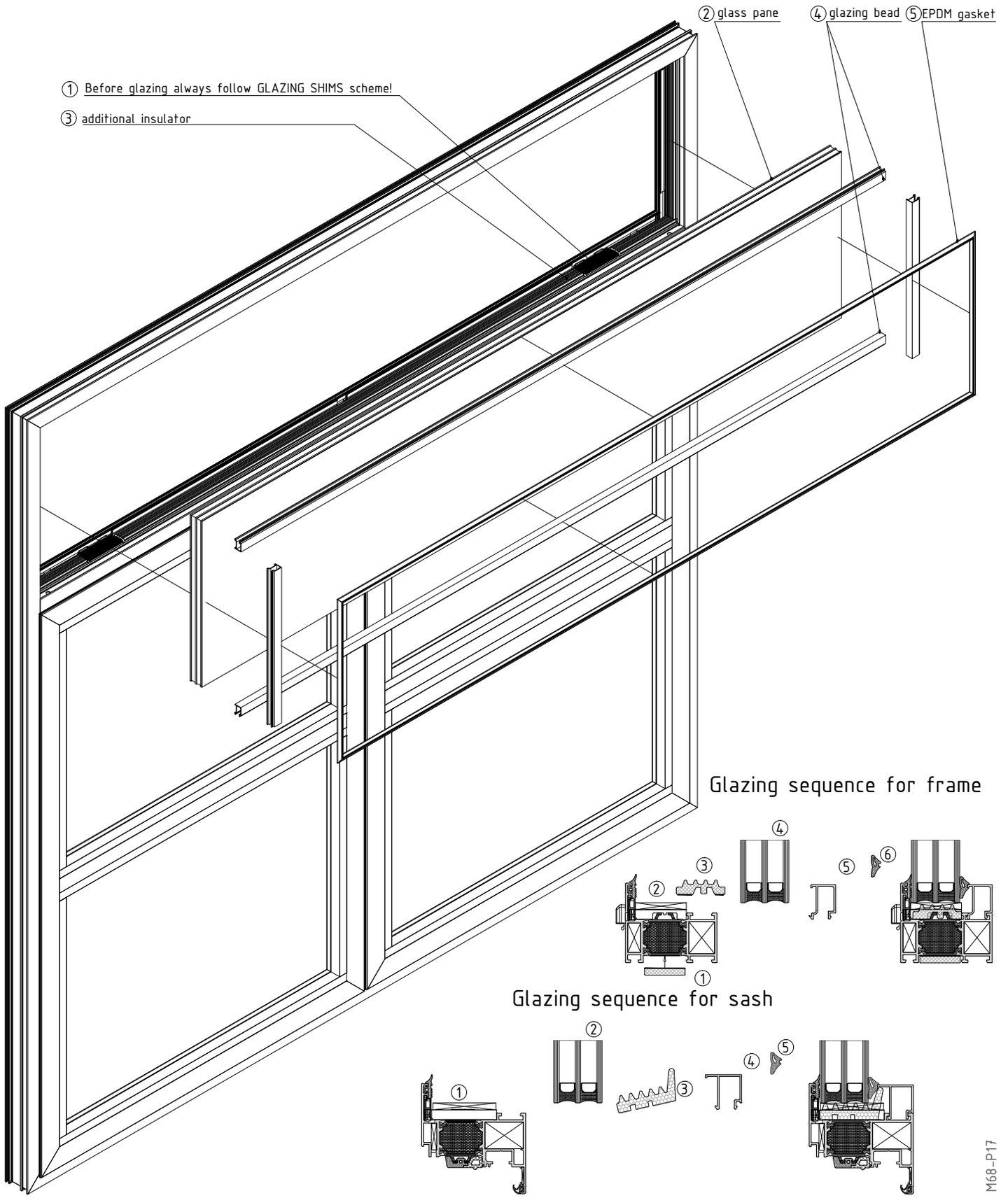
1- use cleaner ET994356.00
2- use primer ET140045.00
3- use glue ET140042.00

- Make sure EPDM vulcanised corner ET060268.00 is glued to the sash!

- Make sure additional EPDM gasket ET130268.00 is in contact and glued to EPDM vulcanised corner ET060268.00!

M68-P16

Sequence for mounting glass pane; glazing bead and gasket



Glazing sequence for frame

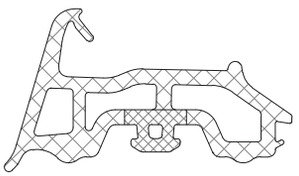
Glazing sequence for sash

M68-P17

ACCESSORIES

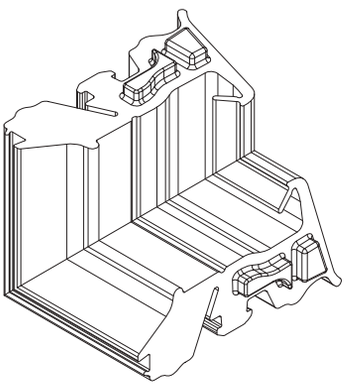
code/description	package/pcs	colour
ET 130168.00	20	●

central EPDM gasket for
E68 premium



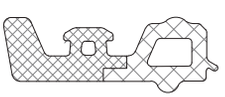
ET 060168.00	50	●

EPDM vulcanised corner for
gasket ET130168.00



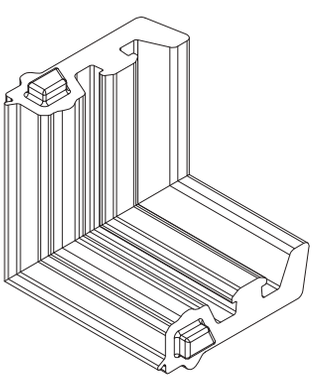
ET 130268.00	50	●

additional EPDM gasket for
E68



ET 060268.00	50	●

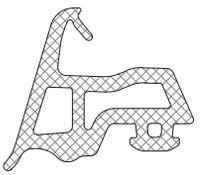
EPDM vulcanised corner for
gasket ET130268.00



A68-1

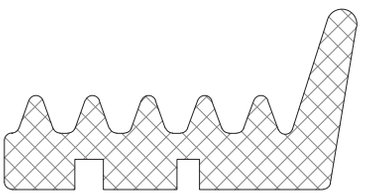
code/description	package/pcs	colour
ET 130068.00	30	●

central EPDM gasket for
E68 standard



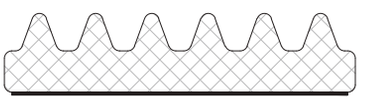
ET 080523.00	2	●

additional insulator for
frame and sash



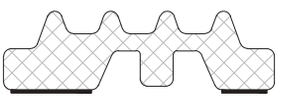
ET 080681.00	2	●

additional insulator for sash
E68



ET 080680.00	2	●

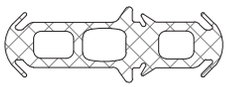
additional insulator for frame
E68



A68-2

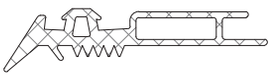
code/description	package/pcs	colour
ET 991275.00	50	●

EPDM gasket for expansion joint



ET 130476.00	60	●

glazing EPDM gasket 3 mm

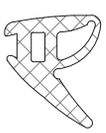


ET 130176.00	80	●

glazing EPDM gasket press-in 5-6 mm

ET 130177.00	60	●

glazing EPDM gasket press-in 7-8 mm



A68-3

code/description	package/pcs	colour
ET 990619.00	125	●

glazing EPDM gasket
press-in 5 mm

ET 990620.00	125	●

glazing EPDM gasket
press-in 6 mm

ET 130207.00	75	●

glazing EPDM gasket
press-in 7 mm

ET 130208.00	40	●

glazing EPDM gasket
press-in 8 mm

A68-4

code/description	package/pcs	colour
ET 130210.00	40	●

glazing EPDM gasket
press-in 10 mm

ET 130758.00	300	●

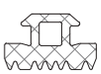
interior EPDM gasket
TOPLINE

ET 080529.00	30	gray

additional ins. for frame E68

ET 130505.00	100	●

wall-joining epdm gasket
(external) for fixed frame

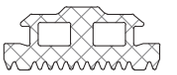


upon customer's request

A68-5

code/description	package/pcs	colour
ET 130506.00	180	●

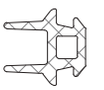
wall-joining epdm gasket
(internal)



upon customer's request

ET 130507.00	220	●

wall-joining EPDM gasket
perimetric(external) for fixed
frame

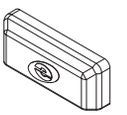


upon customer's request

ET 080199.00	6	●
ET 991308.00	6	○

PVC plug for euro groove

ET 074206.00	100	●

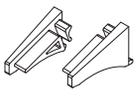


plastic drain cap20 x 6 mm

A68-6

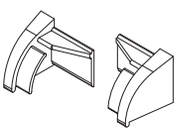
code/description	package/pcs	colour
ET 74629.00	200	●

plastic plug for drip profile
E2357



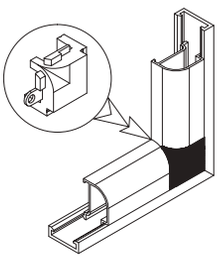
ET 074624.00	200	●

plastic plug for drip profile
E40820



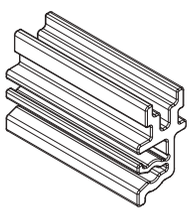
ET 059902.00	25	MF
ET 059902.02	25	●
ET 059902.01	25	●

corner for round bead



ET 074908.00	100 pcs	●

Clips for profile E68

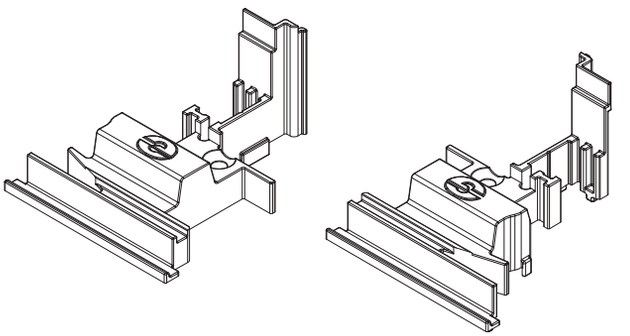


A68-7

code/description	package/pcs	colour
ET 074680.00	5	●

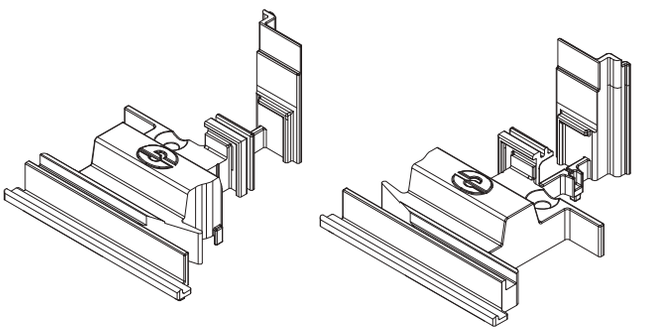
~~ET 991275.00~~

pair of plastic plugs for
secondary sash profile
E68500 euro groove



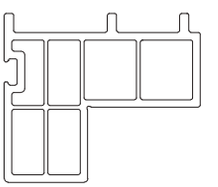
ET 074681.00	5	●

pair of plastic plugs for
secondary sash profile
E68540 PVC groove



ET 080068.00	8pcs x 6m	●

mounting PVC profile for E68



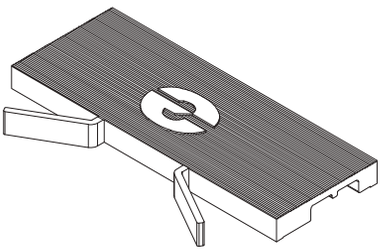
ET 080575.00	48	●

PVC mounting profile

A68-8

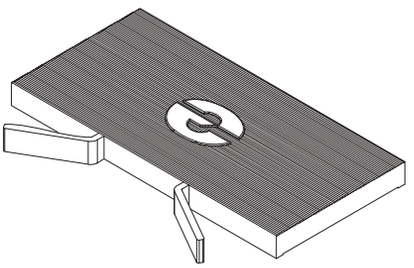
code/description	package/pcs	colour
ET 073680.00	50	●

alignment pad for frame E68



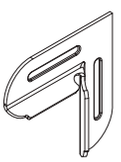
ET 073681.00	50	●

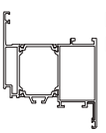
alignment pad for sash E68

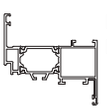


ET 991298.00	20	●

alignment square for
E68200 / E68201

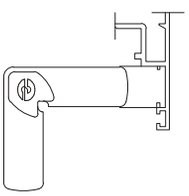






ET 057707.00	100	MF

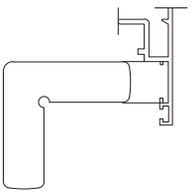
alignment square (plastic)
for E68220;E68221;E68225;E68226



A68-9

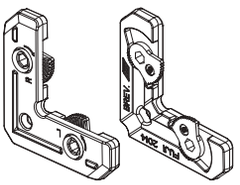
code/description	package/pcs	colour
ET 055509.00	100	INOX

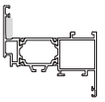
alignment square (INOX)
for E68220;E68221;E68225;E68226

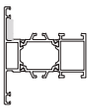


ET 058001.00	250	MF

alignment square with
locking function

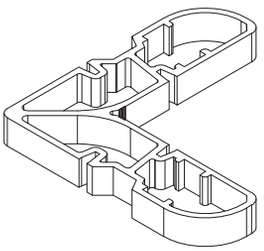




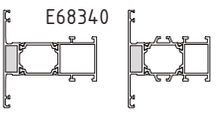


ET 991297.00	250	MF

extruded aluminium corner
bracket 9.3 mm for
E68100 / E68300
E68105 / E68340

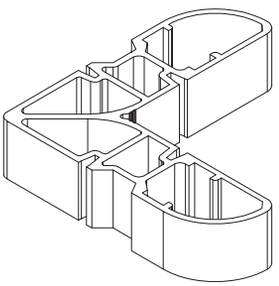


attention
always use epoxy resin
for long lasting joining

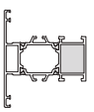


ET 991295.00	100	MF

extruded aluminium corner
bracket 18.9 mm for
E68100 / E68300 / E68105



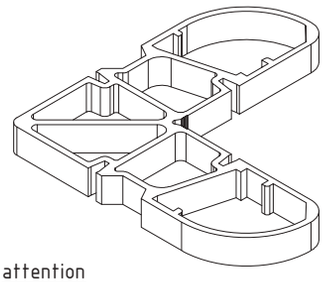
attention
always use epoxy resin
for long lasting joining



A68-10

code/description	package/pcs	colour
ET 991124.00	200	MF

extruded aluminium corner bracket 9.3 mm for E68101

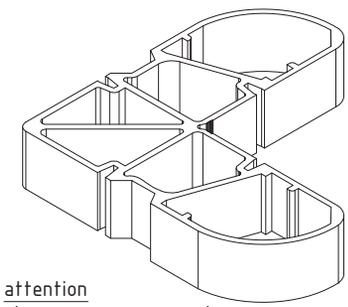


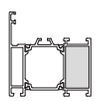
E68101

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 993066.00	100	MF

extruded aluminium corner bracket 18.9 mm for E68101



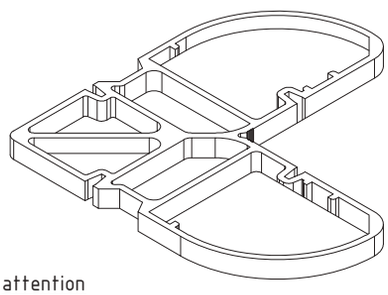


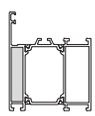
E68101

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054553.00	100	MF

extruded aluminium corner bracket 9.3 mm for E68102



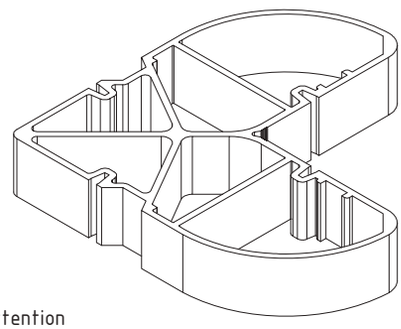


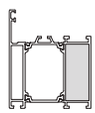
E68102

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054311.00	100	MF

extruded aluminium corner bracket 18.9 mm for E68102





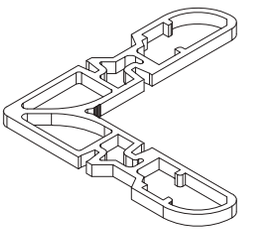
E68102

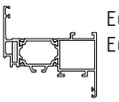
attention
always use epoxy resin
for long lasting joining

A68-11

code/description	package/pcs	colour
ET 991294.00	300	MF

extruded aluminium corner
bracket 3.8 mm for
E68200

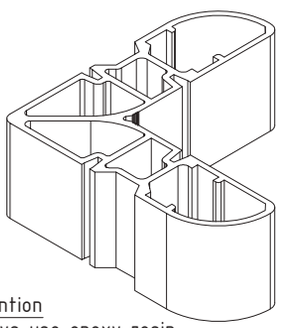


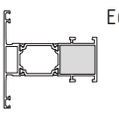


attention
always use epoxy resin
for long lasting joining

ET 991296.00	100	MF

extruded aluminium corner
bracket 28.4 mm for
E68200 / E68340

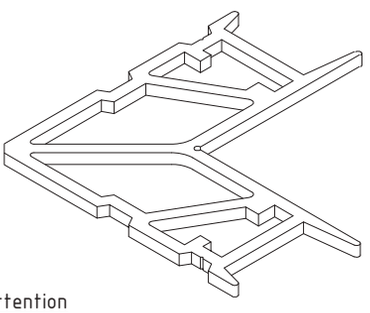


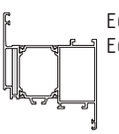


attention
always use epoxy resin
for long lasting joining

ET 991125.00	300	MF

extruded aluminium corner
bracket 3.8 mm for
E68201

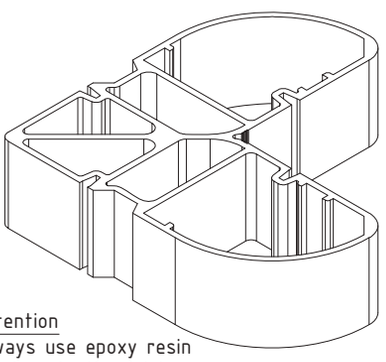


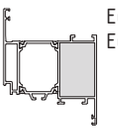


attention
always use epoxy resin
for long lasting joining

ET 991123.00	50	MF

extruded aluminium corner
bracket 28.4 mm for
E68201



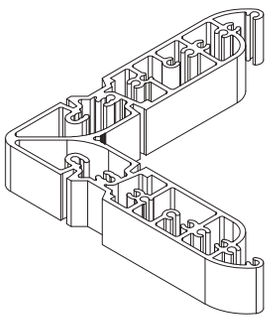


attention
always use epoxy resin
for long lasting joining

A68-12

code/description	package/pcs	colour
ET 991330.00	90	MF

GU



E68100

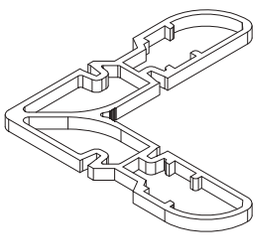
E68105

extruded aluminium corner
bracket 18.9 mm for
E68100 / E68105

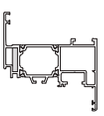
attention
always use epoxy resin
for long lasting joining

ETEM mechanism for side hung window

ET 991329.00	300	MF



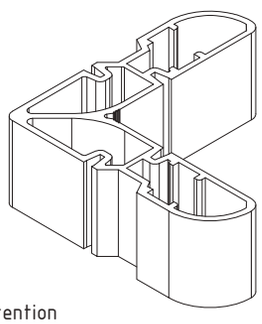
E68220
E68225



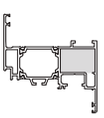
extruded aluminium corner
bracket 3.9 mm for
E68220

attention
always use epoxy resin
for long lasting joining

ET 991331.00	100	MF



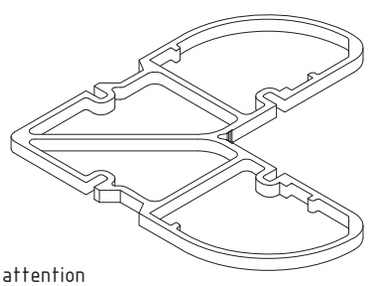
E68220
E68225



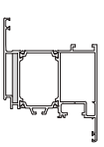
extruded aluminium corner
bracket 28.3 mm for
E68220/E68225

attention
always use epoxy resin
for long lasting joining

ET 054741.00	–	MF



E68221
E68226



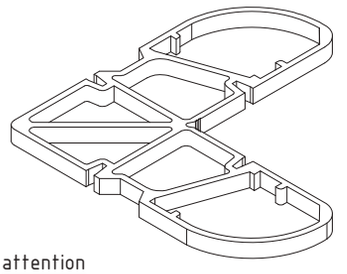
extruded aluminium corner
bracket 3.9 mm for
E68221

attention
always use epoxy resin
for long lasting joining

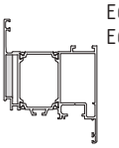
A68-13

code/description	package/pcs	colour
ET 054743.00	–	MF

extruded aluminium corner
bracket 5.2 mm for
E68221

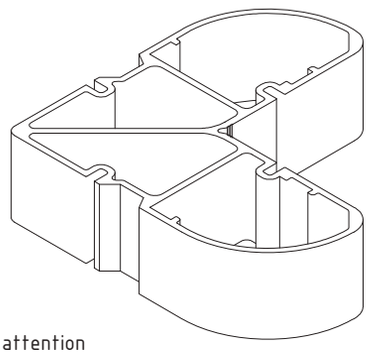


attention
always use epoxy resin
for long lasting joining

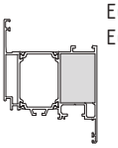


code/description	package/pcs	colour
ET 054742.00	–	MF

extruded aluminium corner
bracket 28.3 mm for
E68221

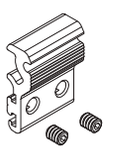


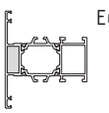
attention
always use epoxy resin
for long lasting joining

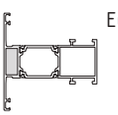


code/description	package/pcs	colour
ET 991407.00	10	MF

T – bracket external side for
E68300 / E68340

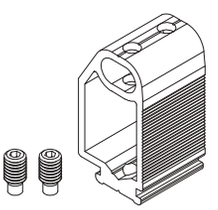


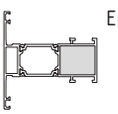




code/description	package/pcs	colour
ET 070201.00	100	MF

T – bracket internal side for
E68340

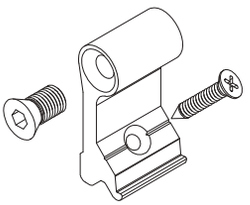


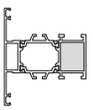


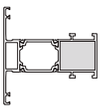
A68-14

code/description	package/pcs	colour
ET 070206.00	10	MF

T - bracket internal side for
E68300 / E68340

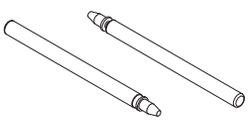






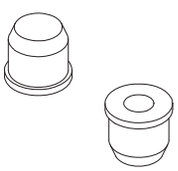
ET 143900.00	100	MF

roll pin 3 x 6 mm with andle



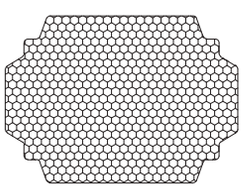
ET 143914.00	100	MF

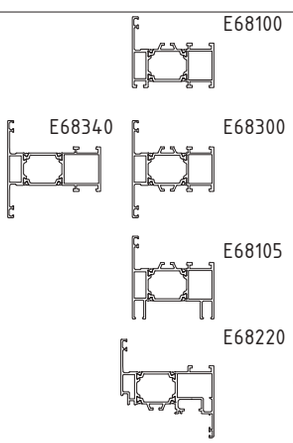
roll pin 4/8 x 6.5 mm - inox



ET 968100.00	9pcs x 700mm	standard

additional insulator for
E68100
E68105
E68300
E68340
E68220

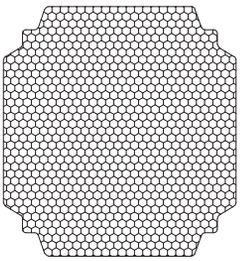


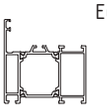


A68-15

code/description	package/pcs	colour
ET 968101.00	9pcs x 700mm	standard

additional insulator for
E68101

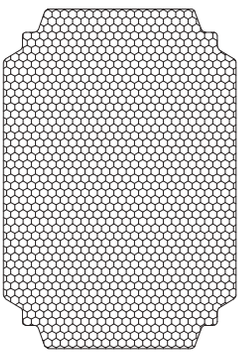


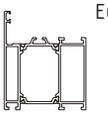


E68101

ET 968102.00	9pcs x 700mm	standard

additional insulator for
E68102

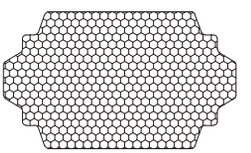


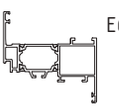


E68102

ET 968200.00	9pcs x 700mm	standard

additional insulator for
E68200

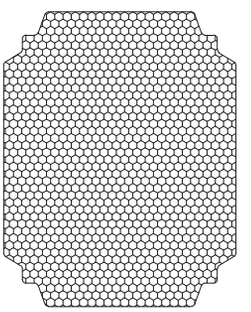


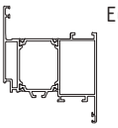


E68200

ET 968201.00	9pcs x 700mm	standard

additional insulator for
E68201



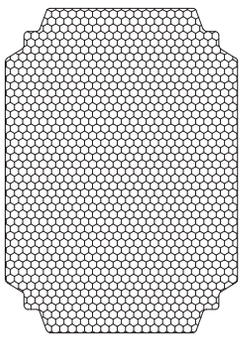


E68201

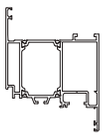
A68-16

code/description	package/pcs	colour
ET 968221.00	9pcs x 700mm	standard

additional insulator for E68221

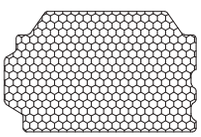


E68221

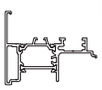


ET 968500.00	9pcs x 700mm	standard

additional insulator for E68500

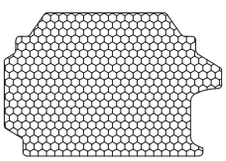


E68500

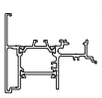


ET 968540.00	9pcs x 700mm	standard

additional insulator for E68540

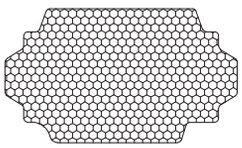


E68540

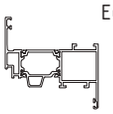


ET 968205.00	9pcs x 700mm	standard

additional insulator for E68205



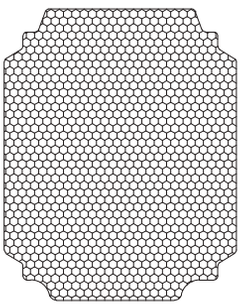
E68205



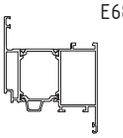
A68-17

code/description	package/pcs	colour
ET 968206.00	9pcs x 700mm	standard

additional insulator for
E68206

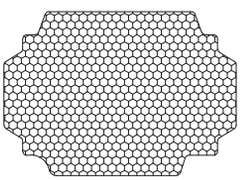


E68206

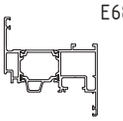


ET 968225.00	9pcs x 700mm	standard

additional insulator for
E68225

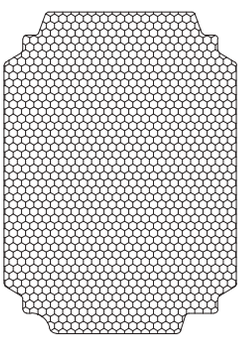


E68225

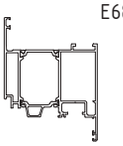


ET 968226.00	9pcs x 700mm	standard

additional insulator for
E68226



E68226



ET 995686.00	1	-

end milling tool for
E68300

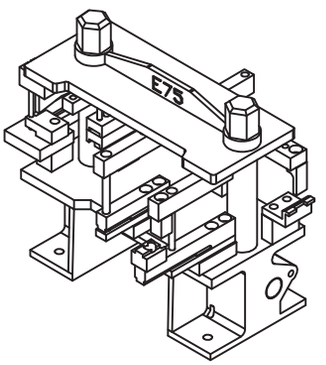
A68-18

code/description	package/pcs	colour
ET 995688.00	1	–

end milling tool for
E68340

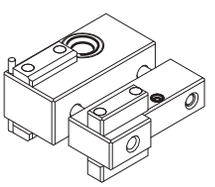
ET 162262.00	1	–

punching machine ETEM



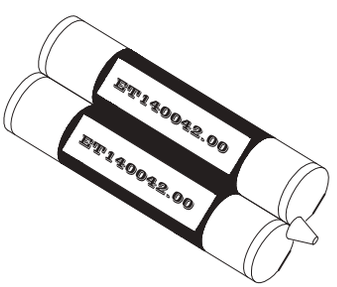
ET 162086.00	1	–

jig for T-profile



ET 140042.00	–	–

adhesive for corner brackets
ETEM 600ml



A68-19

code/description	package/pcs	colour
ET 140044.00	–	–

pistol

ET 140043.00	–	–

mixer

ET 140045.00	–	–

primer super bond 30ml

ET 730035.00	–	–

Vario protect

A68-20

code/description	package/pcs	colour
ET 750016.00	–	–

cleaner for Vario protect

1l

A68-21

CE MARKING

STANDARDS / REQUIREMENTS

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 the general safety requirements set out in the Construction Product Regulation 305/2011.

WHAT IS THE PURPOSE OF CE MARKING?

The CE marking 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?

Doors, windows and gates (except those intended to be used for internal communication only, for fire/smoke compartmentation and on escape routes) are covered by System 3 of assessment and verification of constancy of performance.
According to the Construction Product Regulation 305/2011, this system sets the following duties:

Tasks to be performed by the manufacturer	Tasks to be performed by Notified testing laboratory	Conformity accessment (the basis for CE marking, which is set by the final producer)
factory production control - FPC	Determination of the product type on the basis of type testing, type calculation, tabulated values, etc.	Declaration of performance issued by the manufacturer or his authorized representative based on test results.

LEGAL ACTS

- Construction Products Regulation (305/2011/EU - CPR) – replacing the Construction Products Directive (89/106/EEC - CPD)
- EN 14351-1:2006+A1:2010 - Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics

MAIN METHODS FOR OBTAINING TEST RESULTS BY THE MANUFACTURER

According to the Construction Product Regulation 305/2011 there are three main options for the manufacturers of windows and doors to obtain test results.

1

THE MANUFACTURER SELECTS A SAMPLE FOR TESTING AND CARRIES OUT FACTORY PRODUCTION CONTROL

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE MANUFACTURER OWNS THE TEST REPORT

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

2

PARTNER (SECOND MANUFACTURER PRODUCING PRODUCT WITH CORRESPONDING PRODUCT-TYPE) SELECTS A SAMPLE FOR TESTING AND CARRIES OUT FACTORY PRODUCTION CONTROL

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE PARTNER OWNS THE TEST REPORT

↓

THE MANUFACTURER CARRIES OUT FACTORY PRODUCTION CONTROL AND IS ALLOWED TO USE THE TEST RESULTS OF HIS PARTNER AFTER OBTAINING PARTNER'S AUTHORIZATION

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

3

THE SYSTEM PROVIDER SELECTS SAMPLES FOR TESTING

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE SYSTEM PROVIDER OWNS THE TEST REPORT

↓

THE MANUFACTURER CARRIES OUT FACTORY PRODUCTION CONTROL AND IS ALLOWED TO USE THE TEST RESULTS OF THE SYSTEM PROVIDER AFTER OBTAINING SYSTEM PROVIDER'S AUTHORIZATION

↓

- AGREEMENT BETWEEN THE MANUFACTURER AND THE SYSTEM PROVIDER
- INSTRUCTIONS FOR ASSEMBLING AND INSTALLATION OF THE SYSTEM PROVIDER RELEVANT FOR FPC OF THE MANUFACTURER
- NO REDUCTION OF PERFORMANCE LEVEL OF THE PRODUCT

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

SAMPLE DECLARATION FOR WINDOWS/DOORS

Declaration of performance
№

1. Unique identification code of the product type:	W-01
2. Intended use / uses:	Window/ External pedestrian doorset intended to be used in domestic and commercial locations
3. Manufacturer:	Name Address Phone Email Website
4. Authorized representative (if applicable)	Name Address Phone Email Website
5. System of assessment and verification of constancy of performance:	3
6. Harmonized standard:	EN 14351-1:2006 + A1:2010
7. Notified body/bodies:	Notified body XXX, Identification number of NB 1234 performed determination of the product-type on the basis of type testing under system 3 and issued test and classification report №123456, issued on 01.02.2015

8. Declared performance:

Essential characteristics	Performance	Harmonized technical specification
Watertightness	8A	EN 14351-1:2006 + A1:2010
Resistance to wind load	C3	
Sound insulation	38 (-1;-2) dB	
Air permeability	4	
Thermal transmittance frame glazing sample	 1,3 W/(m^2.K) 1,3 W/(m^2.K) 1,4 W/(m^2.K)	
Radiation properties solar factor light transmittance	 0,55 0,75	
Dangerous substances	NPD	

9. Specific technical documentation used (if applicable): N/A

The performance of the product identified in point 1 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 3.

Signed for and on behalf of the manufacturer by:

.....

(name and function)

Place and date of issue:
Sofia, 01.07.2016

Signature:

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STANDARDS

GENERAL

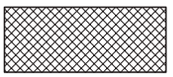
- EN 12020 (1÷2) – ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED PRECISION PROFILES IN ALLOYS EN AW-6060 AND EN AW-6063
- EN 755 (1÷9)– ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED ROD/BAR, TUBE AND PROFILES
- EN 573 (1÷3) – ALUMINIUM AND ALUMINIUM ALLOYS – CHEMICAL COMPOSITION AND FORM OF WROUGHT PRODUCTS
- 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

WINDOWS AND DOORS

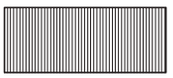
1. EN 14351 – WINDOWS AND DOORS – PRODUCT STANDARD, PERFORMANCE CHARACTERISTICS
2. EN 12519 – WINDOWS AND PEDESTRIAN DOORS – TERMINOLOGY
3. EN 12207 – WINDOWS AND DOORS – AIR PERMEABILITY – CLASSIFICATION
4. EN 1026 – WINDOWS AND DOORS – AIR PERMEABILITY – TEST METHOD
5. EN 12208 – WINDOWS AND DOORS – WATERTIGHTNESS – CLASSIFICATION
6. EN 1027 – WINDOWS AND DOORS – WATERTIGHTNESS – TEST METHOD
7. EN 12210 – WINDOWS AND DOORS – RESISTANCE TO WIND LOAD – CLASSIFICATION
8. EN 12211 – WINDOWS AND DOORS – RESISTANCE TO WIND LOAD – TEST METHOD
9. EN 1191 – WINDOWS AND DOORS – RESISTANCE TO REPEATED OPENING AND CLOSING – TEST METHOD
10. EN ISO 10077 (1÷2) – THERMAL PERFORMANCE OF WINDOWS, DOORS AND SHUTTERS – CALCULATION OF THERMAL TRANSMITTANCE
11. EN 12412-2 – THERMAL PERFORMANCE OF WINDOWS, DOORS AND SHUTTERS – DETERMINATION OF THERMAL TRANSMITTANCE BY HOT BOX METHOD – PART 2: FRAMES
12. EN 13115 – WINDOWS – CLASSIFICATION OF MECHANICAL PROPERTIES – RACKING, TORSION AND OPERATING FORCES
13. EN 1627 – WINDOWS, DOORS, SHUTTERS – BURGLAR RESISTANCE – REQUIREMENTS AND CLASSIFICATION
14. EN 1628 – WINDOWS, DOORS, SHUTTERS – BURGLAR RESISTANCE – TEST METHOD FOR THE DETERMINATION OF RESISTANCE UNDER STATIC LOADING
15. EN 1629 – WINDOWS, DOORS, SHUTTERS – BURGLAR RESISTANCE – TEST METHOD FOR THE DETERMINATION OF RESISTANCE UNDER DYNAMIC LOADING
16. EN 1630 – WINDOWS, DOORS, SHUTTERS – BURGLAR RESISTANCE – TEST METHOD FOR THE DETERMINATION OF RESISTANCE TO MANUAL BURGLARY ATTEMPTS
17. EN ISO 717-1 – ACOUSTICS – RATING OF SOUND INSULATION IN BUILDINGS AND OF BUILDING ELEMENTS – PART 1: AIRBORNE SOUND INSULATION
18. EN ISO 10140 – ACOUSTICS – LABORATORY MEASUREMENT OF SOUND INSULATION OF BUILDING ELEMENTS

HATCHES

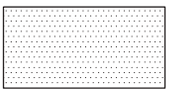
Hatches for different materials



EPDM

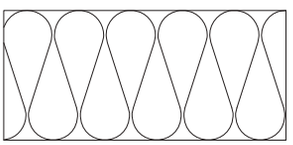


PVC

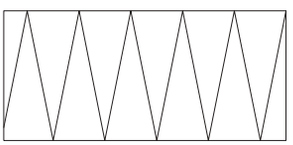


gypsum board

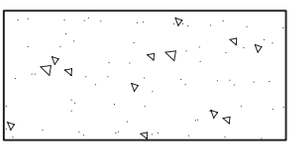
silicone seal



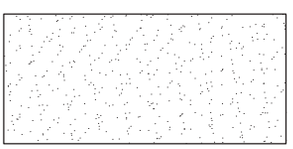
Insulation soft



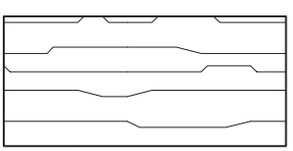
Insulation hard



concrete wall



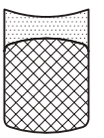
plaster



wood

butyl seal

membrane



silicone seal

backer rod

PVC spacer

etalbond

sheet aluminium

glass

aluminium profile

steel

LIABILITY

The stated data and calculating methods are provided by ETEM as a guideline only.
The information given in this catalogue does not substitute 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 elements as well as any special requirements regarding stability of the structure 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/facade engineer in charge taking into consideration the specific features, such as climate conditions, location, orientation, etc.

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