

// TECHNICAL CATALOGUE

E45

OPENING WINDOW SYSTEM
WITH THERMAL BREAK

E45

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 50 years of experience ETEM is the first fully integrated designer and producer of architectural systems and aluminium profiles for industrial applications.

Our mission is to lead our industry through the pioneering creation of innovative aluminum solutions that enhance quality of life while embodying our unwavering commitment to social responsibility and sustainability.

We aim to redefine industrial standards, inspire boundless creativity, and contribute meaningfully to a world where our aluminum solutions positively impact both people and the planet.

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.

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.

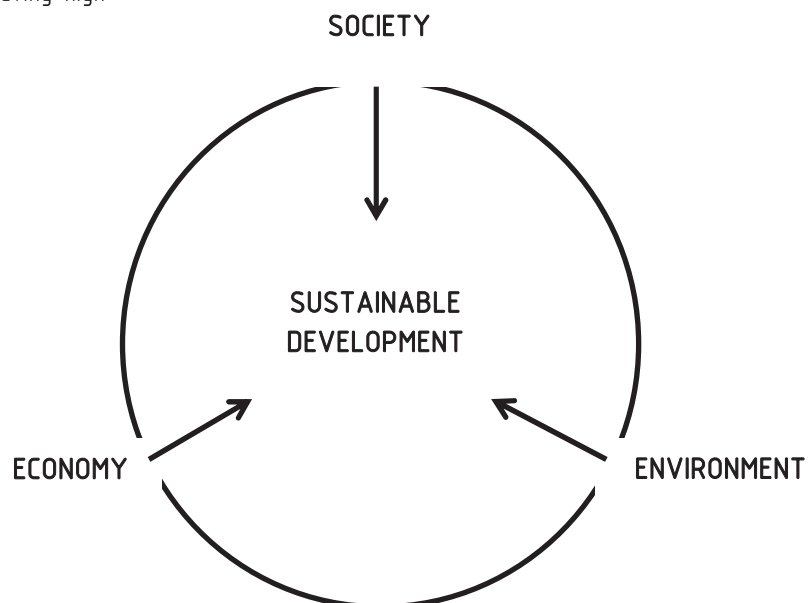
For us meeting this objective translates into the challenge of satisfying market demands at the lowest economic, social and environmental cost possible.

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:

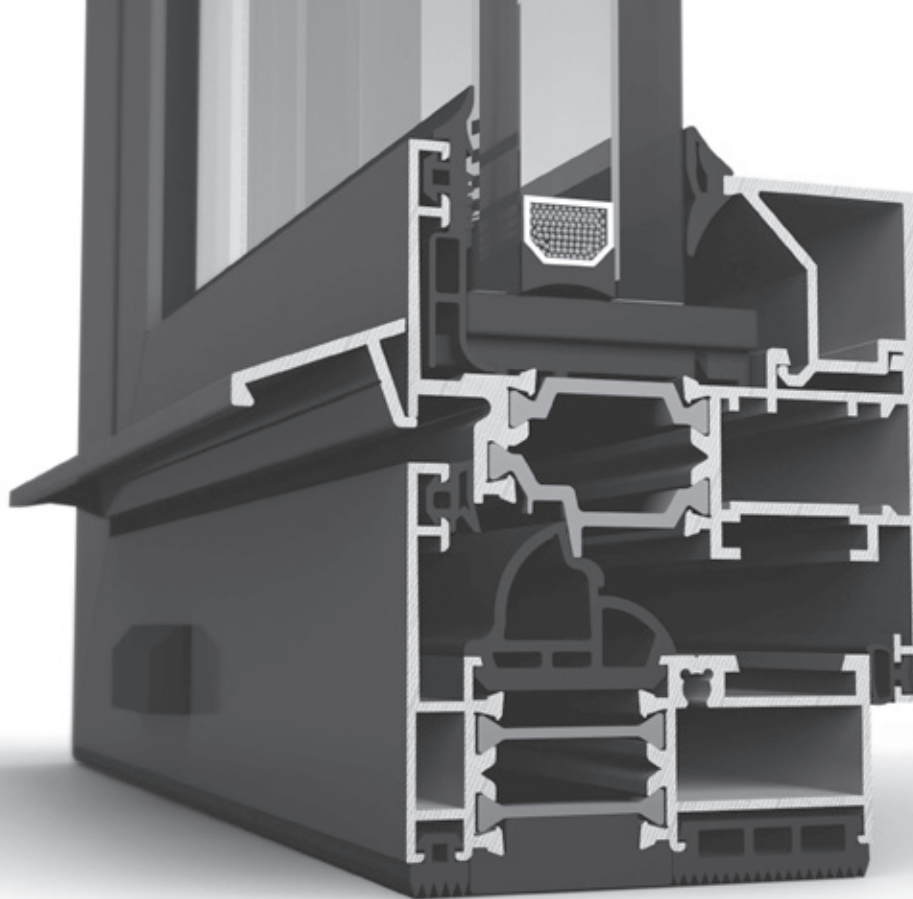
- ENERGY EFFICIENCY
- DAYLIGHT
- SUN-SHADING
- VENTILATION AND GOOD AIR QUALITY
- SAFETY AND SECURITY



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

GENERAL INFORMATION

CONCEPT / ADVANTAGES / CERTIFICATES

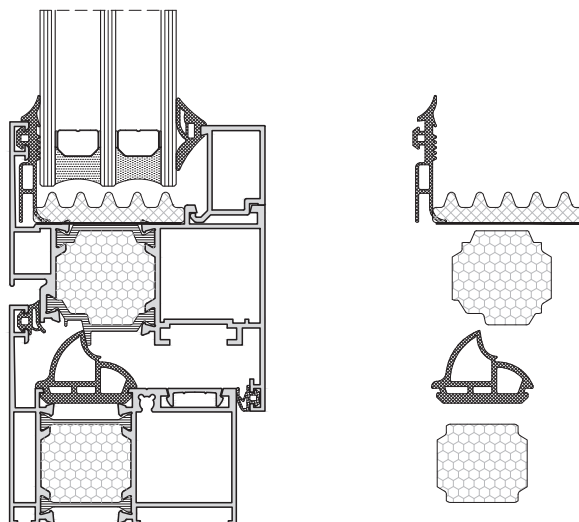


E45 CONCEPT

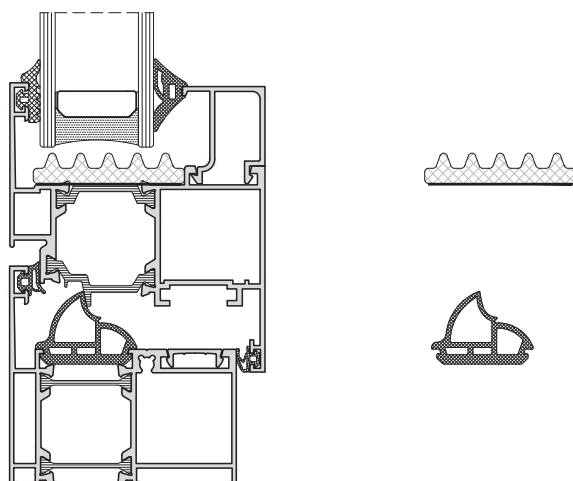
E45 IS AN ENERGY CONSERVATION SYSTEM FOR OPENING WINDOWS AND DOORS.

- Optimized for highest structural stability while using lowest amount of aluminium
- Profile re-inforcement at load bearing points
- Elegant straight or curved line; 60 mm system width in case of straight line type and 67.5 mm width in curved type
- Opening parts – opening at vertical axis, tilt and turn, opening at top or bottom horizontal axes, folding doors, parallel sliding
- Reliable pivot mechanism
- Window sashes for PVC hardware which enables multiple locks, hinges adjustment and fast mounting
- New elegant series with concealed sash
- Mechanism for smoke proof doors according to safety regulations
- Glazing infill up to 47mm

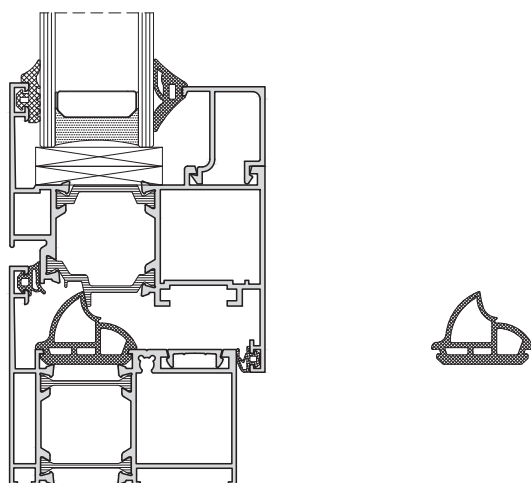
> ADVANCED SYSTEM



> IMPROVED SYSTEM



> BASIC SYSTEM



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 E45

Characteristic	Classification / value	Standard
Air permeability	Up to class 4	EN 1026 / EN 12207
Watertightness	Up to class E1950	EN 1027 / EN 12208
Resistance to wind load	Up to class AE2500/B5	EN 12211 / EN 12210
Thermal transmittance	from 1.9 W/m ² .K	EN ISO 10077-2
Acoustic performance	Up to 50 dB	EN ISO 717-1
Burglar resistance	RC2	EN 1627

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/(m².K))	npd	Declared values										
Radiation properties Solar factor (g)	npd	Declared values										
Radiation properties Light transmittance (τ _v)	npd	Declared values										
Air permeability Max. test pressure (Pa) Reference air permeability at 100 Pa (m³/(h · m²) or m³/(h · 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. COMMERCIALY 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

Aluminium combines many 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.

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 650° 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.

The most common aluminium alloy which is used by ETEM is EN AW 6063. Here are the properties of this alloy:

MATERIAL PROPERTIES

Aluminium alloy	EN AW 6063 F22
Ultimate tensile strength	$R_m = 210 \text{ N/mm}^2$
Yield strength	$R_{p0.2} = 160 \text{ N/mm}^2$
Modulus of elasticity	$E_{al} = 70\,000 \text{ N/mm}^2 = 7.10^9 \text{ kg/m}^2$
Coefficient of thermal expansion	$\alpha = 0.023 \text{ mm/m} \cdot K$ (up to 1.2 mm/m for difference up to 50°C)

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

ETEM profiles are extruded from the following alloys:

EN AW-6060 [Al Mg Si]
EN AW-6063 [Al Mg0,7 Si]
EN AW-6106 [Al Mg Si Mn]
EN AW-6005 [Al Si Mg]
EN AW-6082 [Al Si1 Mg Mn]

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 height of the curtain wall and location. As a guideline, the wind pressure values with respect to the structure height are given in the table below:

Building Height	Wind Velocity	Wind Load		Wind Pressure		Wind Suction in a middle zone				Wind Suction in an edge zone	
h	v	$q = \frac{v^2}{16}$		$W_{p*} = 1.25 \times c_p \times q$ $c_p = 0.8$		$h/b \leq 0.25$ $W_s = c_p \times q$ $c_p = 0.5$		$h/b \geq 0.5$ $W_s = c_p \times q$ $c_p = 0.7$		$b/8 \leq 2 \text{ m}$ $W_s = c_p \times q$ $c_p = 2.0$	
m	m/s	kg/m ²	kN/m ²	kg/m ²	kN/m ²	kg/m ²	kN/m ²	kg/m ²	kN/m ²	kg/m ²	kN/m ²
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/m² and kN/m²

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

c_p – correction factor

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

UNITS CONVERTER

1 m = 100 cm = 1000 mm

1 kg = 10 N

1 kN = 100 kg = 1000 N

1 kg/m² = 0.01 kN/m²

1 Pa = 1 N/m² = 0.1 kg/m²

1 kPa = 1000 Pa = 1 kN/m² = 100 kg/m²

1 MPa = 1000 kPa = 1 000 000 Pa

1 MPa = 1 N/mm² = 0.1 kN/cm² = 100 000 kg/m²

MULLION SELECTION

*Wind load actions:

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

a) triangle load

$$\text{If } \frac{H}{c} \leq 1, I_{yc} \geq \frac{w \cdot (H/2) \cdot H^4 \cdot 10^8}{120 \cdot E_{al} \cdot f_{max}}, \text{cm}^4$$

or

b) trapezoid load

$$\text{If } \frac{H}{c} > 1, I_{yc} \geq \frac{w \cdot (C/2) \cdot H^4}{1920 \cdot E_{al} \cdot f_{max}} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(C/2)^2}{H^2} + 16 \cdot \frac{(C/2)^4}{H^4} \right], \text{cm}^4$$

Use the same method to calculate I_{yd}

Total of required moment of inertia:

$$I_y = I_{yc} + I_{yd}, \text{cm}^4$$

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

H - Length of a mullion, m

a, b - Distance between mullions, m

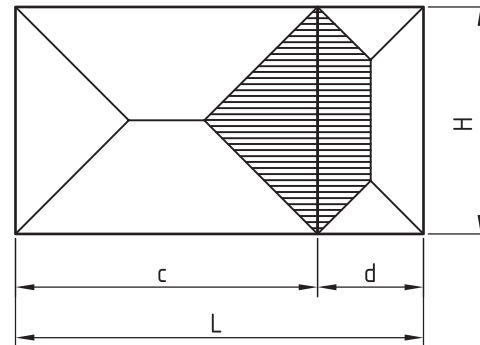
Maximum transom deflection f_{max} by wind load:

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

Use ETEM Catalogue to choose the appropriate mullion 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:



Initial data:

$$H = 2,2 \text{ m}$$

$$c = 2,4 \text{ m}$$

$$d = 0,8 \text{ m}$$

$$w = 60 \text{ kg/m}^2$$

$$E_{al} = 7 \cdot 10^9 \text{ kg/m}^2$$

$$f = \frac{H}{200} = \frac{2,2}{200} = 0,011 \text{ m} \text{ or } 0,015 \text{ m (EN 14351-1)}$$

$\Rightarrow f_{max} = 0,011 \text{ m}$ in the following formulas:

$$\frac{H}{c} = \frac{2,2}{2,4} = 0,91 < 1$$

$$I_{yc} \geq \frac{w \cdot (H/2) \cdot H^4 \cdot 10^8}{120 \cdot E_{al} \cdot f_{max}}, \text{cm}^4$$

$$I_{yc} \geq \frac{60 \cdot (2,2/2) \cdot 2,2^4 \cdot 10^8}{120 \cdot 7 \cdot 10^9 \cdot 0,011}, \text{cm}^4 \Rightarrow I_{yc} \geq 16,73 \text{ cm}^4$$

$$\frac{H}{d} = \frac{2,2}{0,8} = 2,75 > 1$$

$$I_{yd} \geq \frac{w \cdot (d/2) \cdot H^4}{1920 \cdot E_{al} \cdot f_{max}} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(d/2)^2}{H^2} + 16 \cdot \frac{(d/2)^4}{H^4} \right], \text{cm}^4$$

$$I_{yd} \geq \frac{60 \cdot (0,8/2) \cdot 2,2^4}{1920 \cdot 7 \cdot 10^9 \cdot 0,011} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(0,8/2)^2}{2,2^2} + 16 \cdot \frac{(0,8/2)^4}{2,2^4} \right], \text{cm}^4$$

$$I_{yd} \geq 9,01 \text{ cm}^4$$

$$I_y = I_{yc} + I_{yd}, \text{cm}^4 \Rightarrow I_y = 16,73 + 9,01 = 25,74 \text{ cm}^4$$

Use ETEM Catalogue to choose the appropriate mullion with

$$I_y \geq 25,74 \text{ cm}^4$$

We choose mullion E45304 with $I_x = 35,34 \text{ cm}^4$

$$\text{and } I_y = 28,92 \text{ cm}^4$$

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/m³/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:

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

Where:

$a=0,15$ - Distance of a glazing supports of the glass pane, m

I_x - Moment of inertia of a transom, cm⁴

q - Self weight of a transom per linear meter, kg/m

E_{al} - Modulus of Elasticity of aluminium, kg/m²

f_{max} - Maximum transom deflection, m

L - Length of a transom, m

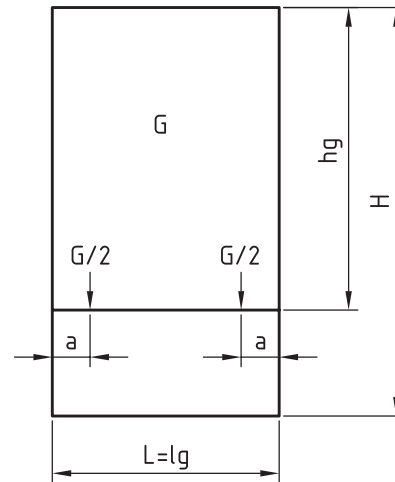
Maximum transom deflection f_{max} by dead load:

$$f = \frac{L}{500}, \text{m} \quad \text{or} \quad 0,003 \text{ m} - \text{whichever is less (EN 14351-1)}$$

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:

$$t = 12 \text{ mm}$$

$$E_{al} = 7 \cdot 10^9 \text{ kg/m}^2$$

$$l_g = 1,5 \text{ m}$$

$$\rho_{glass} = 2,5 \text{ kg/m}^3/\text{mm}$$

$$h_g = 2,0 \text{ m}$$

$$q = 2 \text{ kg/m}$$

$$a = 0,15 \text{ m}$$

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

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

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

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

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

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

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

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

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

Use ETEM Catalogue to choose the appropriate transom with

$$I_x \geq 8,06 \text{ cm}^4$$

We choose transom E45300 with $I_x = 6,59 \text{ cm}^4$

$$\text{and } I_y = 17,02 \text{ cm}^4$$

TRANSOM SELECTION

★Wind load actions:

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

a) triangle load

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

or

b) trapezoid load

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

Use the same method to calculate I_{xb}

Total of required moment of inertia:

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

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

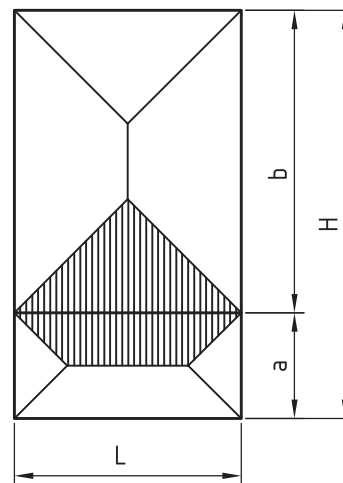
Maximum transom deflection f_{max} by wind load:

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

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:

$$L = 1,5 \text{ m}$$

$$a = 0,7 \text{ m}$$

$$b = 2,0 \text{ m}$$

$$w = 60 \text{ kg/m}^2$$

$$E_{al} = 7.10 \text{ kg/m}^2$$

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

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

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

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

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

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

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

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

$$\Rightarrow I_{yb} \geq 3,62 \text{ cm}^4$$

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

$$\Rightarrow I_y = 2,41 + 3,62 = 6,03 \text{ cm}^4$$

Use ETEM Catalogue to choose the appropriate mullion with

$$I_y \geq 6,03 \text{ cm}^4$$

We choose mullion E45300 with $I_x = 6,59 \text{ cm}^4$

and $I_y = 17,02 \text{ cm}^4$

CALCULATION OF GLASS PANE THICKNESS

*Glazing thickness:

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

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

or

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

Where:

t - Minimum theoretical glass thickness, mm

w - Wind pressure, kg/m²

l_g - The smallest dimension of the glass pane, m

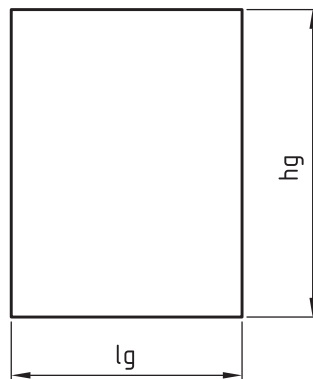
h_g - The largest dimension of the glass pane, m

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:

$$l_g = 1,5 \text{ m}$$

$$h_g = 2,0 \text{ m}$$

$$w = 60 \text{ kg/m}^2$$

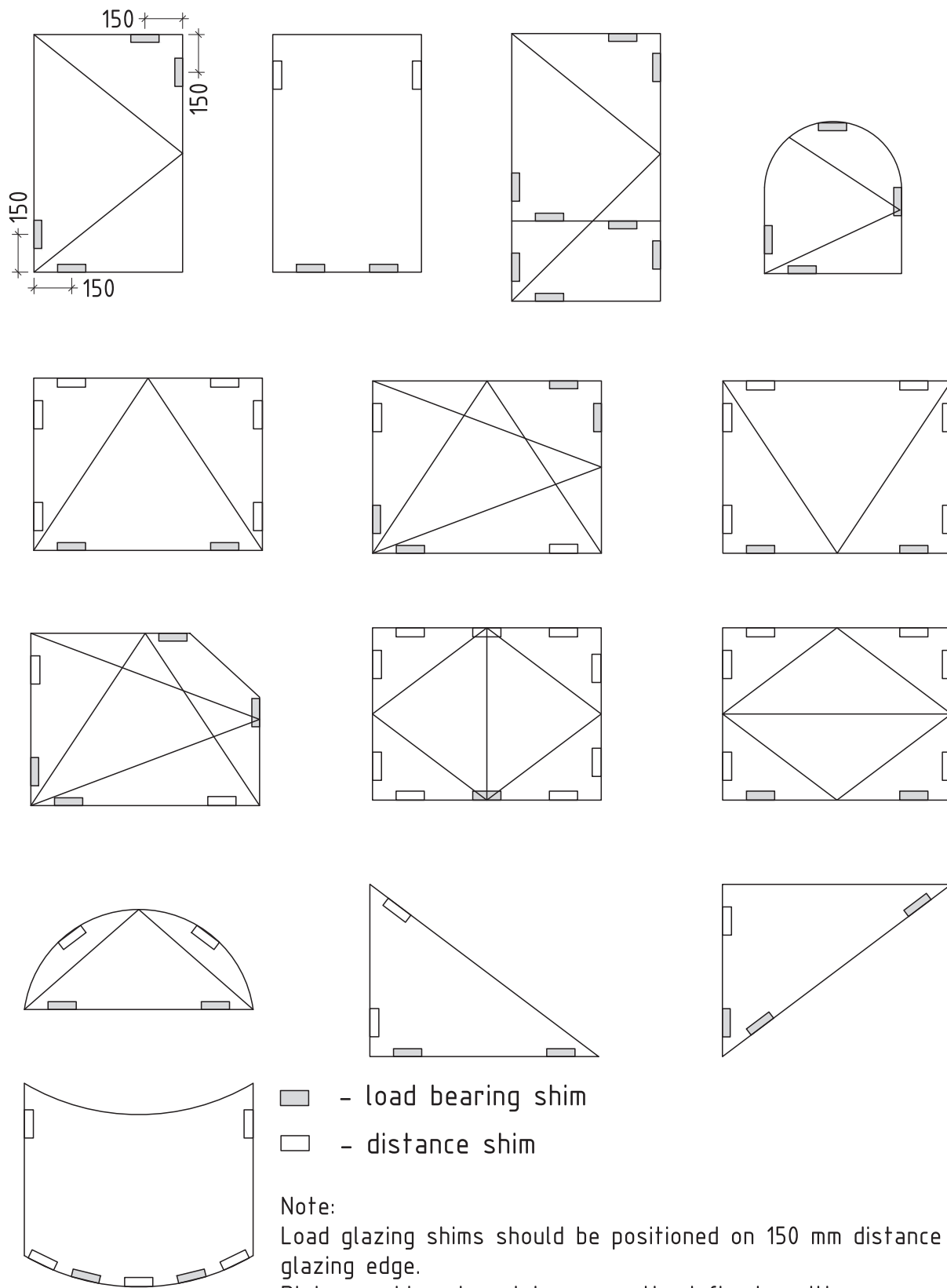
$$\frac{h_g}{l_g} = \frac{2}{1,5} = 1,33 \leq 3$$

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

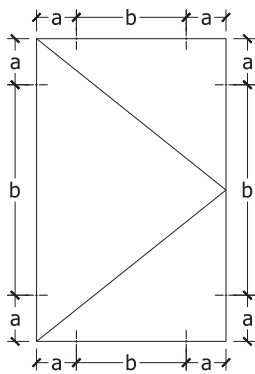
$$\text{For double glazing } t_{\text{req}} = 1,5 \cdot 5 = 7,5 \text{ mm}$$

We choose double glazing 5/14/5

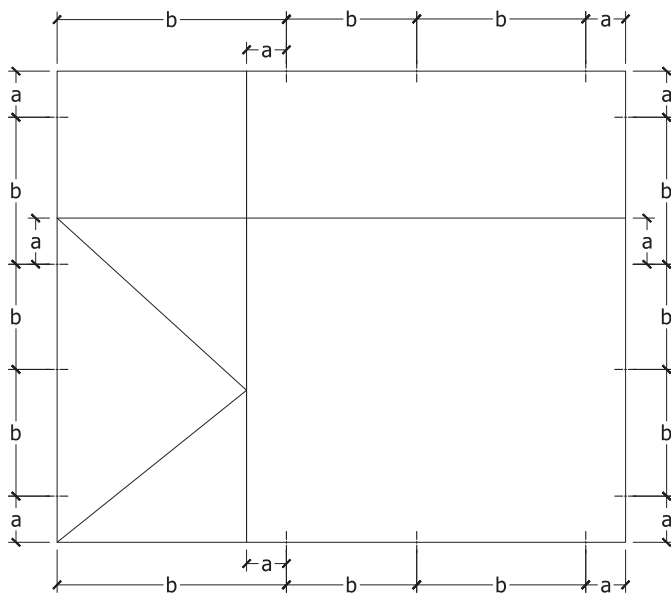
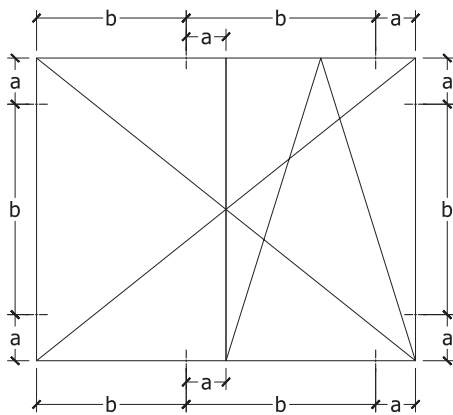
GLAZING SHIMS



POSITION OF ANCHORS



$a = 150 \div 200 \text{ mm}$
 $b \leq 800 \text{ mm}$

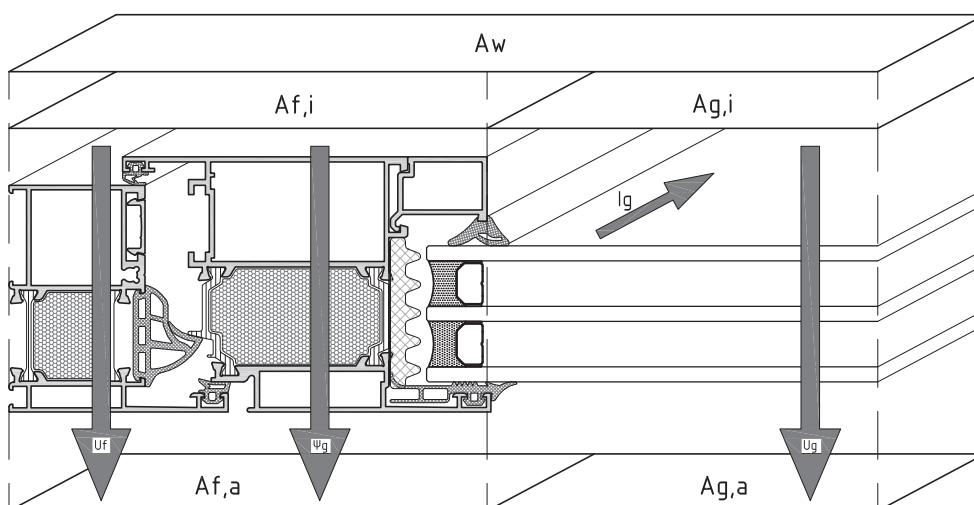


METHOD FOR CALCULATION OF THERMAL TRANSMITTANCE ACCORDING to EN ISO 10077-2

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

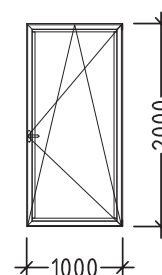
- U_w – thermo-transmittance coefficient of the whole structure
- U_g – glass thermal transmittance coefficient
- U_f – thermo-transmittance coefficient of the aluminium frame (frame and sash)
- ψ_g – spacer linear thermal transmittance
- l_g – total length of the spacer
- A_g – glass area
- A_f – aluminium 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:	E45	U_f	1.9	W/(m ² K)
spacer:	warm edge	ψ_g	0.051	W/(m ² K)
glass:	triple glazing	U_g	1.00	W/(m ² K)
window width:	1.00 m			
window height:	2.00 m			
length of glass edge l_g :	4,89 m			
$A_g = 1.3 \text{ m}^2$; $A_f = 0.7 \text{ m}^2$				

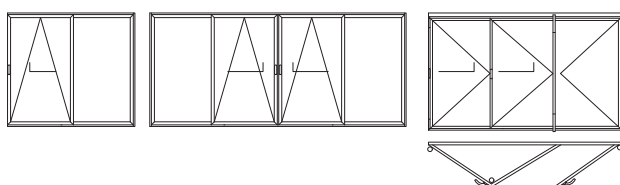
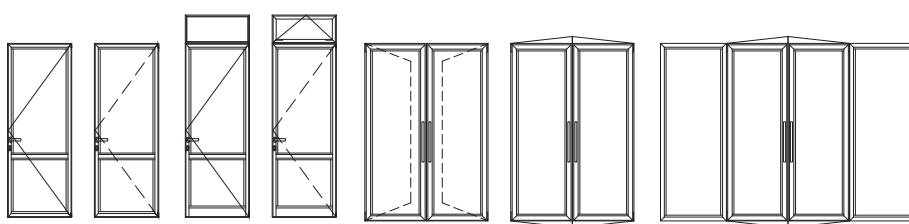
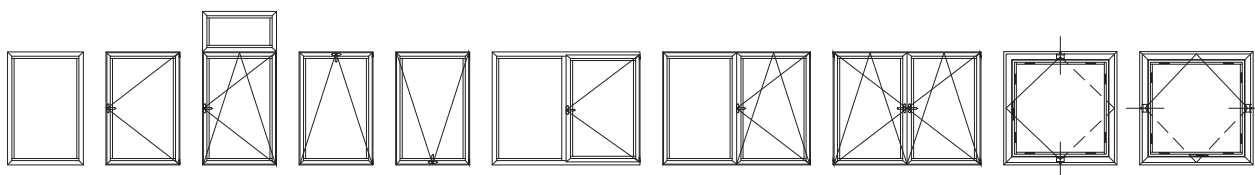


$$U_w = \frac{1.3 \times 1 + 0.7 \times 1.9 + 4.89 \times 0.051}{1.24 + 0.76}$$

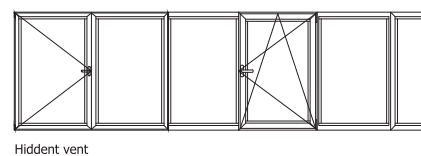
$$U_w \approx 1,44 \text{ W/(m}^2 \text{ K)}$$

TABLES

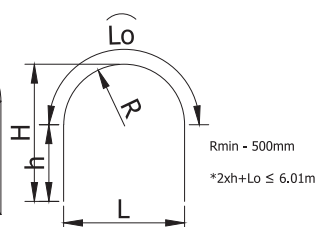
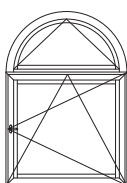
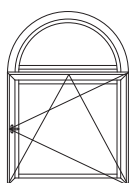
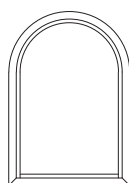
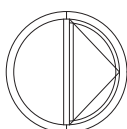
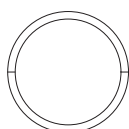
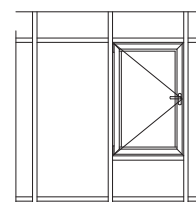
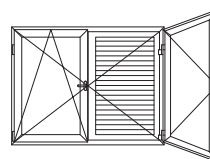
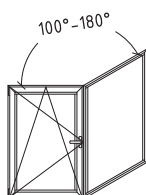
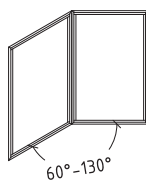
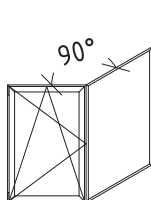
TYPOLOGIES / LIST OF PROFILES / CHARACTERISTICS



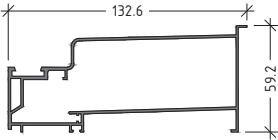
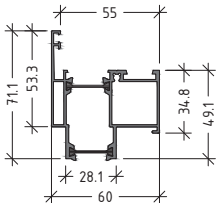
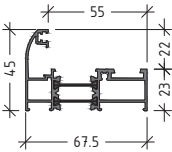
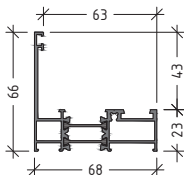
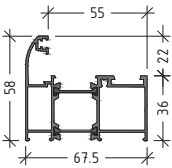
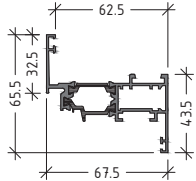
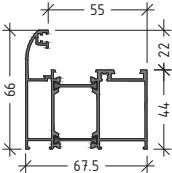
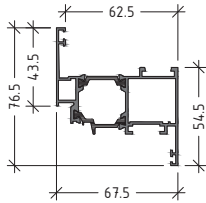
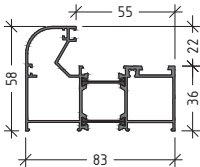
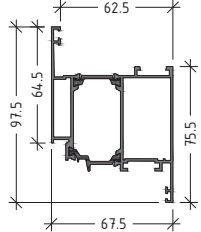
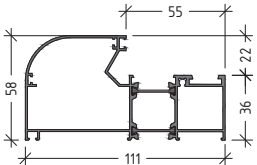
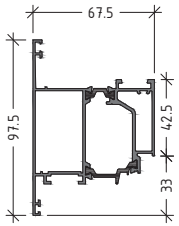
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321;330;431;541;550;
532;651;633;761;770;743



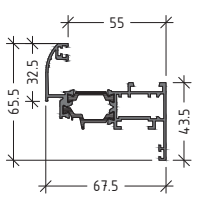
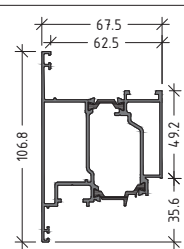
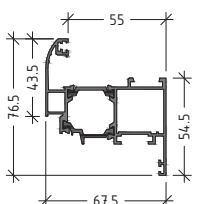
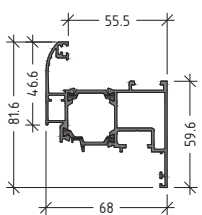
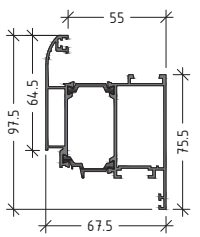
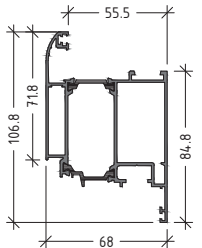
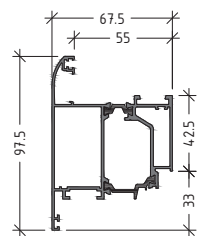
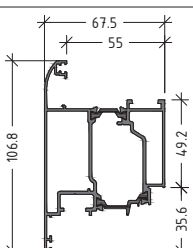
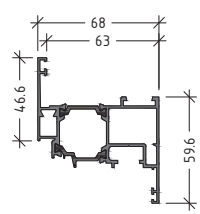
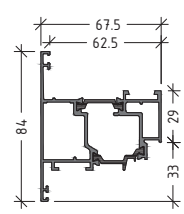
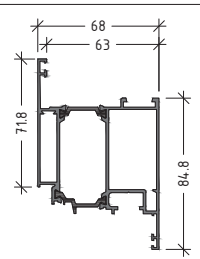
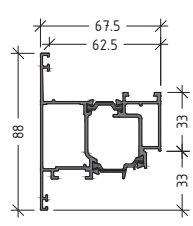
Hidden vent



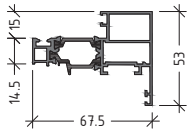
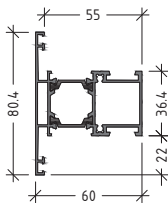
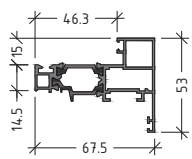
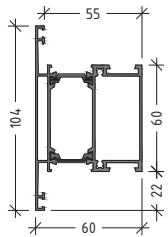
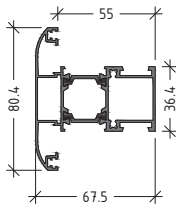
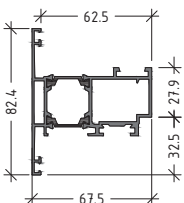
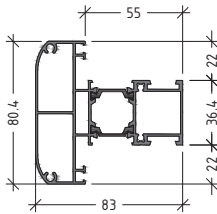
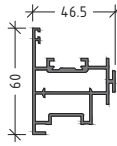
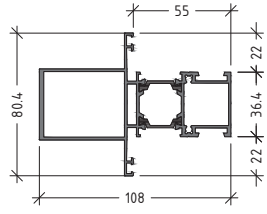
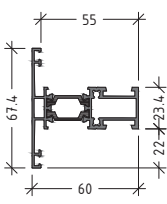
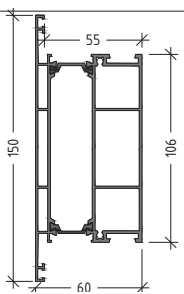
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E45101 frame		1153 g/m L=6.01 m $I_x=8.2 \text{ cm}^4$ $I_y=18.0 \text{ cm}^4$	E45190 frame		1641 g/m L=6.01 m $I_x=12.3 \text{ cm}^4$ $I_y=87.4 \text{ cm}^4$
E45102 frame		1227 g/m L=6.01 m $I_x=12.3 \text{ cm}^4$ $I_y=19.1 \text{ cm}^4$	E45191 frame		1425 g/m L=6.01 m $I_x=11.5 \text{ cm}^4$ $I_y=38.3 \text{ cm}^4$
E45121 frame		1308 g/m L=6.01 m $I_x=11.6 \text{ cm}^4$ $I_y=20.6 \text{ cm}^4$	E45192 frame		1643 g/m L=6.01 m $I_x=12.8 \text{ cm}^4$ $I_y=82.3 \text{ cm}^4$
E45171 reverse profile		1135 g/m L=6.01 m $I_x=5.6 \text{ cm}^4$ $I_y=15.5 \text{ cm}^4$	E45193 frame		1582 g/m L=6.01 m $I_x=12.2 \text{ cm}^4$ $I_y=68.1 \text{ cm}^4$
E45111 frame		1317 g/m L=6.01 m $I_x=16.1 \text{ cm}^4$ $I_y=26.3 \text{ cm}^4$	E45130 frame		2573 g/m L=6.01 m $I_x=28.6 \text{ cm}^4$ $I_y=362.8 \text{ cm}^4$

code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E40135 frame		1609 g/m L=6.01 m $I_x=20 \text{ cm}^4$ $I_y=117.6 \text{ cm}^4$	E45185 frame		1254 g/m L=6.01 m $I_x=13.1 \text{ cm}^4$ $I_y=17.7 \text{ cm}^4$
E45150 frame		1024 g/m L=6.01 m $I_x=4.4 \text{ cm}^4$ $I_y=17.8 \text{ cm}^4$	E45160 frame for hidden vent		1130 g/m L=6.01 m $I_x=10.3 \text{ cm}^4$ $I_y=21.9 \text{ cm}^4$
E45151 frame		1205 g/m L=6.01 m $I_x=9.6 \text{ cm}^4$ $I_y=21.8 \text{ cm}^4$	E45200 vent		1165 g/m L=6.01 m $I_x=6.0 \text{ cm}^4$ $I_y=21.9 \text{ cm}^4$
E45152 frame		1316 g/m L=6.01 m $I_x=14.6 \text{ cm}^4$ $I_y=24.3 \text{ cm}^4$	E45201 vent		1295 g/m L=6.01 m $I_x=10.8 \text{ cm}^4$ $I_y=25.7 \text{ cm}^4$
E45154 frame		1373 g/m L=6.01 m $I_x=12.9 \text{ cm}^4$ $I_y=34.7 \text{ cm}^4$	E45202 vent		1606 g/m L=6.50 m $I_x=27.4 \text{ cm}^4$ $I_y=33.2 \text{ cm}^4$
E45153 frame		1535 g/m L=6.01 m $I_x=17.3 \text{ cm}^4$ $I_y=67.6 \text{ cm}^4$	E45242 vent		1684 g/m L=6.50 m $I_x=28.5 \text{ cm}^4$ $I_y=33.5 \text{ cm}^4$

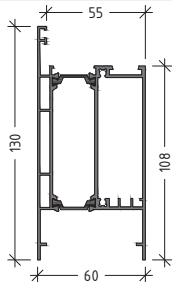
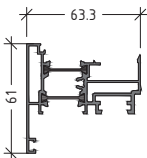
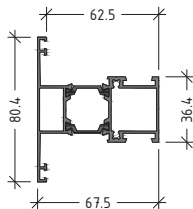
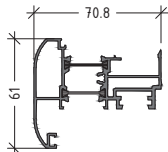
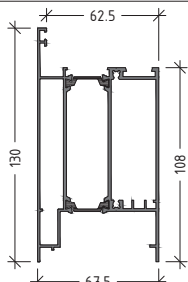
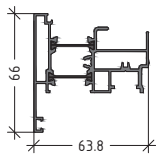
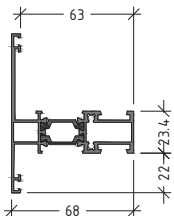
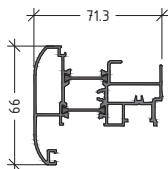
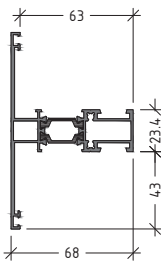
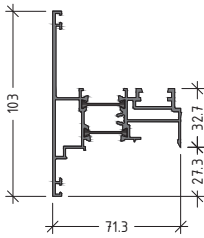
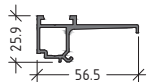
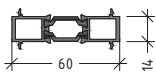
L45-2

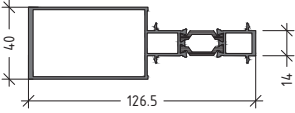
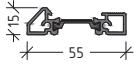
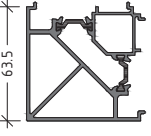
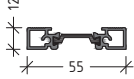
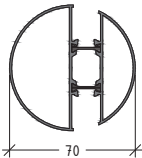
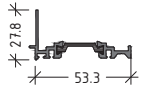
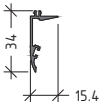
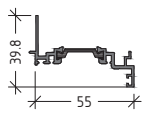
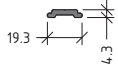
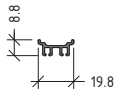
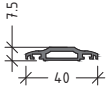
code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E45250 vent		1198 g/m L=6.01 m $I_x=7.3 \text{ cm}^4$ $I_y=22.2 \text{ cm}^4$	E45247 vent PVC groove		1868 g/m L=6.50 m $I_x=38.2 \text{ cm}^4$ $I_y=36.7 \text{ cm}^4$
E45251 vent		1357 g/m L=6.01 m $I_x=12.7 \text{ cm}^4$ $I_y=25.9 \text{ cm}^4$	E45271 vent PVC groove		1454 g/m L=6.01 m $I_x=15.2 \text{ cm}^4$ $I_y=28.8 \text{ cm}^4$
E45252 vent		1630 g/m L=6.50 m $I_x=30.6 \text{ cm}^4$ $I_y=33.3 \text{ cm}^4$	E45272 vent PVC groove		1854 g/m L=6.50 m $I_x=41.5 \text{ cm}^4$ $I_y=39.5 \text{ cm}^4$
E45292 vent		1725 g/m L=6.50 m $I_x=31.3 \text{ cm}^4$ $I_y=33.6 \text{ cm}^4$	E45297 vent PVC groove		1908 g/m L=6.50 m $I_x=41.5 \text{ cm}^4$ $I_y=36.7 \text{ cm}^4$
E45221 vent PVC groove		1410 g/m L=6.01 m $I_x=13.1 \text{ cm}^4$ $I_y=29.0 \text{ cm}^4$	E45241 vent		1521 g/m L=6.01 m $I_x=16.0 \text{ cm}^4$ $I_y=28.6 \text{ cm}^4$
E45222 vent PVC groove		1830 g/m L=6.50 m $I_x=37.8 \text{ cm}^4$ $I_y=39.3 \text{ cm}^4$	E45243 vent		1569 g/m L=6.01 m $I_x=19.3 \text{ cm}^4$ $I_y=30.0 \text{ cm}^4$

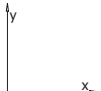
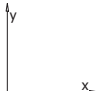
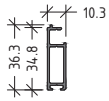
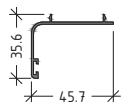
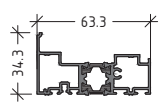
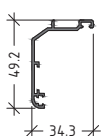
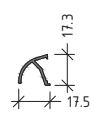
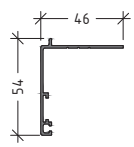
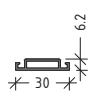
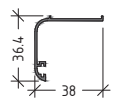
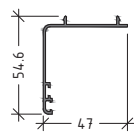
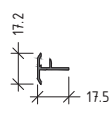
L45-3

code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E45260 hidden vent		1205 g/m L=6.01 m $I_x=5.5 \text{ cm}^4$ $I_y=18.4 \text{ cm}^4$	E45301 T-profile		1355 g/m L=6.01 m $I_x=13.3 \text{ cm}^4$ $I_y=20.5 \text{ cm}^4$
E45261 hidden vent		1188 g/m L=6.01 m $I_x=5.0 \text{ cm}^4$ $I_y=18.6 \text{ cm}^4$	E45304 T-profile		1664 g/m L=6.01 m $I_x=35.34 \text{ cm}^4$ $I_y=26.63 \text{ cm}^4$
E40626 glazing bead		116 g/m L=6.01 m	E45350 T-profile		1472 g/m L=6.01 m $I_x=17.3 \text{ cm}^4$ $I_y=26.61 \text{ cm}^4$
E45230 vent for pivot mechanism		1486 g/m L=6.01 m $I_x=14.5 \text{ cm}^4$ $I_y=29.0 \text{ cm}^4$	E45351 T-profile		1872 g/m L=6.01 m $I_x=28.6 \text{ cm}^4$ $I_y=44.2 \text{ cm}^4$
E40530 additional profile for pivot mechanism		1099 g/m L=6.01 m $I_x=7.9 \text{ cm}^4$ $I_y=10.0 \text{ cm}^4$	E45302 T-profile		2033 g/m L=6.01 m $I_x=19.8 \text{ cm}^4$ $I_y=77.4 \text{ cm}^4$
E45300 T-profile		1138 g/m L=6.01 m $I_x=6.6 \text{ cm}^4$ $I_y=17.0 \text{ cm}^4$	E45303 T-profile		2711 g/m L=6.01 m $I_x=137.0 \text{ cm}^4$ $I_y=47.0 \text{ cm}^4$

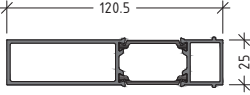
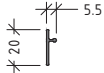
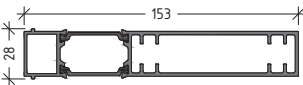
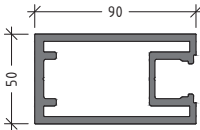
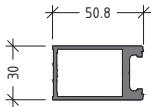
L45-4

code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E45331 door-vent bottom profile		2310 g/m L=6.01 m $I_x=88.7 \text{ cm}^4$ $I_y=41.8 \text{ cm}^4$	E45500 secondary vent		1217 g/m L=6.01 m $I_x=6.6 \text{ cm}^4$ $I_y=19.4 \text{ cm}^4$
E45340 T-profile		1354 g/m L=6.01 m $I_x=13.2 \text{ cm}^4$ $I_y=26.3 \text{ cm}^4$	E45550 secondary vent		1321 g/m L=6.01 m $I_x=8.0 \text{ cm}^4$ $I_y=24.1 \text{ cm}^4$
E45330 door-vent bottom profile		2404 g/m L=6.01 m $I_x=95.5 \text{ cm}^4$ $I_y=51.7 \text{ cm}^4$	E45540 secondary vent PVC groove		1303 g/m L=6.01 m $I_x=8.6 \text{ cm}^4$ $I_y=20.5 \text{ cm}^4$
E45360 T-profile for hidden vent		1330 g/m L=6.01 m $I_x=14.9 \text{ cm}^4$ $I_y=26.3 \text{ cm}^4$	E45590 secondary vent PVC groove		1362 g/m L=6.01 m $I_x=10.2 \text{ cm}^4$ $I_y=25.4 \text{ cm}^4$
E45361 T-profile for hidden vent		1473 g/m L=6.01 m $I_x=25.2 \text{ cm}^4$ $I_y=29.2 \text{ cm}^4$	E45560 secondary profile for hidden vent		1523 g/m L=6.01 m $I_x=24.0 \text{ cm}^4$ $I_y=33.6 \text{ cm}^4$
E40660 additional for hidden vent		589 g/m L=6.01 m	E45655 intermediate profile		768 g/m L=6.01 m $I_x=0.7 \text{ cm}^4$ $I_y=10.3 \text{ cm}^4$

code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E45656 intermediate profile		1563 g/m L=6.01 m $I_x=8.8 \text{ cm}^4$ $I_y=90.8 \text{ cm}^4$	E45800 threshold		566 g/m L=6.01 m
E40600 mullion		2027 g/m L=6.01 m $I_x=30.8 \text{ cm}^4$ $I_y=30.8 \text{ cm}^4$	E45801 threshold		553 g/m L=6.01 m
E40603 mullion		1272 g/m L=6.01 m $I_x=17.8 \text{ cm}^4$ $I_y=17.3 \text{ cm}^4$	E45810 bottom door-vent additional profile		526 g/m L=6.01 m
E40602 additional profile		203 g/m L=6.01 m	E45811 bottom door-vent additional profile		601 g/m L=6.01 m
E2308 operating rod		157 g/m L= 4.4 m	E40812 bottom door-vent additional profile		135 g/m L=6.01 m
E40650 decorative lattice		338 g/m L=6.01 m	E40813 additional profile for door		265 g/m L=6.01 m

code		profile	weight length moment of inertia	code		profile	weight length moment of inertia
E40622 flyscreen profile			280 g/m L=6.01 m	E1127 architrave			289 g/m L=6.01 m
E45820 threshold			1050 g/m L=6.01 m	E40605 architrave			381 g/m L=6.01 m
E40820 drip profile			143 g/m L=6.01 m	E62032 architrave			402 g/m L=6.01 m
E2357 drip profile			144 g/m L=6.01 m	E40651 decorative lattice			203 g/m L=6.01 m
E5366 architrave			269 g/m L=6.01 m	E40995 connecting profile			155 g/m L=6.01 m
E1115 architrave			408 g/m L=6.01 m	E40604 additional profile			116 g/m L=6.01 m

L45-7

code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E50690 intermediate profile		1550 g/m L=6.01 m $I_x=5.0 \text{ cm}^4$ $I_y=79.2 \text{ cm}^4$	E62600 supplementary profile		85 g/m L=6.01 m
E50691 intermediate profile		2046 g/m L=6.01 m $I_x=7.1 \text{ cm}^4$ $I_y=161.3 \text{ cm}^4$			
E62050 reinforcement profile		3555 g/m L=6.01 m $I_x=47.5 \text{ cm}^4$ $I_y=129.5 \text{ cm}^4$			
E22616 cap for E62050		105 g/m L=6.01 m			
E22603 reinforcement profile		1054 g/m L=6.01 m $I_x=5.2 \text{ cm}^4$ $I_y=11.2 \text{ cm}^4$			
E19650 cap for E22603		103 g/m L= 6.01 m			

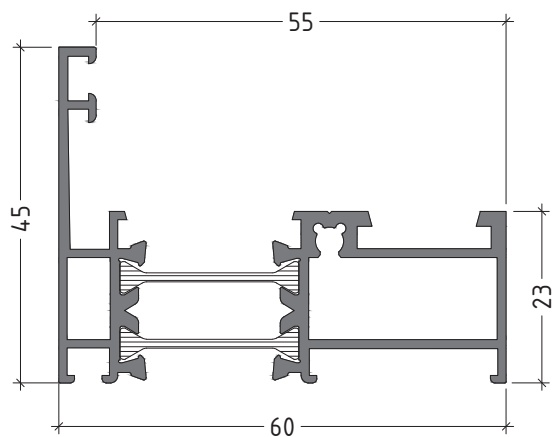
PROFILES

DRAWINGS / SCALE 1:1

E45100

frame

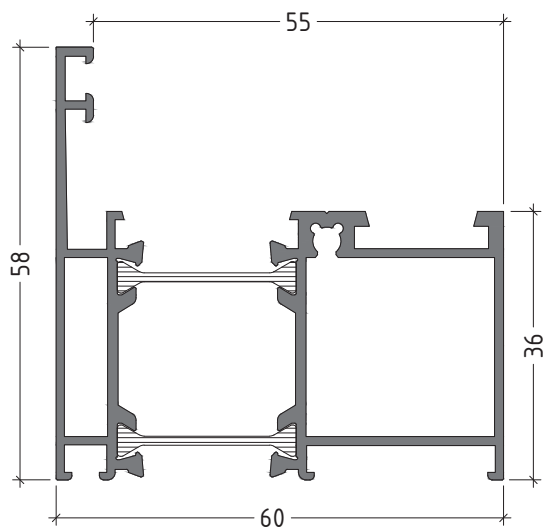
935 g/m



E45101

frame

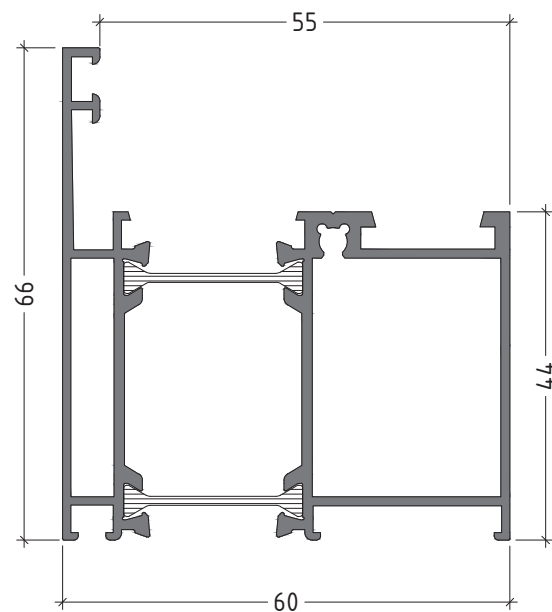
1153 g/m



E45102

frame

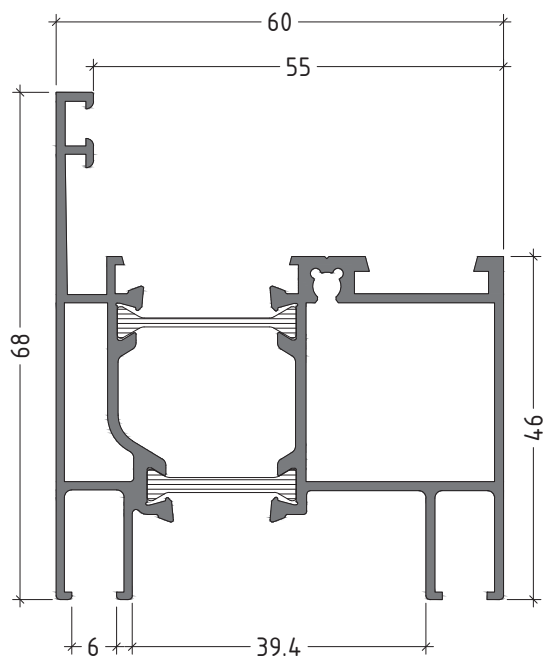
1227 g/m



E45121

frame

1308 g/m



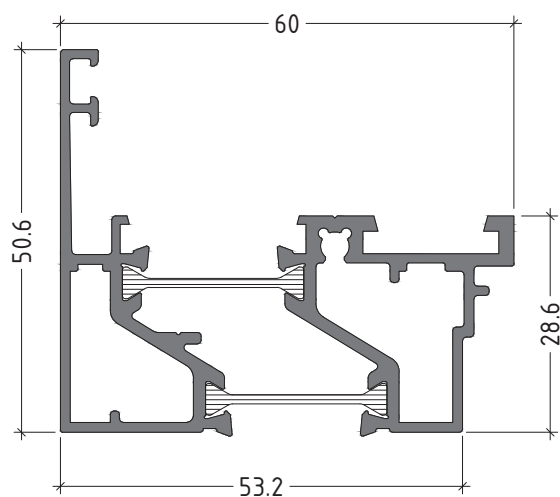
scale : 1:1

P45-01

E45171

reverse profile

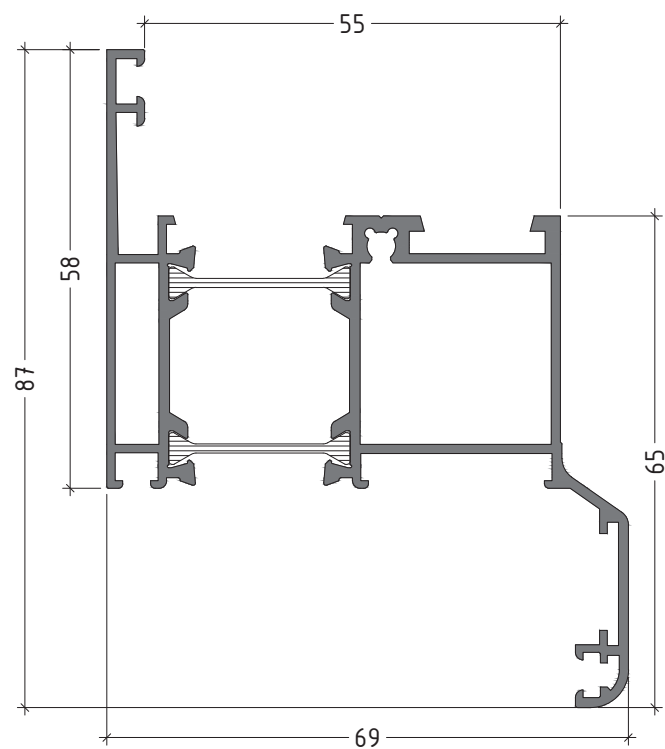
1135 g/m



E45111

frame

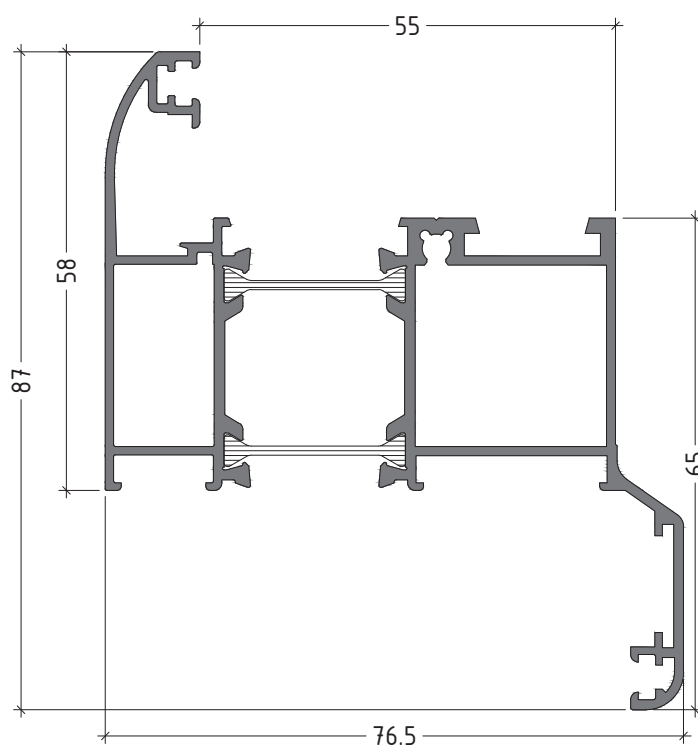
1317 g/m



E45161

frame

1386 g/m



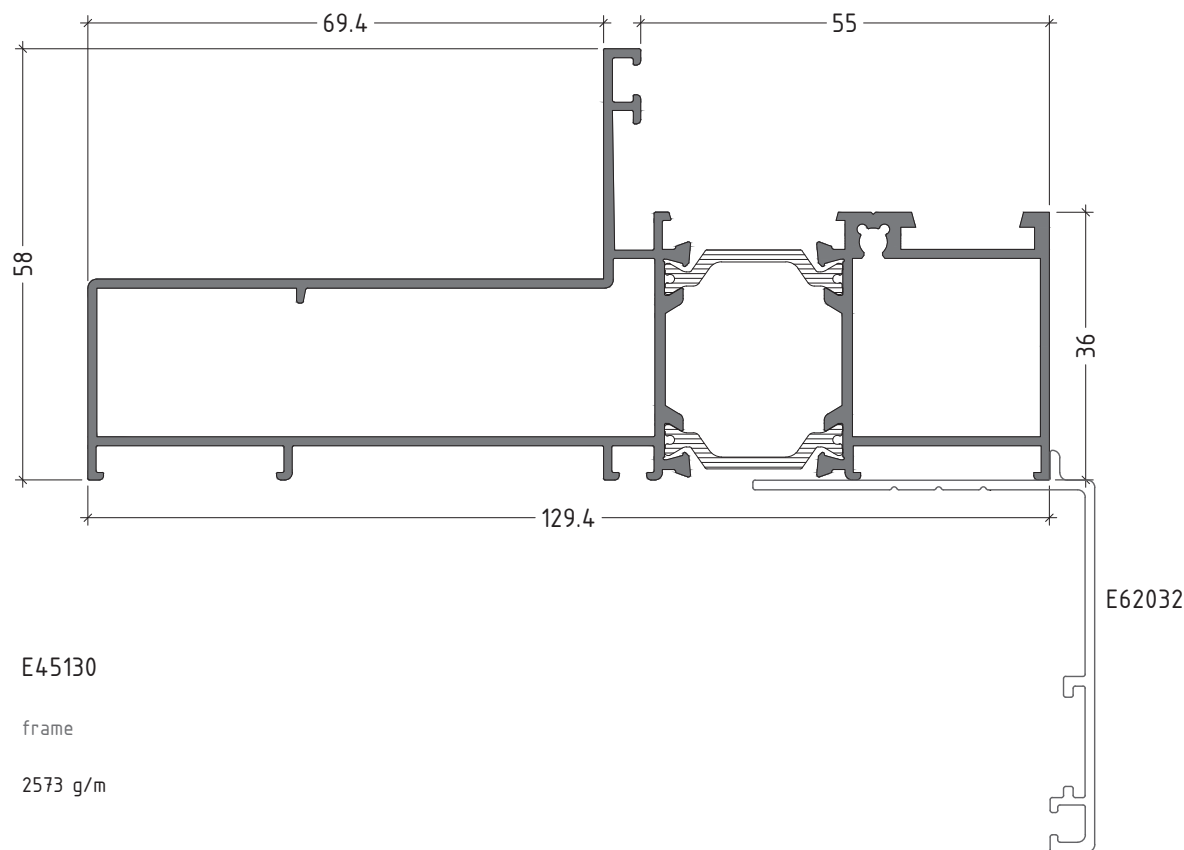
scale : 1:1

P45-02

E45190

frame

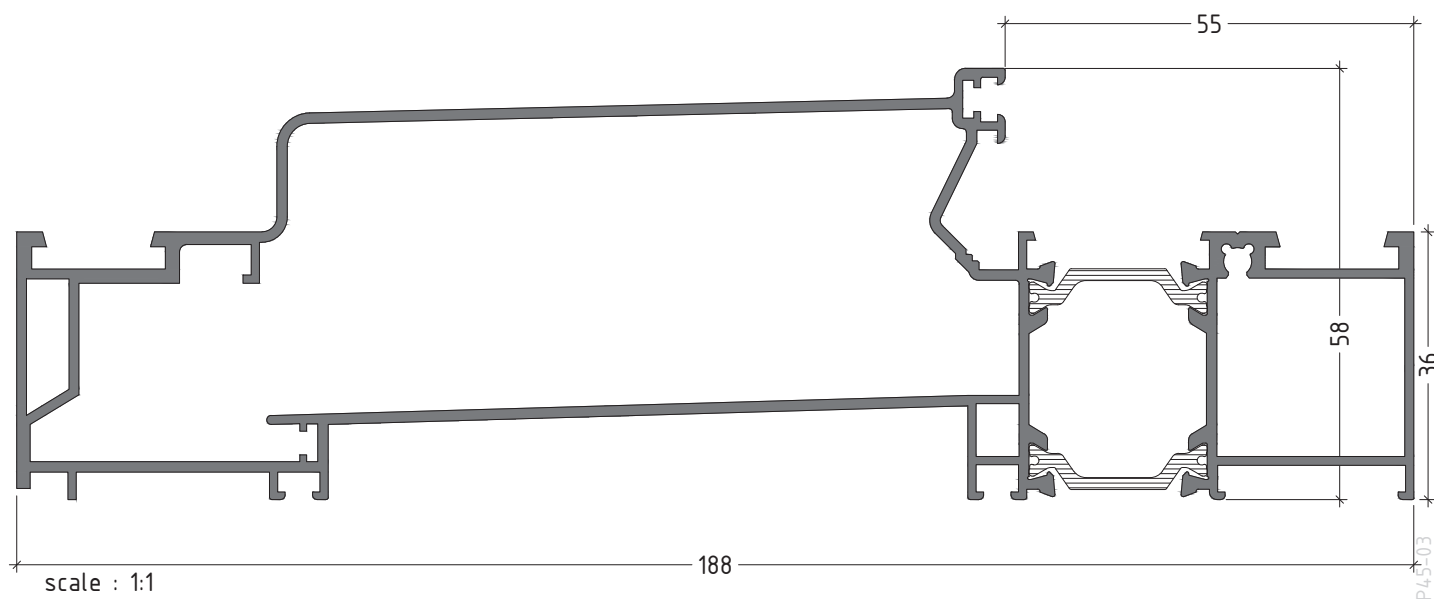
1641 g/m



E45130

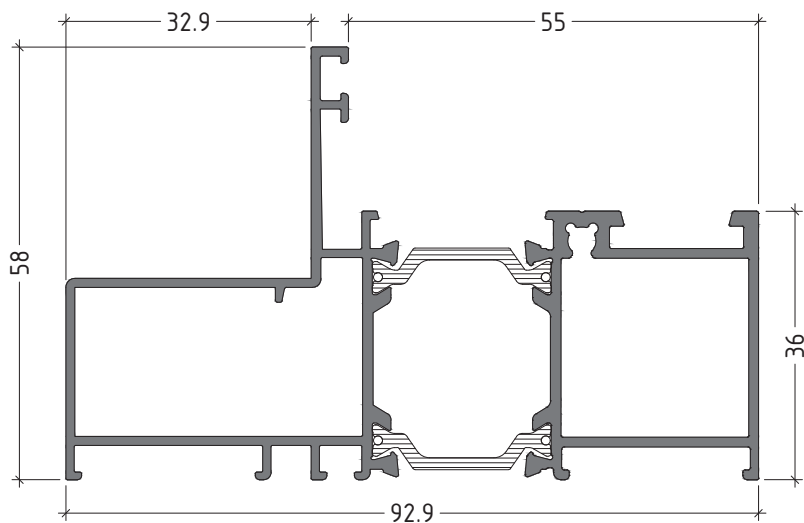
frame

2573 g/m



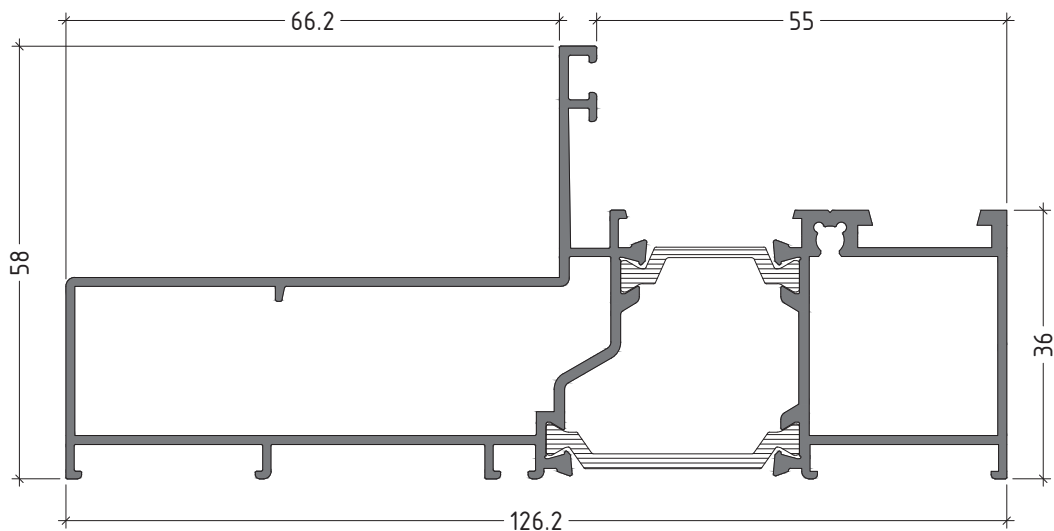
E45191

frame
1425 g/m



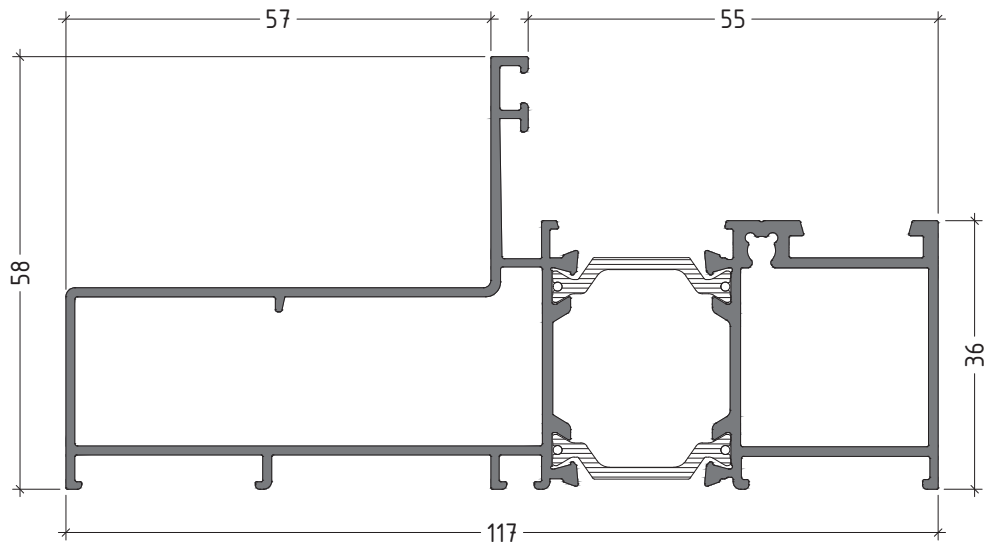
E45192

frame
1643 g/m



E45193

frame
1582 g/m



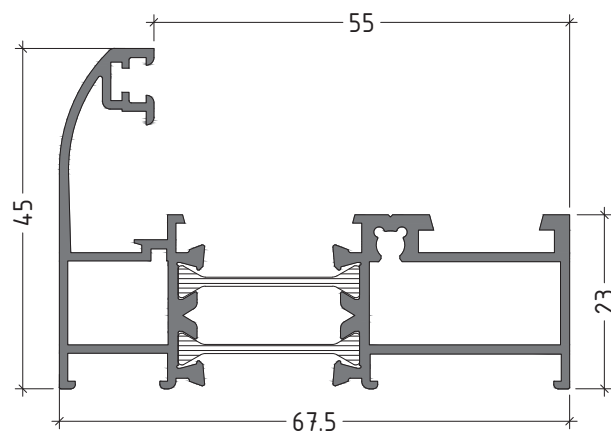
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P45-04

E45150

frame

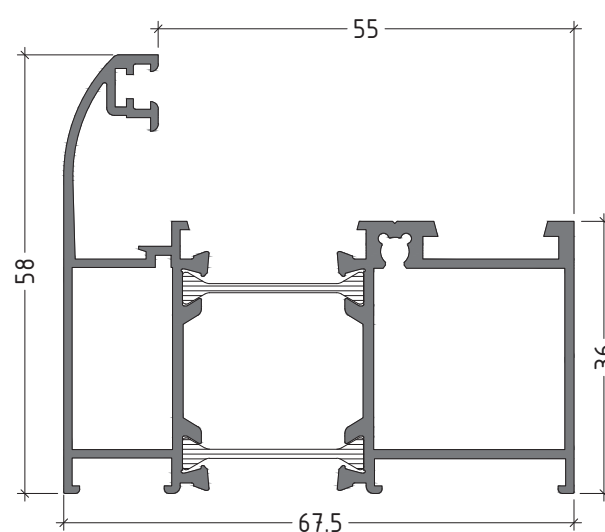
1024 g/m



E45151

frame

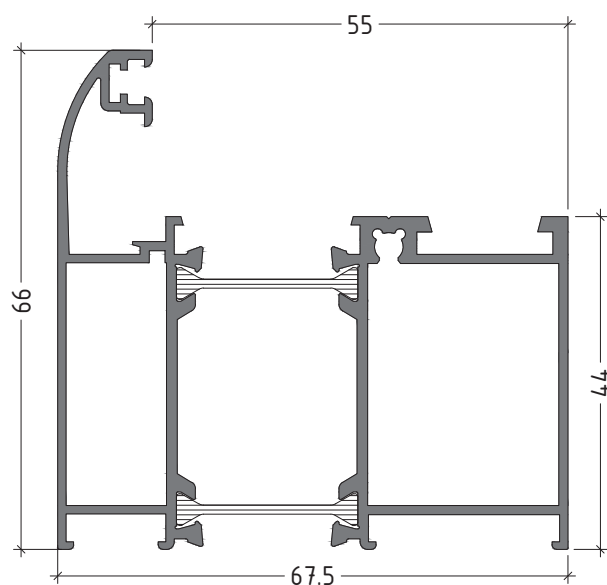
1205 g/m



E45152

frame

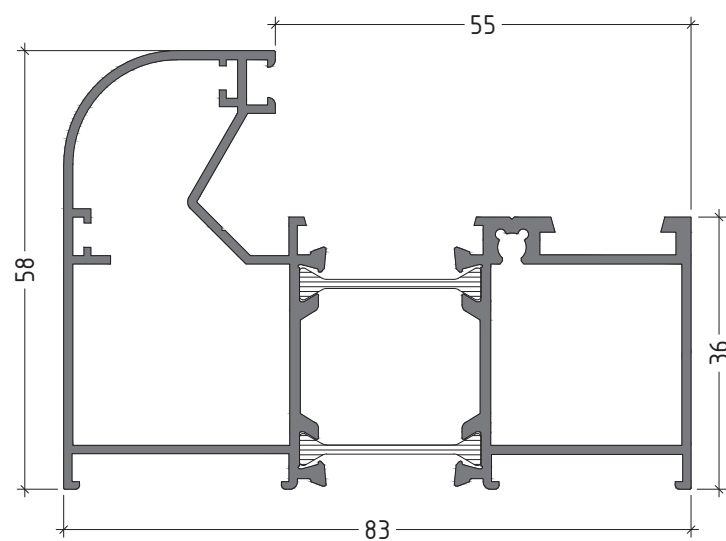
1316 g/m



E45154

frame

1373 g/m



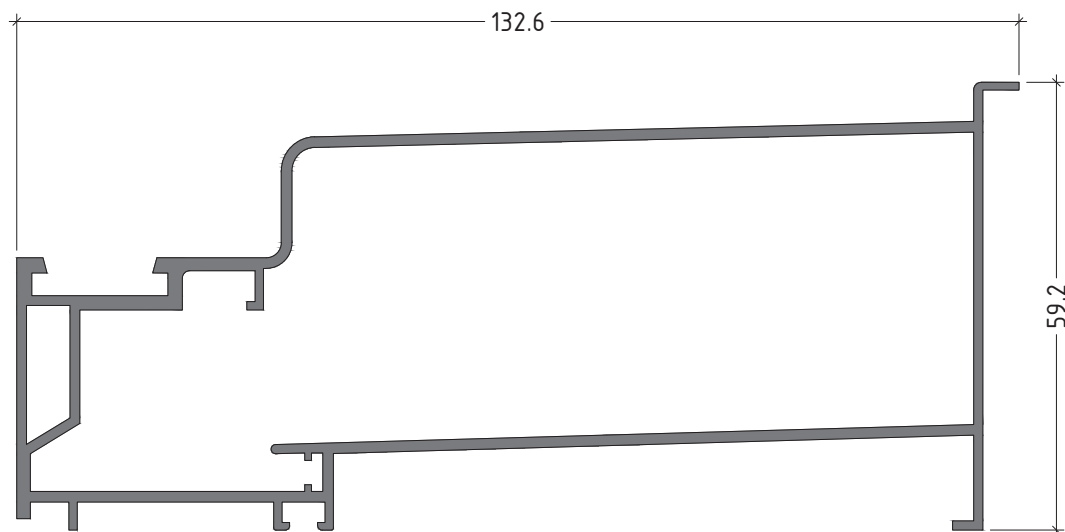
scale : 1:1

P45-05

E45135

frame

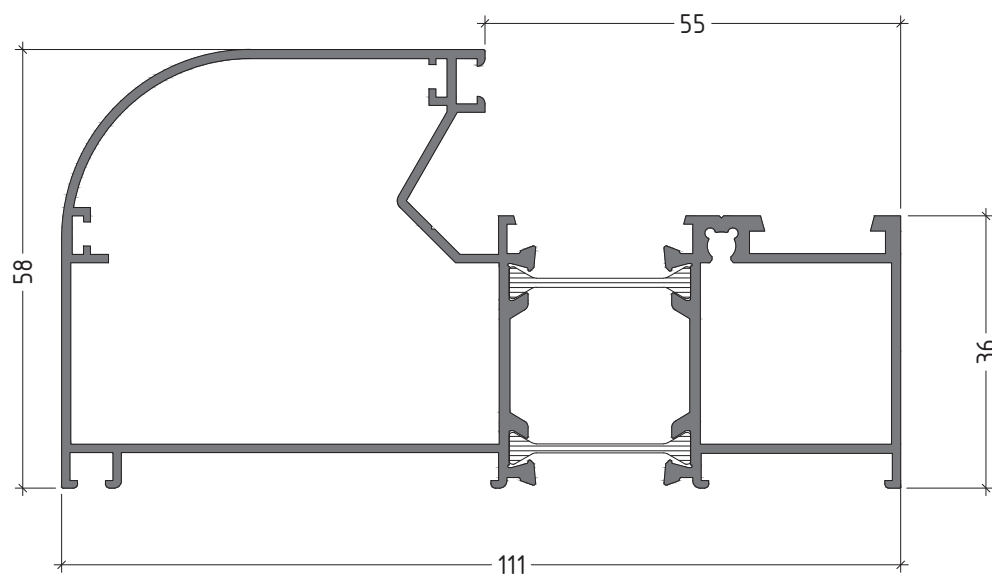
1609 g/m



E45153

frame

1535 g/m



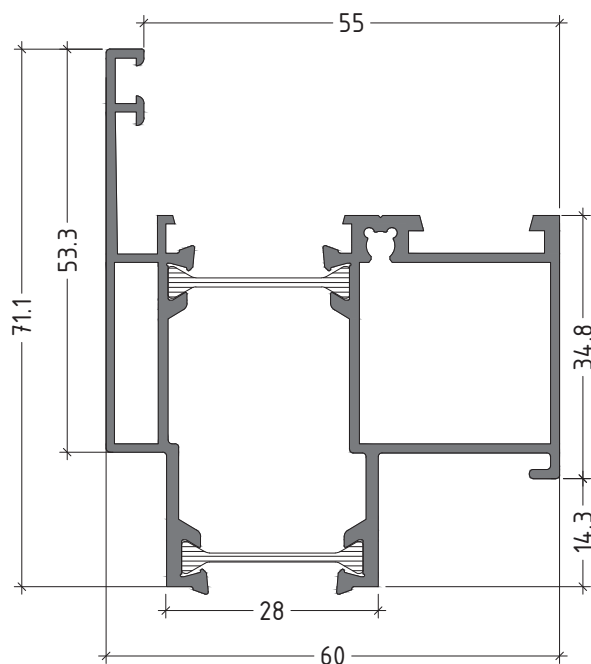
scale : 1:1

P45-06

E45185

frame

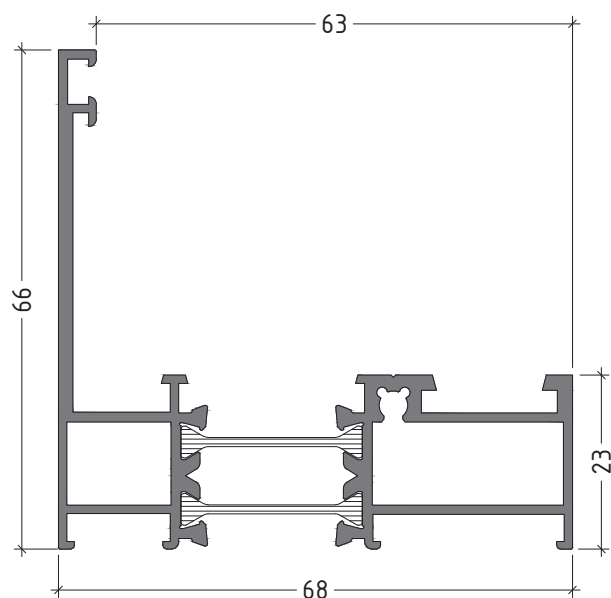
1254 g/m



E45160

frame for
hidden vent

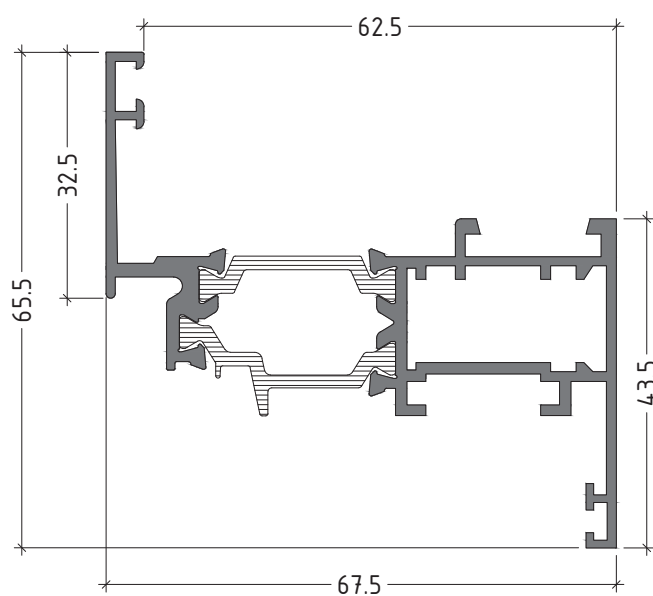
1130 g/m



E45200

vent

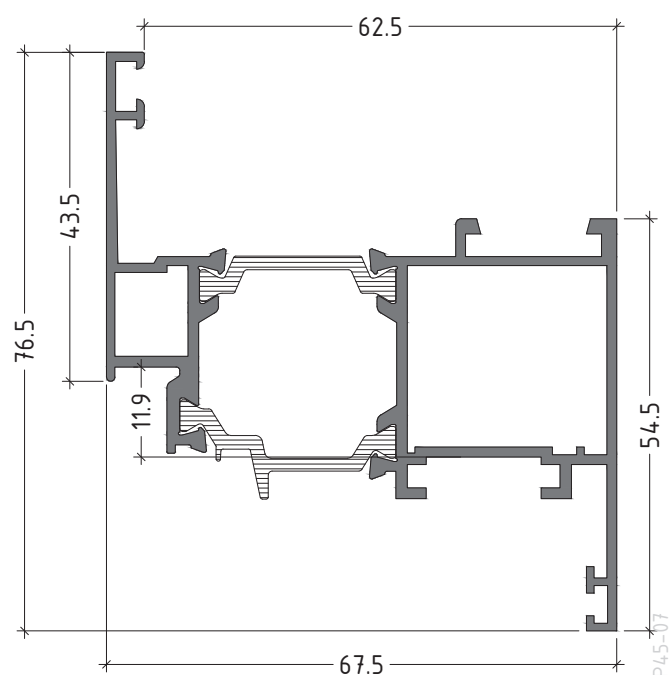
1165 g/m



E45201

vent

1295 g/m

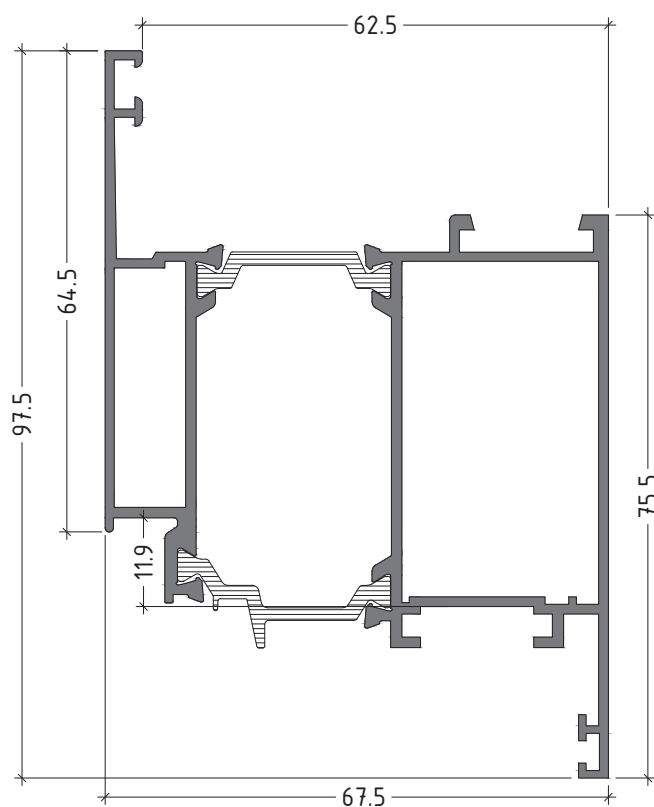


scale : 1:1

E45202

vent

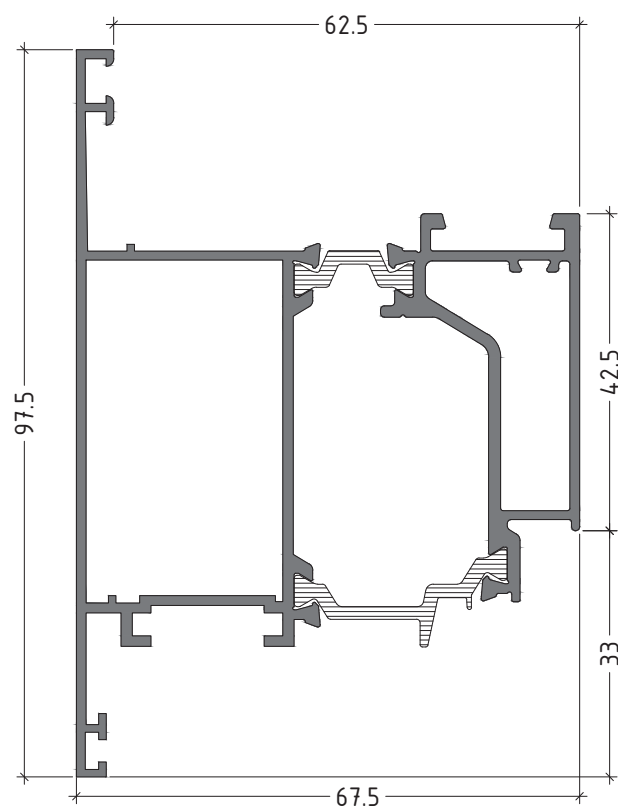
1606 g/m



E45242

vent

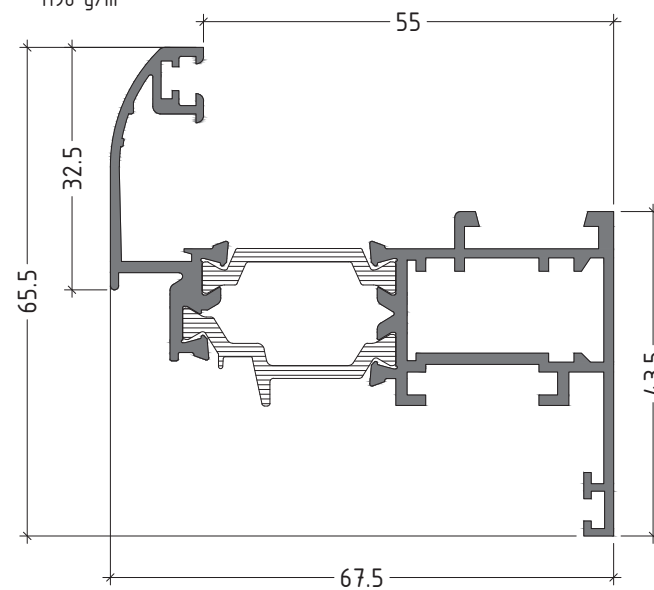
1684 g/m



E45250

vent

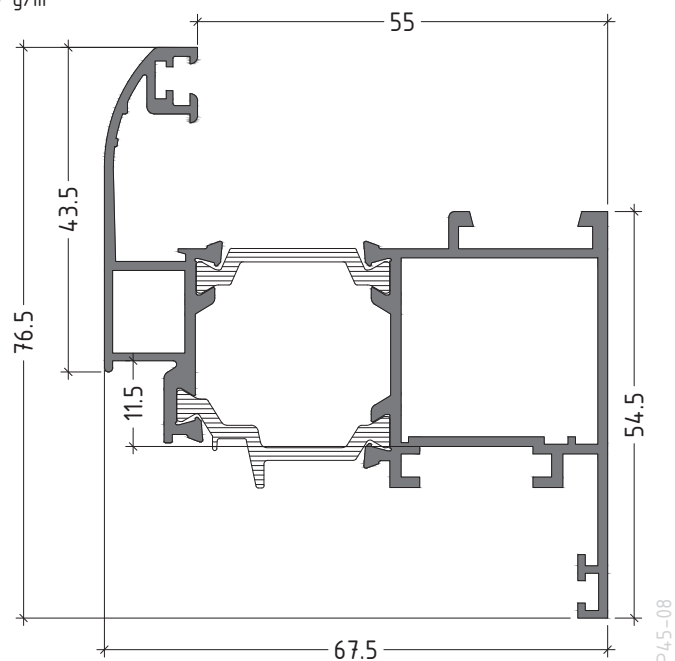
1198 g/m



E45251

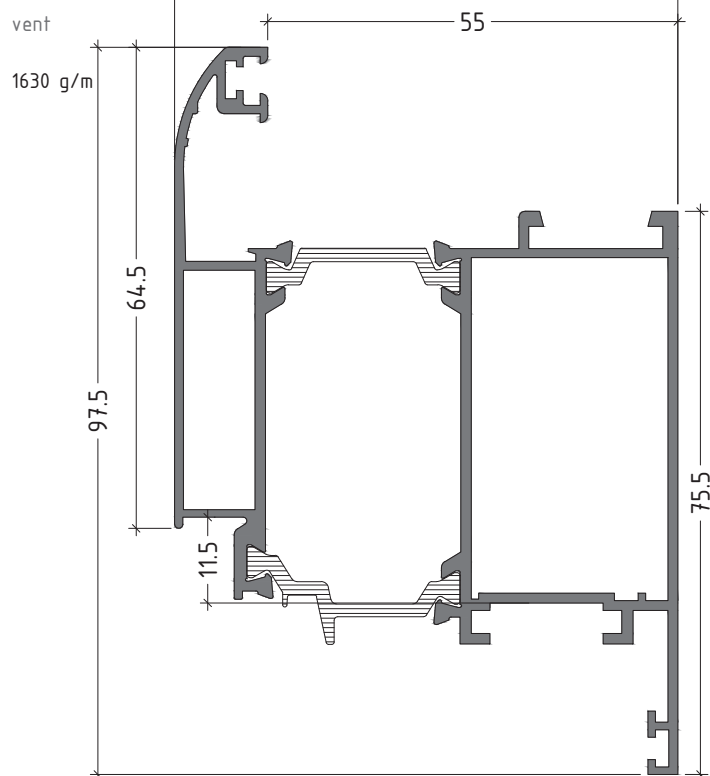
vent

1357 g/m

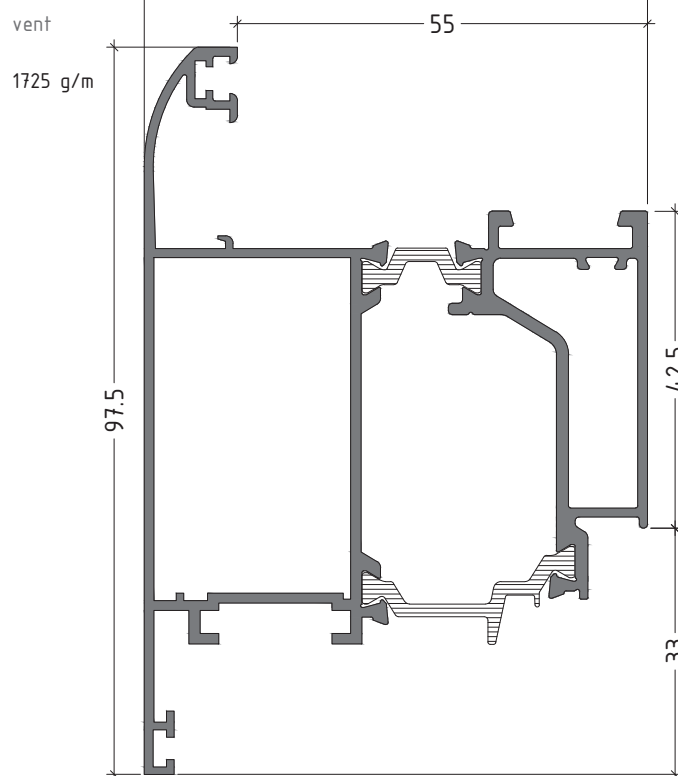


scale : 1:1

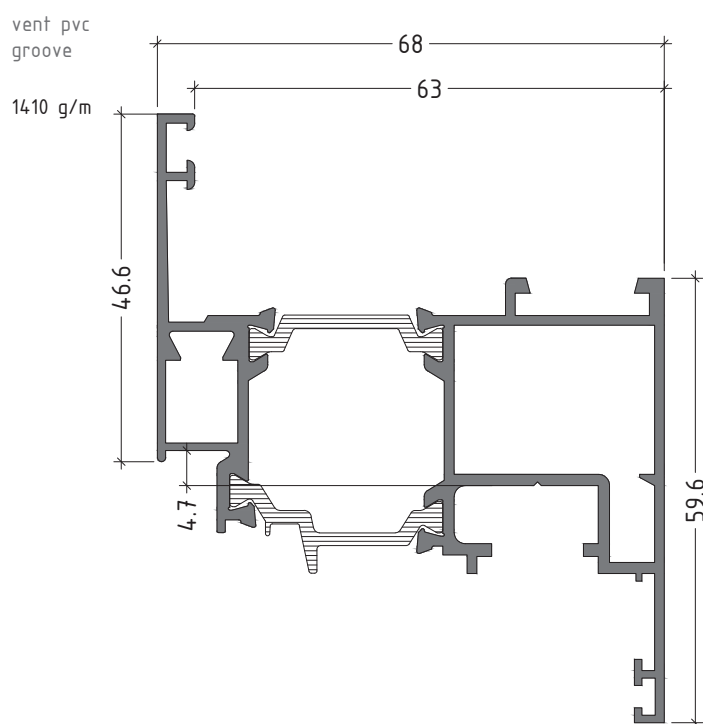
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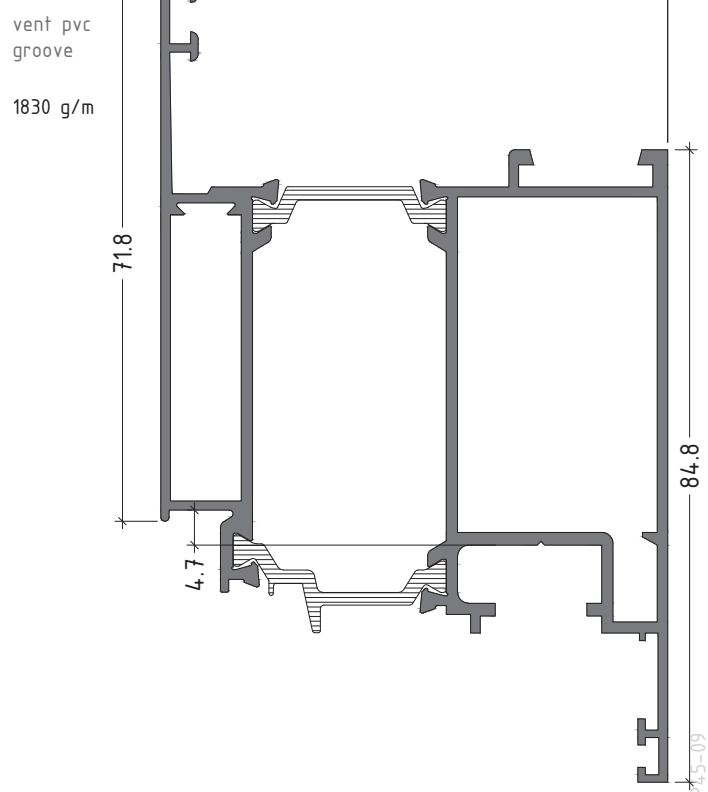
E45292



E45221



E45222

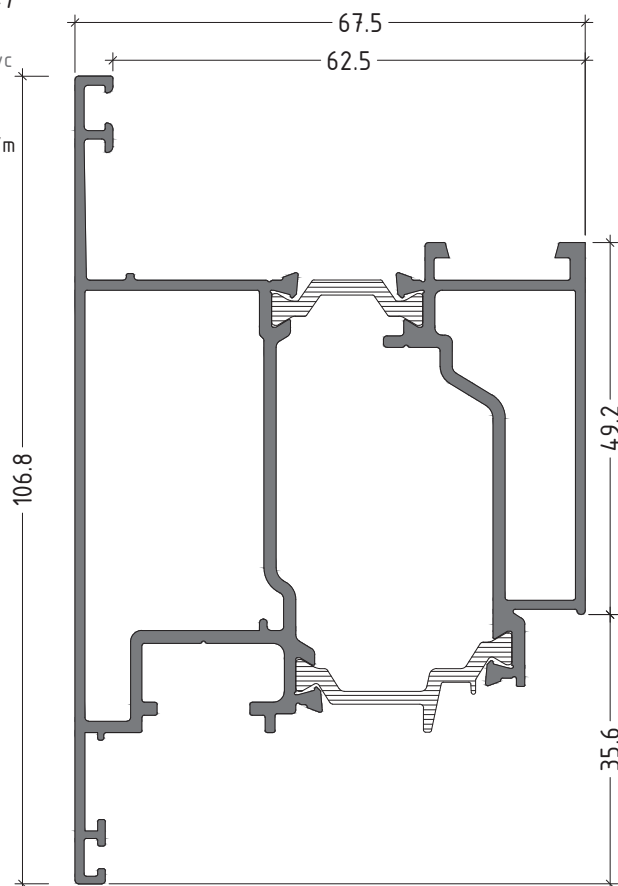


scale : 1:1

E45247

vent pvc
groove

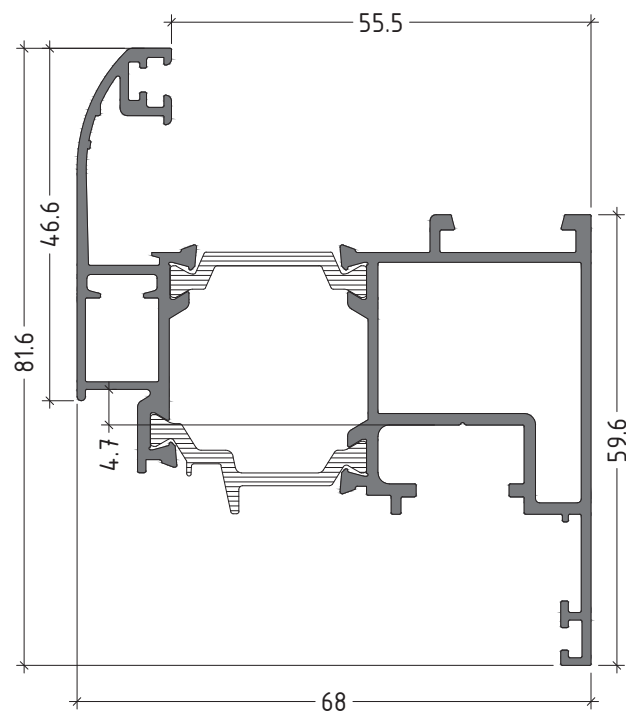
1868 g/m



E45271

vent pvc
groove

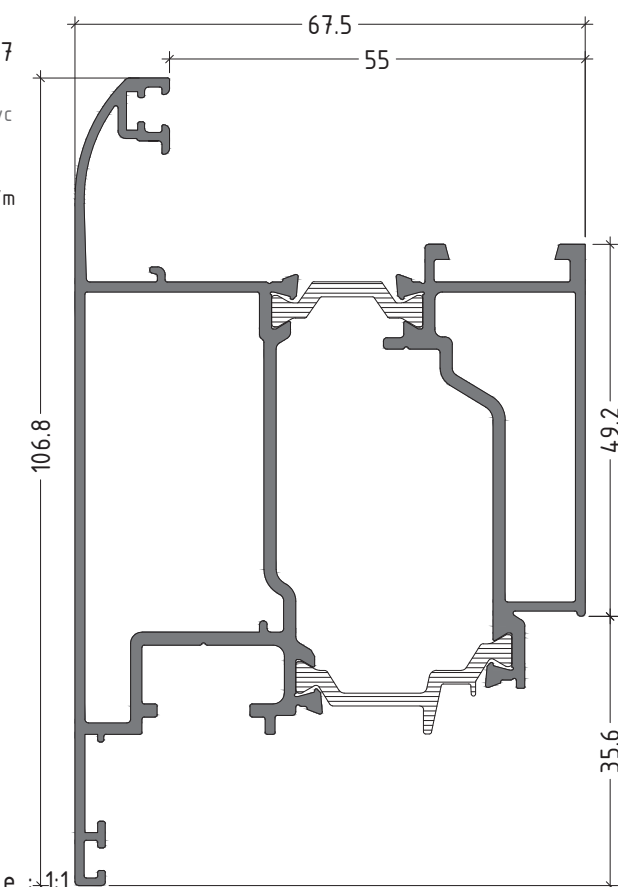
1454 g/m



E45297

vent pvc
groove

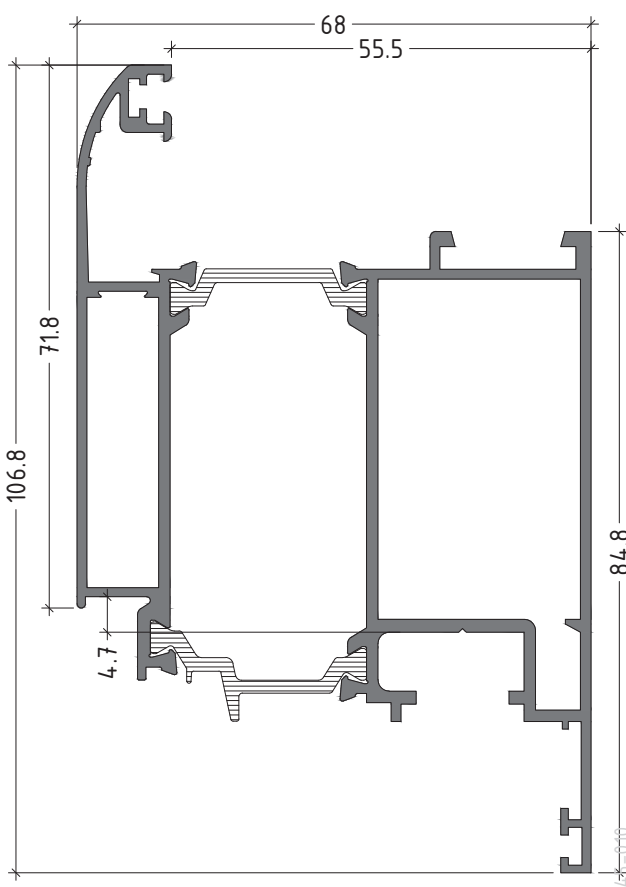
1908 g/m



E45272

vent pvc
groove

1854 g/m

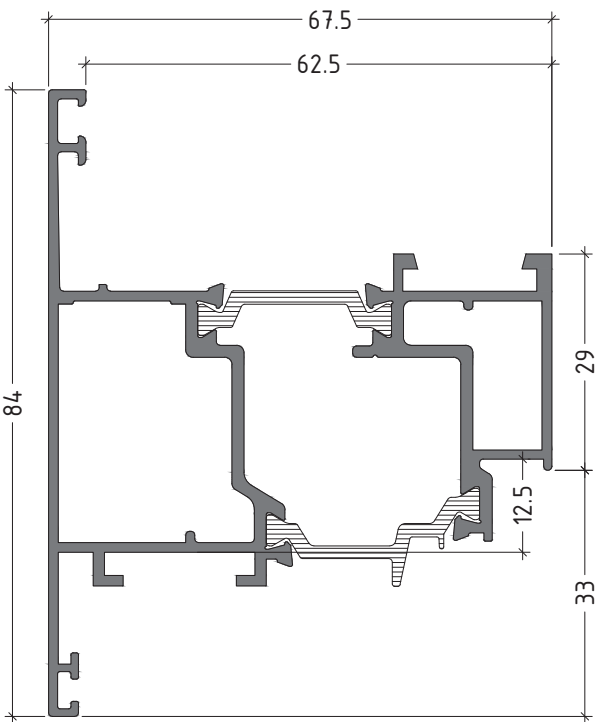


scale 1:1

E45241

vent

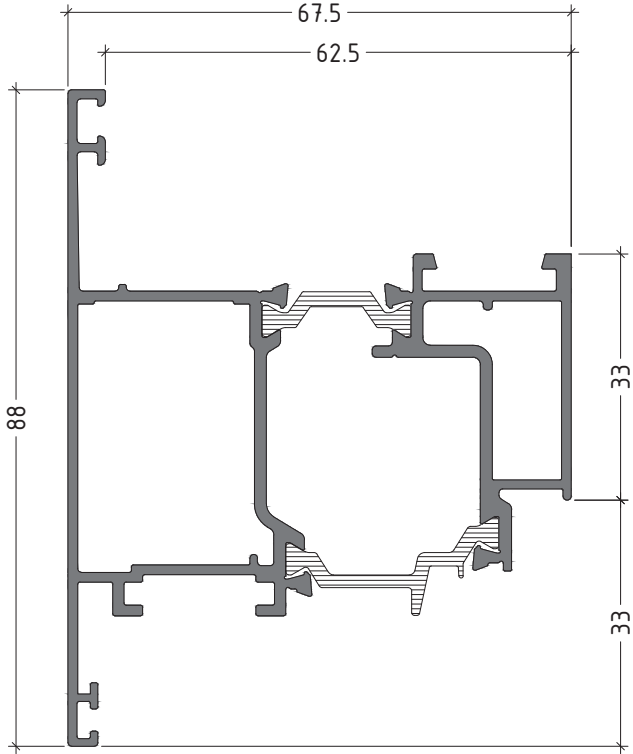
1521 g/m



E45243

vent

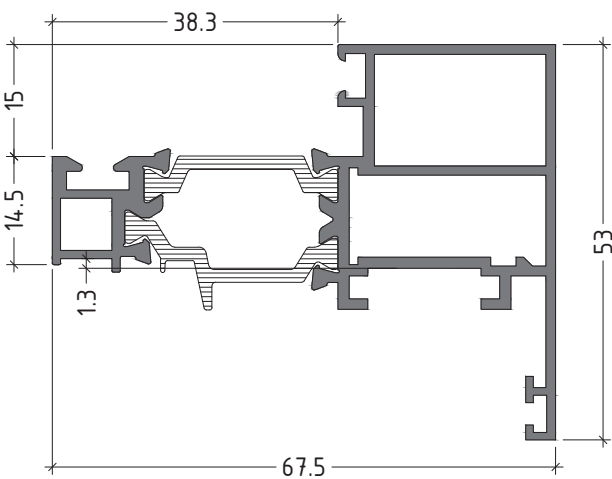
1569 g/m



E45260

hidden vent

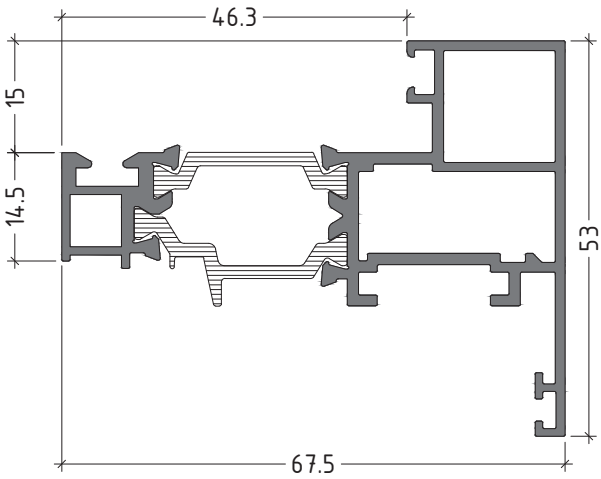
1205 g/m



E45261

hidden vent

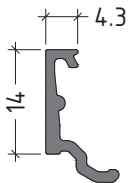
1188 g/m



E40626

glazing bead

116 g/m



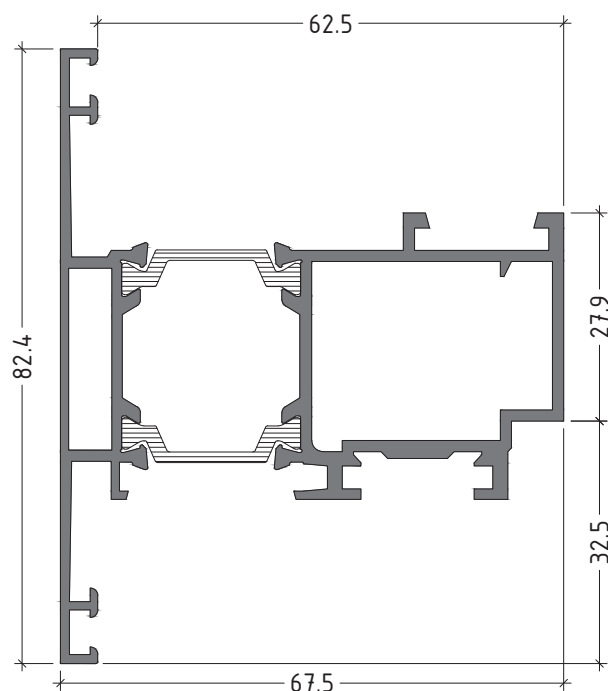
scale : 1:1

P45-011

E45230

vent for pivot
mechanism

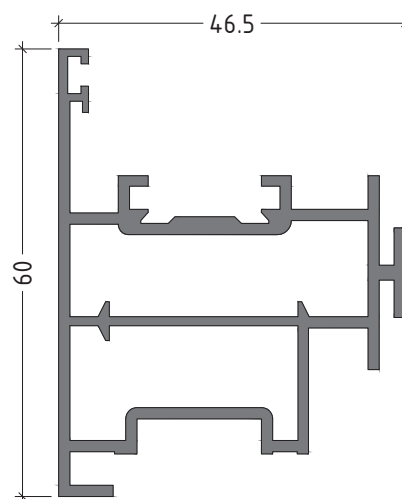
1486 g/m



E40530

additional profile
for pivot mechanism

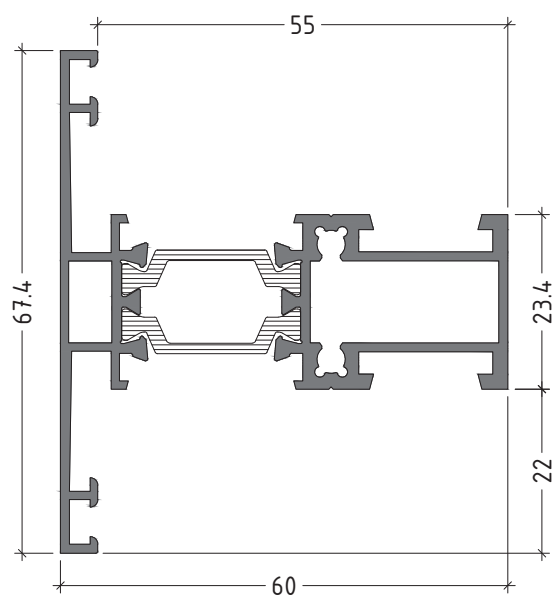
1099 g/m



E45300

T-profile

1138 g/m

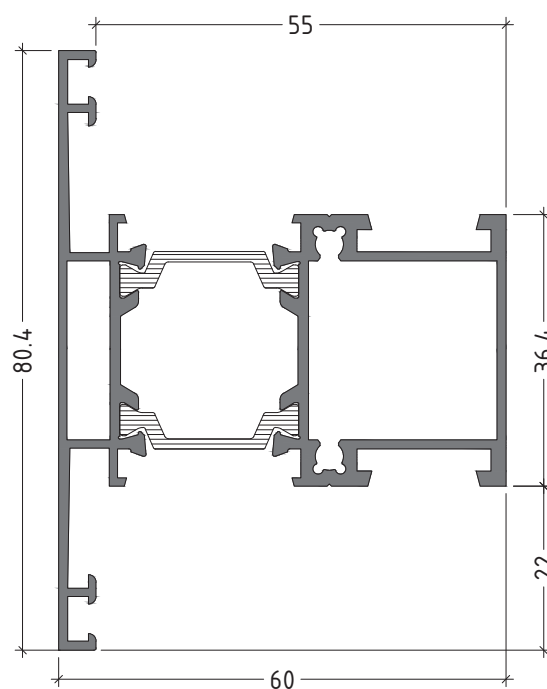


scale : 1:1

E45301

T-profile

1355 g/m

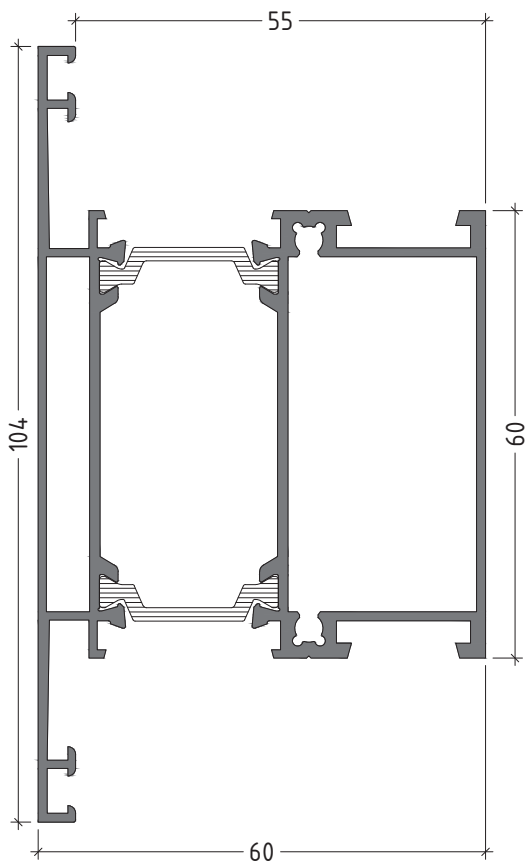


P45-012

E45304

T-profile

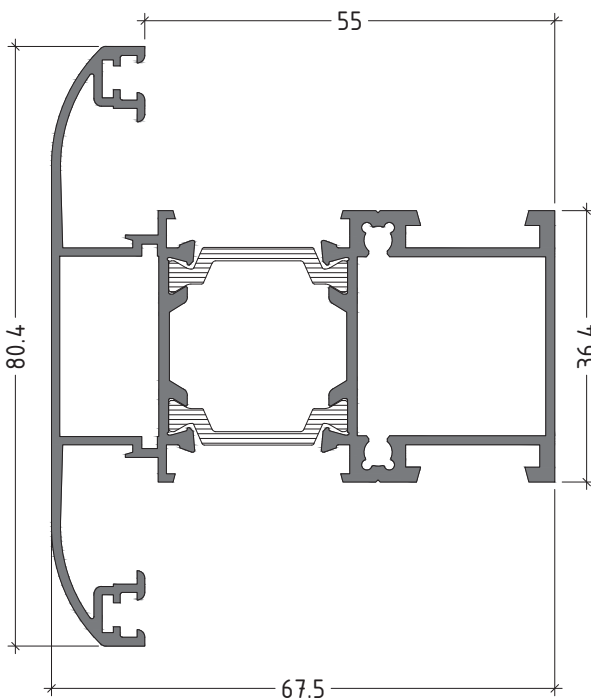
1664 g/m



E45350

T-profile

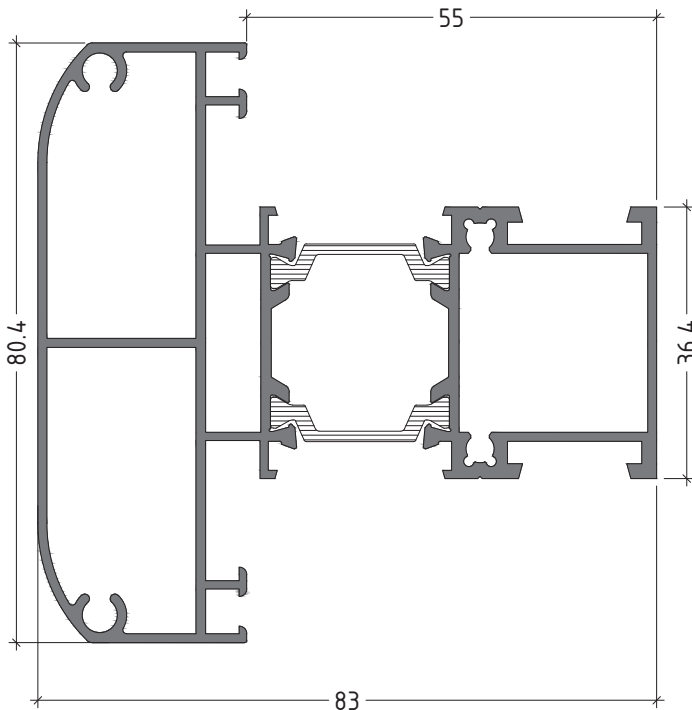
1472 g/m



E45351

T-profile

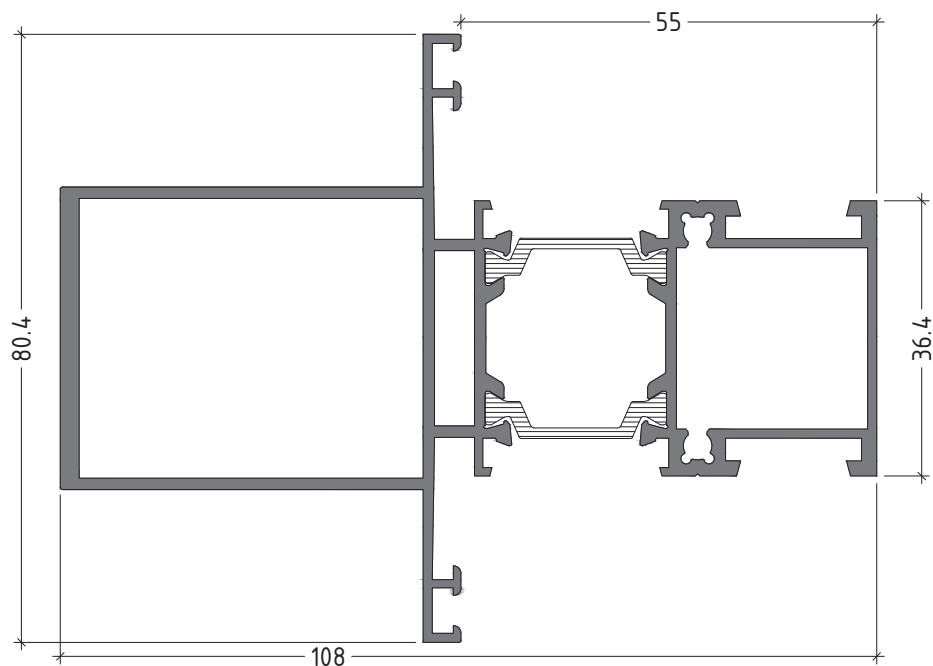
1872 g/m



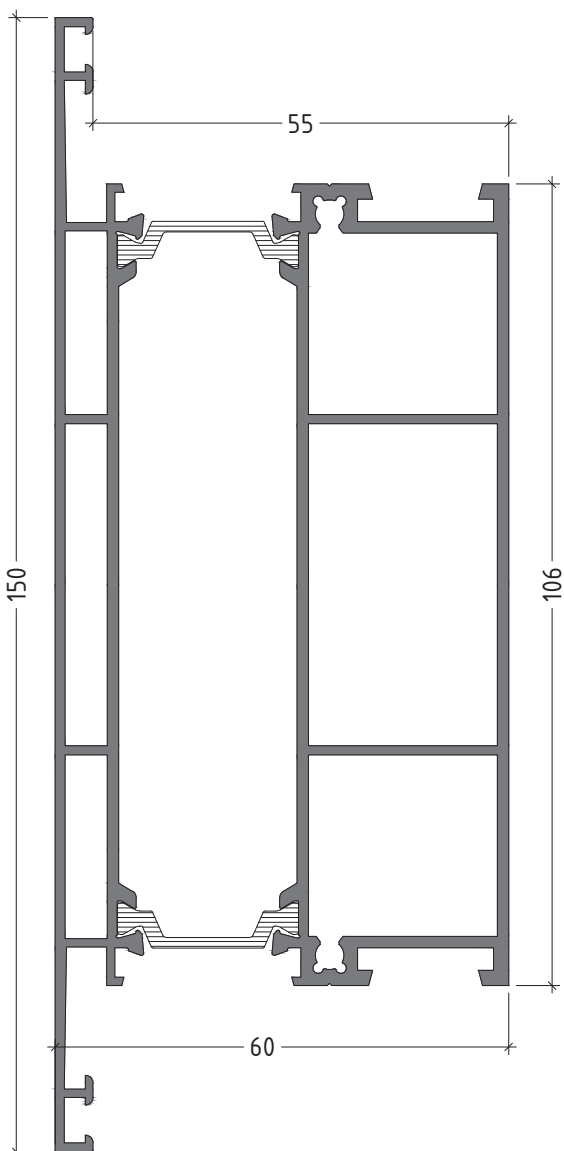
scale : 1:1

P45-013

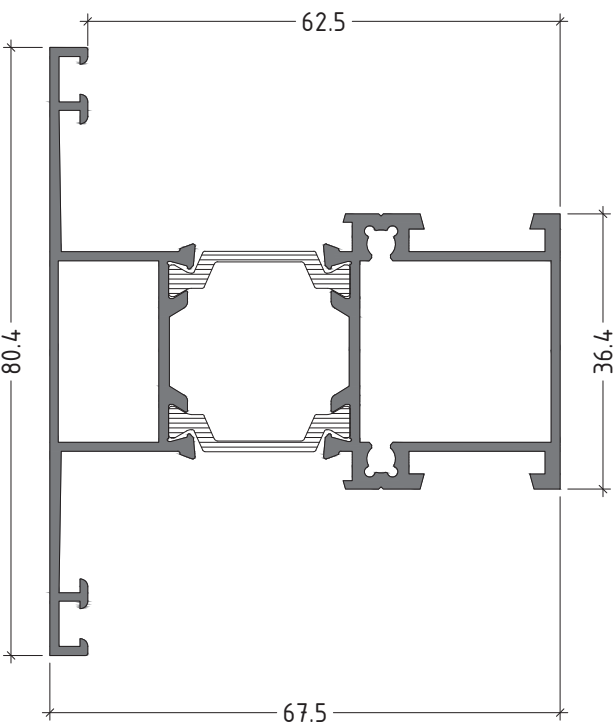
E45302
T-profile
2033 g/m



E45303
T-profile
2711 g/m



E45340
T-profile
1354 g/m



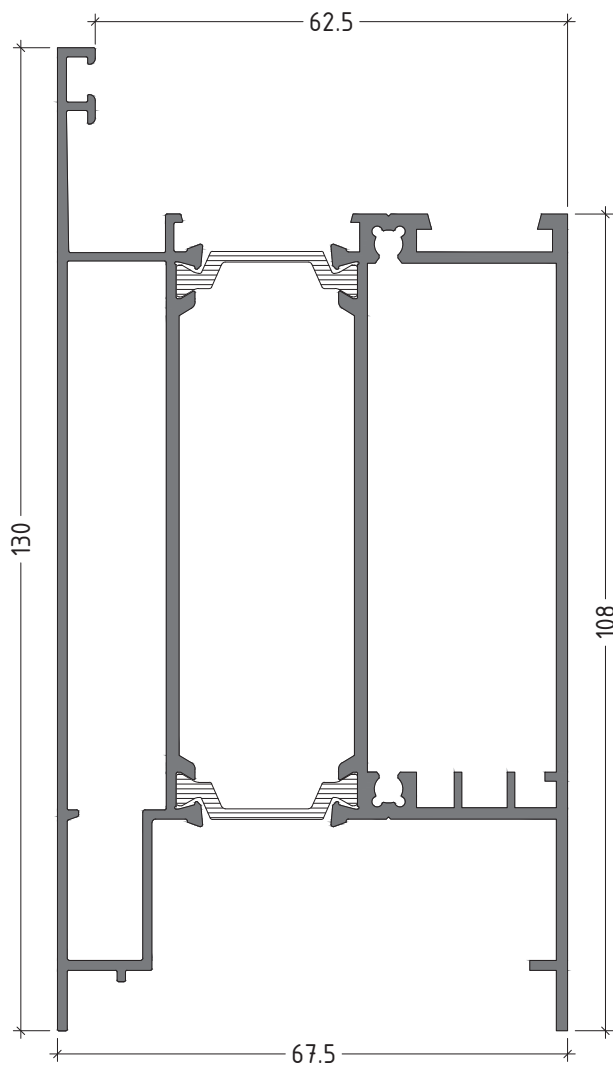
scale : 1:1

P45-014

E45330

door vent
bottom profile

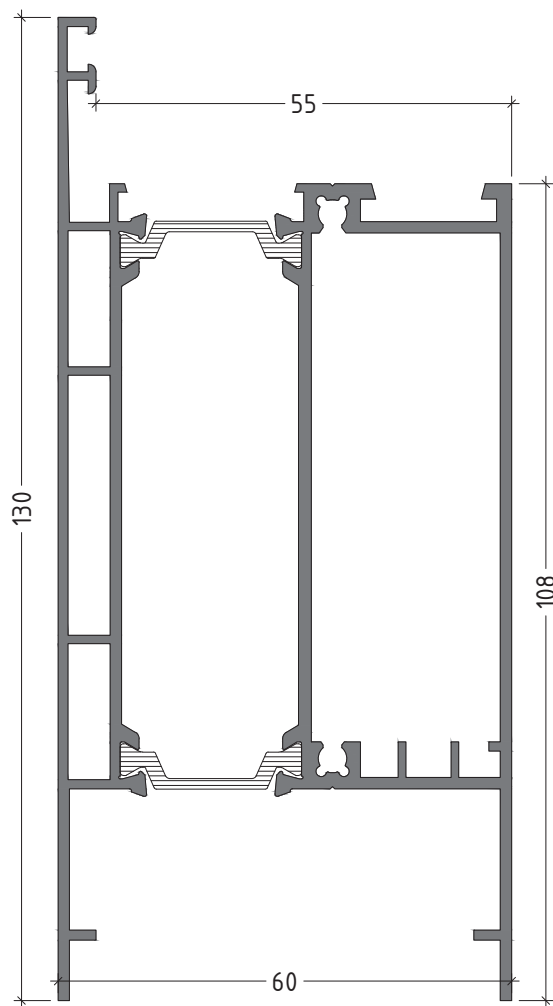
2404 g/m



E45331

door vent
bottom profile

2310 g/m



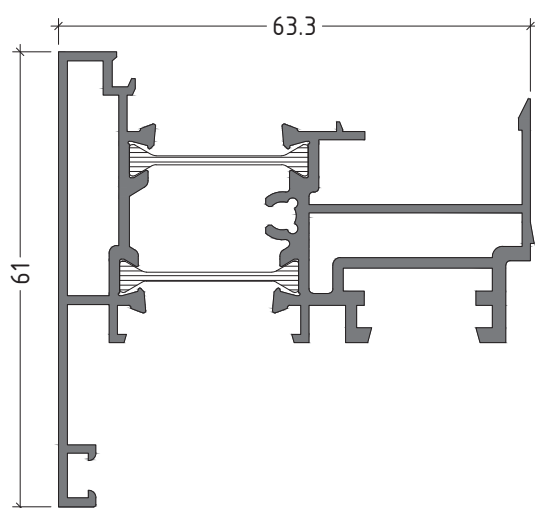
scale : 1:1

P45-015

E45500

secondary vent

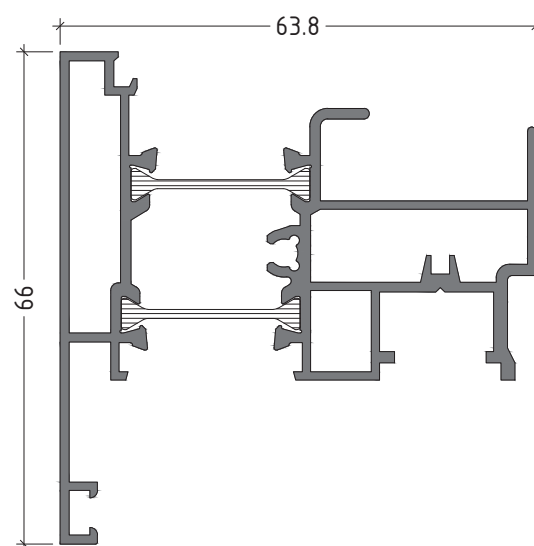
1217 g/m



E45540

secondary vent
pvc groove

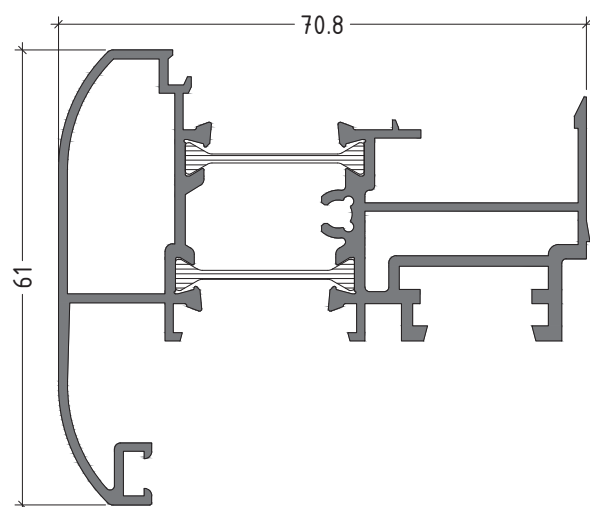
1303 g/m



E45550

secondary vent

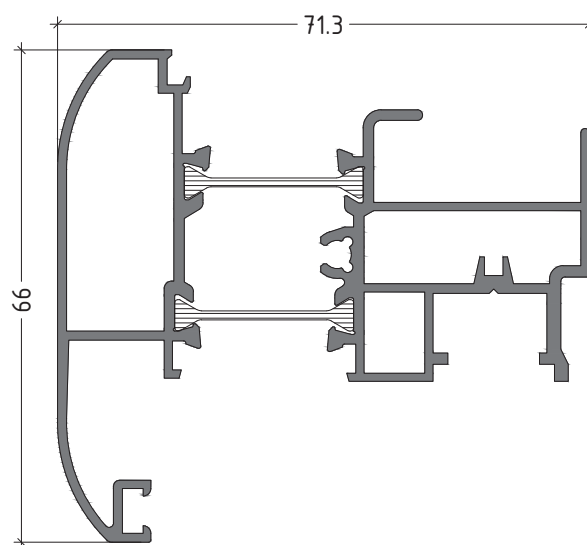
1321 g/m



E45590

secondary vent
pvc groove

1362 g/m



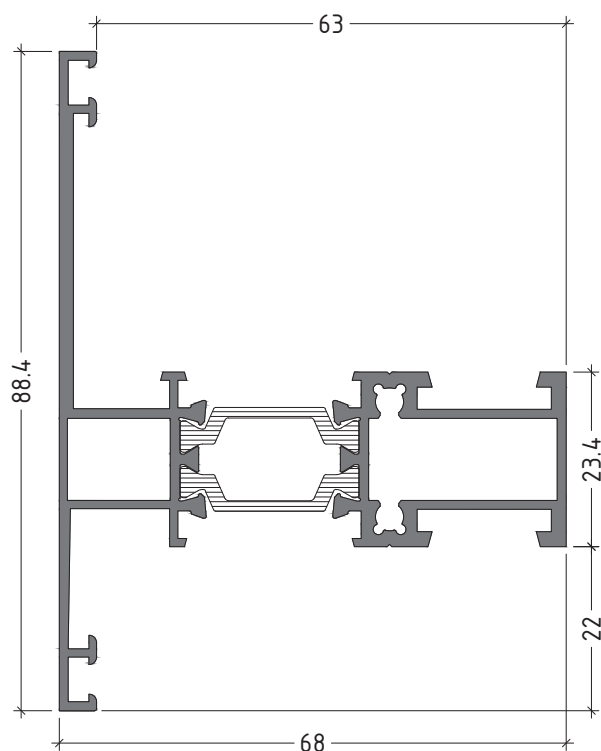
scale : 1:1

P45-016

E45360

T-profile for
hidden vent

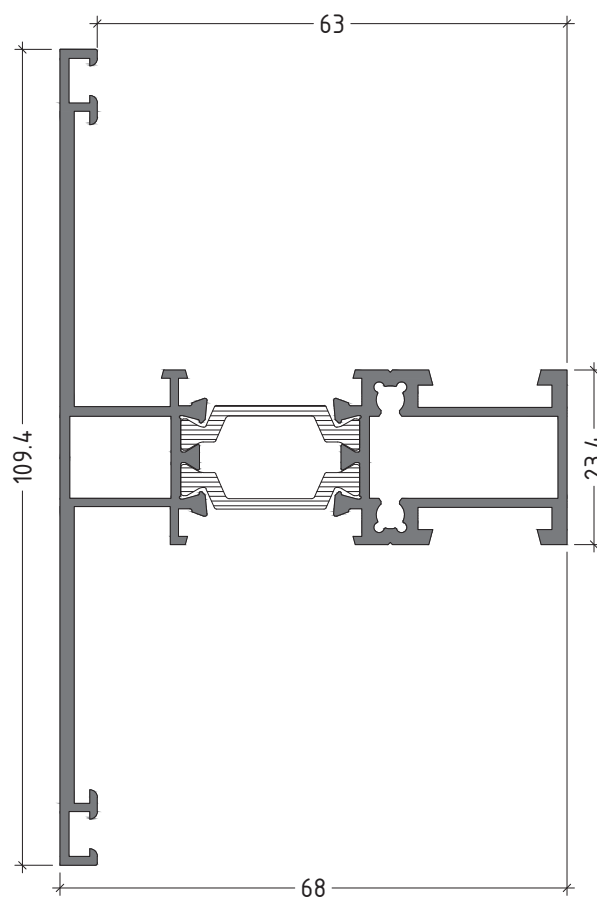
1330 g/m



E45361

T-profile for
hidden vent

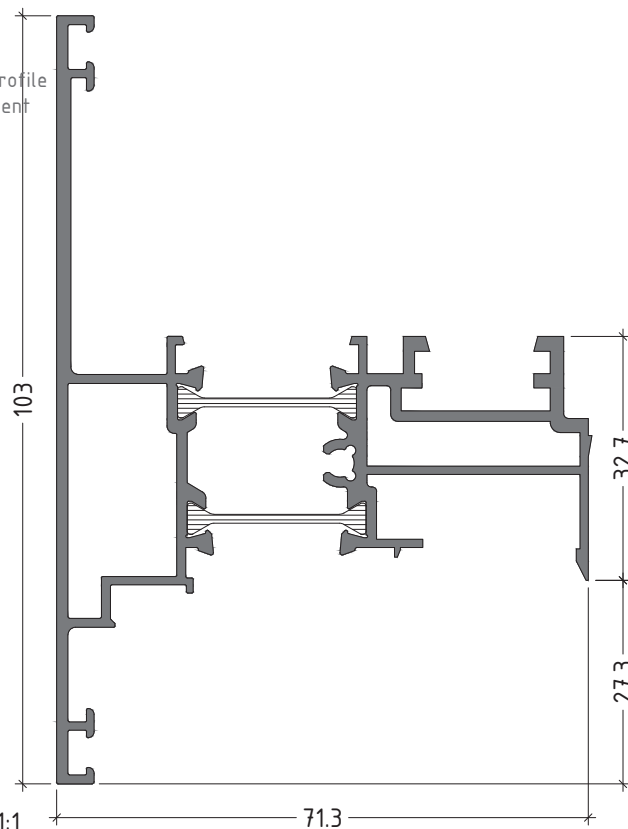
1473 g/m



E45560

secondary profile
for hidden vent

1523 g/m

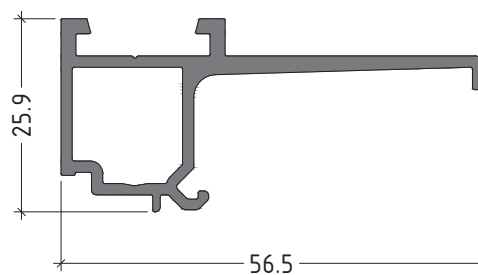


scale : 1:1

E40660

additional for hidden vent

589 g/m

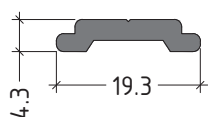


P45-017

E2308

operating rod

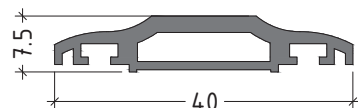
157 g/m



E40650

decorative
lattice

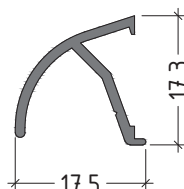
338 g/m



E40820

drip profile

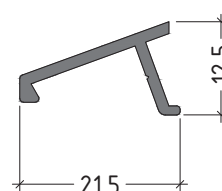
143 g/m



E2357

drip profile

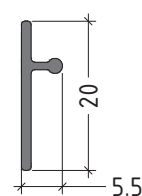
144 g/m



E62600

supplementary
profile

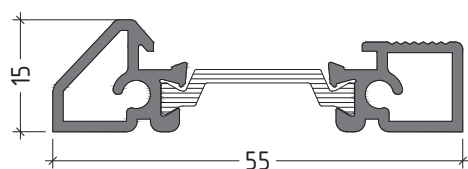
85 g/m



E45800

threshold

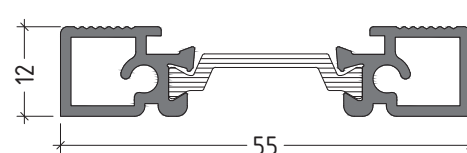
566 g/m



E45801

threshold

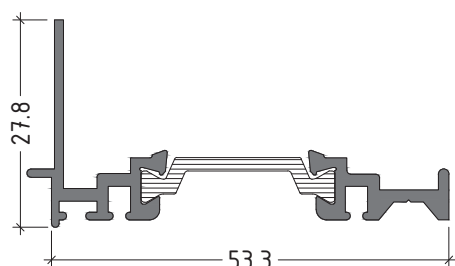
553 g/m



E45810

bottom door-vent
additional profile

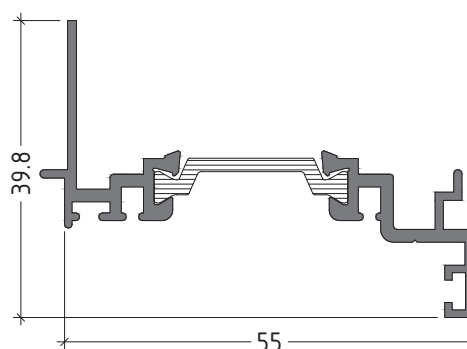
526 g/m



E45811

bottom door-vent
additional profile

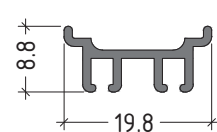
601 g/m



E40812

bottom door-vent
additional profile

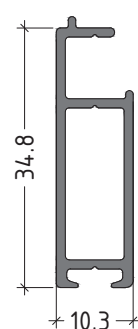
135 g/m



E40622

flyscreen
profile

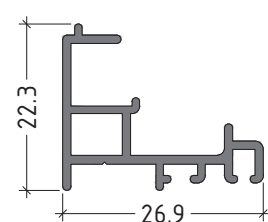
280 g/m



E40813

additional profile
for door

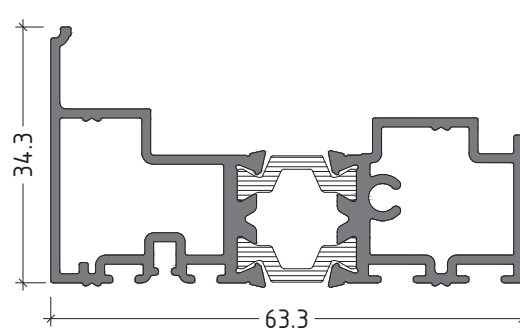
265 g/m



E45820

threshold

1050 g/m



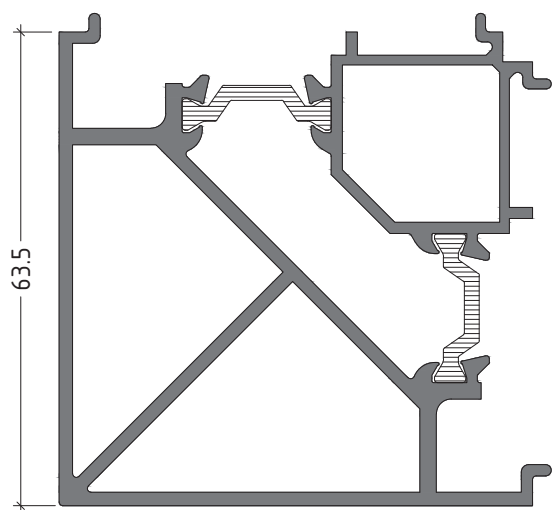
scale : 1:1

P45-018

E40600

mullion

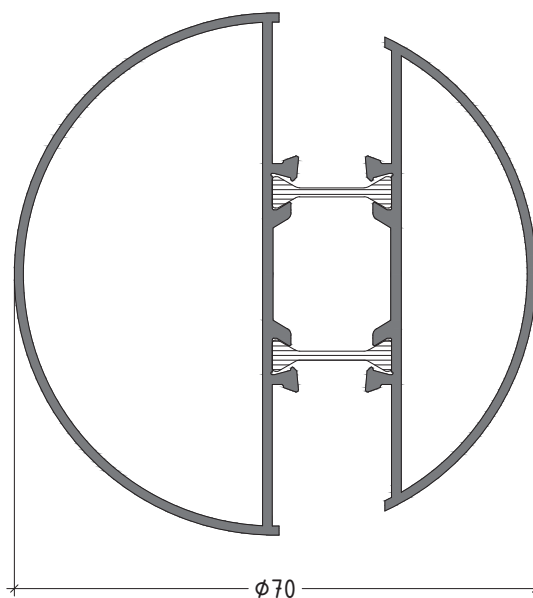
2027 g/m



E40603

mullion

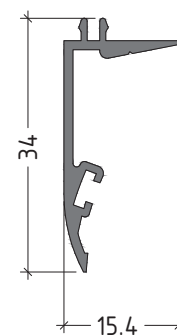
1272 g/m



E40602

additional
profile

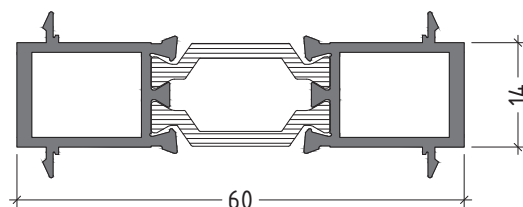
203 g/m



E45655

intermediate
profile

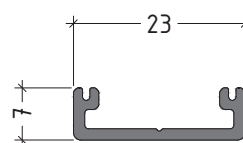
768 g/m



E40995

connecting
profile

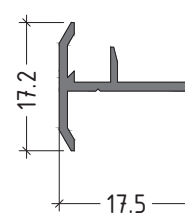
155 g/m



E40604

additional
profile

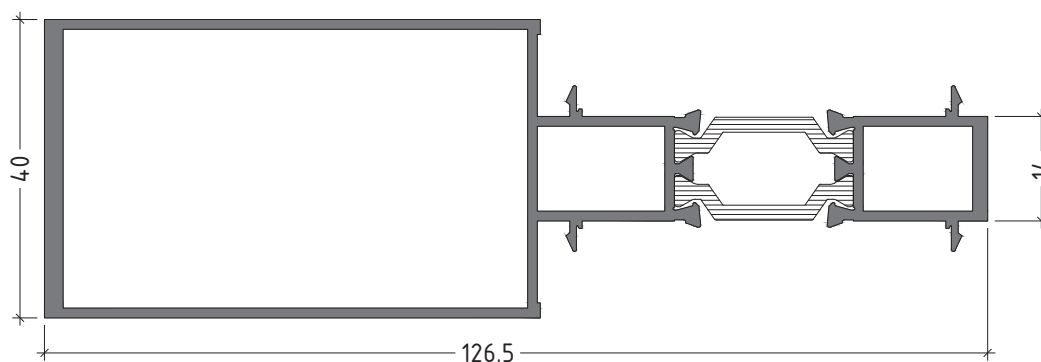
116 g/m



E45656

intermediate
profile

1563 g/m



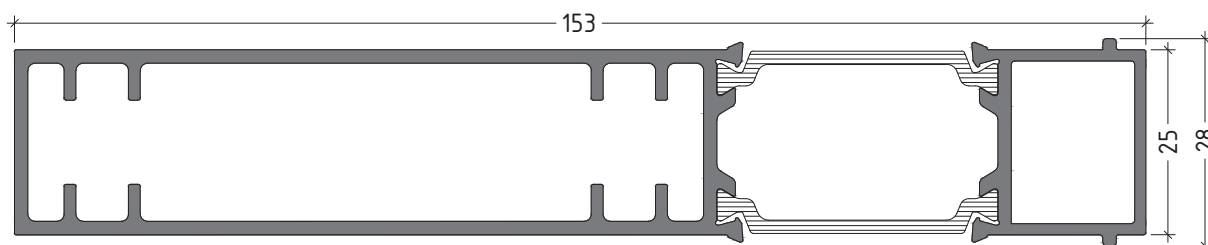
scale : 1:1

P45-019

E50691

reinforcement
profile

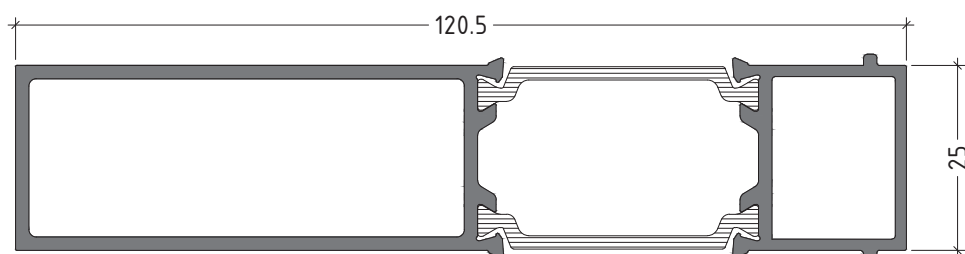
2046 g/m



E50690

reinforcement
profile

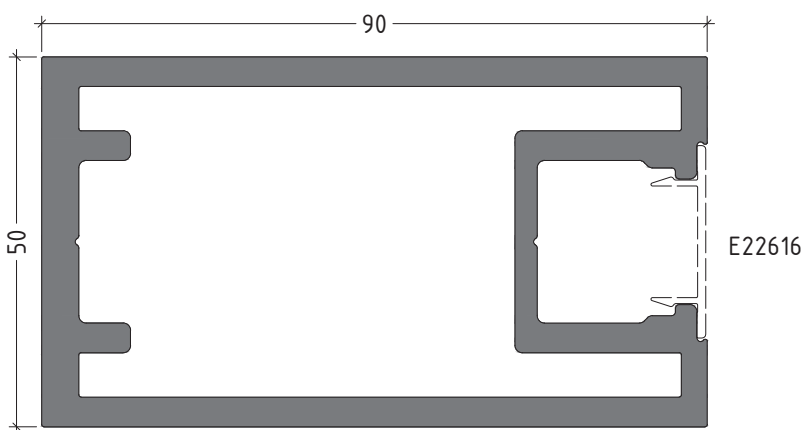
1550 g/m



E62050

reinforcement
profile

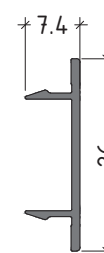
3555 g/m



E22616

cap for
E62050

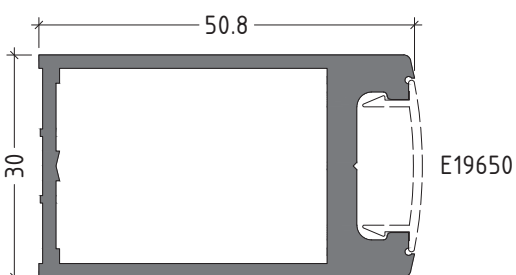
105 g/m



E22603

reinforcement
profile

1054 g/m



E19650
cap for
E22603

103 g/m



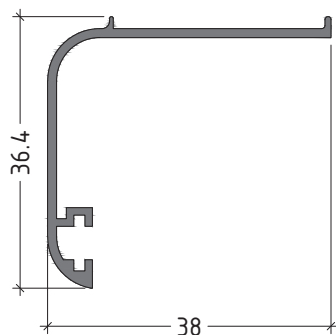
P45-020

scale : 1:1

E5366

architrave

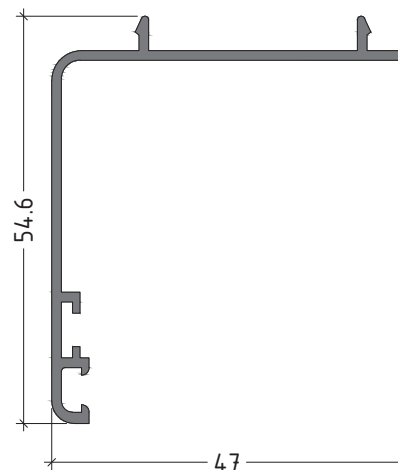
269 g/m



E1115

architrave

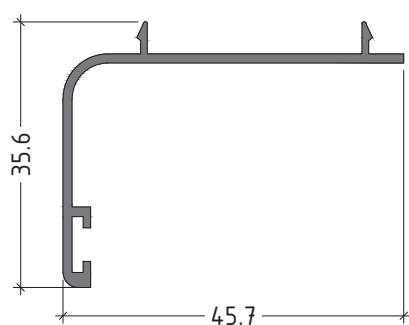
408 g/m



E1127

architrave

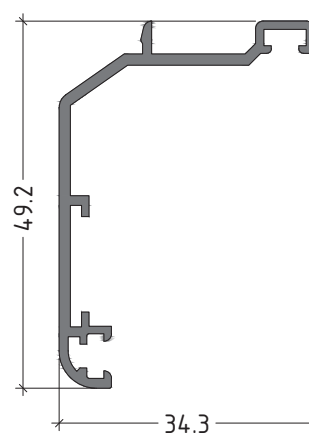
289 g/m



E40605

architrave

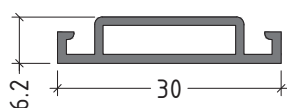
381 g/m



E40651

decorative
lattice

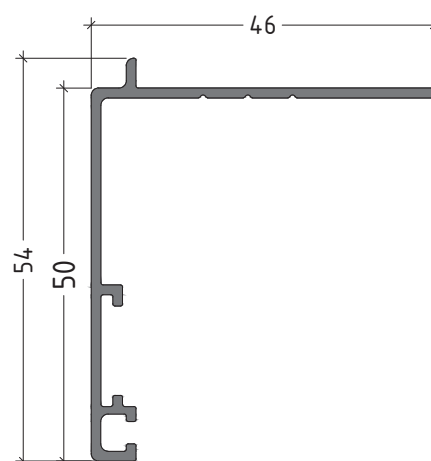
203 g/m



E62032

architrave

402 g/m



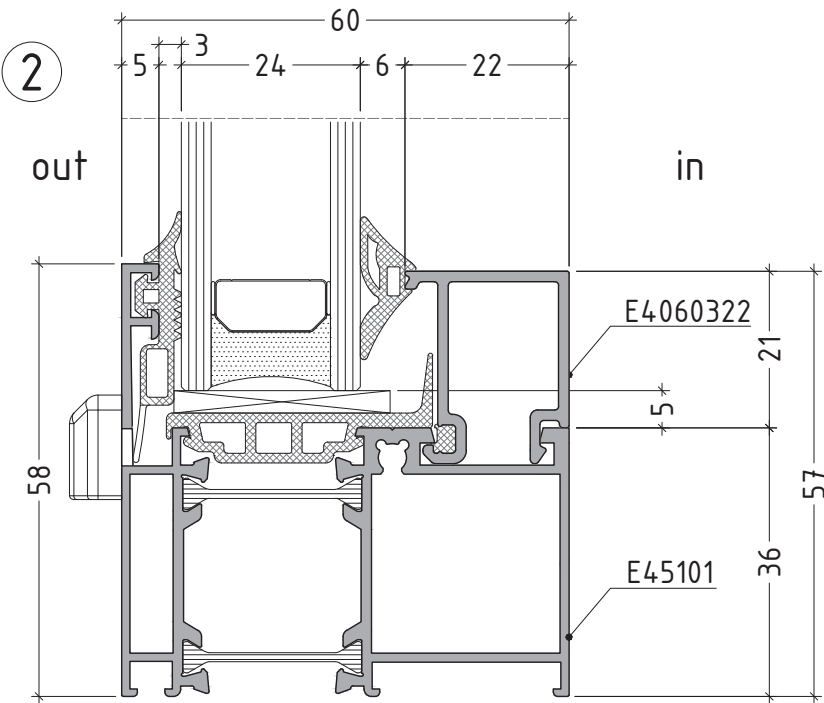
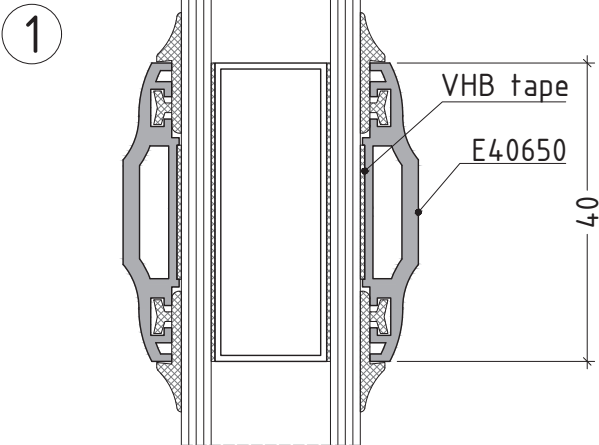
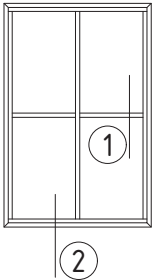
scale : 1:1

P45-021

SECTIONS

SECTIONS / DETAILS

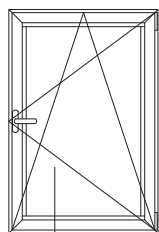
fix
position



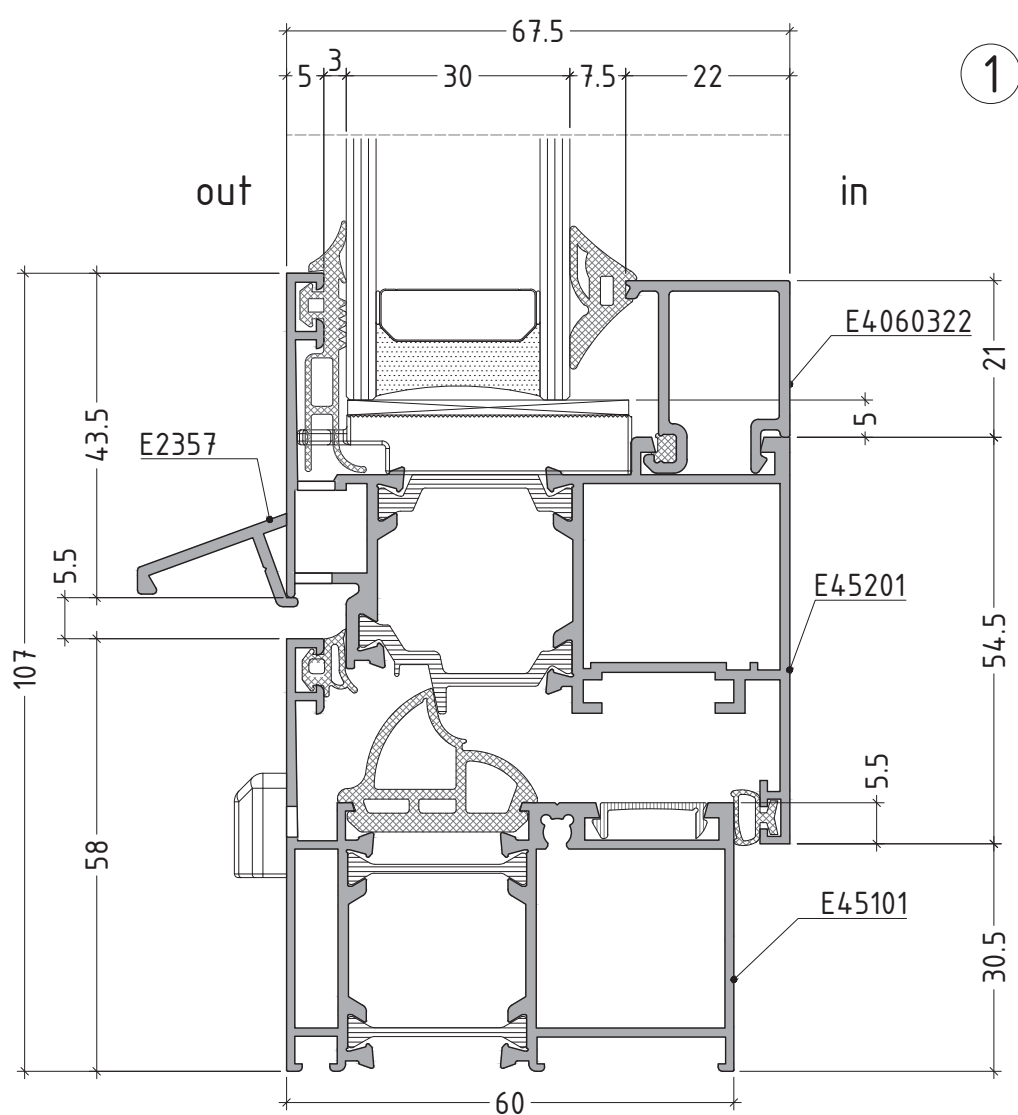
scale : 1:1

D45-1

inward opening



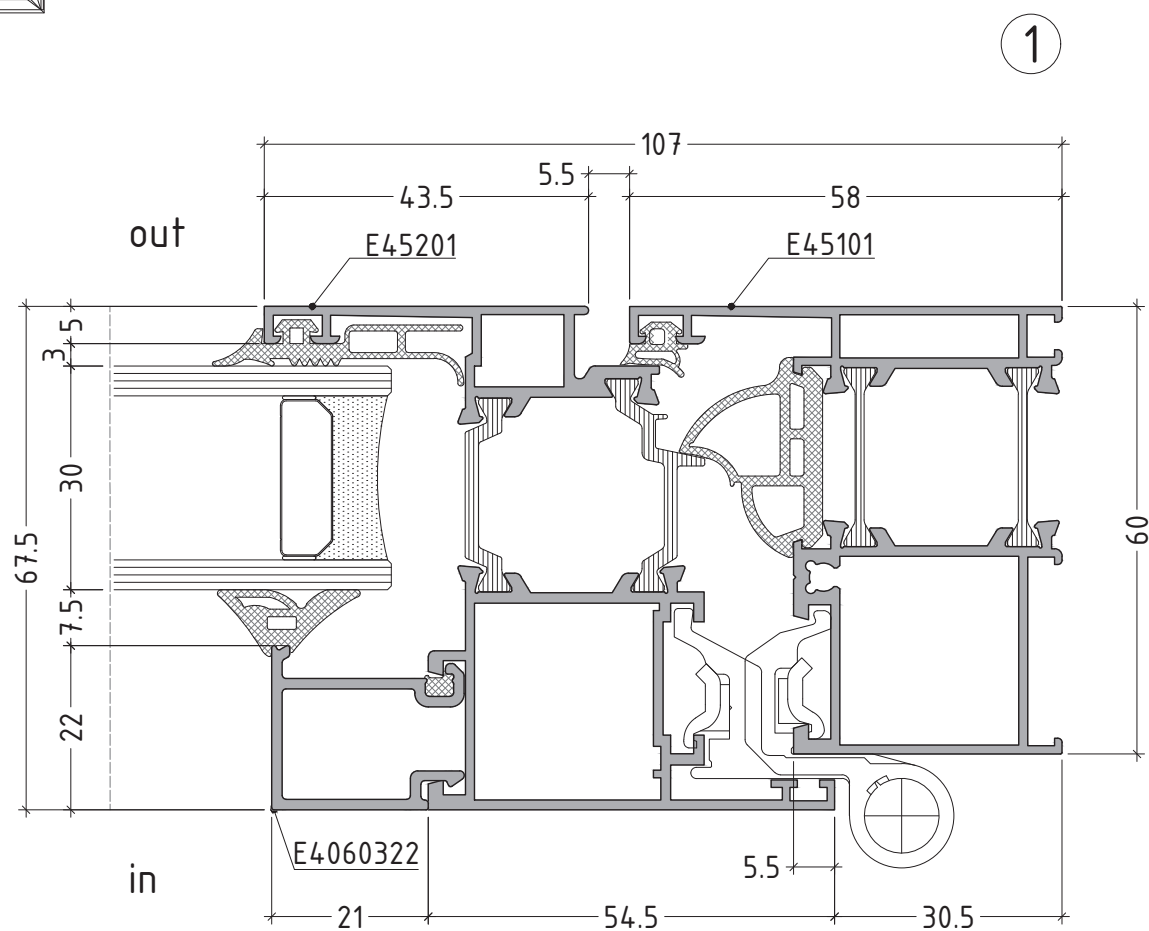
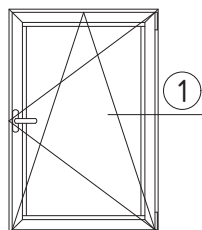
①



scale : 1:1

D45-2

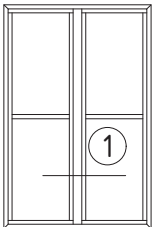
inward opening



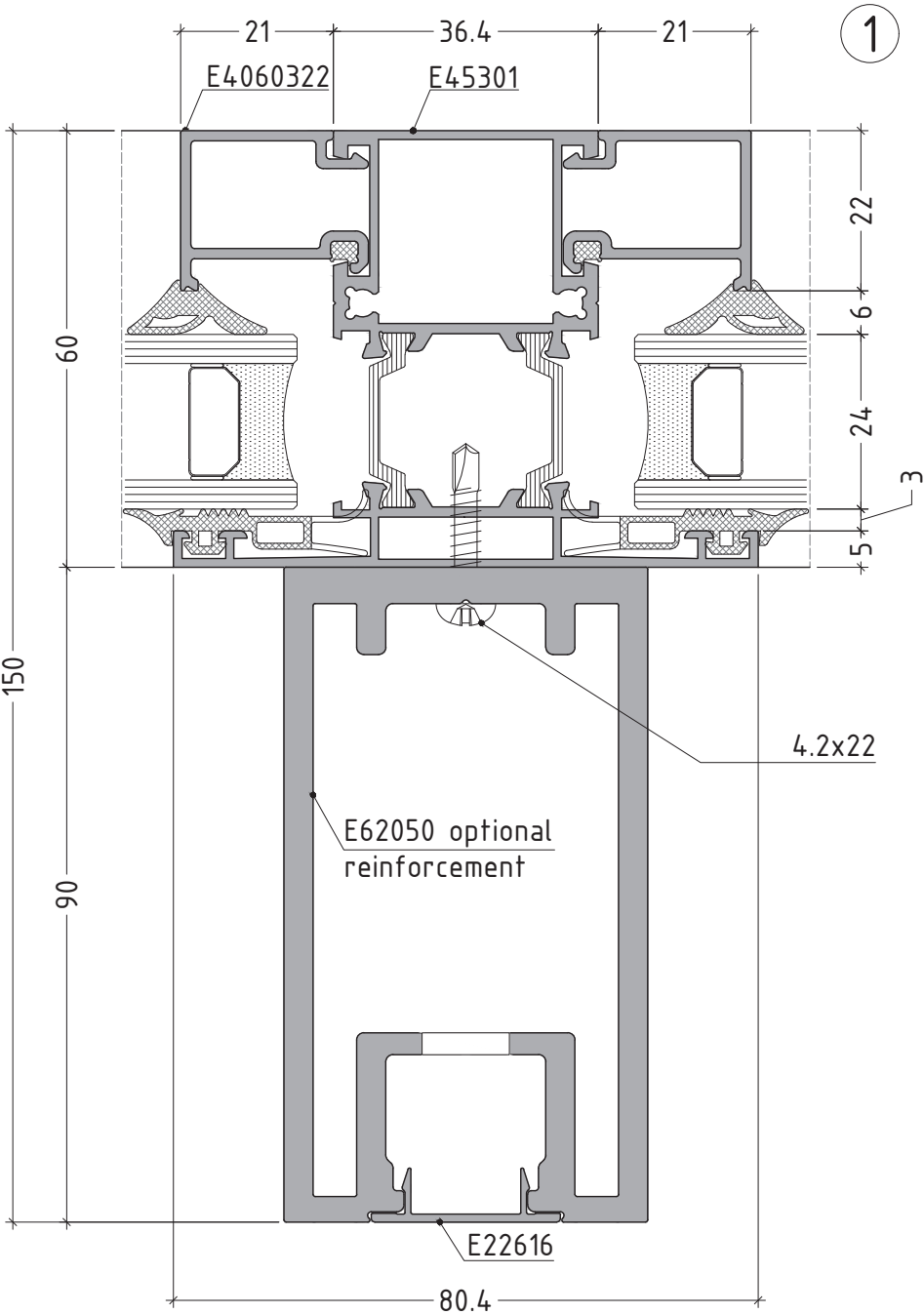
scale : 1:1

D45-3

fix
position



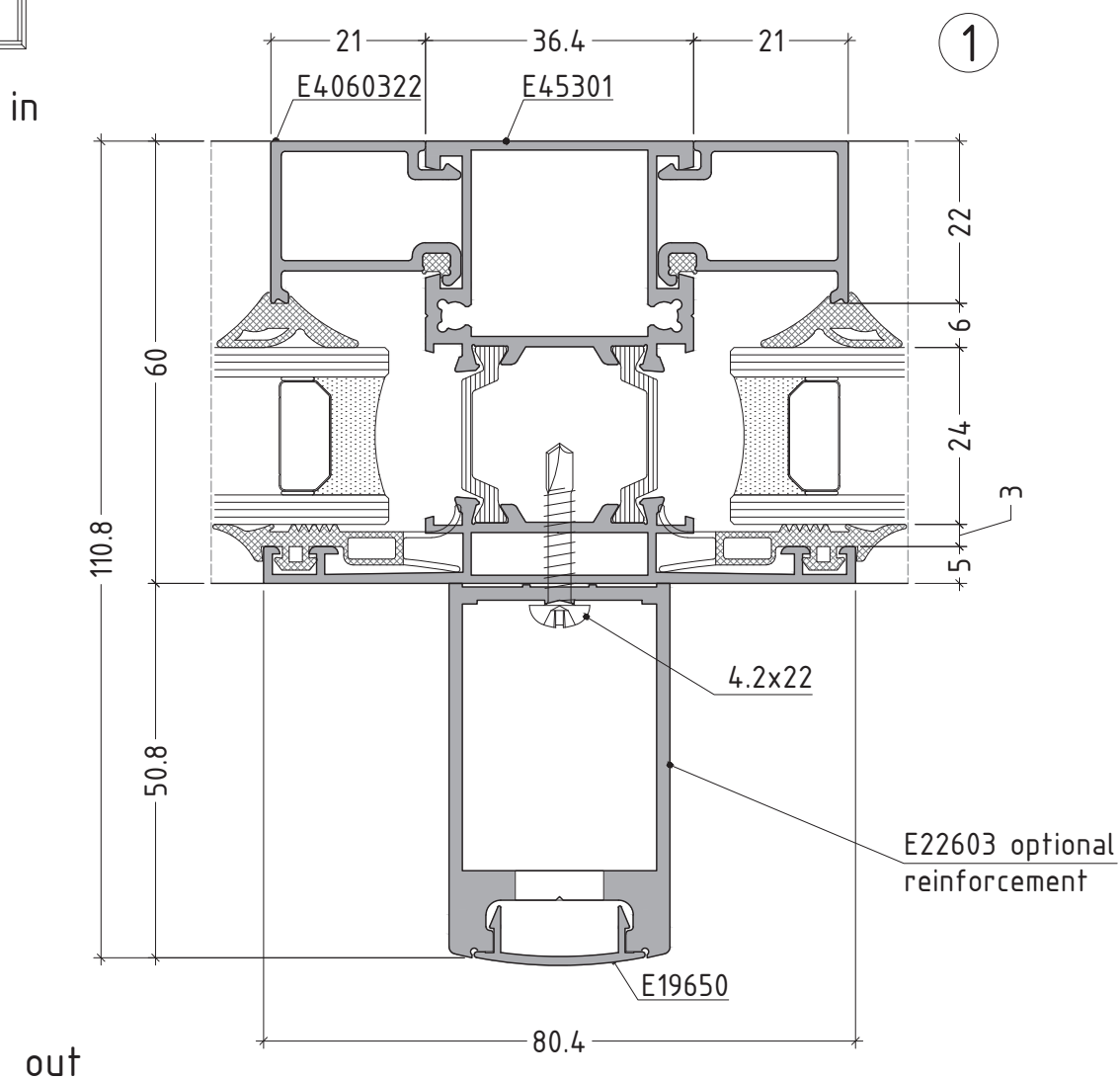
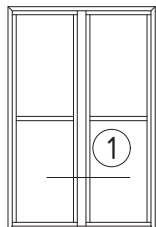
in



out

scale : 1:1

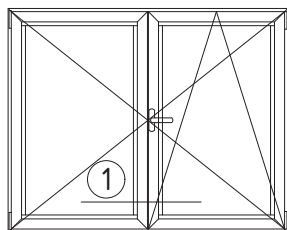
fix
position



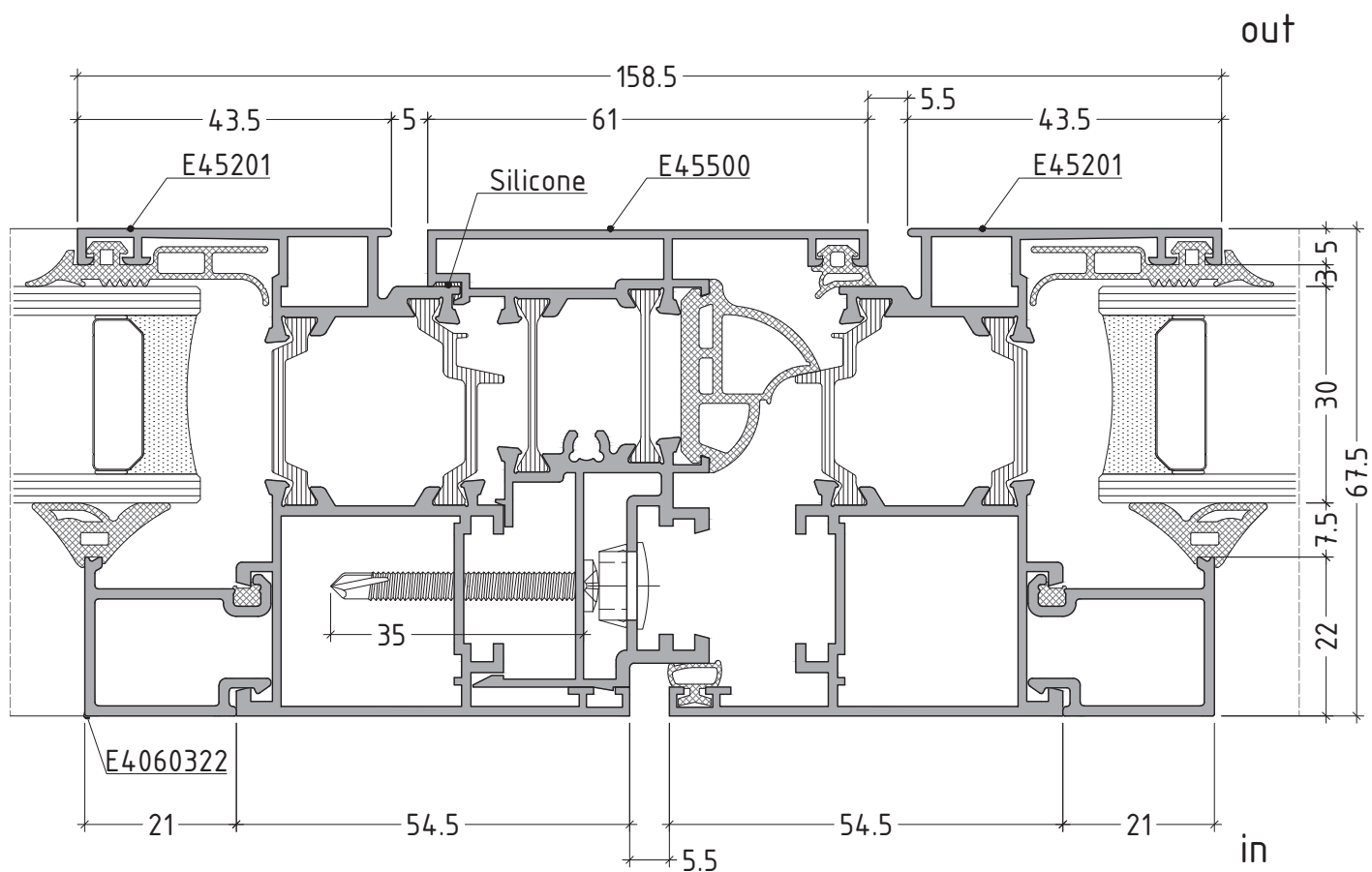
scale : 1:1

D45-5

inward opening



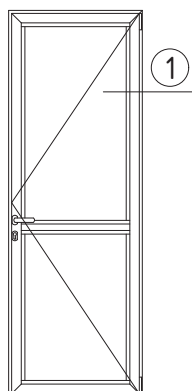
1



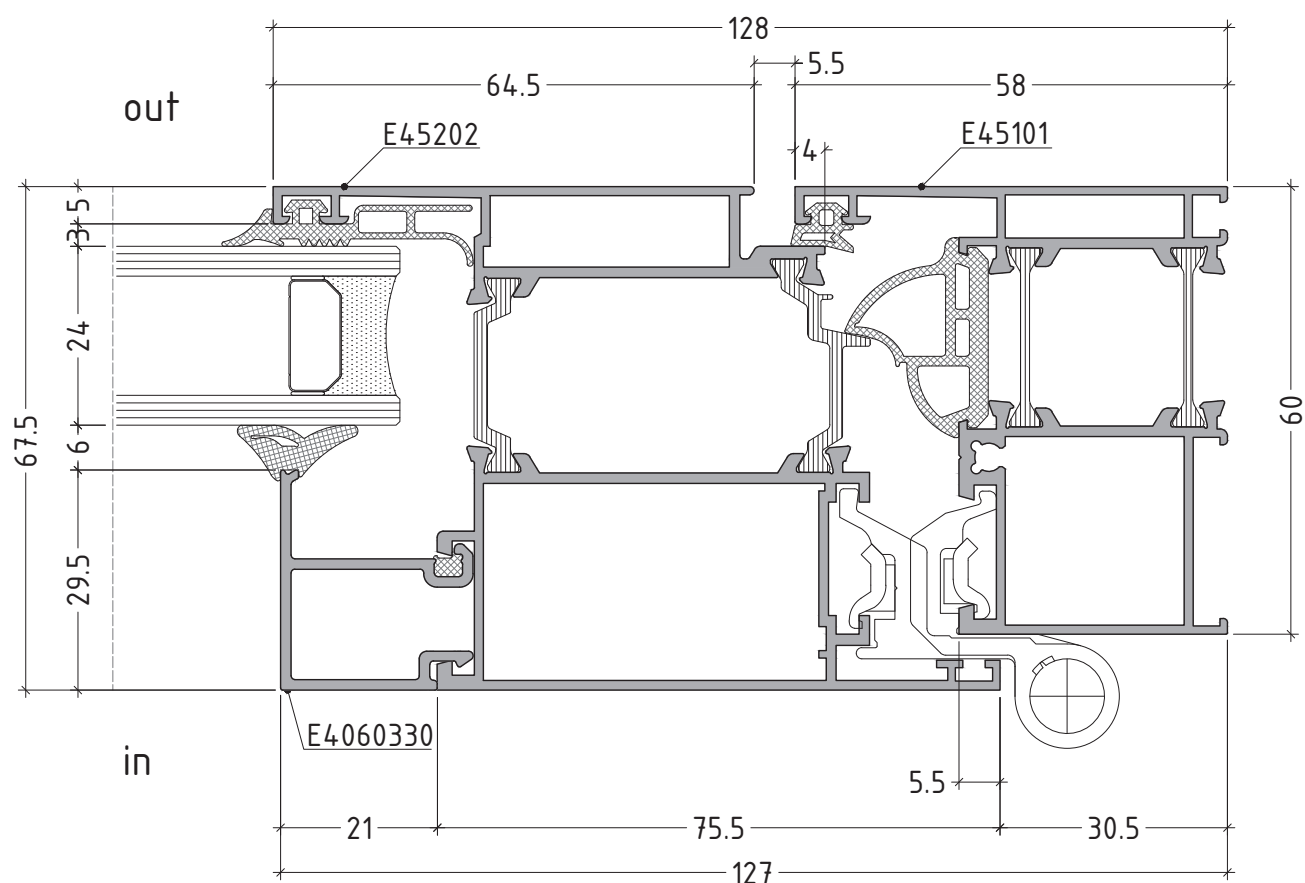
scale : 1:1

D45-6

inward opening



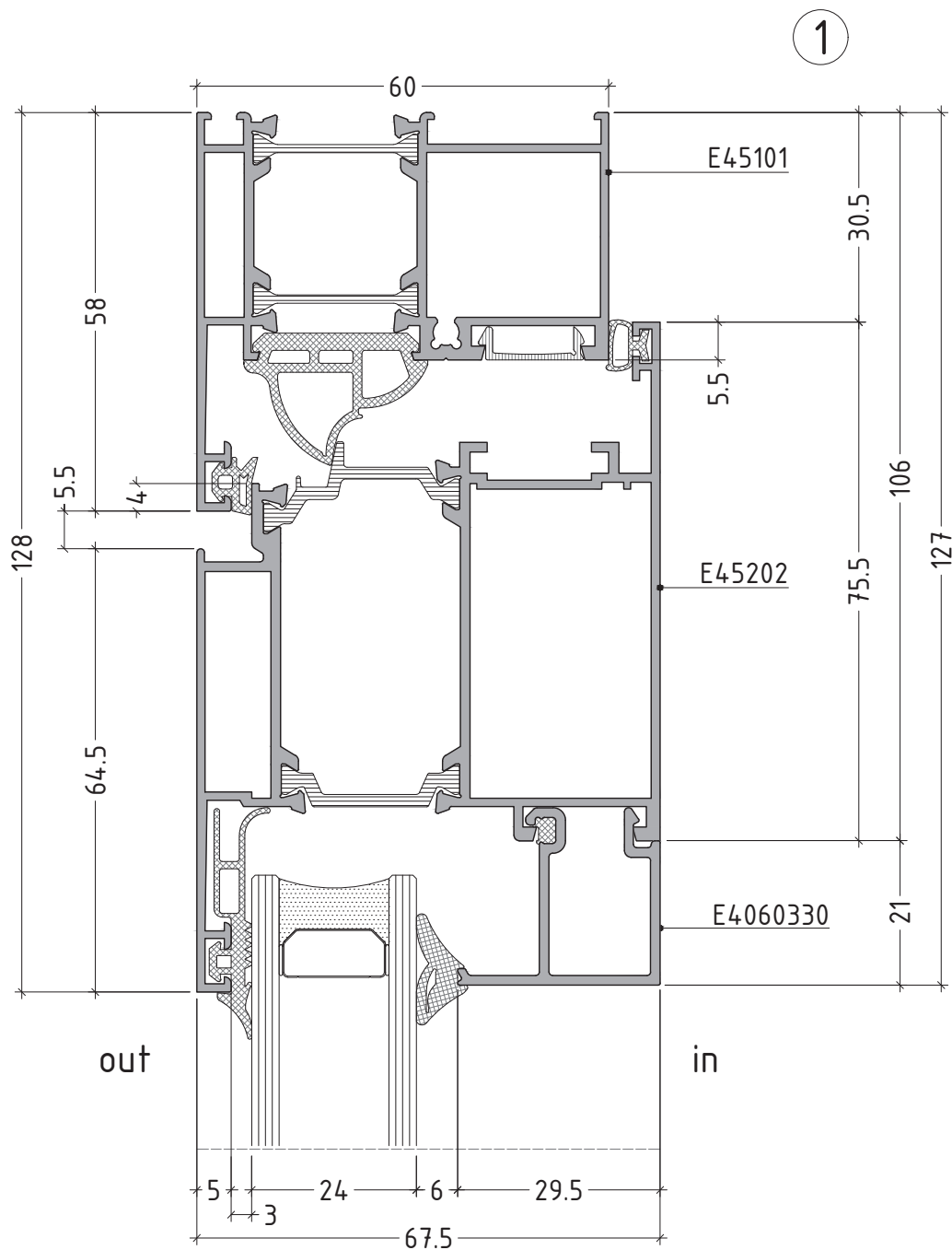
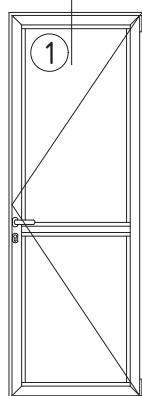
1



scale : 1:1

045-7

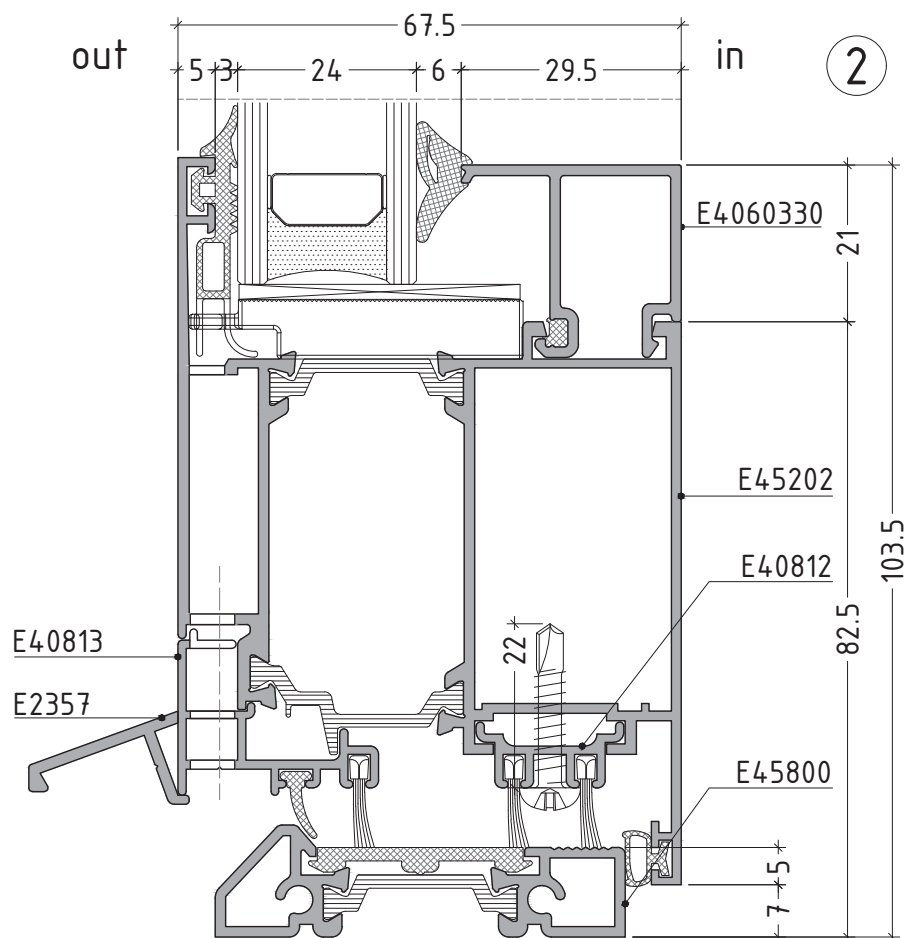
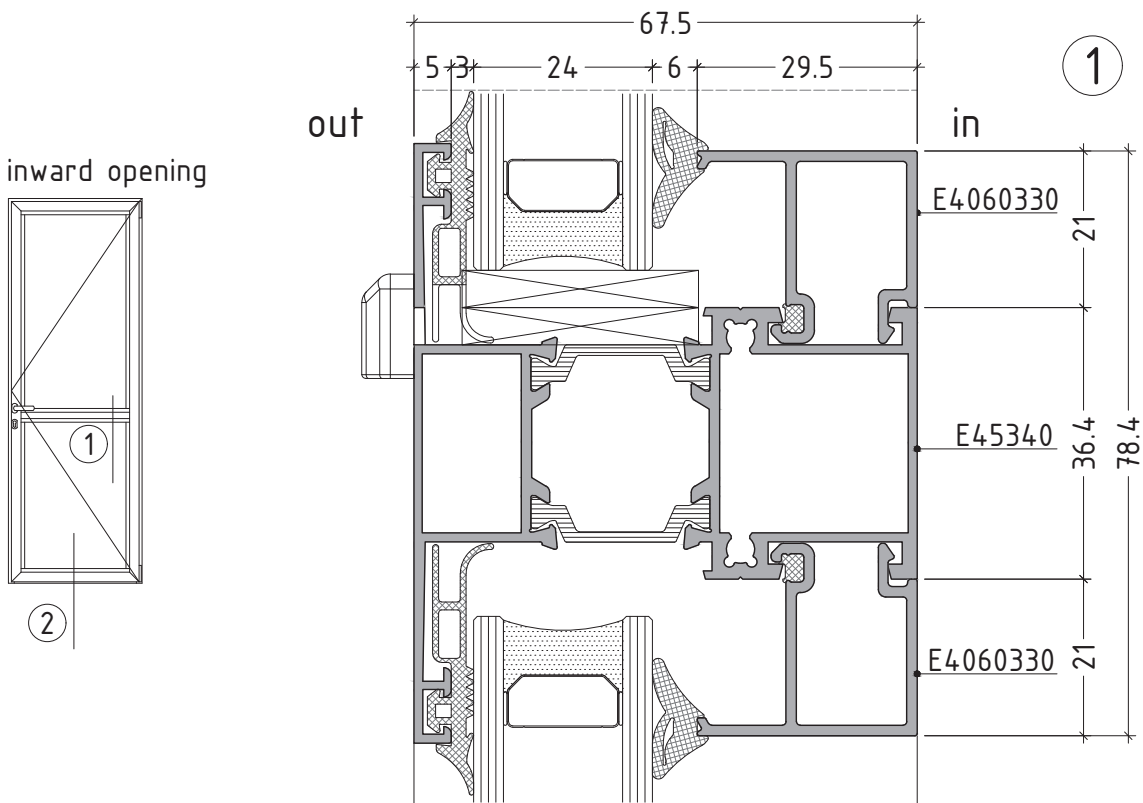
inward opening



scale : 1:1

D45-8

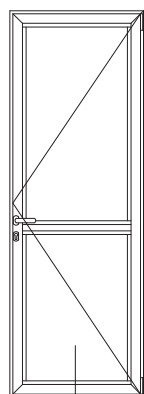
inward opening



scale : 1:1

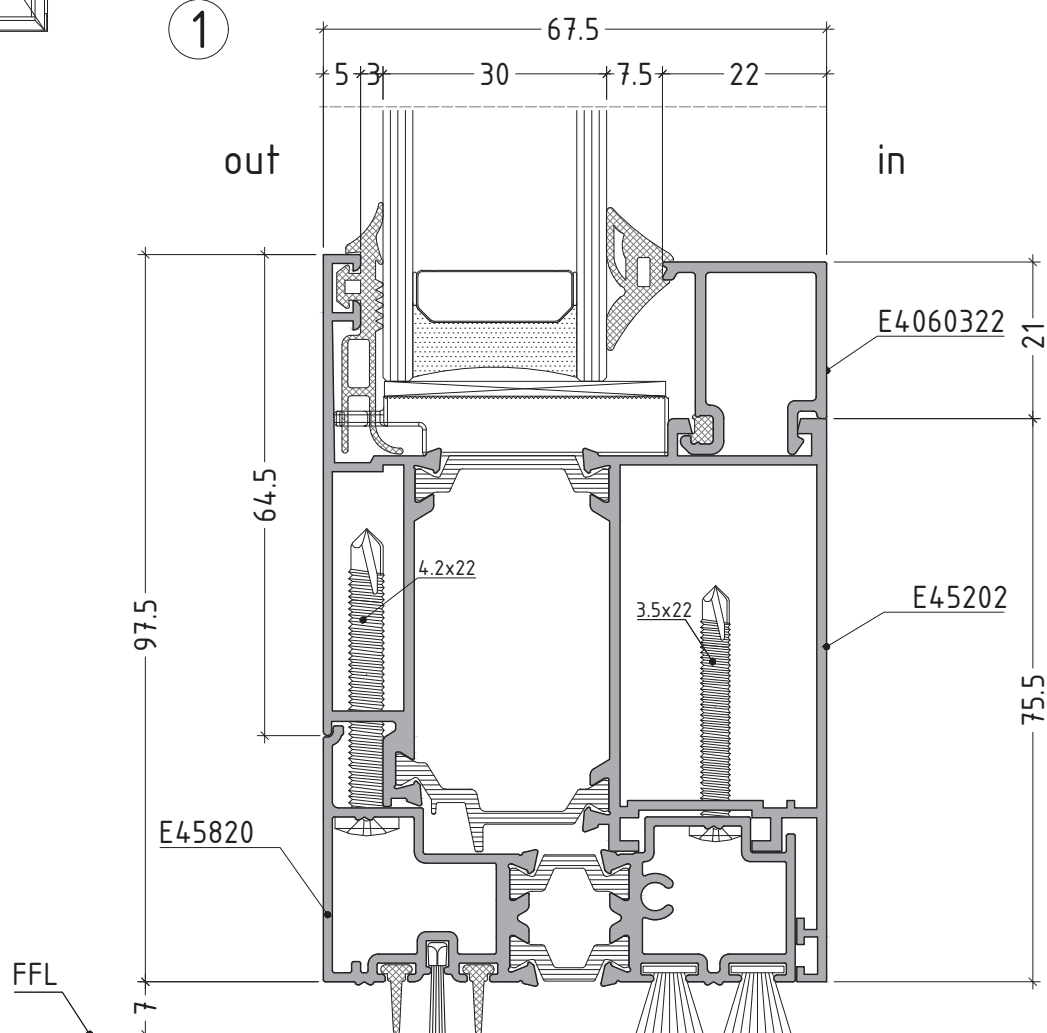
D45-9

inward opening



①

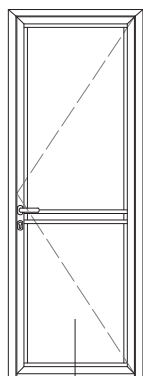
①



scale : 1:1

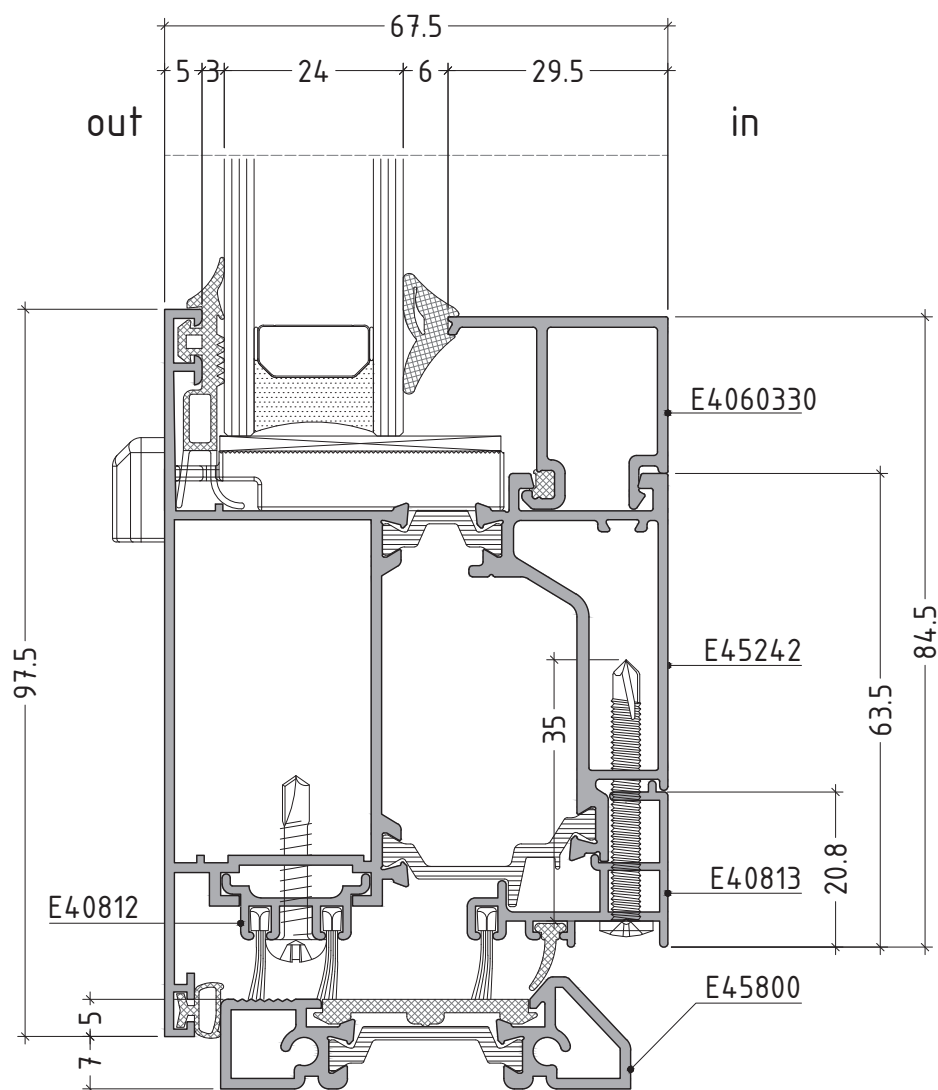
D45-10

outward opening



①

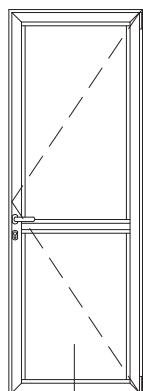
①



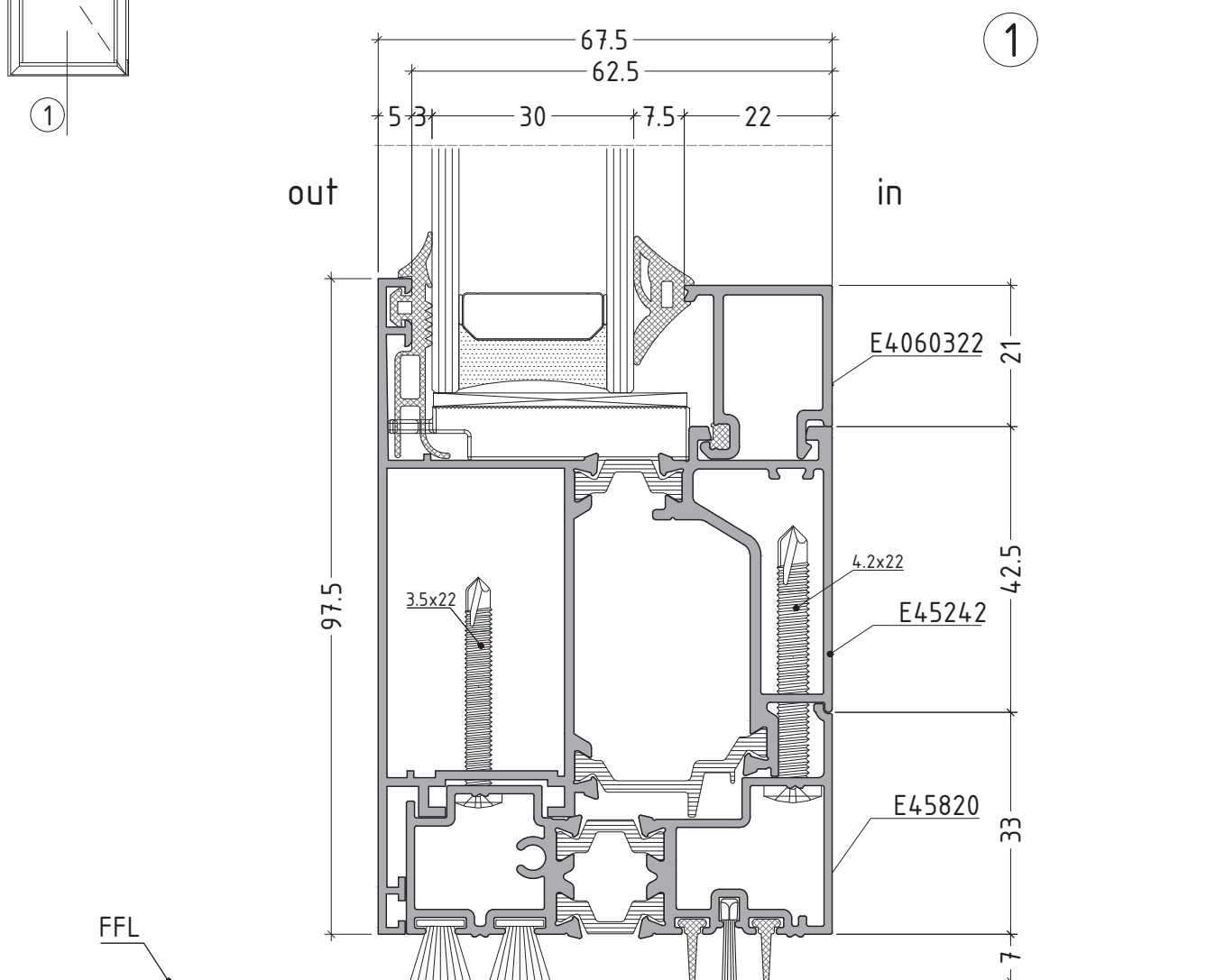
scale : 1:1

D45-11

outward opening



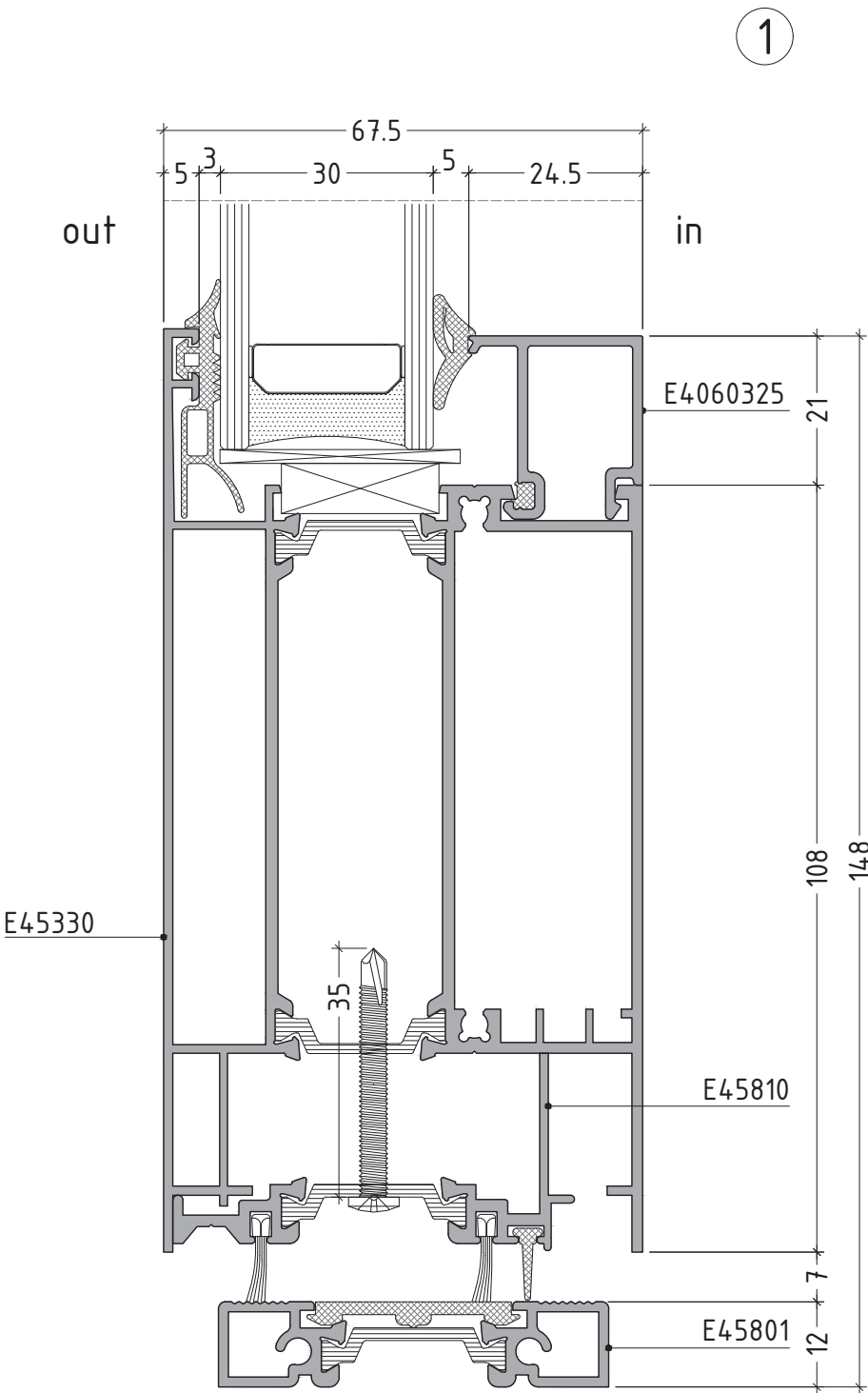
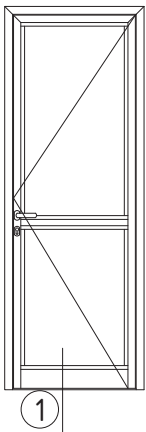
①



scale : 1:1

D45-12

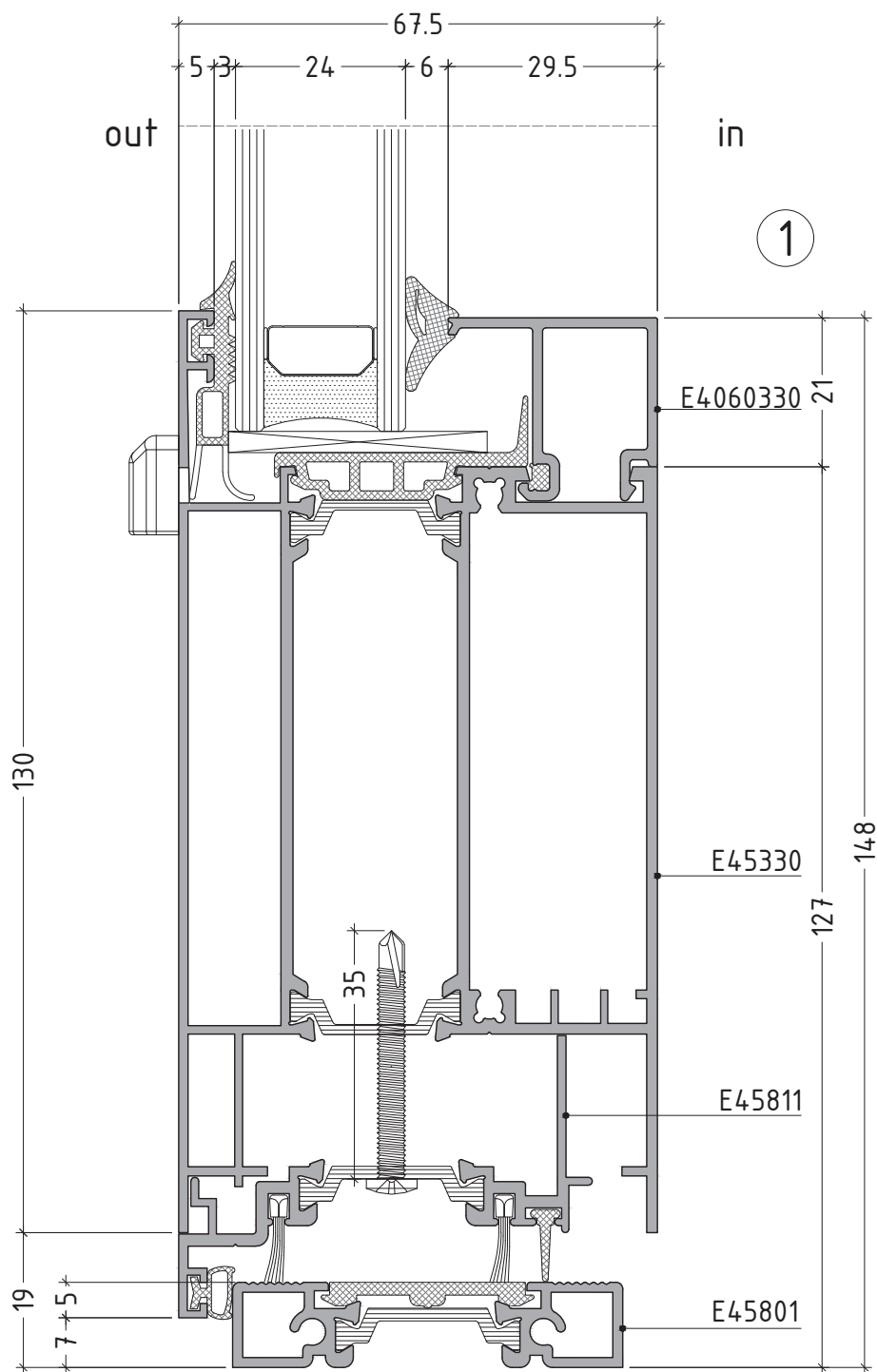
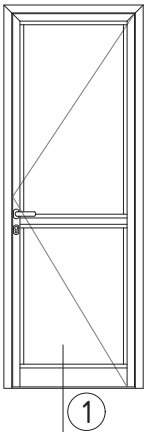
inward opening



scale : 1:1

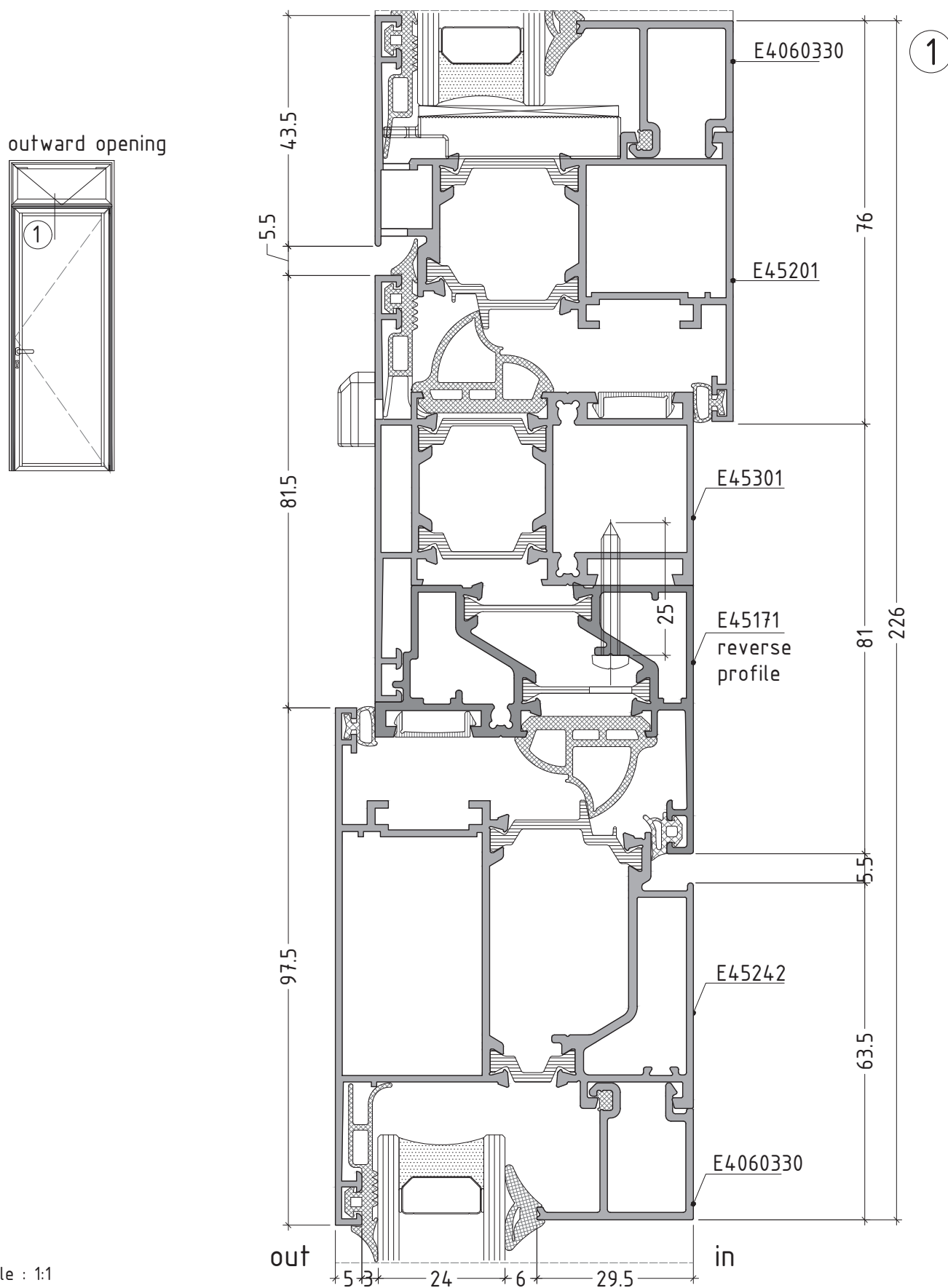
D45-13

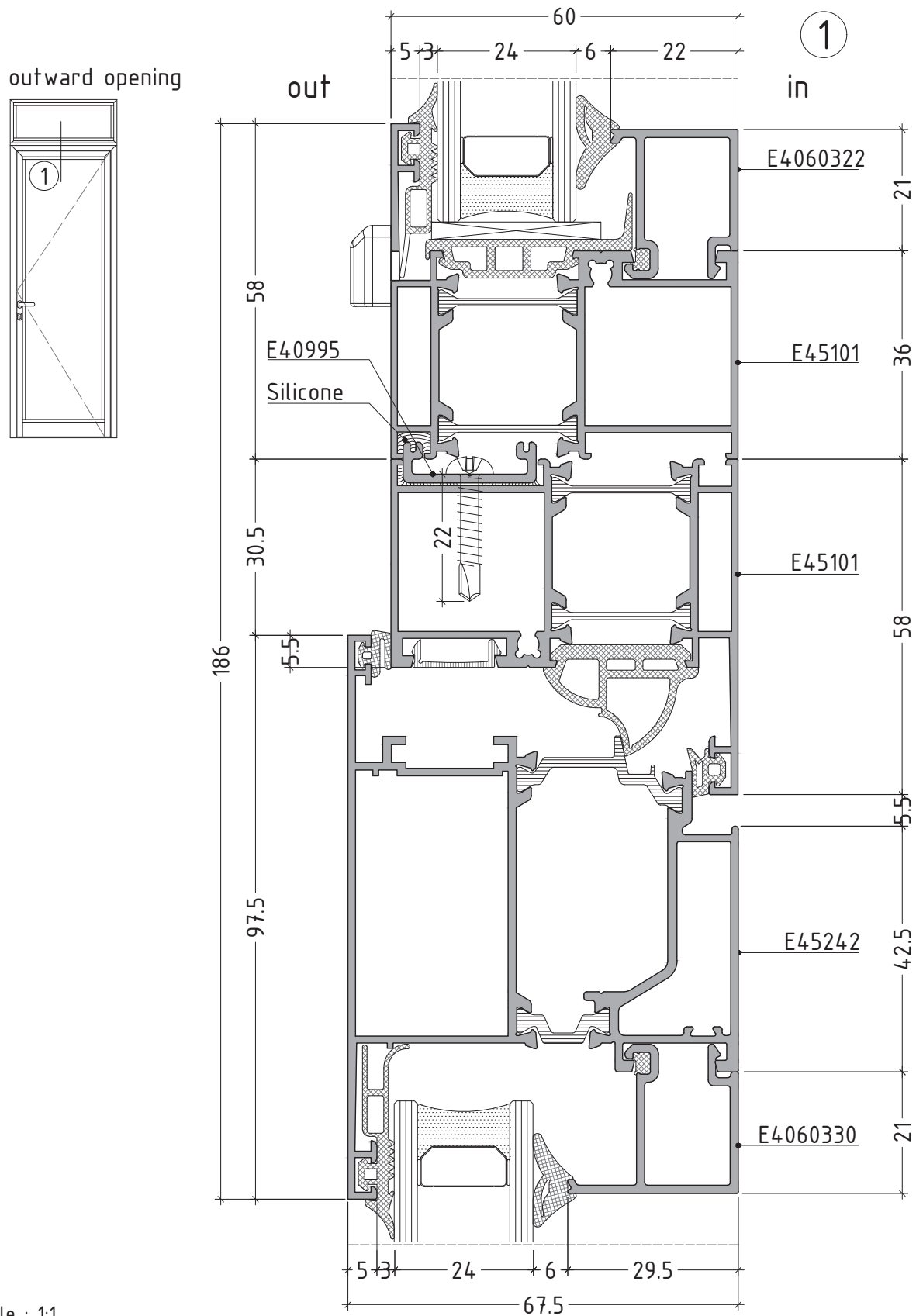
outward opening

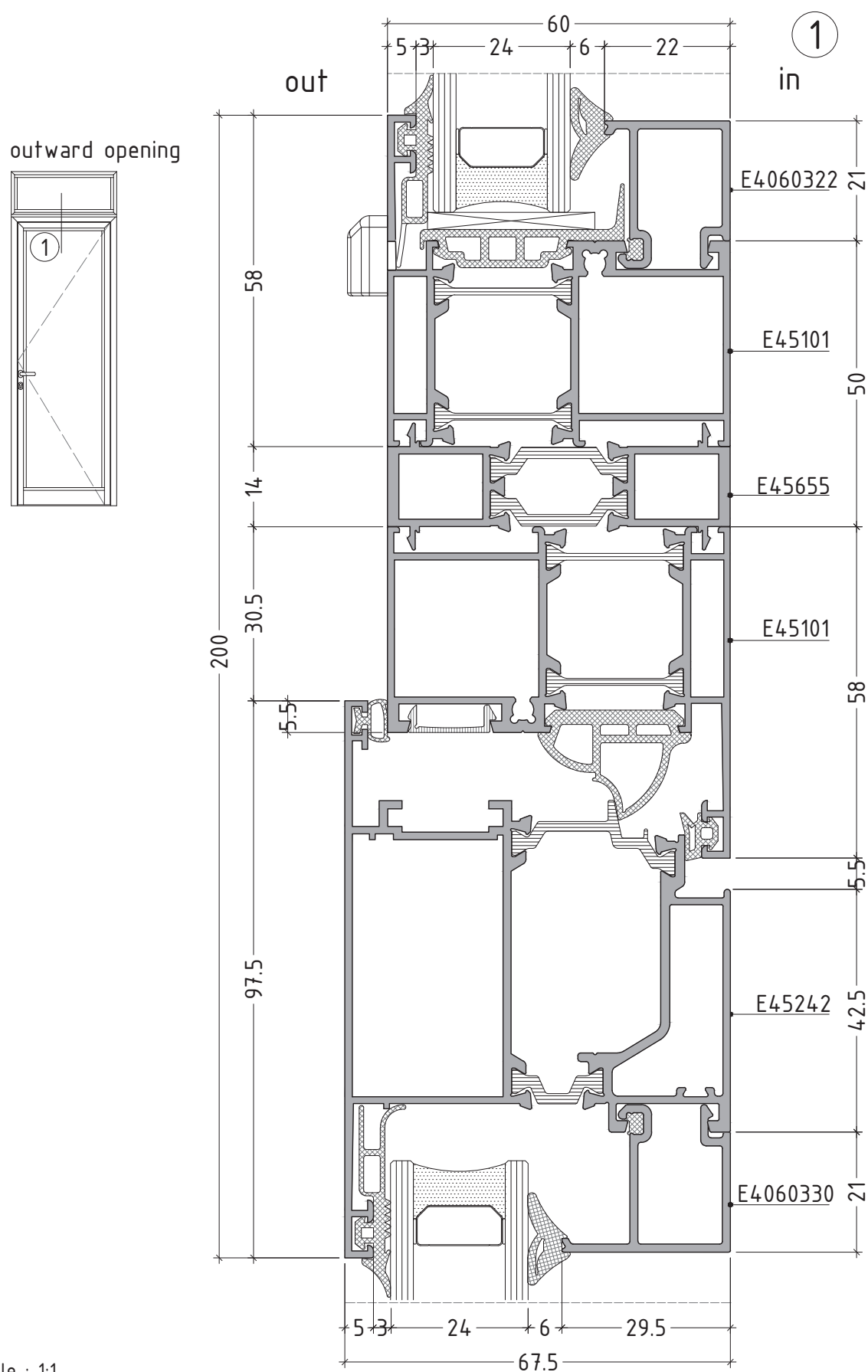


scale : 1:1

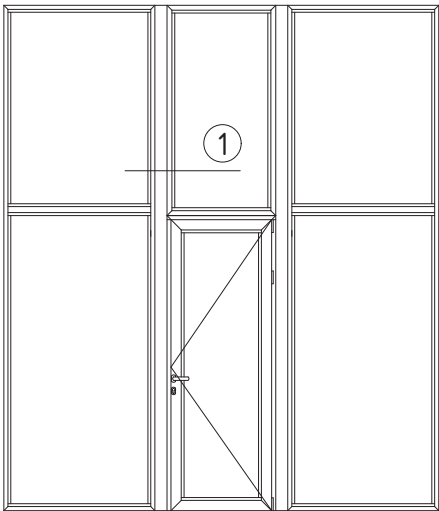
D45-14



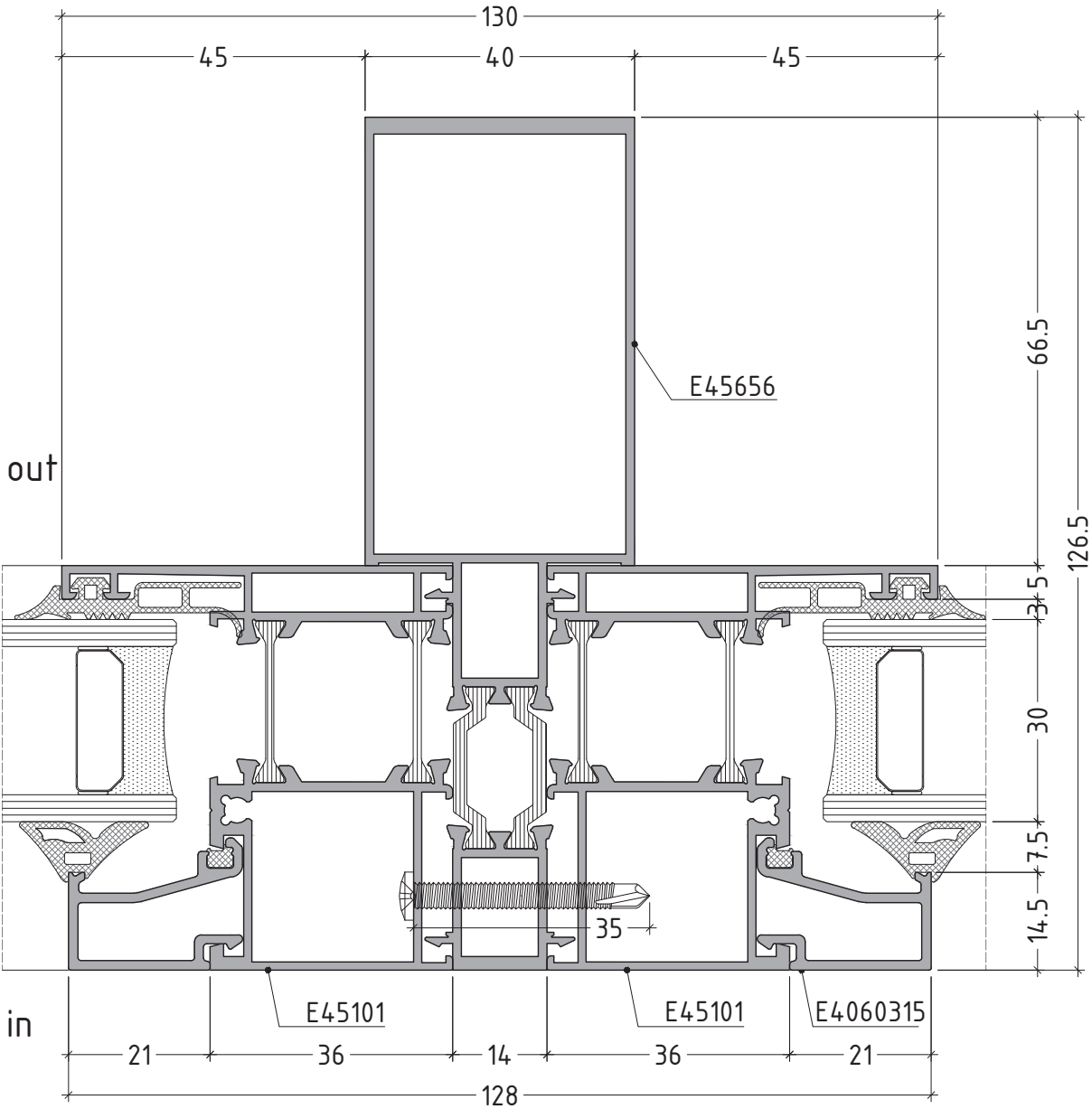




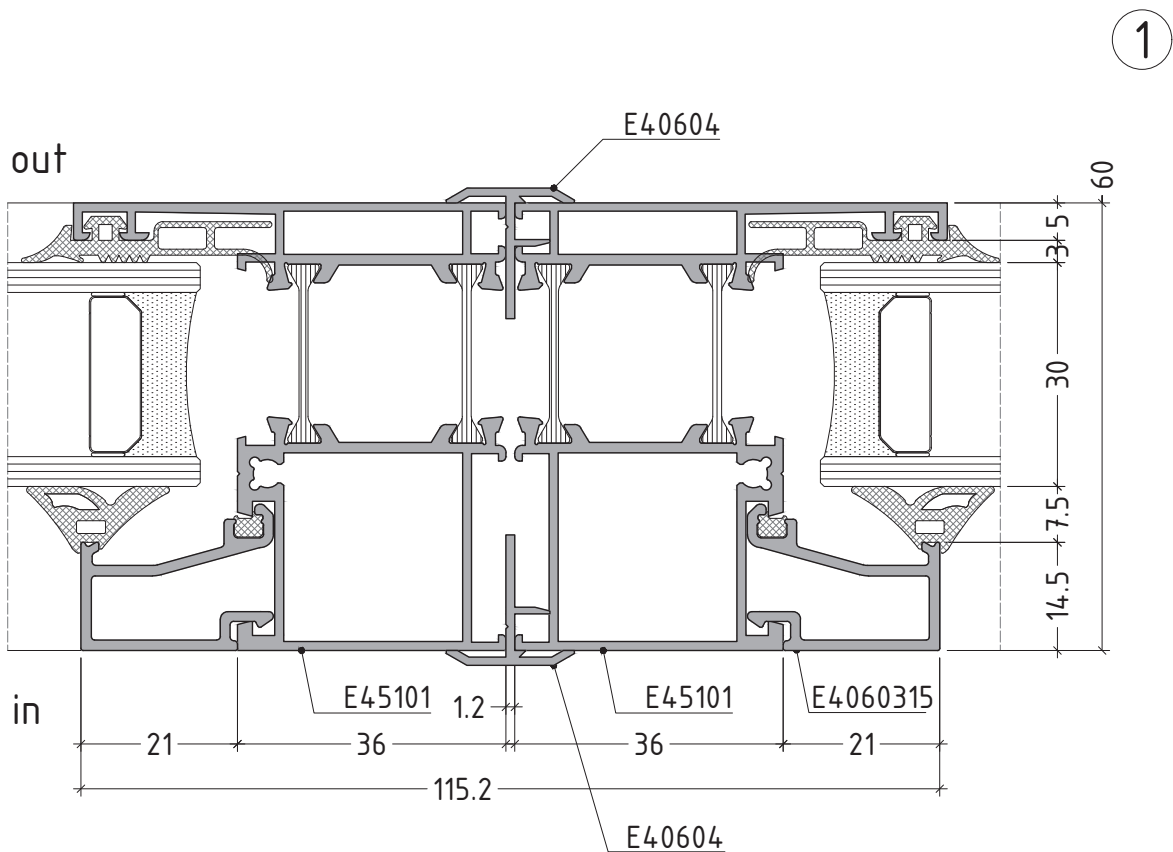
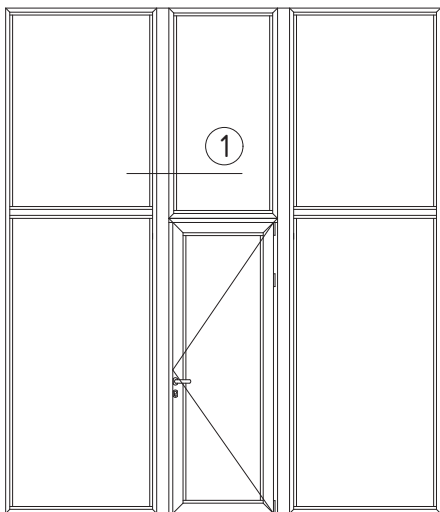
scale : 1:1



1

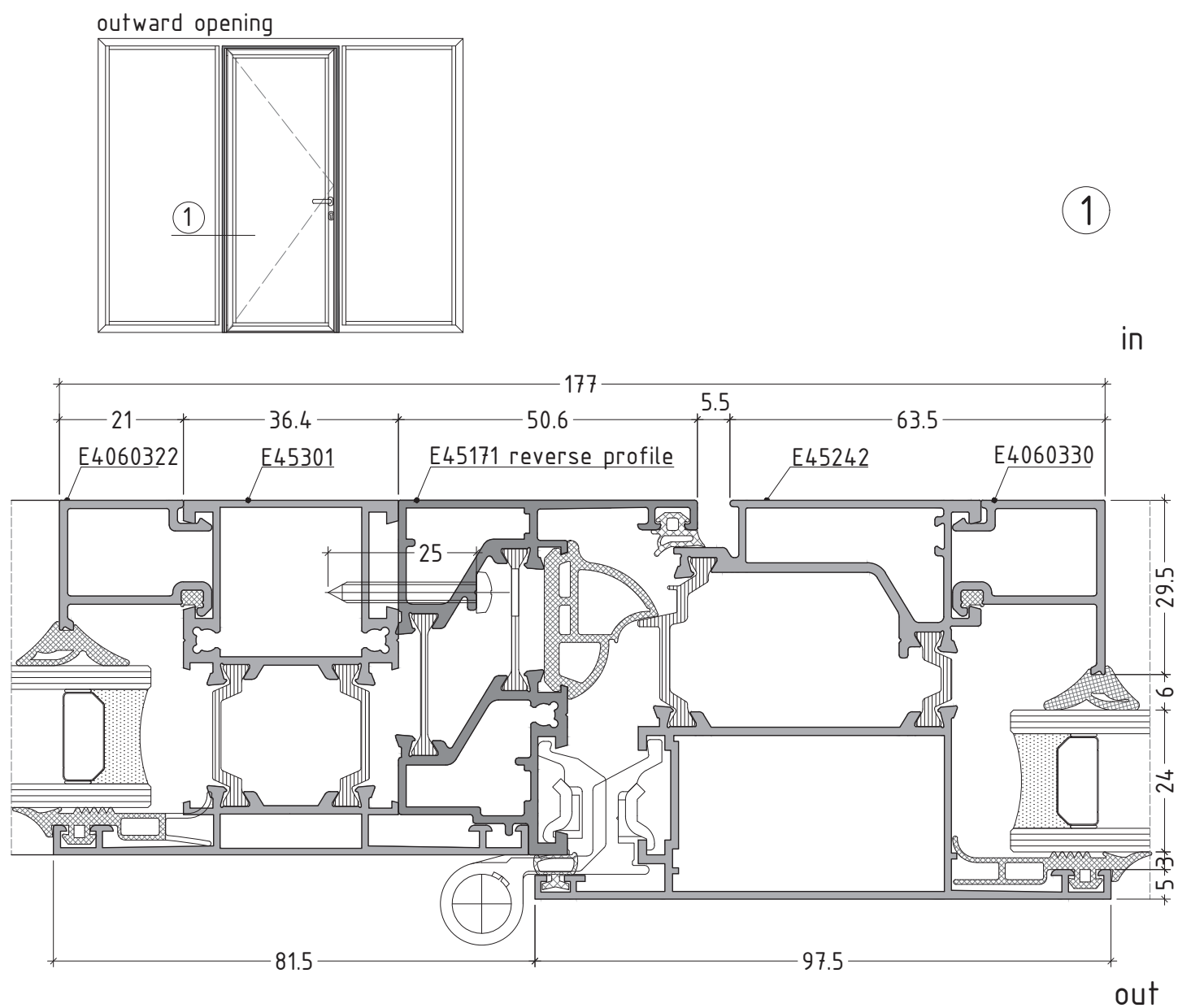


D45-18



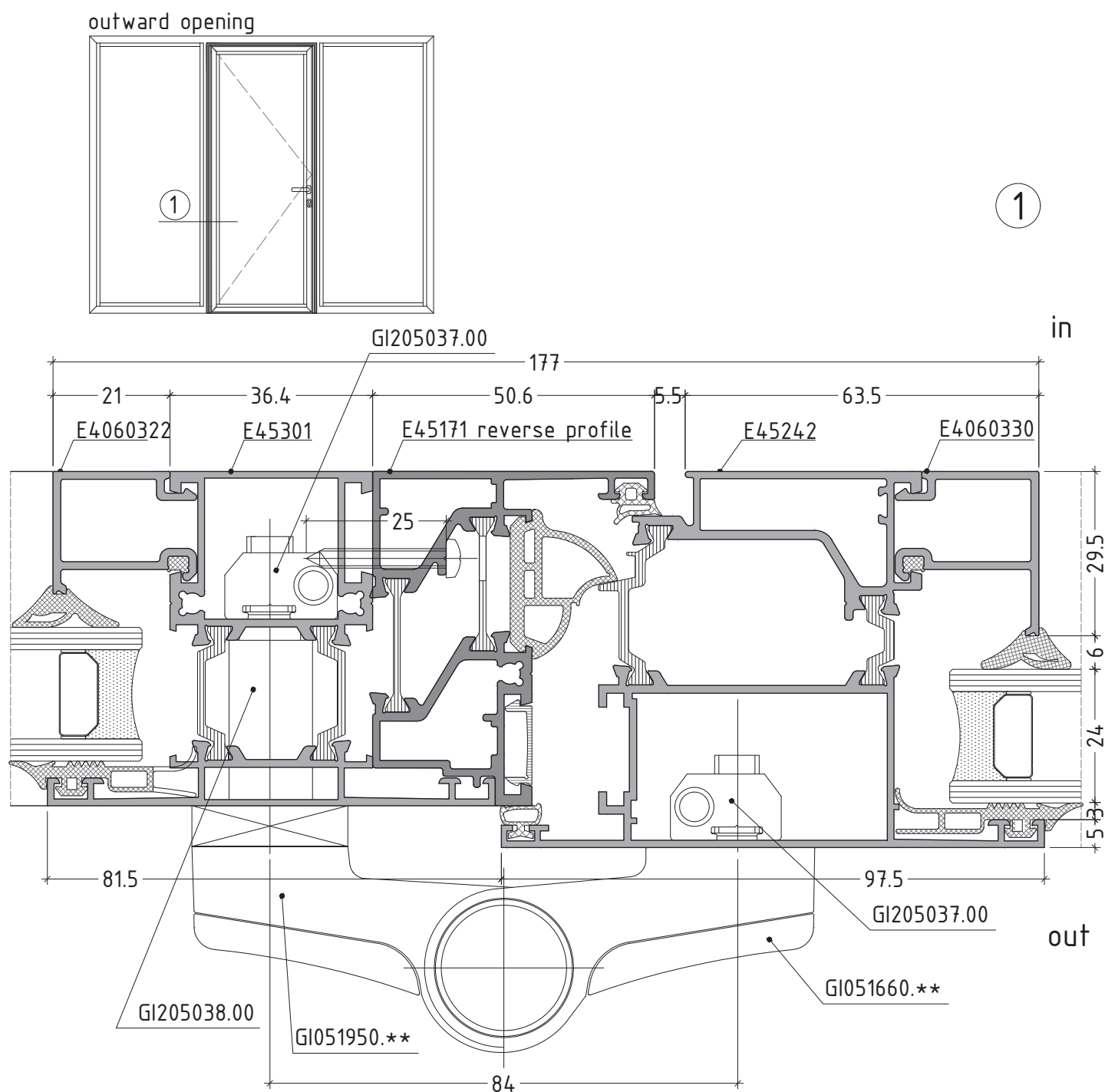
scale : 1:1

D45-19



scale : 1:1

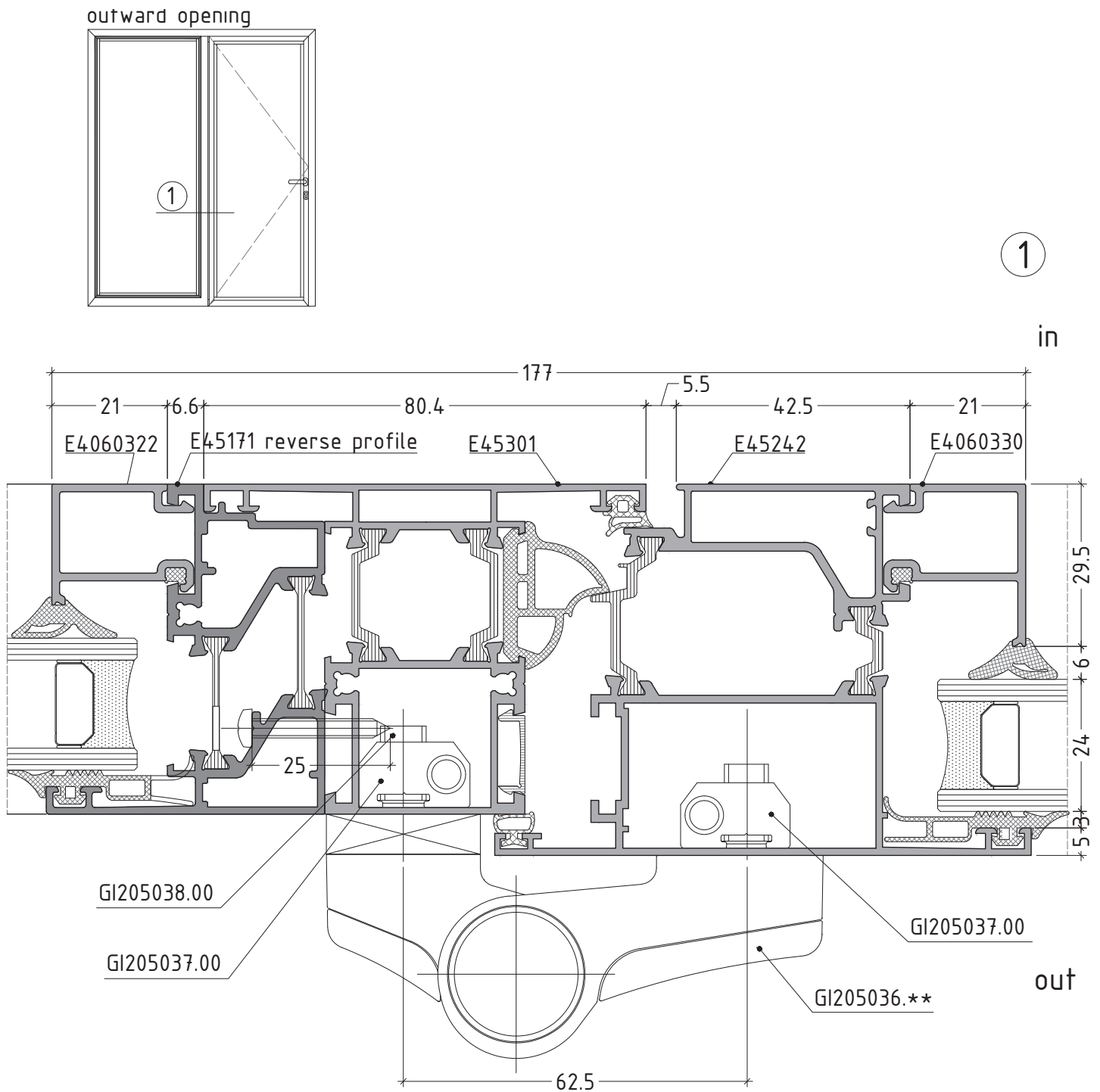
D45-20



When the hinge and reverse profile are inside the openable part, the distance between axes of hinges has to be 84 mm.

scale : 1:1

D45-21



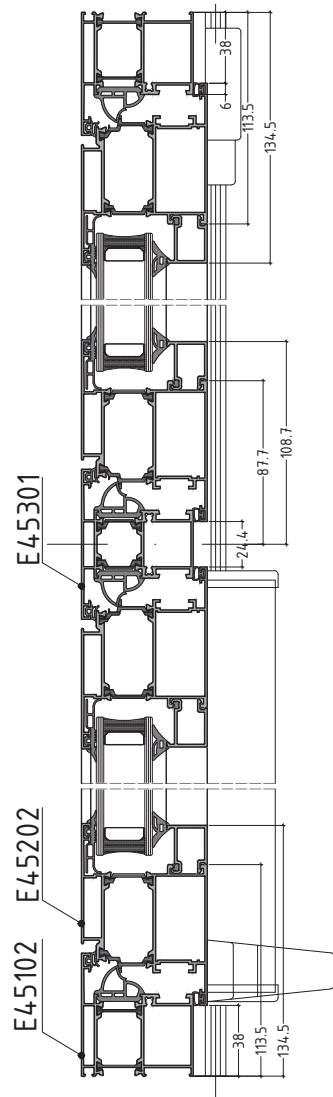
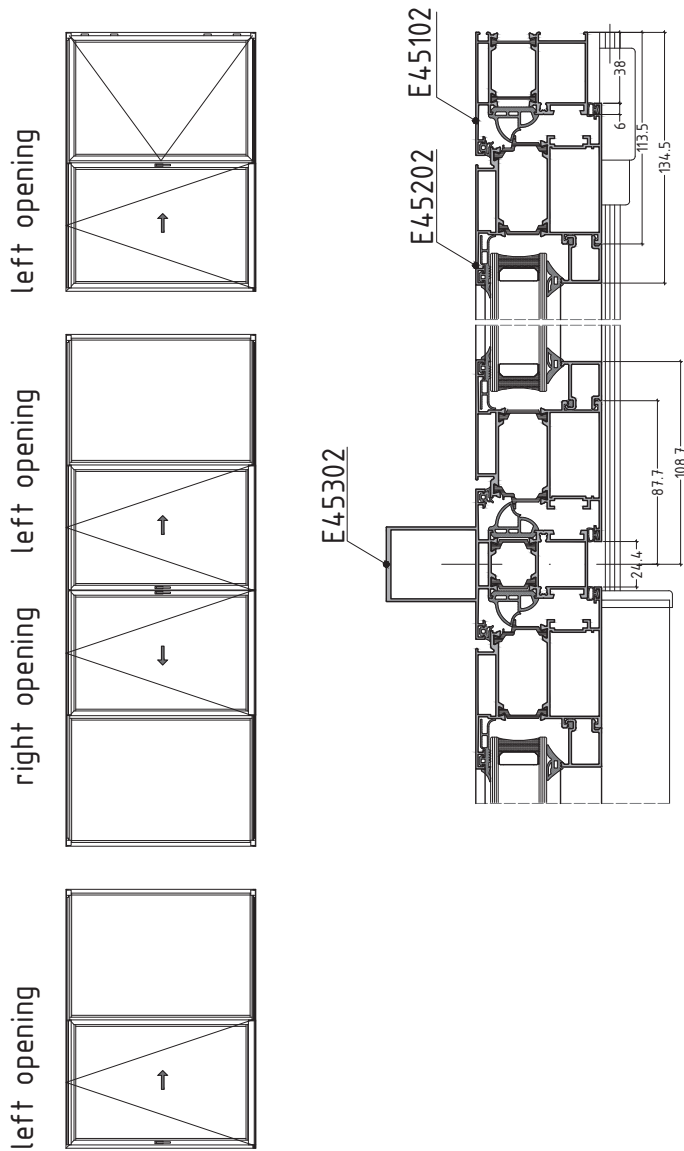
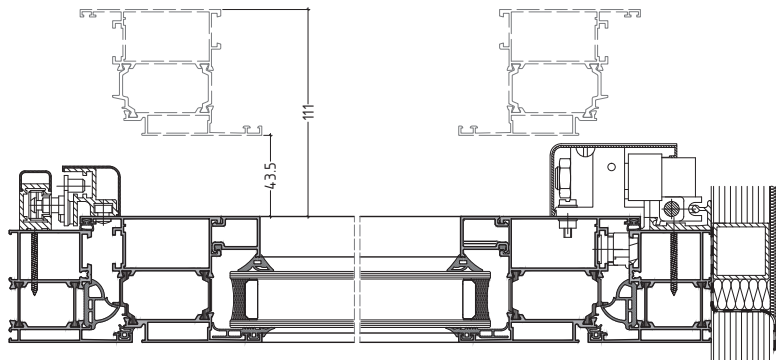
When the hinge and reverse profile are inside the fixed part, the distance between axes of hinges has to be 62,5 mm.

scale :1:1

GU mechanism

width of sash	height of sash	maximum weight
740 – 1600 mm	895 – 2400 mm	150 kg

parallel sliding and tilting door



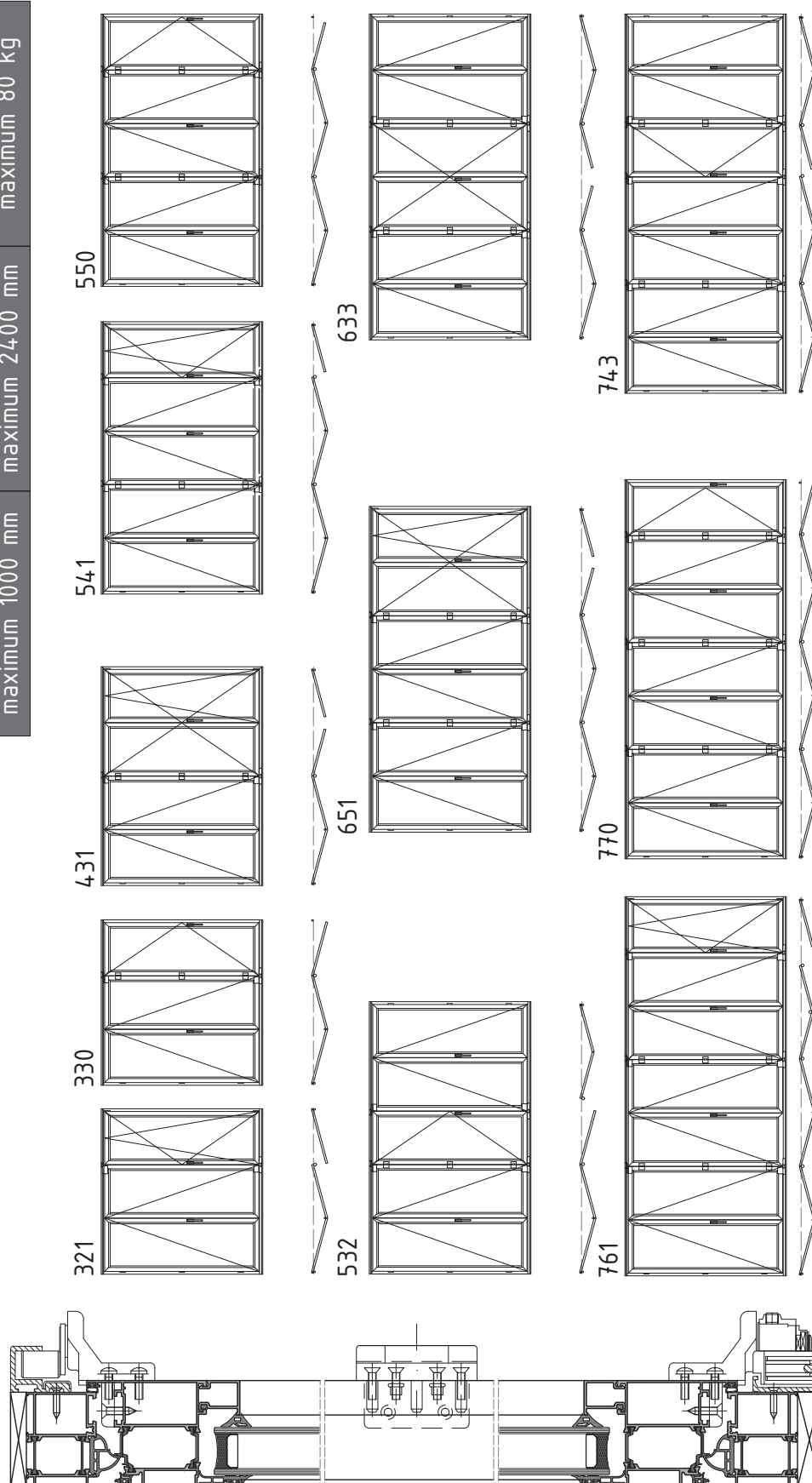
Note:

Dimensions and cutting list of the accessories depend on the specifications given by the hardware producer. Please contact the hardware producer for this specification!

GU mechanism

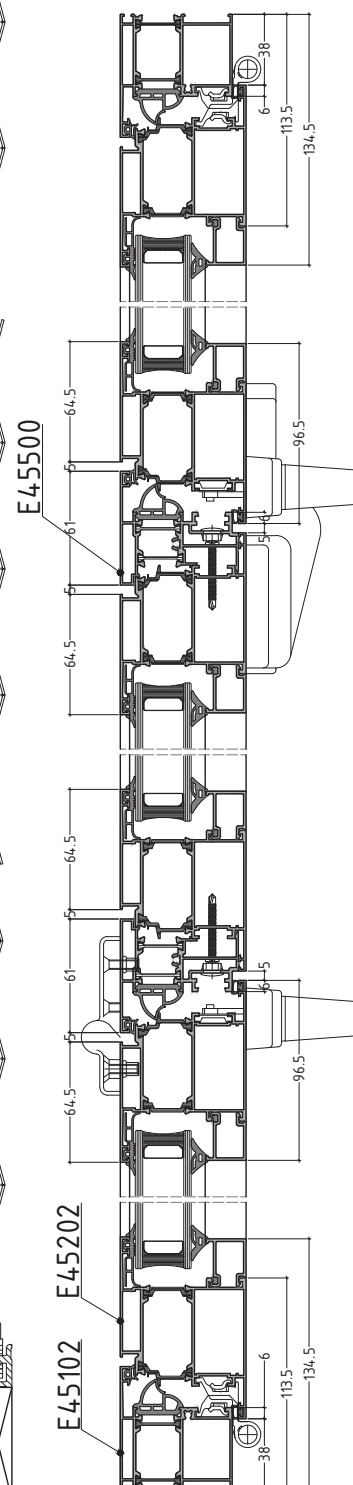
width of sash	height of sash	maximum weight
maximum 1000 mm	maximum 2400 mm	maximum 80 kg

sliding – folding door



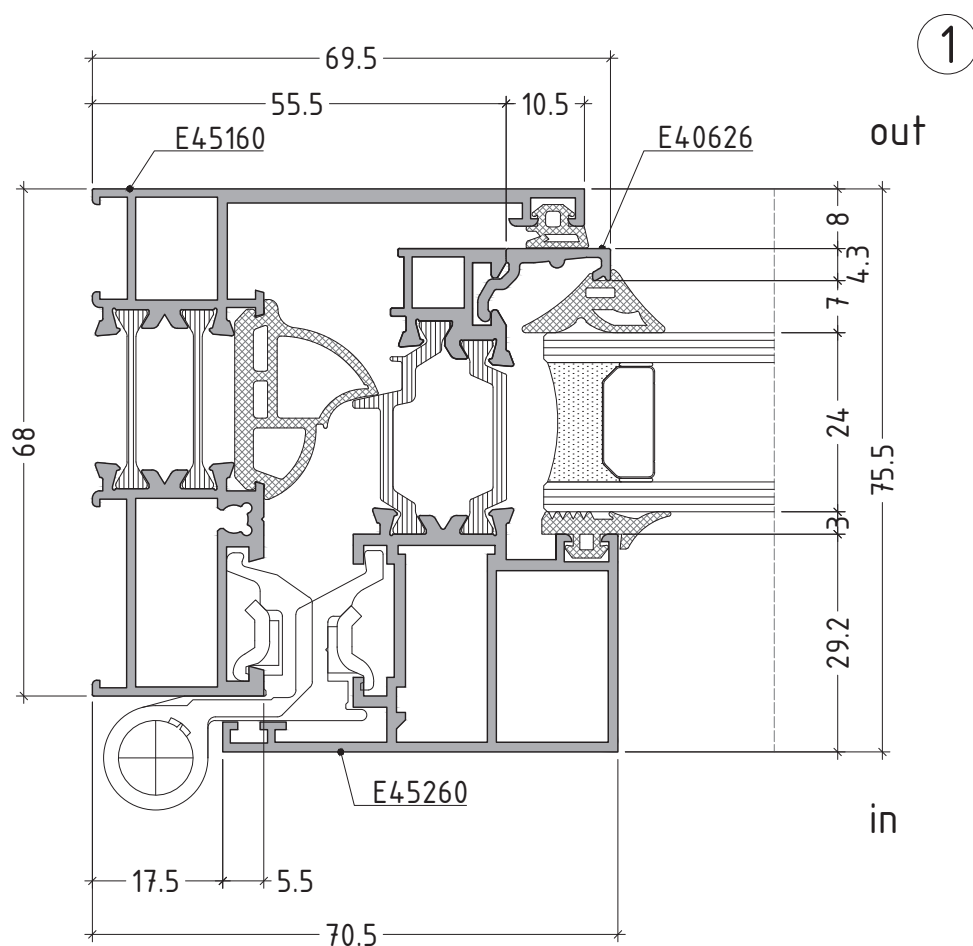
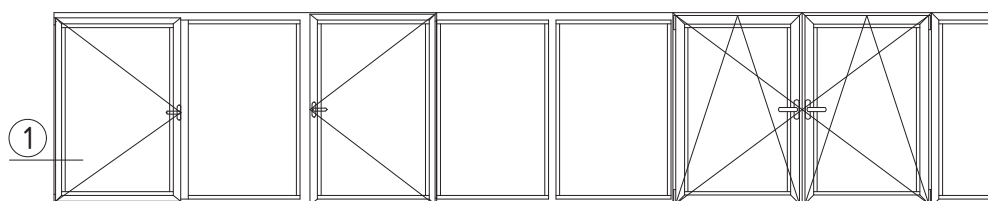
Note:

Dimensions and cutting list of the accessories depend on the specifications given by the hardware producer. Please contact the hardware producer for this specification!



D45-24

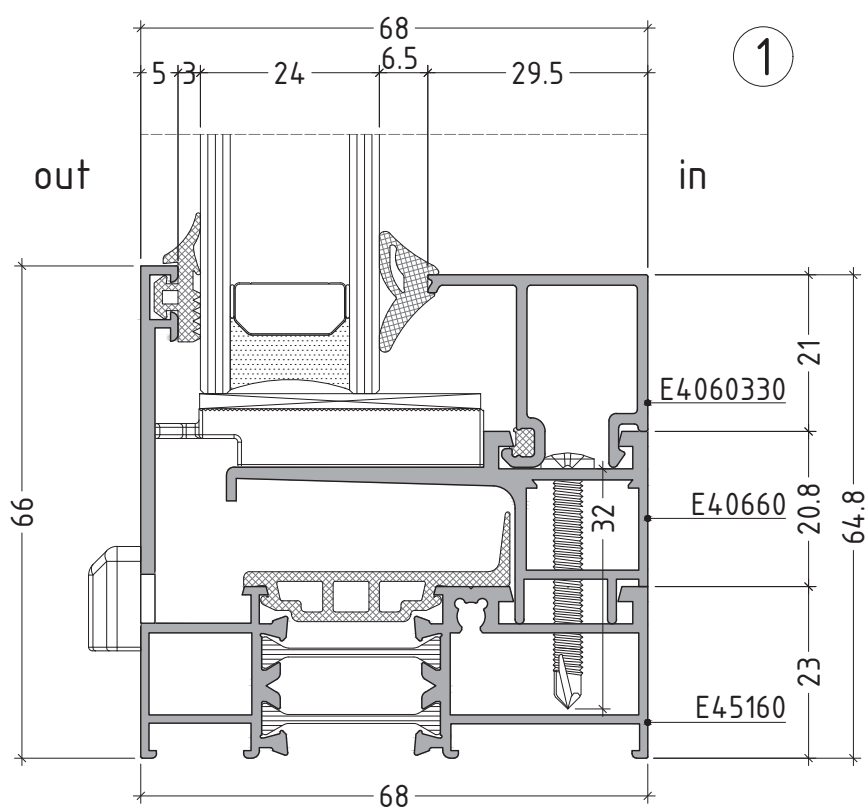
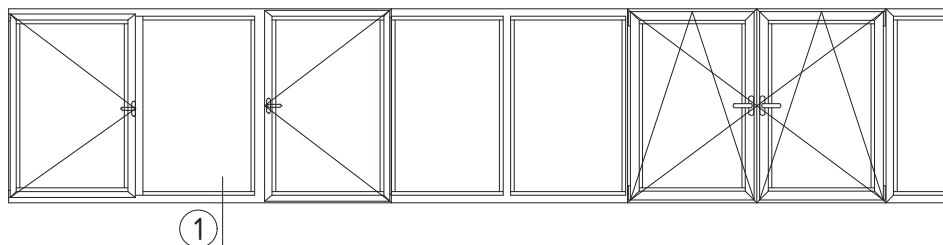
Hidden vent



scale : 1:1

D45-25

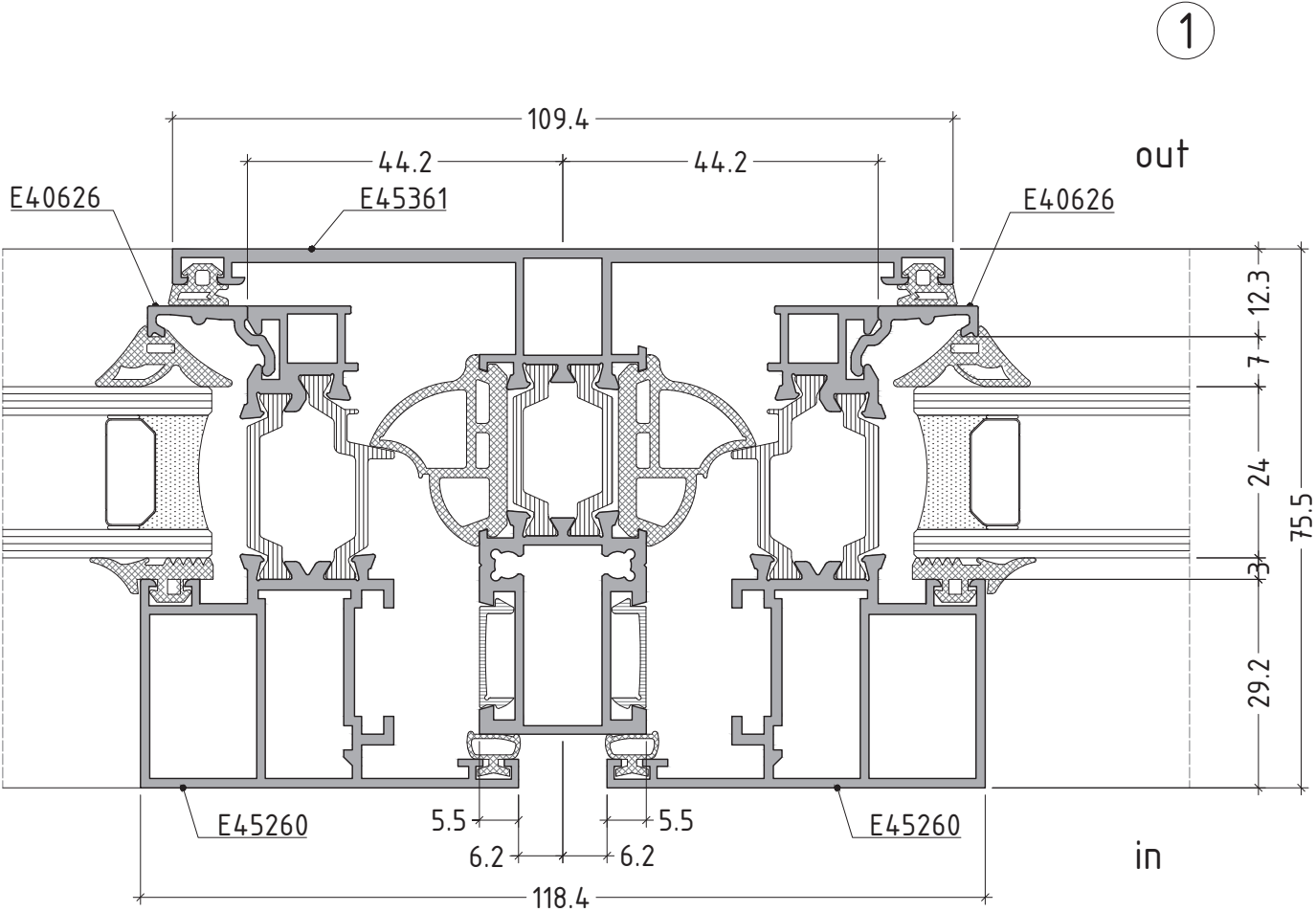
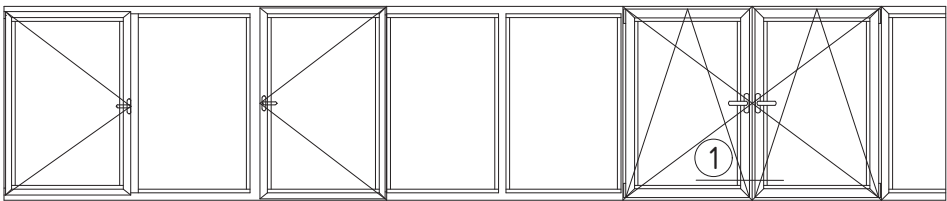
Hidden vent



scale : 1:1

D45-26

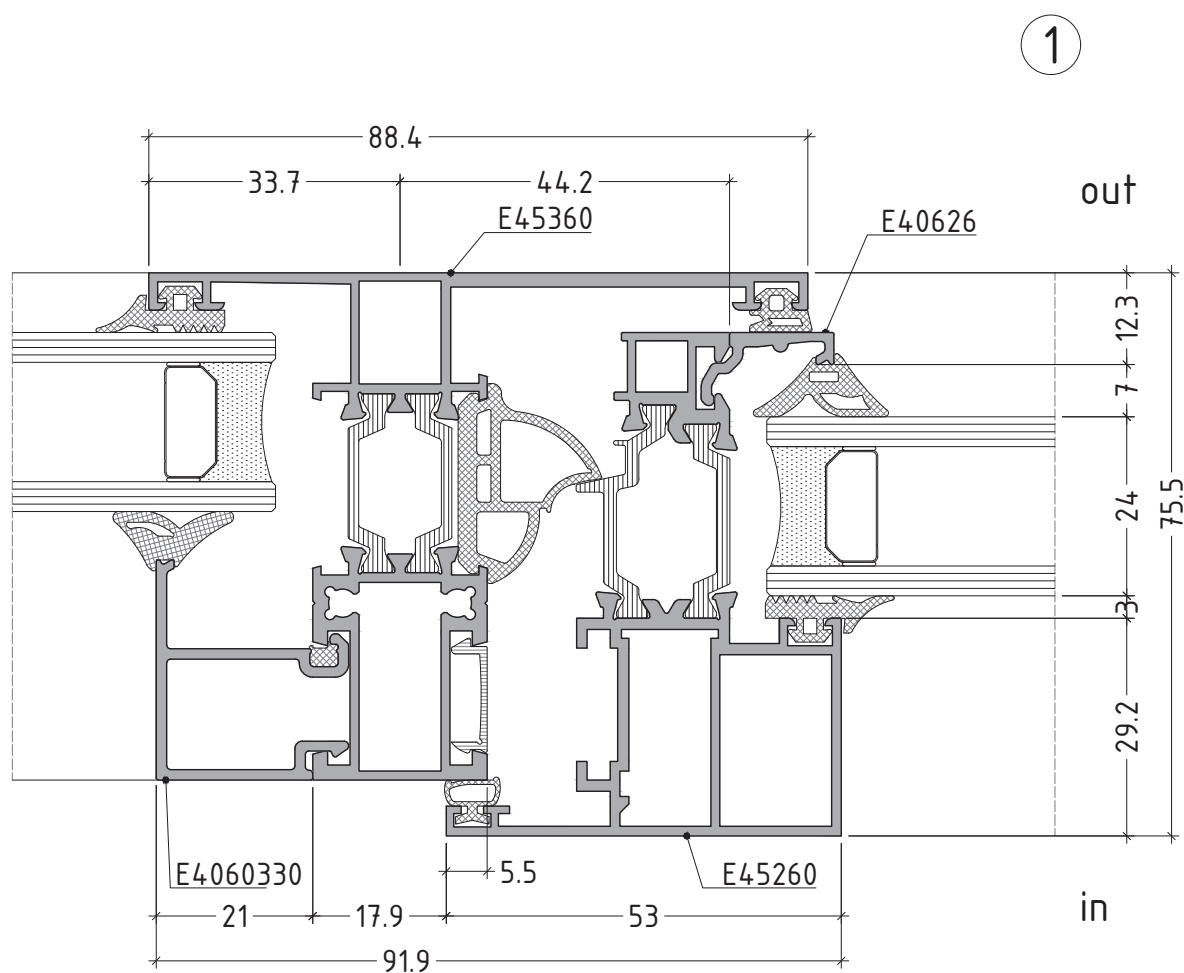
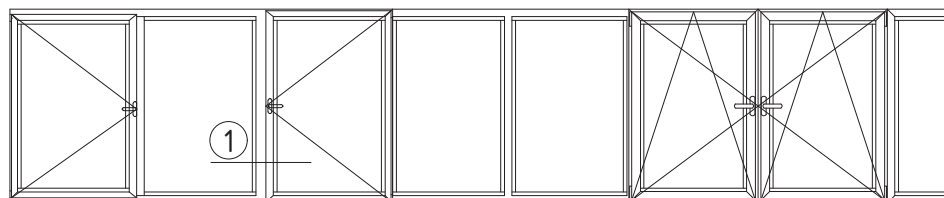
Hidden vent



scale : 1:1

D45-27

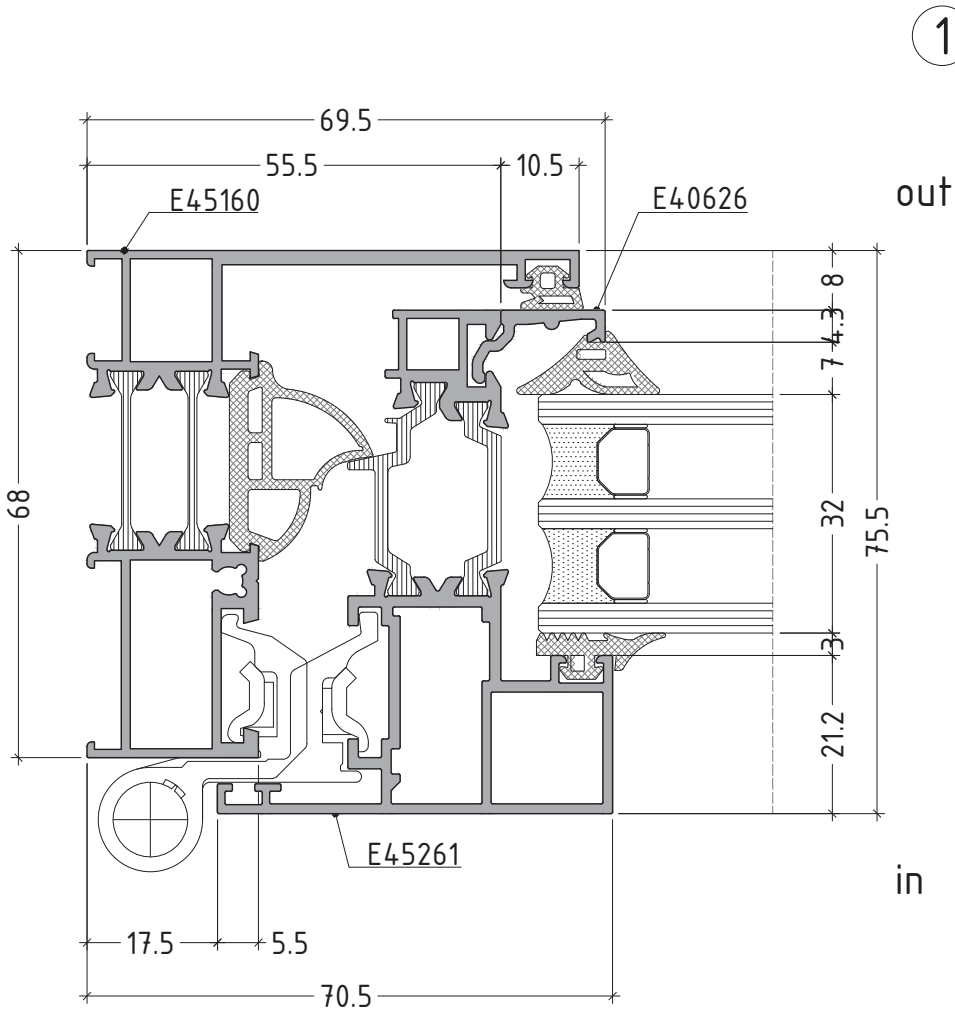
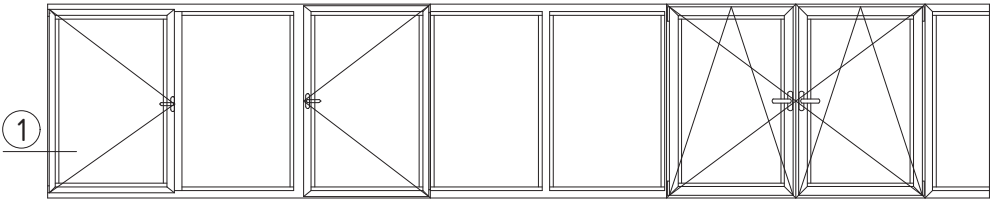
Hidden vent



scale : 1:1

D45-28

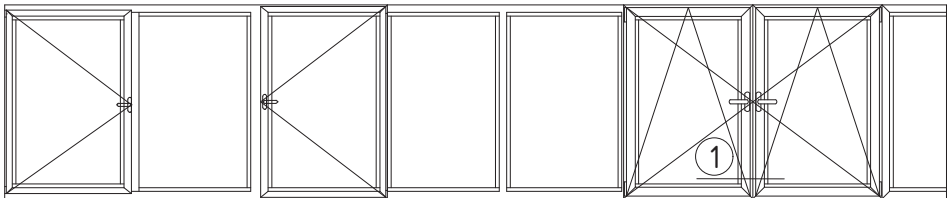
Hidden vent



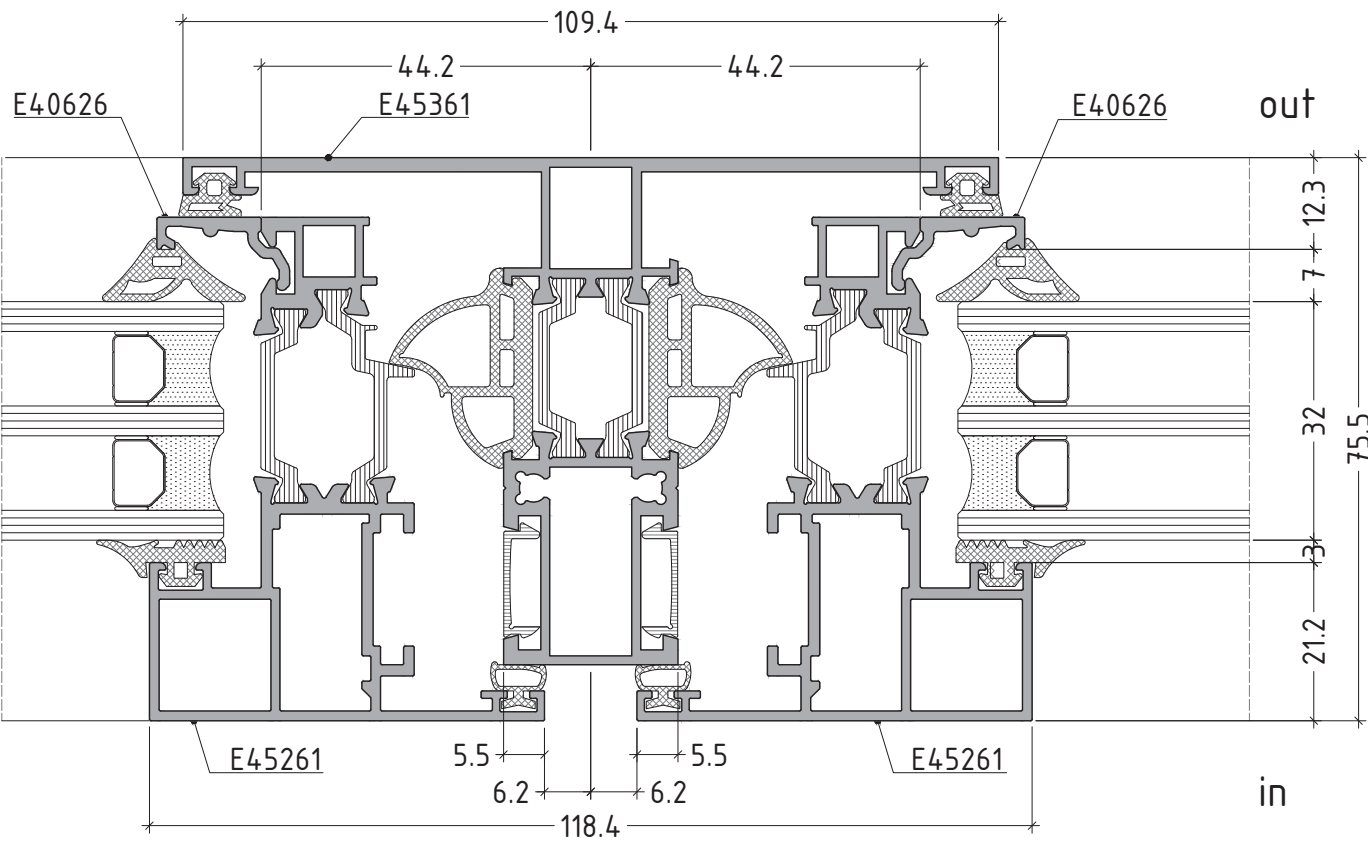
scale : 1:1

D45-29

Hidden vent



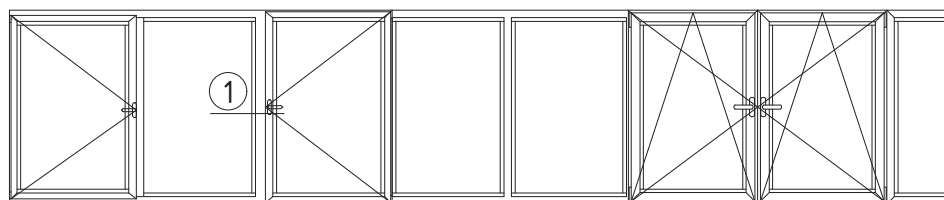
1



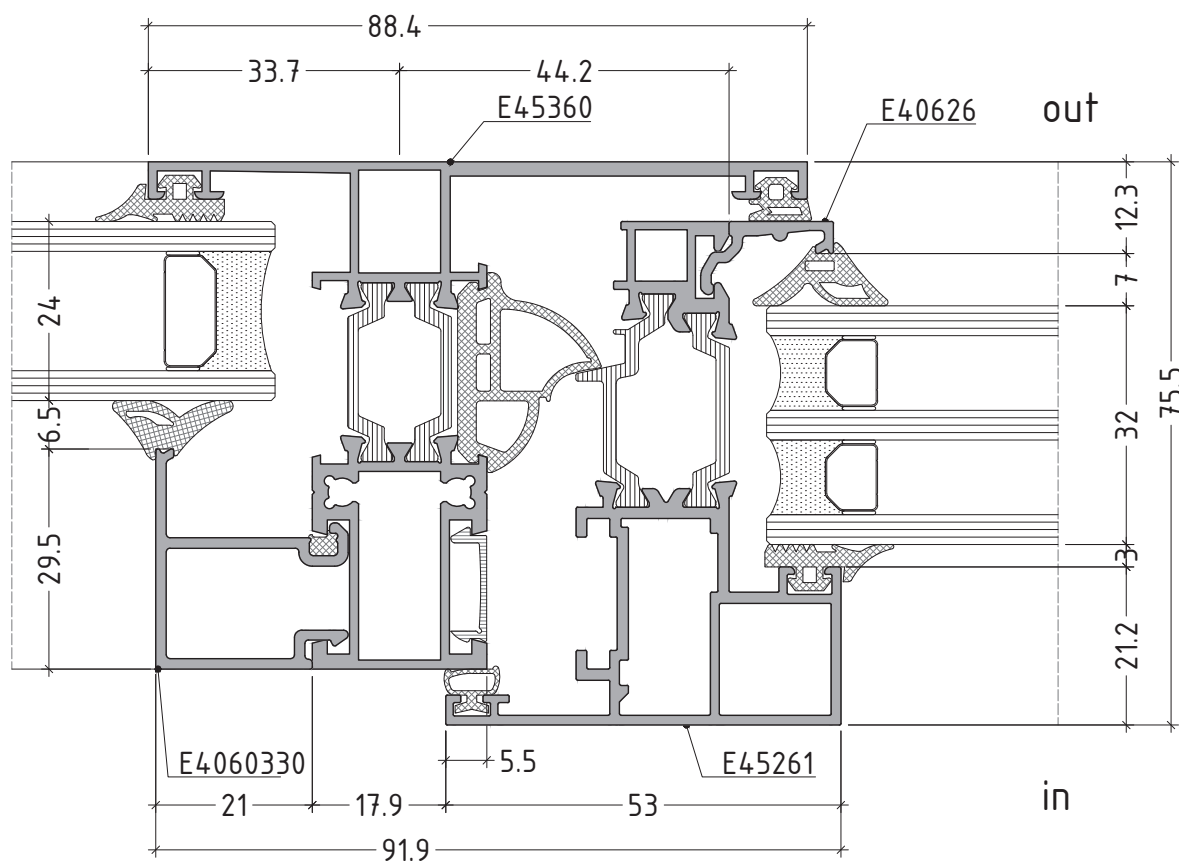
scale : 1:1

D45-30

Hidden vent



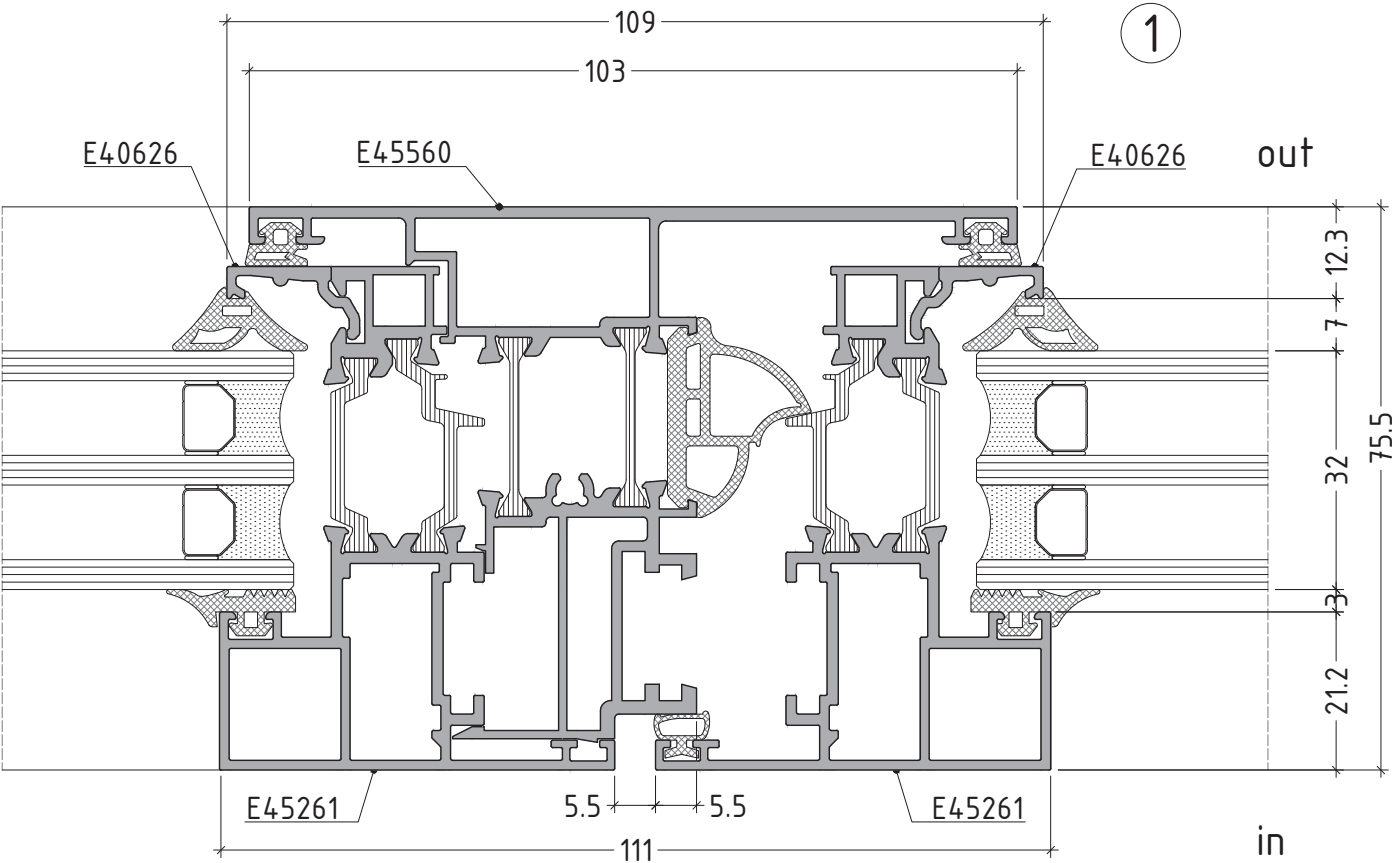
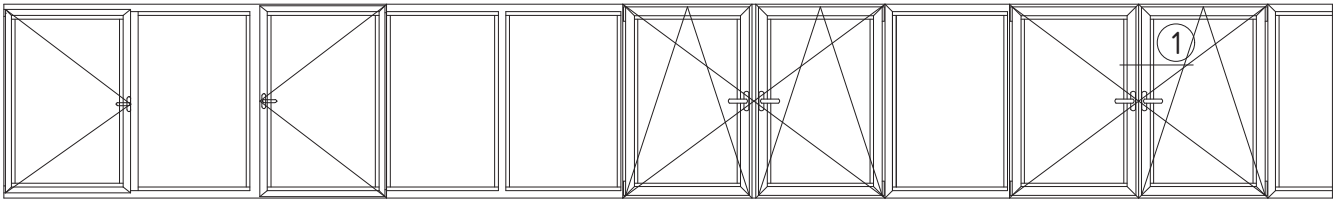
1



scale : 1:1

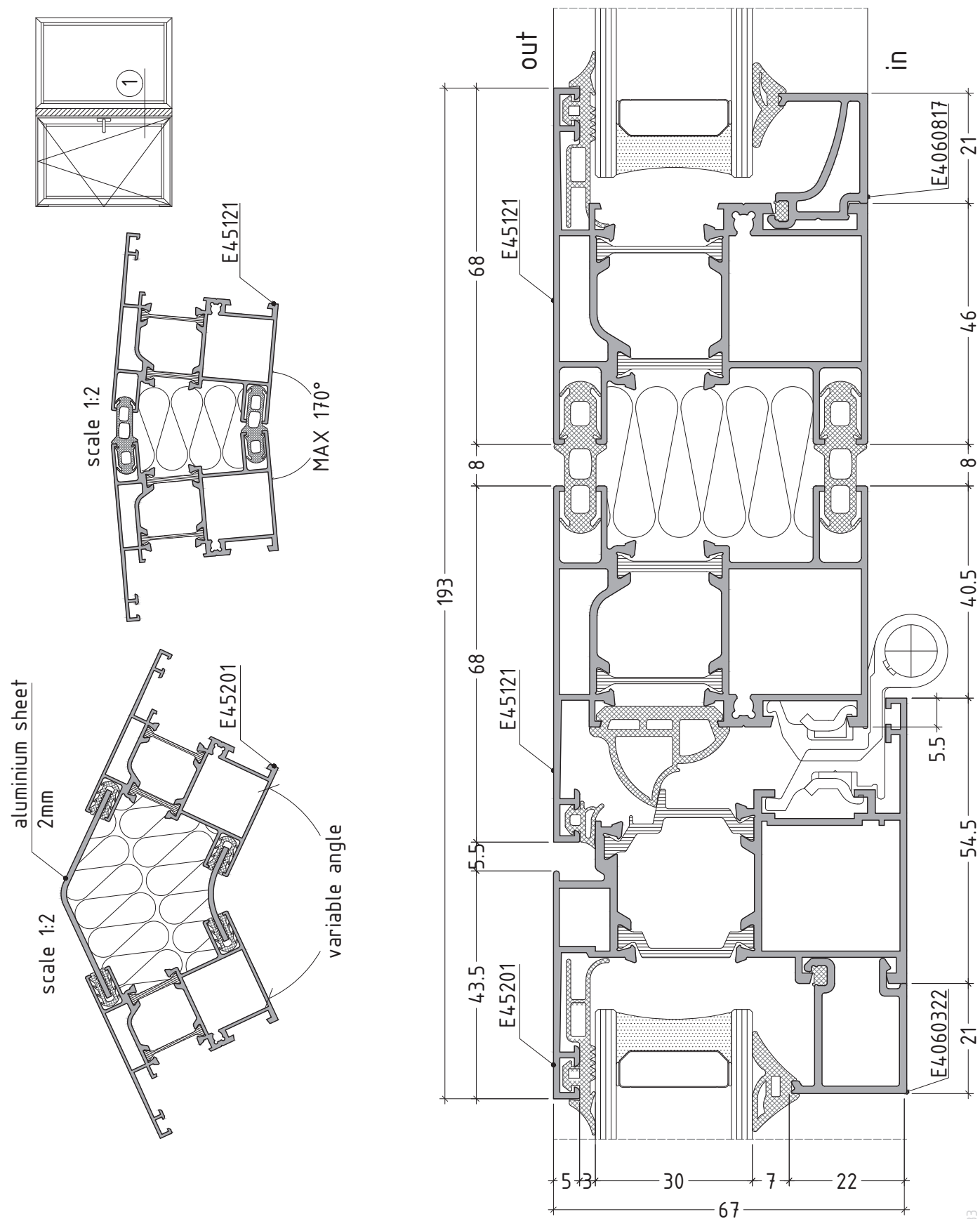
D45-31

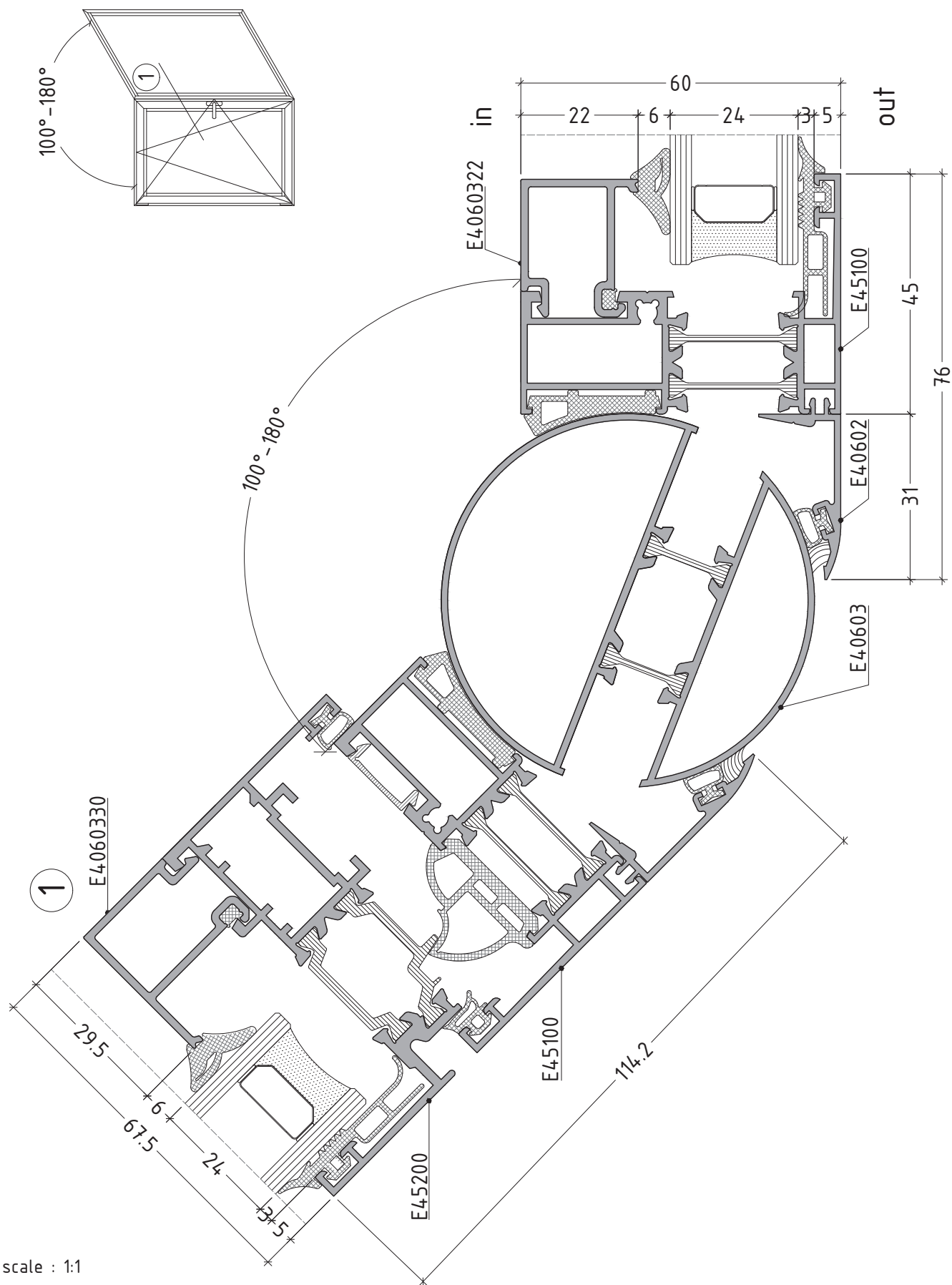
Hidden vent

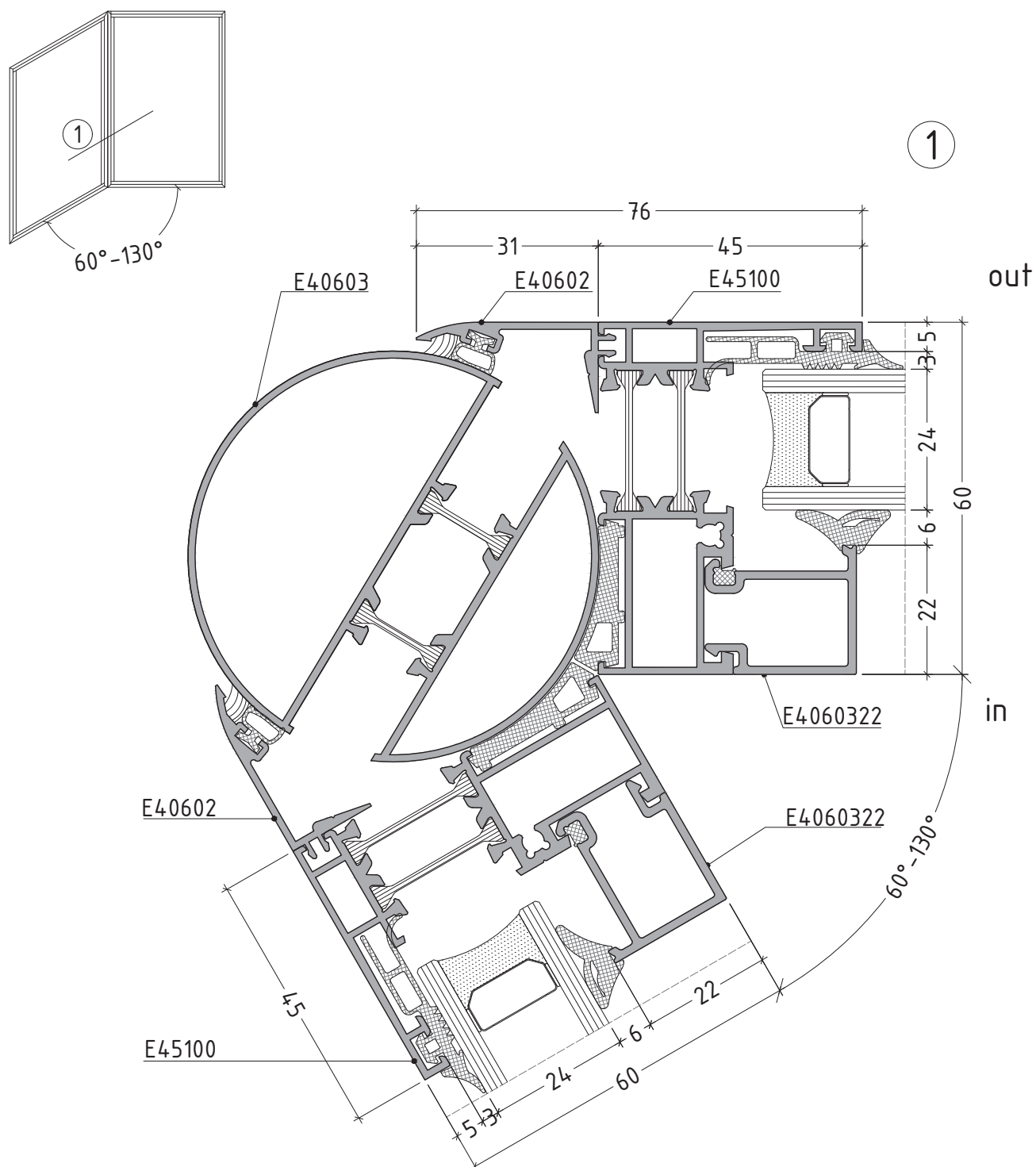


scale : 1:1

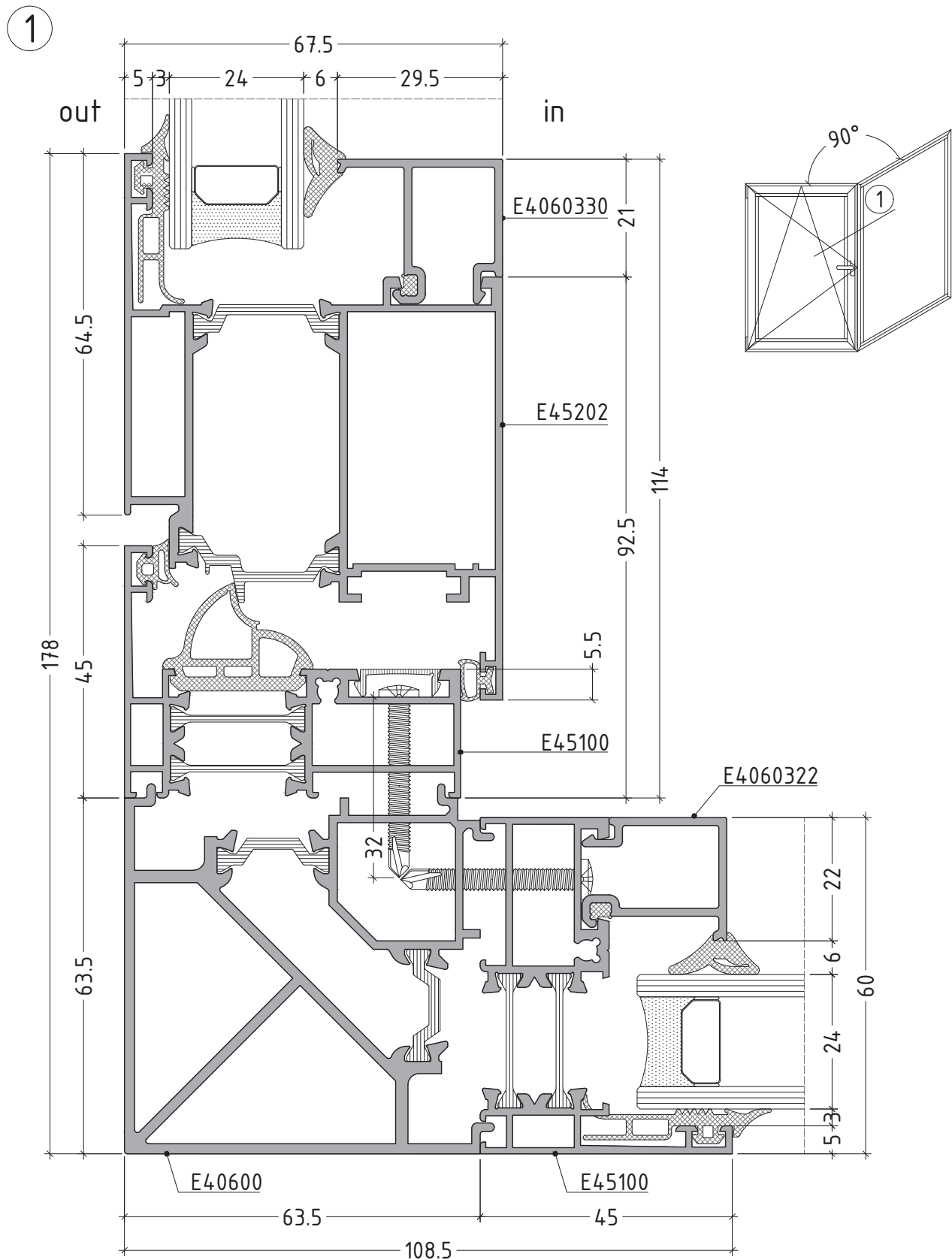
D45-32





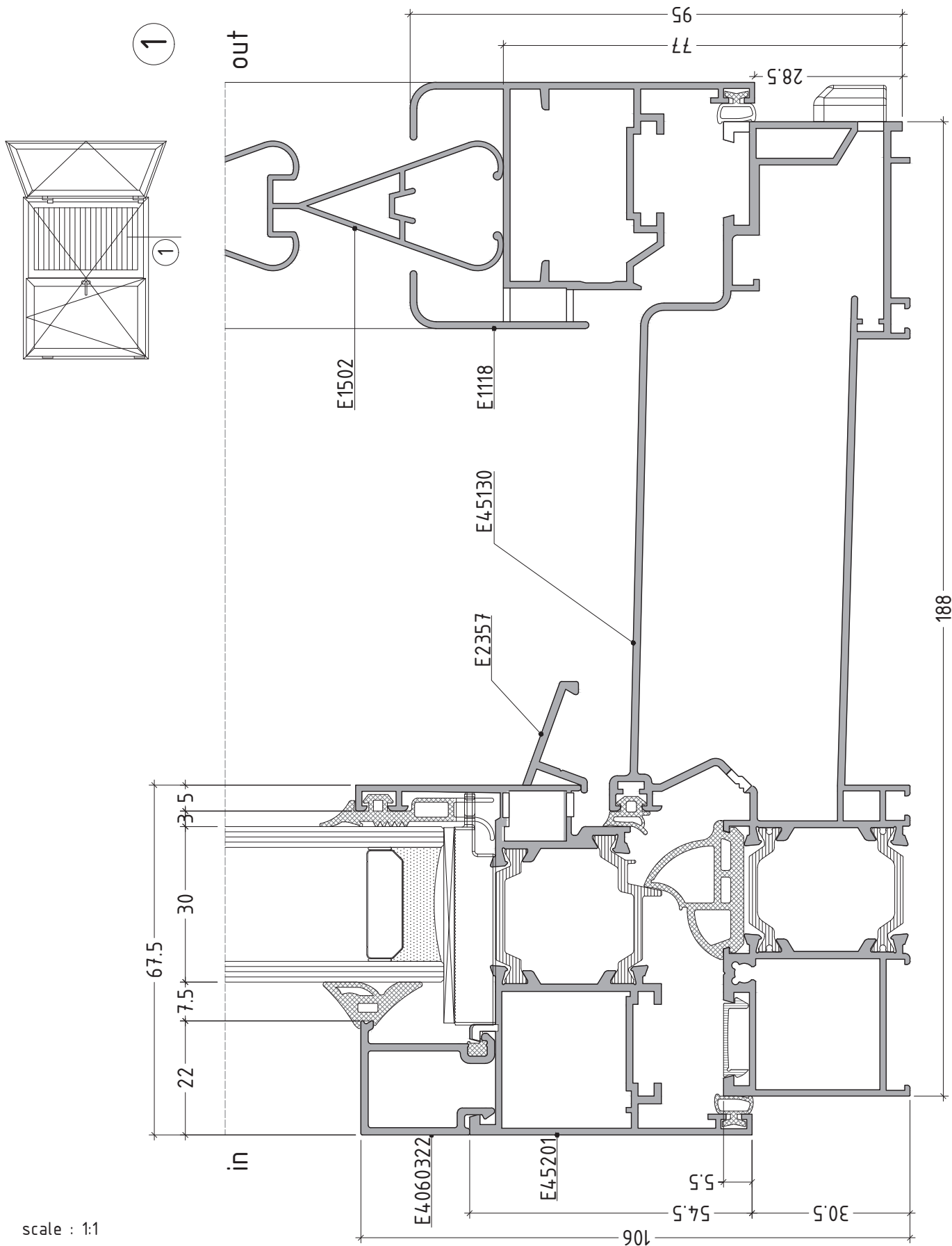


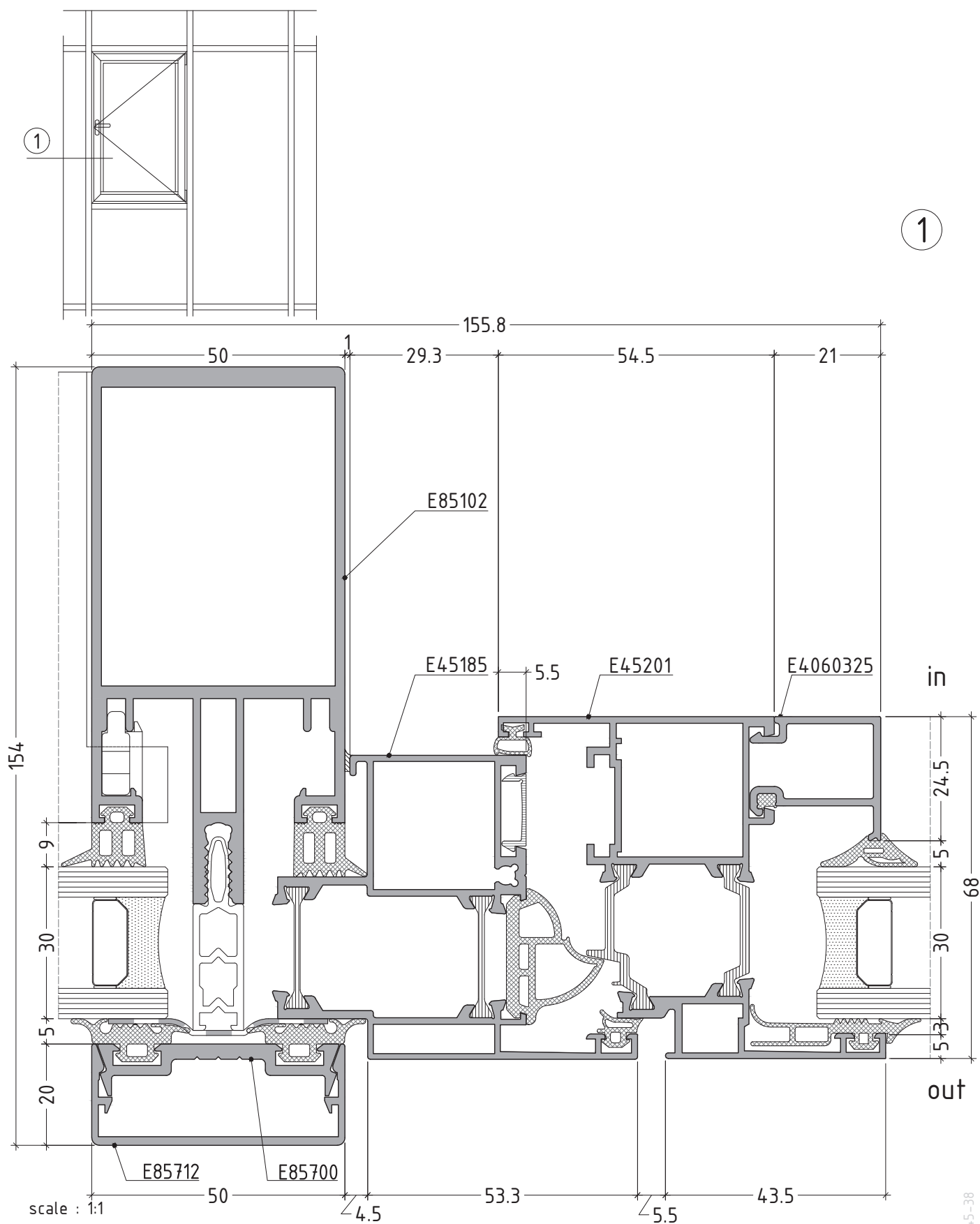
scale : 1:1

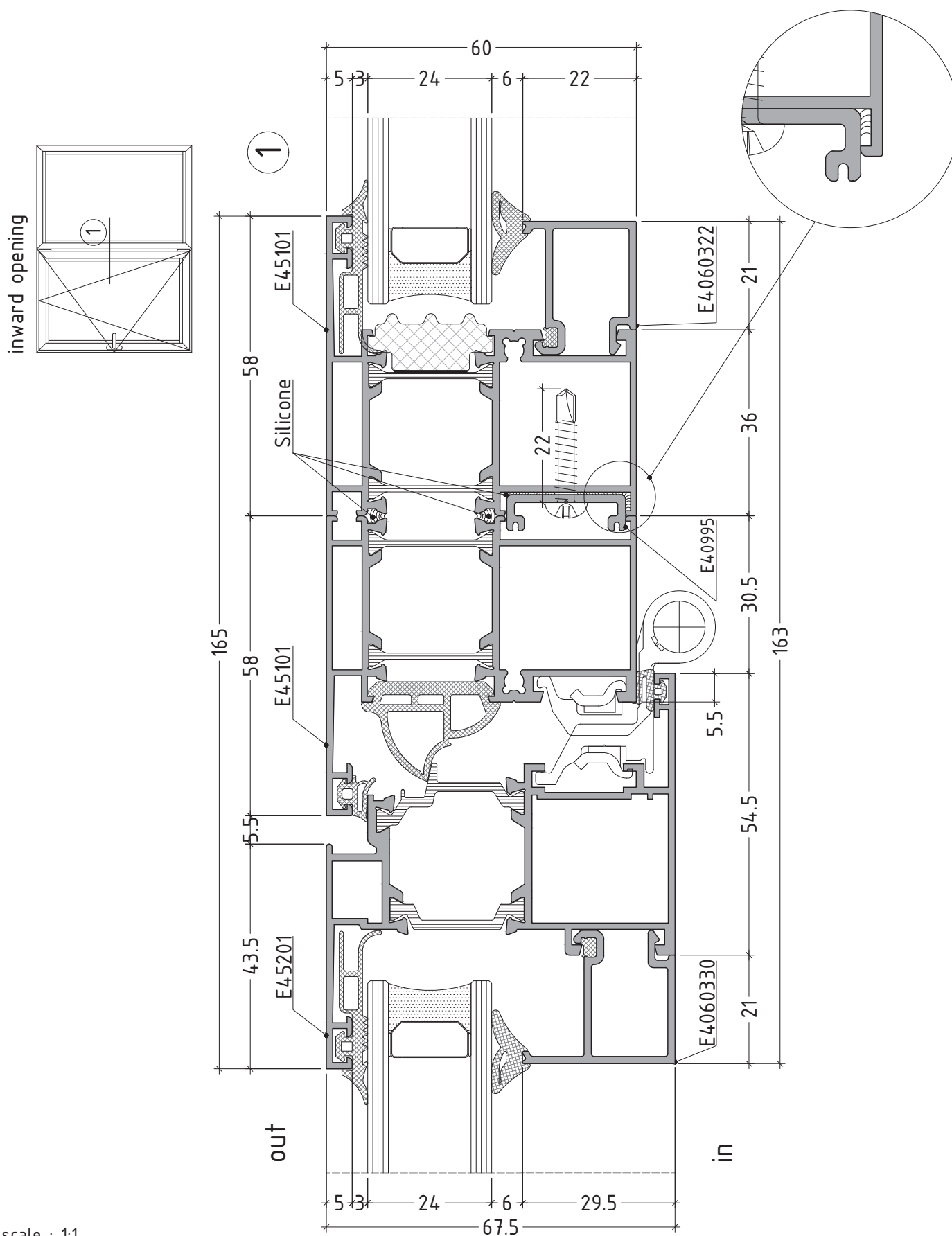


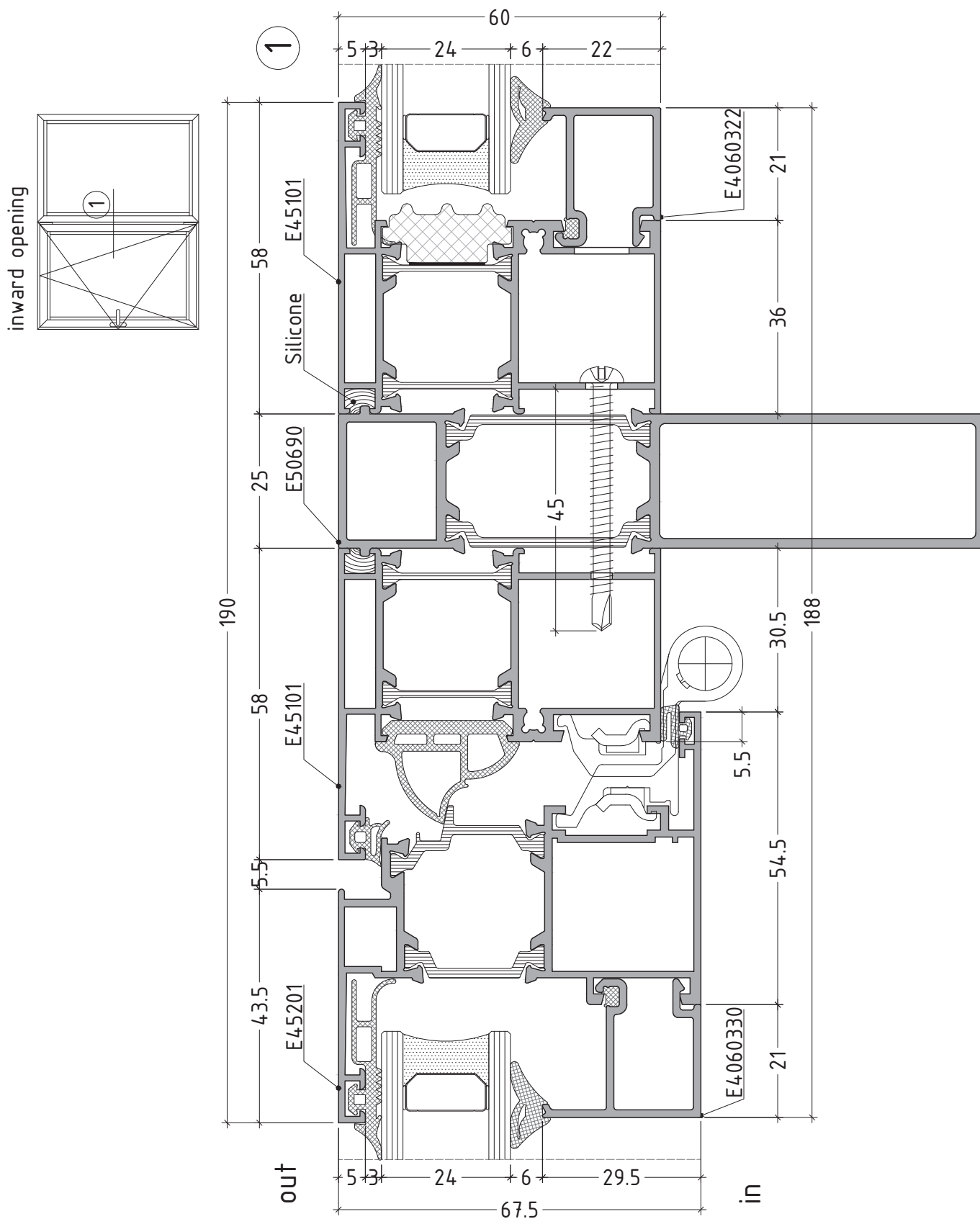
scale : 1:1

D45-36

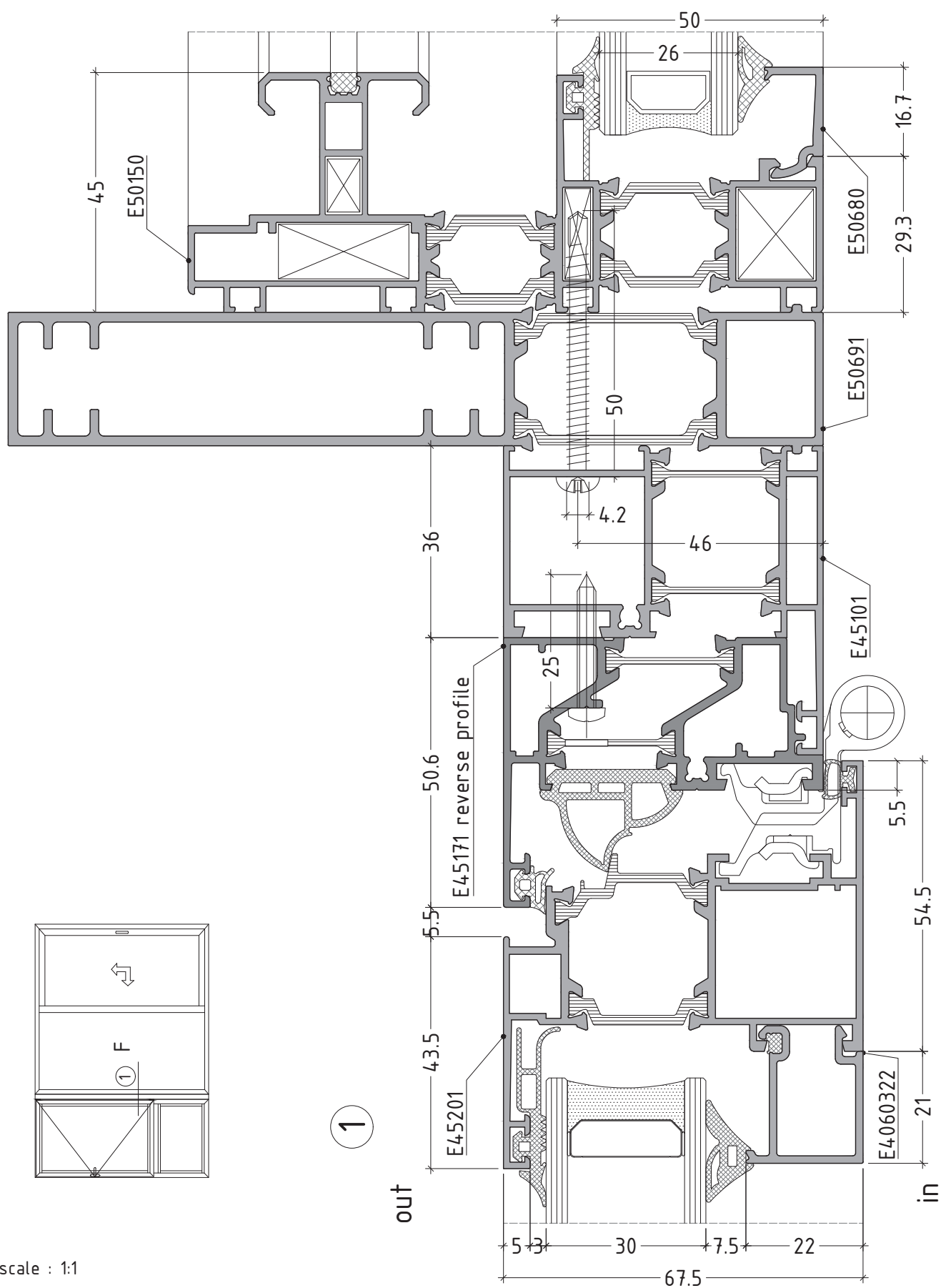




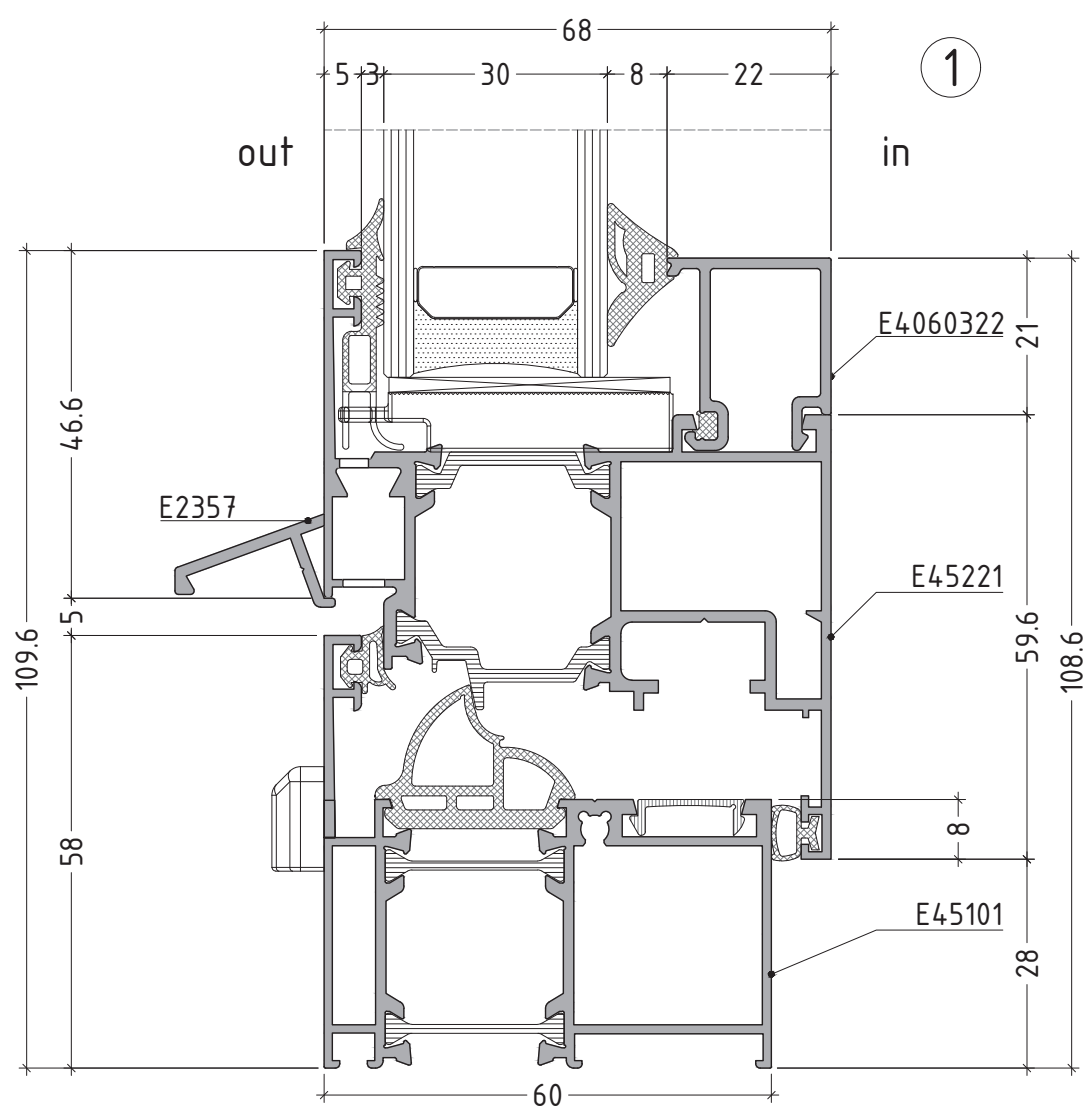
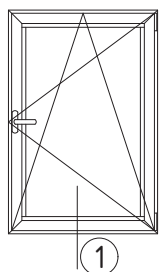




scale : 1:1



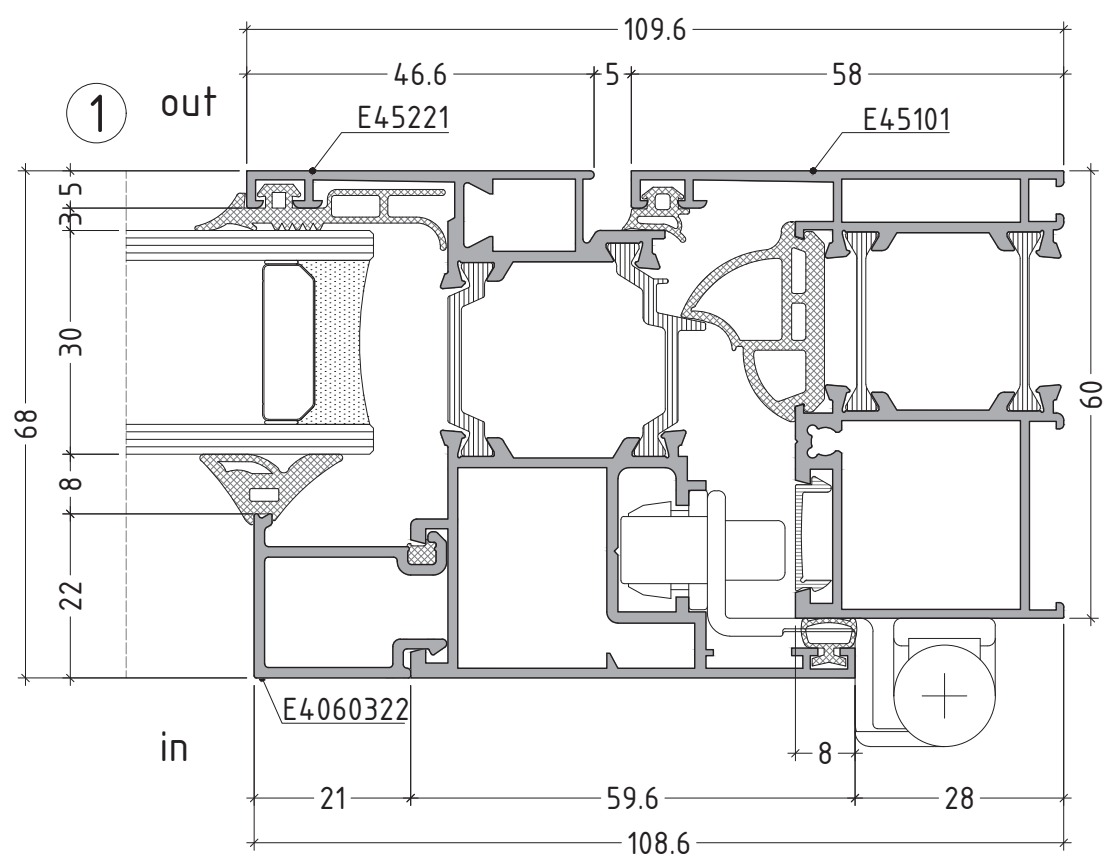
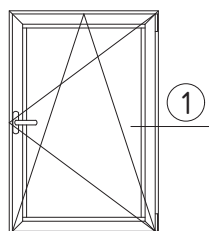
inward opening
PVC groove



scale : 1:1

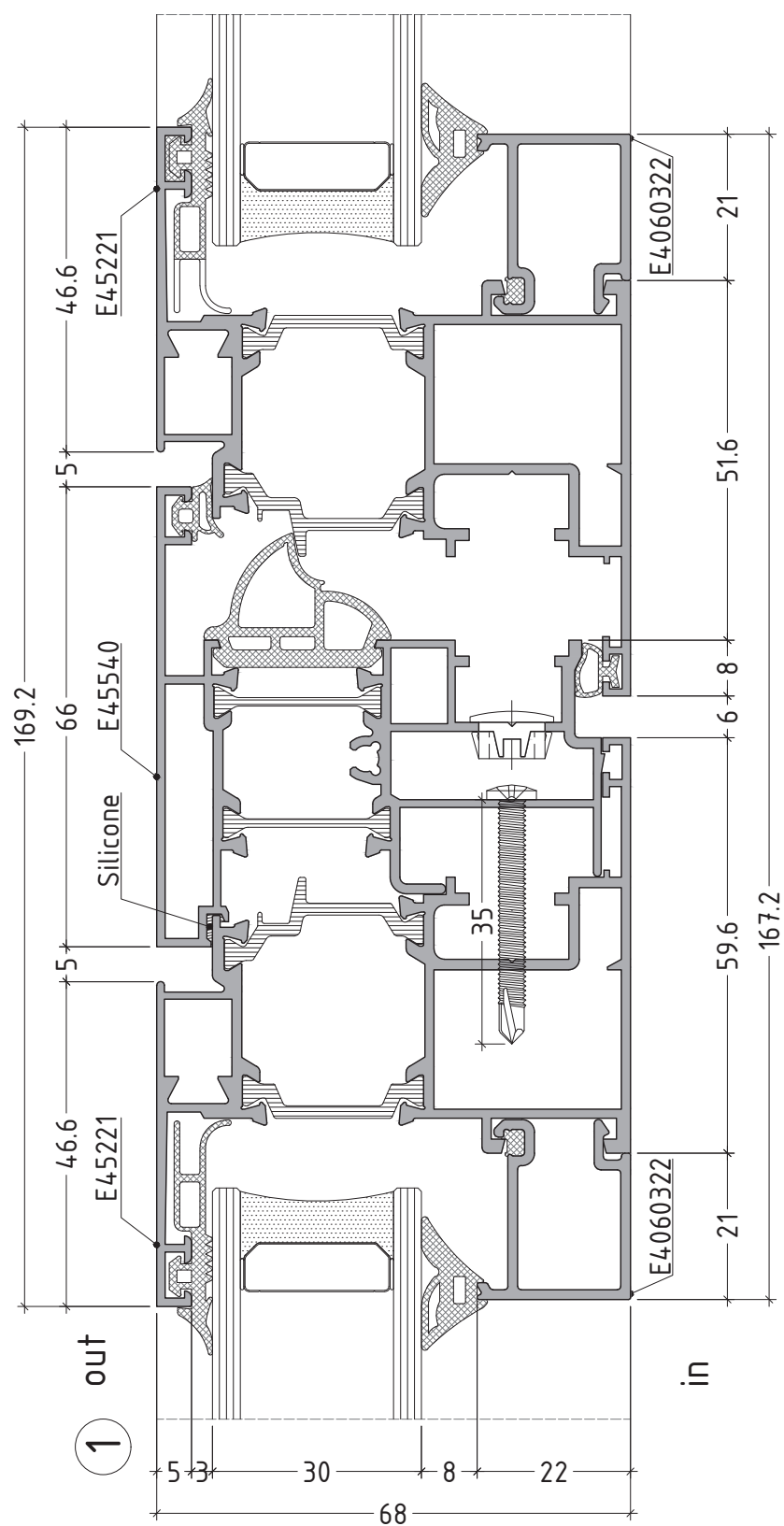
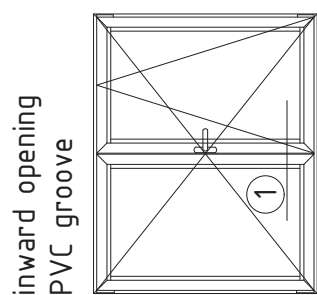
D45-42

inward opening
PVC groove



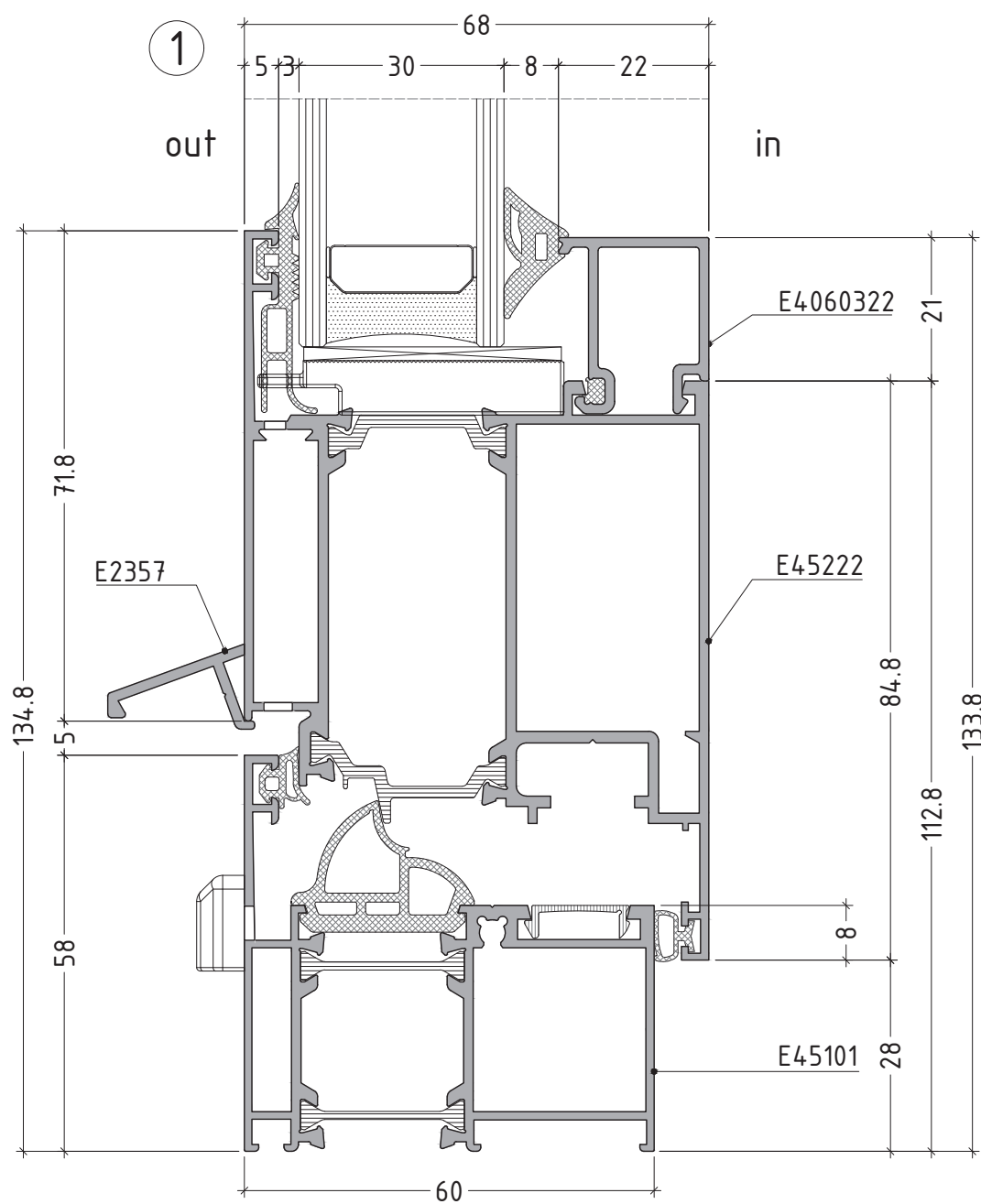
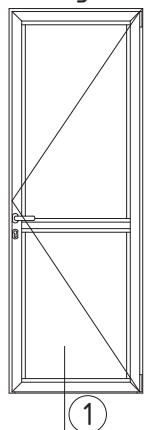
scale : 1:1

D45-43



scale : 1:1

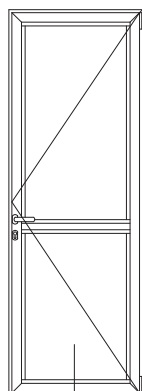
inward opening
PVC groove



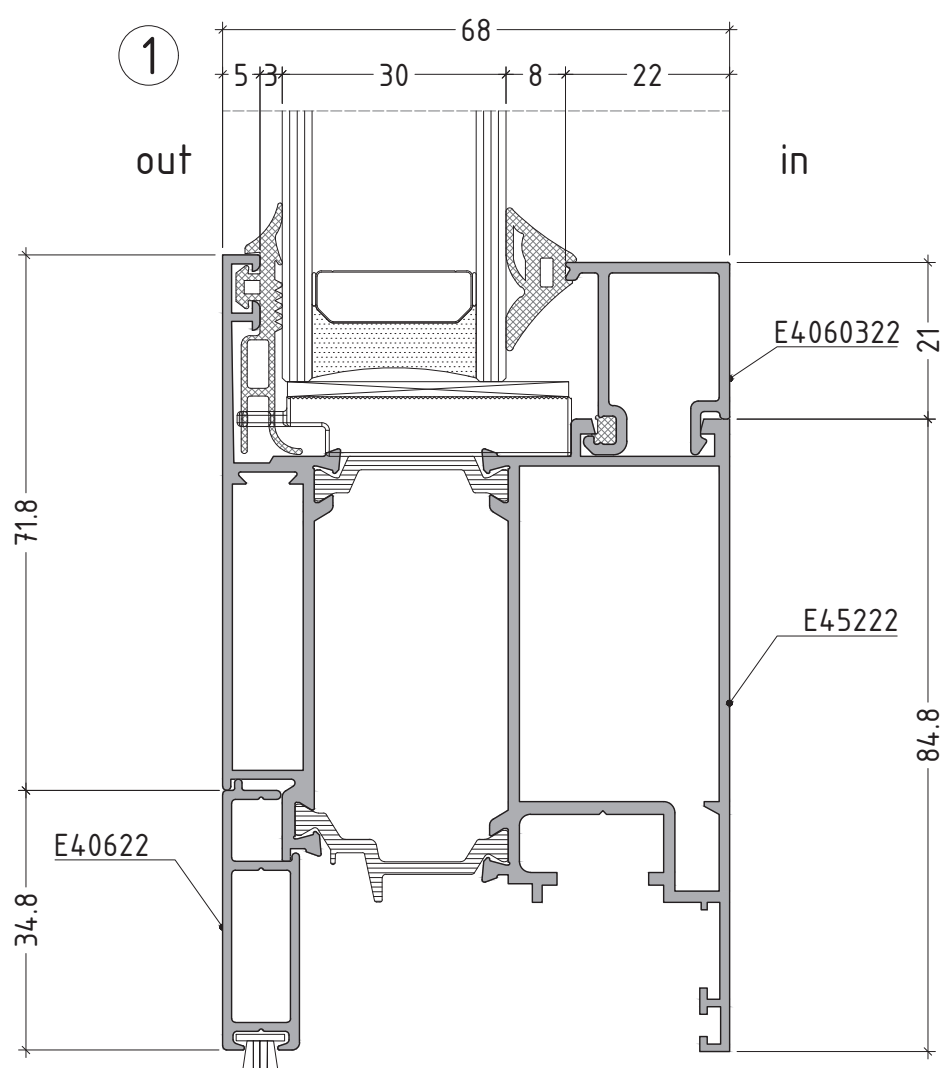
scale : 1:1

D45-45

inward opening
PVC groove



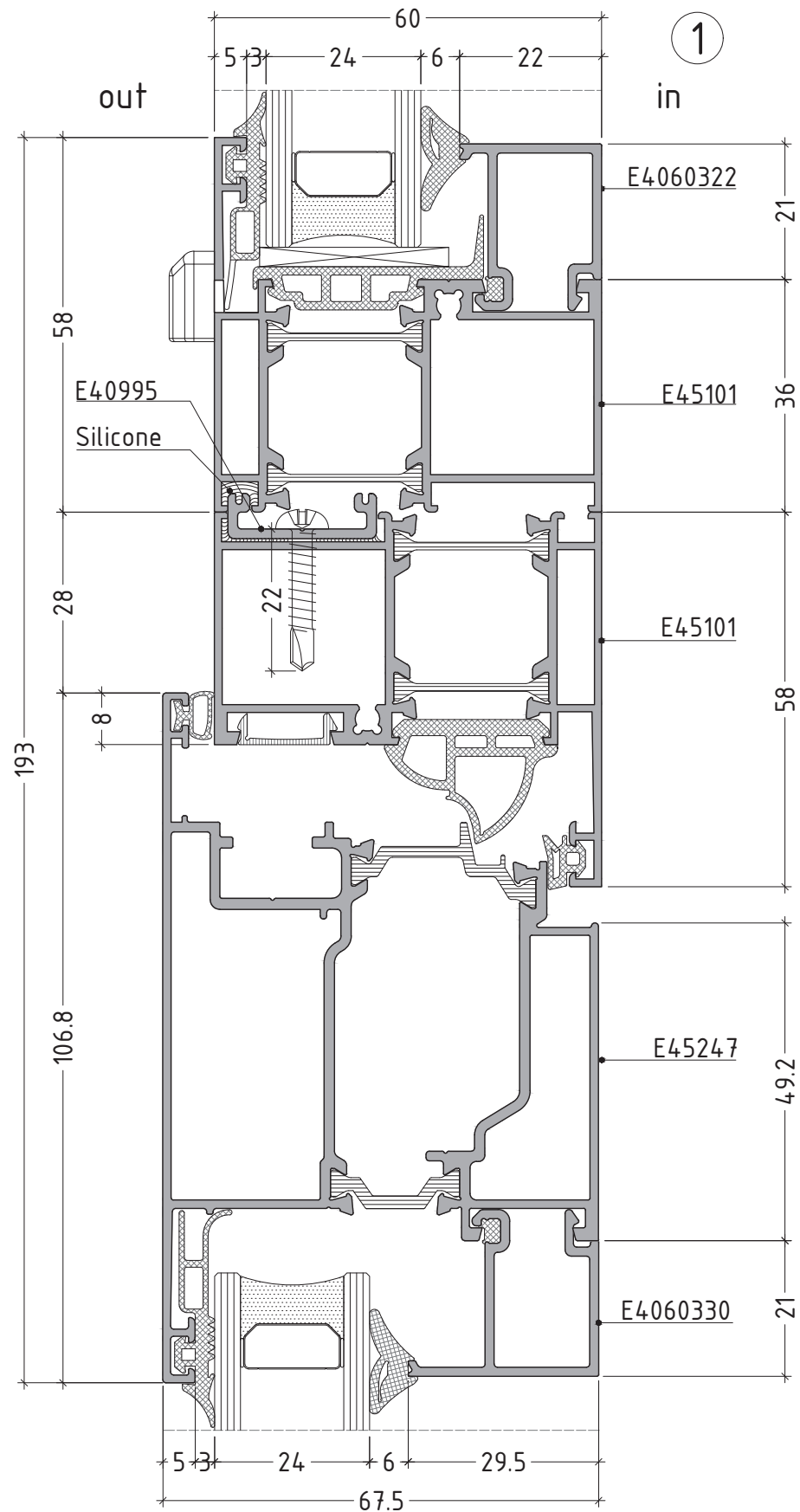
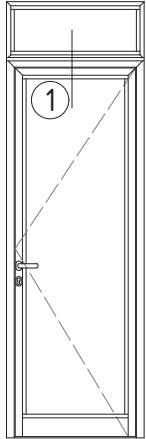
①



scale : 1:1

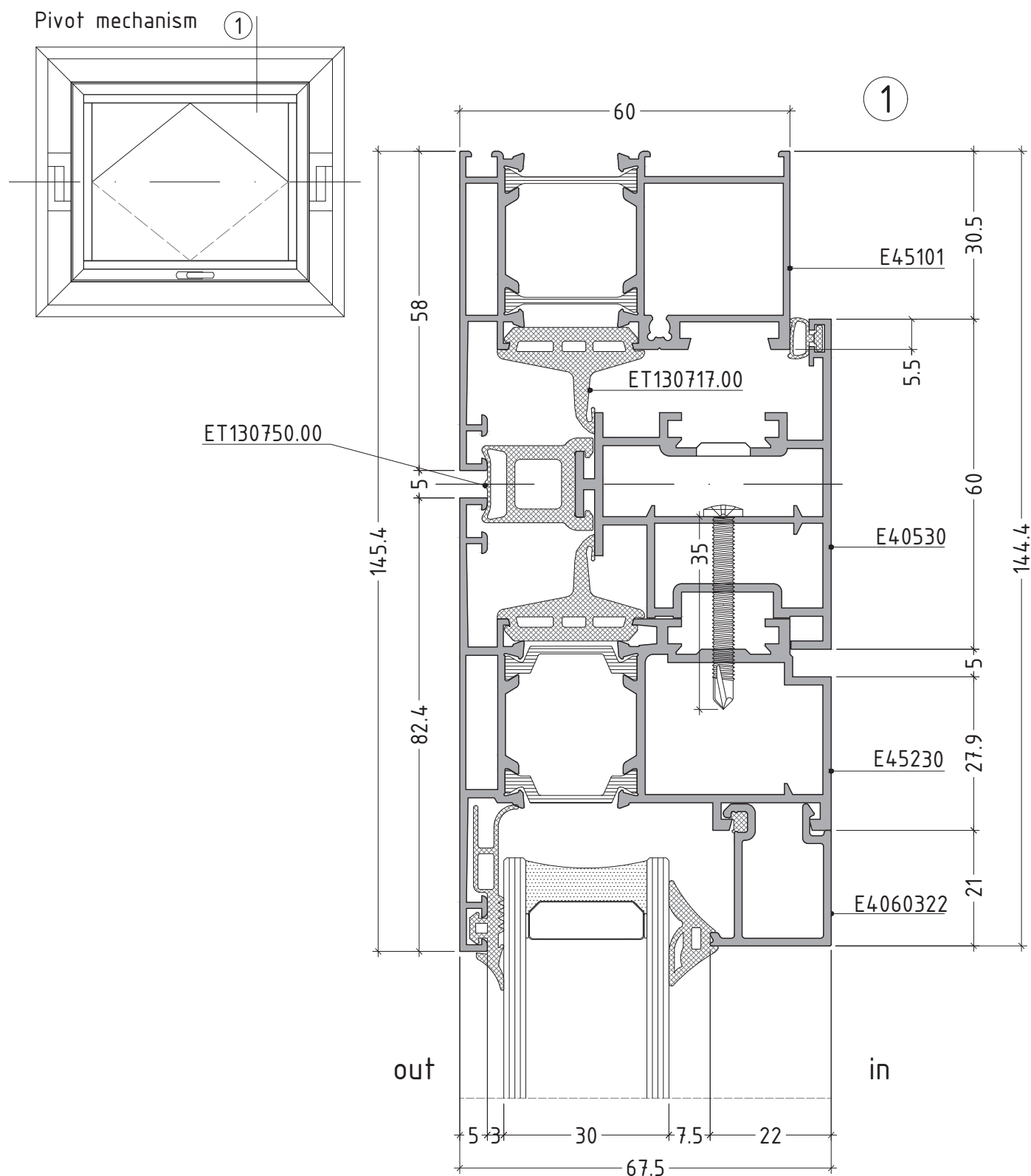
D45-46

outward opening
PVC groove



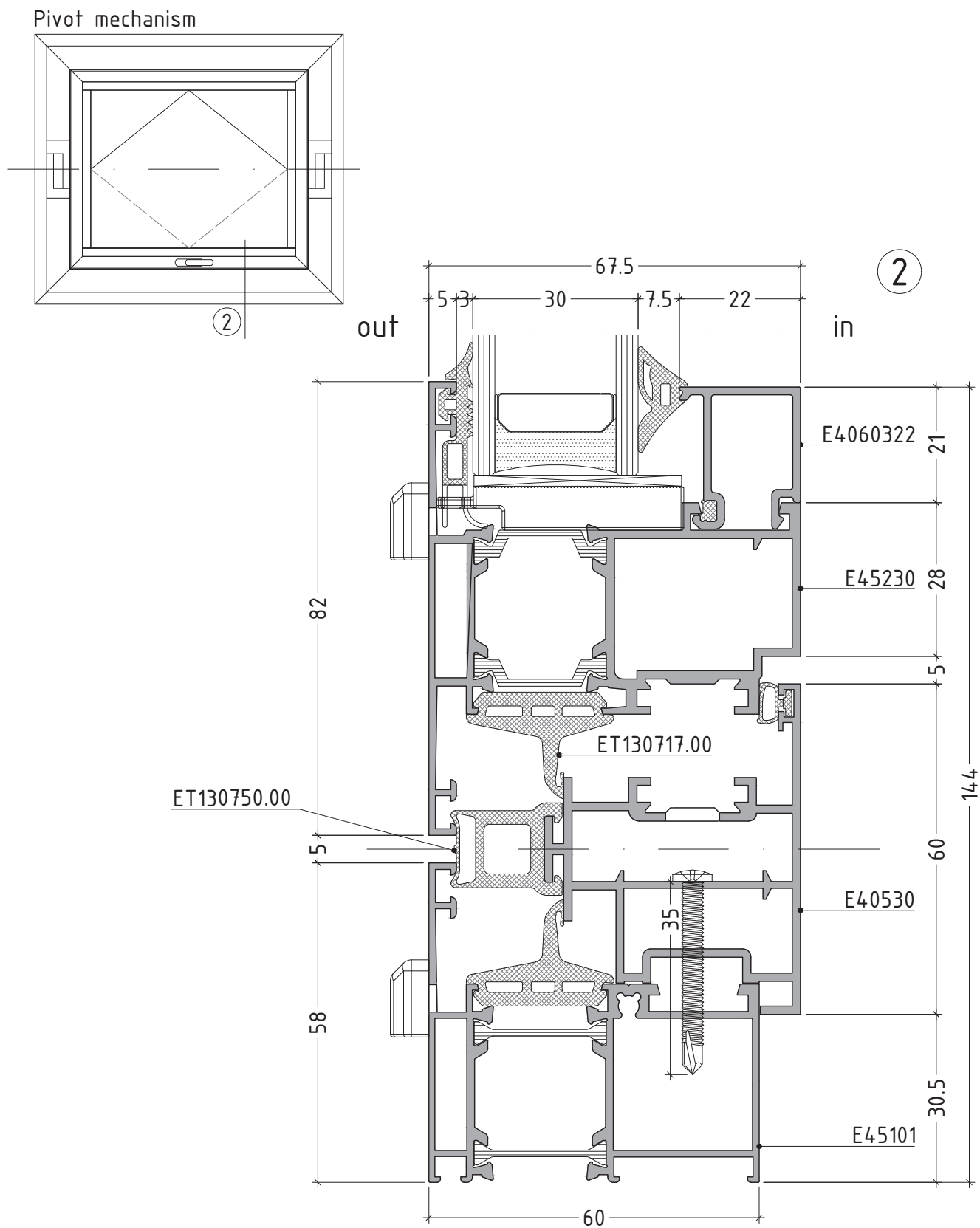
scale : 1:1

D45-47



scale : 1:1

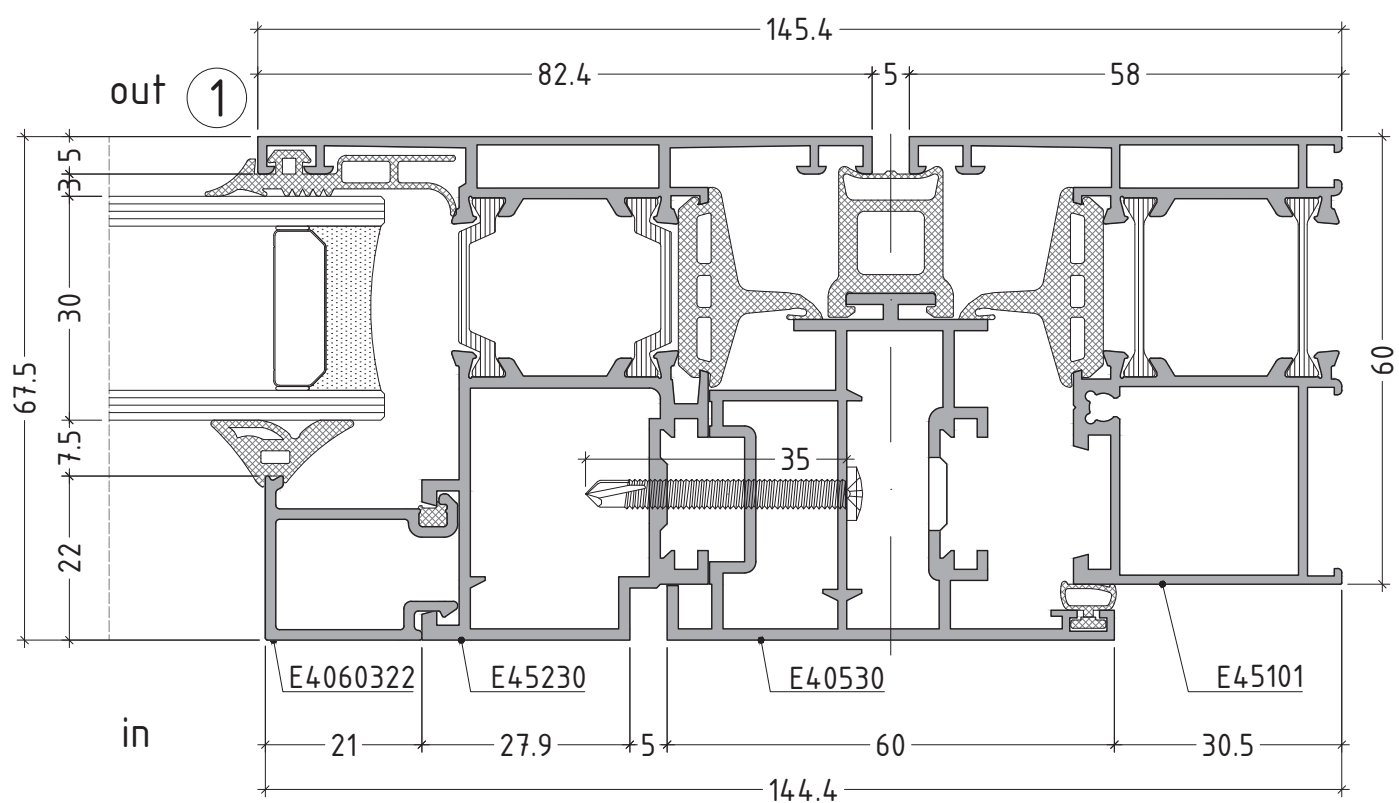
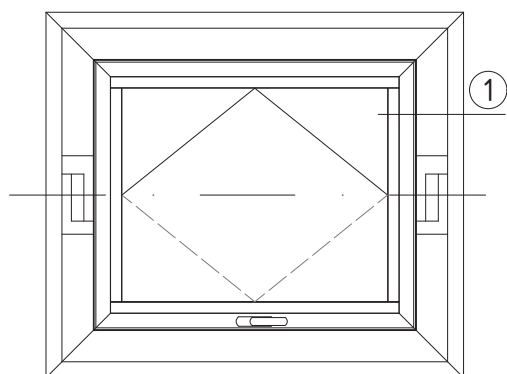
D45-48



scale : 1:1

D45-49

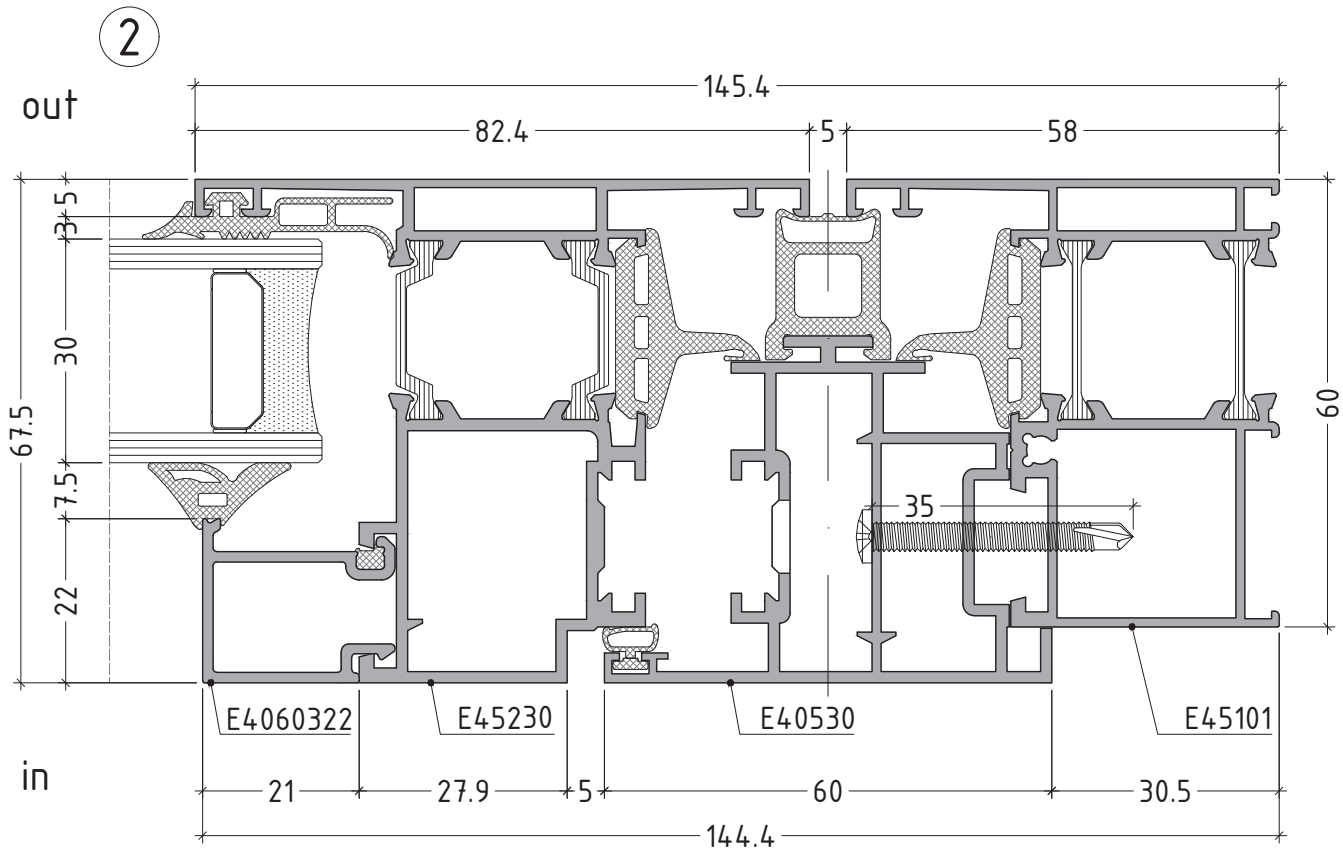
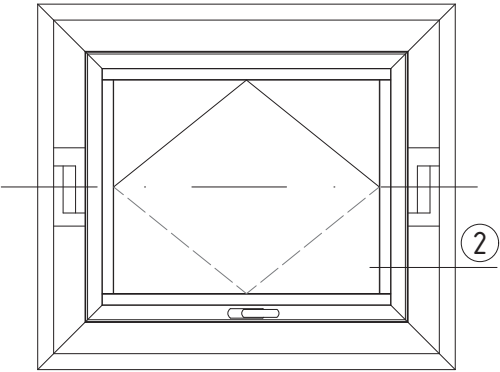
Pivot mechanism



scale : 1:1

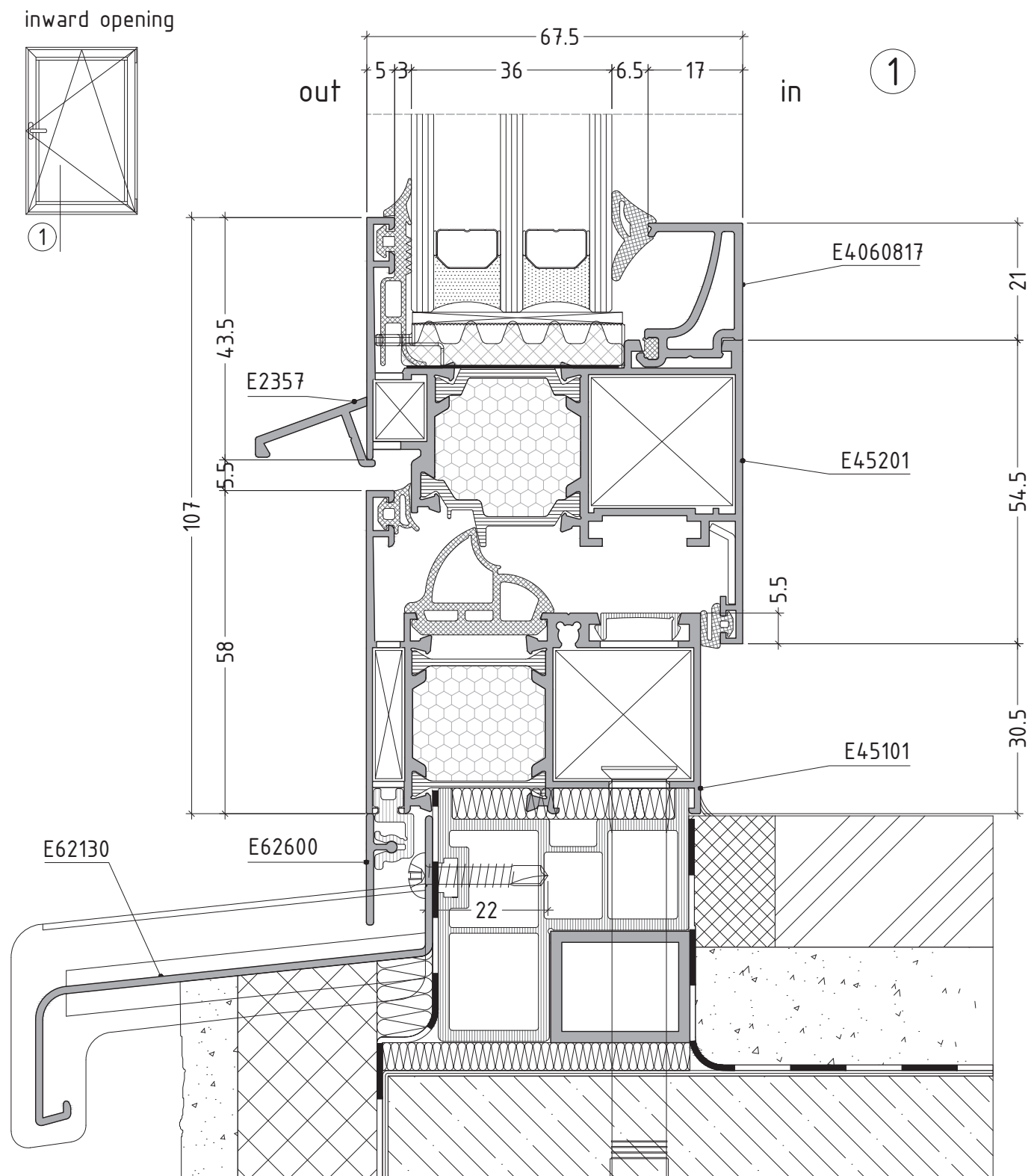
D45-50

Pivot mechanism



scale : 1:1

D45-51



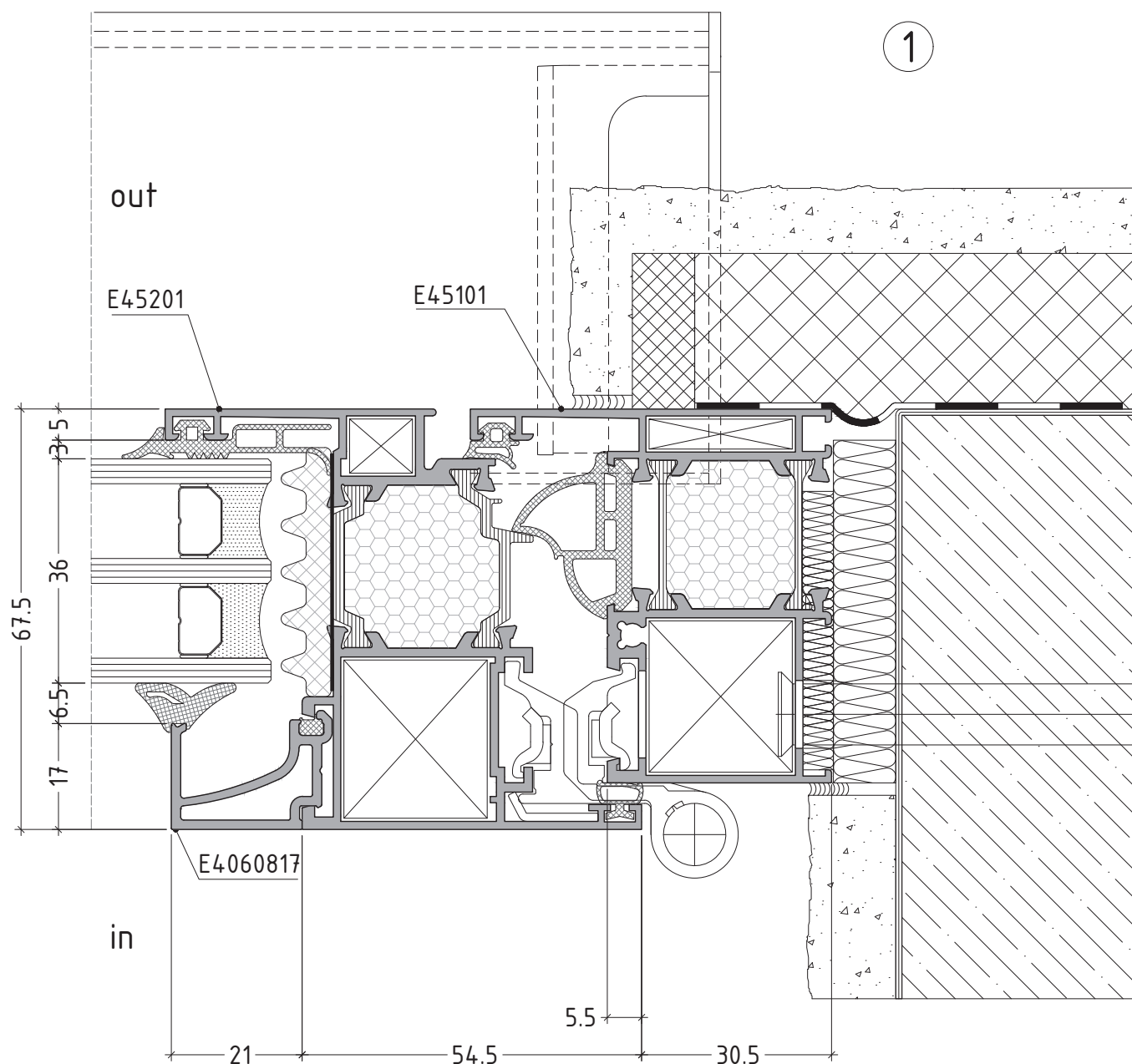
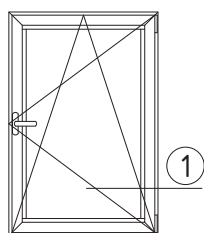
Interface shown on the drawing is an example ONLY!

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

D45-52

inward opening



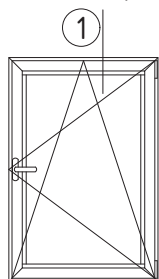
Interface shown on the drawing is an example ONLY!

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.

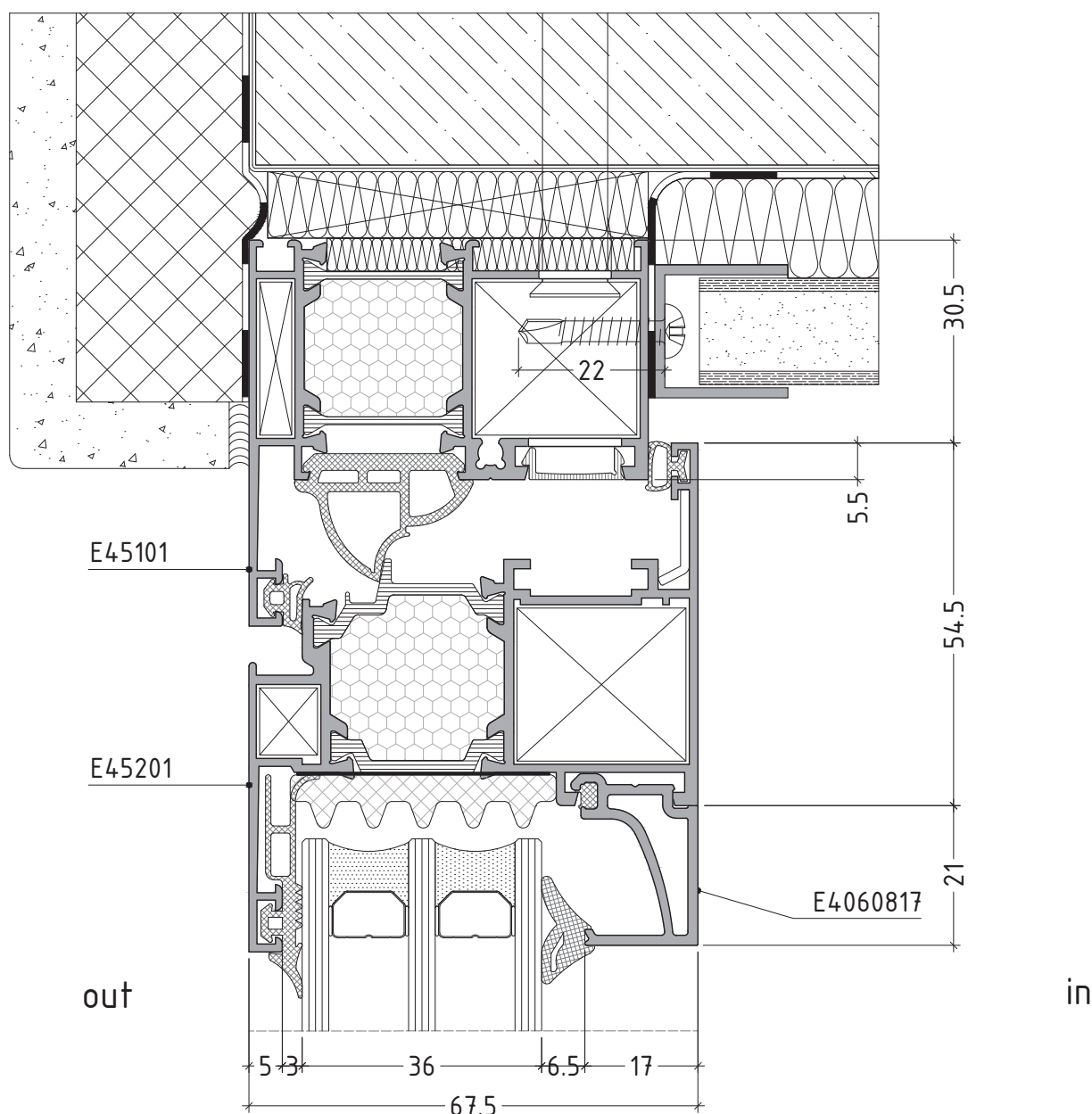
scale : 1:1

D45-53

inward opening



1



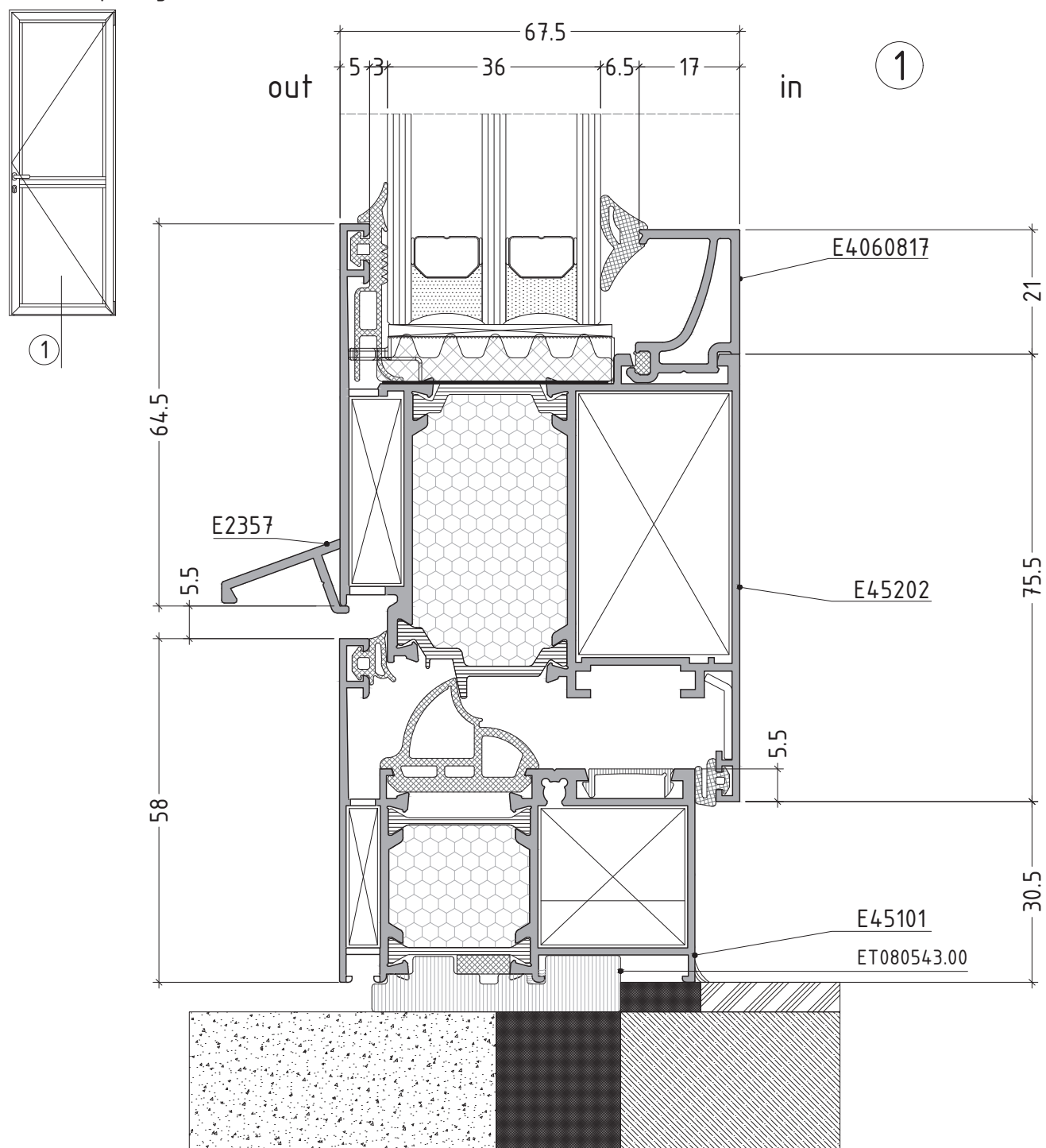
Interface shown on the drawing is an example ONLY!

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

D45-54

inward opening



Interface shown on the drawing is an example ONLY!

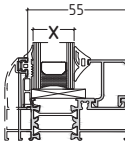
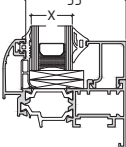
Connection between backing wall and frame is specific for each single project. It is obligatory to observe different projects' features. All final decisions about materials used, interface finishing, etc. should be approved by the structural / façade engineer responsible for the specific project.

scale : 1:1

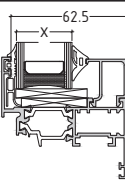
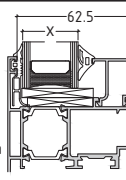
D45-55

GLAZING OPTIONS

Glazing options for E45

GLAZING OPTIONS									
external gaskets		INTERNAL GASKETS					GLAZING BEADS		
 3 mm 130402 130411  4 mm 130153		 5 - 6 mm 130176	 7 - 8 mm 130177				 55  55		
		 5 mm 130205	 6 mm 130206	 7 mm 130207	 8 mm 130208	 10 mm 130210			
		X mm					E40603xx		
130402 / 130411		40	39	38	37	35	E4060307		E4060807
130153		39	38	37	36	34			
130402 / 130411		37	36	35	34	32	E4060310		E4060810
130153		36	35	34	33	31			
130402 / 130411		35	34	33	32	30	E4060312		E4060812
130153		34	33	32	31	29			
130402 / 130411		32	31	30	29	27	E4060315		E4060815
130153		31	30	29	28	26			
130402 / 130411		30	29	28	27	25	E4060317		E4060817
130153		29	28	27	26	24			
130402 / 130411		27	26	25	24	22	E4060320		E4060820
130153		26	25	24	23	21			
130402 / 130411		25	24	23	22	20	E4060322		E4060822
130153		24	23	22	21	19			
130402 / 130411		22	21	20	19	17	E4060325		E4060825
130153		21	20	19	18	16			
130402 / 130411		20	19	18	17	15	E4060327		E4060827
130153		19	18	17	16	14			
130402 / 130411		17	16	15	14	12	E4060330		E4060830
130153		16	15	14	13	11			
130402 / 130411		15	14	13	12	10	E4060332		E4060832
130153		14	13	12	11	9			
130402 / 130411		12	11	10	9	7	E4060335		E4060835
130153		11	10	9	8	6			

Glazing options for E45

GLAZING OPTIONS										
external gaskets	INTERNAL GASKETS					GLAZING BEADS				
 3 mm 130402 130411  4 mm 130153	 5 - 6 mm 130176		 7 - 8 mm 130177							
	 5 mm 130205	 6 mm 130206	 7 mm 130207	 8 mm 130208	 10 mm 130210	Straight sashes		E45230 pivot mechanism		
	X mm					E40603xx		E40608xx		
130402 / 130411	47	46	45	44	42	E4060307		E4060807		
130153	46	45	44	43	41					
130402 / 130411	45	44	43	42	40	E4060310		E4060810		
130153	44	43	42	41	39					
130402 / 130411	42	41	40	39	37	E4060312		E4060812		
130153	41	40	39	38	36					
130402 / 130411	40	39	38	37	35	E4060315		E4060815		
130153	39	38	37	36	34					
130402 / 130411	37	36	35	34	32	E4060317		E4060817		
130153	36	35	34	33	31					
130402 / 130411	35	34	33	32	30	E4060320		E4060820		
130153	34	33	32	31	29					
130402 / 130411	32	31	30	29	27	E4060322		E4060822		
130153	31	30	29	28	26					
130402 / 130411	30	29	28	27	25	E4060325		E4060825		
130153	29	28	27	26	24					
130402 / 130411	27	26	25	24	22	E4060327		E4060827		
130153	26	25	24	23	21					
130402 / 130411	25	24	23	22	20	E4060330		E4060830		
130153	24	23	22	21	19					
130402 / 130411	22	21	20	19	17	E4060332		E4060832		
130153	21	20	19	18	16					
130402 / 130411	20	19	18	17	15	E4060335		E4060835		
130153	19	18	17	16	14					
130402 / 130411	17	16	15	14	12	E4060337		E4060837		
130153	16	15	14	13	11					

Note:

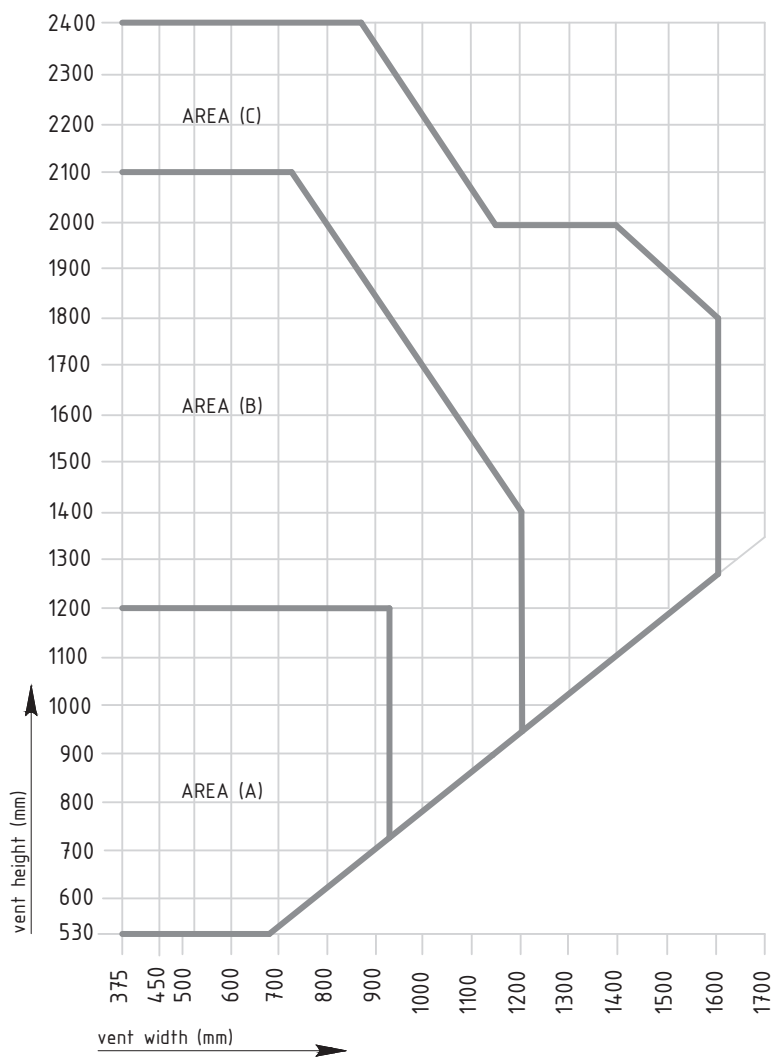
Tolerance in dimension chain $\pm 0.5\text{mm}$

T45-02

CUTTING LISTS

application diagram for vent size

selection of the appropriate vent profile according to the glazing thickness and the dimensions of the window/door



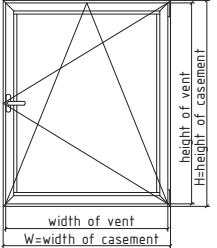
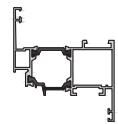
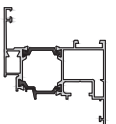
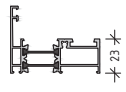
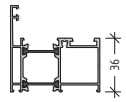
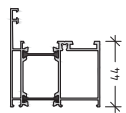
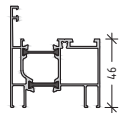
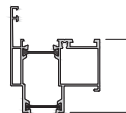
AREA (C)
E45202
E45252
E45222
E45272

AREA (B)
E45201
E45241
E45251
E45221
E45271

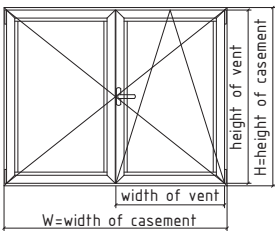
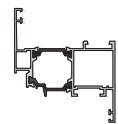
AREA (A)
E45200
E45250

ATTENTION
The diagram is valid for doors/windows which are constructed using corner crimping machine & epoxy resin

calculation of cutting length for one leaf window

		vent profile selection	PVC groove	
frame profile selection		E45200 E45201 E45202 E45250 E45251 E45252 E45241		E45221 E45222 E45271 E45272 
E45100 E45150 	width of vent	W - 35		
	height of vent	H - 35		
E45101 E45190 E45130 E45151 E45154 E45153 E45111 E45161 	width of vent	W - 61		W - 56
	height of vent	H - 61		H - 56
E45102 E45152 	width of vent	W - 77		
	height of vent	H - 77		
E45121 	width of vent	W - 81		W - 76
	height of vent	H - 81		H - 76
E45185 	width of vent	W - 87		W - 82
	height of vent	H - 87		H - 82

calculation of cutting length for two leaf window

		vent profile selection	PVC groove	
frame profile selection		E45200 E45201 E45202 E45250 E45251 E45252 E45241		E45221 E45222 E45271 E45272
E45100 E45150	width of vent	$\frac{W - 40.5}{2}$		
	height of vent	H - 35		
	height of secondary vent profile	H - 107		
E45101 E45190 E45130 E45151 E45154 E45153 E45111 E45161	width of vent	$\frac{W - 66.5}{2}$	$\frac{W - 61}{2}$	
	height of vent	H - 61	H - 56	
	height of secondary vent profile	H - 133	H - 132	
E45102 E45152	width of vent	$\frac{W - 82.5}{2}$		
	height of vent	H - 77		
	height of secondary vent profile	H - 149		
E45121	width of vent	$\frac{W - 86.5}{2}$	$\frac{W - 81}{2}$	
	height of vent	H - 81	H - 76	
	height of secondary vent profile	H - 153	H - 152	
E45185	width of vent	$\frac{W - 92.5}{2}$	$\frac{W - 87}{2}$	
	height of vent	H - 87	H - 82	
	height of secondary vent profile	H - 159	H - 158	

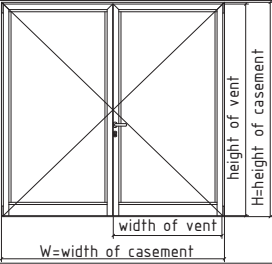
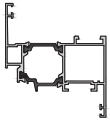
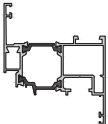
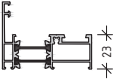
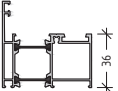
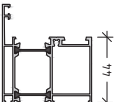
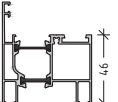
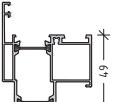
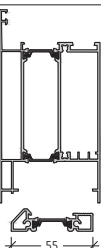
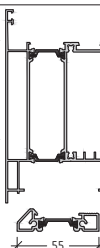
calculation of cutting length for one leaf door with door threshold profile

<	
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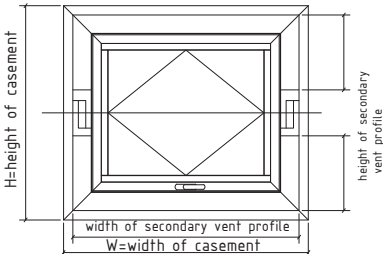
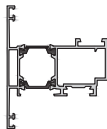
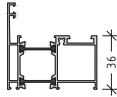
calculation of cutting length for one leaf door with bottom rail and threshold profile

		vent profile selection	PVC groove	
frame profile selection		E45200 E45201 E45202 E45250 E45251 E45252 E45241		E45221 E45222 E45271 E45272
E45100 E45150 	width of vent	W - 35		
	height of vent	H - 36.5		
E45101 E45190 E45130 E45151 E45154 E45153 E45111 E45161 	width of vent	W - 61	W - 56	
	height of vent	H - 49.5	H - 47	
E45102 E45152 	width of vent	W - 77		
	height of vent	H - 57.5		
E45121 	width of vent	W - 81	W - 76	
	height of vent	H - 59.5	H - 57	
E45185 	width of vent	W - 87	W - 82	
	height of vent	H - 62.5	H - 60	
three side vent with door bottom rail and threshold profile		E45330 door bottom rail for straight vent profile E45331 door bottom rail E45800 E45801 	E45330 door bottom rail for straight vent profile E45331 door bottom rail E45800 E45801 	

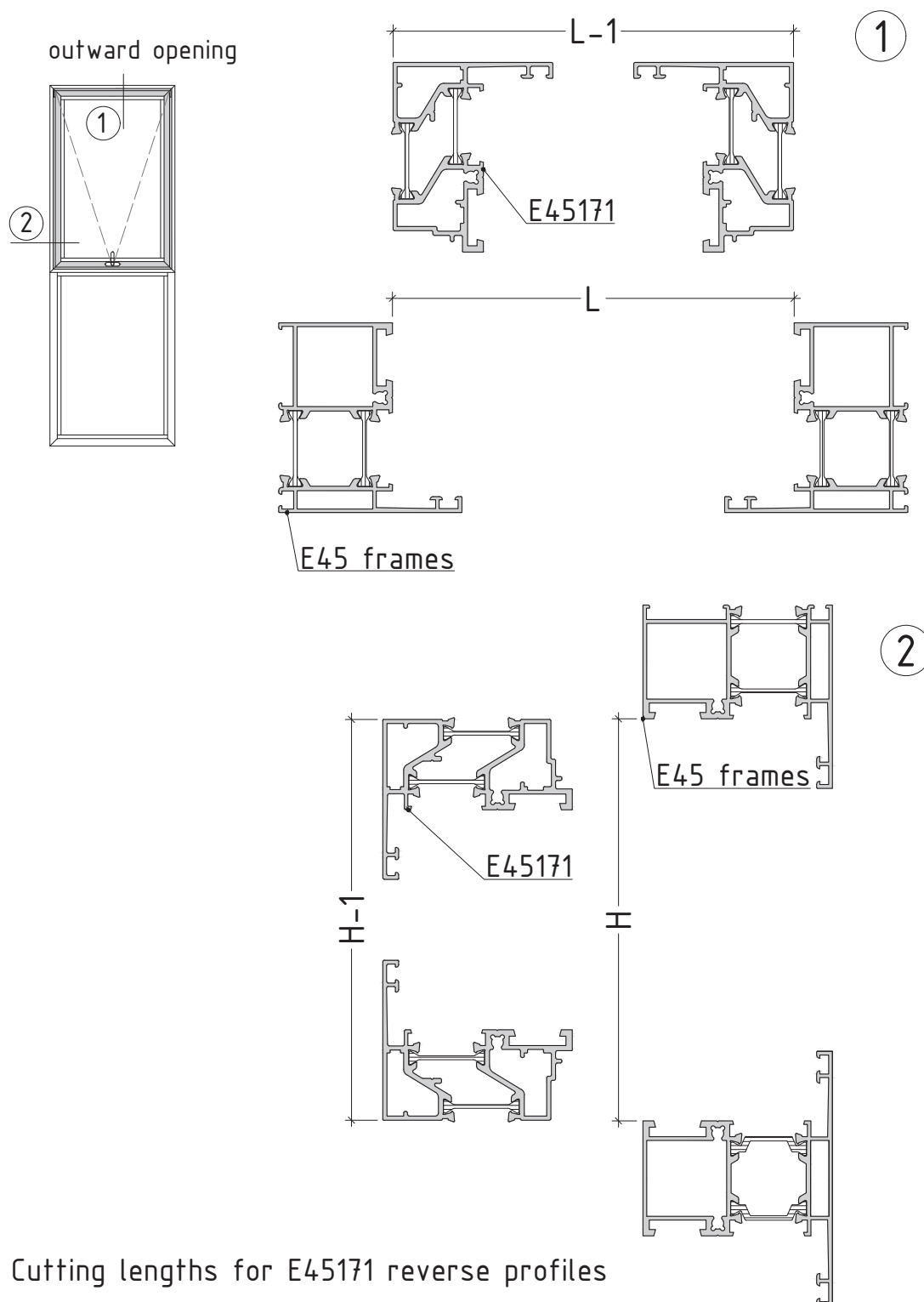
calculation of cutting length for two leaf door with bottom rail and threshold profile

		vent profile selection	PVC groove
frame profile selection		E45200 E45201 E45202 E45250 E45251 E45252 E45241 E45242 	E45221 E45222 E45271 E45272 
E45100 E45150 	width of vent	$\frac{W - 40.5}{2}$	
	height of vent	H - 36.5	
	height of secondary vent profile	H - 72.5	
E45101 E45190 E45130 E45151 E45154 E45153 E45111 E45161 	width of vent	$\frac{W - 66.5}{2}$	$\frac{W - 61}{2}$
	height of vent	H - 49.5	H - 47
	height of secondary vent profile	H - 85.5	H - 85
E45102 E45152 	width of vent	$\frac{W - 82.5}{2}$	
	height of vent	H - 57.5	
	height of secondary vent profile	H - 93.5	
E45121 	width of vent	$\frac{W - 86.5}{2}$	$\frac{W - 81}{2}$
	height of vent	H - 59.5	H - 57
	height of secondary vent profile	H - 95.5	H - 95
E45185 	width of vent	$\frac{W - 92.5}{2}$	$\frac{W - 87}{2}$
	height of vent	H - 62.5	H - 60
	height of secondary vent profile	H - 98.5	H - 98
three side vent with door bottom rail and threshold profile		E45330 door bottom rail for straight vent profile E45331 door bottom rail E45800 E45801 	E45330 door bottom rail for straight vent profile E45331 door bottom rail E45800 E45801 

calculation of cutting length for pivot mechanism

		vent profile selection		E45230 pivot mechanism 		
frame profile selection						
E45101 	width of vent		W - 126			
	height of vent		H - 126			
	width of secondary vent profile		W - 61			
	height of secondary vent profile		$\frac{H - 211}{2}$			

cutting list for profiles E45171



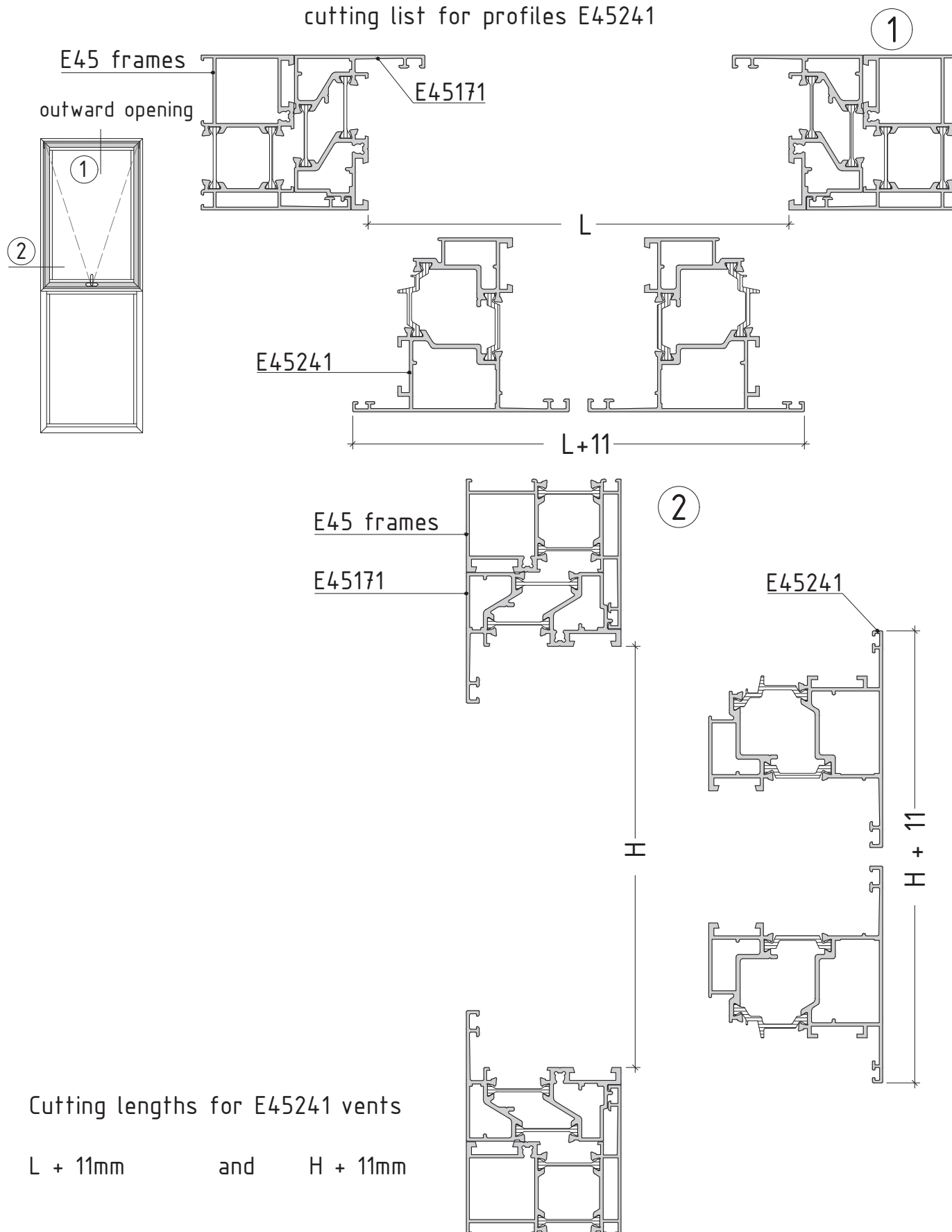
Cutting lengths for E45171 reverse profiles

L - 1mm

and

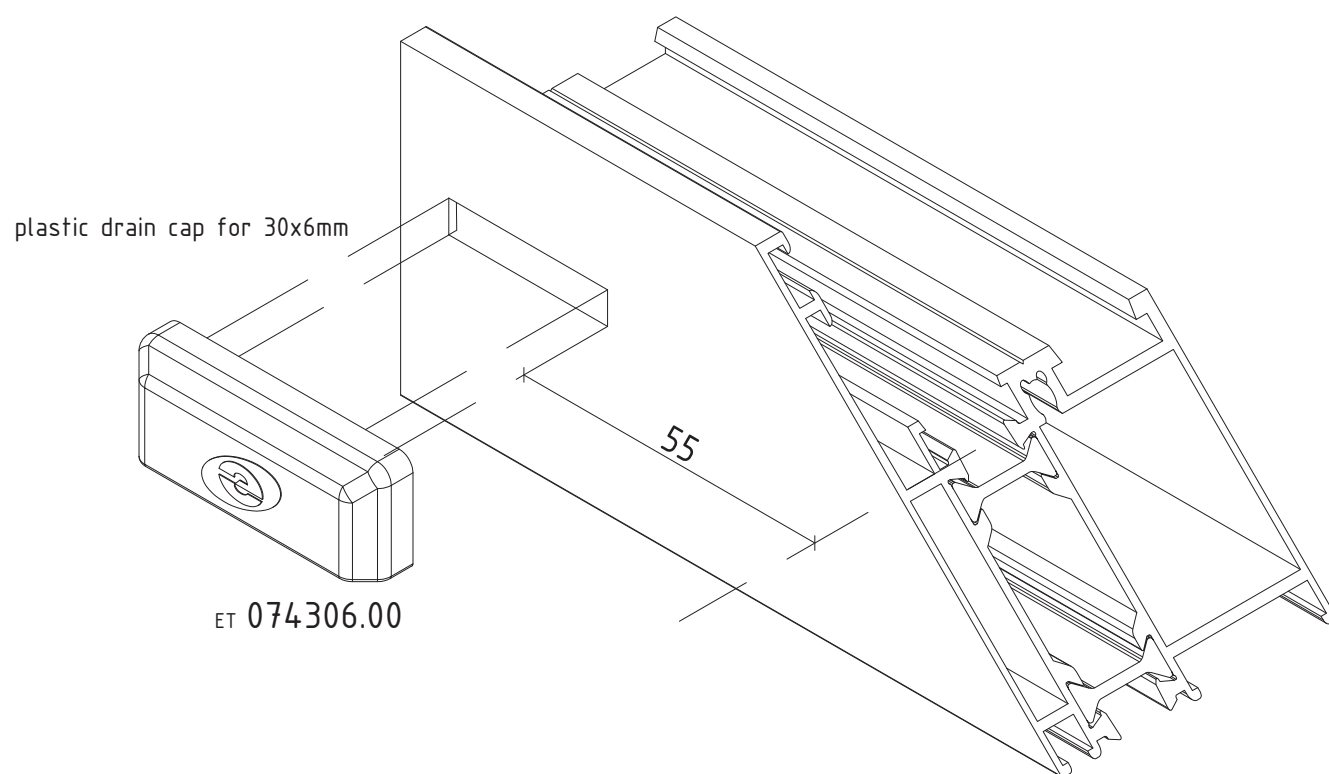
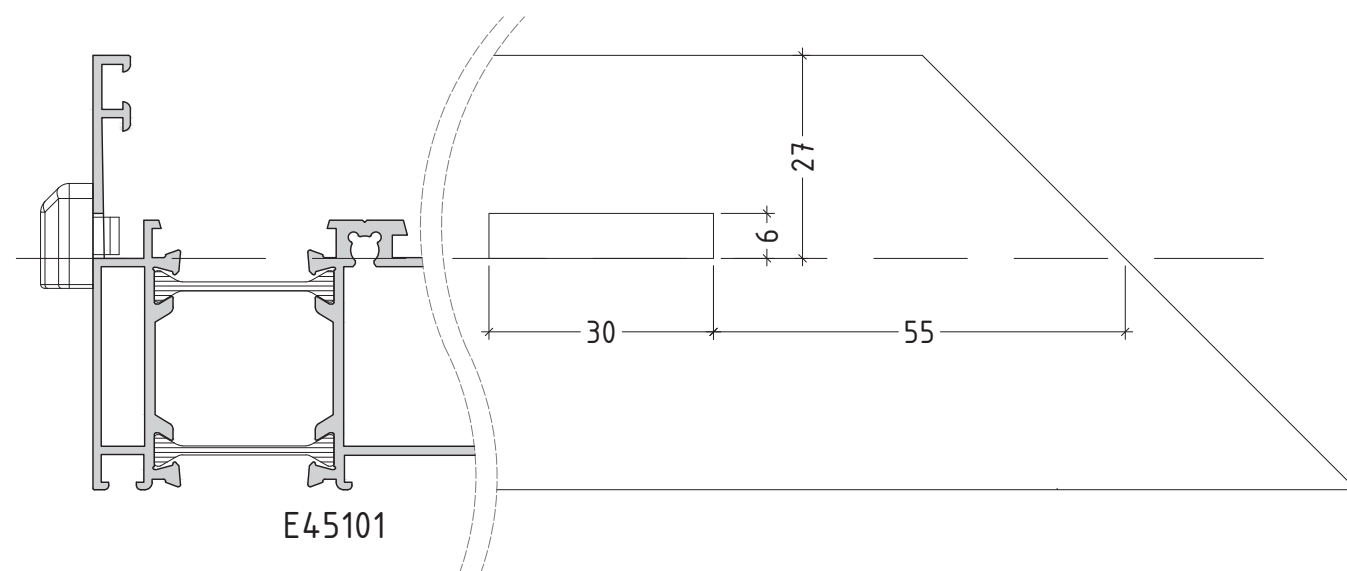
H - 1mm

cutting list for profiles E45241



MACHINING

Machining for drainage and plastic cap - ET 074306.00

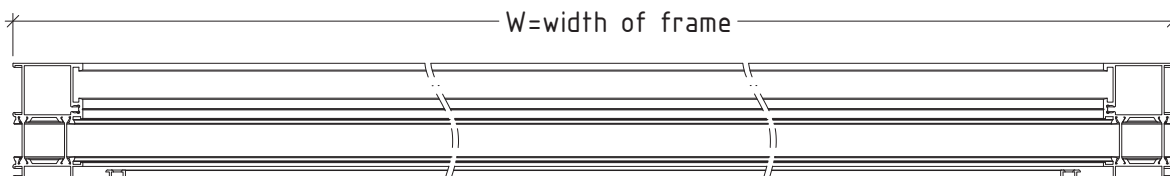
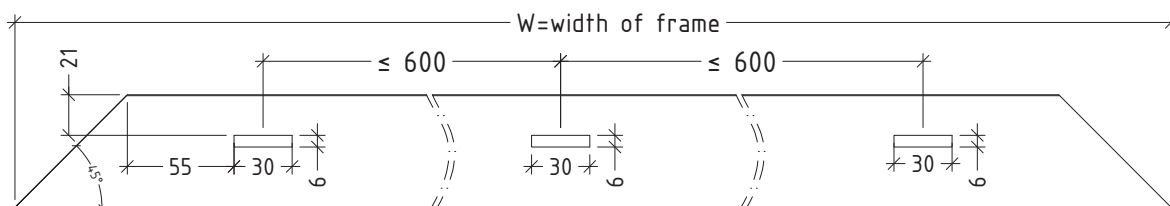
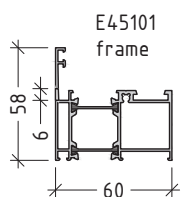
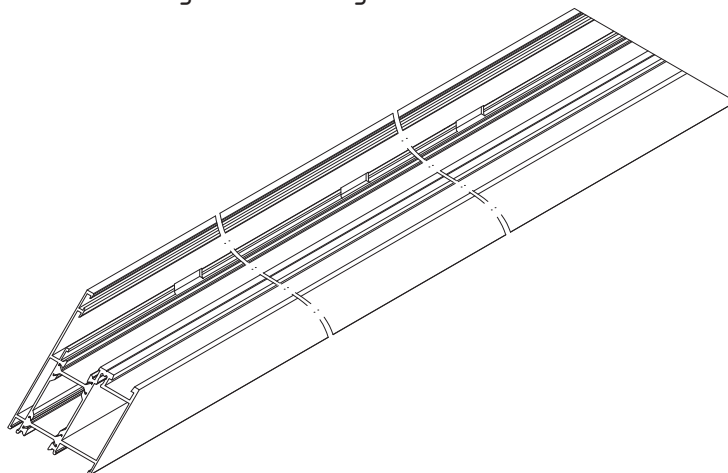
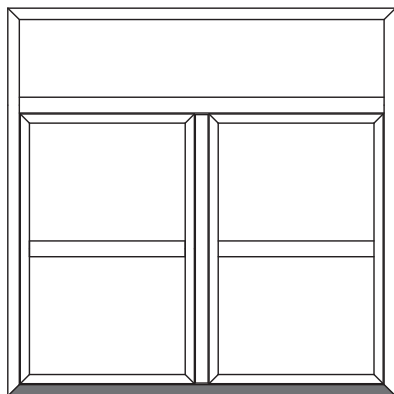


scale : 1:1

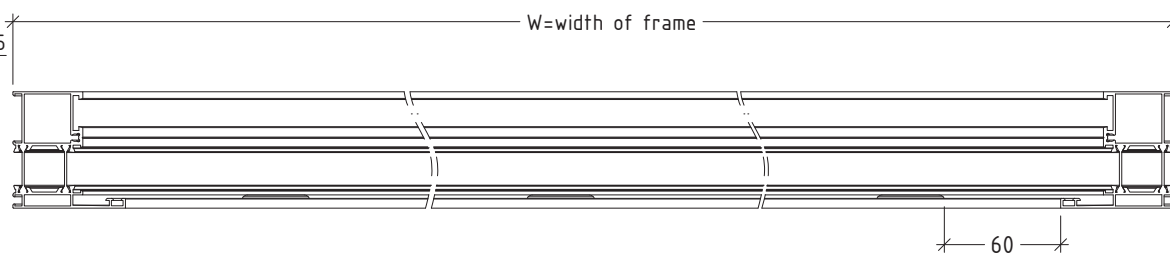
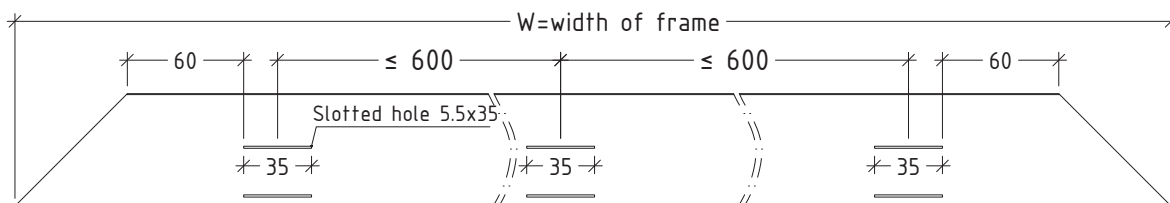
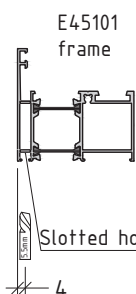
M45-1

Additional treatment of profiles after cutting Frame E45101 - machining for drainage

exterior view



Optional machining for hidden drainage

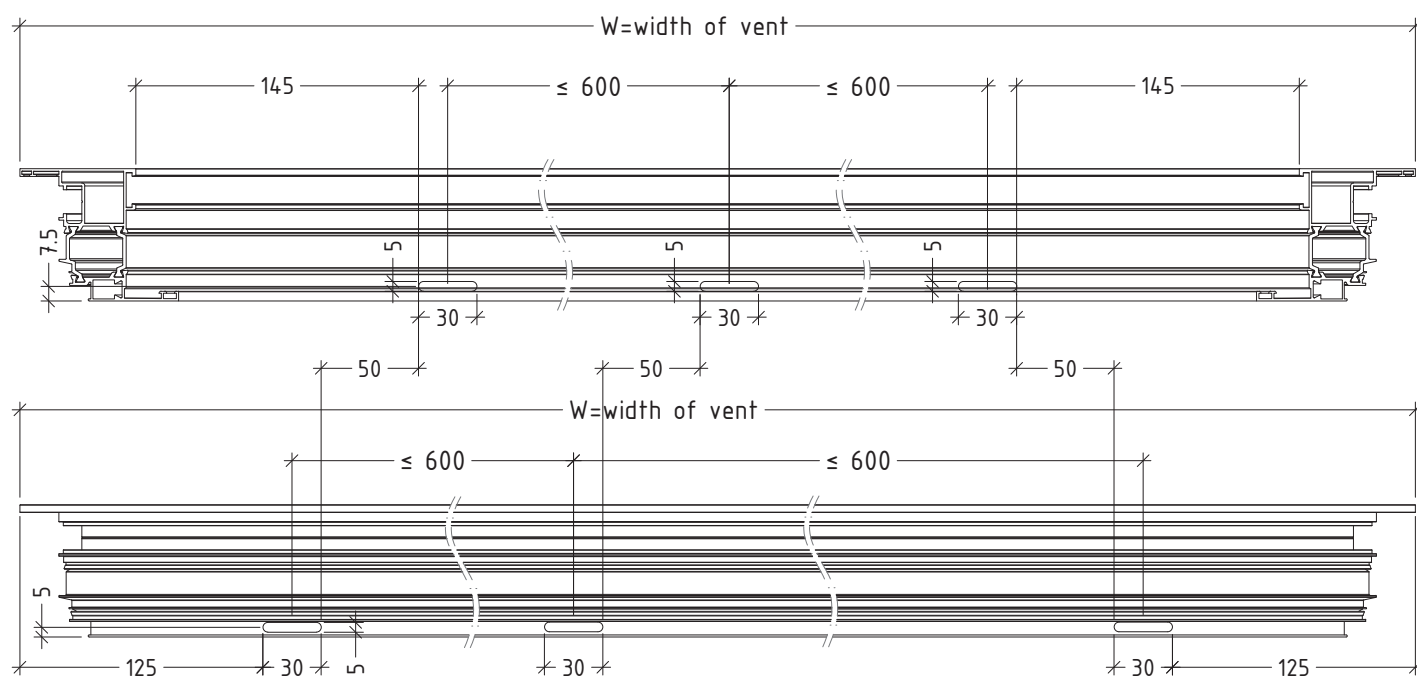
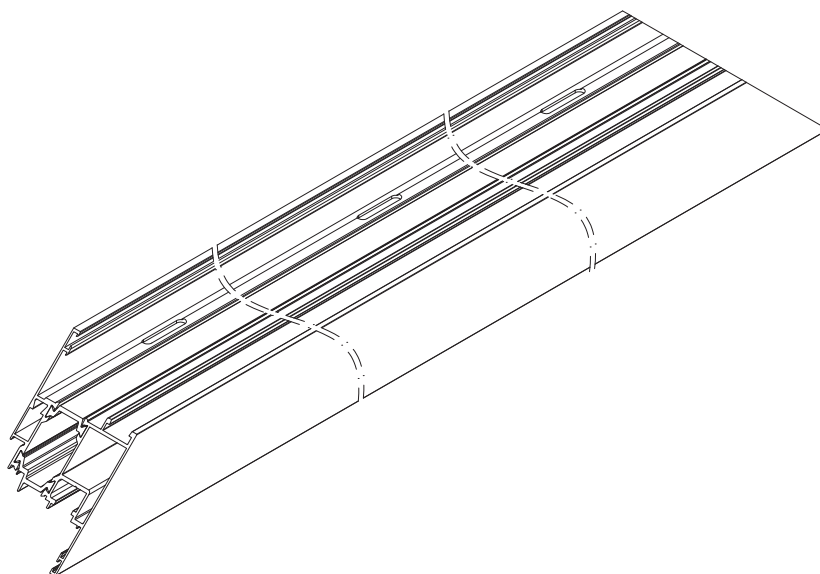
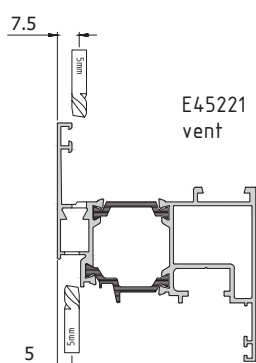
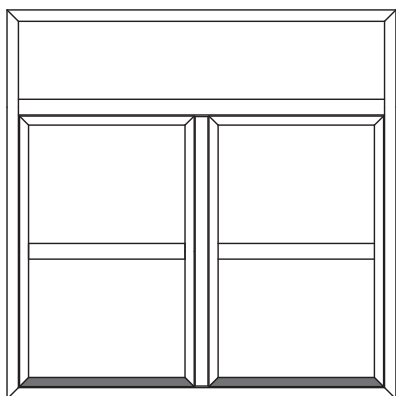


Note:
This machining is valid for all the frame profiles of the system

M45-1a

Additional treatment of profiles after cutting vent E45221 - machining for drainage

exterior view

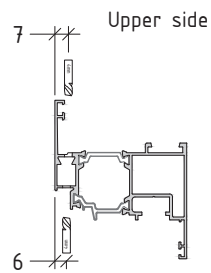
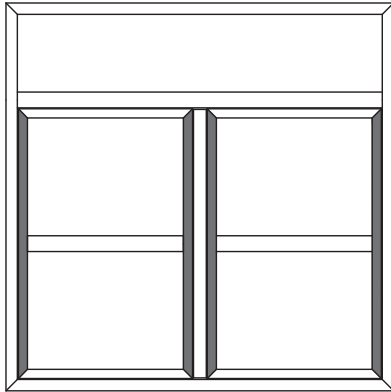


Note:
This machining is valid for all the vent profiles of the system

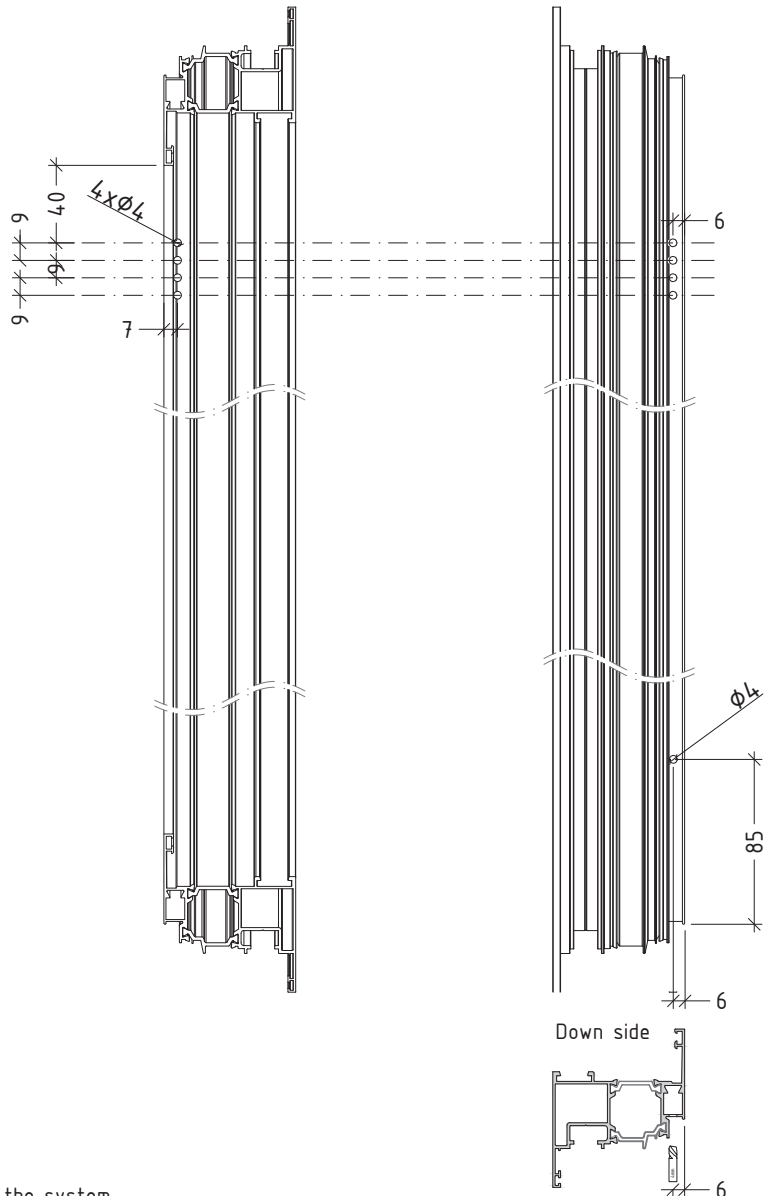
M45-2a

Additional treatment of profiles after cutting vent E45221 - machining for ventilation

exterior view



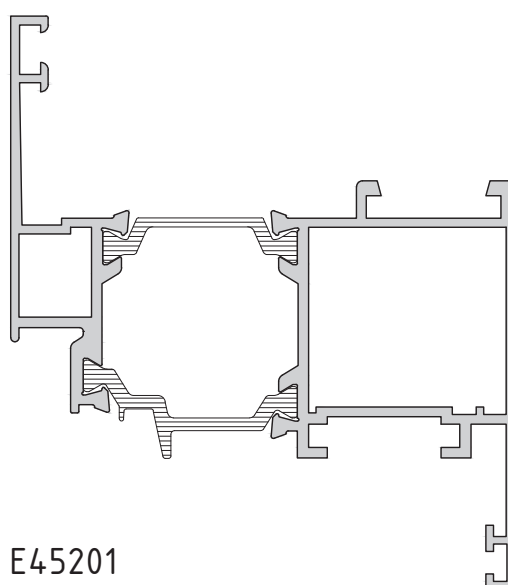
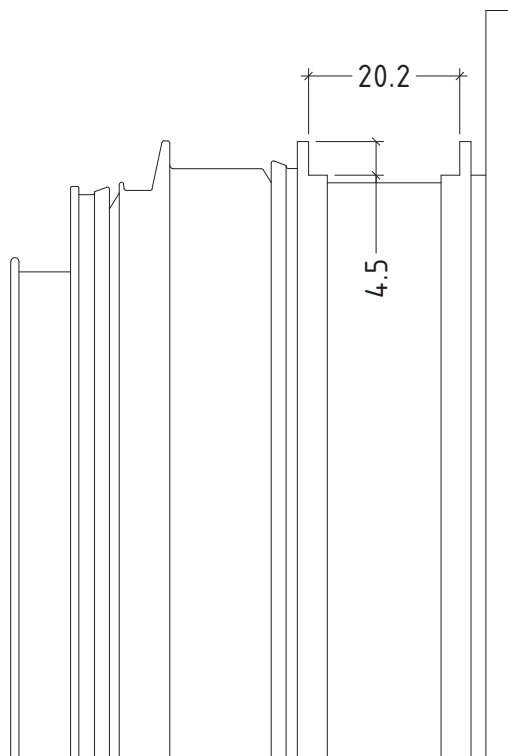
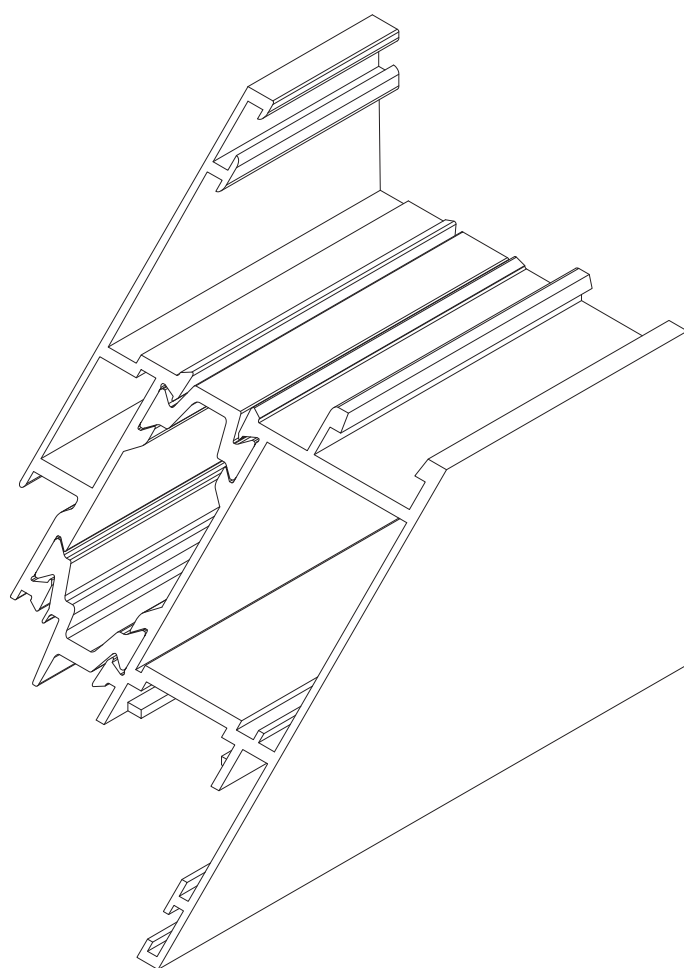
E45221



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

M45-3a

Machining for connecting rod

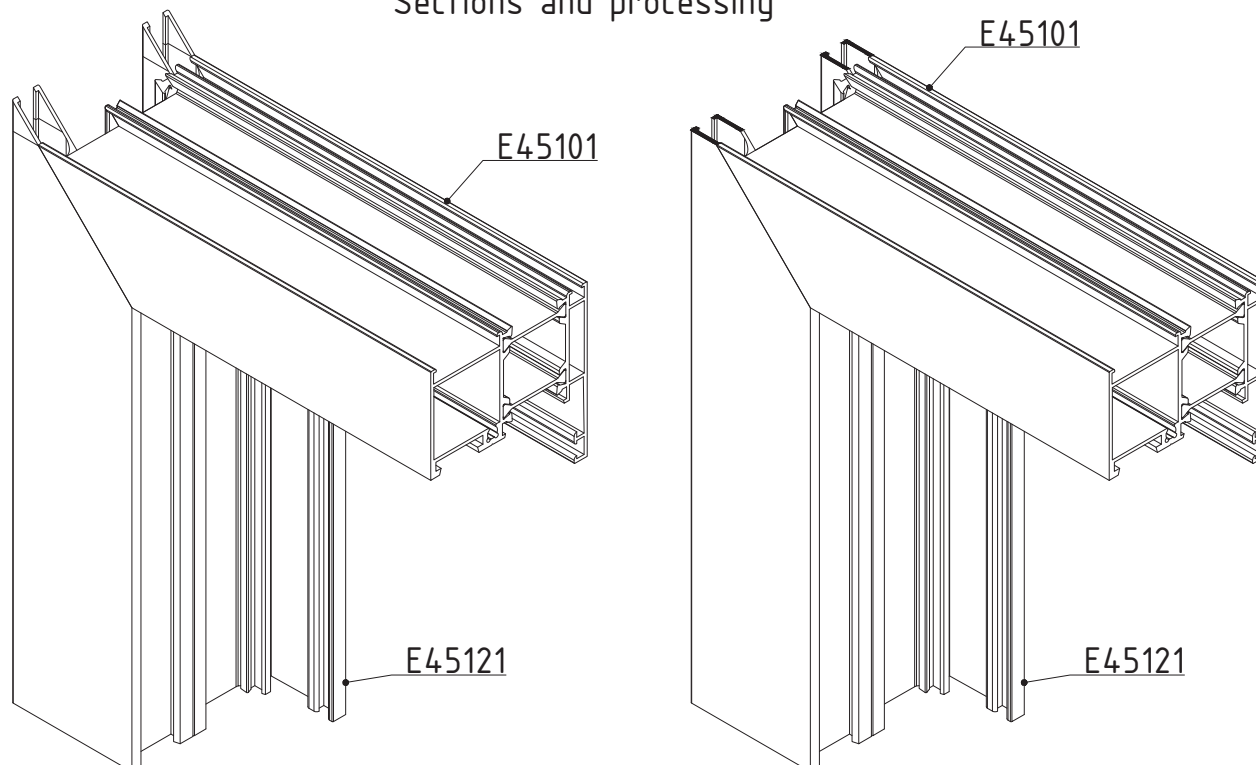


E45201

scale : 1:1

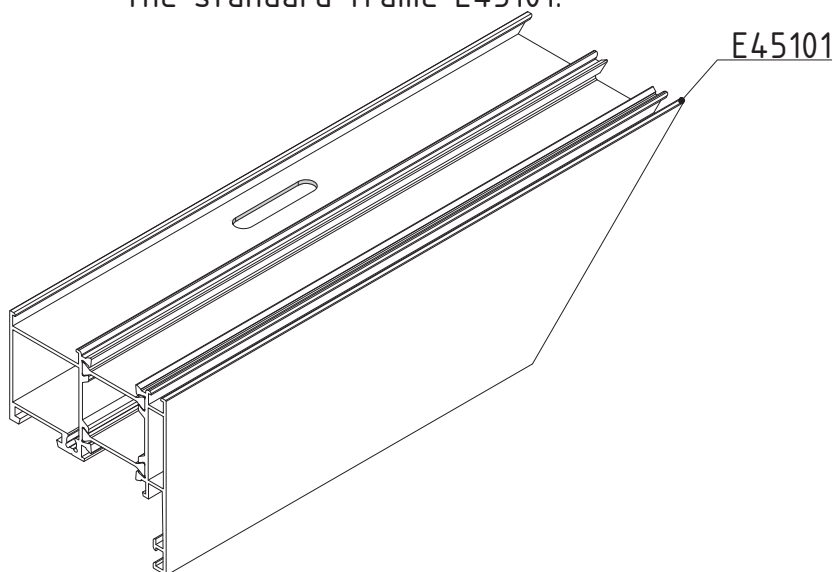
M45-4

Sections and processing



The frame for dilatation gap E45121 is joined with E45101 accordingly, using crimping machine ONLY!

After final assembly, the profile for dilatation gap E45121 is cut in the same plane of the standard frame E45101.

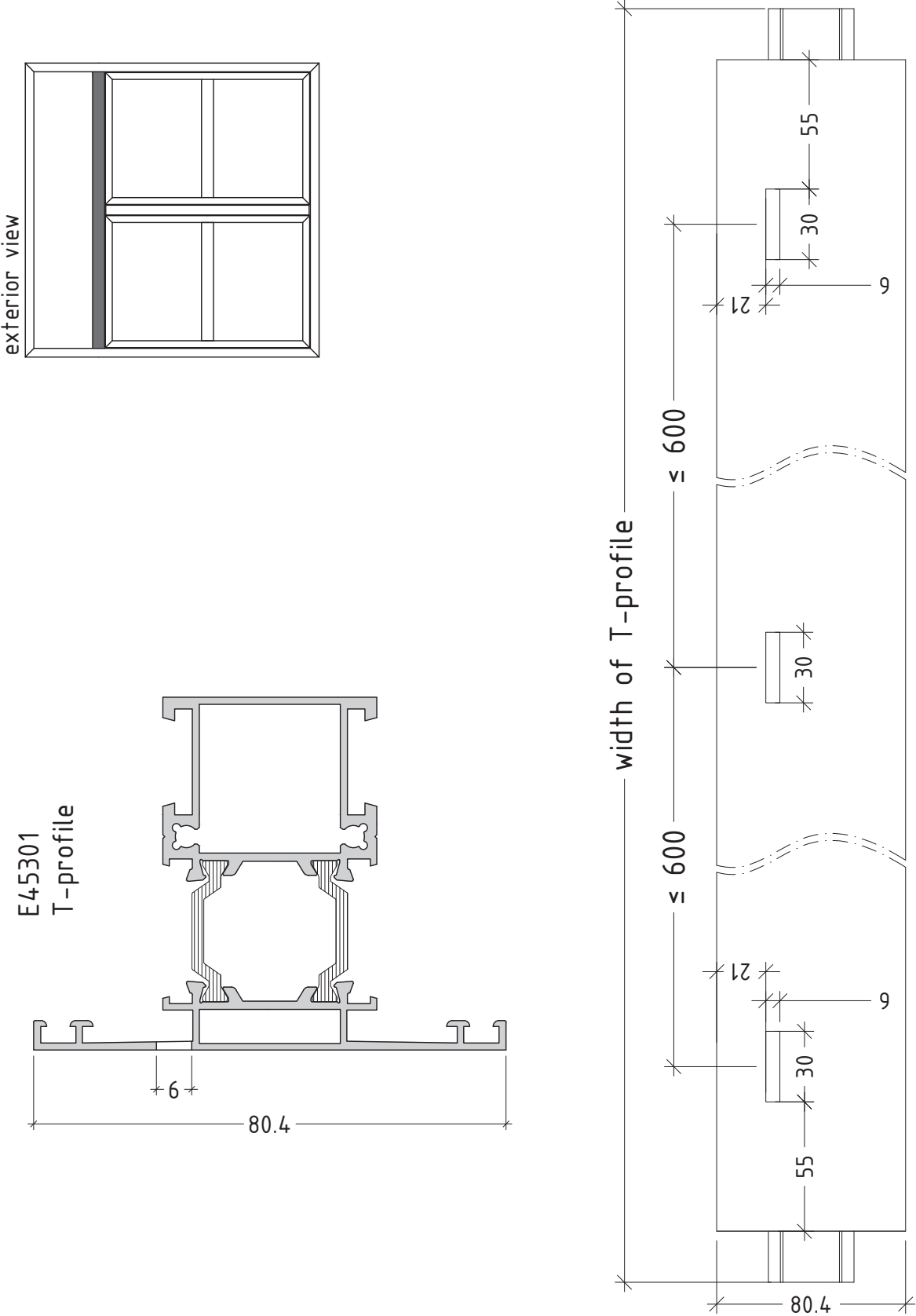


Oval shape of mounting openings are a must and have to be cut in the standard frame E45101, in order to take-in effectively the temperature expansion of the profiles in case of striped windows.

scale :

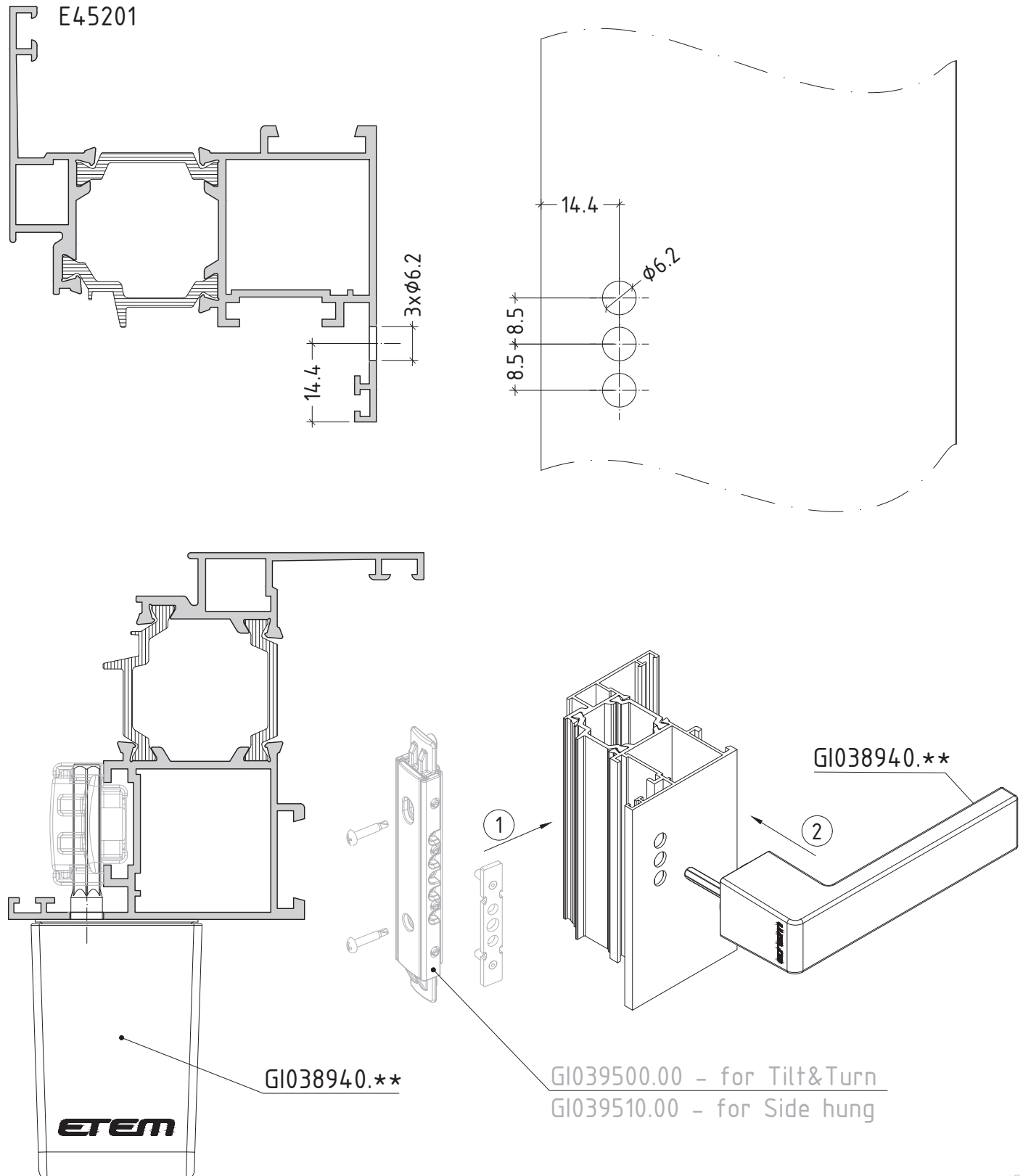
M45-5

Additional treatment of profiles after cutting
T-profile E45301 - machining for drainage

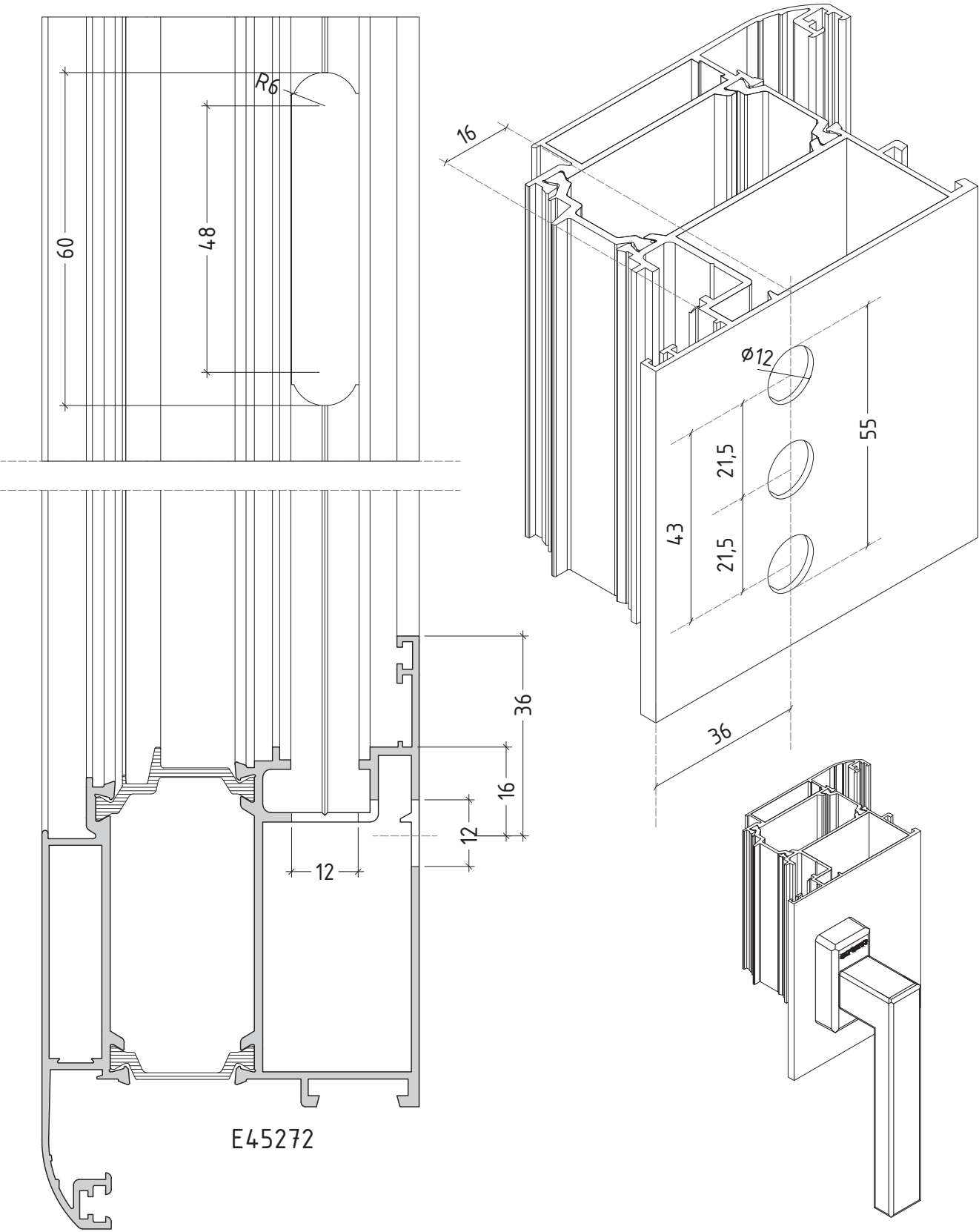


M45-5a

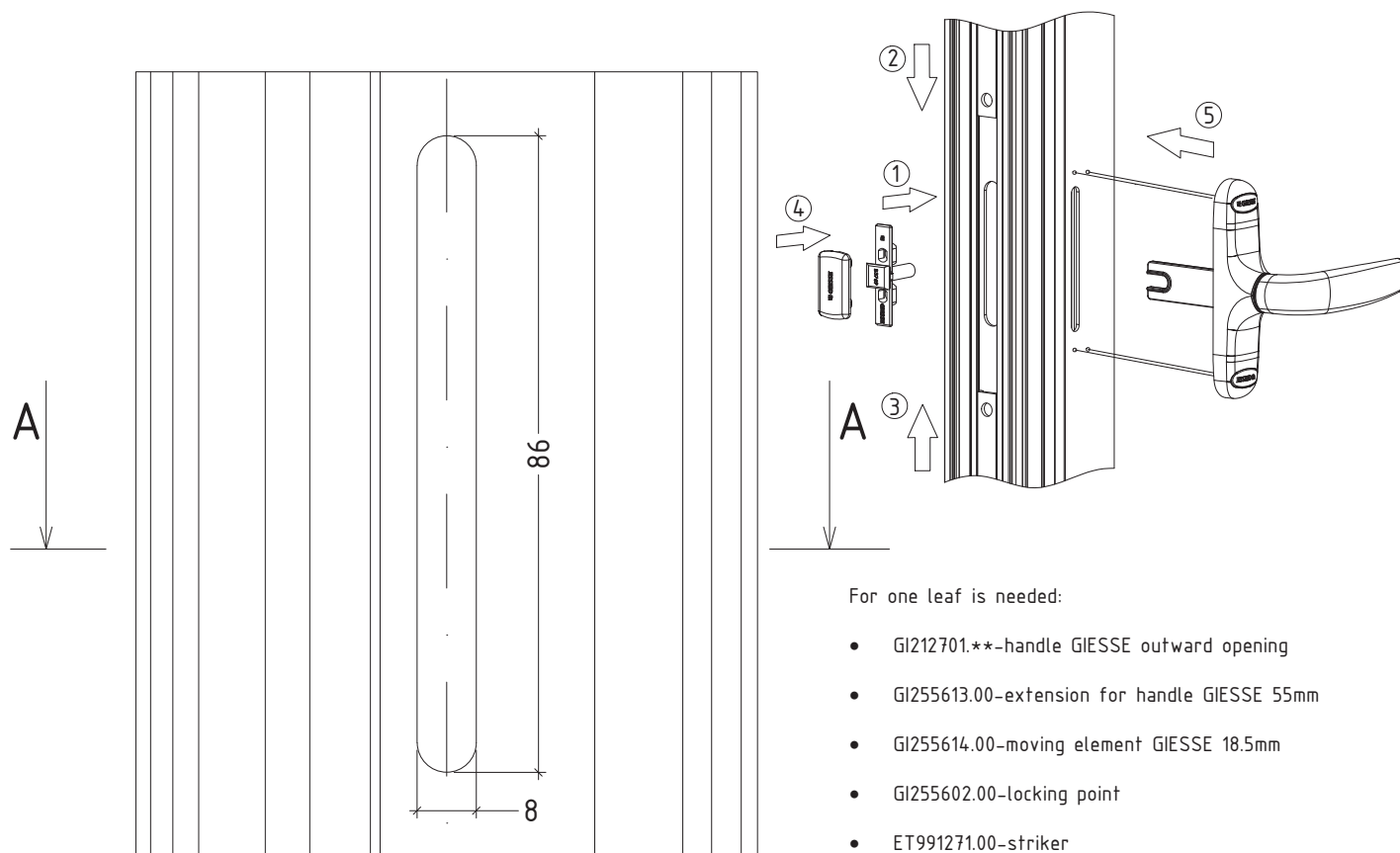
Machining for window handle ETEM



Machining for GU mechanism



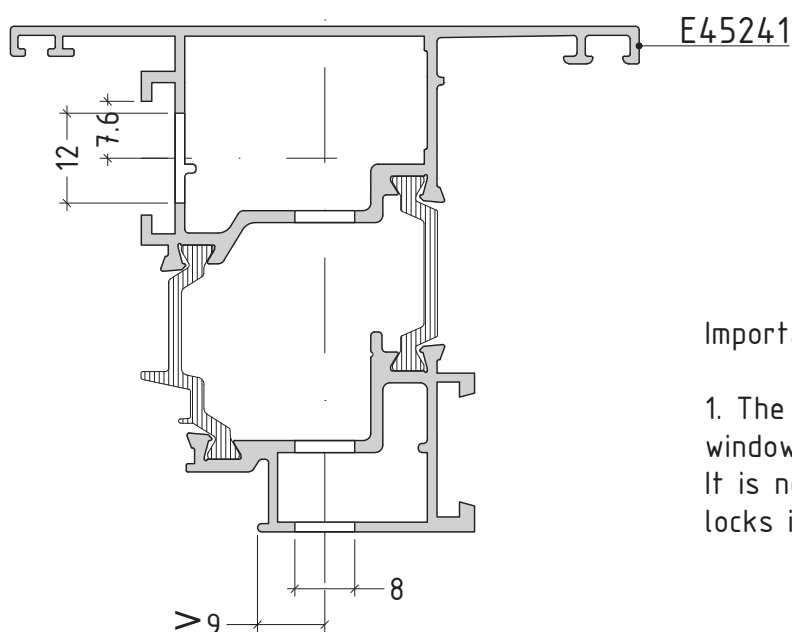
Handle for outward opening GI212701.01 – GI212701.02 – GI212701.06



For one leaf is needed:

- GI212701.**-handle GIESSE outward opening
- GI255613.00-extension for handle GIESSE 55mm
- GI255614.00-moving element GIESSE 18.5mm
- GI255602.00-locking point
- ET991271.00-striker

A - A

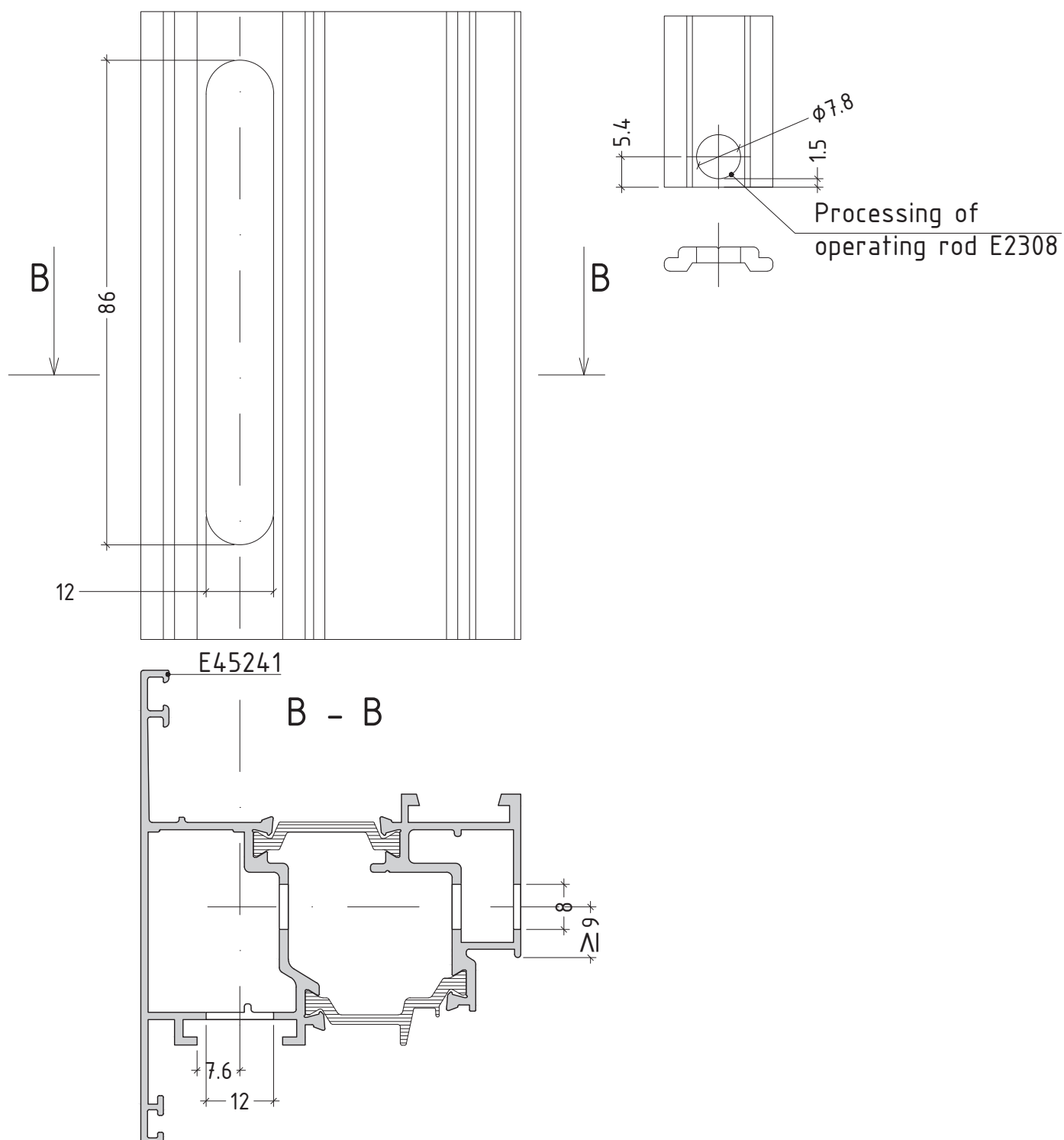


Important information:

1. The vent E45241 allows execution of windows and door-height windows only. It is not possible to incorporate door locks in it.

scale : 1:1

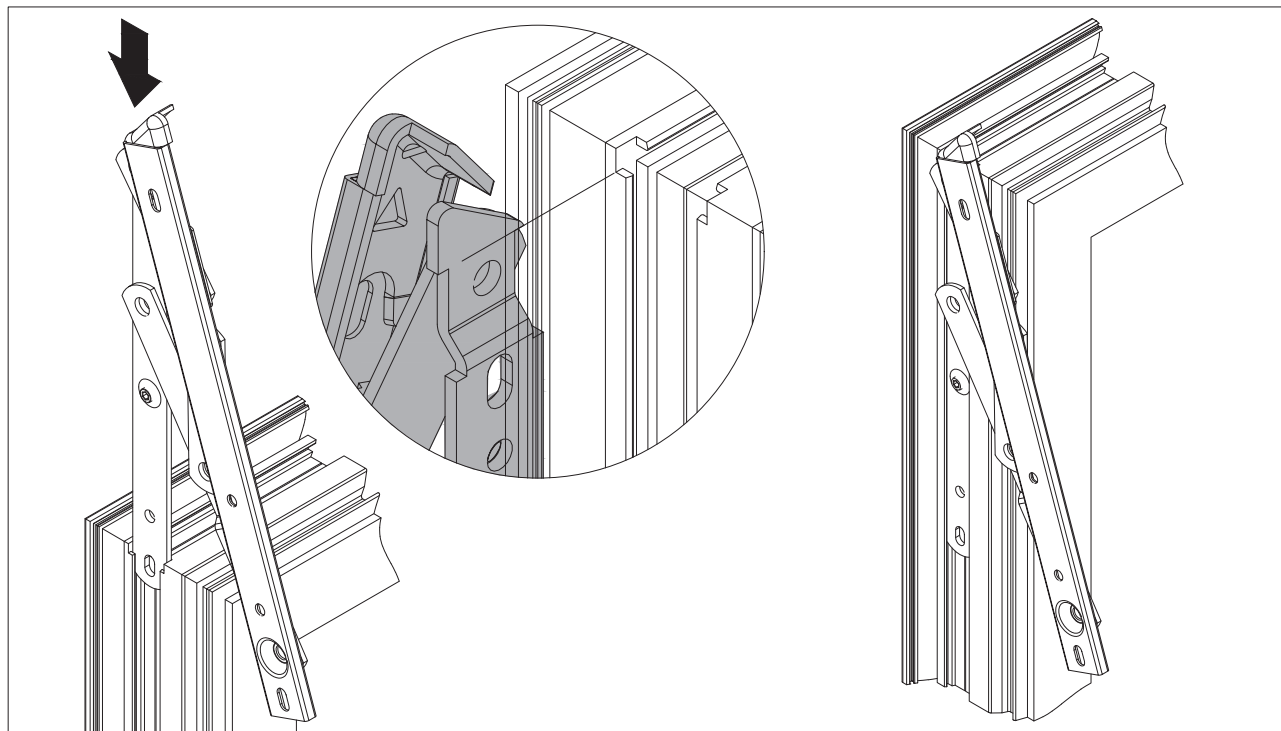
Handle for outward opening GI212701.01 – GI212701.02 – GI212701.06



scale : 1:1

M45-9

Arms for outward opening E45



ARMS FOR E45

Code	Description	Scissors Size (mm)	Opening System	Max height Vent (mm)	Max width Vent (mm)	Max opening angle	Max.Vent. Weight (kg)
GI083090.00	ARM GS HD HUNG 10"	259	TOP	600	1500	50°	25
GI083490.00	ARM GS HD-TS 10"	259	TOP	650	1500	50°	50
			SIDE	1500	660	50° - 84°	35
GI083500.00	ARM GS HD-TS 16"	412	TOP	800	1500	30°	100
						50°	55
			SIDE	1600	760	30° - 50° - 90°	42
				1600	700	30°	60
GI083510.00	ARM GS HD-TS 22"	567	TOP	1500(*)	1700	20°	100
						45°(*)	80
GI083520.00	ARM GS HD-TS 28"	711	TOP	2000	1700	15°	100

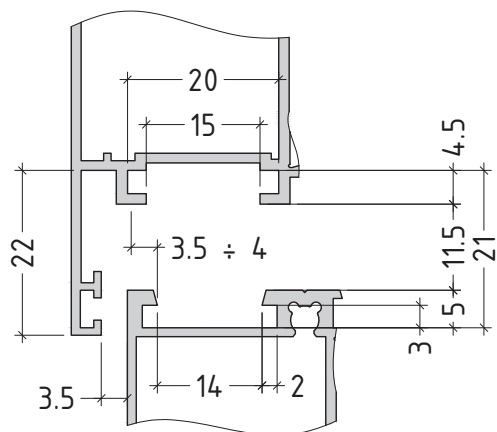
(*)

Height (mm)	≤ 1000 ; Max 45°
	> 1000 ; Max 30°

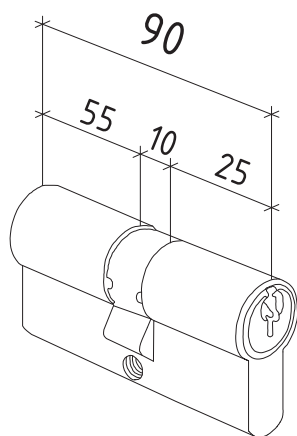
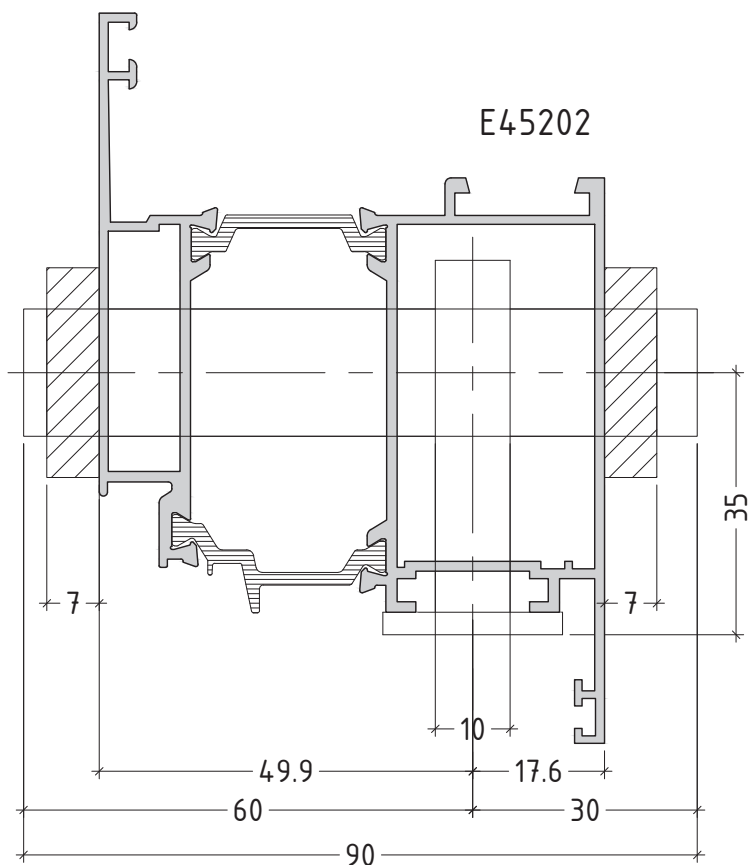
scale : --

M45-10

Machining for cylinder



Note:
Hardware used for E 45 is intended
for Eurogroove with the noted
parameters

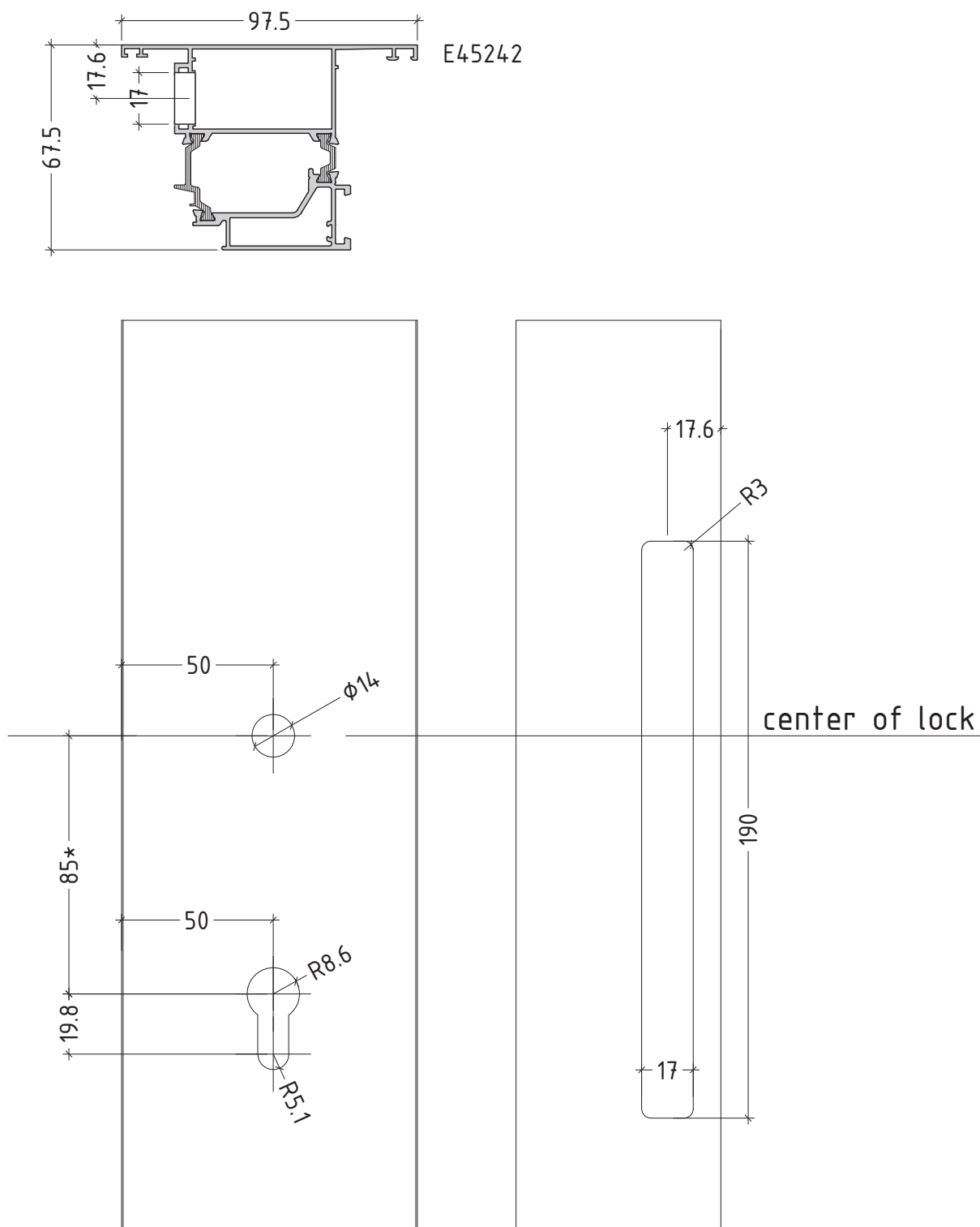


Note:
The length L of the cylinder
depends on the chosen type of
decorative rosettes

scale : 1:1

M45-11

Machining for lock - 35mm



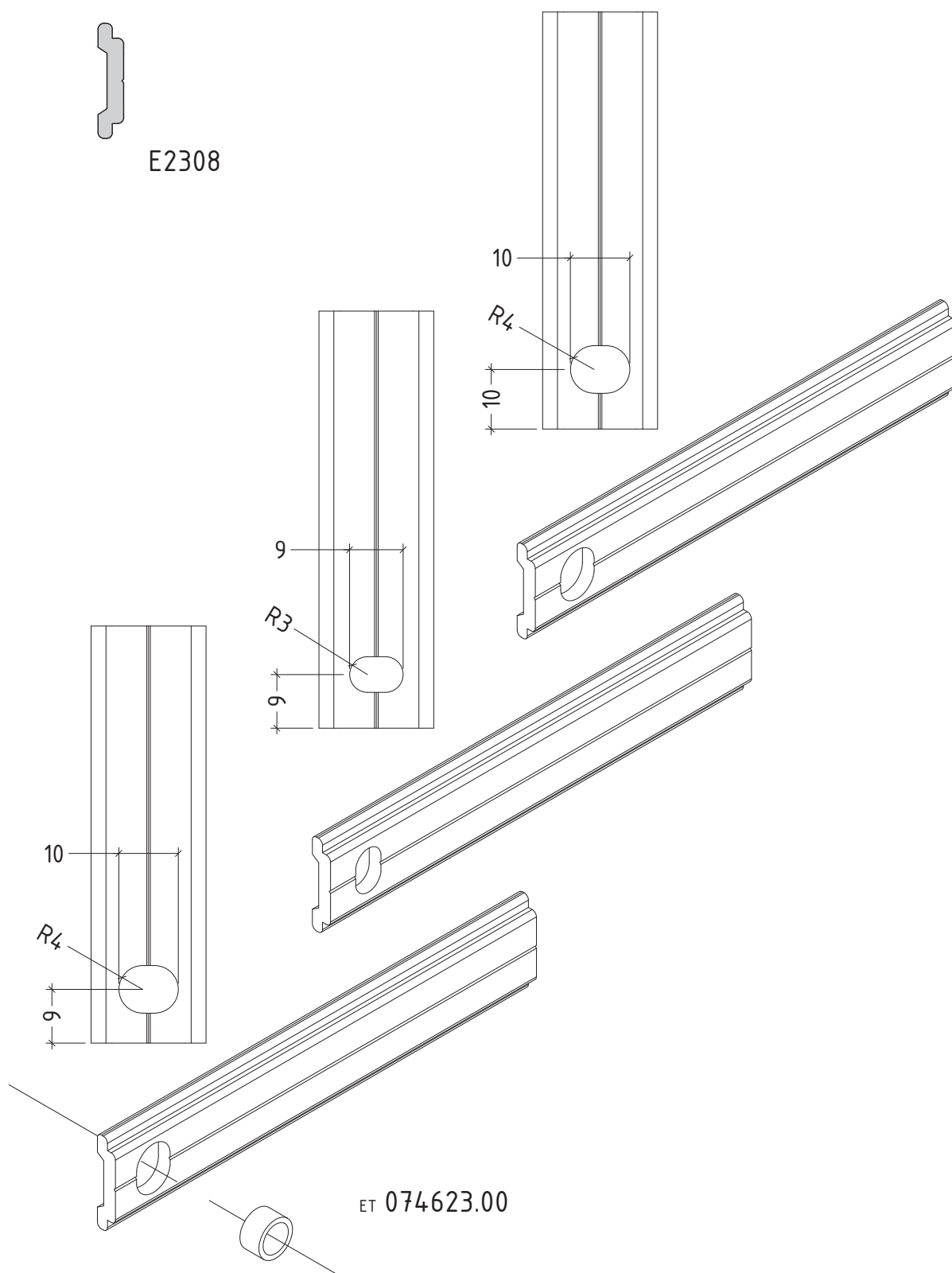
Remark:

*) Depending the lock, distance is 85mm or 92mm.

scale : 1:1

M45-12

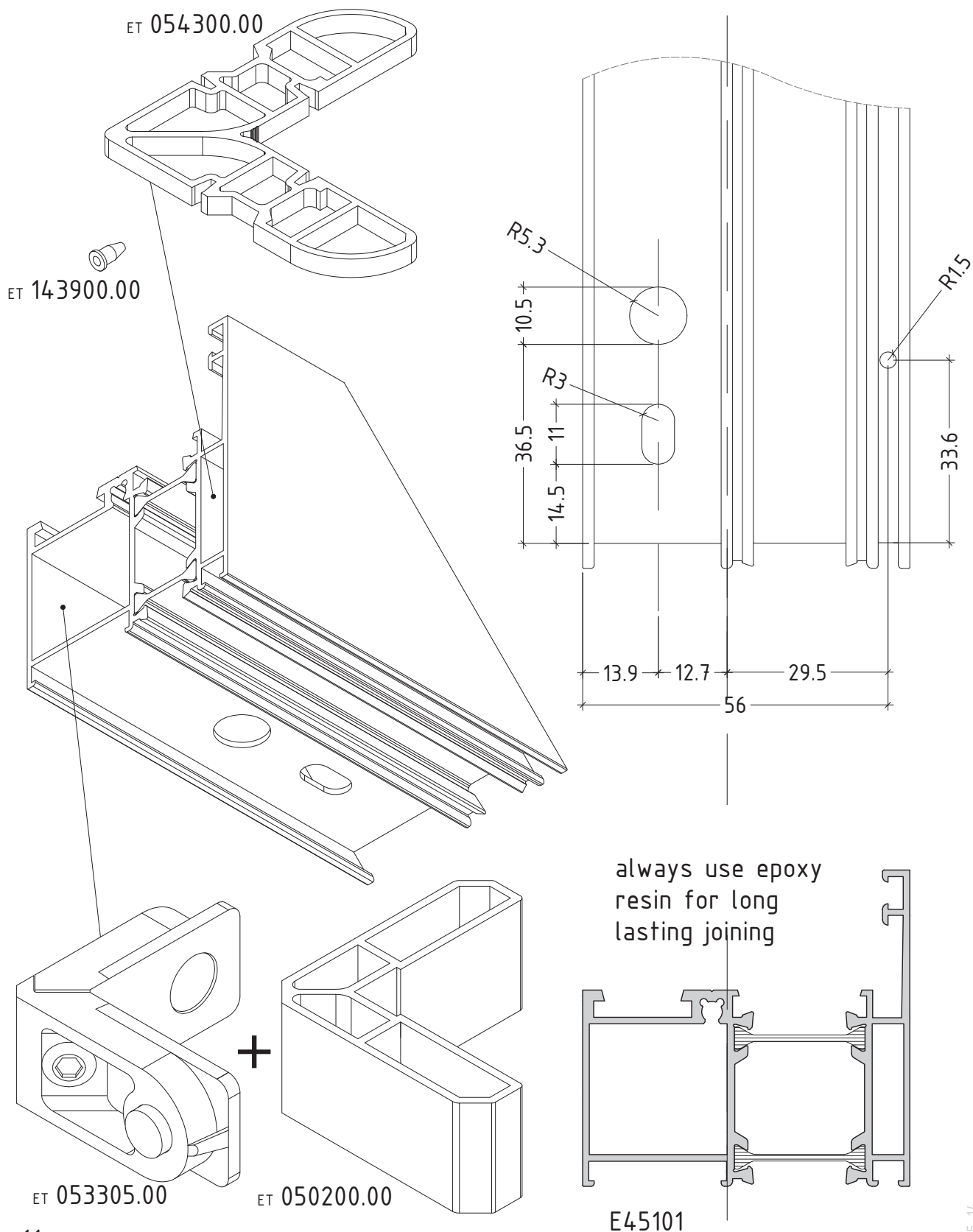
Machining for connecting rod



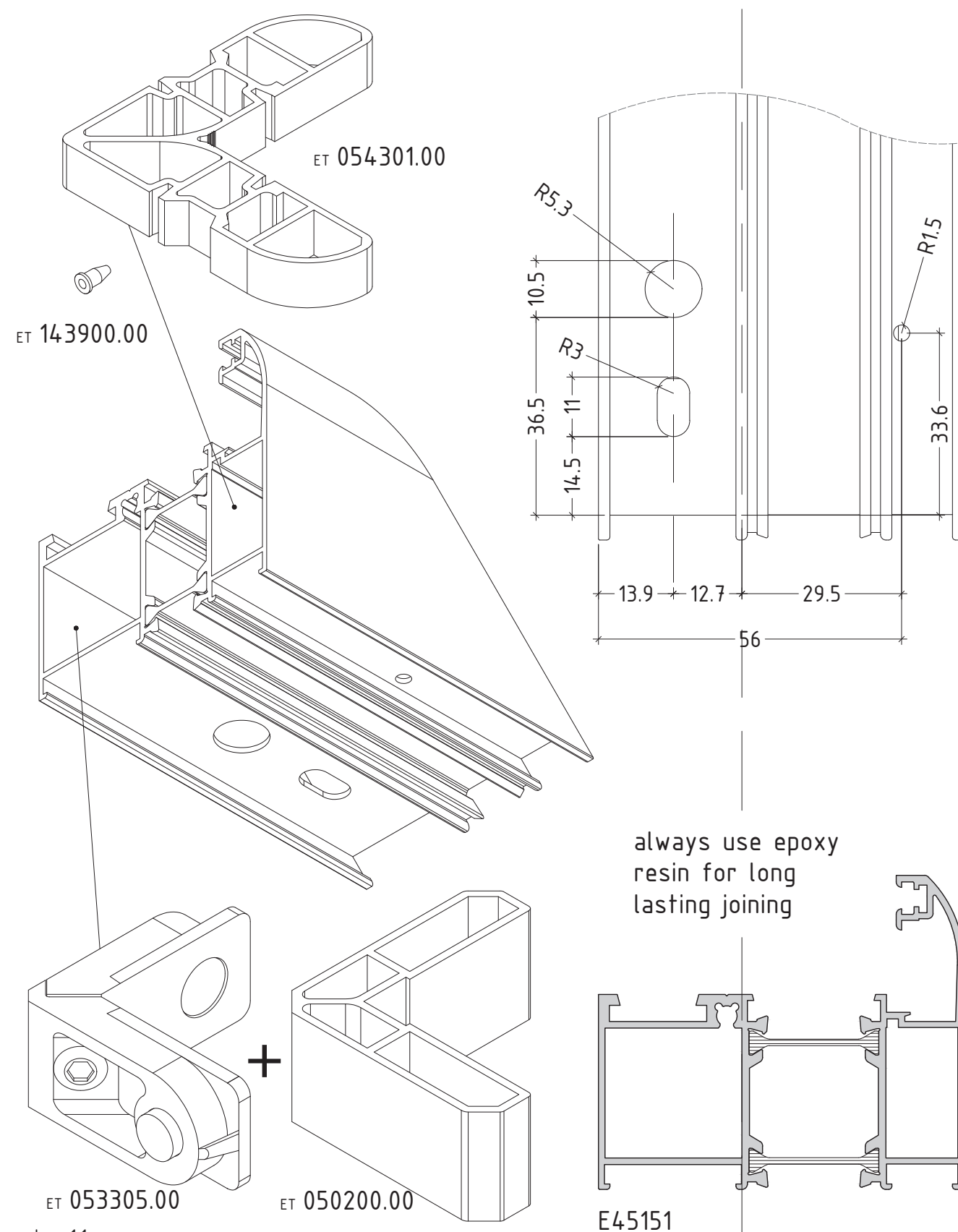
scale : 1:1

M45-13

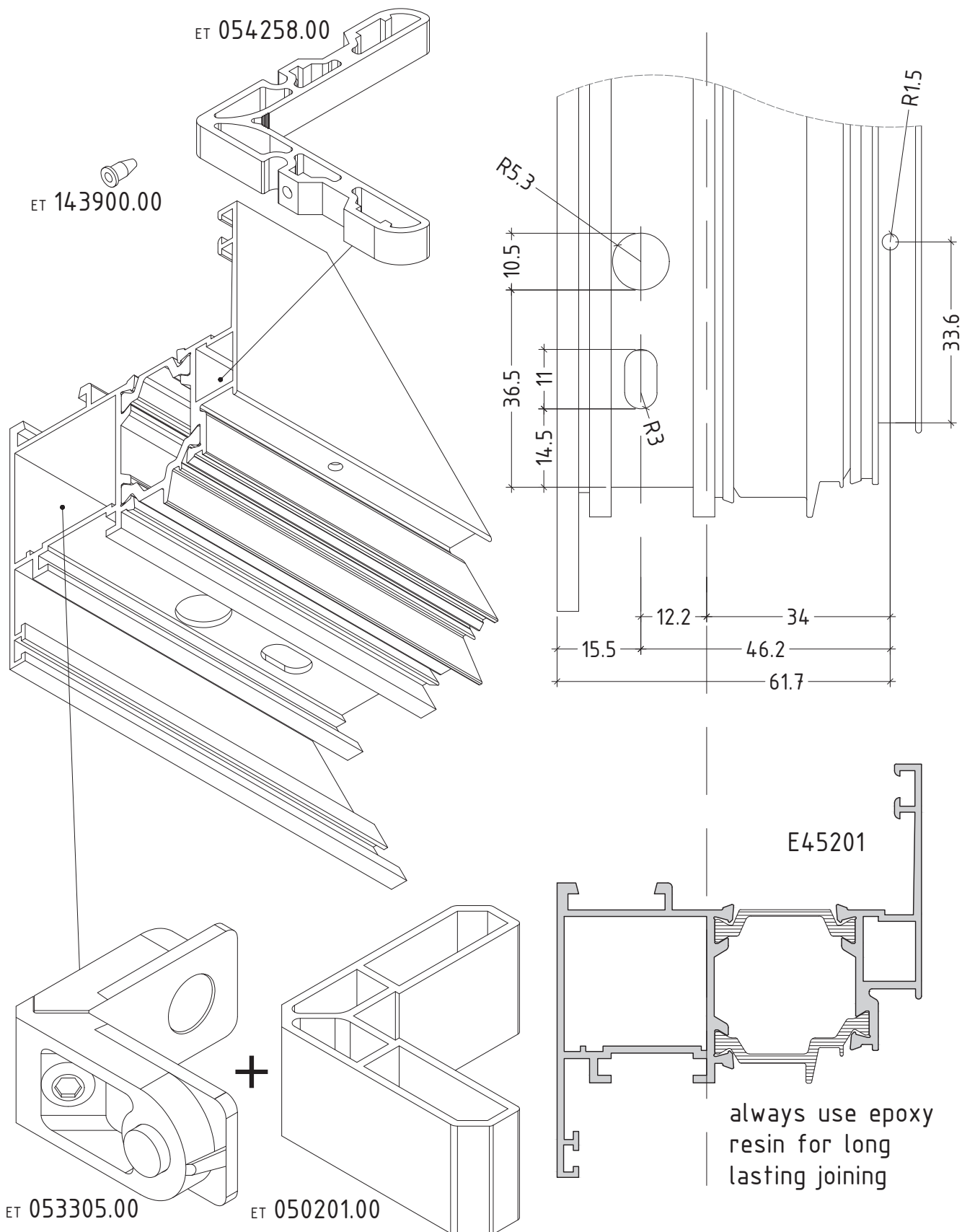
Machining to use die cast joints and al. joint corner bracket



Machining to use die cast joints and al. joint corner bracket



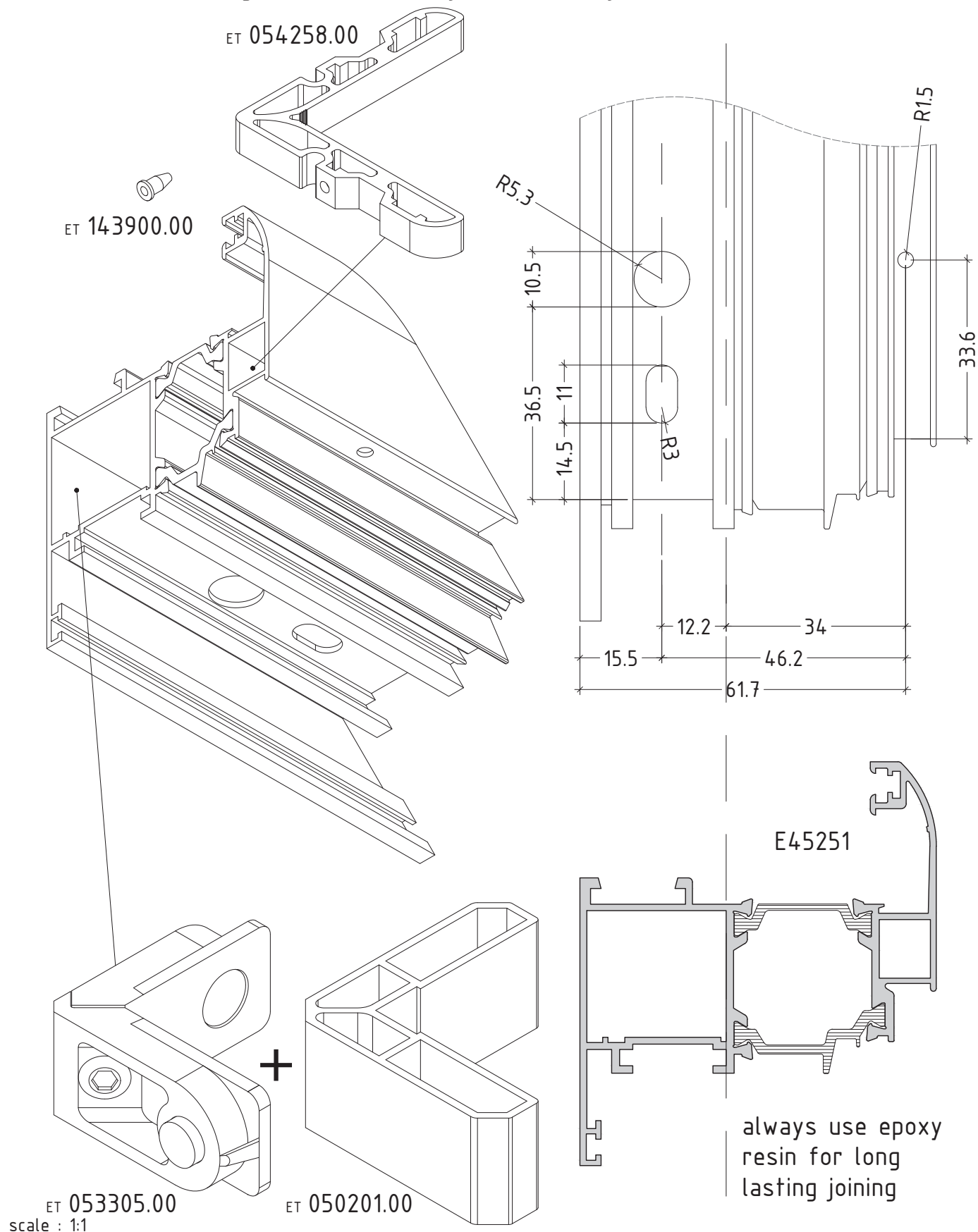
Machining to use die cast joints and al. joint corner bracket



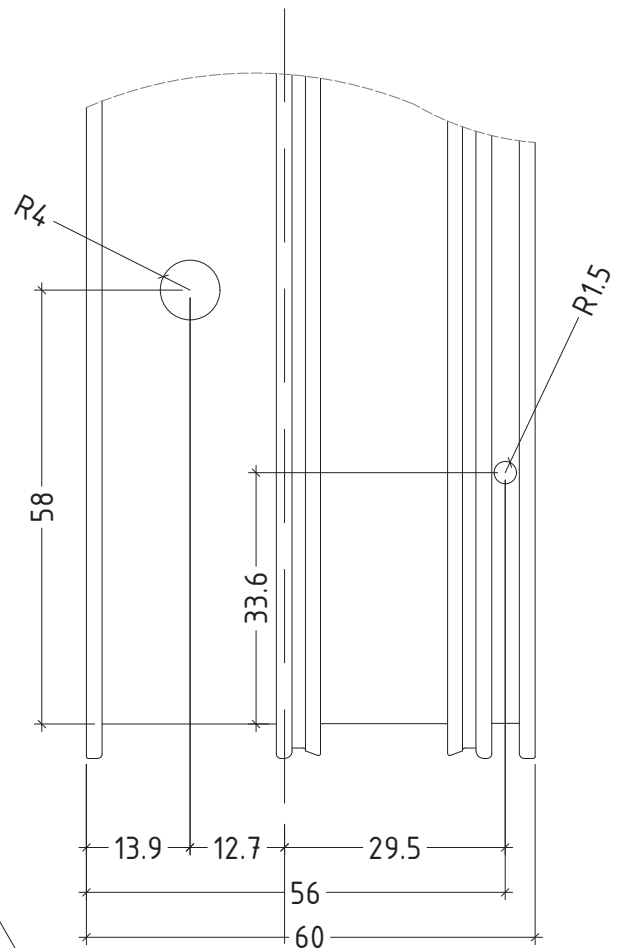
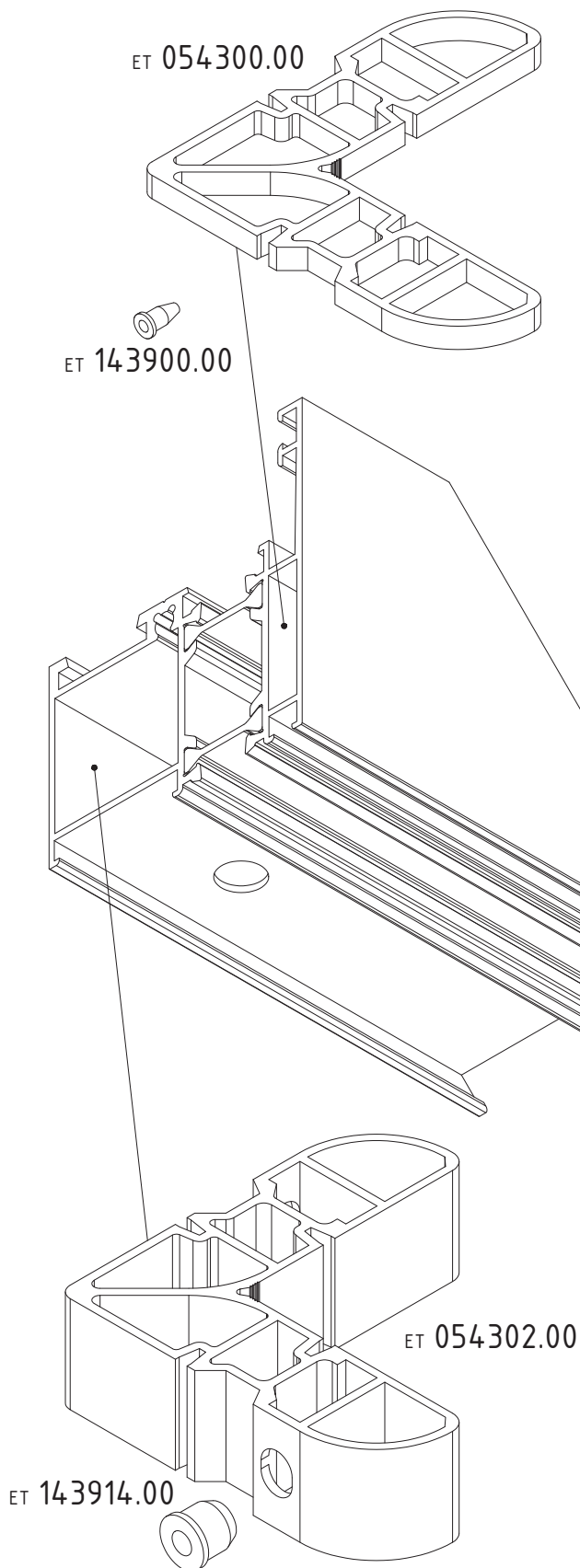
scale : 1:1

M45-16

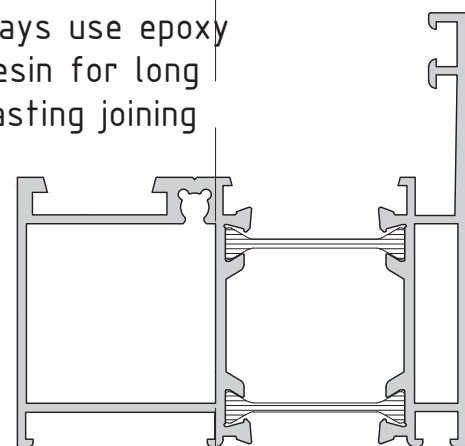
Machining to use die cast joints and al. joint corner bracket



Machining to use roll pins extruded aluminum joint corner brackets



always use epoxy resin for long lasting joining

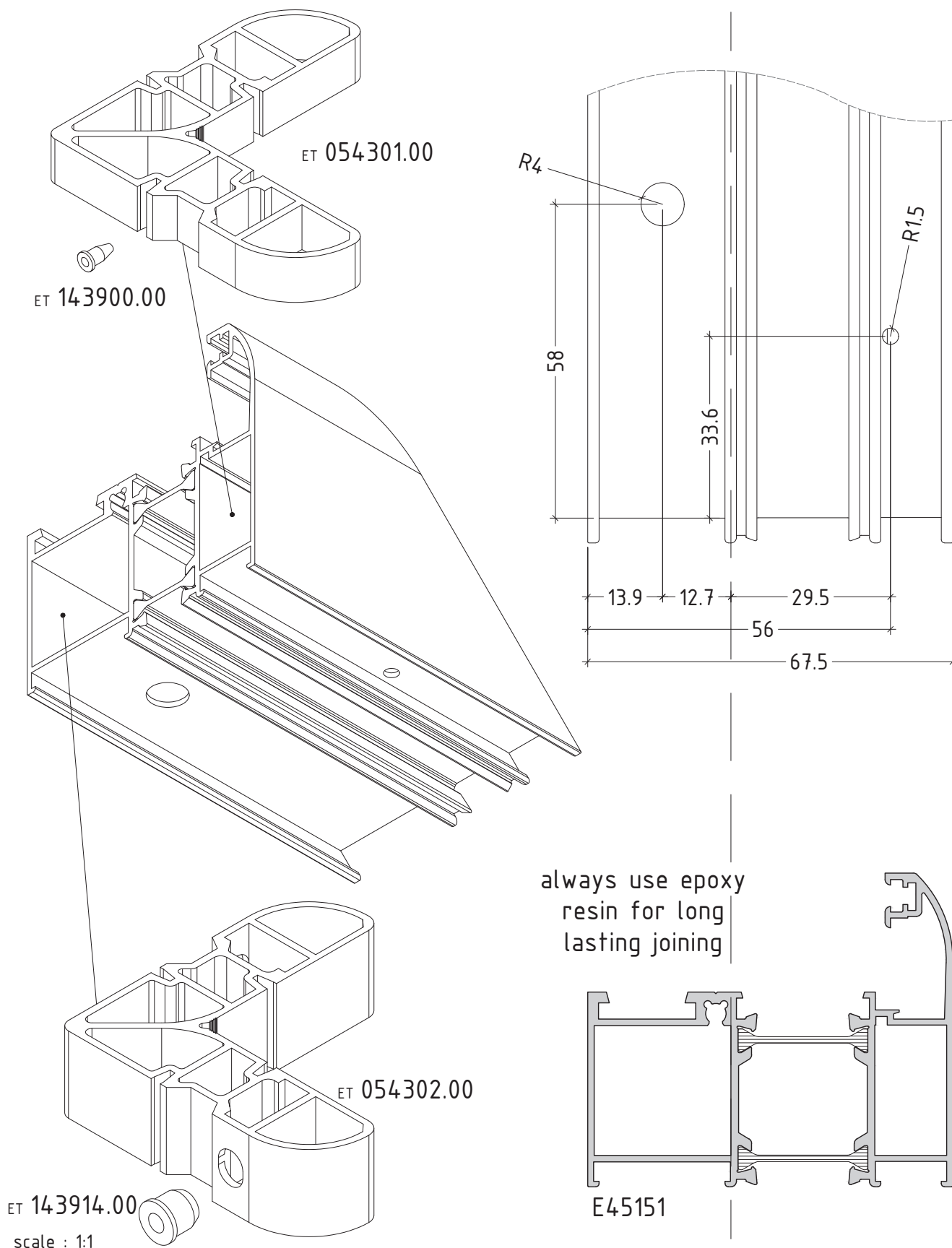


E45101

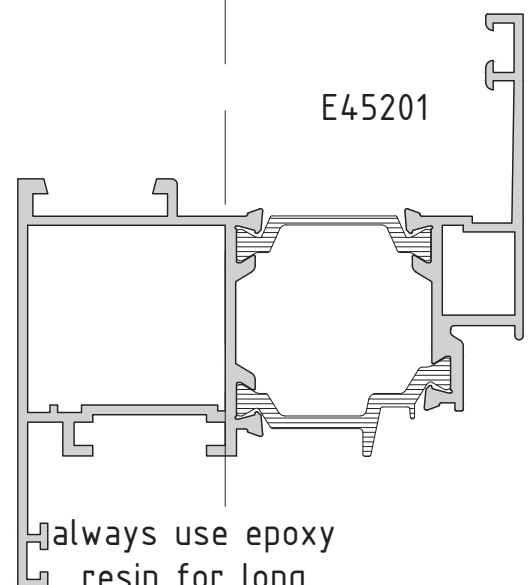
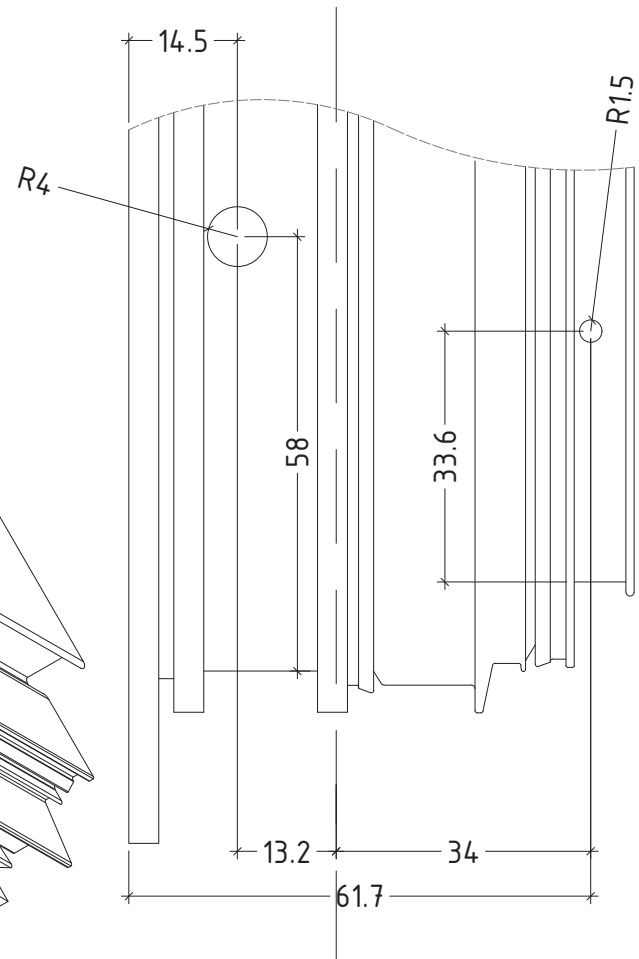
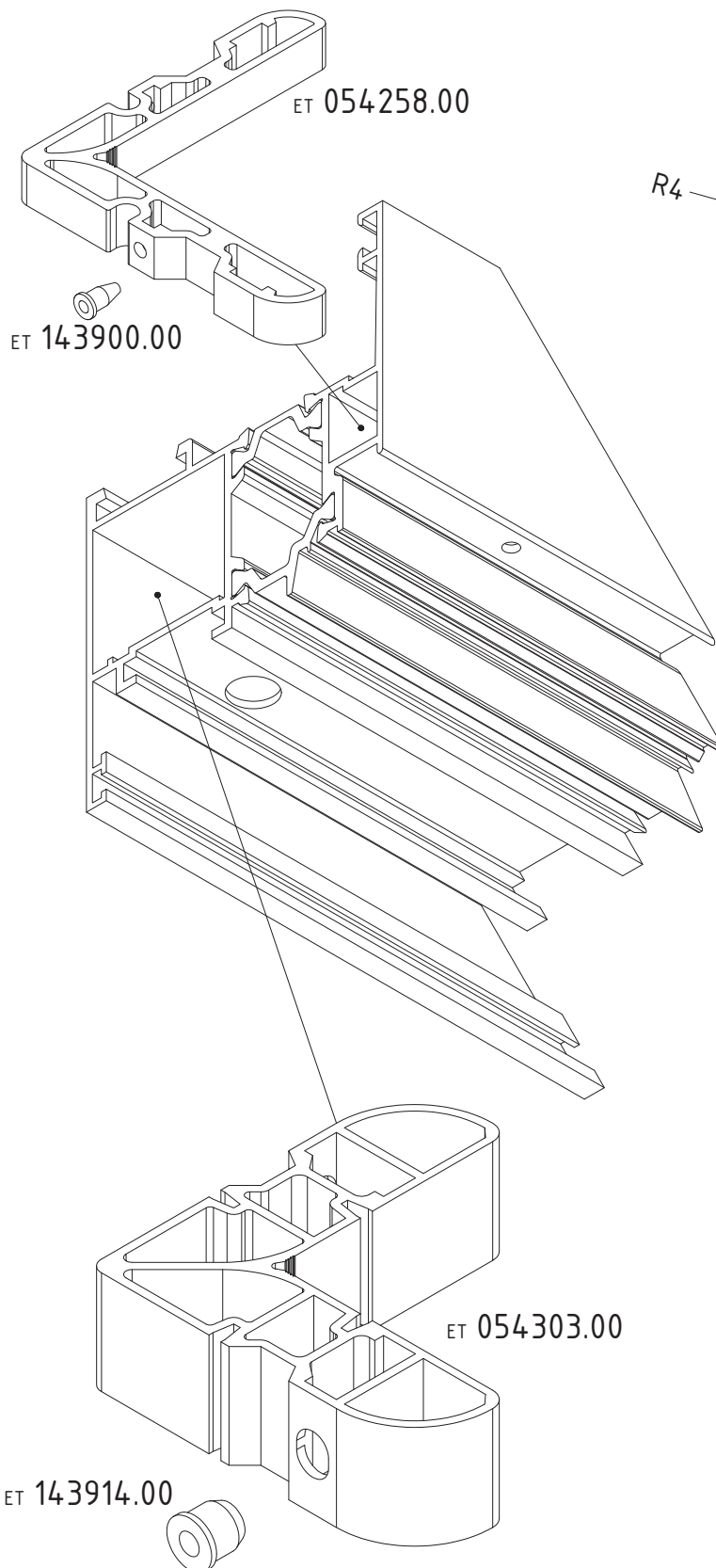
scale : 1:1

M45-18

Machining to use roll pins extruded aluminum joint corner brackets



Machining to use roll pins extruded aluminum joint corner brackets

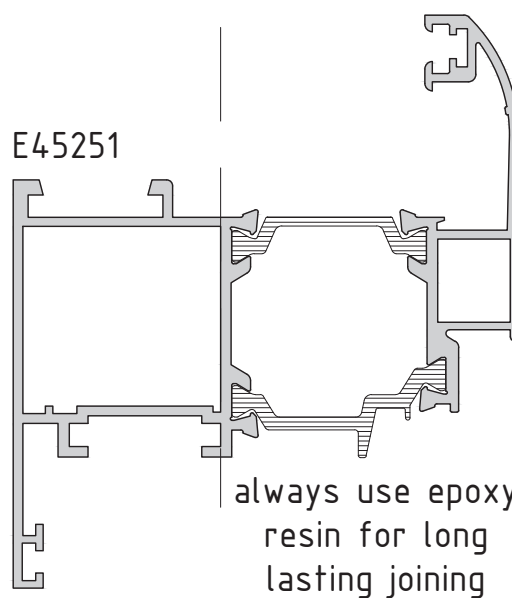
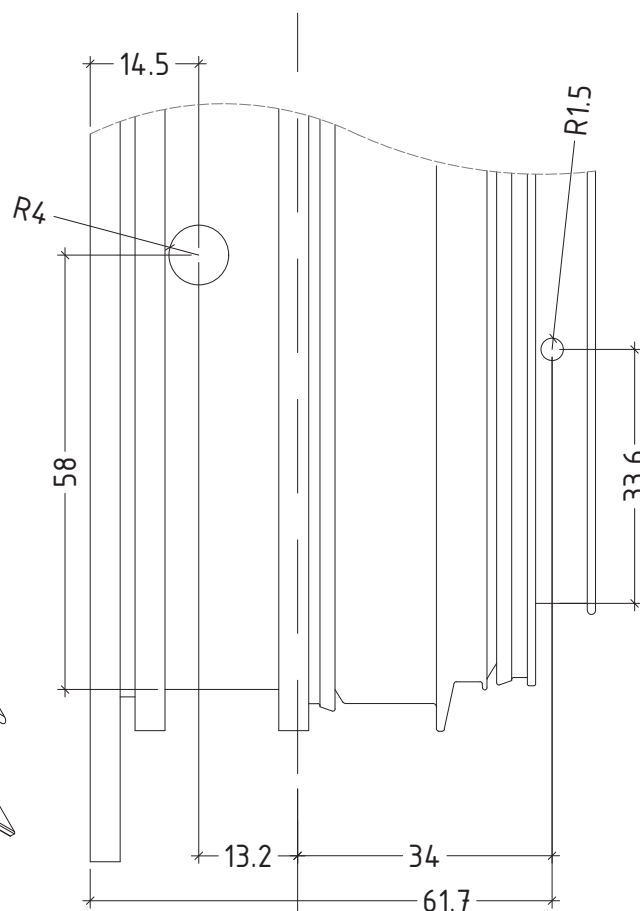
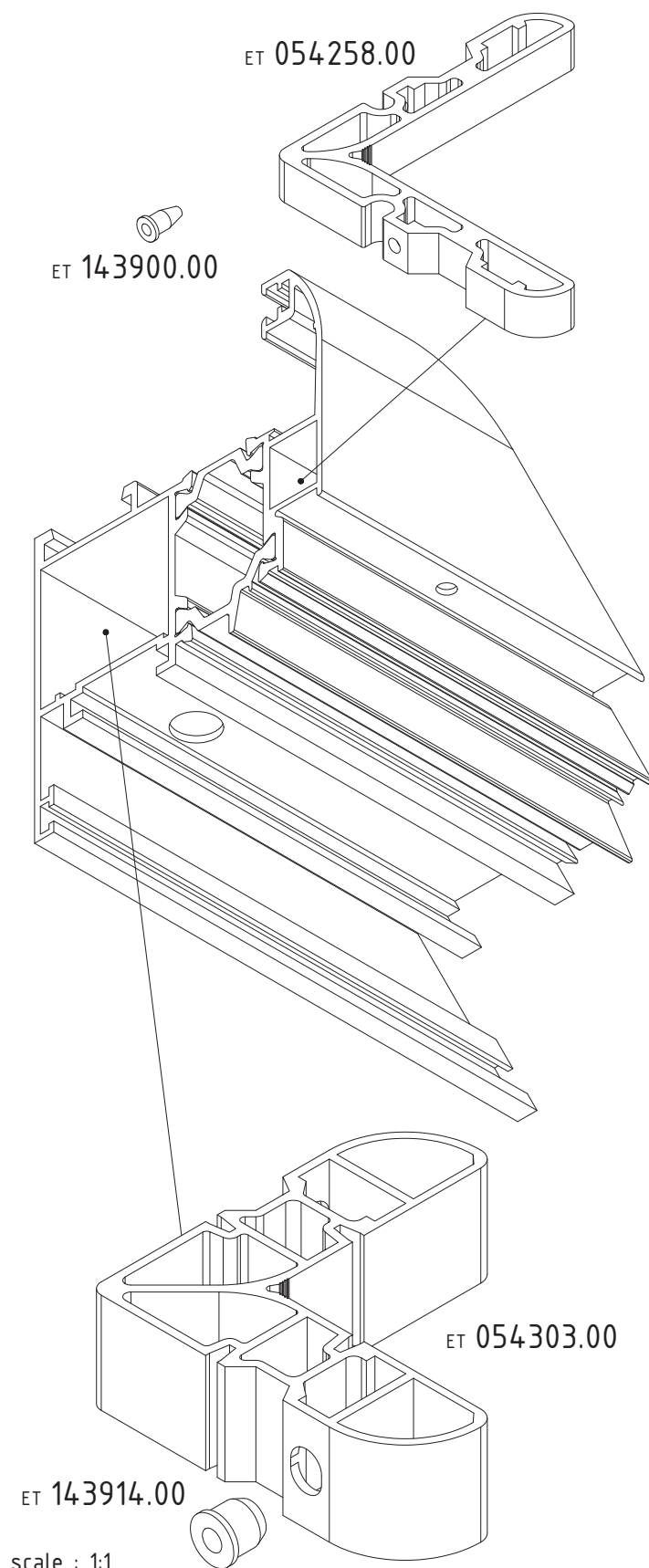


always use epoxy resin for long lasting joining

scale : 1:1

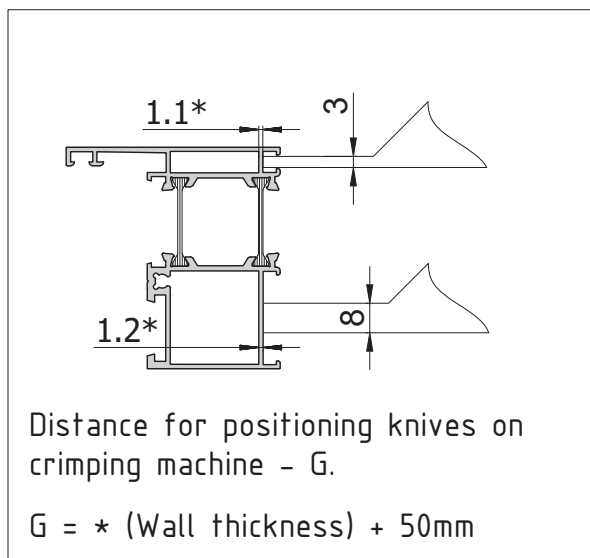
M45-20

Machining to use roll pins extruded aluminum joint corner brackets

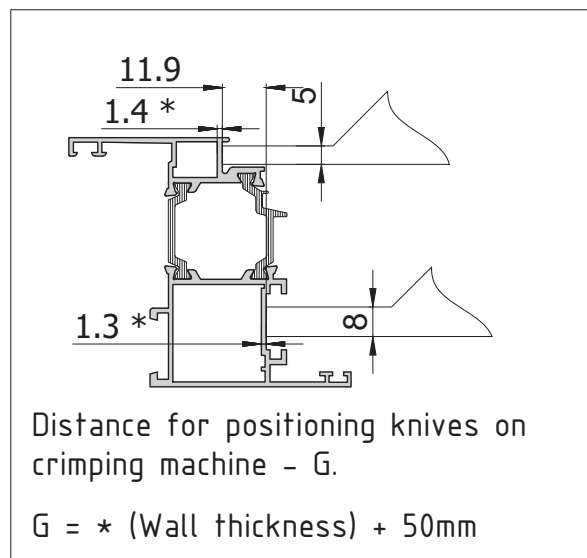


Crimping scheme

E45101-vent

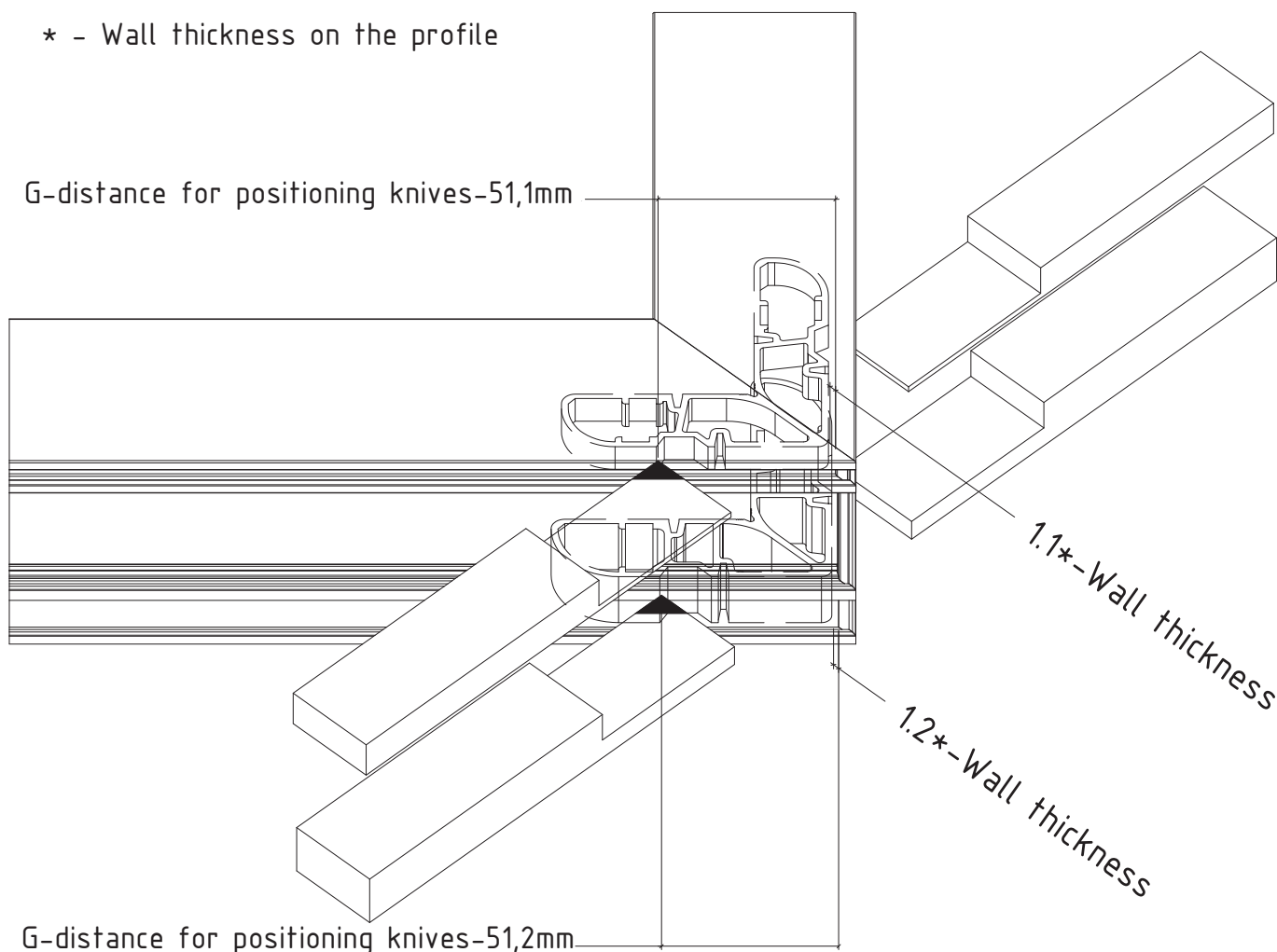


E45201-vent



* - Wall thickness on the profile

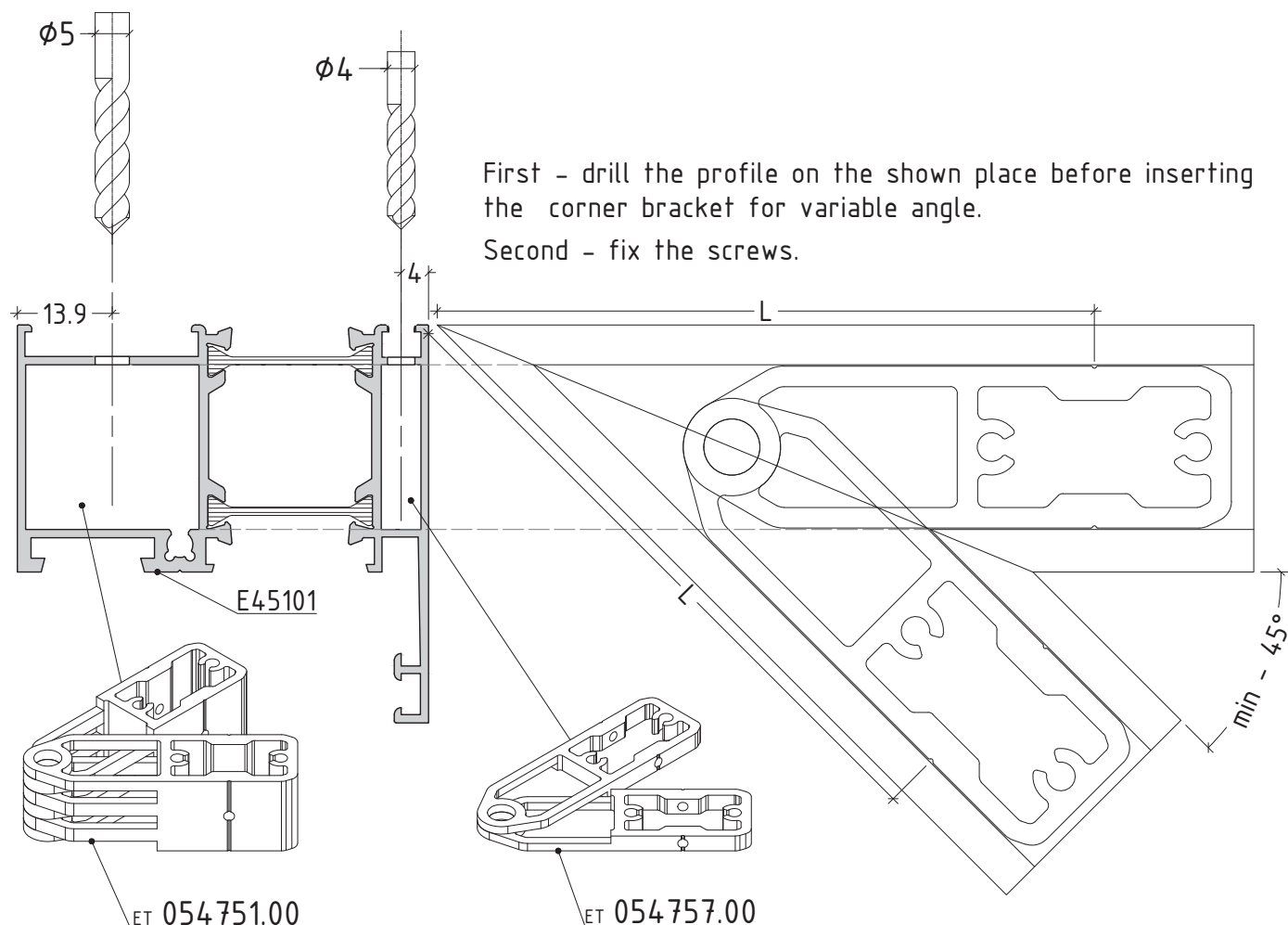
G-distance for positioning knives-51,1mm



scale : 1:1

M45-22

Corner bracket for variable angle for frame E45101



for profiles:									
E 45101									
α (°)	L (mm)	α (°)	L (mm)	α (°)	L (mm)	α (°)	L (mm)	α (°)	L (mm)
45	95,9	74	76,5	103	67,1	132	60,8	161	55,9
46	94,8	75	76,1	104	66,8	133	60,6	162	55,7
47	93,8	76	75,7	105	66,6	134	60,5	163	55,6
48	92,9	77	75,3	106	66,3	135	60,3	164	55,4
49	92,0	78	74,9	107	66,1	136	60,1	165	55,2
50	91,1	79	74,5	108	65,8	137	59,9	166	55,1
51	90,2	80	74,1	109	65,6	138	59,7	167	54,9
52	89,4	81	73,7	110	65,4	139	59,6	168	54,8
53	88,6	82	73,4	111	65,1	140	59,4	169	54,6
54	87,8	83	73,0	112	64,9	141	59,2	170	54,5
55	87,1	84	72,7	113	64,7	142	59,0	171	54,3
56	86,4	85	72,3	114	64,5	143	58,9	172	54,1
57	85,7	86	72,0	115	64,2	144	58,7	173	54,0
58	85,0	87	71,7	116	64,0	145	58,5	174	53,8
59	84,4	88	71,3	117	63,8	146	58,3	175	53,7
60	83,7	89	71,0	118	63,6	147	58,2	176	53,5
61	83,1	90	70,7	119	63,4	148	58,0	177	53,4
62	82,5	91	70,4	120	63,2	149	57,8	178	53,2
63	81,9	92	70,1	121	63,0	150	57,7	179	53,1
64	81,4	93	69,8	122	62,8	151	57,5	180	52,9
65	80,8	94	69,5	123	62,6	152	57,3		
66	80,3	95	69,2	124	62,4	153	57,2		
67	79,8	96	68,9	125	62,2	154	57,0		
68	79,3	97	68,6	126	62,0	155	56,8		
69	78,8	98	68,4	127	61,8	156	56,7		
70	78,3	99	68,1	128	61,6	157	56,5		
71	77,9	100	67,8	129	61,4	158	56,4		
72	77,4	101	67,6	130	61,2	159	56,2		
73	77,0	102	67,3	131	61,0	160	56,0		

scale : 1:1

attention
always use epoxy
resin for long
lasting joining

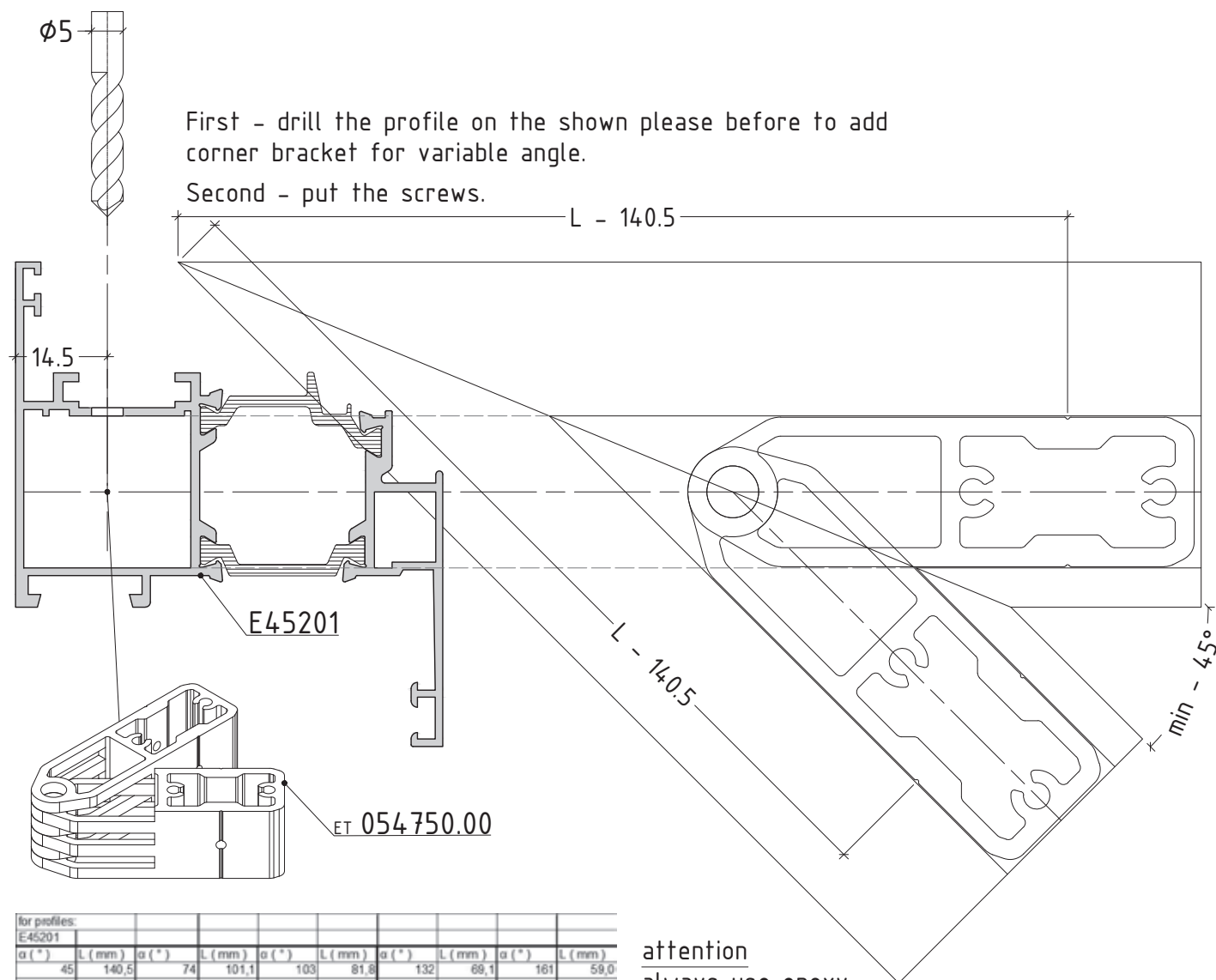
Note:

The table concerns only the profile and the corner bracket shown here.

For other profiles the table is different.

Please contact ETEM R&D department for additional information.

Corner bracket for variable angle for vent E45201



for profiles: E45201									
α (°)	L (mm)	α (°)	L (mm)	α (°)	L (mm)	α (°)	L (mm)	α (°)	L (mm)
45	140,5	74	101,1	103	81,8	132	68,1	161	59,0
46	138,4	75	100,2	104	81,3	133	68,7	162	58,6
47	136,4	76	99,4	105	80,8	134	68,3	163	58,3
48	134,4	77	98,5	106	80,3	135	67,9	164	58,0
49	132,6	78	97,7	107	79,8	136	67,6	165	57,7
50	130,7	79	96,9	108	79,3	137	67,2	166	57,4
51	129,0	80	96,2	109	78,8	138	66,8	167	57,0
52	127,3	81	95,4	110	78,3	139	66,5	168	56,7
53	125,7	82	94,7	111	77,8	140	66,1	169	56,4
54	124,1	83	93,9	112	77,4	141	65,8	170	56,1
55	122,6	84	93,2	113	76,9	142	65,4	171	55,8
56	121,2	85	92,5	114	76,5	143	65,0	172	55,4
57	119,8	86	91,8	115	76,0	144	64,7	173	55,1
58	118,4	87	91,2	116	75,6	145	64,3	174	54,8
59	117,1	88	90,5	117	75,1	146	64,0	175	54,5
60	115,8	89	89,8	118	74,7	147	63,7	176	54,2
61	114,5	90	89,2	119	74,3	148	63,3	177	53,9
62	113,3	91	88,6	120	73,9	149	63,0	178	53,5
63	112,1	92	88,0	121	73,4	150	62,6	179	53,2
64	111,0	93	87,3	122	73,0	151	62,3	180	52,9
65	109,9	94	86,8	123	72,6	152	62,0		
66	108,8	95	86,2	124	72,2	153	61,6		
67	107,7	96	85,8	125	71,8	154	61,3		
68	106,7	97	85,0	126	71,4	155	60,9		
69	105,7	98	84,5	127	71,0	156	60,6		
70	104,7	99	83,9	128	70,6	157	60,3		
71	103,8	100	83,4	129	70,2	158	60,0		
72	102,9	101	82,8	130	69,8	159	59,6		
73	102,0	102	82,3	131	69,4	160	59,3		

scale : 1:1

attention
always use epoxy
resin for long
lasting joining

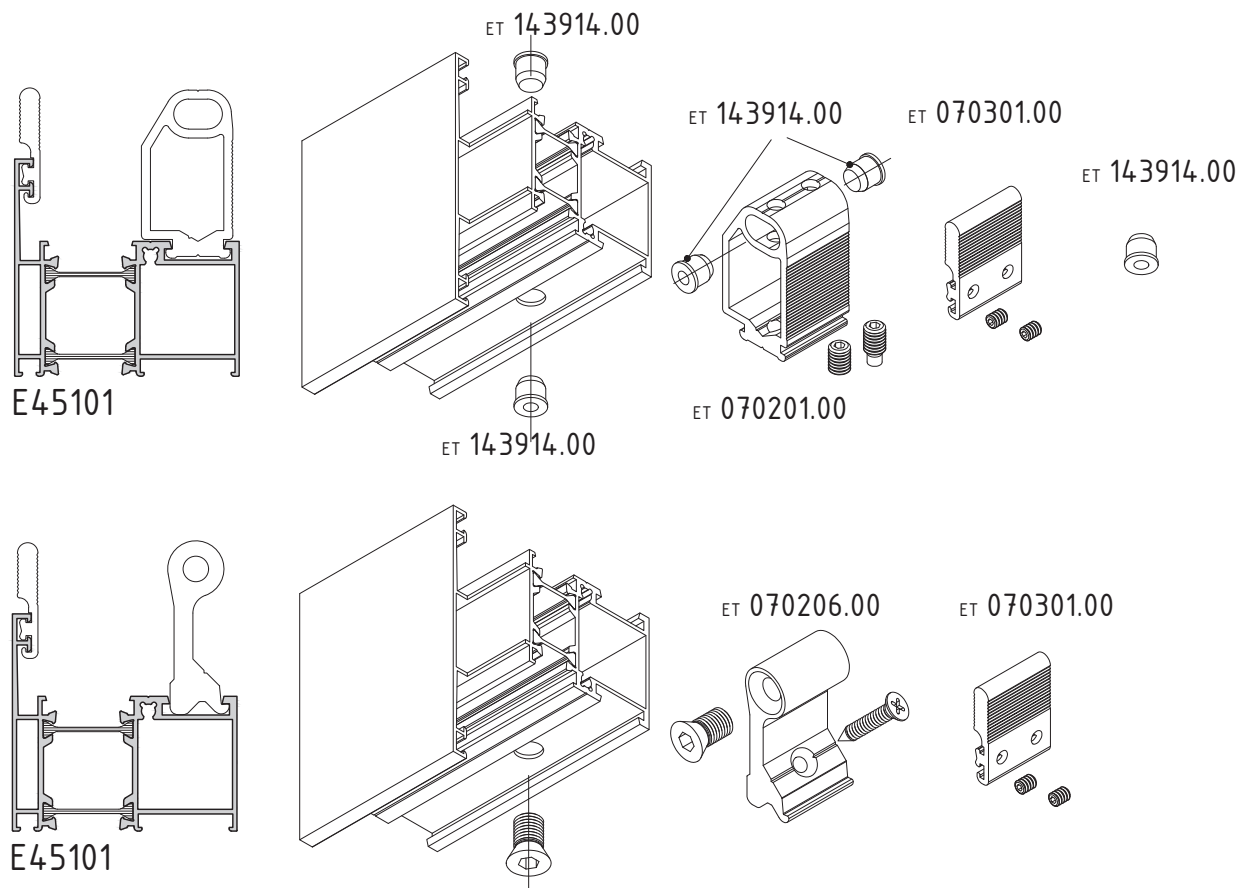
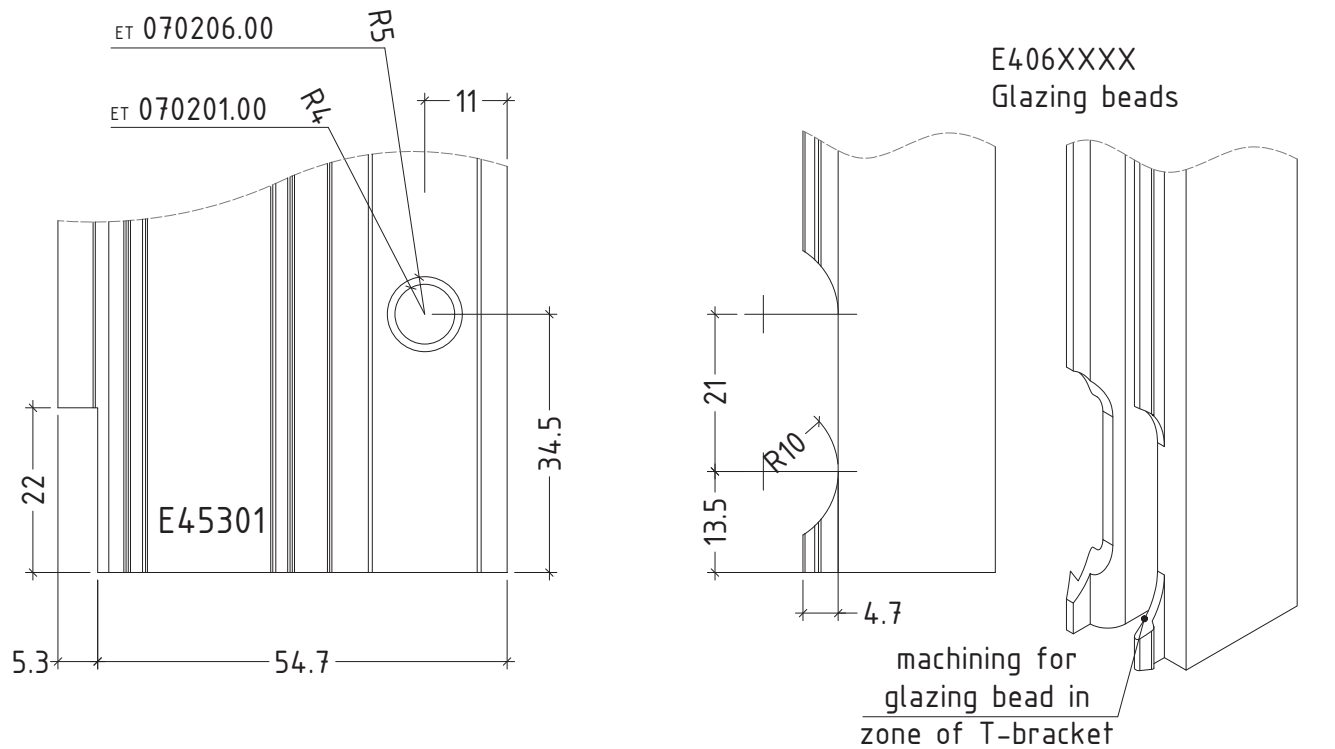
Note:

The tables concern only the profiles shown here.

For other profiles the tables are different.

In case you are using other corner bracket for variable angle for other profiles, please contact ETEM R&D department for additional information.

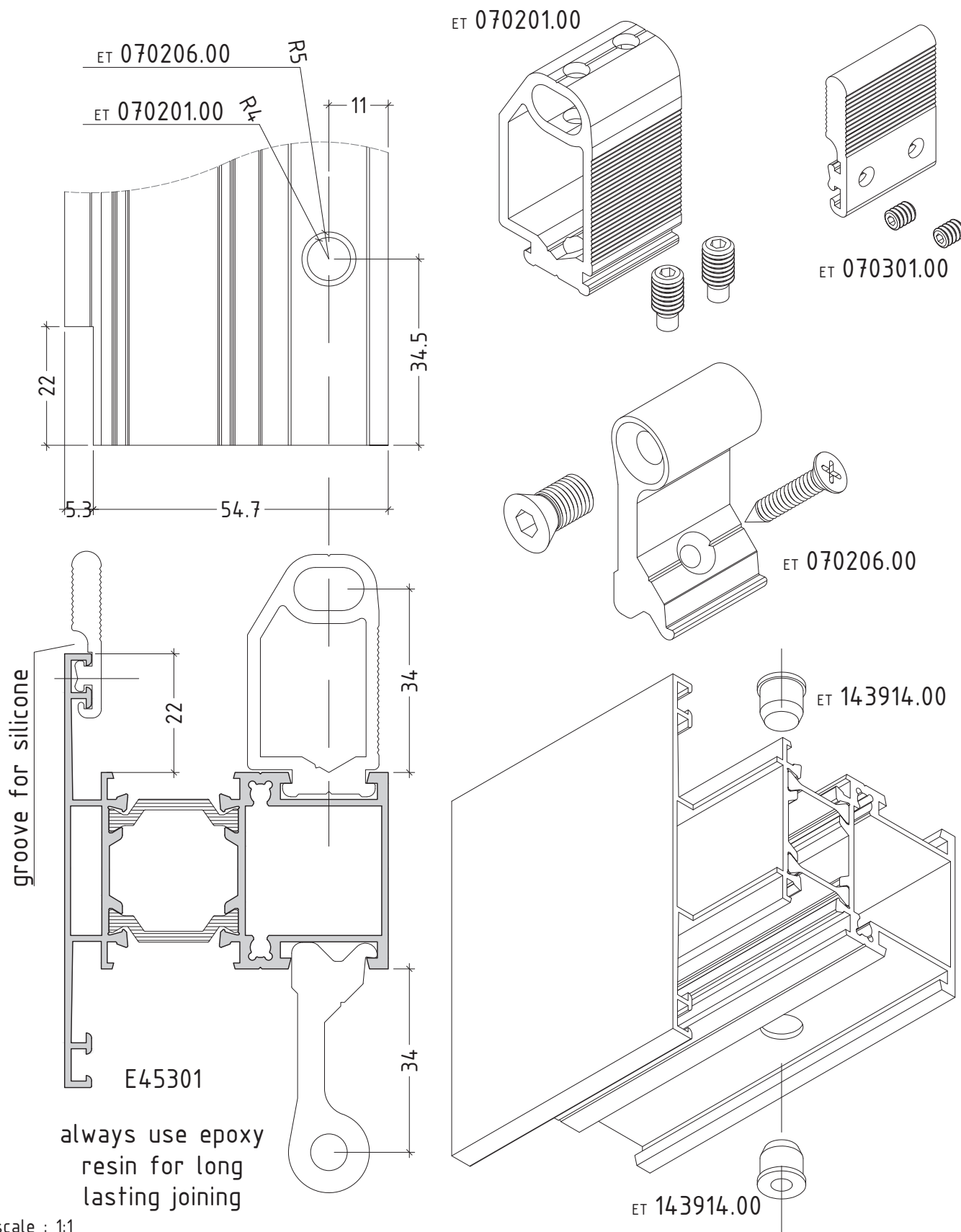
Machining to use T-bracket - T-bracket for mullions/transoms



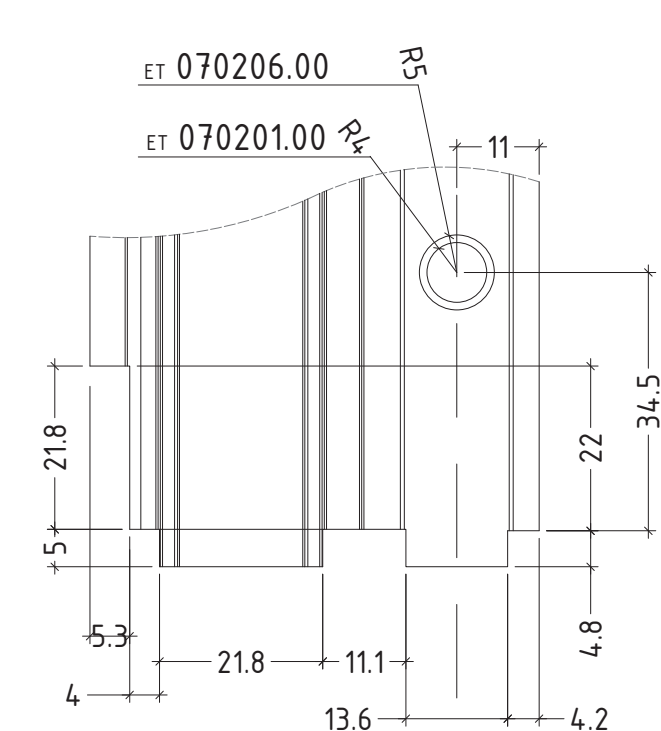
scale : 1:1

M45-25

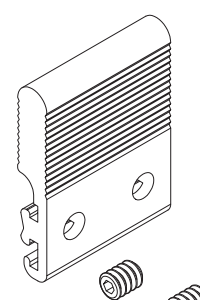
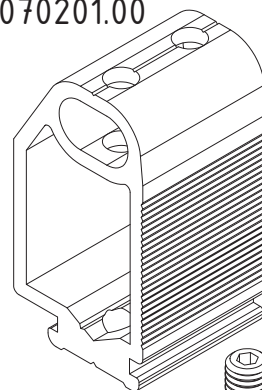
Machining to use T-bracket - T-bracket for mullions/transoms



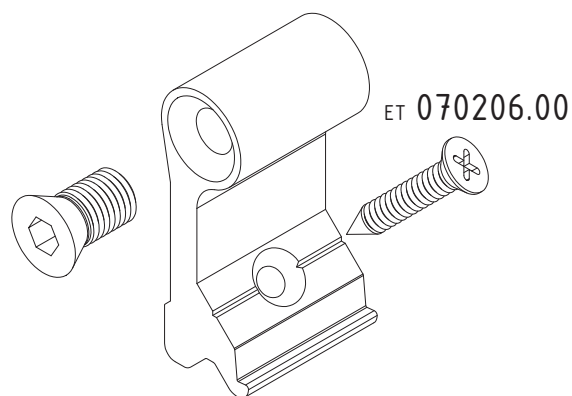
Machining to use T-bracket - T-bracket for mullions/transoms



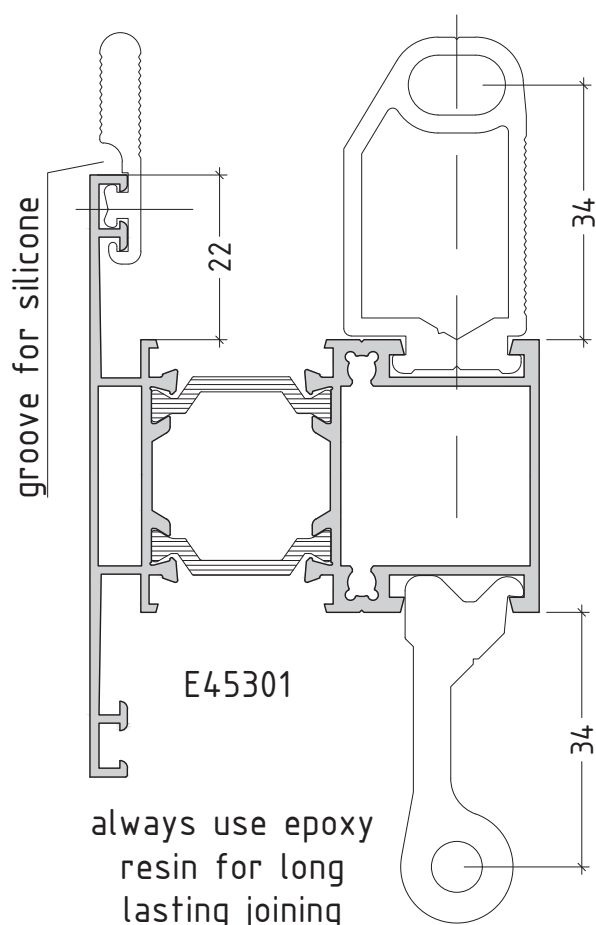
ET 070201.00



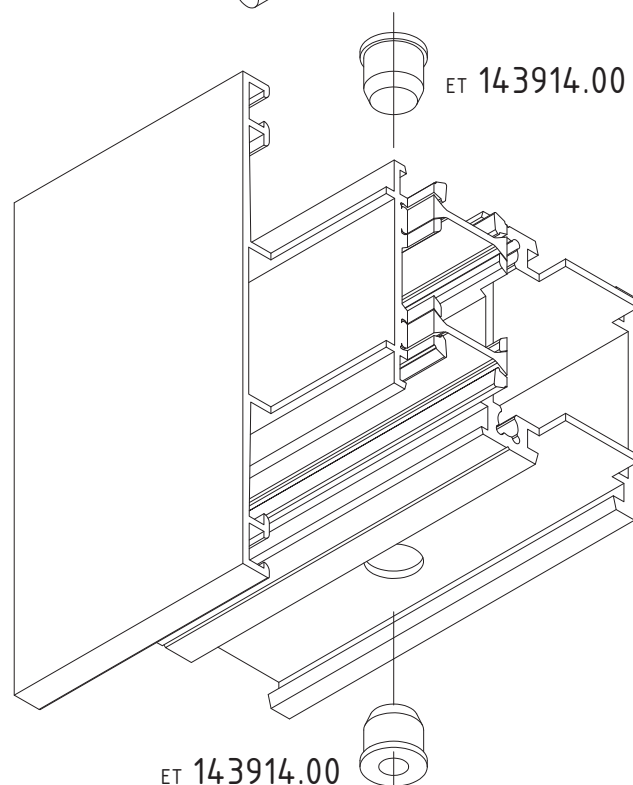
ET 070301.00



ET 070206.00



always use epoxy resin for long lasting joining

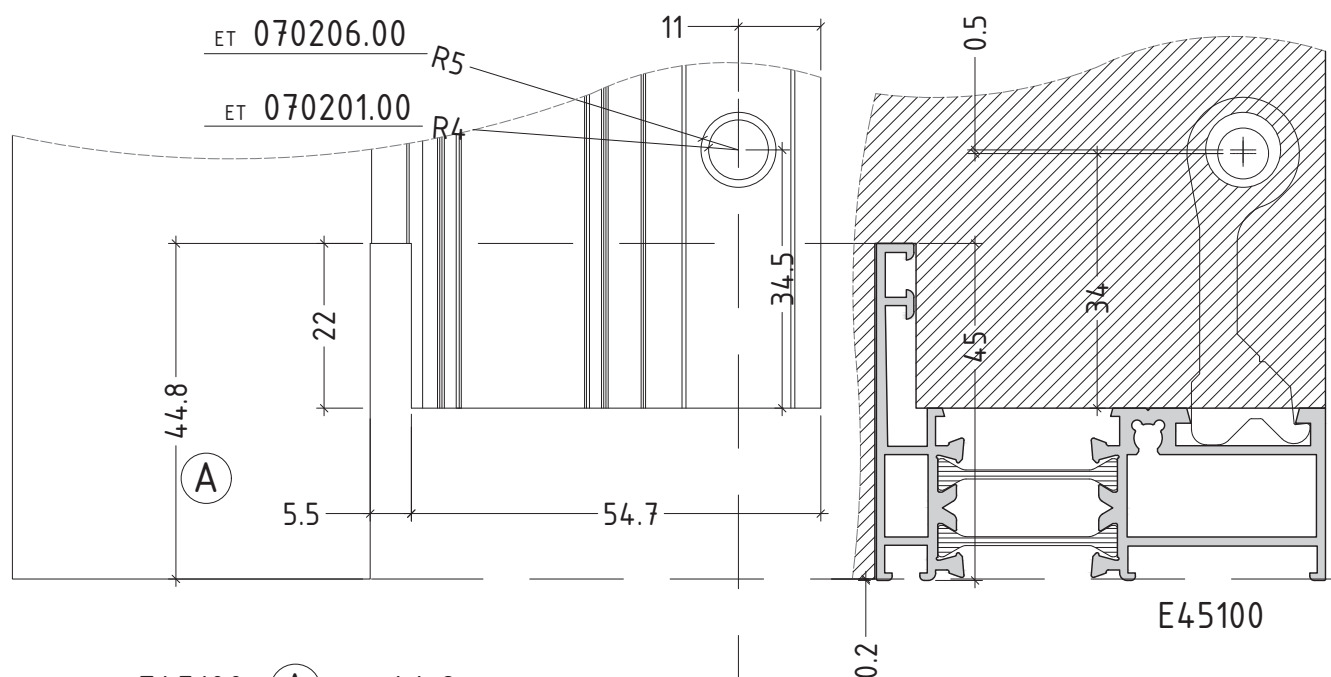


ET 143914.00

ET 143914.00

scale : 1:1

Machining to use E45302 with E45100,1,2 - Option I

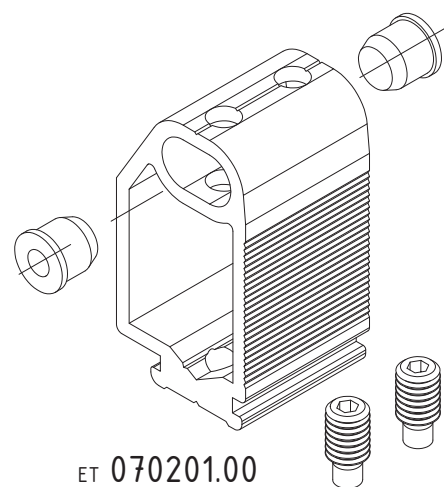


E45100 (A) = 44.8

E45101 (A) = 57.8

E45102 (A) = 65.8

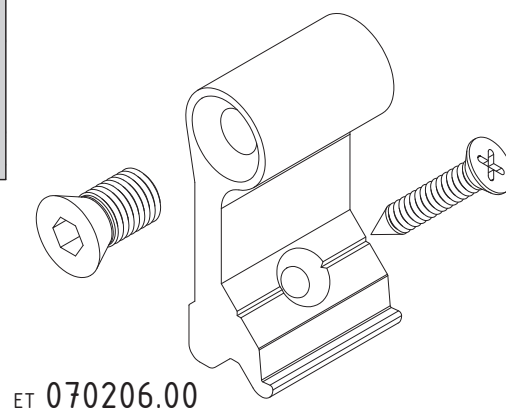
ET 143914.00



ET 070201.00

always use epoxy
resin for long
lasting joining

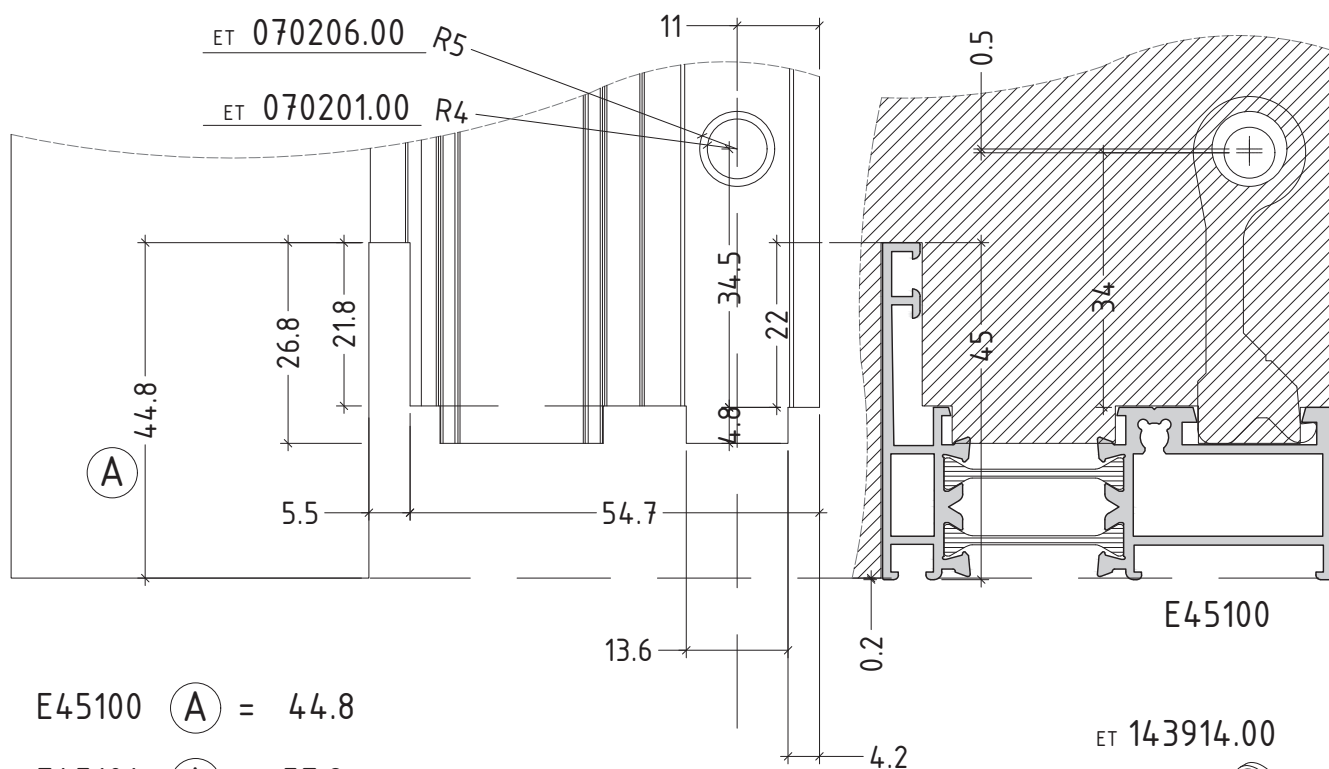
scale : 1:1



ET 070206.00

M45-28

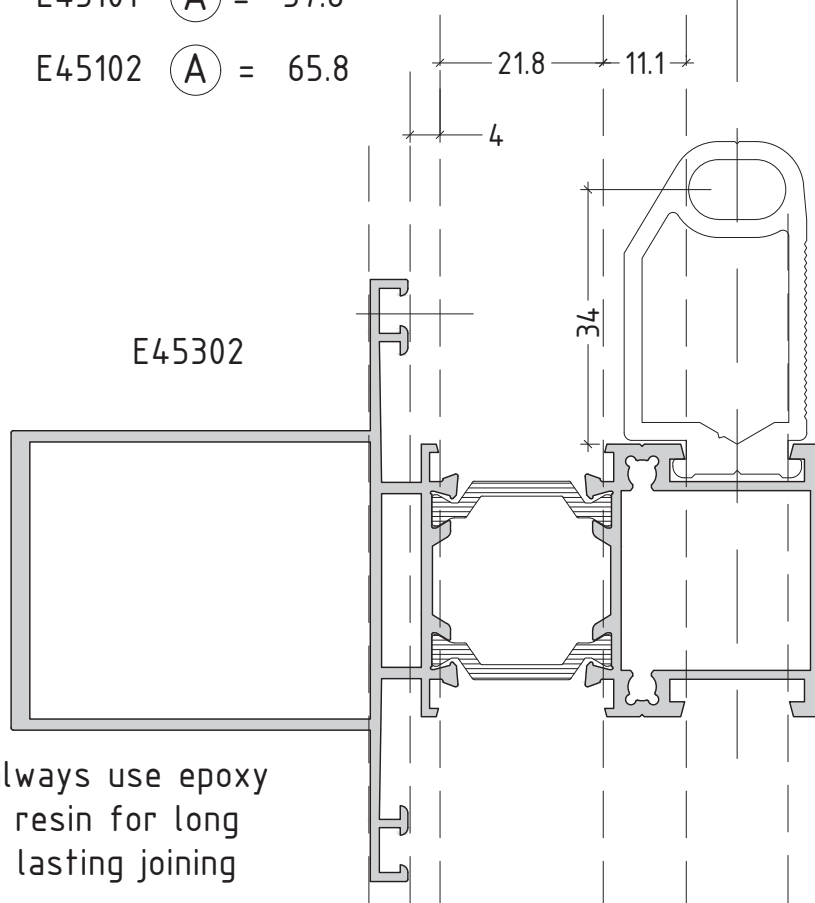
Machining to use E45302 with E45100,1,2 - Option II



E45100 (A) = 44.8

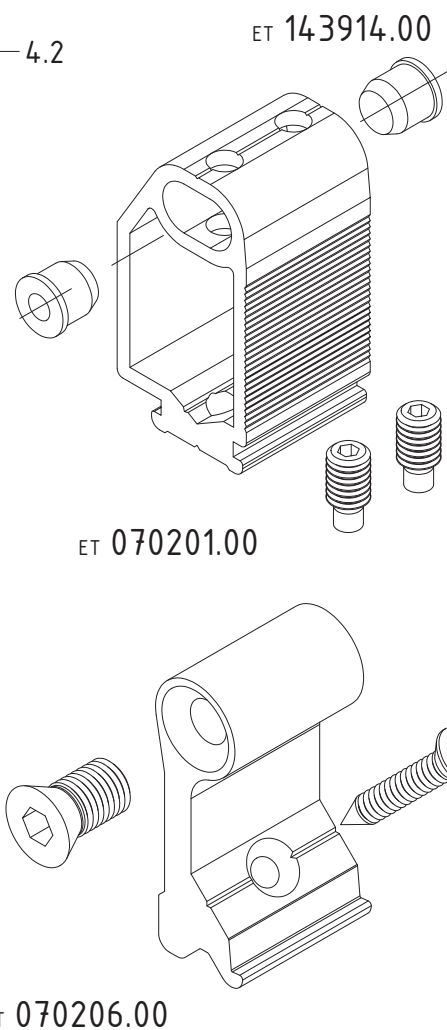
E45101 (A) = 57.8

E45102 (A) = 65.8



always use epoxy
resin for long
lasting joining

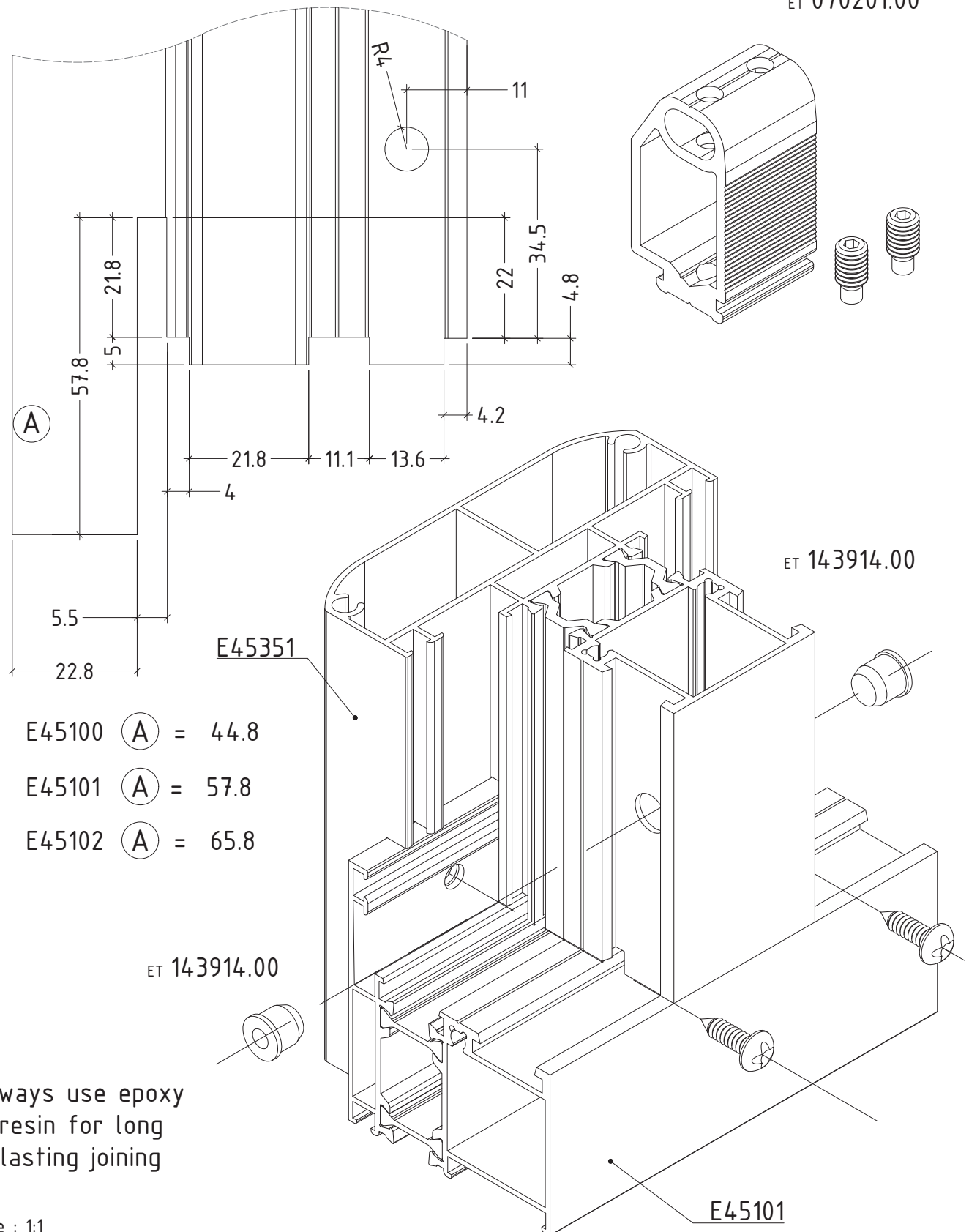
scale : 1:1



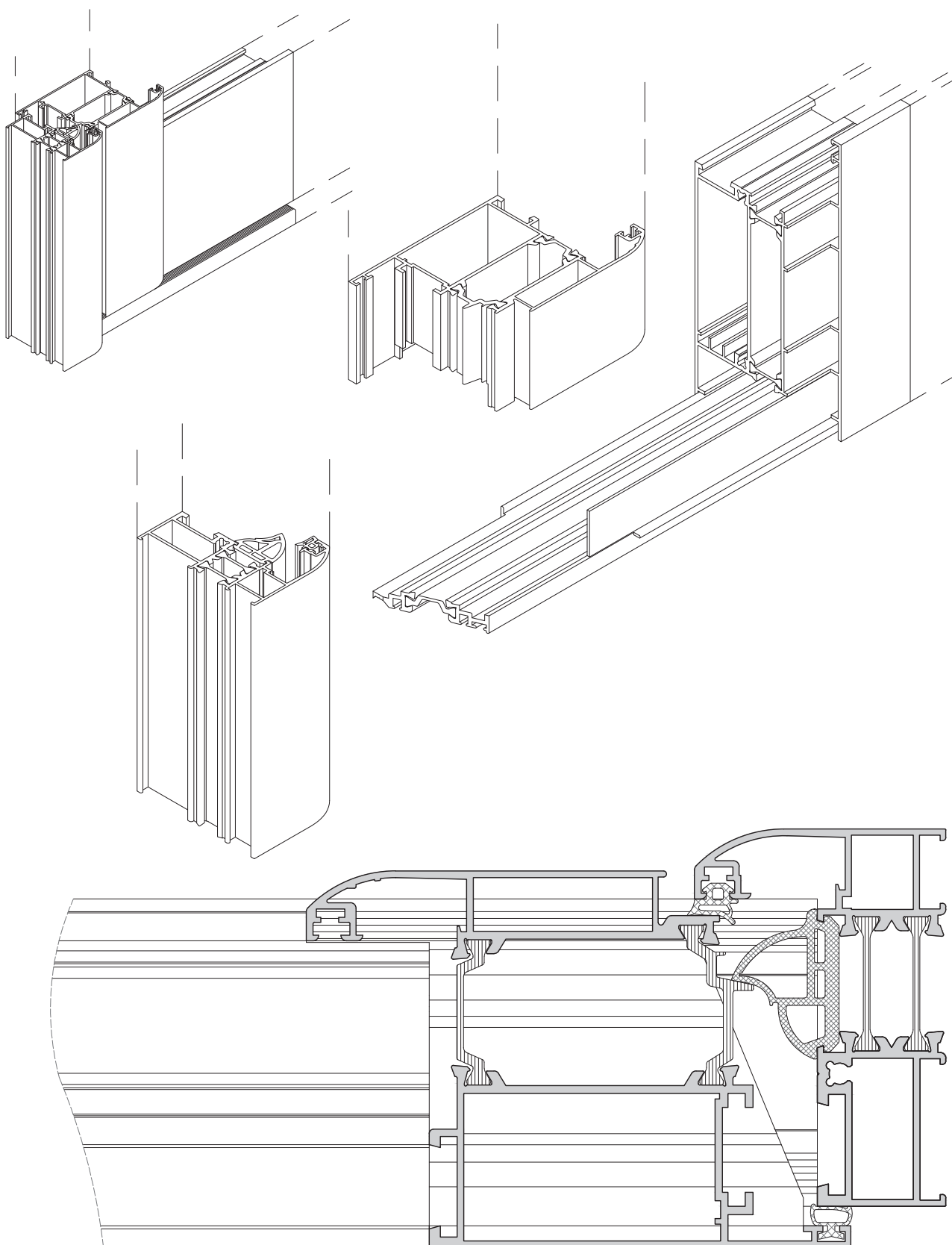
M45-29

Machining to use T-bracket for mullions/transoms

ET 070201.00



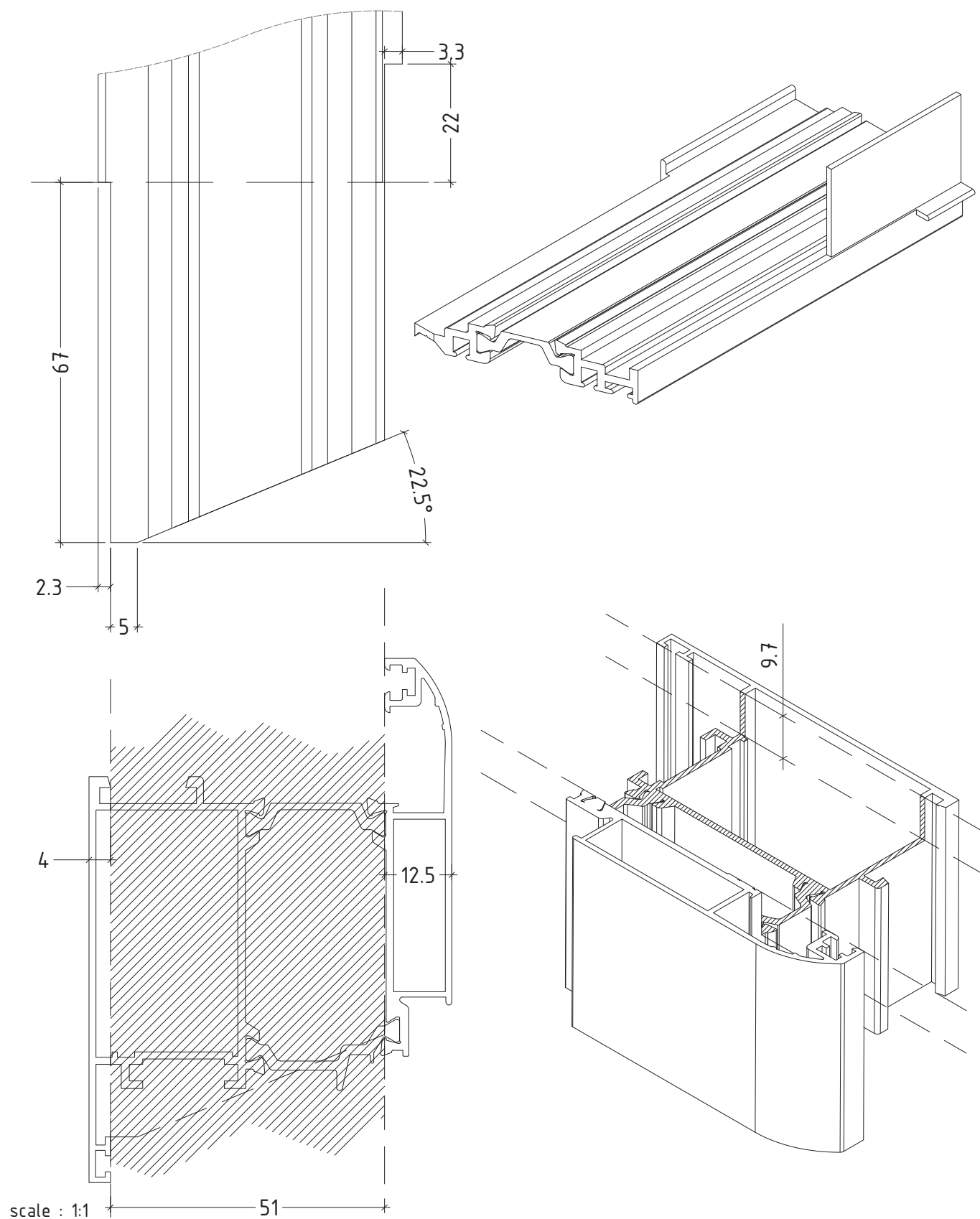
Machining to use E45810



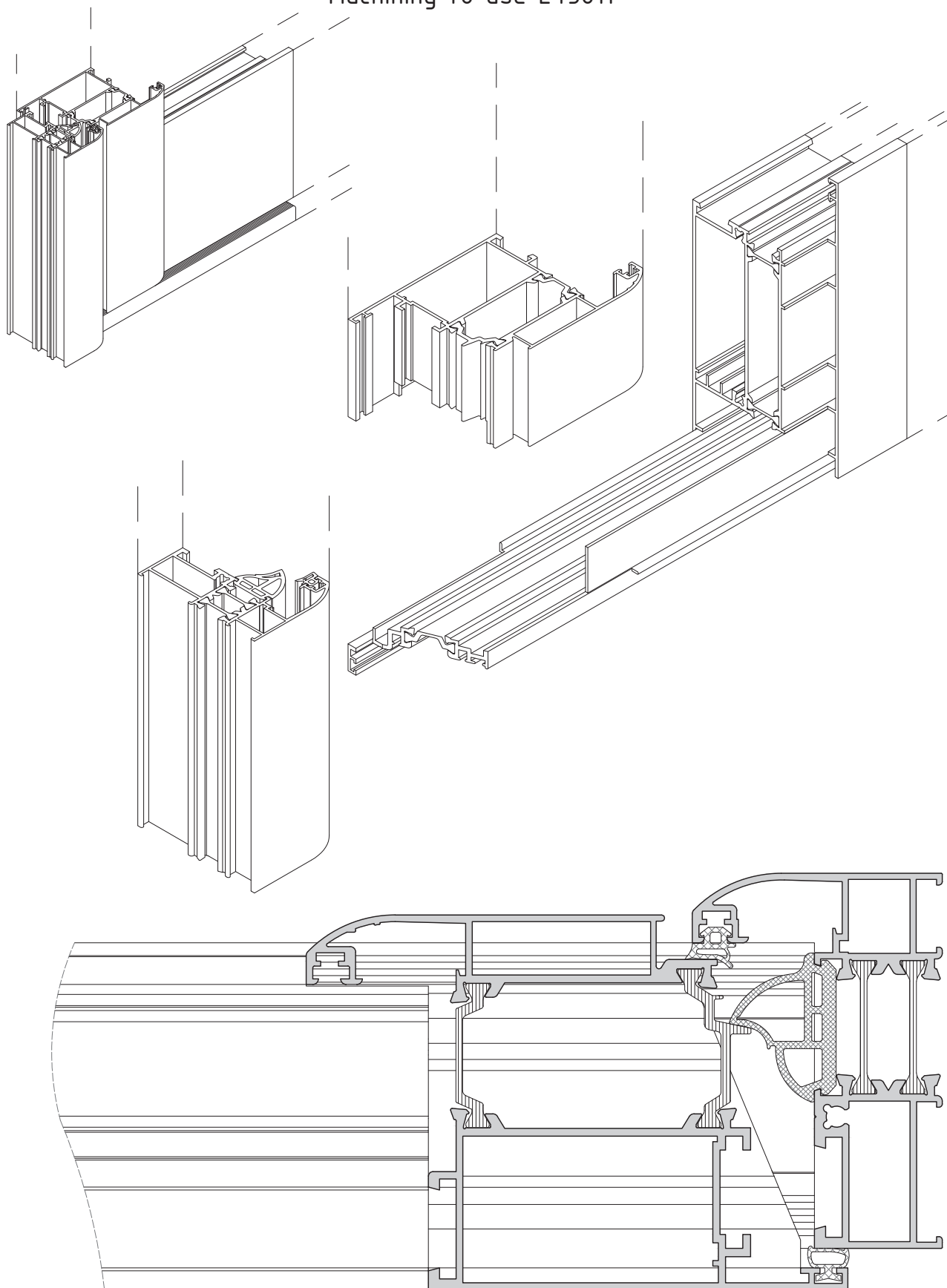
scale : 1:1

M45-31

Machining to use E45810



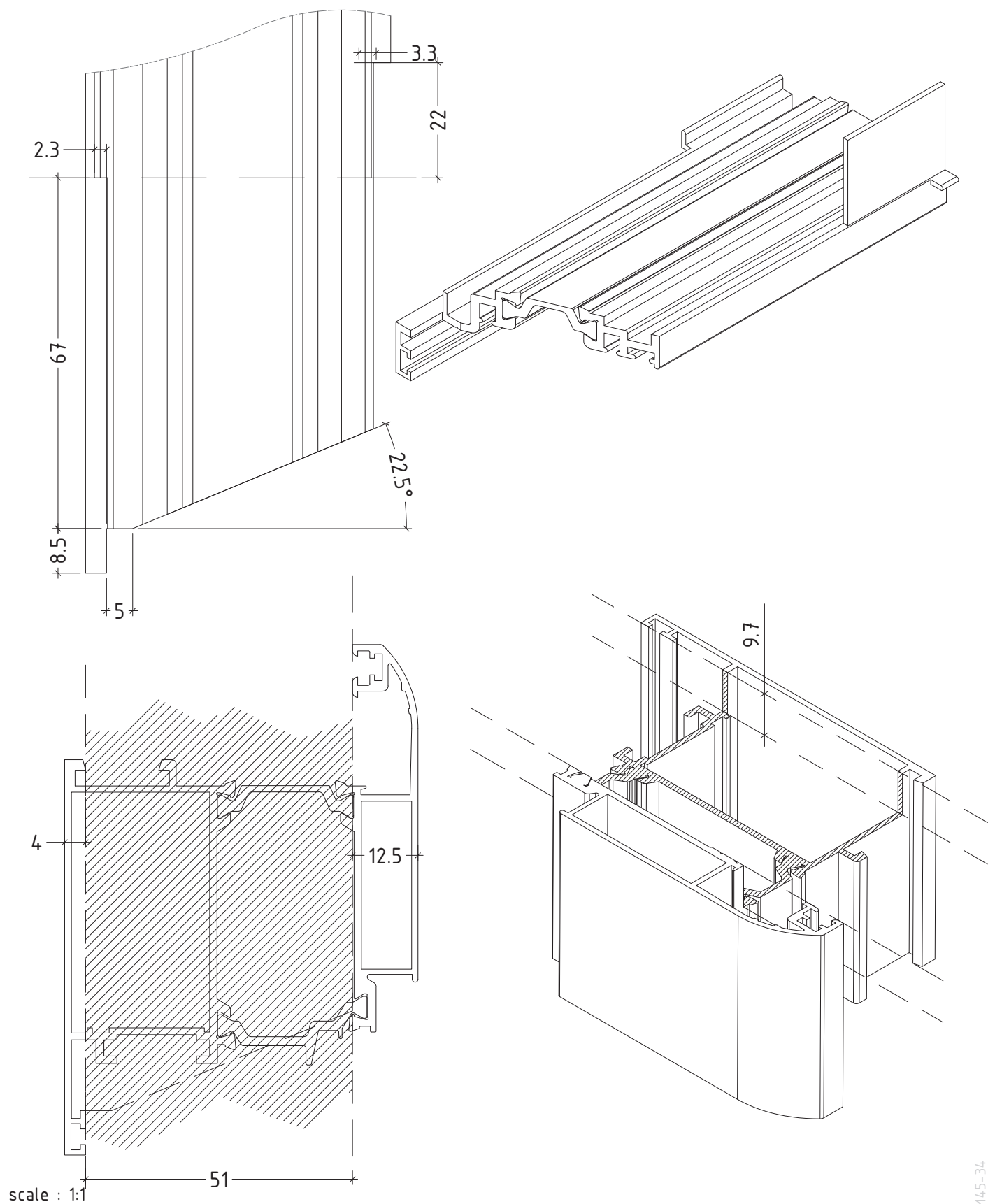
Machining to use E45811



scale :

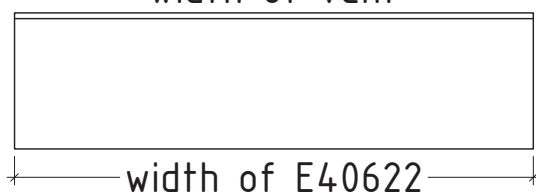
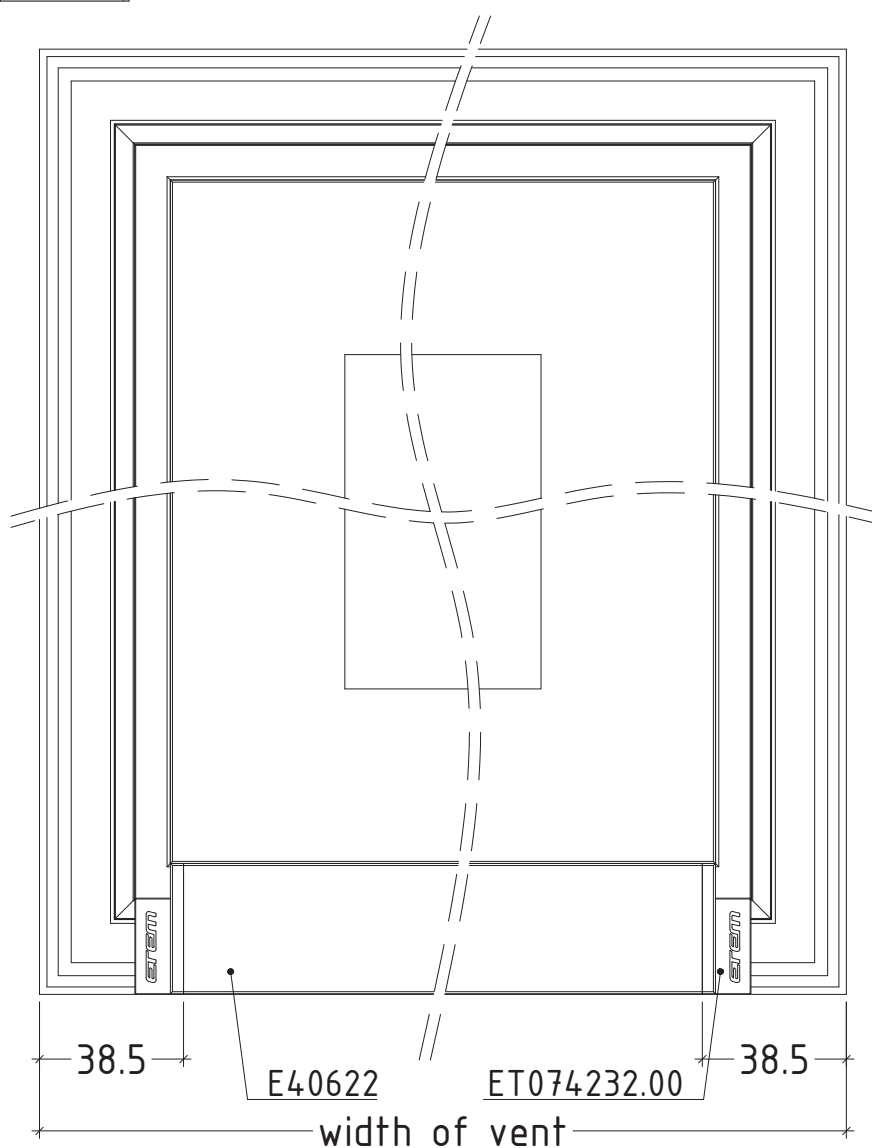
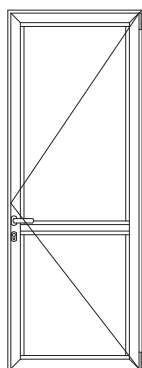
M45-33

Machining to use E45811

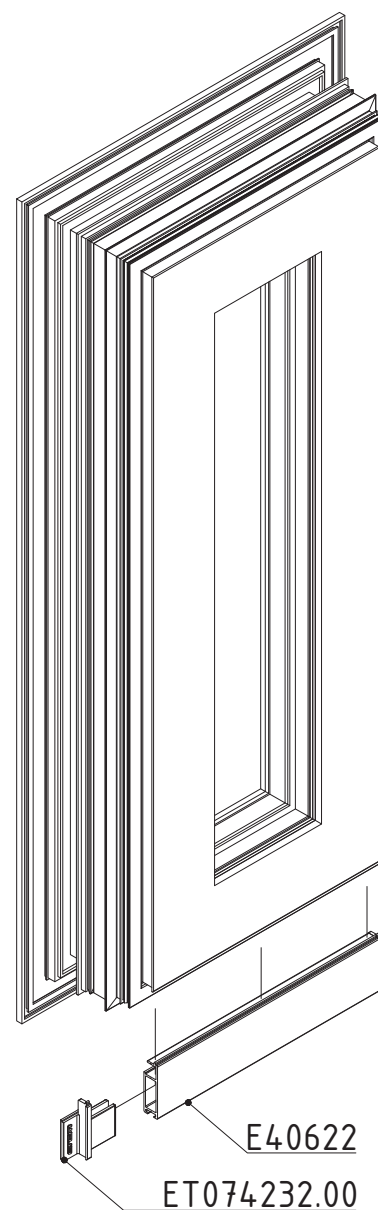


M45-34

Machining to use E40622



width of E40622 = width of vent - 77

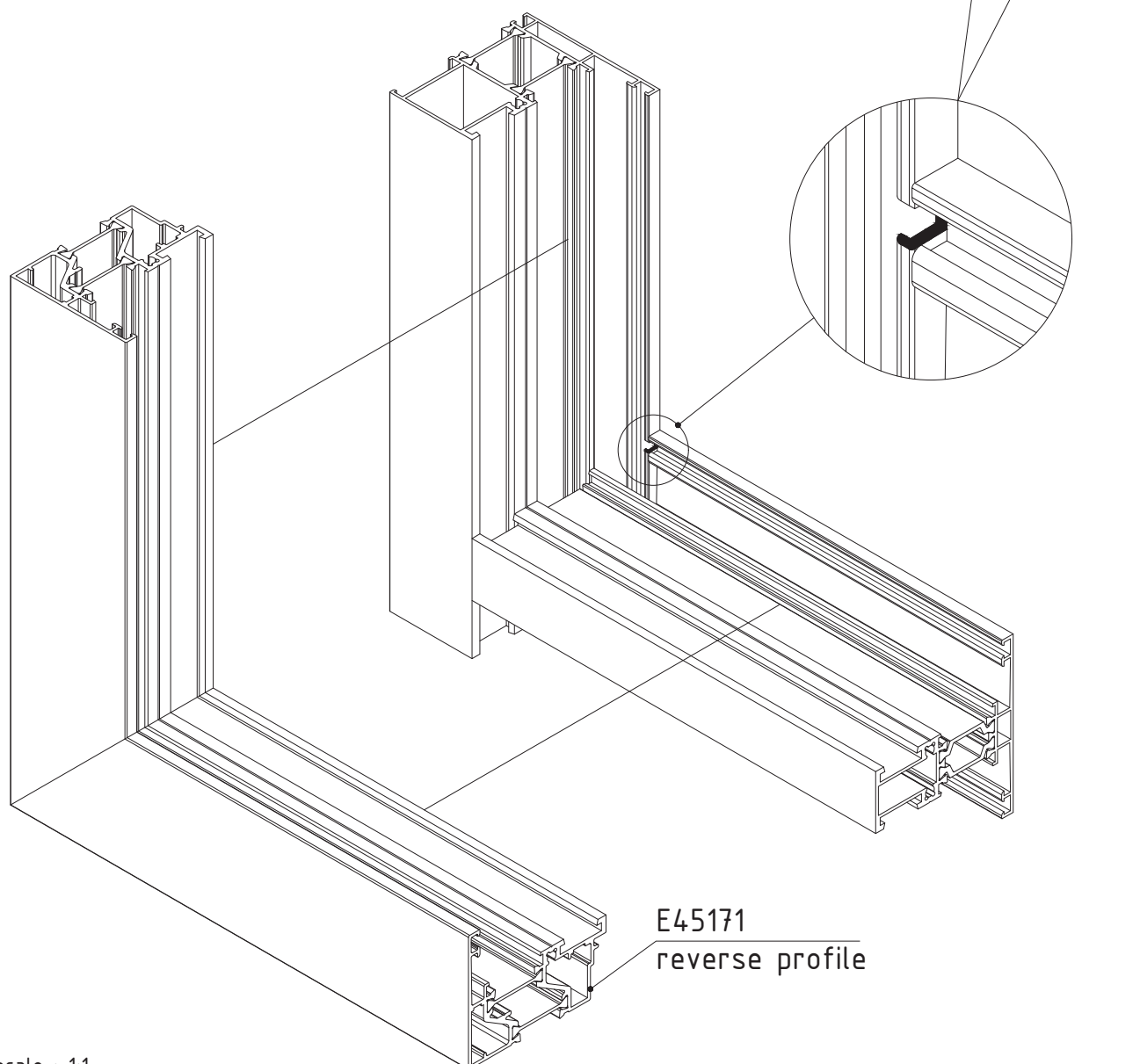


scale : 1:1

Machining T-profile in frame
when using reverse profile E45171

outward opening

Connecting frame, T-profile
and reverse profile E45171, it is necessary
to cut the frame on the shown point.

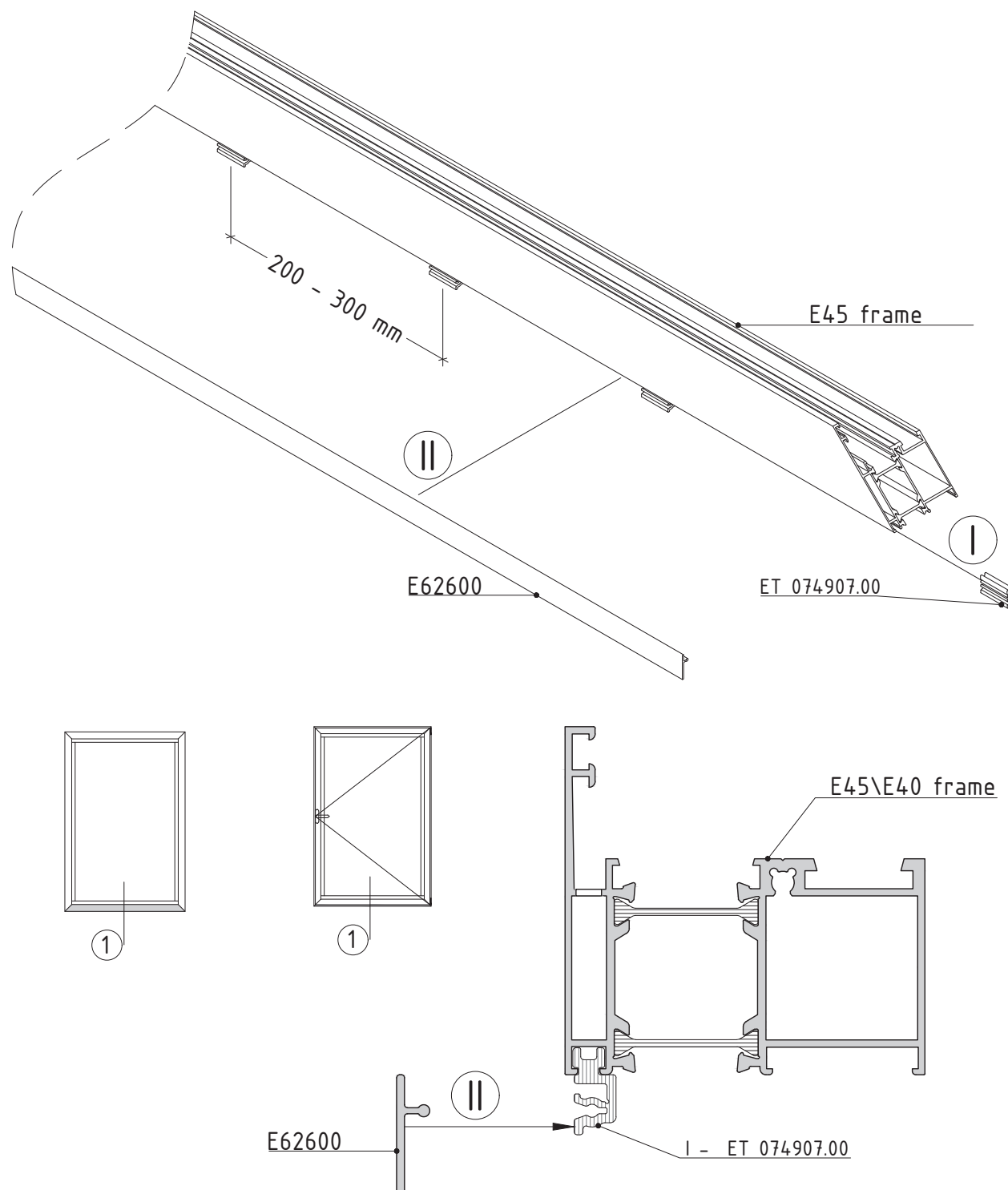


scale : 1:1

E45171
reverse profile

M45-36

Sequence of assembly of ET 074907.00 and E62600 to frame E45 Option - 1

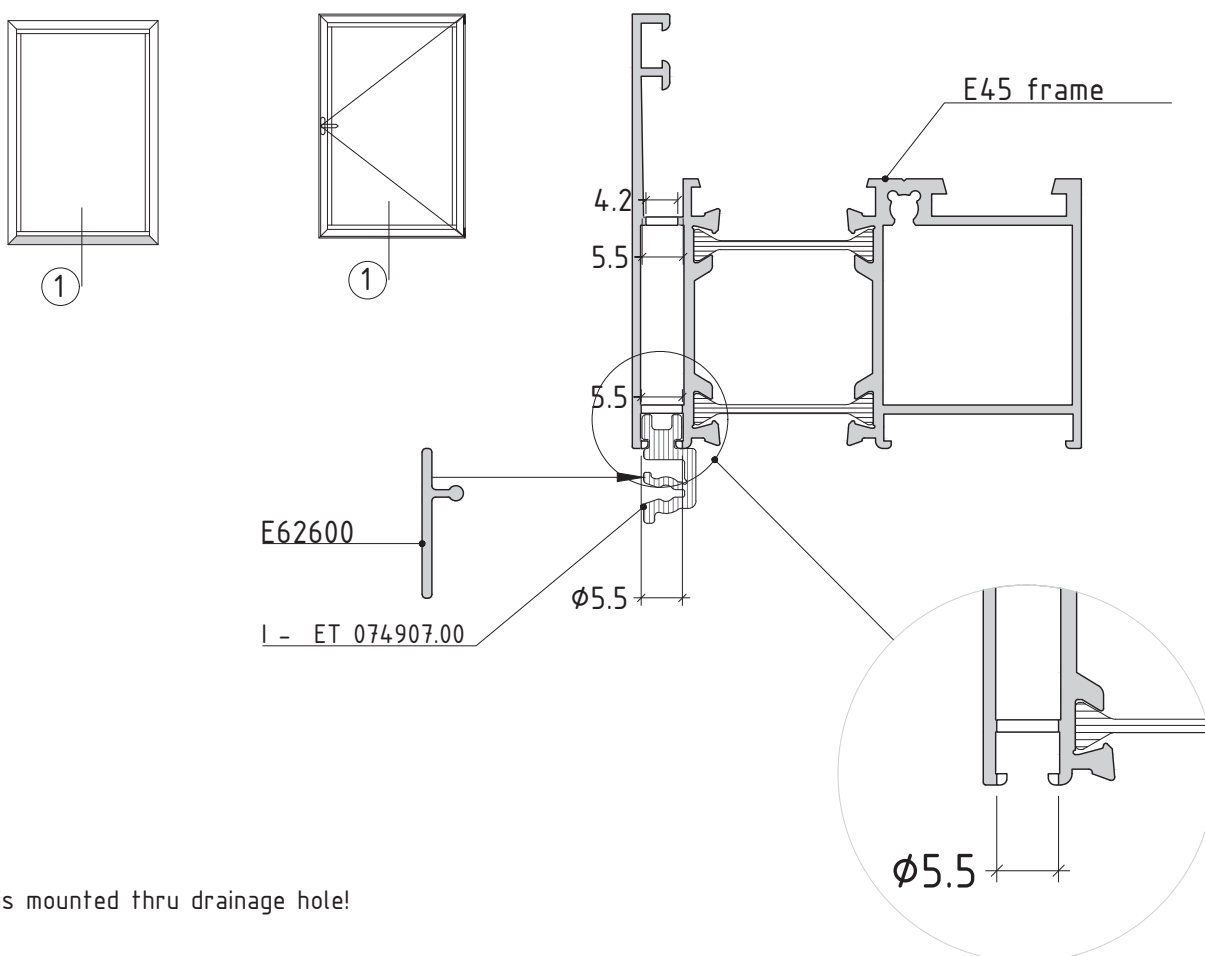
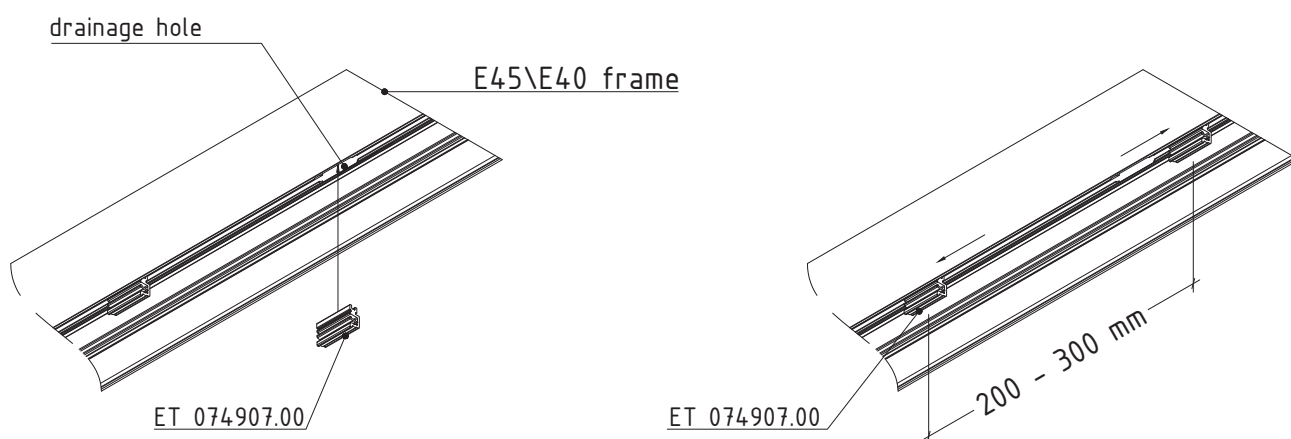


Note:
ET 074907.00 must be mounted before crimping the frame!

scale :

M45-37

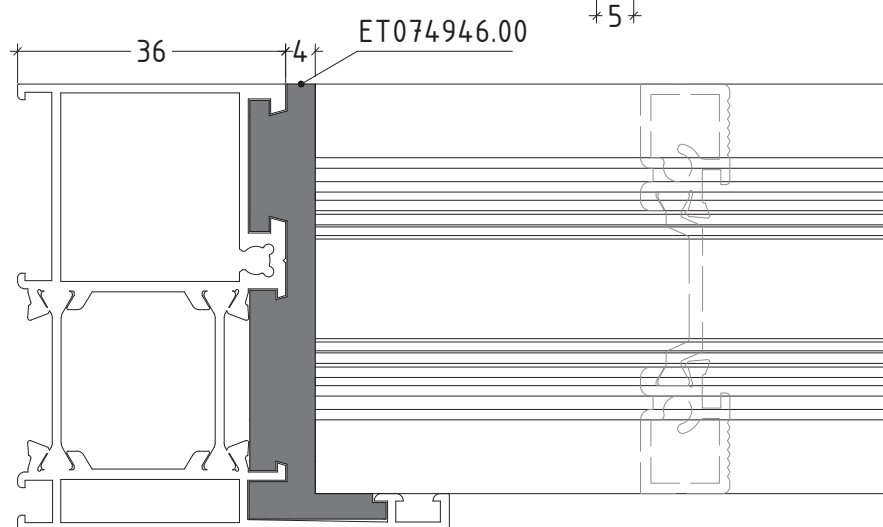
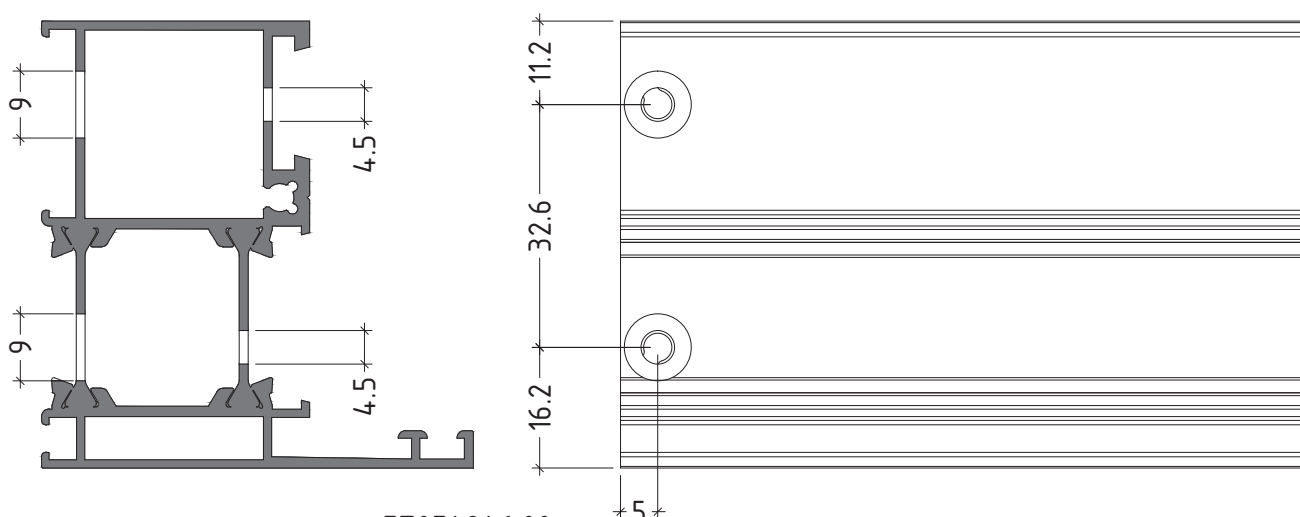
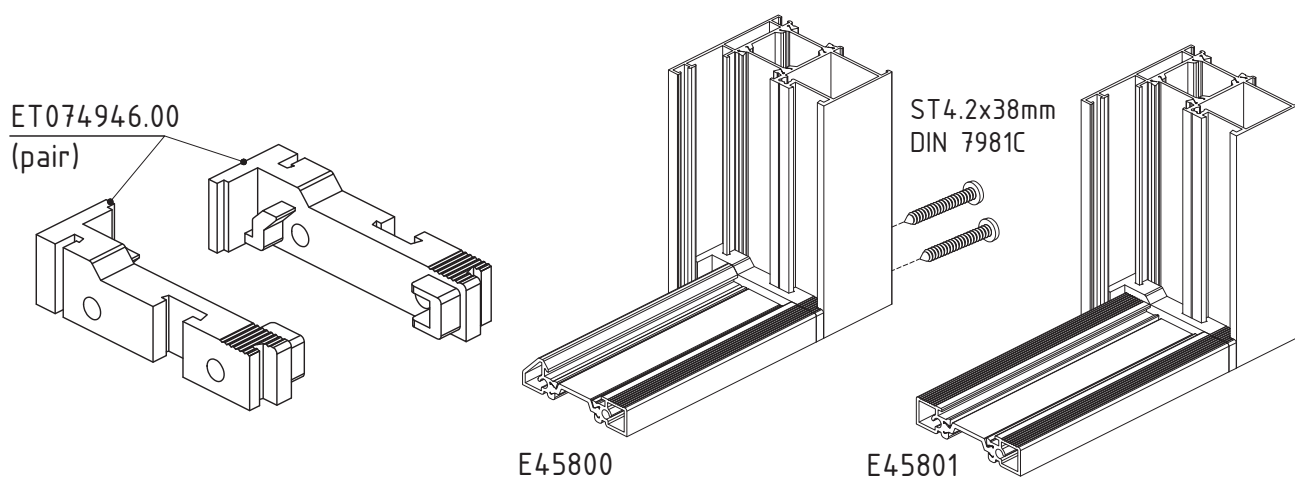
Sequence of assembly of ET 074907.00 and E62600 to frame E45 Option - 2



Note:
ET 074907.00 is mounted thru drainage hole!

M45-38

Machining & instructions for plugs ET074946.00
E45800 - E45801 threshold profiles



E45101

For frame E45100 (23mm):
 $W_{thres.} = W - 54mm$

For frame E45101 (36mm):
 $W_{thres.} = W - 80mm$

For frame E45102 (44mm):
 $W_{thres.} = W - 96mm$

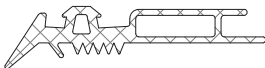
$W_{thres.}$ = Width of E45800 or E45801
W = Width of casement

M45-39

ACCESSORIES

code/description	package/pcs	colour
ET 130402.00	60	●

elongated glazing EPDM
gasket E45 (3 mm)



ET 130411.00	150	●
---------------------	-----	---

glazing EPDM gasket for
E1000 E40 E45 (3 mm)



ET 130153.00	150	●
---------------------	-----	---

glazing EPDM gasket 4 mm



ET 130175.00	250	●
---------------------	-----	---

glazing EPDM gasket
press-in 3-4 mm



A45-1

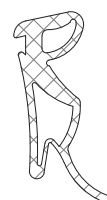
code/description	package/pcs	colour
ET 130176.00	125	

glazing EPDM gasket
press-in 5-6 mm



ET 130407.00	80	
---------------------	----	---

elongated glazing EPDM
gasket press-in 5-6 mm



ET 130177.00	60	
---------------------	----	---

glazing EPDM gasket
press-in 7-8 mm



ET 130205.00	125	
---------------------	-----	---

glazing EPDM gasket
press-in 5 mm



code/description	package/pcs	colour
ET 130206.00	125	

glazing EPDM gasket
press-in 6 mm



ET 130207.00	75	
---------------------	----	---

P7 old code

glazing EPDM gasket
press-in 7 mm



ET 130208.00	40	
---------------------	----	---

P8 old code

glazing EPDM gasket
press-in 8 mm



ET 130210.00	40	
---------------------	----	---

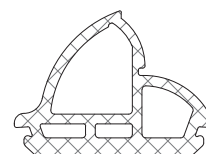
P10 old code

glazing EPDM gasket
press-in 10 mm



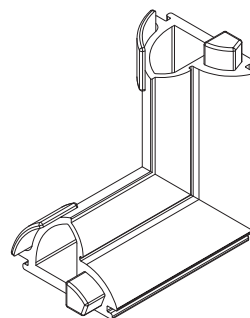
code/description	package/pcs	colour
ET 130421.00	40	●

center seal EPDM gasket
E45



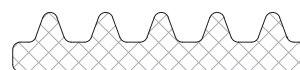
ET 060421.00	40	●
---------------------	----	---

vulcanised EPDM corner E45
for ET130421.00



ET 080452.00	2 m	●
---------------------	-----	---

additional insulator with
tape for glass vent E45



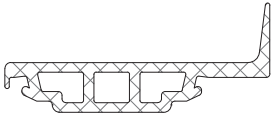
ET 080451.00	2 m	●
---------------------	-----	---

additional insulator with
tape for glass frame E45



code/description	package/pcs	colour
ET 130422.00	70	●

EPDM gasket for drainage
E45



ET 130799.00	200	●
---------------------	-----	---

EPDM gasket



ET 130400.00	250	●
---------------------	-----	---

internal seal EPDM gasket
E45



ET 130174.00	160	●
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interior seal EPDM gasket
top line



code/description	package/pcs	colour
ET 130131.00	200	●

interior seal gasket for:
E2300, E1000, E45



ET 130154.00	200	●
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interior seal window EPDM
gasket for:
E2004, E1000, E45 (4 mm)



ATTENTION
use with profile
E45111 & E45161

ET 130420.00	100	●
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EPDM gasket for E45



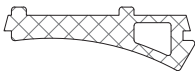
ET 130412.00	240	●
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door seal EPDM gasket for:
E1000, E45



code/description	package/pcs	colour
ET 130424.00	90	●

EPDM gasket for frame for
variable angles E45



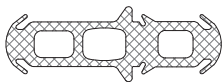
ET 130413.00	200	●
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seal EPDM gasket for
decorative lattice bar
(E40650)



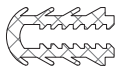
ET 991275.00	100	●
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EPDM gasket for expansion
distance



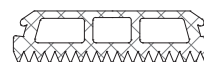
ET 130184.00	200	●
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EPDM gasket



code/description	package/pcs	colour
ET 130403.00	90	●

wall-joining EPDM gasket
(internal)



ET 130404.00	160	●
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wall-joining EPDM gasket
(external) for straight fixed
frame



ET 130409.00	240	●
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wall-joining EPDM gasket
perimeter (external) for
straight fixed frame



ET 130405.00	120	●
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wall-joining EPDM gasket
(external) for round fixed
frame



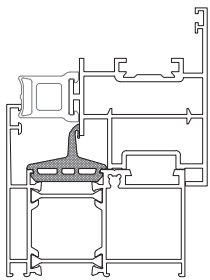
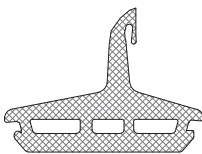
code/description	package/pcs	colour
ET 130101.00		

EPDM additional gasket for
glazing beads



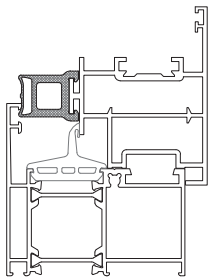
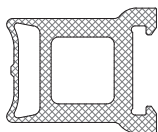
ET 130717.00		
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EPDM central gasket for
pivot window



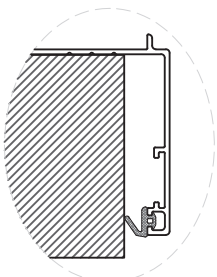
ET 130750.00		
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EPDM gasket for pivot
window



ET 130799.00		
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press in interior seal
gasket

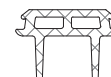


E62032

AV5-8a

code/description	package/pcs	colour
ET 130410.00	120	

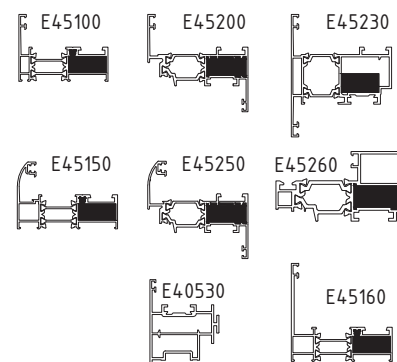
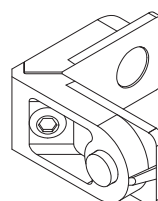
wall-joining EPDM gasket
perimeter (external) for
round fixed frame



ET 053316.00	250	MF
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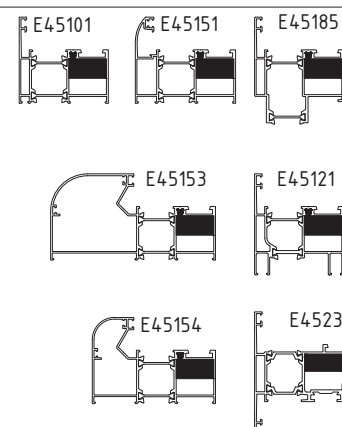
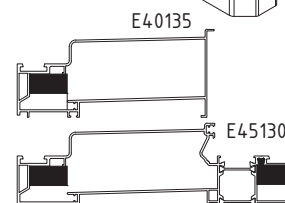
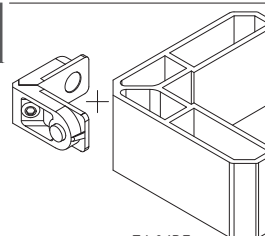
ET053305.00 old code

die cust al. joint corner bracket



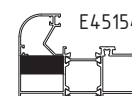
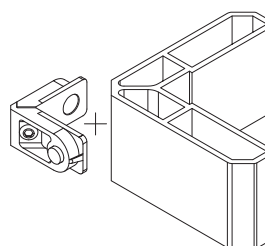
ET 050200.00	300	MF
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extruded al. shimming corner
24.7 mm



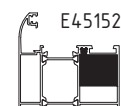
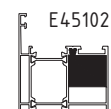
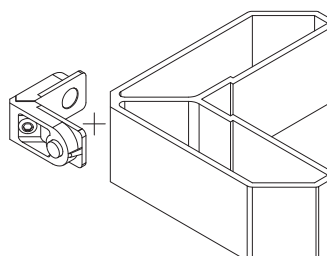
ET 050202.00	250	MF
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extruded al. shimming corner
28.1 mm



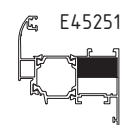
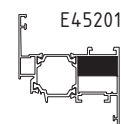
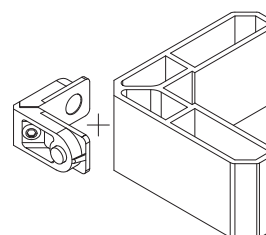
code/description	package/pcs	colour
ET 050300.00	150	MF

extruded al. shimming corner
24.7 mm



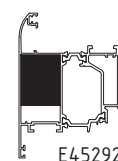
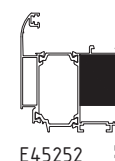
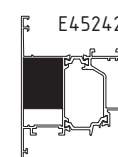
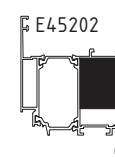
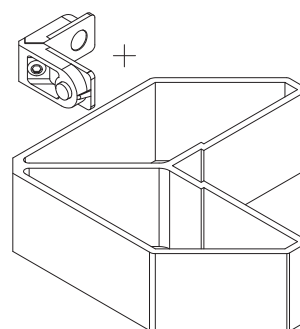
ET 050201.00	300	MF
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extruded al. shimming corner
25.8 mm



ET 050400.00	100	MF
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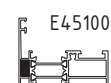
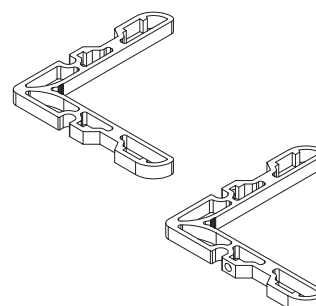
extruded al. shimming corner
25.8 mm



ET 054250.00	300	MF
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ET 054257.00	300	MF
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extruded al. joint corner
bracket 5.2 mm
without hole/ with hole

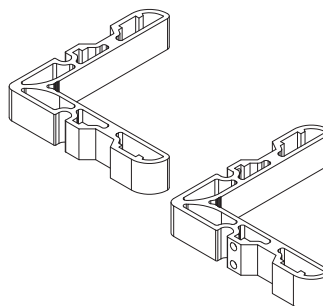


attention
always use epoxy resin
for long lasting joining

A45-10

code/description	package/pcs	colour
ET 054252.00	250	MF
ET 054259.00	250	MF

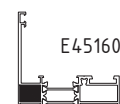
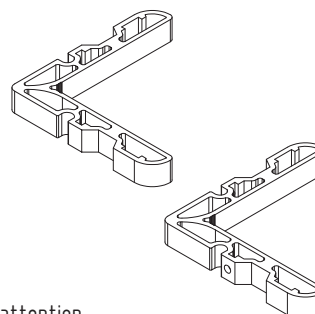
extruded al. joint corner
bracket 12.6 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054261.00	200	MF
ET 054262.00	200	MF

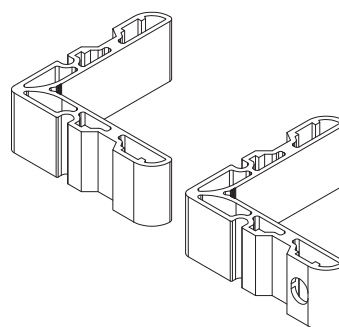
extruded al. joint corner
bracket 13.3 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054255.00	200	MF
ET 054253.00	200	MF

extruded al. joint corner
bracket 24.7 mm
without hole/with hole



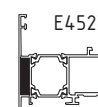
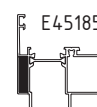
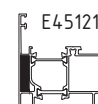
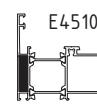
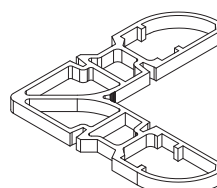
depend on
montage
scheme



attention
always use epoxy resin
for long lasting joining

ET 054300.00	200	MF
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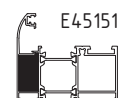
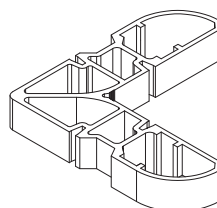
extruded al. joint corner
bracket 5.2 mm



attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054301.00	150	MF

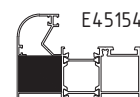
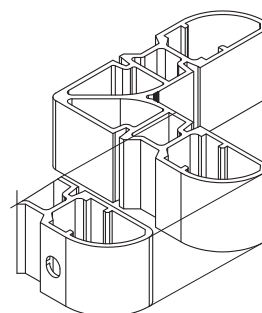
extruded al. joint corner
bracket 12.6 mm



attention
always use epoxy resin
for long lasting joining

ET 054308.00	100	MF
ET 054451.00	100	MF

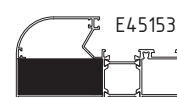
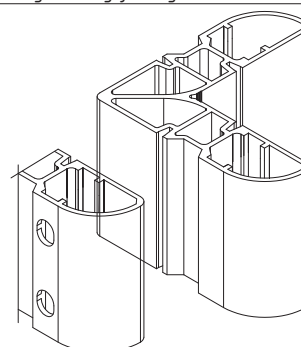
extruded al. joint corner
bracket 28.1 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054307.00	70	MF
ET 054304.00	70	MF

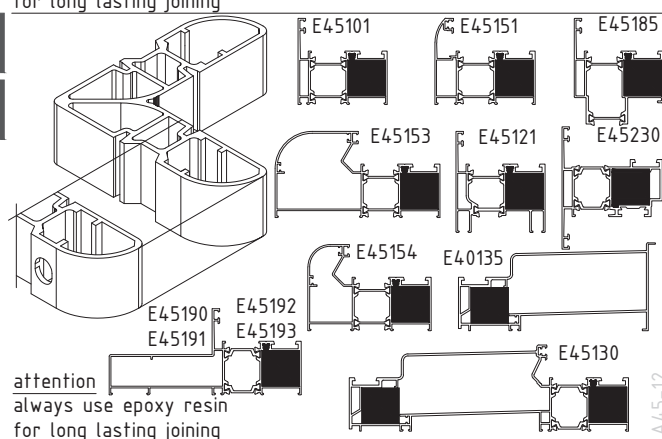
extruded al. joint corner
bracket 56 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054305.00	100	MF
ET 054302.00	100	MF

extruded al. joint corner
bracket 24.7 mm
without hole/with hole

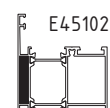
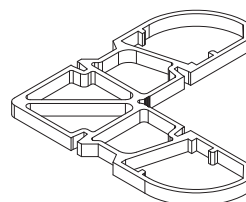


attention
always use epoxy resin
for long lasting joining

A45-12

code/description	package/pcs	colour
ET 054350.00	150	MF

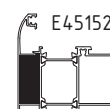
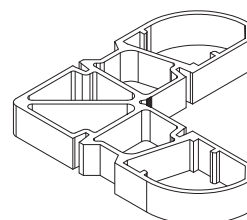
extruded al. joint corner
bracket 5.2 mm



attention
always use epoxy resin
for long lasting joining

ET 054352.00	100	MF
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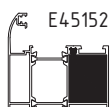
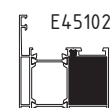
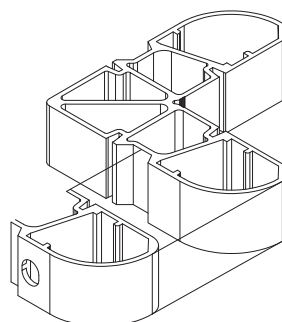
extruded al. joint corner
bracket 12.6 mm



attention
always use epoxy resin
for long lasting joining

ET 054354.00	70	MF
ET 054353.00	70	MF

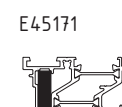
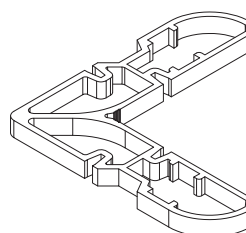
extruded al. joint corner
bracket 24.7 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054472.00	200	MF
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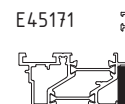
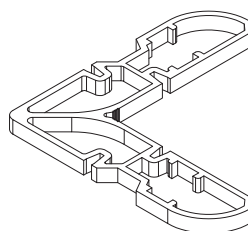
extruded aluminium corner
bracket 6.6 mm



attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054473.00	200	MF

extruded aluminium corner
bracket 4.8 mm

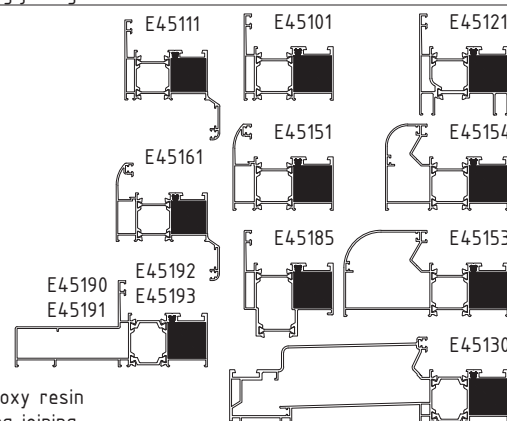
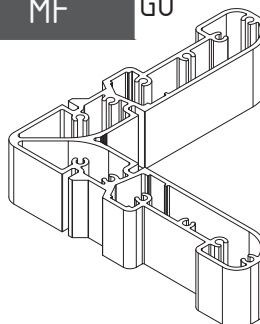


ET 054717.00	70	MF
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extruded al. joint corner
bracket for GU
24.7 mm

attention
always use epoxy resin
for long lasting joining

GU

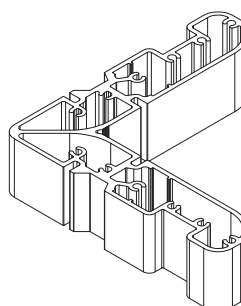


attention
always use epoxy resin
for long lasting joining

ET 054723.00	70	MF
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extruded al. joint corner
bracket for SIEGENIA
24.7 mm

SIEGENIA

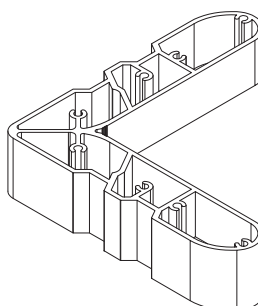


attention
always use epoxy resin
for long lasting joining

ET 054701.00	70	MF
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extruded al. joint corner
bracket for ROTO
24.6 mm

ROTO

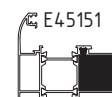
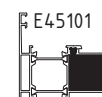
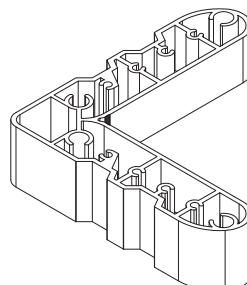


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054652.00	70	MF

MACO

extruded al. joint corner
bracket for MACO
24.6 mm

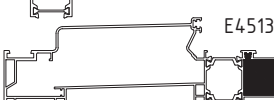
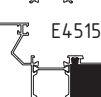
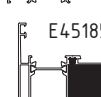
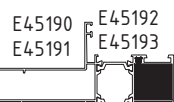
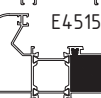
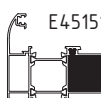
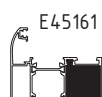
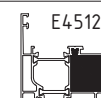
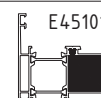
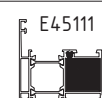
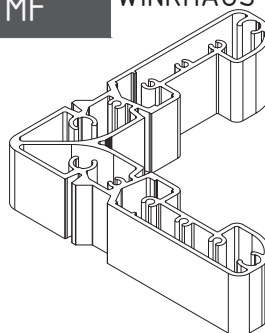


attention
always use epoxy resin
for long lasting joining

ET 054732.00	70	MF
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WINKHAUS

extruded al. joint corner
bracket for WINKHAUS
24.7 mm

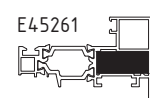
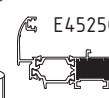
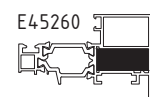
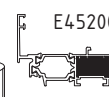
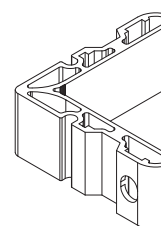
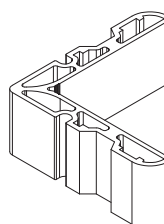


attention
always use epoxy resin
for long lasting joining

ET 054256.00	200	MF
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ET 054254.00	200	MF
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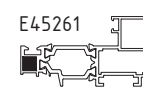
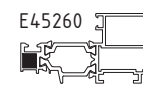
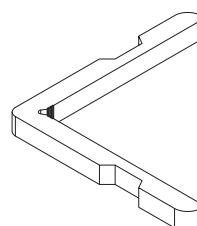
extruded al. joint corner
bracket 25.8 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054651.00	300	MF
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extruded al. joint corner
bracket 6.4 mm

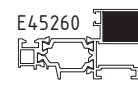
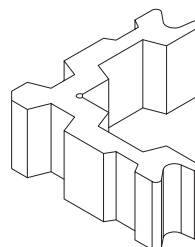


attention
always use epoxy resin
for long lasting joining

A45-15

code/description	package/pcs	colour
ET 054463.00	100	MF

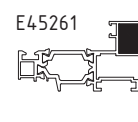
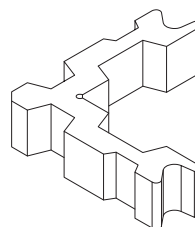
extruded al. joint corner
bracket 22.5 mm



attention
always use epoxy resin
for long lasting joining

ET 054809.00	100	MF
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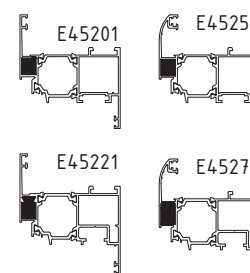
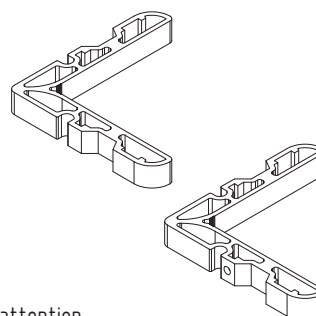
extruded al. joint corner
bracket for E45261



attention
always use epoxy resin
for long lasting joining

ET 054251.00	250	MF
ET 054258.00	250	MF

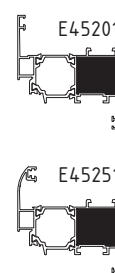
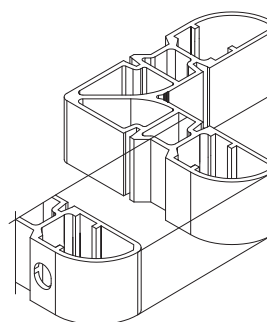
extruded al. joint corner
bracket 9.1 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054306.00	100	MF
ET 054303.00	100	MF

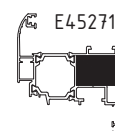
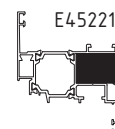
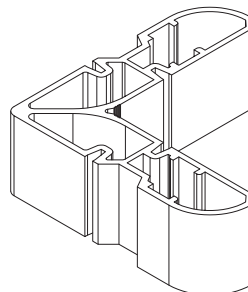
extruded al. joint corner
bracket 25.8 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054551.00	100	MF

extruded al. joint corner
bracket 26.4 mm



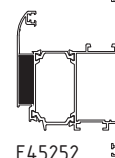
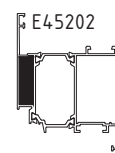
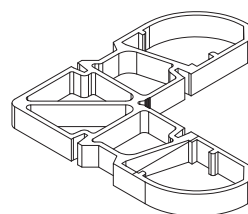
E45190 - E45191
E45192 - E45193



attention
always use epoxy resin
for long lasting joining

ET 054351.00	150	MF
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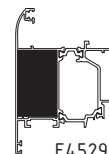
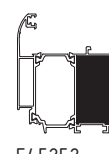
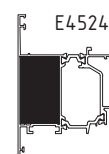
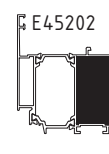
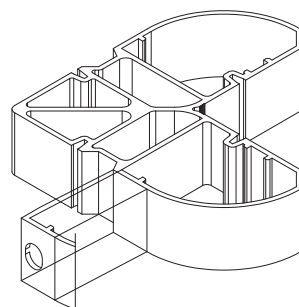
extruded al. joint corner
bracket 9 mm



attention
always use epoxy resin
for long lasting joining

ET 054501.00	50	MF
ET 054500.00	50	MF

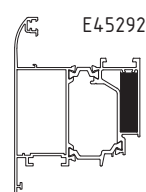
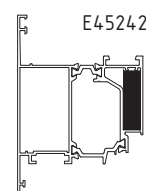
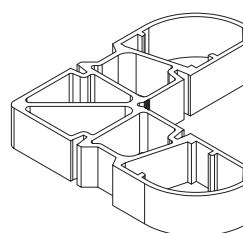
extruded al. joint corner
bracket 25.8 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054448.00	150	MF
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extruded aluminium corner
bracket 8.8 mm

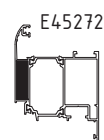
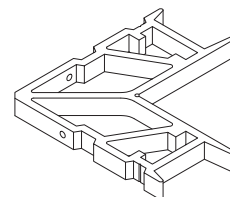
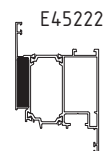
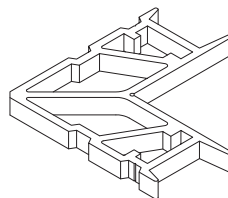


attention
always use epoxy resin
for long lasting joining

A45-17

code/description	package/pcs	colour
ET 054452.00	100	MF
ET 054454.00	100	MF

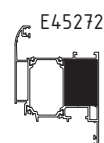
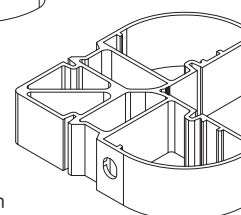
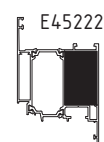
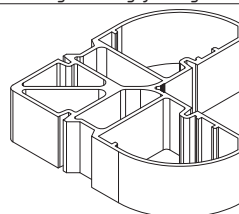
extruded al. joint corner
bracket 9 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054453.00	100	MF
ET 054455.00	100	MF

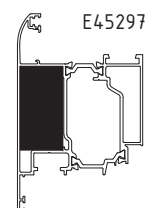
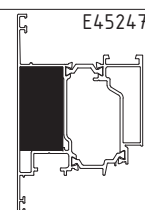
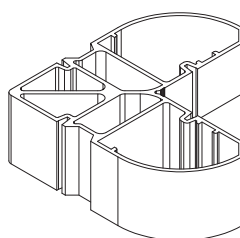
extruded al. joint corner
bracket 26.3 mm
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054449.00	60	MF
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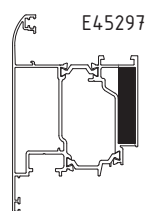
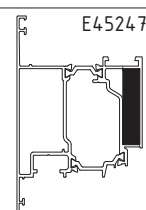
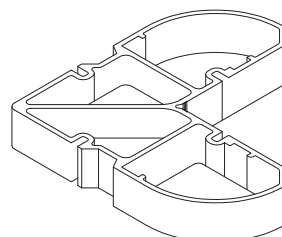
extruded aluminium corner
bracket 22.6 mm



attention
always use epoxy resin
for long lasting joining

ET 054460.00	100	MF
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extruded aluminium corner
bracket 8.8 mm

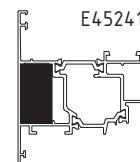
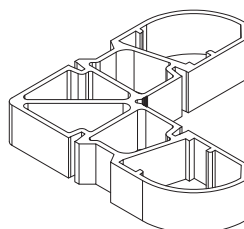


attention
always use epoxy resin
for long lasting joining

A45-18

code/description	package/pcs	colour
ET 054470.00	70	MF

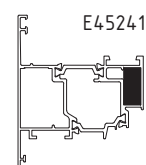
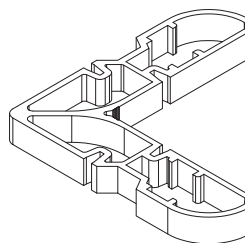
extruded aluminium corner
bracket 16.6 mm



attention
always use epoxy resin
for long lasting joining

ET 054471.00	150	MF
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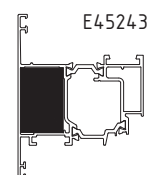
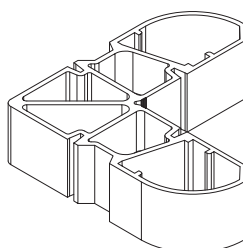
extruded aluminium corner
bracket 8.8 mm



attention
always use epoxy resin
for long lasting joining

ET 054505.00	100	MF
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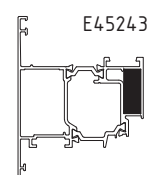
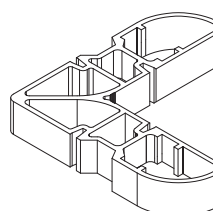
extruded aluminium corner
bracket 22.5 mm



attention
always use epoxy resin
for long lasting joining

ET 054506.00	150	MF
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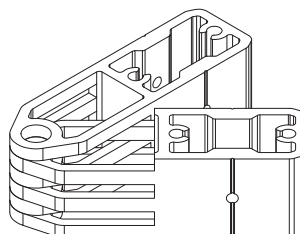
extruded aluminium corner
bracket 8.7 mm



attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054750.00	40	MF

corner bracket for variable
angle 25.9 mm

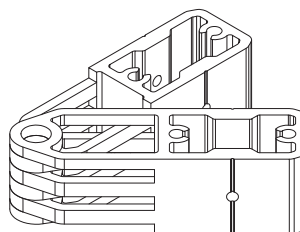


for profiles:
E45201
E45251

ET 054751.00	40	MF
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corner bracket for variable
angle 24.8 mm

attention
always use epoxy resin
for long lasting joining

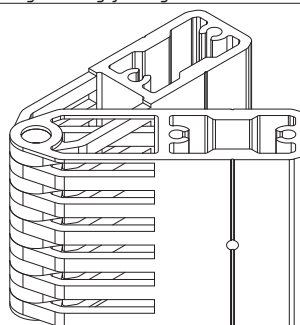


for profiles:
E45101
E45185
E45130
E45151
E45154
E45153
E45301
E45302
E45351
E45340
E45121

attention
always use epoxy resin
for long lasting joining

ET 054753.00	20	MF
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corner bracket for variable
angle 56.2 mm

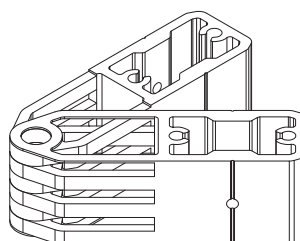


for profiles:
E45153

attention
always use epoxy resin
for long lasting joining

ET 054754.00	30	MF
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corner bracket for variable
angle 28.2 mm

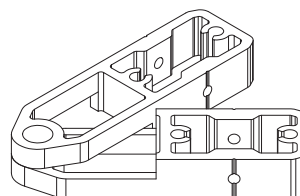


for profiles:
E45154

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054755.00	60	MF

corner bracket for variable
angle 12.8 mm

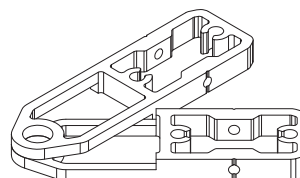


for profiles:
E45340
E45151

attention
always use epoxy resin
for long lasting joining

ET 054756.00	100	MF
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corner bracket for variable
angle 6.9 mm

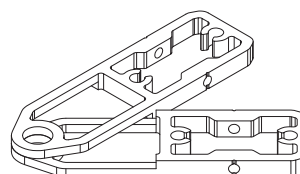


for profiles:
E45351

attention
always use epoxy resin
for long lasting joining

ET 054757.00	100	MF
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corner bracket for variable
angle 5.3 mm

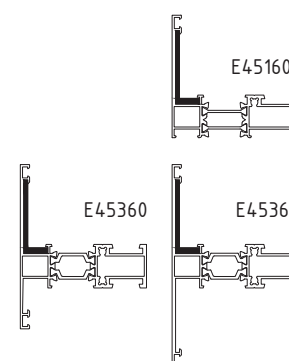


for profiles:
E45101
E45185
E45301

attention
always use epoxy resin
for long lasting joining

ET 991309.00	100	—
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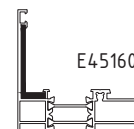
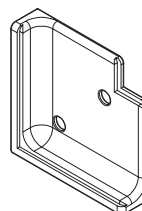
alignment square



A45-21

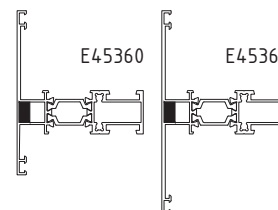
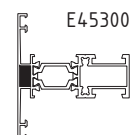
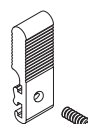
code/description	package/pcs	colour
ET 057708.00	100	●

alignment corner PA6 for
E45 hidden vent



ET 070300.00	100	MF
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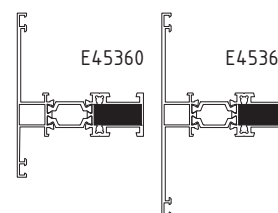
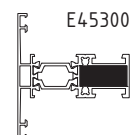
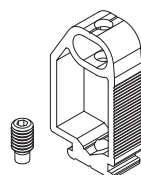
T-bracket 10.5 mm for
mullions/transoms
external side



attention
always use epoxy resin
for long lasting joining

ET 070200.00	100	MF
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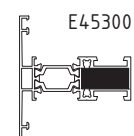
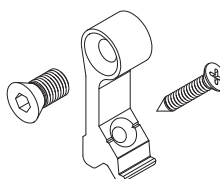
T-bracket 10.5 mm for
mullions/transoms



attention
always use epoxy resin
for long lasting joining

ET 070205.00	10	MF
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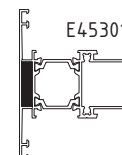
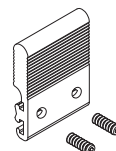
screwing T-bracket 10.5mm
for mullions/transoms



attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070301.00	100	MF

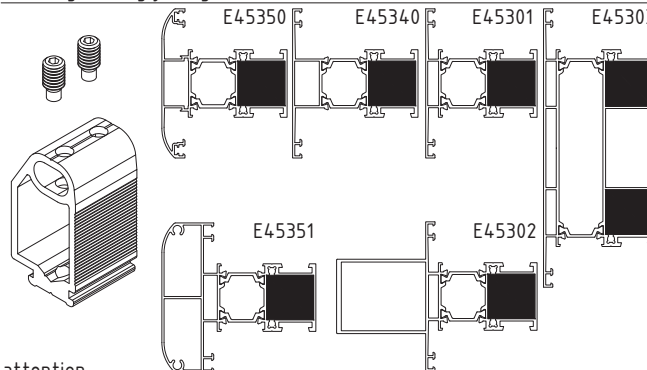
T-bracket 23.5 mm for
mullions/transoms
external side



ET 070201.00	100	MF
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T-bracket 23.5mm for
mullions/transoms

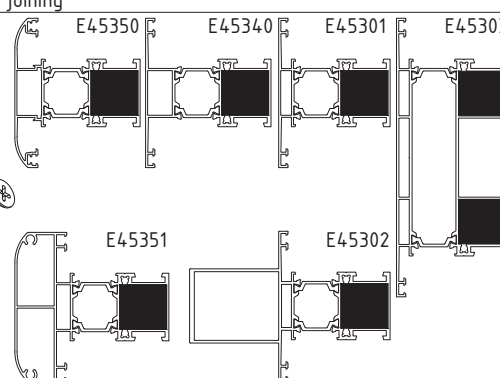
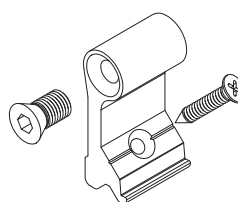
attention
always use epoxy resin
for long lasting joining



attention
always use epoxy resin
for long lasting joining

ET 070206.00	10	MF
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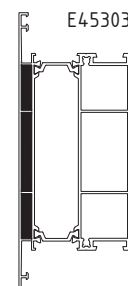
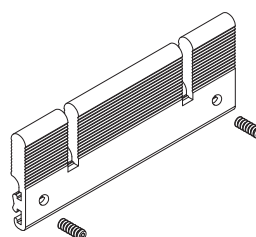
screwing T-bracket 23.5mm
for mullions/transoms



attention
always use epoxy resin
for long lasting joining

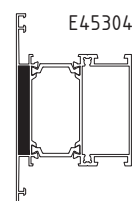
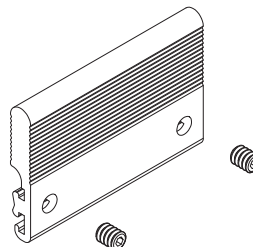
ET 070305.00	50	MF
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T-bracket 93 mm for
mullions/transoms
external side



code/description	package/pcs	colour
ET 070216.00	10	MF

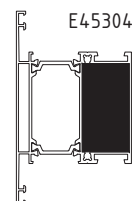
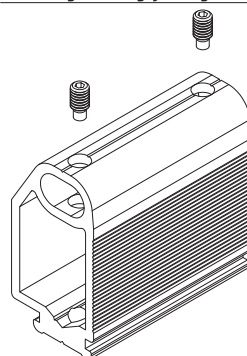
T-bracket 47 mm for
mullions/transoms
external side



attention
always use epoxy resin
for long lasting joining

ET 070215.00	10	MF
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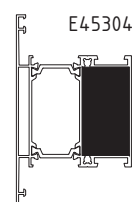
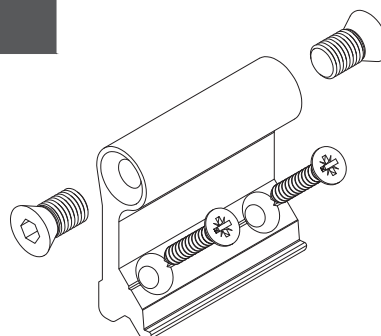
screwing T-bracket 47 mm
for mullions/transoms



attention
always use epoxy resin
for long lasting joining

ET 070311.00	10	MF
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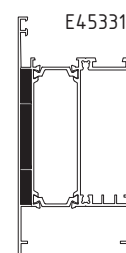
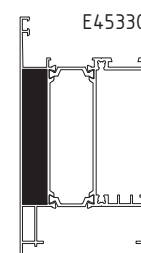
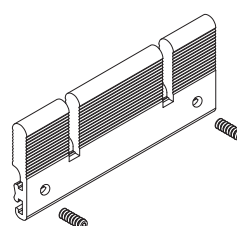
screwing T-bracket 47 mm
for mullions/transoms



attention
always use epoxy resin
for long lasting joining

ET 070302.00	50	MF
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T-bracket 72 mm for
mullions/transoms
external side

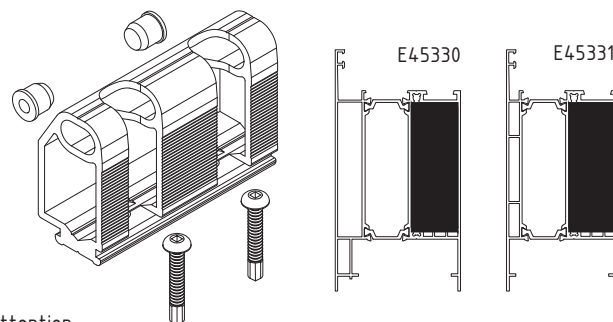


attention
always use epoxy resin
for long lasting joining

A45-24

code/description	package/pcs	colour
ET 070202.00	50	MF

T-bracket 66.8 mm for
mullions/transoms



attention
always use epoxy resin
for long lasting joining

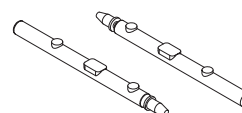
ET 143912.00	100	INOX
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roll pin $\varnothing 9 \times 13$ mm – inox
for ET070202.00



ET 143900.00	100	MF
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roll pin $\varnothing 3 \times 6$ mm
with handle



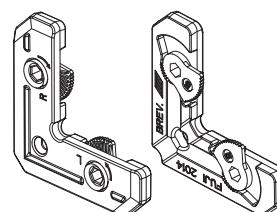
ET 143914.00	100	INOX
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roll pin $\varnothing 4/8 \times 6.5$ mm – inox



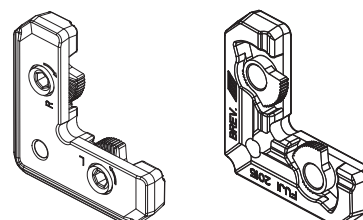
code/description	package/pcs	colour
ET 058001.00	250	MF

alignment square with
locking function for straight
vent profiles and straight
frames



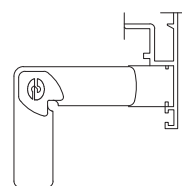
ET 058002.00	250	MF
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alignment square with
locking function for round
vent profiles and round
frames



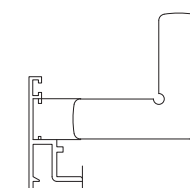
ET 057707.00	100	MF
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alignment square (plastic)
E45271, E45272, E45222,
E45221



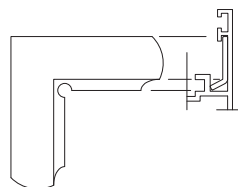
ET 055518	100	INOX
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alignment square
(inox) for
E45271, E45272, E45222



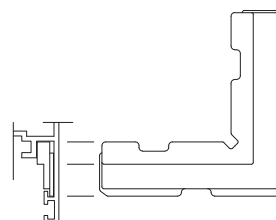
code/description	package/pcs	colour
ET 056603.00	100	INOX

alignment square
(inox) for
E2004, E1000, E45



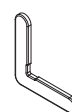
ET 057704.00	100	MF
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alignment square (plastic)
for E1000 E40 E45



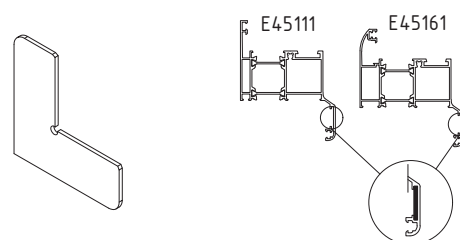
ET 055507.00	200	MF
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alignment square
(galvanized steel) for
E1000, E19, E45 (5x1.25)



ET 055505.00	100	MF
ET 056605.00	100	INOX

alignment square for
E1000, E2004, E45



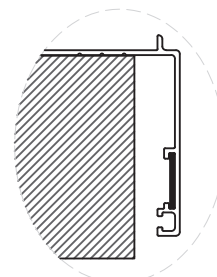
A45-27

code/description	package/pcs	colour
ET 056607.00		INOX
ET 057705.00		Polyamide 6.6

Alignment corner

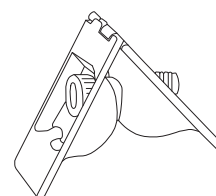


polyamide 6.6

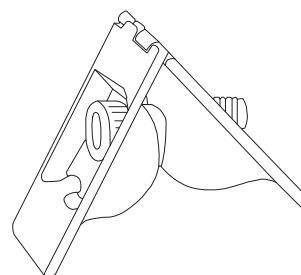


E62032

ET 051101.00	200	MF
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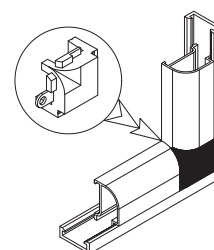
stainless steel joint corner
(small)

ET 051102.00	200	MF
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stainless steel joint corner
(large)

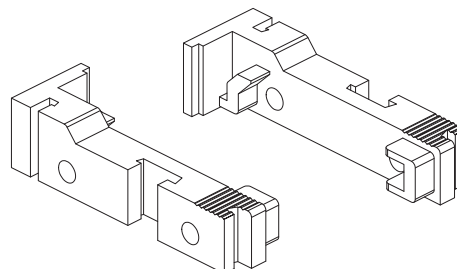
ET 059902.00	25	MF
ET 059902.02	25	●
ET 059902.01	25	●

corner for round bead



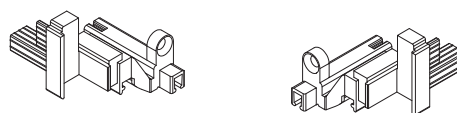
code/description	package/pcs	colour
ET 074946.00		

Pair of plugs for threshold
profiles E45800 & E45801



ET 074653.00	5	●
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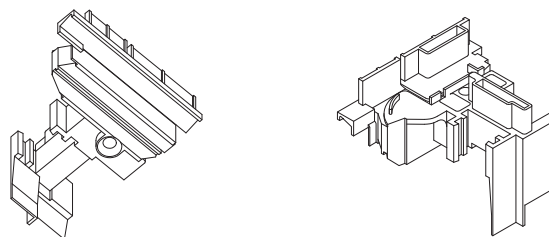
plastic plug for E40813, E45



*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.

ET 074649.00	5	●
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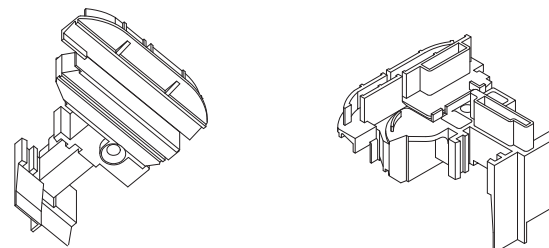
pair of plastic plugs
for straight secondary
vent profile E45500



*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.

ET 074650.00	5	●
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pair of plastic plugs
for round secondary
vent profile E45550



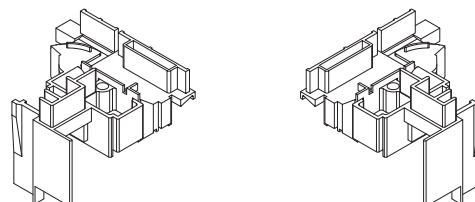
*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.

A45-29

code/description	package/pcs	colour
ET 074651.00	5	●

pair of plastic plugs (flat)
for straight secondary vent
profile E45540
pvc-wood mechanism

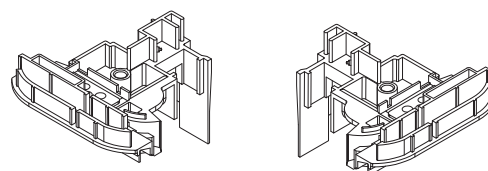
*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.



ET 074662.00	5	●
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pair of plastic plugs (curved)
for round secondary vent
profile E45590
pvc-wood mechanism

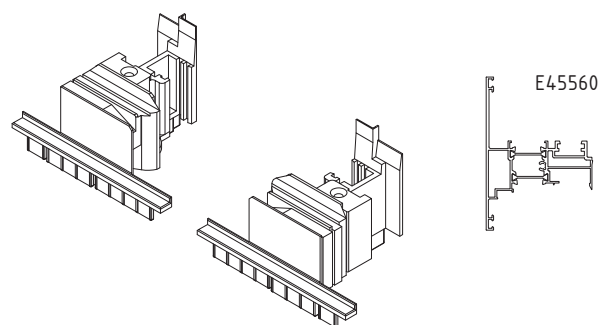
*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.



ET 074556.00	5	●
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pair of plastic plugs for
E45560

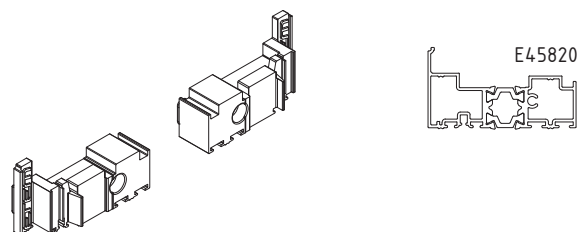
*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.



ET 074924.00	5	●
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plugs (pair) for additional
door bottom profile E45820

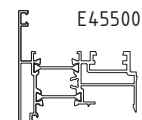
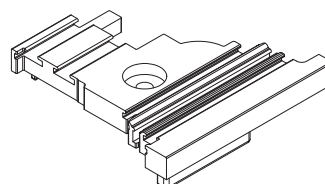
*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.



code/description	package/pcs	colour
ET 074925.00	5	●

plug for door E45500
overhung profile (left-side)

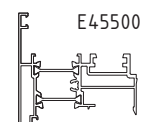
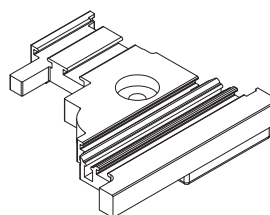
*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.



ET 074926.00	5	●
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plug for door E45500
overhung profile (right-side)

*) application with screw
DIN7982-A2- ϕ 4,2x45mm.
Not included in the set.



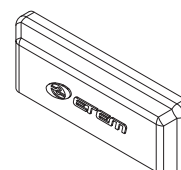
ET 074677.00	100	●
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Plastic plug for E22603



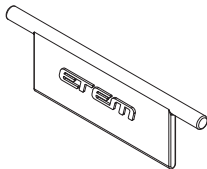
ET 074306.00	200	●
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plastic drainage cap 30x6mm



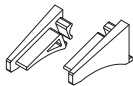
code/description	package/pcs	colour
ET 074307.00	200	●

flap for drainage cap



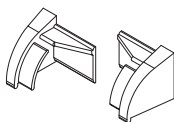
ET 074629.00	200	●
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plastic plug for drip profile
E2357



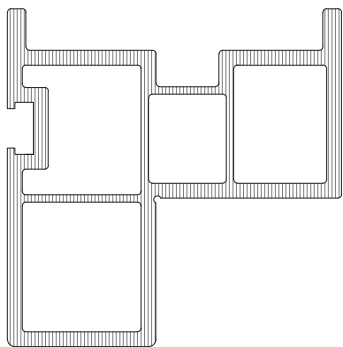
ET 074624.00	200	●
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plastic plug for drip profile
E40820



ET 991280.00	8pcs x 6m	standard
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mounting PVC profile for E45



A45-32

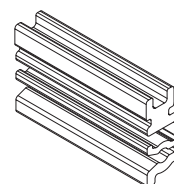
code/description	package/pcs	colour
ET 080543.00	6 m	●

PVC bearing profile for
balcony doors



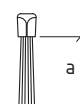
ET 074907.00	100 pcs	●
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PVC accessory "clips"



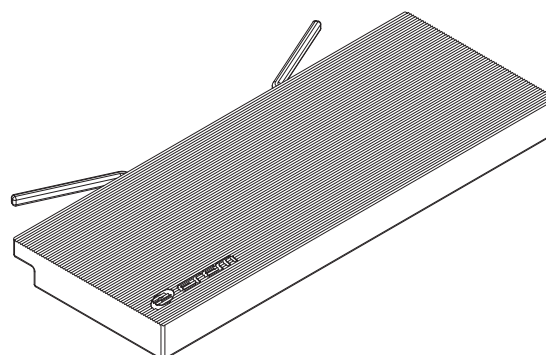
ET 135900.00	200	●
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brush with metallic body
a=12 mm - L=2.2 m



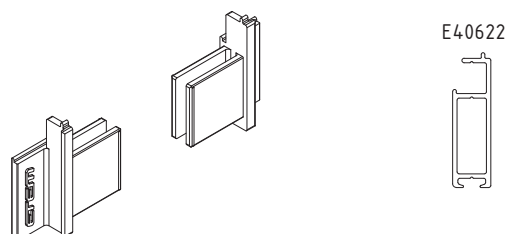
ET 073451.00	100	●
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alignment pad for vent E45



code/description	package/pcs	colour
ET 074232.00	100	●

pair of plastic plugs for
E40622



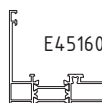
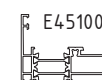
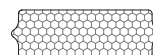
ET 080199.00	6	●
ET 991308.00	6	●

PVC plug for euro groove



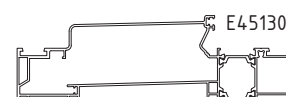
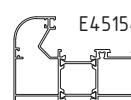
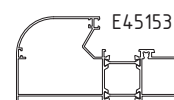
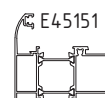
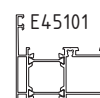
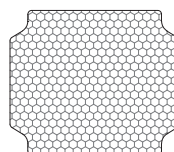
ET 945100.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45100
E45150
E45160 hidden vent



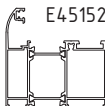
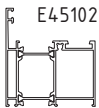
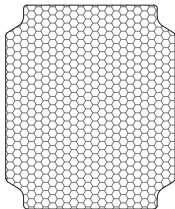
ET 945101.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45101
E45151/E45153
E45130/E45154



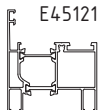
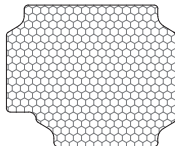
code/description	package/pcs	colour
ET 945102.22	6pcs x 1000mm	●

additional insulator
for profiles:
E45102
E45152



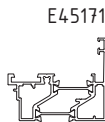
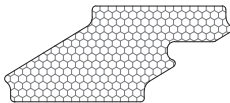
ET 945121.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45121



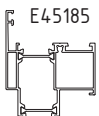
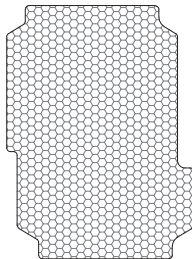
ET 945171.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45171 reverse profile



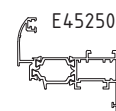
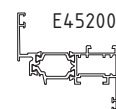
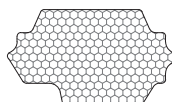
ET 945185.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45185



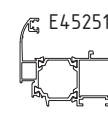
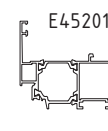
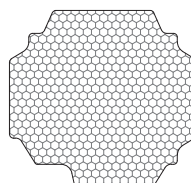
code/description	package/pcs	colour
ET 945200.22	6pcs x 1000mm	●

additional insulator
for profiles:
E45200
E45250



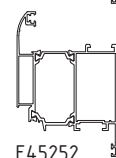
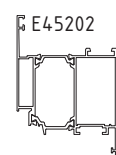
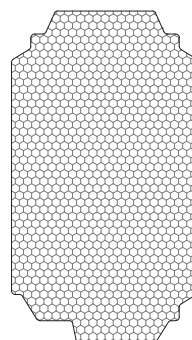
ET 945201.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45201
E45251



ET 945202.22	6pcs x 1000mm	●
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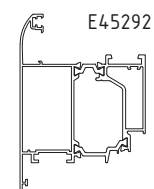
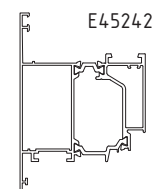
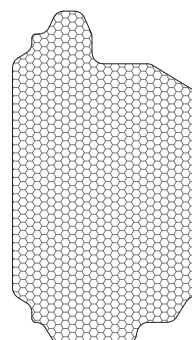
additional insulator
for profiles:
E45202/E45252



E45252

ET 945242.22	6pcs x 1000mm	●
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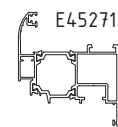
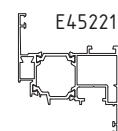
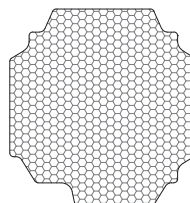
additional insulator
For profiles:
E45242
E45292



E45292

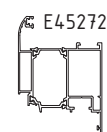
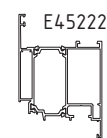
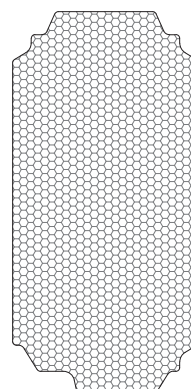
code/description	package/pcs	colour
ET 945271.22	6pcs x 1000mm	●

additional insulator
for profiles:
E45271 PVC
E45221 PVC



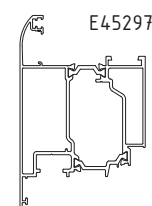
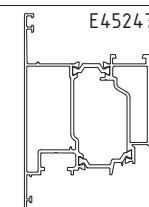
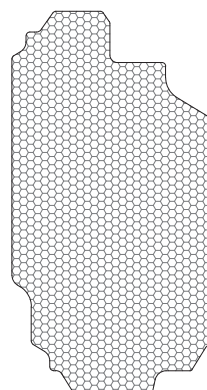
ET 945272.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45272 PVC
E45222 PVC



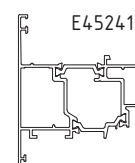
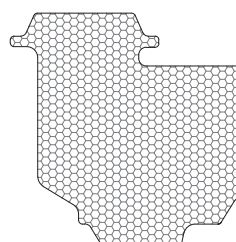
ET 945247.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45247
E45297



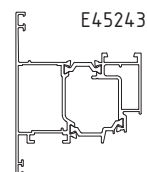
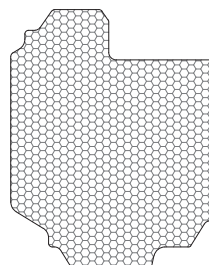
ET 945241.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45241 vent



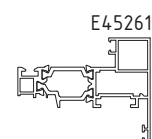
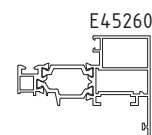
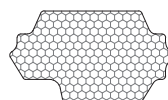
code/description	package/pcs	colour
ET 945243.22	6pcs x 1000mm	●

additional insulator
for profiles:
E45243



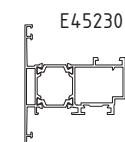
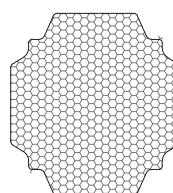
ET 945260.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45260
E45261 hidden vent



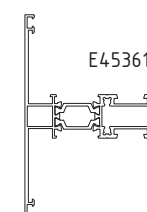
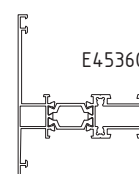
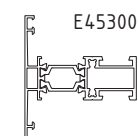
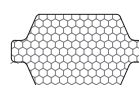
ET 945230.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45230
pivot mechanism



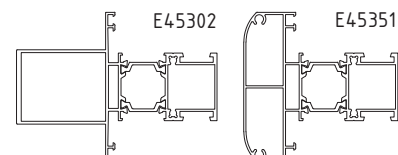
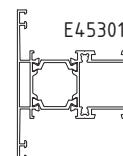
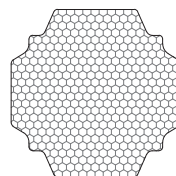
ET 945300.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45300
E45361 hidden vent
E45360 hidden vent



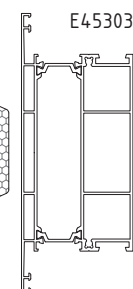
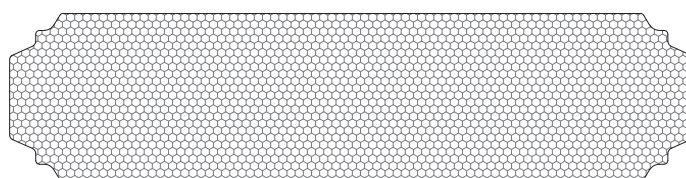
code/description	package/pcs	colour
ET 945301.22	6pcs x 1000mm	●

additional insulator
for profiles:
E45301
E45351
E45302



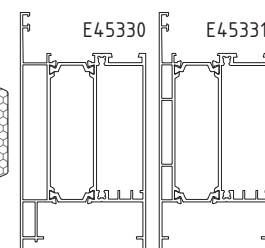
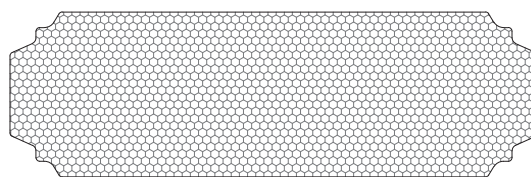
ET 945303.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45303



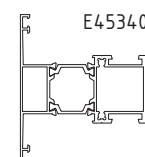
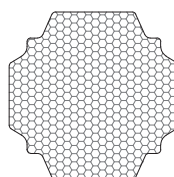
ET 945330.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45330 straight vents
E45331



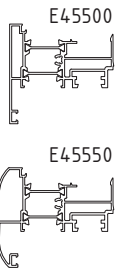
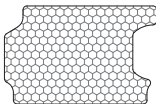
ET 945340.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45340
straight vents



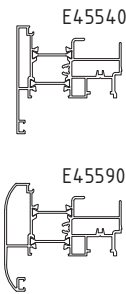
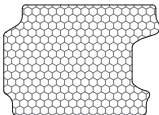
code/description	package/pcs	colour
ET 945500.22	6pcs x 1000mm	●

additional insulator
for profiles:
E45500
E45550



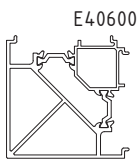
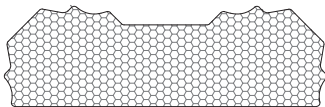
ET 945540.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E45540 PVC
E45590 PVC



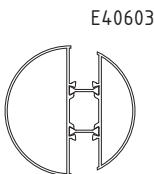
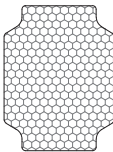
ET 940600.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E40600



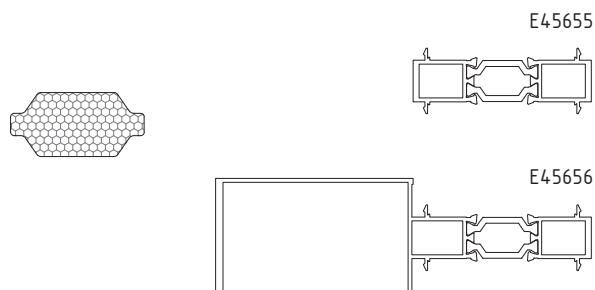
ET 940603.22	6pcs x 1000mm	●
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additional insulator
for profiles:
E40603



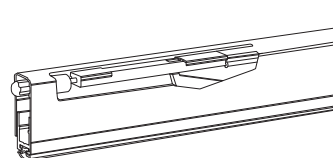
code/description	package/pcs	colour
ET 945655.22	6pcs x 1000mm	●

additional insulator
for profiles:
E45655
E45656



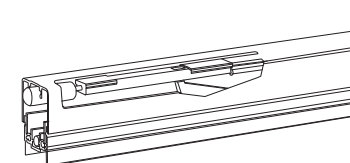
ET 134200.00	1	MF
ET 134201.01	1	MF
ET 134255.00	1	MF

door sealing system internal
- 13 x 28 (14) 1230 , 1030 mm
- 13 x 28 (14) 1030 , 830 mm
- 13 x 28 (14) 830 , 630 mm



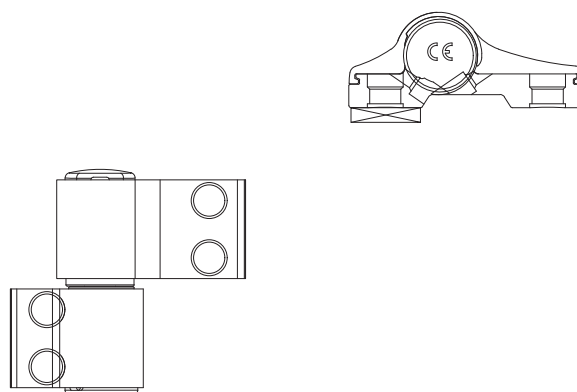
ET 134150.00	1	MF
ET 134151.00	1	MF
ET 134152.00	1	MF
ET 134153.00	1	MF

door sealing system internal
- 15.6 x 28.3 (13) 730 , 830 mm
- 15.6 x 28.3 (13) 830 , 930 mm
- 15.6 x 28.3 (13) 930 , 1030 mm
- 15.6 x 28.3 (13) 1030 , 1130 mm



GI 205036.01	10	●
GI 205036.02	10	●
GI 205036.04	10	●

double hinge for door
Domina - 62,5mm



code/description	package/pcs	colour
GI 205038.00	24	

bolt adjustable spacer
for hinge Domina



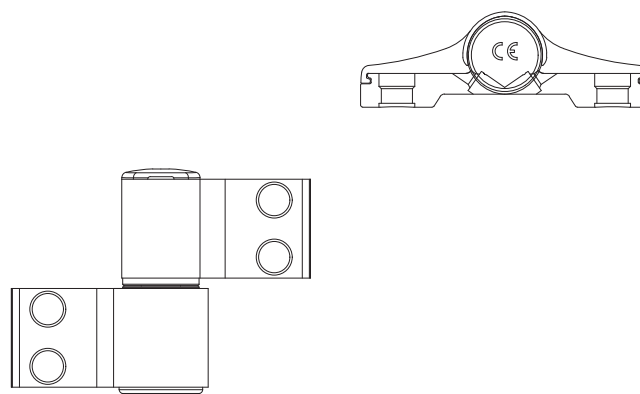
GI 205037.00	24	
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conter plate kit for hinge
Domina



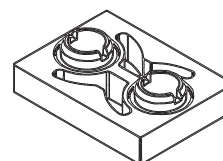
GI 051660.01	-	●
GI 051660.02	-	●
GI 051660.06	-	●

double hinge for flat door
Domina - 84mm



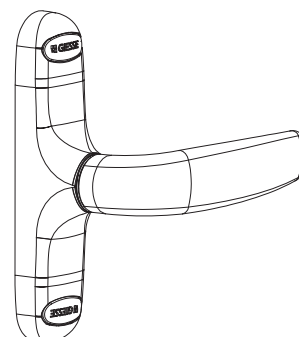
GI 051950.01	-	●
GI 051950.02	-	●
GI 051950.06	-	●

pad for hinge GI051660.**



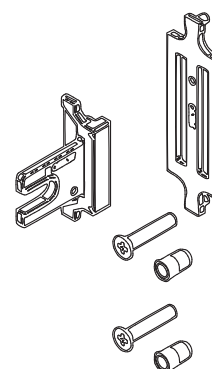
code/description	package/pcs	colour
GI 212701.01	-	●
GI 212701.02	-	●
GI 212701.06	-	●

handle GIESSE outward
opening



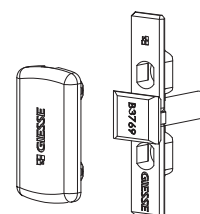
GI 255613.00	---	
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extension for handle
Giesse -55mm



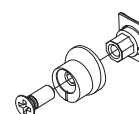
GI 255614.00	---	
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moving element for handle
Giesse -18.5mm



GI 255602.00	1	
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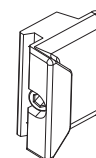
locking pin
2 from 800 to 1800 mm
4 from 1800 to 3000 mm



code/description	package/pcs	colour
ET 991271.00	1	

striker

2 from 800 to 1800 mm
4 from 1800 to 3000 mm



GI 38940.01	1	●
GI 38940.02	1	●
GI 38940.06	1	●
GI 38940.12	1	Brushed BV1

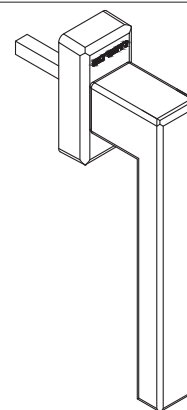
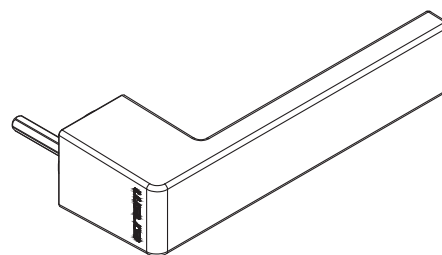
handle NP ULTRA ETEM

ET 271127.02	1	●
ET 271127.11	1	●

handle HOPPE TOULON
(including screws)

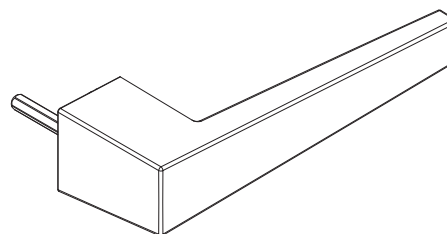
GI 039610.01	10	●
GI 039610.02	10	●
GI 039610.06	10	●

handle NP ULTRA
(rounded)



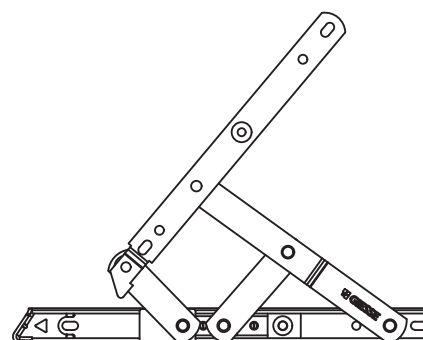
code/description	package/pcs	colour
GI 039600.01	10	●
GI 039600.02	10	●
GI 039600.06	10	●

handle NP ULTRA
(squared)



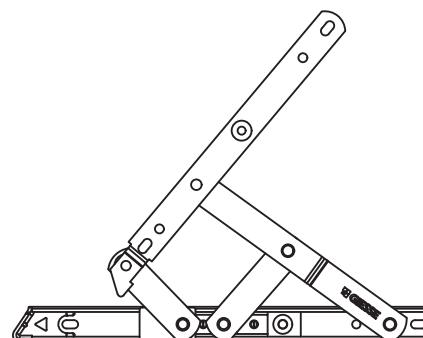
GI 083090.00	1	
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arm GS HD top hung 10"



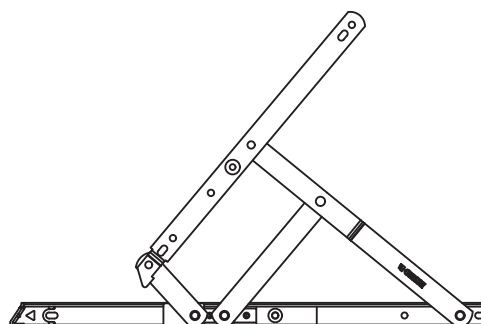
GI 083490.00	1	
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arm GS HD-TS 10"



GI 083500.00	1	
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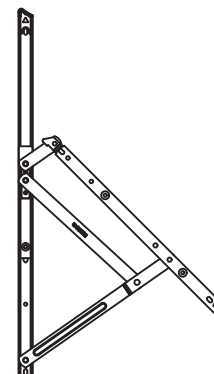
arm GS HD-TS 16"



A45-45

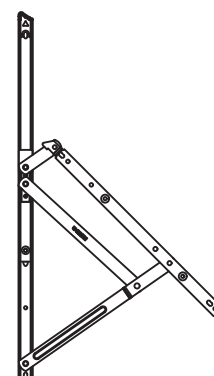
code/description	package/pcs	colour
GI 083510.00	1	

arm GS HD-TS 22"



GI 083520.00	1	
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arm GS HD-TS 28"



ET 995642.00	1	○
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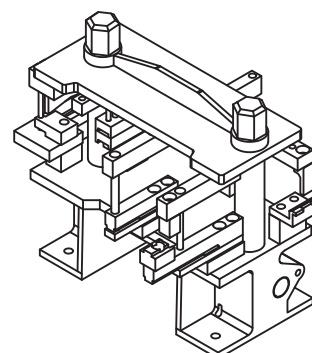
cutter for end milling
machine for E45



ET 991908.00	1	
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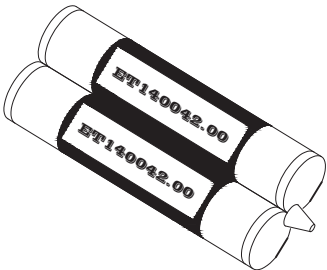
punching machine ETEM

Please note that changes are possible. In case you start with E45, please ask for the last modification of the punching machine.



code/description	package/pcs	colour
ET 140042.00	1	–

adhesive for corner brackets
ETEM 600ml



ET 140044.00	1	–
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pistol



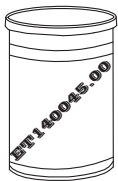
ET 140043.00	1	–
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mixer



ET 140045.00	1	–
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primer super bond 30ml



code/description	package/pcs	colour
ET 730035.00	1	-



Vario protect

ET 750016.00	1	-
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cleaner for Vario protect
1 l.

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CE MARKING

STANDARDS / PERFORMANCE CHARACTERISTICS

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:

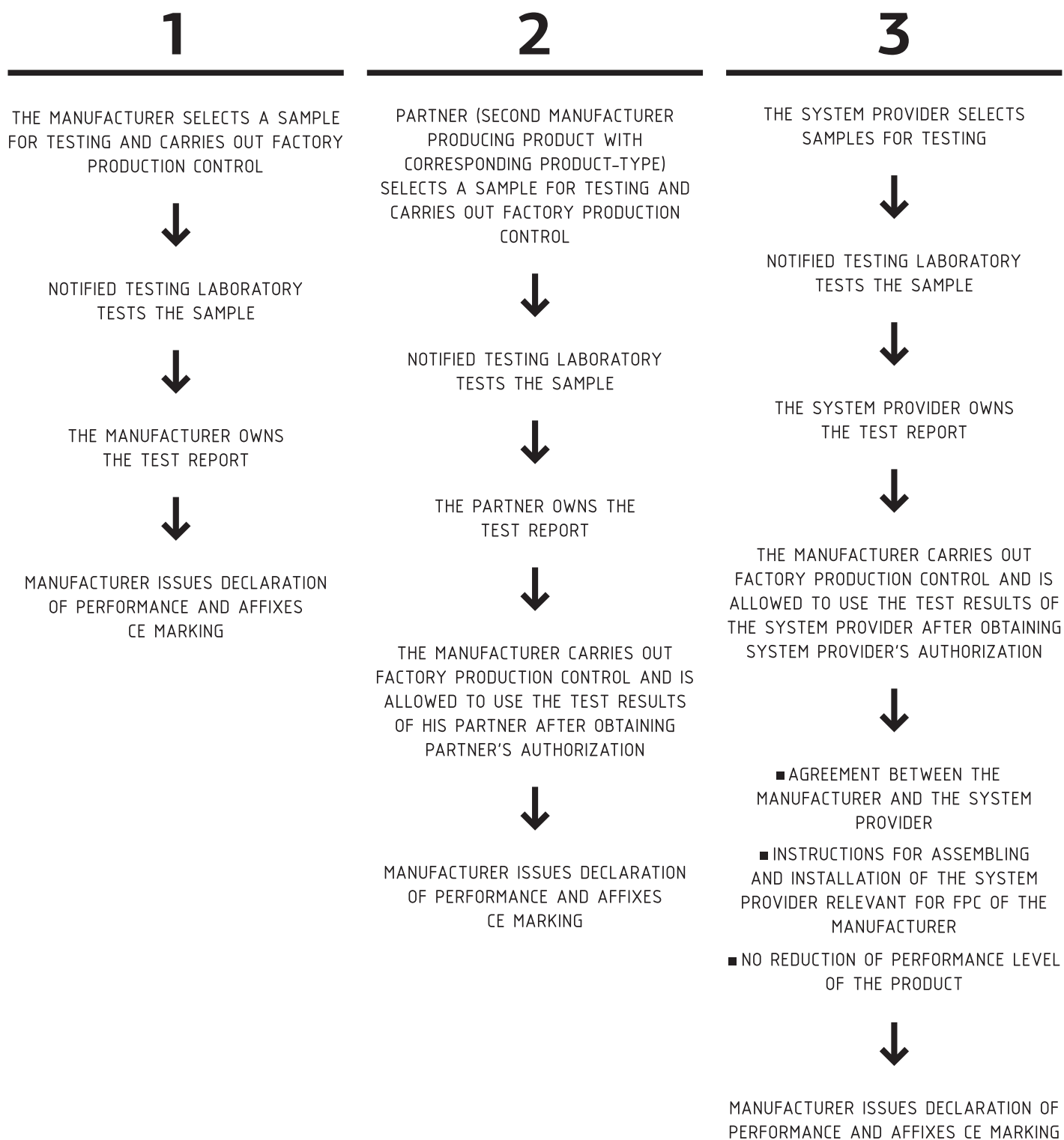
Tasks to be performed by the manufacturer	Tasks to be performed by Notified testing laboratory	Conformity assessment (the basis for CE marking, which is set by the final producer)
factory production control - FPC	Determination of the product type on the basis of type testing, type calculation, tabulated 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.



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



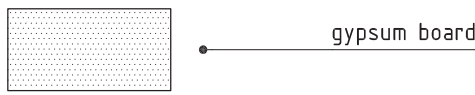
butyl seal



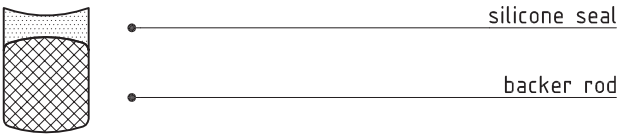
PVC



membrane



gypsum board



silicone seal

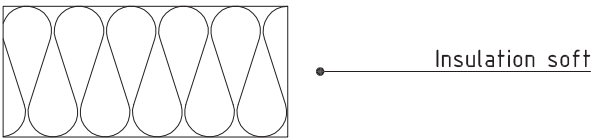
backer rod



silicone seal



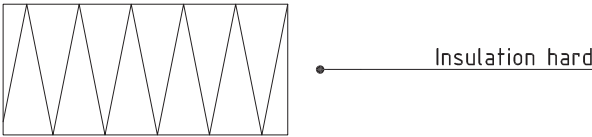
PVC spacer



Insulation soft



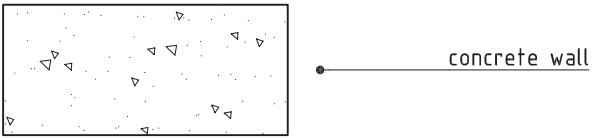
etalbond



Insulation hard



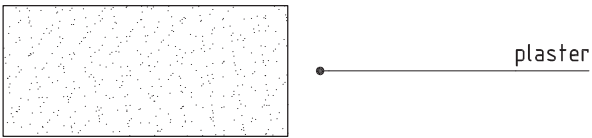
sheet aluminium



concrete wall



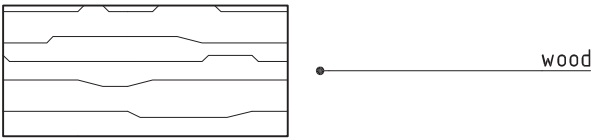
glass



plaster



aluminium profile



wood



steel

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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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