TECHNICAL CATALOGUE

OPENING WINDOW AND DOOR SYSTEM WITH THERMAL BREAK

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

ETEM

ETEM HISTORY

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

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

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

SERVICES WE PROVIDE

ETEM supports you with the following:

▷ design of conventional and bespoke architectural system solutions

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

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

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

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

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

▷ production of non-standard length profiles and non-standard processing high quality powder coating

ETEM PRODUCTS AND SUSTAINABLE DEVELOPMENT

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

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

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

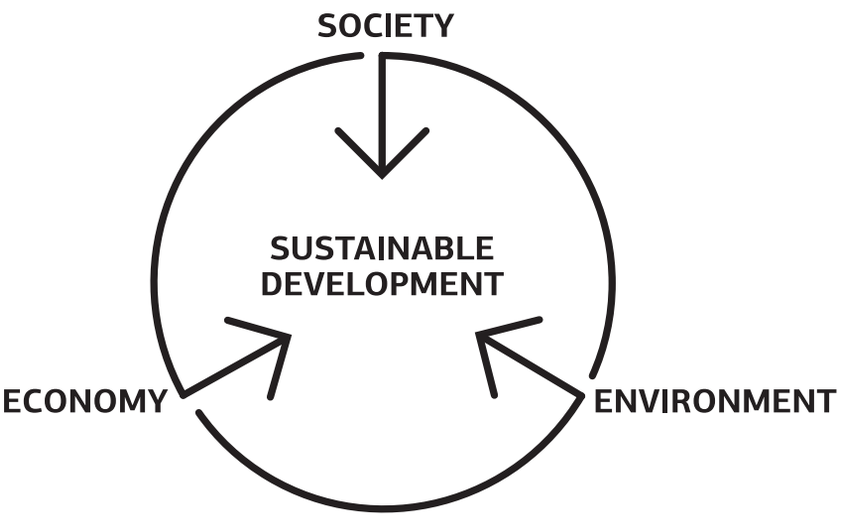
For us meeting this objective translates into the challenge of satisfying market demands at the lowest economic, social and environmental cost possible.

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

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

As a moderator between outside and inside our systems provide:

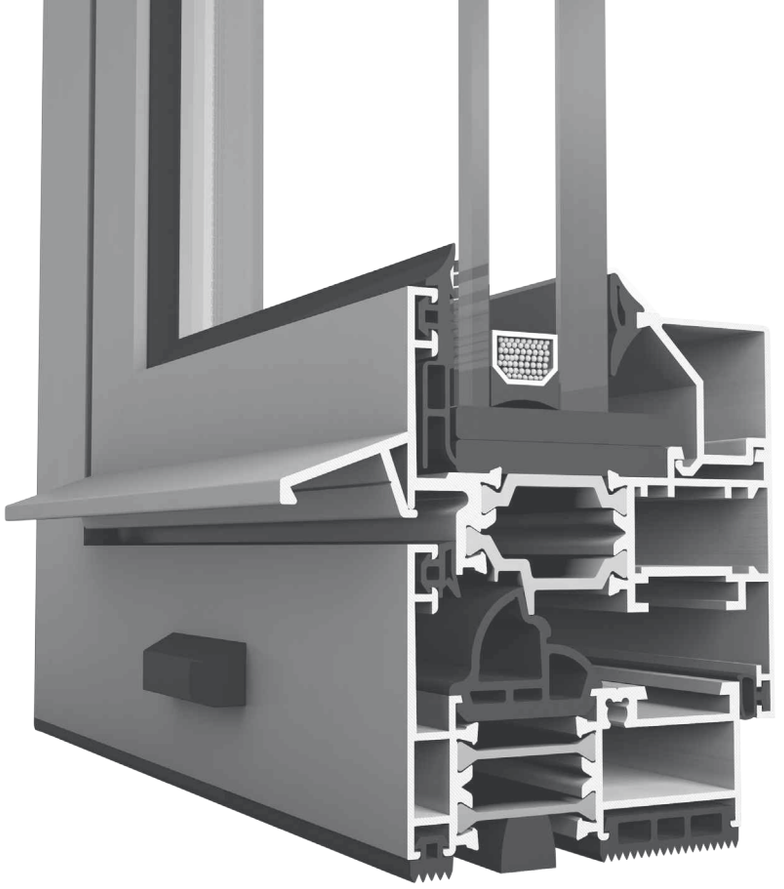
› ENERGY EFFICIENCY
› DAYLIGHT
› SUN-SHADING
› VENTILATION AND GOOD AIR QUALITY
› SAFETY AND SECURITY



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

GENERAL INFORMATION

CONCEPT / ADVANTAGES / CERTIFICATES



E40 CONCEPT

E40 IS AN ENERGY CONSERVATION SYSTEM FOR OPENING WINDOWS AND DOORS.

- Effective and affordable solutions for all types of constructions
- Wide range of profiles and design flexibility of both straight line and round contours
- Aesthetics, functionality and durability
- Sound insulation, sealing and thermal insulation
- Capability of powder coating in any RAL colour, special woodgrain, patterns and other surfaces
- Opening parts- opening at vertical axis, tilt&turn, opening at top or bottom horizontal axes, folding doors, parallel sliding
- Reliable pivot mechanism
- Window sashes for PVC hardware enables multiple locks, hinges adjustment and fast mounting
- Mechanism for smoke proof doors according to safety regulations
- Double glazing from 18 up to 32 mm

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 E40

Characteristic	**Classification / value**	**Standard**
Air permeability	Up to class 4	EN 1026 / EN 12207
Watertightness	Up to class E1050	EN 1027 / EN 12208
Resistance to wind load	Up to class C5	EN 12211 / EN 12210
Thermal transmittance	from 2.8 W/m^2K	EN 12412-2 / EN ISO 10077-2
Acoustic performance	Up to 41 dB	EN ISO 717-1

CLASSIFICATION OF CHARACTERISTICS

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

Characteristic / value / dimension	Classification / Value										
Resistance to wind load Test pressure P1 (Pa)	npd	1 (400)		2 (800)		3 (1200)		4 (1600)		5 (2000)	Exxxx (>2000)
Resistance to wind load Frame deflection	npd	A (≤1/150)				B (≤1/200)				C (≤1/300)	
Resistance to snow and permanent load	npd	Declared information on the infill (e.g. type and thickness of glass)									
Reaction to fire	npd	F		E		D		C		B	A2	A1
External fire performance	npd	According to EN 13501-5									
Watertightness Non-shielded (A) Test pressure (Pa)		1A (0)	2A (50)	3A (100)	4A (150)	5A (200)	6A (250)	7A (300)	8A (450)	9A (600)	Exxxx (>600)
Watertightness Shielded (B) Test pressure (Pa)	npd	1B (0)		2B (50)		3B (100)		4B (150)	5B (200)	6B (250)	7B (300)
Dangerous substances	npd	As required by regulations									
Impact resistance Drop height (mm)	npd	200		300		450		700		950	
Load-bearing capacity of safety devices	npd[a]	Threshold value									
Acoustic performance Sound insulation R_w ($C;C_{tr}$) (dB)	npd	Declared values									
Thermal transmittance U_w ($W/(m^2.K)$)	npd	Declared values									
Radiation properties Solar factor (g)	npd	Declared values									
Radiation properties Light transmittance (τv)	npd	Declared values									
Air permeability Max. test pressure (Pa) Reference air permeability at 100 Pa ($m^3/(h \cdot m^2)$) or $m^3/(h \cdot m)$)	npd	1 (150) (50 or 12,50)			2 (300) (27 or 6,75)			3 (600) (9 or 2,25)		4 (600) (3 or 0,75)	
Operating forces[b]	npd	1						2			
Mechanical strength	npd	1			2			3		4	
Ventilation Air flow exponent n Air flow characteristic K Air flow rates	npd	Declared values									
Bullet resistance	npd	FB1	FB2		FB3	FB4		FB5	FB6	FB7	FSG
Explosion resistance Shock tube	npd	EPR1			EPR2			EPR3		EPR4	
Explosion resistance Range test	npd	EXR1			EXR2		EXR3		EXR4	EXR5	
Resistance to repeated opening and closing Number of cycles	npd	5000				10 000			20 000		
Behaviour between different climates	npd	Under development									
Burglar resistance	npd	1		2		3		4		5	6

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

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

[b] Manually operated windows only

BUILDING PHYSICS

DIMENSIONING / FORMULAS / EXAMPLES

ALUMINIUM AS MATERIAL

ALUMINIUM IS A VERY YOUNG METAL, EXTRACTED FOR THE FIRST TIME IN 1854. COMMERCIALLY PRODUCED AS A PRECIOUS METAL FROM 1886, ITS INDUSTRIAL PRODUCTION FOR CIVIL APPLICATIONS ONLY ACHIEVED WIDE USE IN THE 1950'S.

NOW ALUMINIUM PLAYS A KEY ROLE FOR THE SUSTAINABILITY OF NEW BUILDINGS AND THE RENOVATION OF EXISTING ONES. THANKS TO ITS PERFORMANCE PROPERTIES ALUMINIUM CONTRIBUTES TO THE ENERGY PERFORMANCE, SAFETY AND COMFORT OF NEW BUILDINGS.

ADVANTAGES

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

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

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

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

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

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

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

ALLOYS

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

ETEM profiles are extruded from the following alloys:
EN AW-1050 [Al 99.5]
EN AW-6060 [Al Mg Si]
EN AW-6063 [Al Mg0,7 Si]
EN AW-6061 [Al Mg1 Si Cu]
EN AW-6005 [Al Si Mg]
EN AW-6082 [Al Si1 Mg Mn]

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

MATERIAL PROPERTIES	
Aluminium alloy	EN AW 6063 F22
Ultimate tensile strength	Rm = 210 N/mm^2
Yield strength	R_{p02} = 160 N/mm^2
Modulus of elasticity	Eal=70 000 N/mm^2 = 7.10^9 kg/m^2
Coefficient of thermal expansion	α=0,0023 mm/m .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 aluminium surface, increasing hardness, corrosion and abrasion resistance. Anodizing gives a very decorative silver matt surface finish, and colored can also be obtained by sealing metallic dyes into the anodized layer.

MAINTENANCE

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

RECYCLING

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

WIND LOAD

Wind action

The main influence over the facade is wind action, which depends mainly on the heigh of the curtain wall and location.

As a guideline, the wind pressure values with respect to the structure height are given in the table below:

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

where:

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

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

UNITS CONVERTER

1 m = 100 cm = 1000 mm

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

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

MULLION SELECTION

*Wind load actions:

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

a) triangle load

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

or

b) trapezoid load

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

Use the same method to calculate I_{yd}

Total of required moment of inertia:
$I_y = I_{yc} + I_{yd}$, 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
c,d – Distance between mullions, m

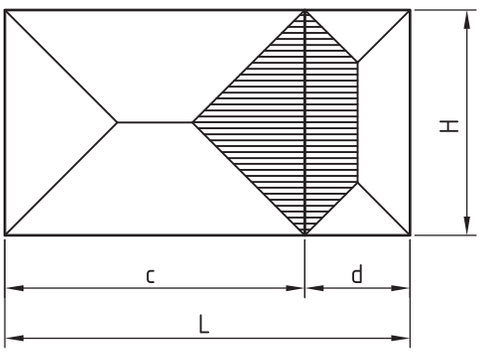
Maximum transom deflection f_{max} by wind load:

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

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 m w = 60 kg/m^2
c = 2,4 m E_{al} = 7.10^9 kg/m^2
d = 0,8 m

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

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

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

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

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

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

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

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

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

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

Use ETEM Catalogue to choose the appropriate mullion with
$I_y \ge 25,74\ cm^4$
We choose mullion E40351 with $I_x = 28,62\ cm^4$
and $I_y = 33,38\ cm^4$

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/m^2/mm
l_g – Horizontal dimension of the glass pane, m
h_g – Vertical dimension of the glass pane, m

*Transom self weight:

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

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

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

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

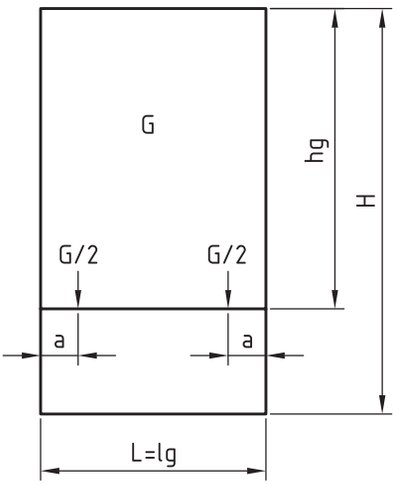
Maximum transom deflection f max by dead load:

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

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

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

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



Initial data:

t = 12 mm	E_{al} = 7.10^9 kg/m^2
l_g = 1,5 m	ϱ_{glass} = 2,5 kg/m^2/mm
h_g = 2,0 m	q = 2 kg/m
a = 0,15 m	

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

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

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

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

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

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

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

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

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

Use ETEM Catalogue to choose the appropriate transom with
$I_x \geq 8{,}06$ cm^4
We choose transom E40301 with $I_x = 13{,}26$ cm^4
and $I_y = 14{,}22$ 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

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

or

b) trapezoid load

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

Use the same method to calculate I_{xb}

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

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

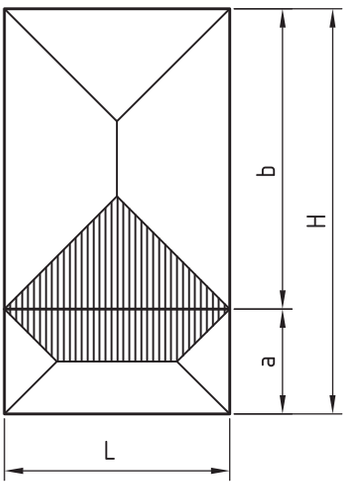
Maximum transom deflection f_{max} by wind load:

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

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

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

Example:



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

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

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

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

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

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

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

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

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

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

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

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

Use ETEM Catalogue to choose the appropriate mullion with $I_y \geq 6,03$ cm^4
We choose mullion E40301 with $I_x = 13,26$ cm^4
and $I_y = 14,22$ cm^4

CALCULATION OF GLASS PANE THICKNESS

*Glazing thickness:

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

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

or

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

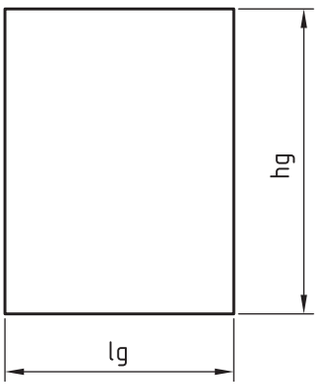
Where:
t – Minimum theoretical glass thickness, mm
w – Wind pressure, kg/m^2
l_g – The smallest dimension of the glass pane, m
h_g – The largest dimension of the glass pane, m

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

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

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

Example:



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

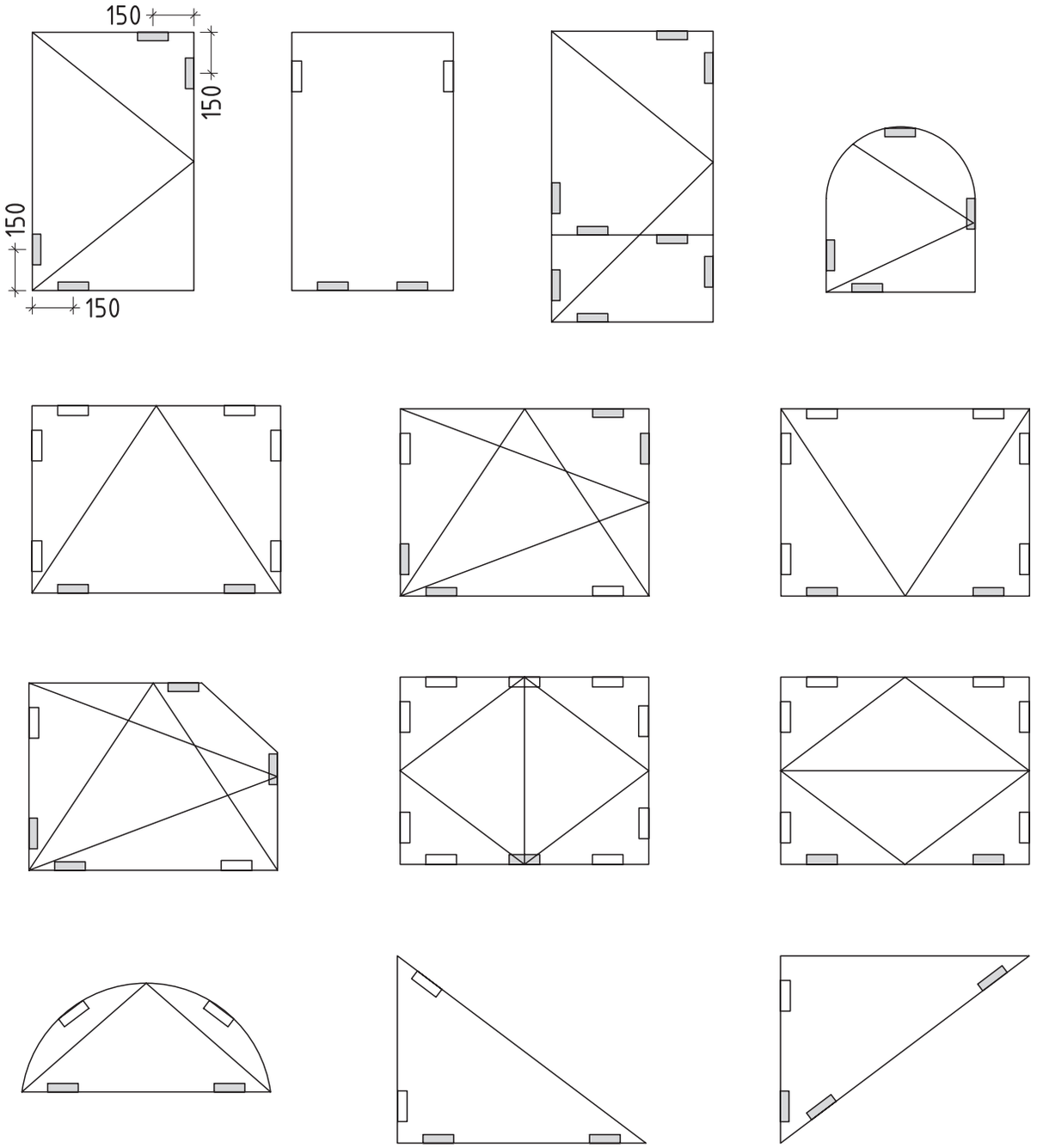
$$\frac{h_g}{l_g} = \frac{2}{1,5} = 1,33 \leq 3$$

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

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

We choose double glazing 5/14/5

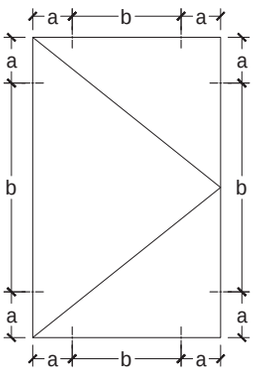
GLAZING SHIMS



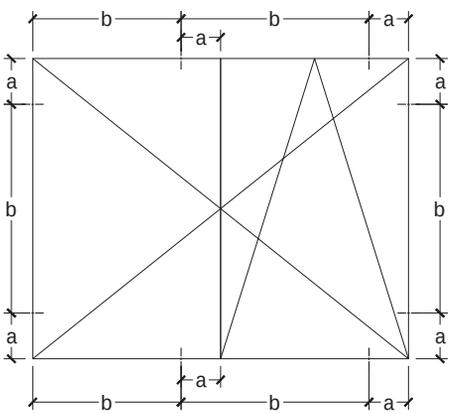
- main glazing shim
- positioning shim

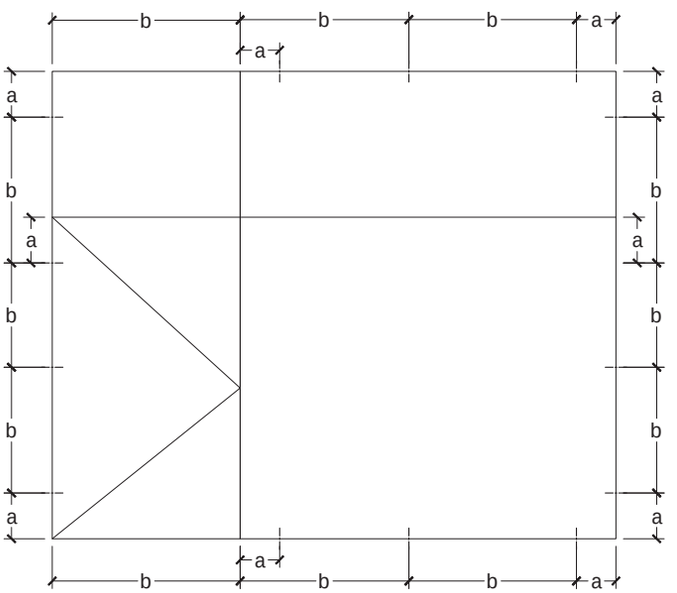
Note:
Main glazing shims should be positioned on 150 mm distance from the glazing edge.
Positioning shims do not have exactly defined position.

POSITION OF ANCHORS



a = 150 ÷ 200 mm
b ≤ 800 mm



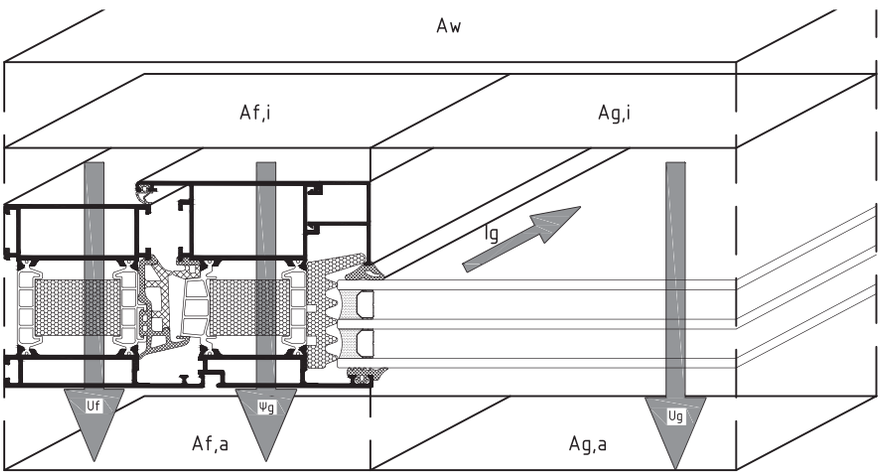


METHOD FOR CALCULATION OF THERMAL TRANSMITTANCE ACCORDING to EN ISO 10077-2

$$Uw = \frac{Ag \times Ug + Af \times Uf + lg \times \Psi g}{Ag + Af} \qquad (1)$$

Uw - thermal transmittance coefficient of the whole structure
Ug - glass thermal transmittance coefficient
Uf - thermal transmittance coefficient of the aluminium frame (frame and sash)
Ψg - spacer linear thermal transmittance
lg - total length of the spacer
Ag - glass area
Af - aluminium frame area (frame and sash)

Uw - is calculated by formula (1)
Ug - is given by the glass manufacturer
Uf - is given by the manufacturer of the aluminium profiles

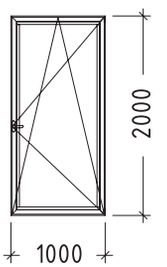


EXAMPLE FOR CALCULATING THERMAL TRANSMITTANCE COEFFICIENT

frame: E40	Uf	2.8	W/(m²K)
spacer: warm edge	Ψg	0.051	W/(mK)
glass: triple glazing	Ug	1.00	W/(m²K)

window width:	1.00 m
window height:	2.00 m
lenght of glass edge lg:	4.89 m

A_g = 1.3 m²; A_f = 0.7 m²



$$Uw = \frac{1.3 \times 1 + 0.7 \times 2.8 + 5 + 0.051}{1.3 + 0.7}$$

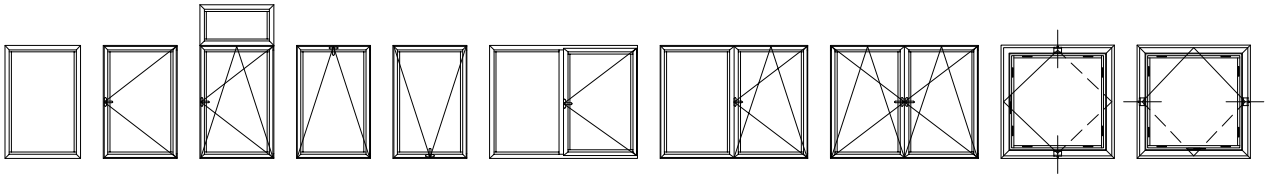
Uw ≈ 1.75 W/(m²K)

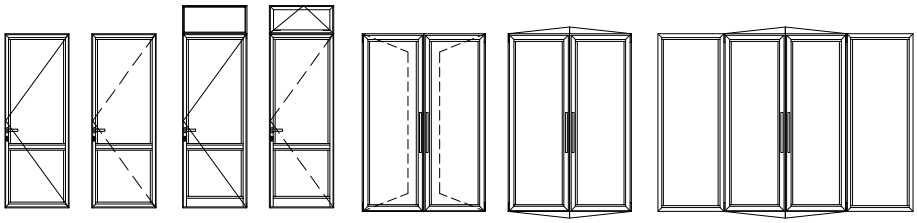
TABLES

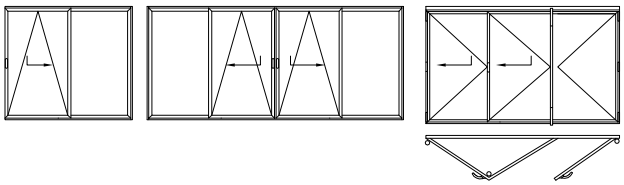
TYPOLOGIES / LIST OF PROFILES / CHARACTERISTICS

opening system with thermal break

E40

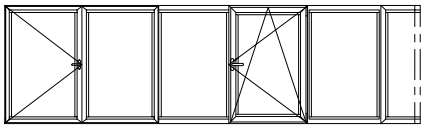




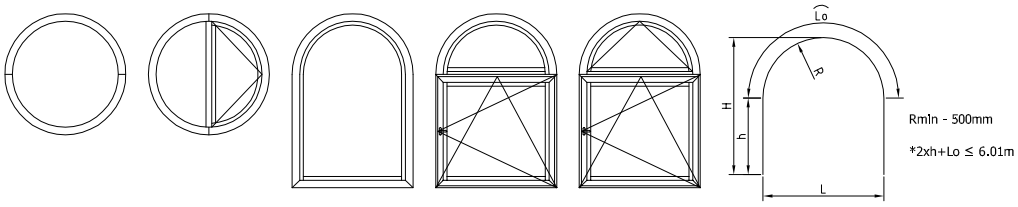


opening schemes:

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



Hidden vent



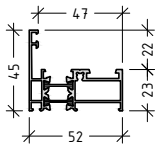
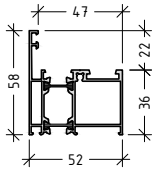
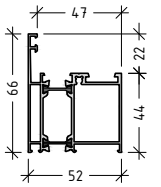
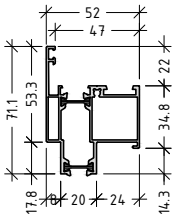
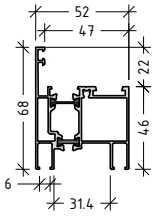
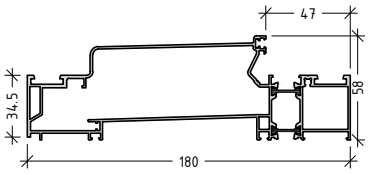
Rmin - 500mm

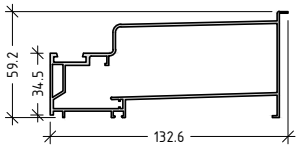
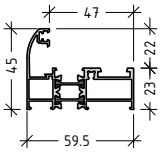
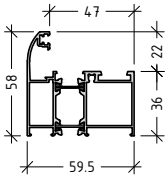
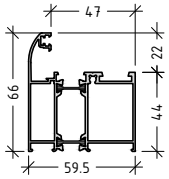
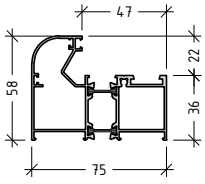
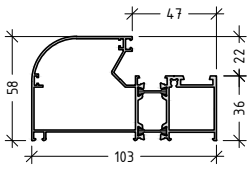
*2xh+Lo ≤ 6.01m

G4.0-01

opening system with thermal break

E40

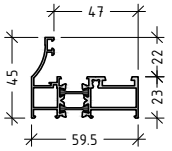
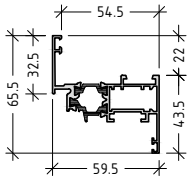
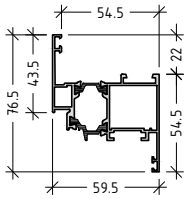
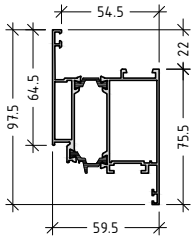
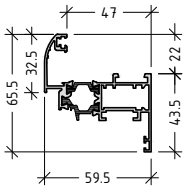
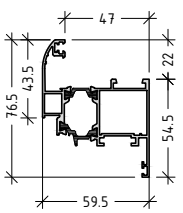
code	profile	weight length moment of inertia
E40100		913 g/m L=6.01 m Ix=3.37 cm^4 Iy=9.46 cm^4
E40101		1094 g/m L=6.01 m Ix=7.96 cm^4 Iy=11.86 cm^4
E40102		1205 g/m L=6.01 m Ix=12.32 cm^4 Iy=13.33 cm^4
E40185		972 g/m L=6.01 m Ix=13.09 cm^4 Iy=12.11 cm^4
E40121		1276 g/m L=6.01 m Ix=11.62 cm^4 Iy=14.44 cm^4
E40130		2500 g/m L=6.01 m Ix=26.24 cm^4 Iy=307.81 cm^4

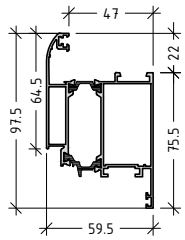
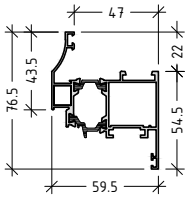
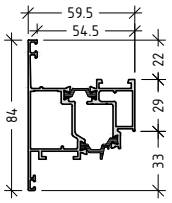
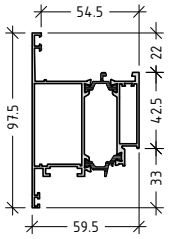
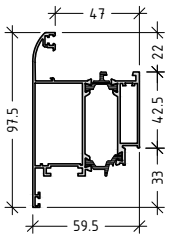
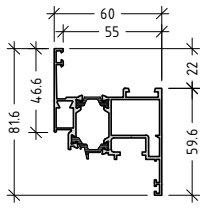
code	profile	weight length moment of inertia
E40135		1627 g/m L=6.01 m Ix=20 cm^4 Iy=117.58 cm^4
E40150		1001 g/m L=6.01 m Ix=4.36 cm^4 Iy=12.65 cm^4
E40151		1183 g/m L=6.01 m Ix=9.66 cm^4 Iy=15.56 cm^4
E40152		1294 g/m L=6.01 m Ix=14.58 cm^4 Iy=17.34 cm^4
E40154		1350 g/m L=6.01 m Ix=12.92 cm^4 Iy=26.29 cm^4
E40153		1513 g/m L=6.01 m Ix=17.25 cm^4 Iy=55.97 cm^4

L40-01

opening system with thermal break

E40

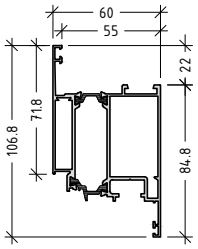
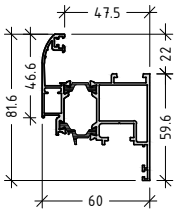
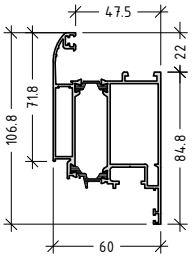
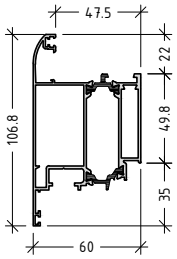
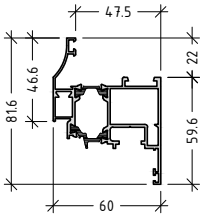
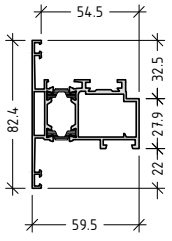
code	profile	weight length moment of inertia
E40180		972 g/m L=6.01 m Ix=3.53 cm^4 Iy=11.75 cm^4
E40200		1125 g/m L=6.01 m Ix=5.95 cm^4 Iy=16.21 cm^4
E40201		1251 g/m L=6.01 m Ix=10.79 cm^4 Iy=18.99 cm^4
E40202		1554 g/m L=6.01 m Ix=27.35 cm^4 Iy=24.51 cm^4
E40250		1154 g/m L=6.01 m Ix=7.32 cm^4 Iy=16.26 cm^4
E40251		1283 g/m L=6.01 m Ix=12.73 cm^4 Iy=18.98 cm^4

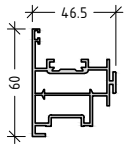
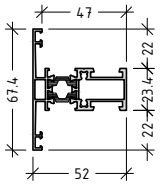
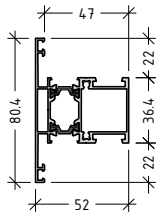
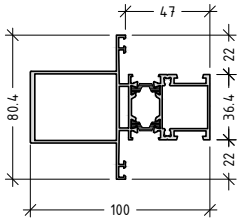
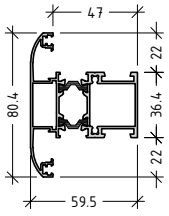
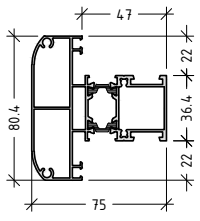
code	profile	weight length moment of inertia
E40252		1586 g/m L=6.01 m Ix=30.6 cm^4 Iy=24.48 cm^4
E40281		1238 g/m L=6.01 m Ix=10.83 cm^4 Iy=17.43 cm^4
E40241		1481 g/m L=6.01 m Ix=15.98 cm^4 Iy=20.88 cm^4
E40240		1548 g/m L=6.01 m Ix=26.92 cm^4 Iy=24.15 cm^4
E40290		1601 g/m L=6.01 m Ix=29.81 cm^4 Iy=24.13 cm^4
E40221 PVC		1374 g/m L=6.01 m Ix=13.14 cm^4 Iy=21.49 cm^4

L40-02

opening system with thermal break

E40

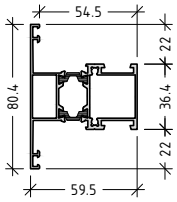
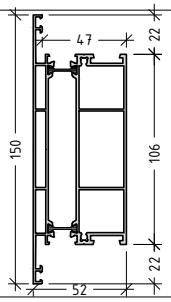
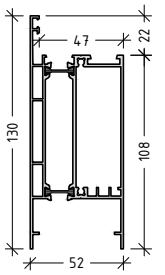
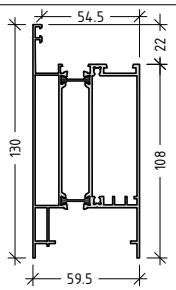
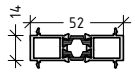
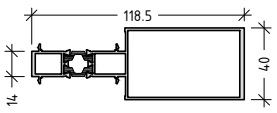
code	profile	weight length moment of inertia
E40222 PVC		1792 g/m L=6.01 m Ix=37.76 cm^4 Iy=29.11 cm^4
E40271 PVC		1395 g/m L=6.01 m Ix=15.21 cm^4 Iy=21.51 cm^4
E40272 PVC		1824 g/m L=6.01 m Ix=41.48 cm^4 Iy=29.13 cm^4
E40295 PVC		1831 g/m L=6.01 m Ix=40.47 cm^4 Iy=28.58 cm^4
E40275 PVC		1359 g/m L=6.01 m Ix=13.12 cm^4 Iy=19.88 cm^4
E40230 pivot mech.		1460 g/m L=6.01 m Ix=14.5 cm^4 Iy=21.15 cm^4

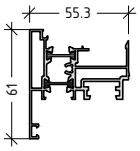
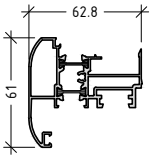
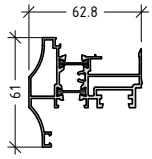
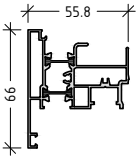
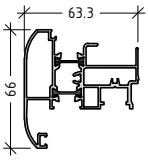
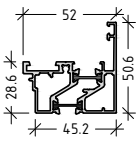
code	profile	weight length moment of inertia
E40530 pivot mech.		1099 g/m L=6.01 m Ix=7.87 cm^4 Iy=9.96 cm^4
E40300		1114 g/m L=6.01 m Ix=6.59 cm^4 Iy=11.77 cm^4
E40301		1316 g/m L=6.01 m Ix=13.26 cm^4 Iy=14.22 cm^4
E40302		1997 g/m L=6.01 m Ix=19.77 cm^4 Iy=63.9 cm^4
E40350		1409 g/m L=6.01 m Ix=17.3 cm^4 Iy=18.95 cm^4
E40351		1846 g/m L=6.01 m Ix=28.62 cm^4 Iy=33.38 cm^4

L40-03

opening system with thermal break

E40

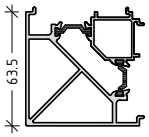
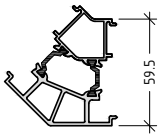
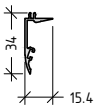
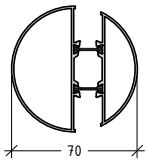
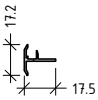
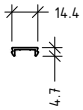
code	profile	weight length moment of inertia
E40340 straight sashes		1330 g/m L=6.01 m Ix=13.22 cm^4 Iy=18.96 cm^4
E40303		2677 g/m L=6.01 m Ix=137.04 cm^4 Iy=33.15 cm^4
E40331		2248 g/m L=6.01 m Ix=87.7 cm^4 Iy=29.8 cm^4
E40330 straight sashes		2363 g/m L=6.01 m Ix=96.17 cm^4 Iy=38.48 cm^4
E40655		730 g/m L=6.01 m Ix=0.71 cm^4 Iy=7 cm^4
E40656		1524 g/m L=6.01 m Ix=8.84 cm^4 Iy=80.55 cm^4

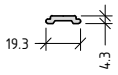
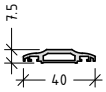
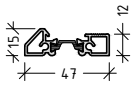
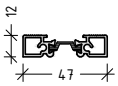
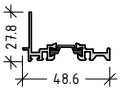
code	profile	weight length moment of inertia
E40500		1194 g/m L=6.01 m Ix=6.58 cm^4 Iy=13.69 cm^4
E40550		1264 g/m L=6.01 m Ix=7.98 cm^4 Iy=17.36 cm^4
E40580		1238 g/m L=6.01 m Ix=6.82 cm^4 Iy=15.94 cm^4
E40540 PVC		1187 g/m L=6.01 m Ix=8.6 cm^4 Iy=14.42 cm^4
E40590 PVC		1328 g/m L=6.01 m Ix=10.26 cm^4 Iy=18.28 cm^4
E40171 reverse profile		1140 g/m L=6.01 m Ix=5.64 cm^4 Iy=10.42 cm^4

L40-04

opening system with thermal break

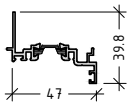
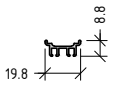
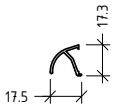
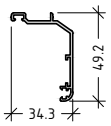
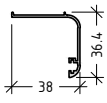
E40

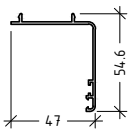
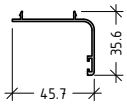
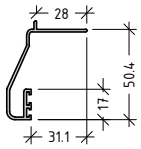
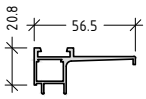
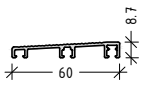
code	profile	weight length moment of inertia
E40600		2038 g/m L=6.01 m Ix=30.82 cm^4 Iy=30.82 cm^4
E40601		1549 g/m L=6.01 m Ix=18.87 cm^4 Iy=12.44 cm^4
E40602		203 g/m L=6.01 m
E40603		1276 g/m L=6.01 m Ix=17.76 cm^4 Iy=17.27 cm^4
E40604		113 g/m L=6.01 m
E23600		66.5 g/m L=6.01 m

code	profile	weight length moment of inertia
E2308		159 g/m L=4.4m
E2357		144 g/m L=6.01 m
E40650		338 g/m L=6.01 m
E40800		541 g/m L=6.01 m
E40801		528 g/m L=6.01 m
E40810		480 g/m L=6.01 m

opening system with thermal break

E40

code	profile	weight length moment of inertia
E40811		555 g/m L=6.01 m
E40812		135 g/m L=6.01 m
E40813		265 g/m L=6.01 m
E40820		143 g/m L=6.01 m
E40605		381 g/m L=6.01 m Ix=3.7 cm^4 Iy=1.56 cm^4
E5366		269 g/m L=6.01 m Ix=1.53 cm^4 Iy=1.37 cm^4

code	profile	weight length moment of inertia
E1115		408 g/m L=6.01 m Ix=4.77 cm^4 Iy=3.37 cm^4
E1127		288 g/m L=6.01 m Ix=1.28 cm^4 Iy=2.39 cm^4
E40607		494 g/m L=6.01 m Ix=6.67 cm^4 Iy=2.22 cm^4
E40651		203 g/m L=6.01 m
E40660		564 g/m L=6.01 m Ix=0.83 cm^4 Iy=5.27 cm^4
E40821		416 g/m L=6.01 m

L40-06

opening system with thermal break

E40

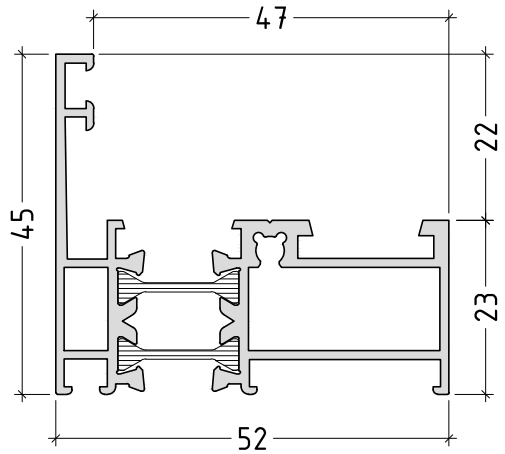
code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E40910		427 g/m L=6.01 m			

L40-07

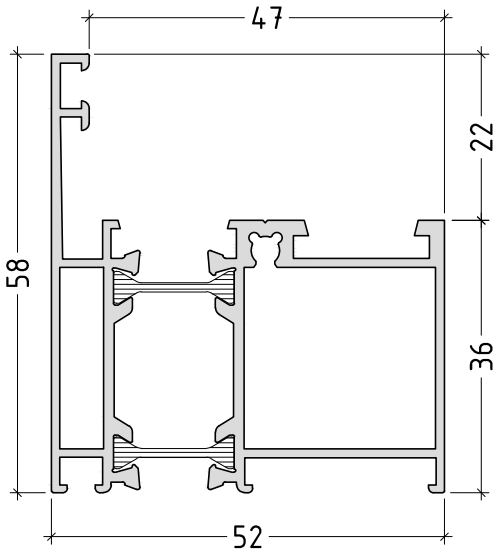
PROFILES

DRAWINGS / SCALE 1:1

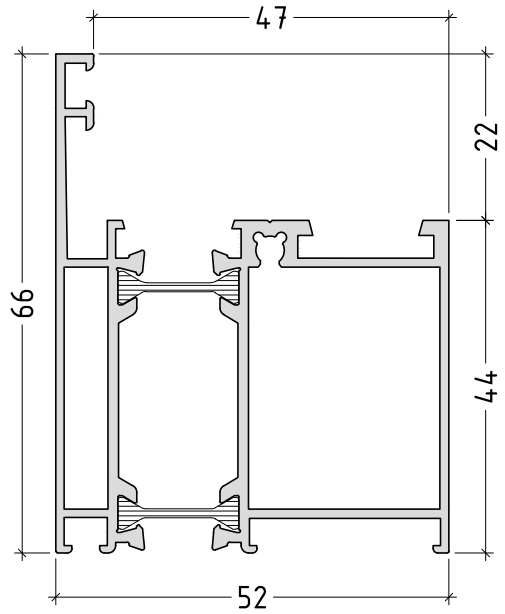
E40100
913 g/m



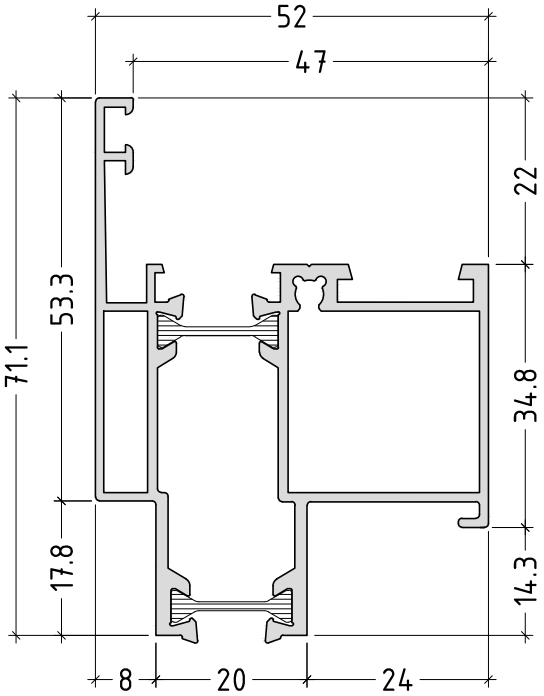
E40101
1094 g/m



E40102
1205 g/m



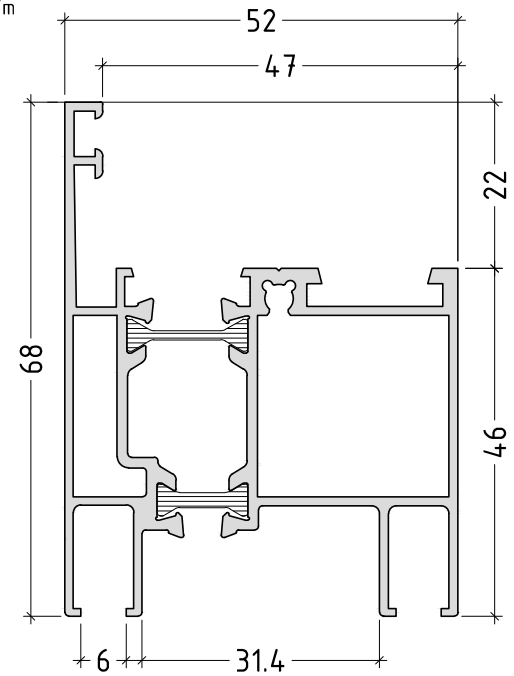
E40185
972 g/m



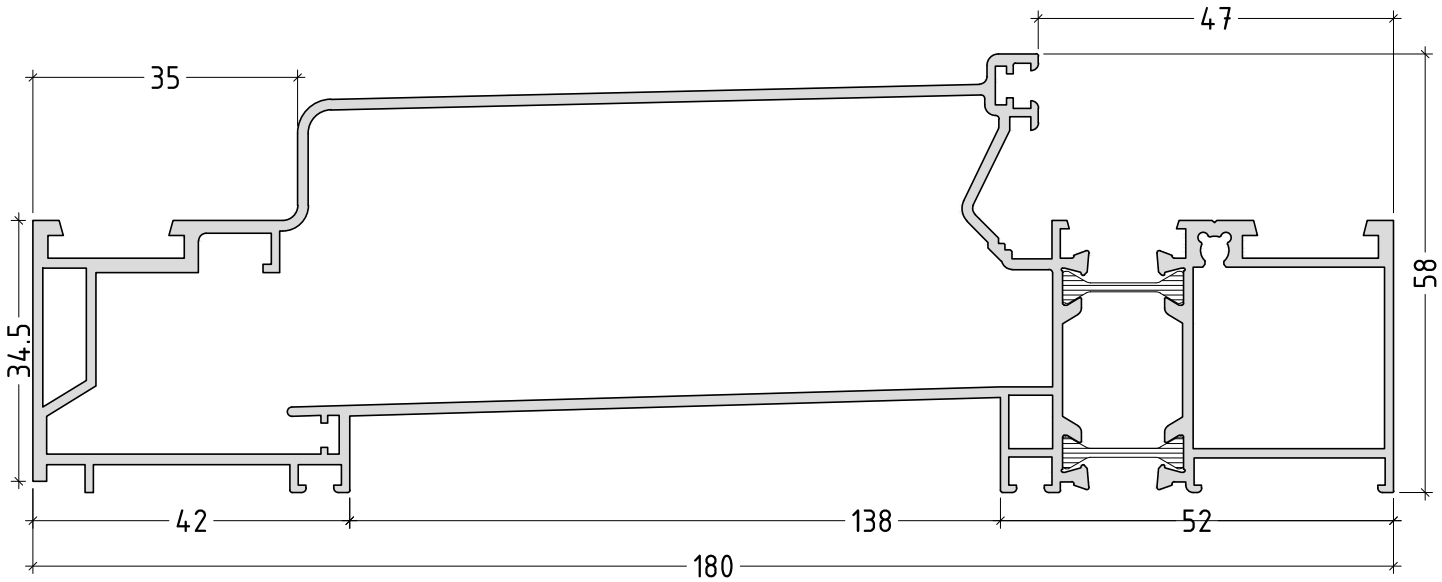
scale : 1:1

P4.0-01

E40121
1276 g/m



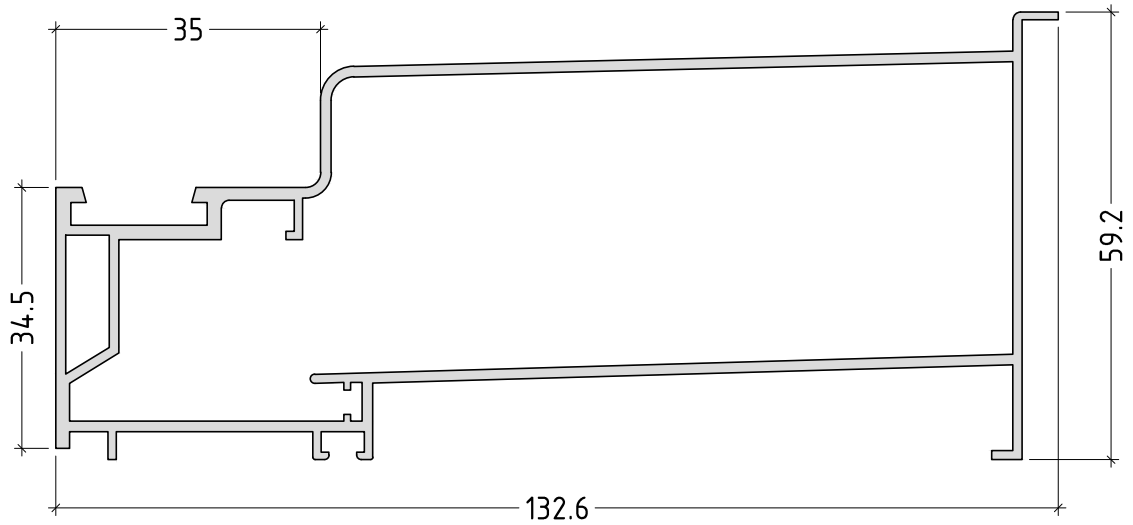
E40130
2500 g/m



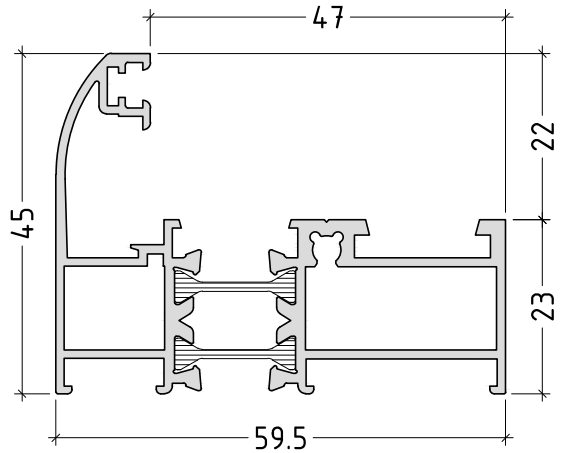
scale : 1:1

P40-02

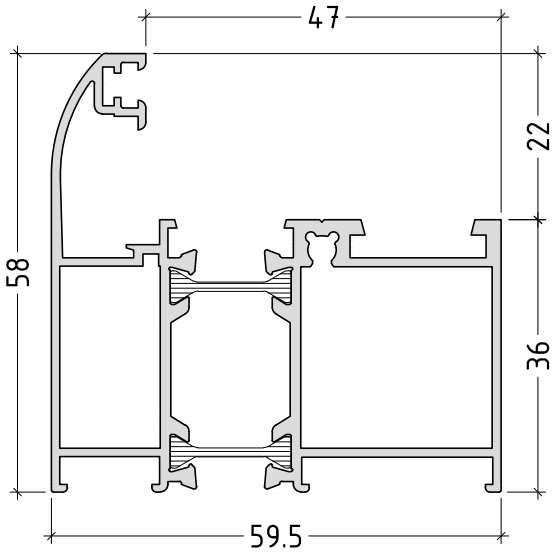
E40135
1627 g/m



E40150
1001 g/m



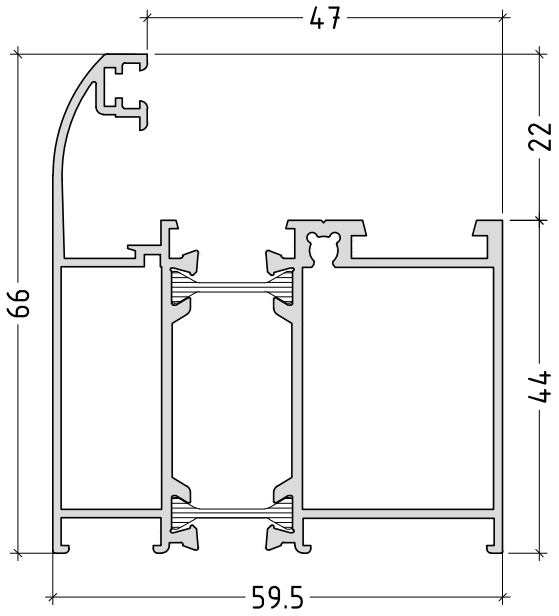
E40151
1183 g/m



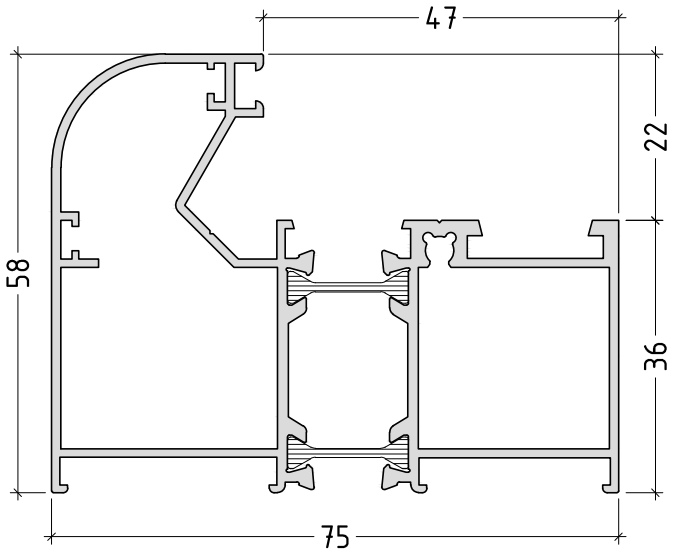
scale : 1:1

P40-03

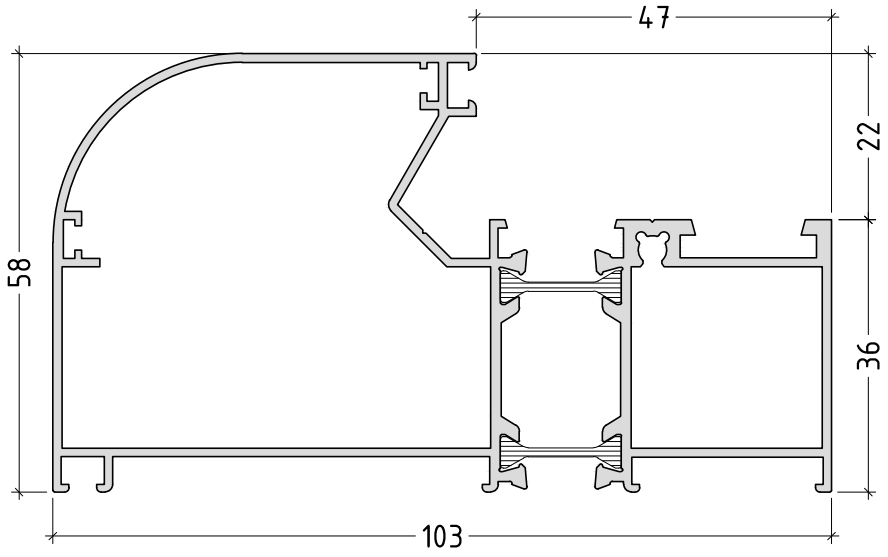
E40152
1294 g/m



E40154
1350 g/m



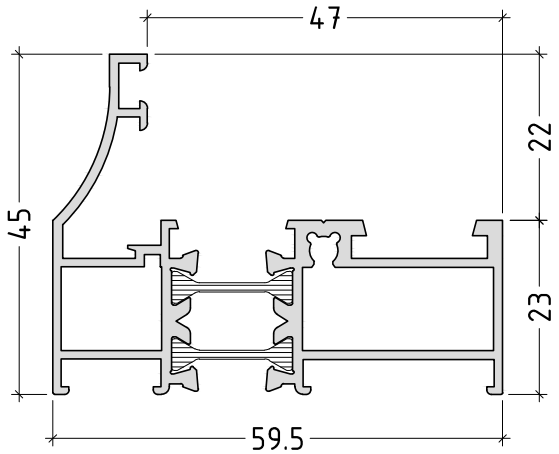
E40153
1513 g/m



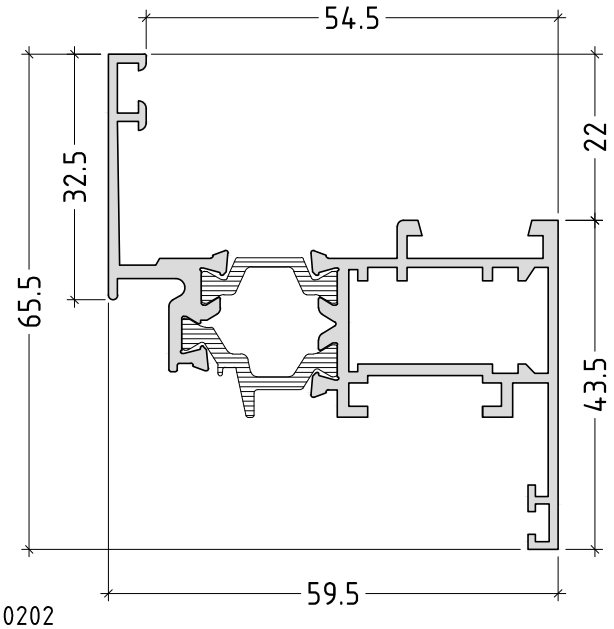
scale : 1:1

P40-04

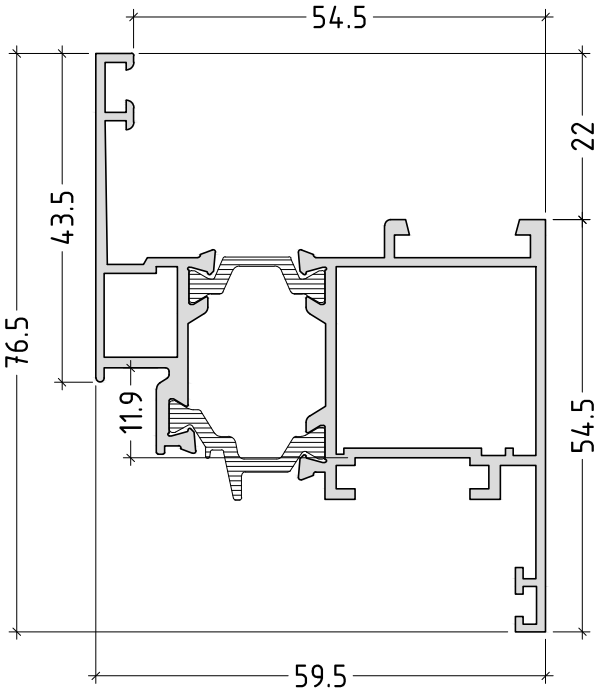
E40180
972 g/m



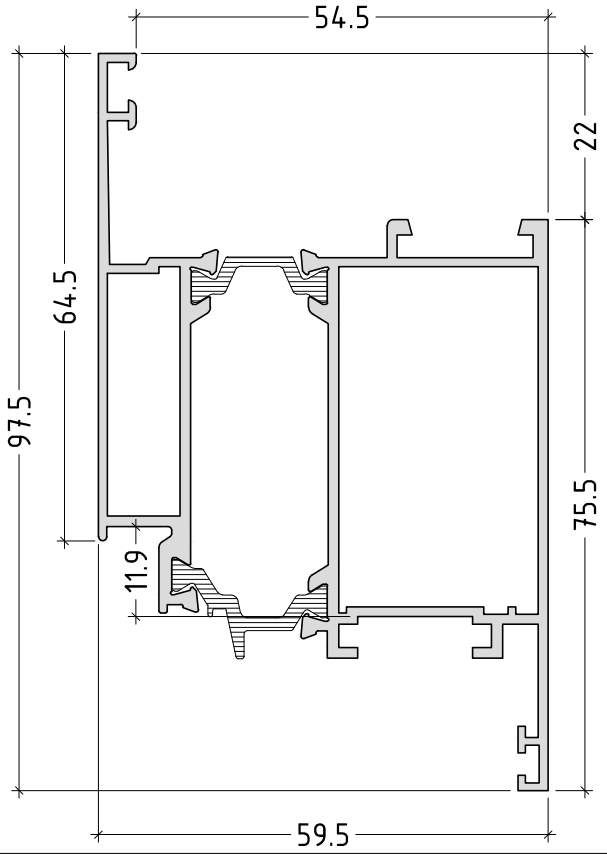
E40200
1125 g/m



E40201
1251 g/m



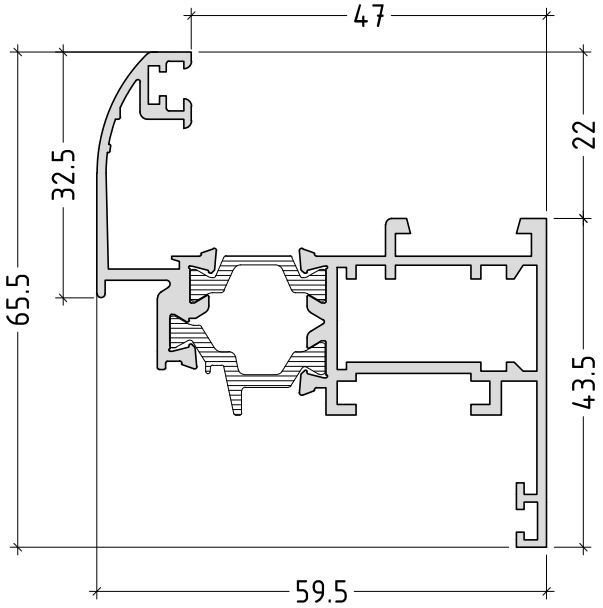
E40202
1554 g/m



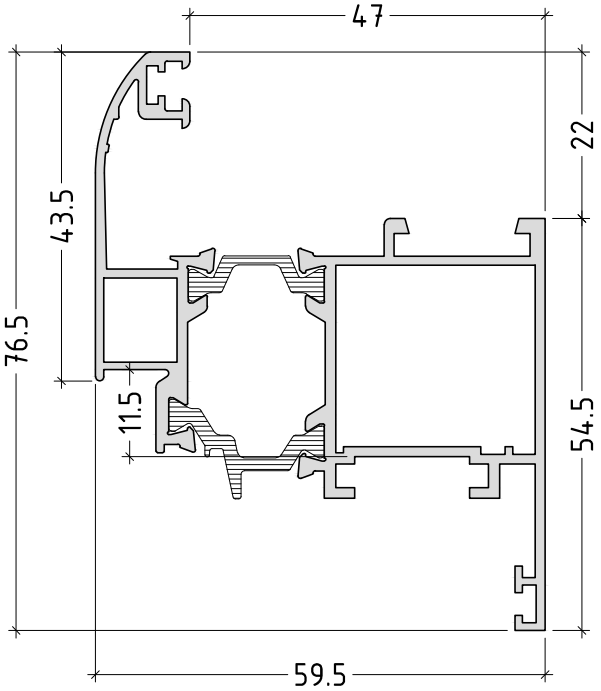
scale : 1:1

P40-05

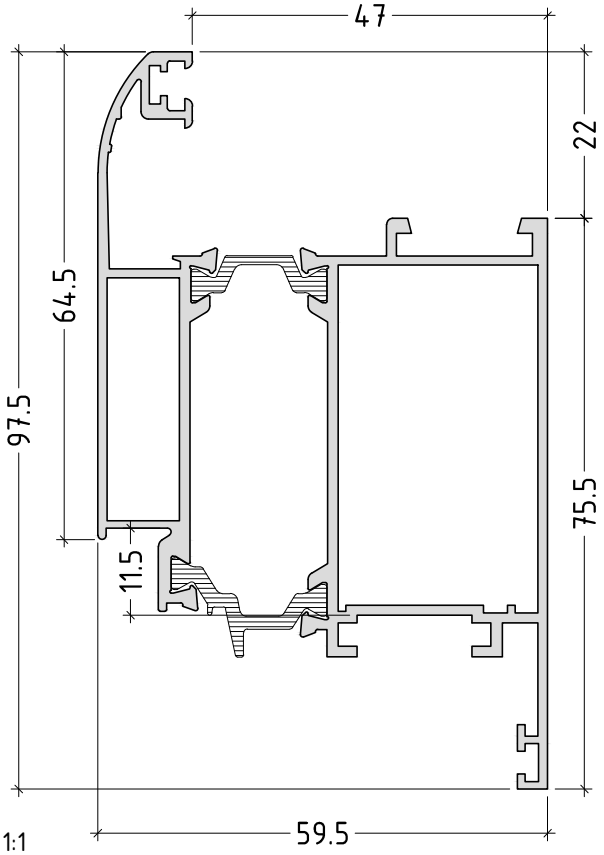
E40250
1154 g/m



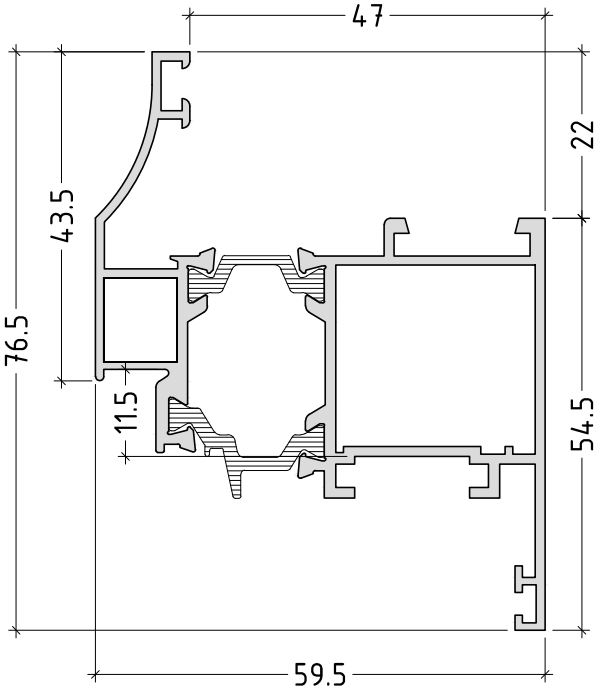
E40251
1283 g/m



E40252
1586 g/m



E40281
1238 g/m



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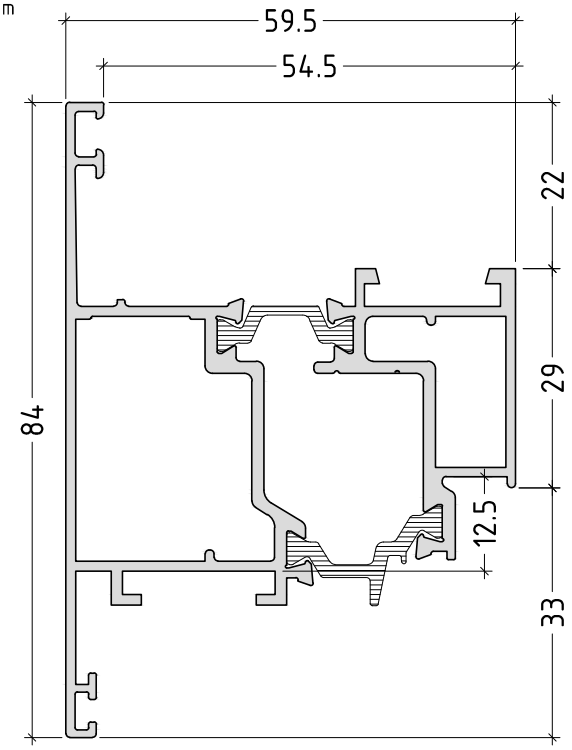
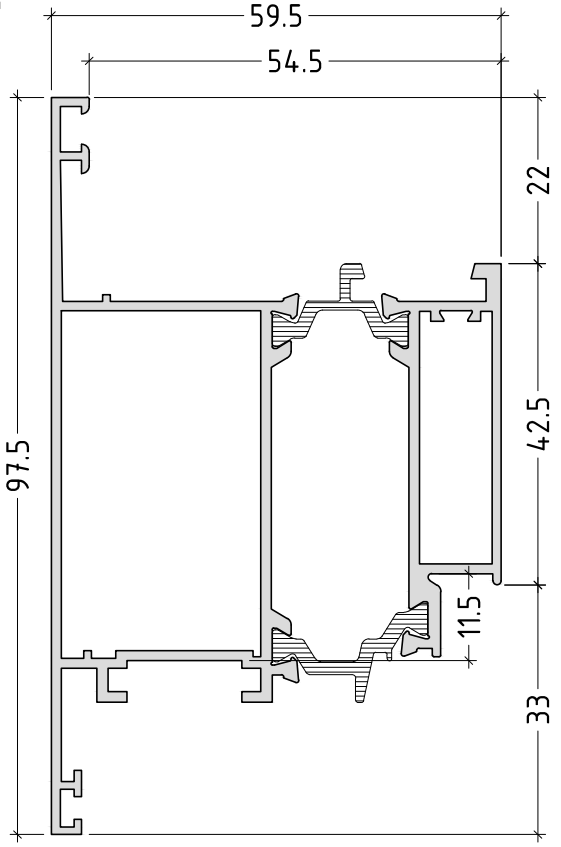
P40-06

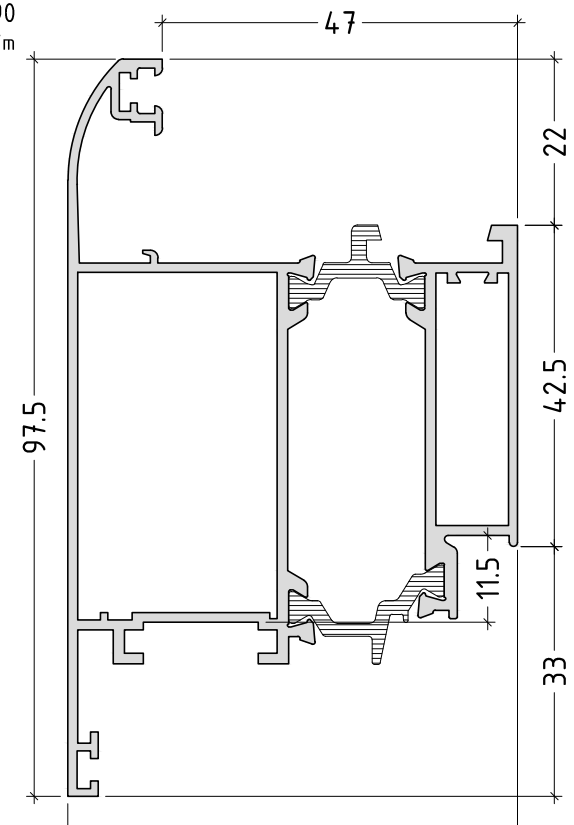
E40241
1481 g/m



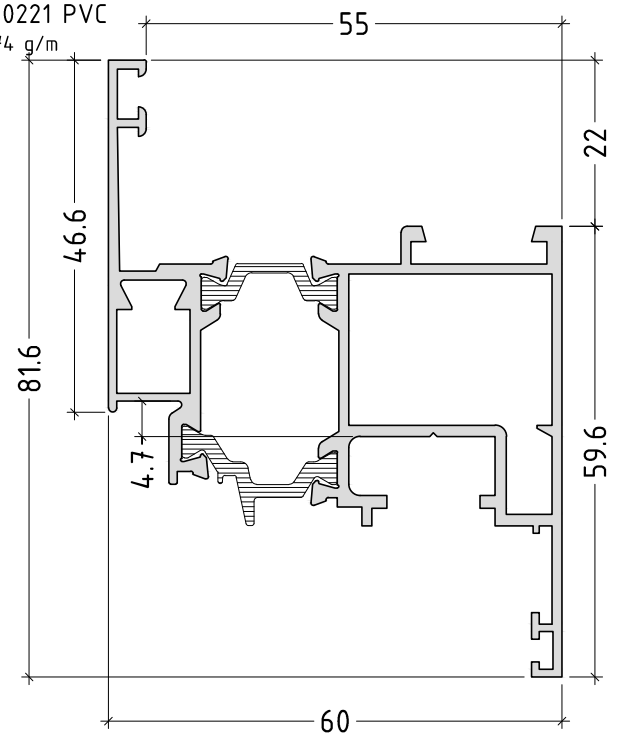
E40240
1548 g/m



E40290
1601 g/m



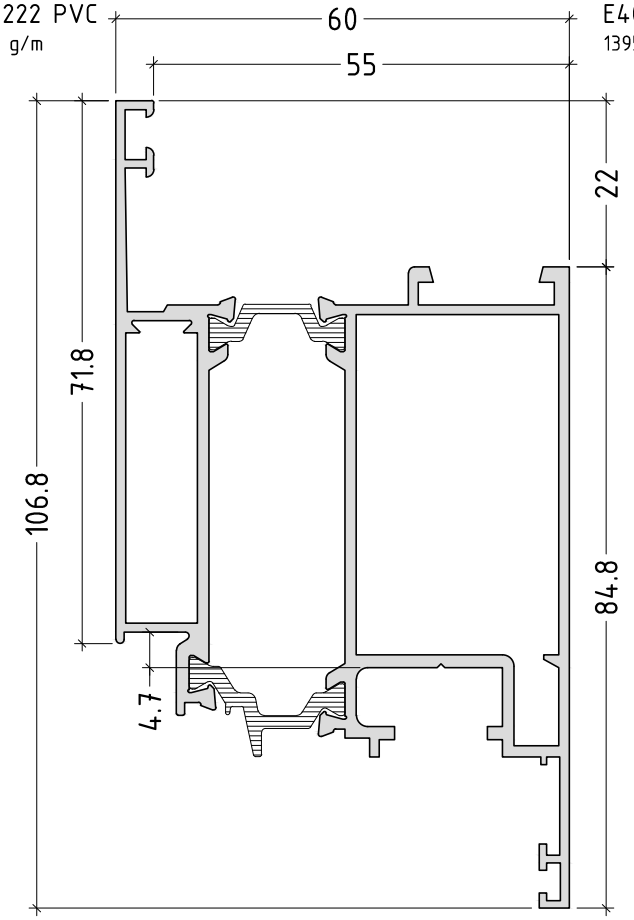
E40221 PVC
1374 g/m



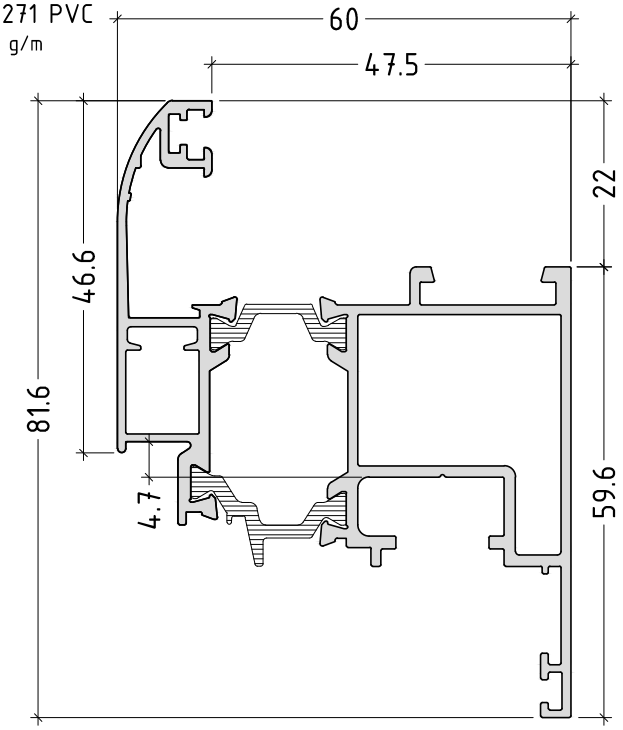
scale : 1:1

P40-07

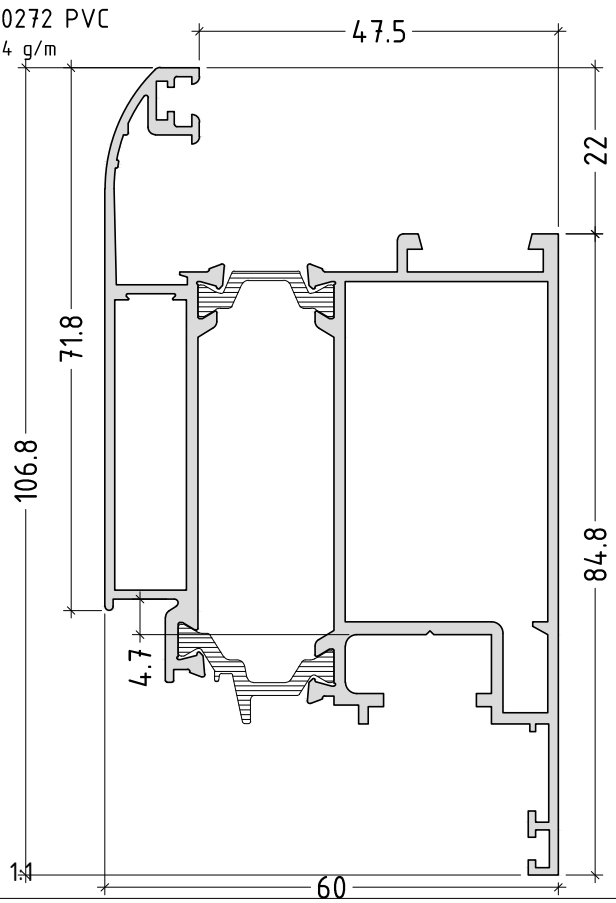
E40222 PVC
1792 g/m



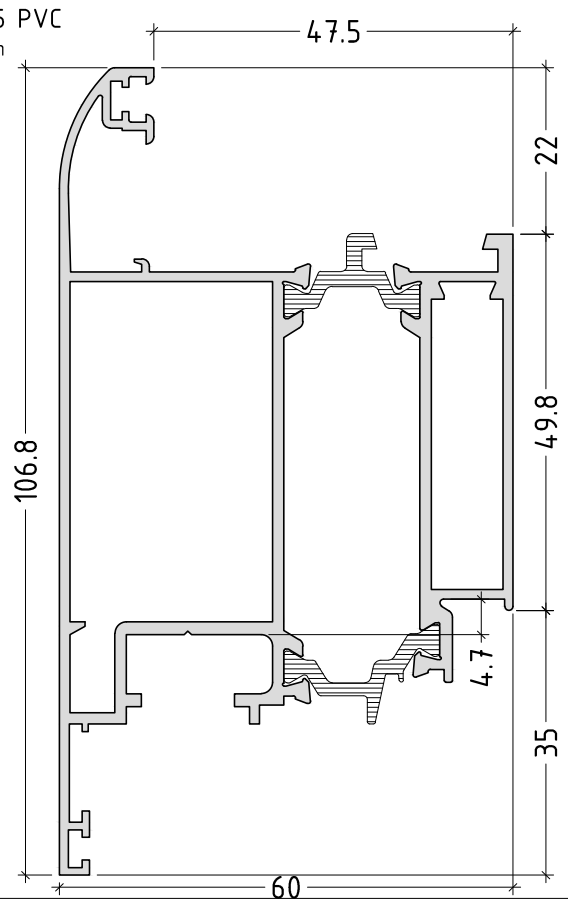
E40271 PVC
1395 g/m



E40272 PVC
1824 g/m



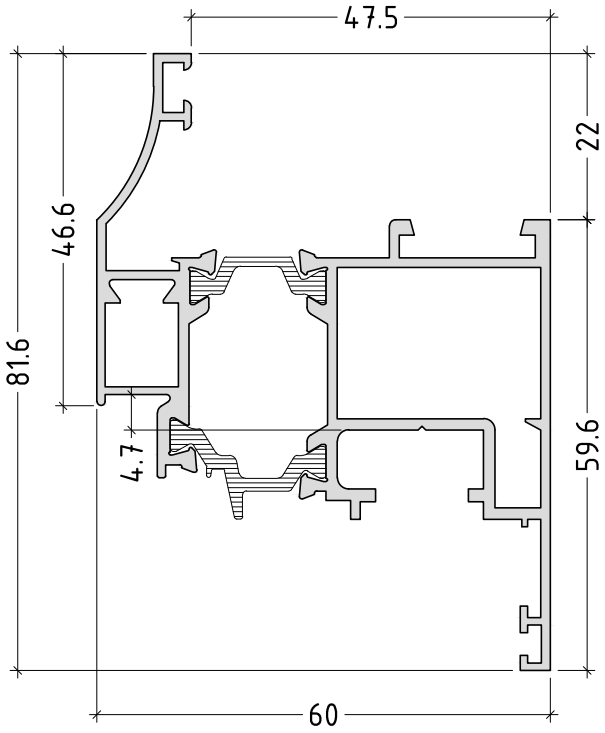
E40295 PVC
1831 g/m



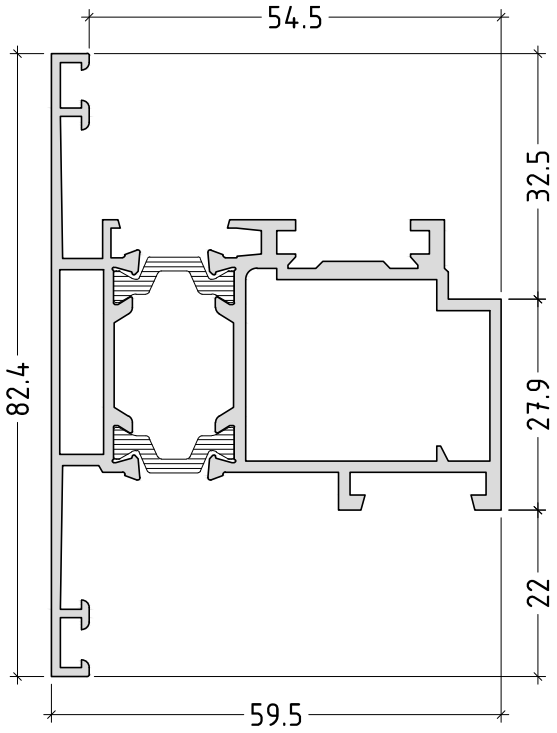
scale : 1:1

P40-08

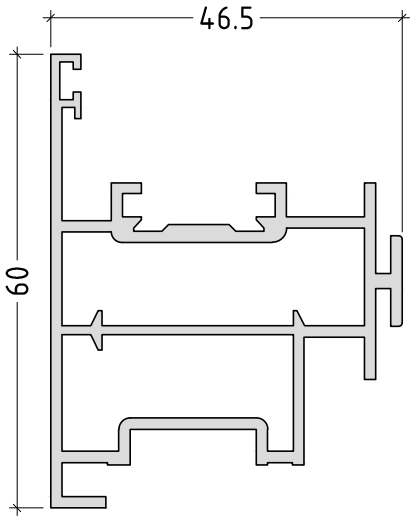
E40275 PVC
1359 g/m



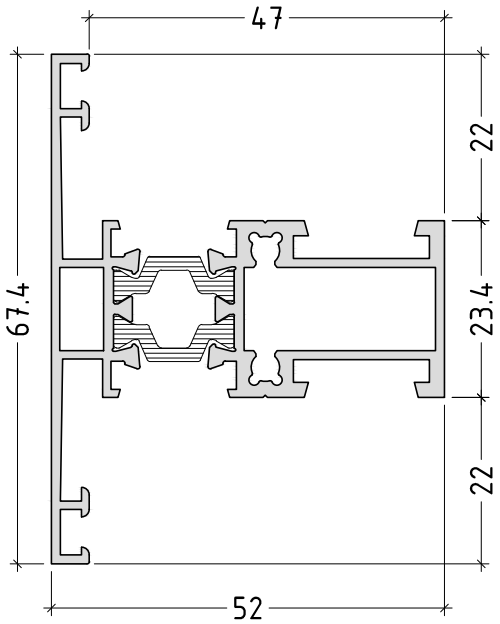
E40230 pivot mech.
1460 g/m



E40530 pivot mech.
1099 g/m



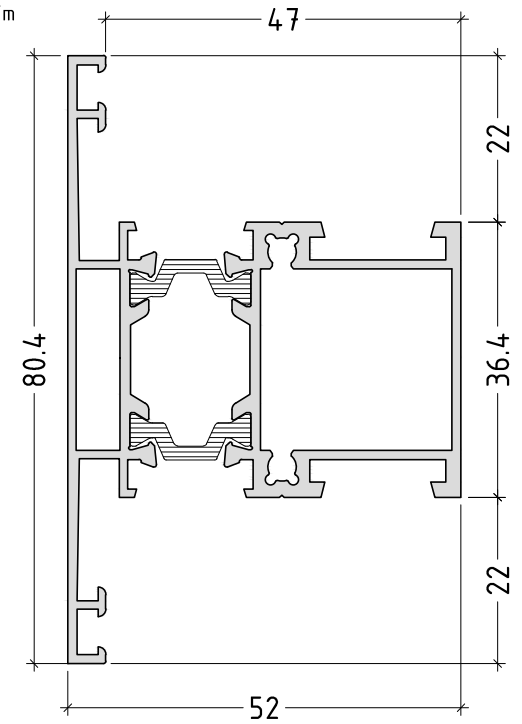
E40300
1114 g/m



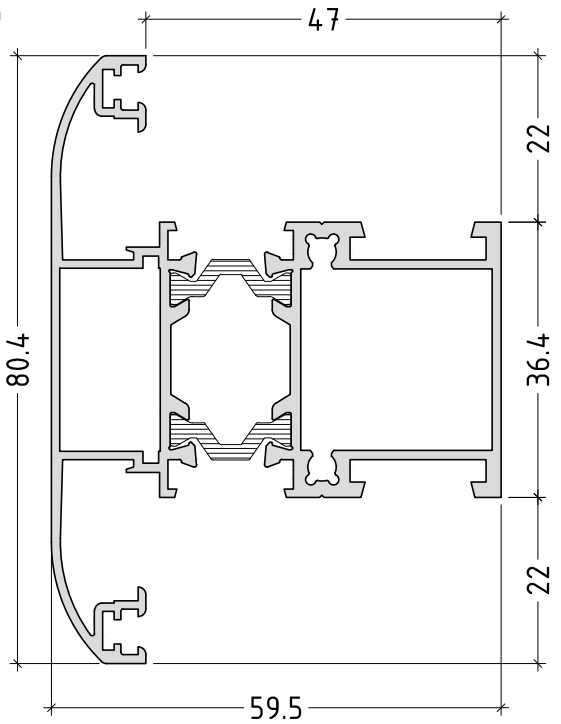
scale : 1:1

P40-09

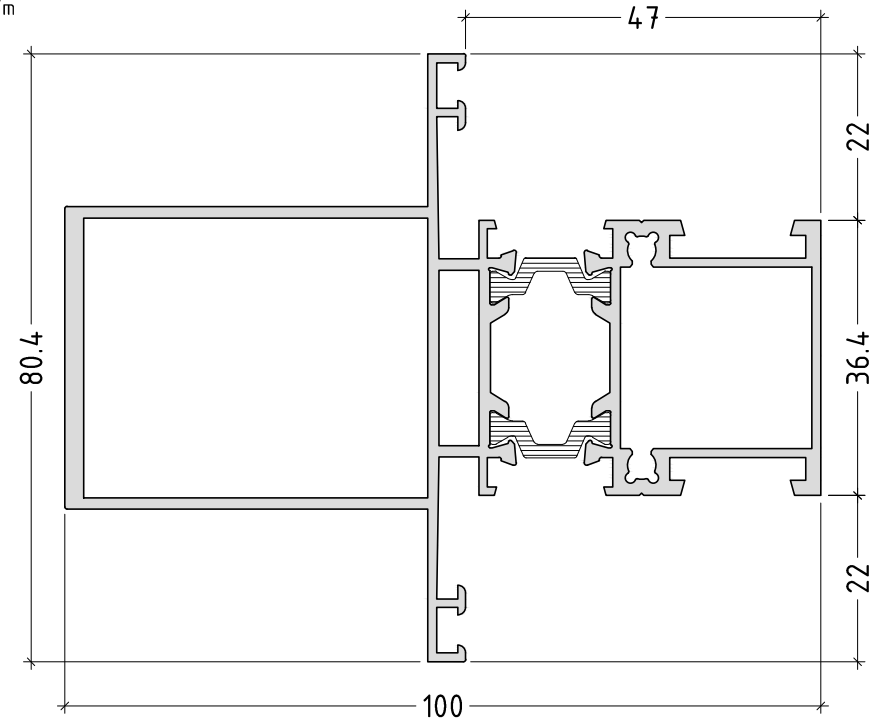
E40301
1316 g/m



E40350
1409 g/m



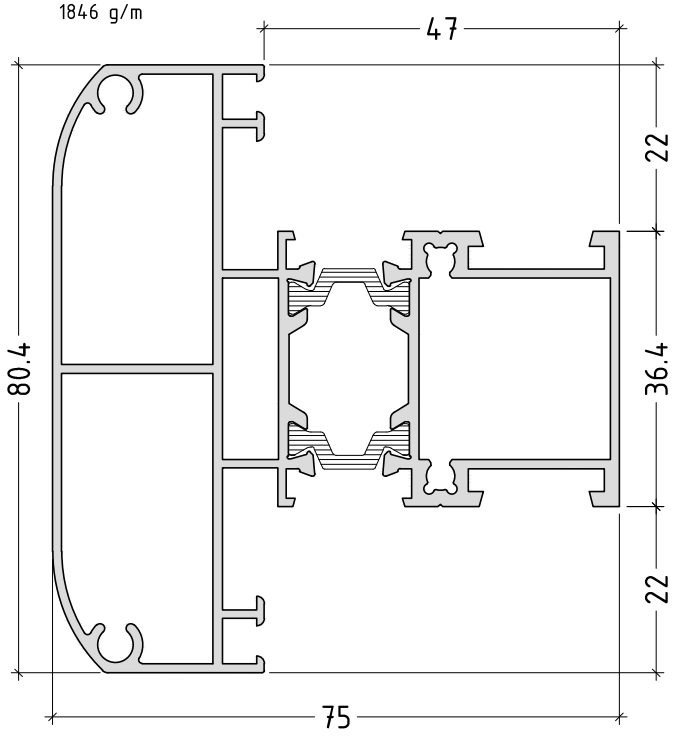
E40302
1997 g/m



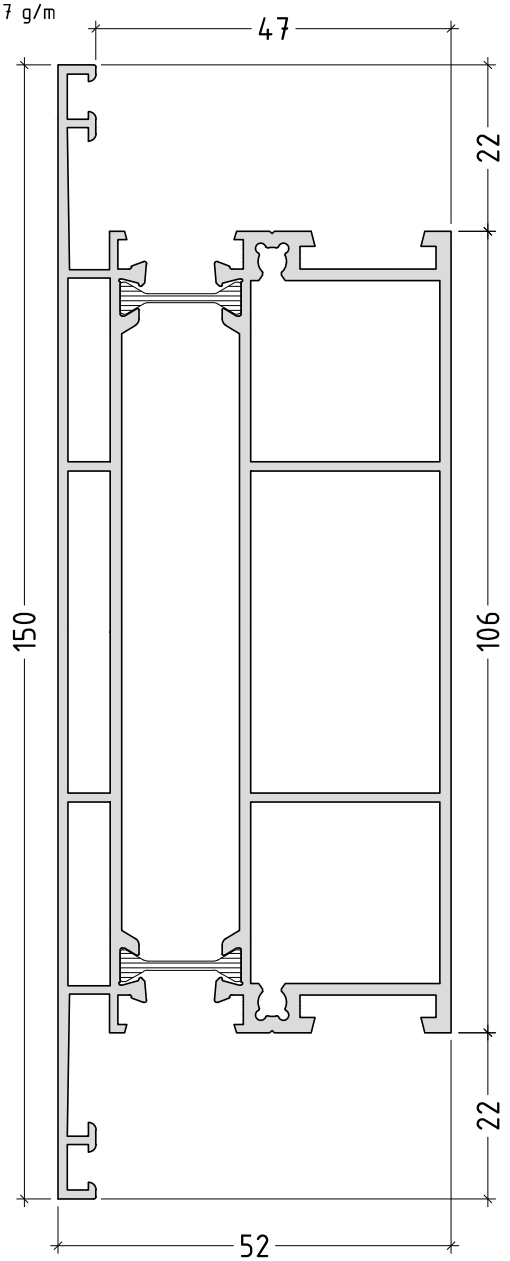
scale : 1:1

P40-10

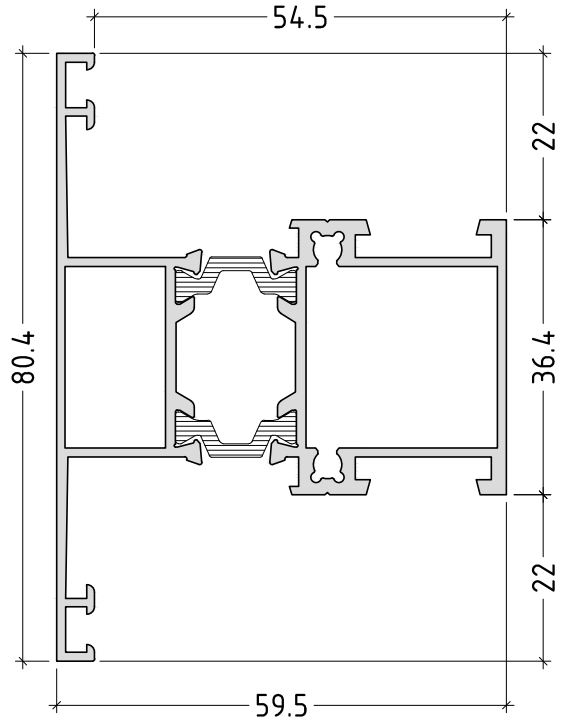
E40351
1846 g/m



E40303
2677 g/m



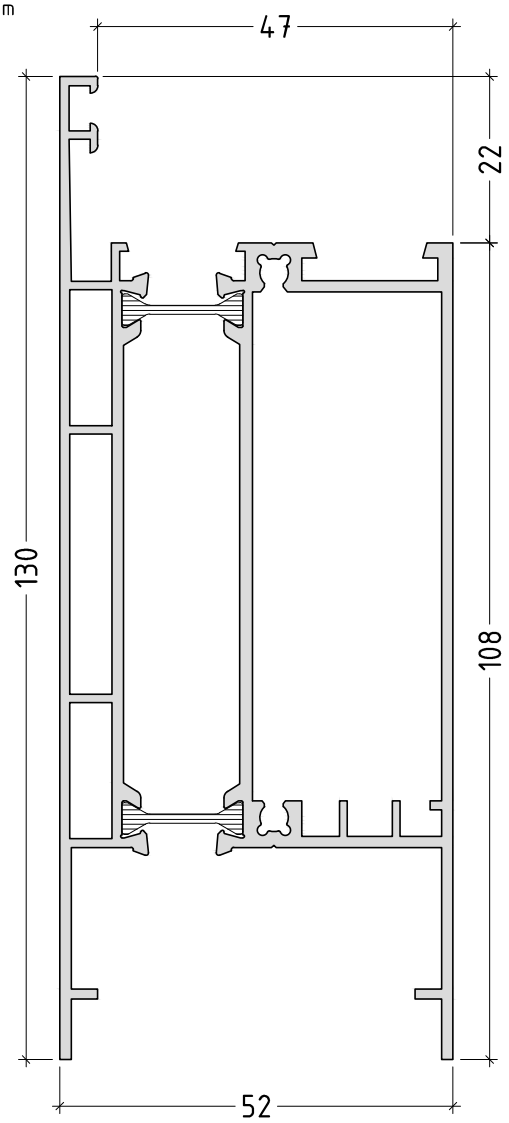
E40340 straight sasshes
1330 g/m



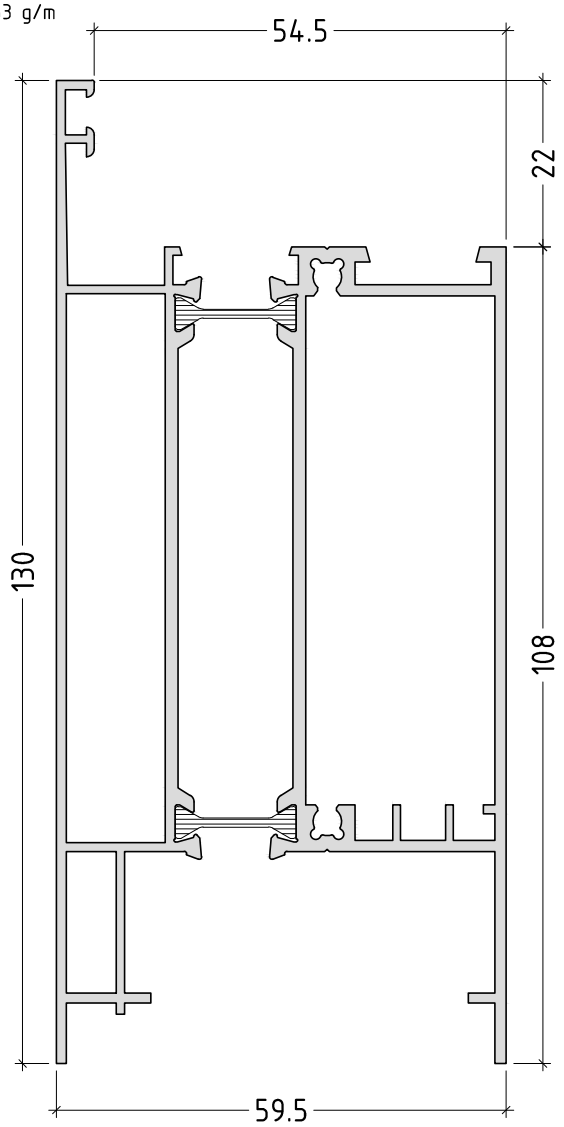
scale : 1:1

P4.0-11

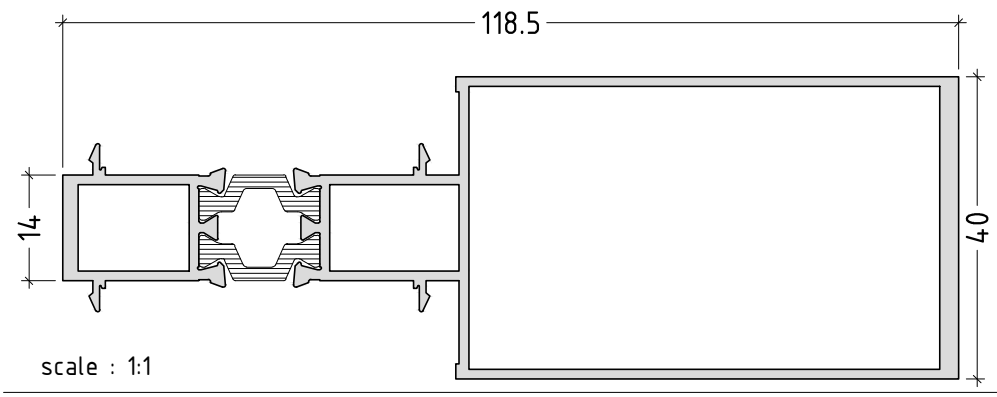
E40331
2248 g/m



E40330 straight sashes
2363 g/m

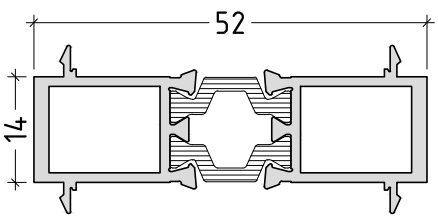


E40656
1524 g/m



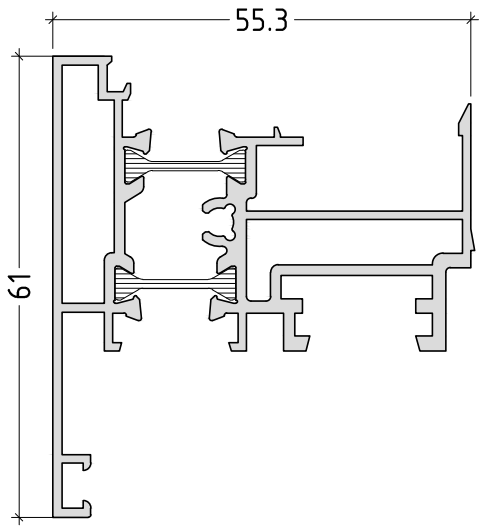
scale : 1:1

E40655
730 g/m

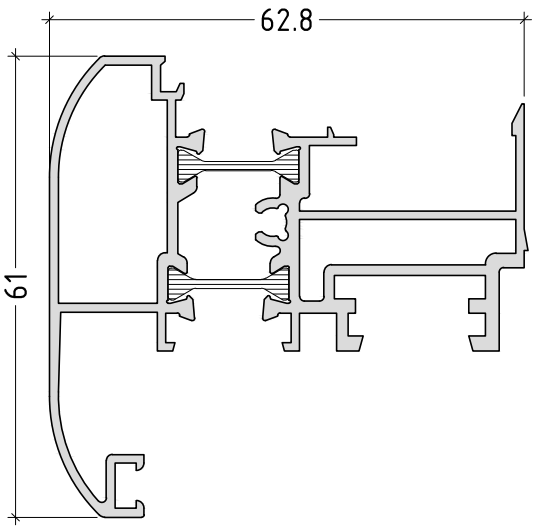


P4.0-12

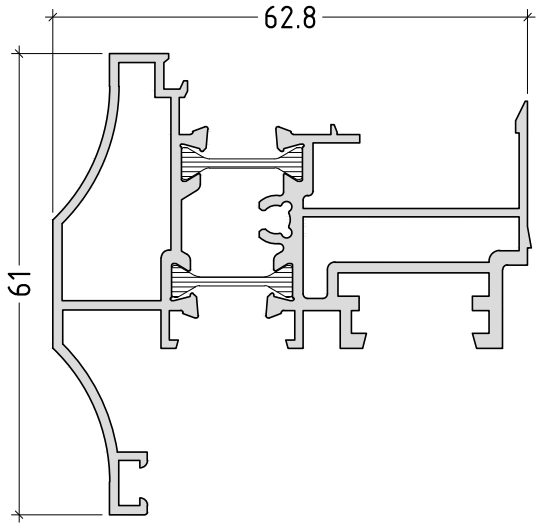
E40500
1194 g/m



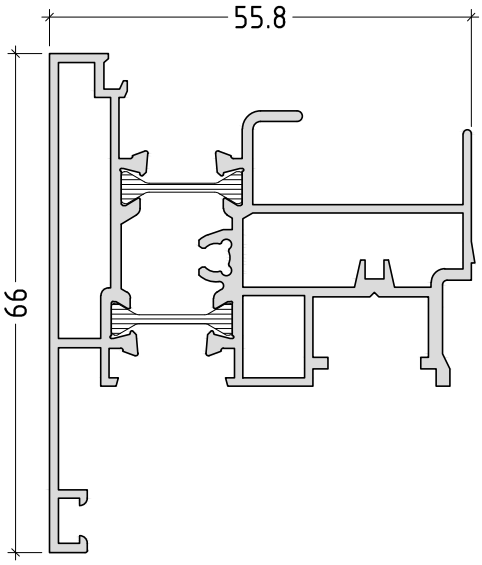
E40550
1264 g/m



E40580
1238 g/m



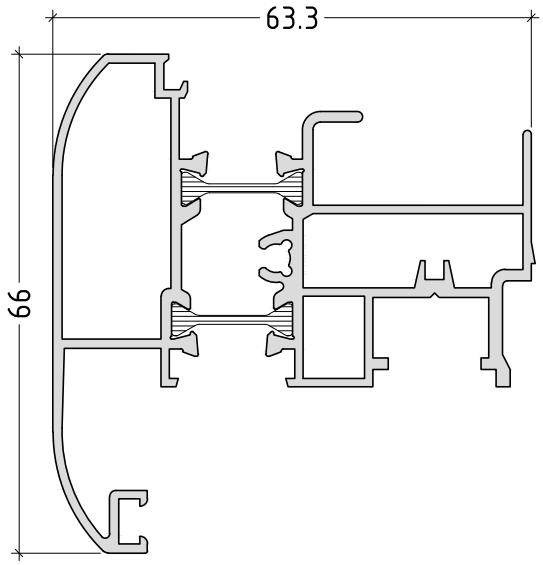
E40540 PVC
1187 g/m



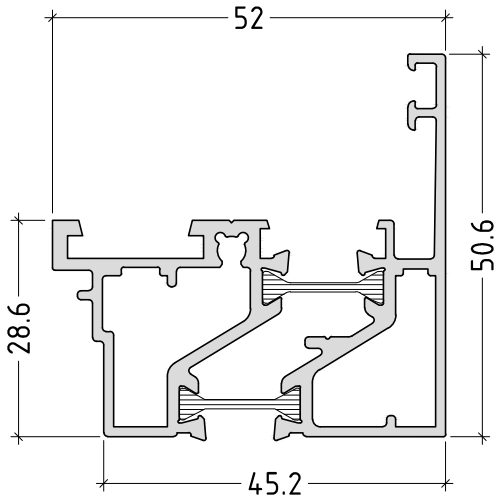
scale : 1:1

P4.0-13

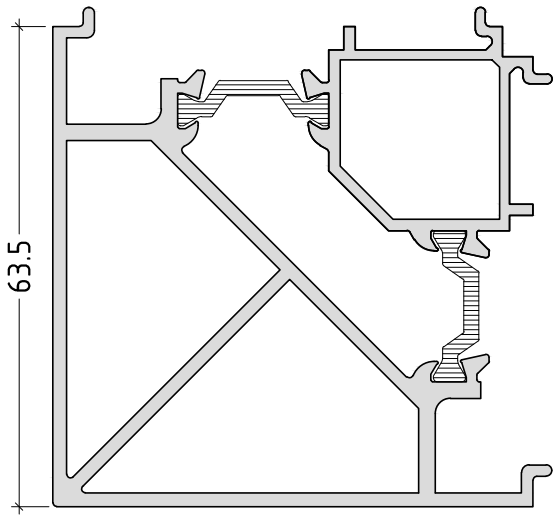
E40590 PVC
1328 g/m



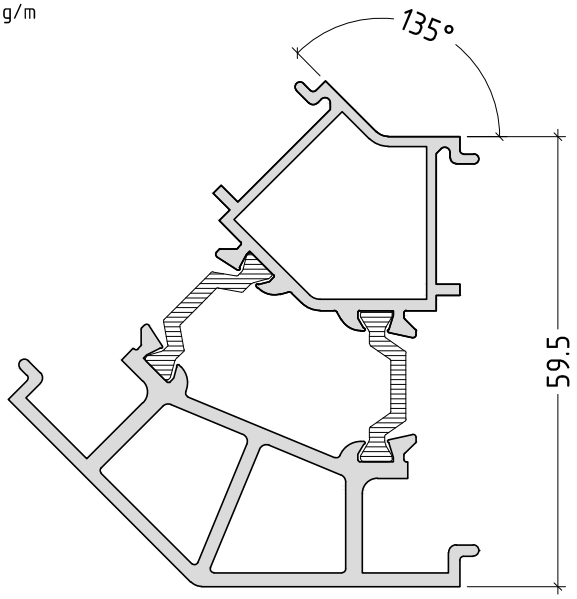
E40171 reverse profile
1140 g/m



E40600
2038 g/m



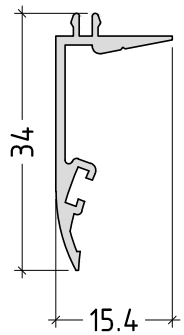
E40601
1549 g/m



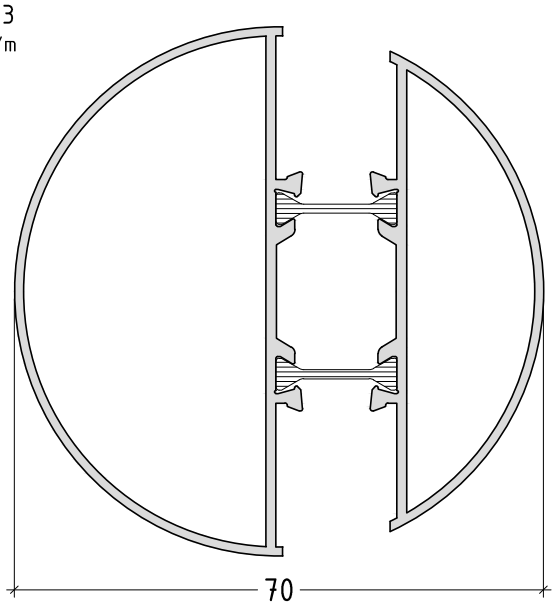
scale : 1:1

P4.0-14

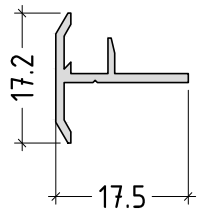
E40602
203 g/m



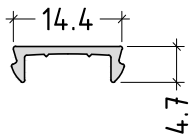
E40603
1276 g/m



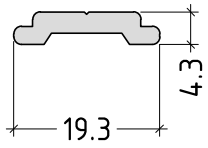
E40604
113 g/m



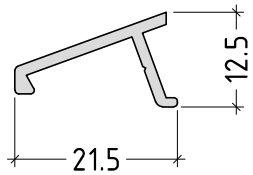
E23600
66.5 g/m



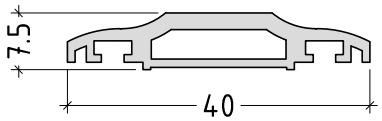
E2308
159 g/m



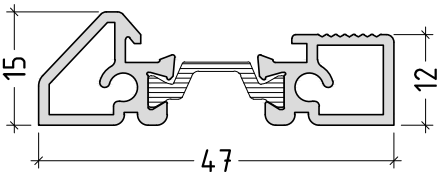
E2357
144 g/m



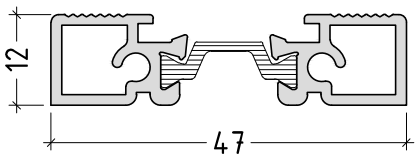
E40650
338 g/m



E40800
541 g/m



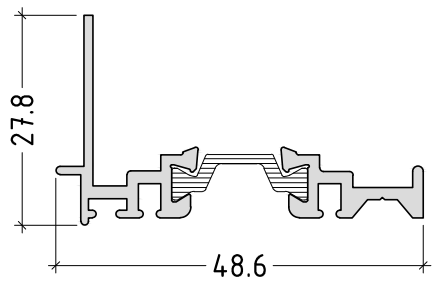
E40801
528 g/m



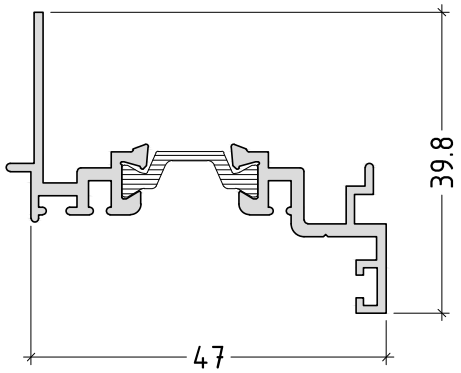
scale : 1:1

P4.0-15

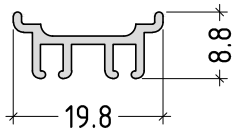
E40810
480 g/m



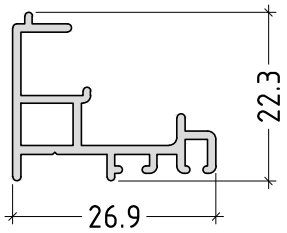
E40811
555 g/m



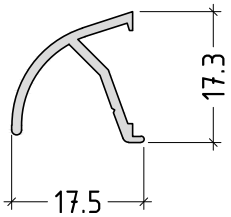
E40812
135 g/m



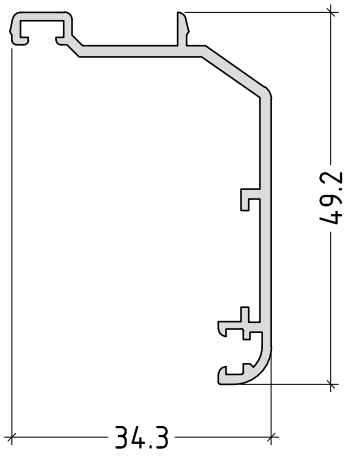
E40813
265 g/m



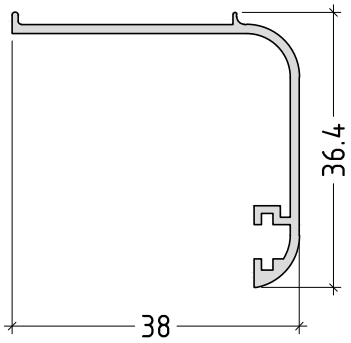
E40820
143 g/m



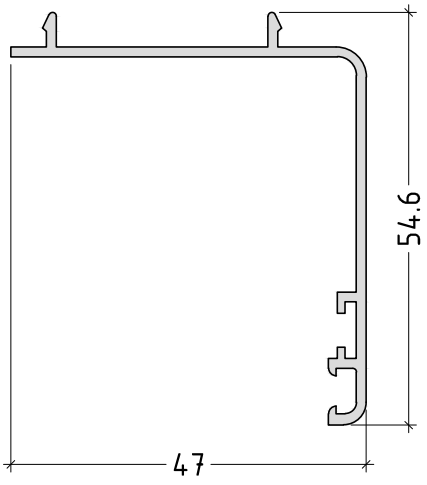
E40605
381 g/m



E5366
269 g/m



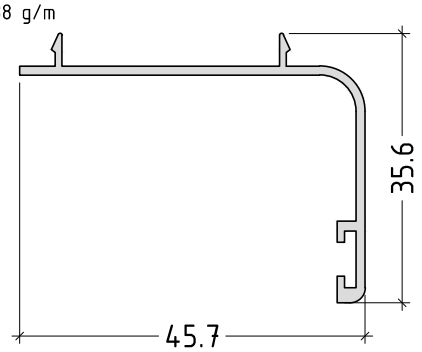
E1115
408 g/m



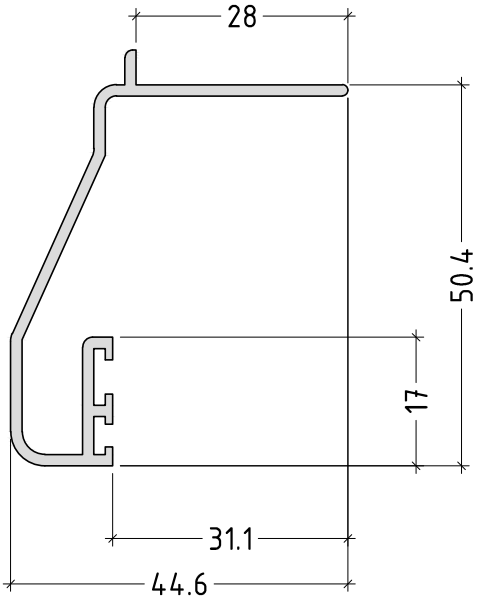
scale : 1:1

P4.0-16

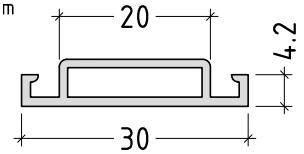
E1127
288 g/m



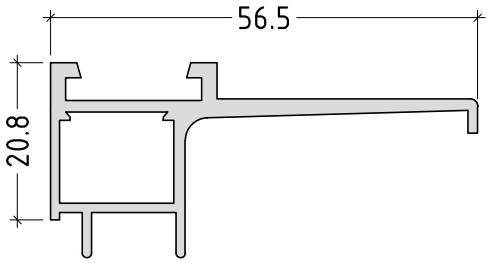
E40607
494 g/m



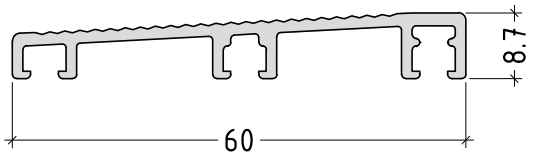
E40651
203 g/m



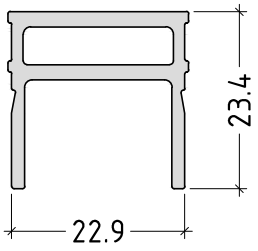
E40660
564 g/m



E40821
416 g/m



E40910
427 g/m



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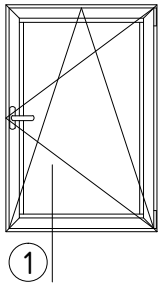
P40-17

SECTIONS

SECTIONS / DETAILS

inward opening



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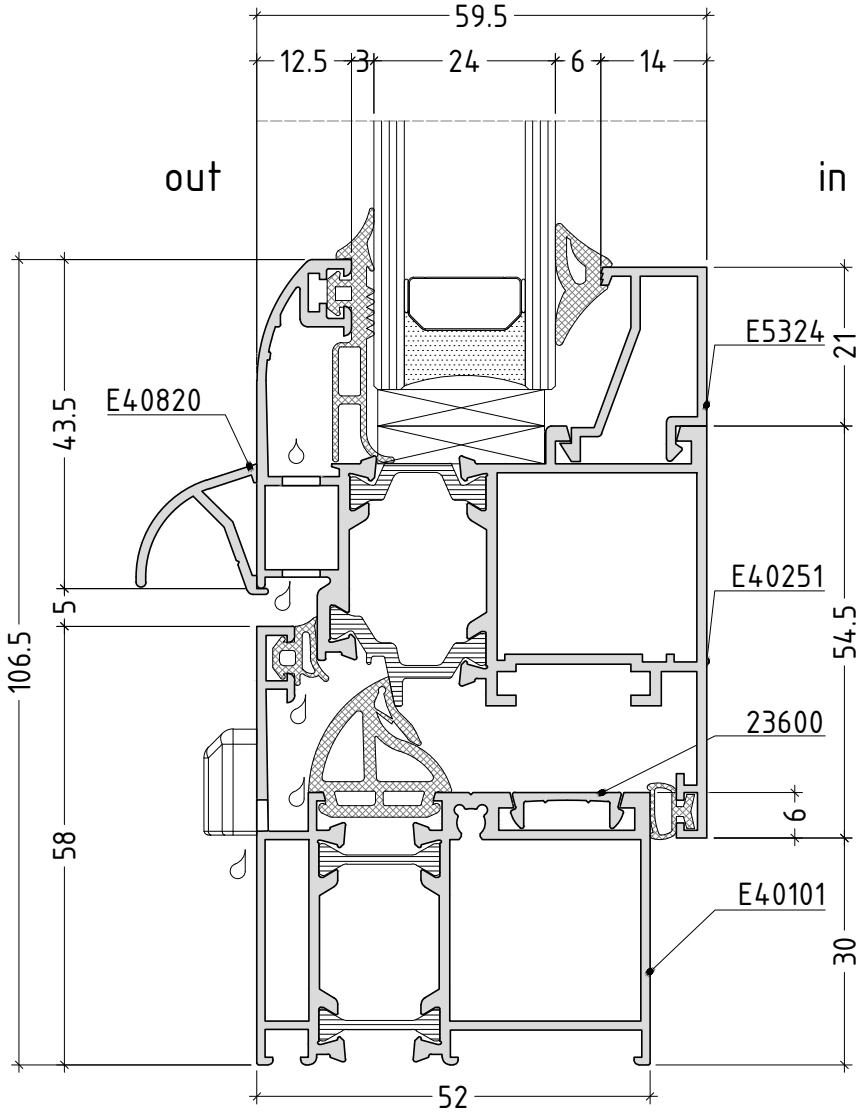

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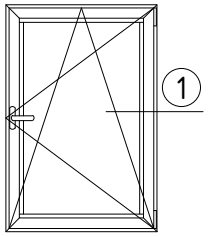
D4.0-01

opening system with thermal break

E40

inward opening



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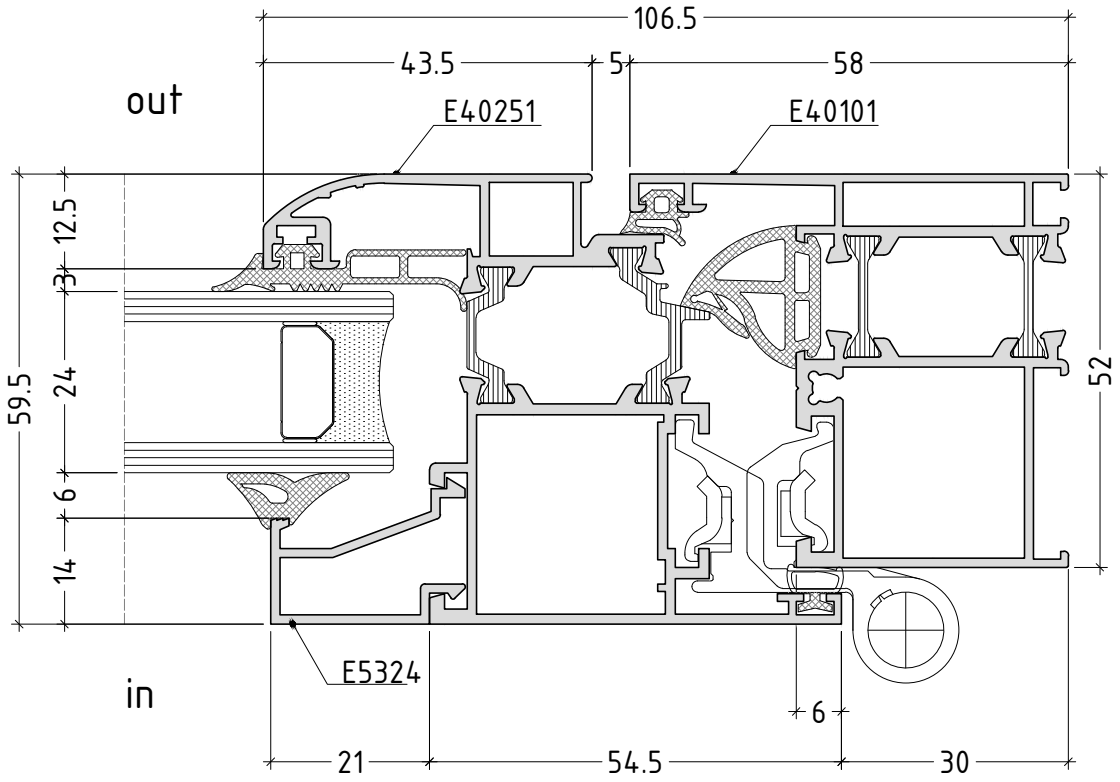

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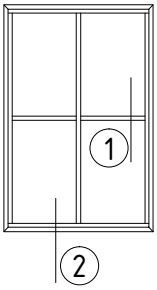
D40-02

opening system with thermal break

E40

fix
position



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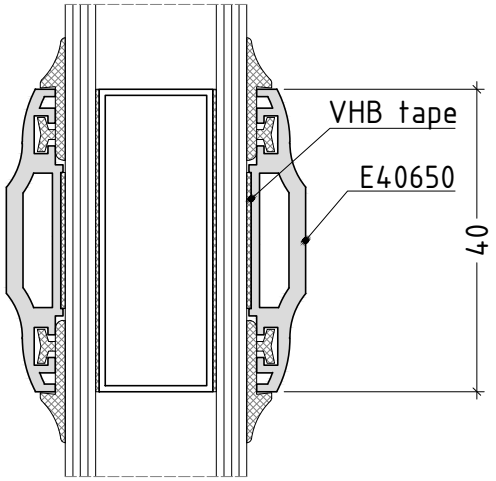

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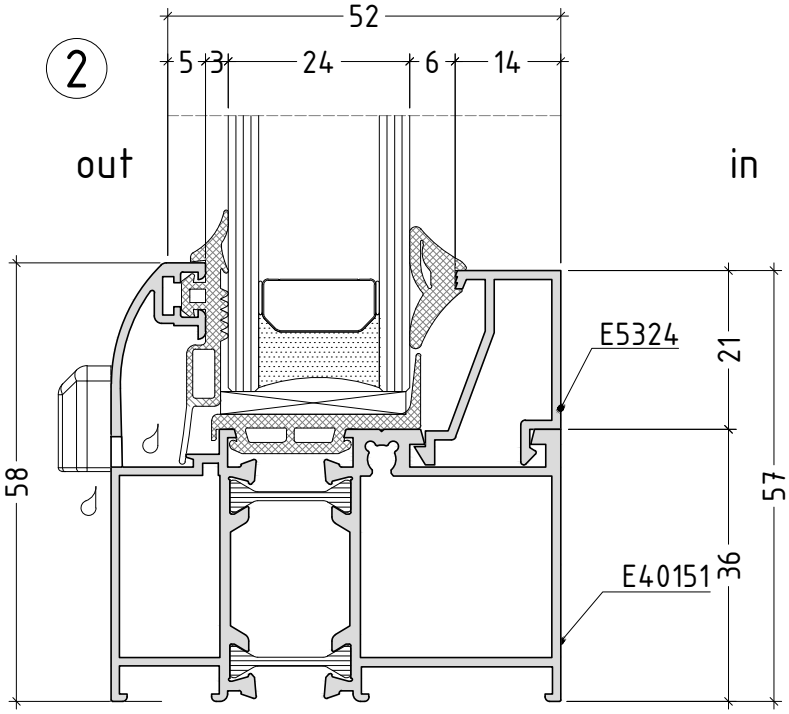

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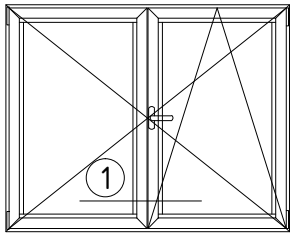
D40-03

inward opening



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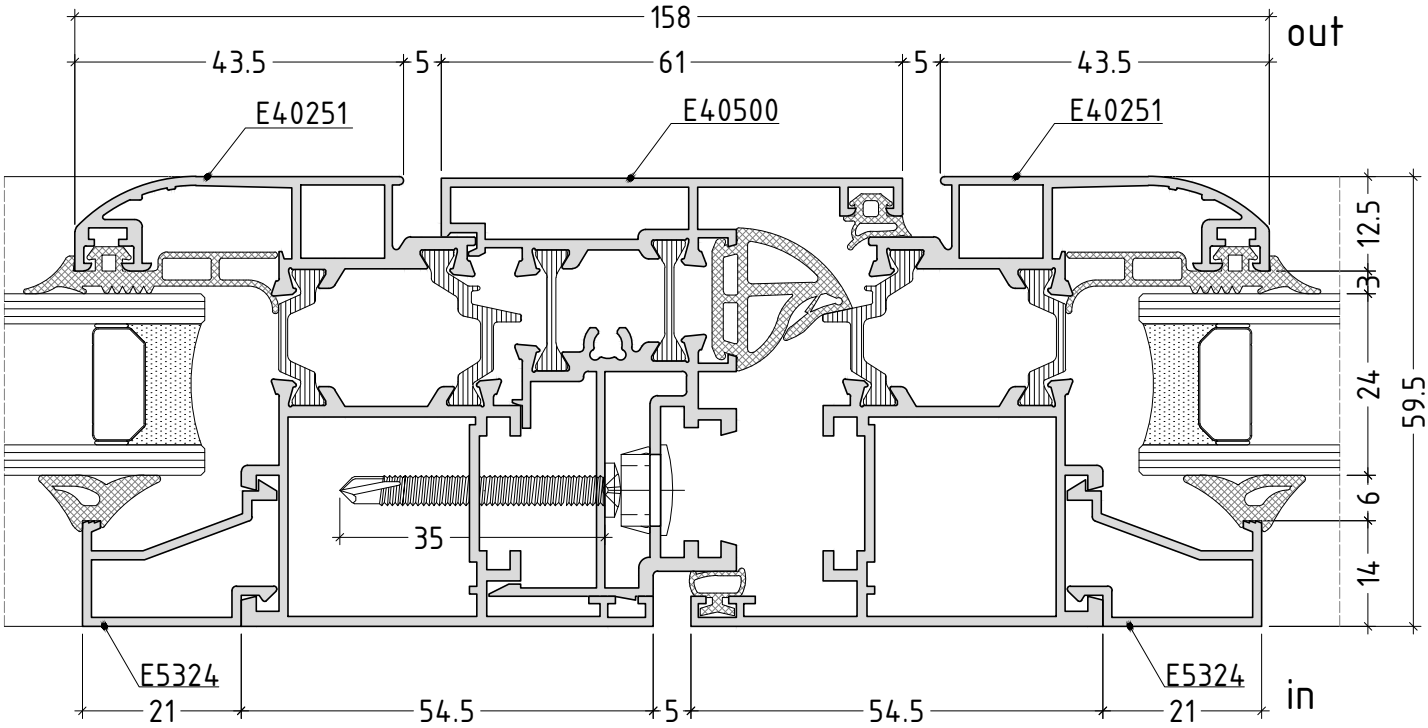

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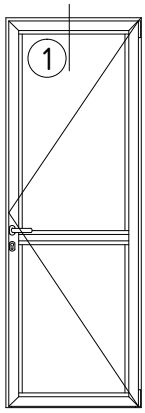
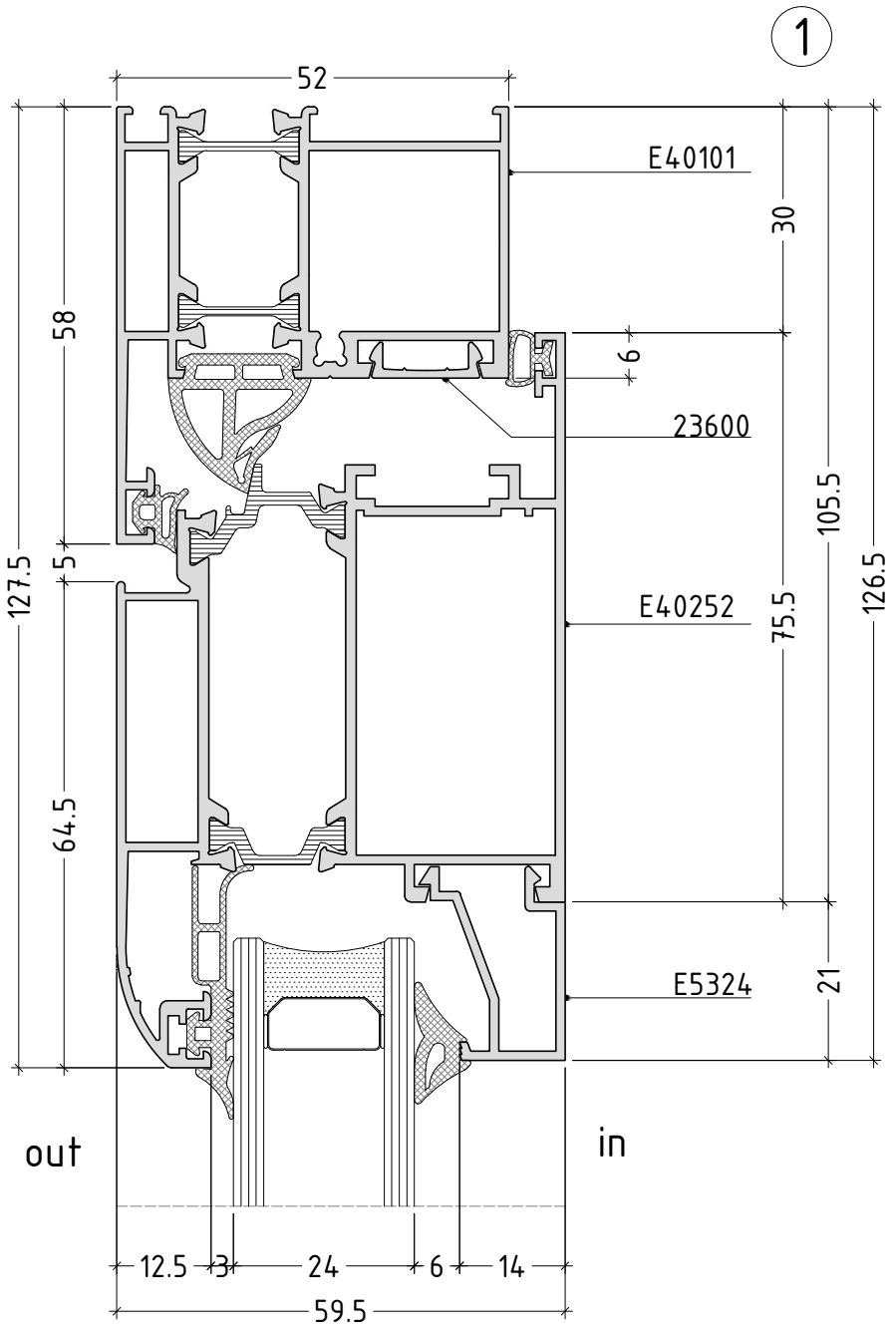
D40-04

opening system with thermal break

E40

inward opening





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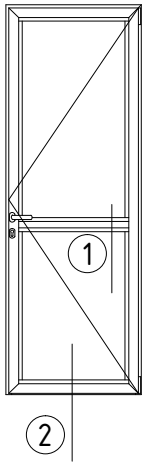
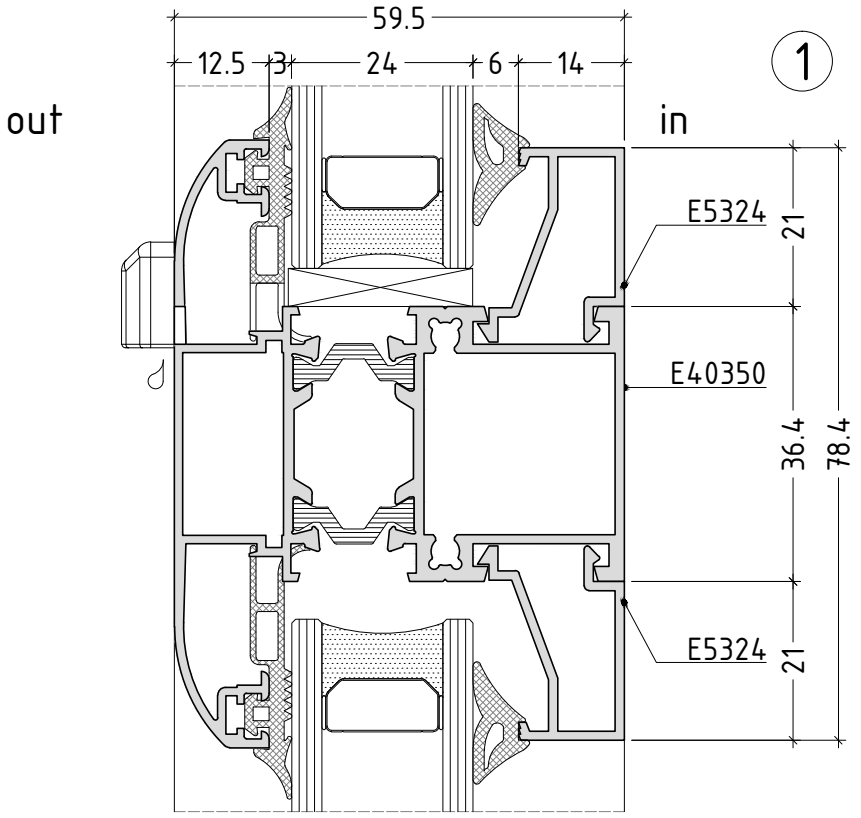
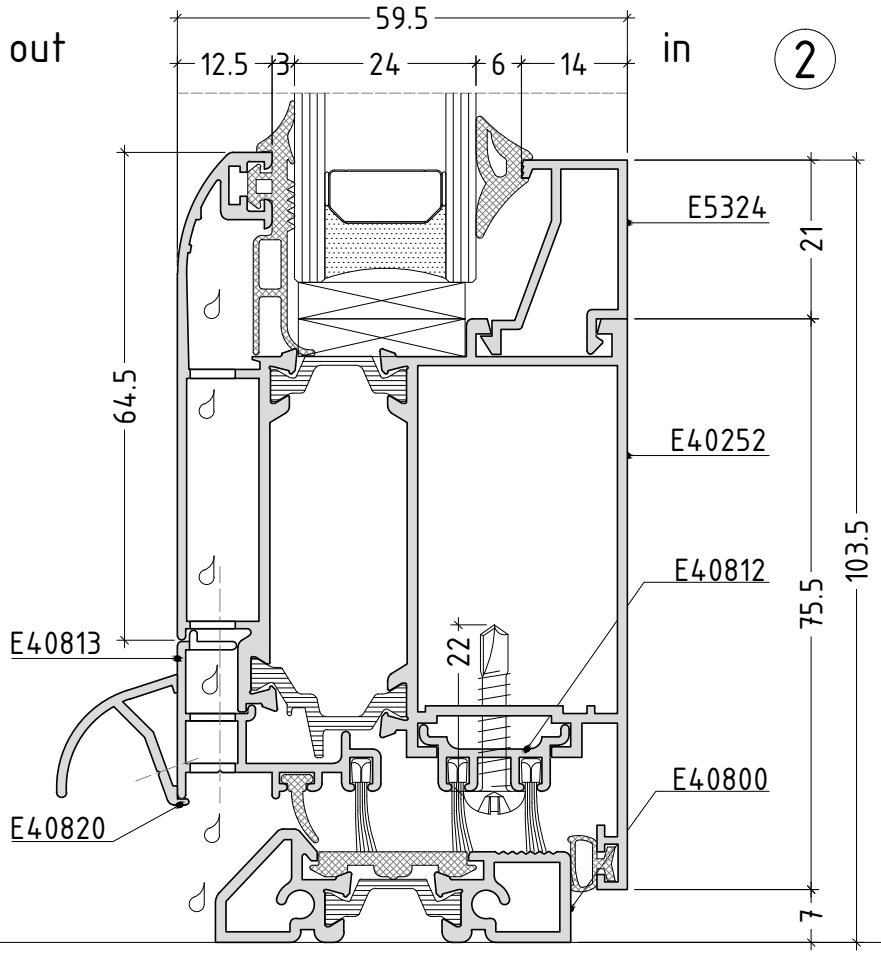
D40-05

inward opening







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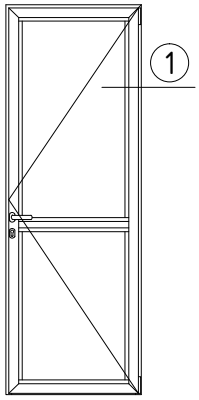
D40-06

inward opening



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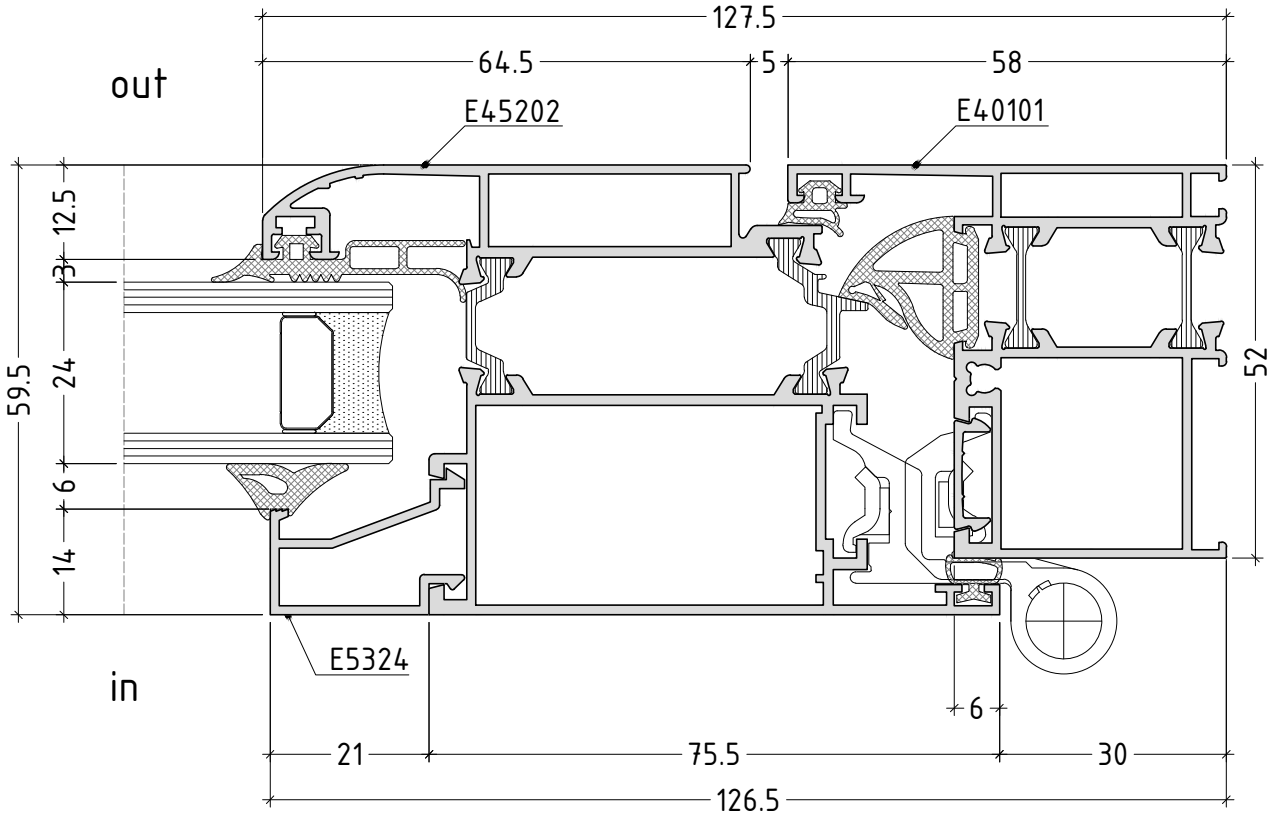
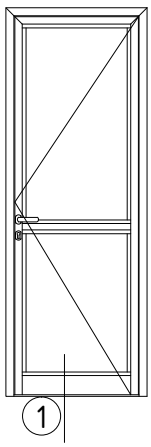


scale : 1:1

D40-07

inward opening



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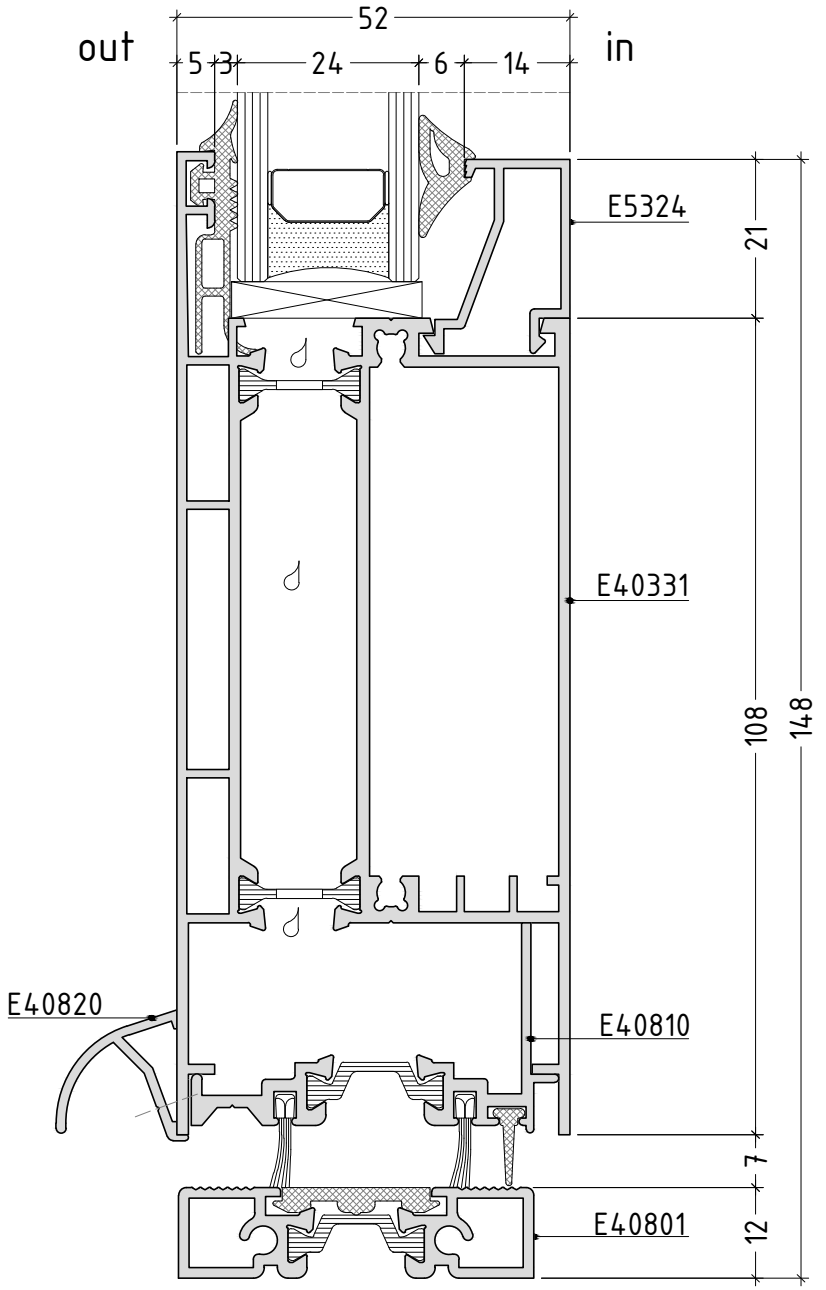

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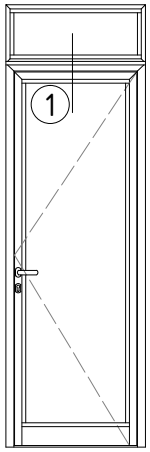
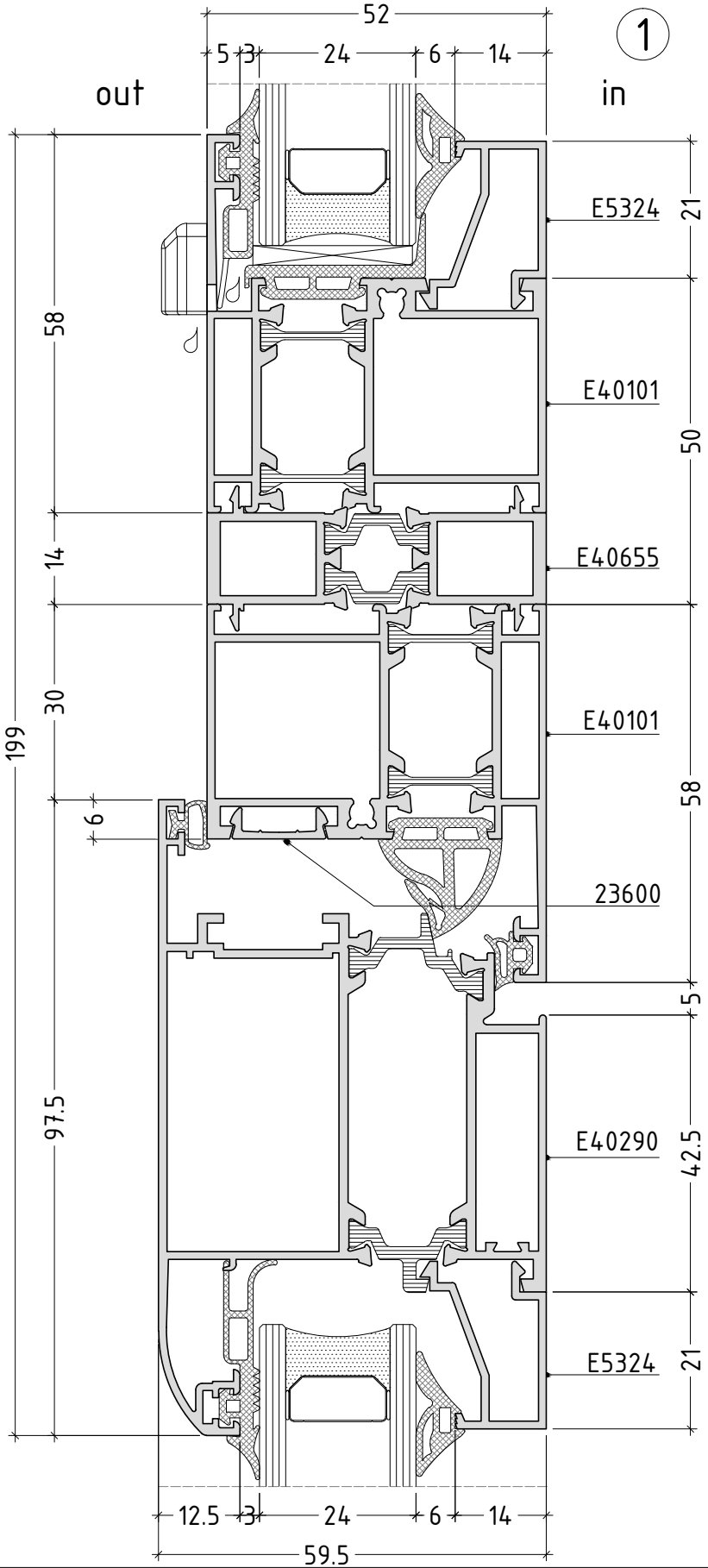
D40-08

opening system with thermal break

E40

outward opening





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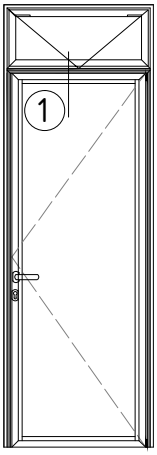
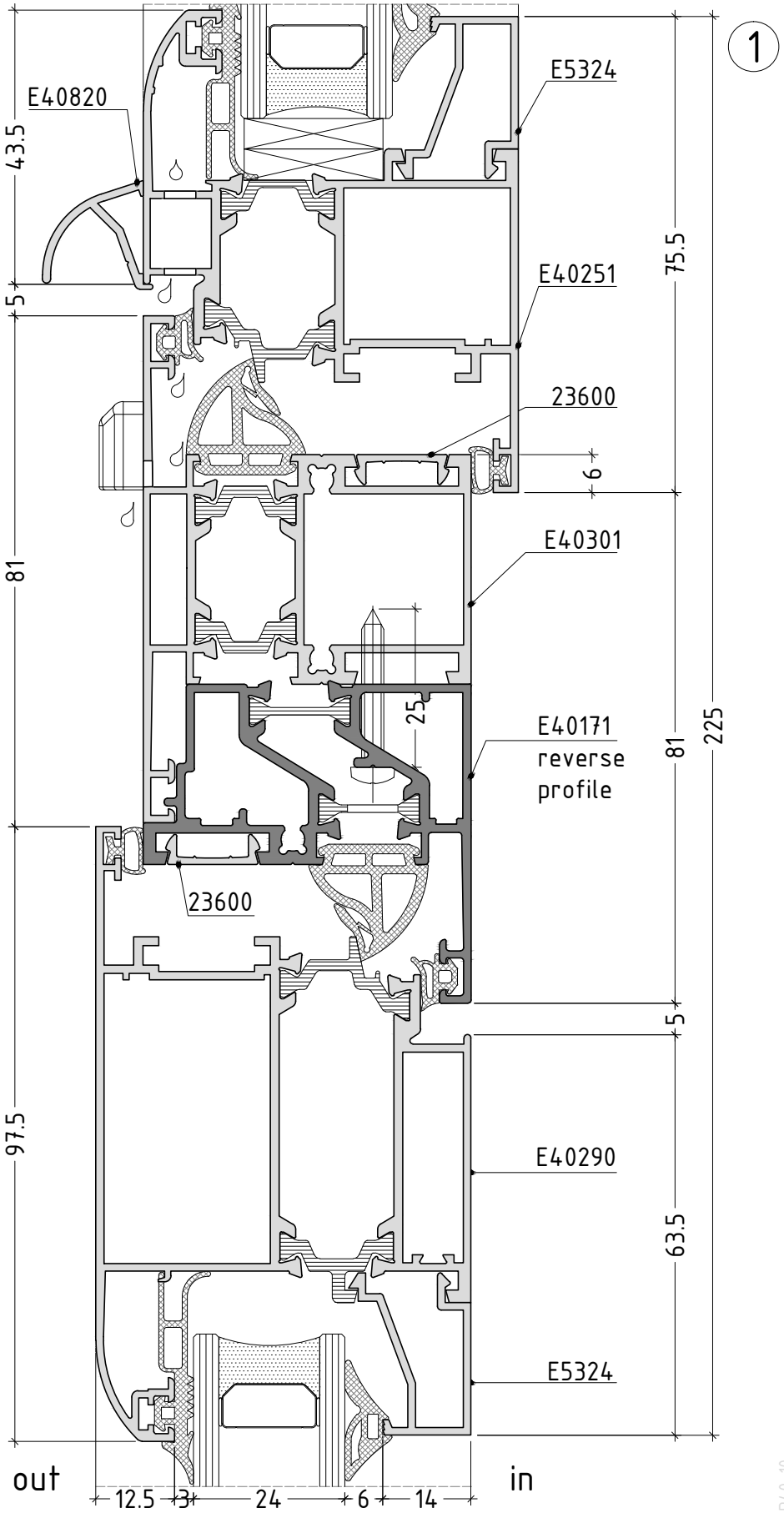
D40-09

opening system with thermal break

E40

outward opening





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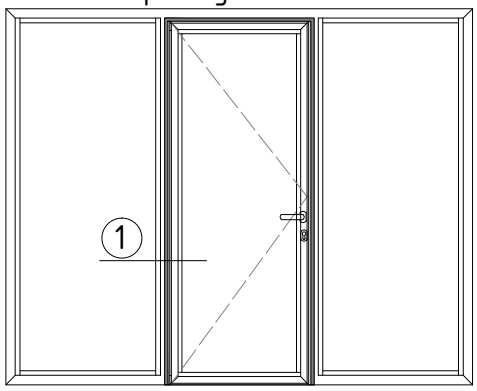
D40-10

outward opening



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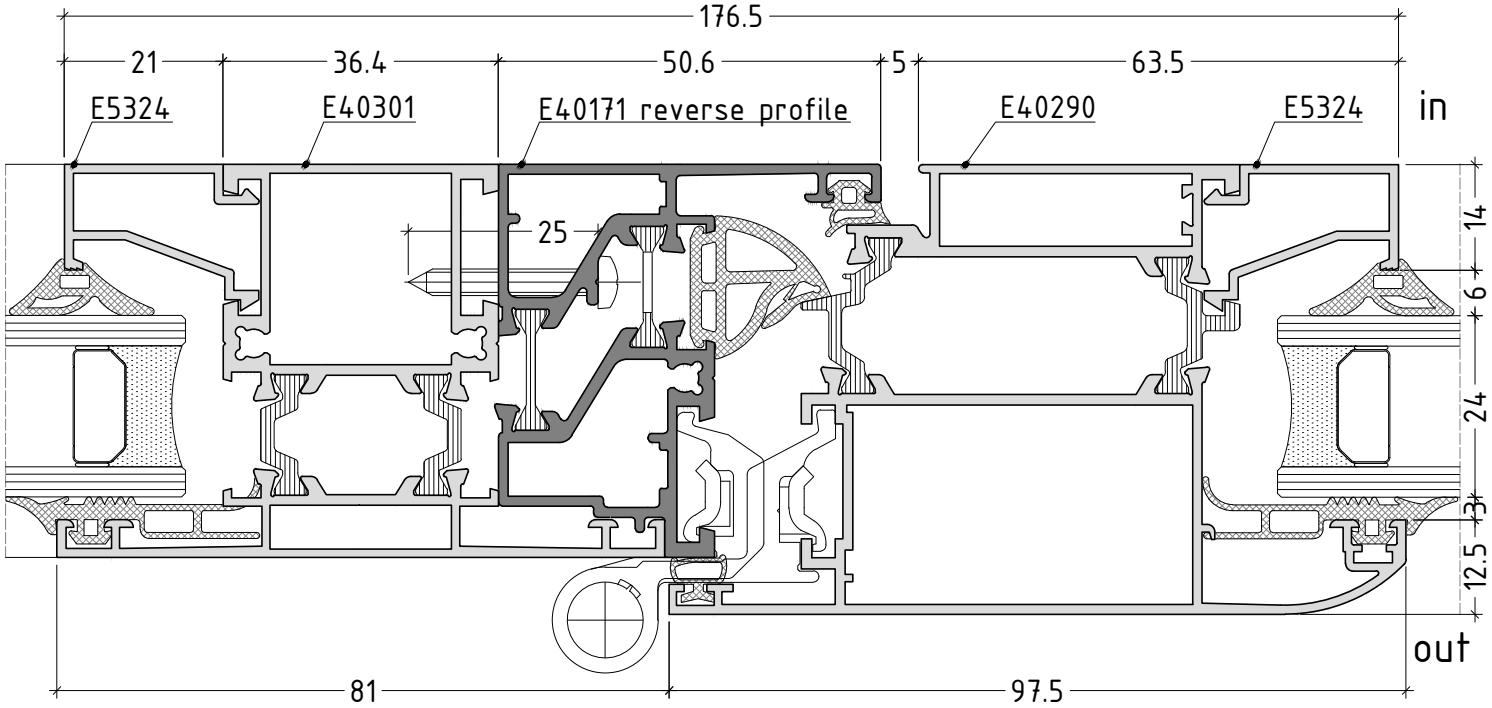

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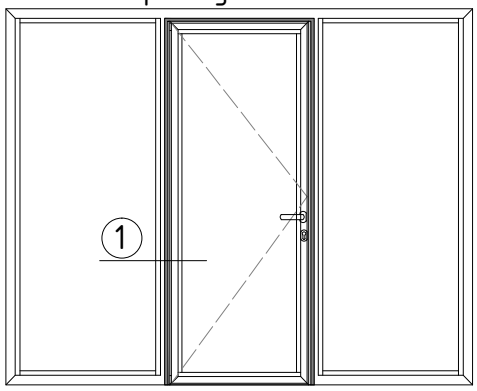
D40-11

outward opening



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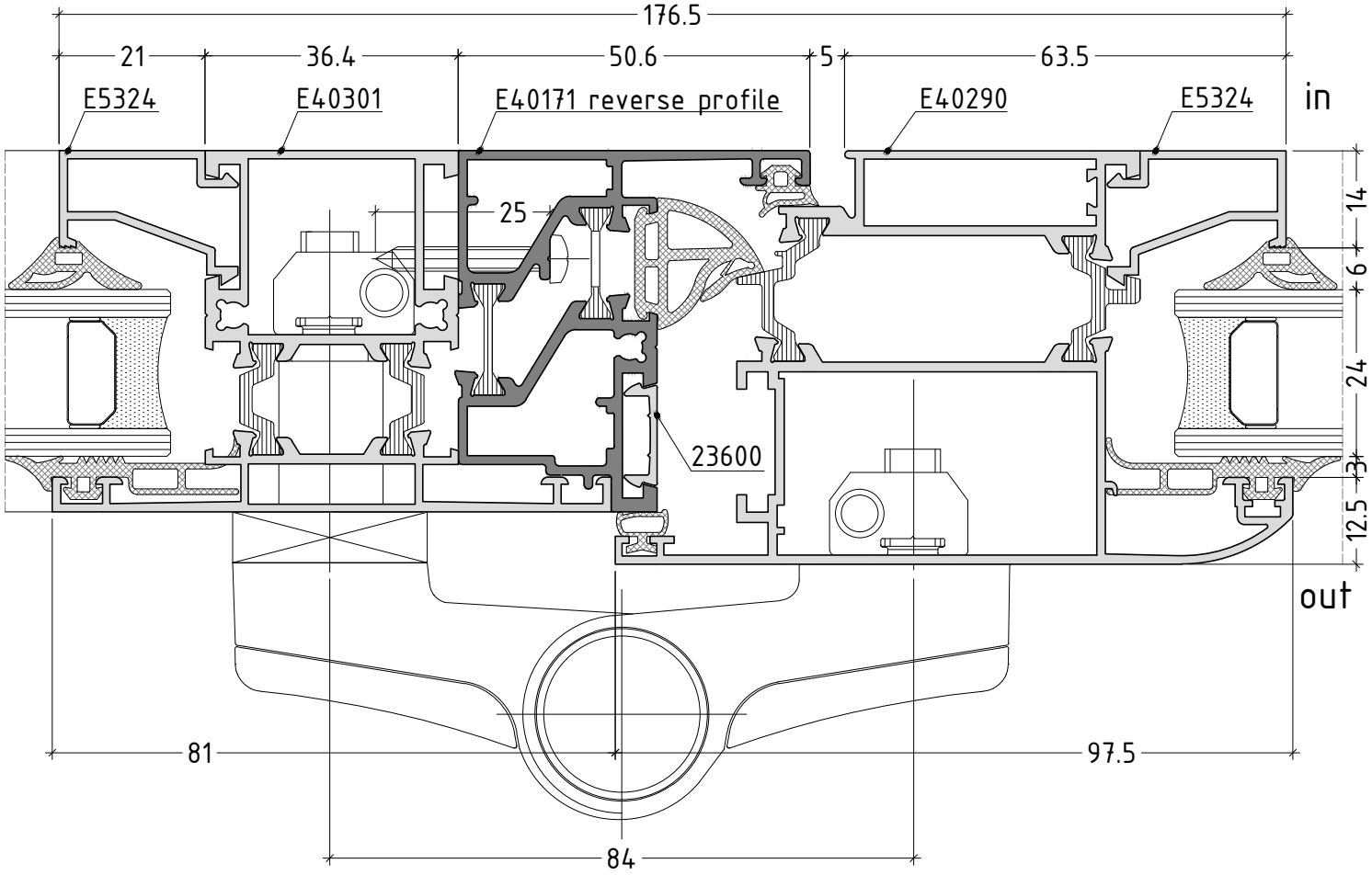
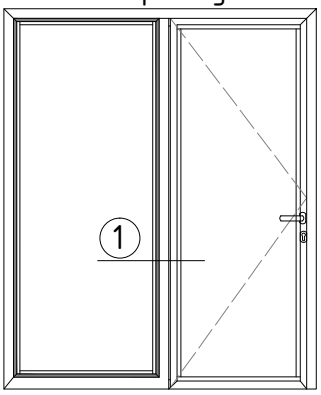


When the hinge and reverse profile are inside the openable part, the distance between axes of hinges has to be 84 mm

scale : 1:1

D40-12

outward opening



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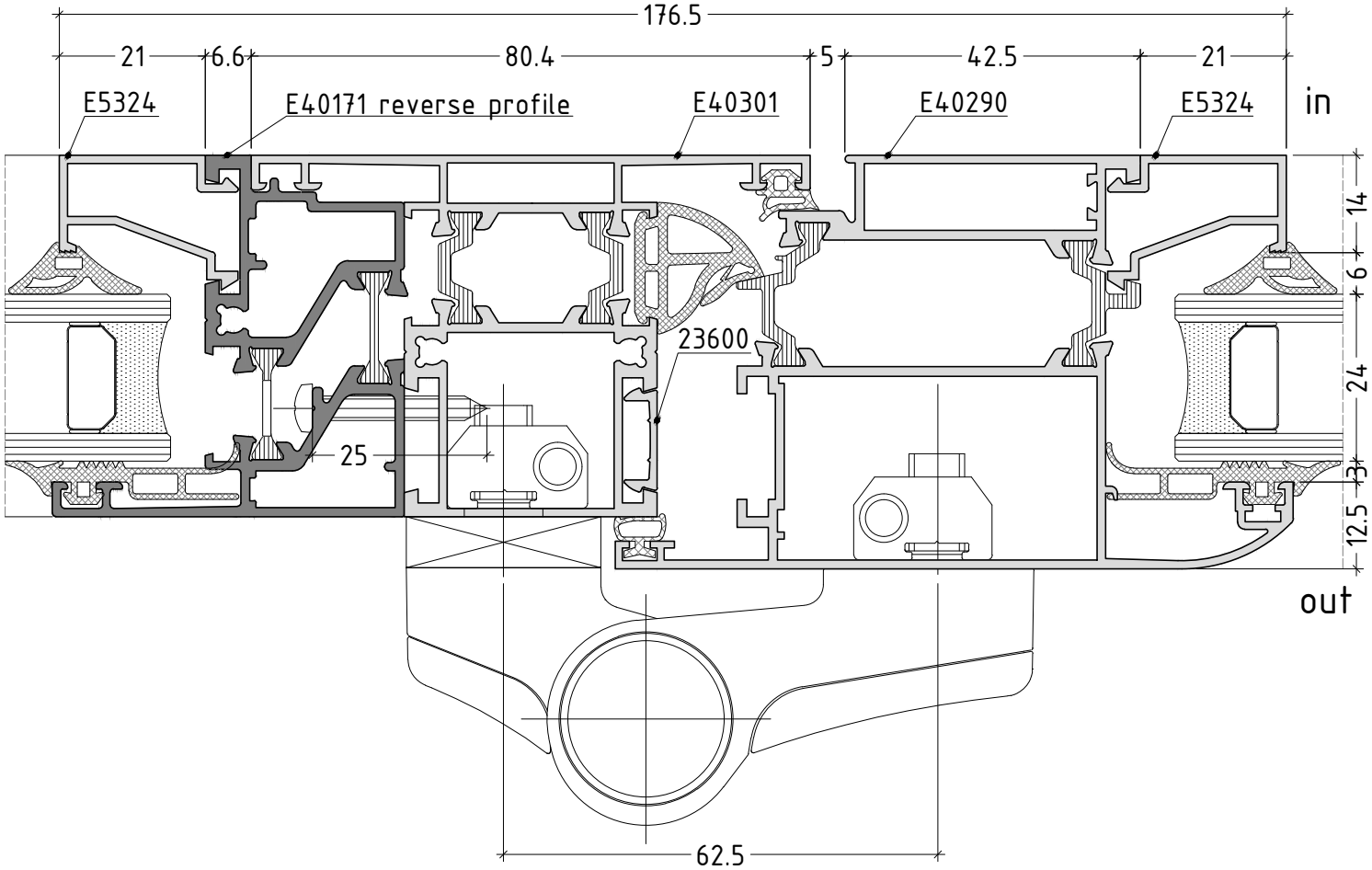


When the hinge and reverse profile are inside the fixed part, the distance between axes of hinges has to be 62,5 mm

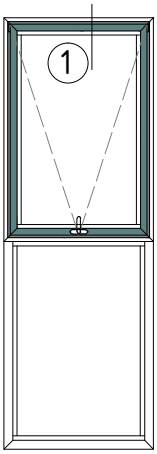
scale : 1:1

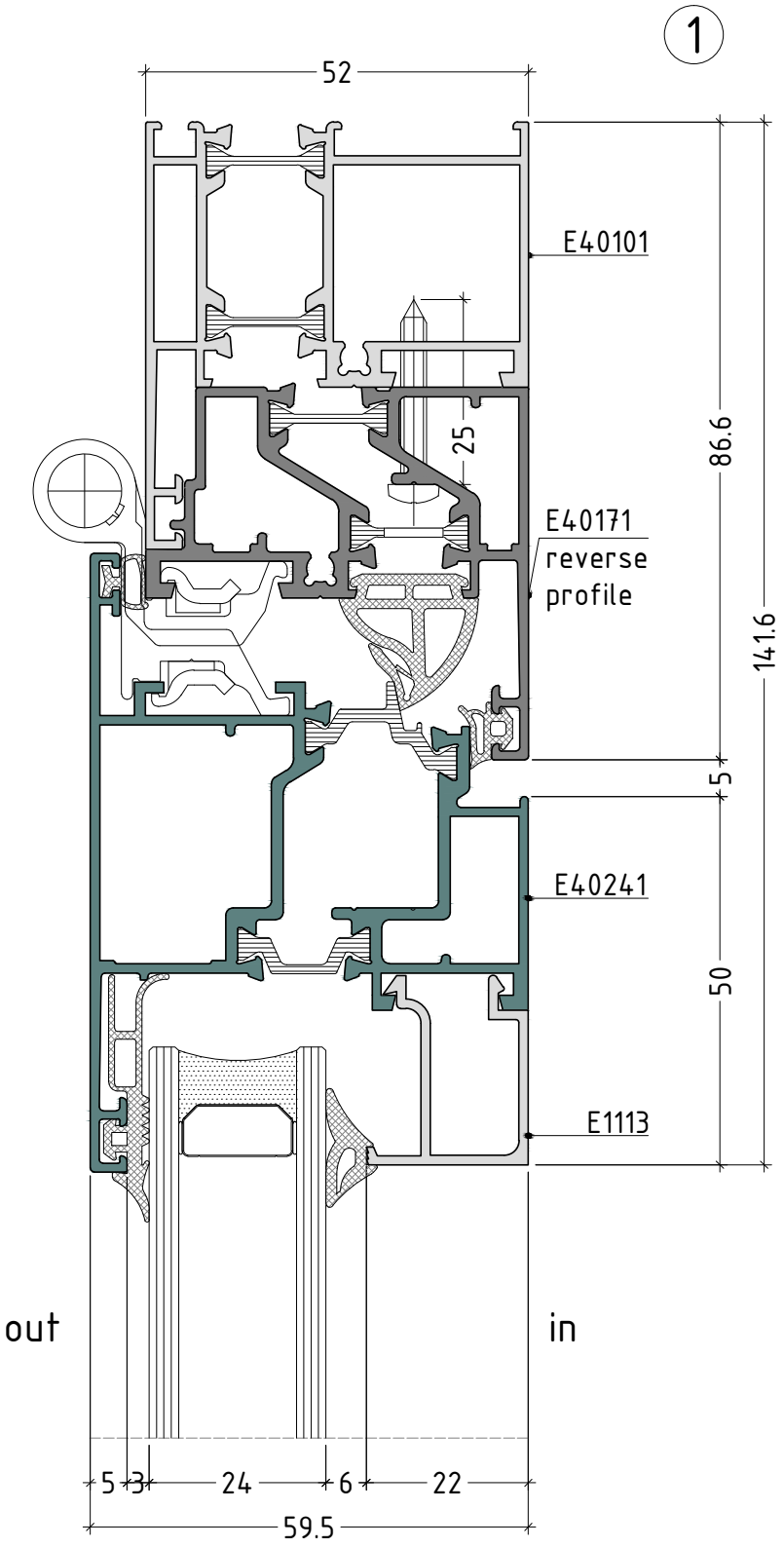
D40-13

opening system with thermal break

E40

outward opening

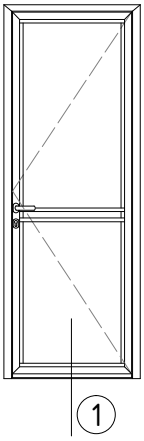




scale : 1:1

D40-14

outward opening



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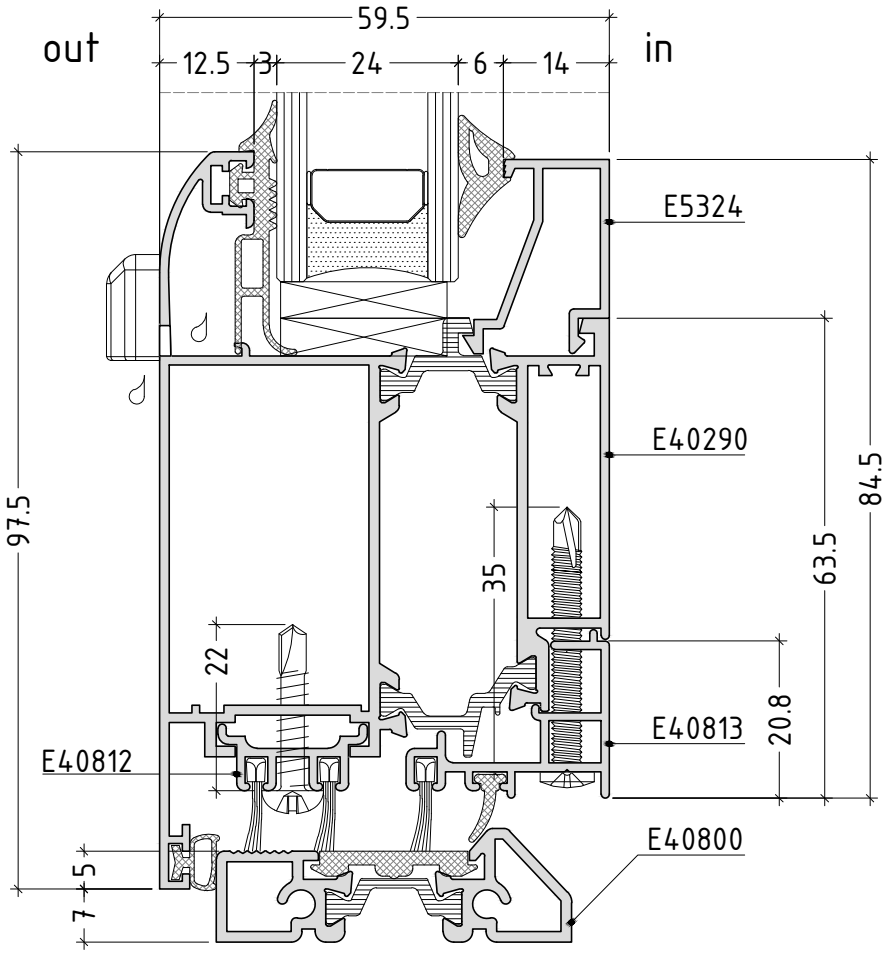


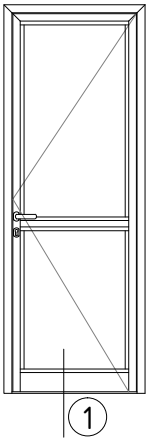
scale : 1:1

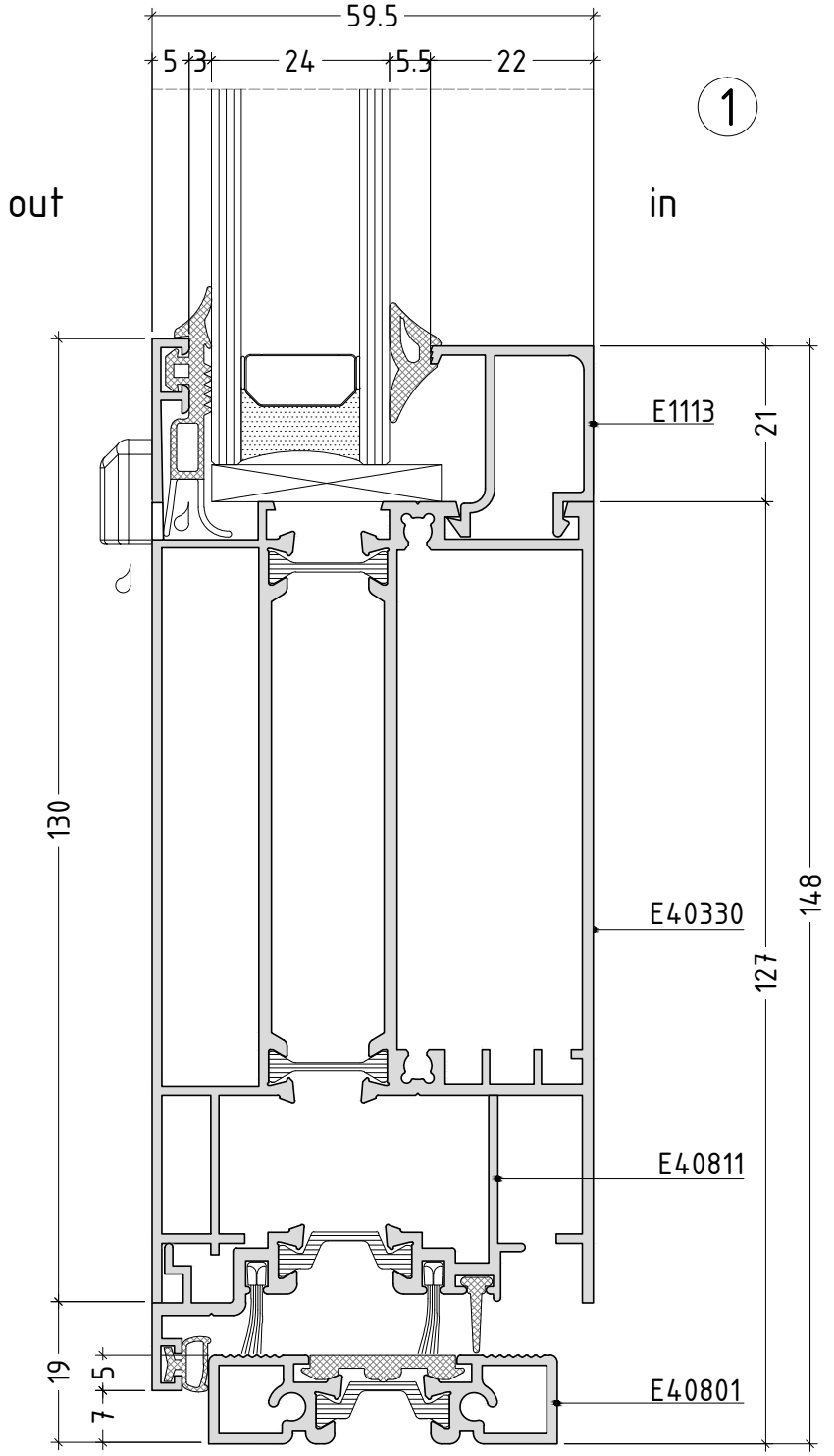
D40-15

opening system with thermal break

E40

outward opening



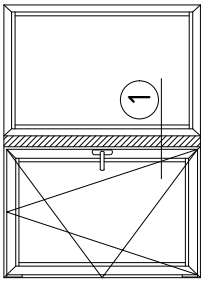


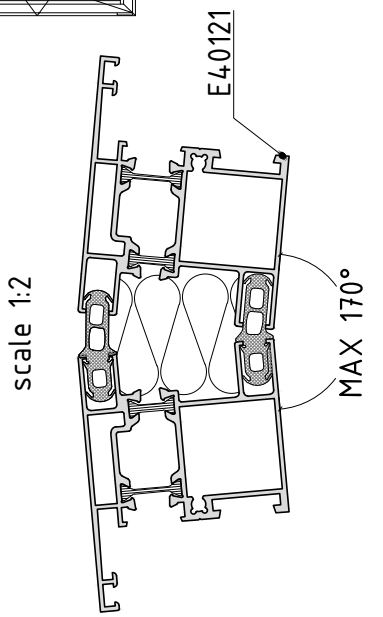
scale : 1:1

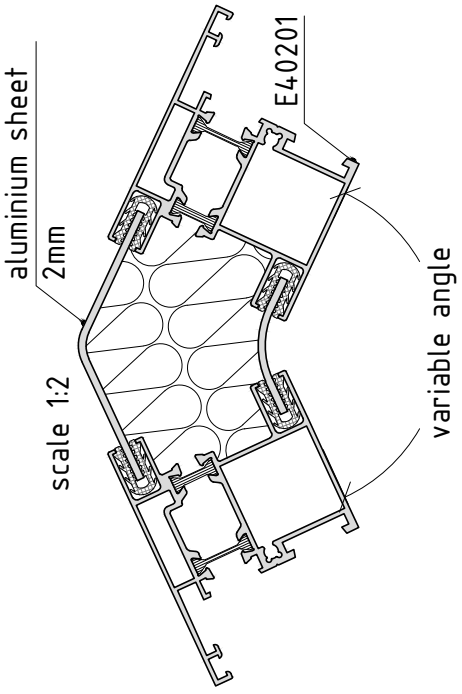
D40-16

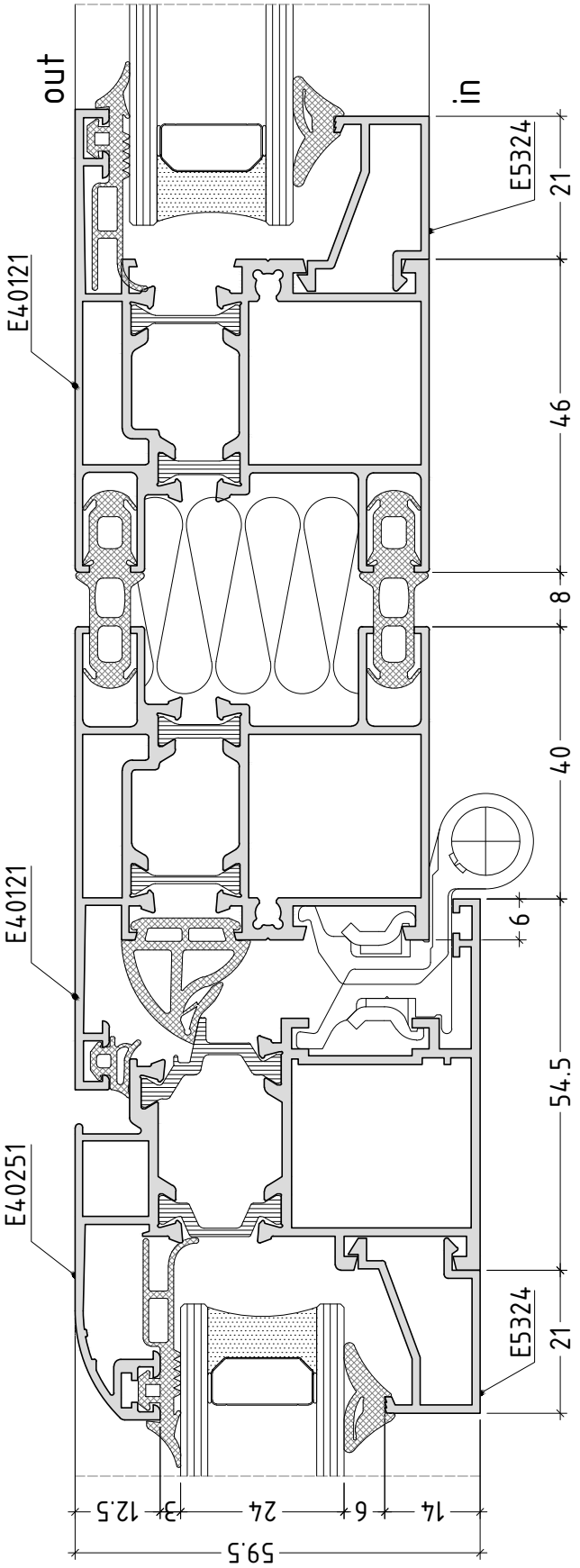
opening system with thermal break

E40









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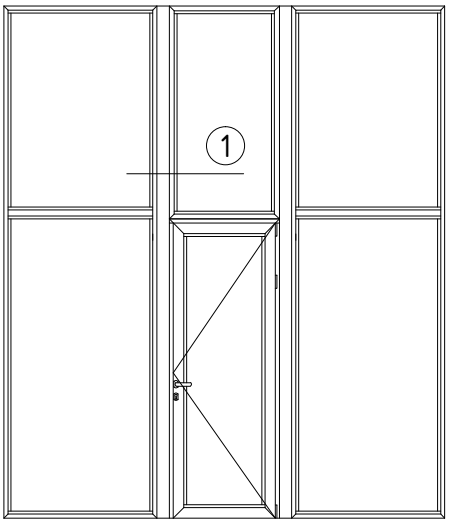
D40-17



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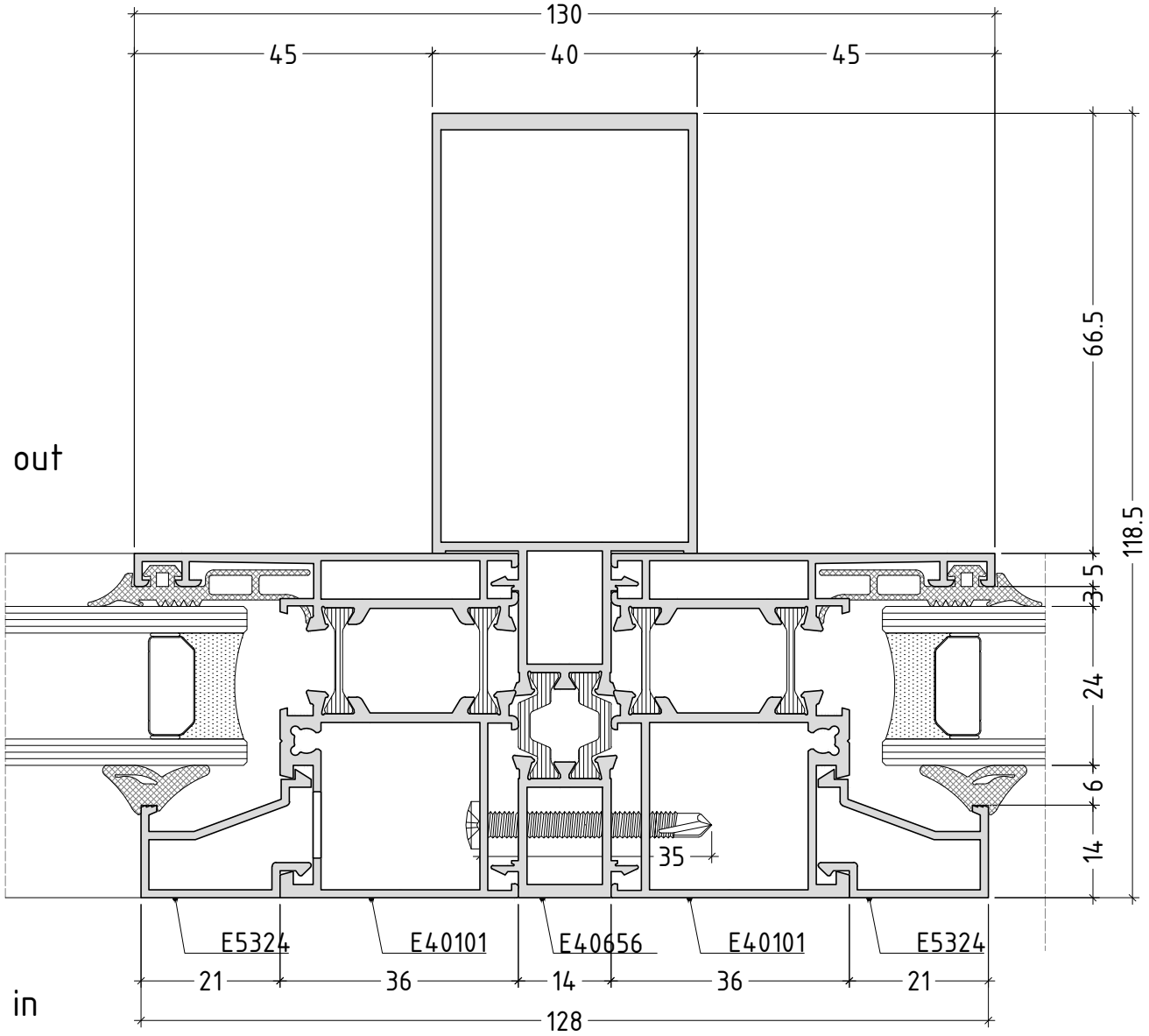
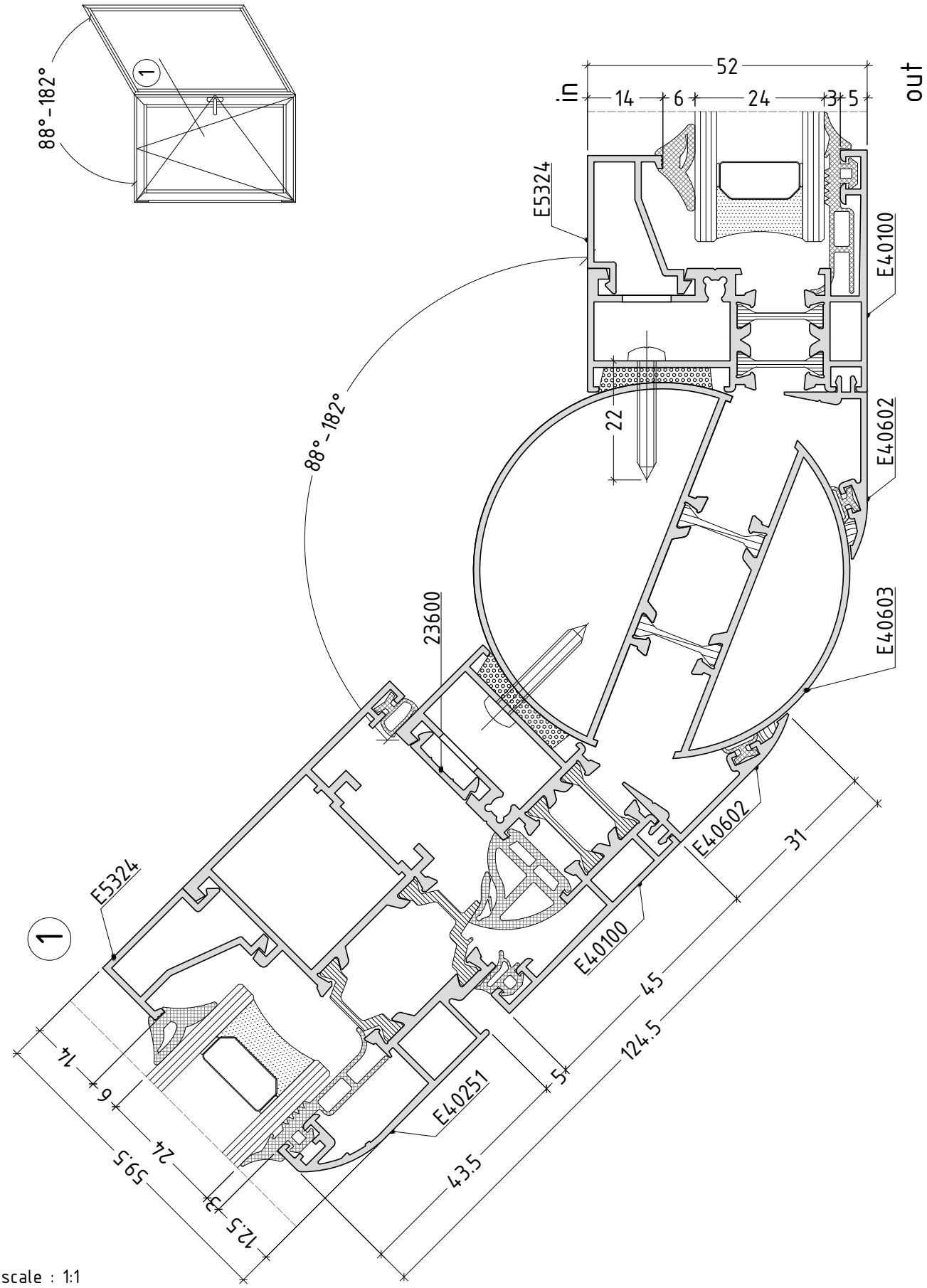


scale : 1:1

D40-18

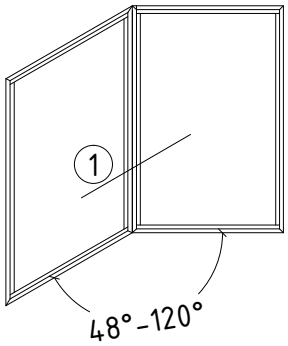
opening system with thermal break

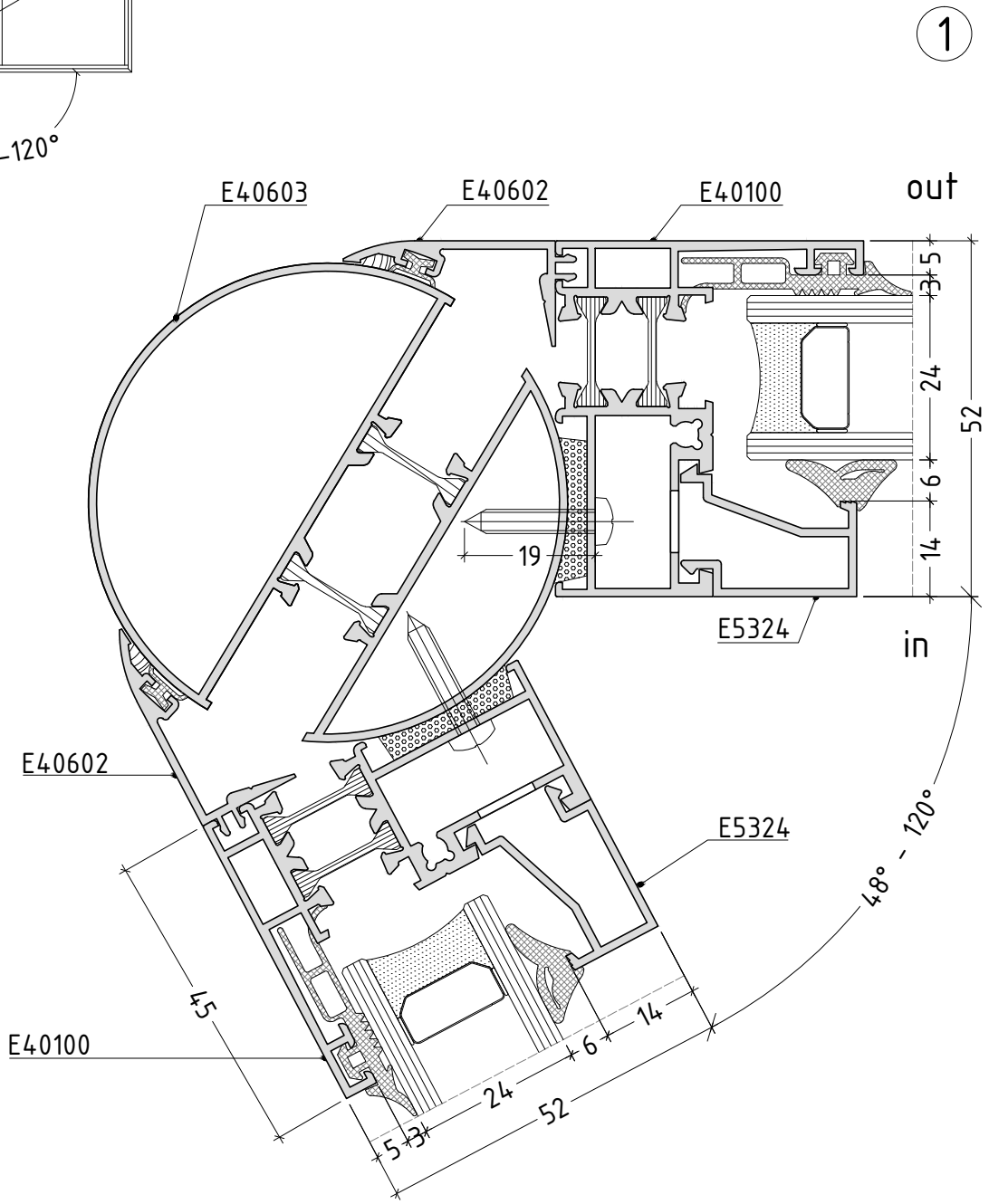
E40



opening system with thermal break

E40



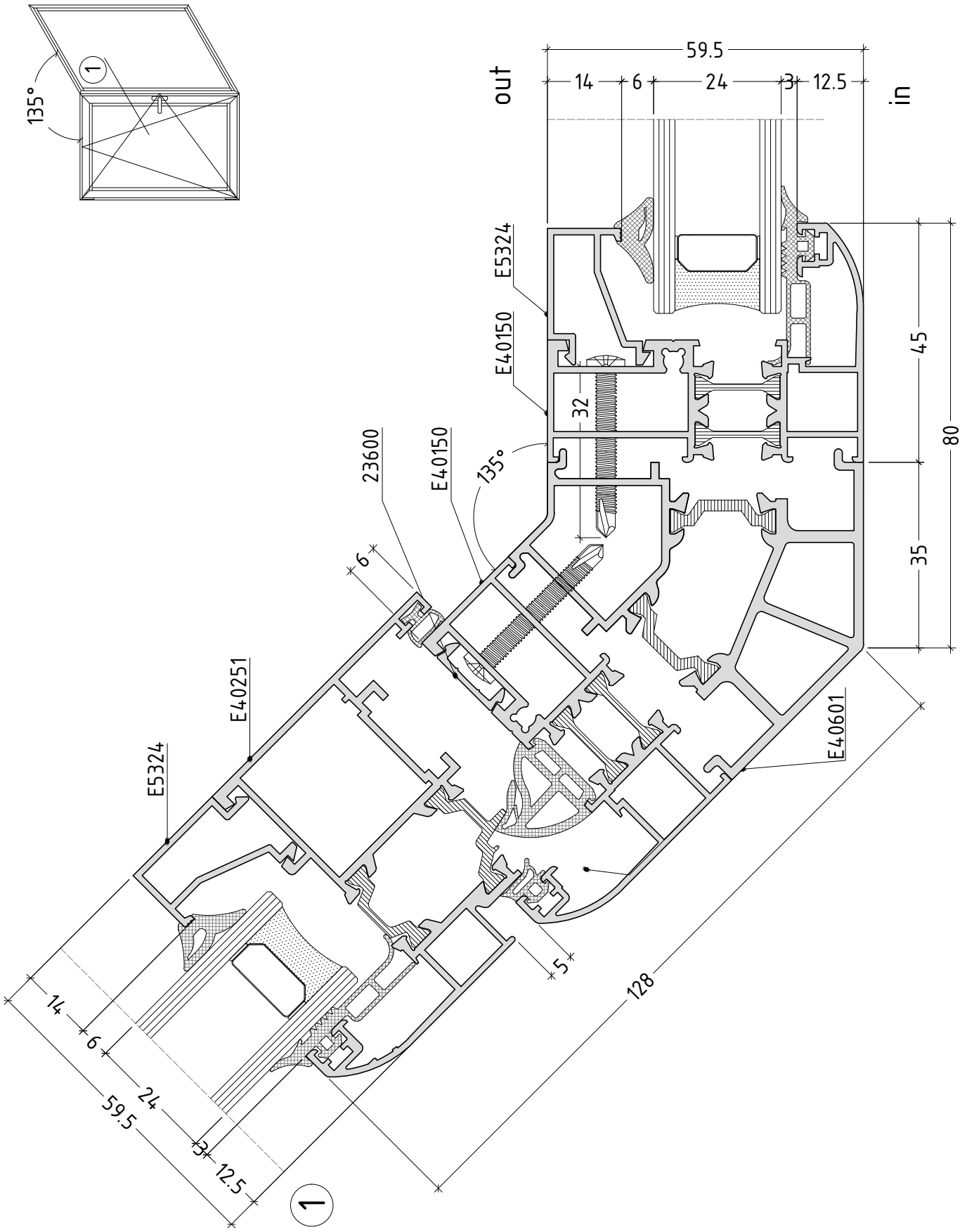


scale : 1:1

D40-20

opening system with thermal break

E40

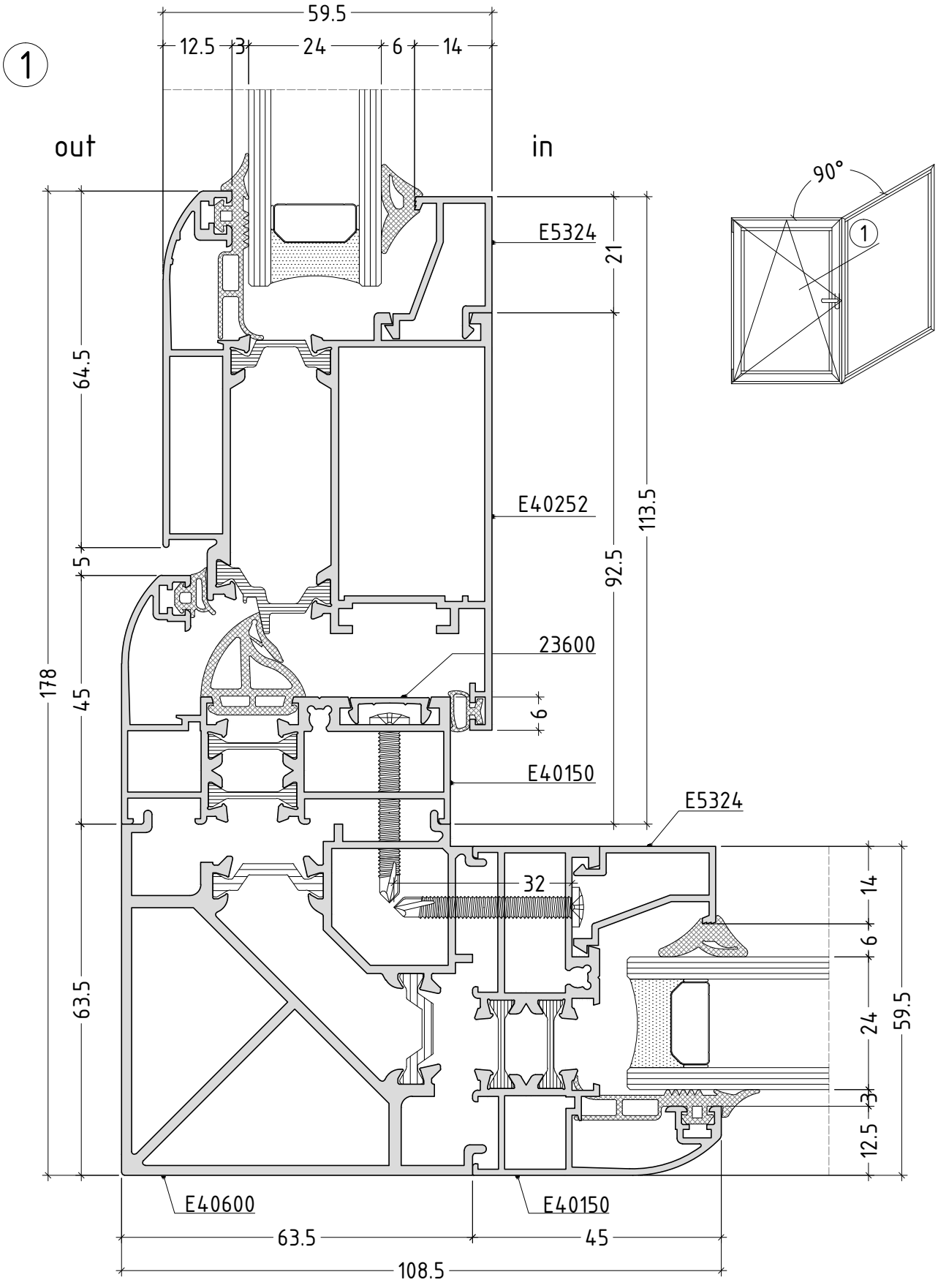


scale : 1:1

D40-21

opening system with thermal break

E40



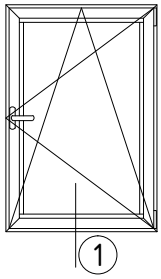
scale : 1:1

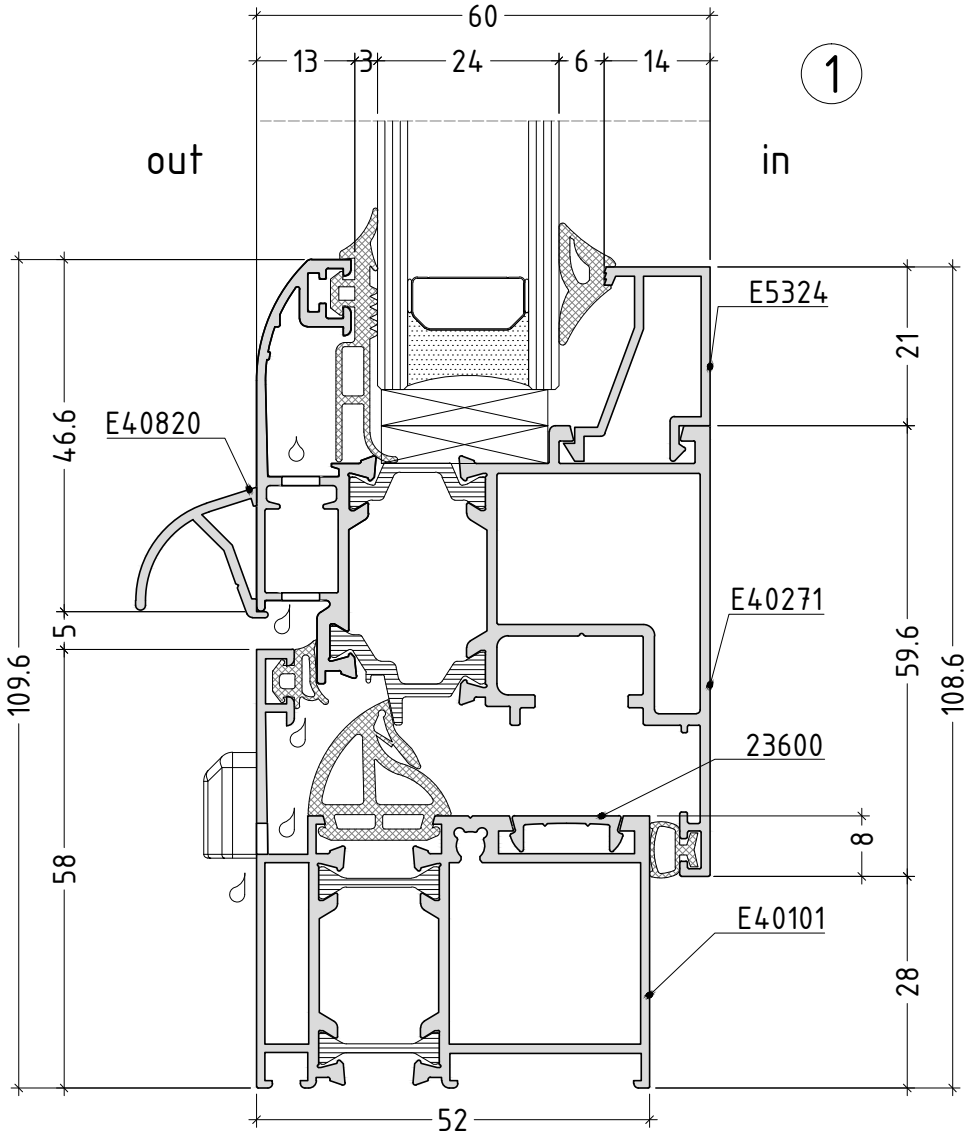
D40-22

opening system with thermal break

E40

inward opening
PVC groove

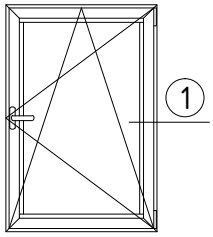


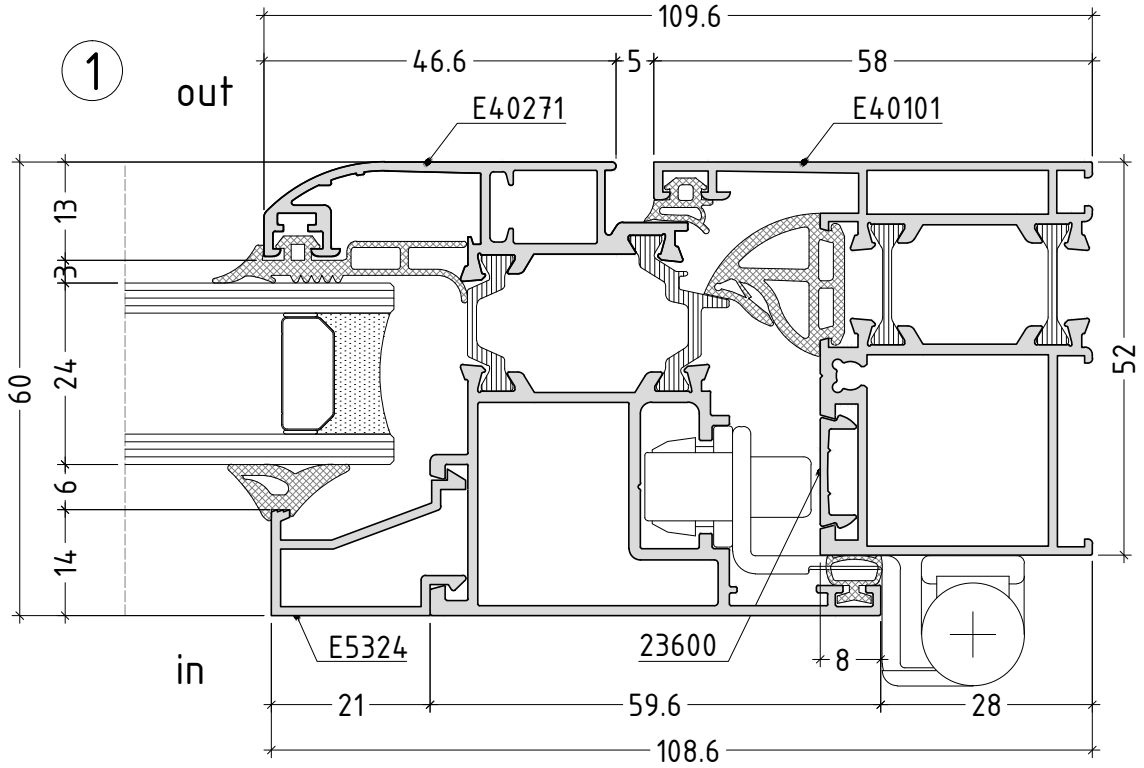


scale : 1:1

D40-23

inward opening
PVC groove



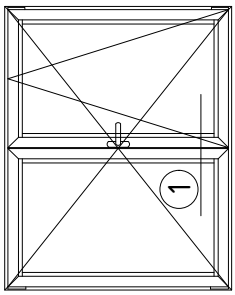


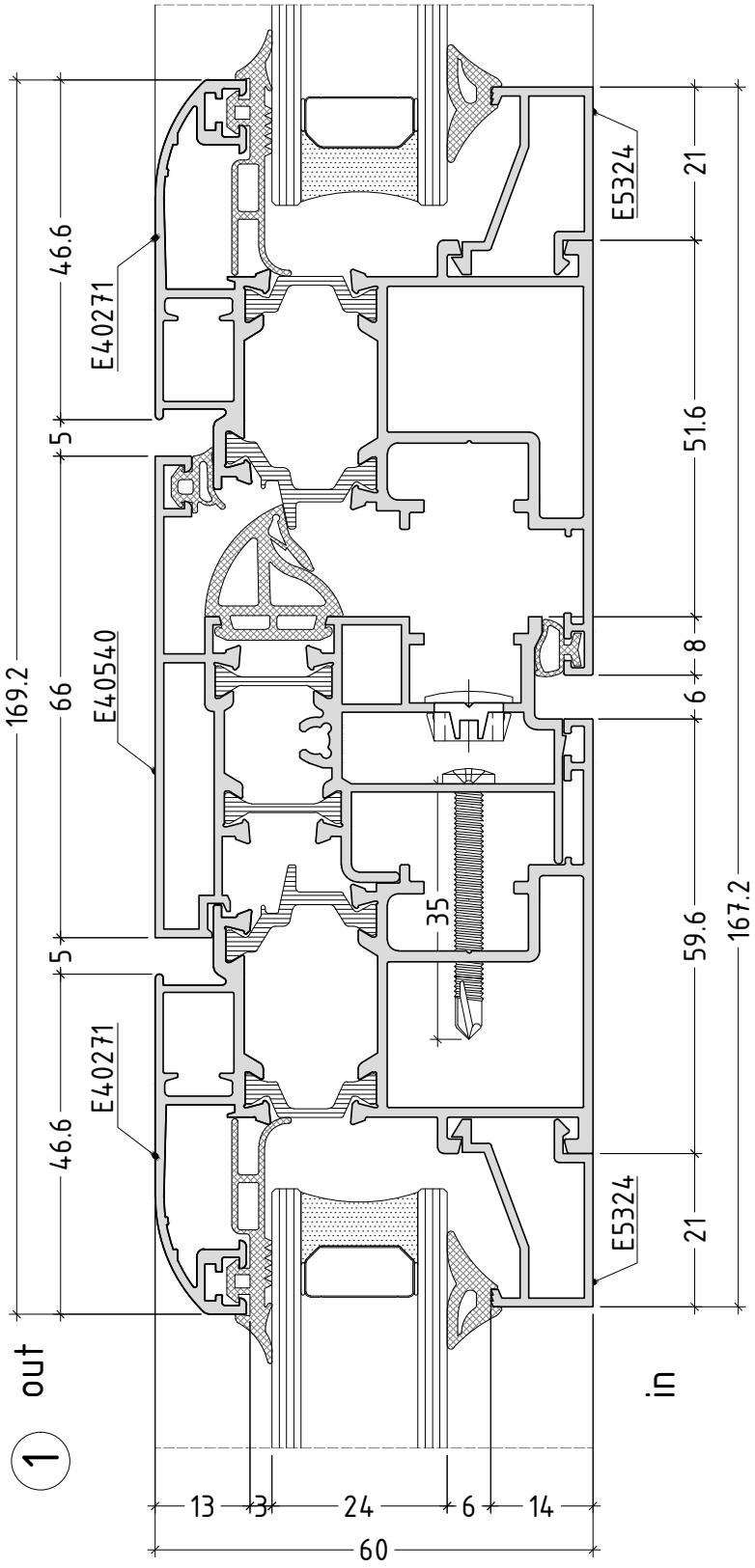
scale : 1:1

D40-24

opening system with thermal break

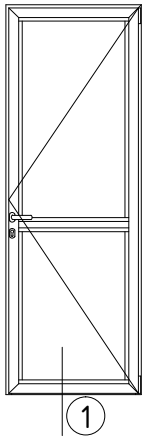
E40

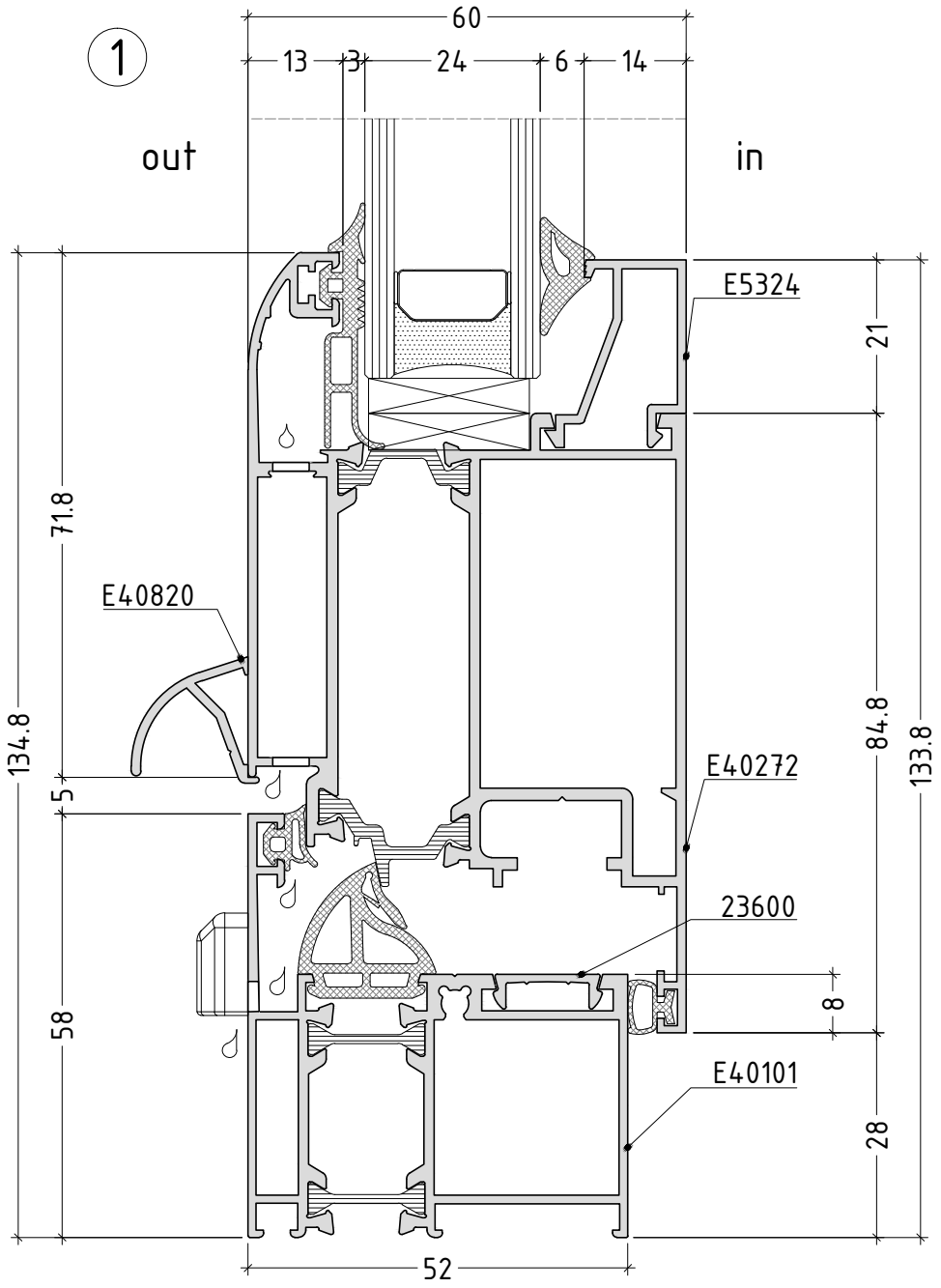




scale : 1:1

inward opening
PVC groove





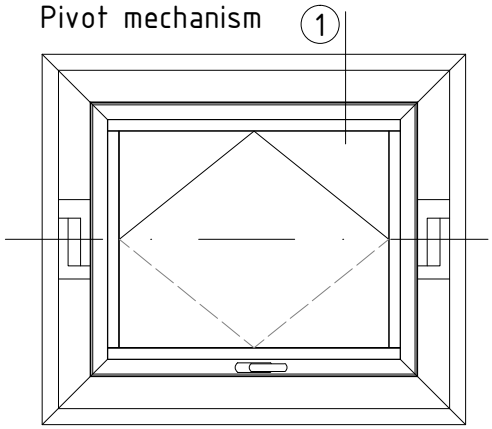
scale : 1:1

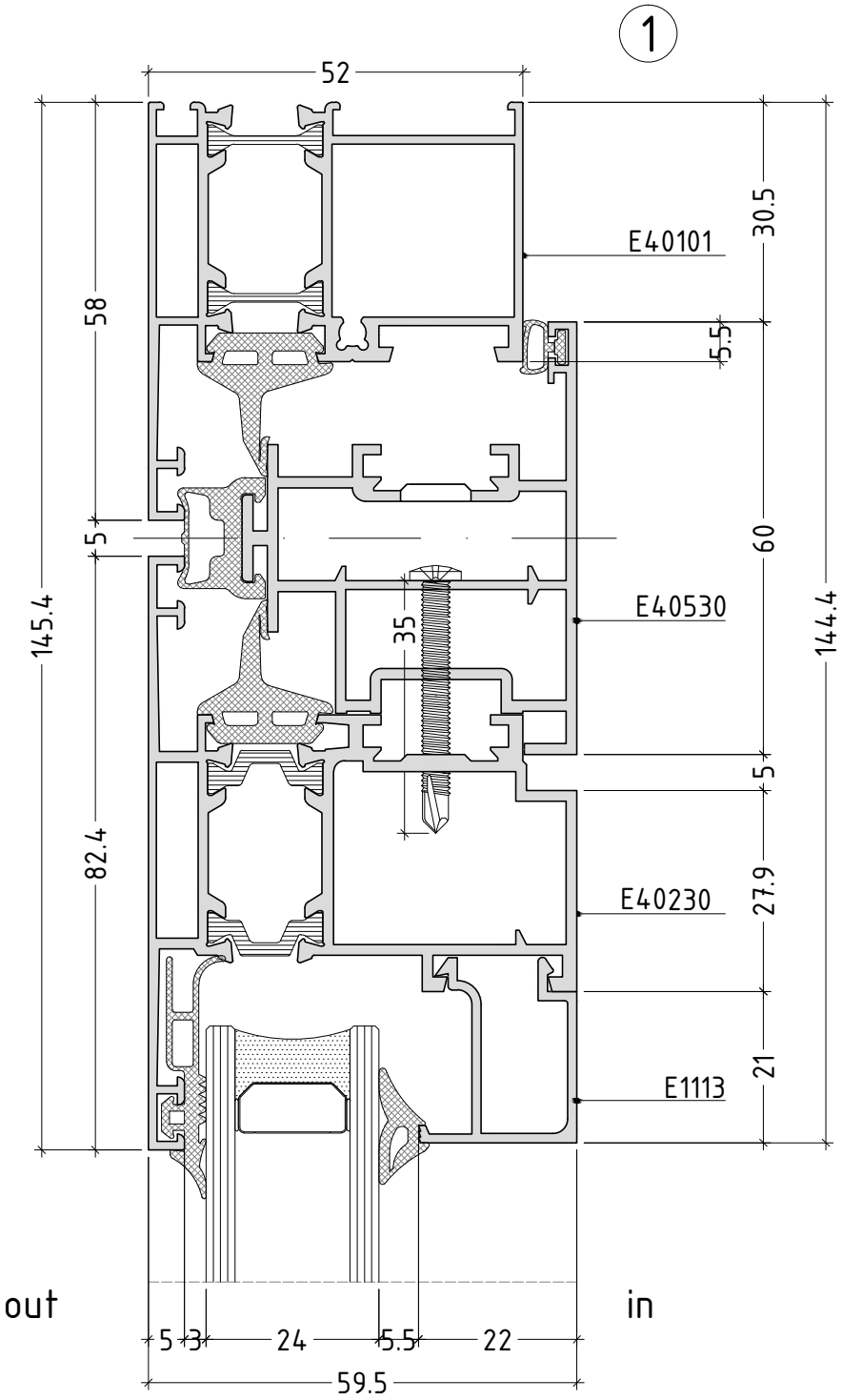
D40-26

opening system with thermal break

E40

Pivot mechanism





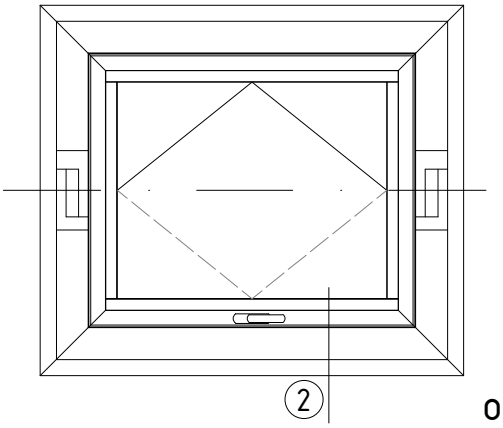
scale : 1:1

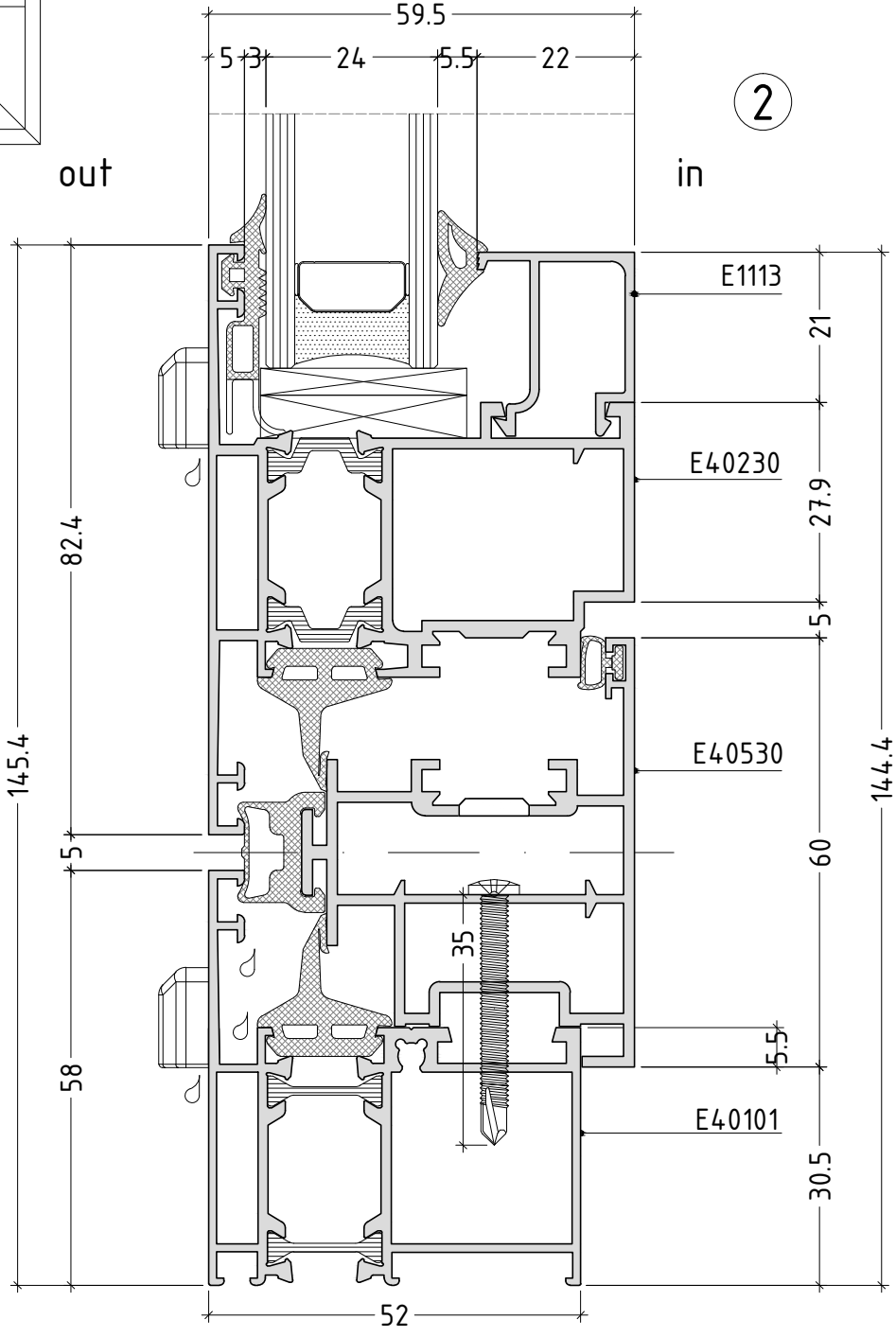
D40-27

opening system with thermal break

E40

Pivot mechanism

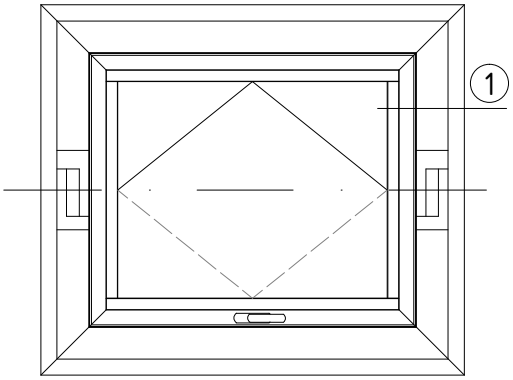


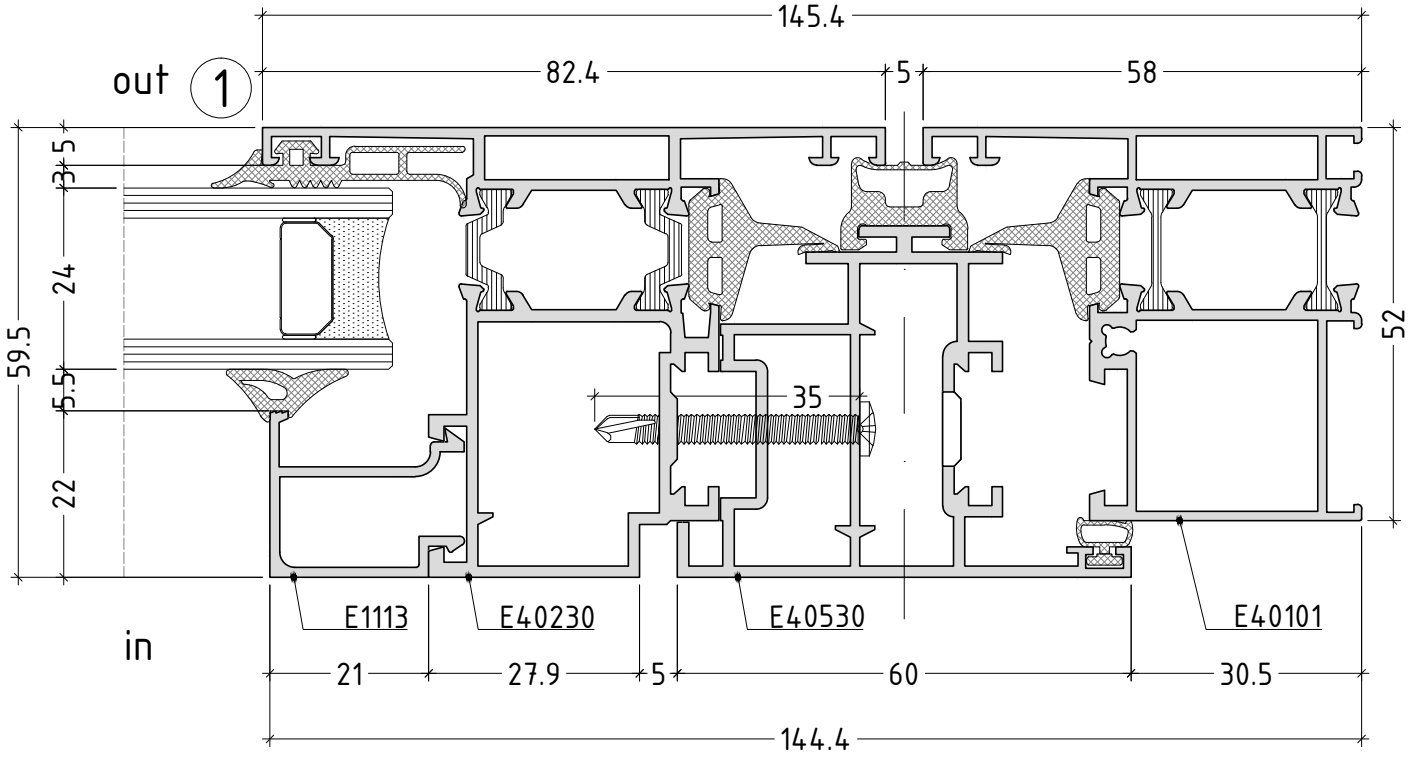


scale : 1:1

D40-28

Pivot mechanism

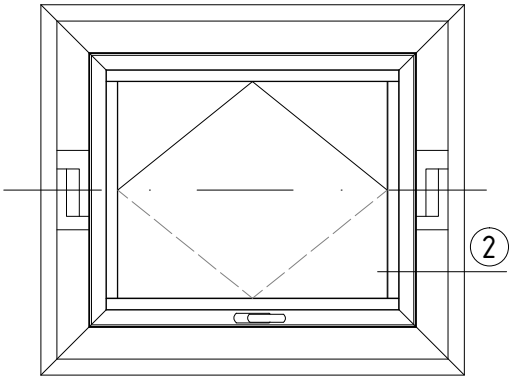


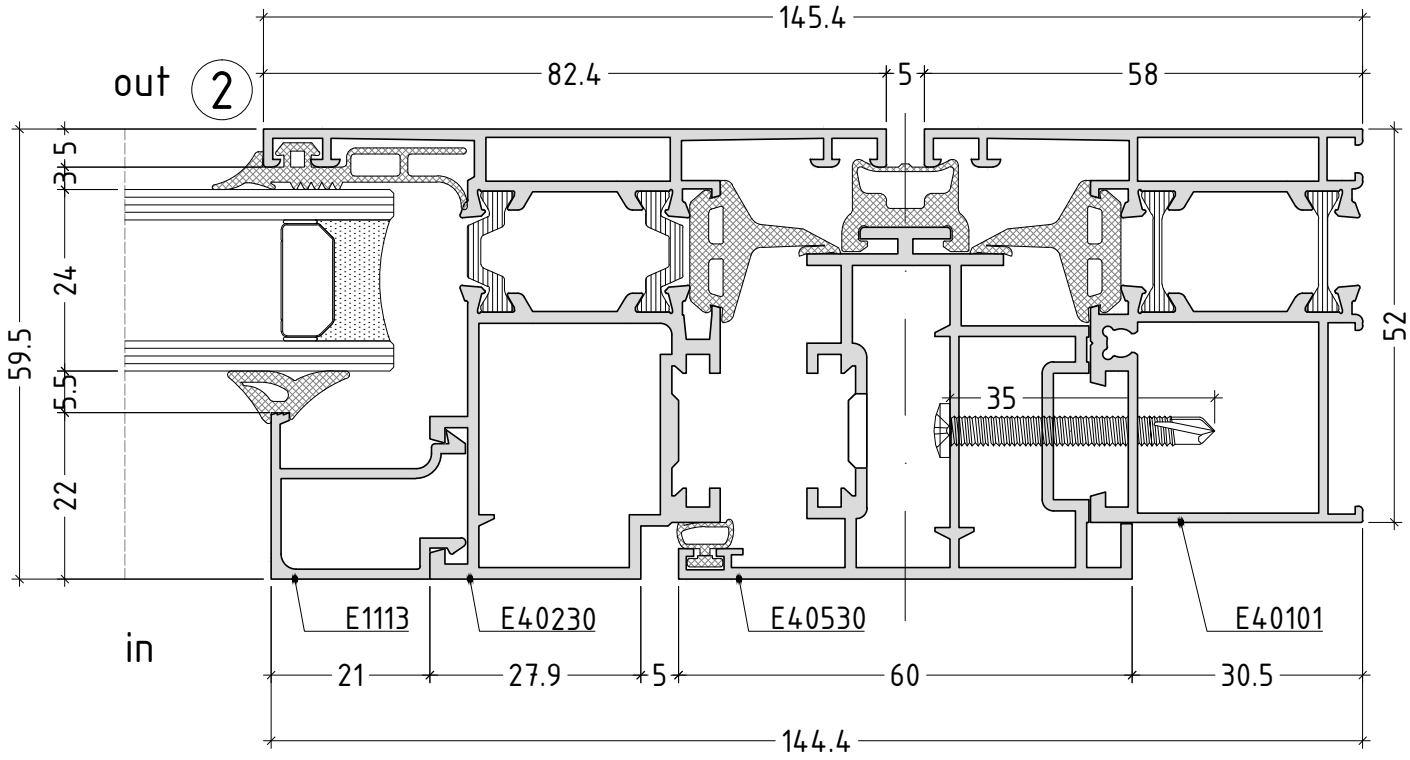


scale : 1:1

D40-29

Pivot mechanism



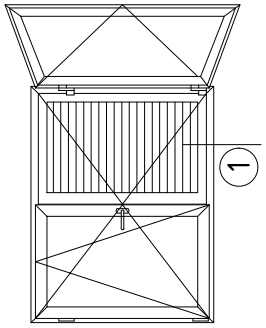


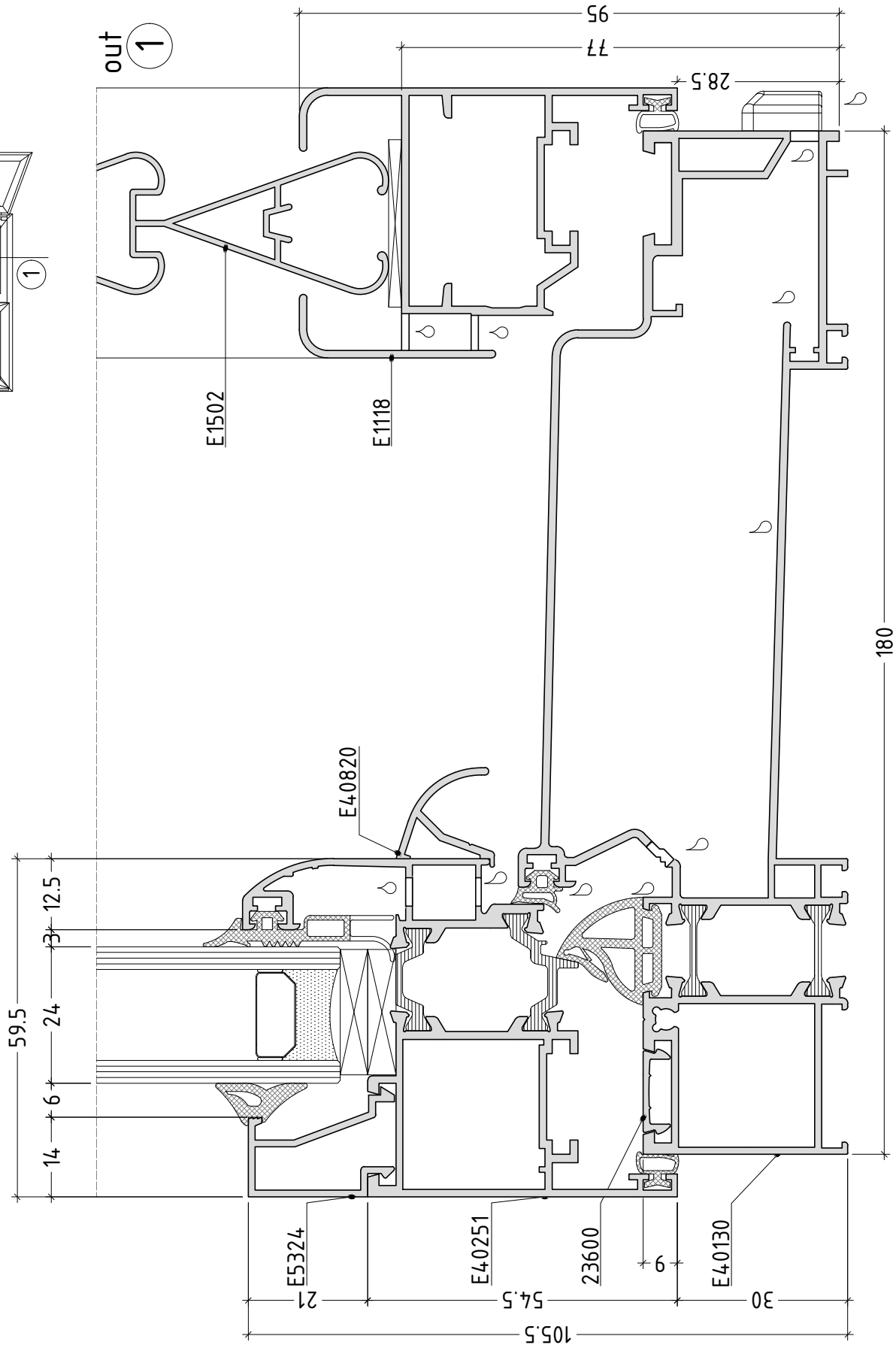
scale : 1:1

D40-30

opening system with thermal break

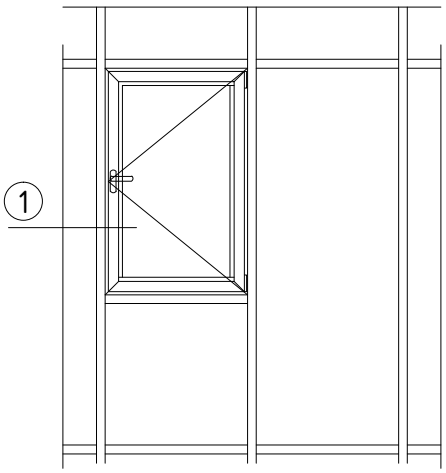
E40



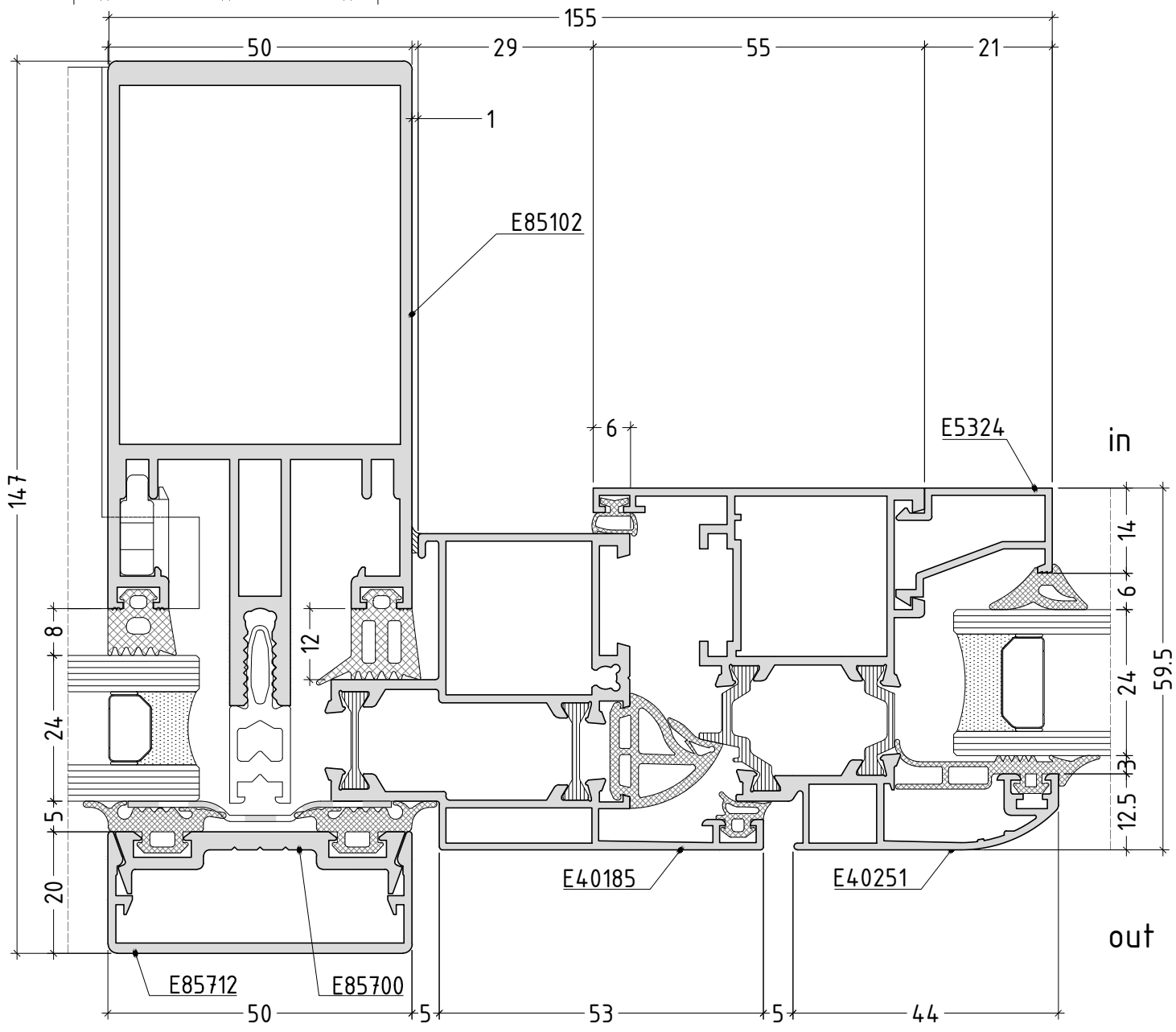


scale : 1:1

D40-31

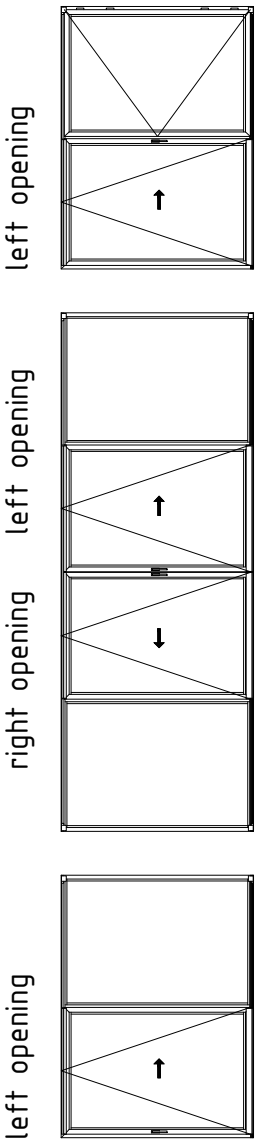


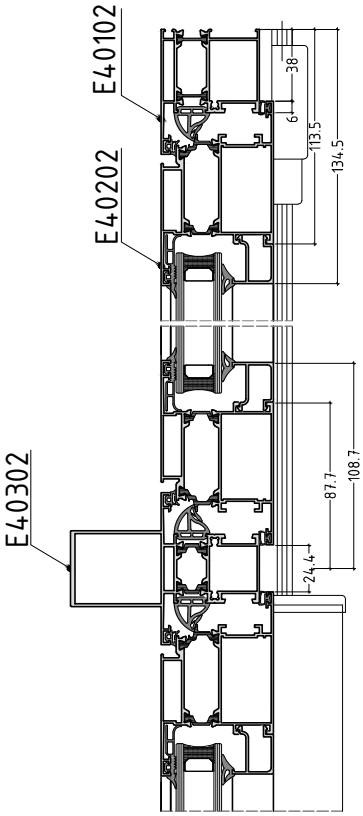
1

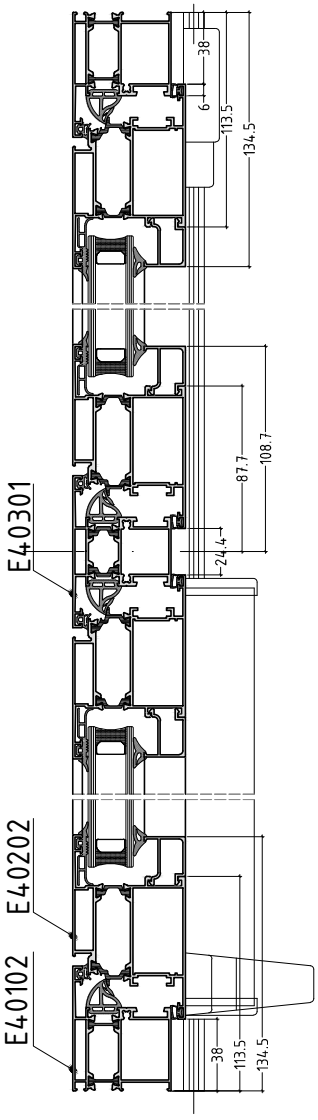


scale : 1:1

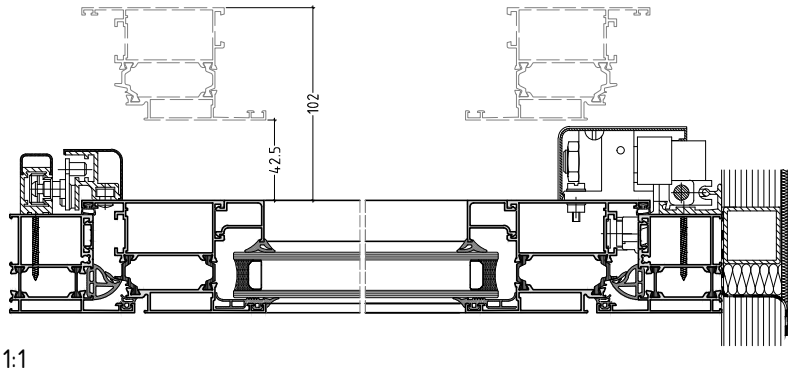
D40-32







parallel sliding and tilting door

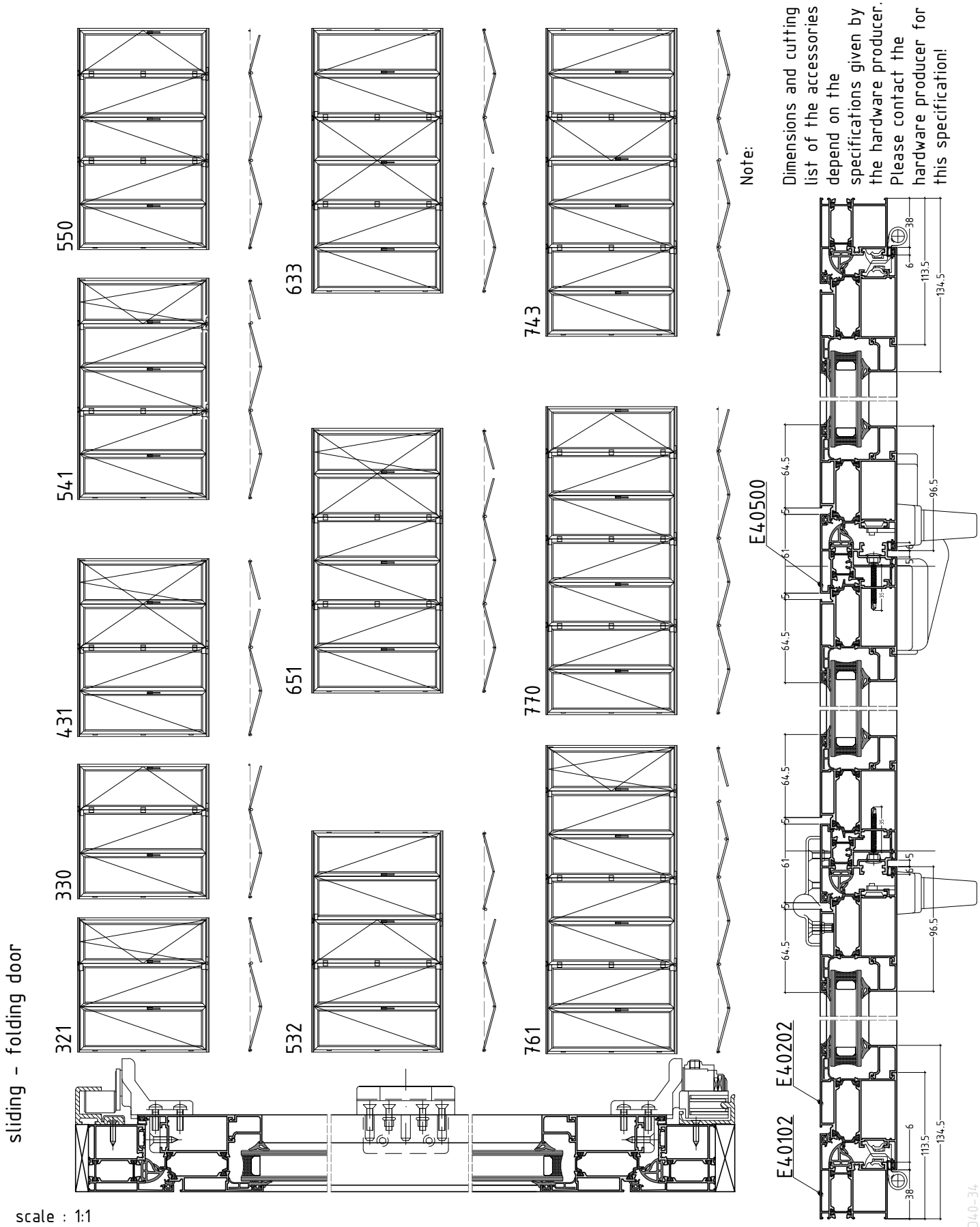


scale : 1:1

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!

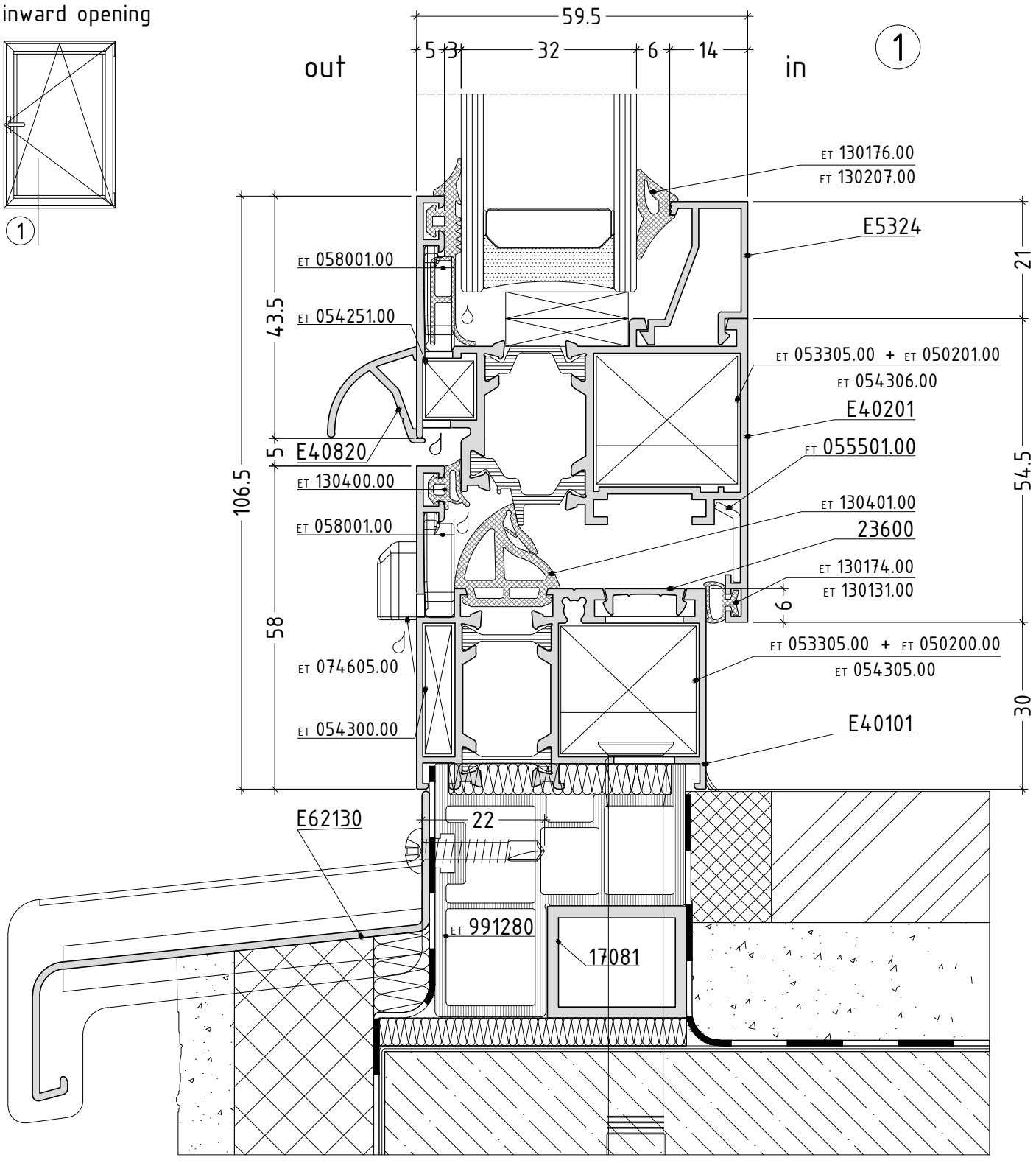
D40-33


sliding - folding door
321
330
431
532
541
550
633
651
743
761
770
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!
E40500
E40202
E40102
64.5
96.5
61
6
113.5
134.5
38
D40-34

scale : 1:1

opening system with thermal break

E40

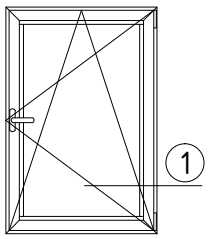


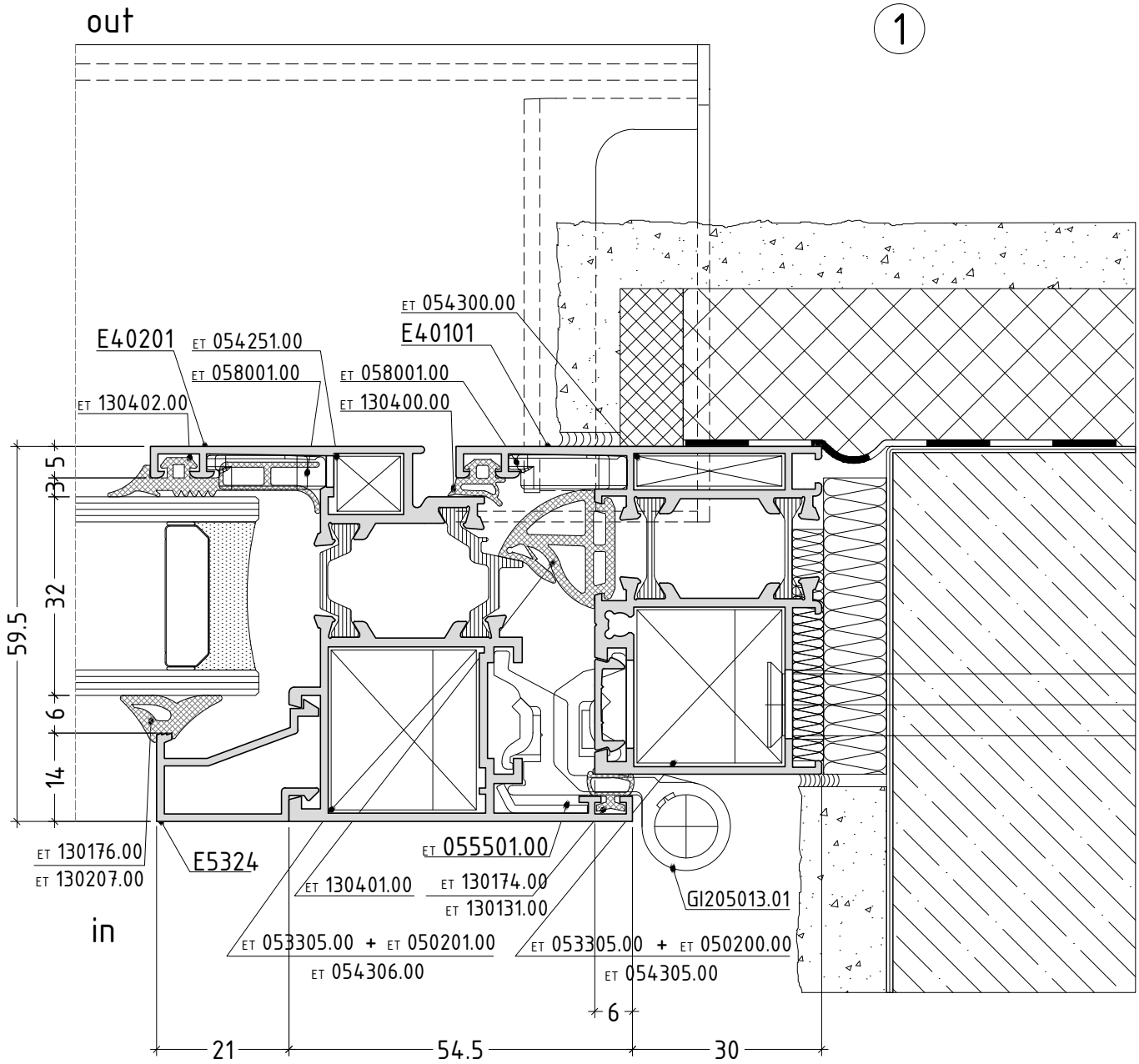
Interface shown on the drawing is an example ONLY!
Connection between backing wall and frame is specific for each single project. It is obligatory to observe different projects' features. All final decisions about materials used, interface finishing, etc. should be approved by the structural / façade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

scale : 1:1

D40-35

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.

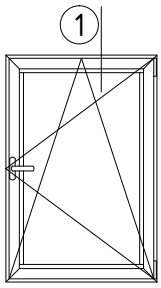
scale : 1:1

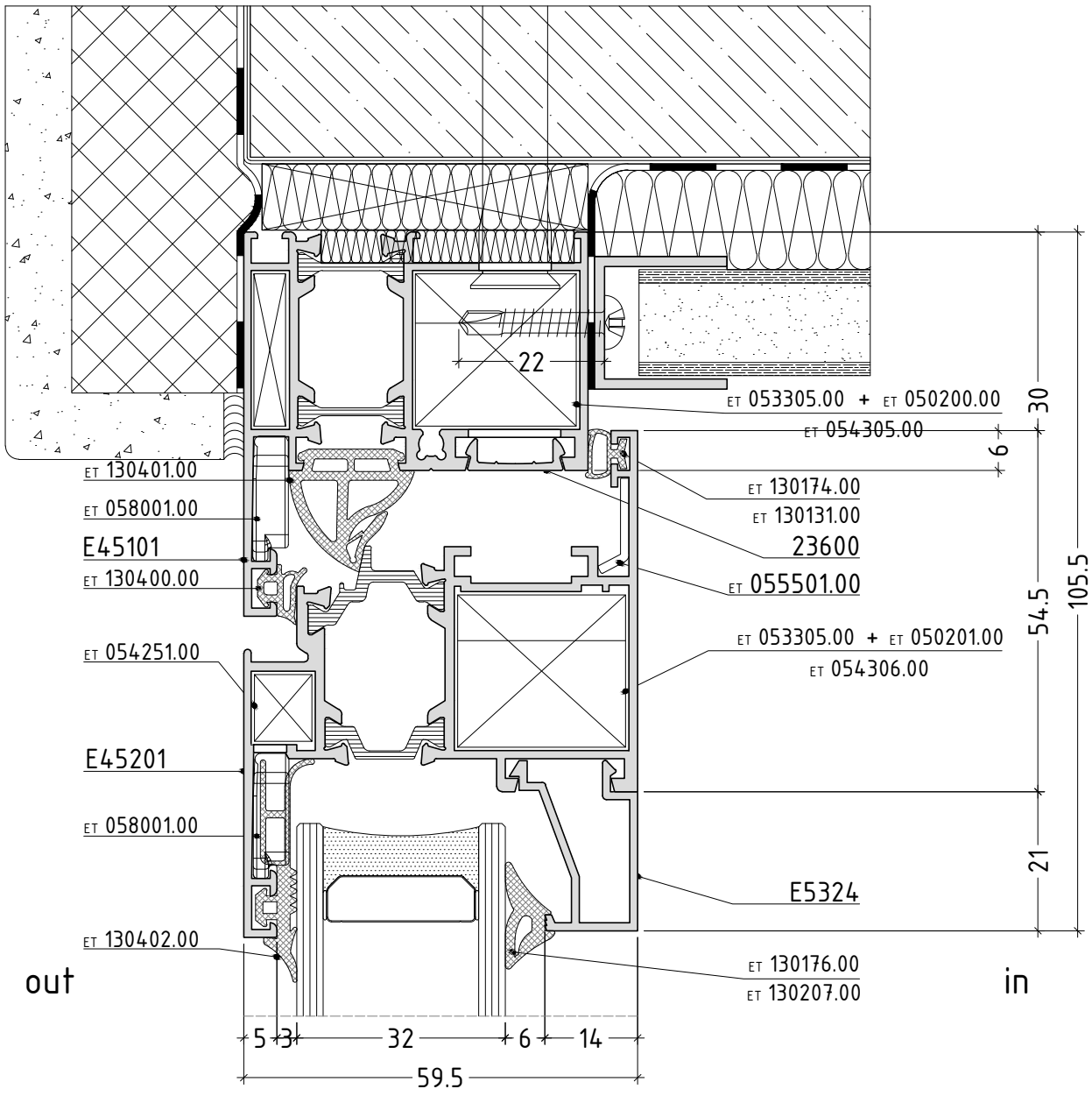
D40-36

opening system with thermal break

E40

inward opening



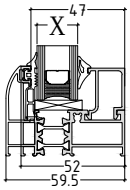
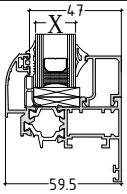
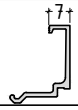
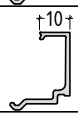
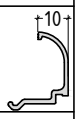
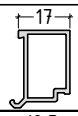
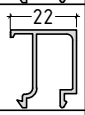
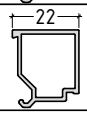
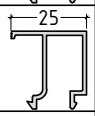
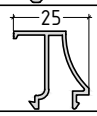
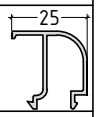
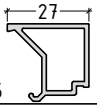
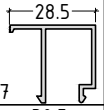
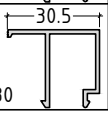
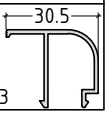


Interface shown on the drawing is an example ONLY!
Connection between backing wall and frame is specific for each single project. It is obligatory to observe different projects' features. All final decisions about materials used, interface finishing, etc. should be approved by the structural / façade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

scale : 1:1

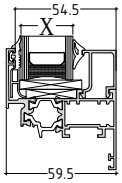
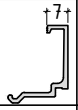
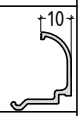
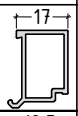
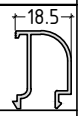
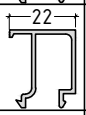
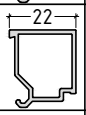
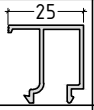
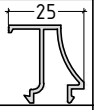
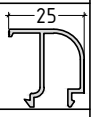
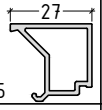
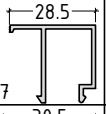
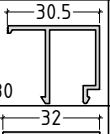
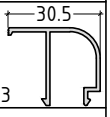
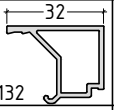
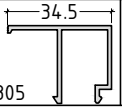
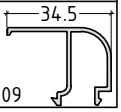
D40-37

GLAZING OPTIONS

GLAZING OPTIONS								
external gaskets	INTERNAL GASKETS					GLAZING BEADS		
3 mm 130411 130402 4 mm 130153	5 - 6 mm 130176		7 - 8 mm 130177					
	5 mm 990619	6 mm 130207	7 mm 130207	8 mm 130208	10 mm 130210			
	X mm					1	2	3
130411 130402	32	31	30	29	27			
130153	31	30	29	28	26	E1144	E1114	
130411 130402	29	28	27	26	24			
130153	28	27	26	25	23		E60110	E1130
130411 130402	25	24	23	22	20			
130153	24	23	22	21	19	E5324		
130411 130402	22	21	20	19	17			
130153	21	20	19	18	16		E5311	
130411 130402	20	19	18	17	15			
130153	19	18	17	16	14	E5304	E5314	E5394
130411 130402	17	16	15	14	12			
130153	16	15	14	13	11	E1113	E5312	
130411 130402	14	13	12	11	9			
130153	13	12	11	10	8	E5307	E5316	E5308
130411 130402	12	11	10	9	7			
130153	11	10	9	8	6		E5325	
130411 130402	10	9	8	7	5			
130153	9	8	7	6	4	E5397		
130411 130402	8	7	6	5	-			
130153	7	6	5	4	-	E5380		E5393

Note:
Tolerance in dimension chain ±0.5mm

T40-01

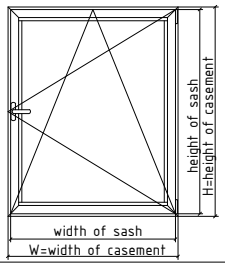
GLAZING OPTIONS								
external gaskets	INTERNAL GASKETS					GLAZING BEADS		
3 mm 130411	5 - 6 mm 130176		7 - 8 mm 130177			 For profile E40200 E40201 E40202 E40230 E40240 E40330 E40340		
130402	5 mm 990619	6 mm 130207	7 mm 130207	8 mm 130208	10 mm 130210			
4 mm 130153	X mm					1	2	3
130411 130402	39	38	37	36	34			
130153	38	37	36	35	33	E1144	E1114	
130411 130402	36	35	34	33	31			
130153	35	34	33	32	30		E60110	E1130
130411 130402	32	31	30	29	27			
130153	31	30	29	28	26	E5324		
130411 130402	29	28	27	26	24			
130153	28	27	26	25	23		E5311	
130411 130402	28	27	26	25	23			
130153	27	26	25	24	22	E5304	E5314	E5394
130411 130402	24	23	22	21	19			
130153	23	22	21	20	18	E1113	E5312	
130411 130402	21	20	19	18	16			
130153	20	19	18	17	15	E5307	E5316	E5308
130411 130402	19	18	17	16	14			
130153	18	17	16	15	13		E5325	
130411 130402	18	17	16	15	13			
130153	17	16	15	14	12	E5397		
130411 130402	16	15	14	13	11			
130153	15	14	13	12	10	E5380		E5393
130411 130402	14	13	12	11	9			
130153	13	12	11	10	8	E60132		
130411 130402	12	11	10	9	7			
130153	11	10	9	8	6	E5305		E5309

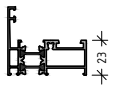
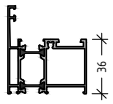
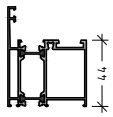
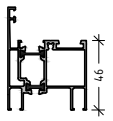
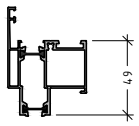
Note:
Tolerance in dimension chain ±0.5mm

T40-02

CUTTING LISTS

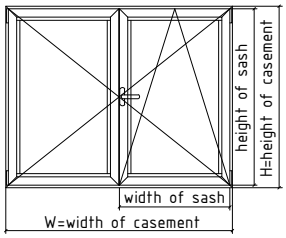
calculation of cutting length for one leaf window



frame profile selection		sash profile selection: E40200 E40201 E40202 E40240 E40250 E40251 E40252 E40290 E40281 E40241	sash profile selection: PVC groove E40221 E40222 E40271 E40272 E40275 E40295
E40100 E40150 E40180 	width of sash	W - 35	
	height of sash	H - 35	
E40101 E40130 E40151 E40154 E40153 	width of sash	W - 61	W - 57
	height of sash	H - 61	H - 57
E40102 E40152 	width of sash	W - 77	
	height of sash	H - 77	
E40121 	width of sash	W - 81	W - 77
	height of sash	H - 81	H - 77
E40185 	width of sash	W - 87	W - 83
	height of sash	H - 87	H - 83

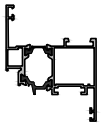
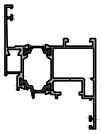
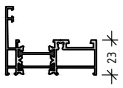
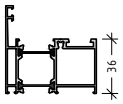
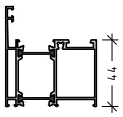
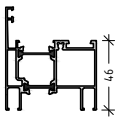
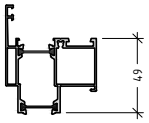
T40-01

calculation of cutting length for two leaf window



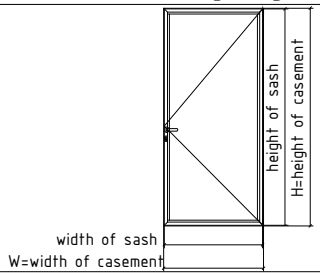
sash profile selection

frame profile selection

		E40200 E40201 E40202 E40240 E40250 E40251 E40252 E40290 E40281 E40241 	PVC groove: E40221 E40222 E40271 E40272 E40275 E40295 
E40100 E40150 E40180 	width of sash	$\frac{W - 40}{2}$	
	height of sash	H - 35	
	height of secondary sash profile	H - 107	
E40101 E40130 E40151 E40154 E40153 	width of sash	$\frac{W - 66}{2}$	$\frac{W - 62}{2}$
	height of sash	H - 61	H - 57
	height of secondary sash profile	H - 133	H - 133
E40102 E40152 	width of sash	$\frac{W - 82}{2}$	
	height of sash	H - 77	
	height of secondary sash profile	H - 149	
E40121 	width of sash	$\frac{W - 86}{2}$	$\frac{W - 82}{2}$
	height of sash	H - 81	H - 77
	height of secondary sash profile	H - 153	H - 153
E40185 	width of sash	$\frac{W - 92}{2}$	$\frac{W - 88}{2}$
	height of sash	H - 87	H - 83
	height of secondary sash profile	H - 159	H - 159

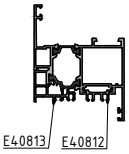
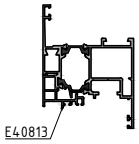
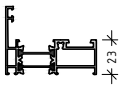
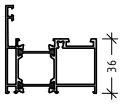
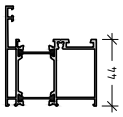
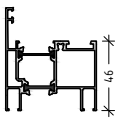
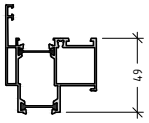
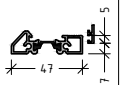
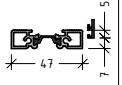
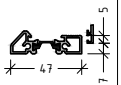
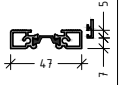
T40-02

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



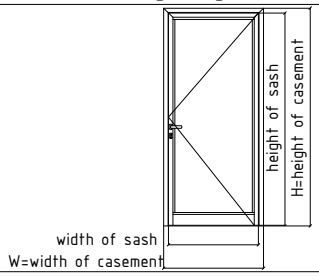
sash profile selection

frame profile selection

		E40200 E40201 E40202 E40240 E40250 E40251 E40252 E40290 E40281 E40241 	PVC groove E40221 E40222 E40271 E40272 E40275 E40295 
E40100 E40150 E40180 	width of sash	W - 35	
	height of sash	H - 24.5	
E40101 E40130 E40151 E40154 E40153 	width of sash	W - 61	W - 57
	height of sash	H - 37.5	H - 35.5
E40102 E40152 	width of sash	W - 77	
	height of sash	H - 45.5	
E40121 	width of sash	W - 81	W - 77
	height of sash	H - 47.5	H - 45.5
E40185 	width of sash	W - 87	W - 81
	height of sash	H - 50.5	H - 48.5
four side sash with door threshold profile		E40800  E40801 	E40800  E40801 

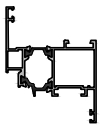
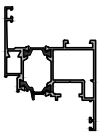
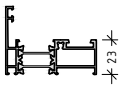
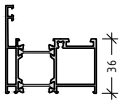
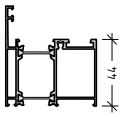
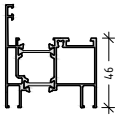
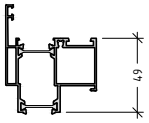
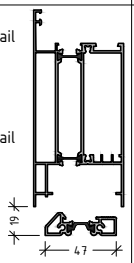
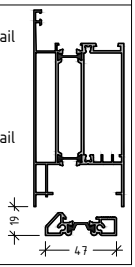
T40-03

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



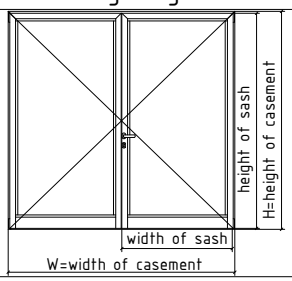
sash profile selection

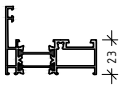
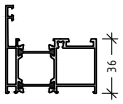
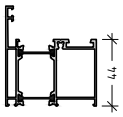
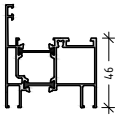
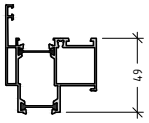
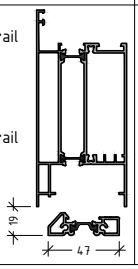
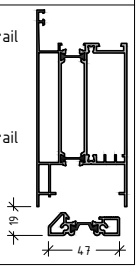
frame profile selection

		E40200 E40201 E40202 E40240 E40250 E40251 E40252 E40290 E40281 E40241 	PVC groove E40221 E40222 E40271 E40272 E40275 E40295 
E40100 E40150 E40180 	width of sash	W - 35	
	height of sash	H - 36.5	
E40101 E40130 E40151 E40154 E40153 	width of sash	W - 61	W - 57
	height of sash	H - 49.5	H - 47.5
E40102 E40152 	width of sash	W - 77	
	height of sash	H - 57.5	
E40121 	width of sash	W - 81	W - 77
	height of sash	H - 59.5	H - 57.5
E40185 	width of sash	W - 87	W - 83
	height of sash	H - 62.5	H - 60.5
three side sash with door bottom rail and threshold profile		E40330 door bottom rail for straight sash profile E40331 door bottom rail E40800 E40801 	E40330 door bottom rail for straight sash profile E40331 door bottom rail E40800 E40801 

T40-04

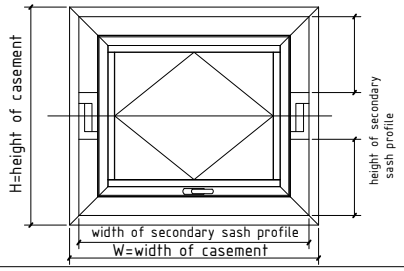
calculation of cutting length for two leaf door with bottom rail and threshold profile

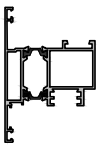
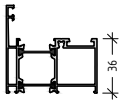


frame profile selection		sash profile selection: E40200, E40201, E40202, E40240, E40250, E40251, E40252, E40290, E40281, E40241	PVC groove: E40221, E40222, E40271, E40272, E40275, E40295
E40100, E40150, E40180 	width of sash	$\frac{W - 40}{2}$	
	height of sash	H - 36.5	
	height of secondary sash profile	H - 72.5	
E40101, E40130, E40151, E40154, E40153 	width of sash	$\frac{W - 66}{2}$	$\frac{W - 62}{2}$
	height of sash	H - 49.5	H - 47.5
	height of secondary sash profile	H - 85.5	H - 85.5
E40102, E40152 	width of sash	$\frac{W - 82}{2}$	
	height of sash	H - 57.5	
	height of secondary sash profile	H - 93.5	
E40121 	width of sash	$\frac{W - 86}{2}$	$\frac{W - 82}{2}$
	height of sash	H - 59.5	H - 57.5
	height of secondary sash profile	H - 95.5	H - 95.5
E40185 	width of sash	$\frac{W - 92}{2}$	$\frac{W - 88}{2}$
	height of sash	H - 62.5	H - 60.5
	height of secondary sash profile	H - 98.5	H - 98.5
three side sash with door bottom rail and threshold profile		E40330 door bottom rail for straight sash profile E40331 door bottom rail E40800 E40801 	E40330 door bottom rail for straight sash profile E40331 door bottom rail E40800 E40801 

T40-05

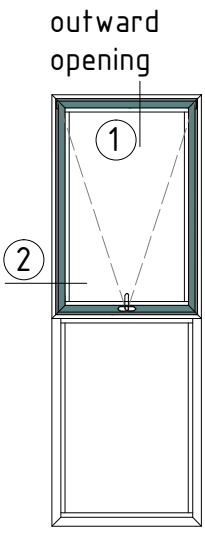
calculation of cutting length for pivot mechanism

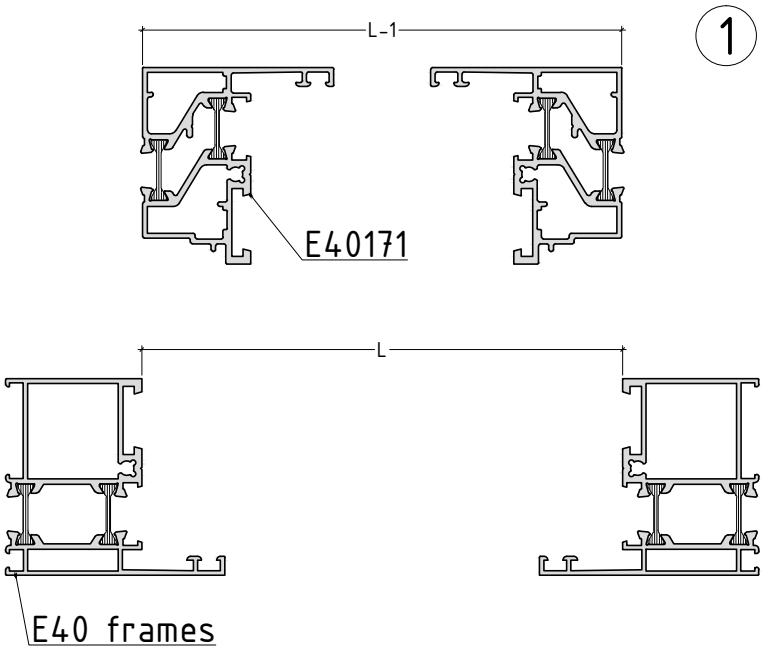


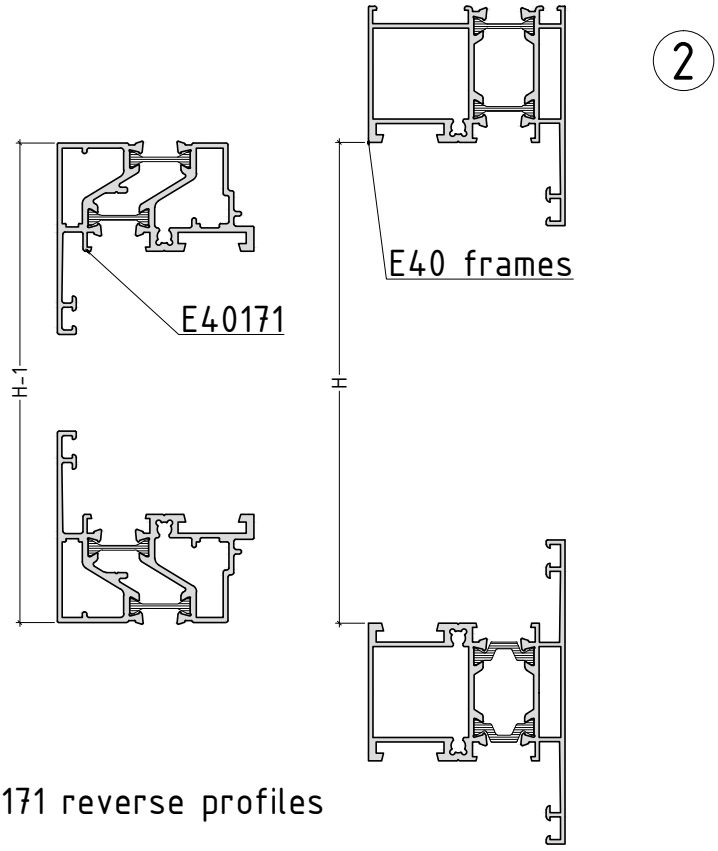
frame profile selection		sash profile selection: E40230 pivot mechanism 
E40101 	width of sash	W - 126
	height of sash	H - 126
	width of secondary sash profile	H - 61
	height of secondary sash profile	$\frac{H - 211}{2}$

T40-06

cutting list for profiles E40171





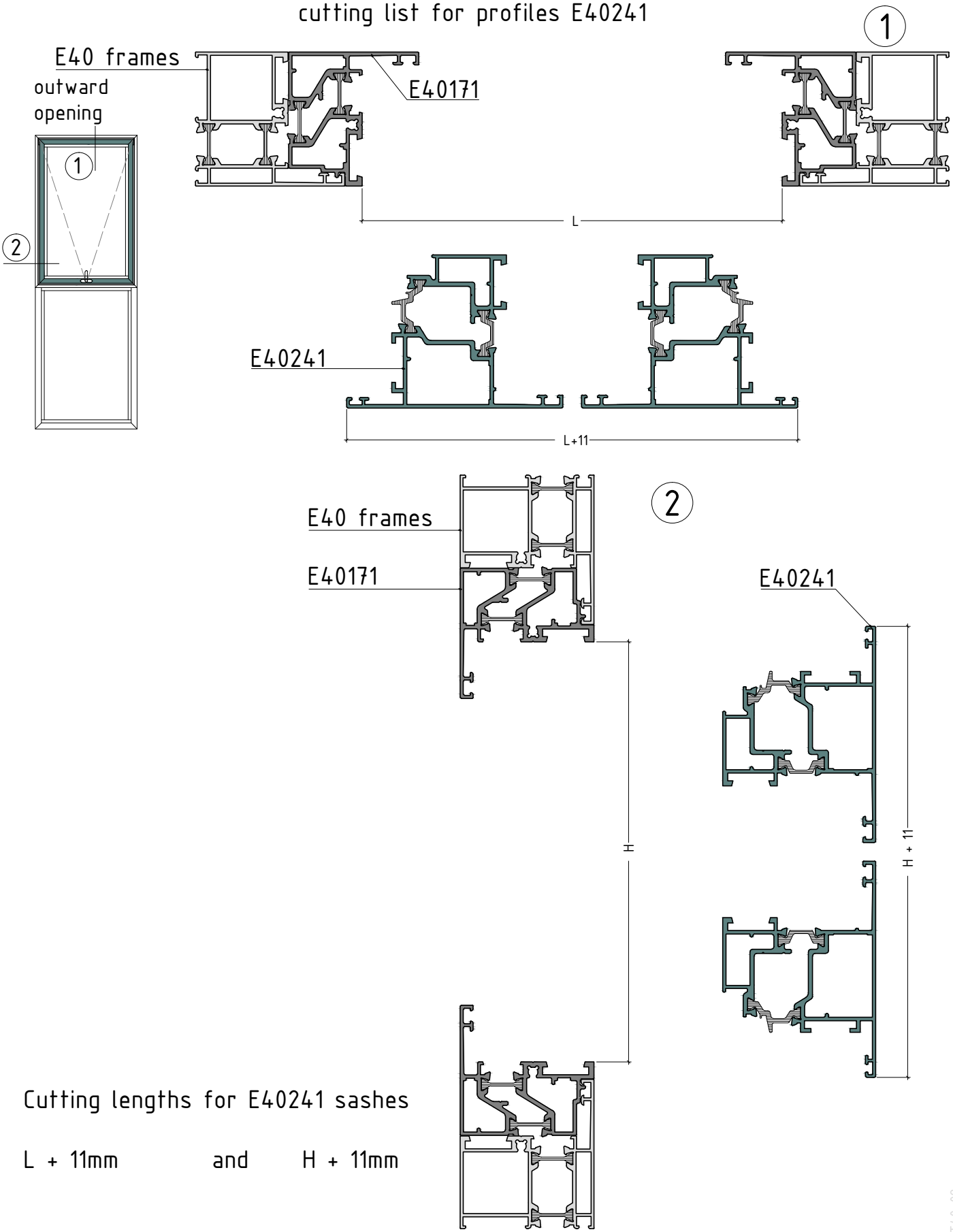


Cutting lengths for E40171 reverse profiles

L - 1mm and H - 1mm

T40-07

cutting list for profiles E40241



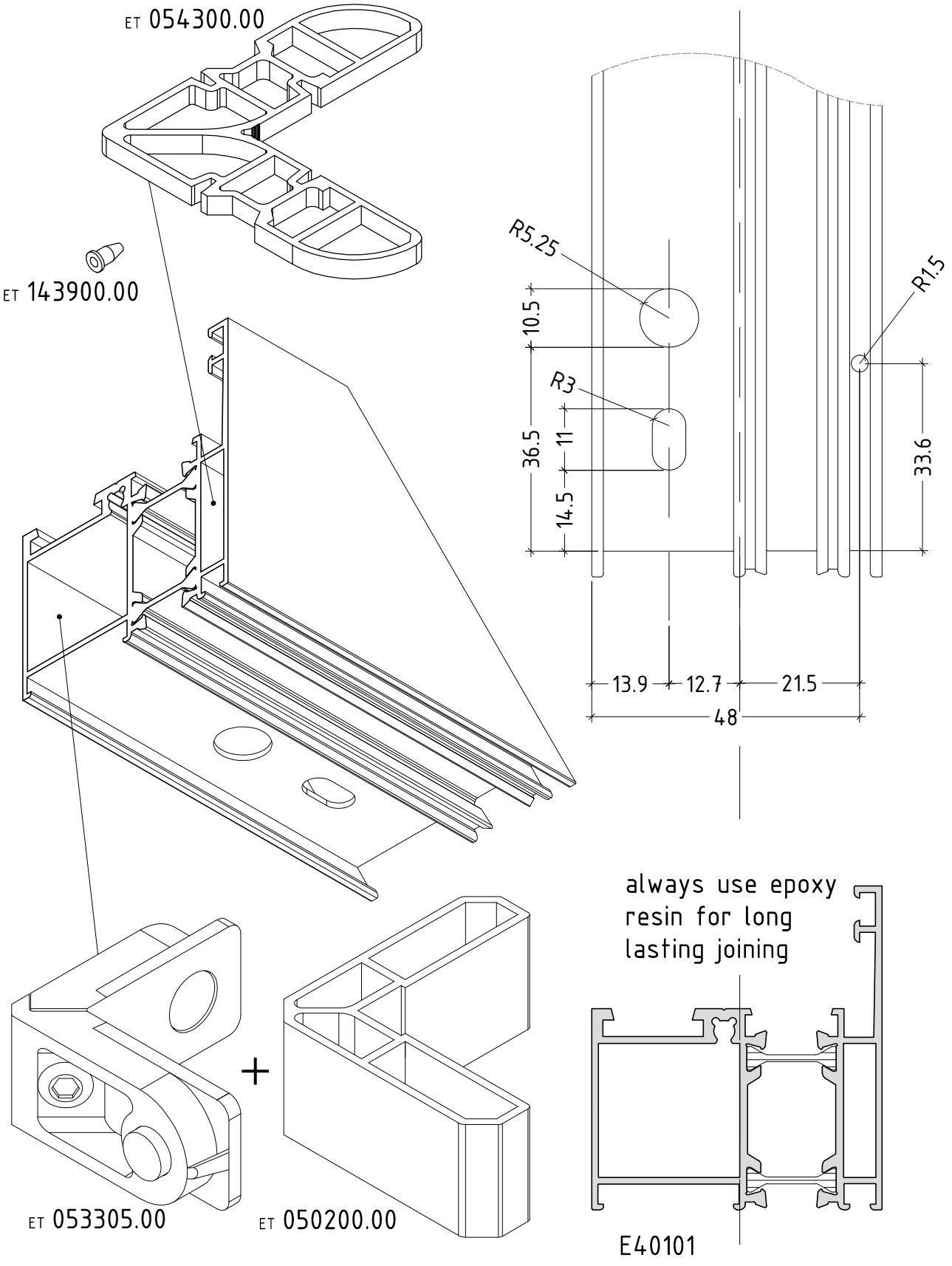
Cutting lengths for E40241 sashes

L + 11mm and H + 11mm

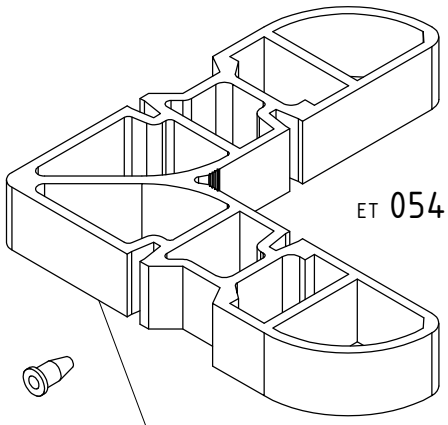
T40-08

MACHINING

machining to use die cust joints and al. joint corner bracket

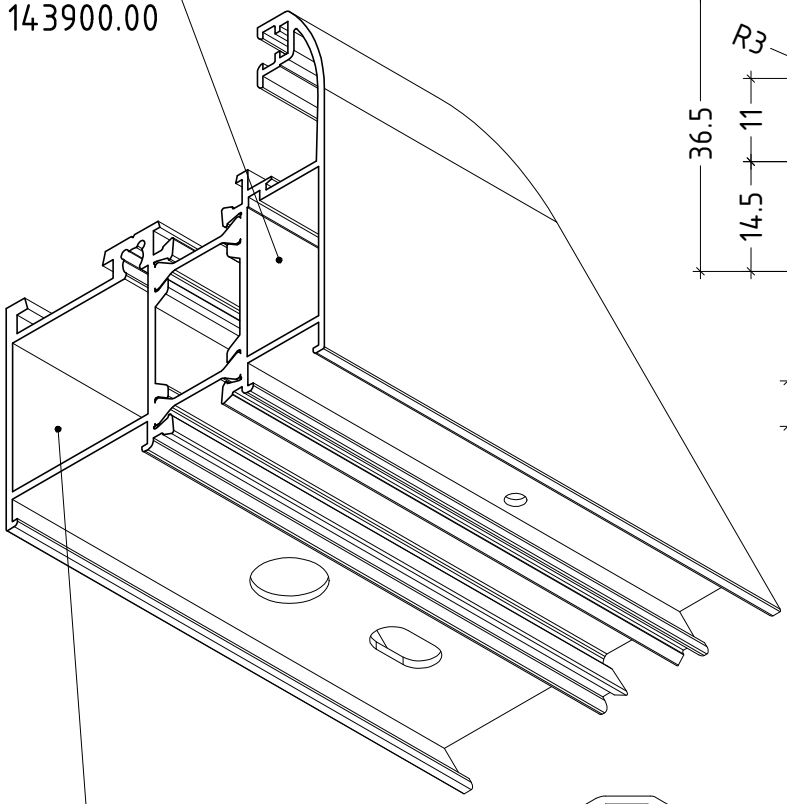


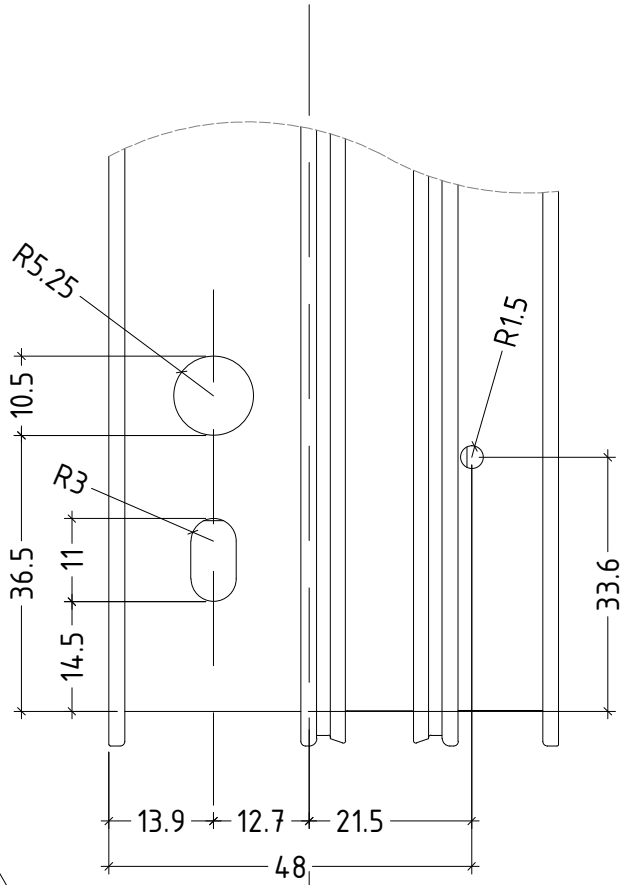
machining to use die cust joints and al. joint corner bracket



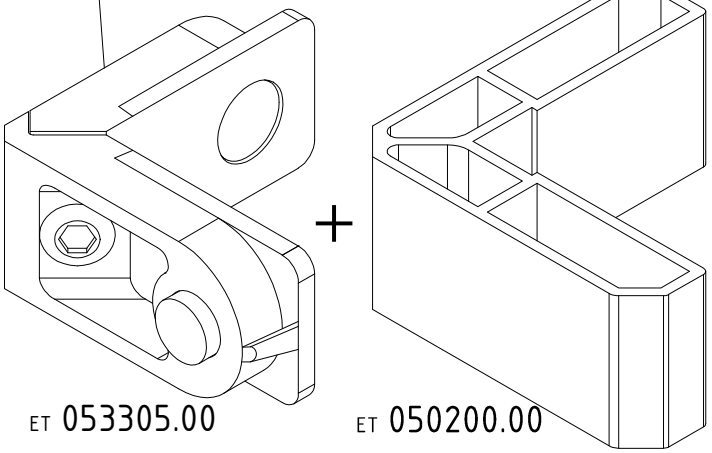
ET 054301.00

ET 143900.00

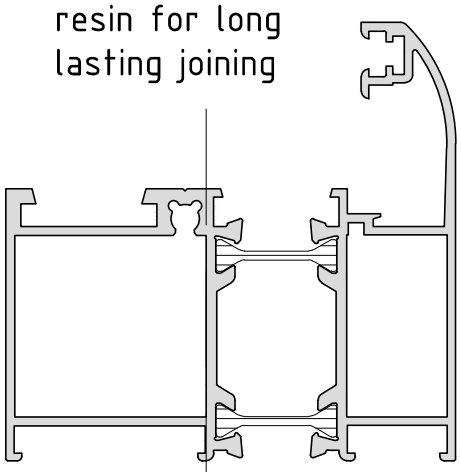




always use epoxy resin for long lasting joining



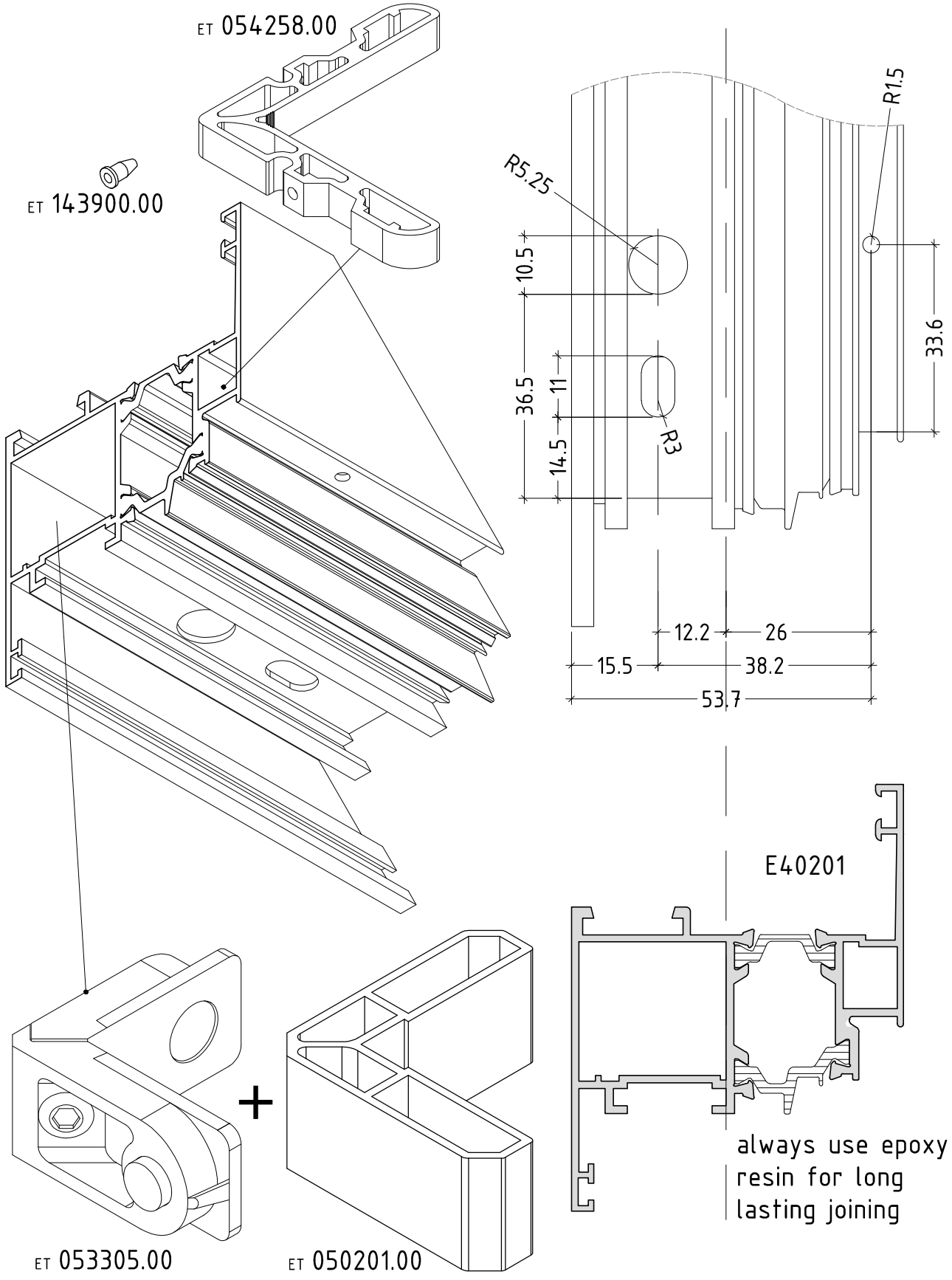
ET 053305.00 + ET 050200.00



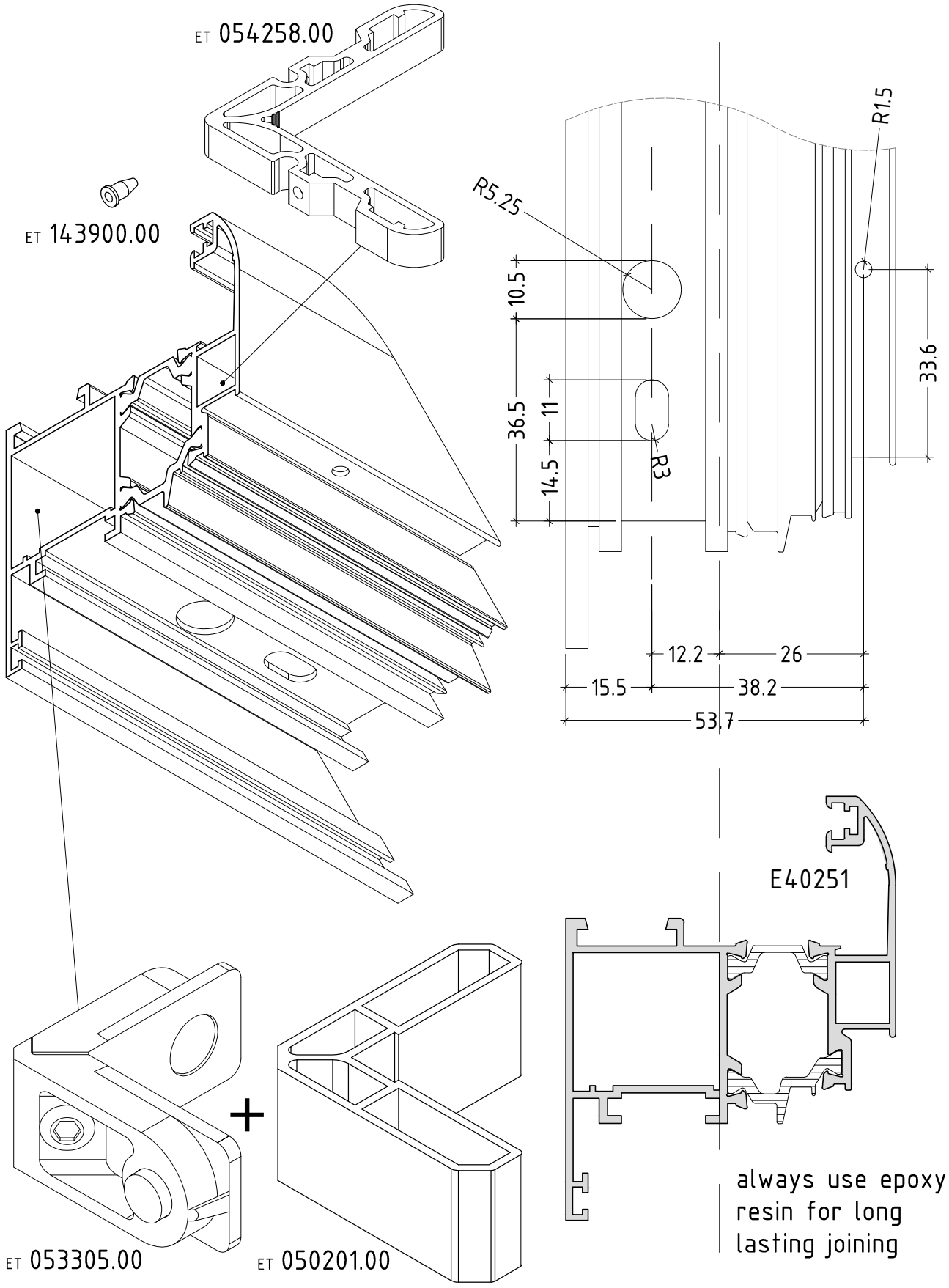
E40151

D40-02

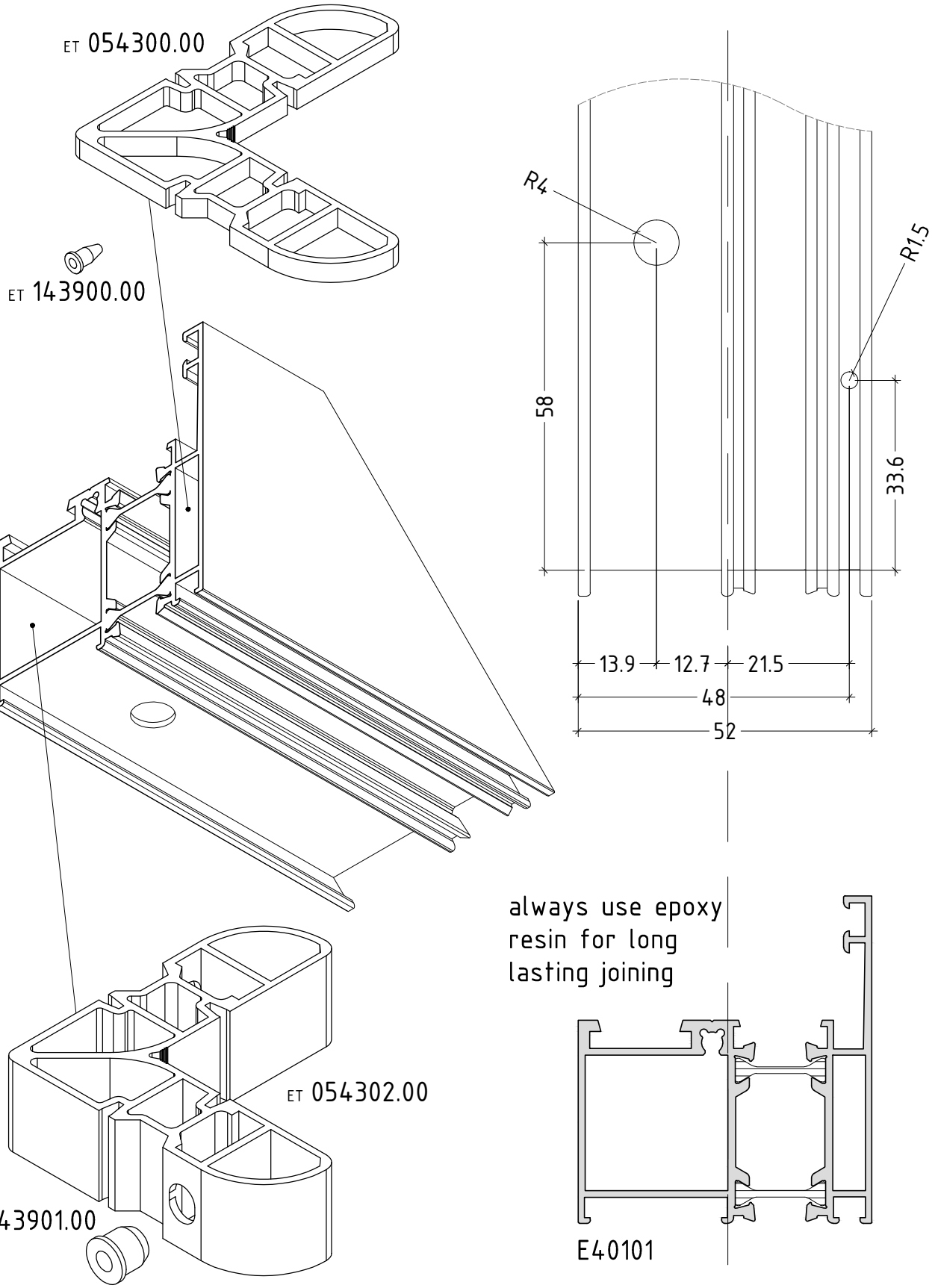
machining to use die cust joints and al. joint corner bracket



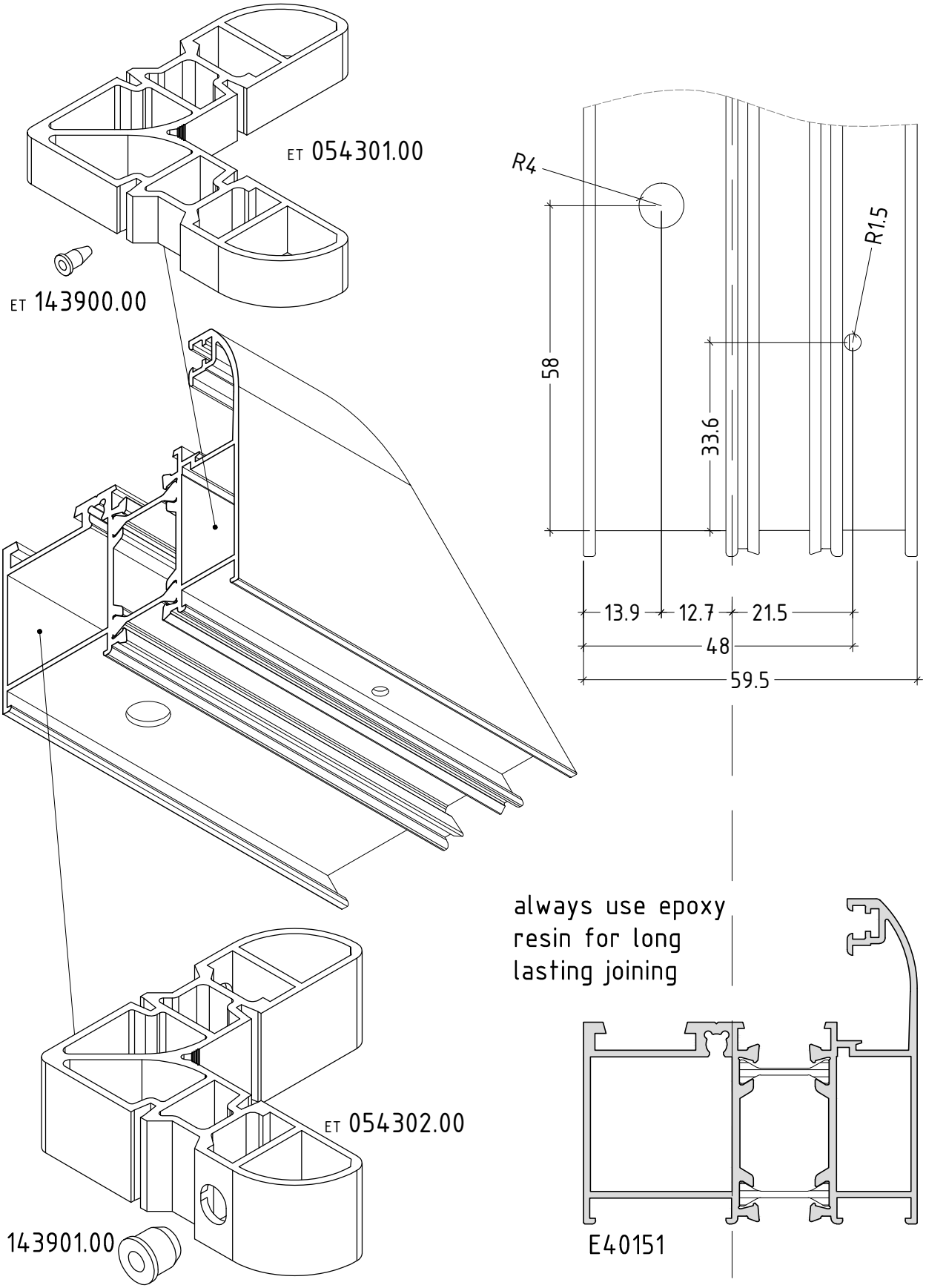
machining to use die cust joints and al. joint corner bracket



machining to use roll pins extruded aluminum joint corner brackets

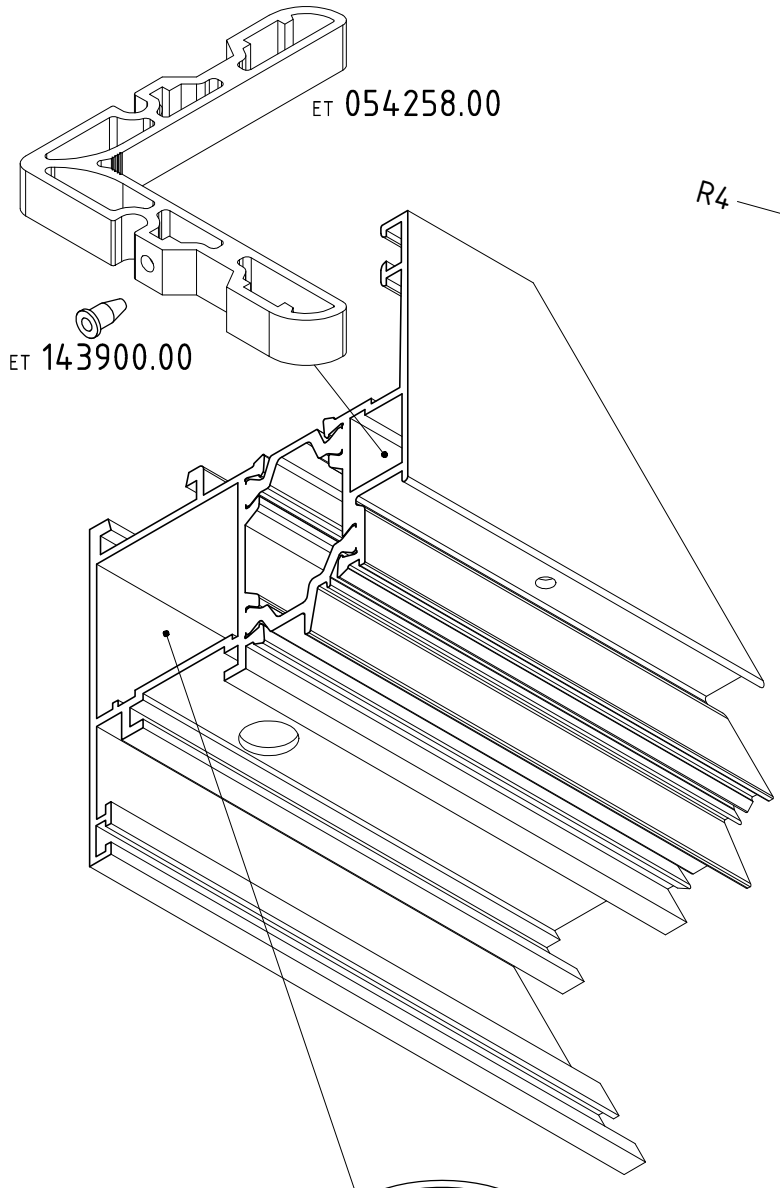


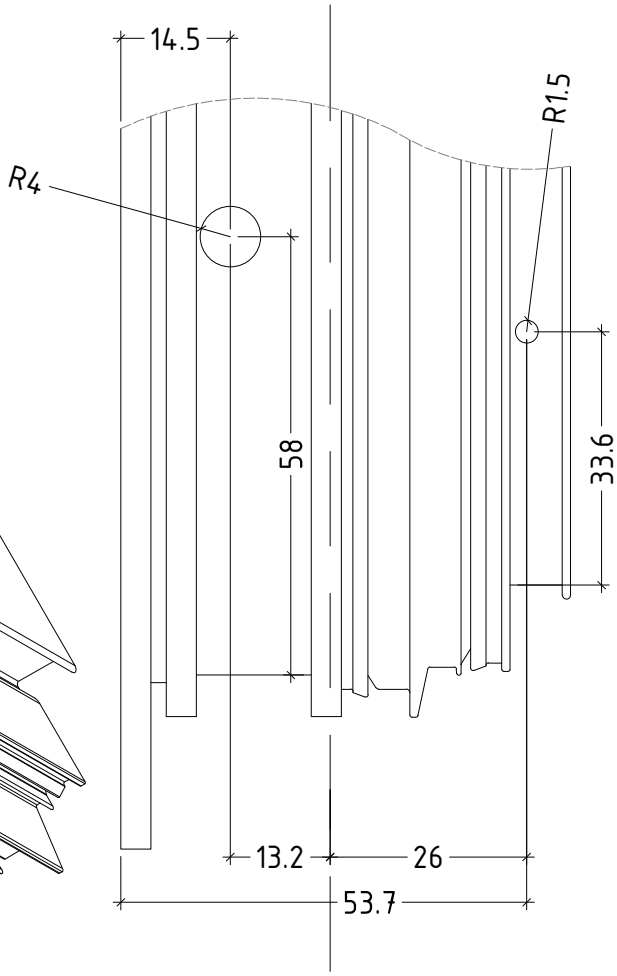
machining to use roll pins extruded aluminum joint corner brackets

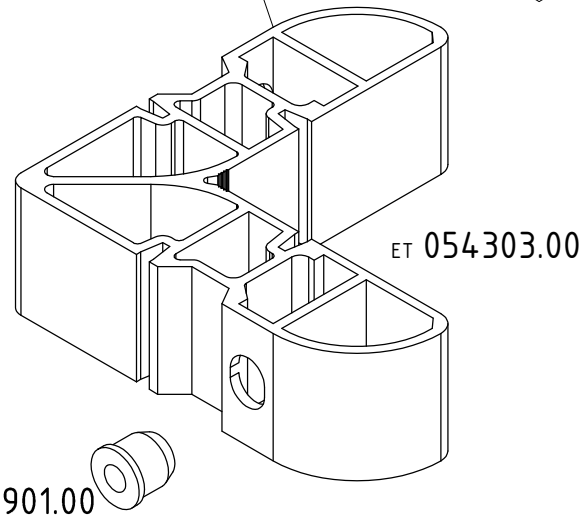


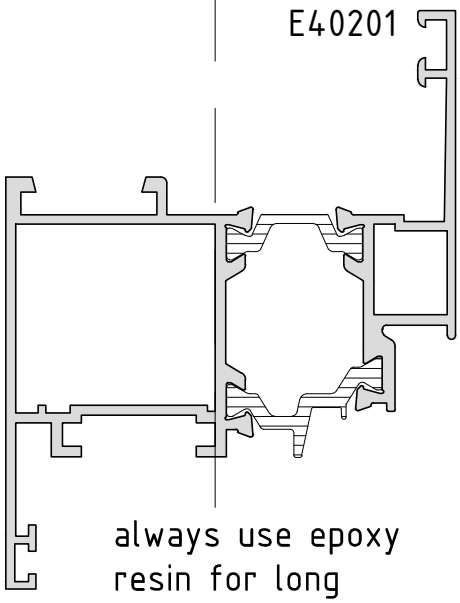
D40-06

machining to use roll pins extruded aluminum joint corner brackets





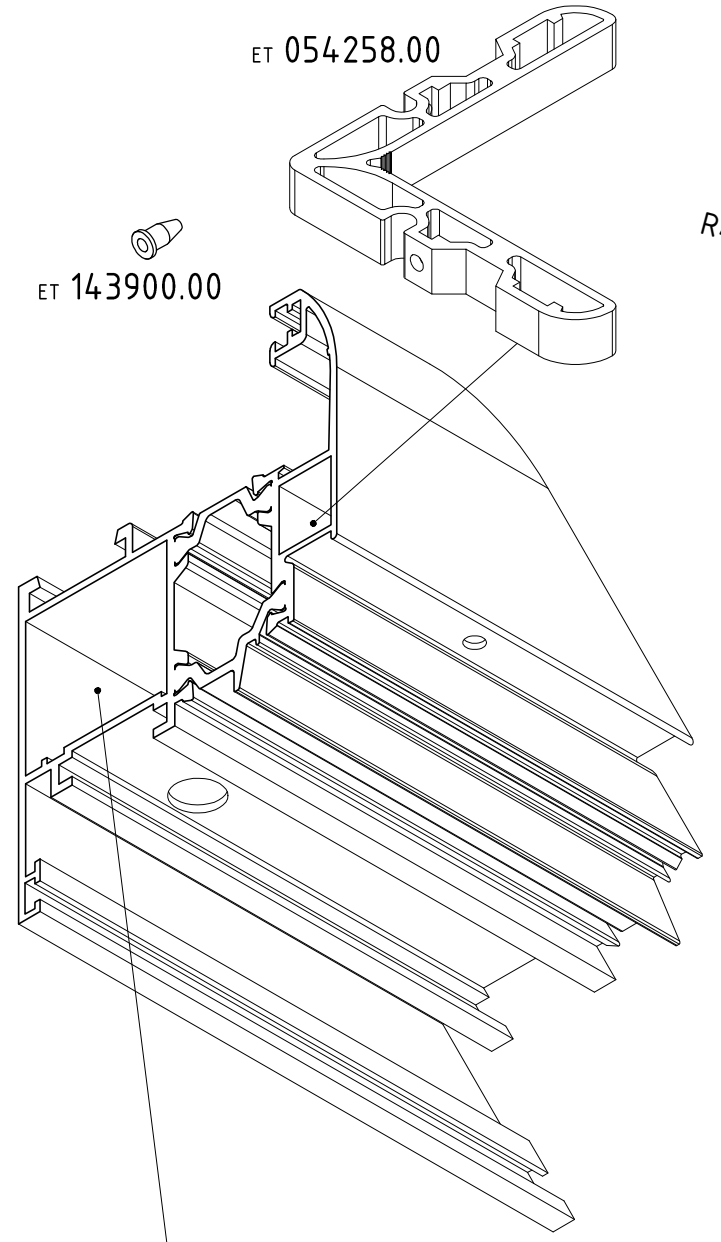


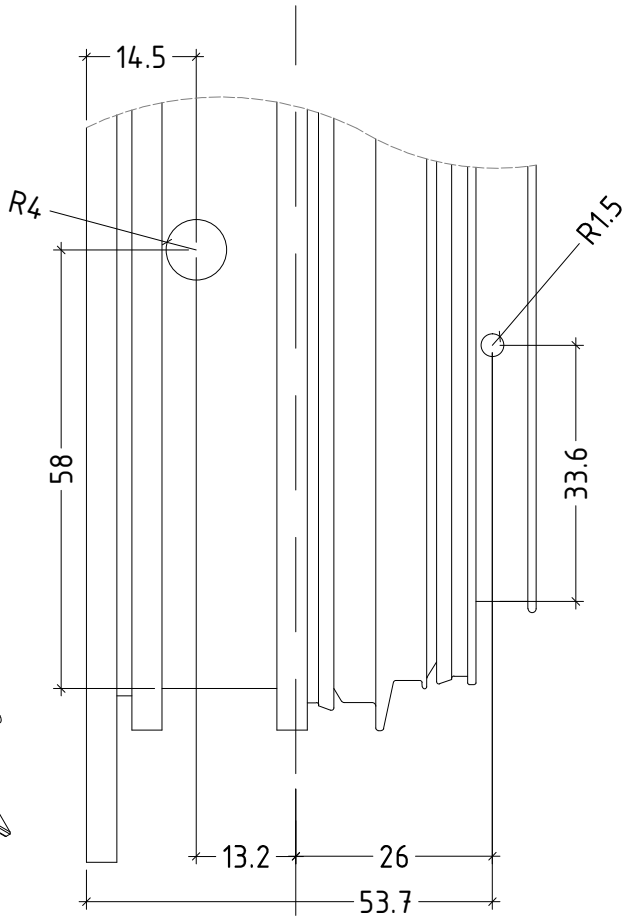


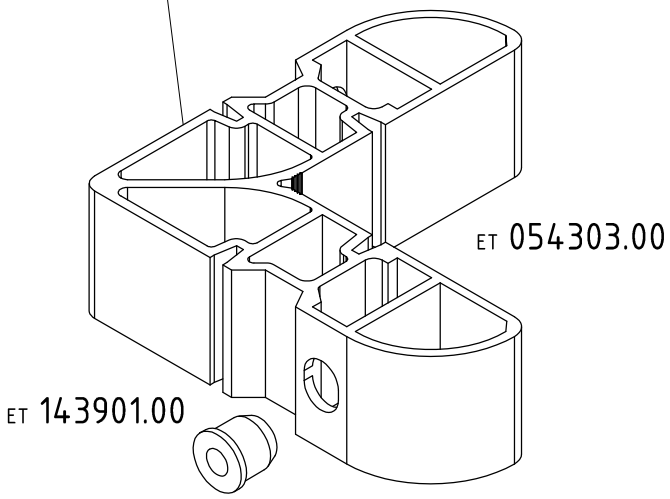
always use epoxy resin for long lasting joining

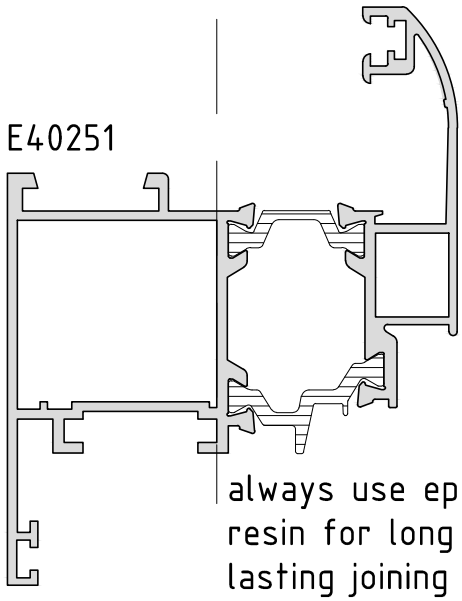
D40-07

machining to use roll pins extruded aluminum joint corner brackets





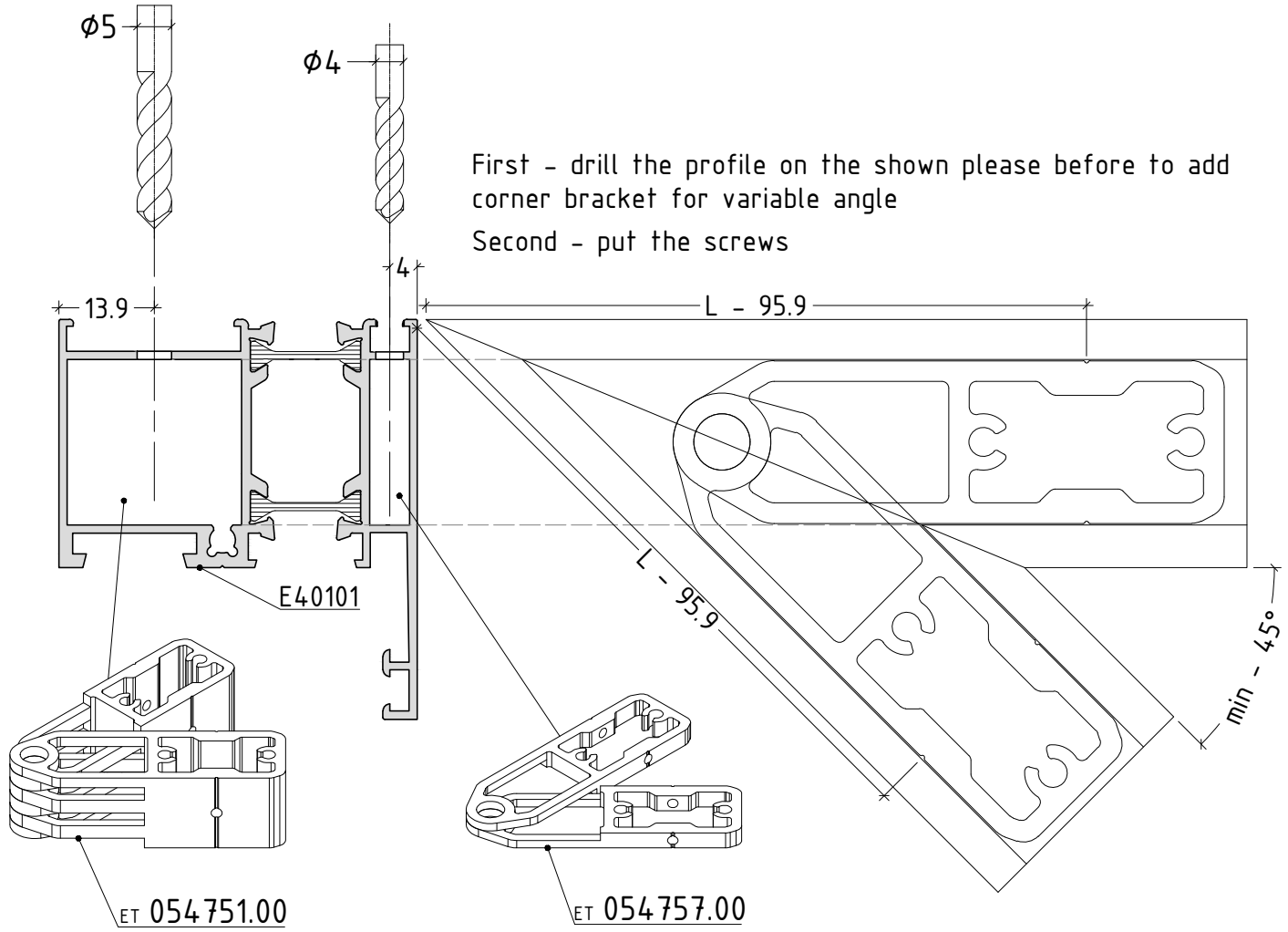




always use epoxy resin for long lasting joining

D40-08

corner bracket for variable angle for frame E40101



First - drill the profile on the shown please before to add corner bracket for variable angle

Second - put the screws

for profiles: E 40101									
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		

attention

always use epoxy resin for long lasting joining

Note:

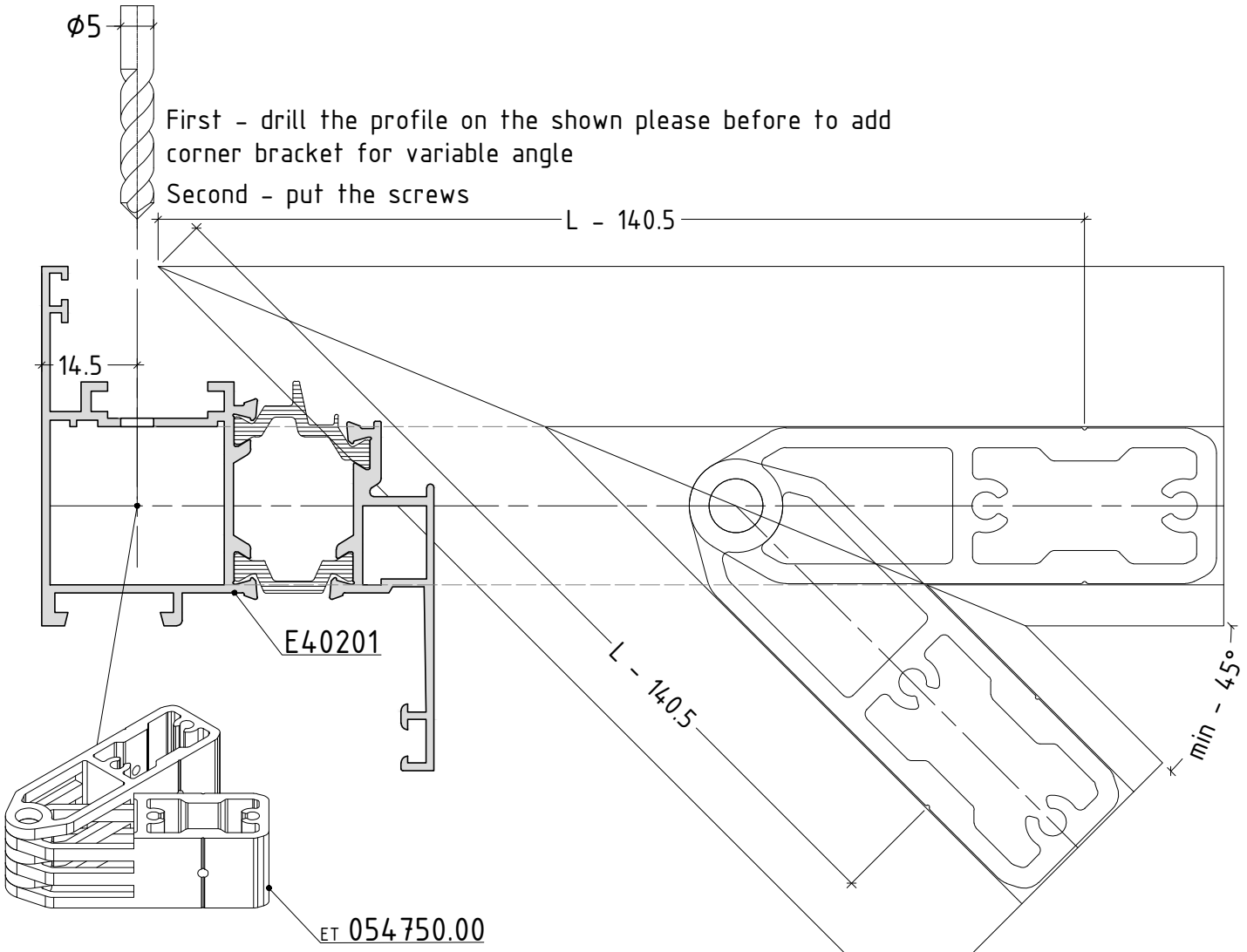
The tables concern only the profiles shown here.

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.

D40-09

corner bracket for variable angle for sash E40201



for profiles: E40201									
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	69,1	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	85,6	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		

attention
always use epoxy resin for long lasting joining

Note:

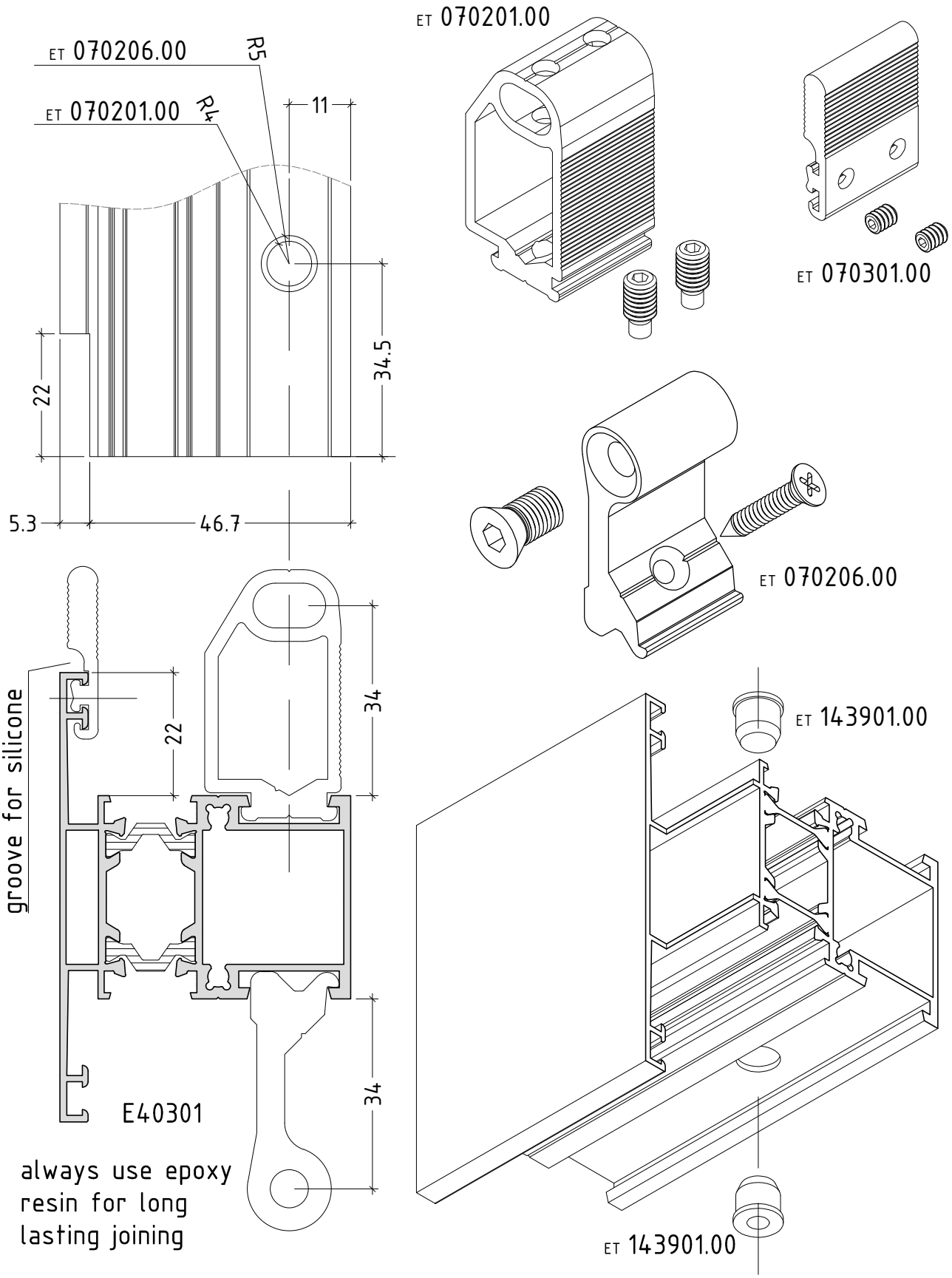
The tables concern only the profiles shown here.

For other profiles the tables are different.

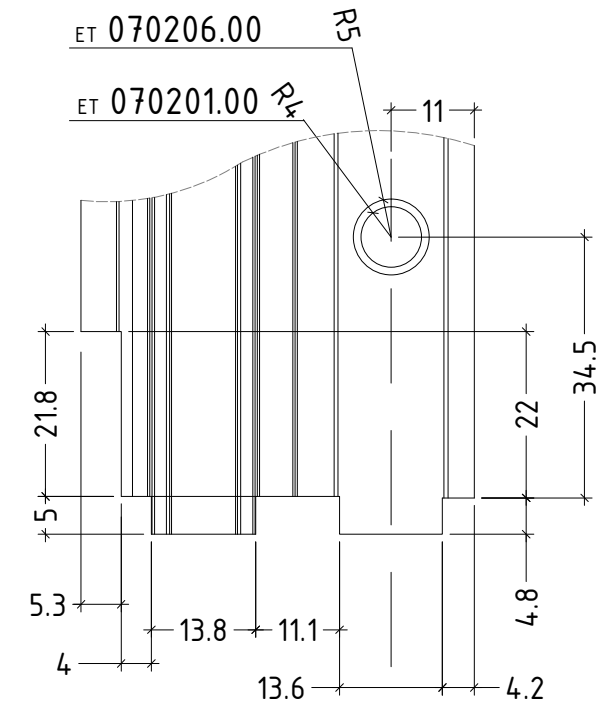
In case you are using other corner bracket for variable angle for other profiles, please contact ETEM R&D department for additional information.

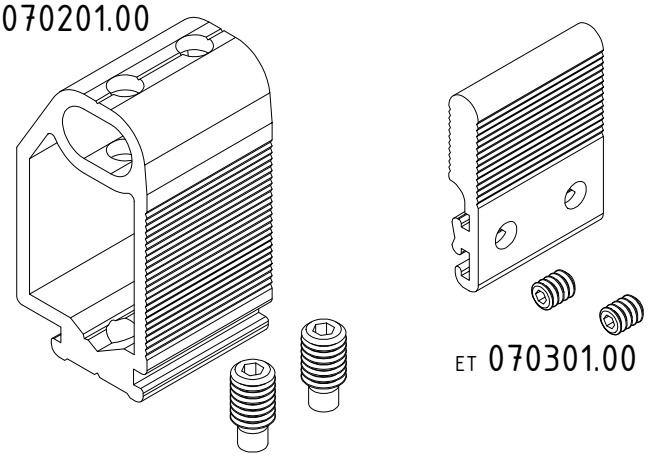
D40-10

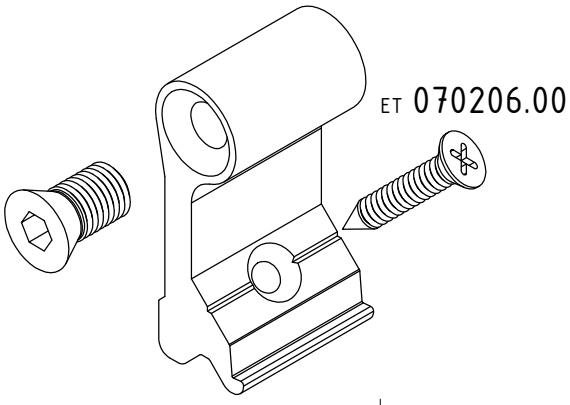
machining to use T-bracket – T-bracket for mullions/transoms

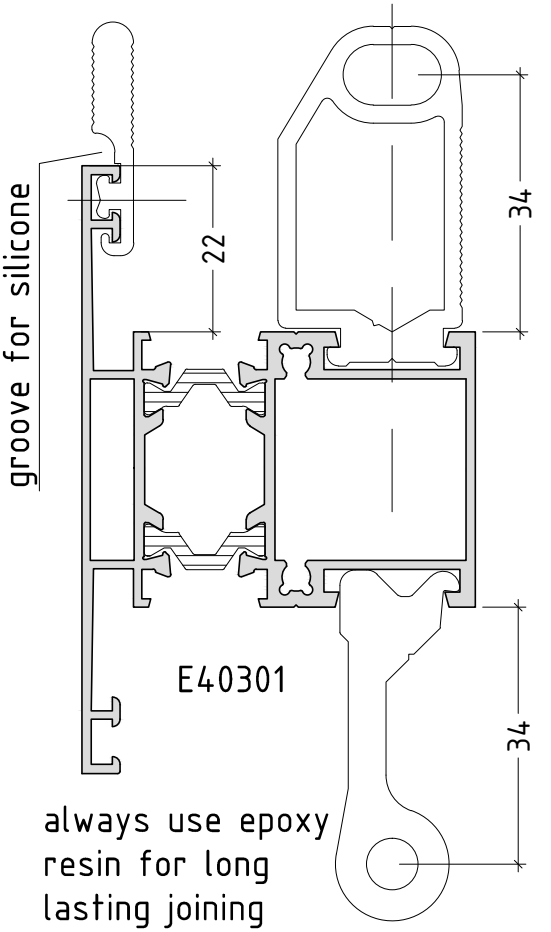


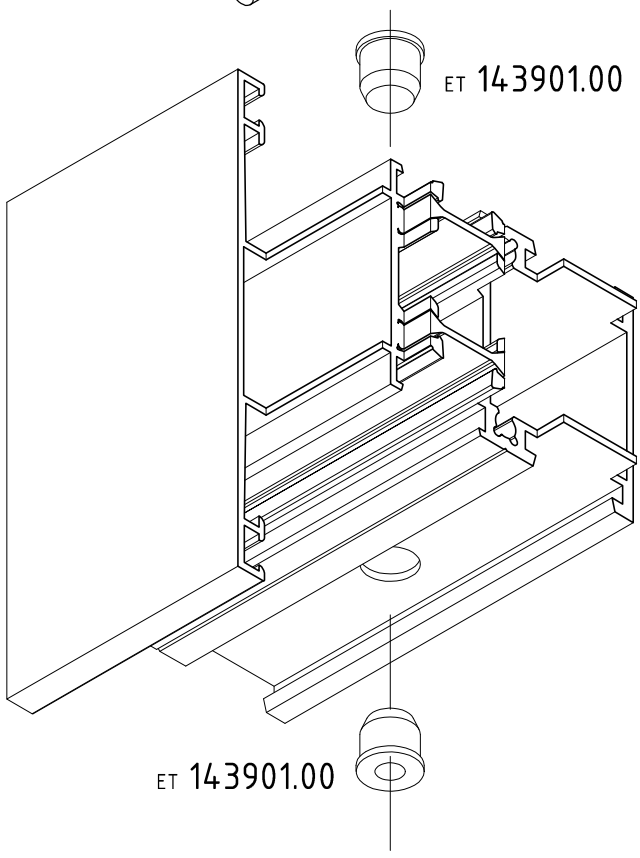
machining to use T-bracket – T-bracket for mullions/transoms





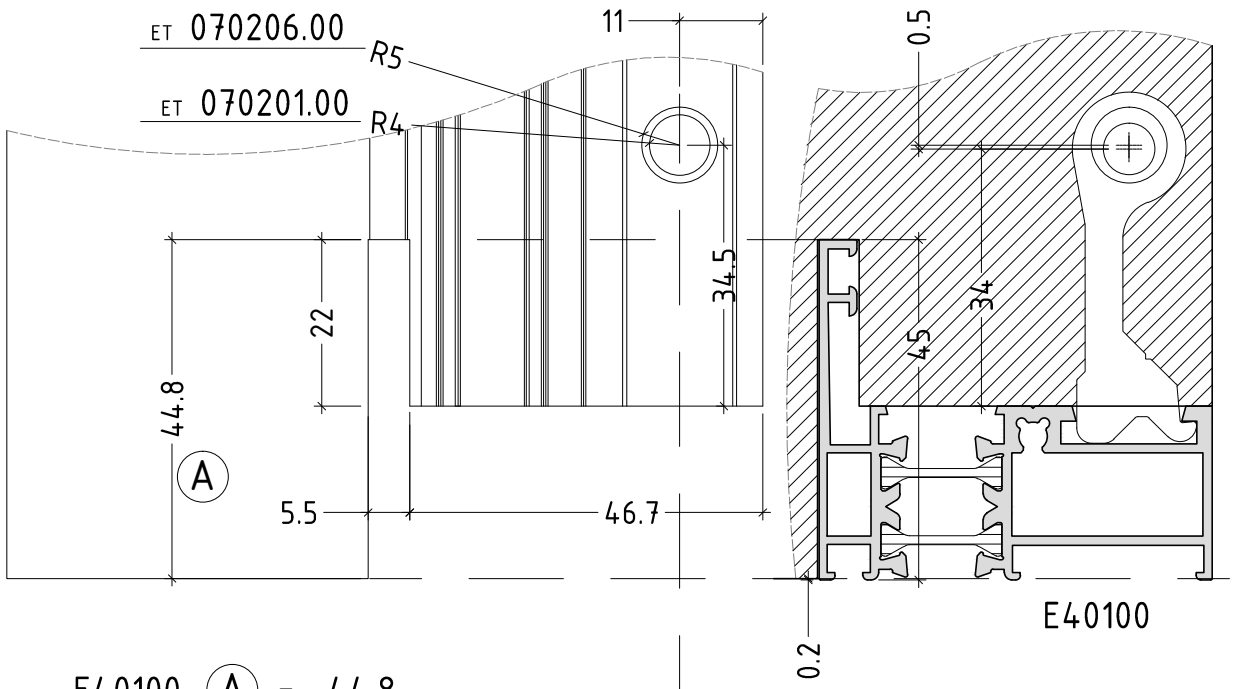






D40-12

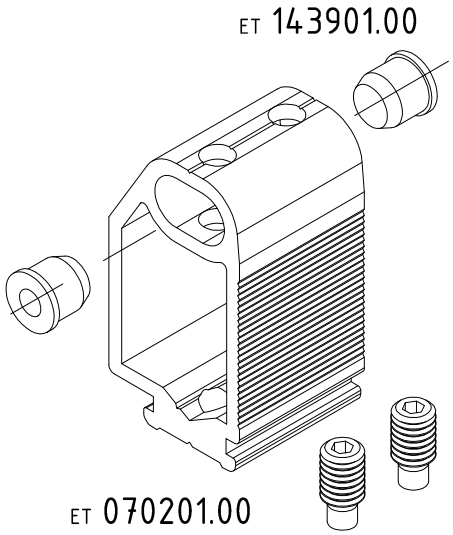
machining to use E45302 with E45100,1,2

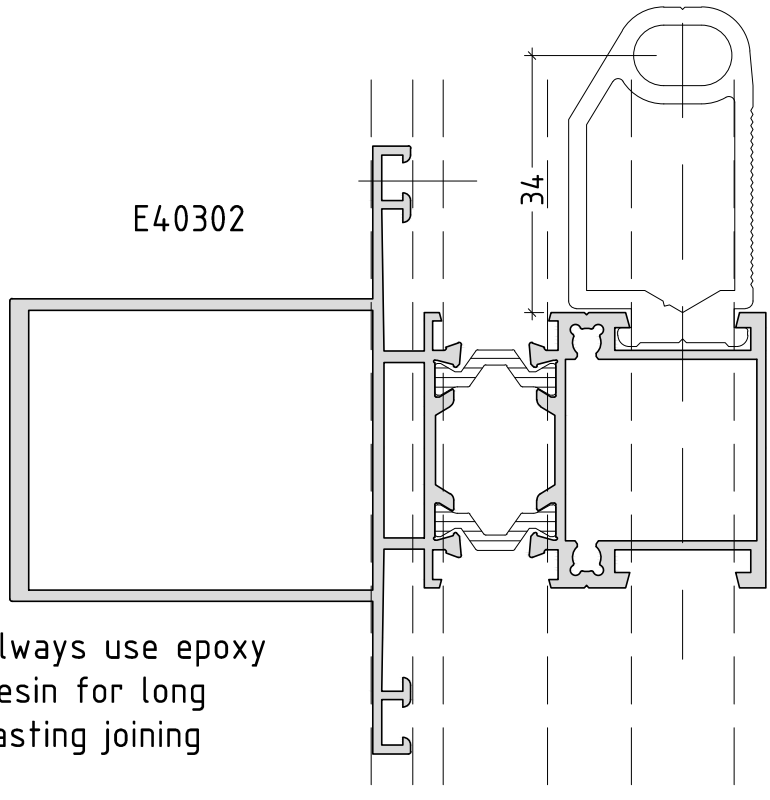


E40100 (A) = 44.8

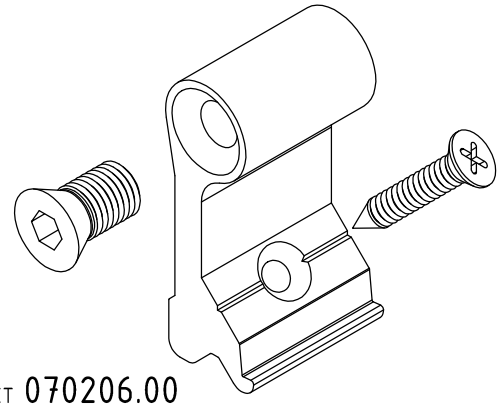
E40101 (A) = 57.8

E40102 (A) = 65.8



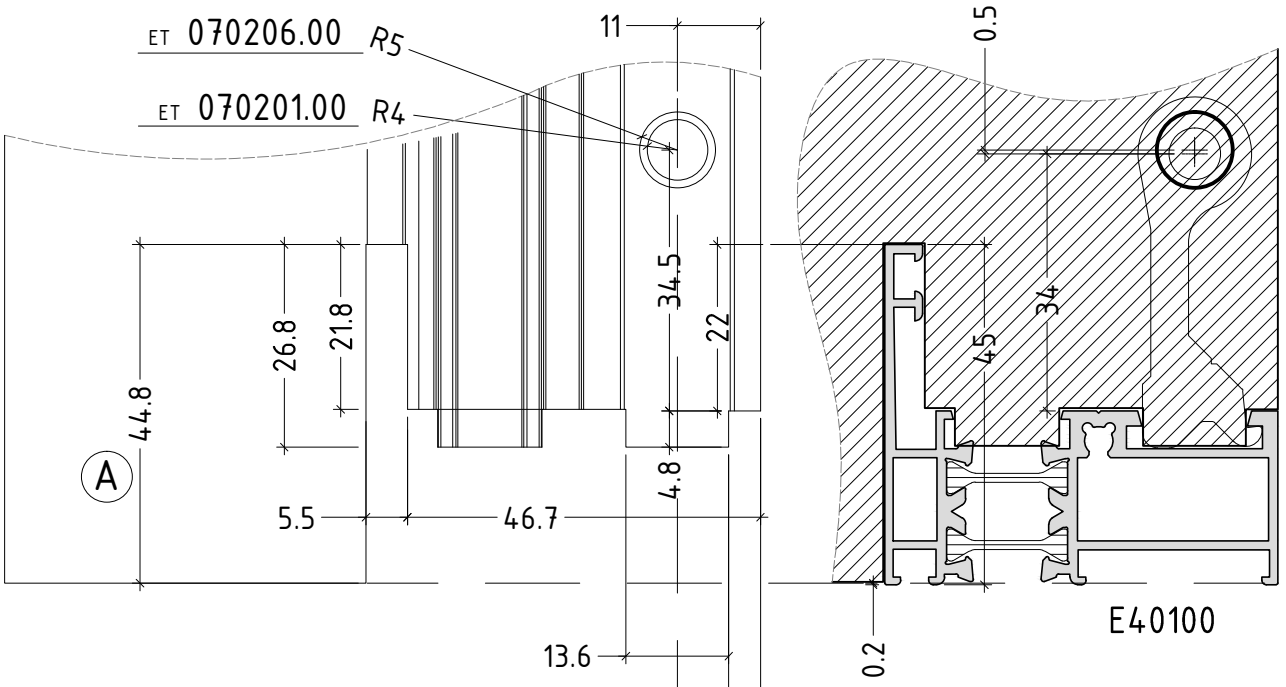


always use epoxy resin for long lasting joining



D40-13

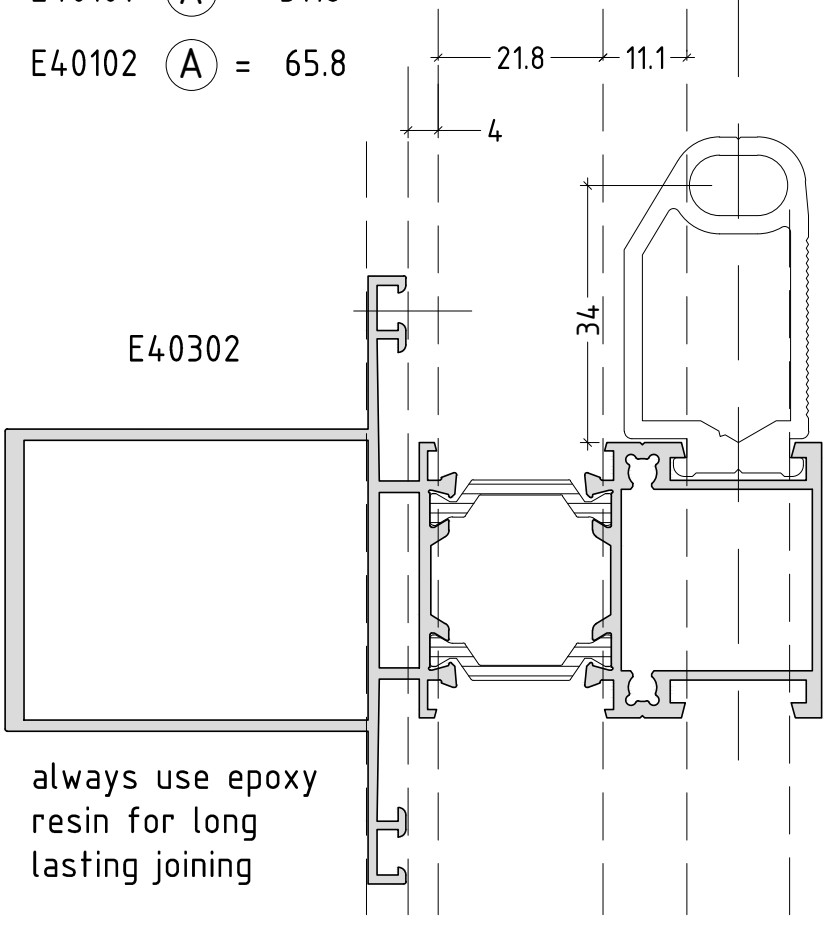
machining to use E45302 with E45100,1,2

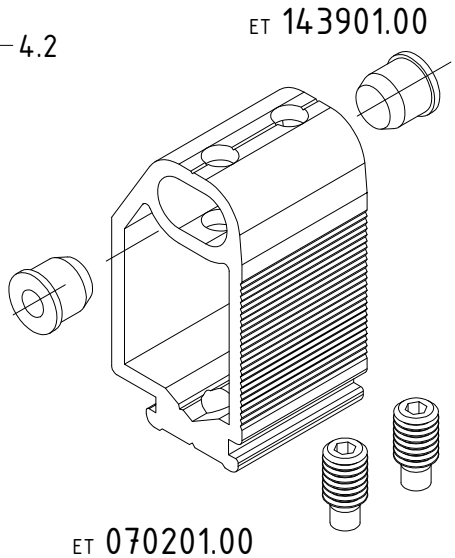


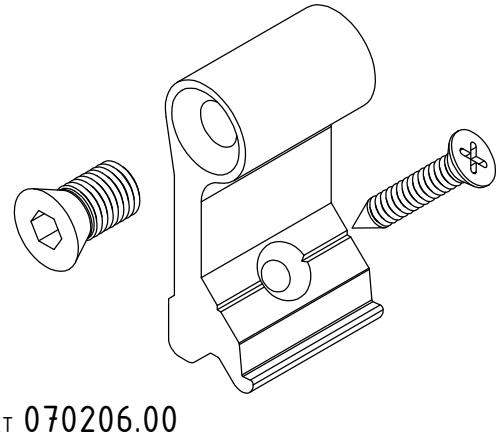
E40100 (A) = 44.8

E40101 (A) = 57.8

E40102 (A) = 65.8



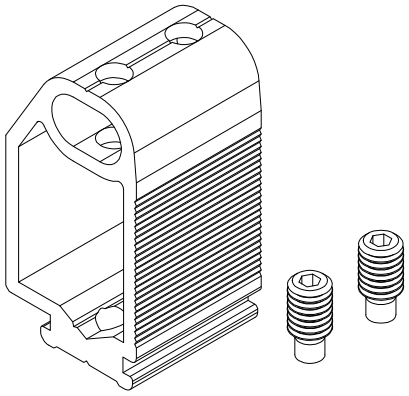


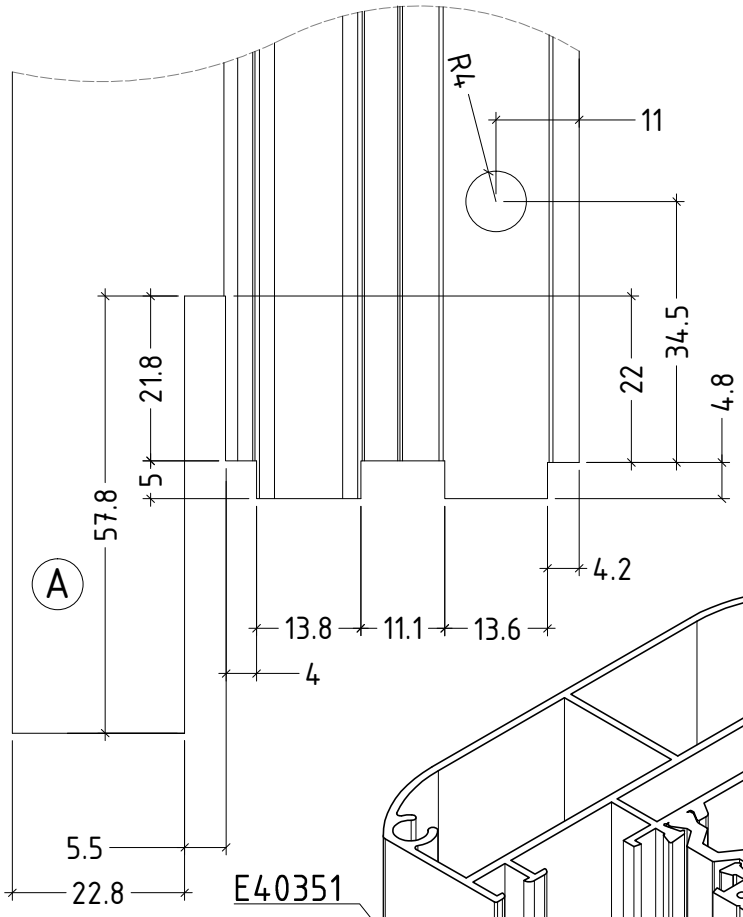


D40-14

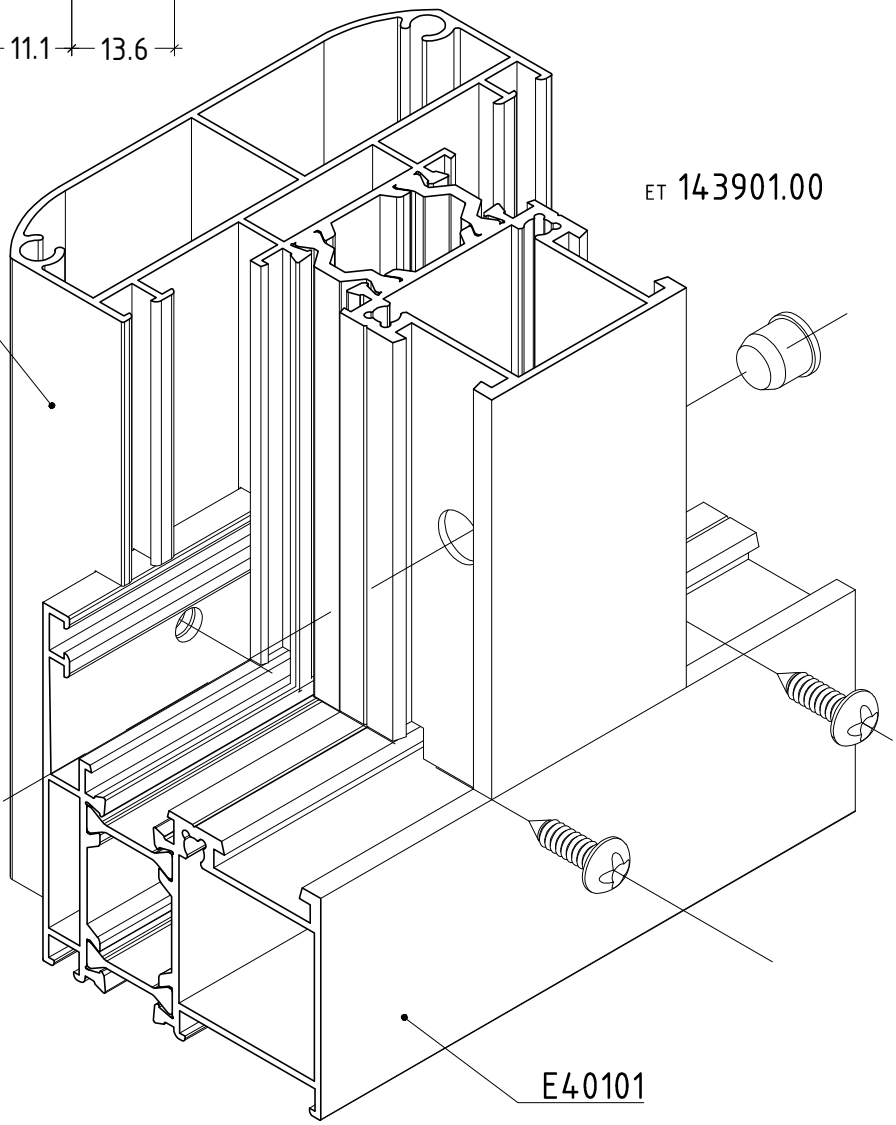
machining to use T-bracket for mullions/transoms

ET 070201.00





ET 143901.00

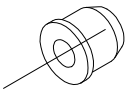


E40100 (A) = 44.8

E40101 (A) = 57.8

E40102 (A) = 65.8

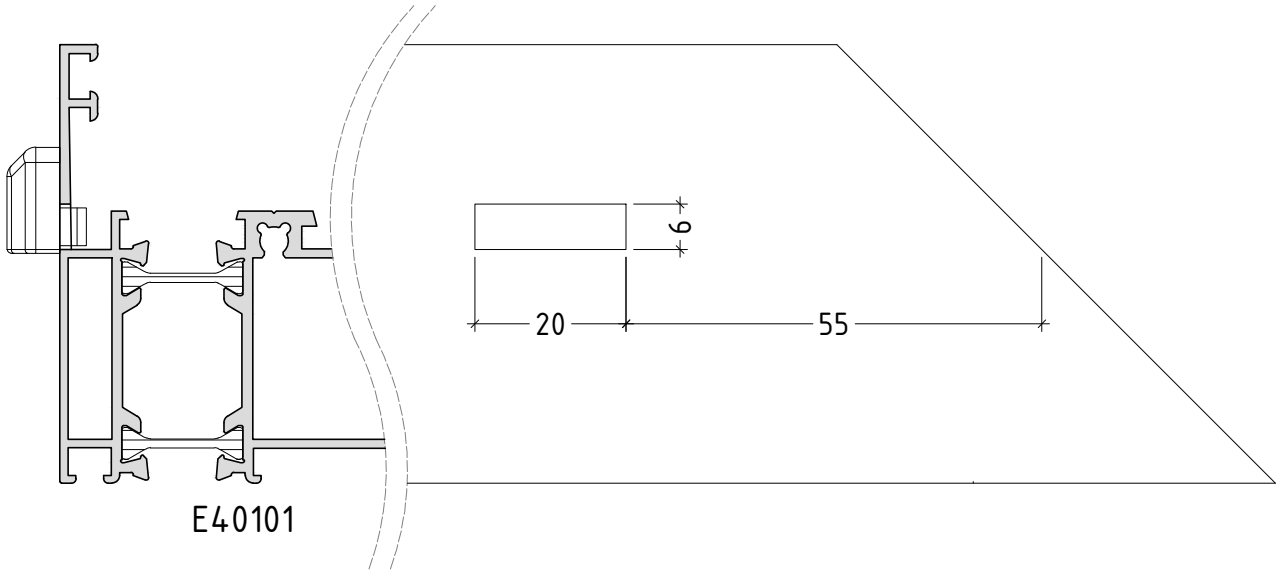
ET 143901.00



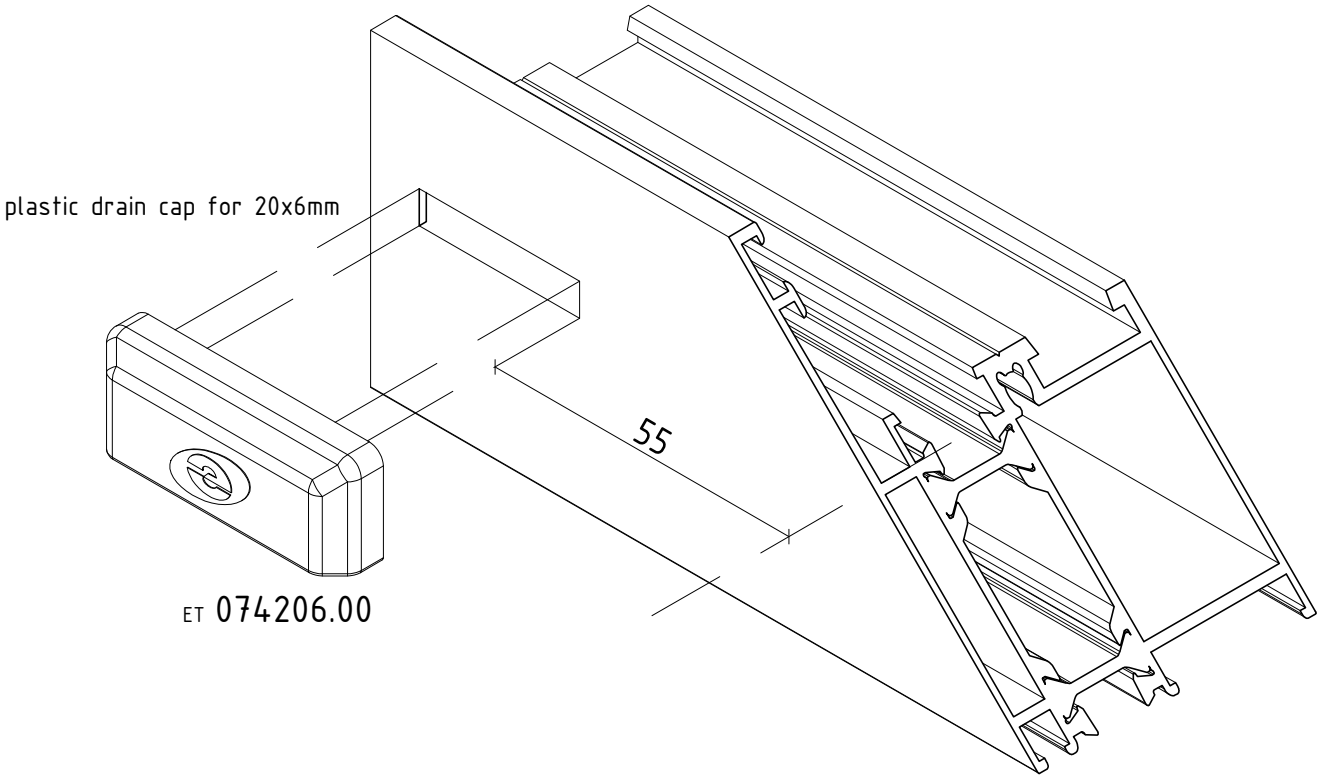
always use epoxy resin for long lasting joining

D40-15

machining for drainage and plastic cap – ET 074206.00



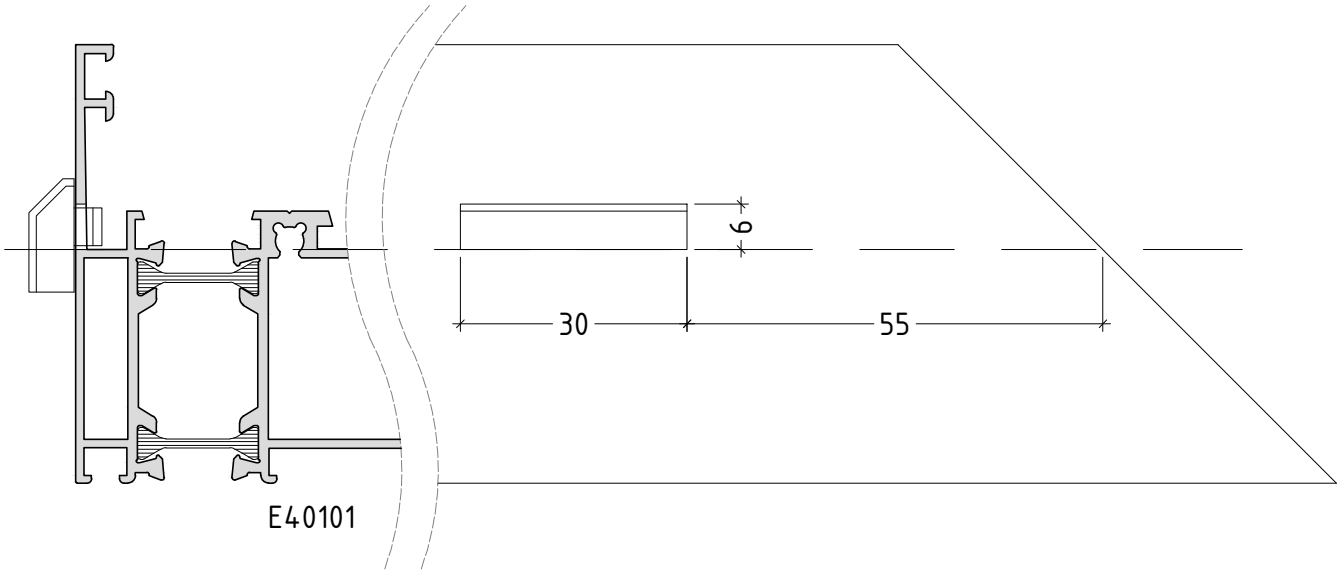
E40101



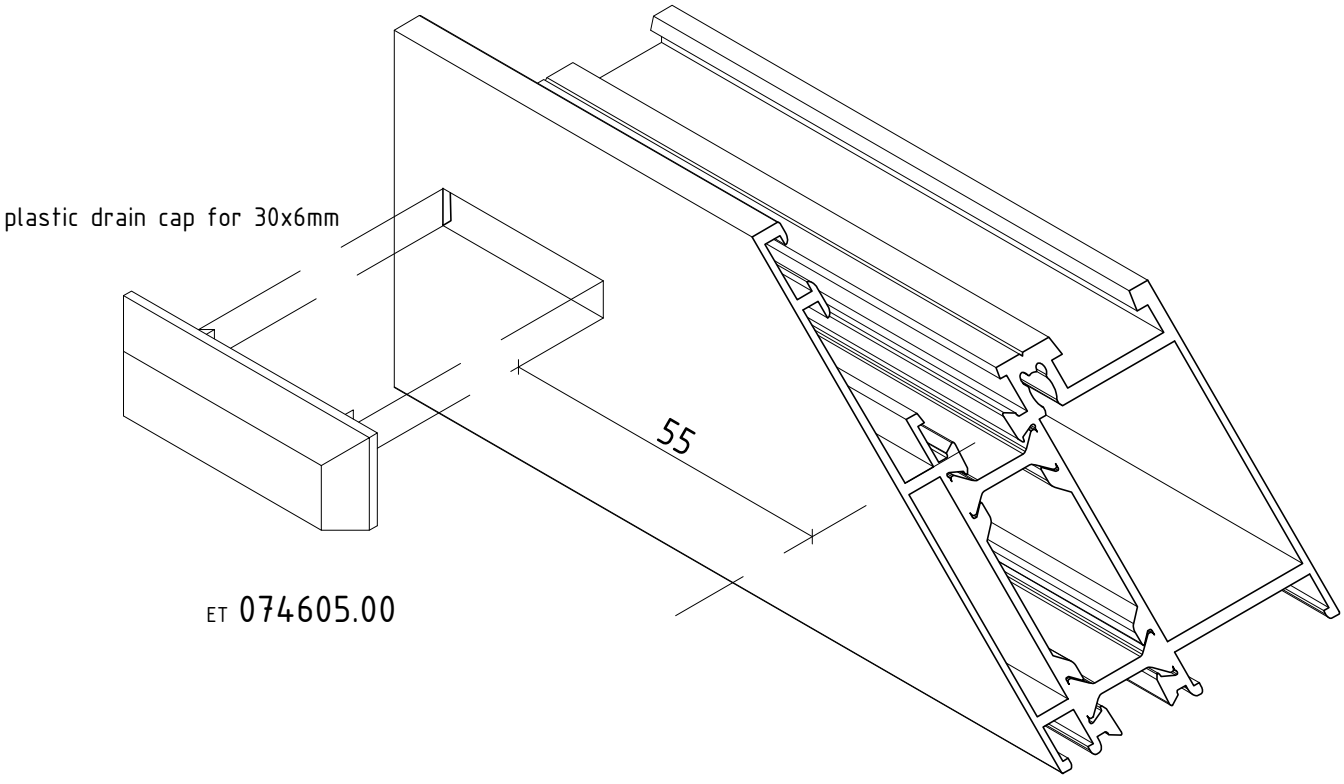
ET 074206.00

D40-16

machining for drainage and plastic cap – ET 074605.00



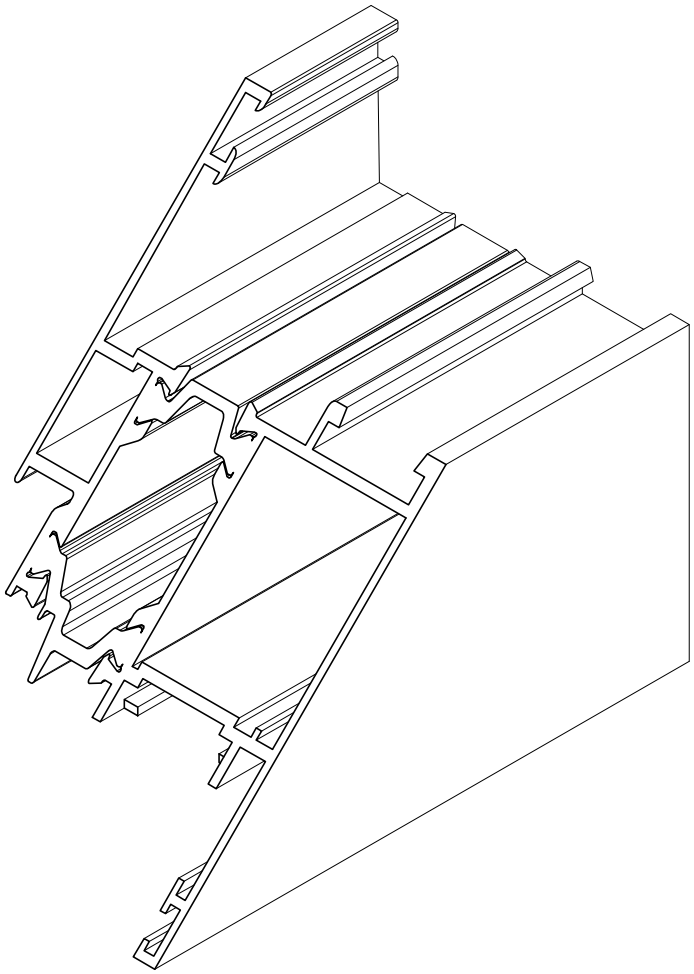
E40101

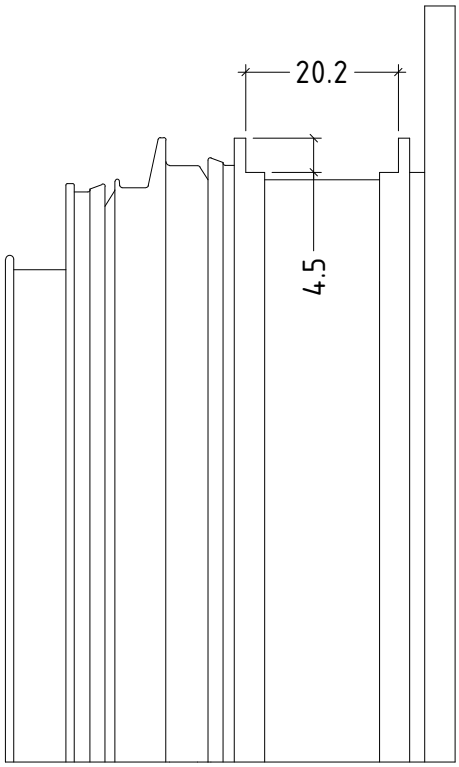


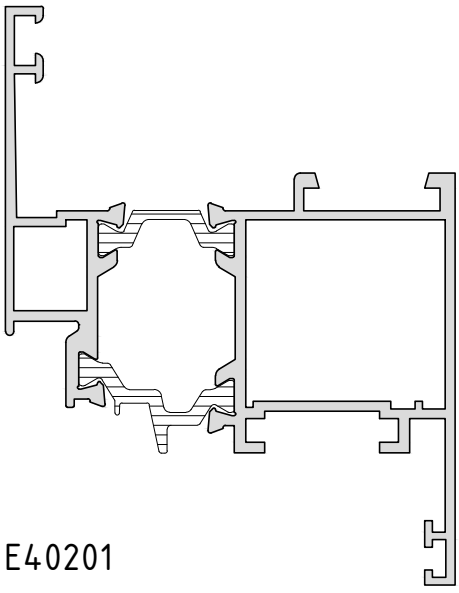
ET 074605.00

D40-17

machining for connecting rod

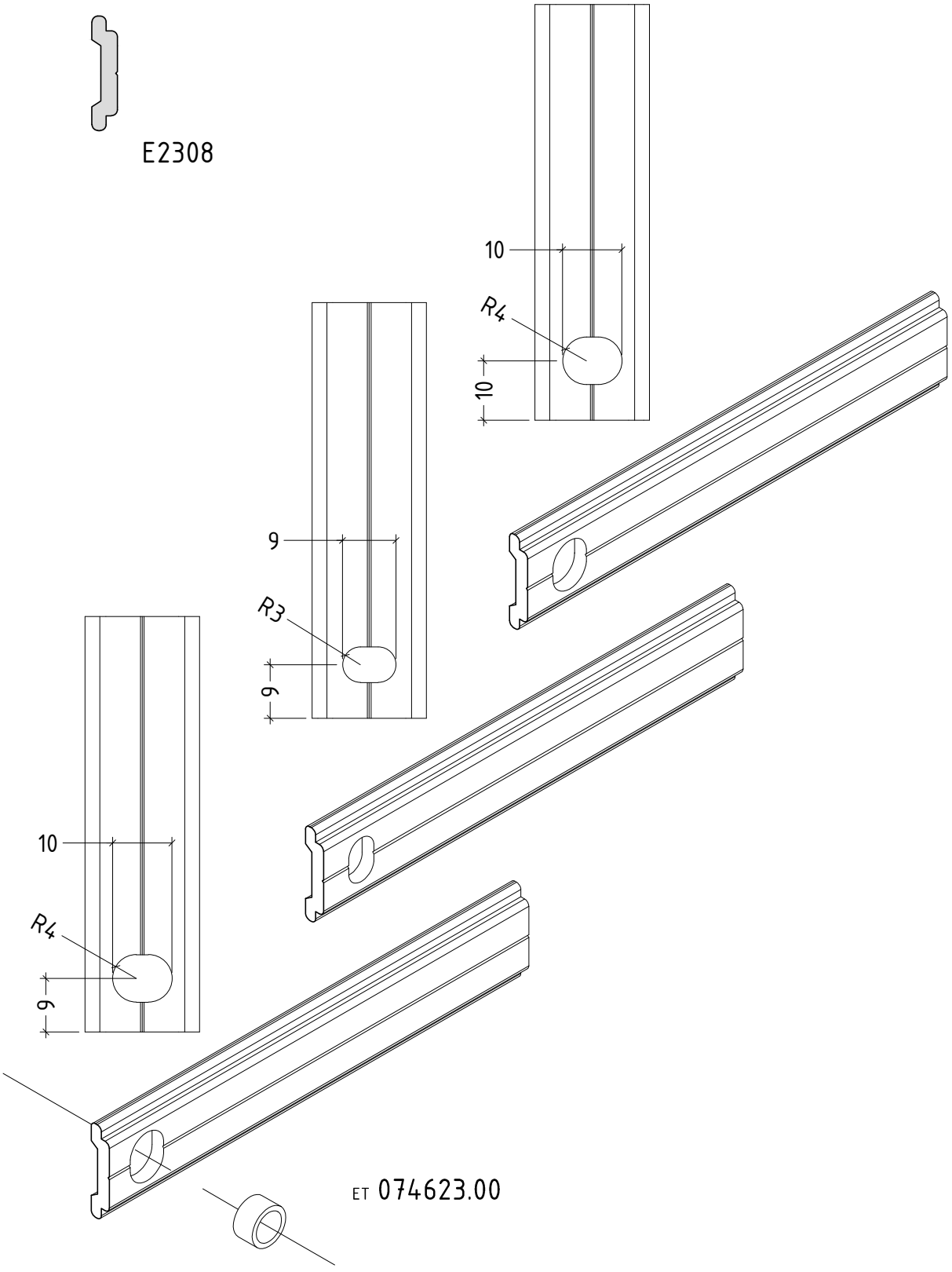




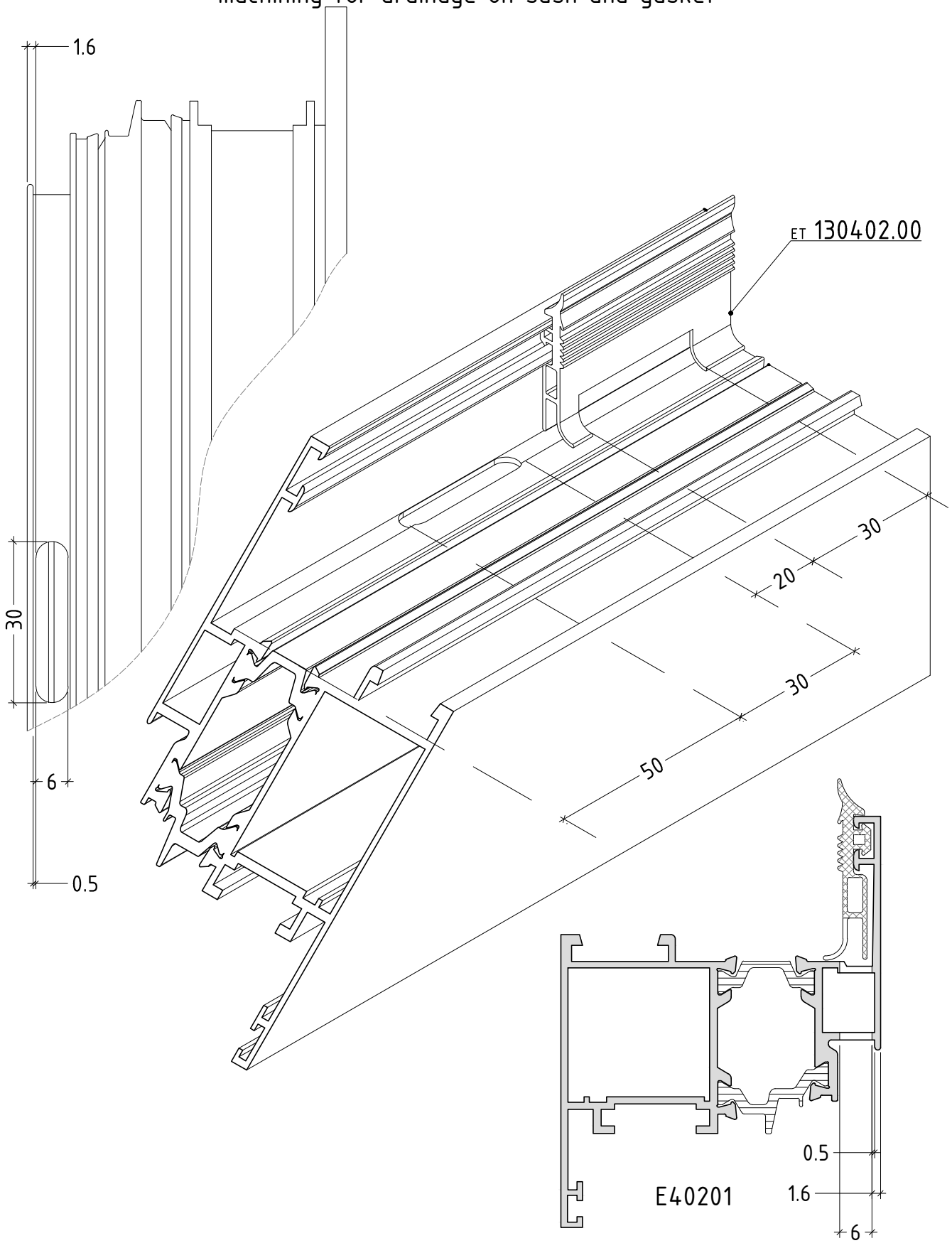


E40201

machining for connecting rod

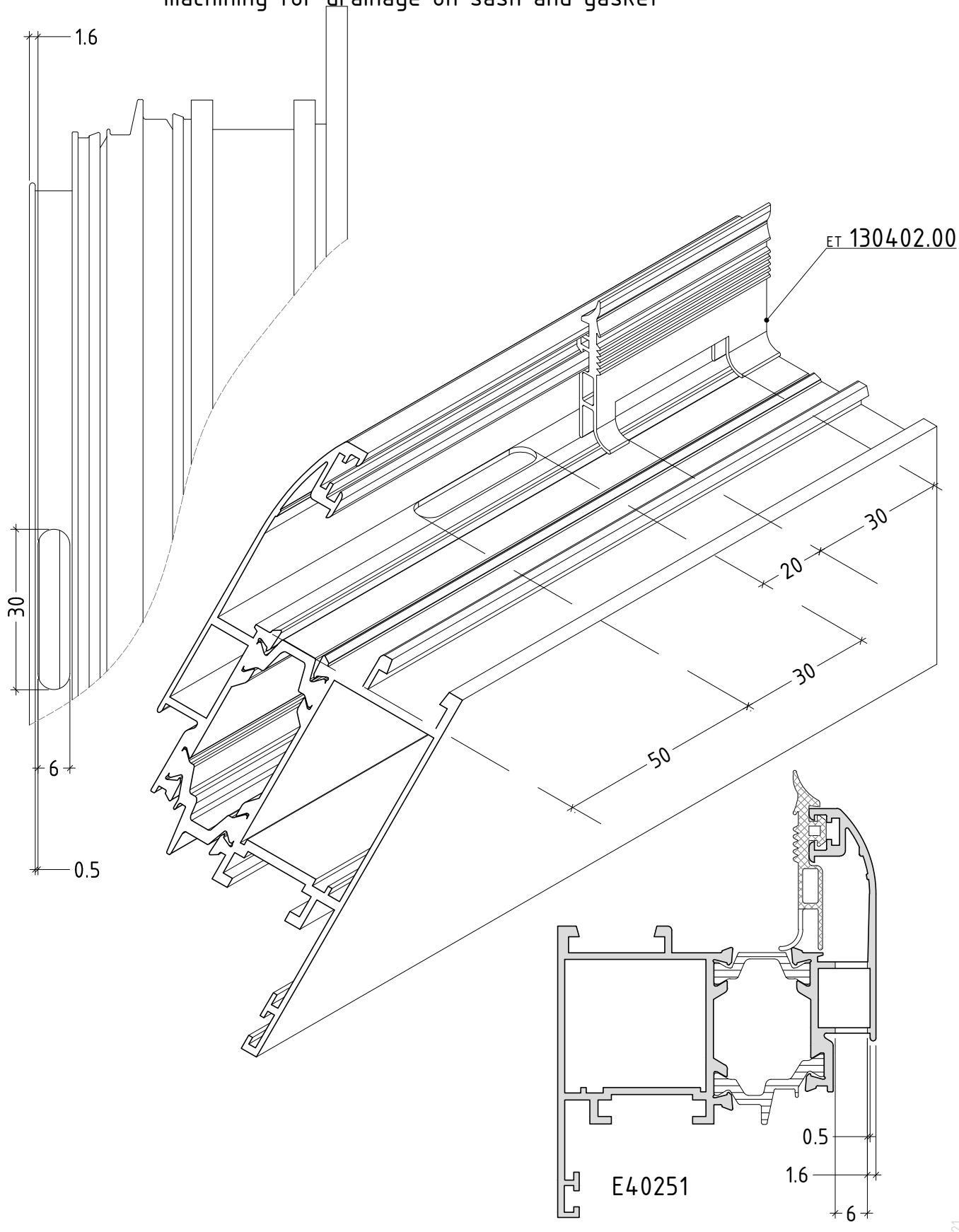


machining for drainage on sash and gasket

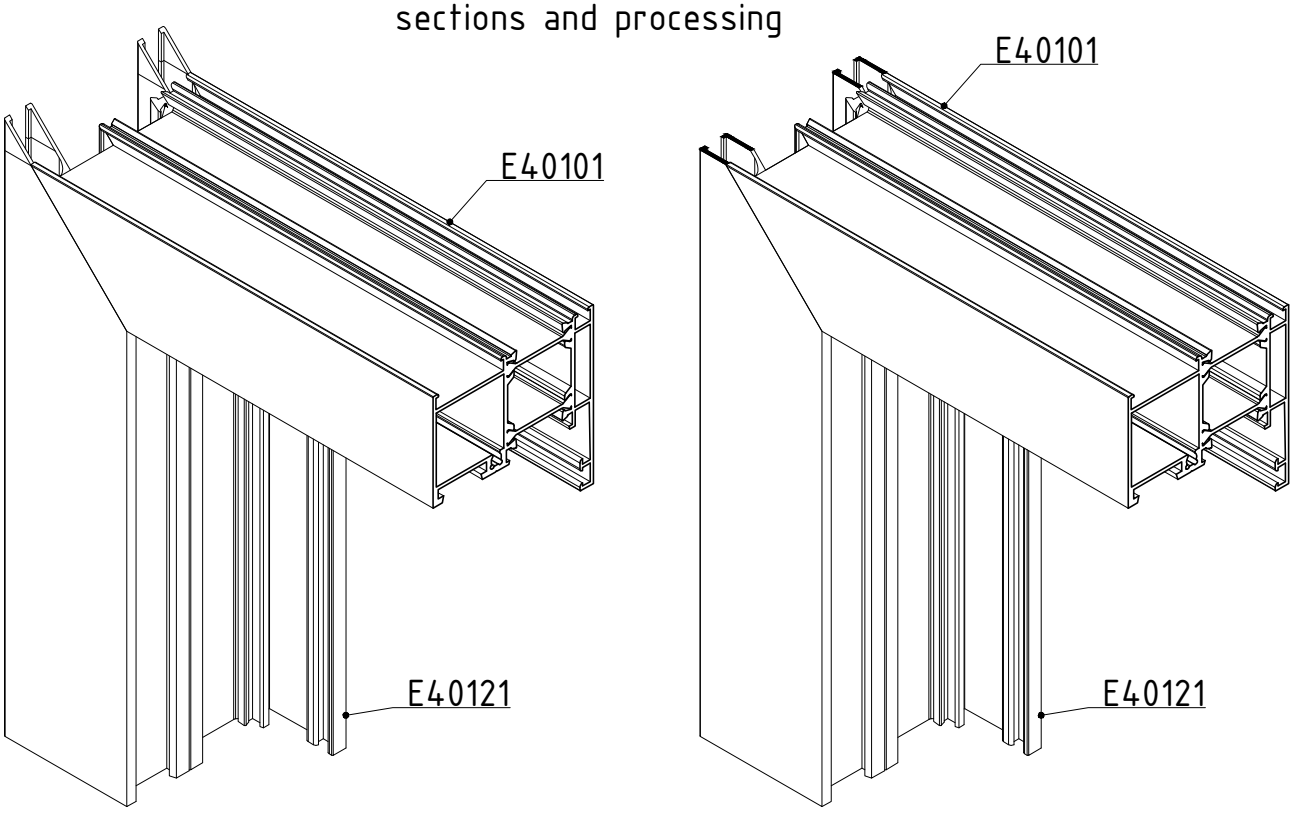


D40-20

machining for drainage on sash and gasket

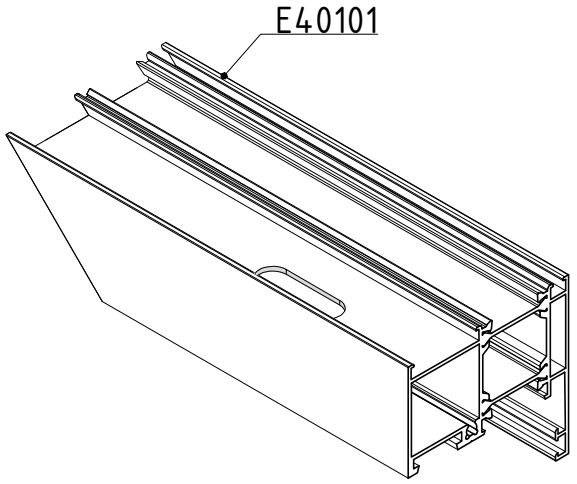


sections and processing



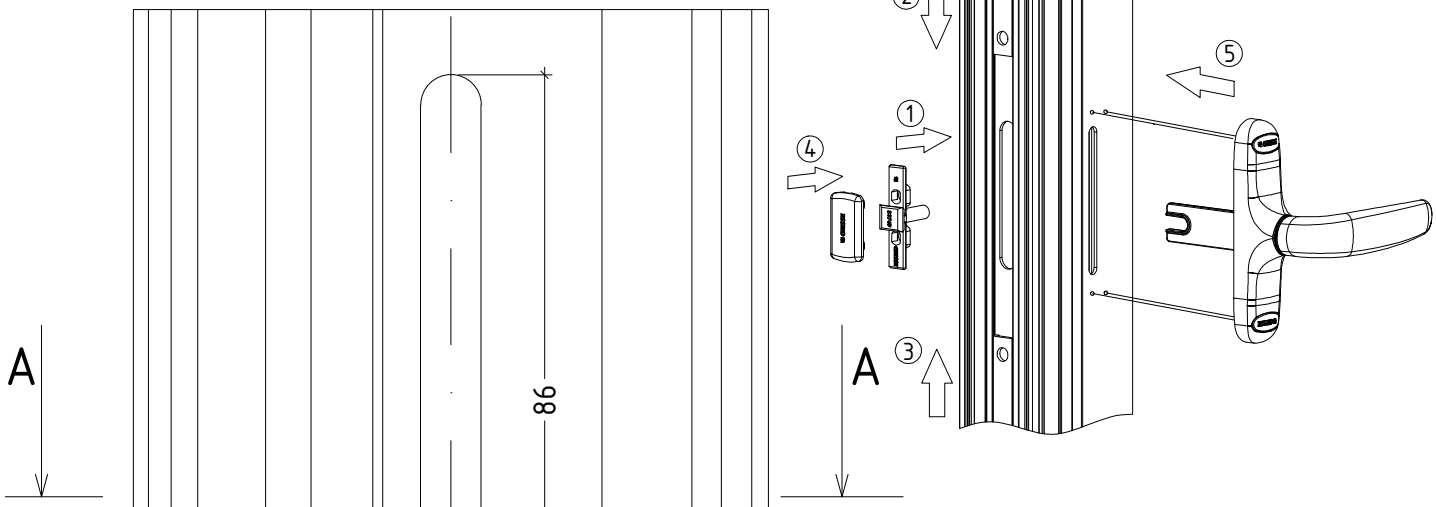
The frame for dilatation gap E40121 is joined with E40101 accordingly, using crimping machine ONLY!

After final assembly, the profile for dilatation gap E45121 is cut in the same plane of the standard frame E40101.



Oval shape of mounting openings are a must and have to be cut in the standard frame E40101, in order to take-in effectively the temperature expansion of the profiles in case of striped windows.

machining for handle GI212701.01 – GI212701.02



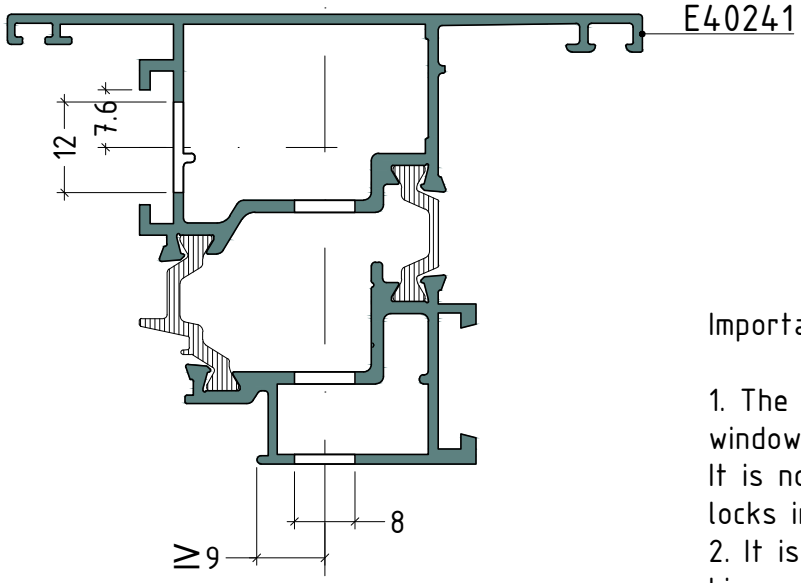
For one leaf sash is needed:

- GI212701-handle GIESSE outward opening
- GI255612.00-extension for handle GIESSE 45mm for E40

or

- GI255613.00-extension for handle GIESSE 55mm for E45
- GI255614.00moving element GIESSE 18.5mm for E40, E45

A – A

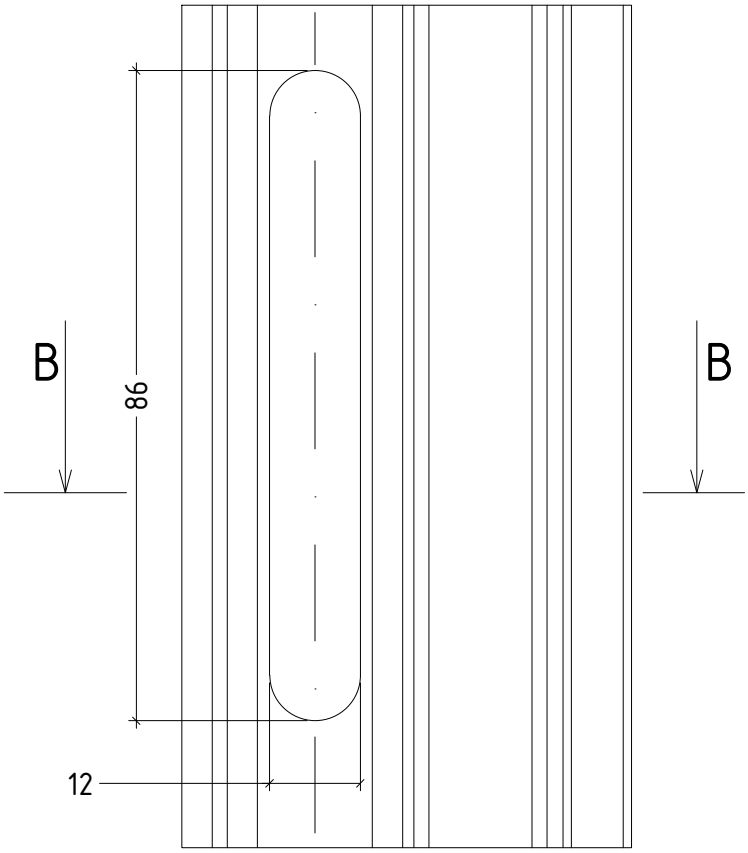


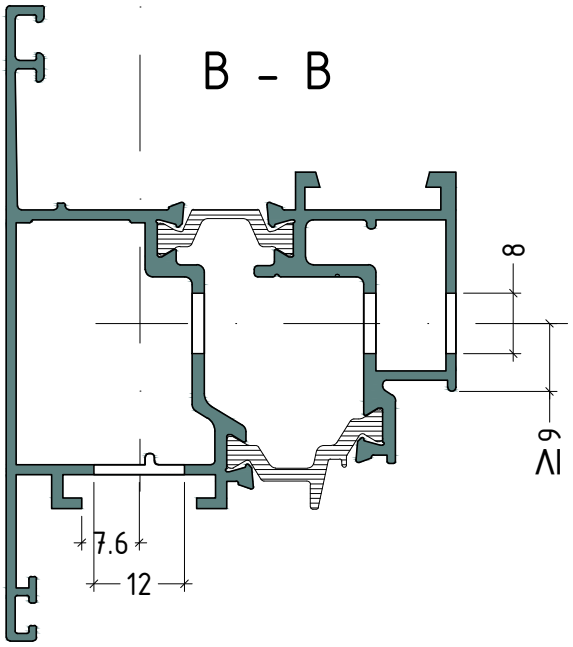
Important information:

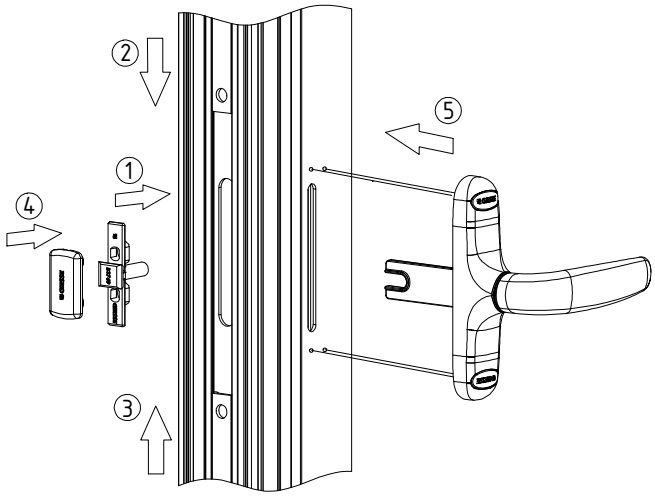
1. The new sash allows execution of windows and door-height windows only. It is not possible to incorporate door locks in sash E40241
2. It is possible to use every kind of hinges, which are suitable for Euro-groove.

D40-23

machining for handle GI212701.01 – GI212701.02





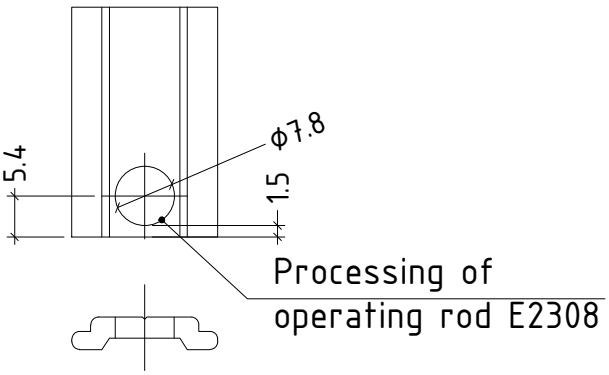


For one leaf sash is needed:

- GI212701-handle GIESSE outward opening
- GI255612.00-extension for handle GIESSE 45mm for E40

or

- GI255613.00-extension for handle GIESSE 55mm for E45
- GI255614.00moving element GIESSE 18.5mm for E40, E45

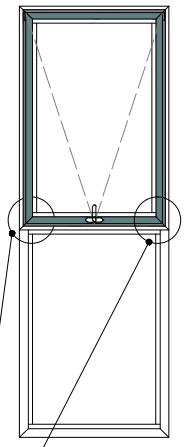


Important information:

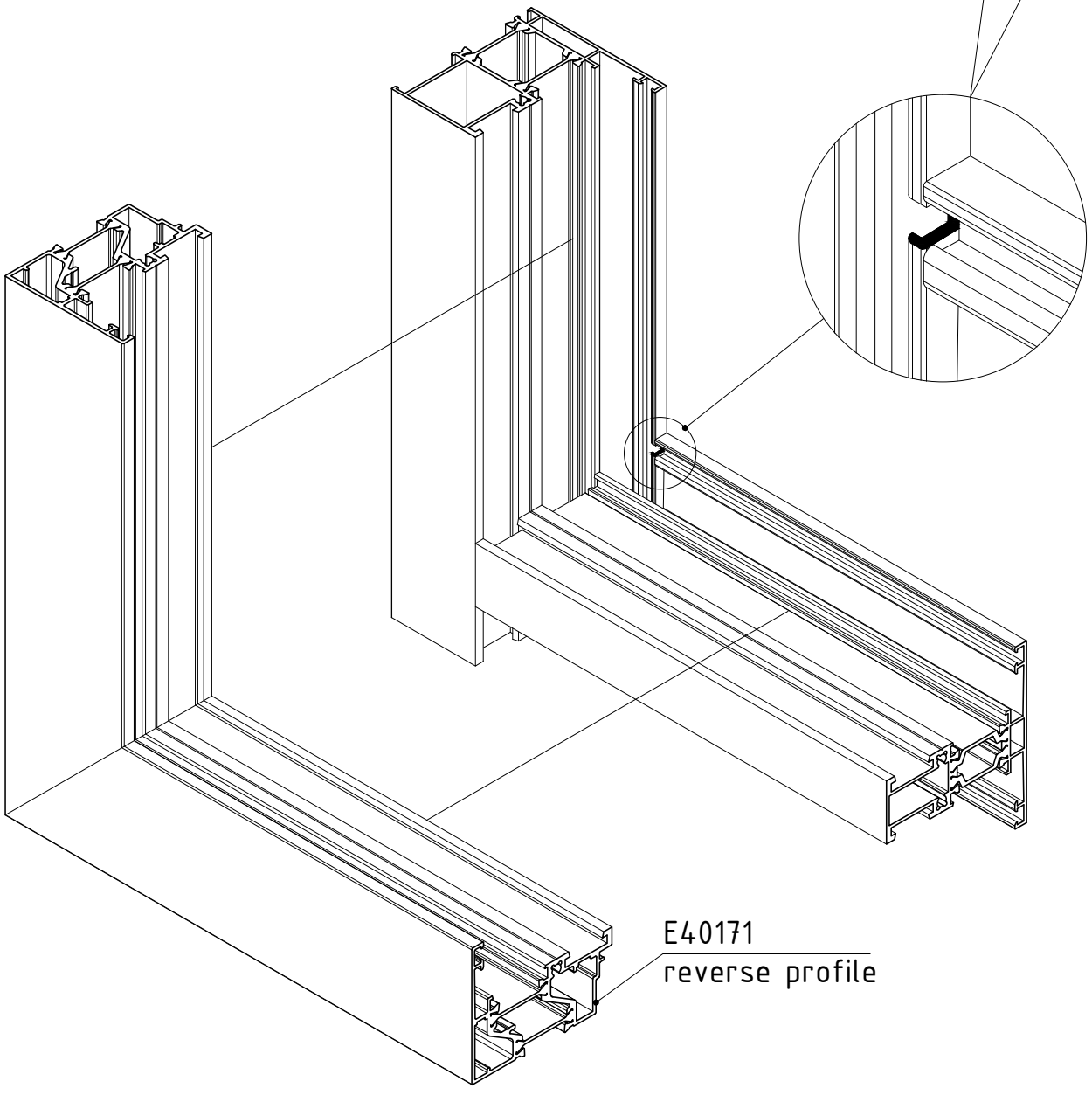
1. The new sash allows execution of windows and door-height windows only. It is not possible to incorporate door locks in sash E45241
2. It is possible to use every kind of hinges, which are suitable for Euro-groove.

D40-24

outward opening

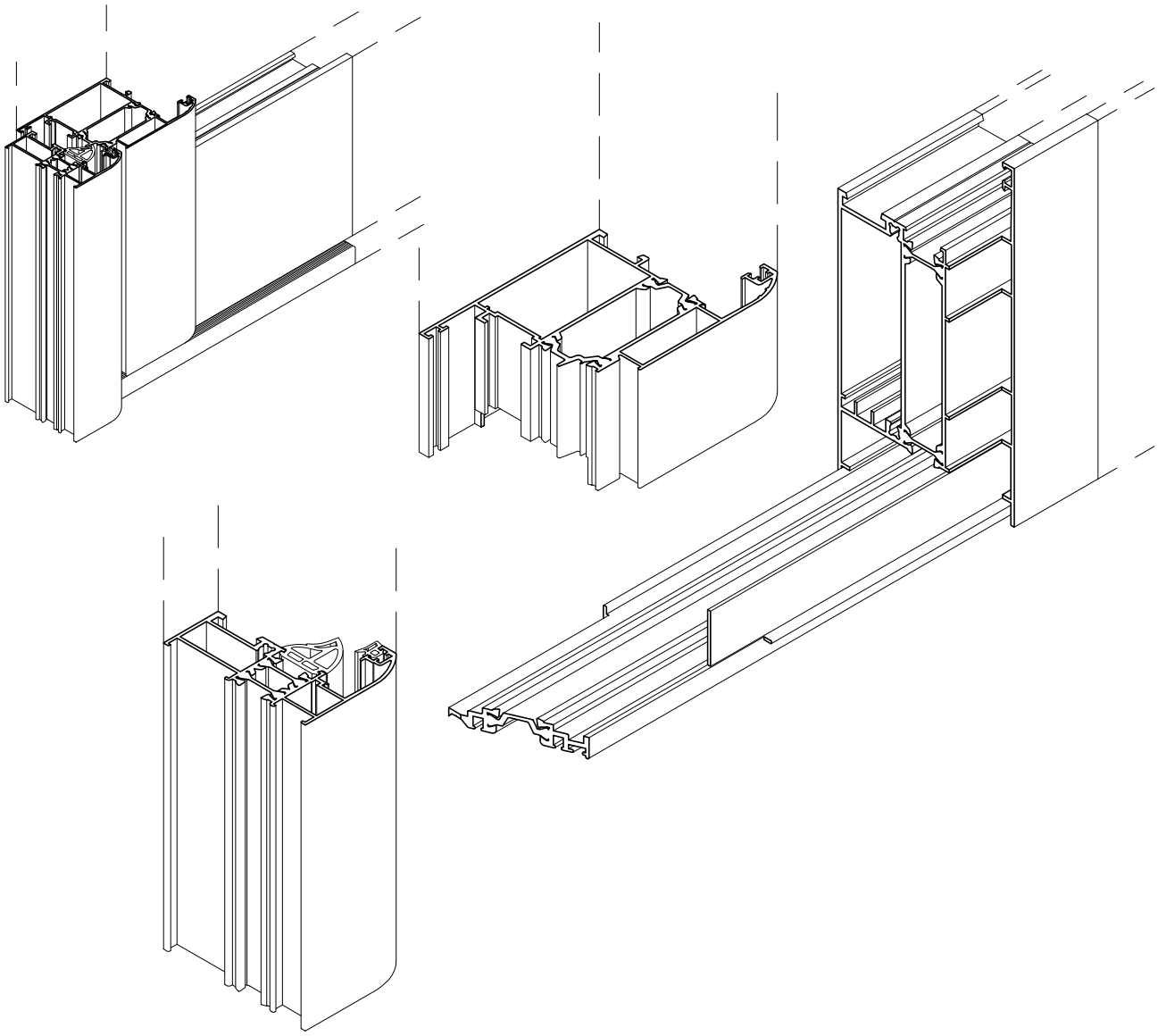


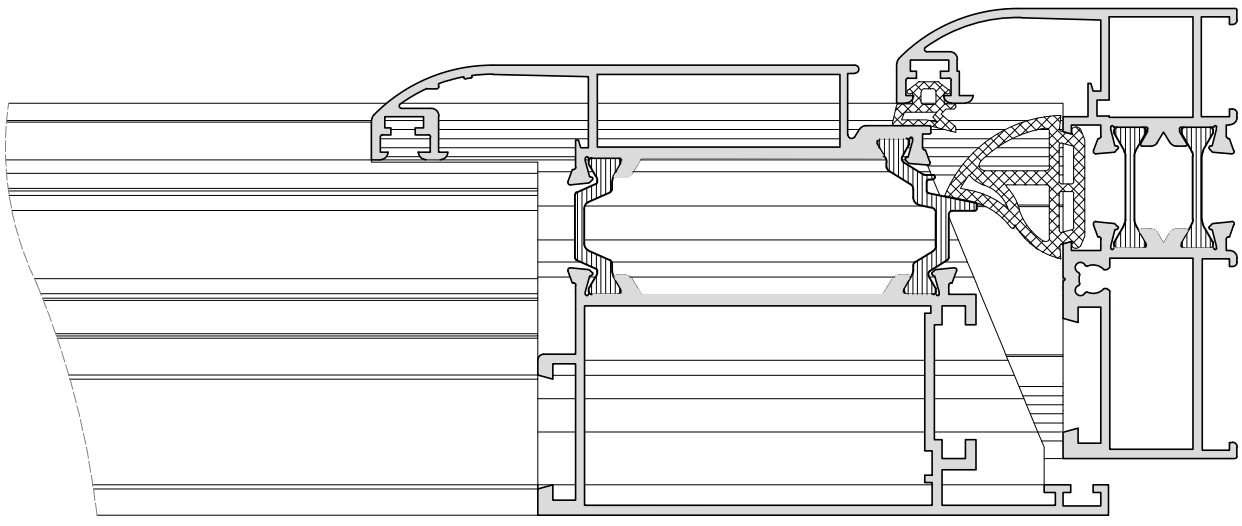
Connecting frame, T-profile
and reverse profile E40171, it is necessary
to cut the frame on the shown point



D40-25

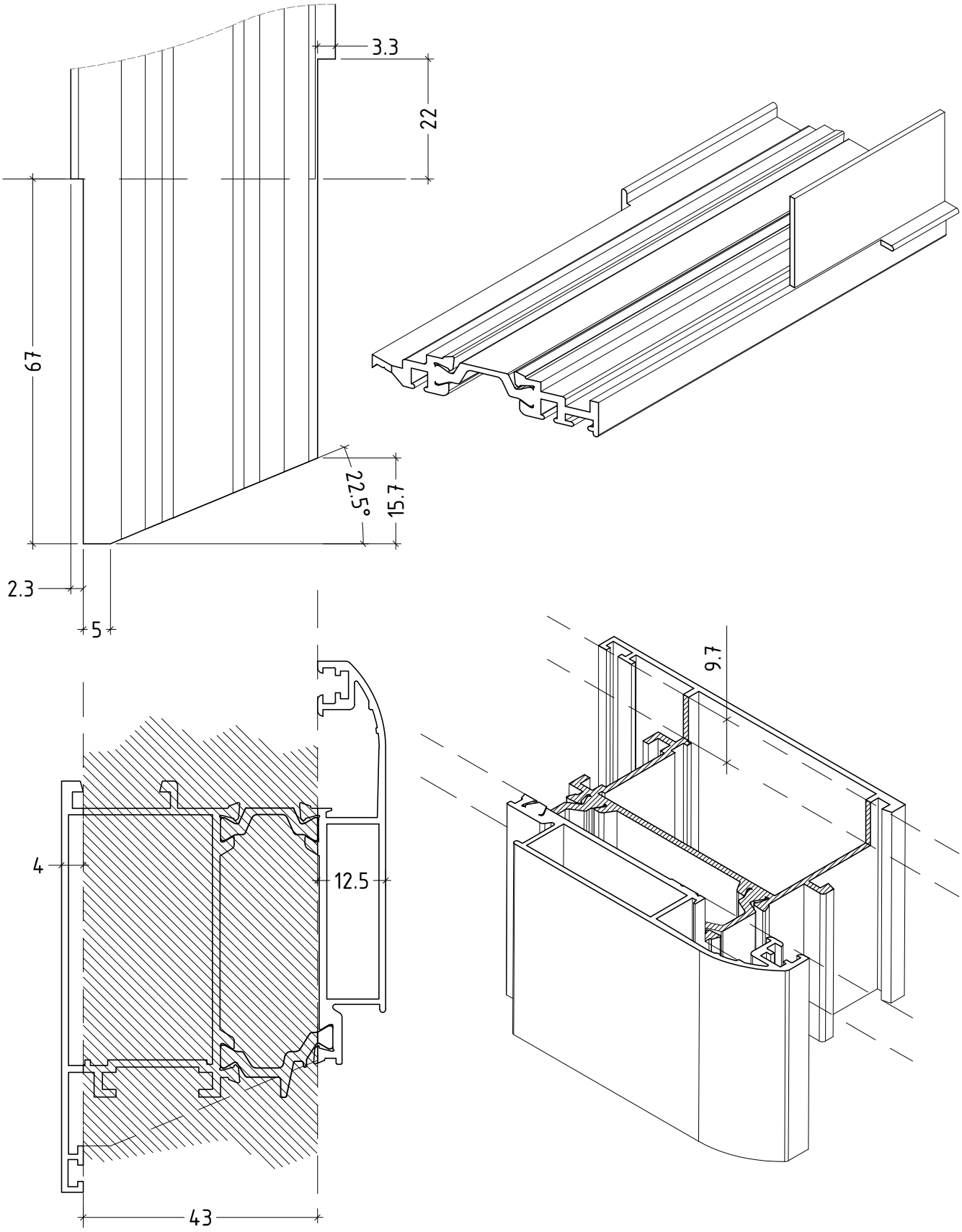
machining to use E40810





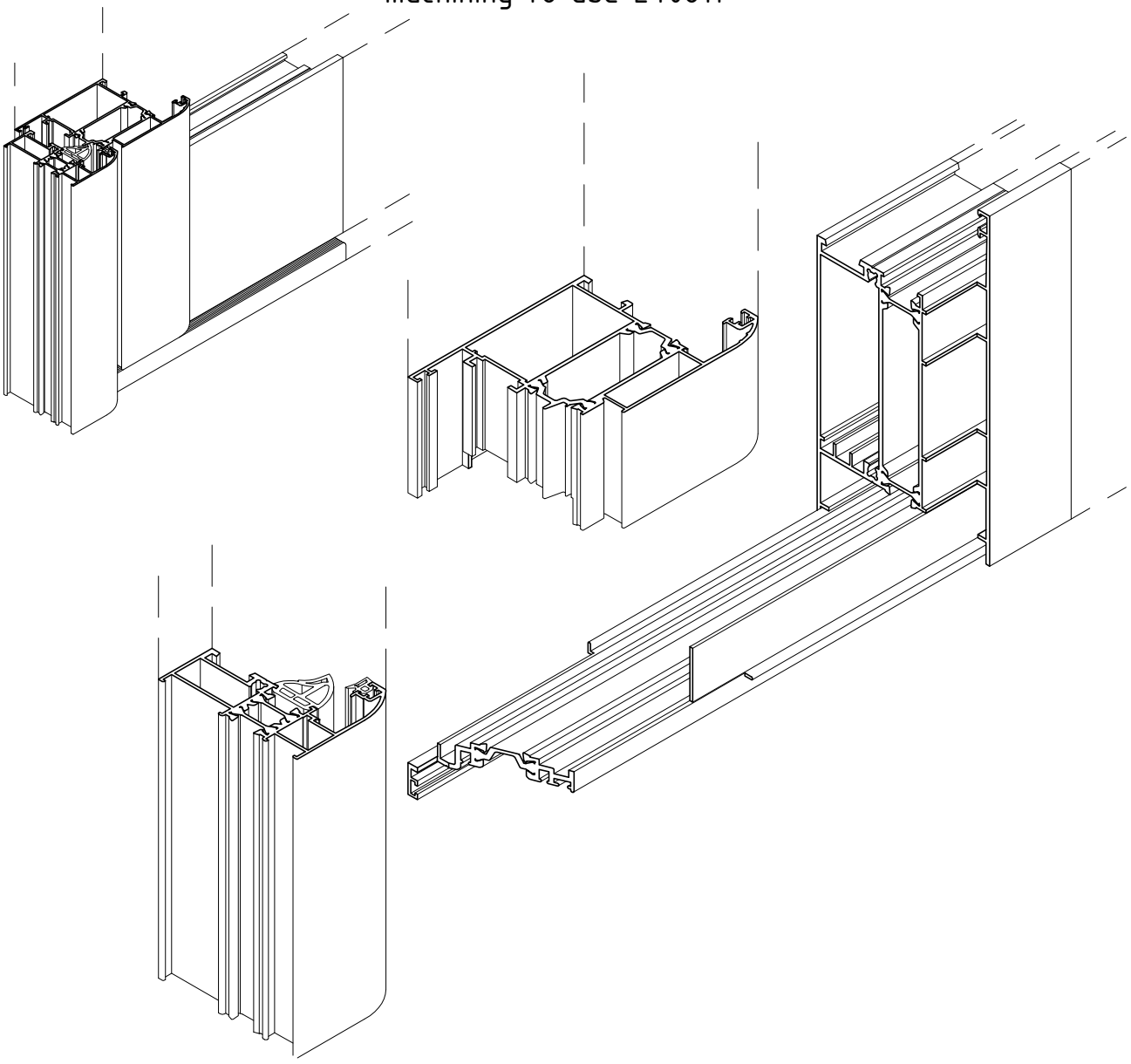
D40-26

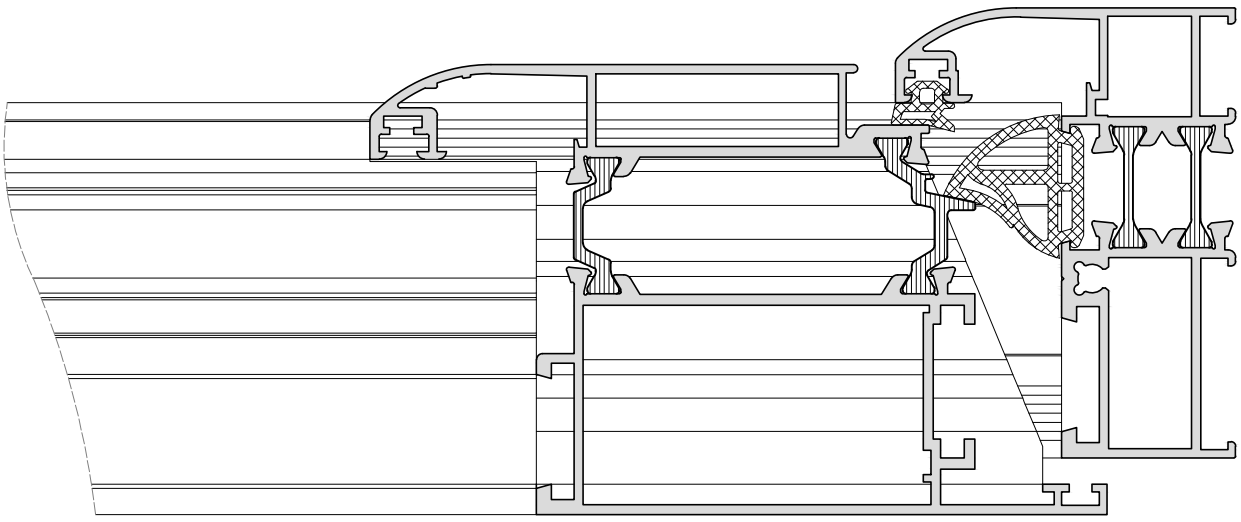
machining to use E40810



D40-27

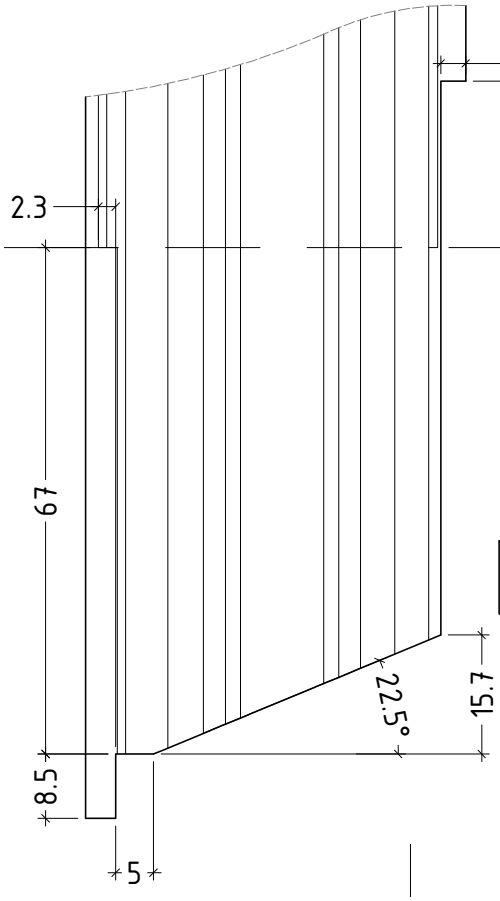
machining to use E40811

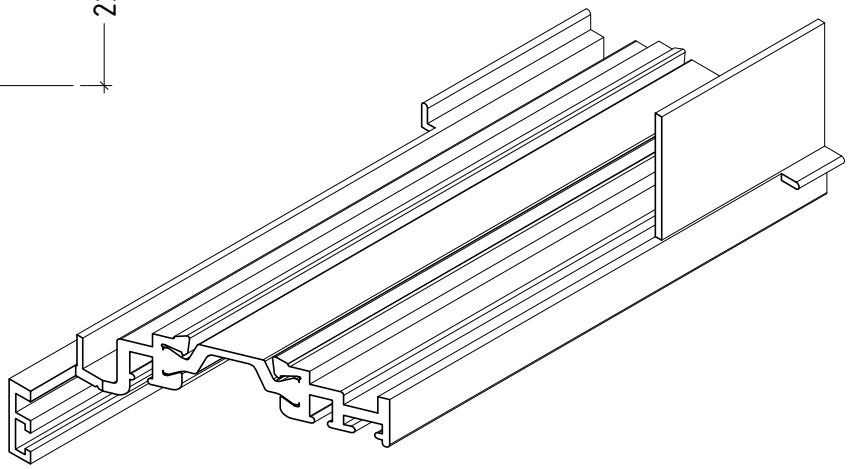


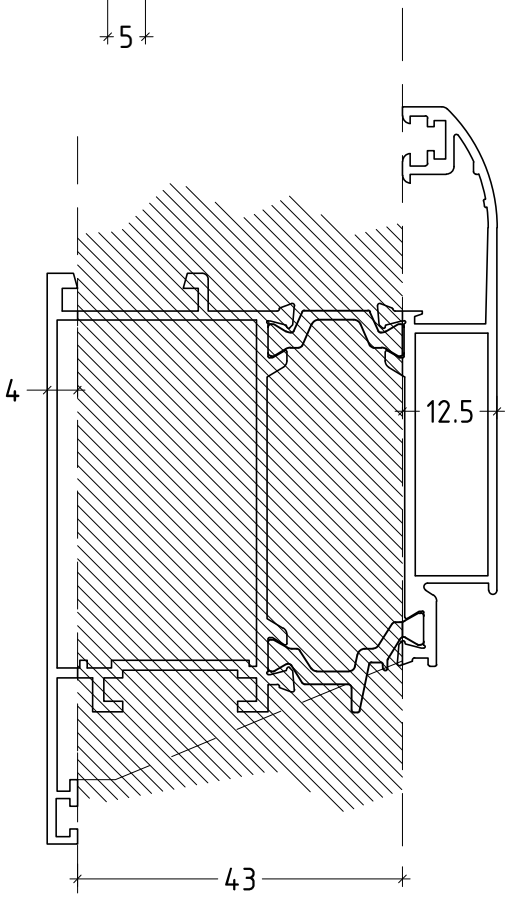


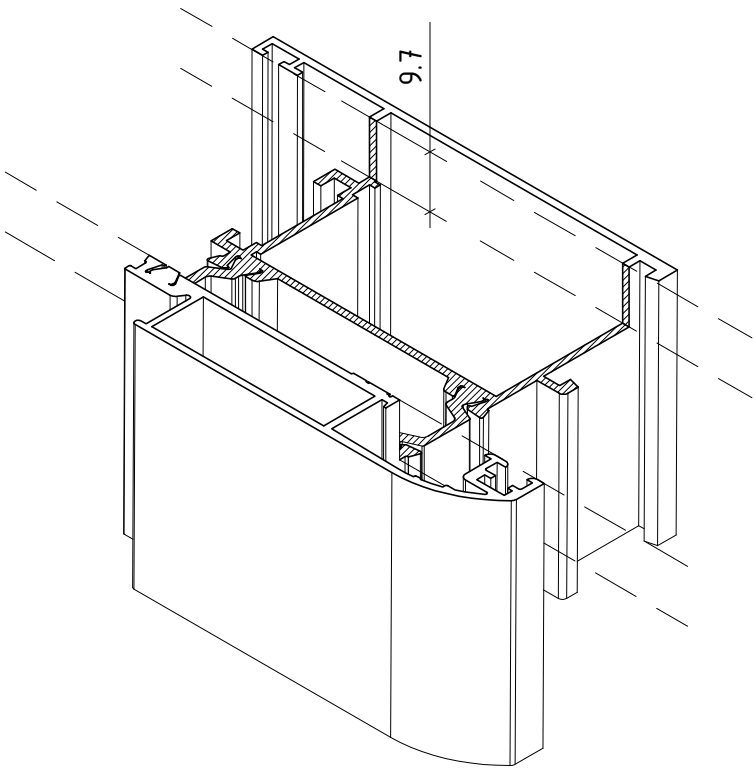
D40-28

machining to use E40811

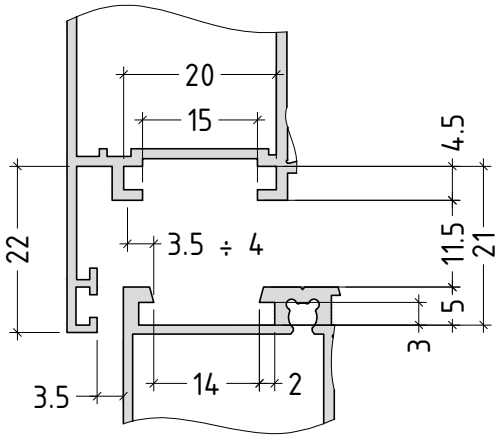


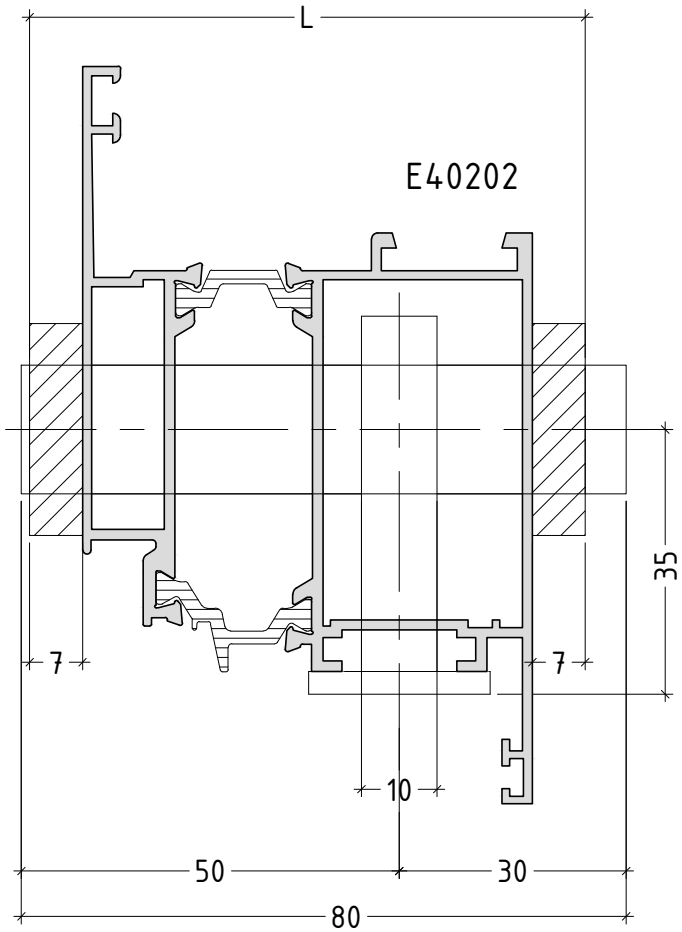




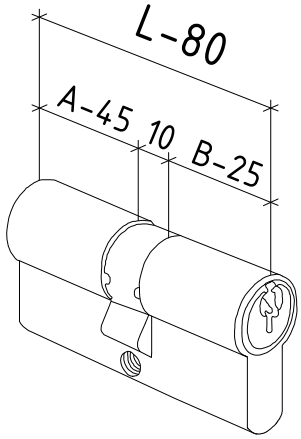


D40-29





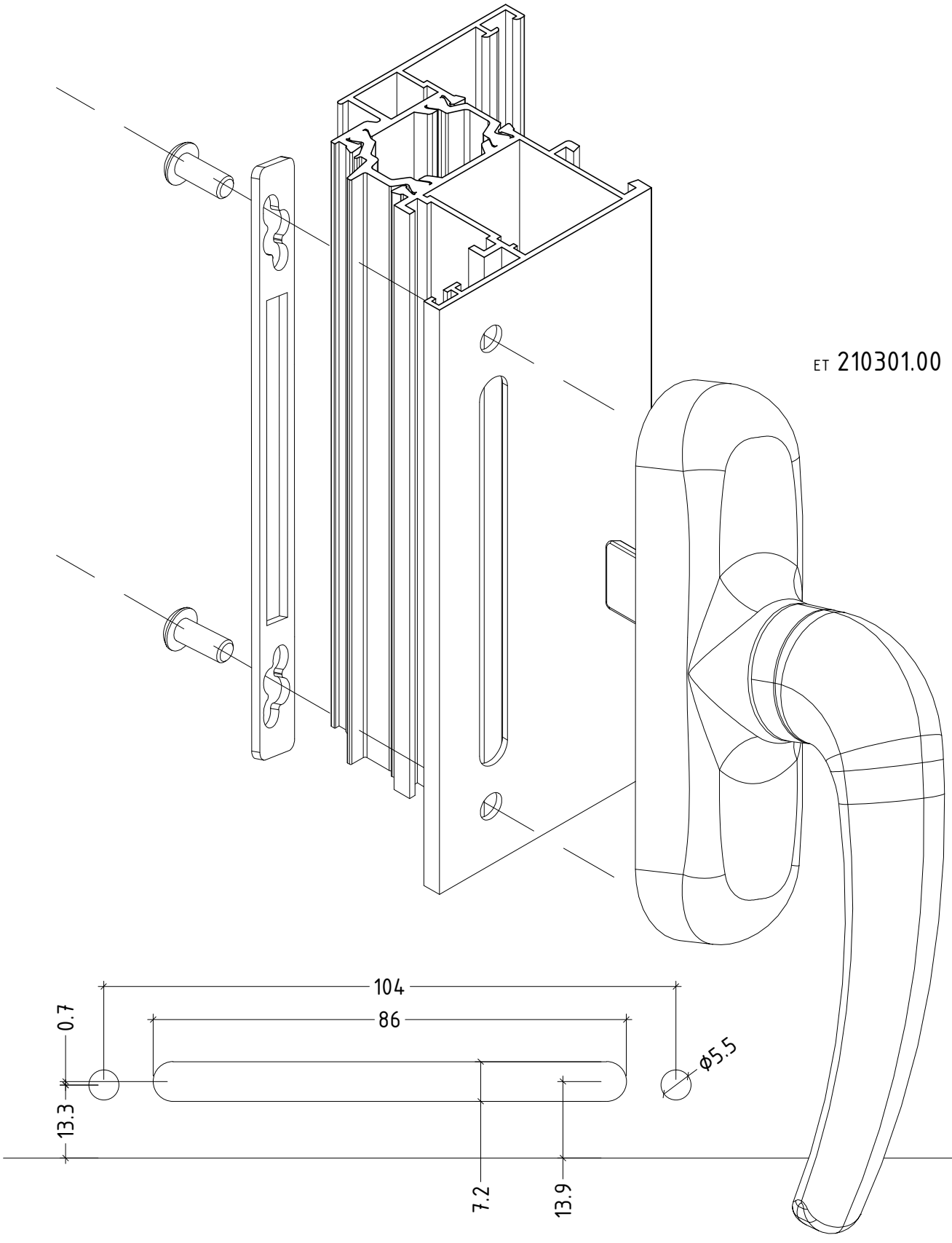
Note:
Hardware used for E40 is intended for Eurogroove with the noted parameters



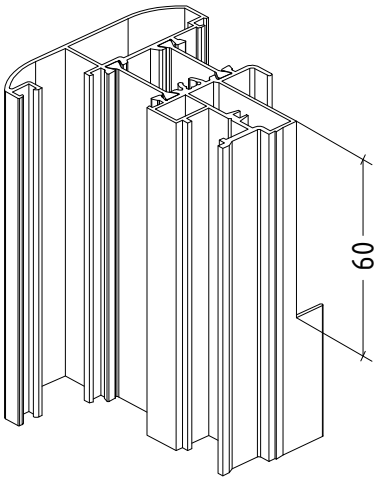
Note:
The length L of the cylinder depends on the chosen type of decorative rosettes

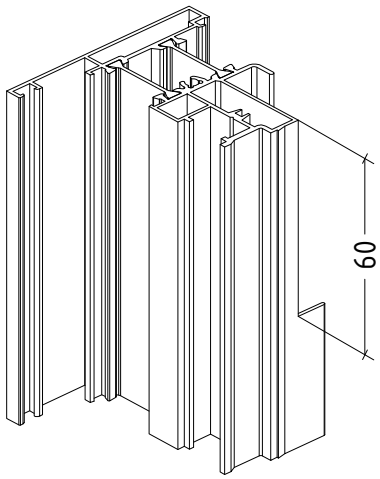
D40-30

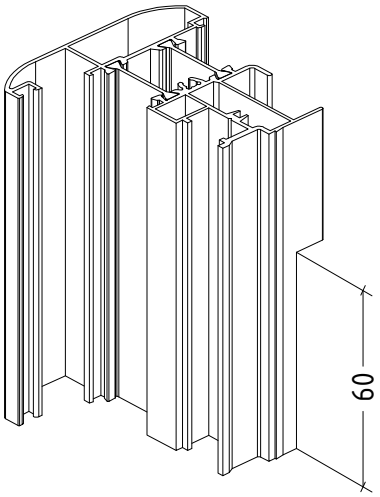
machining for window handle

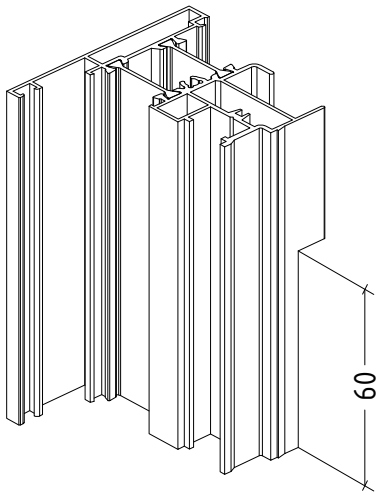


D40-31

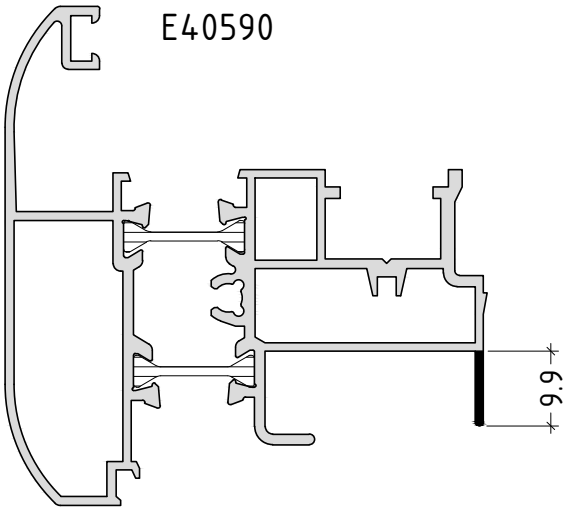




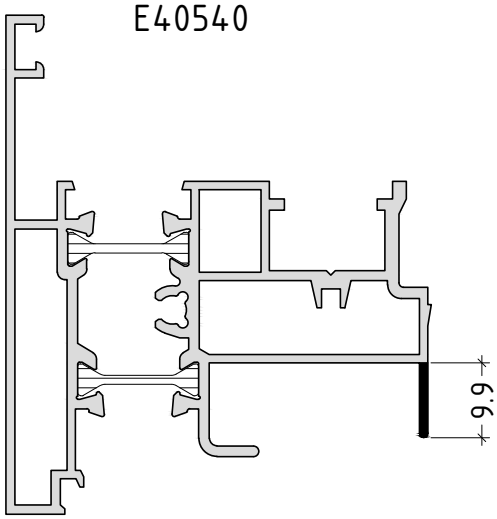




E40590

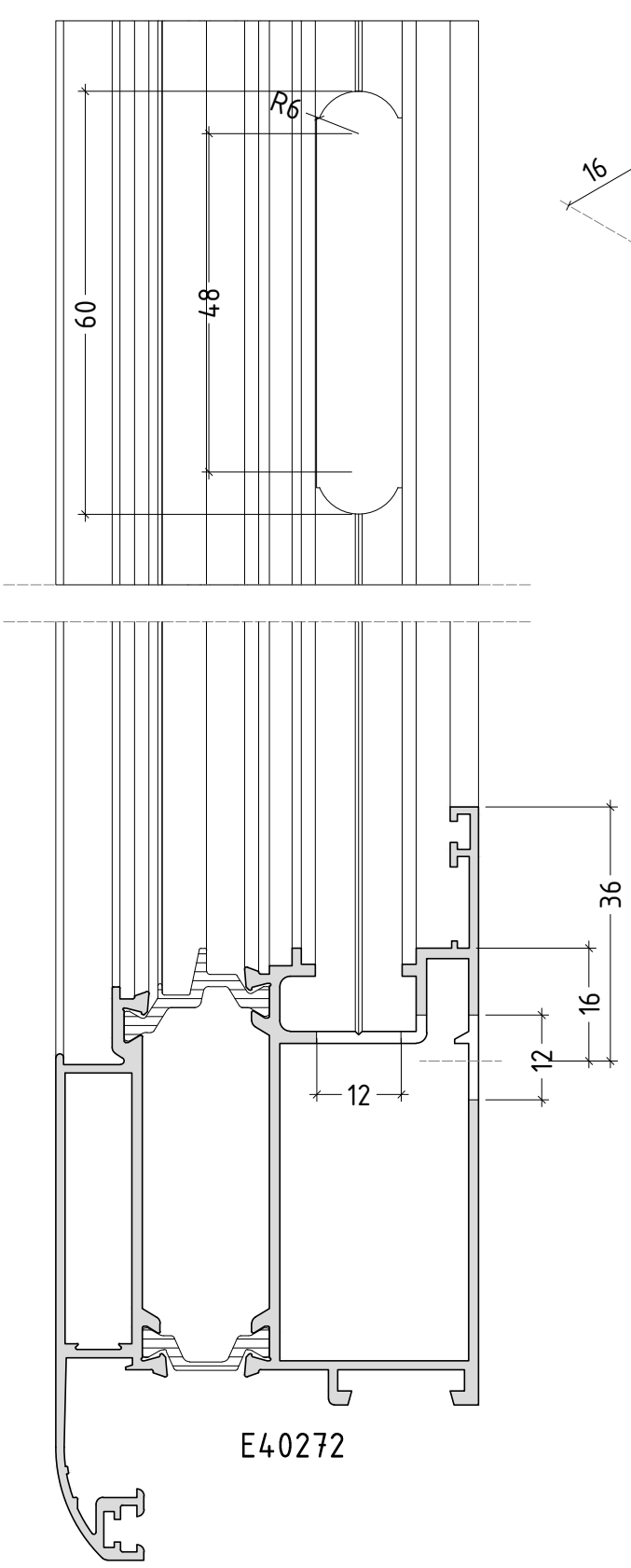


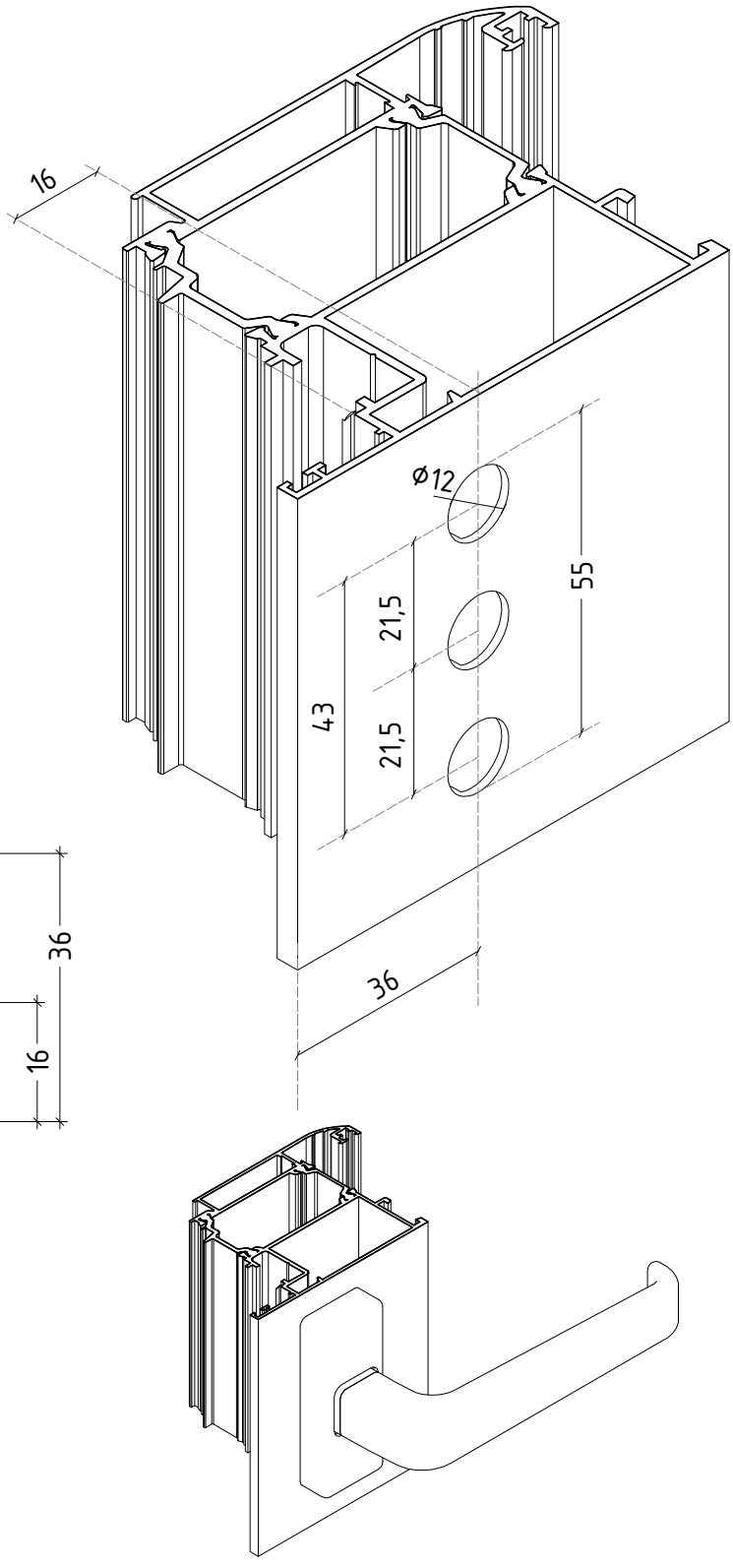
E40540



D40-32

machining for GU mechanism



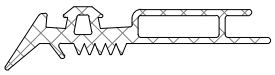


D40-33

ACCESSORIES

code/description	package/pcs	colour
ET 130402.00	60	●

elongated glazing EPDM gasket (3 mm)

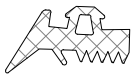


ET 130411.00	150	●

glazing EPDM gasket (3 mm)

ET 130153.00	150	●

glazing EPDM gasket 4 mm



ET 130175.00	250	●

glazing EPDM gasket press-in 3-4 mm

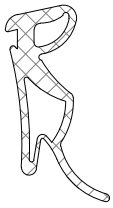
A40-01

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 990619.00	125	●
ET 130205.00	125	●

P5 old code

glazing EPDM gasket
press-in 5 mm

A40-02

code/description	package/pcs	colour
ET 990620.00	125	●
ET 130206.00	125	●

P6 old code

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	●

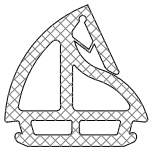
P10 old code

glazing EPDM gasket
press-in 10 mm

A40-03

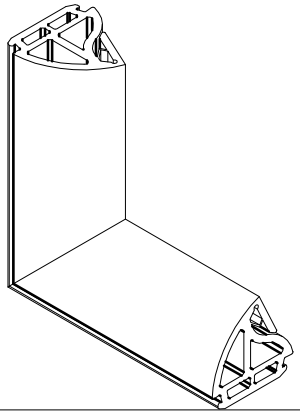
code/description	package/pcs	colour
ET 130401.00	40	●

center seal EPDM gasket



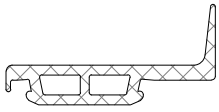
ET 060401.00	40	●

vulcanised EPDM corner for 130421



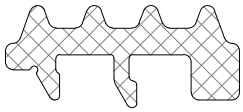
ET 130414.00	70	●

EPDM gasket for drainage



ET 080527.00	75	●

additional insulator for frame, sash for double glazing



A40-04

code/description	package/pcs	colour
ET 130400.00	250	●

internal seal EPDM gasket

ET 130174.00	160	●

interior seal EPDM gasket
top line

ET 130131.00	200	●

interior seal gasket

ET 130154.00	200	●

interior seal window EPDM
gasket (4 mm)

ATTENTION
use with profile
E40161

A40-05

code/description	package/pcs	colour
ET 130172.00	100	●

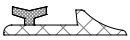
EPDM gasket

ET 130412.00	240	●

door seal EPDM gasket

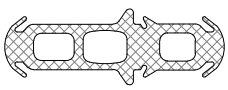
ET 130413.00	200	●

seal EPDM gasket for
decorative lattice bar
(E40650)



ET 991275.00	100	●

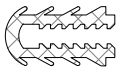
EPDM gasket for expansion
distance



A40-06

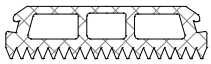
code/description	package/pcs	colour
ET 130184.00	200	●

EPDM gasket



ET 130403.00	90	●

wall-joining EPDM gasket (internal)



ET 130404.00	160	●

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

ET 130427.00	-	●

internal seal EPDM gasket

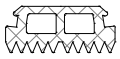
A40-07

code/description	package/pcs	colour
ET 130409.00	240	●

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

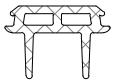
ET 130405.00	120	●

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



ET 130410.00	120	●

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



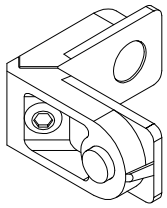
ET 130193.00	-	●

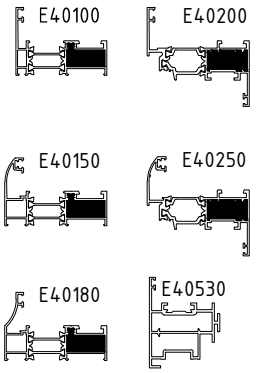
press in interior seal gasket

A40-08

code/description	package/pcs	colour
ET 053305.00	250	MF

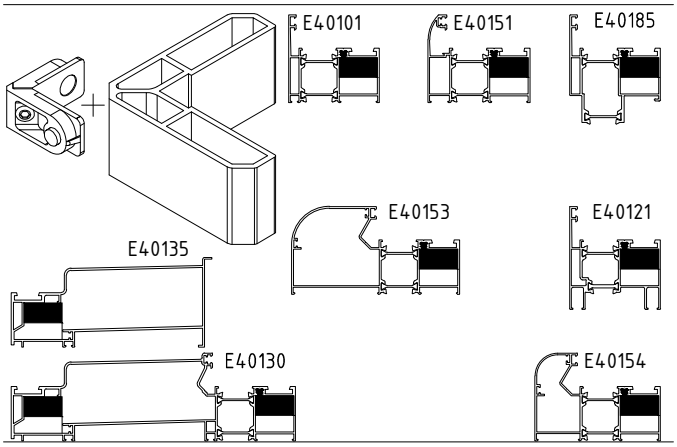
die cust al. joint corner bracket





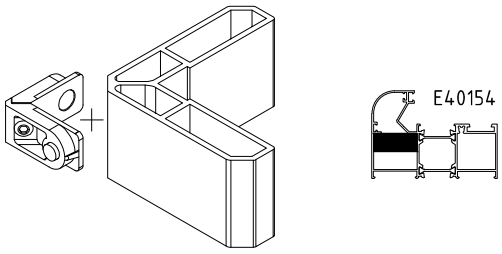
code/description	package/pcs	colour
ET 050200.00	300	MF

extruded al. shimming corner



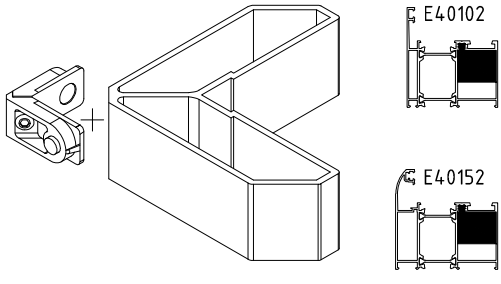
code/description	package/pcs	colour
ET 050202.00	250	MF

extruded al. shimming corner



code/description	package/pcs	colour
ET 050300.00	150	MF

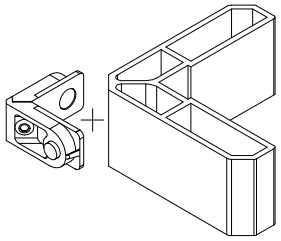
extruded al. shimming corner

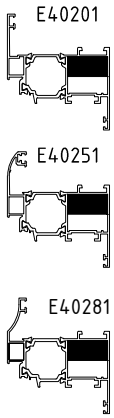


A40-09

code/description	package/pcs	colour
ET 050201.00	300	MF

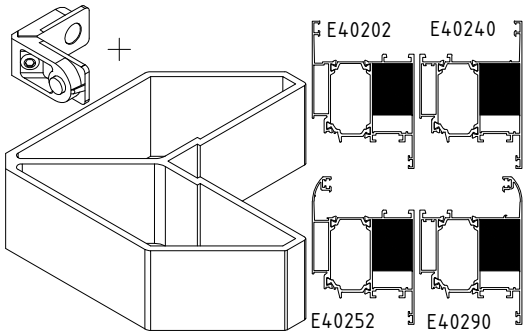
extruded al. shimming corner





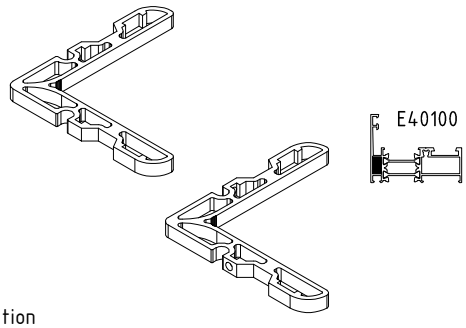
ET 050400.00	100	MF

extruded al. shimming corner



ET 054250.00	300	MF
ET 054257.00	300	MF

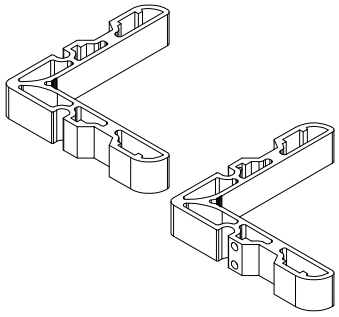
extruded al. joint corner
bracket
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054252.00	250	MF
ET 054259.00	250	MF

extruded al. joint corner
bracket
without hole/with hole

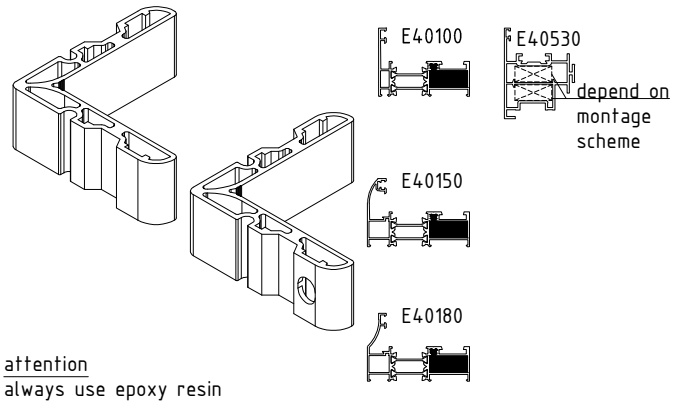


attention
always use epoxy resin
for long lasting joining

A40-10

code/description	package/pcs	colour
ET 054255.00	200	MF
ET 054253.00	200	MF

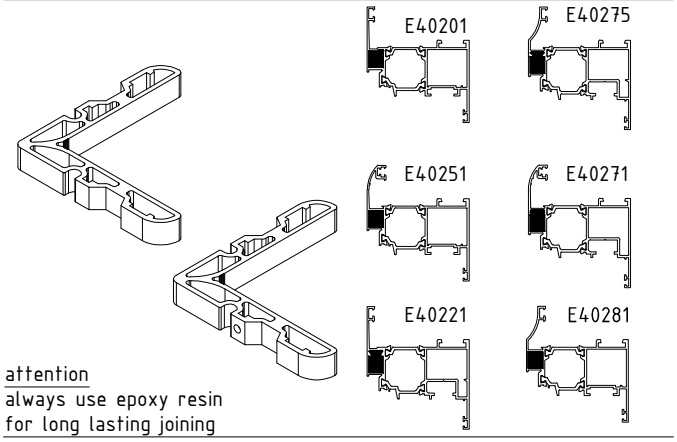
extruded al. joint corner
bracket
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054251.00	250	MF
ET 054258.00	250	MF

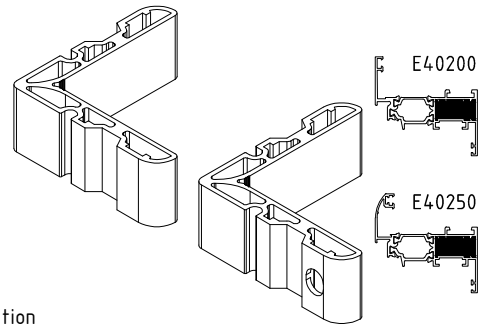
extruded al. joint corner
bracket
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054256.00	200	MF
ET 054254.00	200	MF

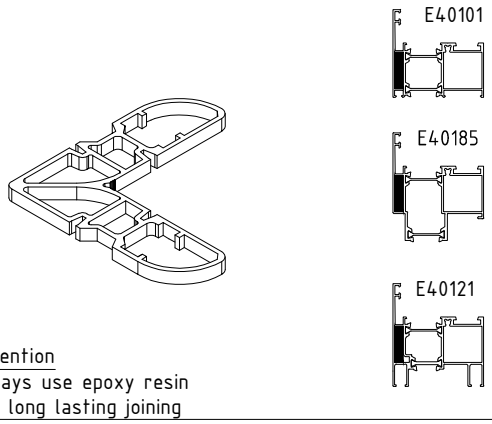
extruded al. joint corner
bracket
without hole/with hole



attention
always use epoxy resin
for long lasting joining

ET 054300.00	200	MF

extruded al. joint corner
bracket

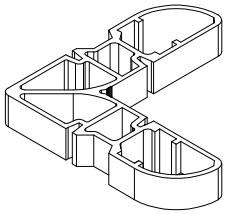


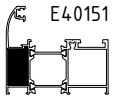
attention
always use epoxy resin
for long lasting joining

A40-11

code/description	package/pcs	colour
ET 054301.00	150	MF

extruded al. joint corner
bracket

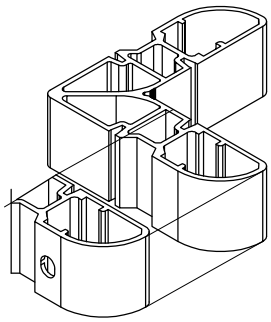


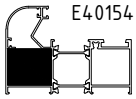


attention
always use epoxy resin
for long lasting joining

ET 054308.00	100	MF
ET 054451.00	100	MF

extruded al. joint corner
bracket
without hole/with hole

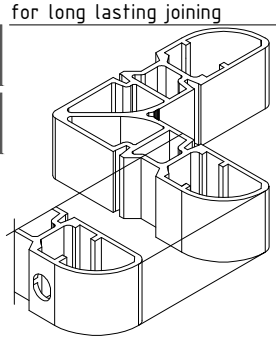


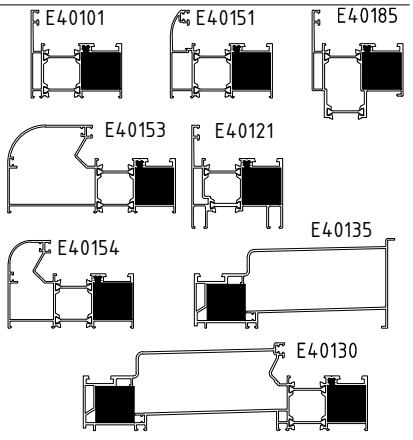


attention
always use epoxy resin
for long lasting joining

ET 054305.00	100	MF
ET 054302.00	100	MF

extruded al. joint corner
bracket
without hole/with hole

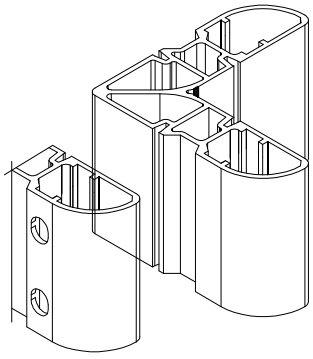


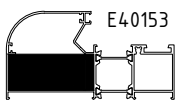


attention
always use epoxy resin
for long lasting joining

ET 054307.00	70	MF
ET 054304.00	70	MF

extruded al. joint corner
bracket
without hole/with hole



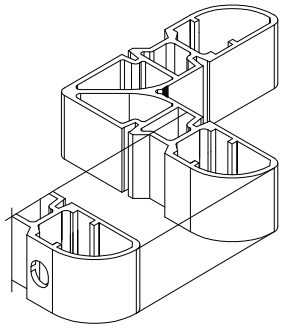


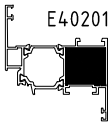
attention
always use epoxy resin
for long lasting joining

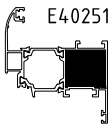
A40-12

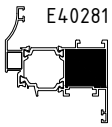
code/description	package/pcs	colour
ET 054306.00	100	MF
ET 054303.00	100	MF

extruded al. joint corner
bracket
without hole/with hole





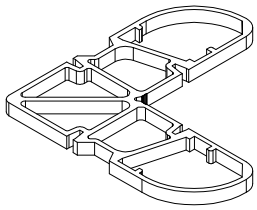


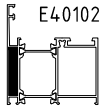


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054350.00	150	MF

extruded al. joint corner
bracket

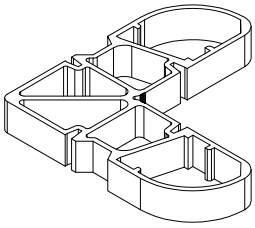


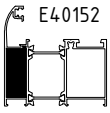


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054352.00	100	MF

extruded al. joint corner
bracket

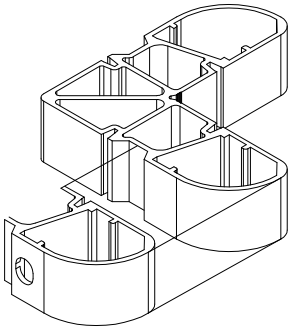


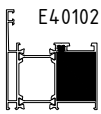


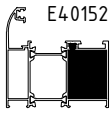
attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054354.00	70	MF
ET 054353.00	70	MF

extruded al. joint corner
bracket
without hole/with hole





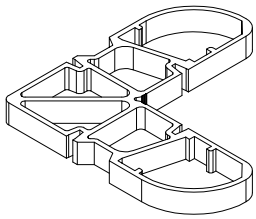


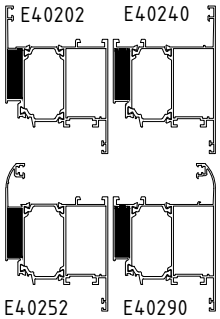
attention
always use epoxy resin
for long lasting joining

A40-13

code/description	package/pcs	colour
ET 054351.00	150	MF

extruded al. joint corner
bracket

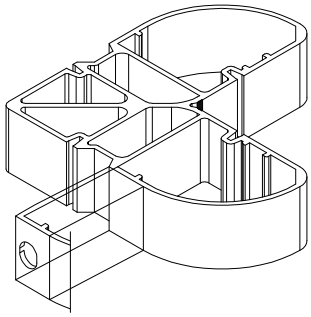


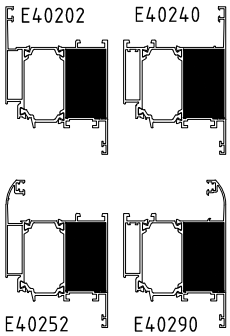


attention
always use epoxy resin
for long lasting joining

ET 054501.00	50	MF
ET 054500.00	50	MF

extruded al. joint corner
bracket
without hole/with hole

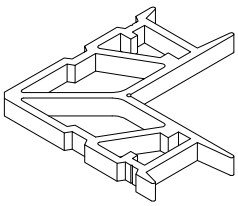


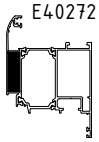


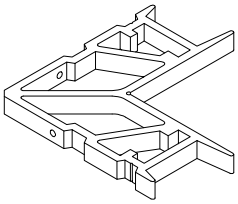
attention
always use epoxy resin
for long lasting joining

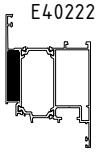
ET 054452.00	100	MF
ET 054454.00	100	MF

extruded al. joint corner
bracket
without hole/with hole





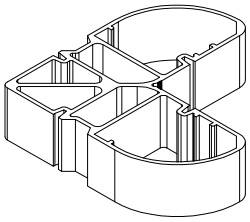


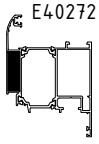


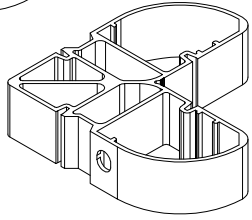
attention
always use epoxy resin
for long lasting joining

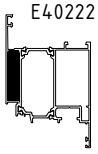
ET 054453.00	100	MF
ET 054455.00	100	MF

extruded al. joint corner
bracket
without hole/with hole







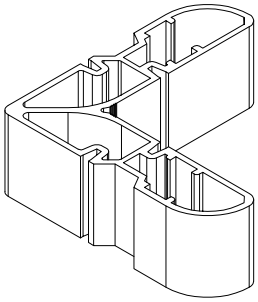


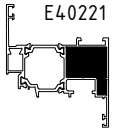
attention
always use epoxy resin
for long lasting joining

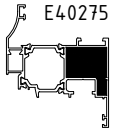
A40-14

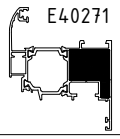
code/description	package/pcs	colour
ET 054551.00	100	MF

extruded al. joint corner bracket





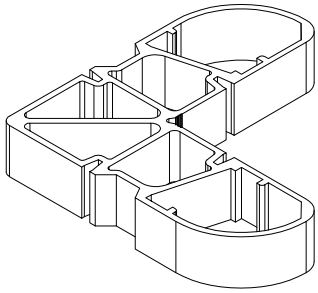


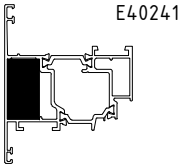


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054470.00	70	MF

extruded aluminium corner bracket

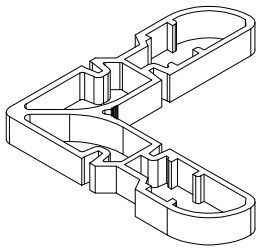


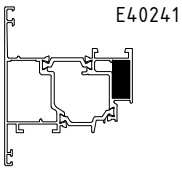


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054471.00	150	MF

extruded aluminium corner bracket

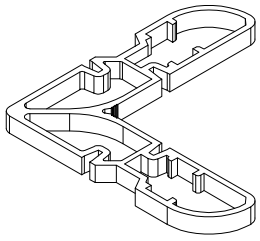


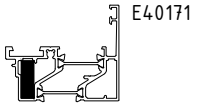


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054472.00	200	MF

extruded aluminium corner bracket



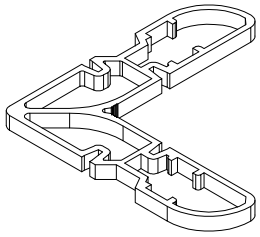


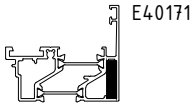
attention
always use epoxy resin
for long lasting joining

A40-15

code/description	package/pcs	colour
ET 054473.00	200	MF

extruded aluminium corner bracket

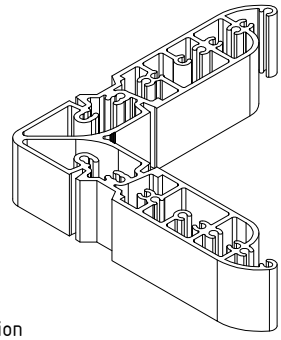


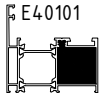


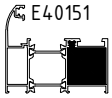
attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054700.00	70	MF

extruded al. joint corner bracket
for GU-SIEGENIA



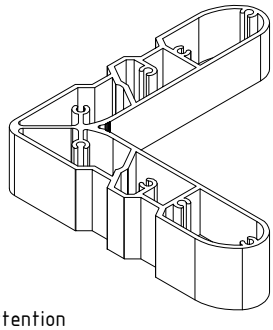


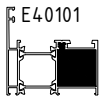


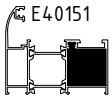
attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054701.00	70	MF

extruded al. joint corner bracket
for ROTO-WINKHAUSS



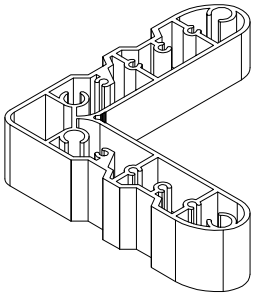


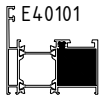


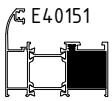
attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054652.00	70	MF

extruded al. joint corner bracket
for MACO





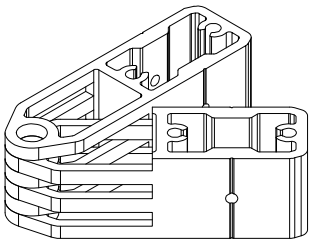


attention
always use epoxy resin
for long lasting joining

A40-16

code/description	package/pcs	colour
ET 054750.00	-	MF

corner bracket for variable angle 25,9mm

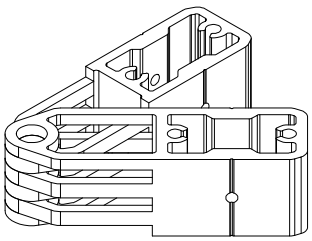


for profiles:
E40201
E40251
E40281

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054751.00	-	MF

corner bracket for variable angle 24,8mm

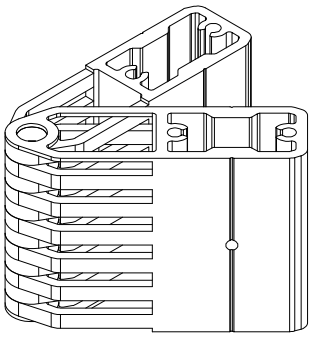


for profiles:
E40101
E40185
E40130
E40151
E40154
E40153
E40301
E40302
E40351
E40340
E40121

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054753.00	-	MF

corner bracket for variable angle 56.2mm

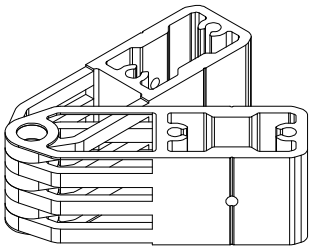


for profiles:
E40153

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054754.00	-	MF

corner bracket for variable angle 28.2mm



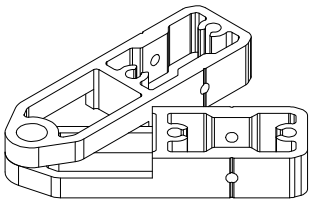
for profiles:
E40154

attention
always use epoxy resin
for long lasting joining

A40-17

code/description	package/pcs	colour
ET 054755.00	-	MF

corner bracket for variable angle 12.8mm

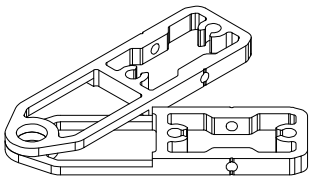


for profiles:
E45340
E45151

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054757.00	-	MF

corner bracket for variable angle 5.3mm

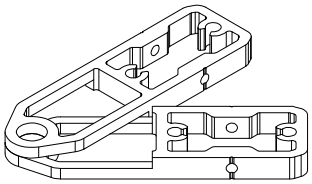


for profiles:
E40101
E40185
E40301

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 054756.00	-	MF

corner bracket for variable angle 6.9mm

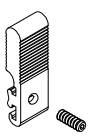


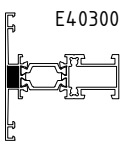
for profiles:
E45351

attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070300.00	100	MF

T bracket for mullions/transoms external side



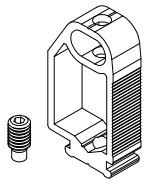


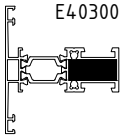
attention
always use epoxy resin
for long lasting joining

A40-18

code/description	package/pcs	colour
ET 070200.00	100	MF

t-bracket for
mullions/transoms

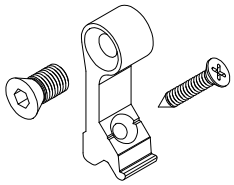


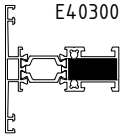


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070205.00	10	MF

screwing ''T'' bracket for
mullions/transoms

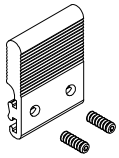


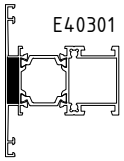


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070301.00	100	MF

T bracket for
mullions/transoms -
external side

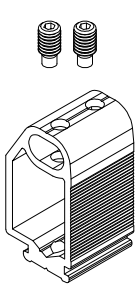


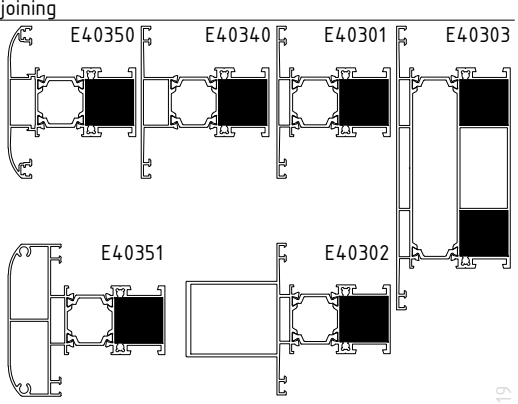


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070201.00	100	MF

T-bracket for
mullions/transoms



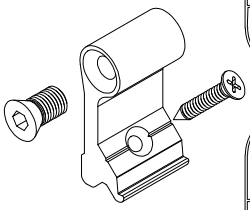


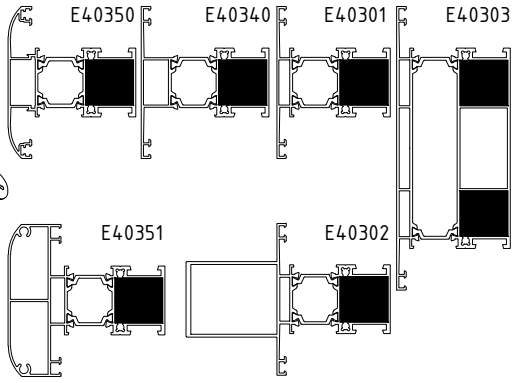
attention
always use epoxy resin
for long lasting joining

A40-19

code/description	package/pcs	colour
ET 070206.00	10	MF

screwing "T" bracket for mullions/transoms

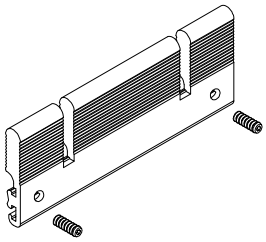


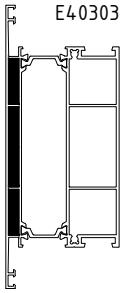


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070305.00	-	MF

T bracket for mullions/transoms - external side

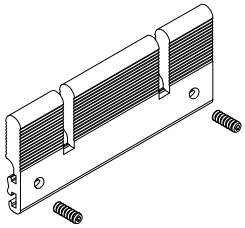


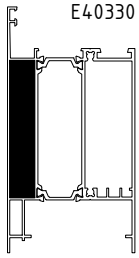


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070302.00	50	MF

T bracket for mullions/transoms - external side

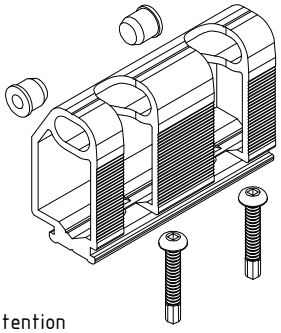


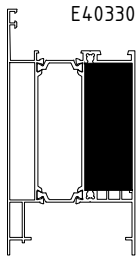


attention
always use epoxy resin
for long lasting joining

code/description	package/pcs	colour
ET 070202.00	50	MF

T-bracket for mullions/transoms



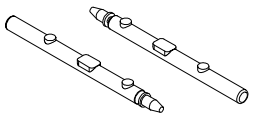


attention
always use epoxy resin
for long lasting joining

A40-20

code/description	package/pcs	colour
ET 143900.00	100	MF

roll pin ϕ3 x 6 mm
with handle

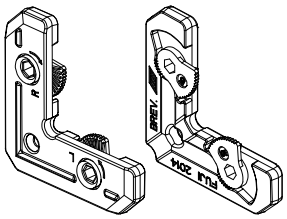


ET 143901.00	100	MF

roll pin ϕ4/8 x 6.5 mm

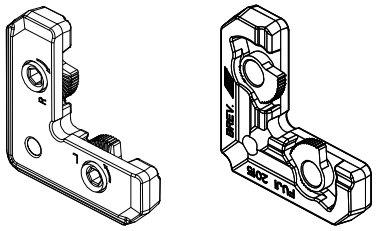
ET 058001.00	250	MF

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



ET 058002.00	250	MF

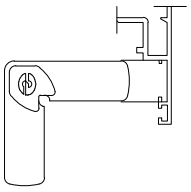
alignment square with
locking function
for round sash profiles and
round frames



A40-21

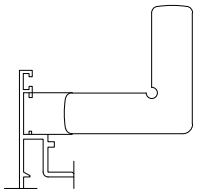
code/description	package/pcs	colour
ET 057707.00	100	MF

alignment square (plastic)
E40271, E40272, E40222,
E40245, E40275, E40295



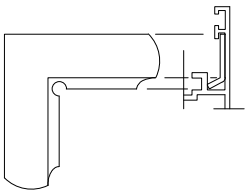
ET 055509.00	100	MF

alignment square
(galvanized steel) for
E40271, E40272, E40222,
E40245, E40275, E40295



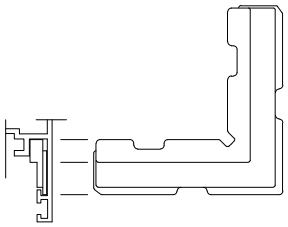
ET 055501.00	100	MF

alignment square
(galvanized steel)
for
E2004 E1000 E40 E40



ET 057704.00	100	MF

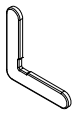
alignment square (plastic)
for E1000 E40 E40



A40-22

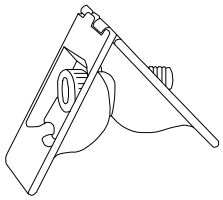
code/description	package/pcs	colour
ET 055507.00	200	MF

alignment square
(galvanized steel)
for E1000 E19 E40 E40
(5x1.25)



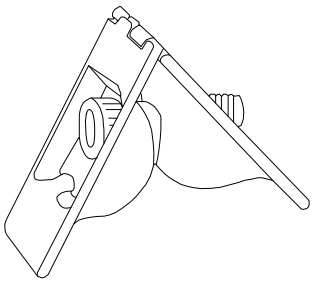
ET 051101.00	200	MF

stainless steel joint corner
(small)



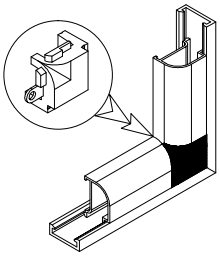
ET 051102.00	200	MF

stainless steel joint corner
(large)



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

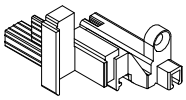
corner for round bead

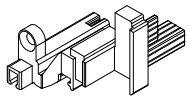


A40-23

code/description	package/pcs	colour
ET 074622.00	5	-

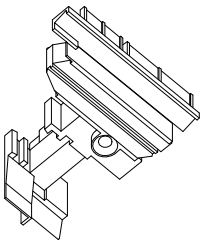
plastic plug for E40813

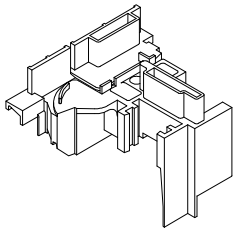




ET 074620.00	5	-

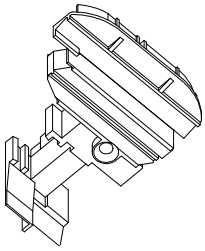
pair of plastic plugs
for straight secondary
sash profile E40500

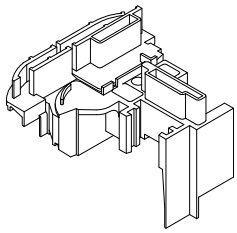




ET 074621.00	5	-

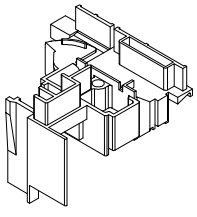
pair of plastic plugs
for round secondary
sash profile E40550

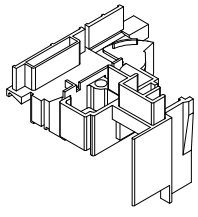




ET 074635.00	5	●

pair of plastic plugs (flat)
for straight secondary sash
profile E40540
pvc-wood mechanism

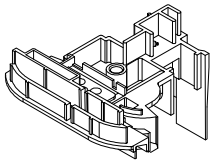


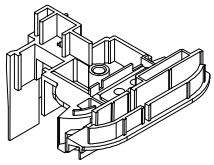


A40-24

code/description	package/pcs	colour
ET 074659.00	5	●

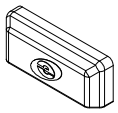
pair of plastic plugs (curved)
for round secondary sash
profile E40590
pvc-wood mechanism





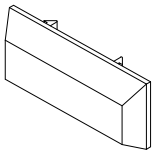
ET 074206.00	100	●

plastic drain cap 20x6mm



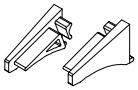
ET 074605.00	100	●

plastic drain cap 30x6mm



ET 074629.00	200	●

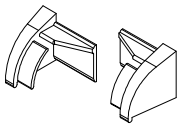
plastic plug for drip profile
E 2357



opening system with thermal break

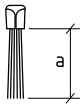
E40

code/description	package/pcs	colour
ET 074624.00	200	●



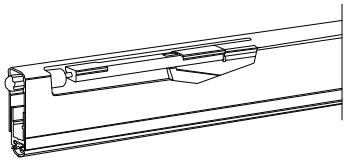
plastic plug for drip profile
E 40820

ET 135900.00	200	○



brush with metallic body
a=12 mm - L=2.2 m

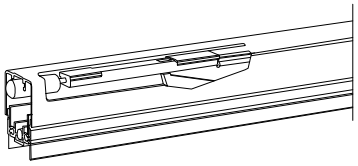
ET 134200.00	1	MF
ET 134201.01	1	MF
ET 134255.00	1	MF



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

45 dB

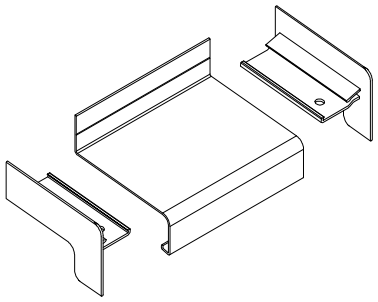


door sealing system internal
- 15.6 x 28.3 (13) 730 , 830 mm
- 15.6 x 28.3 (13) 830 , 930 mm
- 15.6 x 28.3 (13) 930 , 1030 mm
- 15.6 x 28.3 (13) 1030 , 1130 mm

A40-26

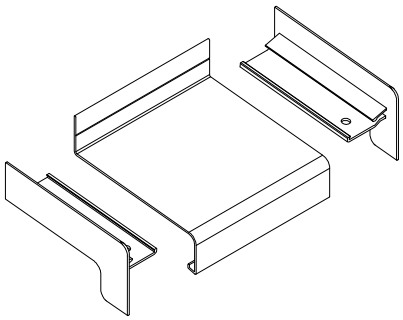
code/description	package/pcs	colour
ET 074800.00	1	MF
ET 074800.01	1	●

pair of al. plugs for drip sill
E62130



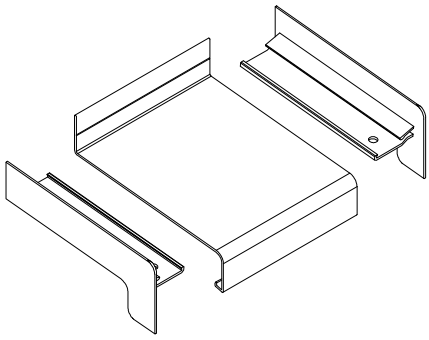
ET 074801.00	1	MF
ET 074801.01	1	●

pair of al. plugs for drip sill
E62131



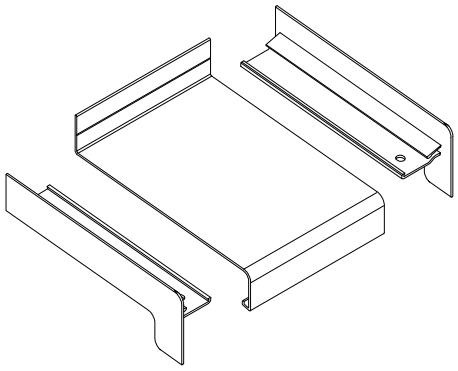
ET 074802.00	1	MF
ET 074802.01	1	●

pair of al. plugs for drip sill
E62132



ET 074803.00	1	MF
ET 074803.01	1	●

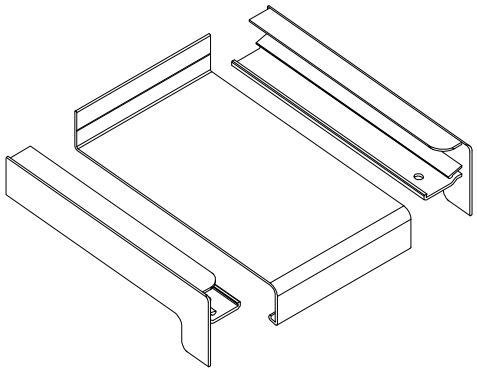
pair of al. plugs for drip sill
E62133



A40-27

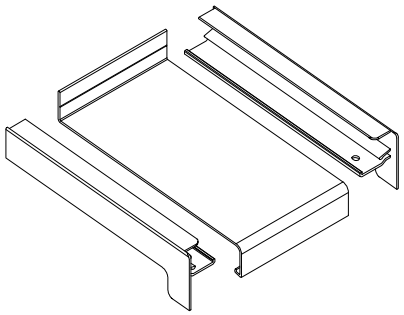
code/description	package/pcs	colour
ET 074804.00	1	MF
ET 074804.01	1	●

pair of al. plugs for drip sill
E62134



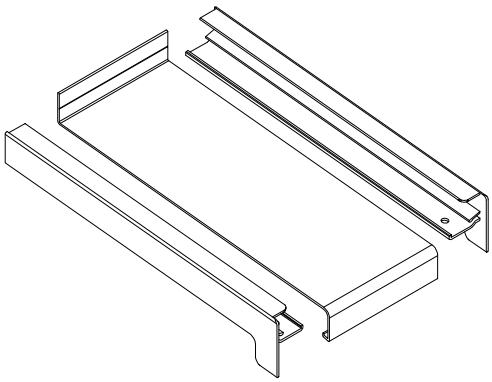
ET 074805.00	1	MF
ET 074805.01	1	●

pair of al. plugs for drip sill
E62135



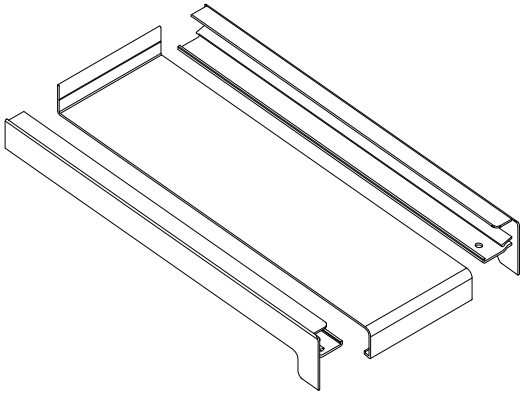
ET 074807.00	1	MF
ET 074807.01	1	●

pair of al. plugs for drip sill
E62137



ET 074808.00	1	MF
ET 074808.01	1	●

pair of al. plugs for drip sill
E62138



A40-28

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

LEGAL ACTS

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

MAIN METHODS FOR OBTAINING TEST RESULTS BY THE MANUFACTURER

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

1

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

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE MANUFACTURER OWNS THE TEST REPORT

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

2

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

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE PARTNER OWNS THE TEST REPORT

↓

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

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

3

THE SYSTEM PROVIDER SELECTS SAMPLES FOR TESTING

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE SYSTEM PROVIDER OWNS THE TEST REPORT

↓

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

↓

AGREEMENT BETWEEN THE MANUFACTURER AND THE SYSTEM PROVIDER

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

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

STANDARDS

GENERAL

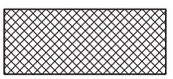
- EN 12020 (1÷2) – ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED PRECISION PROFILES IN ALLOYS EN AW-6060 AND EN AW-6063
- EN 755 (1÷9)– ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED ROD/BAR, TUBE AND PROFILES
- EN 573 (1÷3) – ALUMINIUM AND ALUMINIUM ALLOYS – CHEMICAL COMPOSITION AND FORM OF WROUGHT PRODUCTS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

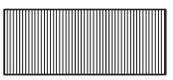
1. EN 14351 – WINDOWS AND DOORS – PRODUCT STANDARD, PERFORMANCE CHARACTERISTICS
2. EN 12519 – WINDOWS AND PEDESTRIAN DOORS – TERMINOLOGY
3. EN 12207 – WINDOWS AND DOORS – AIR PERMEABILITY – CLASSIFICATION
4. EN 1026 – WINDOWS AND DOORS – AIR PERMEABILITY – TEST METHOD
5. EN 12208 – WINDOWS AND DOORS – 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

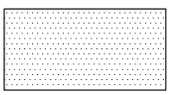
[illegible]



EPDM

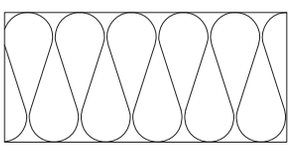


PVC

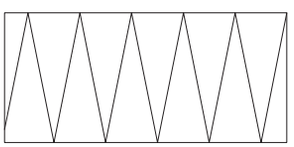


gypsum board

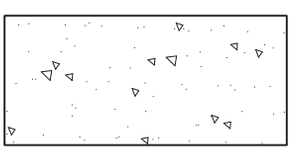
silicone seal



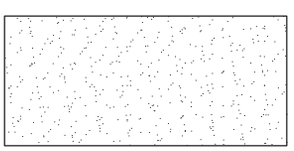
Insulation soft



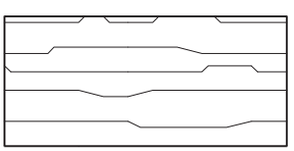
Insulation hard



concrete wall



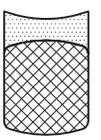
plaster



wood

butyl seal

membrane



silicone seal

backer rod

PVC spacer

etalbond

sheet aluminium

glass

aluminium profile

steel

LIABILITY

The stated data and calculating methods are provided by ETEM as a guideline only.
The information given in this catalogue does not substitute of all applicable regulations – Eurocodes, harmonized European standards, national or regional building codes.

The specific conditions and technical details of every particular project have to be taken into consideration.

The right choice of all 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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