

GENERAL INFORMATION

CONCEPT / ADVANTAGES / CERTIFICATES



EW70 CONCEPT

EW70 IS A SYSTEM CORRESPONDING TO THE HIGH REQUIREMENTS FOR THERMAL INSULATION, FUNCTIONALITY AND AESTHETICS

- Elegant straight design
- 70 mm system allowing usage of triple glazing
- Wide polyamide bars
- Excellent thermal insulation
- Effective drainage
- Excellent water-tightness and air-permeability
- EPDM central gasket
- Extruded corners for crimping machine with glue allowing greater connections

COMPLIANCE WITH APPLICABLE REGULATIONS

Production management

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

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 powder coated aluminium profiles and Qualanod for anodized profiles used in architectural applications.

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

PERFORMANCE CHARACTERISTICS OF EW70

Characteristic	Classification / value	Standard
Air permeability	class 4	EN 1026 / EN 12207
Watertightness	class 9A	EN 1027 / EN 12208
Resistance to wind load	class C4	EN 12211 / EN 12210
Body impact	class 4	EN 13049
Thermal transmittance (Uf)	from 1.4 W/m ² .K	EN ISO 10077-2
Operating forces	class 1	EN 13115
Mechanical properties	class 2	EN 13115

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 ($\leq 1/150$)		B ($\leq 1/200$)		C ($\leq 1/300$)					
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 (τ_v)	npd	Declared values									
Air permeability Max. test pressure (Pa) Reference air permeability at 100 Pa (m ³ /(h · m ²) or m ³ /(h · m))	npd	1 (150) (50 or 12.50)		2 (300) (27 or 6.75)		3 (600) (9 or 2.25)		4 (600) (3 or 0.75)			
Operating forces^b	npd	1				2					
Mechanical strength	npd	1			2		3		4		
Ventilation Air flow exponent n Air flow characteristic K Air flow rates	npd	Declared values									
Bullet resistance	npd	FB1	FB2	FB3	FB4	FB5	FB6	FB7	FSG		
Explosion resistance Shock tube	npd	EPR1		EPR2		EPR3		EPR4			
Explosion resistance Range test	npd	EXR1		EXR2		EXR3		EXR4		EXR5	
Resistance to repeated opening and closing Number of cycles	npd	5000			10 000			20 000			
Behaviour between different climates	npd	Under development									
Burglar resistance	npd	1	2	3	4	5	6				

NOTE 1: npd: no performance determined

NOTE 2: The figures in brackets are for information

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

^b Manually operated windows only

BUILDING PHYSICS

DIMENSIONING / FORMULAS / EXAMPLES

ALUMINIUM AS MATERIAL

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

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

ADVANTAGES

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 Mg_{0,7} Si]

EN AW-6061 [Al Mg₁ Si Cu]

EN AW-6005 [Al Si Mg]

EN AW-6082 [Al Si₁ Mg Mn]

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

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

EXTRUSION PROCESS

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

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.

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

MAINTENANCE

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

RECYCLING

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

WIND LOAD

Wind action

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

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

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

where:

h – building height, m

b – building width, m

v – wind velocity, m/s

q – wind load, kg/m² and kN/m²

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

c_p – correction factor

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

UNITS CONVERTER

1 m = 100 cm = 1000 mm

1 kg = 10 N

1 kN = 100 kg = 1000 N

1 kg/m² = 0.01 kN/m²

1 Pa = 1 N/m² = 0.1 kg/m²

1 kPa = 1000 Pa = 1 kN/m² = 100 kg/m²

1 MPa = 1000 kPa = 1 000 000 Pa

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

MULLION SELECTION

*Wind load actions:

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

a) triangle load

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

or

b) trapezoid load

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

Use the same method to calculate I_{yd}

Total of required moment of inertia:

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

Where:

I_y - Moment of inertia of a transom, cm^4

w - Wind pressure, kg/m^2

E_{al} - Modulus of Elasticity of aluminium, kg/m^2

f_{max} - Maximum transom deflection, m

H - Length of a mullion, m

a, b - Distance between mullions, m

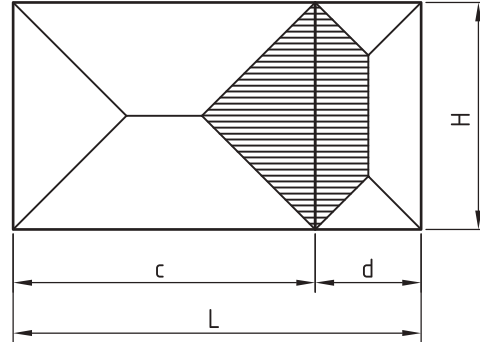
Maximum transom deflection f_{max} by wind load:

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

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

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

Example:



Initial data:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Use ETEM Catalogue to choose the appropriate mullion with

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

We choose mullion E68300 with $I_y = 33,27 \text{ cm}^4$

$$\text{and } I_x = 14,17 \text{ cm}^4$$

TRANSOM SELECTION

*Dead load actions:

*Glass pane self weight:

Weight of the glass pane G is calculated as follows:

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

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

Where:

G - Weight of glass pane, kg

t - Glass pane thickness, mm

ρ_{glass} - Density of glass material, kg/m³

l_g - Horizontal dimension of the glass pane, m

h_g - Vertical dimension of the glass pane, m

*Transom self weight:

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

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

Total of required moment of inertia:

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

Where:

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

I_x - Moment of inertia of a transom, cm⁴

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

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

f_{max} - Maximum transom deflection, m

L - Length of a transom, m

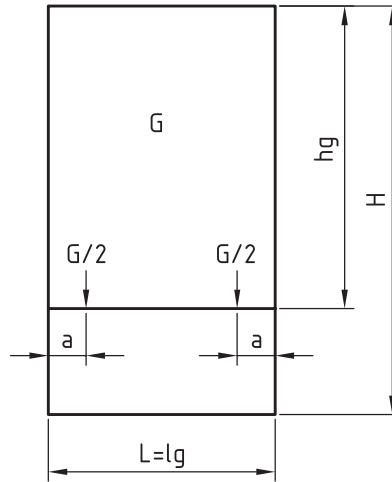
Maximum transom deflection f max by dead load:

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

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

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

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



Initial data:

t = 10 mm

$E_{al} = 7.10^9 \text{ kg/m}^2$

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

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

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

q = 2 kg/m

a = 0,15 m

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

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

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

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

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

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

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

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

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

Use ETEM Catalogue to choose the appropriate transom with

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

We choose transom E68300 with $I_x = 14,17 \text{ cm}^4$

and $I_y = 33,25 \text{ cm}^4$

TRANSOM SELECTION

*Wind load actions:

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

a) triangle load

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

or

b) trapezoid load

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

Use the same method to calculate I_{xb}

Total of required moment of inertia:

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

Where:

I_y - Moment of inertia of a transom, cm^4

w - Wind pressure, kg/m^2

E_{al} - Modulus of Elasticity of aluminium, kg/m^2

f_{max} - Maximum transom deflection, m

L - Length of a transom, m

a, b - Distance between transoms, m

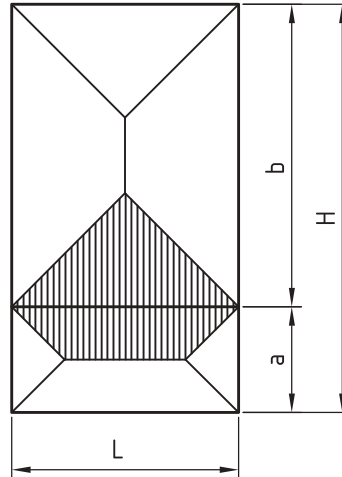
Maximum transom deflection f_{max} by wind load:

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

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

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

Example:



Initial data:

$$\begin{aligned} L &= 1,5 \text{ m} & w &= 60 \text{ kg/m}^2 \\ a &= 0,7 \text{ m} & E_{al} &= 7.10 \text{ kg/m}^2 \\ b &= 2,0 \text{ m} \end{aligned}$$

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

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

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

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

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

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

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

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

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

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

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

Use ETEM Catalogue to choose the appropriate mullion with

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

We choose mullion E68300 with $I_y = 33,25 \text{ cm}^4$
and $I_x = 14,17 \text{ cm}^4$

CALCULATION OF GLASS PANE THICKNESS

*Glazing thickness:

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

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

or

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

Where:

t - Minimum theoretical glass thickness, mm

w - Wind pressure, kg/m²

l_g - The smallest dimension of the glass pane, m

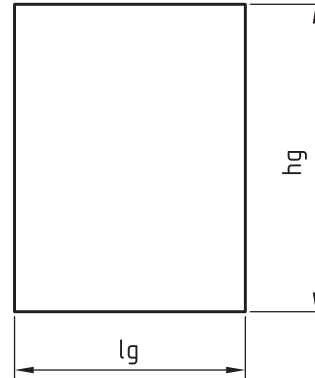
h_g - The largest dimension of the glass pane, m

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

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

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

Example:



Initial data:

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

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

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

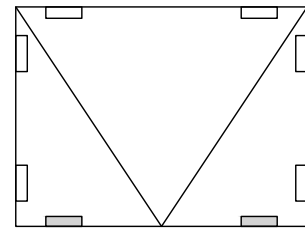
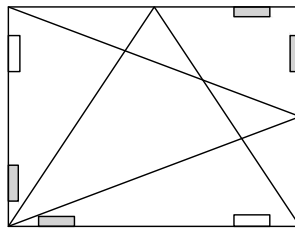
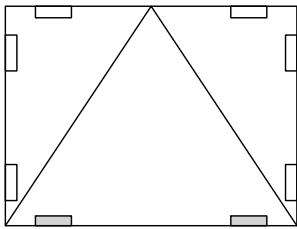
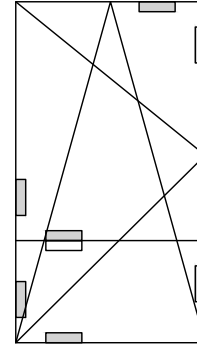
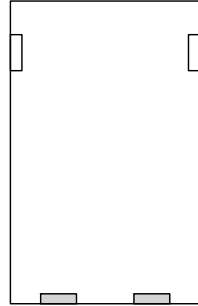
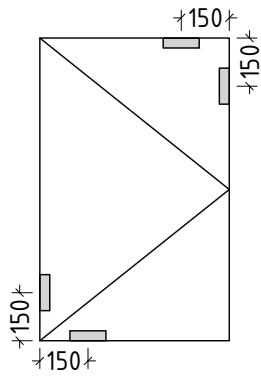
$$\frac{h_g}{l_g} = \frac{2}{1,5} = 1,33 \leq 3$$


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

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

We choose double glazing 5/14/5

GLAZING SHIMS



 - load bearing shim

 - distance shim

Note:

Load glazing shims should be positioned on 150 mm distance from the glazing edge.

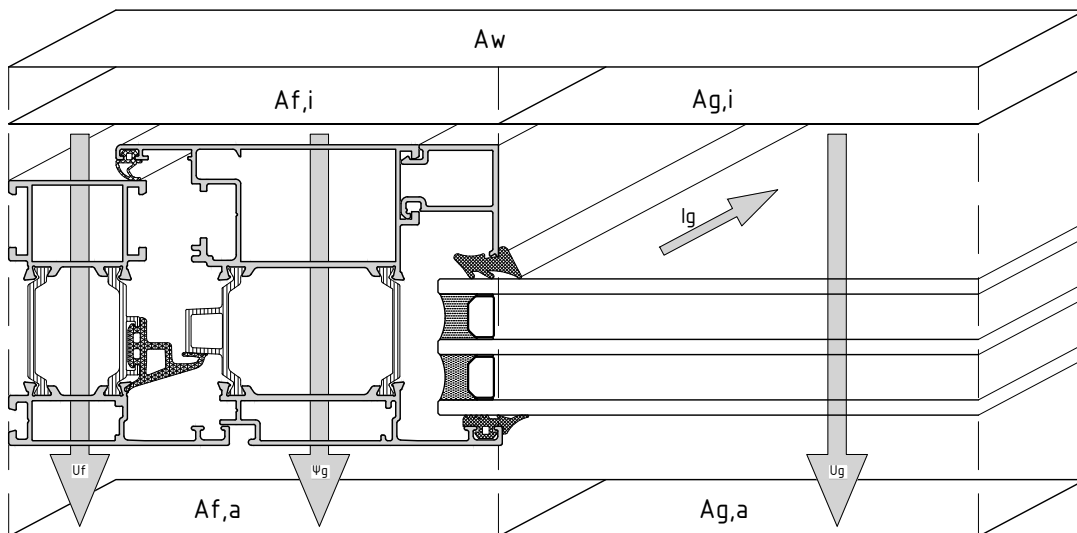
Distance shims do not have exactly defined position.

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

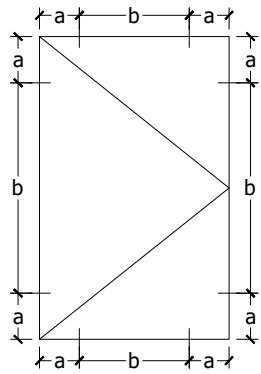
$$U_w = \frac{A_g \times U_g + A_f \times U_f + l_g \times \Psi_g}{A_g + A_f} \quad (1)$$

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

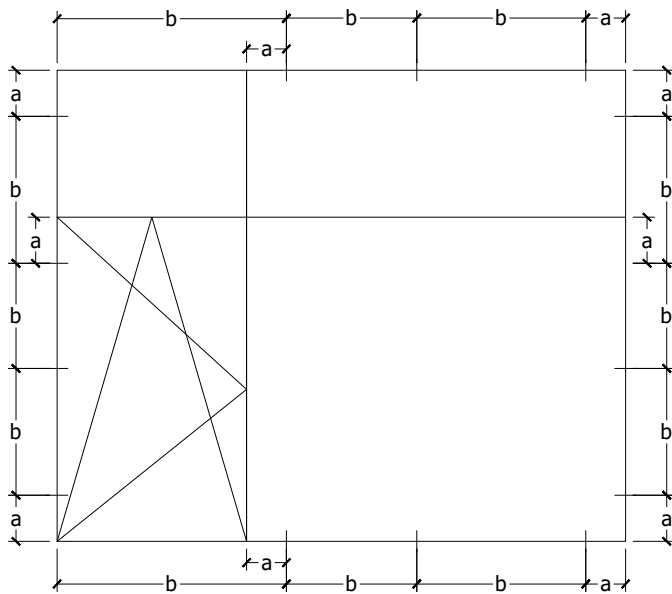
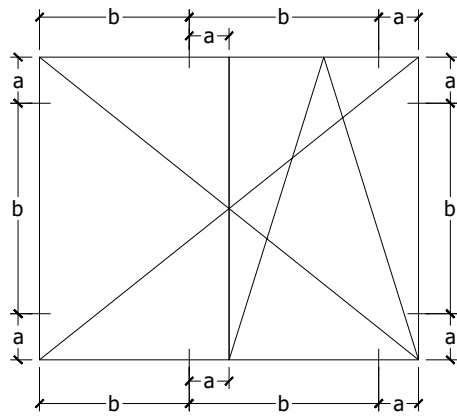
- U_w - is calculated by formula (1)
- U_g - is given by the glass manufacturer
- U_f - is given by the manufacturer of the aluminium profiles



POSITION OF ANCHORS

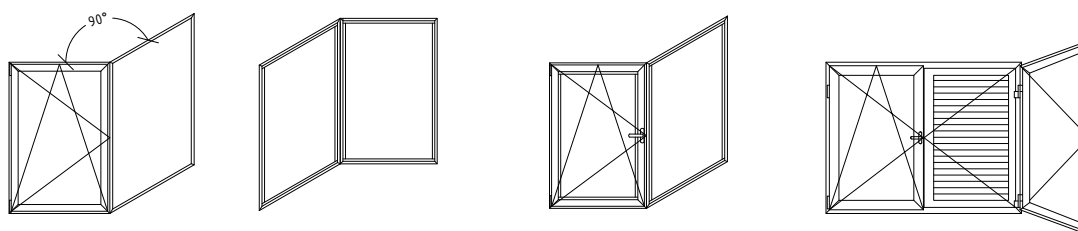
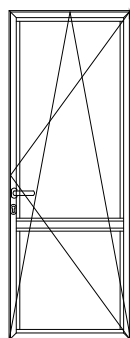
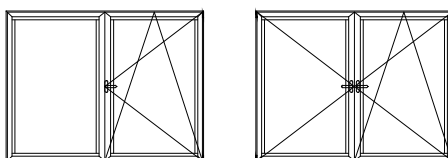
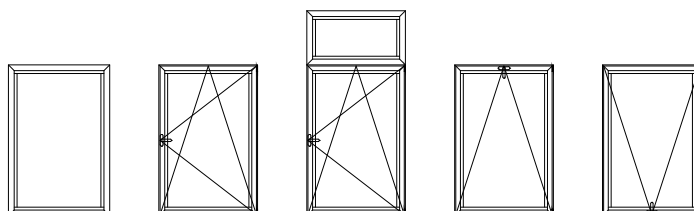


$a = 150 \div 200 \text{ mm}$
 $b \leq 800 \text{ mm}$



TABLES

TYPES / LIST OF PROFILES / CHARACTERISTICS



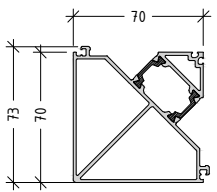
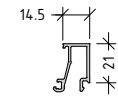
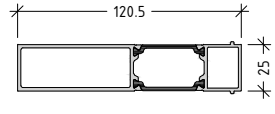
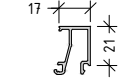
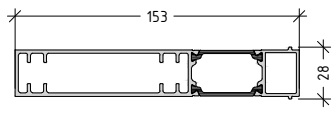
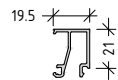

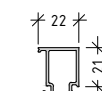
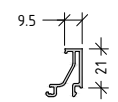
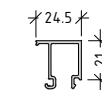
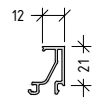
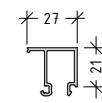
opening system with thermal break

EW70

code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E4270100 frame		1280 g/m L=6.01 m Ix=8.63 cm ⁴ Iy=27.14 cm ⁴	E4270340 T profile for casement		1379 g/m L=6.01 m
E4270220 casement PVC groove		1472 g/m L=6.01 m Ix=12.99 cm ⁴ Iy=39.77 cm ⁴	E4270540 overhung secondary casement profile PVC groove		1293 g/m L=6.01 m
E4270221 casement PVC groove		1806 g/m L=6.01 m Ix=31.77 cm ⁴ Iy=50.83 cm ⁴	E4270500 overhung secondary casement profile Euro groove		1214 g/m L=6.01 m
E4270200 casement EURO groove		1367 g/m L=6.01 m Ix=10.23 cm ⁴ Iy=36.49 cm ⁴	E4275606 alignment profile		120 g/m L=6.01 m
E4270201 casement EURO groove		1693 g/m L=6.01 m Ix=26.40 cm ⁴ Iy=47.1 cm ⁴	E75602 adapter		216 g/m L=6.01 m
E4270300 T profile for frame		1371 g/m L=6.01 m Ix=12.54 cm ⁴ Iy=29.97 cm ⁴	E75603 round column		2232 g/m L=6.01 m Ix=56.34 cm ⁴ Iy=55.75 cm ⁴

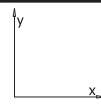
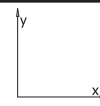
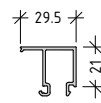
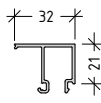
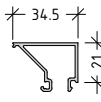
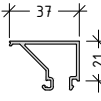
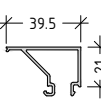
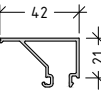
opening system with thermal break

EW70

code	profile	weight length moment of inertia	code	profile	weight length moment of inertia
E4268600 90° column		2083 g/m L=6.01 m $I_x=43.17 \text{ cm}^4$ $I_y=43.17 \text{ cm}^4$	E4060315 glazing bead		287 g/m L=6.01 m
E50690 Intermediate profile		1550 g/m L=6.01 m $I_x=5.03 \text{ cm}^4$ $I_y=79.15 \text{ cm}^4$	E4060317 glazing bead		297 g/m L=6.01 m
E50691 Intermediate profile		2046 g/m L=6.01 m $I_x=7.09 \text{ cm}^4$ $I_y=161.25 \text{ cm}^4$	E4060320 glazing bead		305 g/m L=6.01 m
E4060307 glazing bead		267 g/m L=6.01 m	E4060322 glazing bead		314 g/m L=6.01 m
E4060310 glazing bead		277 g/m L=6.01 m	E4060325 glazing bead		324 g/m L=6.01 m
E4060312 glazing bead		287 g/m L=6.01 m	E4060327 glazing bead		335 g/m L=6.01 m

opening system with thermal break

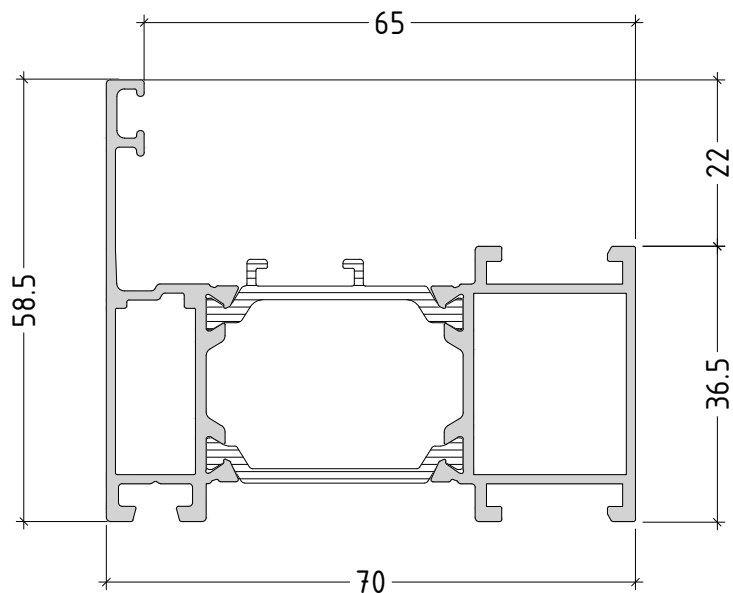
EW70

code		profile	weight length moment of inertia	code		profile	weight length moment of inertia
E4060330 glazing bead			345 g/m L=6.01 m				
E4060332 glazing bead			355 g/m L=6.01 m				
E4060335 glazing bead			385 g/m L=6.01 m				
E4060337 glazing bead			395 g/m L=6.01 m				
E4060340 glazing bead			405 g/m L=6.01 m				
E4060342 glazing bead			416 g/m L=6.01 m				

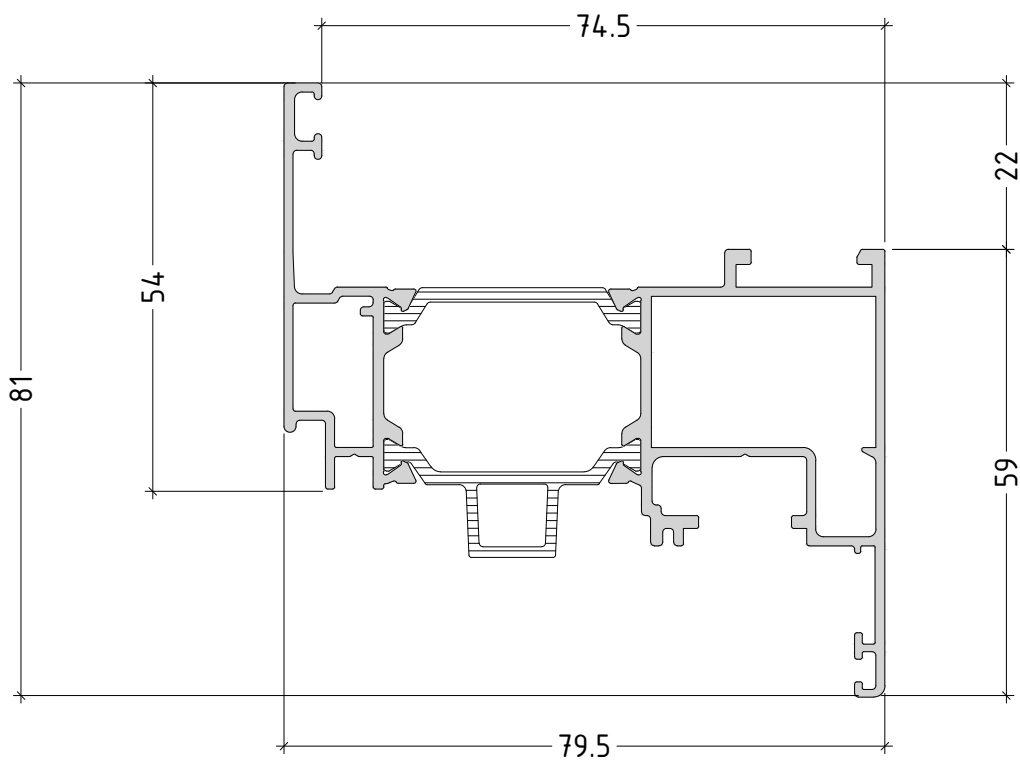
PROFILES

DRAWINGS / SCALE 1:1

E4270100
1280 g/m



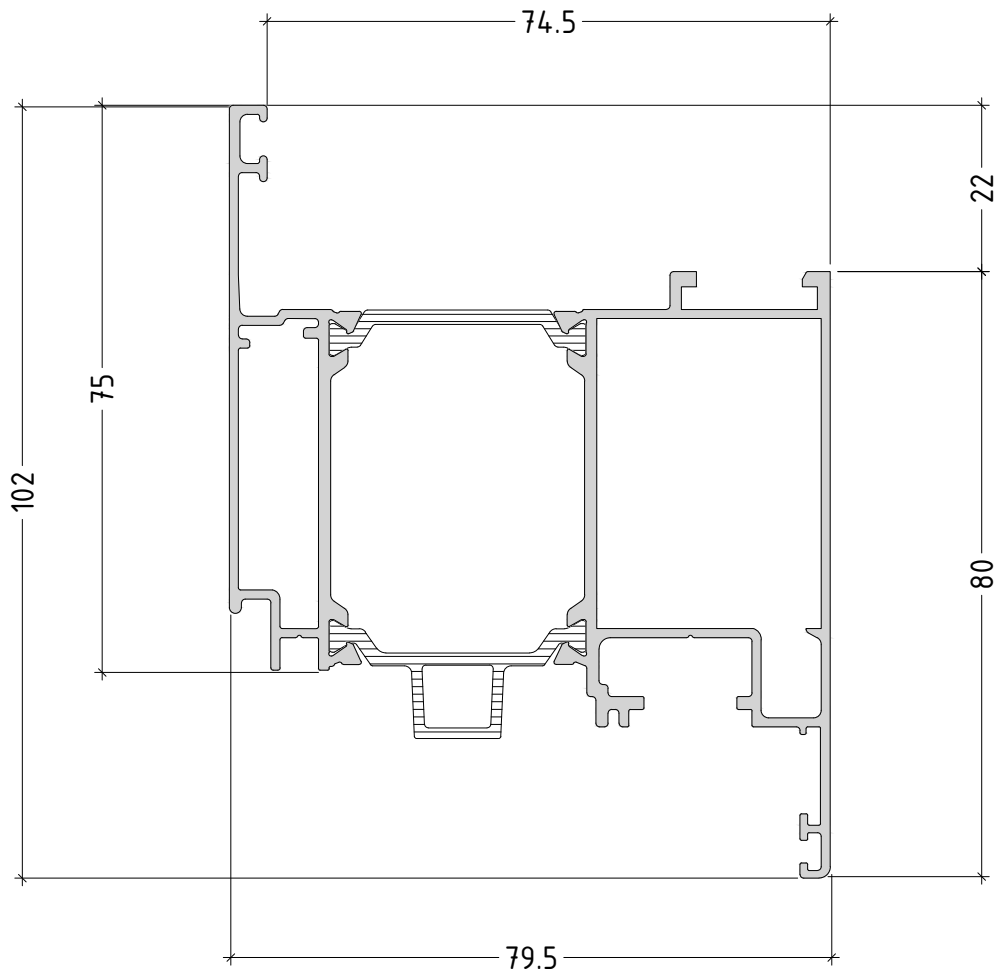
E4270220
1472 g/m



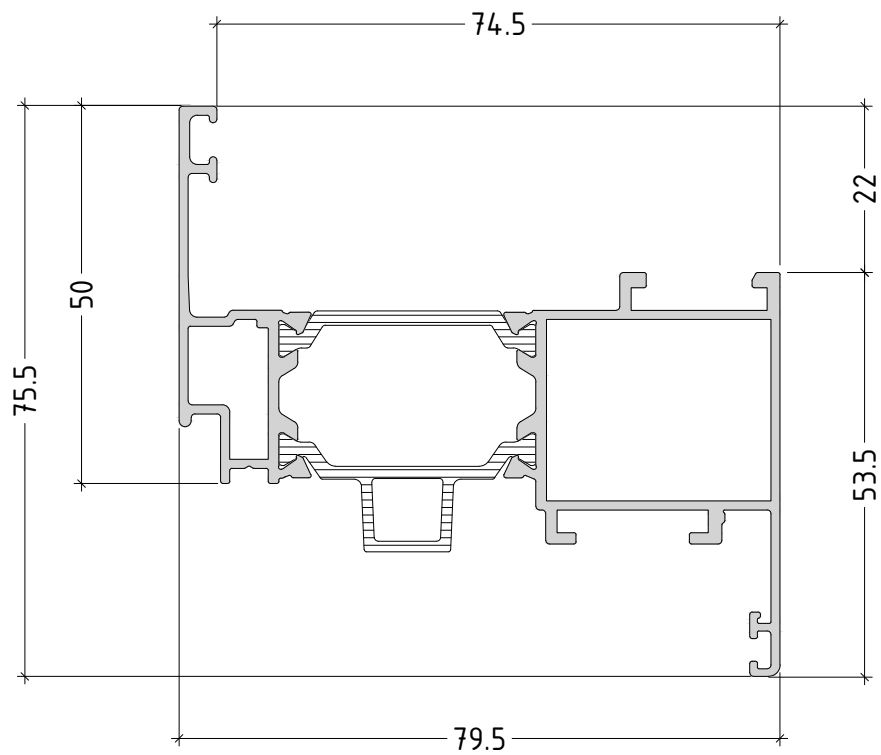
scale : 1:1

EW70-2

E4270221
1806 g/m

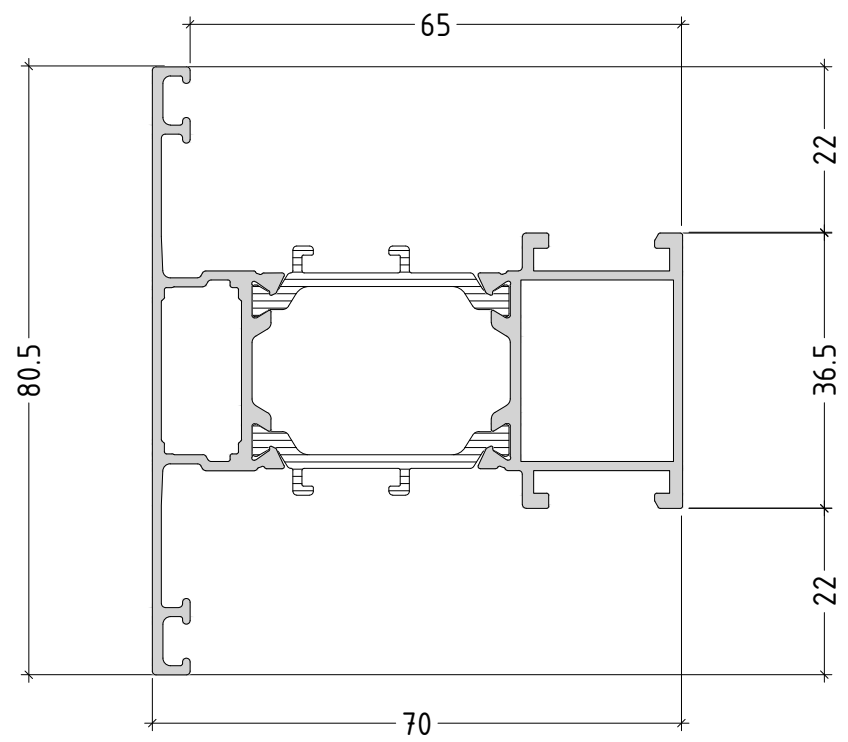
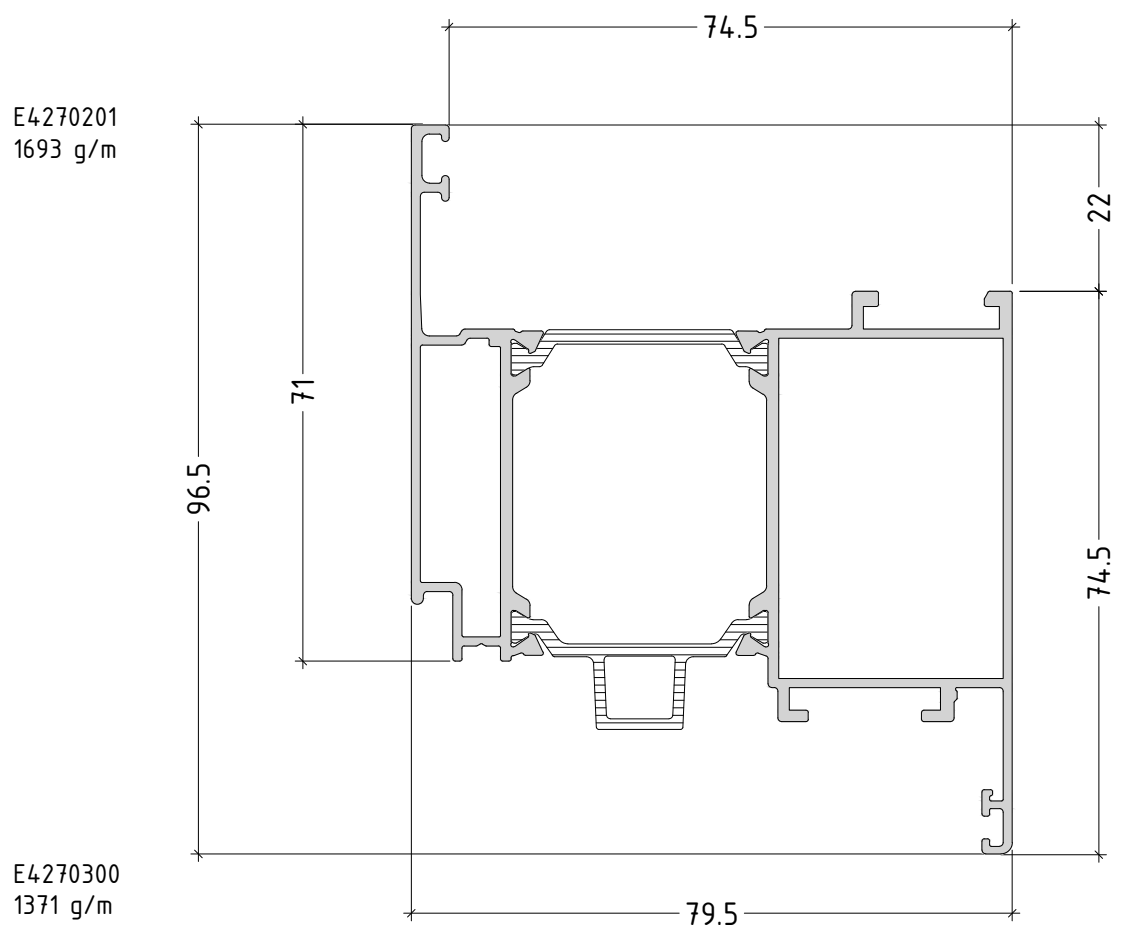


E4270200
1367 g/m



scale : 1:1

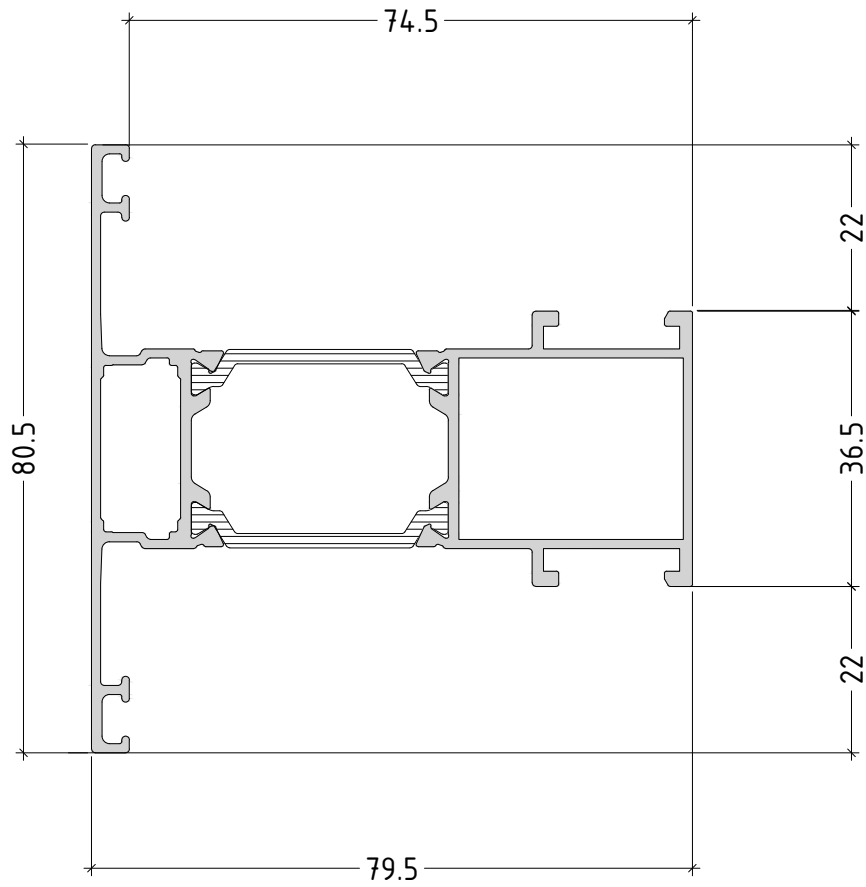
EW70-3



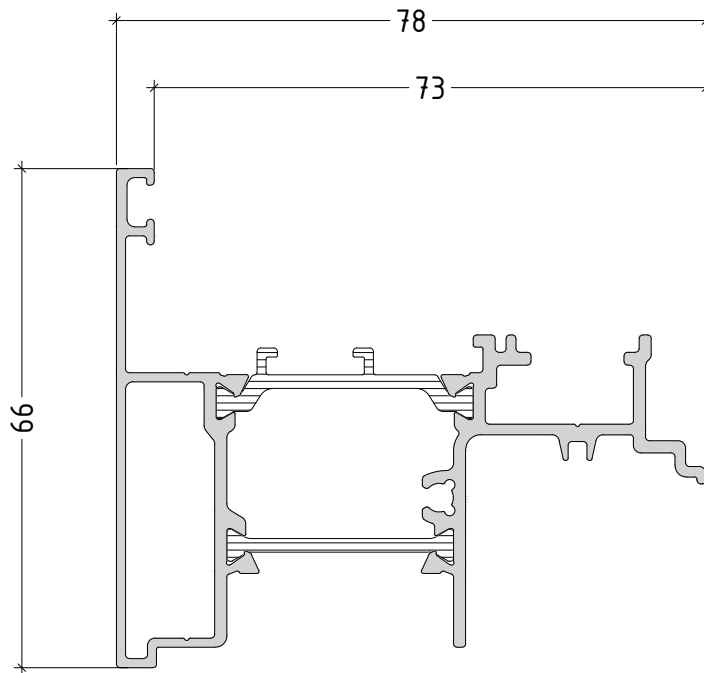
scale : 1:1

EW70-4

E4270340
1379 g/m



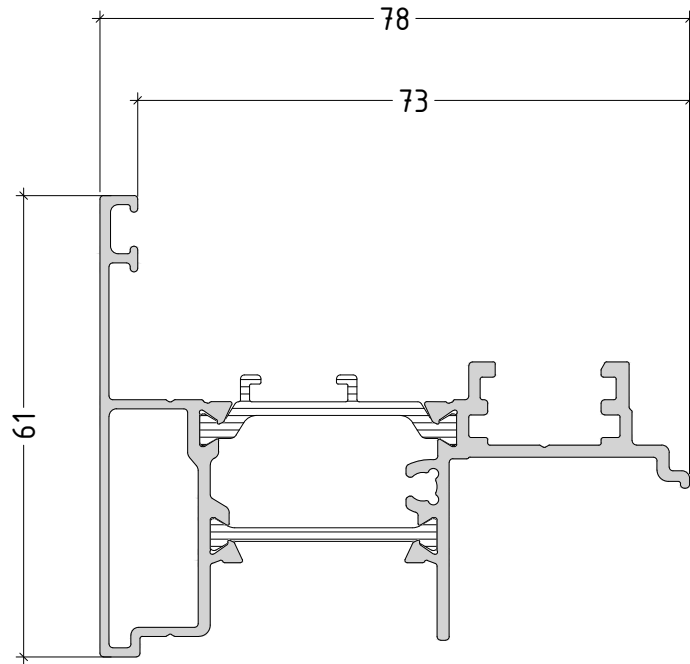
E4270540
1293 g/m



scale : 1:1

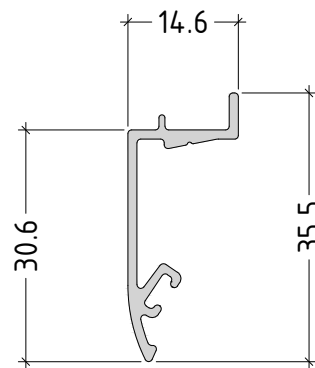
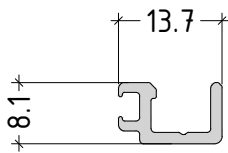
EW70-5

E4270500
1214 g/m



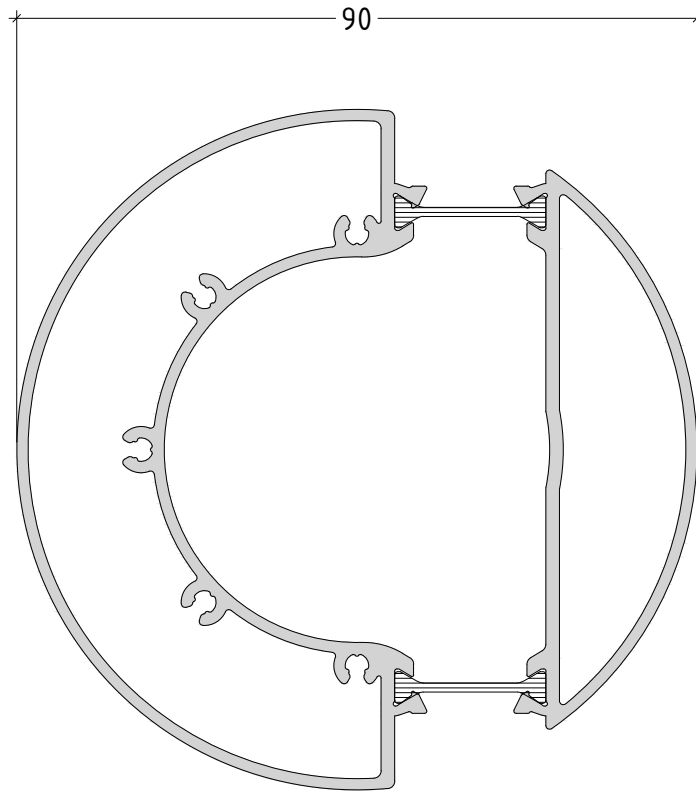
E4275606
120 g/m

E75602
216 g/m

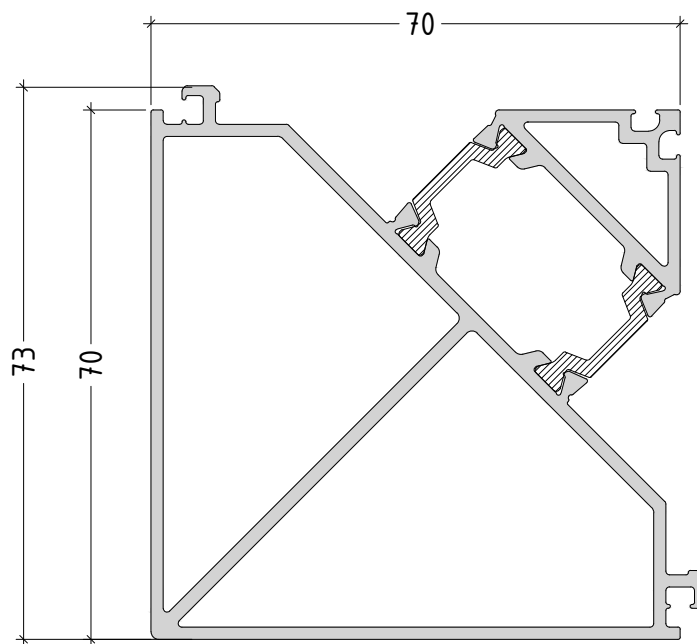


scale : 1:1

E75603
2232 g/m



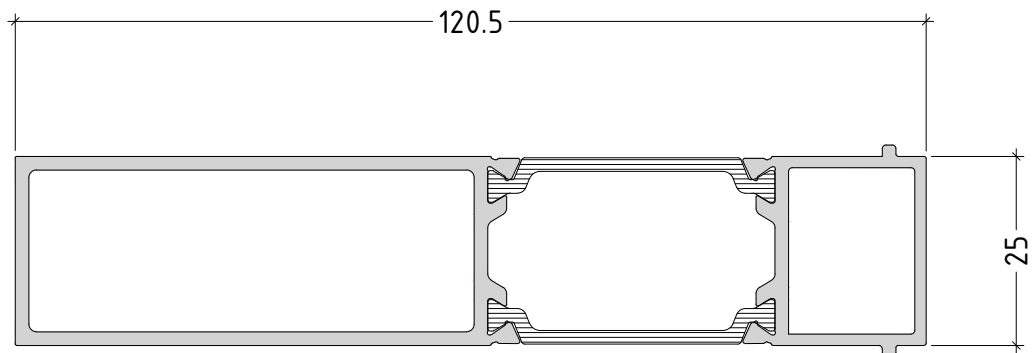
E4268600
2083 g/m



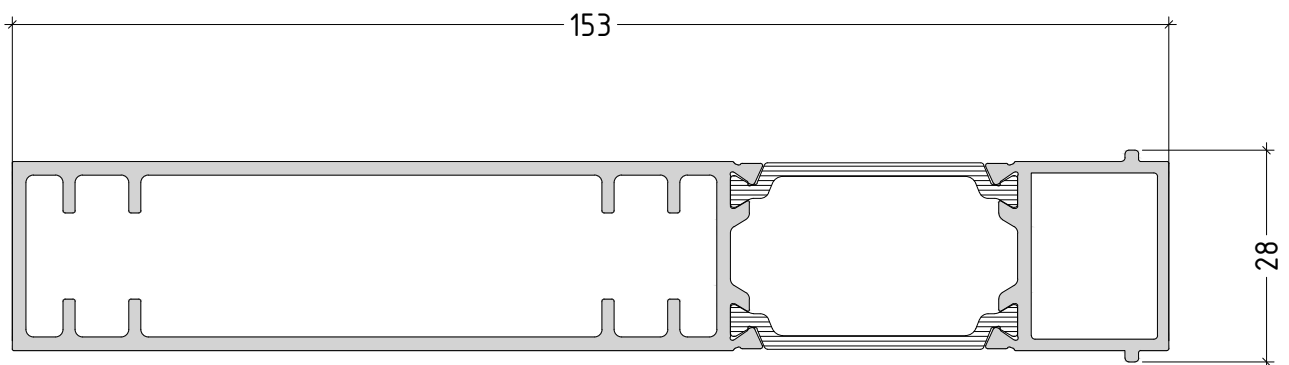
scale : 1:1

EW70-7

E50690
1550 g/m

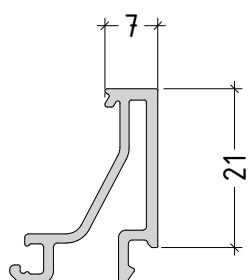


E50691
2046 g/m

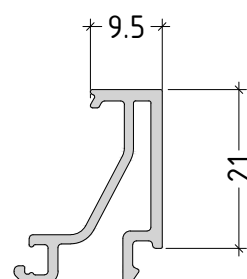


scale : 1:1

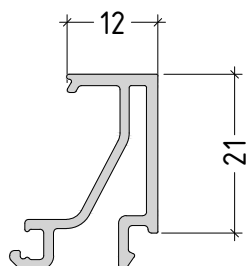
E4060307
267 g/m



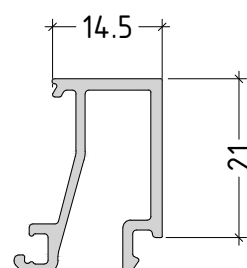
E4060310
277 g/m



E4060312
287 g/m



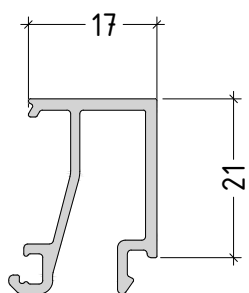
E4060315
287 g/m



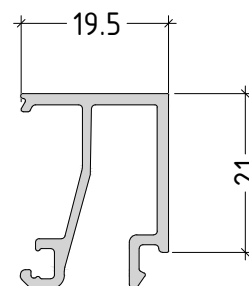
scale : 1:1

EW70-9

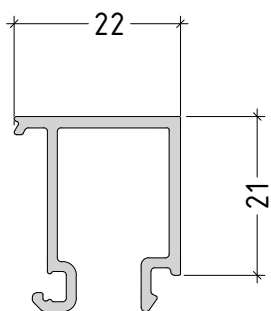
E4060317
297 g/m



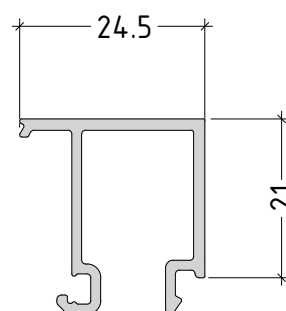
E4060320
305 g/m



E4060322
314 g/m

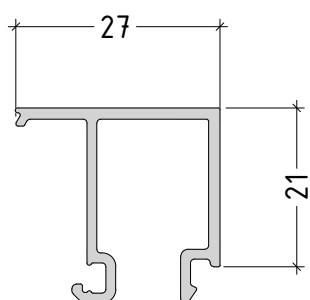


E4060325
324 g/m

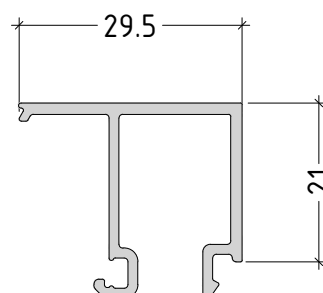


scale : 1:1

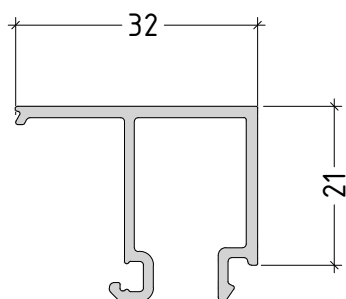
E4060327
335 g/m



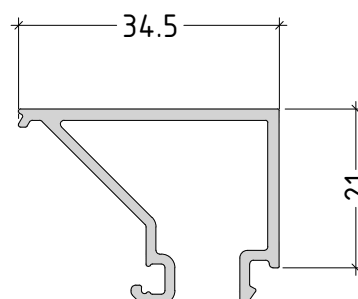
E4060330
345 g/m



E4060332
355 g/m



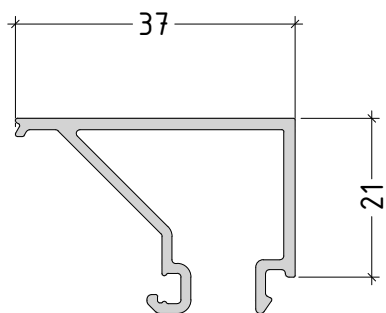
E4060335
385 g/m



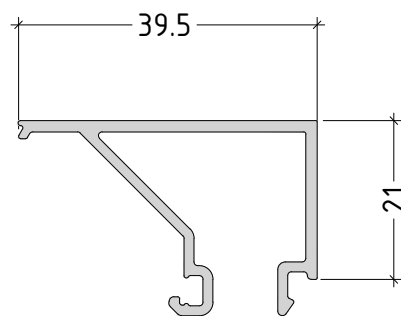
scale : 1:1

EW70-11

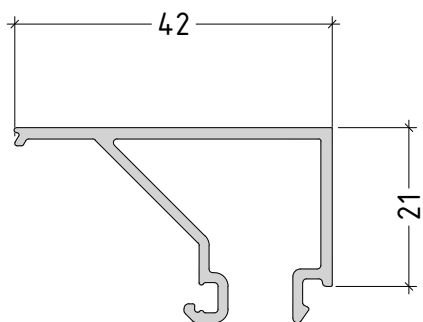
E4060337
395 g/m



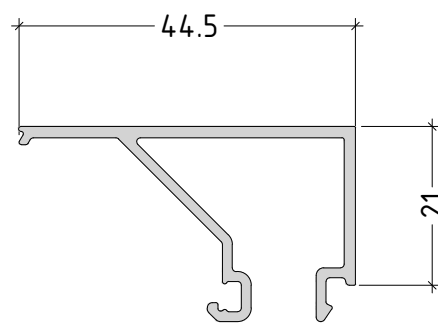
E4060340
405 g/m



E4060342
416 g/m



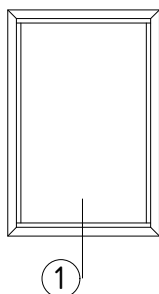
E4060345
426 g/m



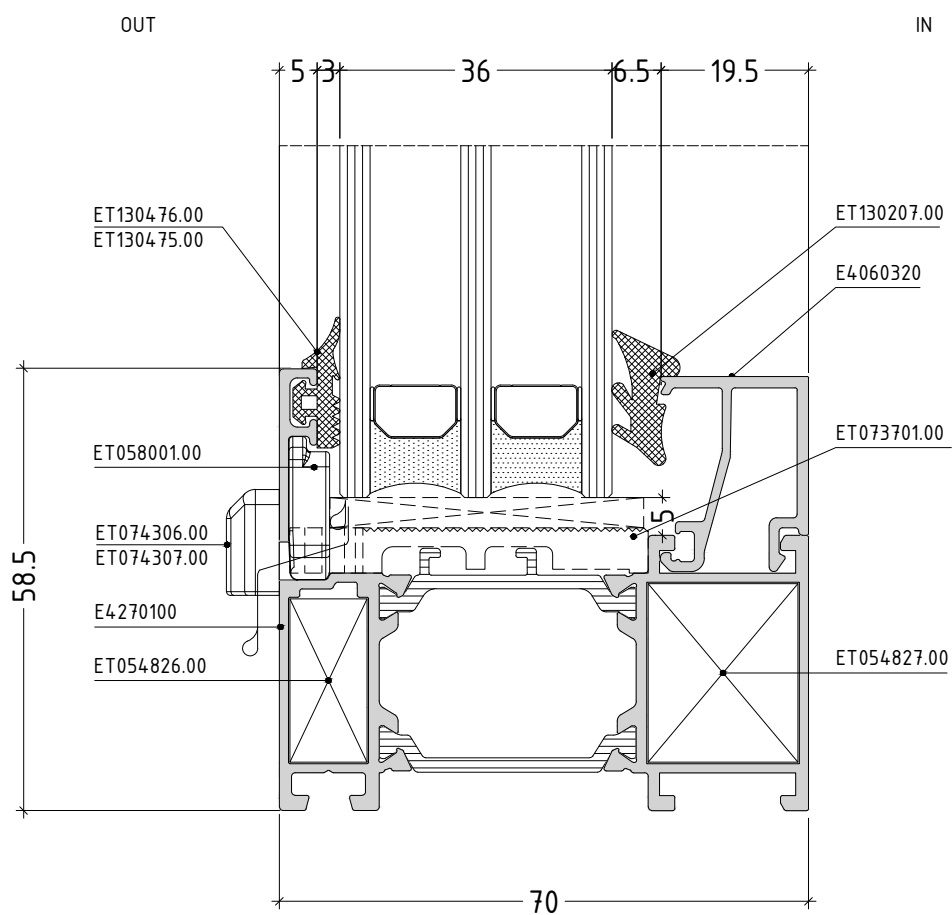
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SECTIONS

SECTIONS / DETAILS

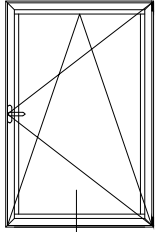


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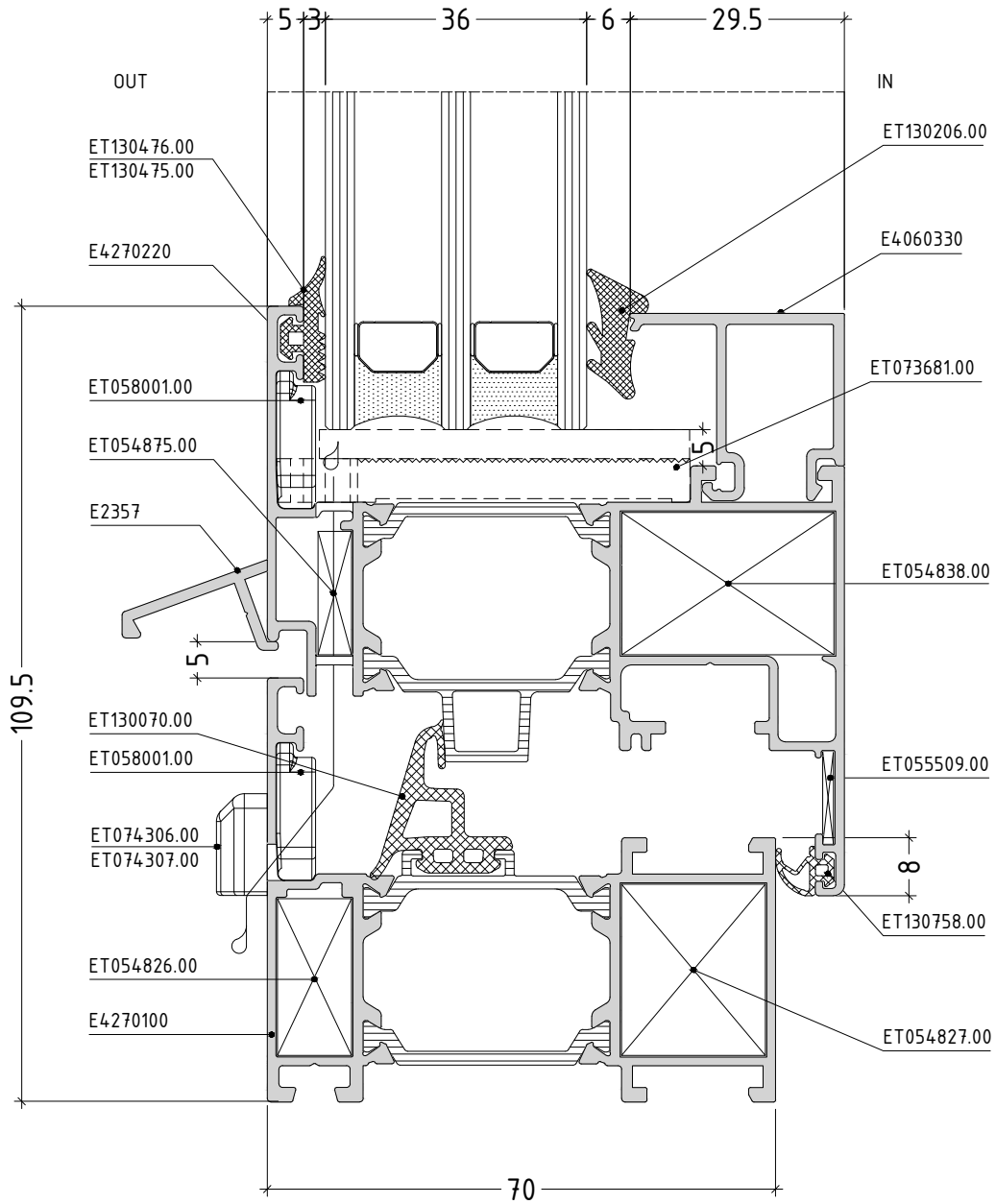
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EW70-1



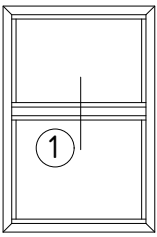
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1

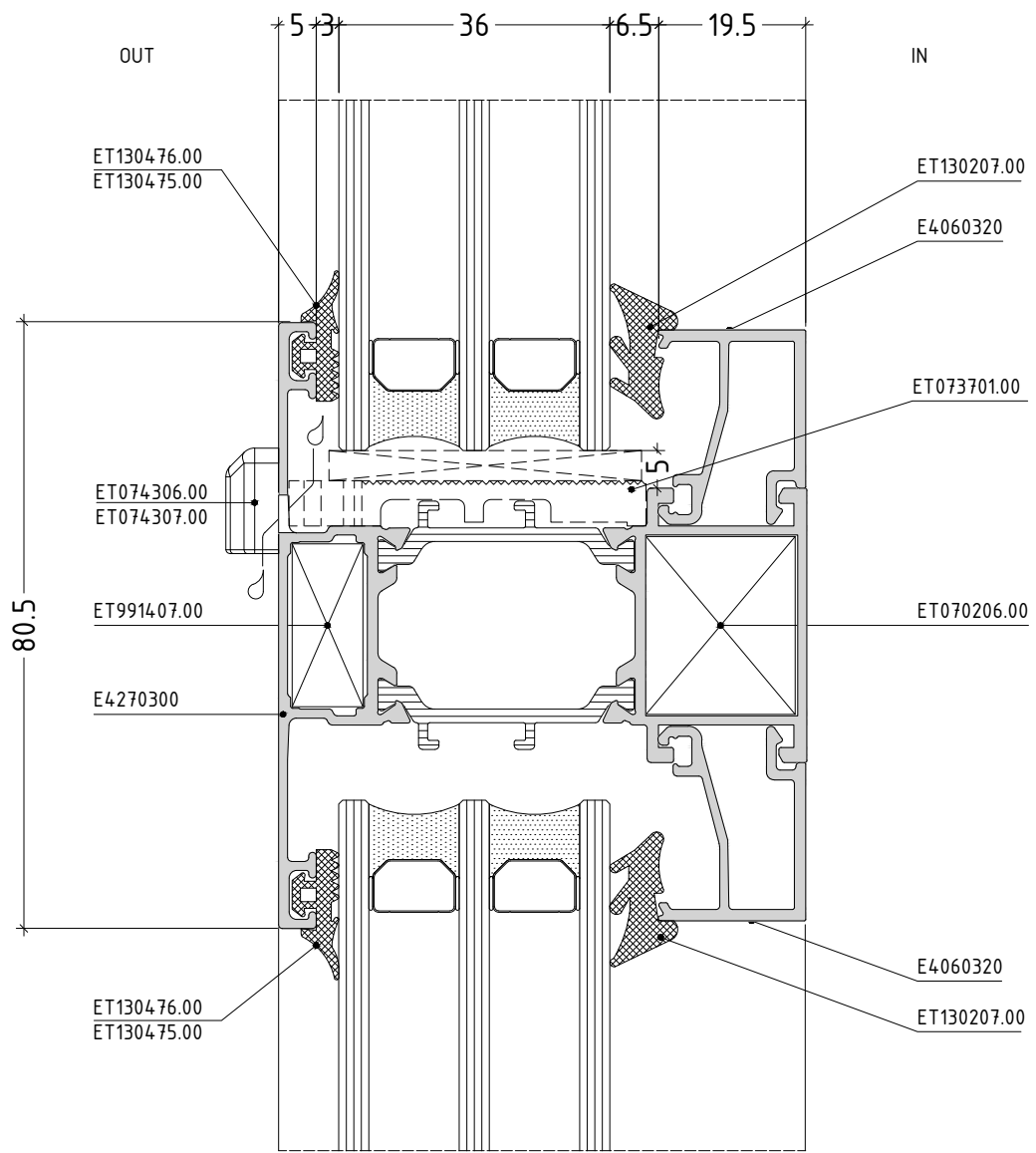


scale : 1:1

EW70-2

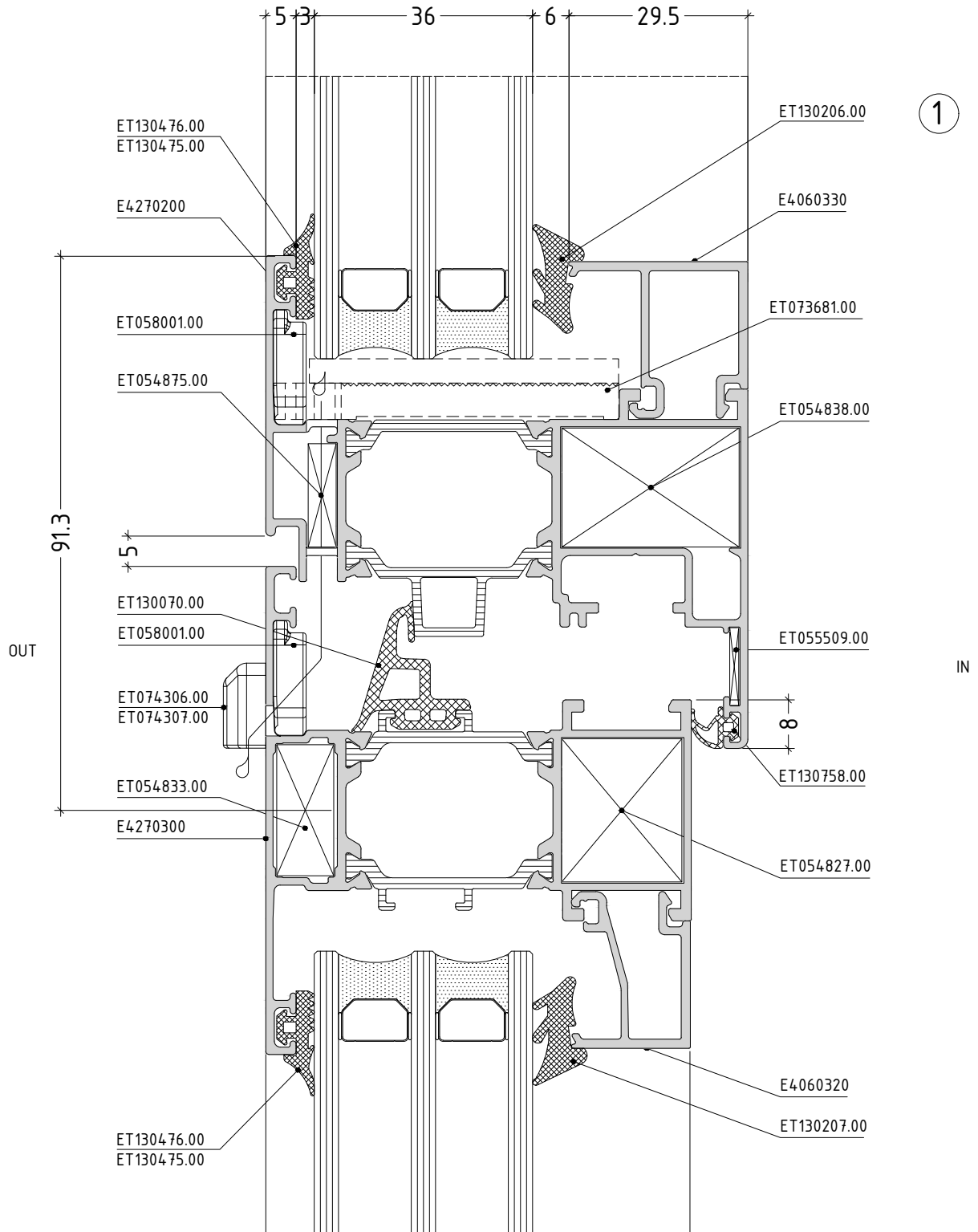
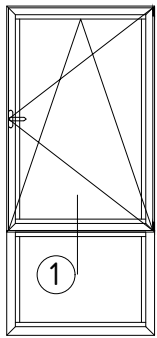


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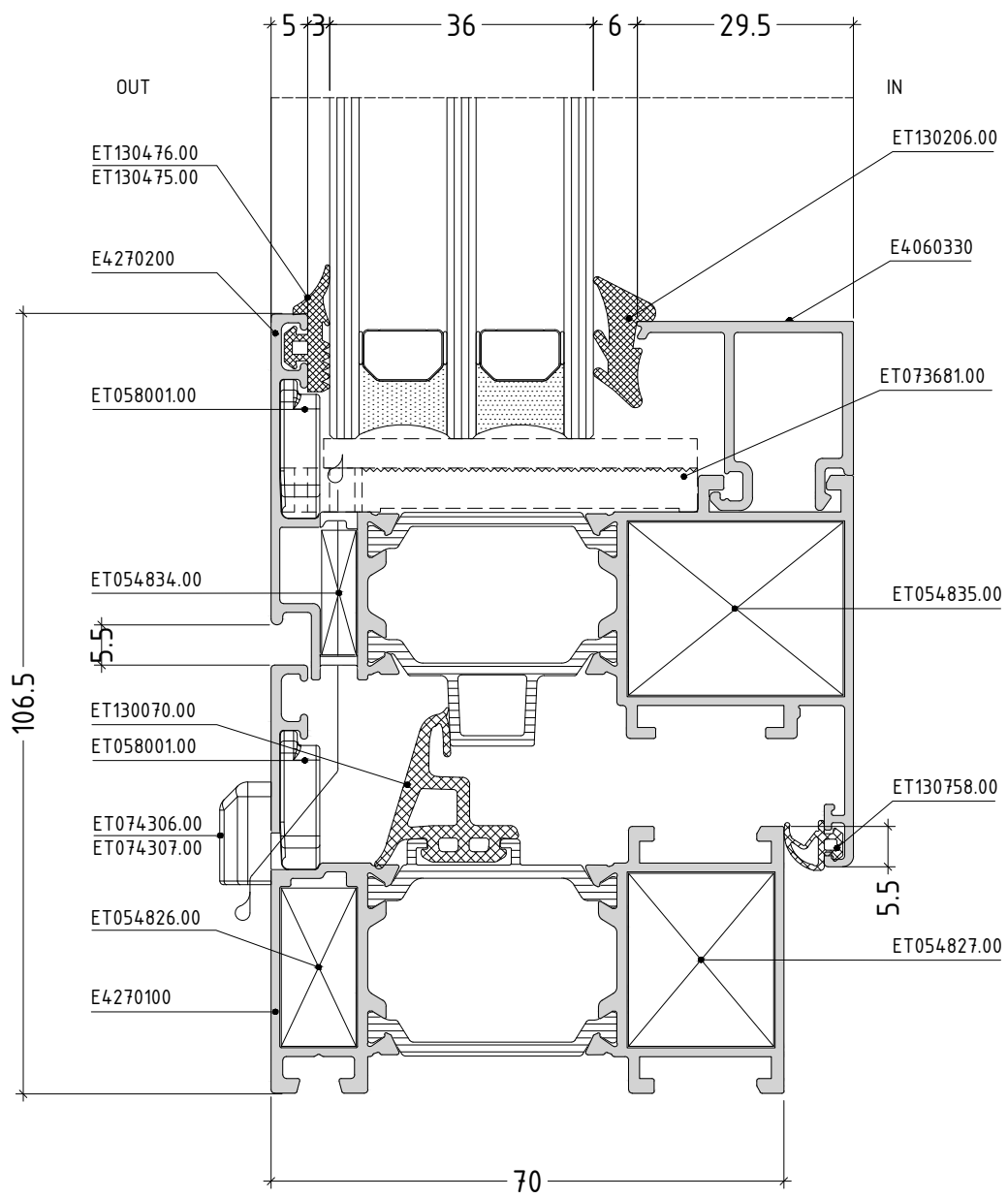
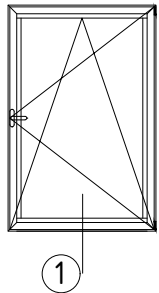
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EW70-3



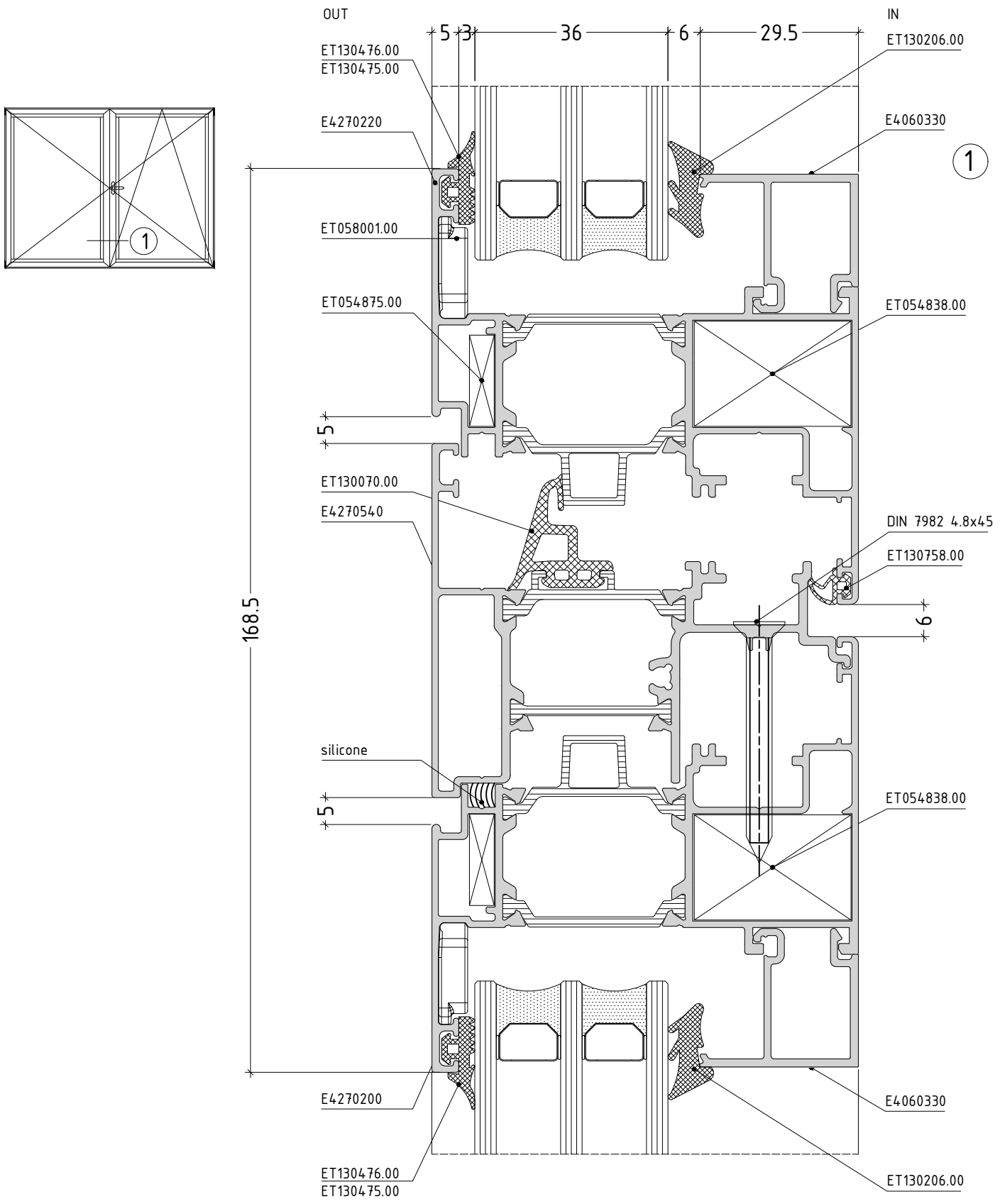
scale : 1:1

EW70-5



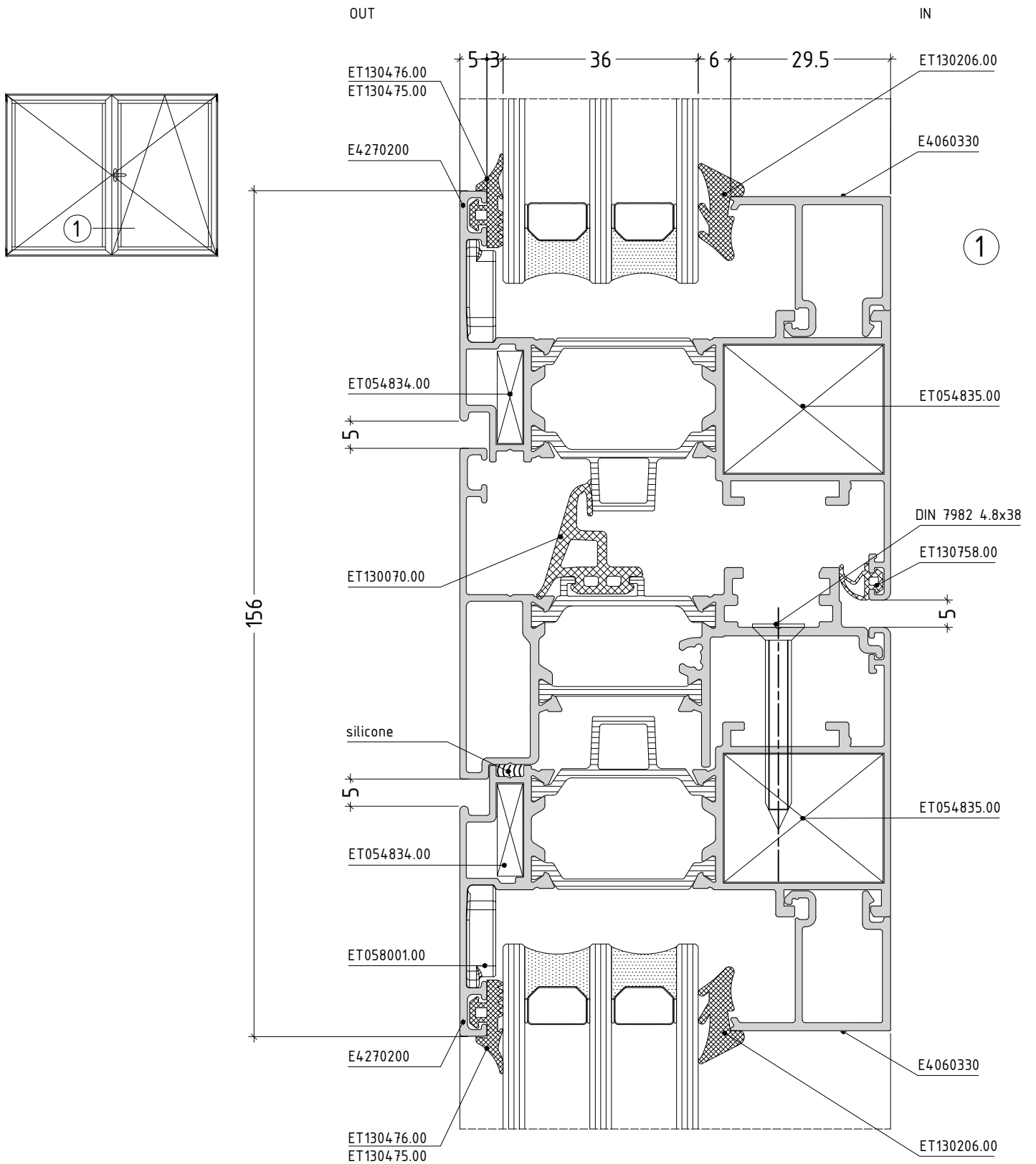
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EW70-6



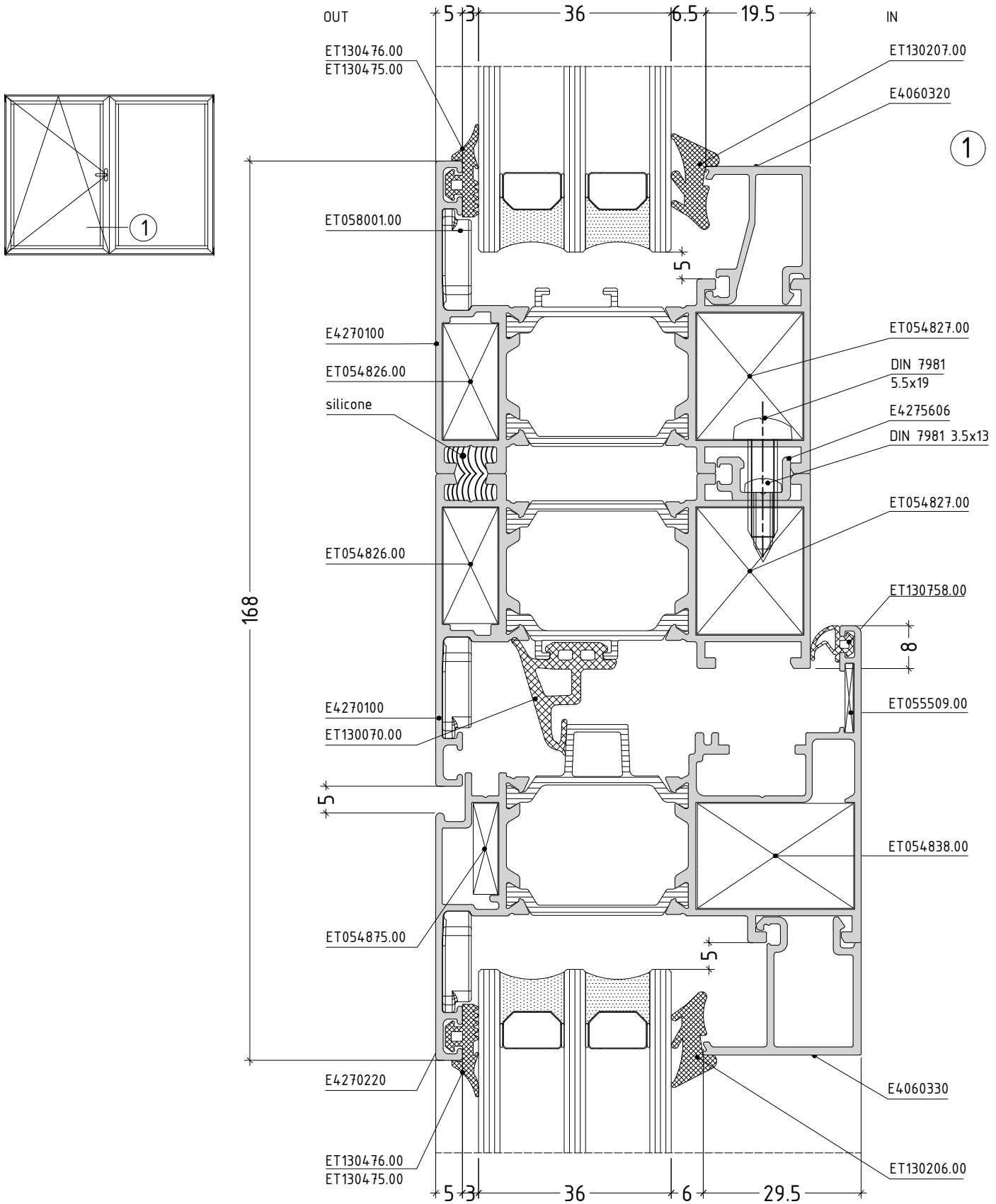
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EW70-8



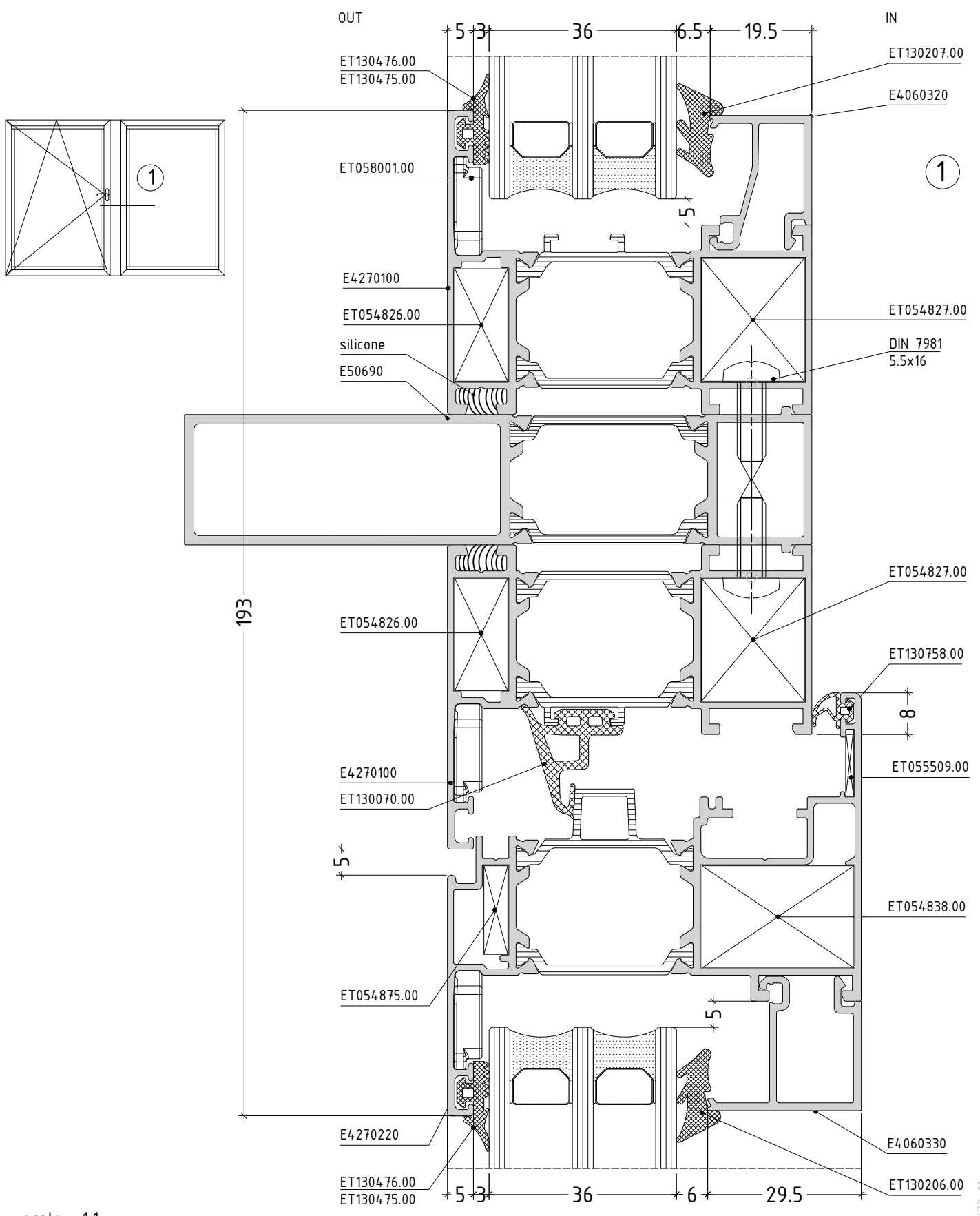
scale : 1:1

EW70-9



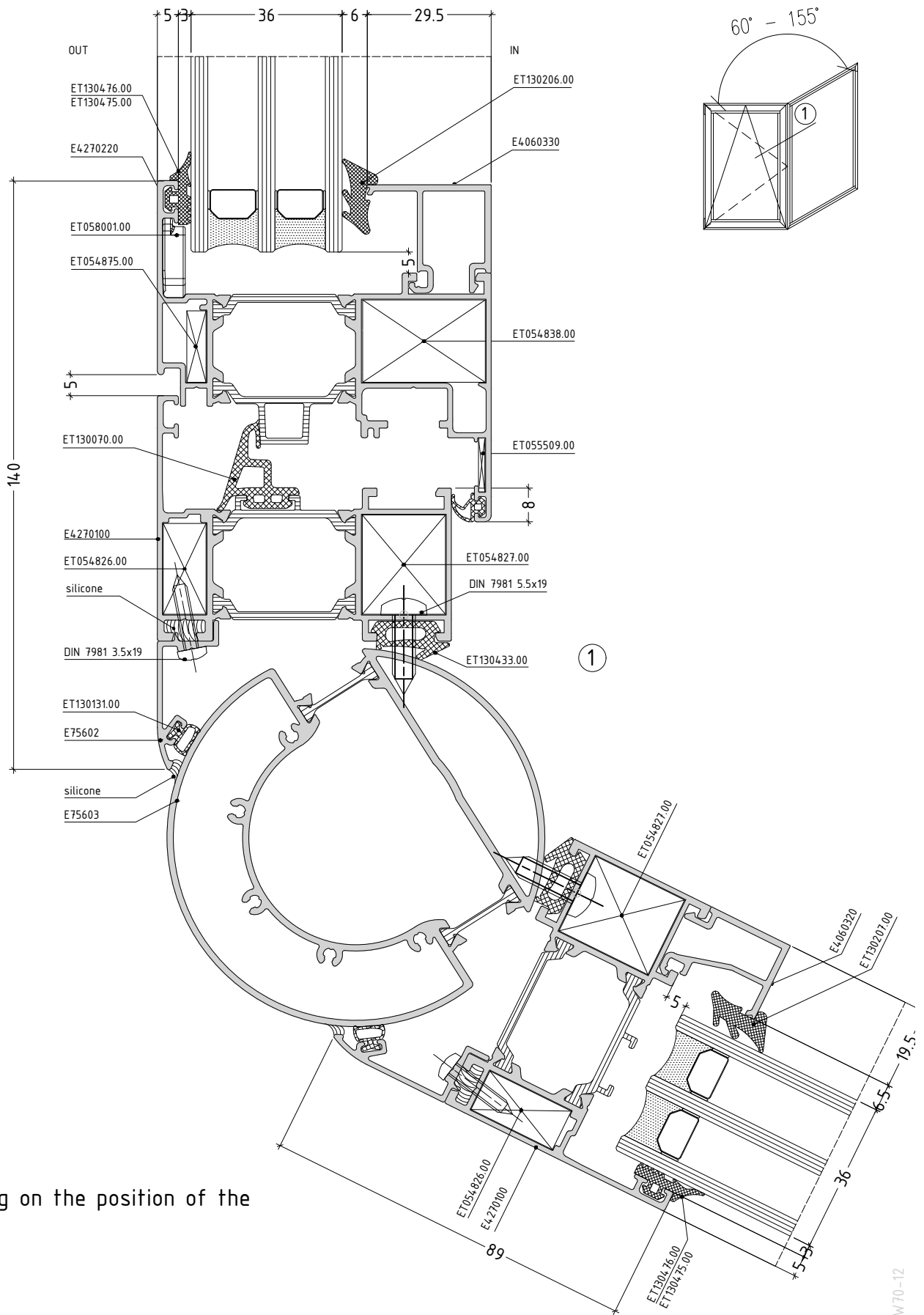
scale : 1:1

EW70-10



scale : 1:1

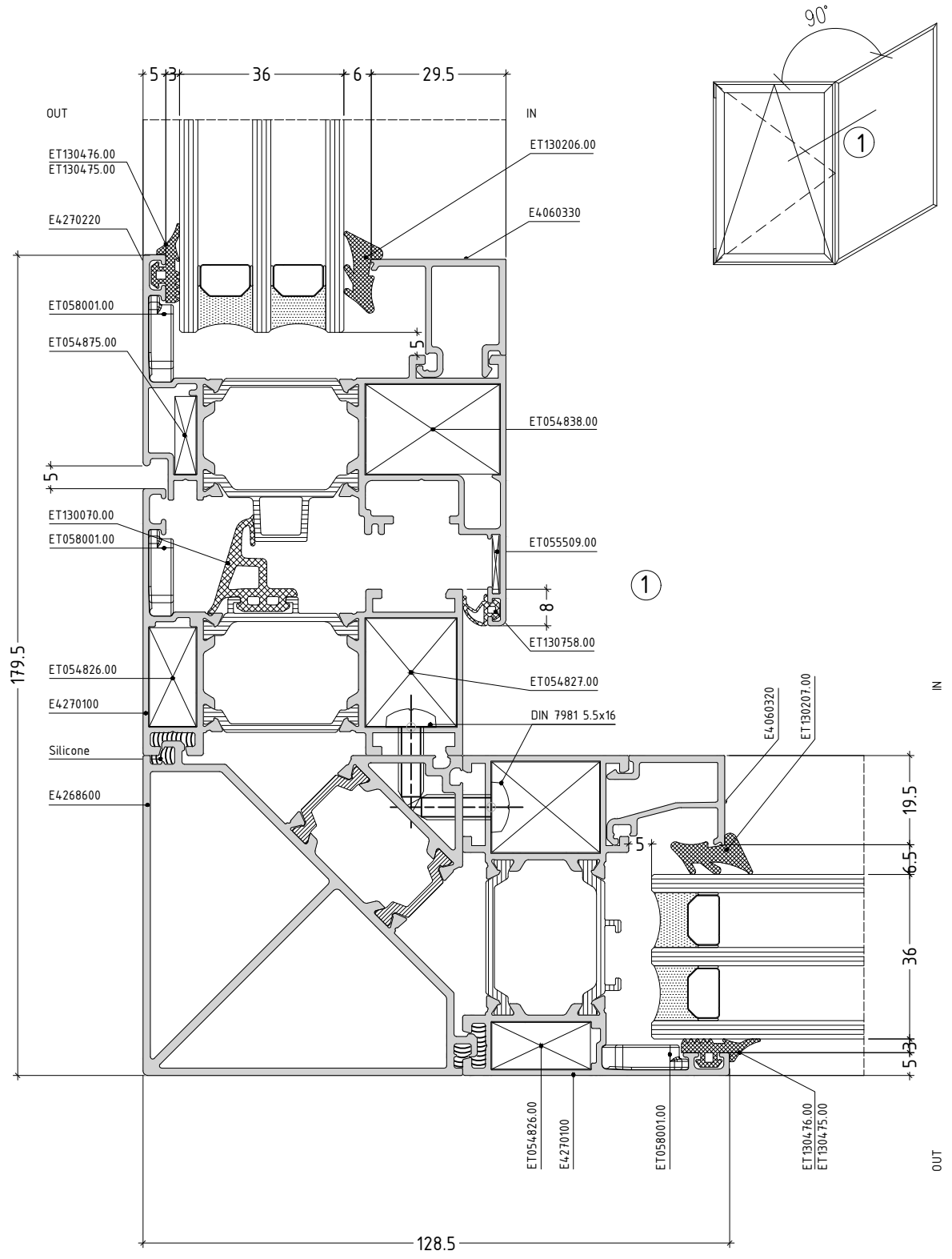
EW70-11



NOTE:
depending on the position of the
column.

scale : 1:1



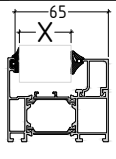

















EW70-12



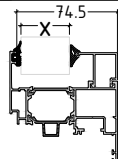



















scale : 1:1

EW70-13

GLAZING OPTIONS

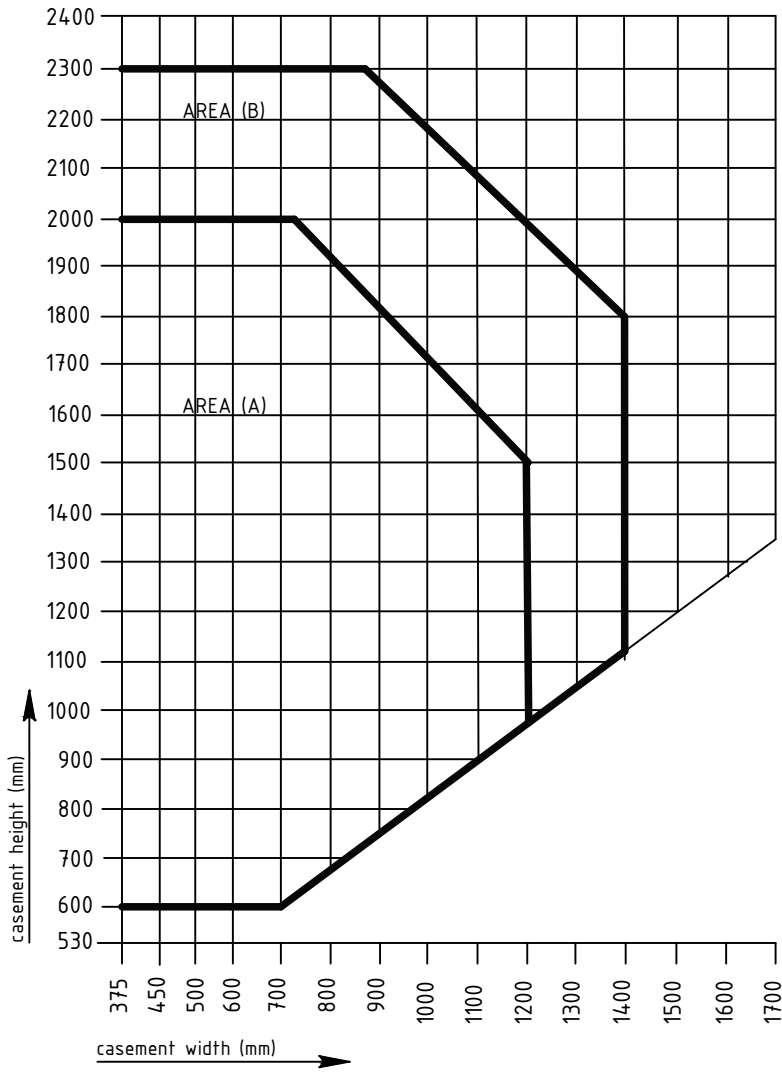
GLAZING OPTIONS FOR FRAME					
external gaskets	INTERNAL GASKETS				GLAZING BEADS
3 mm 130475		5 - 6 mm 130176		7 - 8 mm 130177	
3 mm 130476		5 mm 130205		6 mm 130206	
				7 mm 130207	
				8 mm 130208	
	X mm				E4.0603xx
130475 130476	50	49	48	47	E4.060307 
130475 130476	47	46	45	44	E4.060310 
130475 130476	45	44	43	42	E4.060312 
130475 130476	42	41	40	39	E4.060315 
130475 130476	40	39	38	37	E4.060317 
130475 130476	37	36	35	34	E4.060320 
130475 130476	35	34	33	32	E4.060322 
130475 130476	32	31	30	29	E4.060325 
130475 130476	30	29	28	27	E4.060327 
130475 130476	27	26	25	24	E4.060330 
130475 130476	25	24	23	22	E4.060332 
130475 130476	22	21	20	19	E4.060335 
130475 130476	20	19	18	17	E4.060337 

GLAZING OPTIONS FOR VENT					
external gaskets	INTERNAL GASKETS				GLAZING BEADS
3 mm 130475		5 - 6 mm 130176		7 - 8 mm 130177	
3 mm 130476		5 mm 130205		6 mm 130206	
				7 mm 130207	
				8 mm 130208	
	X mm				E4.0603xx
130475 130476	52	51	50	49	E4.060315 
130475 130476	49	48	47	46	E4.060317 
130475 130476	47	46	45	44	E4.060320 
130475 130476	44	43	42	41	E4.060322 
130475 130476	42	41	39	38	E4.060325 
130475 130476	39	38	37	36	E4.060327 
130475 130476	37	36	35	34	E4.060330 
130475 130476	34	33	32	31	E4.060332 
130475 130476	32	31	30	29	E4.060335 
130475 130476	29	28	27	26	E4.060337 
130475 130476	27	26	25	24	E4.060340 
130475 130476	24	23	22	21	E4.060342 
130475 130476	22	21	20	19	E4.060345 

CUTTING LISTS

application diagram for overall casement dimensions

selection of the appropriate casement profile and the dimensions of the casement



AREA (A)
E4270200
E4270220
AREA (B)
E4270201
E4270221

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

Cutting for PVC groove

calculation of cutting length for one leaf window

		casement profile selection	E4270220	E4270221
frame profile selection				
E4270100	width of casement	W - 57	W - 57	
	height of casement	H - 57	H - 57	

calculation of cutting length for two leaf window

		casement profile selection	E4270220	E4270221
frame profile selection				
E4270100	width of casement	$\frac{W - 62}{2}$	$\frac{W - 62}{2}$	
	height of casement	H - 57	H - 57	
E4270540	height of secondary casement profile	H - 133	H - 133	

Cutting for EURO groove

calculation of cutting length for one leaf window

<p>frame profile selection</p>		E4270200	E4270201
	width of casement	$W - 62$	$W - 62$
	height of casement	$H - 62$	$H - 62$

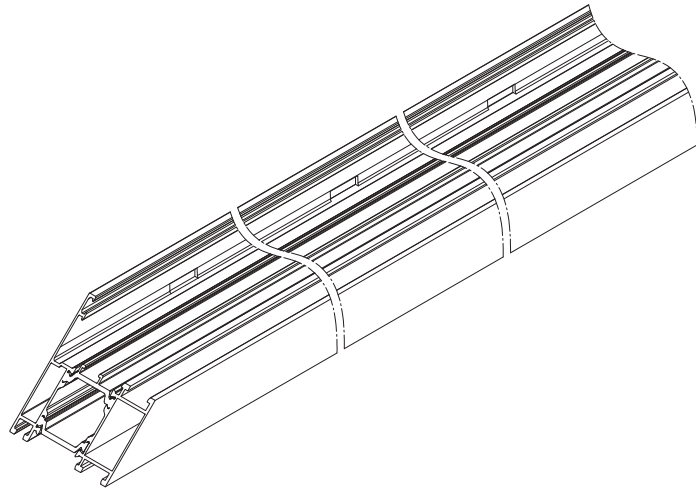
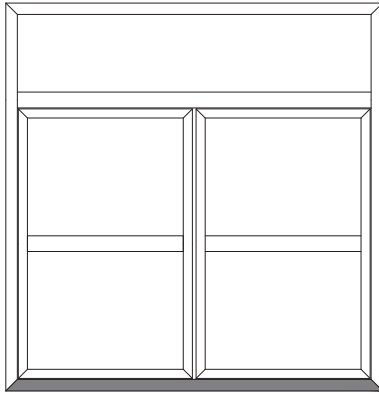
calculation of cutting length for two leaf window

<p>frame profile selection</p>		E4270200	E4270201
	width of casement	$\frac{W - 68}{2}$	$\frac{W - 68}{2}$
	height of casement	$H - 62$	$H - 62$
	height of secondary casement profile	$H - 133$	$H - 133$

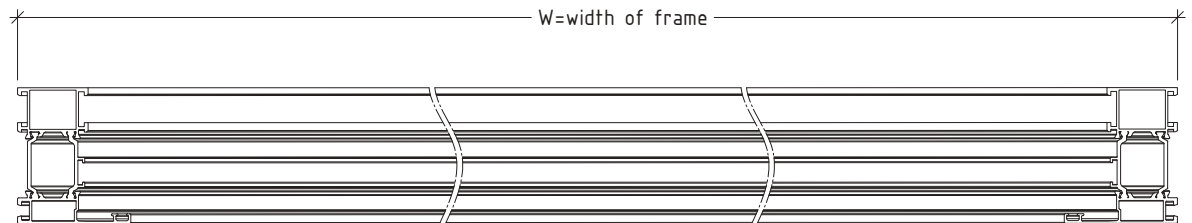
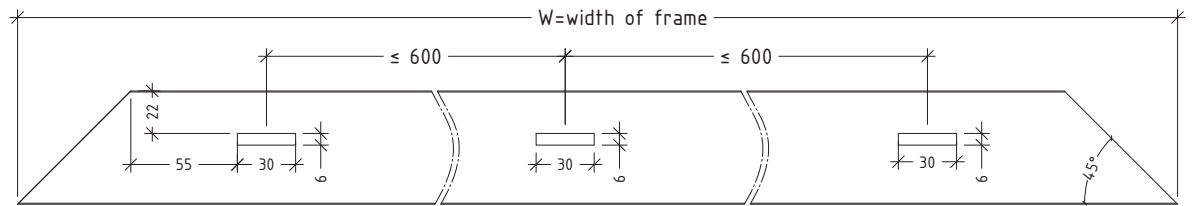
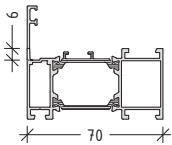
MACHINING

Additional treatment of profiles after cutting
Frame E4270100 - machining for drainage

exterior view

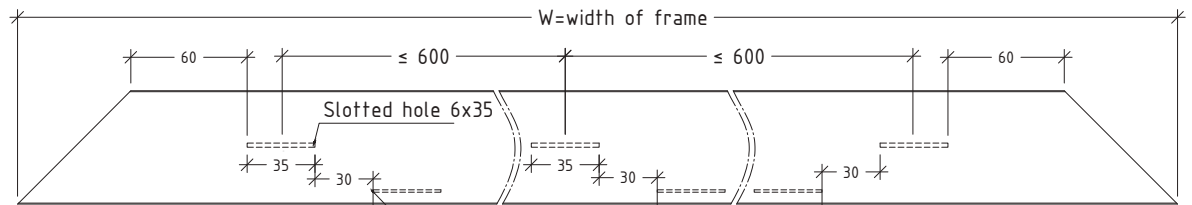
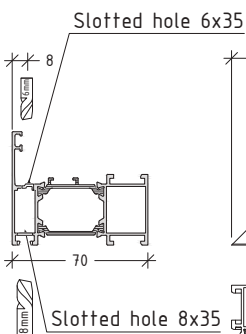


E4270100



E4270100

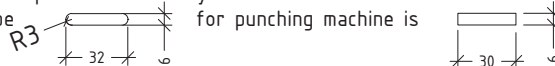
Optional
machining for hidden drainage



Note:

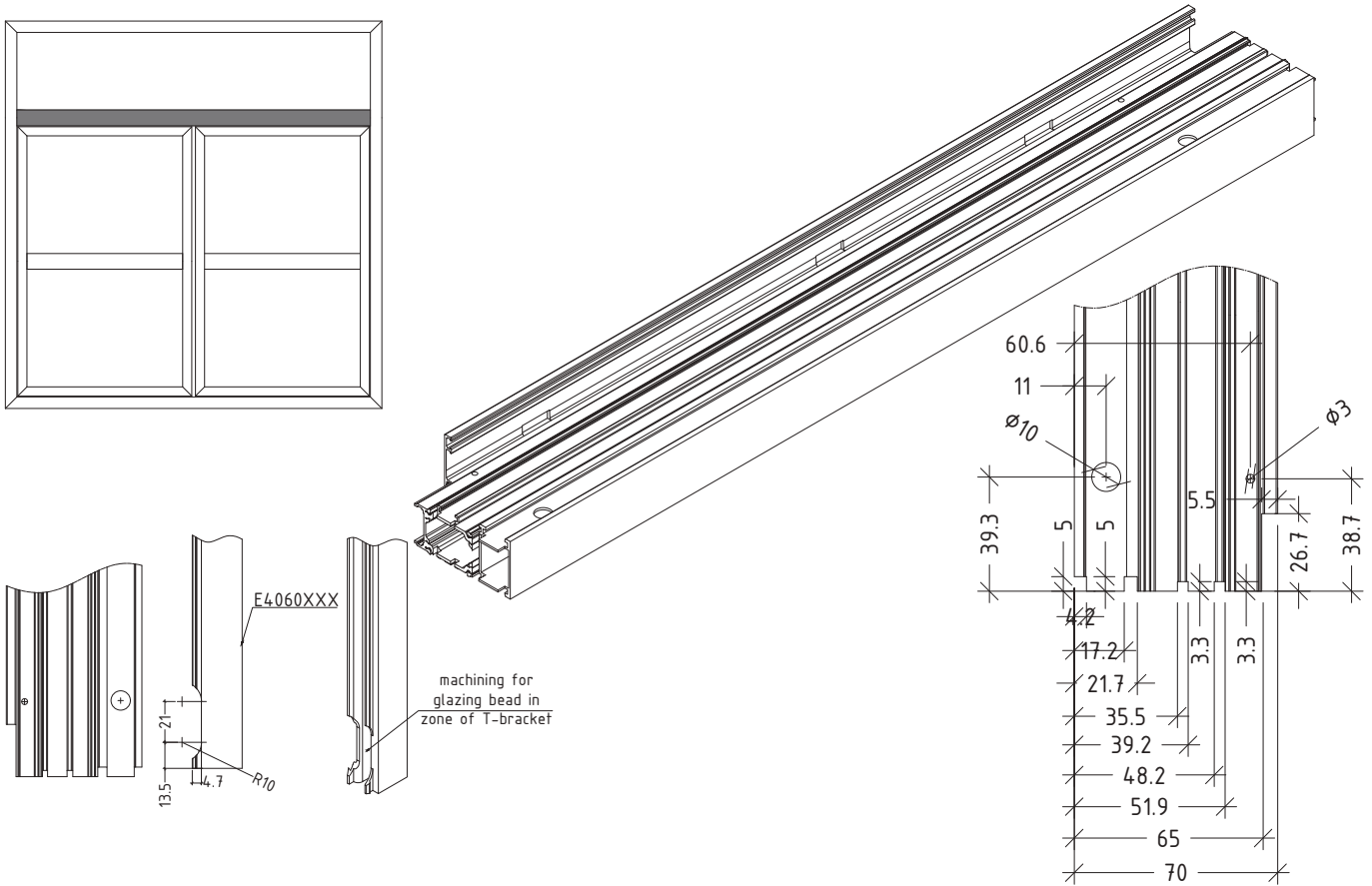
This machining is valid for all the frame profiles of the system

For CNC machine drainage hole must be

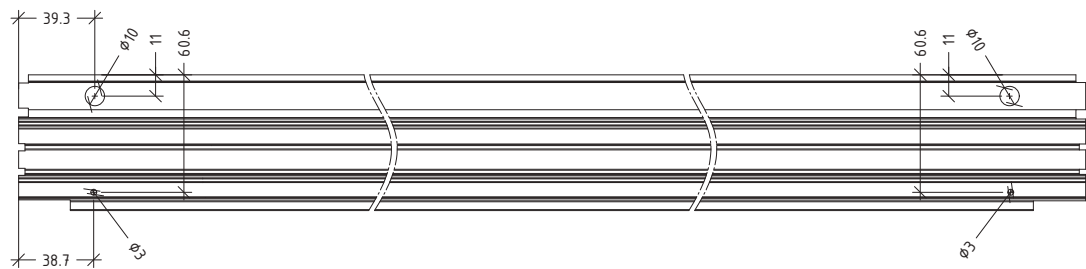
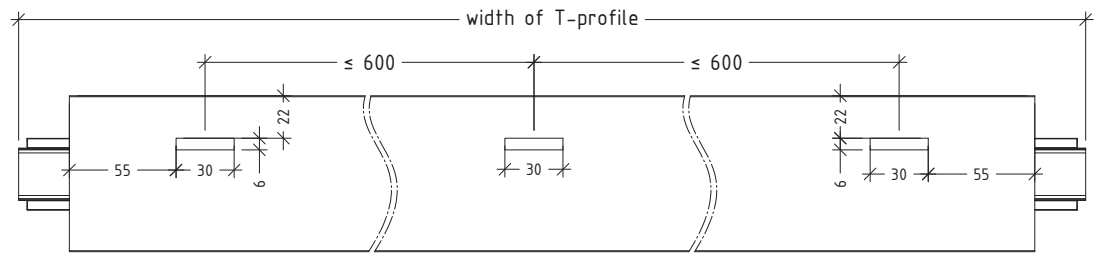
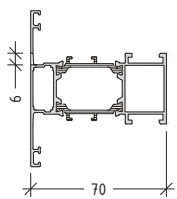


EW70-17

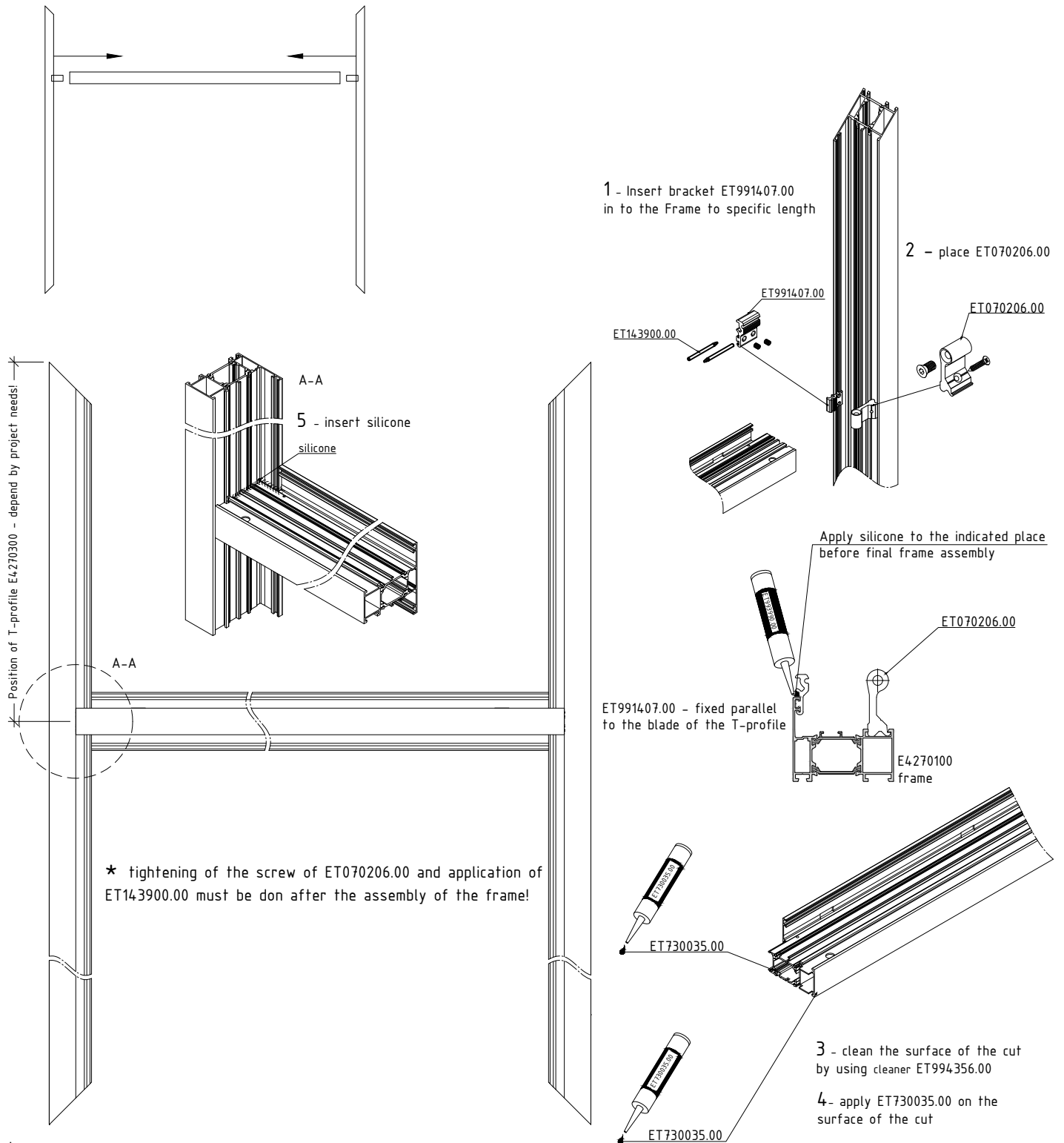
Additional treatment of profiles after cutting
 T profile E4270300 - machining for visible drainage and connecting to the frame



E4270300
 T profile



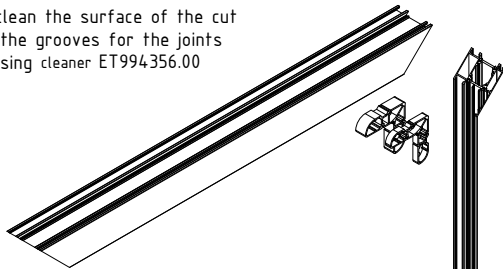
Sequence for mounting of T-profile E4270300 to the frame E4270100



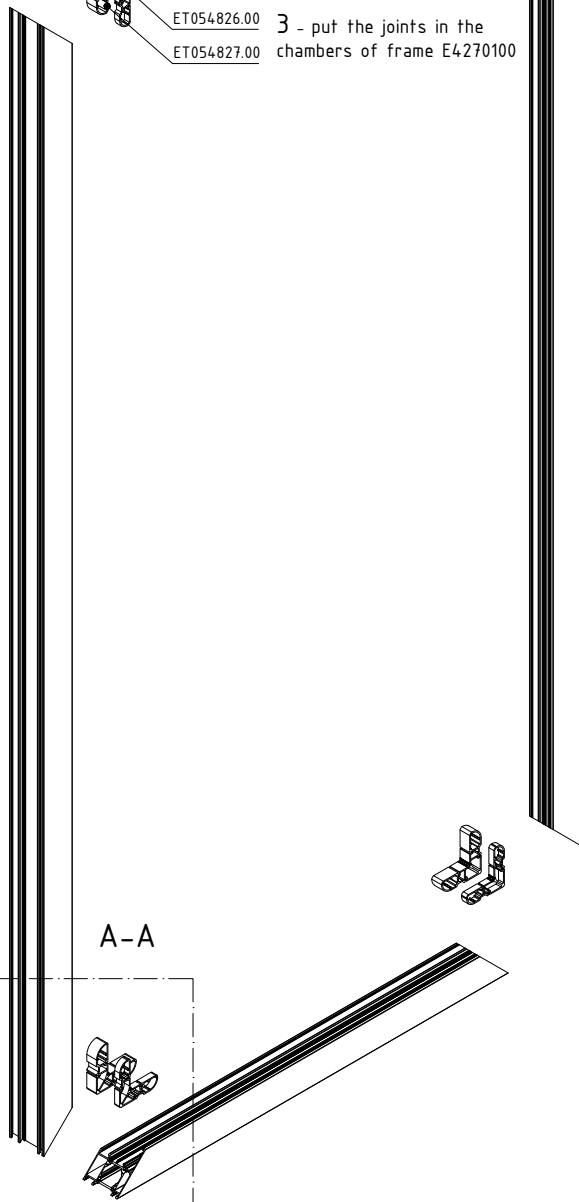
Note:
This mounting sequence is valid for all the frames in the system

Assembly sequence for frame E4270100

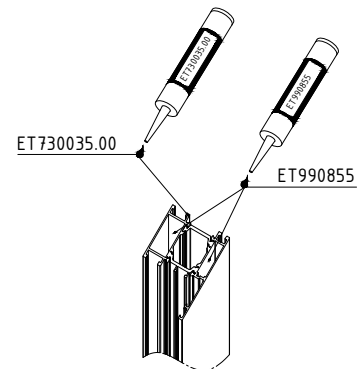
1 - clean the surface of the cut and the grooves for the joints by using cleaner ET994356.00



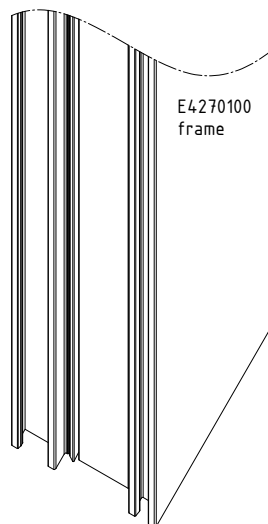
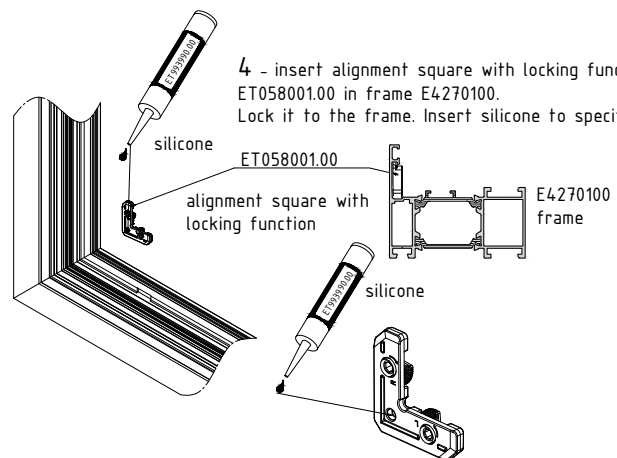
ET054826.00
ET054827.00 3 - put the joints in the chambers of frame E4270100



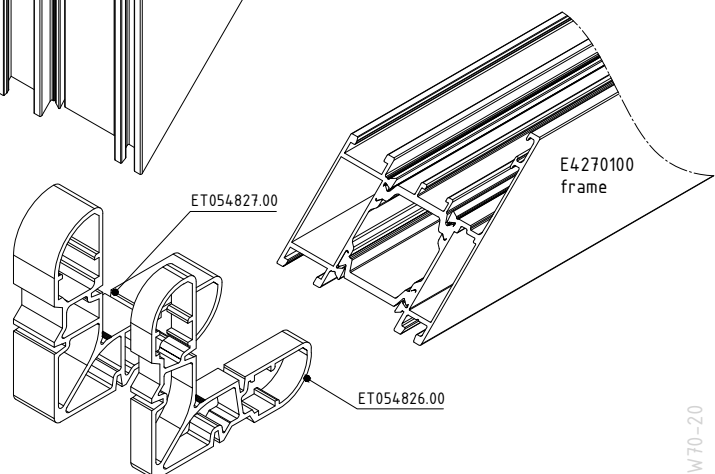
2 - apply ET730035.00 on the surface of the cut and ET990855 in the grooves for the joints



4 - insert alignment square with locking function ET058001.00 in frame E4270100. Lock it to the frame. Insert silicone to specific point

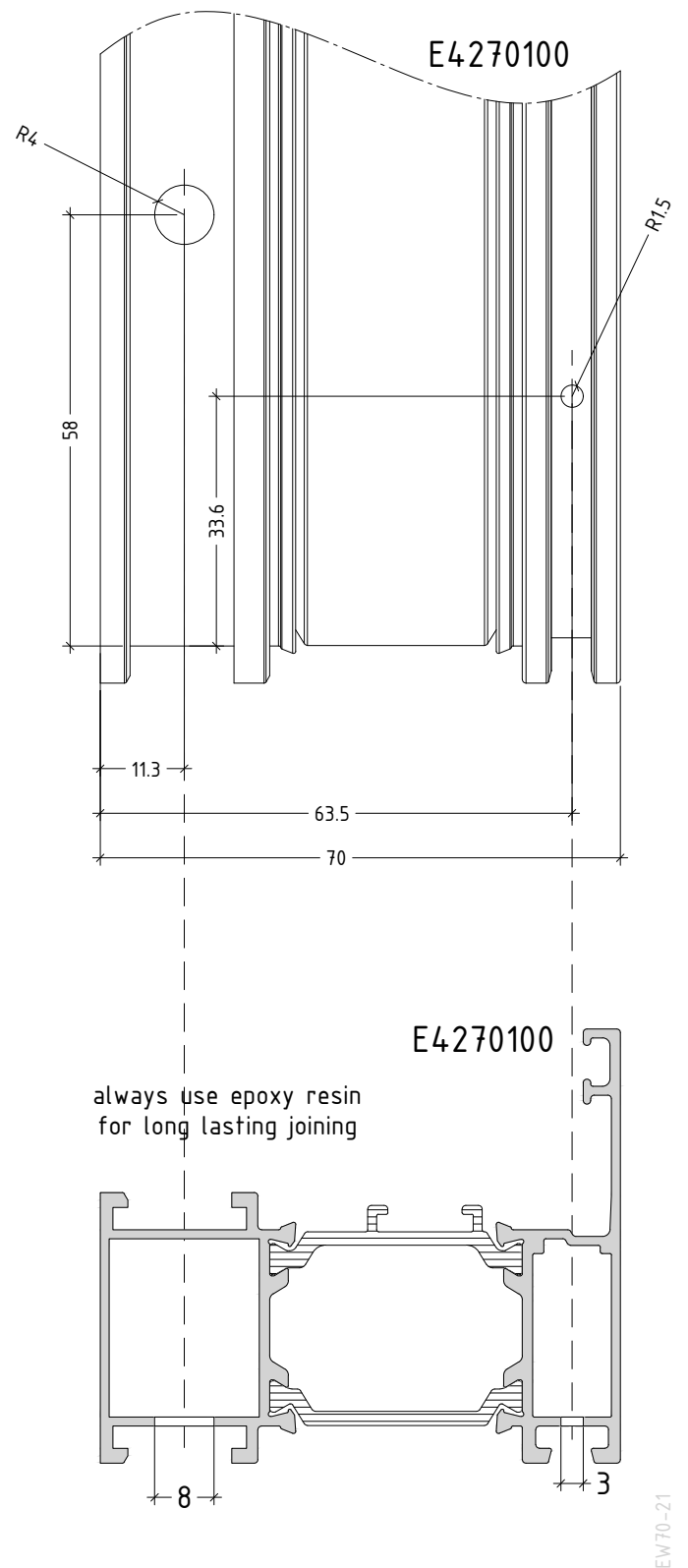
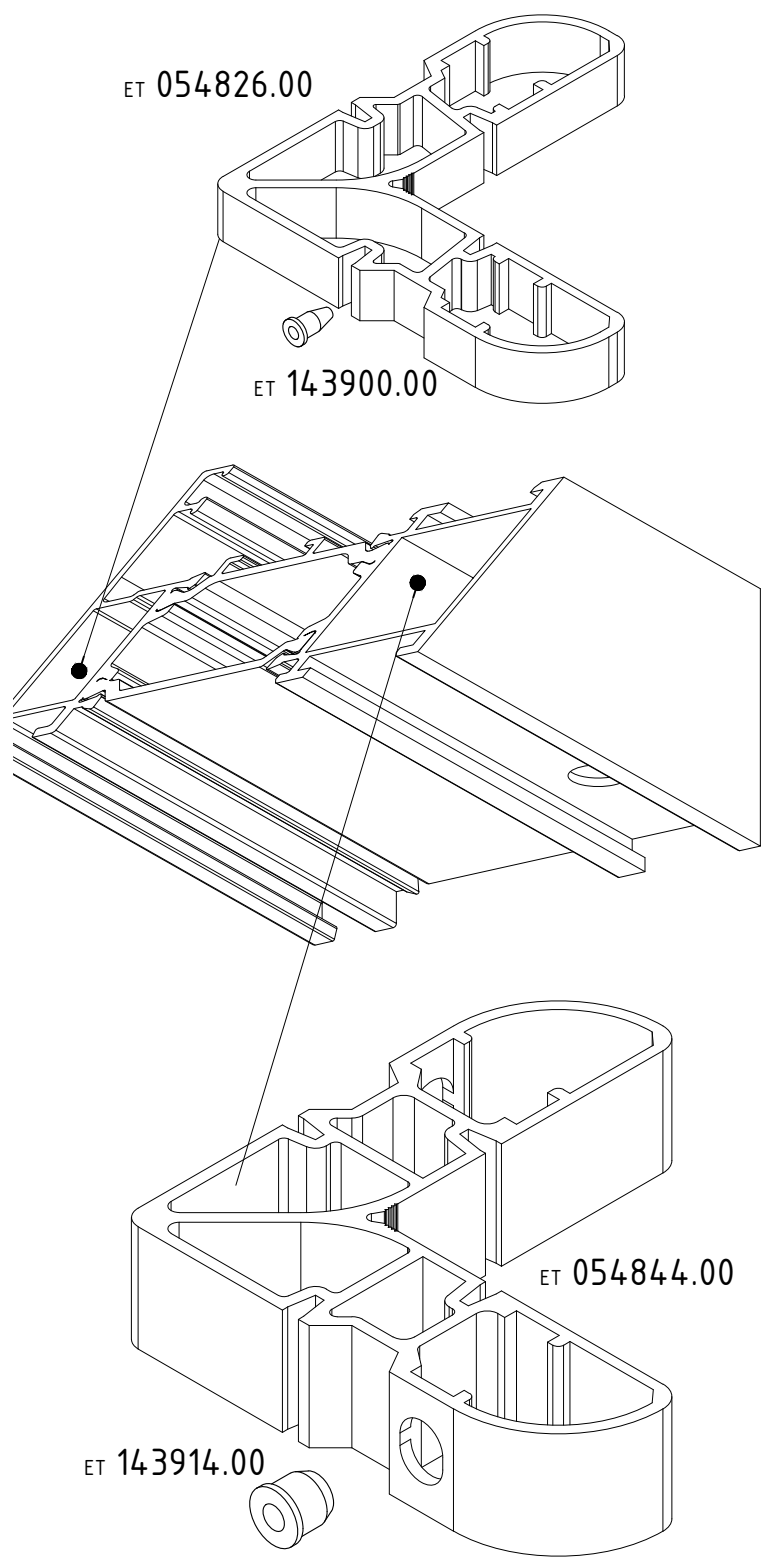


A-A
scale 1.5



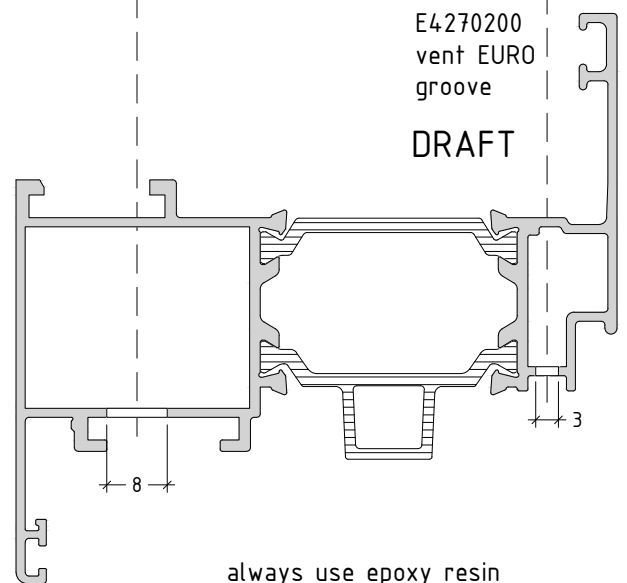
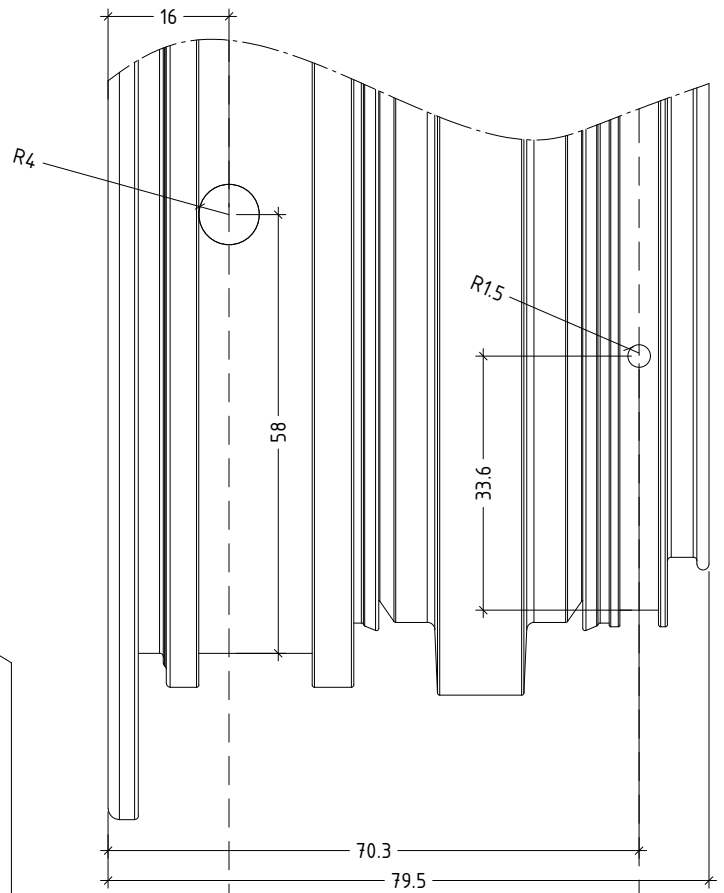
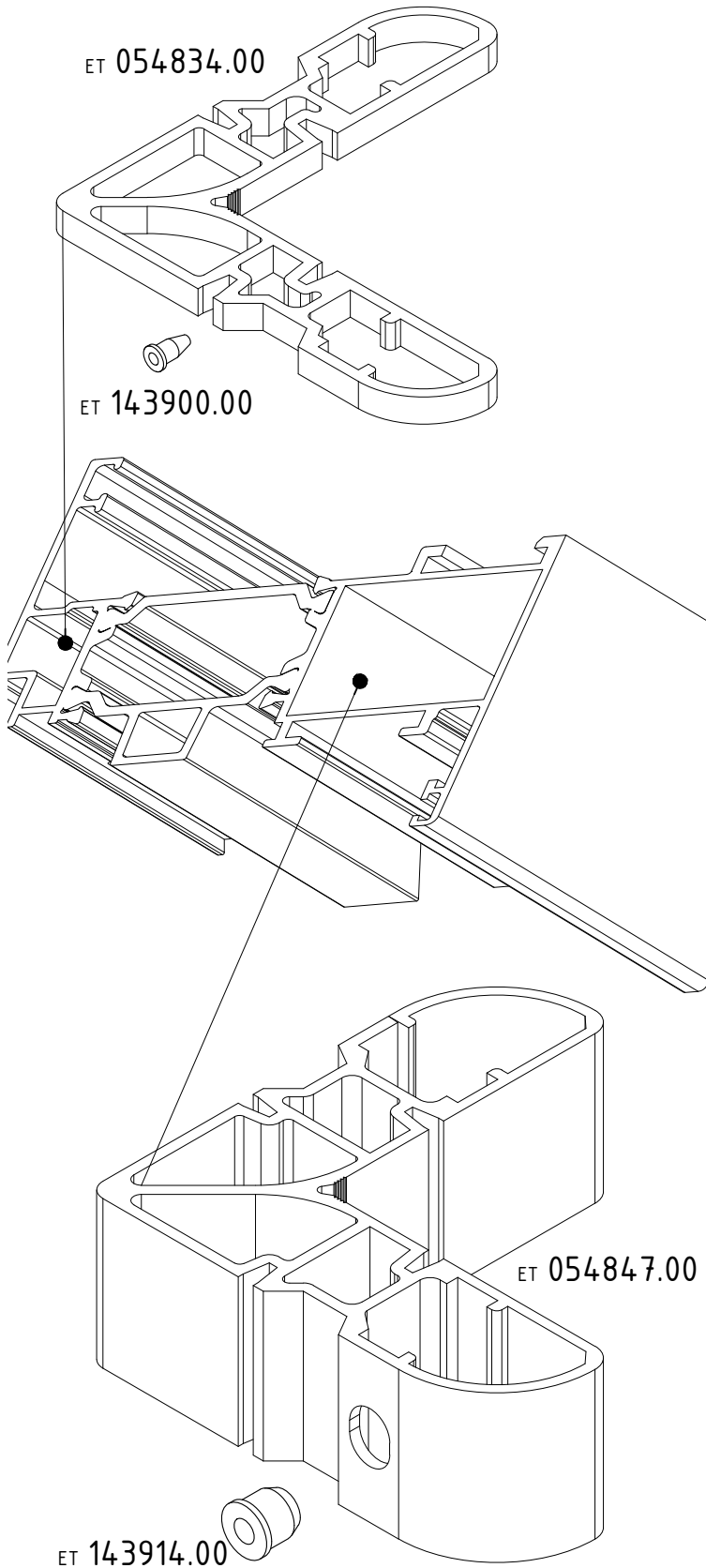
EW70-20

Machining if use roll pins extruded aluminum joint corner brackets



EW70-21

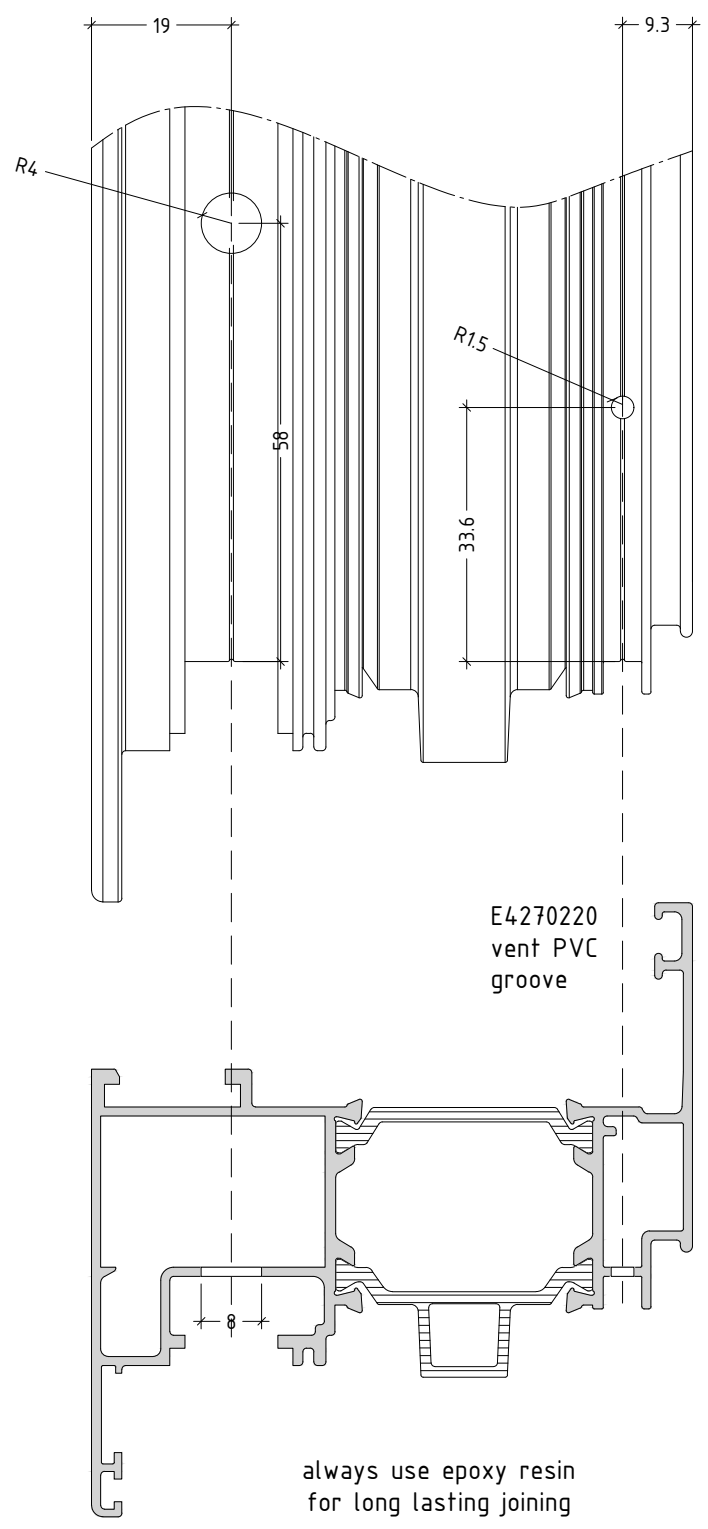
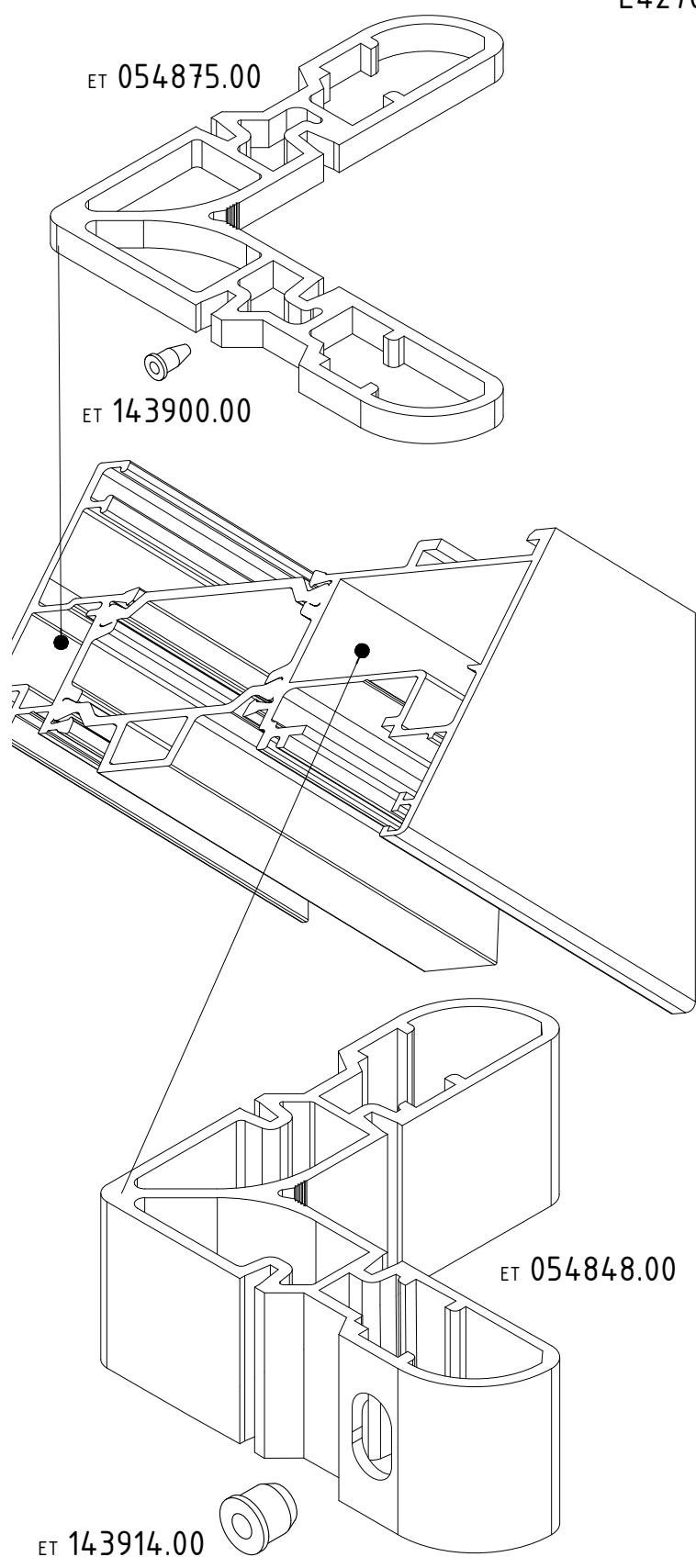
Machining if use roll pins extruded aluminum joint corner brackets
E4270200



always use epoxy resin
for long lasting joining

EW70-23

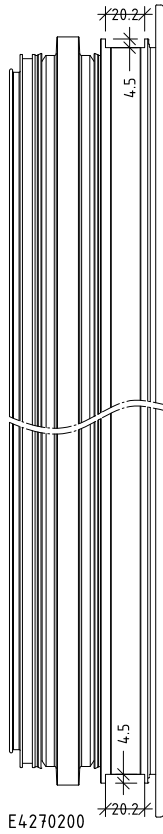
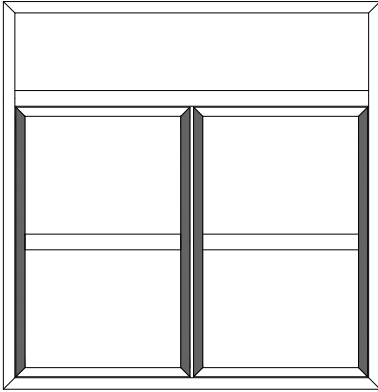
Machining if use roll pins extruded aluminum joint corner brackets
E4270220



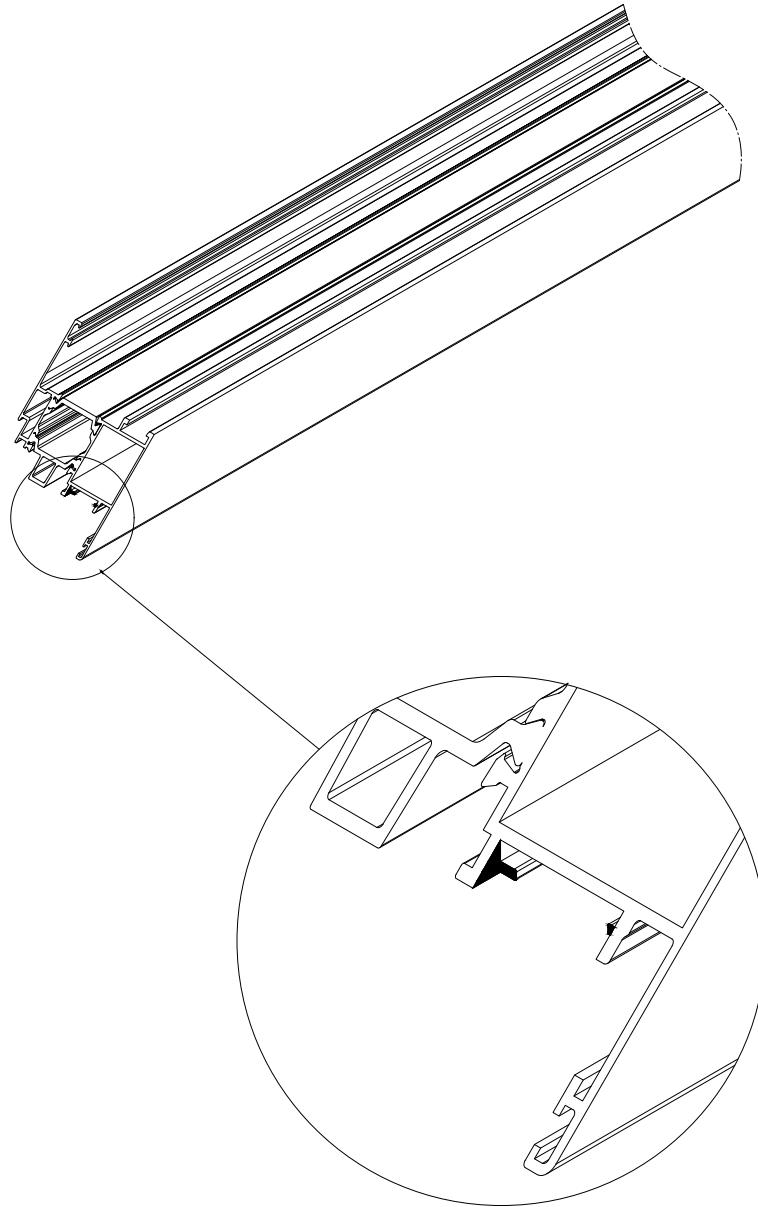
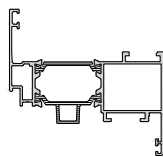
EW70-25

Additional treatment of profiles after cutting
 casement E4270200 - machining for connecting rod E2308

exterior view



E4270200

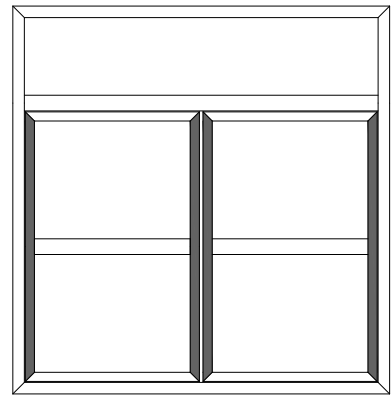


Note:
 This machining's is valid for all the vent profiles with Euro groove in the system

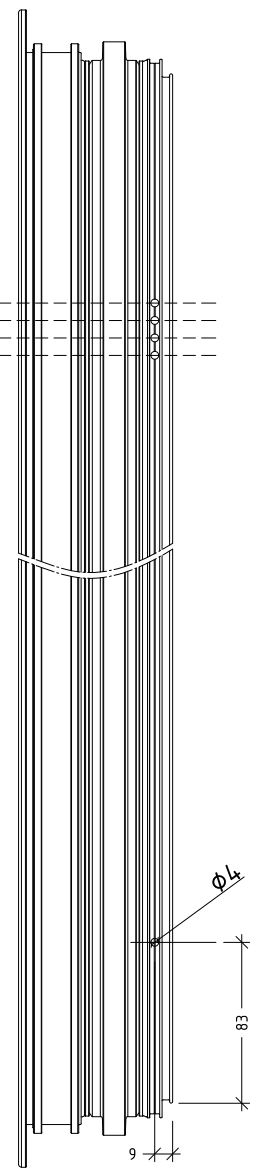
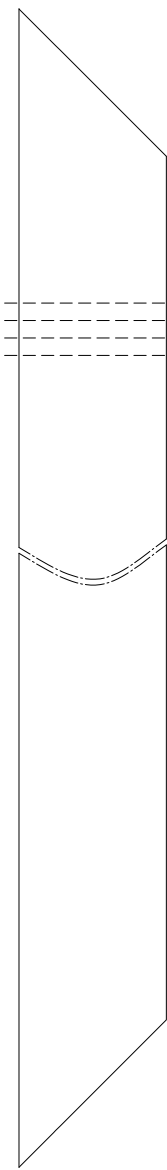
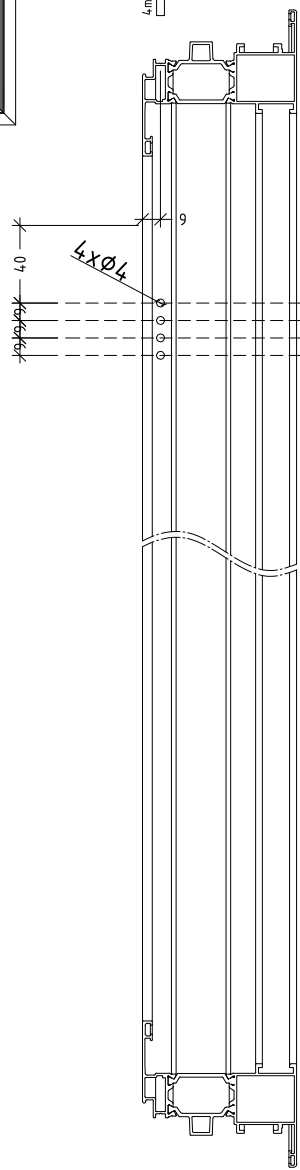
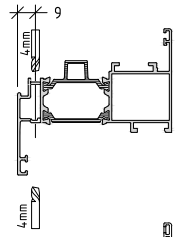
EW70-27

Additional treatment of profiles after cutting
casement E4270200 - machining for ventilation

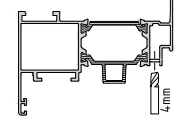
exterior view



Upper side
E4270200



Down side
E4270200

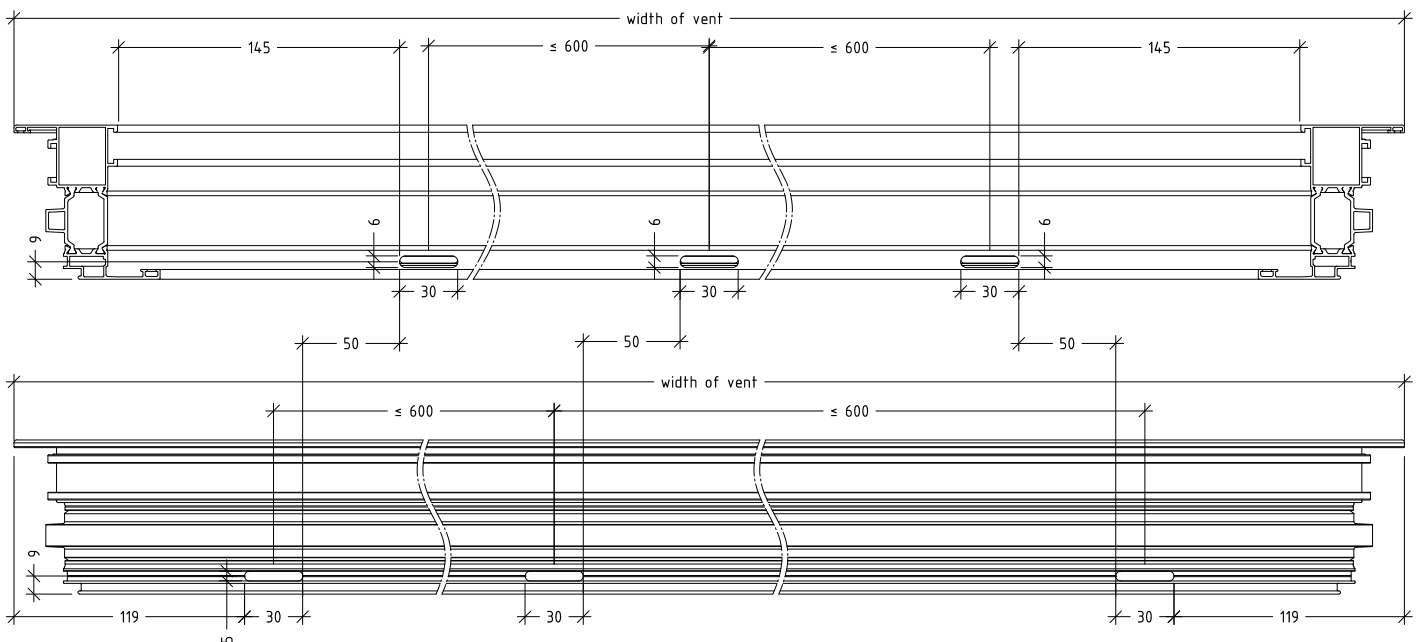
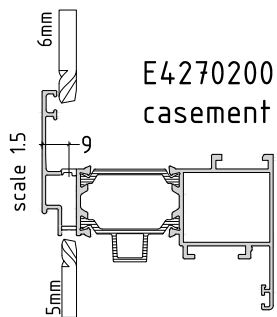
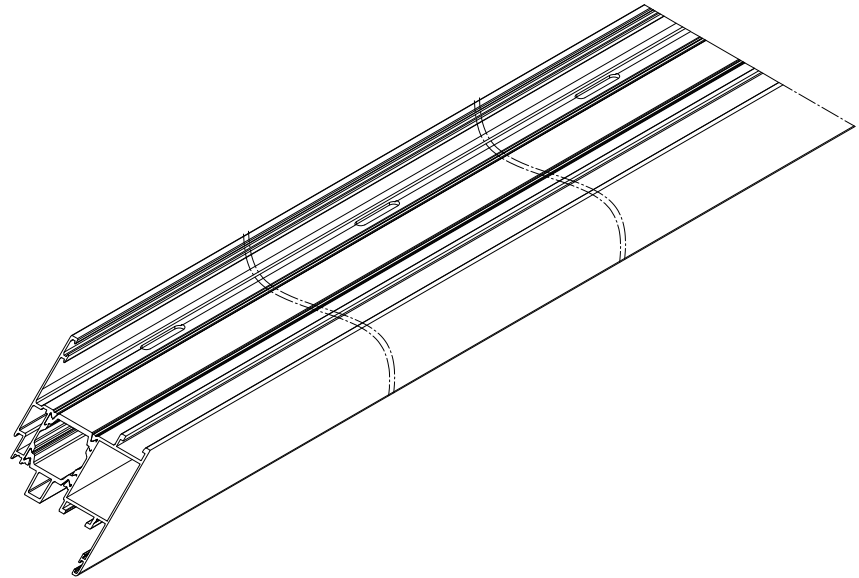
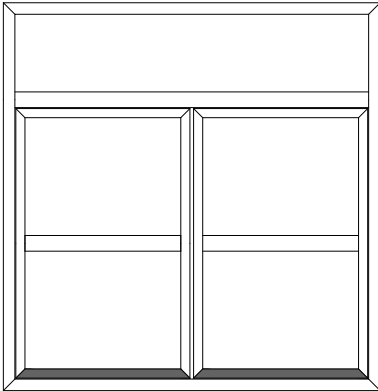


Note:
This machining's is valid for all the casement profiles with Euro groove in the system

EW70-28

Additional treatment of profiles after cutting
casement E4270200 - machining for drainage

exterior view

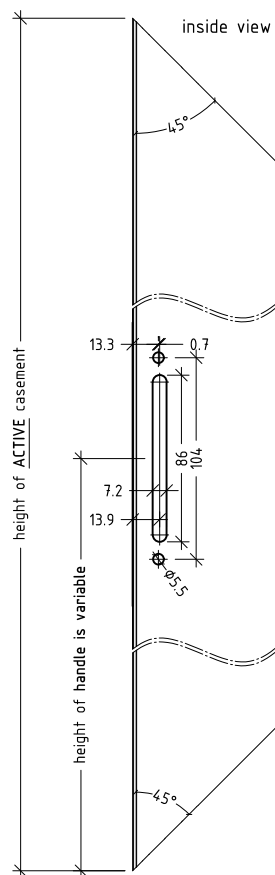
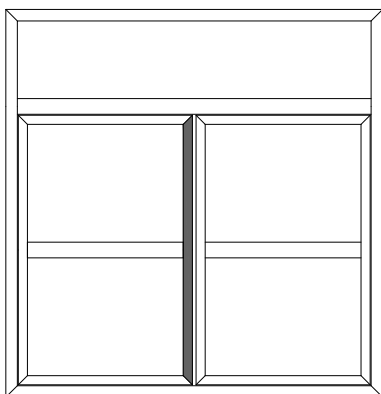


Note:
This machining is valid for all the casement profiles in the system

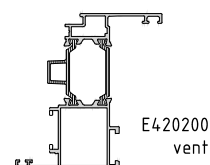
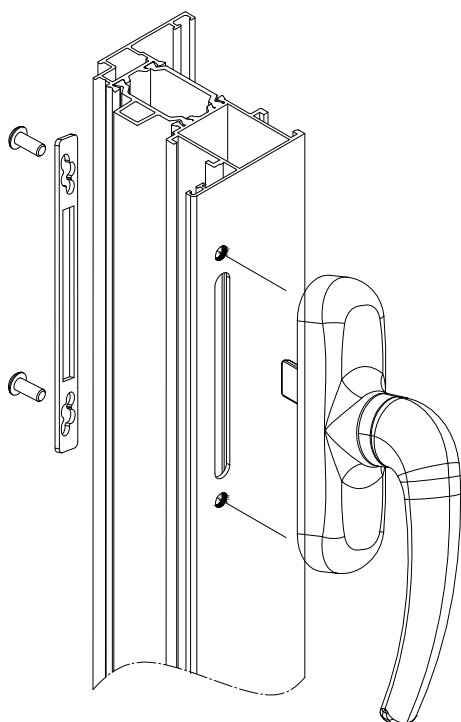
EW70-29

Additional treatment of profiles after cutting casement E4270200 - machining for handle on active vent

exterior view



machining for window handle



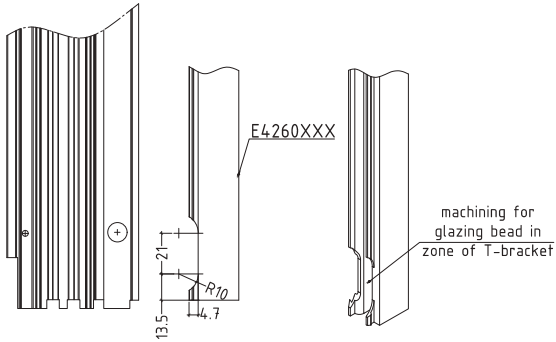
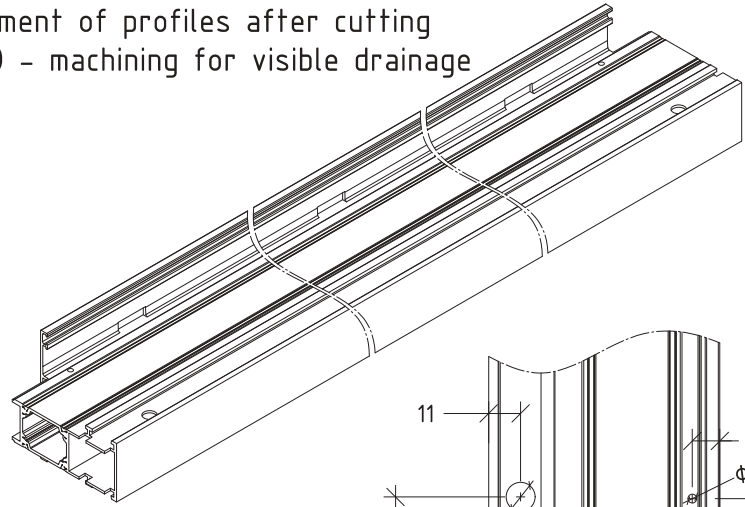
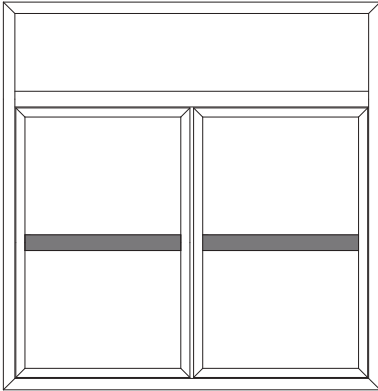
NOTE:

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

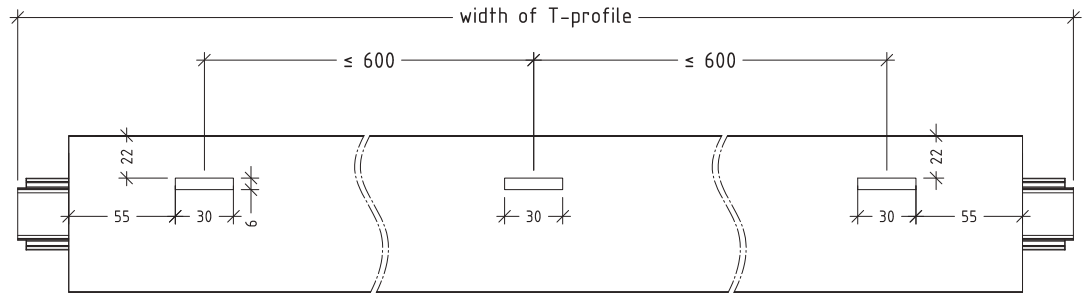
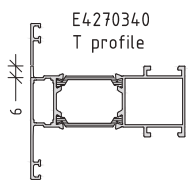
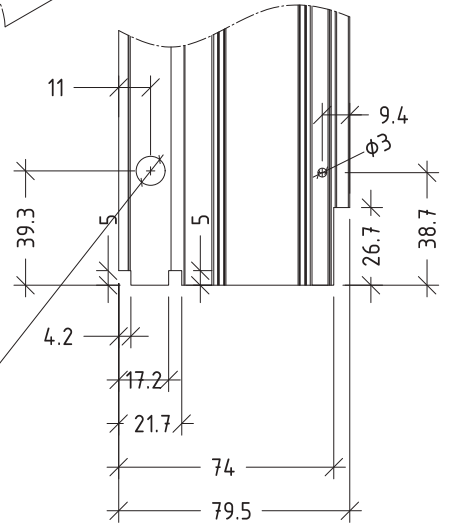
Note:
This machining is valid for all the casement profiles with Euro groove in the system

Additional treatment of profiles after cutting
T-profile E4270340 - machining for visible drainage

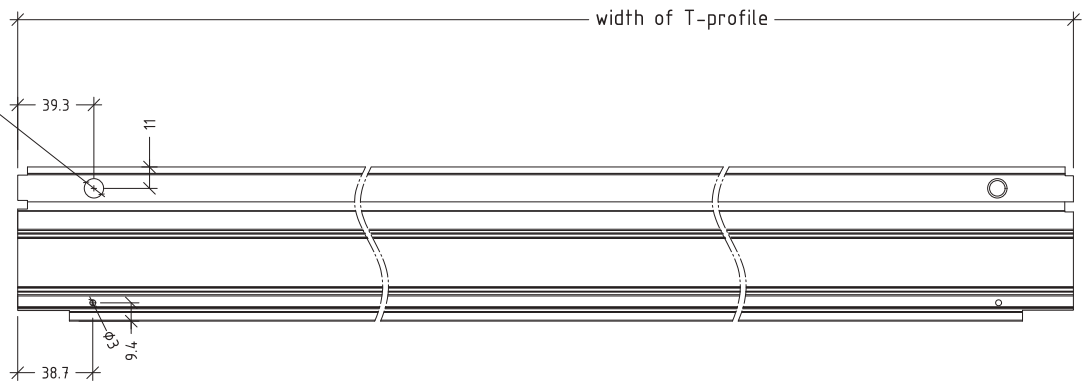
exterior view



$\phi 10$ - for accessory
ET070206.00

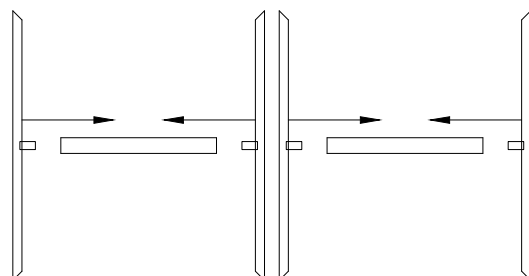


$\phi 10$ - for accessory
ET070206.00

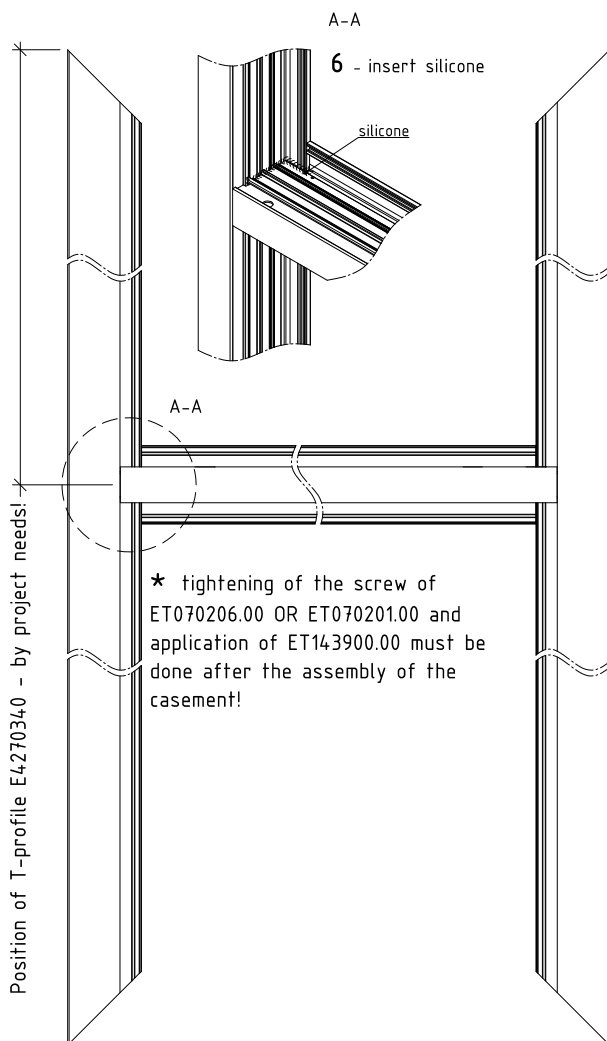
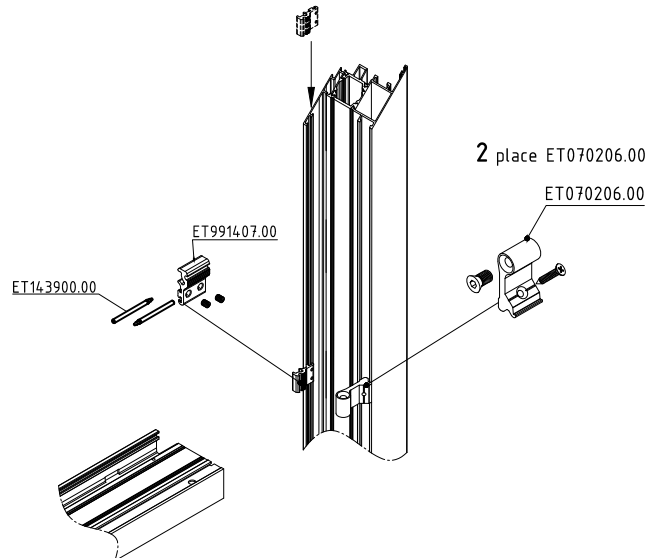


EW70-31

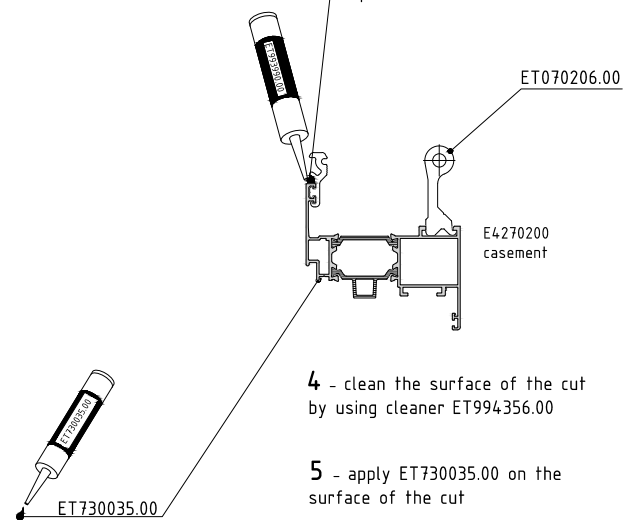
Sequence for mounting of T-profile E4270340 to the casement E4270200



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



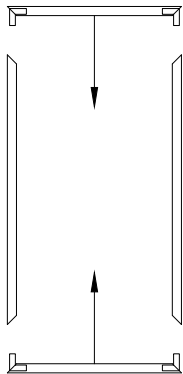
3 Apply silicone to the indicated place before final frame assembly



Note:

* This mounting sequence is valid for all casement profile with Euro groove in the system

Sequence for assembly the casement E4270200



3 - put the joints in the chambers of casement E4270200

ET054834.00

ET054835.00

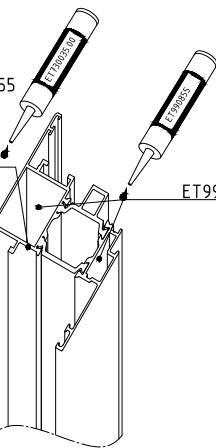
ET994356.00

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

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

ET730035.00

ET990855



4 - insert alignment square with locking function ET058001.00 in casement E4270200. Lock it to the casement. Insert silicone to specific point

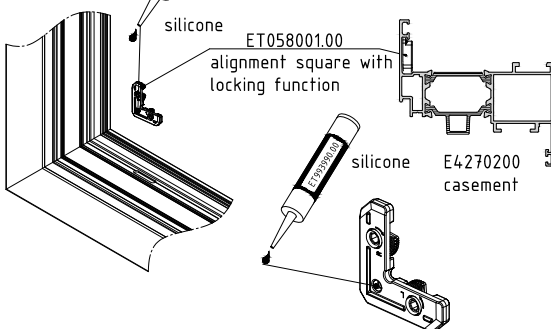
silicone

ET058001.00

alignment square with locking function

silicone

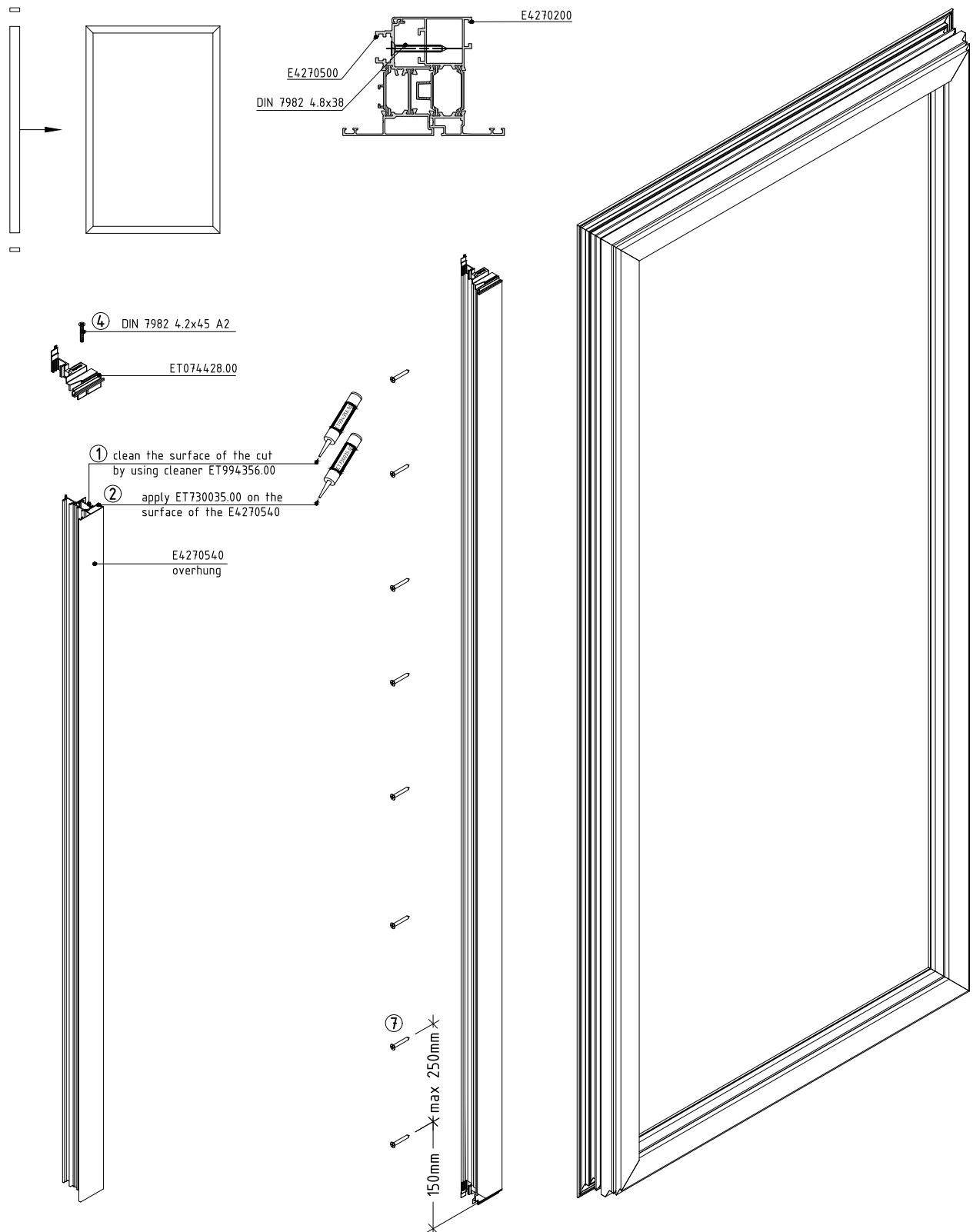
E4270200 casement



Note:

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

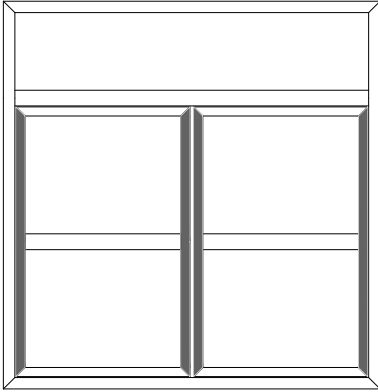
Sequence for assembly the E4270500 overhung and mounting to the casement E4270200



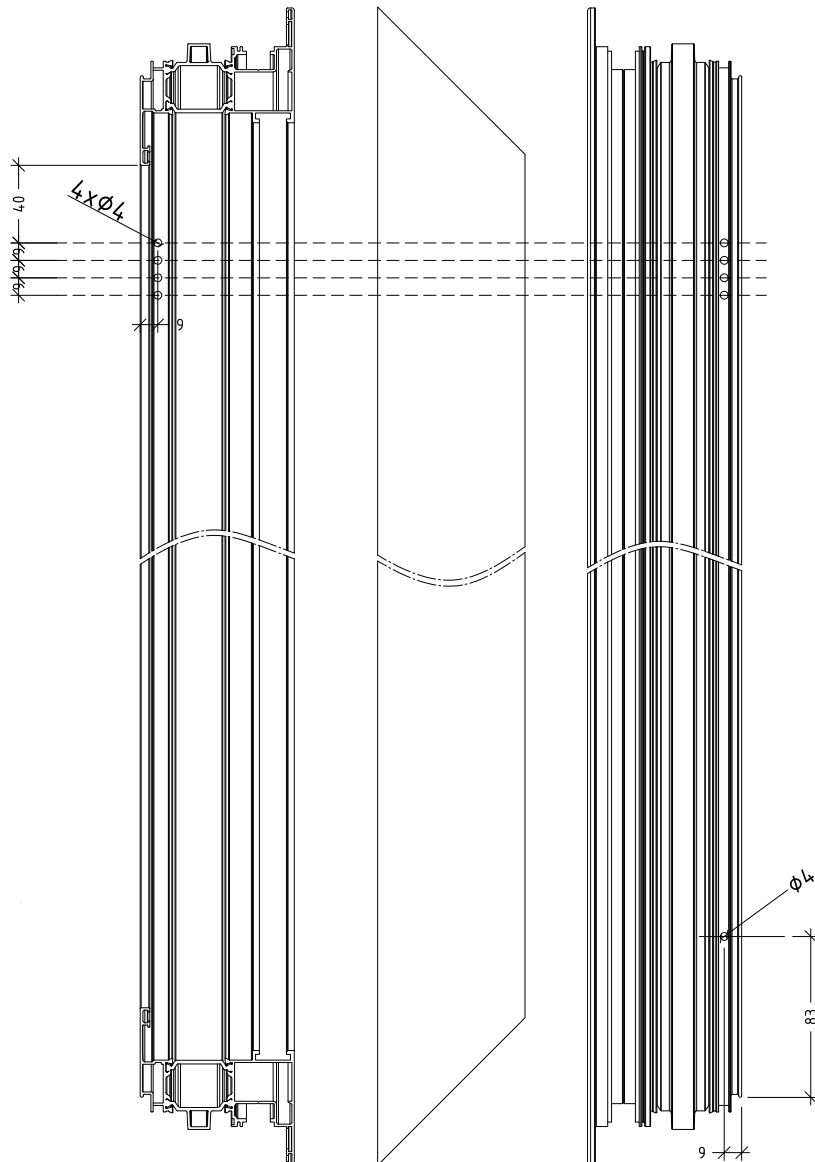
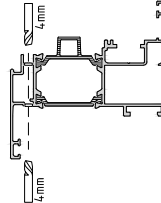
EW70-34

Additional treatment of profiles after cutting
casement E4270220 - machining for ventilation

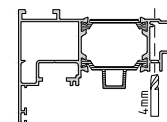
exterior view



Upper side
E4270220



Down side
E4270220

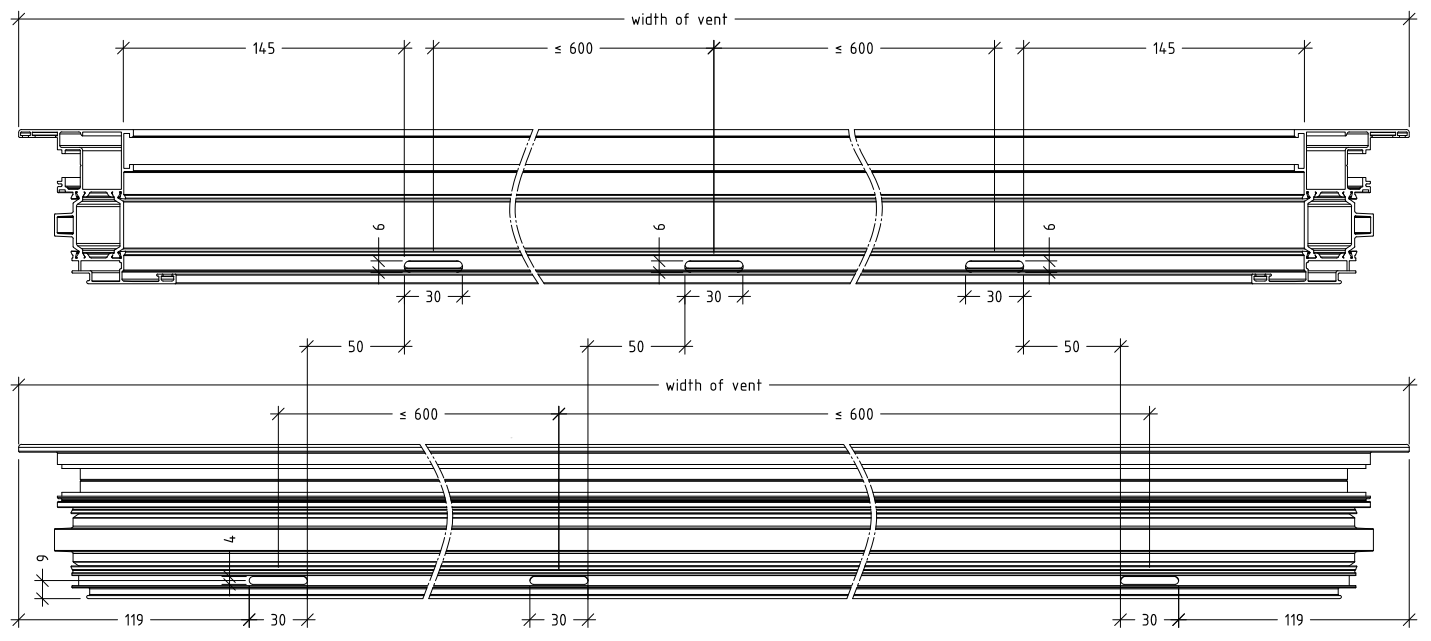
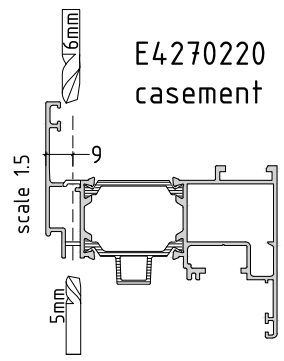
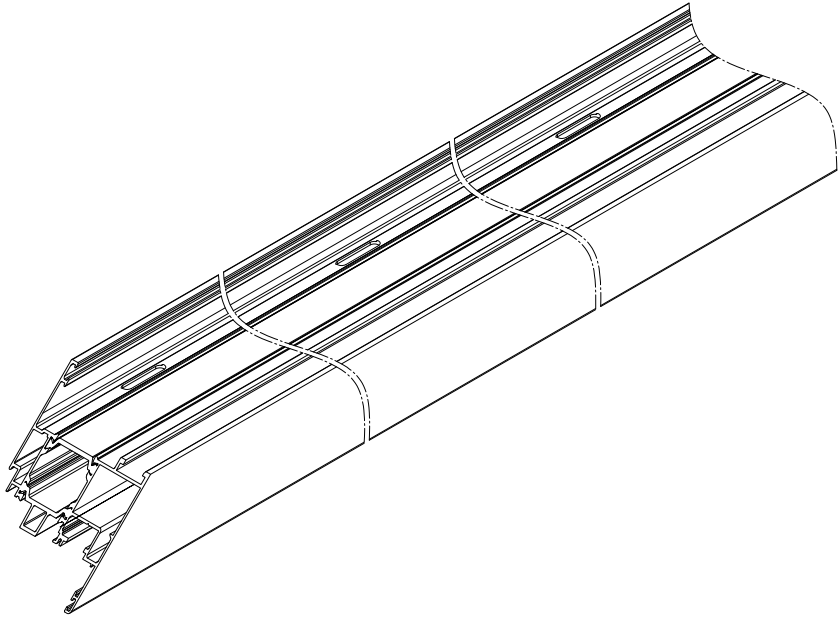
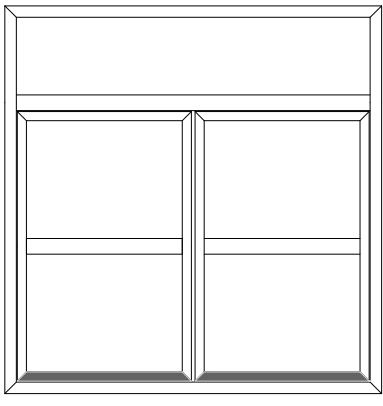


Note:
This machining's is valid for all the casement profiles with Euro groove in the system

EW70-35

Additional treatment of profiles after cutting
casement E4270220 - machining for drainage

exterior view

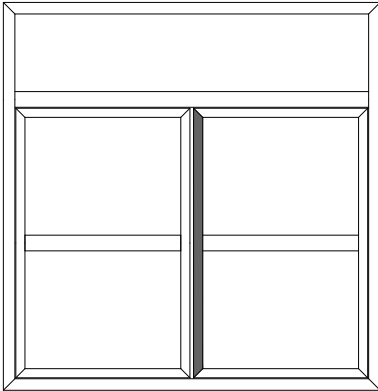


Note:
This machining is valid for all the casement profiles in the system

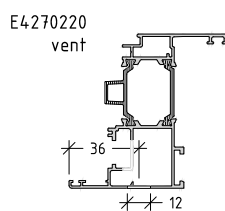
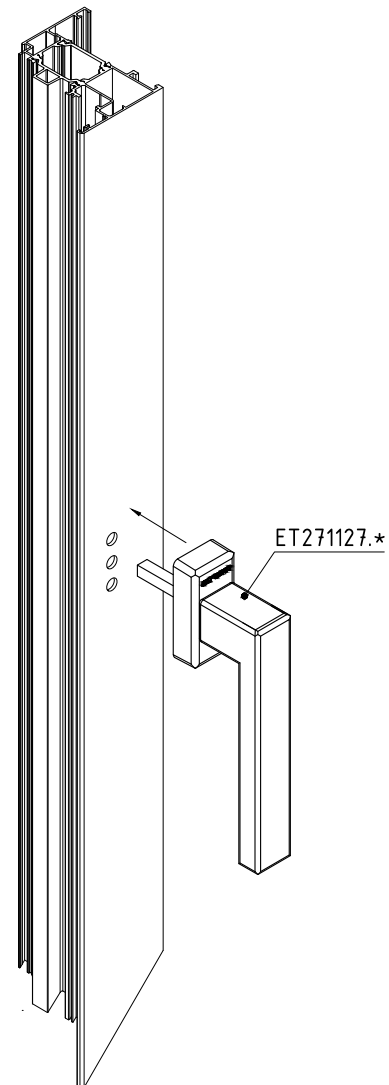
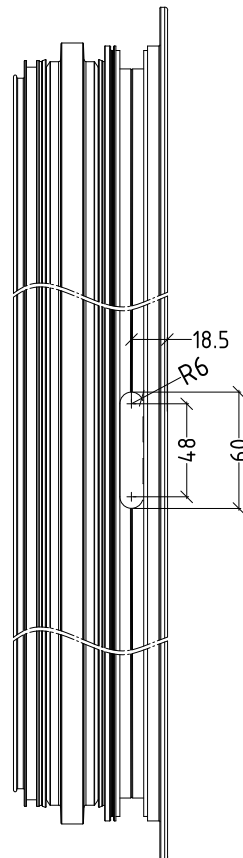
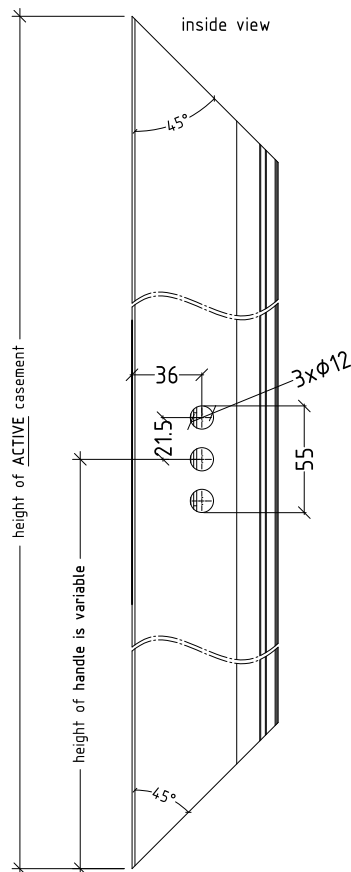
EW70-36

Additional treatment of profiles after cutting
casement E4270220 - machining for handle on active vent

exterior view



machining's to fix T/T handle

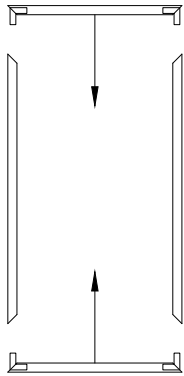


NOTE:

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

EW70-37

Assembly sequence for casement E4270220



3 - put the joints in the chambers of vent E4270220

ET054875.00

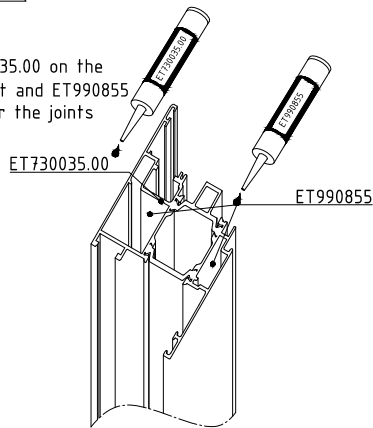
ET054838.00



ET994356.00

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

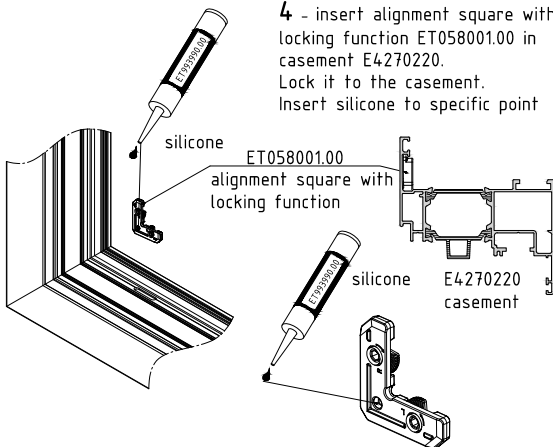
2 - apply ET730035.00 on the surface of the cut and ET990855 in the grooves for the joints



ET730035.00

ET990855

4 - insert alignment square with locking function ET058001.00 in casement E4270220. Lock it to the casement. Insert silicone to specific point



silicone

ET058001.00

alignment square with locking function

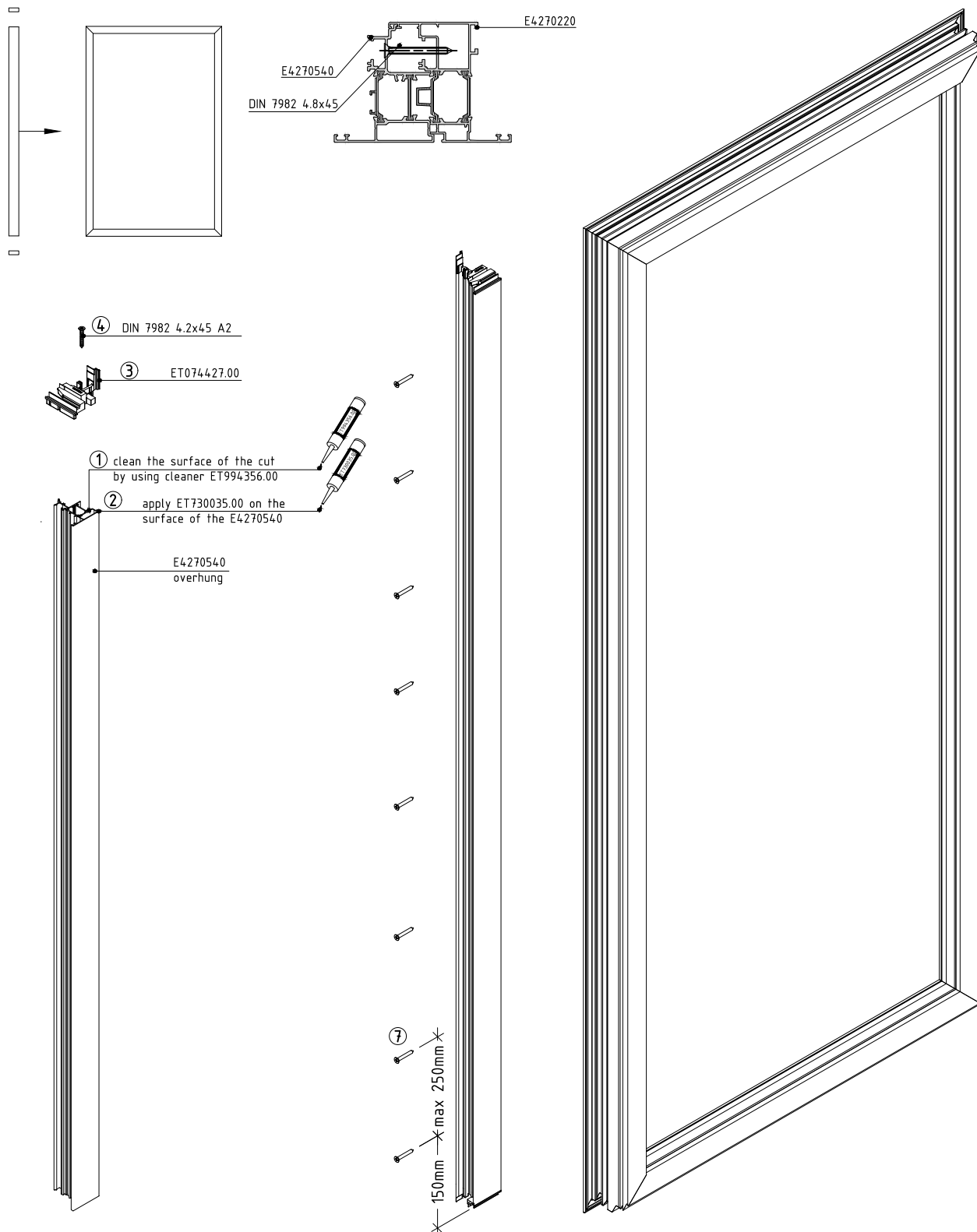
silicone

E4270220 casement

Note:

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

Assembly sequence for E4270220 casement and mounting E4270500 overhung



ACCESSORIES

opening system with thermal break

EW70

code/description	package/pcs	colour
ET 130475.00	125	●

glazing EPDM gasket (3mm)



ET 130476.00	75	●
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glazing EPDM gasket (3mm)



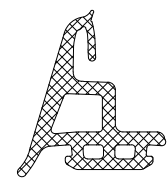
ET 130758.00	150	●
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interior EPDM gasket
TOPLINE



ET 130070.00	40	●
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central EPDM gasket for
EW70 premium



opening system with thermal break

EW70

code/description	package/pcs	colour
ET 130176.00	80	●

glazing EPDM gasket
press-in 5-6 mm



ET 130177.00	60	●
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glazing EPDM gasket
press-in 7-8 mm



ET 130205.00	75	●
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glazing EPDM gasket
press-in 5 mm



ET 130206.00	75	●
---------------------	----	---

glazing EPDM gasket
press-in 6 mm



A 100 01

opening system with thermal break

EW70

code/description	package/pcs	colour
ET 130207.00	75	●

glazing EPDM gasket
press-in 7 mm



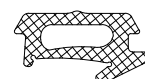
ET 130208.00	40	●
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glazing EPDM gasket
press-in 8 mm



ET 130433.00	40	●
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EPDM gasket for 75603
round column



ET 130131.00	200	●
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EPDM gasket for 75603
round column

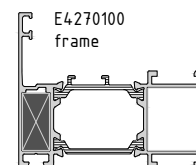
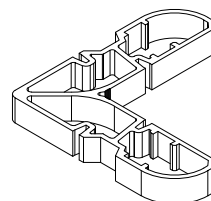


opening system with thermal break

EW70

code/description	package/pcs	colour
ET 054826.00	250	●

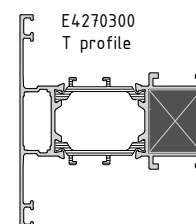
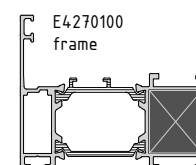
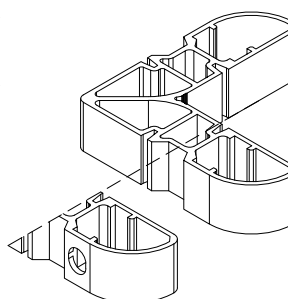
CORNER 10.2mm(70954) FOR
E4.270100



ET 054827.00	50	●
ET 054844.00	50	●

CORNER 19.8mm(40951) FOR
E4.270100; E4.270300

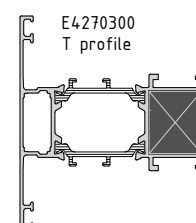
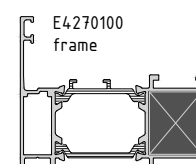
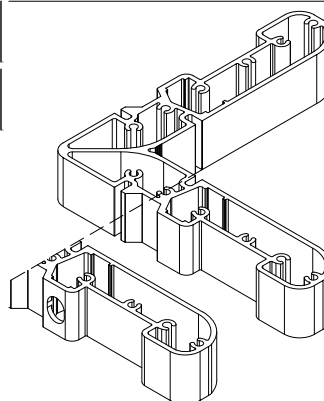
CORNER 19.8(40951) FOR
E4.270100; E4.270300 with
hole for pin



ET 054830.00	50	●
ET 054845.00	50	●

CORNER 19.8mm (40984) FOR
E4.270100; E4.270300 for GU

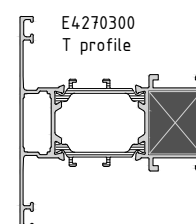
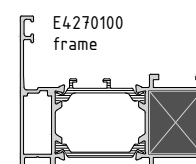
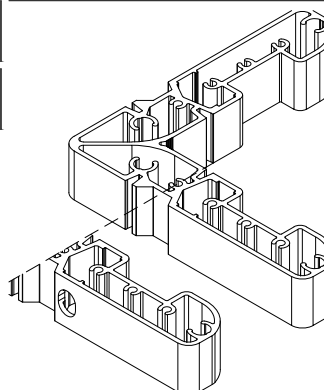
CORNER 19.8mm (40984)
E4.270100; E4.270300
with hole for pin GU



ET 054832.00	50	●
ET 054846.00	50	●

CORNER 19.8mm (40983) FOR
E4.270100; E4.270300
WINKHAUS

CORNER 19.8 mm (40983)
E4.270100; E4.270300
with hole for pin
WINKHAUS



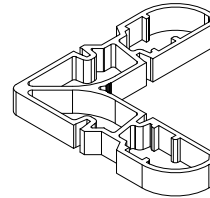
A68-27

opening system with thermal break

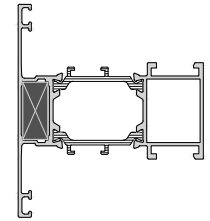
EW70

code/description	package/pcs	colour
ET 054833.00	250	●

CORNER 9.4mm(70954)FOR
E4270300

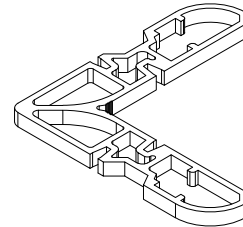


E4270300
T profile

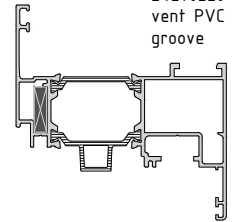


ET 054875.00	300	●
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CORNER 4,6mm(40990) FOR
E4270220

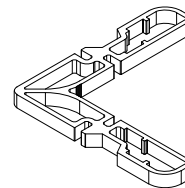


E4270220
vent PVC
groove

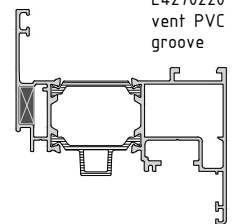


ET 054837.00	300	●
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CORNER 5.4mm(59114) FOR
E4270220



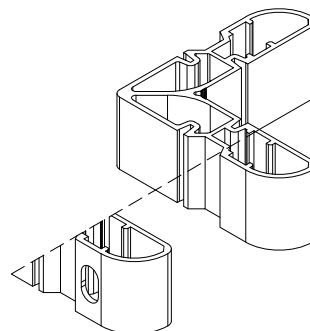
E4270220
vent PVC
groove



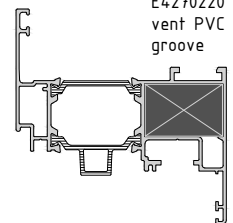
ET 054838.00	50	●
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CORNER 29.2mm (40954) FOR
E4270220

CORNER 29.2mm (40954) FOR
E4270220 WITH HOLE



E4270220
vent PVC
groove

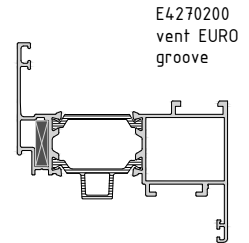
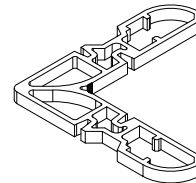


opening system with thermal break

EW70

code/description	package/pcs	colour
ET 054834.00	300	●

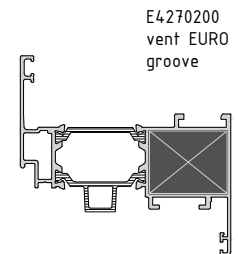
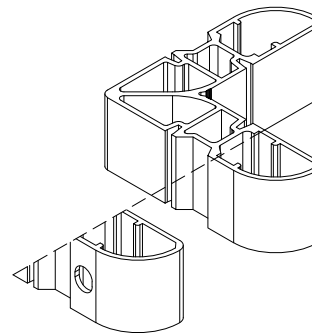
CORNER 4.7mm(40990) FOR E4270200



ET 054835.00	50	●
ET 054847.00	50	●

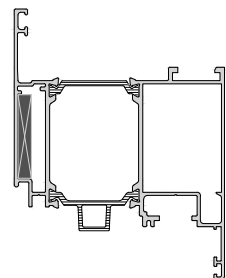
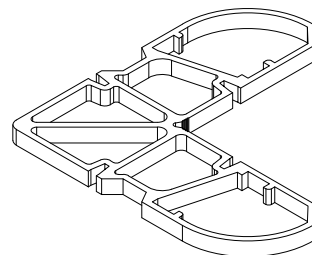
CORNER 29.3mm (40951) FOR E4270200

CORNER 29.3mm (40951) FOR E4270200 with hole



ET 054871.00	50	●
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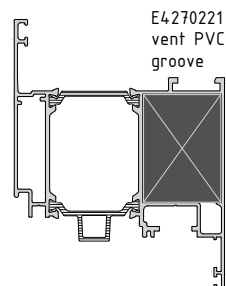
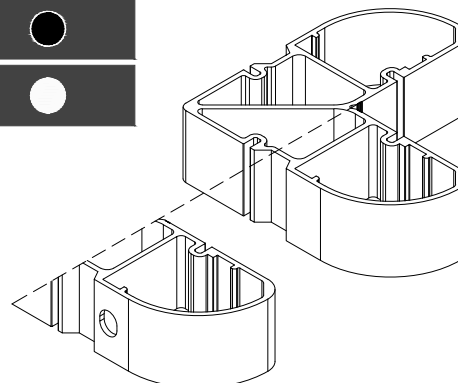
CORNER 5.1mm(40952) FOR E4270221



ET 054841.00	50	●
ET 054849.00	50	●

CORNER 29.2mm(75952) FOR E4270221

CORNER 29.2mm (75952) E4270221 WITH HOLE



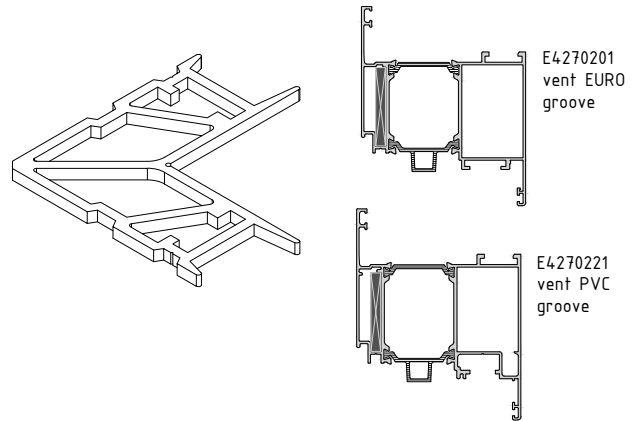
A68-29

opening system with thermal break

EW70

code/description	package/pcs	colour
ET 054842.00	50	●

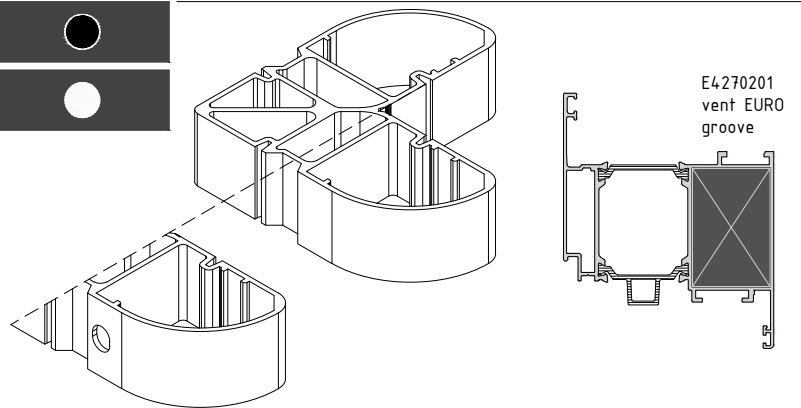
CORNER 4.7mm(5382) FOR E4270201



ET 054843.00	50	●
ET 054850.00	50	●

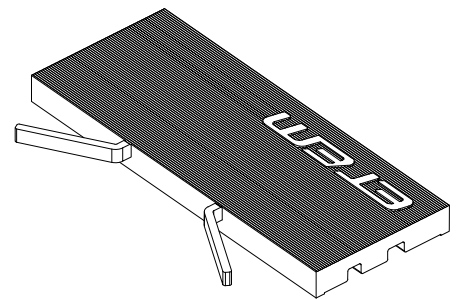
CORNER 29.3mm (40953) FOR E4270201

CORNER 29.3mm (40953) E4270201 WITH HOLE



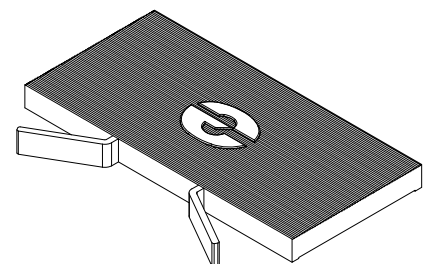
ET 073701.00	50	●
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alignment pad for frame E4270100



ET 073681.00	50	●
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alignment pad for sash

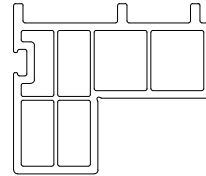


opening system with thermal break

EW70

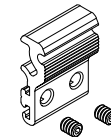
code/description	package/pcs	colour
ET 080068.00	8pcs x 6m	●

mounting PVC profile



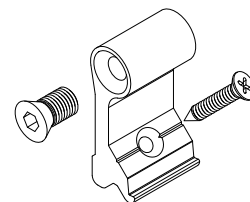
ET 991407.00	10	MF
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T - bracket external side for
E4270300 / E4270340



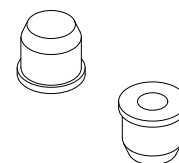
ET 070206.00	10	MF
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T - bracket internal side for
E4270300 / E4270340



ET 143914.00	100	MF
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roll pin 4/8 x 6.5 mm - inox

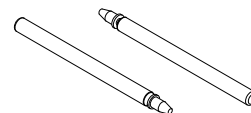


opening system with thermal break

EW70

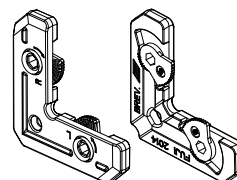
code/description	package/pcs	colour
ET 143900.00	100	MF

roll pin 3 x 6 mm with handle



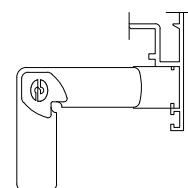
ET 058001.00	250	MF
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alignment square with locking function



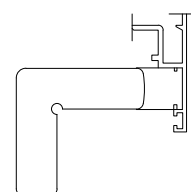
ET 057707.00	100	MF
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alignment square (plastic)
for E4270220;E4270221



ET 055509.00	100	INOX
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alignment square (INOX)
for E4270220;E4270221

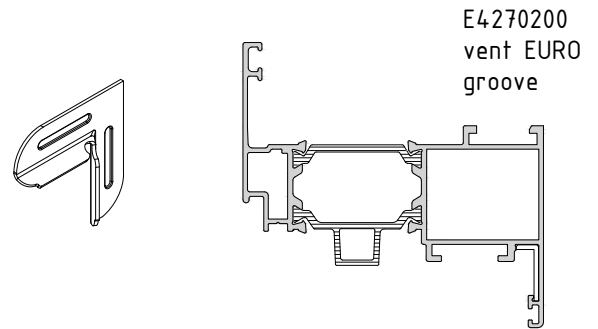


opening system with thermal break

EW70

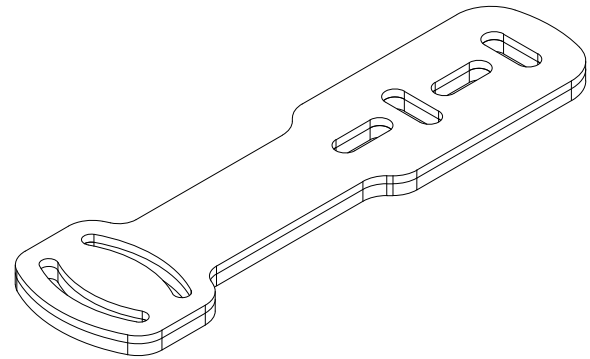
code/description	package/pcs	colour
ET 991298.00	20	●

alignment square for
E4270200 / E4270201



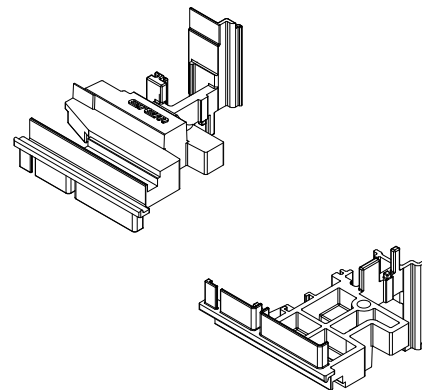
ET 055516.00	1	-
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anchor for E75603



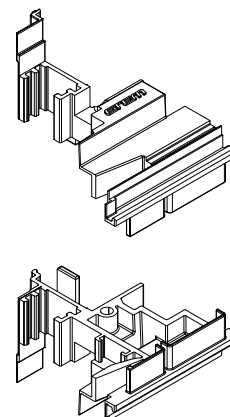
ET 074427.00	5	●
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pair PA6 plugs for E4270540



ET 074428.00	5	●
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pair PA6 plugs for E4270500



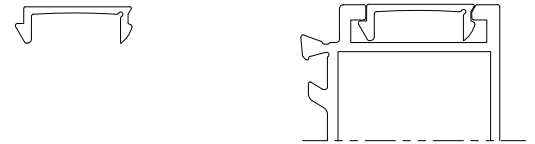
A68-33

opening system with thermal break

EW70

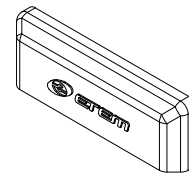
code/description	package/pcs	colour
ET 080199.00	6	●
ET 991308.00	6	●

PVC plug for euro groove



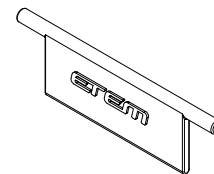
ET 074306.00	200	●
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plastic drainage cap 30x6mm



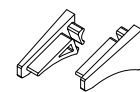
ET 074307.00	200	●
---------------------	-----	---

flap for drainage cap



ET 74629.00	200	●
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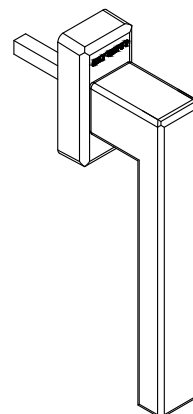
plastic plug for drip profile
E2357



opening system with thermal break

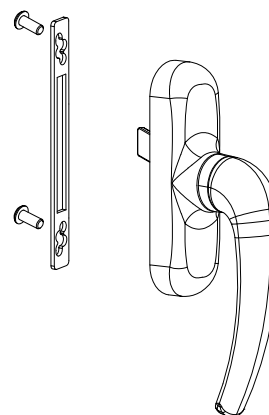
EW70

code/description	package/pcs	colour
ET 271127.02	1	●
ET 271127.11	1	●



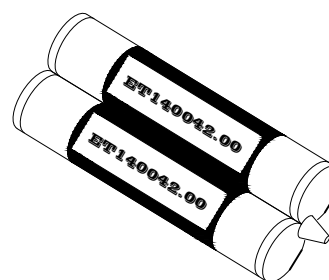
HANDLE HOPPE TOULON
(including screws)

GI 235016.01	1	●
GI 235016.02	1	●
GI 235016.06	1	●



Handle for T/T mechanism
Prima

ET 140042.00	1	-
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adhesive for corner brackets
ETEM 600ml

ET 140044.00	1	-
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pistol



opening system with thermal break

EW70

code/description	package/pcs	colour
ET 140043.00	1	-

mixer



ET 140045.00	1	-
---------------------	---	---

primer super bond 30ml



ET 730035.00	1	-
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Vario protect



ET 750016.00	1	-
---------------------	---	---

cleaner for Vario protect
1l

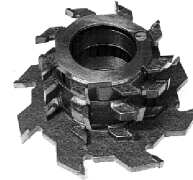


opening system with thermal break

EW70

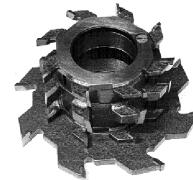
code/description	package/pcs	colour
ET 995760.00	1	-

end milling tool for
E4270340



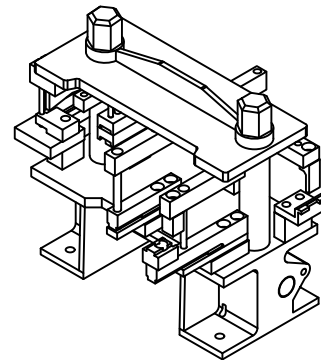
ET 995693.00	1	-
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end milling tool for
E4270300



ET 162262.00	1	-
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punching machine ETEM



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CE MARKING

STANDARDS / REQUIREMENTS

CE MARKING

WHAT DOES THE SIGN CE MEAN?

It is an abbreviation of the French "Conformite Europeene"- i.e. European Conformity. By placing the CE marking the manufacturer declares that the product complies with the general safety requirements set out in the Construction Product Regulation 305/2011.

WHAT IS THE PURPOSE OF CE MARKING?

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

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

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

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

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

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

WHAT ARE THE REQUIREMENTS FOR THE CE MARKING?

Doors, windows and gates (except those intended to be used for internal communication only, for fire/smoke compartmentation and on escape routes) are covered by System 3 of assessment and verification of constancy of performance.

According to the Construction Product Regulation 305/2011, this system sets the following duties:

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

LEGAL ACTS

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

MAIN METHODS FOR OBTAINING TEST RESULTS BY THE MANUFACTURER

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

1

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



NOTIFIED TESTING LABORATORY TESTS THE SAMPLE



THE MANUFACTURER OWNS THE TEST REPORT



MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

2

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



NOTIFIED TESTING LABORATORY TESTS THE SAMPLE



THE PARTNER OWNS THE TEST REPORT



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



MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

3

THE SYSTEM PROVIDER SELECTS SAMPLES FOR TESTING



NOTIFIED TESTING LABORATORY TESTS THE SAMPLE



THE SYSTEM PROVIDER OWNS THE TEST REPORT



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



■ AGREEMENT BETWEEN THE MANUFACTURER AND THE SYSTEM PROVIDER

■ INSTRUCTIONS FOR ASSEMBLING AND INSTALLATION OF THE SYSTEM PROVIDER RELEVANT FOR FPC OF THE MANUFACTURER

■ NO REDUCTION OF PERFORMANCE LEVEL OF THE PRODUCT



MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

SAMPLE DECLARATION FOR WINDOWS/DOORS

Declaration of performance Nº

1. Unique identification code of the product type: W-01
2. Intended use / uses: Window/ External pedestrian doorset intended to be used in domestic and commercial locations
3. Manufacturer: Name
Address
Phone
Email
Website
4. Authorized representative (if applicable) Name
Address
Phone
Email
Website
5. System of assessment and verification of constancy of performance: 3
6. Harmonized standard: EN 14351-1:2006 + A1:2010
7. Notified body/bodies: Notified body XXX, Identification number of NB 1234 performed determination of the product-type on the basis of type testing under system 3 and issued test and classification report Nº123456, issued on 01.02.2015

8. Declared performance:

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

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

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

Signed for and on behalf of the manufacturer by:

.....
(name and function)

Place and date of issue:
Sofia, 01.07.2016

Signature:
.....

STANDARDS

GENERAL

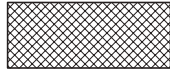
- EN 12020 (1÷2) - ALUMINIUM AND ALUMINIUM ALLOYS - EXTRUDED PRECISION PROFILES IN ALLOYS EN AW-6060 AND EN AW-6063
- EN 755 (1÷9)- ALUMINIUM AND ALUMINIUM ALLOYS - EXTRUDED ROD/BAR, TUBE AND PROFILES
- EN 573 (1÷3) - ALUMINIUM AND ALUMINIUM ALLOYS - CHEMICAL COMPOSITION AND FORM OF WROUGHT PRODUCTS
- EN 1990 EUROCODE - BASIS OF STRUCTURAL DESIGN
- EN 1991 EUROCODE 1 - ACTIONS ON STRUCTURES
- EN 1998 EUROCODE 8 - DESIGN OF STRUCTURES FOR EARTHQUAKE RESISTANCE
- EN 1999 EUROCODE 9 - DESIGN OF ALUMINIUM STRUCTURES

WINDOWS AND DOORS

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

HATCHES

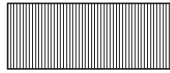
Hatches for different materials



EPDM



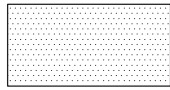
butyl seal



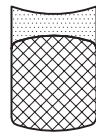
PVC



membrane



gypsum board



silicone seal

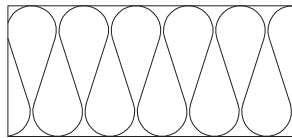
backer rod



silicone seal



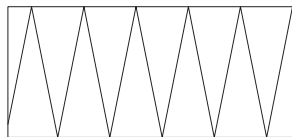
PVC spacer



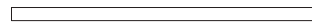
Insulation soft



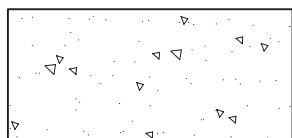
etalbond



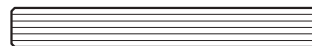
Insulation hard



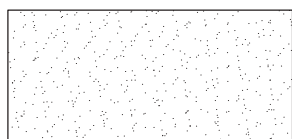
sheet aluminium



concrete wall



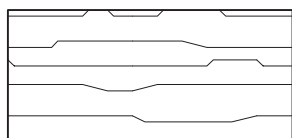
glass



plaster



aluminium profile



wood



steel

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

The right choice of all elements as well as any special requirements regarding stability of the structure must always be considered by the structural/façade engineer, responsible for the project.

The solutions presented in these pages are indicative and can not cover all possible project cases. Because of that every single project has to be evaluated by the structural/facade engineer in charge taking into consideration the specific features, such as climate conditions, location, orientation, etc.

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