

E45 E8000

TECHNICAL CATALOGUE

UNITISED FAÇADE SYSTEMS

E52

Q72

E99

E50

E90 E75

E2300

E40

Q60

E19

E99

E90

UNITISED FAÇADE SYSTEMS

TABLE OF CONTENTS

I.

E99 UNITISED FAÇADE SYSTEM

GENERAL INFORMATION	page 09
BUILDING PHYSICS	page 15
TABLES	page 31
PROFILES	page 35
COVER CAP	page 43
MACHINING	page 55
ACCESSORIES	page 63

II.

E90 UNITISED FAÇADE SYSTEM

GENERAL INFORMATION	page 75
TABLES	page 83
PROFILES	page 87
COVER CAP	page 95
MACHINING	page 105
ACCESSORIES	page 111

III.

CE MARKING

ETEM HISTORY

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

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

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

SERVICES WE PROVIDE

▷ **Design & Engineering** - ETEM creates catalogue and tailor made solutions that can be easily combined into entire building envelopes, if needed. We have a broad portfolio of façades, curtain wall module systems, adaptive modular solutions, sunshading systems, claddings, rain screens and other deliberated engineering solutions.

▷ **Testing & Certification** - In order to secure a smooth service life of a building, we don't leave anything to chance. You can be sure that our systems have been tested in advance in every imaginable real-life situation as well as in exceptional extreme circumstances. We produce mock-ups and prototypes of our solutions.

▷ **Analysis & Specification** - Building physics and technical requirements are taken into serious consideration at the very initial project stage. ETEM always minimizes the risk of mistakes at early stage by making analyses and specifications. We are applying the holistic approach while observing the building envelope as a whole and involving all related participants in the process in a multidisciplinary team.

▷ **Development & Innovation** - Thinking ahead starts for us in the present. That's why we make preliminary energy and thermal simulations and calculate energy saving variants like different shading concepts or possibilities for the generation of solar energy from the façade in advance and integrate them already in the construction process of a building, for a future optimization of its energy expenses.

▷ **Communication & Coordination** - Every project's success depends on the skills and ambitions of experts and people from different fields of knowledge. At ETEM we make sure to coordinate suppliers and contractors and facilitate the communication between architects, developers, constructors and investors. We can also act as a supervisor throughout the bidding process to keep all the process controlled, we can supervise the entire installation process and conduct site inspections, whenever required.

ETEM PRODUCTS AND SUSTAINABLE DEVELOPMENT

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

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

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

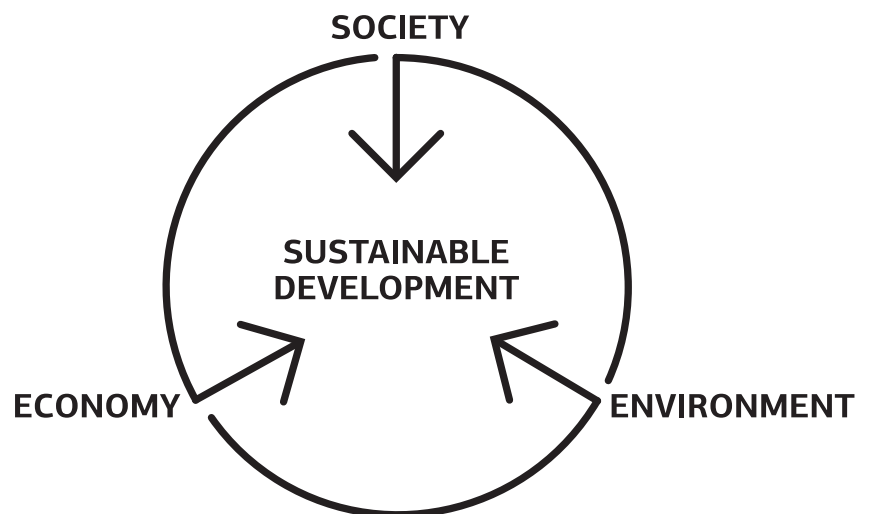
For us meeting this objective translates into the challenge of satisfying market demands at the lowest economic, social and environmental cost possible.

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

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

As a moderator between outside and inside our systems provide:

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



GENERAL INFORMATION

CONCEPT / ADVANTAGES / CERTIFICATES



WE CREATE TAILOR MADE SYSTEMS FOCUSED ON FINDING RATIONAL APPROACH TOWARDS THE CHALLENGES OF MODERN ARCHITECTURE. DURING THE DESIGN OF BOTH SYSTEMS

THE HOLISTIC APPROACH WAS FOLLOWED BY INTERDISCIPLINARY TEAMS OF SPECIALISTS, SEEKING TO BALANCE THE DIFFERENT ASPECTS OF THE BUILDING ENVELOPE AND FINDING THE BEST COMBINATION IN ORDER TO ACHIEVE THE HIGHEST PERFORMANCE CHARACTERISTICS.

Our E90 and E99 systems:

- Improve the quality and safety of the finished project
- Reduce installation and onsite labour time
- Ensure design freedom and uniqueness within the architectural solution.

WHAT IS AN UNITISED SYSTEM?

Unitised Façade is a curtain wall system using pre-fabricated units that form a lightweight frame of at least one storey height. The units may contain glass, infill panels as well as opening parts. Applied in most high-rise buildings worldwide they ensure unlimited design freedom with integration of different finishing, fast paced and economic installation, and extreme strength and stability accommodating the building movements.

FAST AND EFFICIENT INSTALLATION

WITH INDIVIDUALLY PREFABRICATED ELEMENTS

Unitised Façades ensure unmatched productivity with limited manpower and reduced onsite installation costs. The fast paced floor by floor construction allows for parallel finishing works inside the building thus shortening the overall construction schedules.

▷ **High on-site efficiency** - Unitised Systems ensure a drastic reduction of the installation time with 5 to 7 minutes per module. They allow working at the project site regardless of the weather conditions.

▷ **Structure completed at the factory** - Unitised System modules are completely finished and glazed according to highest quality standards at the factory. The gaskets infill panels are put in place in advance.

▷ **Tests and certificates** - The systems are tested and their conformity with the European standards is assessed by different notified bodies.

▷ **Secure installation** - The different units can be mounted easily onto the main structure and fixed securely by specially designed adjustable fixing devices. The installation is carried out with platforms or a crane and light mechanization, no scaffolding being necessary.

ENDLESS DESIGN FREEDOM

WITH SEAMLESS ADAPTATION TO SPECIFIC REQUIREMENTS

Unitised Systems offer unlimited possibilities to convey the unique aesthetics of the building and to answer the technical requirements of every single project while keeping the ease of installation.

▷ **Open system solutions** - The system may be individually adapted to the specific needs of the project and its base of standard components makes it compatible with all ETEM window systems.

▷ **Freedom of combination** - Unitised Façade provides the possibility for architects to combine different solutions flexibly, emphasizing the individuality and uniqueness of their project. It can be chosen from a wide variety of different materials, such as glass, ceramics, composite materials, fiber cement plates, HPL or stone.

▷ **Facade lighting** - Possibility for professional lighting of the façade, highlighting its advantages. Can be conceptualized, designed and installed in advance.

▷ **Selection of colours and finishes** - Customizing aluminium profiles with individually chosen colours and finishes via powder coating in a modern vertical powder coating installation.

BUILT-IN FUNCTIONALITY

RELATED TO PARTICULAR USE AND ENERGY PERFORMANCE OF THE BUILDING

Apart from the maximised daylight use, the modular concept of the Unitised Systems allows for improvement of thermal comfort and energy efficiency of the building.

▷ **Energy efficiency** - The systems are designed and developed so that to achieve a low overall U value using the advantages of triple glazing and the excellent properties of the high selective glasses.

▷ **Renewable sources** - Photo-voltaic panels can be installed optionally in the Unitised Façade, in order to produce additional energy from a renewable source.

▷ **Sun protection & ventilation** - Our modules are engineered to provide natural possibilities of ventilation, e.g. by outward projecting windows. Unitised System is compatible with all the openable ETEM systems. Additionally louvers, like the E66 system, can be installed to manage the light exposure of different rooms and protect against the sun

▷ **Security** - The system has been designed by means of specialized software for maximum security in compliance with the Eurocode 9 (EN 1999-1-1) and the applicable European regulations.

▷ **Weather resistance** - Unitised System guarantees a high level of water tightness with five levels of controlled drainage of condensed water and rainwater. The modules are engineered to correspond with the highest requirements for wind load and seismic resistance.

BUILDING PHYSICS

DIMENSIONING / FORMULAS / EXAMPLES

ALUMINIUM AS MATERIAL

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

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

ADVANTAGES

ALUMINIUM COMBINES MANY ADVANTAGES:

DESIGN FLEXIBILITY

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

LONG SERVICE LIFE

Aluminium building products are made from alloys that are weatherproof, corrosion-resistant and immune to the harmful effects of UV rays, ensuring optimal performance over a very long period 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	$R_m = 195 \text{ N/mm}^2$
Yield strength	$R_{p0,2} = 150 \text{ N/mm}^2$
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.

ANODIZING

It is an electrochemical process whereby to reinforce the natural oxide film on the aluminium surface, increasing hardness, corrosion and abrasion resistance. Anodizing gives a very decorative silver matt surface finish, and colored can also be obtained by sealing metallic dyes into the anodized layer.

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.

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.

* Part of the aforementioned information is an extract from report Sustainability of Aluminium in Buildings of the European Aluminium Association

DEFINITION OF CURTAIN WALLING

Curtain walling is a part of the building envelope made of a framework usually consisting of horizontal and vertical profiles, connected together and anchored to the supporting structure of the building, and containing fixed and/or openable infills, which provides all the required functions of an internal or external wall or part thereof, but does not contribute to the load bearing or the stability of the structure of the building. Curtain walling is designed as a self-supporting construction which transmits dead-loads and imposed loads to the main building structure.

Unitised construction is pre-assembled, interlinking, storey height or multi-storey height facade modules, complete with infill panels.

The stated definition is in accordance with European standards EN 13830 and EN 13119.

WIND ACTIONS

The main influence over the façade is wind action. Which depends mainly on the height of the curtain wall and location.

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

h	v	q	wind pressure	suction in middle zone	suction in edge zone	
(m)	(m/s)	(kg/m ²)	(kN/m ²)	cp= 0.5 h/b ≤ 0.25	cp= 0.7 h/b ≤ 0.5	cp= 2.0 h/8 ≤ 2 m
			cp= 0.8 wp* = 1.2x0.8xq kN/m ²	cp= 0.5 wa= 0.5 x q kN/m ²	cp= 0.7 wa= 0.7 x q kN/m ²	cp= 2.0 wa= 2.0 x q kN/m ²
0 - 8	28.3	50	0.5	0.25	0.35	1
8 - 20	35.8	80	0.8	0.4	0.56	1.6
20 - 100	42.0	110	1.1	0.55	0.77	2.2
> 100	45.6	130	1.3	0.65	0.91	2.6

Where:

h - building height, m

b - building width, m

v - wind velocity, m/s

q - wind load, kg/m² / kN/m²

w p/ s - wind pressure / suction, kN/m²

cp - correction factor

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

For calculating wind actions, when the wind velocity value is given in m/s, the following formula applies:

$$q = \frac{v^2}{16}, \text{ kg/m}^2$$

ALLOWABLE DEFLECTIONS

wind and snow load resistance:

In accordance with EN 13830 and Eurocode 9 the allowable deflections are as follows:

Under the imposed winds only the maximum frontal deflection (d) of the curtain walling's framing members shall not exceed the following limits:

- $d \leq L/200$, if $L \leq 3000$ mm;
- $d \leq 5 \text{ mm} + L/300$, if $3000 \text{ mm} < L < 7500$ mm;
- $d \leq L/250$, if $L \geq 7500$ mm.

when measured between the points of support or anchorage to the building's structure (L).

In addition, the permissible deflection limits of the infill shall be taken into account (usually taken 15 mm, because of IGU).

resistance to live horizontal loads at sill level:

In case of horizontal curtain walling's framing member (transom) actin as a sill, the maximum frontal deflection (d) of the curtain walling's framing members (transom) shall not exceed the following limits:

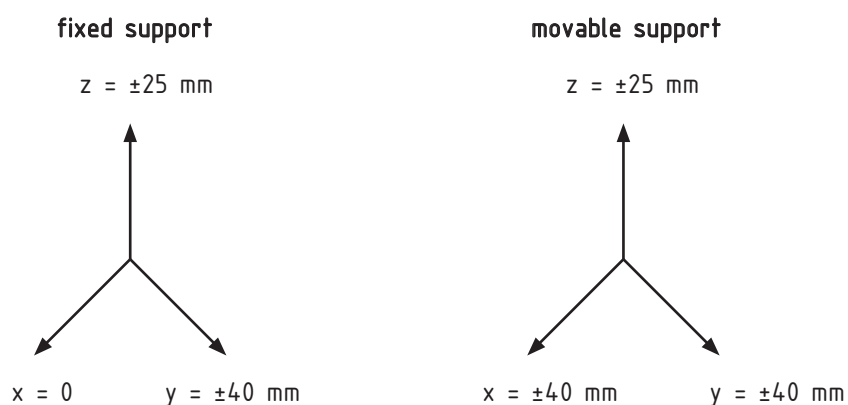
- $d \leq L/200$, if $L \leq 3000$ mm;
- $d \leq 5 \text{ mm} + L/300$, if $L > 3000$ mm.

L is the length of the curtain walling's framing members measured between its point of support.

FIXING BRACKETS

Fixing brackets must fulfill the following criteria:

- Transfer safely all loads from the facade resulting from the wind pressure, weight of mullions and transoms and weight of infill panels
- Permit movement of mullions caused by thermal expansion



THERMAL TRANSMITTANCE COEFFICIENT U_{CW} OF CURTAIN WALL

according to EN ISO 12631

$$U_{CW} = \frac{\sum A_g \cdot U_g + \sum A_p \cdot U_p + \sum A_f \cdot U_f + \sum A_m \cdot U_m + \sum A_t \cdot U_t + \sum l_g \cdot \psi_g + \sum l_p \cdot \psi_p}{A_{CW}} \quad (1)$$

$A_{CW} = A_g + A_p + A_f + A_m + A_t$
visible curtain wall area, (m²)

U_{CW} - thermal transmittance of the curtain wall, (W/m².K)
calculated by formula (1)

U_g - thermal transmittance of the glass, (W/m².K)
by the glass manufacturer

U_p - thermal transmittance of the panel, (W/m².K)
by the panel manufacturer

U_f - thermal transmittance of the aluminium profile, (W/m².K)
by system house

U_m - thermal transmittance of the mullion, (W/m².K)
by system house

U_t - thermal transmittance of the transom, (W/m².K)
by system house

l_g - total length of the glass spacer, (m)

l_p - total length of the panel spacer, (m)

ψ_g - linear thermal transmittance of the glass spacer, (W/m².K)

ψ_p - linear thermal transmittance of the panel spacer, (W/m².K)

A_g - visible glass area, (m²)

A_p - visible panel area, (m²)

A_f - aluminium frame area, (m²)

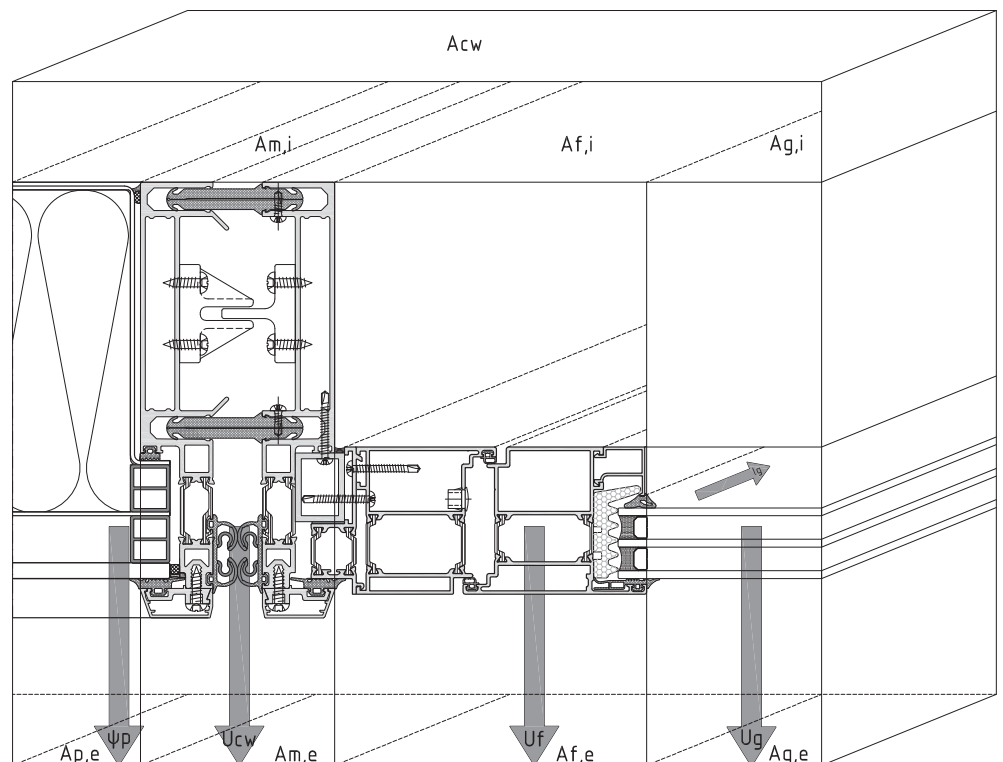
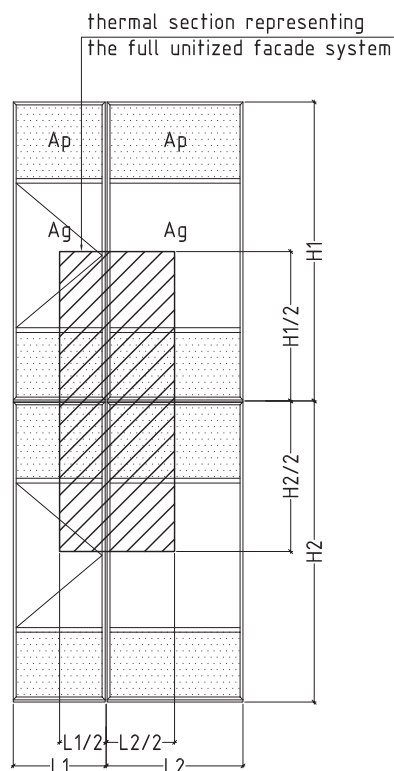
A_m - aluminium mullion area, (m²)

A_t - aluminium transom area, (m²)

R - thermal resistance, (W/m².K)

d - panel thickness, (m)

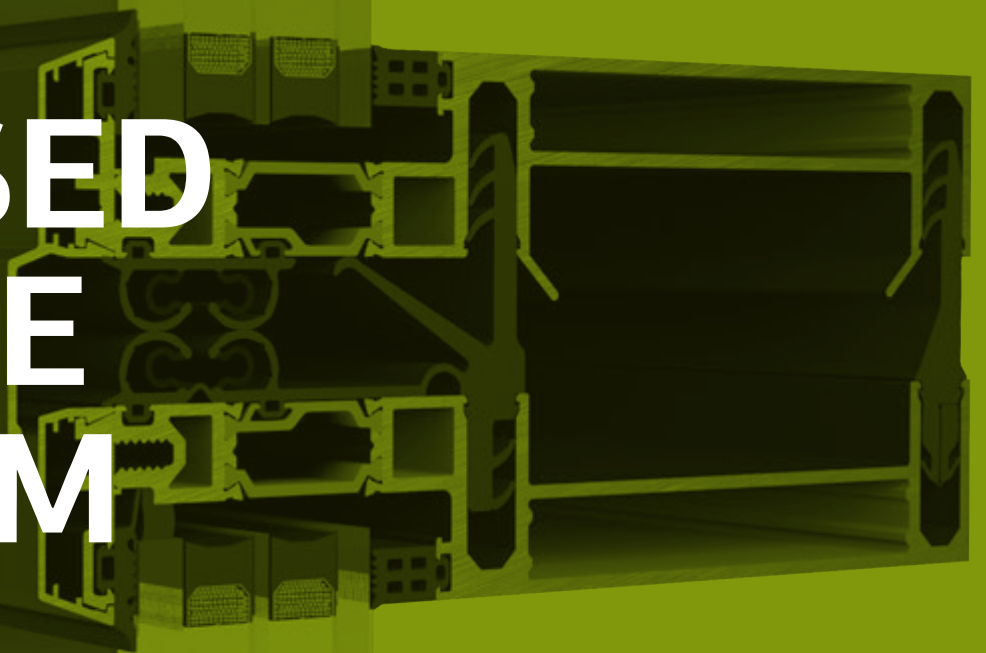
λ - thermal conductivity, (W/m².K)



I.

E99

UNITISED FAÇADE SYSTEM



E99 UNITISED FAÇADE SYSTEM

BESPOKE MODULAR FAÇADE SYSTEM DESIGNED FOR THE FIRST HIGH-RISE BUILDING IN BULGARIA

- Variety of cladding solution
- 99 mm system width
- 25 mm gap between modules, allowing movement and deformations up to 14 mm
- High quality factory-produced modules, not dependent on weather conditions
- Nearly 70% reduction of installation time
- Designed according to the high requirements for wind load and seismic resistance
- Custom designed EPDM gaskets
- Adjustability of the fixing devices in all directions
- Glass panels up to 61 mm thickness
- Controlled drainage of rainwater and condensation
- Easy installation and adjustment of the modules without scaffolding
- Compatible with all ETEM window systems

STANDARD SIZE OF ONE MODULE: 1350 MM X 3800 MM

WIDTH OF THE SYSTEM

99 mm

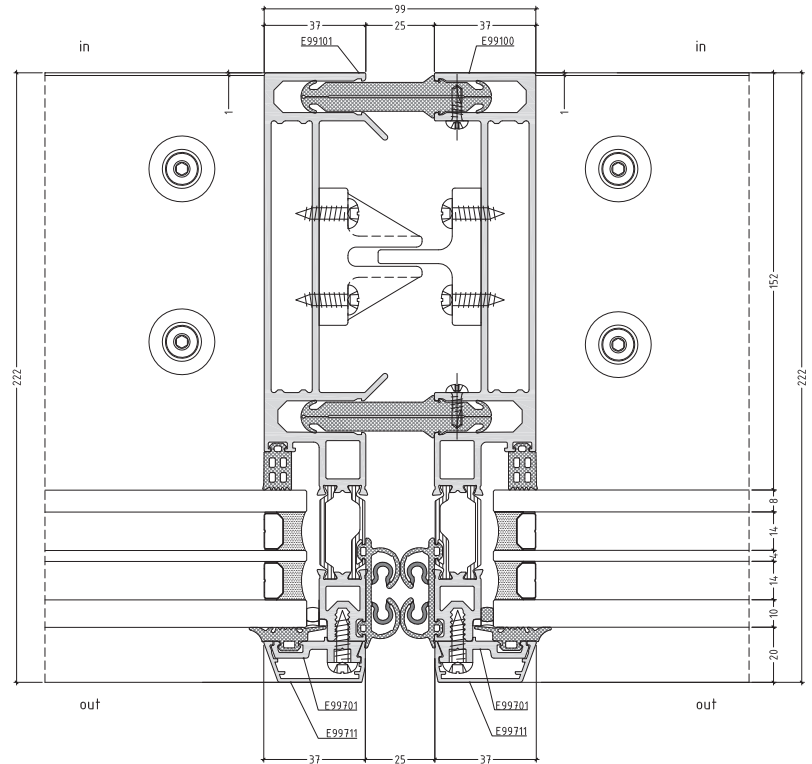
JOINT

25 mm, ensuring the absorption of movements and deformations of up to 14 mm. Designed to absorb seismic shifts typical of the Eurasian tectonic plate and in particular the seismic activity of Southeastern Europe, which is one of those parts of the continents that are most prone to seismic activity.

The seismic resistance is tested according to AAMA 501.4 and AAMA 501.6.

THICKNESS OF THE INFILLS

Possibility to use triple glazing or infill panels with maximum thickness of 61 mm.



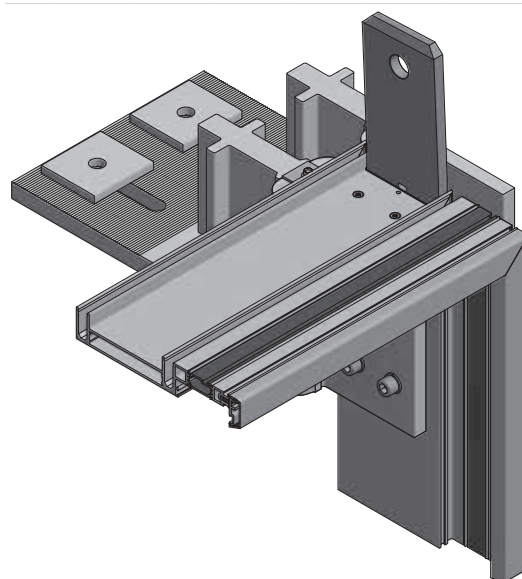
SECURE MOUNTING

Suspension hook made of steel mounted on the panel and serving as the link between the panels. Possibility of position adjustment: $z \pm 25\text{mm}$; $x \pm 40\text{mm}$; $y \pm 40\text{mm}$

Easy suspension of the module.

PRESSURE BALANCE

Suspending devices that absorb the deviations in the concrete in all directions.



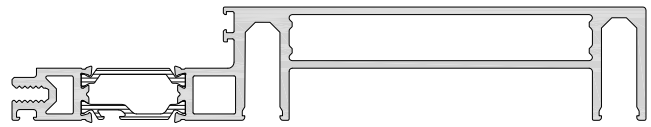
TWO TYPES OF FRAME PROFILES

Standard type and profile with special design allowing easier mounting process.

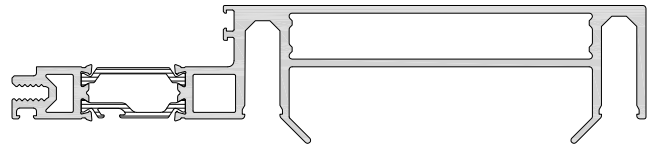
The system is designed and tested for resistance to wind load of 2,4 kN/m².

The profiles have been designed in conformity with the Eurocode 9 (EN 1999-1-1).

The system has been developed in accordance with the principles of designing the structures of the construction projects and the impacts on them.



E99100

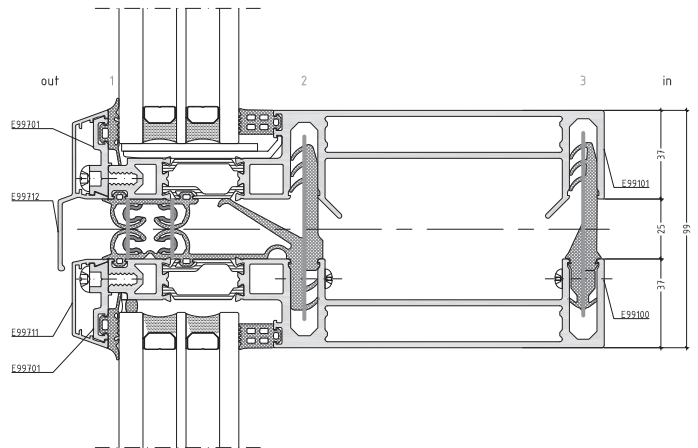


E99101

WATER TIGHTNESS

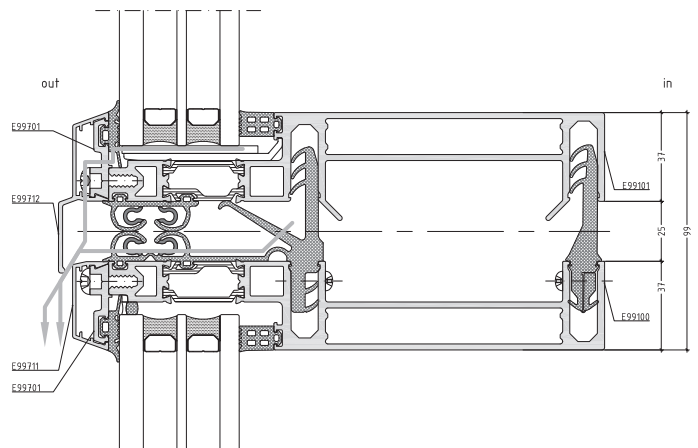
High degree of water tightness – four lines of defense.

Specially designed cover cap with additional legs which protect the gap in case of severe weather conditions.



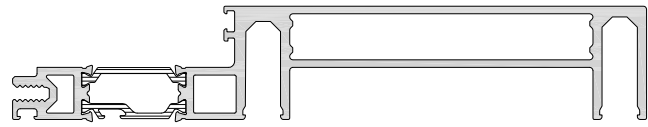
WATER DRAINAGE

Controlled taking out of the rain water and of the condensed water. Draining that would not allow the passing through of water into the interior of the building.

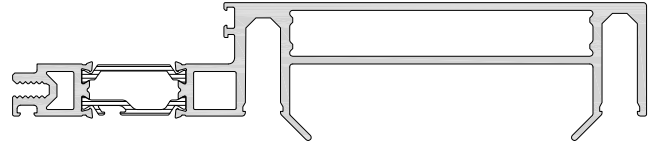


COMPATABILITY

Compatible with all openable ETEM systems – windows and doors of E68, E75 systems and of outward projecting windows of the E85 system.



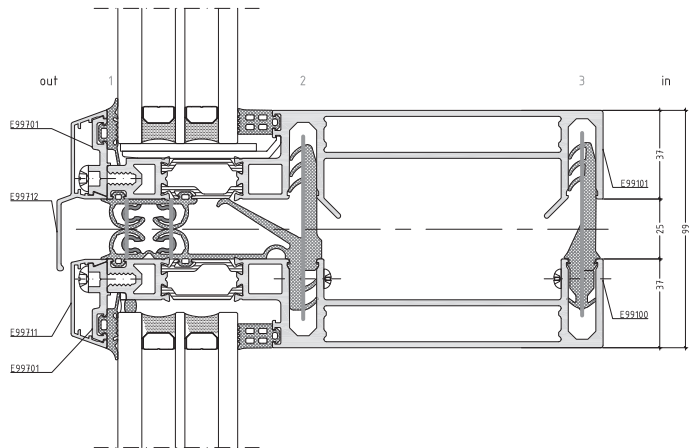
E99100



E99101

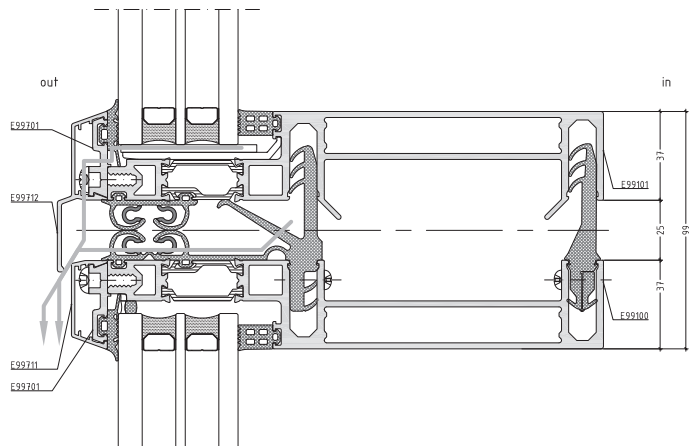
L CORNER

Secure, elongated L corner. Securing of impermeability and strength of the assembly parts through putting in polyurethane glue.



POSSIBILITY FOR POLYGONALITY

Optional polygonality of central angle: $\alpha \leq 8^\circ$.



COMPLIANCE WITH APPLICABLE REGULATIONS

Production management

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

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

Aluminium profiles produced by ETEM are accessed in accordance with EN ISO 14025 – Environmental Product Declarations.

Factory production control system is certified according to the requirements of EN 15088.

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

Occupational Health & Safety management system is certified in accordance with OHSAS 18001.

PERFORMANCE CHARACTERISTICS OF E99

Characteristics	Result	Standard
Air permeability	class A4	EN 12152
	(both positive & negative pressure)	EN 12153
Watertightness	Class RE 1500	EN 12154
		EN 12155
Resistance to wind load	Design load: $\pm 2,4 \text{ kN/m}^2$	EN 13116
	Safety load: $\pm 3,6 \text{ kN/m}^2$	EN 12179
Seismic resistance	10 mm moving for 3 times passed;	AAMA 501.4
	0 to $\pm 75 \text{ mm}$ in 0,8Hz; $\pm 75 \text{ mm}$ to $\pm 82 \text{ mm}$ in 0,4 Hz	AAMA 501.6
Thermal transmittance	$U_f = 2,4 \text{ W/m}^2\cdot\text{K}$	EN 12412-2

Characteristics and performances of curtain walling according to EN 13830

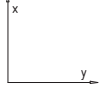
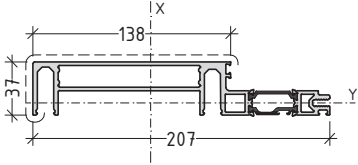
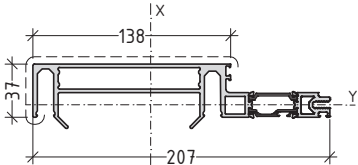
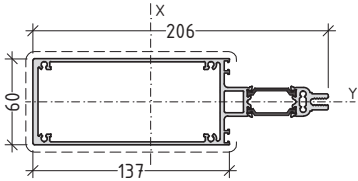
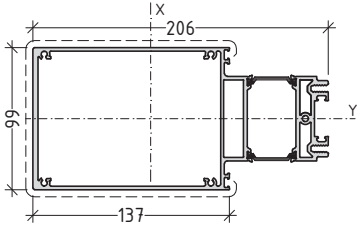

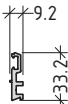
№	Designation	Units	Class or Declared value							
			npd	F	E	D	C	B	A2	A1
1	Reaction to fire of components		npd	F	E	D	C	B	A2	A1
2	Fire resistance									
	Integrity (E) i→o, o→i, i↔o	min	npd	E15	E30	E60	E90	E120		
	Integrity and insulation (EI) i→o, o→i, i↔o	min	npd	EI15	EI30	EI60	EI90	EI120		
	Integrity and radiation (EW) i→o, o→i, i↔o	min	npd	EW20	EW30	EW60				
3	Fire propagation	min	npd	Declared value						
4	Watertightness Test pressure	Pa	npd	R4 (150)	R5 (300)	R6 (450)	R7 (600)	RE (>600)		
5	Resistance to its own dead loads	kN/m ²	npd	Declared value						
6	Wind load resistance	kN/m ²	npd	Declared value						
7	Resistance to snow load (only for elements subjected to snow load)	kN/m ²	npd	Declared value						
8	Impact resistance/safe breakage									
	Internal Drop height	mm	npd	I0 (n.a.)	I1 (200)	I2 (300)	I3 (450)	I4 (700)	I5 (950)	
	External Drop height	mm	npd	E0 (n.a.)	E1 (200)	E2 (300)	E3 (450)	E4 (700)	E5 (950)	
9	Resistance to live horizontal loads at sill level	kN/m	npd	Declared value						
10	Seismic resistance									
	Serviceability	-	npd	Declared value						
	Safety in use	-	npd	Declared value						
11	Thermal shock resistance	-	npd	Declared type of glass						
12	Direct airborne sound insulation $R_w(C;C_{tr})$	dB	npd	Declared value						
13	Flanking sound transmittance $D_{n,f,w}$	dB	npd	Declared value						
14	Thermal transmittance U_{cw}	W/(m ² .K)	npd	Declared value						
15	Air permeability Test pressure	Pa	npd	A1 (150)	A2 (300)	A3 (450)	A4 (600)	AE (>600)		
16	Water vapour permeability	-	npd	Declared type of vapour barrier						
17	Radiation properties									
	Total solar energy transmittance (Solar factor)	-	npd	Declared value						
	Light transmittance	-	npd	Declared value						
18	Equipotential bonding	-	npd	Declared value						
19	Durability									
	Durability of watertightness	-	npd	Declared value						
	Durability of thermal transmittance	-	npd	Declared value						
	Durability of air permeability	-	npd	Declared value						

TABLES

TYPES / LIST OF PROFILES / CHARACTERISTICS

unitised façade system

E99

code description	 profile	weight length ext.perimeter vis.perimeter area	static values	
E99100		3926 g/m *6.01 m 760 mm 180 mm 14.49 cm ²	I _x = 571.36 cm ⁴ W _x = 51.47 cm ³	I _y = 19.83 cm ⁴ W _y = 9.32 cm ³
**				
E99101		4243 g/m *6.01 m 808 mm 180 mm 14.91 cm ²	I _x = 584.13 cm ⁴ W _x = 52.21 cm ³	I _y = 22.31 cm ⁴ W _y = 8.00 cm ³
**				
E99300		3911 g/m *6.01 m 597 mm 368 mm 14.43 cm ²	I _x = 633.6 cm ⁴ W _x = 57.5 cm ³	I _y = 66.27 cm ⁴ W _y = 22.09 cm ³
**				
E99301		5547 g/m *6.01 m 753 mm 377 mm 21.42 cm ²	I _x = 1090.19 cm ⁴ W _x = 102.65 cm ³	I _y = 253.54 cm ⁴ W _y = 51.22 cm ³
**				
E99700		504 g/m *6.01 m - mm - mm 1.87 cm ²	I _x = 0.1 cm ⁴ W _x = 0.14 cm ³	I _y = 5.13 cm ⁴ W _y = 5.14 cm ³
**				
E99701		353 g/m *6.01 m - mm - mm 1.3 cm ²	I _x = 1.18 cm ⁴ W _x = 0.13 cm ³	I _y = 1.17 cm ⁴ W _y = 0.64 cm ³

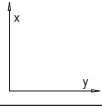
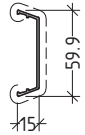
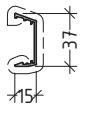
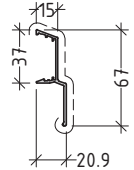
Note:

* the length of profile can be different for each project needs

** The values shown do not take into account the characteristics of the polyamide bars!

When calculating a particular project, the usage of the correction coefficients is mandatory!

L99-01

code description		profile	weight length ext.perimeter vis.perimeter area	static values			
E99710			320 g/m *6.01 m 168 mm 88 mm 1.18 cm ²	I _x = 0.26 cm ⁴ W _x = 0.24 cm ³		I _y = 4.96 cm ⁴ W _y = 1.65 cm ³	
E99711			259 g/m *6.01 m 135 mm 75 mm 0.96 cm ²	I _x = 0.22 cm ⁴ W _x = 0.21 cm ³		I _y = 1.74 cm ⁴ W _y = 0.88 cm ³	
E99712			426 g/m *6.01 m 205 mm 89 mm 1.57 cm ²	I _x = 0.55 cm ⁴ W _x = 0.4 cm ³		I _y = 5.81 cm ⁴ W _y = 1.64 cm ³	

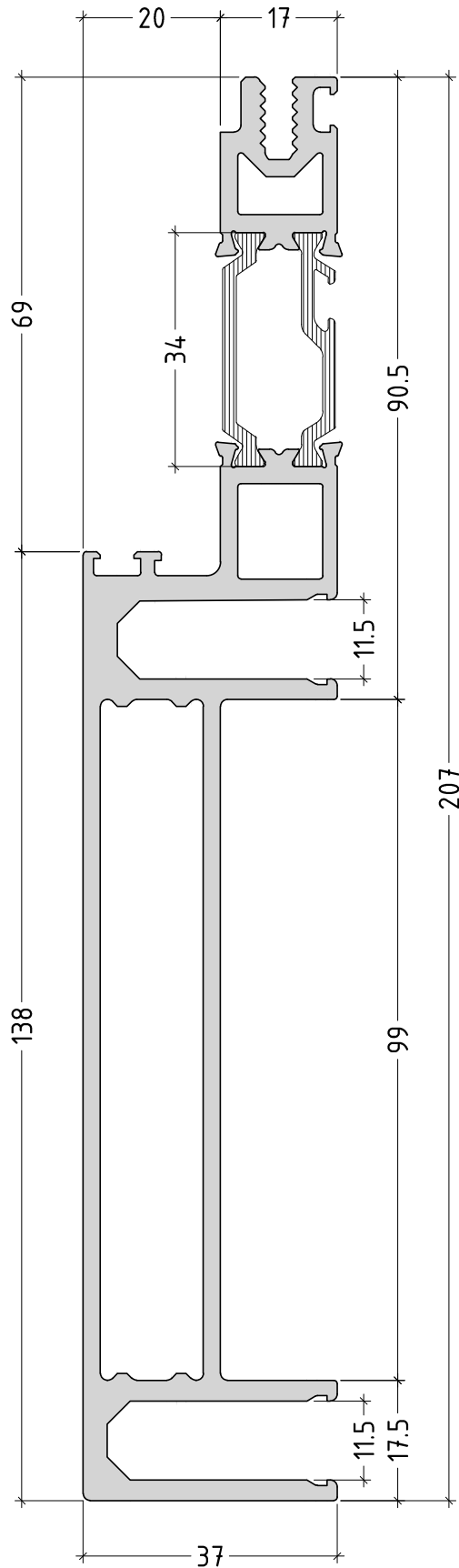
Note:

- * the length of profile can be different for each project needs
 - ** The values shown do not take into account the characteristics of the polyamide bars!
- When calculating a particular project, the usage of the correction coefficients is mandatory!

PROFILES

DRAWINGS

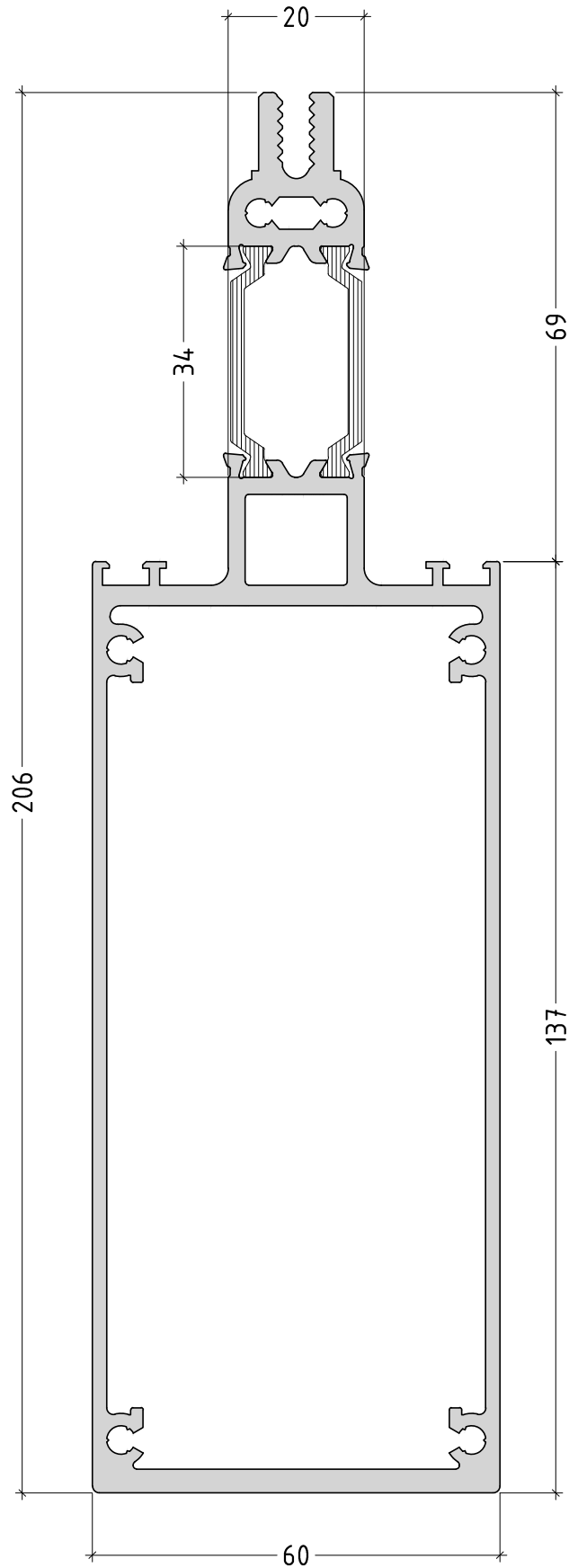
E99100
3926 g/m



scale : 1:1

P99-01

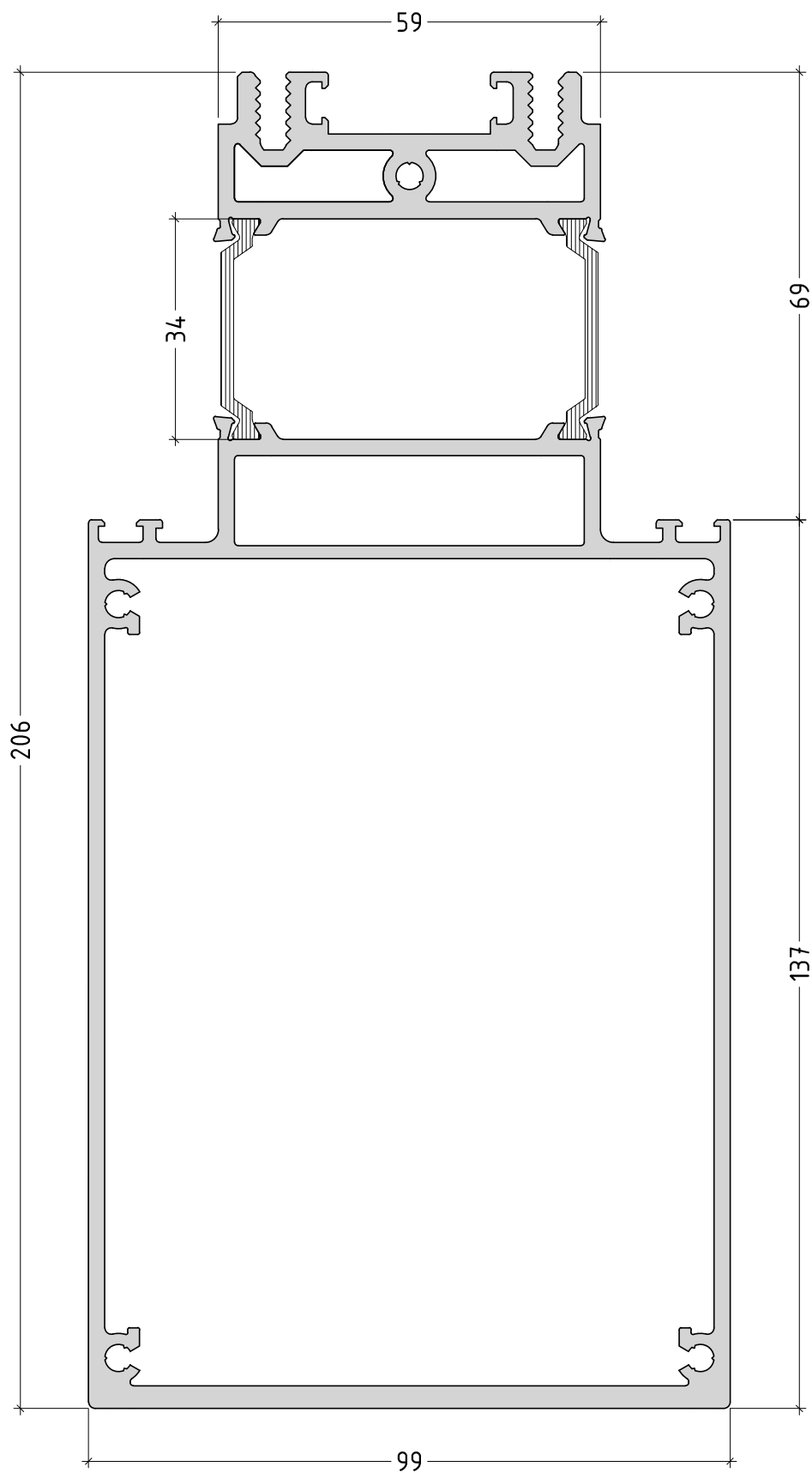
E99300
3911 g/m



scale : 1:1

P99-03

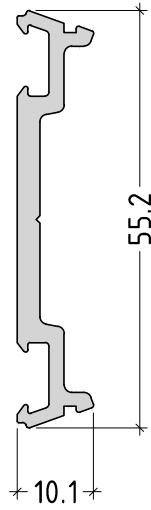
E99301
5547 g/m



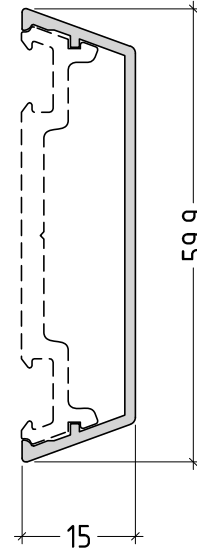
scale : 1:1

P99-04

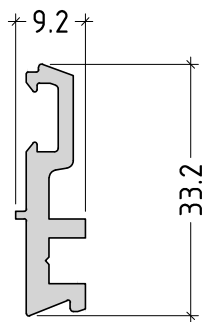
E99700
504 g/m



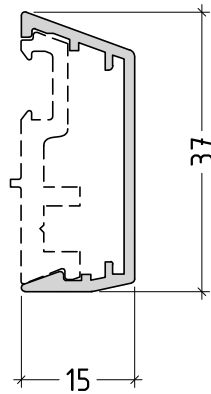
E99710
320 g/m



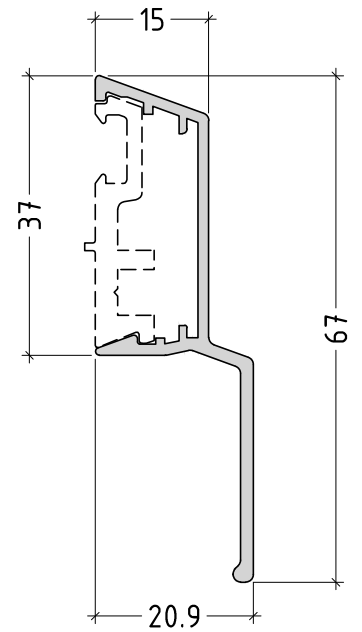
E99701
353 g/m



E99711
259 g/m



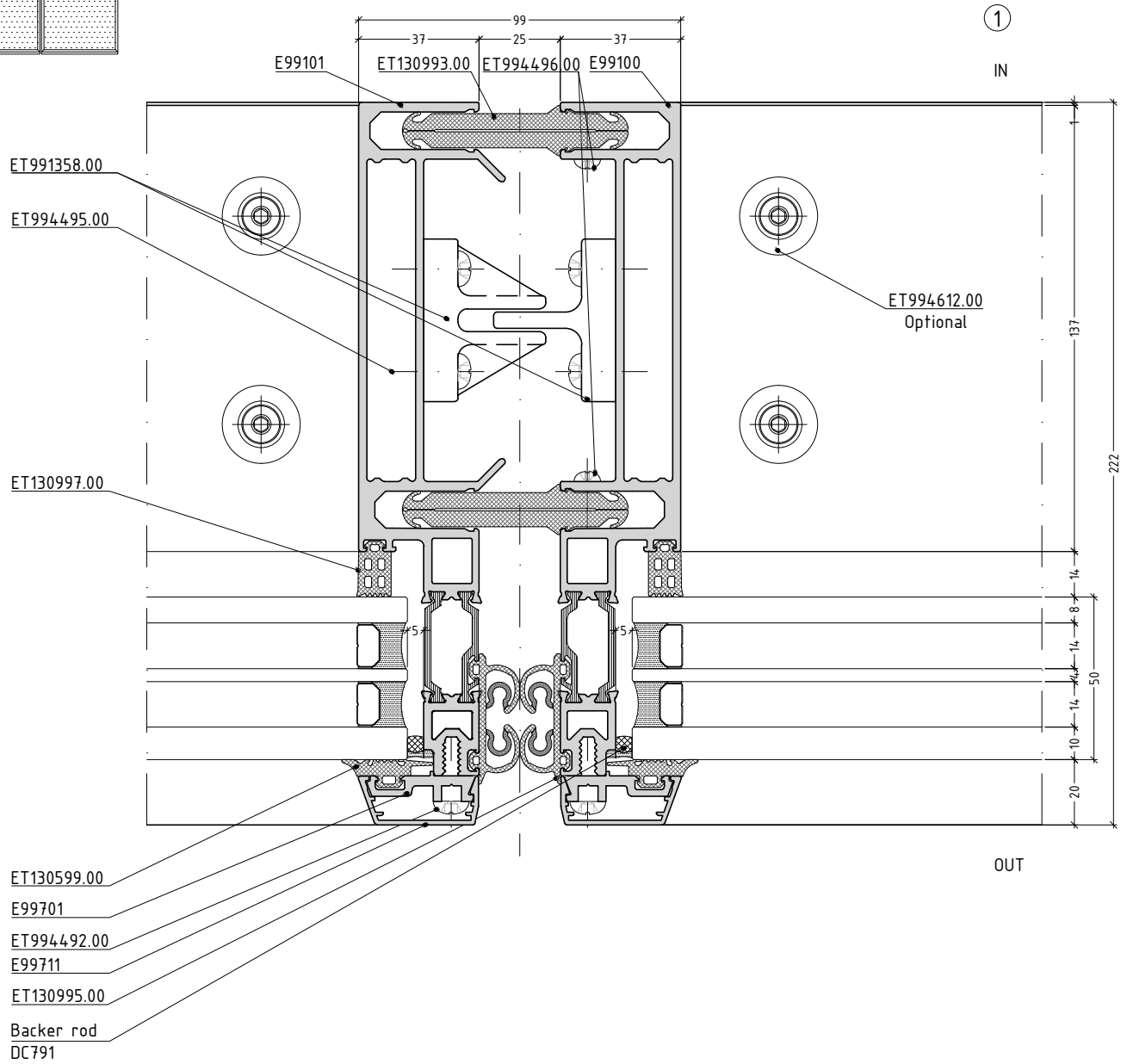
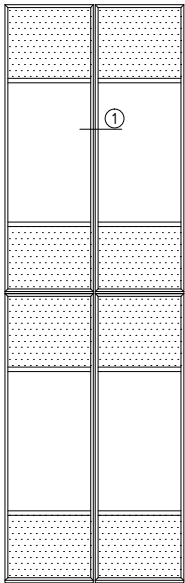
E99712
426 g/m



scale : 1:1

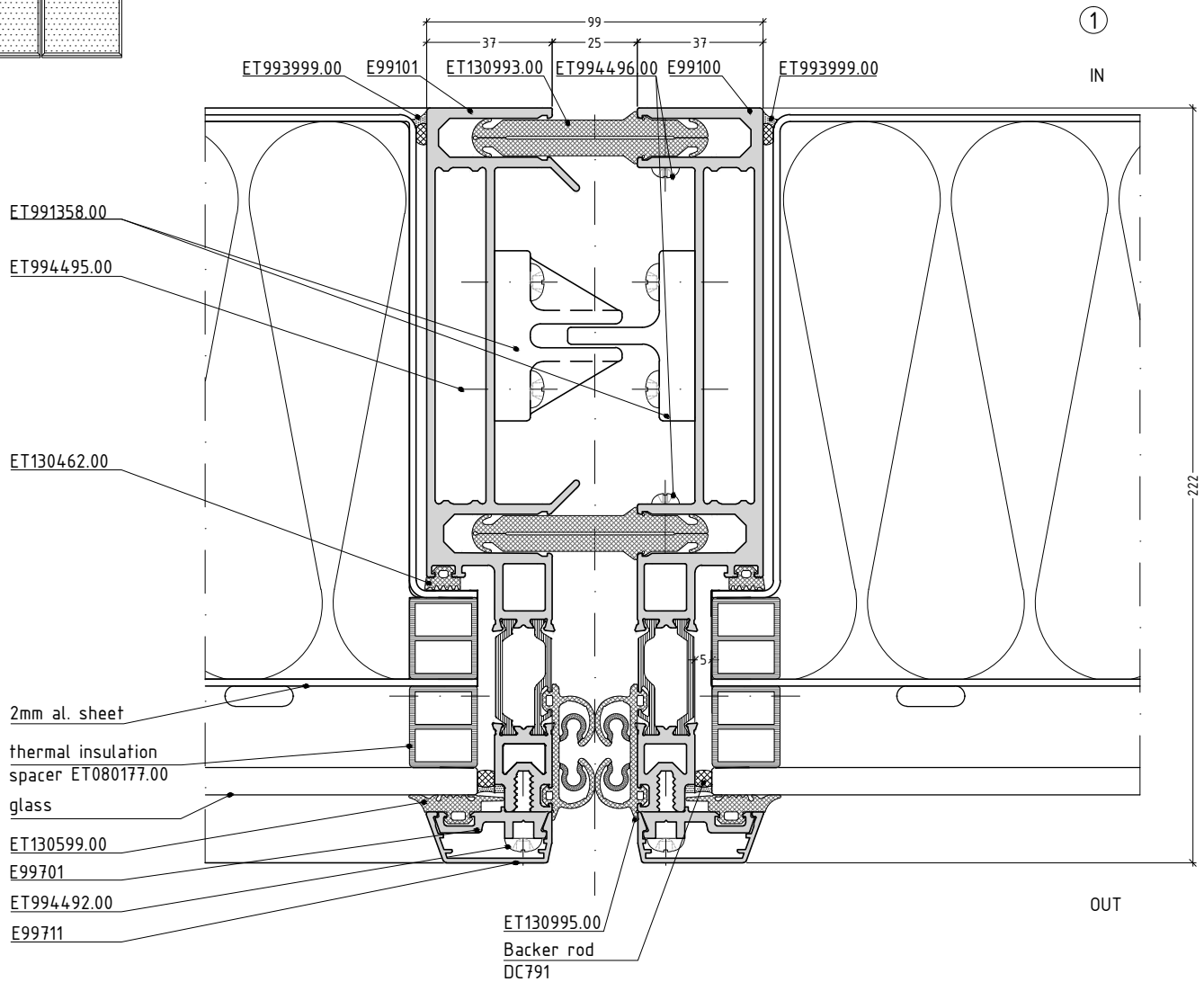
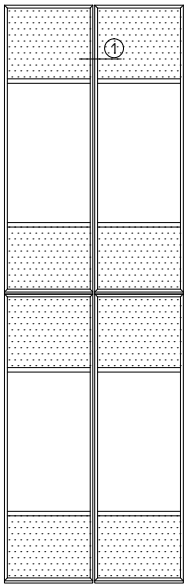
SECTIONS

SECTIONS / DETAILS



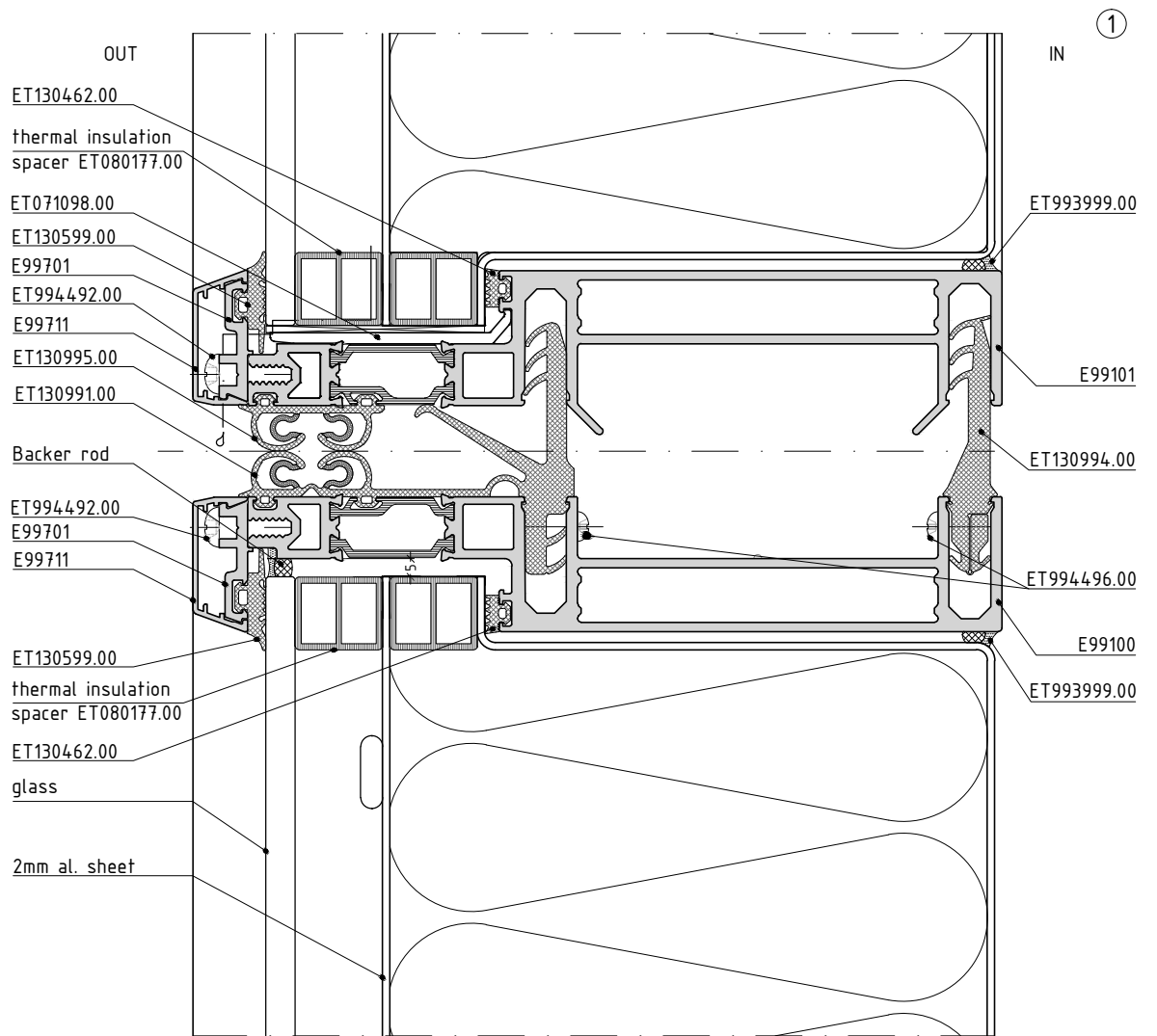
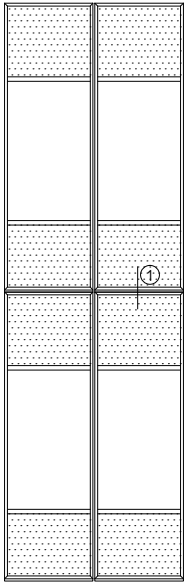
scale 1/2

E99D-01



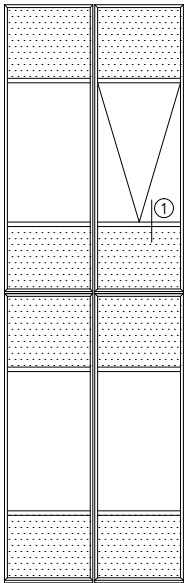
scale 1/2

E99D-02

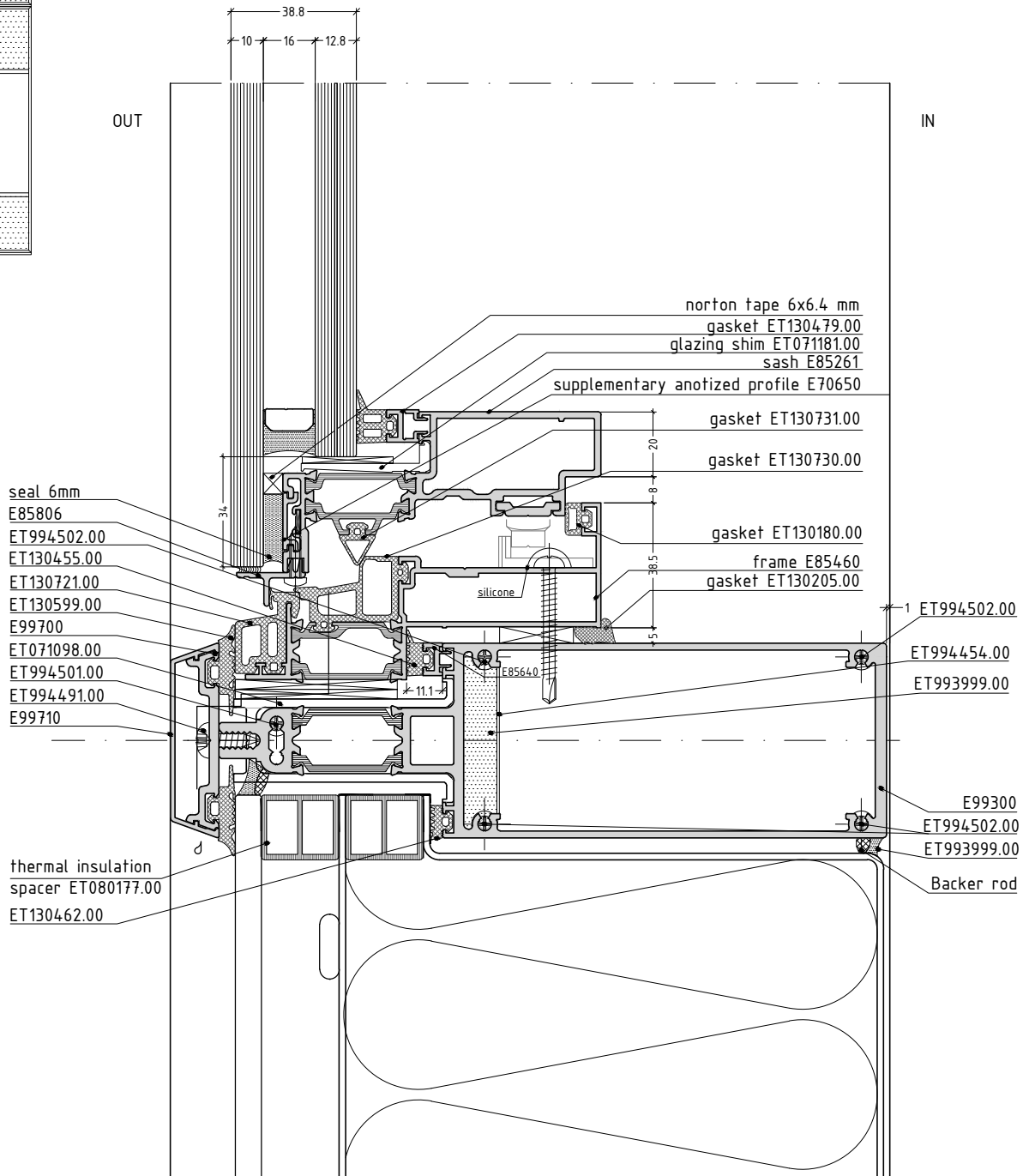


scale 1/2

E99D-03

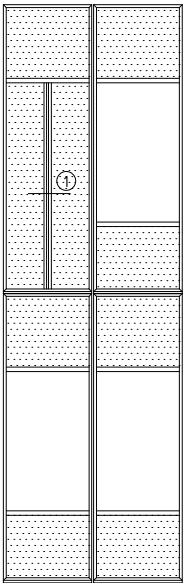


①

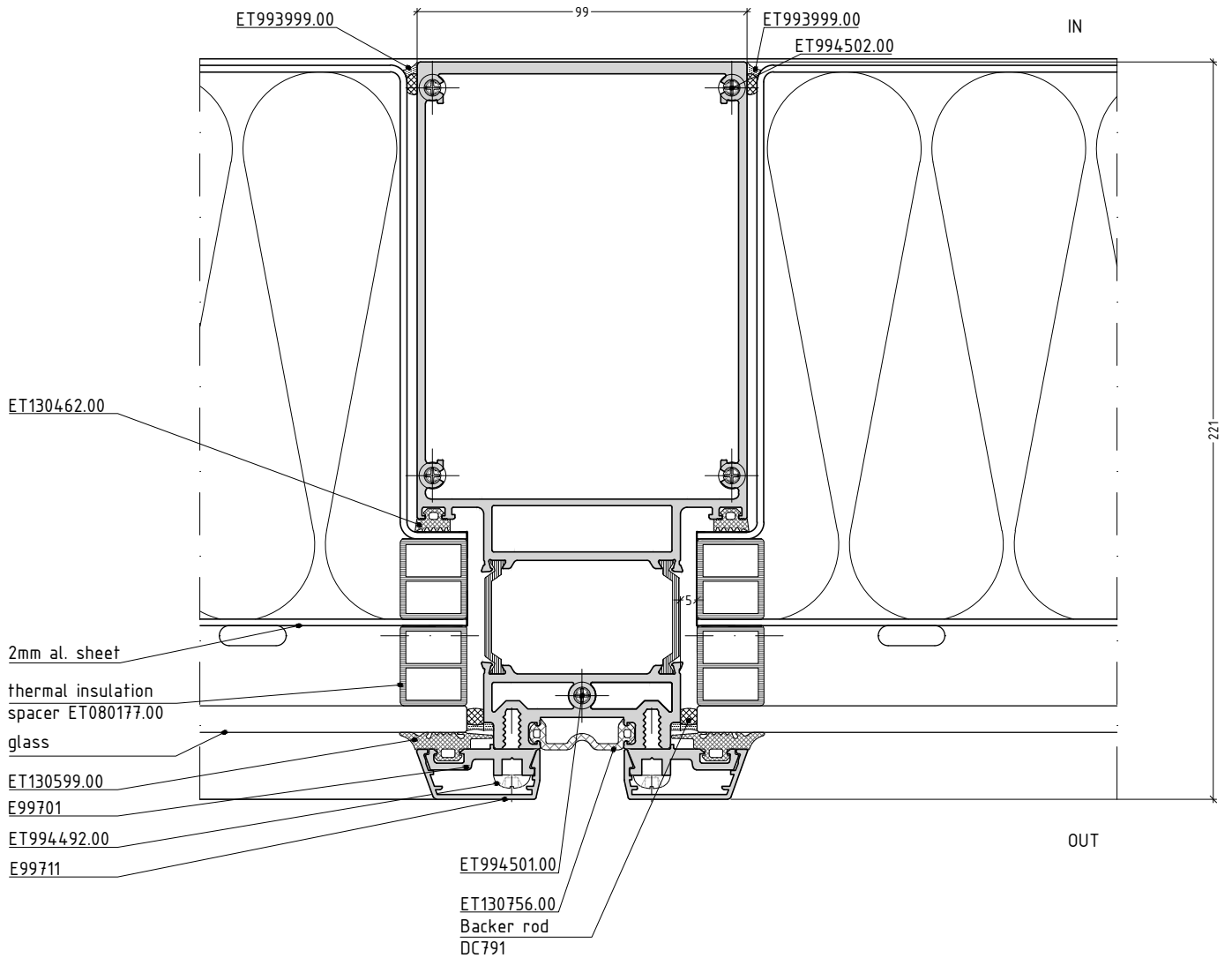


scale 1/2

E99D-03-1

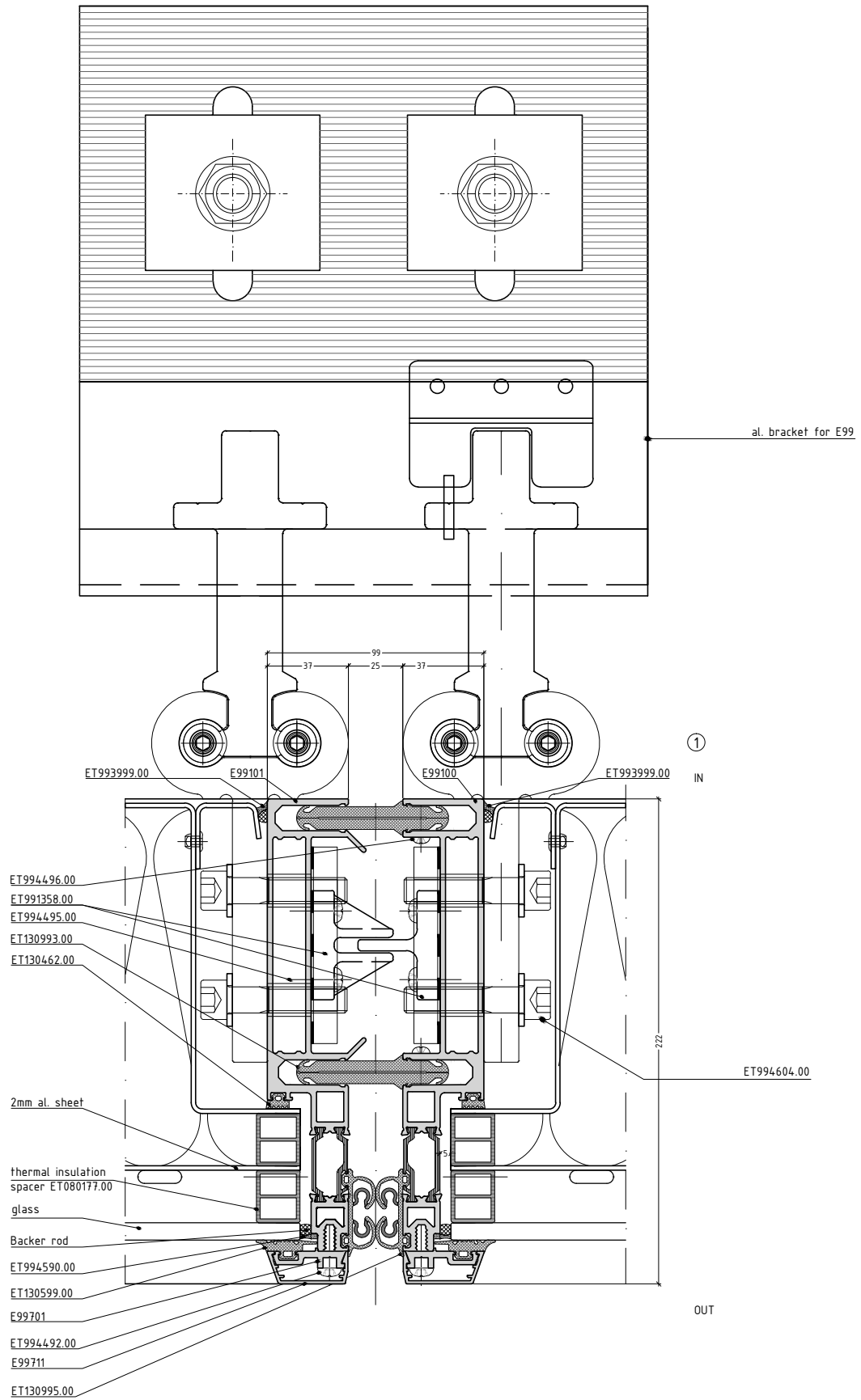
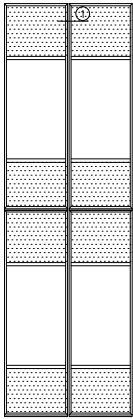


①



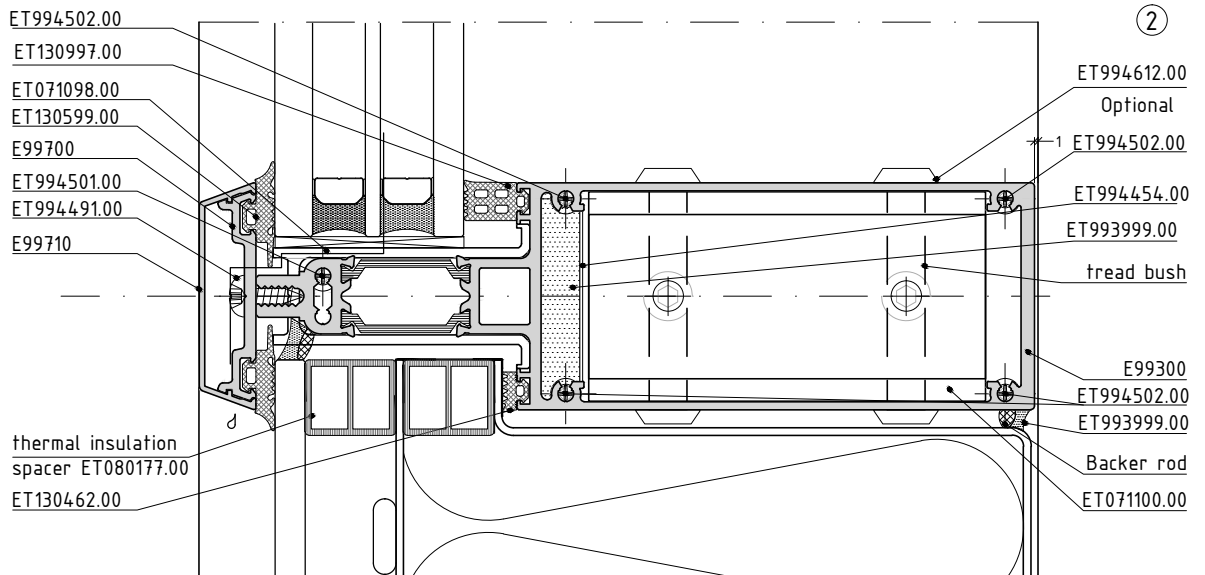
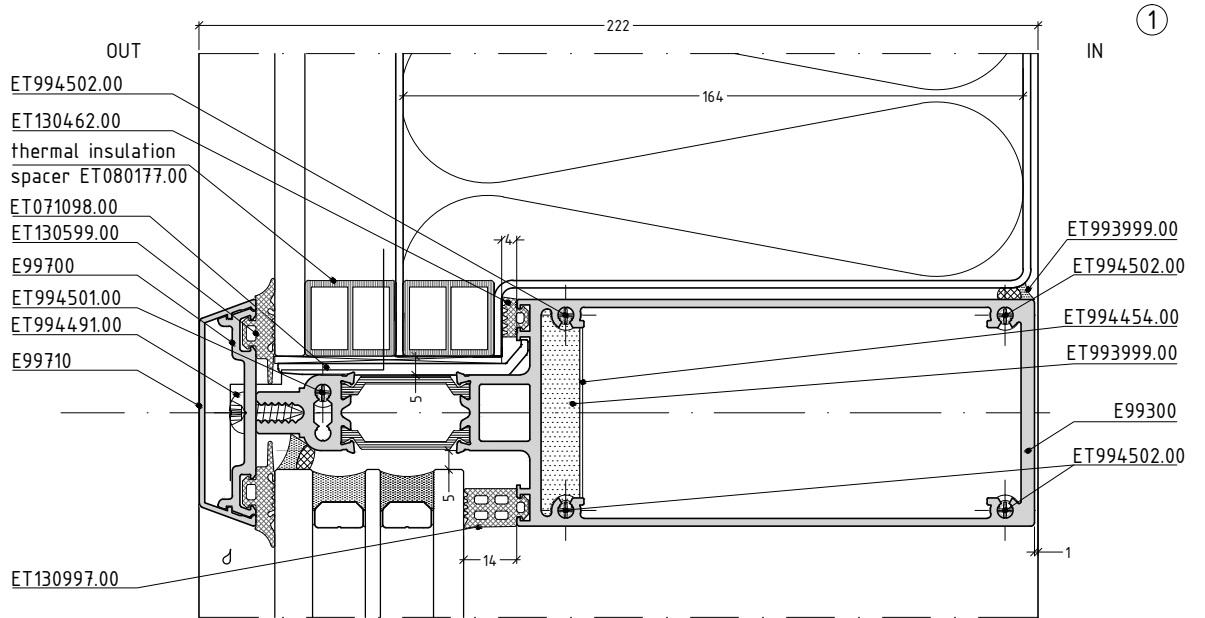
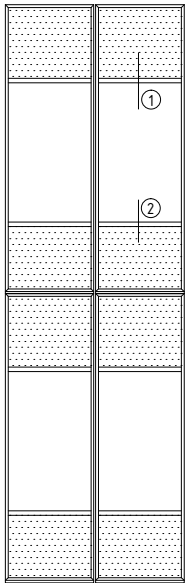
scale 1/2

E99D-03-2



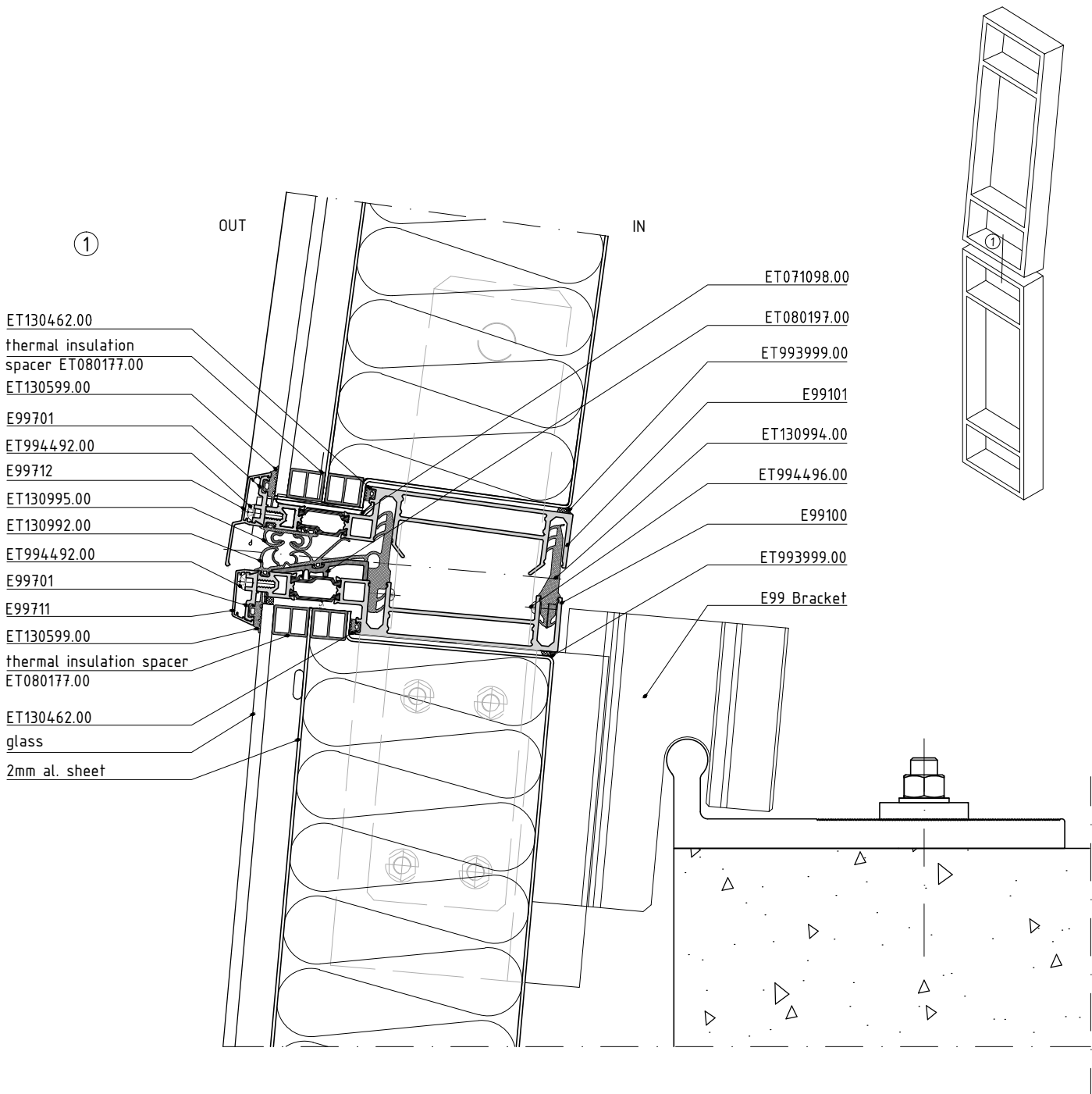
scale 1/4

E99D-04



scale 1/2

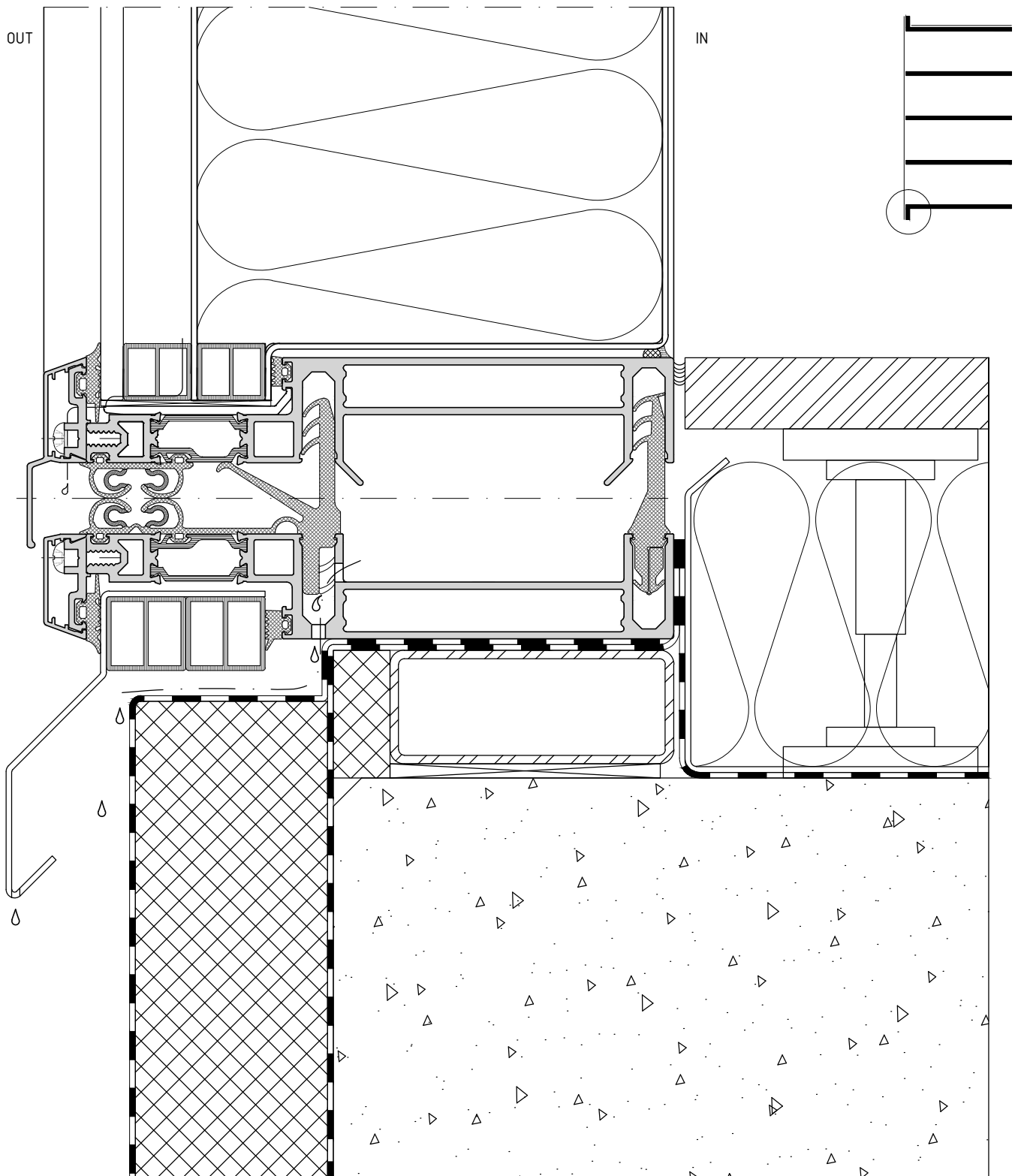
E99D-05



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

scale 1/4

①



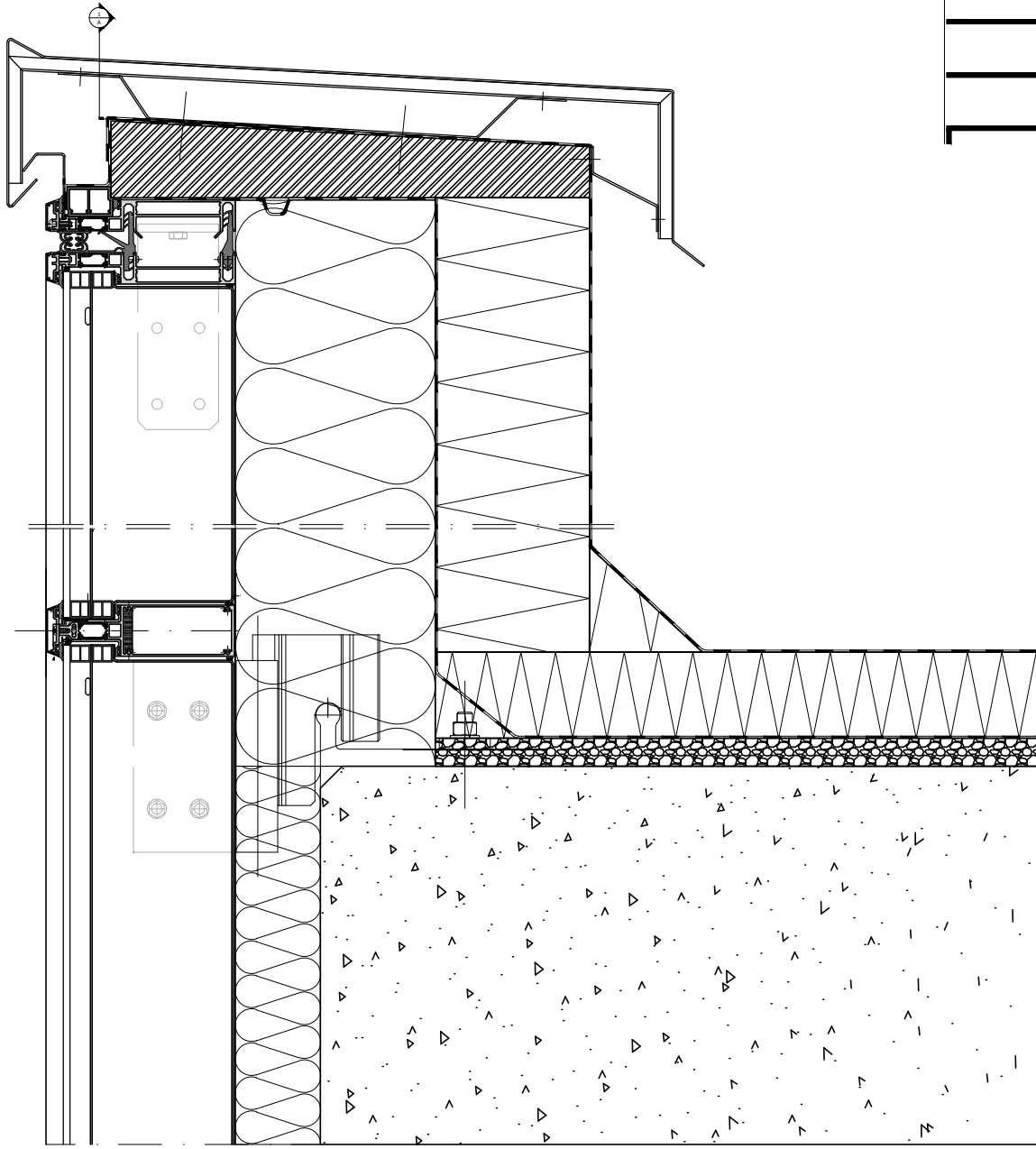
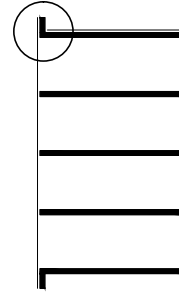
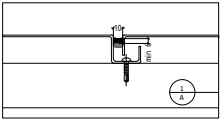
Interface shown on the drawing is an example ONLY!

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

scale 1/2

E99D-07

upper finishing with ENF



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

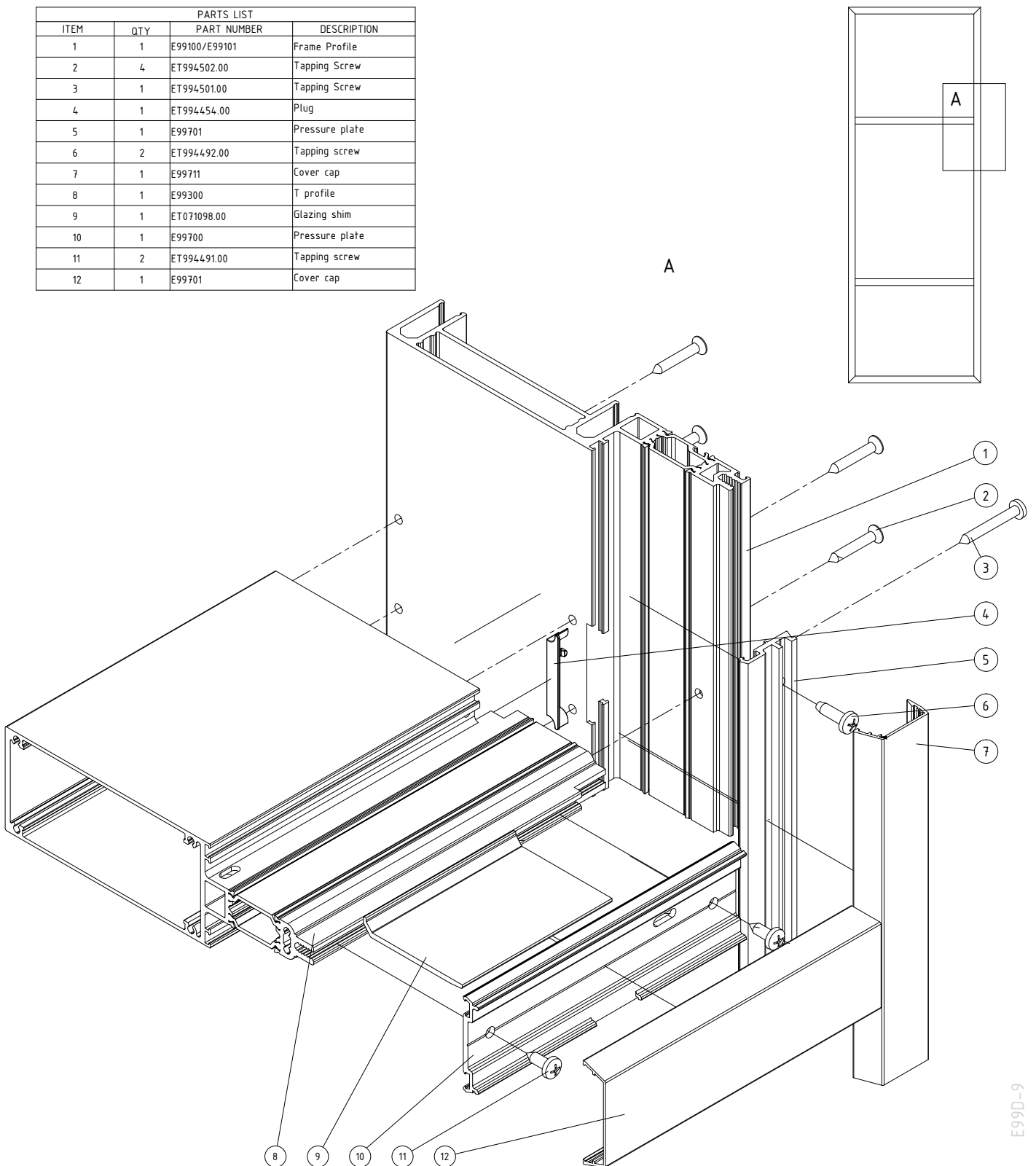
scale 1/8

E99D-08

MACHINING

List of items for mounting T-profile E99300 to frame E99100/E99101 with screws

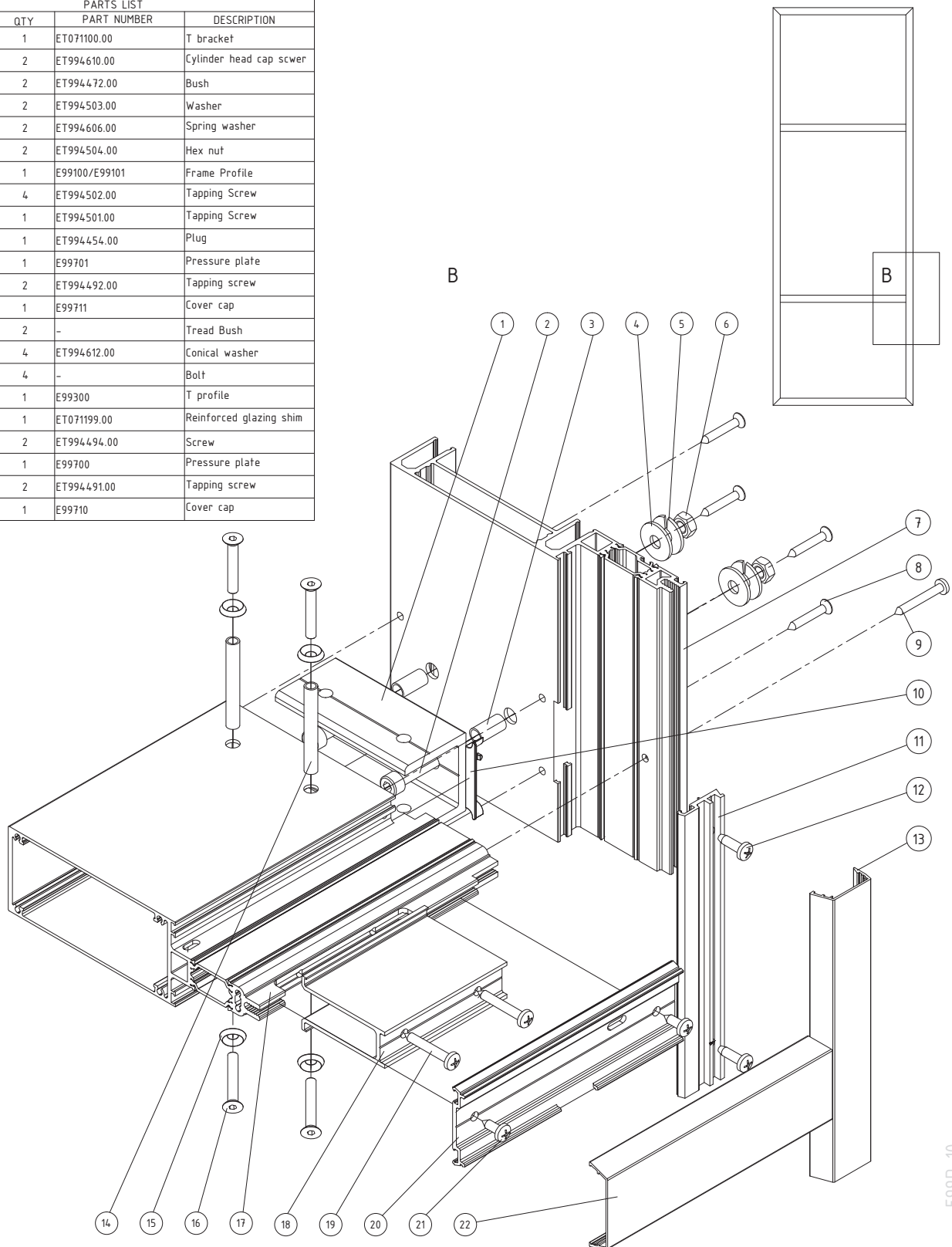
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	E99100/E99101	Frame Profile
2	4	ET994502.00	Tapping Screw
3	1	ET994501.00	Tapping Screw
4	1	ET994454.00	Plug
5	1	E99701	Pressure plate
6	2	ET994492.00	Tapping screw
7	1	E99711	Cover cap
8	1	E99300	T profile
9	1	ET071098.00	Glazing shim
10	1	E99700	Pressure plate
11	2	ET994491.00	Tapping screw
12	1	E99701	Cover cap



E99D-9

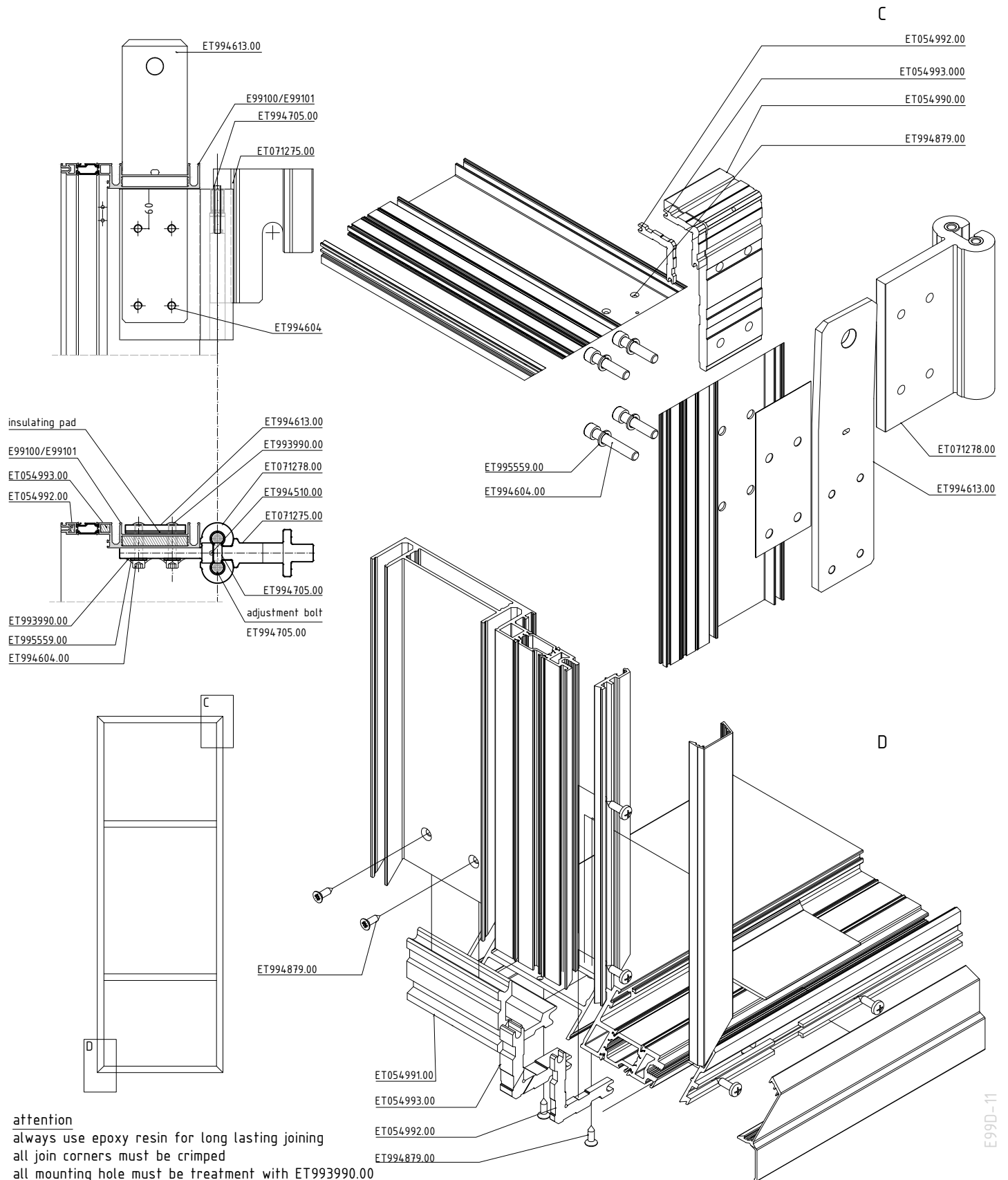
List of items for mounting T-profile E99300 to frame E99100/E99101 with T-bracket for heavy duty solutions

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	ET071100.00	T bracket
2	2	ET994610.00	Cylinder head cap scwer
3	2	ET994472.00	Bush
4	2	ET994503.00	Washer
5	2	ET994606.00	Spring washer
6	2	ET994504.00	Hex nut
7	1	E99100/E99101	Frame Profile
8	4	ET994502.00	Tapping Screw
9	1	ET994501.00	Tapping Screw
10	1	ET994454.00	Plug
11	1	E99701	Pressure plate
12	2	ET994492.00	Tapping screw
13	1	E99711	Cover cap
14	2	-	Tread Bush
15	4	ET994612.00	Conical washer
16	4	-	Bolt
17	1	E99300	T profile
18	1	ET071199.00	Reinforced glazing shim
19	2	ET994494.00	Screw
20	1	E99700	Pressure plate
21	2	ET994491.00	Tapping screw
22	1	E99710	Cover cap



E99D-10

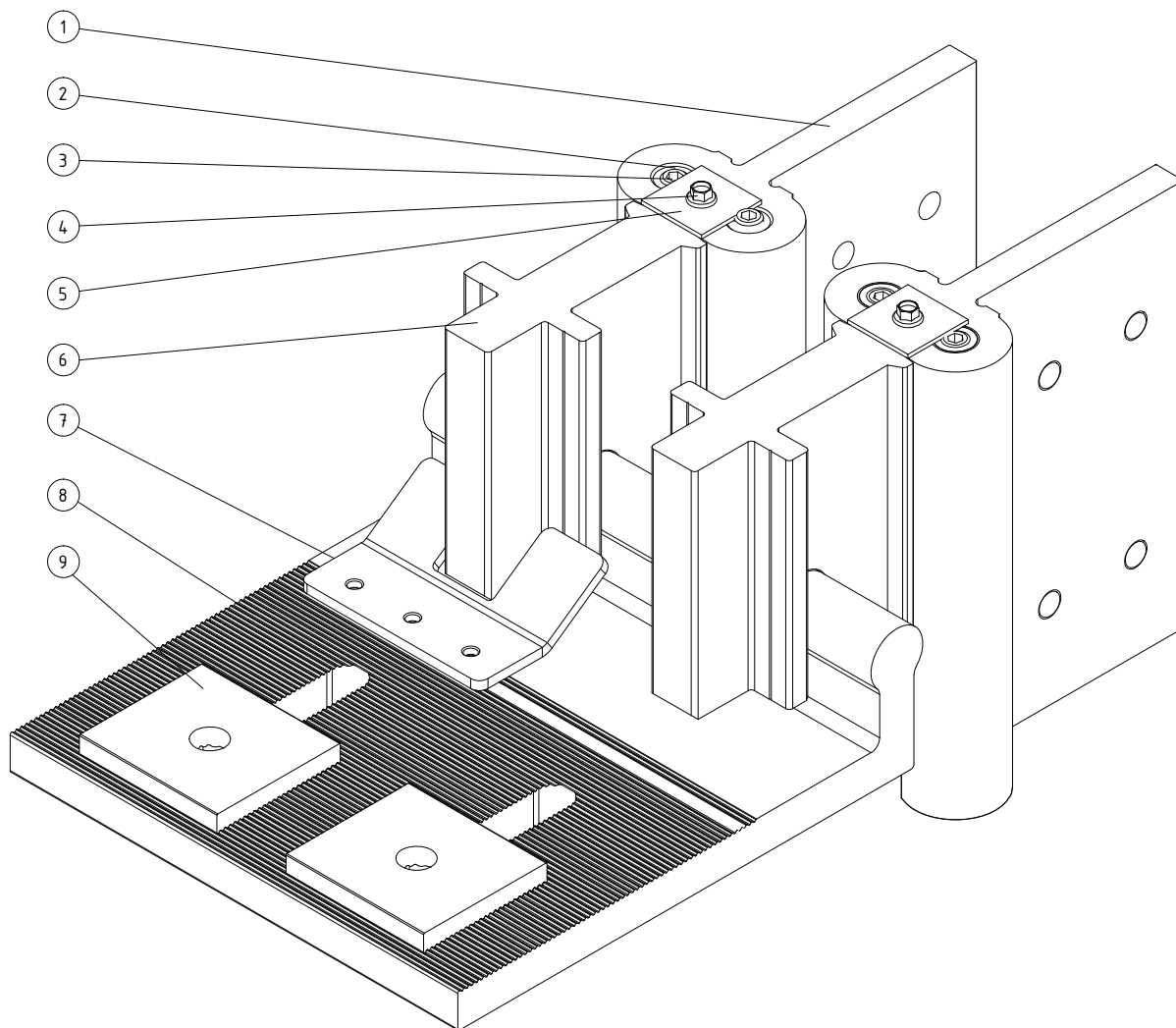
Mounting of join corner and fixing bracket



attention
 always use epoxy resin for long lasting joining
 all join corners must be crimped
 all mounting hole must be treatment with ET993990.00

Aluminium bracket for E99

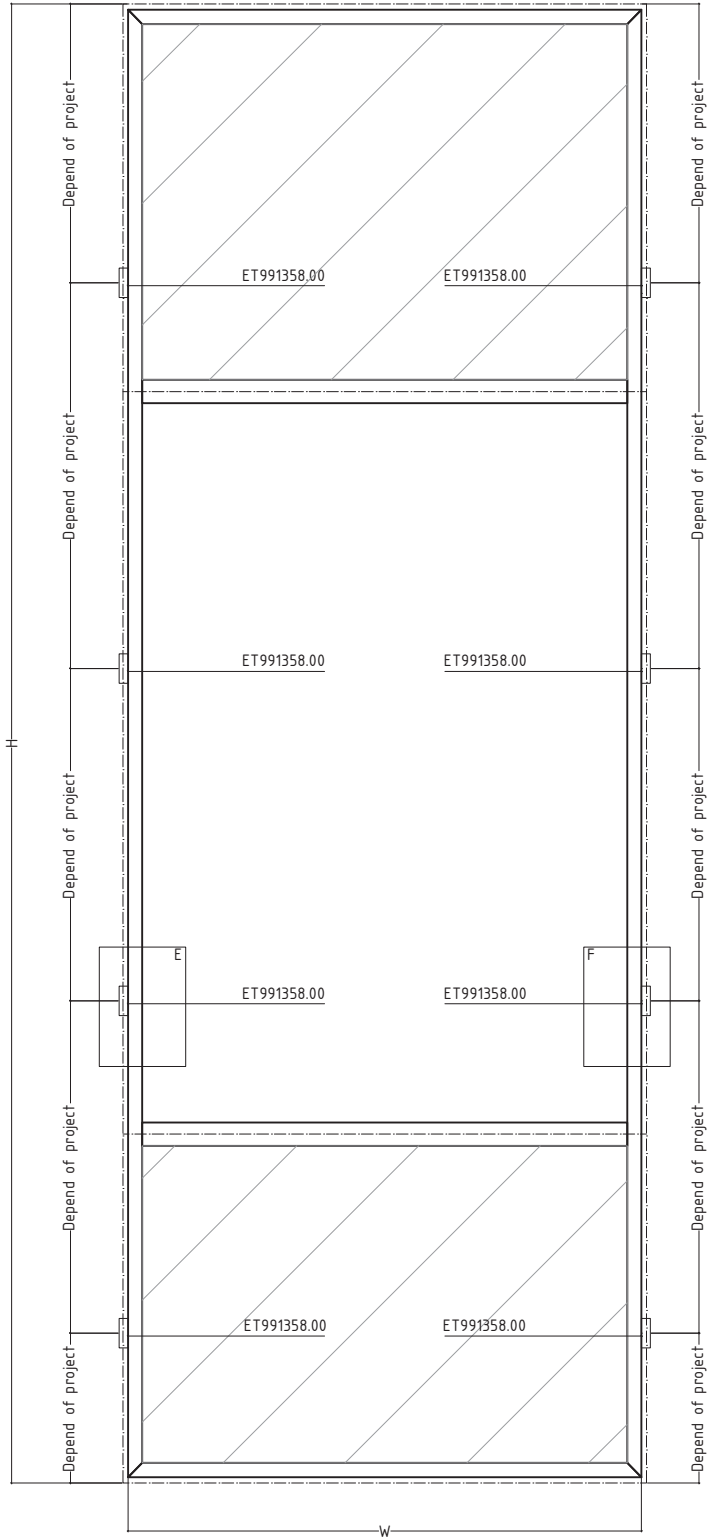
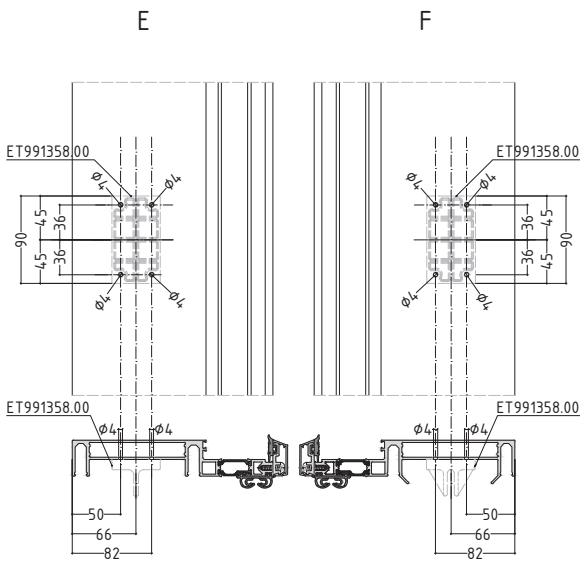
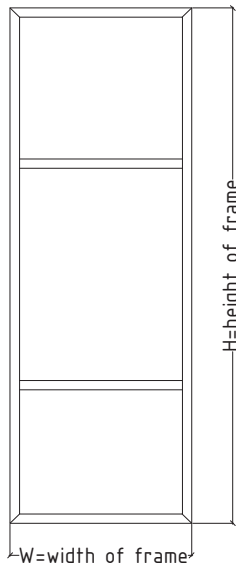
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	ET071278.00	Fixing part
2	4	ET071274.00	Tread bush
3	4	ET994705.00	Screw
4	2	ET994510.00	Bolt
5	2	ET994705.00	Al. Washer
6	2	ET071275.00	Anchor
7	1	ET994382.00	Fixing device
8	1	ET071276.00	Plate
9	2	ET071277.00	Washer
10	1	ET994512.00	Screw



Notes
 The fixing device is mounted to the plate with steel nails by dint of the appropriate device.
 Connection between backing wall and frame is specific for each single project. It is obligatory to observe different projects' features.
 All final decisions about materials used, interface finishing, etc. should be approved by the structural / façade engineer responsible for the specific project.

E99D-12

Mounting of alignment space bar between modules



E99D-13

ACCESSORIES

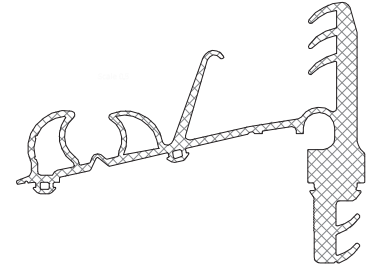
unitised façade system

E99

code/description	package/pcs	colour
ET 130992.00	-	●

* specific length for each project

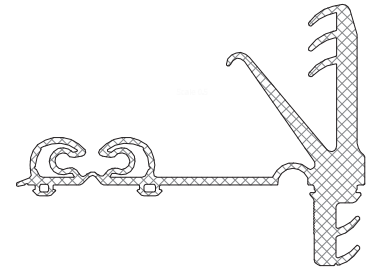
central EPDM gasket for E99



ET 130991.00	-	●
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* specific length for each project

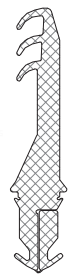
central EPDM gasket for E99



ET 130994.00	-	●
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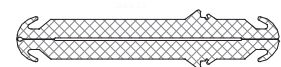
* specific length for each project

horizontal EPDM gasket for E99



ET 130993.00	50	●
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EPDM gasket for vertical second level E99

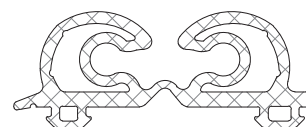


unitised façade system

E99

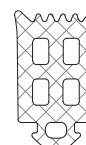
code/description	package/pcs	colour
ET 130995.00	100	●

vertical and horizontal EPDM gasket for E99



ET 130997.00	50	●
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glazing EPDM gasket for E99



ET 130455.00	150	●
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EPDM gasket for glazing
5mm



ET 130599.00	100	●
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EPDM gasket for
pressure plate



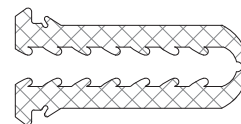
A 99-2

unitised façade system

E99

code/description	package/pcs	colour
ET 130996.00	80	●

EPDM gasket for E99



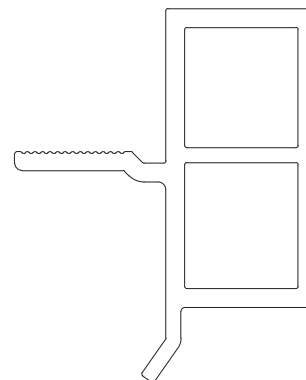
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EPDM decorative gasket for E99301



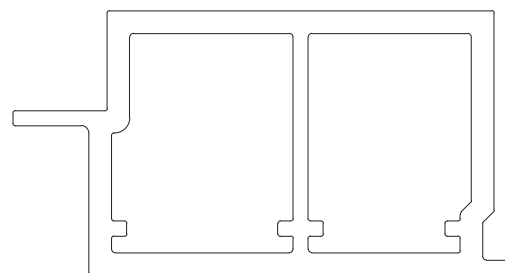
ET 991352.00	6	●
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PVC profile for E99



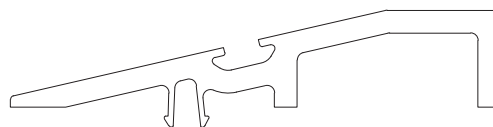
ET 994452.00	6	●
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polyamide 51,3x35x56 for E99



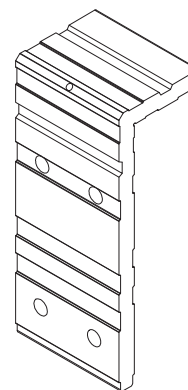
code/description	package/pcs	colour
ET 080197.00	6	●

PVC drainage profile for E99



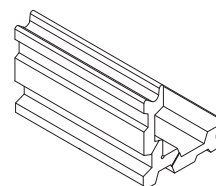
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reinforced corner bracket for E99100/E99101



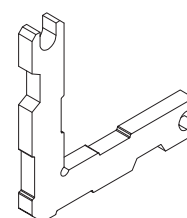
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reinforced glazing shim 100mm



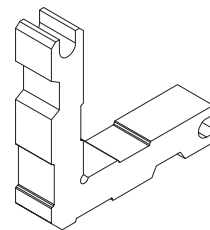
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corner bracket 5mm for E99100



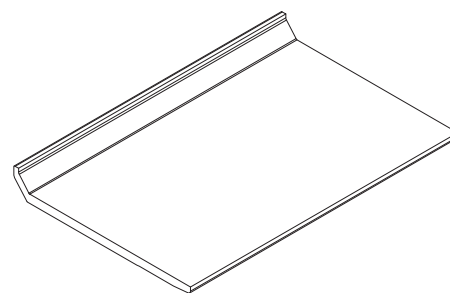
code/description	package/pcs	colour
ET 054993.00	200	MF

corner bracket for E99100



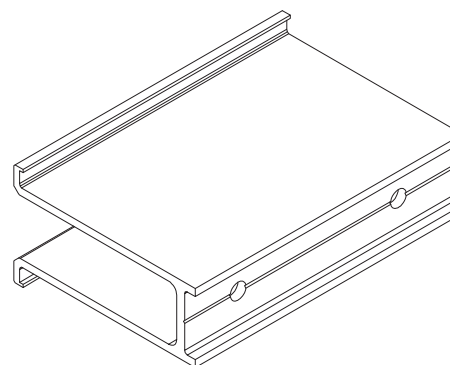
ET 071098.00	100	MF
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aluminium glazing shim



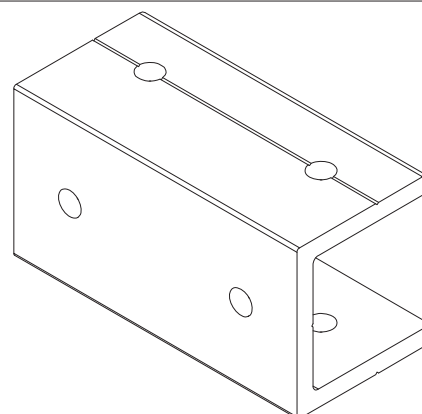
ET 071199.00	50	MF
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reinforced glazing shim



ET 071100.00	50	MF
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T-bracket E99300/E99940

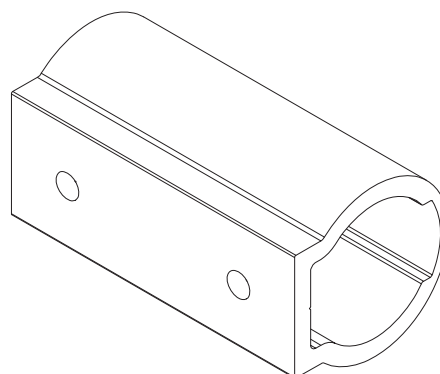


unitised façade system

E99

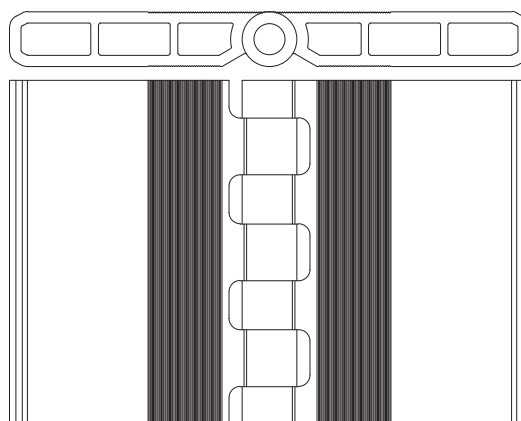
code/description	package/pcs	colour
ET 071099.00	40	MF

T-bracket for E99300



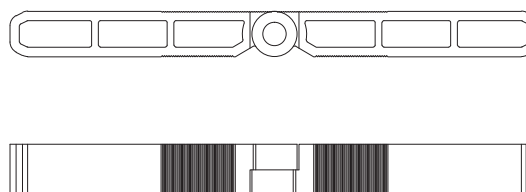
ET 994310.00	10	MF
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bracket for random angle
96,4mm 99951



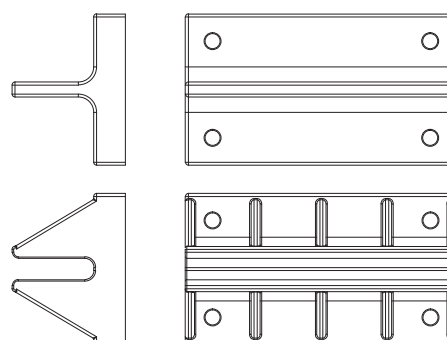
ET 994311.00	100	MF
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bracket for random angle
13,4mm 99950



ET 991358.00	100	MF
--------------	-----	----

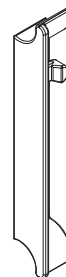
spacer for modules E99



A 99-6

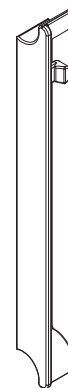
code/description	package/pcs	colour
ET 994454.00	300	-

Plug for E99300



ET 994456.00	300	-
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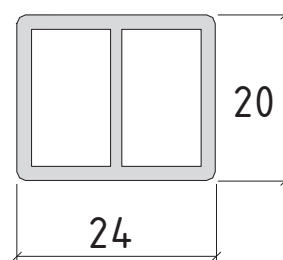
Plug for E99301



ET080177.00	6	●
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ET080177 old code

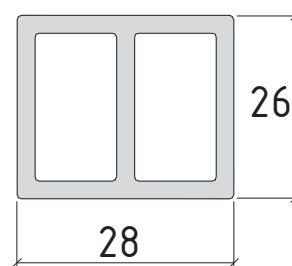
thermal insulation spacer
PVC 20x24 mm



ET080165.00	6	●
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ET080184 old code

thermal insulation spacer
PVC 26x28 mm

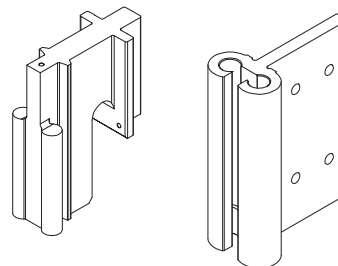


unitised façade system

E99

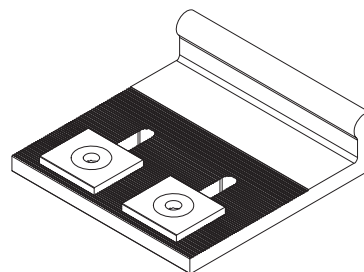
code/description	package/pcs	colour
ET 072111.00	-	MF

aluminium brackets set 1 for E99



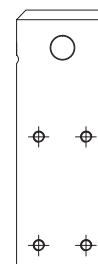
ET 072112.00	-	MF
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aluminium brackets set 2 for E99



ET 994613.00	-	MF
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fixing device



II.

E90

**UNITISED
FAÇADE
SYSTEM**

A detailed technical cross-section of a unitised facade system. The image shows a horizontal mullion and a vertical mullion intersecting. The horizontal mullion is shown in a cutaway view, revealing its internal structure, including a central cavity with a drainage channel and various internal components like gaskets and seals. The vertical mullion is also shown in a cutaway view, showing its internal structure and how it connects to the horizontal mullion. The background is a solid, light green color, and the entire image has a semi-transparent green overlay.

GENERAL INFORMATION

CONCEPT / ADVANTAGES / CERTIFICATES

E90 UNITISED FAÇADE SYSTEM

UNITISED FAÇADE SYSTEM DESIGNED TO MEET THE STRINGENT REQUIREMENTS REGARDING WIND LOADS FOR HIGH-RISE BUILDINGS

- 90 mm system width
- Easy installation without scaffolding
- Big variety of cladding solutions, various types of materials
- 20 mm gap between modules, allowing movement and deformations up to 14 mm
- High quality, factory-produced modules
- Nearly 70% reduction in installation time
- Custom designed EPDM gaskets
- Adjustability of the fixing devices
- Manufacturing not dependent on weather conditions
- Glass panels from 23 up to 40 mm thickness
- Controlled drainage of rain water and condensation
- High level of watertightness with four barriers
- Compatible with all ETEM window systems

STANDARD SIZE OF ONE MODULE: 1500 MM X 3600 MM

WIDTH OF THE SYSTEM

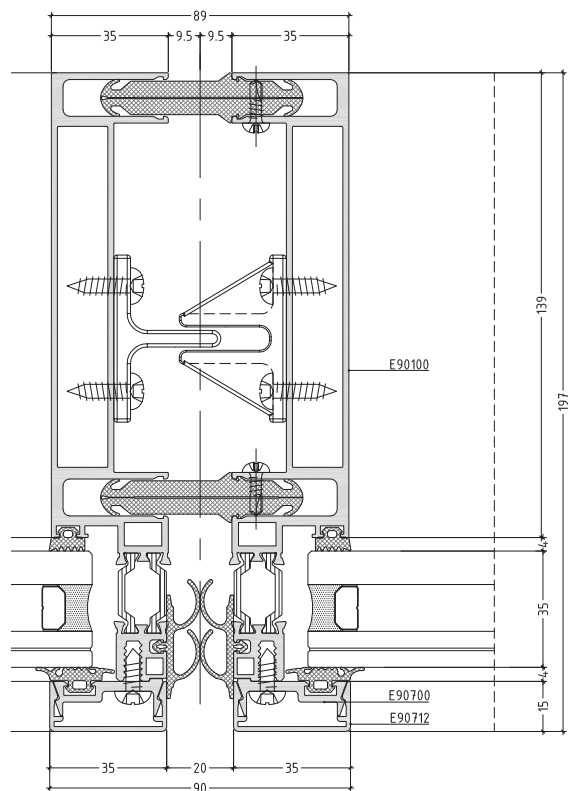
90 mm

JOINT

20 mm, ensuring the absorption of movements and deformations of up to 14 mm. Designed to absorb seismic shifts typical of the Eurasian tectonic plate and in particular the seismic activity of Southeastern Europe, which is one of those parts of the continents that are most prone to seismic activity.

THICKNESS OF THE INSULATED GLAZING

From 23 to 40 mm depending on the width of the polyamide.



SECURE MOUNTING

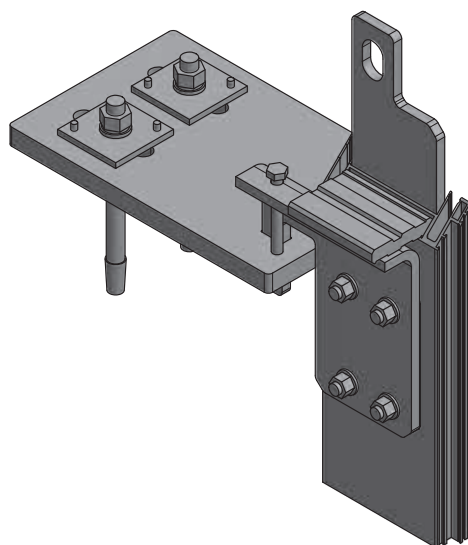
Suspension hook made of steel mounted on the panel and serving as the link between the panels. Possibility of regulation - vertically ± 20 mm and horizontally ± 35 mm. Easy suspension of the module.

STEEL REINFORCEMENT

A console made of steel mounted on the reinforced concrete plate.

PRESSURE BALANCE

Suspending devices that absorb the deviations in the concrete in all directions.



TWO TYPES OF FRAME PROFILES

Standard type and strengthened type profiles of equal visible width – used depending on the degree of loading of the zone where the system is to be applied.

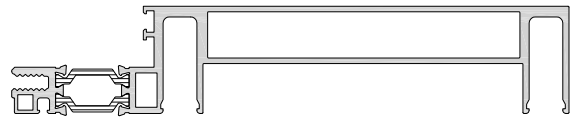
Standard profiles:

for wind pressure of up to 1,5 kN/m²

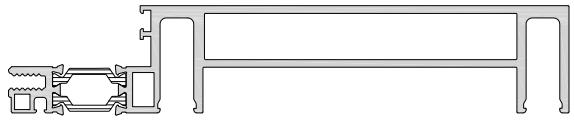
Strengthened profiles:

for wind pressure of up to 2,2 kN/m²

The profiles have been designed in conformity with the Eurocode 9 (EN 1999-1-1). The system has been developed in accordance with the requirements of Bulgarian National Regulation 3 for the basic principles of designing the structures of the construction projects and the impacts on them.



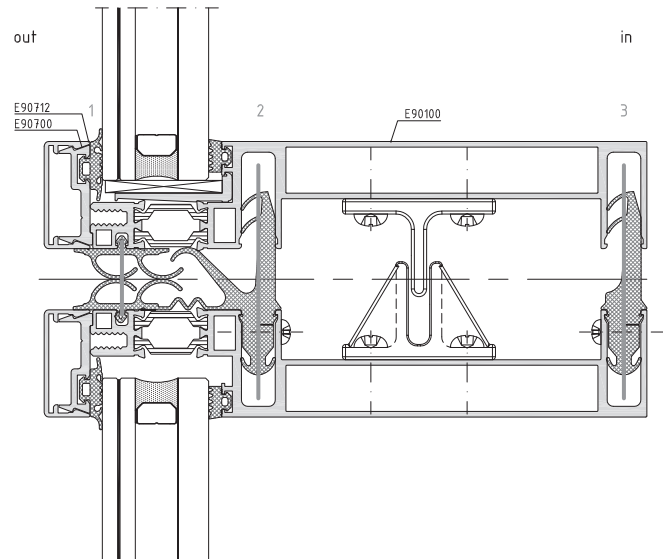
E90100



E90101

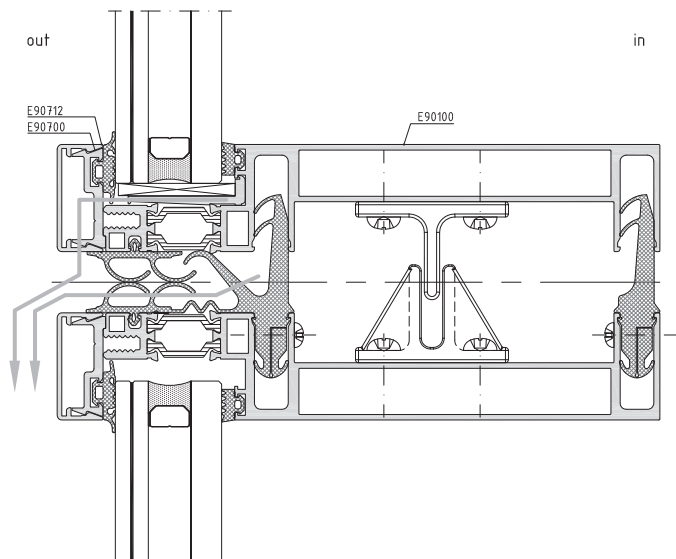
WATER TIGHTNESS

High degree of water tightness – three lines of defense.



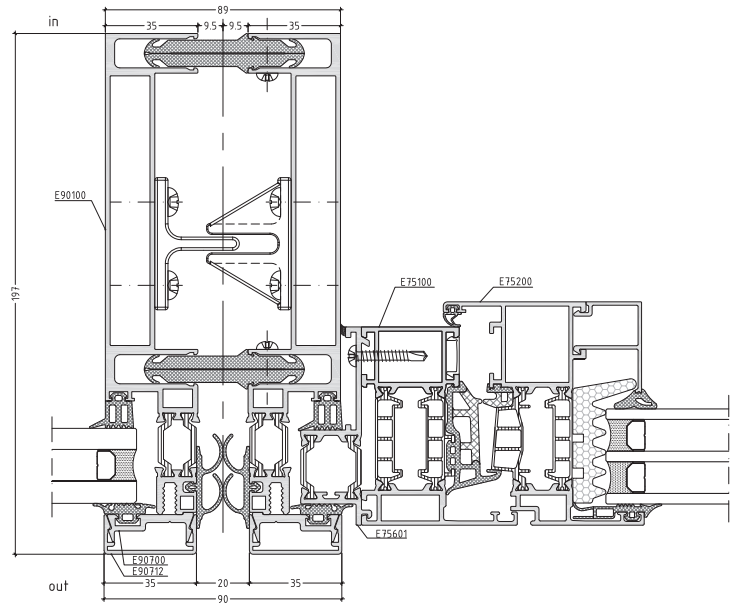
WATER DRAINAGE

Controlled taking out of the rain water and of the condensed water. Draining that would not allow the passing through of water into the interior of the building.



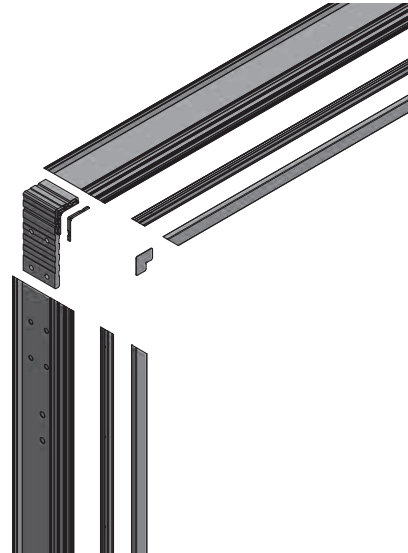
COMPATIBILITY

Compatible with all openable ETEM systems – windows and doors of E40, E45, E24 systems and of outward projecting windows of the E85 system.



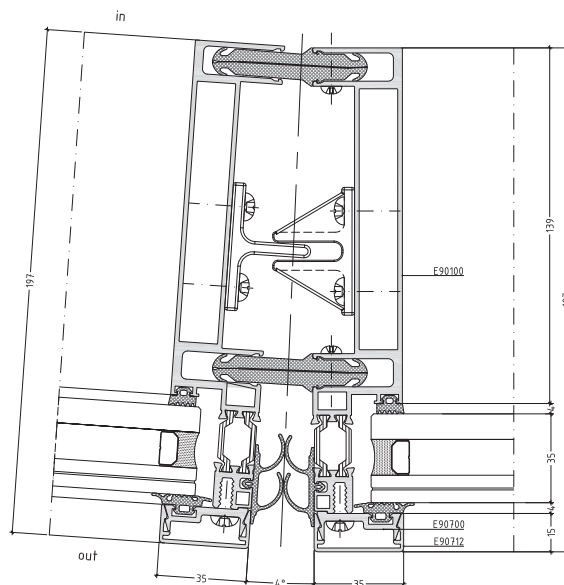
L CORNER

Secure, elongated L corner. Securing of impermeability and strength of the assembly parts through putting in polyurethane glue.



POSSIBILITY FOR POLYGONALITY

Optional polygonality in plan-angle up to 4°.



COMPLIANCE WITH APPLICABLE REGULATIONS

Production management

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

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

Aluminium profiles produced by ETEM are accessed in accordance with EN ISO 14025 – Environmental Product Declarations.

Factory production control system is certified according to the requirements of EN 15088.

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

Occupational Health & Safety management system is certified in accordance with OHSAS 18001.

PERFORMANCE CHARACTERISTICS OF E90

Characteristics	Result	Standard
Air permeability	A4	EN 12152 EN 12153
Watertightness	Static ; R7; Dynamic: 188 Pa/563 Pa	EN 12154 EN 12155 EN 13050
Resistance to wind load	Design load: $\pm 1,5 \text{ kN/m}^2$ Safety load: $\pm 2,25 \text{ kN/m}^2$	EN 13116 EN 13116
Impact resistance	I4 / E 4	EN 14019
Thermal transmittance	$U_f = 2,6 \text{ W/m}^2\cdot\text{K}$	EN 12412-2

TABLES

TYPES / LIST OF PROFILES / CHARACTERISTICS

unitised façade system

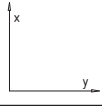
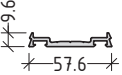
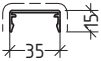
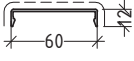
E90

code description	profile	weight length ext.perimeter vis.perimeter area	static values			
E90100		2671 g/m *6.01 m 658 mm 180 mm 10.13 cm ²	I _x = 311 cm ⁴ W _x = 35.7 cm ³	I _y = 12 cm ⁴ W _y = 5.77 cm ³	**	
E90101		3305 g/m *6.01 m 653 mm 183 mm 12.35 cm ²	I _x = 380 cm ⁴ W _x = 39.54 cm ³	I _y = 14.6 cm ⁴ W _y = 6.94 cm ³	**	
E90300		2343 g/m *6.01 m 408 mm 193 mm 8.68 cm ²	I _x = 89.7 cm ⁴ W _x = 14.66 cm ³	I _y = 35.9 cm ⁴ W _y = 11.98 cm ³	**	
E90301		3092 g/m *6.01 m 479 mm 213 mm 11.53 cm ²	I _x = 141.3 cm ⁴ W _x = 25.76 cm ³	I _y = 77.1 cm ⁴ W _y = 19.39 cm ³	**	
E90302		3854 g/m *6.01 m 624 mm 357 mm 14.42 cm ²	I _x = 535.2 cm ⁴ W _x = 56.63 cm ³	I _y = 120.8 cm ⁴ W _y = 30.35 cm ³	**	
E90700		322 g/m *6.01 m - mm - mm 1.19 cm ²	I _x = 1.2 cm ⁴ W _x = 0.75 cm ³	I _y = 0.06 cm ⁴ W _y = 0.1 cm ³	**	

Note:

- * the length of profile can be different for each project needs
- ** The values shown do not take into account the characteristics of the polyamide bars!
When calculating a particular project, the usage of the correction coefficients is mandatory!

L90-01

code description		profile	weight length ext.perimeter vis.perimeter area	static values			
E8620			554 g/m *6.01 m - mm - mm 2.04 cm ²	I _x = 6.08 cm ⁴ W _x = 2.11 cm ³	I _y = 0.09 cm ⁴ W _y = 0.14 cm ³		
E90712			270 g/m *6.01 m 136 mm 63 mm 1.19 cm ²	I _x = 1.8 cm ⁴ W _x = 1.04 cm ³	I _y = 0.2 cm ⁴ W _y = 0.18 cm ³		
E90711			300 g/m *6.01 m 163 mm 82 mm 1.22 cm ²	I _x = 5.4 cm ⁴ W _x = 1.81 cm ³	I _y = 0.1 cm ⁴ W _y = 0.12 cm ³		

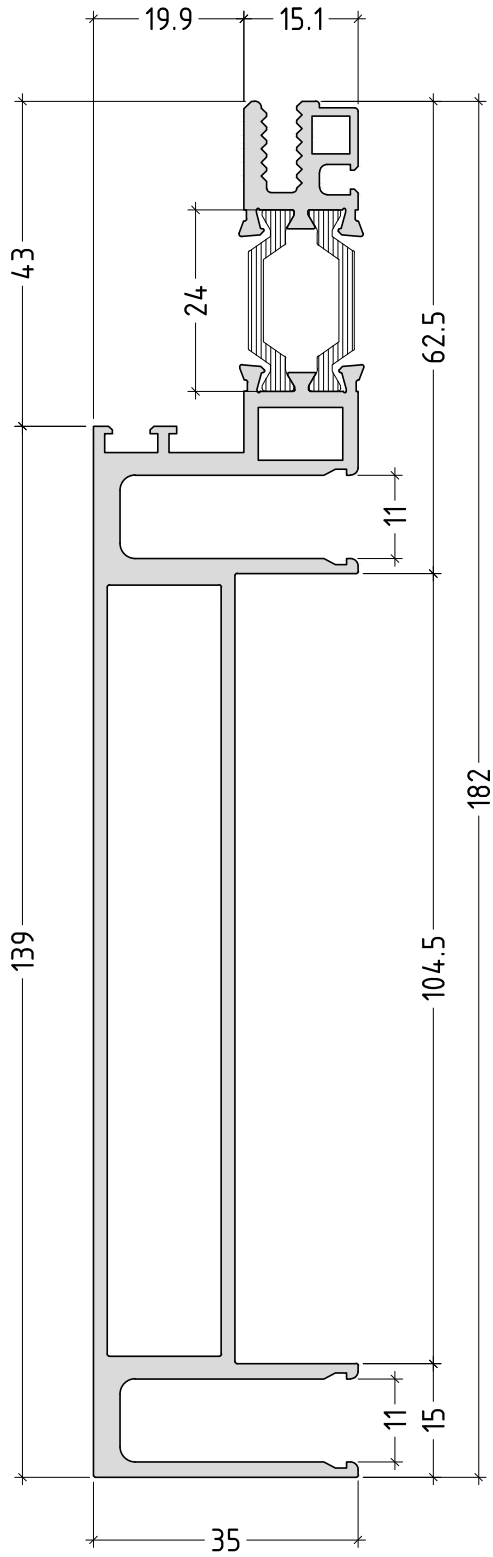
Note:

- * the length of profile can be different for each project needs
- ** The values shown do not take into account the characteristics of the polyamide bars!
When calculating a particular project, the usage of the correction coefficients is mandatory!

PROFILES

DRAWINGS

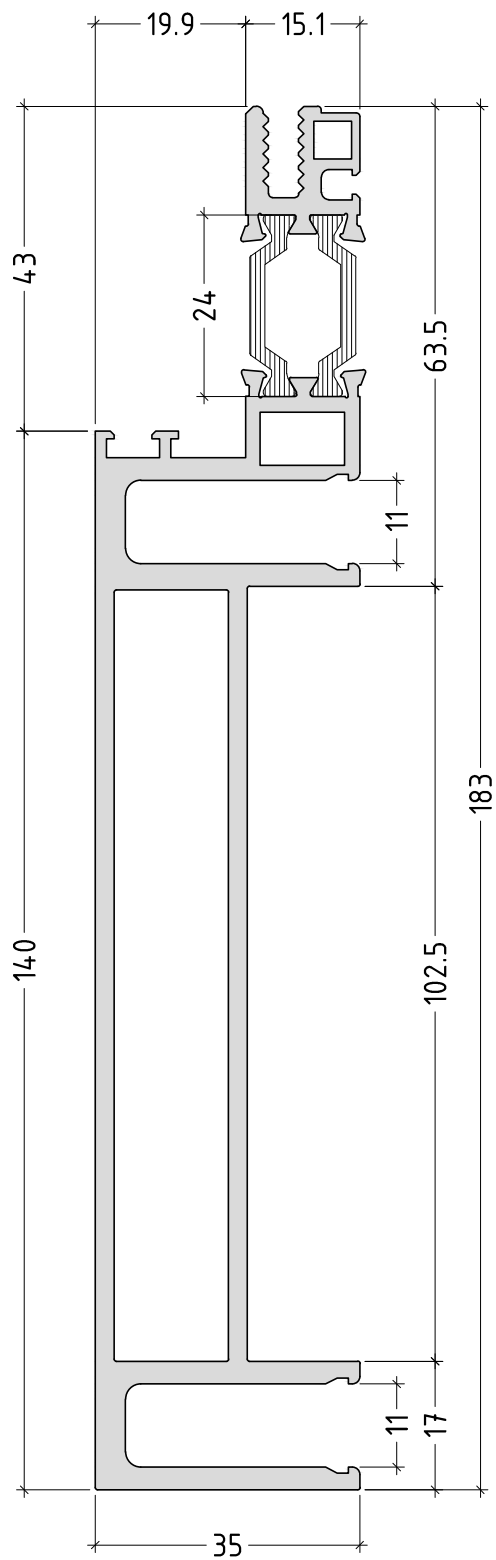
E90100
2671 g/m



scale : 1:1

P90-01

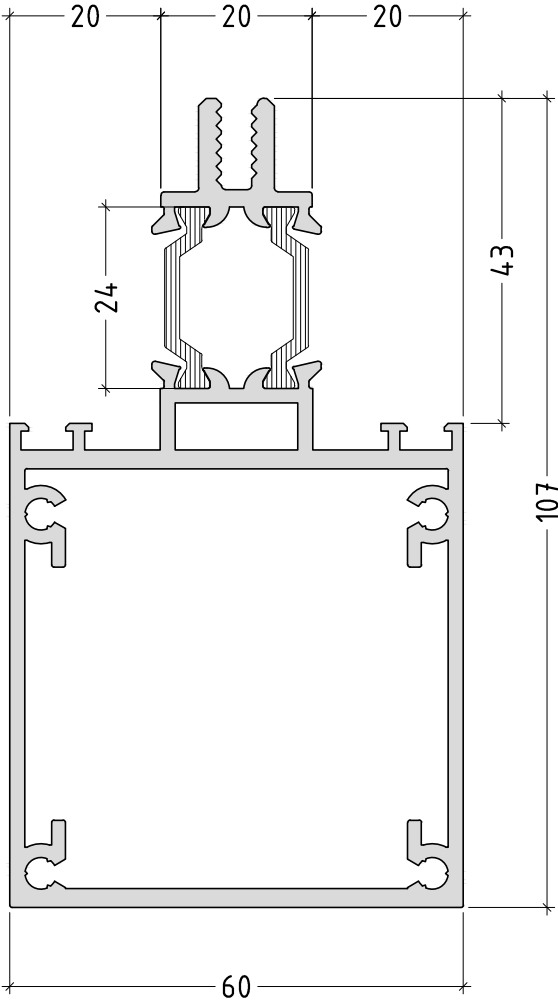
E90101
3305 g/m



scale : 1:1

P90-02

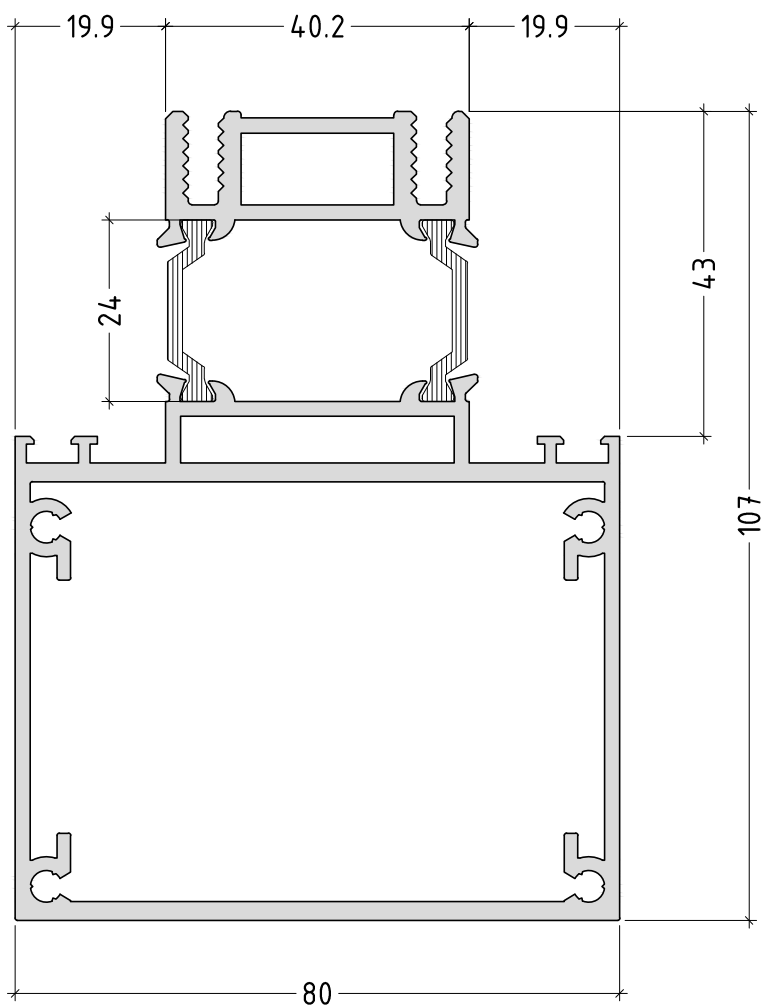
E90300
2343 g/m



scale : 1:1

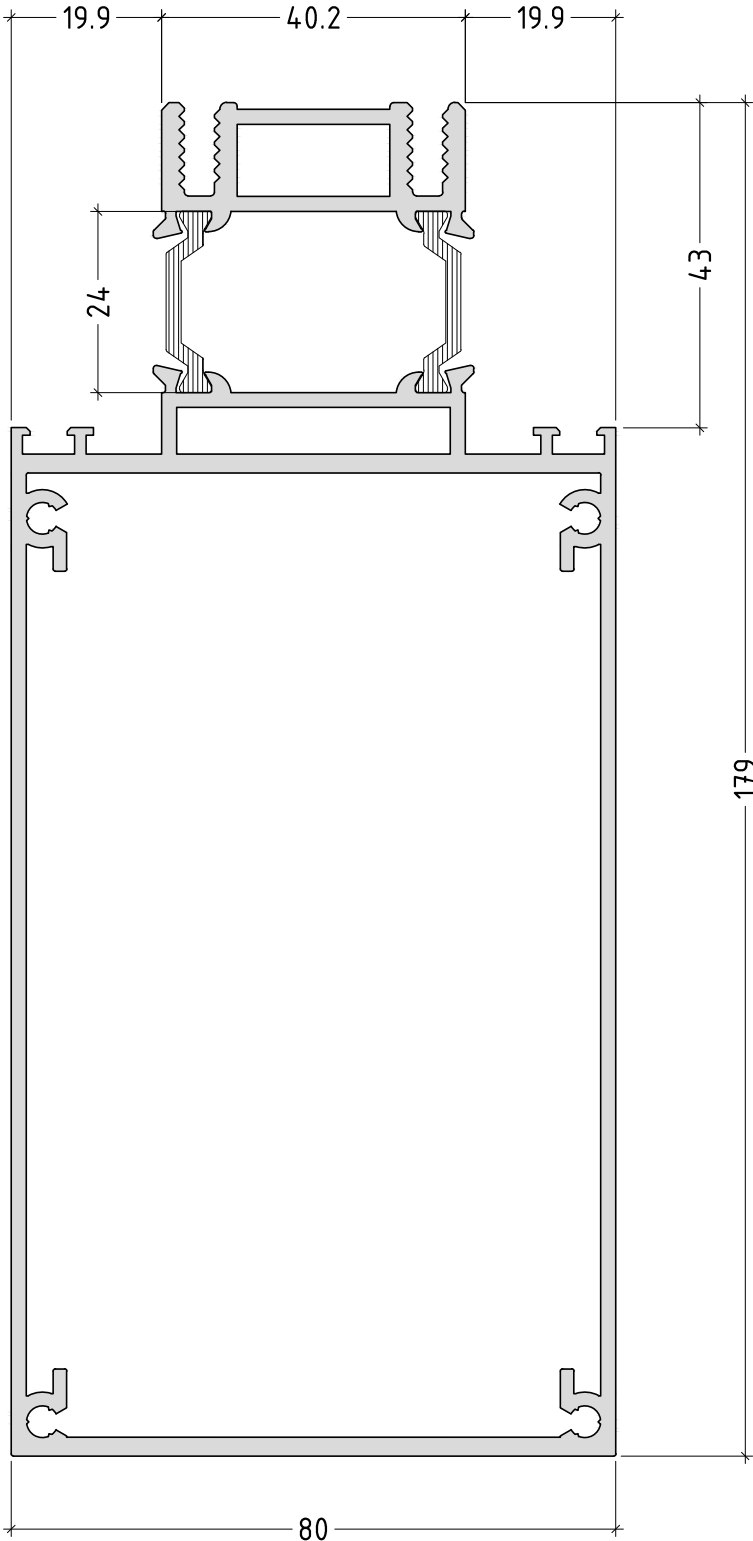
P90-03

E90301
3092 g/m



scale : 1:1

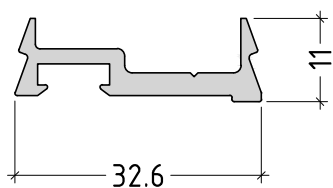
E90302
3854 g/m



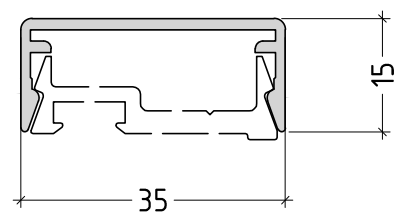
scale : 1:1

P90-05

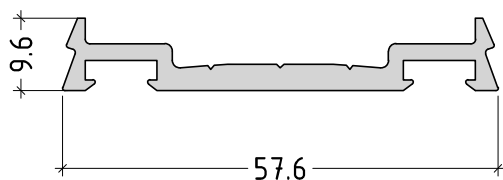
E90700
322 g/m



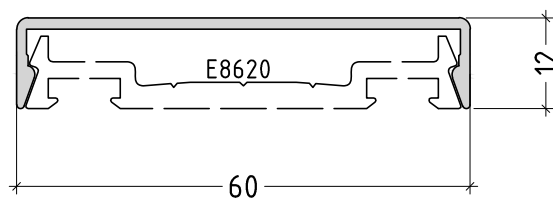
E90712
270 g/m



E8620
554 g/m



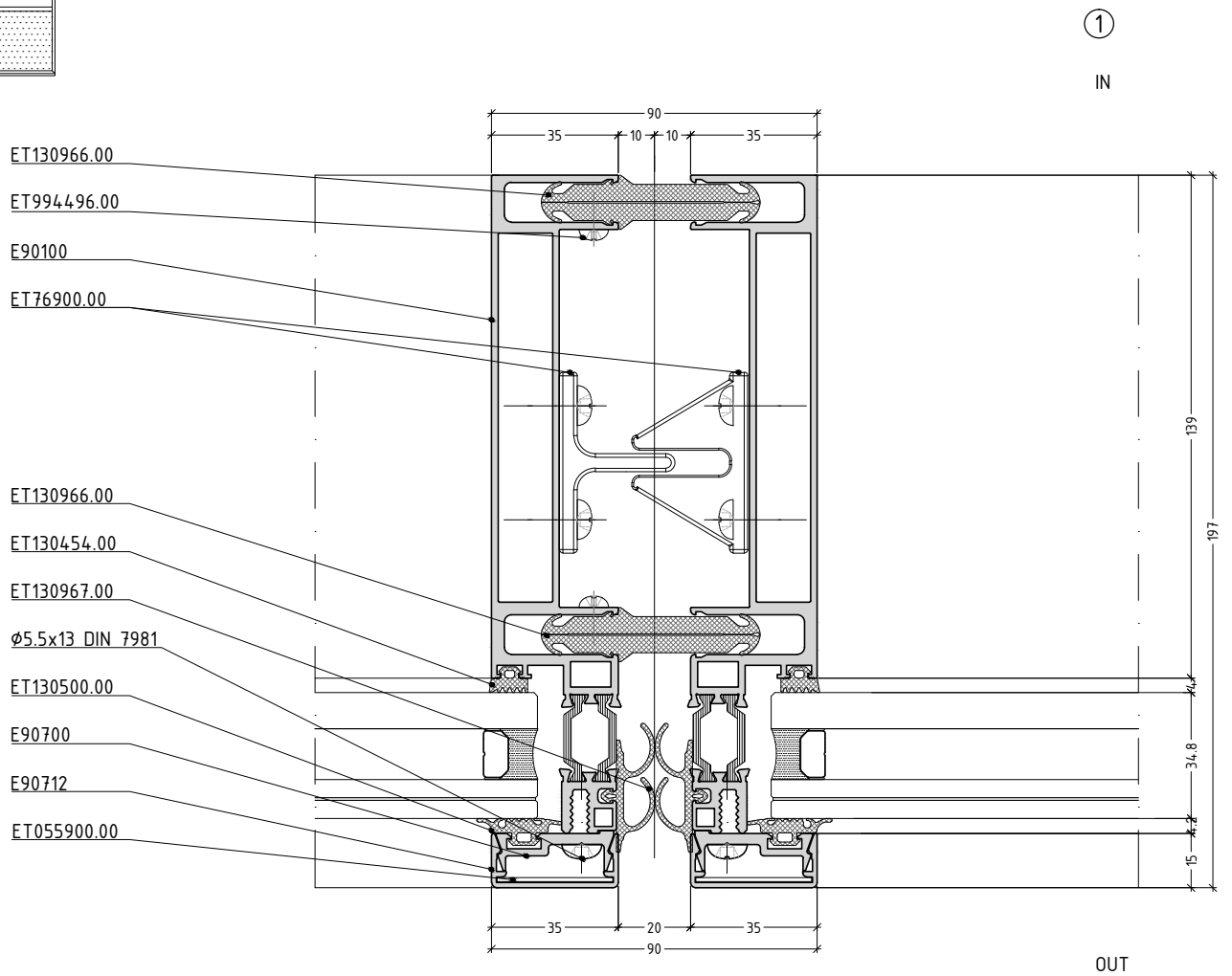
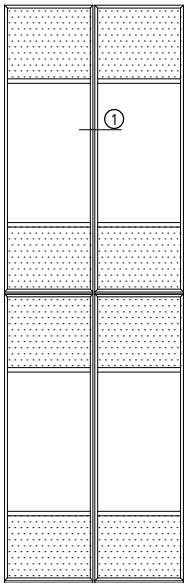
E90711
300 g/m



scale : 1:1

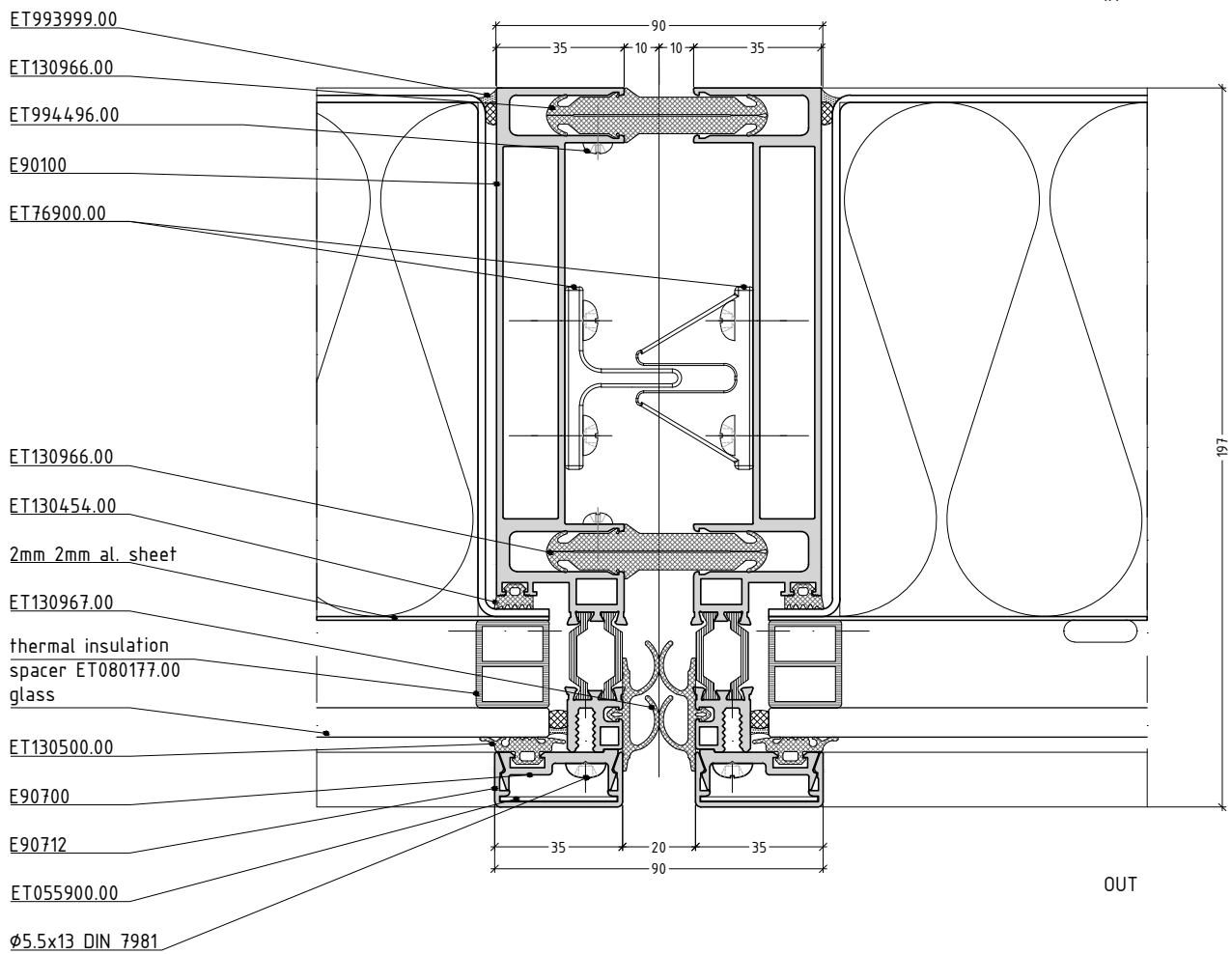
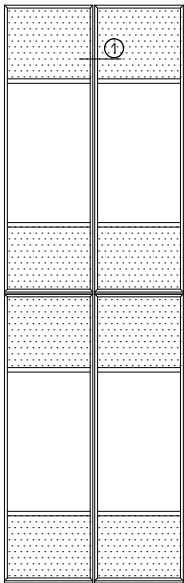
SECTIONS

SECTIONS / DETAILS



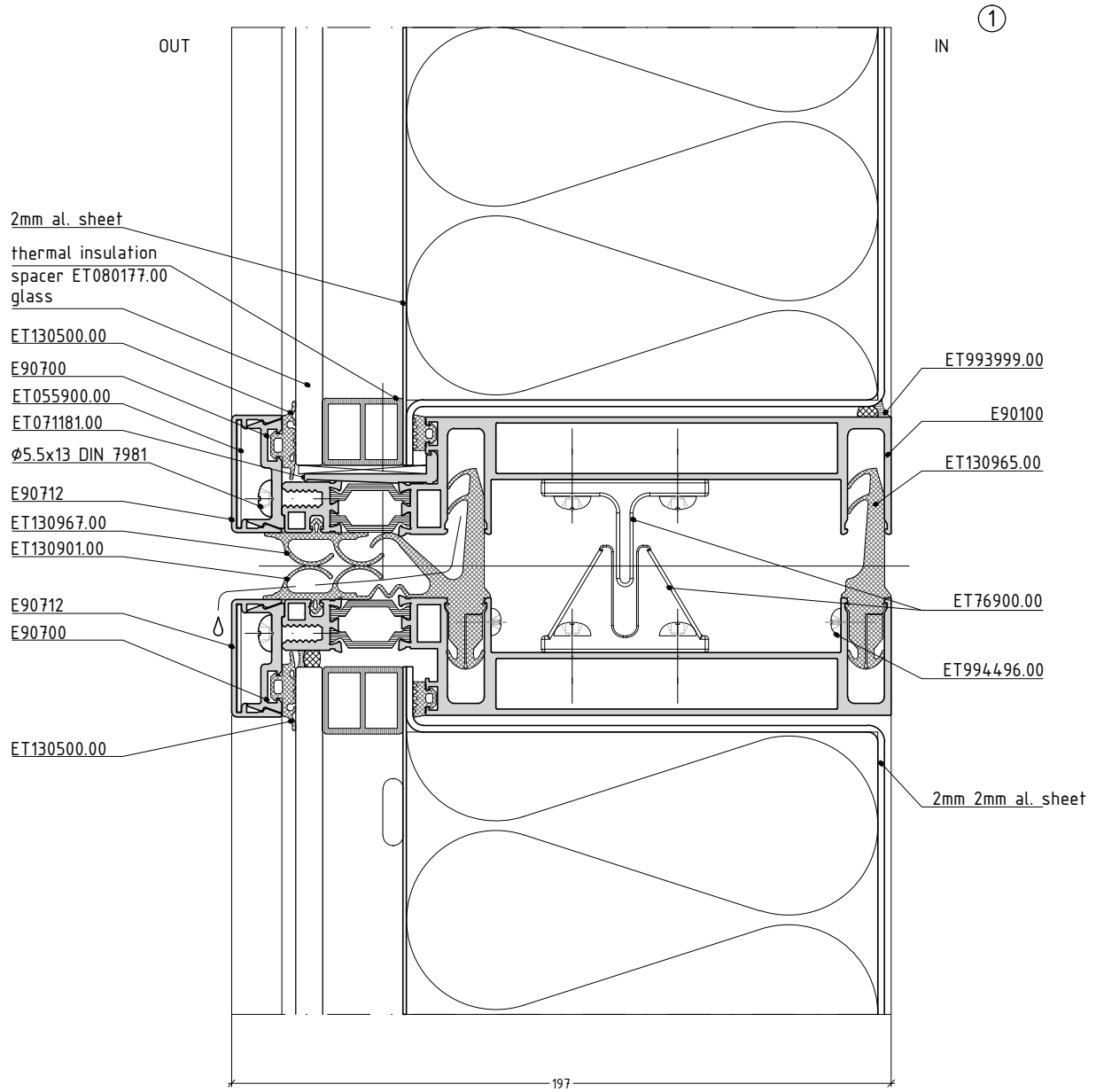
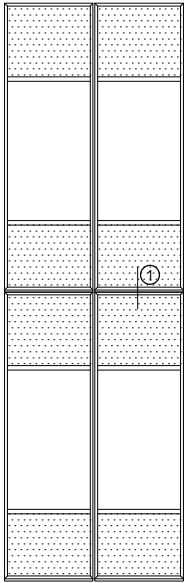
scale 1/2

E90D-01



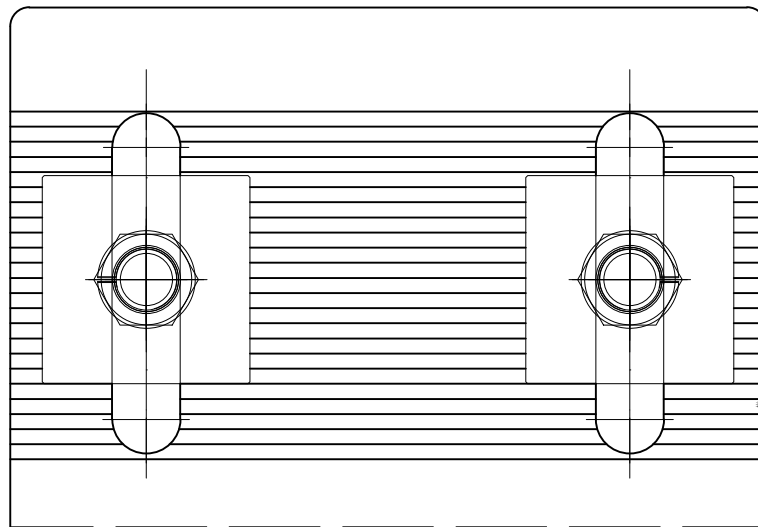
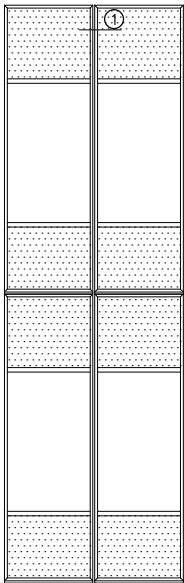
scale 1/2

E90D-02

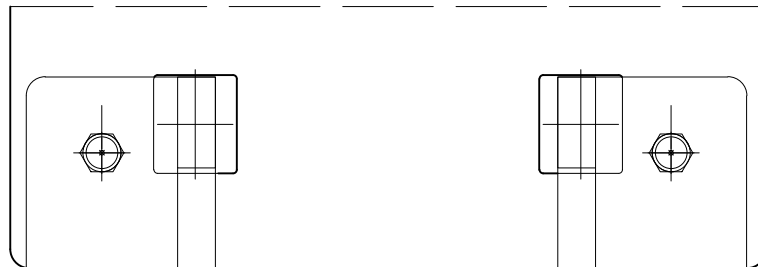


scale 1/2

E90D-03



al. bracket for E90



①

IN

ET130966.00

E90100

ET130966.00

ET130454.00

2mm 2mm al. sheet

ET130967.00

thermal insulation
spacer ET080177.00

ET130500.00

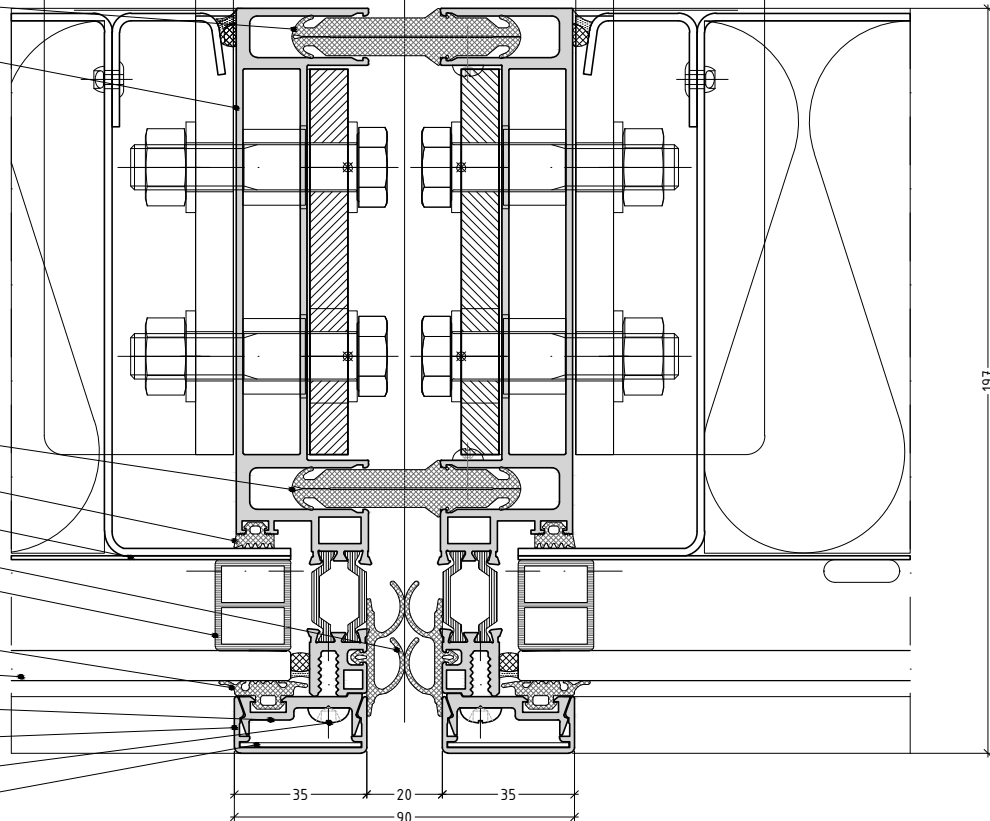
glass

E90700

E90712

Ø5.5x13 DIN 7981

ET055900.00

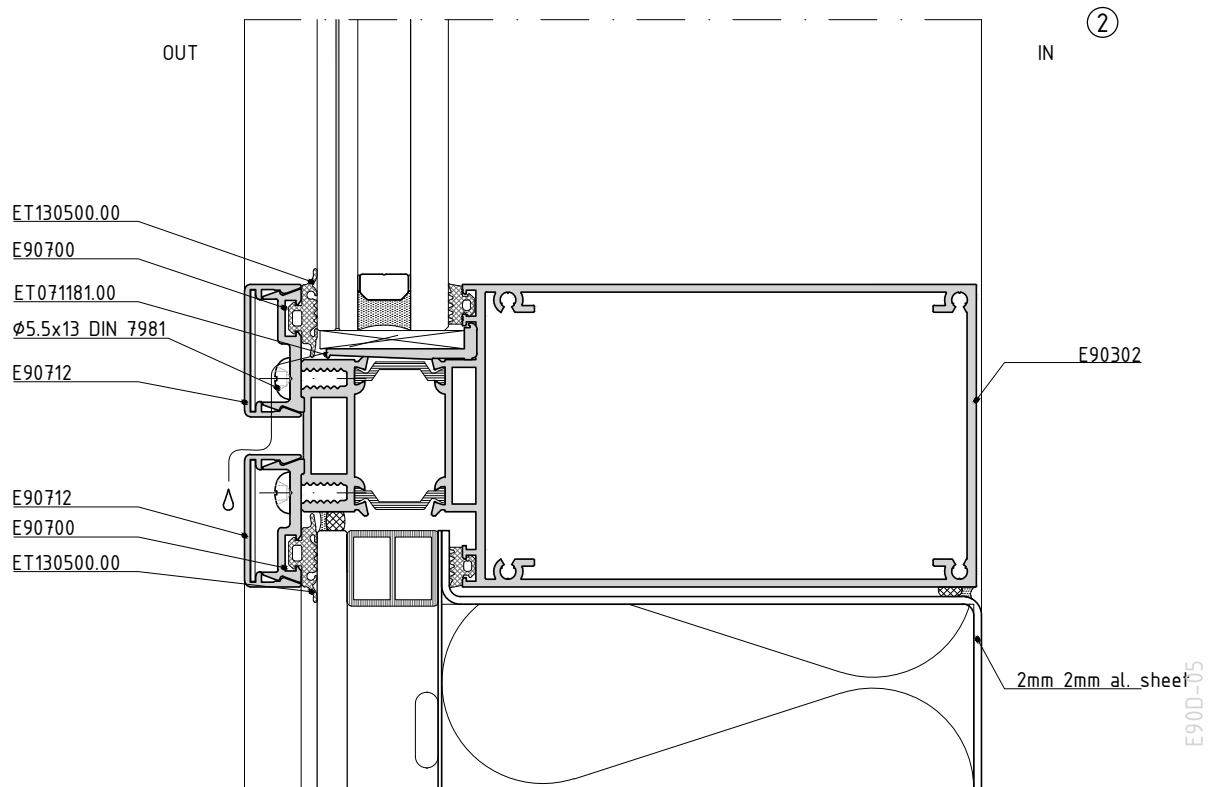
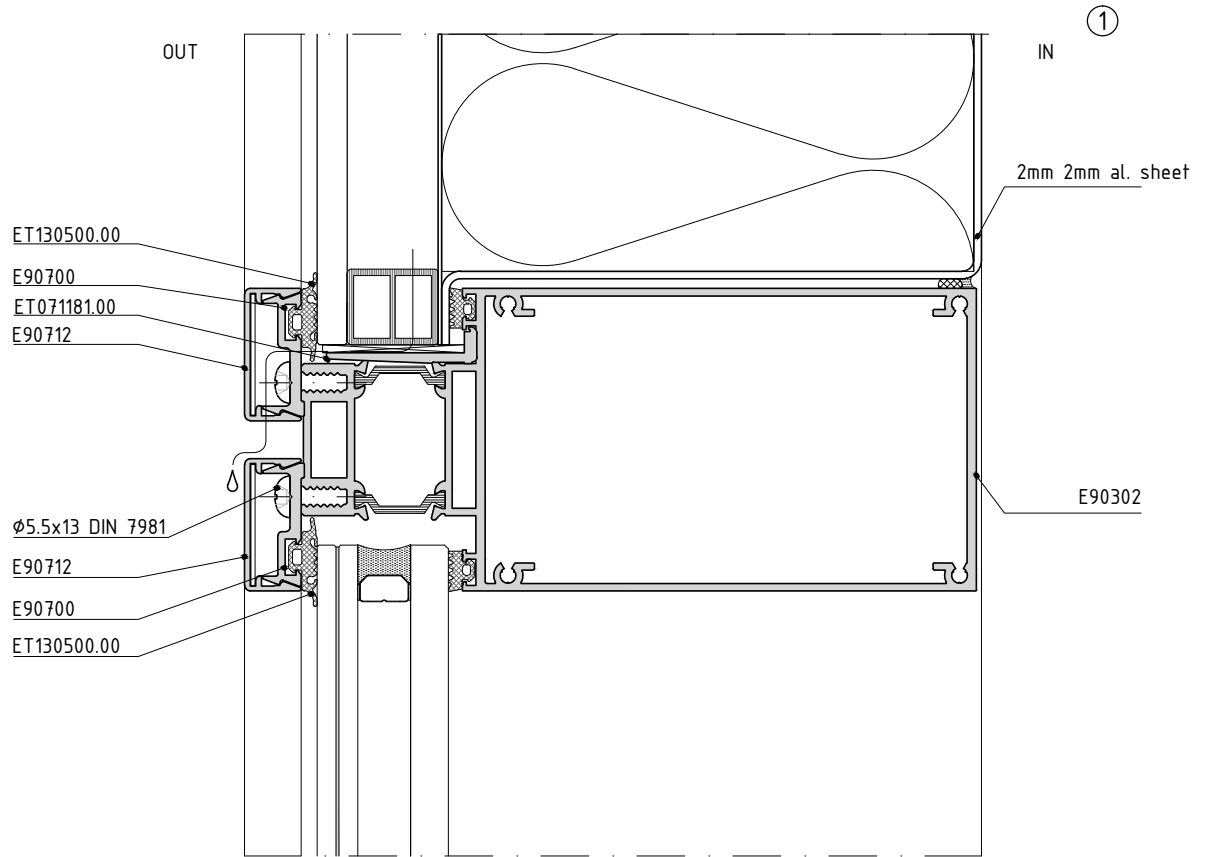
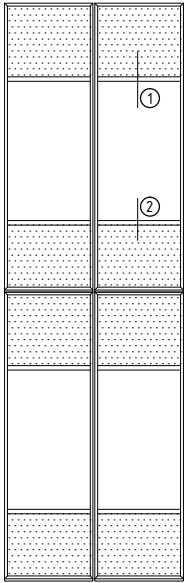


197

OUT

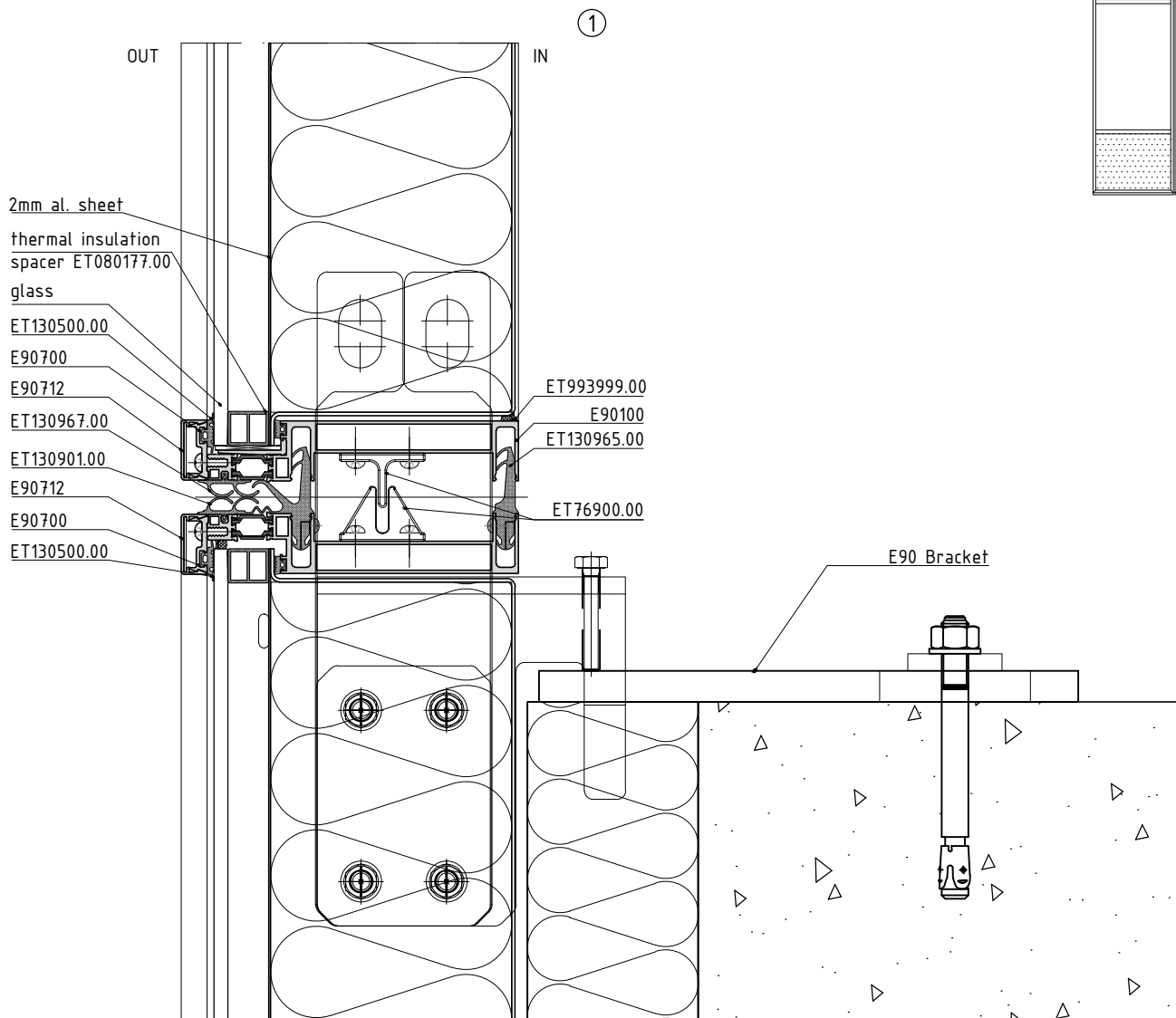
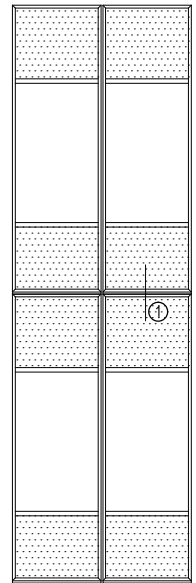
E90D-04

scale 1/2



scale 1/2

E90D-05



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

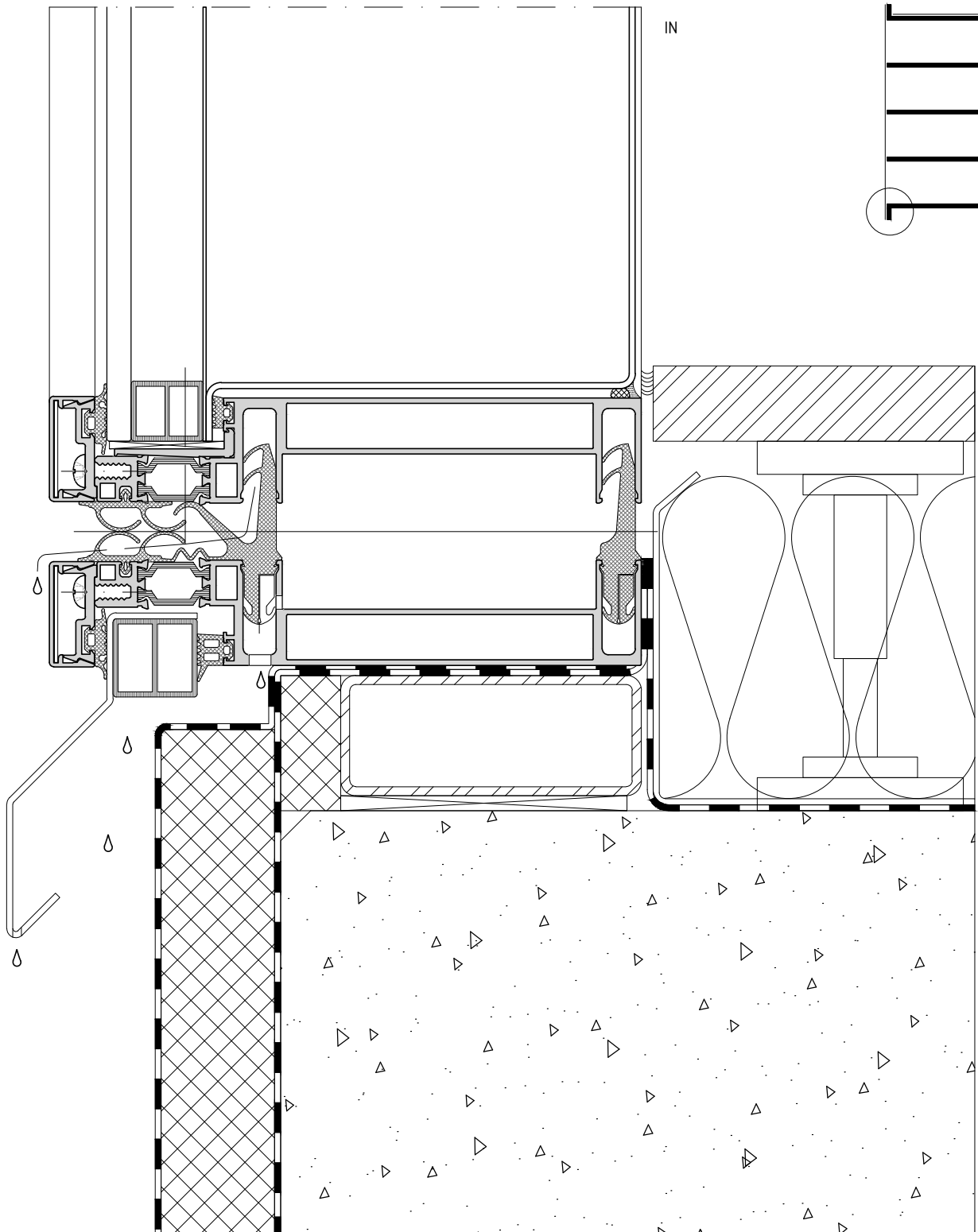
scale 1/4

E90D-06

①

OUT

IN



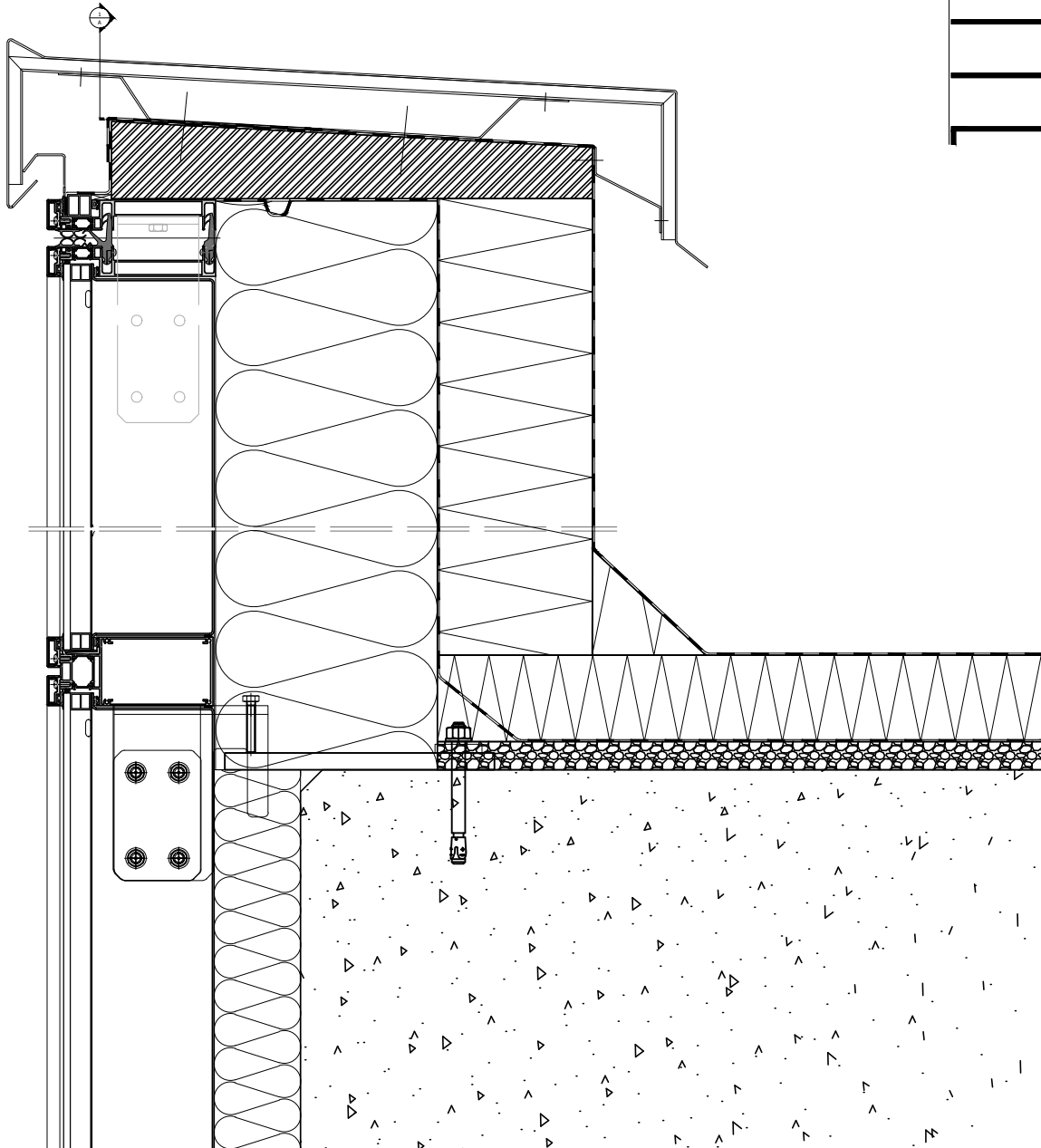
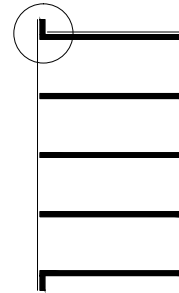
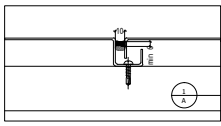
Interface shown on the drawing is an example ONLY!

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

scale 1/2

E90D-07

upper finishing with ENF



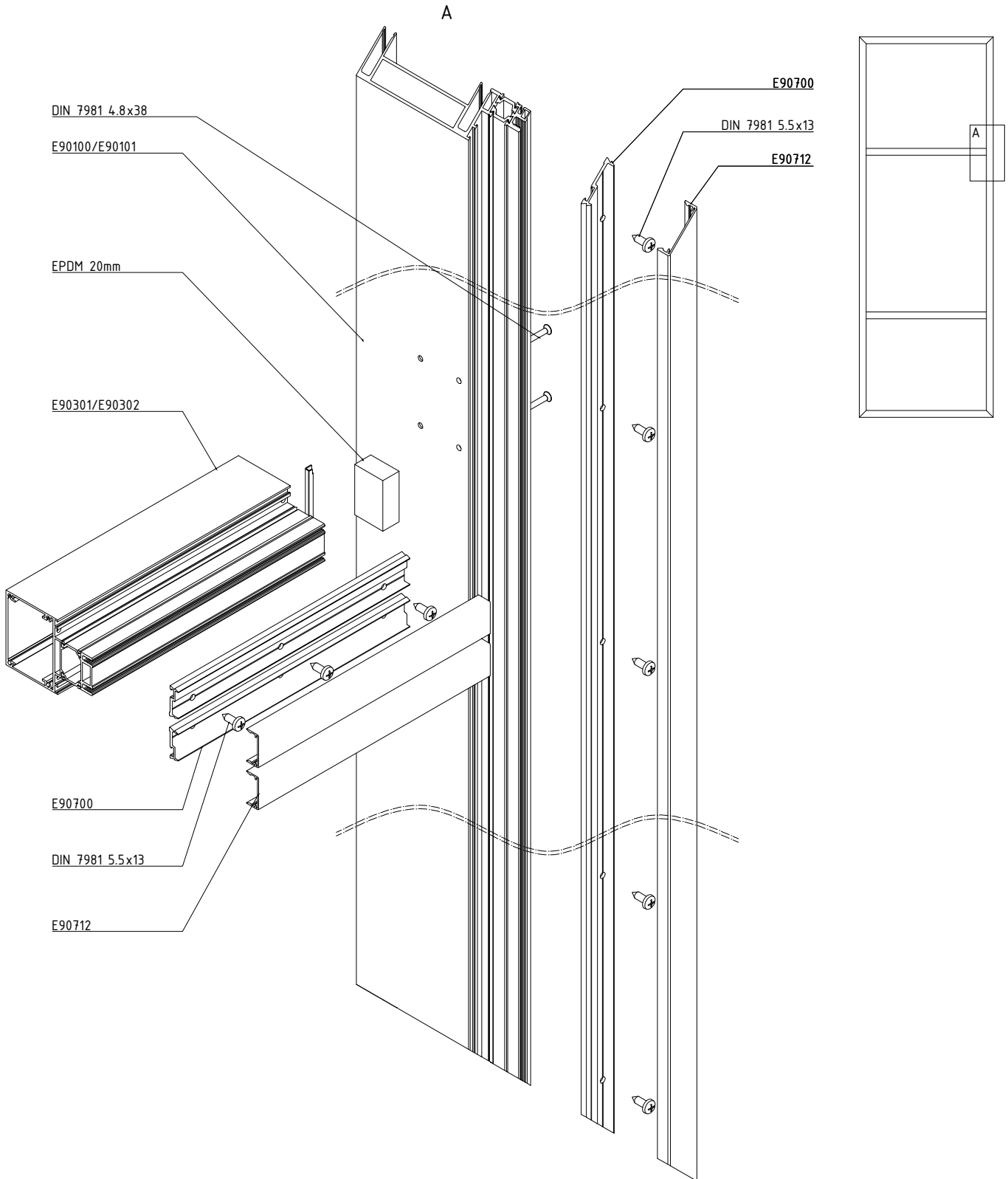
Interface shown on the drawing is an example ONLY!
 Connection between backing wall and frame is specific for each single project. It is obligatory to observe different projects' features.
 All final decisions about materials used, interface finishing, etc. should be approved by the structural / façade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

scale 1/8

E90D-08

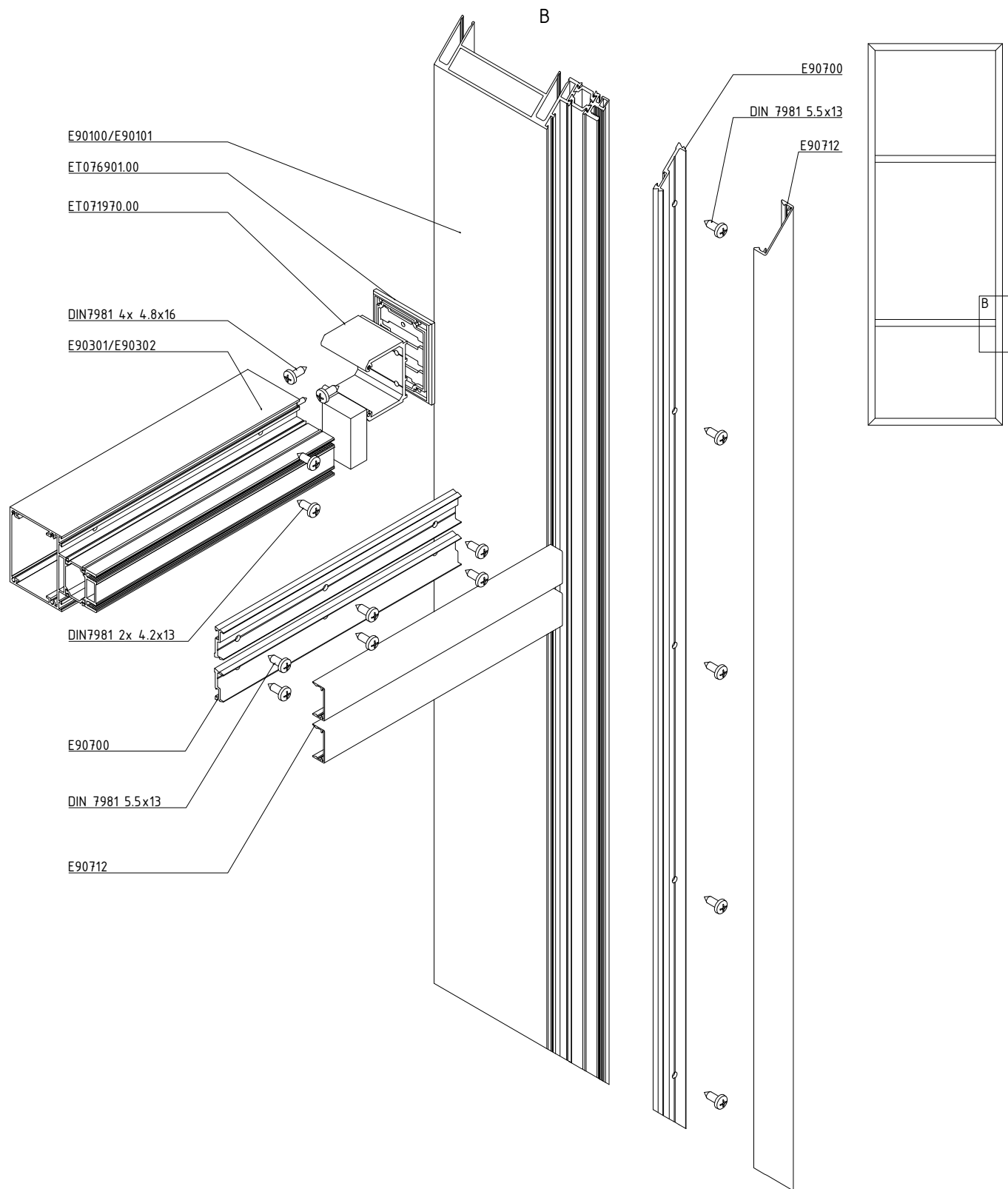
MACHINING

List of items for mounting T-profile E90301/E90302 to frame E90100/E90101 with screws



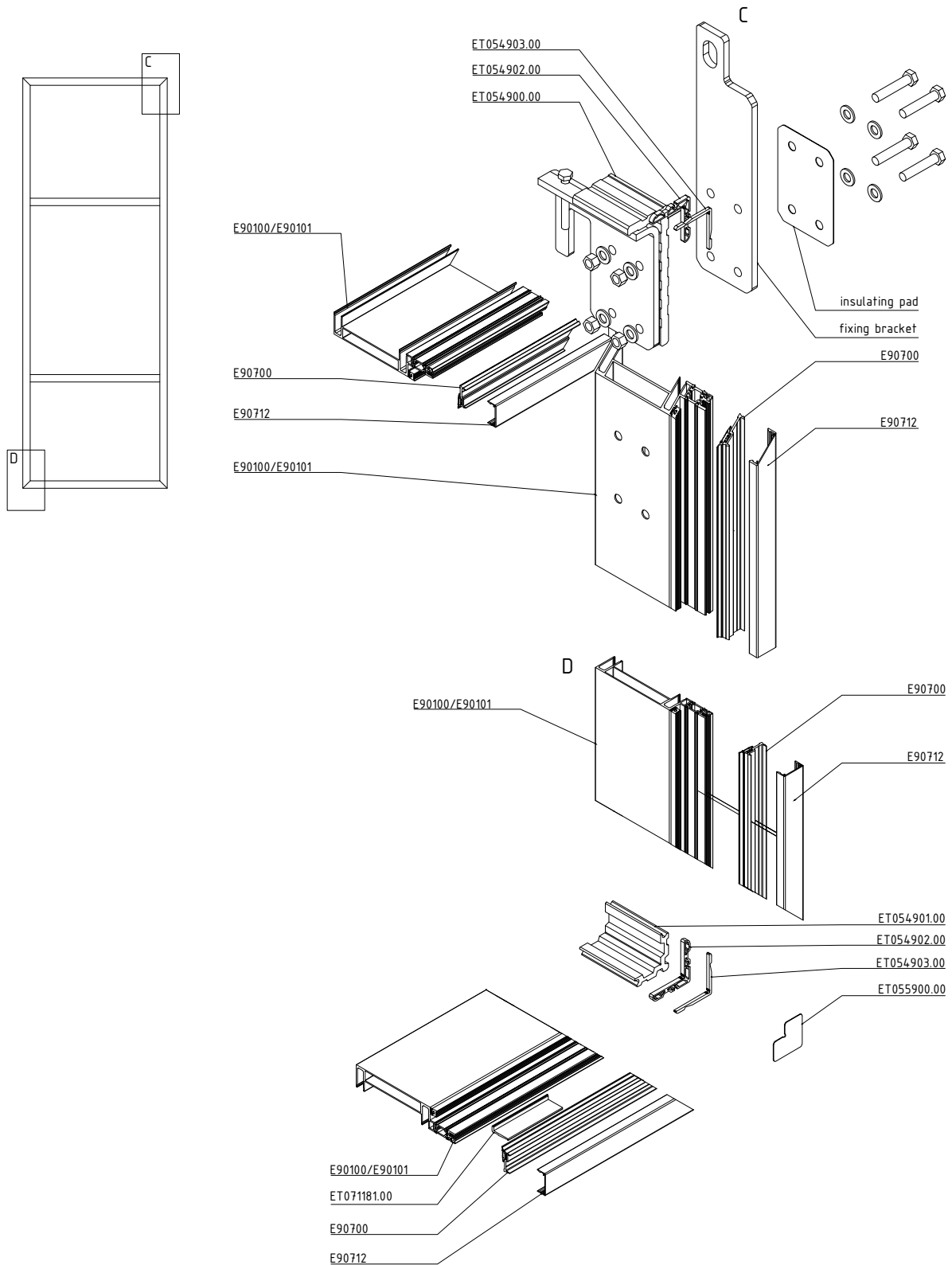
E90D-9

List of items for mounting T-profile E90301/E90302 to frame E90100/E90101 with T-bracket for heavy duty solutions



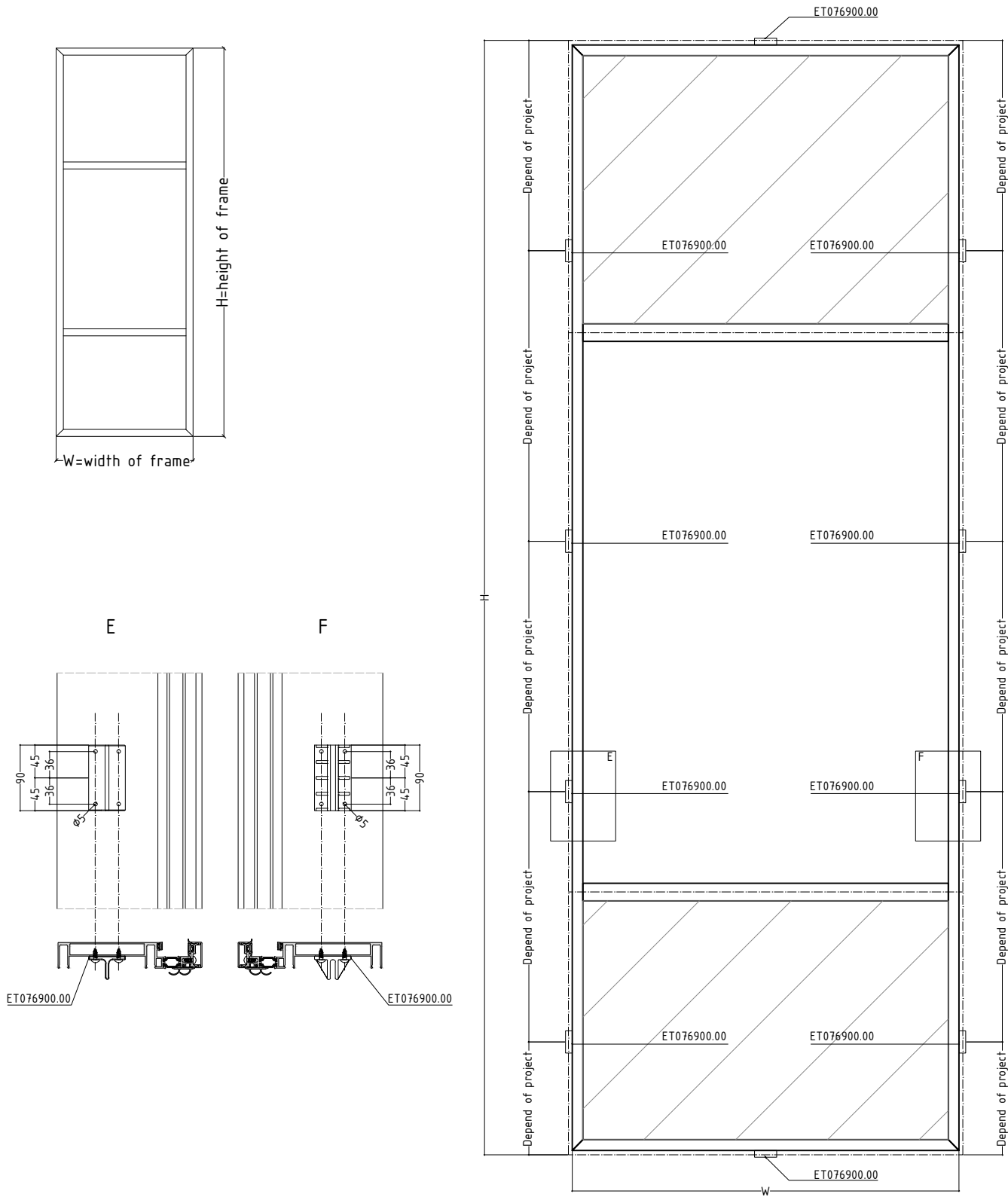
E90D-10

Mounting of join corner and fixing bracket



attention
 always use epoxy resin for long lasting joining
 all join corners must be crimped
 all mounting hole must be treatment with ET993990.00

Mounting of alignment space bar between modules



E90D-12

ACCESSORIES

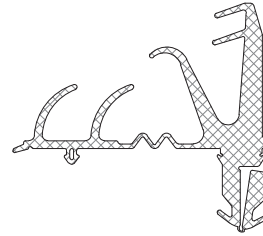
unitised façade system

E90

code/description	package/pcs	colour
ET 130901.00	-	●

* specific length for each project

EPDM gasket between frame
E90100\E90101



ET 130965.00	-	●
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* specific length for each project

EPDM gasket between frame
E90100\E90101



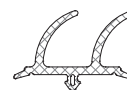
ET 130966.00	50	●
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EPDM gasket between frame
E90100\E90101



ET 130967.00	100	●
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EPDM gasket between frame
E90100\E90101

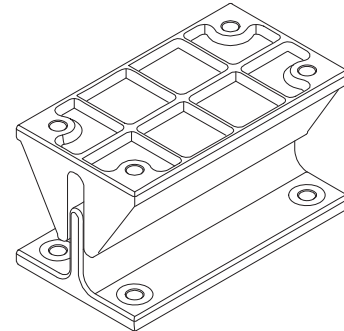


unitised façade system

E90

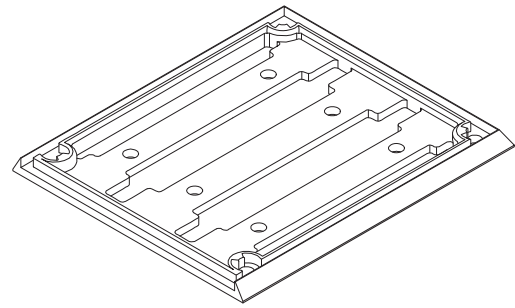
code/description	package/pcs	colour
ET 076900.00	-	-

Alignment space bar between modules for E90



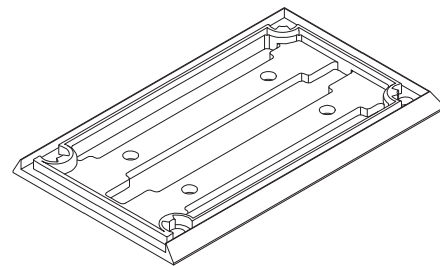
ET 076901.00	-	-
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flange (EPDM) for transom E90301



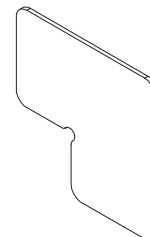
ET 076902.00	-	-
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flange (EPDM) for transom E90300



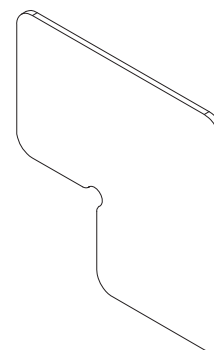
ET 055900.00	-	-
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Alignment square (galvanized steel) for E90712



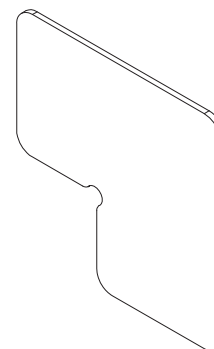
code/description	package/pcs	colour
ET 055901.00	-	-

Alignment square (galvanized steel) for E90300/E90301



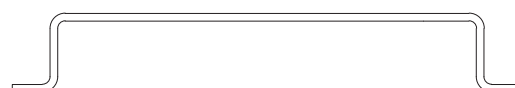
ET 055902.00	-	-
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alignment square (galvanized steel) for E90300/E90302



ET 060905.00	-	-
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Plug (aluminium) for transom E90301/E90302



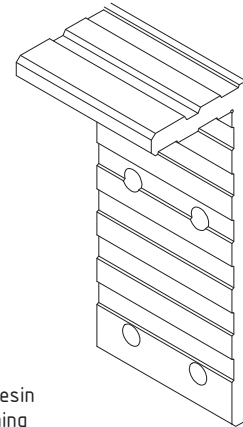
ET 060906.00	-	-
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Plug (aluminium) for transom E90300



code/description	package/pcs	colour
ET 054900.00	-	-

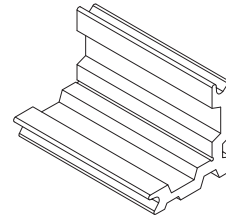
extruded al. joint corner
bracket for E90100 and
E90101



attention
always use epoxy resin
for long lasting joining

ET 054901.00	-	MF
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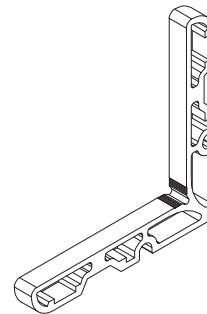
Extruded al. joint corner
bracket for E90100\E90101



attention
always use epoxy resin
for long lasting joining

ET 054902.00	-	MF
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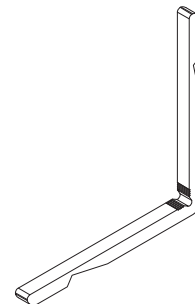
Extruded al. joint corner
bracket for E90100\E90101



attention
always use epoxy resin
for long lasting joining

ET 054903.00	-	MF
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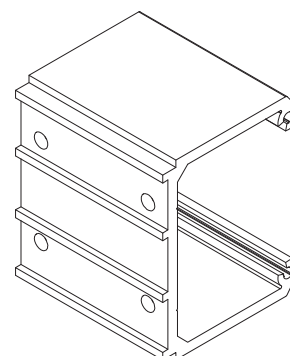
Extruded al. joint corner
bracket for E90100\E90101



attention
always use epoxy resin
for long lasting joining

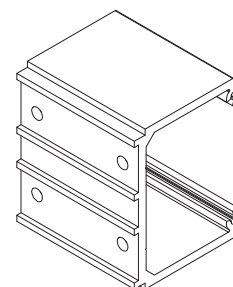
code/description	package/pcs	colour
ET 071970.00	-	-

T-bracket for E90301



ET 071971.00	-	-
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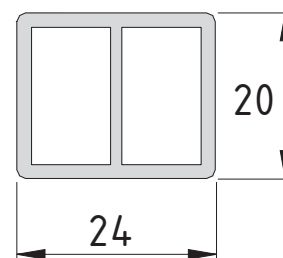
T-bracket for E90300



ET080177.00	6	●
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ET080177 old code

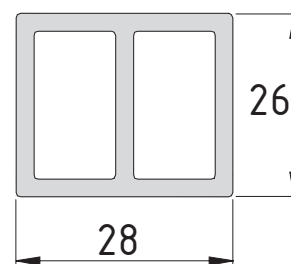
thermal insulation spacer
PVC 20x24 mm



ET080165.00	6	●
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ET080184 old code

thermal insulation spacer
PVC 26x28 mm



CE MARKING

STANDARDS / PERFORMANCE CHARACTERISTICS

CE MARKING

WHAT DOES THE SIGN CE MEAN?

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

WHAT IS THE PURPOSE OF CE MARKING?

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

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

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

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

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

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

WHAT ARE THE REQUIREMENTS FOR THE CE MARKING?

Curtain walling kits intended to be used as external walls not subjected to reaction to fire requirements are covered by System 3 of assessment and verification of constancy of performance.

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 13830 – Curtain walling – Product standard

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 CURTAIN WALLS

Declaration of performance Nº

1. Unique identification code of the product type: W-01
2. Intended use / uses: Curtain wall
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 13830
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 N°123456, issued on 01.02.2015

8. Declared performance:

Essential characteristics	Performance	Harmonized technical specification
Watertightness	RE 1500	EN 13830
Resistance to wind load	2,4 kN/m ² (design load)	
Sound insulation	38 (-1;-2) dB	
Air permeability	A4	
Thermal transmittance	1,9 W/(m ² .K)	

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

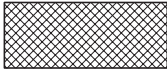
- EN 12020 (1÷2) – ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED PRECISION PROFILES IN ALLOYS EN AW-6060 AND EN AW-6063
- EN 755 (1÷9)– ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED ROD/BAR, TUBE AND PROFILES
- EN 573 (1÷3) – ALUMINIUM AND ALUMINIUM ALLOYS – CHEMICAL COMPOSITION AND FORM OF WROUGHT PRODUCTS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

CURTAIN WALLING

1. EN 13830 – CURTAIN WALLING – PRODUCT STANDARD
 2. EN 13119 – CURTAIN WALLING – TERMINOLOGY
 3. CWCT STANDARD FOR SYSTEMIZED BUILDING ENVELOPES
 4. EN 12152 – CURTAIN WALLING – AIR PERMEABILITY – PERFORMANCE REQUIREMENTS AND CLASSIFICATION
 5. EN 12153 – CURTAIN WALLING – AIR PERMEABILITY – TEST METHOD
 6. EN 1026 – WINDOWS AND DOORS – AIR PERMEABILITY – TEST METHOD
 7. EN 12154 – CURTAIN WALLING – WATERTIGHTNESS – PERFORMANCE REQUIREMENTS AND CLASSIFICATION
 8. EN 12155 – CURTAIN WALLING – WATERTIGHTNESS – LABORATORY TEST UNDER STATIC PRESSURE
 9. EN 13050 – CURTAIN WALLING – WATERTIGHTNESS – LABORATORY TEST UNDER DYNAMIC CONDITION OF AIR PRESSURE AND WATER SPRAY
 10. EN 1027 – WINDOWS AND DOORS – WATER TIGHTNESS – TEST METHOD
 11. EN 13116 – CURTAIN WALLING – RESISTANCE TO WIND LOAD – PERFORMANCE REQUIREMENTS
 12. EN 12179 – CURTAIN WALLING – RESISTANCE TO WIND LOAD – TEST METHOD
 13. EN 14019 – CURTAIN WALLING – IMPACT RESISTANCE – PERFORMANCE REQUIREMENTS
 14. EN ISO 12631 – THERMAL PERFORMANCE OF CURTAIN WALLING – CALCULATION OF THERMAL TRANSMITTANCE
 15. EN ISO 10077 (1-2) – THERMAL PERFORMANCE OF WINDOWS, DOORS AND SHUTTERS – CALCULATION OF THERMAL TRANSMITTANCE
 16. EN 12412-2 – THERMAL PERFORMANCE OF WINDOWS, DOORS AND SHUTTERS – DETERMINATION OF THERMAL TRANSMITTANCE BY HOT BOX METHOD – PART 2: FRAMES
 17. EN ISO 10140-1- ACOUSTICS – LABORATORY MEASUREMENT OF SOUND INSULATION OF BUILDING ELEMENTS – PART 1: APPLICATION RULES FOR SPECIFIC PRODUCTS
 18. EN ISO 717-1 – ACOUSTICS – RATING OF SOUND INSULATION IN BUILDINGS AND OF BUILDING ELEMENTS – PART 1: AIRBORNE SOUND INSULATION
-

HATCHES

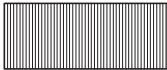
Hatches for different materials



EPDM



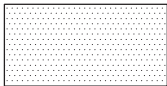
butyl seal



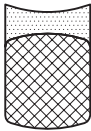
PVC



membrane



gypsum board



silicone seal

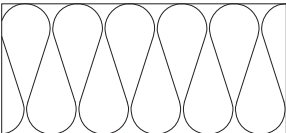
backer rod



silicone seal



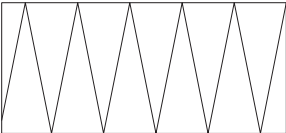
PVC spacer



Insulation soft



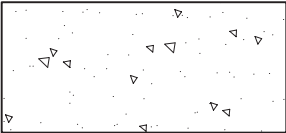
etalbond



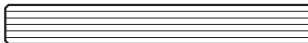
Insulation hard



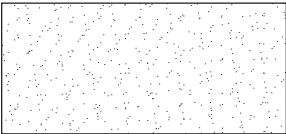
sheet aluminium



concrete wall



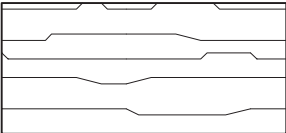
glass



plaster



aluminium profile



wood



steel

LIABILITY

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

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

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

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

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