TECHNICAL CATALOGUE

CURTAIN WALL SYSTEM
ΥΑΛΟΠΕΤΑΣΜΑ

E45 ES70 E52 Q72 E8000 E19 ED75 E75 E68 EW70 E85 E50

ETEM

E8000
CURTAIN WALL SYSTEM

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ETEM HISTORY

ETEM is a leading aluminium extrusion company. It was founded in 1971 as a part of the largest metal manufacturing holding on the Balkans. With over 40 years of experience ETEM is 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 following the applicable standards of the European Union.

ETEM SUPPORTS YOU WITH THE FOLLOWING:

⊳ design of conventional and bespoke architectural system solutions

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

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

⊳ reliable customer care constant support

⊳ trainings, technical support and audits on site

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

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

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

ΙΣΤΟΡΙΑ ΤΗΣ ETEM

Η ETEM είναι μια κορυφαία διέλαση αλουμινίου. Ιδρύθηκε το 1971 ως μέλος του μεγαλύτερου μεταλλουργικού ομίλου στα Βαλκάνια. Με περισσότερα από 40 χρόνια εμπειρίας η ETEM αποτελεί την πρώτη ολοκληρωμένη βιομηχανία, που σχεδιάζει και παράγει ολοκληρωμένα συστήματα αλουμινίου καθώς και προφίλ και εξαρτήματα για βιομηχανική χρήση.

Αποστολή μας είναι να απαντάμε γρήγορα και αποτελεσματικά στα αιτήματα των πελατών μας, καθώς και στον σχεδιασμό και κατασκευή προϊόντων αλουμινίου, λαμβάνοντας υπόψη τις σύγχρονες τεχνικές και αισθητικές λεπτομέρειες.

Η ETEM επικεντρώνεται στην βιώσιμη ανάπτυξη, ενώ αποδεικνύει έμπρακτα την ανησυχία της για την προστασία του περιβάλλοντος, κάνοντας σημαντικές επενδύσεις που έχουν σαν στόχο την καταπολέμηση της ρύπανσης και βελτιστοποίηση των μεθόδων παραγωγής, με βάση τις ισχύουσες Ευρωπαϊκές προδιαγραφές.

Η ETEM ΣΑΣ ΥΠΟΣΤΗΡΙΖΕΙ ΜΕ ΤΑ ΕΞΗΣ:

⊳ Σχεδιασμός συμβατικών και κατά παραγγελία αρχιτεκτονικών συστημά-των αλουμινίου

⊳Καινοτόμος τεχνολογία στους τομείς υαλοπετασμάτων, κουφωμάτων, αεριζό-μενων προσόψεων κτλ.

⊳ Εξειδικευμένη τεχνική υποστήριξη και συμβουλές, από ομάδα μηχανικών με μεγάλη πείρα σε όλους τους τομείς αρχιτεκτονικών εφαρμογών

⊳ Αξιόπιστη και συνεχής τεχνική υποστήριξη πελατών

⊳ Σεμινάρια, τεχνική εκπαίδευση και επιτόπου έλεγχοι

⊳ Υψηλής ποιότητας υπηρεσίες που εγγυώνται την καλύτερη λύση ανάλογα με τις απαιτήσεις του κάθε έργου

⊳ Διαδικασίες πιστοποίησης σύμφωνα με τα ισχύοντα Ευρωπαϊκά πρότυπα, και με τη συνεργασία κοινοποιημένων ευρωπαϊκών εργαστηρίων.

⊳ Παραγωγή μη τυποποιημένων διατομών σε διάφορα μήκη και κράματα, και για διάφορες χρήσεις, καθώς και υψηλής ποιότητας ηλεκτροστατική βαφή.

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:

⊳ DAYLIGHT
⊳ SUN-SHADING
⊳ VENTILATION AND GOOD AIR QUALITY
⊳ SAFETY AND SECURITY

ΠΡΟΪΟΝΤΑ ETEM ΚΑΙ ΑΕΙΦΟΡΟΣ ΑΝΑΠΤΥΞΗ

Η ΑΕΙΦΟΡΟΣ ΑΝΑΠΤΥΞΗ ΕΙΝΑΙ Η ΑΝΑΠΤΥΞΗ ΠΟΥ ΙΚΑΝΟΠΟΙΕΙ ΤΙΣ ΑΝΑΓΚΕΣ ΤΟΥ ΠΑΡΟΝΤΟΣ ΧΩΡΙΣ ΝΑ ΔΙΑΚΥΒΕΥΕΤΑΙ Η ΙΚΑΝΟΤΗΤΑ ΤΩΝ ΜΕΛΛΟΝΤΙΚΩΝ ΓΕΝΕΩΝ ΝΑ ΚΑΛΥΨΟΥΝ ΤΙΣ ΔΙΚΕΣ ΤΟΥΣ ΑΝΑΓΚΕΣ†

Για πολλούς, η αειφόρος ανάπτυξη αφορά την προστασία του περιβάλλοντος. Αυτό είναι αλήθεια, περιλαμβάνει όμως δύο ακόμα διαφορετικές πτυχές, μια κοινωνική και μια οικονομική.

Βιώσιμη ανάπτυξη σημαίνει να βρεθεί η σωστή ισορροπία μεταξύ της οικονομικής ανάπτυξης, της κοινωνικής δικαιοσύνης και της προστασίας του περιβάλλοντος.

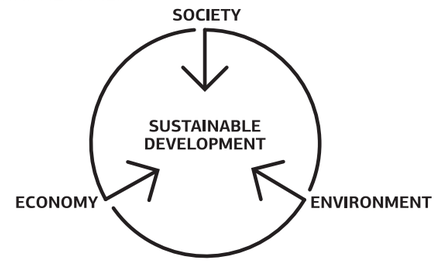
Για εμάς η επίτευξη του στόχου μεταφράζεται σε πρόκληση της ικανοποίησης των απαιτήσεων της αγοράς με το χαμηλότερο οικονομικό, κοινωνικό και περιβαλλοντικό δυνατό κόστος.

Η ETEM έχει σχεδιάσει τα αρχιτεκτονικά της συστήματα, με τρόπο τέτοιο ώστε να ικανοποιούν όλες τις απαιτήσεις για την επίτευξη υψηλής ενεργειακής απόδοσης.

Προκειμένου να εξασφαλιστεί η άνεση των κατοίκων κτιρίου, τα συστήματα της ETEM έχουν προσαρμόσει τις λειτουργίες ώστε να ταιριάζουν σε ένα μεταβαλλόμενο περιβάλλον.

Ως παραγωγοί λειτουργούμε με τρόπο τέτοιο ώστε τα προϊόντα μας να παρέχουν::

⊳ ΦΥΣΙΚΟ ΦΩΤΙΣΜΟ
⊳ ΣΚΙΑΣΗ
⊳ ΕΞΑΕΡΙΣΜΟ
⊳ ΠΡΟΣΤΑΣΙΑ ΚΑΙ ΑΣΦΑΛΕΙΑ

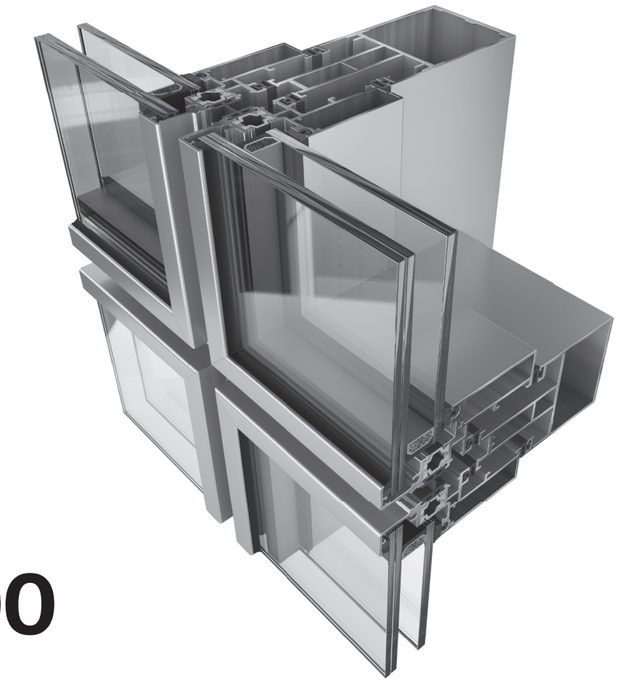


* Extract from Brundtland Report, from the United Nations World Commission on Environment and Development WCED

†Απόσπασμα από την έκθεση Brundtland, από την Παγκόσμια Επιτροπή των Ηνωμένων Εθνών για το Περιβάλλον και την Ανάπτυξη WCED

GENERAL INFORMATION

CONCEPT / ADVANTAGES / CERTIFICATES



E8000

E8000 IS A CASSETTE CURTAIN WALL SYSTEM. SUITABLE FOR ALL KINDS OF BUILDINGS (LOW, MID AND HIGH-RISE). WITH ITS WIDE VARIETY OF PROFILES THIS SYSTEM CAN BE ADAPTED TO MEET THE REQUIREMENTS OF ANY PROJECT.

- Ability of semi structural and structural glazing solutions
- Single and double glazing options
- Projected and fixed sub-frame
- Easy and fast manufacturing, glazing and installation

ΤΟ E8000 ΕΙΝΑΙ ΕΝΑ ΚΥΨΕΛΩΤΟ ΣΥΣΤΗΜΑ ΥΑΛΟΠΕΤΑΣΜΑΤΩΝ ΜΕ ΚΟΛΩΝΕΣ ΚΑΙ ΤΡΑΒΕΡΣΕΣ. ΚΑΤΑΛΛΗΛΟ ΓΙΑ ΟΛΕΣ ΤΙΣ ΚΤΙΡΙΑΚΕΣ ΕΦΑΡΜΟΓΕΣ. ΧΑΡΗ ΣΤΗΝ ΠΟΙΚΙΛΙΑ ΔΙΑΤΟΜΩΝ ΠΟΥ ΔΙΑΘΕΤΕΙ, ΤΟ ΣΥΣΤΗΜΑ ΜΠΟΡΕΙ ΝΑ ΠΡΟΣΑΡΜΟΣΤΕΙ ΕΤΣΙ ΩΣΤΕ ΝΑ ΠΛΗΡΟΙ ΤΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΘΕ ΕΡΓΟΥ.

- Δυνατότητα όψης με σκοτία αλουμινίου (semi structural) ή πλήρους γυάλινης όψης (structural)
- Εφαρμογή μονής και διπλής υάλωσης
- Προβαλλόμενα και σταθερά πλαίσια
- Ένκολη και γρήγορη κατασκευή, τοποθέτηση υαλοπινάκων και εγκατάσταση

BUILDING PHYSICS

DIMENSIONING / FORMULAS / EXAMPLES

ALUMINIUM AS MATERIAL

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

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

ADVANTAGES

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.

EN AW-1050 [Al 99.5]
EN AW-6060 [Al Mg Si]
EN AW-6063 [Al Mg0,7 Si]
EN AW-6061 [Al Mg1 Si Cu]
EN AW-6005 [Al Si Mg]
EN AW-6082 [Al Si1 Mg Mn]

ETEM profiles are extruded from the following alloys:

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

MATERIAL PROPERTIES	
Aluminium alloy	EN AW 6063 F22
Ultimate tensile strength	Rm = 210 N/mm^2
Yield strength	Rp0,2 = 160 N/mm^2
Modulus of elasticity	Eal=70 000 N/mm^2 = 7.109 kg/m^2
Coefficient of thermal expansion	α=0,023 mm/m .K (up to 1,2 mm/m for difference up to 500C)

EXTRUSION PROCESS

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

FINISHING

POWDER COATING

It is a type of paint that is applied as a dry powder. Coating is applied on ETEM profiles electrostatically and then is cured under heat to allow it to flow and form a ''skin''.

ETEM is authorized to use the quality sign QUALICOAT for powder coatings on aluminium for architectural applications. A wide range of colors and gloss levels can be achieved.

ETEM also offers timber imitations painting, in addition to all RAL colors. The technology EZY provides the following colors: Golden Oak, Acero, Betulla, Mogano, Verde Scuro, Wenge, Noce Fiammato, Noce Chiaro, Ciliegio Rosso, Acacia S curo, Ciliegio Antico, Noce Reale, Ciliegio Reale.

ANODIZING

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

MAINTENANCE

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

RECYCLING

Aluminium scrap can be repeatedly recycled without any loss of value or properties.

In many instances, aluminium is combined with other materials such as steel or plastics, which are most frequently mechanically separated from aluminium before being molten.

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

ΤΟ ΑΛΟΥΜΙΝΙΟ ΩΣ ΥΛΙΚΟ

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ΠΛΕΟΝΕΚΤΗΜΑΤΑ

ΤΟ ΑΛΟΥΜΙΝΙΟ ΠΑΡΟΥΣΙΑΖΕΙ ΠΟΛΛΑ ΠΛΕΟΝΕΚΤΗΜΑΤΑ:

ΕΥΕΛΙΞΙΑ ΣΧΕΔΙΑΣΜΟΥ
Η διαδικασία διέλασης προσφέρει τεράστια ποικιλία σε μορφές και σχήματα, επιτρέποντας στους σχεδιαστές να ενσωματώσουν πολλές λειτουργίες σε ένα προφίλ

ΜΕΓΑΛΗ ΔΙΑΡΚΕΙΑ ΖΩΗΣ
Οικοδομικά προϊόντα αλουμινίου κατασκευάζονται από κράματα που είναι ανθεκτικά στις καιρικές συνθήκες, στη διάβρωση, καθώς και στις βλαβερές συνέπειες των ακτίνων UV, εξασφαλίζοντας τη βέλτιστη απόδοση για πολύ μεγάλο χρονικό διάστημα.

ΥΨΗΛΟ ΛΟΓΟ ΑΝΤΟΧΗΣ ΠΡΟΣ ΒΑΡΟΣ
Λόγω των ιδιοτήτων του μετάλλου και την ακαμψία του, παράθυρα και υαλοπετάσματα μπορούν να κατασκευαστούν από σχετικά μικρές διατομές. Είναι ελαφρύ υλικό με
ένκολη μεταφορά και διαχείριση.

ΥΨΗΛΗ ΑΝΑΚΛΑΣΤΙΚΟΤΗΤΑ
ΤΑυτό το χαρακτηριστικό κάνει το αλουμίνιο ένα πολύ αποτελεσματικό υλικό για τη διαχείριση του φωτός. Σκίαστρα αλουμινίου μπορούν να χρησιμοποιηθούν και να μειώσουν τις ανάγκες κλιματισμού ενός κτιρίου.

ΠΥΡΑΣΦΑΛΕΙΑ
Το αλουμίνιο δεν καίγεται και ως εκ τούτου, έχει χαρακτηριστεί ως μη - ενφλεκτο υλικό κατασκευής (European Fire Class A1). Τα κράματα του λιώνουν, σε
θερμοκρασία περίπου 650 C, χωρίς όμως να απελευθερώνουν επιβλαβή αέρια

ΔΕΝ ΥΠΑΡΧΕΙ ΚΑΜΙΑ ΕΚΛΥΣΗ ΕΠΙΚΙΝΔΥΝΩΝ ΟΥΣΙΩΝ
Πολλές μελέτες έχουν αποδείξει ότι η χρήση αλουμινίου στην οικοδομή δεν παρουσιάζει κίνδυνο για τον άνθρωπο ή το περιβάλλον. Τα προϊόντα αλουμινίου δεν
έχουν καμία αρνητική επίπτωση, είτε στην ποιότητα του αέρα ή στο έδαφος, στα επιφανειακά ή τα υπόγεια ύδατα.

ΒΕΛΤΙΣΤΗ ΑΣΦΑΛΕΙΑ
Όπου απαιτείται υψηλή ασφάλεια, ειδικά σχεδιασμένες διατομές μπορούν να χρησιμο-ποιηθούν για να ενισχυθούν κουφώματα αλουμινίου. Ενώ το γυαλί για τέτοιες εφαρμογές μπορεί να είναι βαρύ, το συνολικό βάρος της κατασκευής παραμένει σχετικά χαμηλό, λόγω του χαμηλού βάρους των διατομών αλουμινίου.

ΚΡΑΜΑΤΑ

Το αλουμίνιο σε καθαρή μορφή, είναι ένα πολύ μαλακό μέταλλο. Χάρη στην προσθήκη όμως άλλων στοιχείων κράματος, όπως ο χαλκός, το μαγγάνιο, το μαγνήσιο, ο ψευδάργυρος κ.λπ. και χάρη σε κατάλληλες διαδικασίες παραγωγής, οι φυσικές και μηχανικές του ιδιότητες μπορούν να μεταβάλλονται σε ένα ευρύ φάσμα ώστε να ικανοποιούν τις

EN AW - 1050 [Al 99.5]
EN AW - 6060 [Al Mg Si]
EN AW - 6063 [Al Mg0 , 7 Si]
EN AW - 6061 [Al Mg1 Si Cu]
EN AW - 6005 [Al Mg Si]
EN AW - 6082 [Al Mg Si1 Mn]

απαιτήσεις ενός μεγάλου αριθμού διαφορετικών εφαρμογών.

Η ETEM μπορεί να κάνει διέλαση προφίλ από τα παρακάτω κράματα:

Το πιο κοινό κράμα αλουμινίου το οποίο χρησιμοποιείται από την ETEM είναι το EN AW 6063.
Παρακάτω φαίνονται οι ιδιότητες αυτού του κράματος:

ΙΔΙΟΤΗΤΕΣ ΥΛΙΚΟΥ	
Ονομασία κράματος	EN AW 6063 F22
Όριο θραύσης	Rm = 210 N/mm^2
Όριο διαρροής	Rp0,2 = 160 N/mm^2
Μέτρο ελαστικότητας	Eal=70 000 N/mm^2 = 7.109 kg/m^2
Συντελεστής θερμικής διαστολής	α=0,023 mm/m .K (μέχρι 1,2 mm/m για διαφορά ως 500C)

ΔΙΑΔΙΚΑΣΙΑ ΔΙΕΛΑΣΗΣ

Οι διατομές της ETEM παράγονται μέσω της διαδικασίας διέλασης, κατά την οποία το αλουμίνιο θερμαίνεται και
διαμορφώνεται περνώντας διαμέσου μήτρας με το τελικό σχήμα του προφίλ. Η διαδικασία αυτή προσφέρει τεράστια ποικιλία σχημάτων και μορφών, επιτρέποντας στους σχεδιαστές μας να ενσωματώσουν πολλές λειτουργίες σε ένα προφίλ.

ΗΛΕΚΤΡΟΣΤΑΤΙΚΗ ΒΑΦΗ

Είναι ένα είδος βαφής που εφαρμόζεται συχνά στα προφίλ αλουμινίου. Το υλικό της βαφής είναι σε μορφή πούδρας, η οποία επικάθεται στο προφίλ ηλεκτροστατικά και κατόπιν θερμαίνεται, κάτι που της επιτρέπει να λιώσει και να σχηματίσει μια ενιαία ανθεκτική εξωτερική επίστρωση.
Η ETEM είναι εξουσιοδοτημένη να χρησιμοποιεί το σήμα ποιότητας QUALICOAT για τα προϊόντα αρχιτεκτονικών εφαρμογών που βάφονται με τη μέθοδο της ηλεκτροστατικής βαφής. Η βαφή αυτή μπορεί να προσφέρει τεράστια ποικιλία χρωμάτων RAL, σε διάφορα επίπεδα στιλπνότητας καθώς και αποχρώσεις απομίμησης ξύλου με τη μέθοδο EZY.
Η τεχνολογία EZY παρέχει τα εξής χρώματα : Golden Oak, Acero, Betulla, Mogano, Verde Scuro, Wenge, Noce Fiammato, Noce Chiaro, Ciliegio Rosso, Acacia Scuro, Ciliegio Antico, Noce Reale, Ciliegio Reale

ΑΝΟΔΙΩΣΗ

Είναι μια ηλεκτροχημική διαδικασία με την οποία ενισχύεται η φυσική επιφάνεια του αλουμινίου, αυξάνοντας την
σκληρότητά της, δίνοντας μεγάλη αντοχή στη διάβρωση.
Η ανοδίωση δίνει ένα ομοιόμορφο φινίρισμα στην επιφάνεια του προφίλ και μπορεί να είναι ασημί ή με τις
κατάλληλες προσμίξεις σε διάφορα χρώματα.

ΣΥΝΤΗΡΗΣΗ

Πέρα από τον συνήθη καθαρισμό για αισθητικούς λόγους, τα προφίλ αλουμινίου της ETEM δεν απαιτούν καμία συντήρηση η οποία μεταφράζεται σε σημαντικό κόστος και οικολογικό πλεονέκτημα για τη
διάρκεια ζωής του προϊόντος.

ΑΝΑΚΥΚΛΩΣΗ

Το αλουμίνιο μπορεί να ανακυκλωθεί πολλές φορές χωρίς καμία σχεδόν απώλεια της αξίας του ή των ιδιοτήτων του.

* Μέρος της πιο πάνω πληροφορίας είναι ένα απόσπασμα από την έκθεση για τη βιωσιμότητα του αλουμινίου στα κτίρια της Ευρωπαϊκής Ένωσης Αλουμινίου

DEFINITION OF CURTAIN WALLING

Curtain walling usually consists of vertical and horizontal structural members, connected together and anchored to the supporting structure of the building and infilled, to form a lightweight, space enclosing continuous skin, which provides, by itself or in conjunction with the building construction, all the normal functions of an external wall, but does not take on any of the load bearing characteristics of the building structure.

The curtain walling shall be sufficiently rigid to resist the declared wind loads for serviceability, both positive and negative. It shall transfer the declared wind loads to the building's structure, safely, via the fixings intended for that purpose.

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= 0.8	cp= 0.5 h/b ≤ 0.25	cp= 0.7 h/b ≤ 0.5	cp= 2.0 h/8 ≤ 2 m
				wp*= 1.2x0.8xq kN/m^2	wa= 0.5 x q kN/m^2	wa= 0.7 x q kN/m^2	wa= 2.0 x q kN/m^2
0 - 8	28.3	50	0.5	0.5	0.25	0.35	1
8 - 20	35.8	80	0.8	0.8	0.4	0.56	1.6
20 - 100	42.0	110	1.1	1.1	0.55	0.77	2.2
> 100	45.6	130	1.3	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/m^2 / kN/m^2
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 = , 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≤ L/200, if L≤3000 mm;
- d≤ 5 mm+ L/300, if 3000 mm< L < 7500 mm;
- d≤ L/250, if L≥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≤ L/200, if L≤ 3000 mm;
- d≤ 5 mm + L/300, if L> 3000 mm.

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

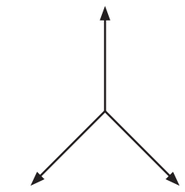
FIXING BRACKETS

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

fixed support

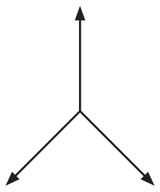
z = ±12 mm



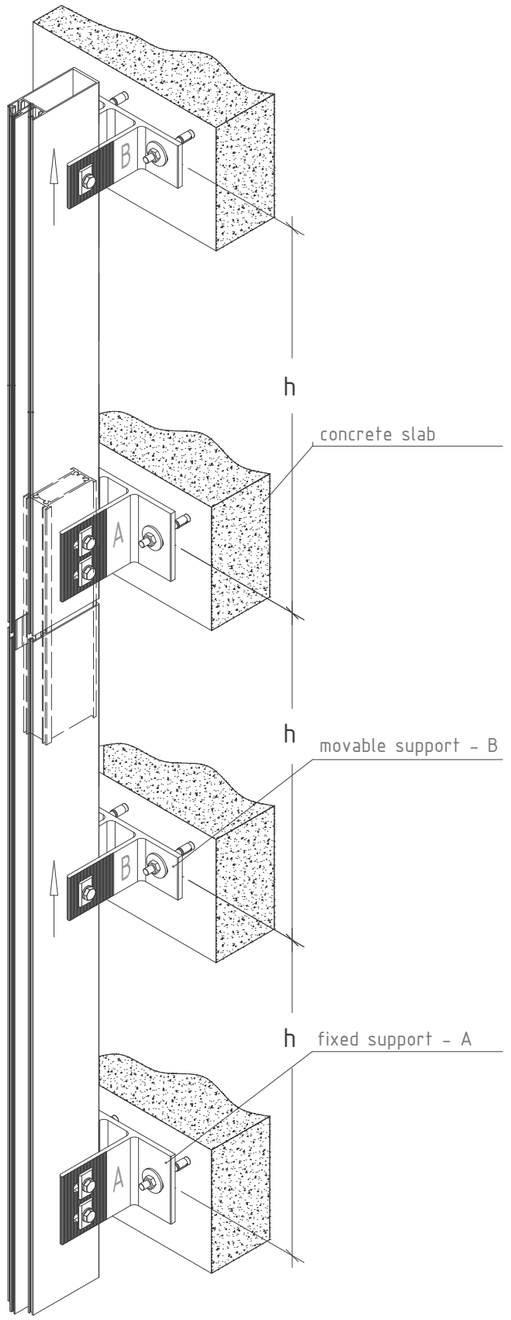
x = 0 y = ±12 mm

movable support

z = 0



x = ±12 mm y = ±12 mm



- Mullions must be fixed using at least two fixing brackets, which are mounted onto the backing wall and never on a brick wall.
- Mullion is fixed permanently at one point only – fixed support. The other one or two fixing points of mullion must allow movement – movable support.
- Fixed support ensures steady fixing of mullions to the backing wall. It does not allow any movement of the fixed component after final assembly. Fixed support bears vertical/dead loads as well as wind loads acting on a certain part of the structure.
- Movable support also ensures fixing of mullions to the construction but it allows vertical movement of the mullion caused by temperature changes. Movable support bears only wind loads acting on the structure.

Choosing the appropriate fixing bracket
Simply supported beam with one fixed and one movable support

Fixed support

■ Own weight - dead load
V = g.h.b

■ Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

■ Wind load-suction
$W_s = q . c_p . h/2 . b$

where:
V - load, kN
g - weight of mullions, transoms and infill panels, kN/m²
W_p - wind pressure, kN
W_s - wind suction, kN
f_1 - correction factor
q - dynamic load, kN/ m²
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Movable support

■ Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

■ Wind load-suction
$W_s = q . c_p . h/2 . b$

Example

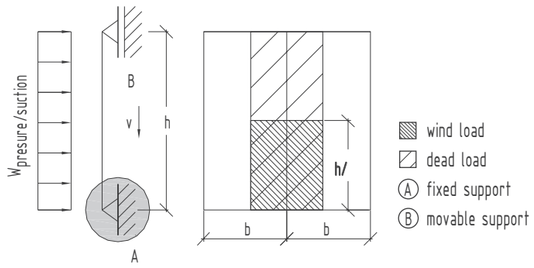
Initial data:
H = 0-8 m (middle zone)
g = 0,5 kN/m²
f_1 = 1,25
q = 0,5 kN/m²
c_p = 0,8 (wind pressure)
c_p= - 0,5 (wind suction)
h = 3m
b = 1,2m

■ Own weight - dead load
V = g . h . b = 0,3 . 3 . 1,2 =
= 1,8 kN

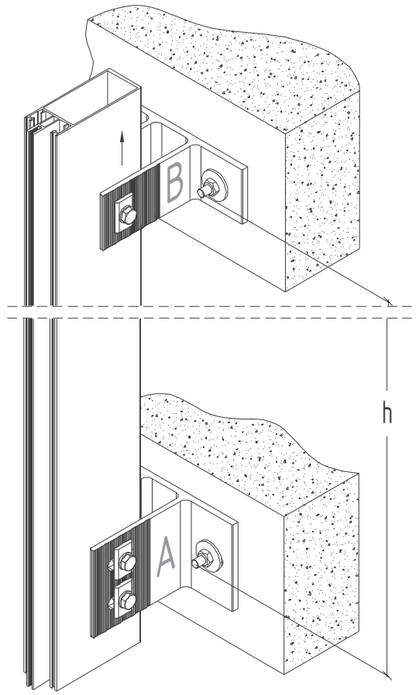
■ Wind load
$W_p = f_1 . q . c_p . h/2 . b$ =
= 1,25 . 0,5 . 0,8 . (0,5 . 3) . 1,2 =
= 0,9 kN

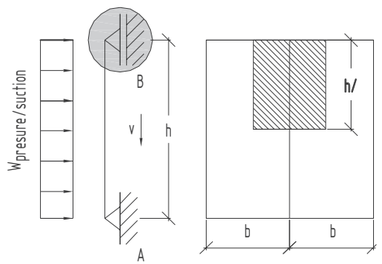
$W_s = q . c_p . h/2 . b$ =
= 0,5 . (-0,5) . (0,5 .3) . 1,2 =
= (-0,45) = 0,45 kN

■ Wind load
$W_p = f_1 . q . c_p . h/2 . b$ =
= 1,25 . 0,5 . 0,8 . (0,5 . 3) . 1,2 =
= 0,9 kN
Ws = q . c_p . h/2 . b =
= 0,5 . (-0,5) . (0,5 . 3) . 1,2 =
= (-0,45) = 0,45 kN



Fixed support

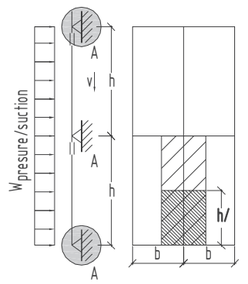




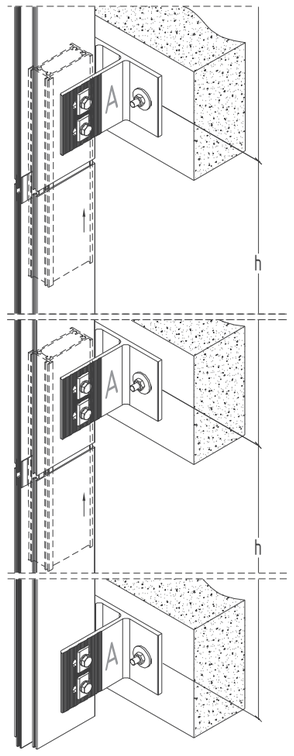
Movable support

Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.
Fixing bracket for movable support must bear just wind load.

Choosing the appropriate fixing bracket
Continuous simply supported beam



Fixed support



Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.

Fixed support end supports

Own weight - dead load
V = g . h . b

■ Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

■ Wind load-suction
$W_s = q . c_p . h/2 . b$

where:
V - load, kN
g - weight of mullions, transoms and infill panels, kN/m²
W_p - wind pressure, kN
W_s - wind suction, kN
f_1 - correction factor
q - dynamic load, kN/ m²
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Movable support

■ Own weight - dead load
V = g . h . b

■ Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h . b$

■ Wind load-suction
W_s =q . c_p . h . b

Example

Initial data:
H = 8 - 20 m (middle zone)
g = 0,5 kN/m²
f_1 = 1,25
q = 0,8 kN/m²
c_p = 0,8 (wind pressure)
c_p= - 0,5 (wind suction)
h = 3,5m
b = 1,0m

■ Own weight - dead load
V = g . h . b = 0,5 . 3,5 . 1,0 = 1,75 kN

■ Wind load
$W_p = f_1 . q . c_p . h/2 . b$ =
= 1,25 . 0,8 . 0,8 . (0,5 . 3.5) . 1,0 =
= 1,4 kN

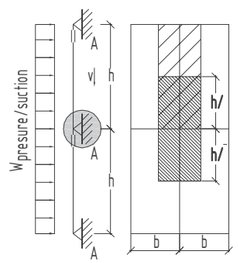
$W_s = q . c_p . h/2 . b$ =
= 0,8 . (-0,5) . (0,5 .3,5) . 1,0 =
= (-0,7) = 0,7 kN

■ Own weight - dead load
V = g . h . b =
= 0,5 . 3,5 . 1,0 = 1,75 kN

■ Wind load
$W_p = f_1 . q . c_p . h . b$ =
= 1,25 . 0,8 . 0,8 . 3,5 . 1,0= 2,8 kN

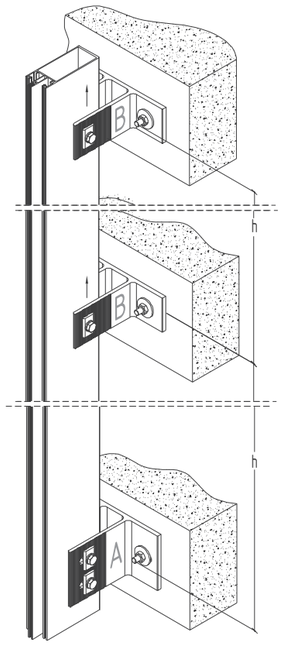
$W_s = q . c_p . h . b$ =
= 0,8 . (-0,5) . 3,5 . 1,0 =
= (-1,4) = 1,4 kN

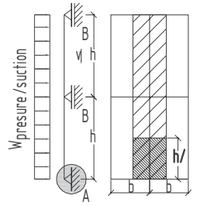
wind load
dead load
A fixed support



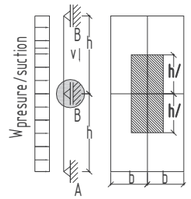
Movable support

Choosing the appropriate fixing bracket
Continuous beam with one fixed and two movable supports

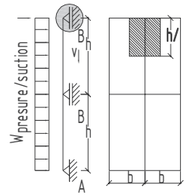




Fixed support



Movable support (middle)



Movable support (end)

wind load
dead load
Ⓐ fixed support
Ⓑ movable support

Fixed support

- Own weight - dead load
V = g . 2h . b

- Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

- Wind load-suction
$W_s = q . c_p . h/2 . b$

where:
V - load, kN
g - weight of mullions, transoms and infill panels, kN/m²
W_p - wind pressure, kN
W_s - wind suction, kN
f 1 - correction factor
q - dynamic load, kN/ m²
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Example

Initial data:
H = 0-8 m (middle zone)
g = 0,5 kN/m²
f_1 = 1,25
q = 0,5 kN/m²
c_p = 0,8 (wind pressure)
c_p= - 0,5 (wind suction)
h = 3,3m
b = 0,9m

- Own weight - dead load
V = g . 2 . h . b =
= 0,5 . 2 . 3,3 . 0,9 =
=2,97 kN

- Wind load
$W_p = f_1 . q . c_p . h/2 . b$ =
= 1,25 . 0,5 . 0,8 . (0,5. 3.3) . 0,9 =
= 0,74 kN

$W_s = q . c_p . h/2 . b$ =
= 0,5 . (-0,5) . (0,5 . 3,3) . 0,9 =
= (- 3,7) = 0,37 kN

Movable support (middle)

- Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . f_2 . q . c_p . h . b$

- Wind load-suction
$W_s = f_2 . q . c_p . h . b$

where:
f_2 - correction factor

- Wind load
$W_p = f_1 . f_2 . q . c_p . h . b$ =
= 1,25 . 1,25 . 0,5 . 0,8 . 3,3 . 0,9 =
= 1,86 kN

$Ws = f_2 . q . c_p . h . b$ =
= 1,25 . 0,5 . (-0,5) . 3,3 . 0,9 =
= (-0,93) = 0,93 kN

Movable support (end)

- Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

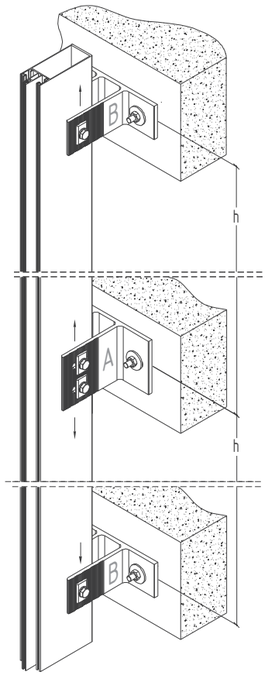
- Wind load-suction
$W_s = q . c_p . h/2 . b$

- Wind load
$W_p = f_1 . q . c_p . h/2 . b$ =
= 1,25 . 0,5 . 0,8 . (0,5. 3,3) . 0,9 =
= 0,74 kN

$Ws = q . c_p . h/2 . b$ =
= 0,5 . (-0,5) . (0,5 . 3,3) . 0,9 =
= (-0,37) = 0,37 kN

Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.
Fixing bracket for movable support must bear just wind load.

Choosing the appropriate fixing bracket
Continuous supported beam with one fixed support in the middle and two movable in the end



Fixed support

- Own weight - dead load
V = g . 2h . b

- Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . f_2 . q . c_p . h . b$

- Wind load-suction
$W_s = f_2 . q . c_p . h . b$

where:
V - load, kN
g - weight of mullions, transoms and infill panels, kN/m²
W_p - wind pressure, kN
W_s - wind suction, kN
f_1 - correction factor
f_2 - correction factor
q - dynamic load, kN/ m²
c_p - correction factor (wind pressure)
h - floor height, m
b - distance between mullions, m
H - buiding height, m

Example

Initial data:
H = 0-8 m (middle zone)
g = 0,5 kN/m²
f_1 = 1,25
q = 0,5 kN/m²
c_p = 0,8 (wind pressure)
c_p= - 0,5 (wind suction)
h = 3,2m
b = 1,3m

- Own weight - dead load
V = g . 2h . b =
= 0,5 . 2 . 3,2 . 1,3 = 4,16 kN

- Wind load
$W_p = f_1 . f_2 . q . c_p . h . b$ =
= 1,25 . 1,25 . 0,5 . 0,8 . 3,2 . 1,3 =
= 2,6 kN

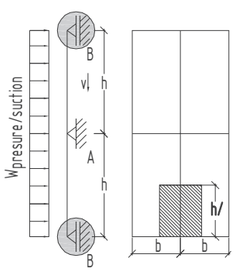
$W_s = f_2 . q . c_p . h . b$ =
= 1,25 . 0,5 . (-0,5) . 3,2 . 1,3 =
= (-1,3) = 1,3 kN

Movable support

- Wind load-pressure
For determining the maximum permissible wind load the following formulae apply:
$W_p = f_1 . q . c_p . h/2 . b$

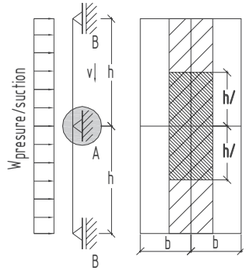
- Wind load-suction
$W_s = q . c_p . h/2 . b$

- Wind load
$W_p = f_1 . q . c_p . h/2 . b$ =
= 1,25 . 0,5 . 0,8 . (0,5 . 3,2) . 1,3 =
= 1,04 kN
$Ws = q . c_p . h/2 . b$ =
= 0,5 . (-0,5) . (0,5 . 3,2) . 1,3 =
= (-0,52) = 0,52 kN



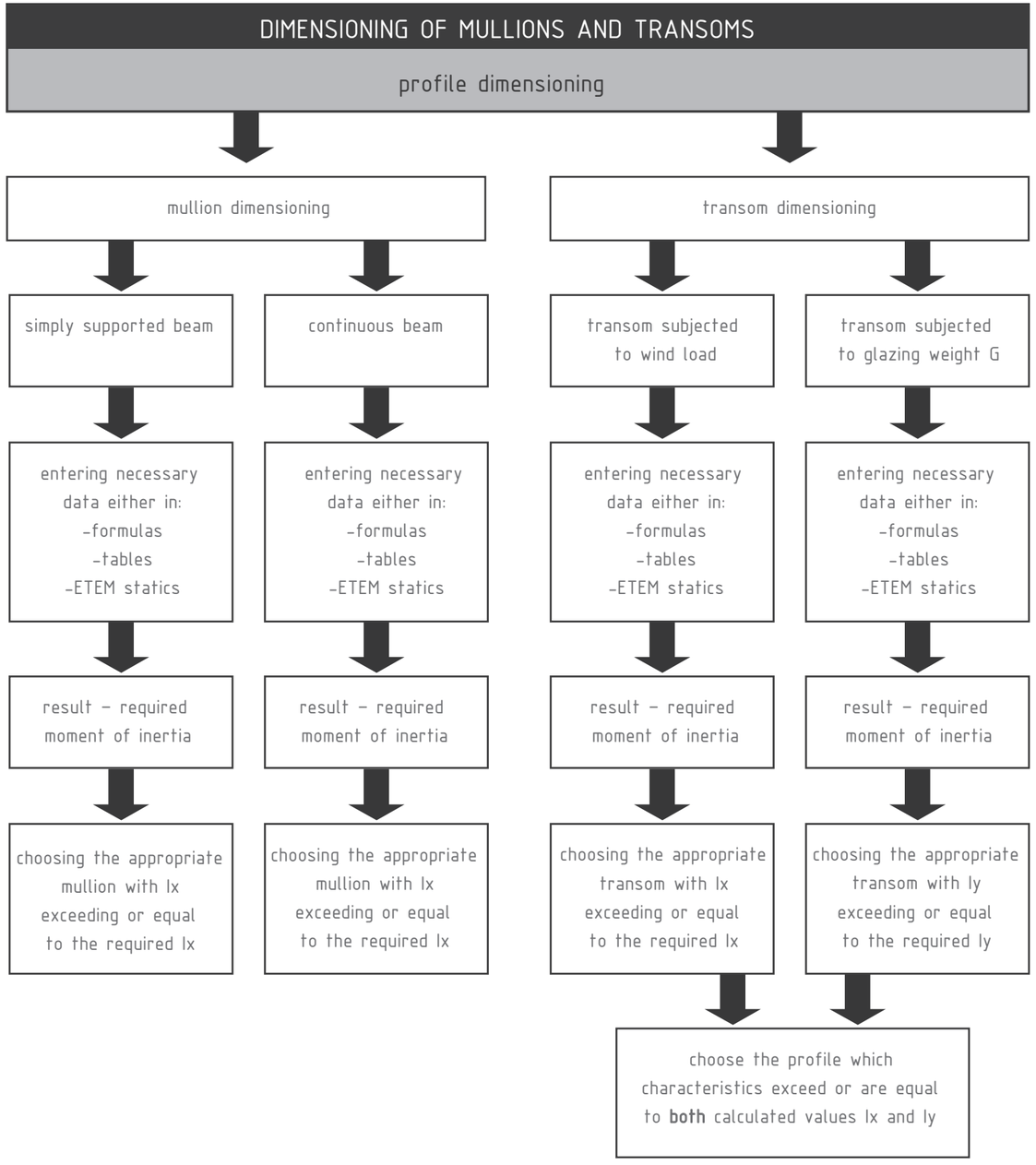
wind load
dead load
Ⓐ fixed support
Ⓑ movable support

Movable support



Fixed support

Finally we choose the appropriate fixing bracket with bigger bearing capacity than the calculated value.
Fixing bracket for fixed support must bear both calculated values for dead load and wind load.
Fixing bracket for movable support must bear just wind load.



▪ Wind load actions

1. Simply supported beam

Trapezoidal load
The moment of inertia of a mullion, supported at two points, subjected to wind load is given by the following equation:

$$I_{x_a} = \frac{w \,.\, (a/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40\,\frac{(a/2)^2}{h^2} + 16\,\frac{(a/2)^2}{h^2}\right]$$

$$I_{x_b} = \frac{w \,.\, (b/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40\,\frac{(b/2)^2}{h^2} + 16\,\frac{(b/2)^2}{h^2}\right]$$

where:
I_x – moment of inertia,cm^4
w – wind pressure, kg/m^2
a, b – distance betweenmullions,m
h – distance between fixing brackets,m
E_{al} – modulus of elasticity, kg/m^2
f – deflection, m – according to EN 13830

Total required moment of inertia:

$I_x = I_a + I_b$

Use ETEM catalogue to choose the appropriate mullion with Ix exceeding or equal to the required Ix.

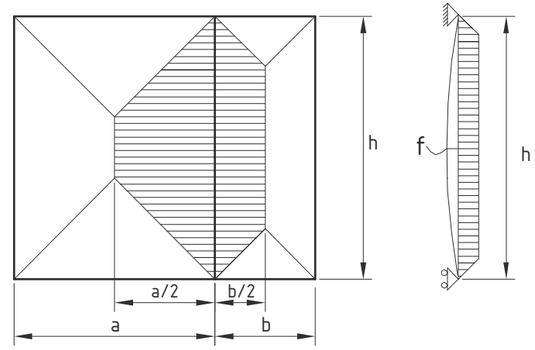
Example:

Initial data:
a = 1.5 m
b = 1.2 m
h = 4 m
w = 60 kg/m^2
$E_{al} = 7.10^9$ kg/m^2

$f = \frac{l}{300} + 5$ mm = 18,3 mm > 15 mm (0,015 m)

$\Rightarrow$ f = 0,015 m in the following formulae:

*f should be 15 mm, because of limitation for IGU



$$I_{x_a} = \frac{w \,.\, (a/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(a/2)^2}{h^2} + 16 \,.\, \frac{(a/2)^2}{h^2}\right] =$$

$$= \frac{60 \,.\, (1{,}5/2) \,.\, 4^4}{1920 \,.\, 7.\, 10^9 \,.\, 0{,}015} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(1{,}5/2)^2}{4^2} + 16 \,.\, \frac{(1{,}5/2)^2}{4^2}\right] =$$

= 138,0 cm^4

$$I_{x_b} = \frac{w \,.\, (b/2) \,.\, h^4}{1920 \,.\, E_{al} \,.\, f} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(b/2)^2}{h^2} + 16 \,.\, \frac{(b/2)^2}{h^2}\right] =$$

$$= \frac{60 \,.\, (1{,}2/2) \,.\, 4^4}{1920 \,.\, 7.\, 10^9 \,.\, 0{,}015} \,.\, 10^8 \,.\left[25 - 40 \,.\, \frac{(1{,}2/2)^2}{4^2} + 16 \,.\, \frac{(1{,}2/2)^2}{4^2}\right] =$$

= 111,8 cm^4

Total required moment of inertia:

$I_x = I_a + I_b$ = 138,0 + 111,8 = 249,8 cm^2

The appropriate mullion is E 8104 with

I_x = 454 cm^4

2. Continuous beam

Rectangular load

The required moment of inertia of a mullion, supported at three points, subjected to wind load is given by the following equation:

$$I_{x_a} = \frac{w \cdot (a/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f}$$

$$I_{x_b} = \frac{w \cdot (b/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f}$$

where:
I_x – moment of inertia,cm^4
w – wind pressure, kg/m^2
a, b – distance between mullions,m
h – distance between fixing brackets,m
E_{al} – modulus of elasticity, kg/m^2
f – deflection, m – according to EN 13830

Total required moment of inertia:

$I_x = I_a + I_b$

Use ETEM catalogue to choose the appropriate mullion with Ix exceeding or equal to the required Ix.

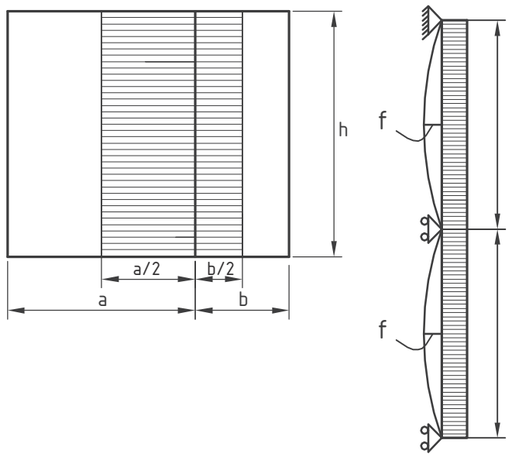
Example:

Initial data:
a = 1.5 m
b = 1 m
h = 3,3 m
w = 96 kg/m^2
E_{al} = 7.10^9 kg/m^2

$f = \frac{l}{300} + 5\text{ mm} = 16\text{ mm} > 15\text{ mm}$ (0,015 m)

$\Rightarrow$ f = 0,015 m in the following formulae:

*f should be 15 mm, because of limitation for IGU



$$I_{x_a} = \frac{w \cdot (a/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f} = \frac{96 \cdot (1{,}5/2) \cdot 3{,}3^4 \cdot 10^8}{185 \cdot 7 \cdot 10^9 \cdot 0{,}015} = 43{,}9\ \text{cm}^4$$

$$I_{x_b} = \frac{w \cdot (b/2) \cdot h^4 \cdot 10^8}{185 \cdot E_{al} \cdot f} = \frac{96 \cdot (1/2) \cdot 3{,}3^4 \cdot 10^8}{185 \cdot 7 \cdot 10^9 \cdot 0{,}015} = 29{,}3\ \text{cm}^4$$

Total required moment of inertia:

$I_x = I_a + I_b = 43{,}9 + 29{,}3 = 73{,}2\ \text{cm}^2$

The appropriate mullion is E 8101 with

I_x = 76,6 cm^4

SELECTION OF TRANSOM

Wind load actions

$$\frac{l}{h_0} \le 1 \qquad I_x = \frac{w \cdot (h_0/2) \cdot l \cdot 10^8}{120 \cdot E_{al} \cdot f}$$

$$\frac{l}{h_0} > 1 \qquad I_x = \frac{w \cdot (h_0/2) \cdot l^4}{1920 \cdot E_{al} \cdot f} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(h_0/2)^2}{l^2} + 16 \cdot \frac{(h_0/2)^2}{l^2}\right]$$

where:
I_x – moment of inertia,cm^4
w – wind pressure, kg/m^2
l – length of transom, m
E_{al} – modulus of elasticity, kg/m^2
f – deflection, m – according to EN 13830
h_0 – distance between transoms, m

Use ETEM catalogue to choose the appropriate transom with Ix exceeding or equal to the required Ix.

Example 1:

Initial data:
l = 1,2 m
h_0 = 3m
w = 60 kg/m^2
E_{al} = 7.10^9 kg/m^2

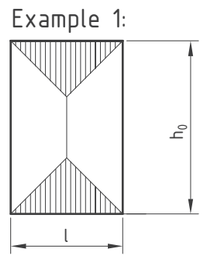
$\frac{l}{h_0} = \frac{1{,}2}{3} = 0{,}4 \le 1$

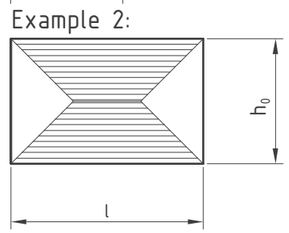
$f = \frac{l}{200} = \frac{1{,}2}{200} = 0{,}006 > 0{,}015\text{m}$

$\Rightarrow$ f = 0, 006 m in the following formula :

$$I_x = \frac{w \cdot (h_0/2) \cdot l \cdot 10^8}{120 \cdot E_{al} \cdot f} = \frac{60 \cdot (3/2) \cdot 1.2 \cdot 10^8}{120 \cdot 0{,}006 \cdot 10^9 \cdot 7} = 2{,}1\ \text{cm}^4$$

The appropriate transom is E 8300 with I_x = 20,4 cm





Example 2:

Initial data:
l = 2 m
h_0 = 1.5 m
w = 60 kg/m^2
E_{al} = 7.10^9 kg/m^2

$\frac{l}{h_0} = \frac{2}{1{,}5} = 1{,}33 > 1$

$f = \frac{l}{200} = \frac{2}{200} = 0{,}01 < 0{,}015\text{m}$

$\Rightarrow$ f = 0, 01 m in the following formula :

$$I_x = \frac{w \cdot (h_0/2) \cdot l^4}{1920 \cdot E_{al} \cdot f} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(h_0/2)^2}{l^2} + 16 \cdot \frac{(h_0/2)^2}{l^2}\right] =$$

$$= \frac{60 \cdot (1.5/2) \cdot 2^4}{1920 \cdot 7 \cdot 10^9 \cdot 0{,}01} \cdot 10^8 \cdot \left[25 - 40 \cdot \frac{(1{,}5/2)^2}{2^2} + 16 \cdot \frac{(1.5/2)^2}{2^2}\right] =$$

= 11,6 cm4

The appropriate transom is E 8300 with I_x = 20,4 cm

Important note: This selection of transoms is not final! We choose the appropriate profile which characteristics exceed or are equal to both calculated values Ix and Iy.

CALCULATION OF THE REQUIRED GLASS PANE THICKNESS

Weight of the glass pane G is calculated as follows:

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

where:
t – minimum theoretical thickness, mm
ρ_{glass} – specific weight of glass = 2,5 kg/m² x mm
l_g – the smallest dimension of the glass pane,m
h_g – the largest dimension of the glass pane,m

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

$$\frac{h_g}{l_g} \le 3 \qquad t = \sqrt{\frac{10 \cdot l_g \cdot h_g \cdot w}{72}}$$

where:
w – wind pressure,kg/m²

$$\frac{h_g}{l_g} < 3 \qquad t = \frac{l_g \cdot \sqrt{10 \cdot w}}{4,9}$$

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

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

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

Sample

Initial data:
l_g = 2 m
h_g = 1,5 m
w = 60 kg/m²

$$\frac{h_g}{l_g} = \frac{1,5}{2} = 0,75 \le 3$$

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

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

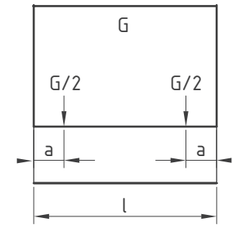
According to ETAG 002 the minimum thickness of the glass panes for curtain walls is 6 mm.
Because of that we choose double glazing 6/14/6.

GLASS PANE WEIGHT

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

$$I_{y_1} = \frac{G \cdot a \cdot 10^8}{48 \cdot E_{al} \cdot f_1} \cdot (3 \cdot l^2 - 4 \cdot a^2)$$

The distance a of the glazing supports of the glass pane is a= 0.150 m



▪ Self weight

The required moment of inertia of a transom subjected to self weight loading is given by:

$$I_{y_2} = \frac{5 \cdot q \cdot l^4 \cdot 10^8}{384 \cdot E_{al} \cdot f_2}$$

where:
G – weight of glass pane, kg
l – length of transom, m
q – weight of transom per linear meter, kg/m

For transoms loaded by dead loads:

$$f = \frac{l}{500}, \text{ or max 3 mm}$$

Total required moment of inertia:

$$I_y = I_{y_1} + I_{y_2}$$

Use ETEM catalogue to choose the appropriate transom with Iy exceeding or equal to the required Iy.

Use ETEM catalogue to choose the appropriate profile which characteristics exceed or are equal to both calculated values Ix and Iy.

Sample

Initial data:
t = 12mm
ρ_{glass} = 2,5 kg/m²x mm
l_g = 2m
h_g = 1,5m
E_{al} = 7.10⁹ kg/m²
a = 0,150 m

$$G = t \cdot \rho_{glass} \cdot l_g \cdot h_g = 12 \cdot 2,5 \cdot 2 \cdot 1,5 = 90 \text{ kg}$$

$$f = \frac{l}{500} = \frac{2}{500} = 0,004 > 3 \text{ m}$$

$\Rightarrow$ f = 0,003 m in the following formula:

$$I_{y_1} = \frac{G \cdot a \cdot 10^8}{48 \cdot E_{al} \cdot f} \cdot (3 \cdot l^2 - 4 \cdot a^2) =$$

$$= \frac{90 \cdot 0,150 \cdot 10^8}{48 \cdot 7 \cdot 10^9 \cdot 0,003} \cdot (3 \cdot 2^2 - 4 \cdot 0,150^2) =$$

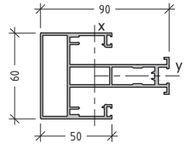
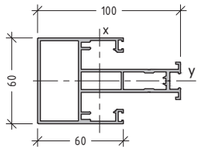
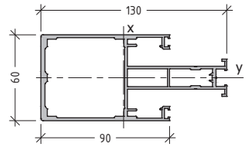
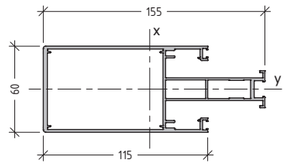
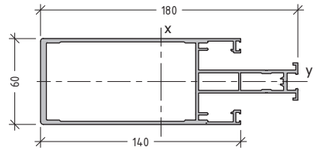
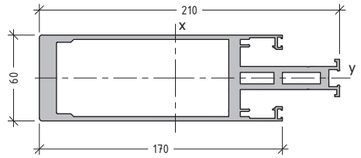
$$= 15,9 \text{ cm}^4$$

We choose the appropriate profile which characteristics exceed or are equal to both calculated values
I_x = 19,5 cm⁴ and I_y = 15,9 cm⁴

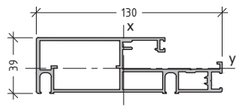
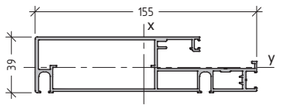
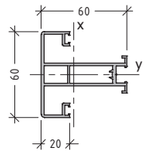
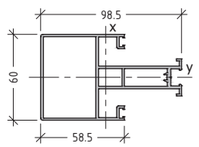
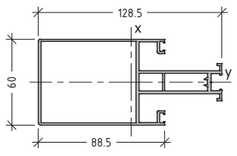
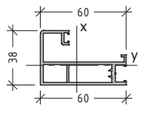
The appropriate transom is E 8301 with
I_x = 65 cm⁴ and I_y = 25,6 cm⁴

TABLES

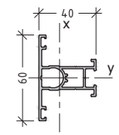
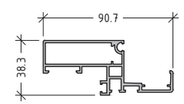
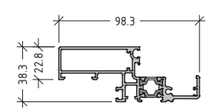
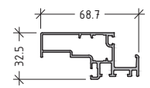
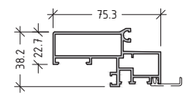
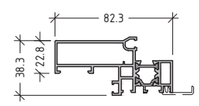
TYPOLOGIES / LIST OF PROFILES / CHARACTERISTICS

code κωδικός	Profile Διατομή	Weight - Βάρος Length - Μήκος	Static values Στατικές τιμές
E8100 Mullion Κολώνα		2141 g/m L=6,6 m	Ix= 56,20 cm^4 Wx= 10,79 cm^3 ex= 3,00 cm ix= 2,66 cm Iy= 26,36 cm^4 Wy= 8,79 cm^3 ey= 5,21 cm iy= 1,82 cm
E8101 Mullion Κολώνα		2352 g/m L=6,6 m	Ix= 74,57 cm^4 Wx= 13,15 cm^3 ex= 3,00 cm ix= 2,93 cm Iy= 31,26 cm^4 Wy= 10,42 cm^3 ey= 5,67 cm iy= 1,89 cm
E8102 Mullion Κολώνα		2978 g/m L=6,6 m	Ix= 173,66 cm^4 Wx= 24,05 cm^3 ex= 3,00 cm ix= 3,97 cm Iy= 46,27 cm^4 Wy= 15,42 cm^3 ey= 7,22 cm iy= 2,05 cm
E8180 Mullion Κολώνα		2851 g/m L=6,6 m	Ix= 244,55 cm^4 Wx= 30,34 cm^3 ex= 3,00 cm ix= 4,81 cm Iy= 48,36 cm^4 Wy= 16,12 cm^3 ey= 8,06 cm iy= 2,14 cm
E8104 Mullion Κολώνα		3702 g/m L=6,6 m	Ix= 454,03 cm^4 Wx= 47,39 cm^3 ex= 3,00 cm ix= 5,75 cm Iy= 66,32 cm^4 Wy= 22,11 cm^3 ey= 9,58 cm iy= 2,20 cm
E8105 Mullion Κολώνα		7557 g/m L=6,6 m	Ix= 1329,33 cm^4 Wx= 115,59 cm^3 ex= 3,00 cm ix= 6,89 cm Iy= 113,48 cm^4 Wy= 37,83 cm^3 ey= 11,50 cm iy= 2,01 cm

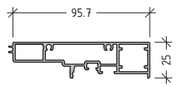
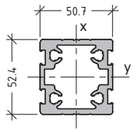
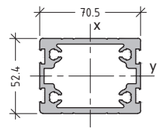
E8000.L-01

code κωδικός	Profile Διατομή	Weight - Βάρος Length - Μήκος	Static values Στατικές τιμές
E8152 Mullion Κολώνα		2344 g/m L=6,6 m	Ix= 139,20 cm⁴ Iy= 15,18 cm⁴ Wx= 20,20 cm³ Wy= 7,09 cm³ ex= 2,14 cm ey= 6,89 cm ix= 3,99 cm iy= 1,36 cm
E8181 Mullion Κολώνα		2543 g/m L=6,6 m	Ix= 221,26 cm⁴ Iy= 18,00 cm⁴ Wx= 28,04 cm³ Wy= 8,49 cm³ ex= 2,12 cm ey= 7,89 cm ix= 4,84 cm iy= 1,41 cm
E8300 Transom Τραβέρσα		1388 g/m L=6,01 m	Ix= 20,40 cm⁴ Iy= 12,59 cm⁴ Wx= 5,48 cm³ Wy= 4,20 cm³ ex= 3,00 cm ey= 3,72 cm ix= 1,99 cm iy= 1,56 cm
E8301 Transom Τραβέρσα		2012 g/m L=6,01 m	Ix= 65,03 cm⁴ Iy= 25,63 cm⁴ Wx= 12,29 cm³ Wy= 8,54 cm³ ex= 3,00 cm ey= 5,29 cm ix= 2,96 cm iy= 1,86 cm
E8302 Transom Τραβέρσα		2255 g/m L=6,01 m	Ix= 129,76 cm⁴ Iy= 33,33 cm⁴ Wx= 20,43 cm³ Wy= 11,11 cm³ ex= 3,00 cm ey= 6,35 cm ix= 3,94 cm iy= 2,00 cm
E8303 Transom Τραβέρσα		1102 g/m L=6,01 m	Ix= 17,08 cm⁴ Iy= 4,55 cm⁴ Wx= 4,95 cm³ Wy= 1,88 cm³ ex= 2,42 cm ey= 3,45 cm ix= 1,99 cm iy= 1,17 cm

E8000.L-02

code κωδικός	Profile Διατομή	Weight - Βάρος Length - Μήκος	Static values Στατικές τιμές
E8380 Transom Τραβέρσα		877 g/m L=6,01 m	Ix= 6,28 cm⁴ Iy= 5.53 cm⁴ Wx= 2,45 cm³ Wy= 1,84 cm³ ex= 3,00 cm ey= 2,56 cm ix= 1,39 cm iy= 1,31 cm
E8200 Sash profile Φύλλο		1253 g/m L=6,01 m	
E8282 Sash profile Φύλλο		1622 g/m L=6,01 m	
E8288 Sash profile Φύλλο		870 g/m L=6,01 m	
E8203 Sash profile Φύλλο		1191 g/m L=6,01 m	
E8250 Sash profile Φύλλο		1485 g/m L=6,01 m	

E8000.L-03

code κωδικός	Profile Διατομή	Weight - Βάρος Length - Μήκος	Static values Στατικές τιμές
E8608 Glazing bead Προφίλ συγκράτησης υάλωσης		125 g/m L=6,01 m	
E8670 Additional profile Πρόσθετο προφίλ		1256 g/m L=6,01 m	
E8950 Mullion connector Σύνδεσμος κολώνας		2749 g/m L=6,01 m	Ix= 32,16 cm^4 Wx= 12,71 cm^3 ex= 2,62 cm ix= 1,78 cm Iy= 35,95 cm^4 Wy= 13,72 cm^3 ey= 2,53 cm iy= 1,88 cm
E8951 Mullion connector Σύνδεσμος κολώνας		3175 g/m L=6,01 m	Ix= 76,14 cm^4 Wx= 21,63 cm^3 ex= 2,62 cm ix= 2,54 cm Iy= 45,25 cm^4 Wy= 17,27 cm^3 ey= 3,52 cm iy= 1,96 cm
E8983 Glazing shim for sash E8282 Τακάκι τζαμιού για φύλλο E8282		246 g/m L=6,01 m	

E8000.L-04

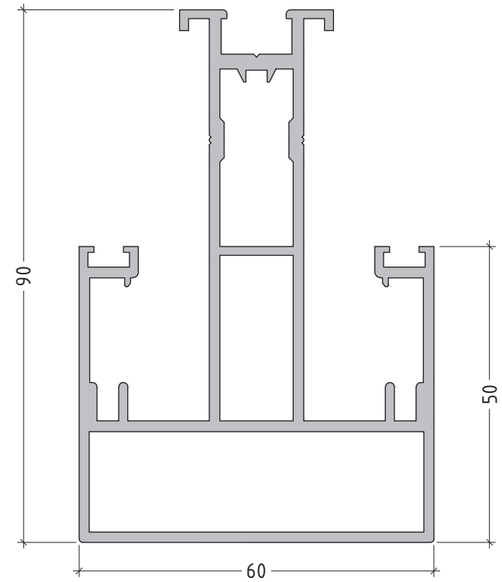
PROFILES

LIST OF PROFILES / DRAWINGS

E8100

Mullion
Κολώνα

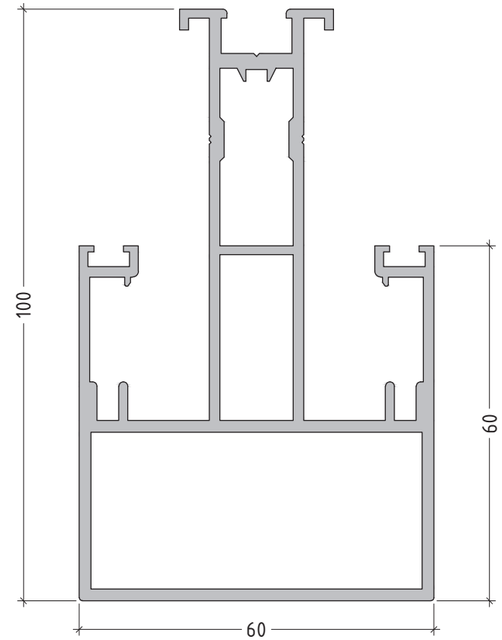
2141 g/m



E8101

Mullion
Κολώνα

2352 g/m

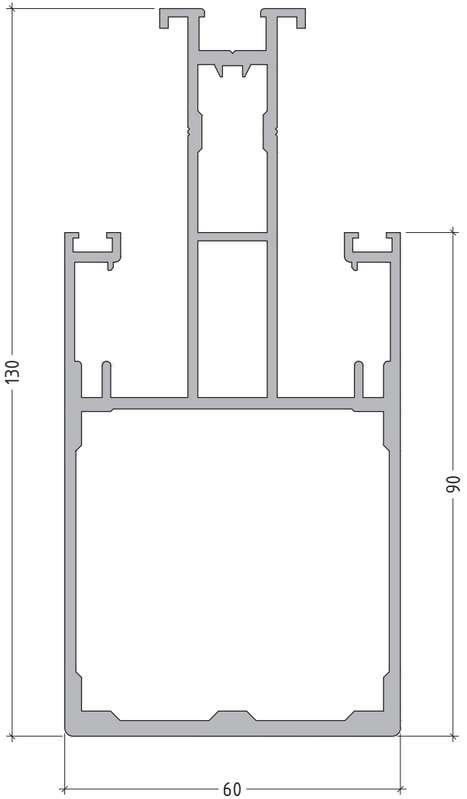


scale : 1:1

E8102

Mullion
Κολώνα

2978 g/m



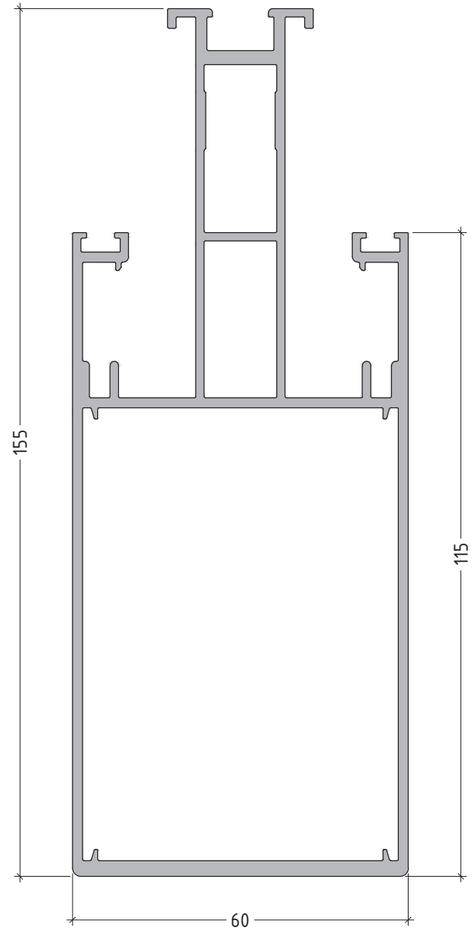
scale : 1:1

E8000.P-02

E8180

Mullion
Κολώνα

2851 g/m



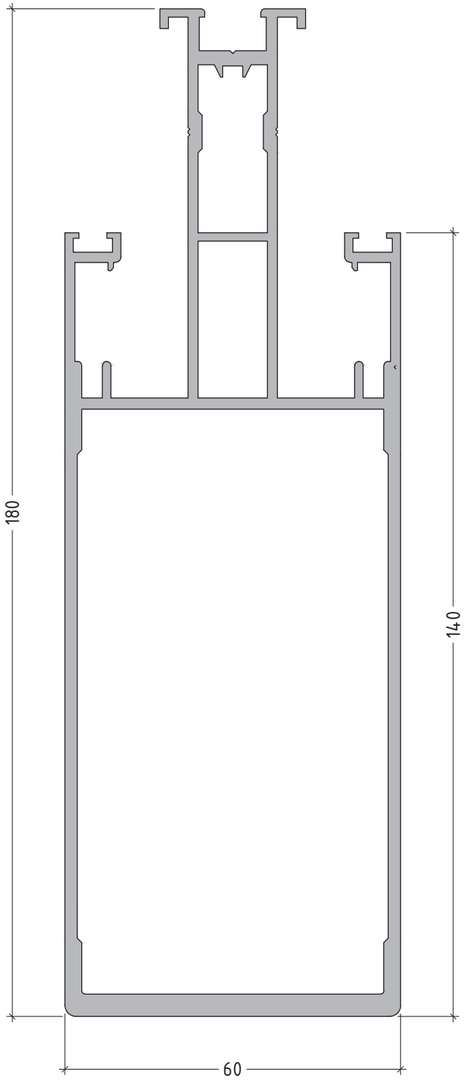
scale : 1:1

E8000.P-03

E8104

Mullion
Κολώνα

3702 g/m



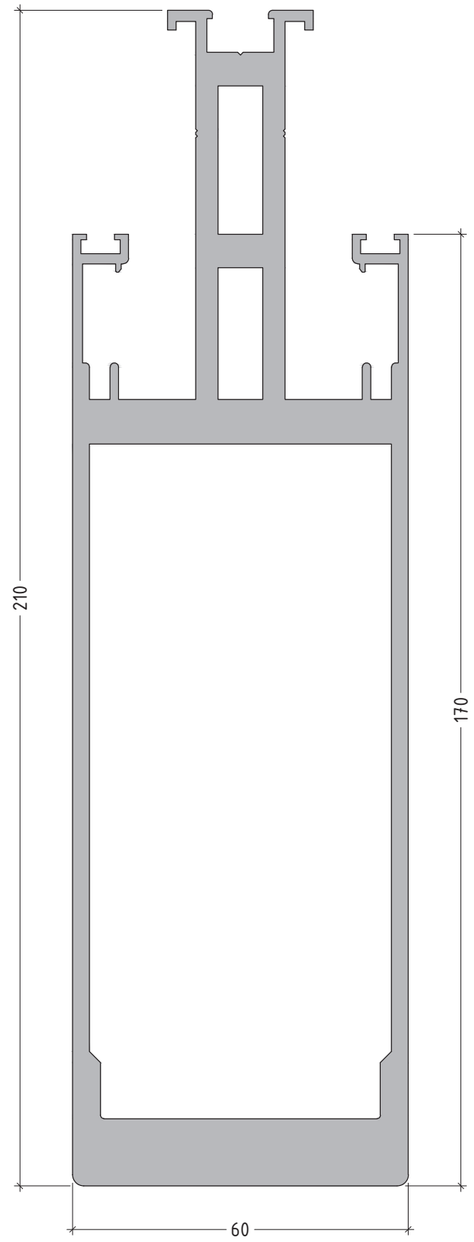
scale : 1:1

E8000.P-04

E8105

Mullion
Κολώνα

7557 g/m



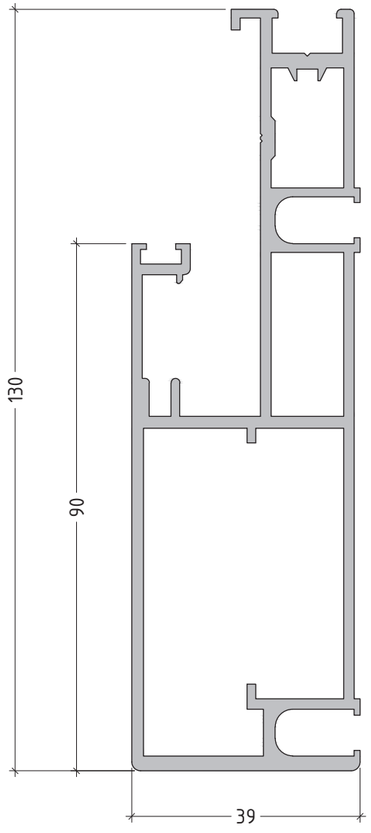
scale : 1:1

E8000.P-05

E8152

Mullion
Κολώνα

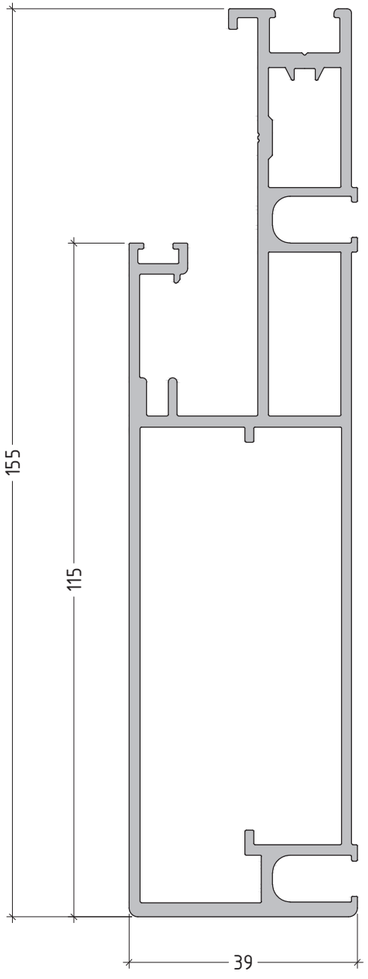
2344 g/m



E8181

Mullion
Κολώνα

2543 g/m



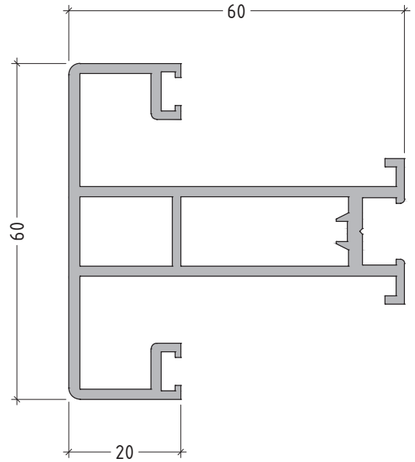
scale : 1:1

E8000.P-06

E8300

Transom
Τραβέρσα

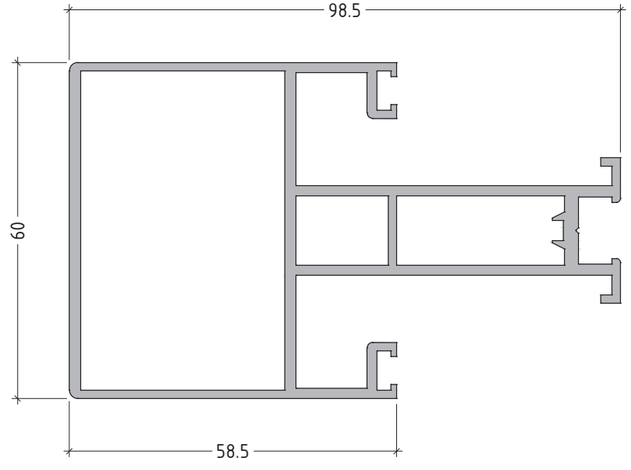
1388 g/m



E8301

Transom
Τραβέρσα

2012 g/m



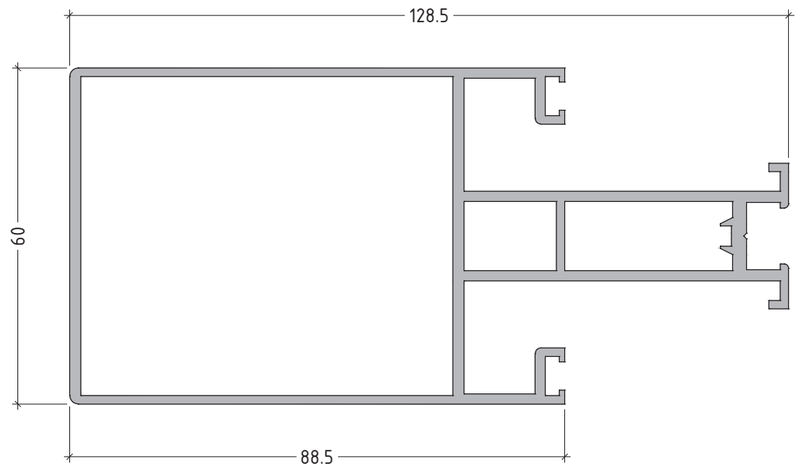
scale : 1:1

E8000.P-07

E8302

Transom
Τραβέρσα

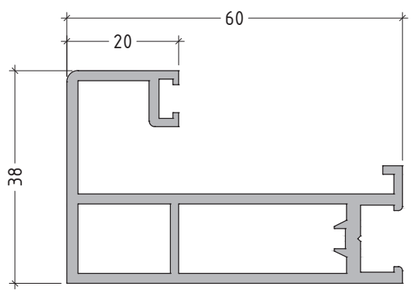
2255 g/m



E8303

Transom
Τραβέρσα

1102 g/m



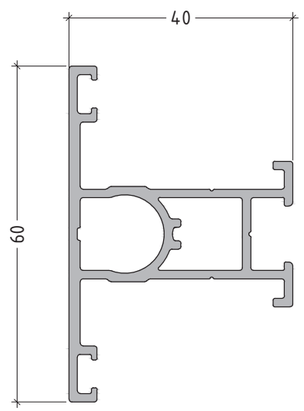
scale : 1:1

E8000.P-08

E8380

Transom
Τραβέρσα

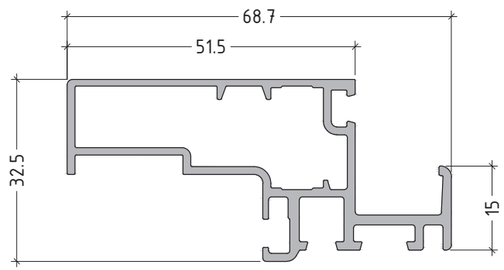
877 g/m



E8288

Sash profile
Φύλλο

870 g/m



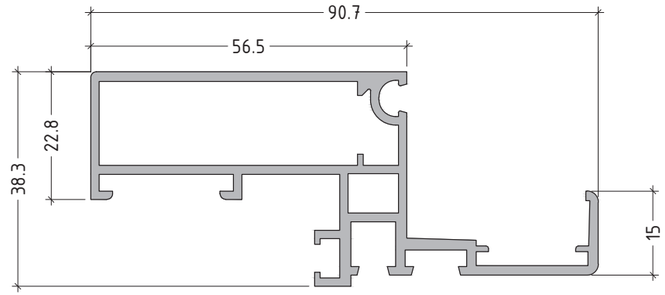
scale : 1:1

E8000.P-09

E8200

Sash profile
Φύλλο

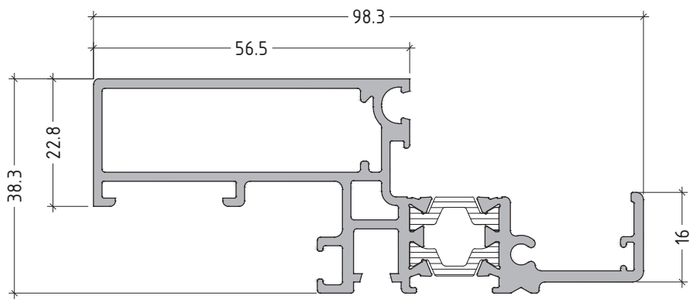
1253 g/m



E8282

Sash profile
Φύλλο

1622 g/m



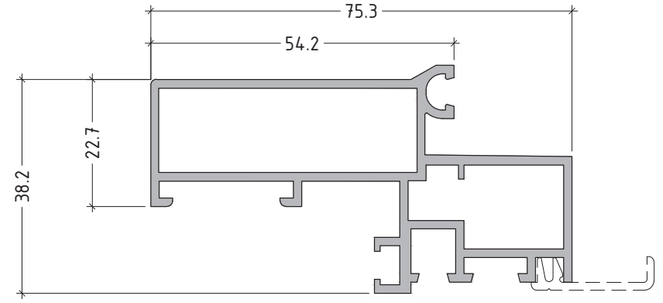
scale : 1:1

E8000.P-010

E8203

Sash profile
Φύλλο

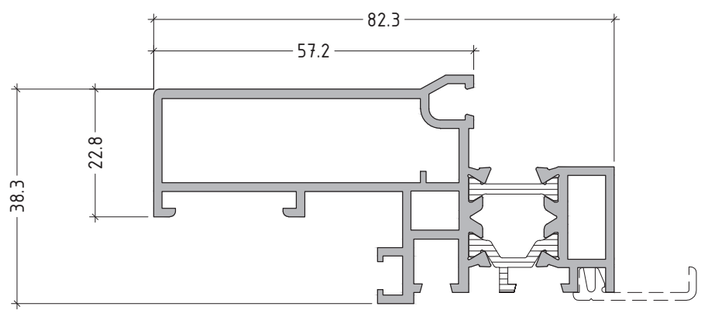
1191 g/m



E8250

Sash profile
Φύλλο

1485 g/m



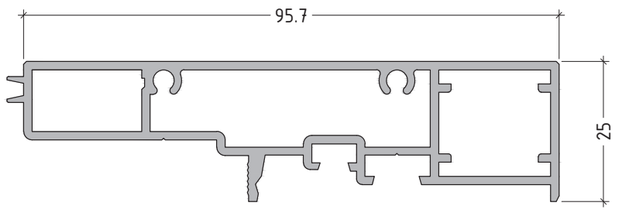
scale : 1:1

E8000.P-011

E8670

Additional profile
Πρόσθετο προφίλ

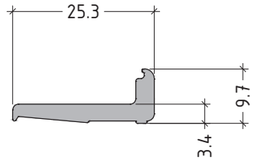
1256 g/m



E8983

Glazing shim for
E8282
Τακάκι υάλωσης
για E8282

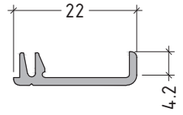
246 g/m



E8908

Glazing bead
Προφίλ
συγκράτησης
υάλωσης

125 g/m



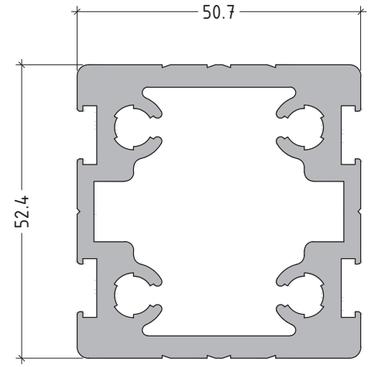
scale : 1:1

E8000.P-012

E8950

Mullion connector
Σύνδεσμος κολώνας

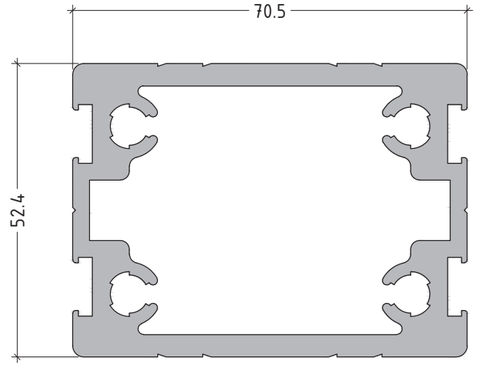
2749 g/m



E8951

Mullion connector
Σύνδεσμος κολώνας

3175 g/m



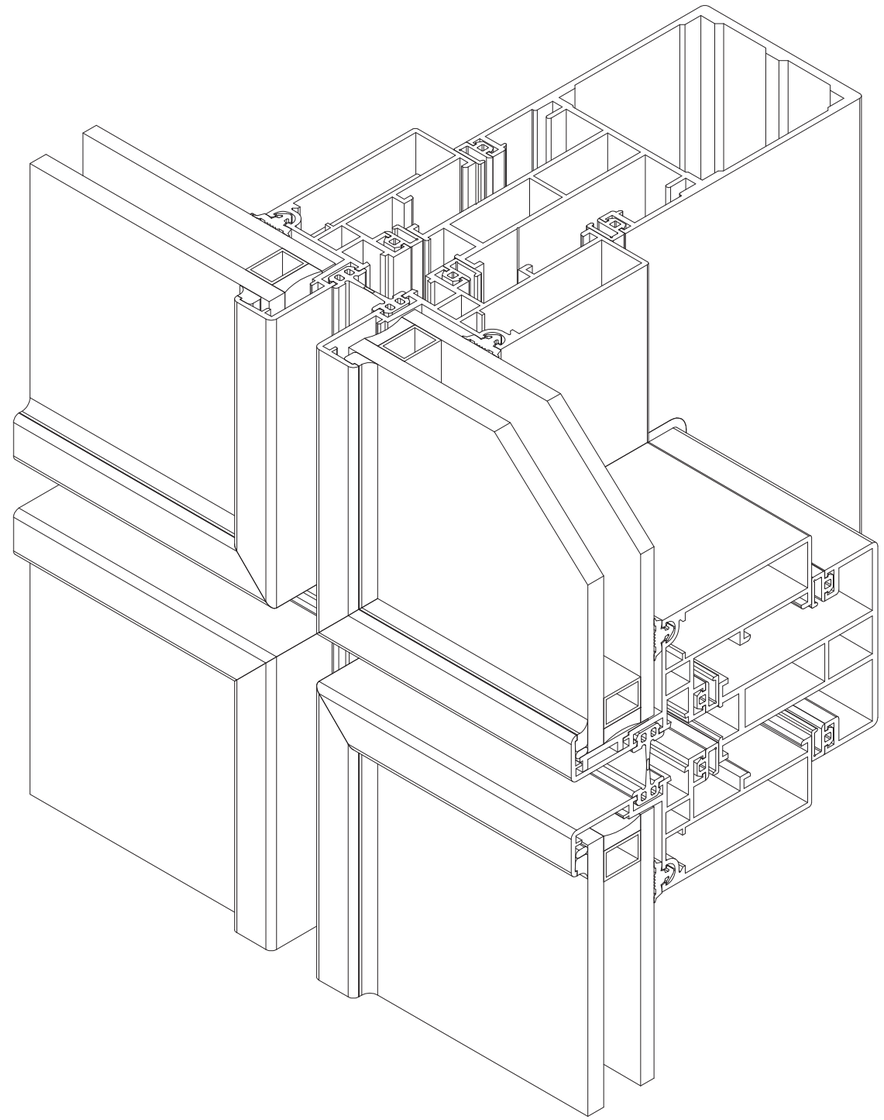
scale : 1:1

E8000.P-013

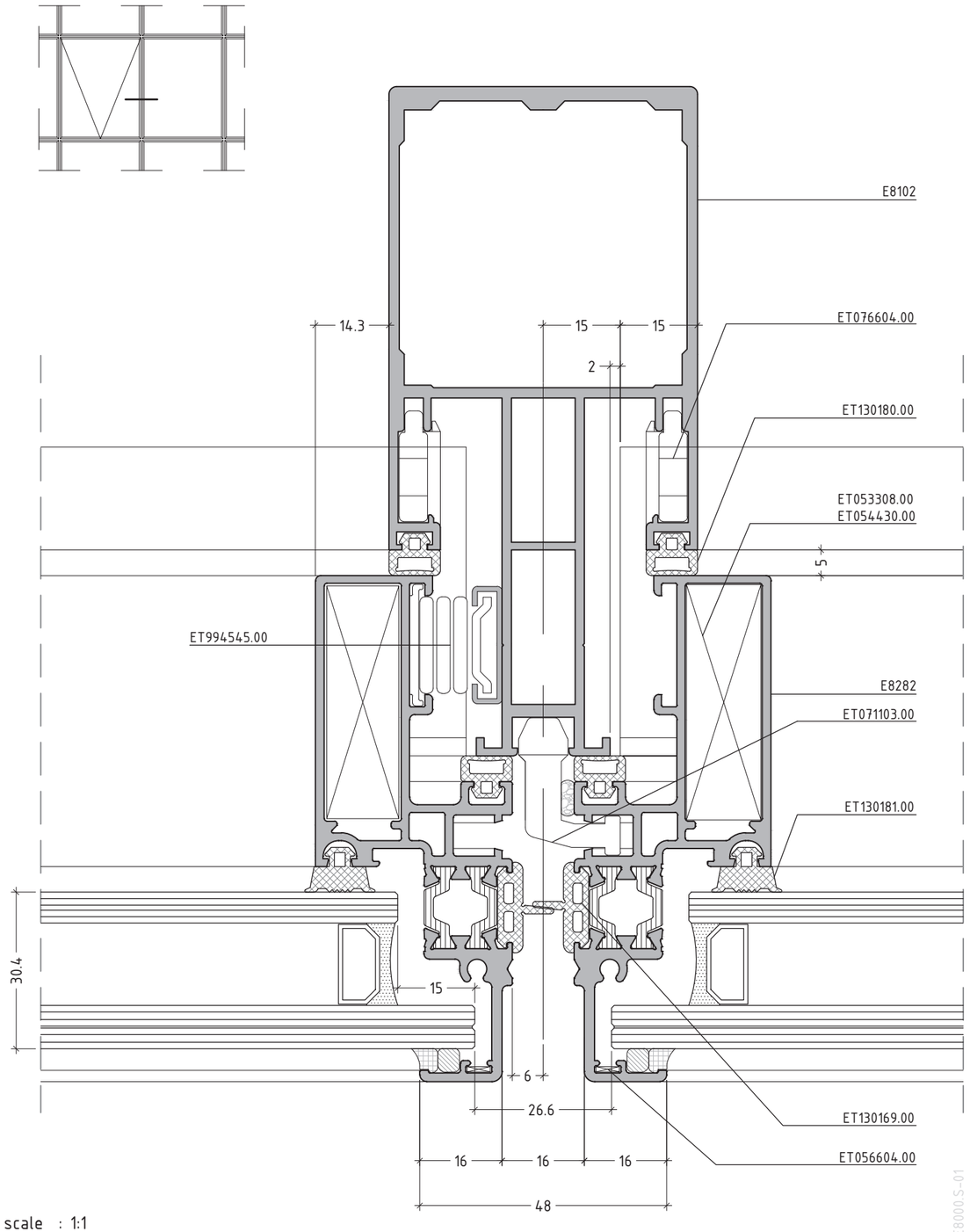
SECTIONS

SECTIONS / DETAILS

SEMI STRUCTURAL GLAZING

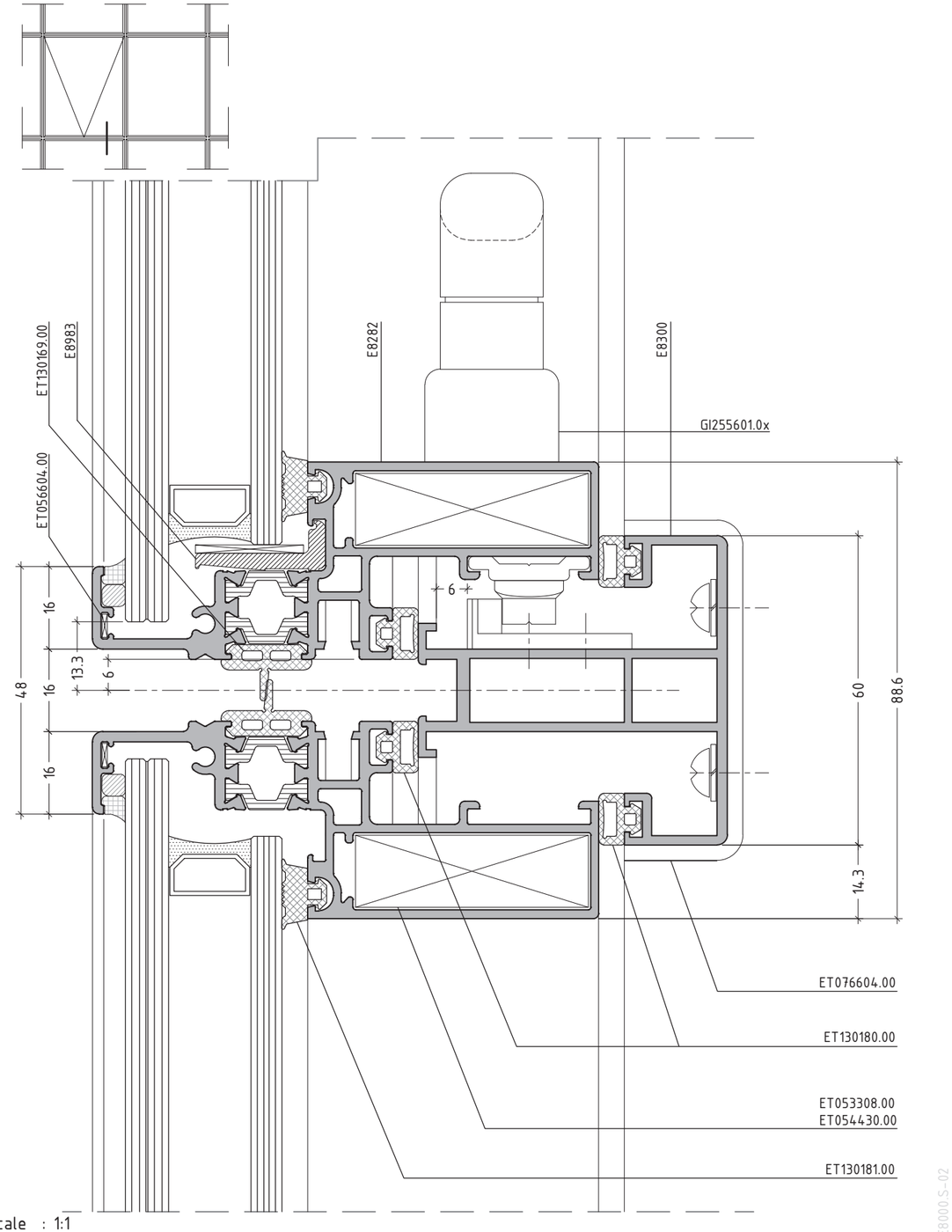


E8000.SSG



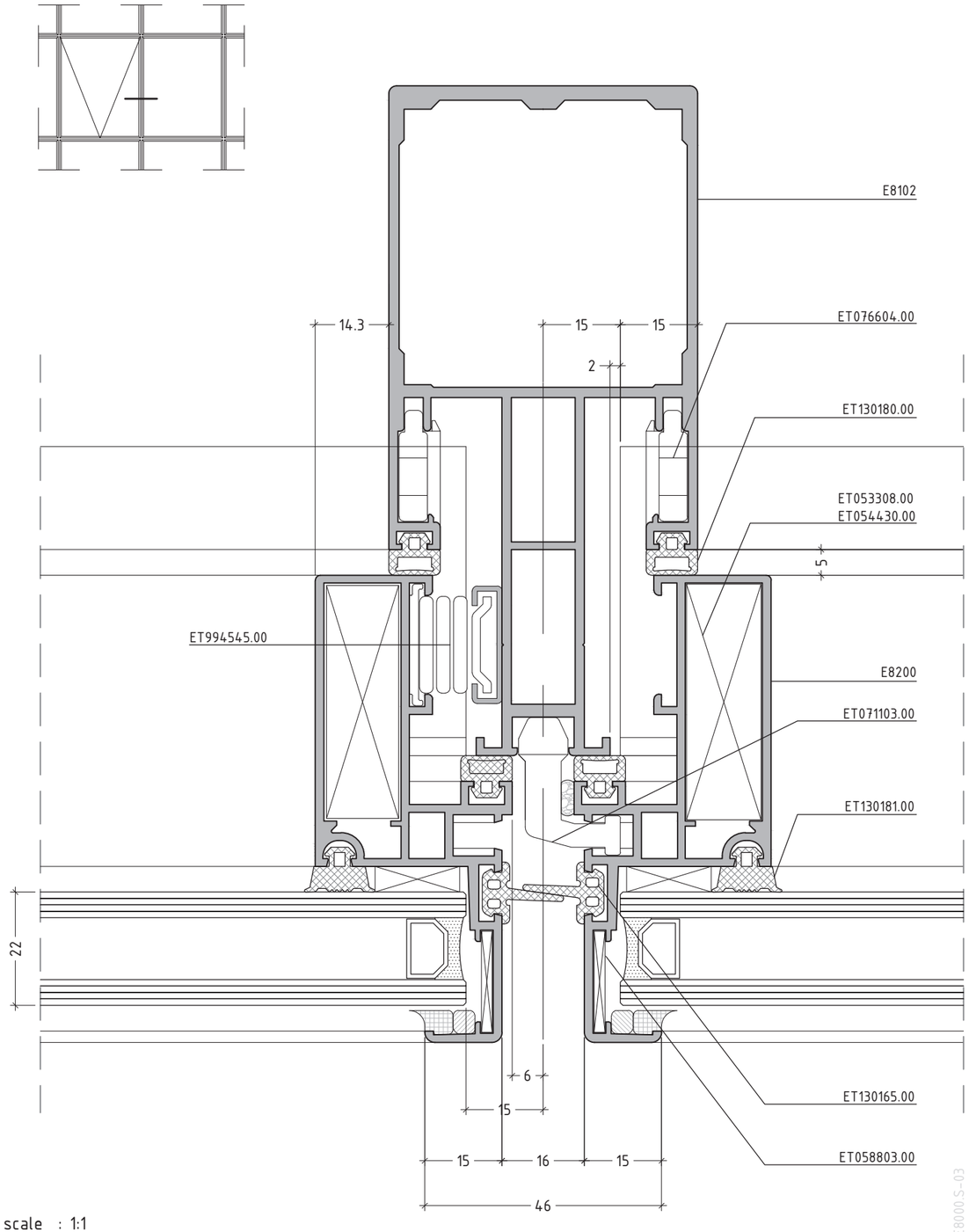
scale : 1:1

E8000.S-01



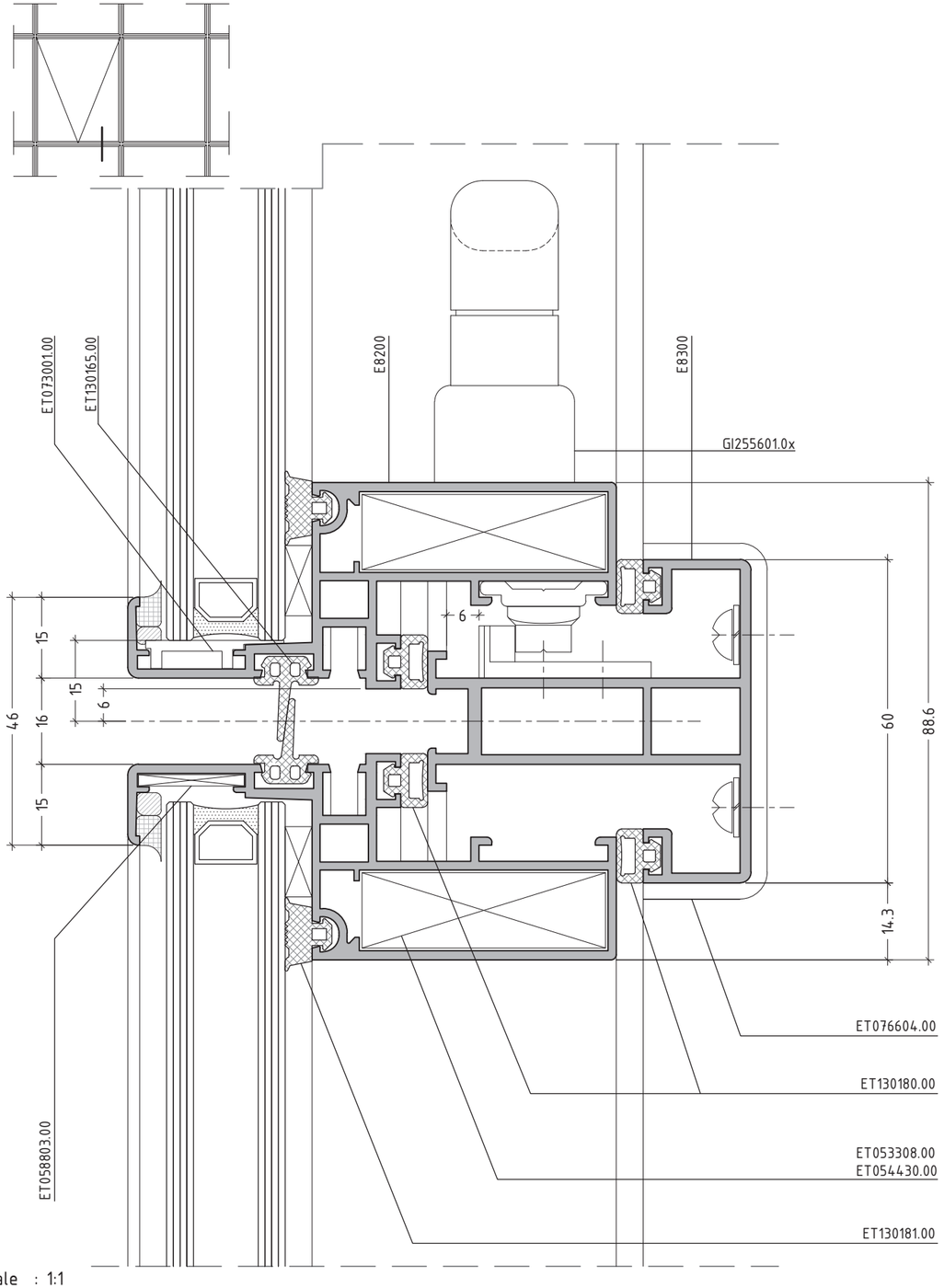
scale : 1:1

E8000.S-02



scale : 1:1

E8000.S-03



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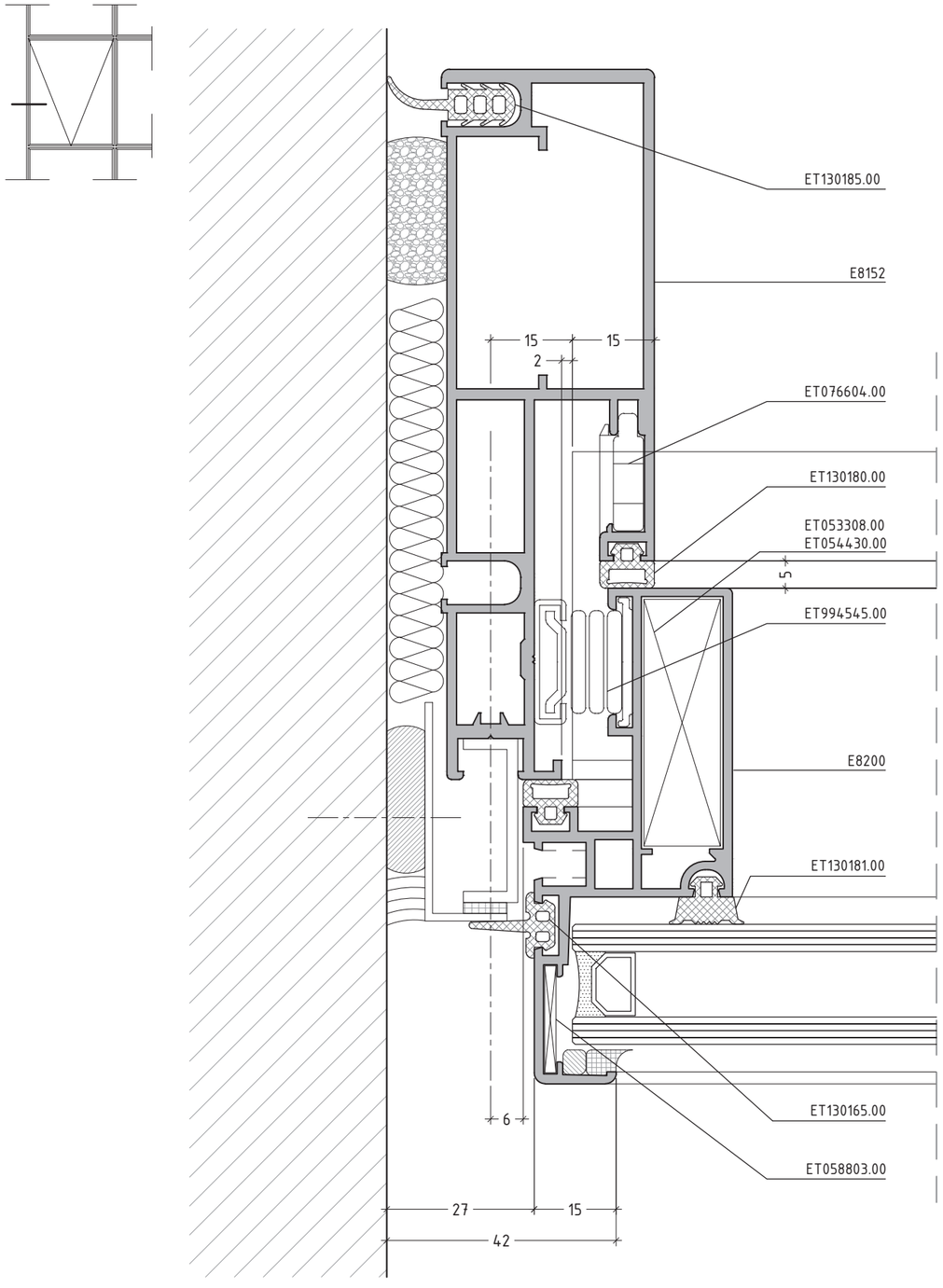
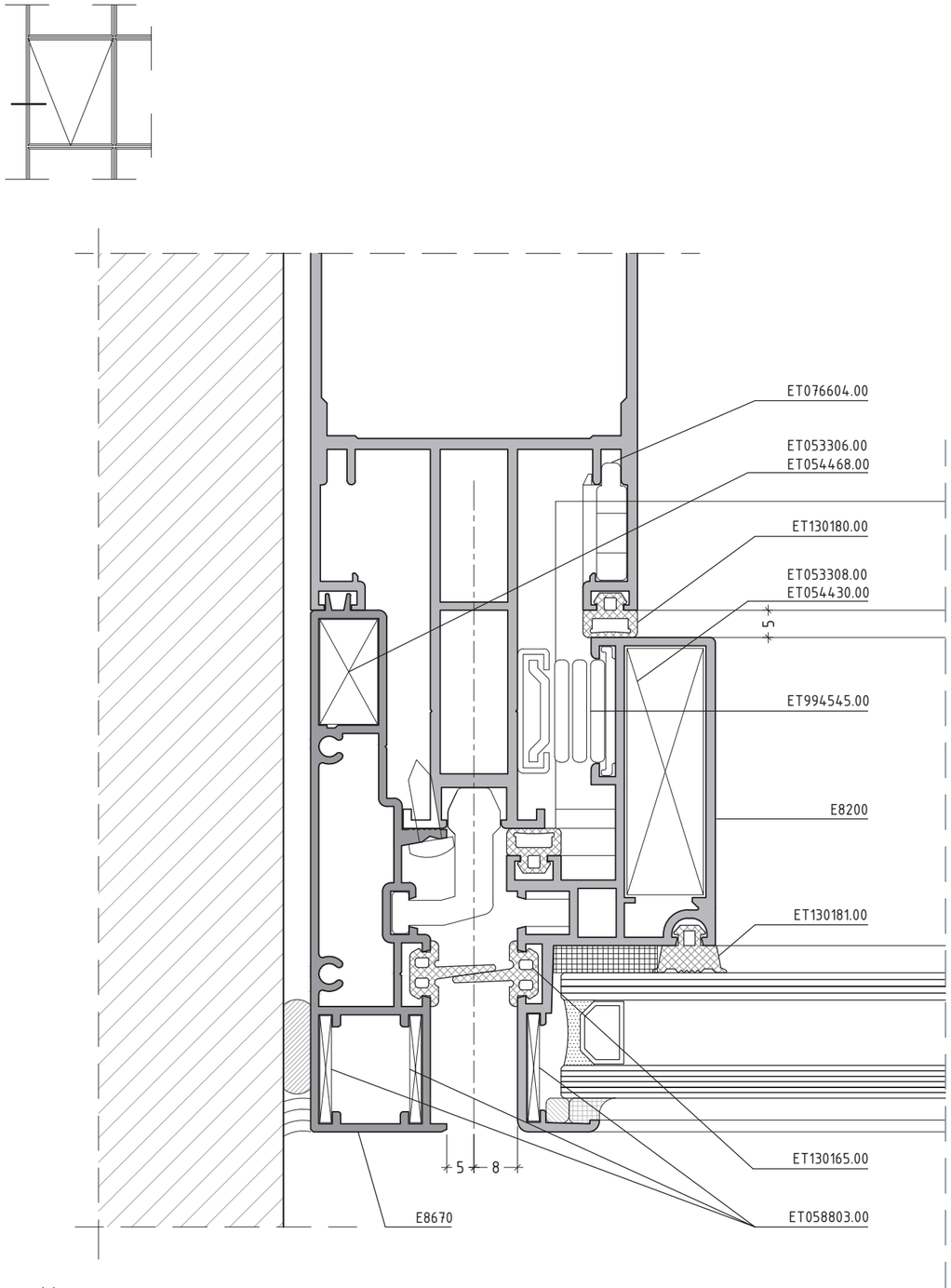
E8000.S-04



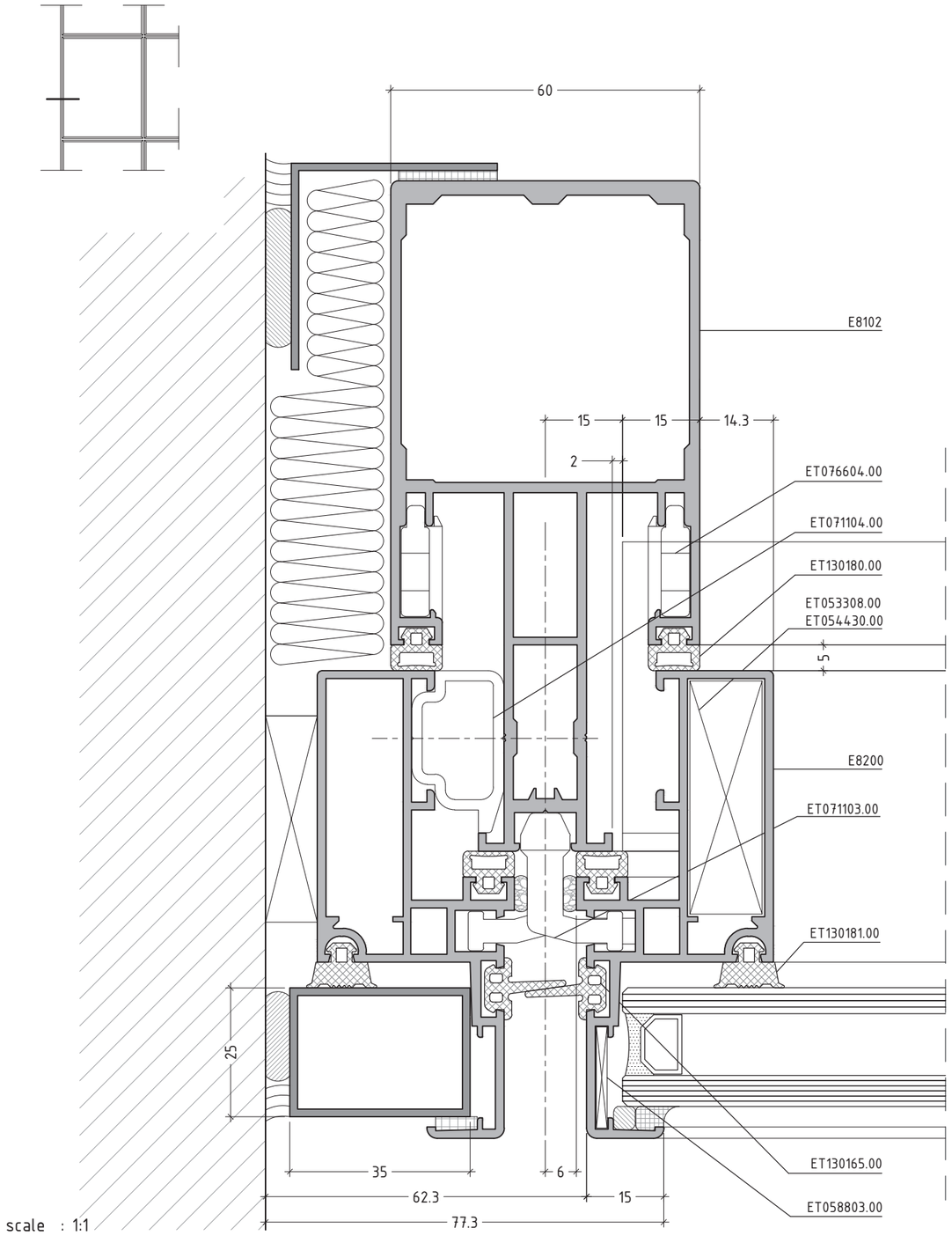
scale : 1:1

E8000.S-05

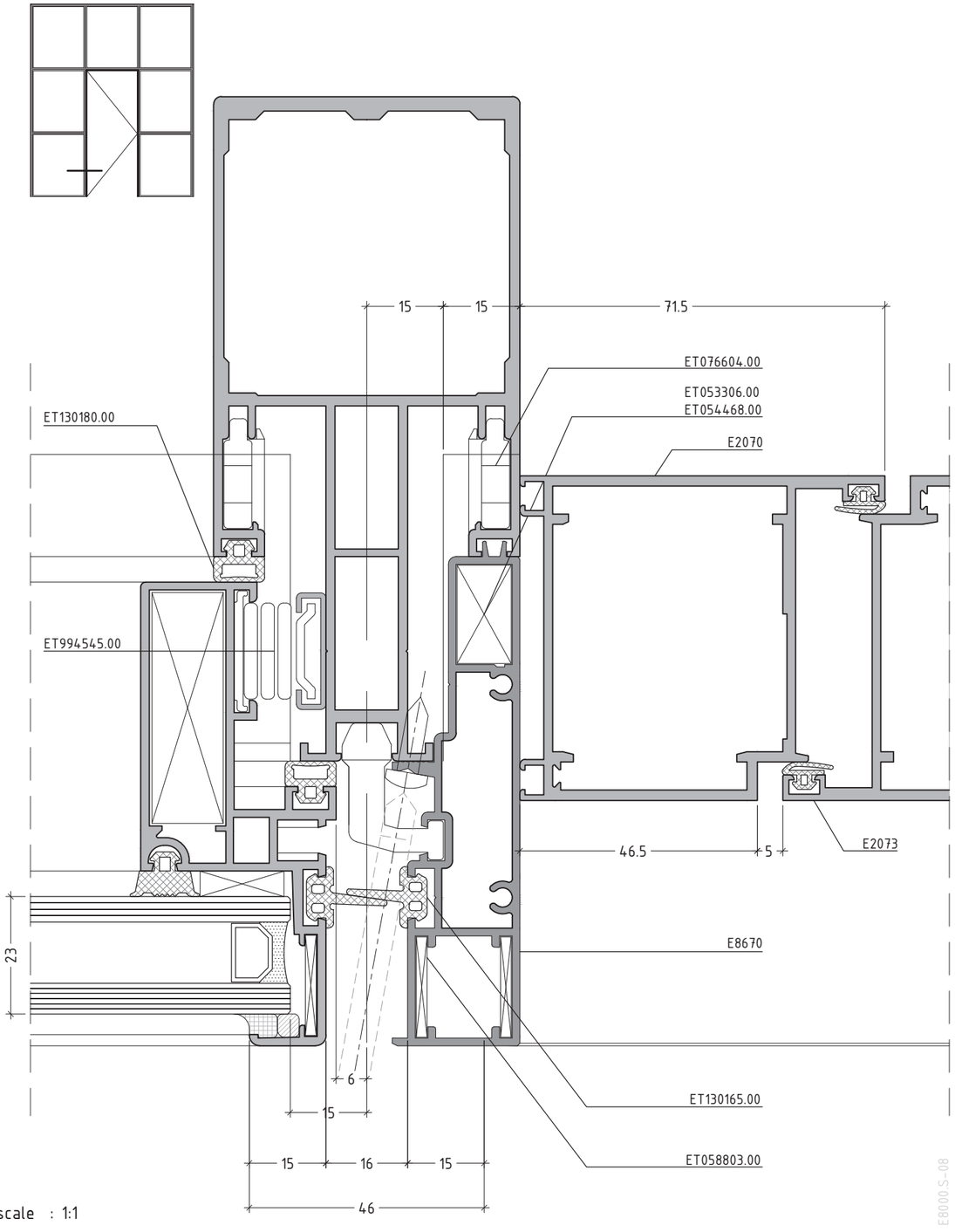


scale : 1:1

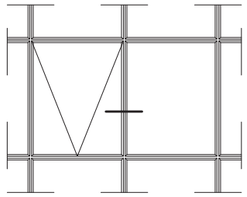
E8000.S-06

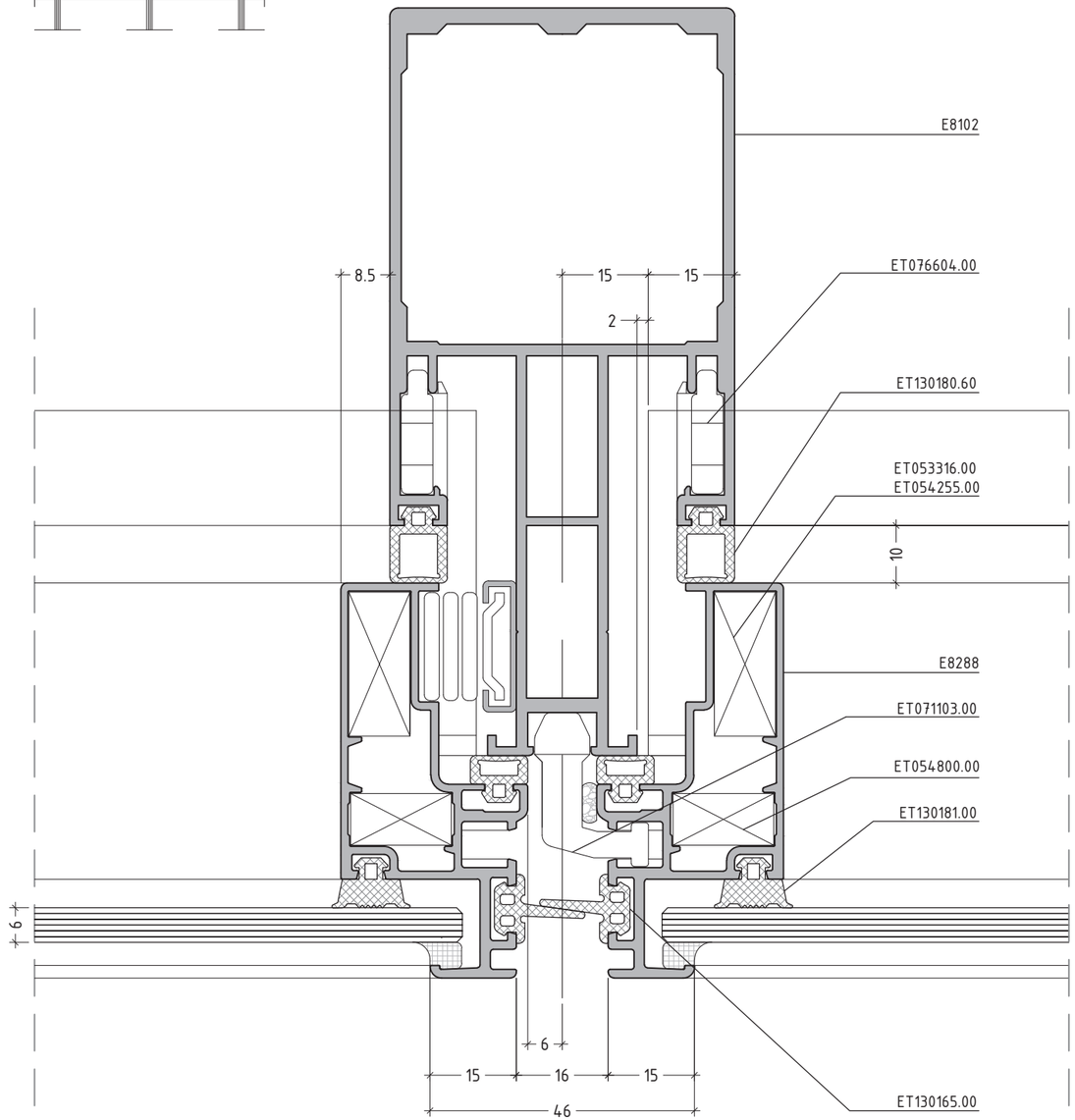


scale : 1:1



scale : 1:1

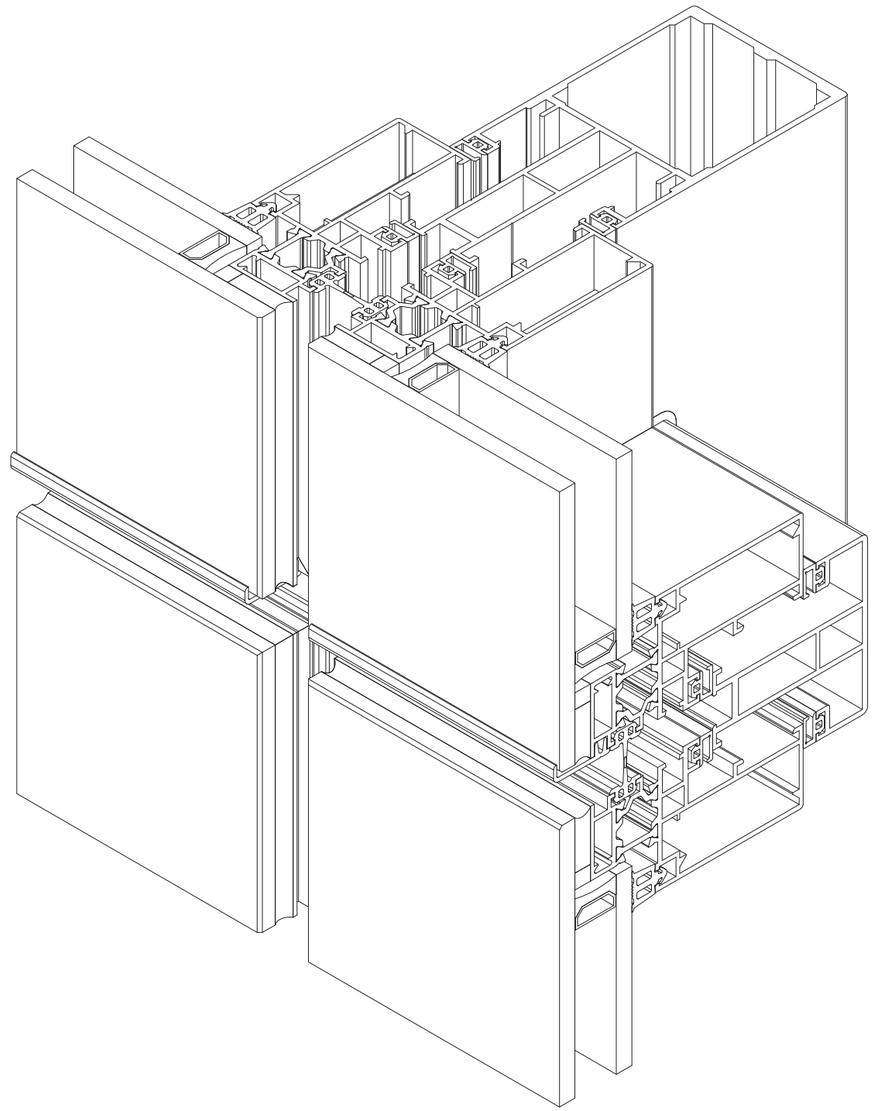




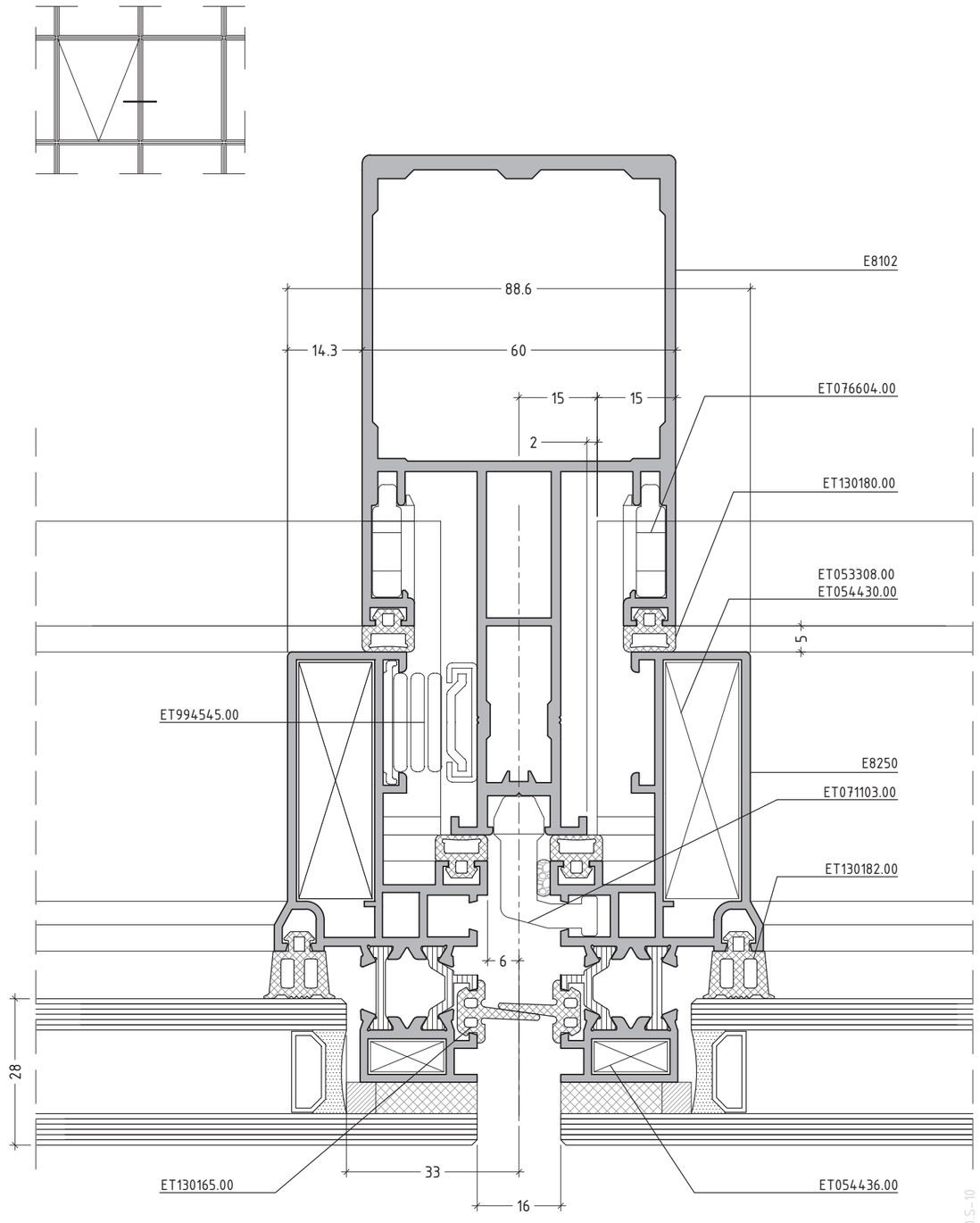
scale : 1:1

E8000.S-09

STRUCTURAL GLAZING

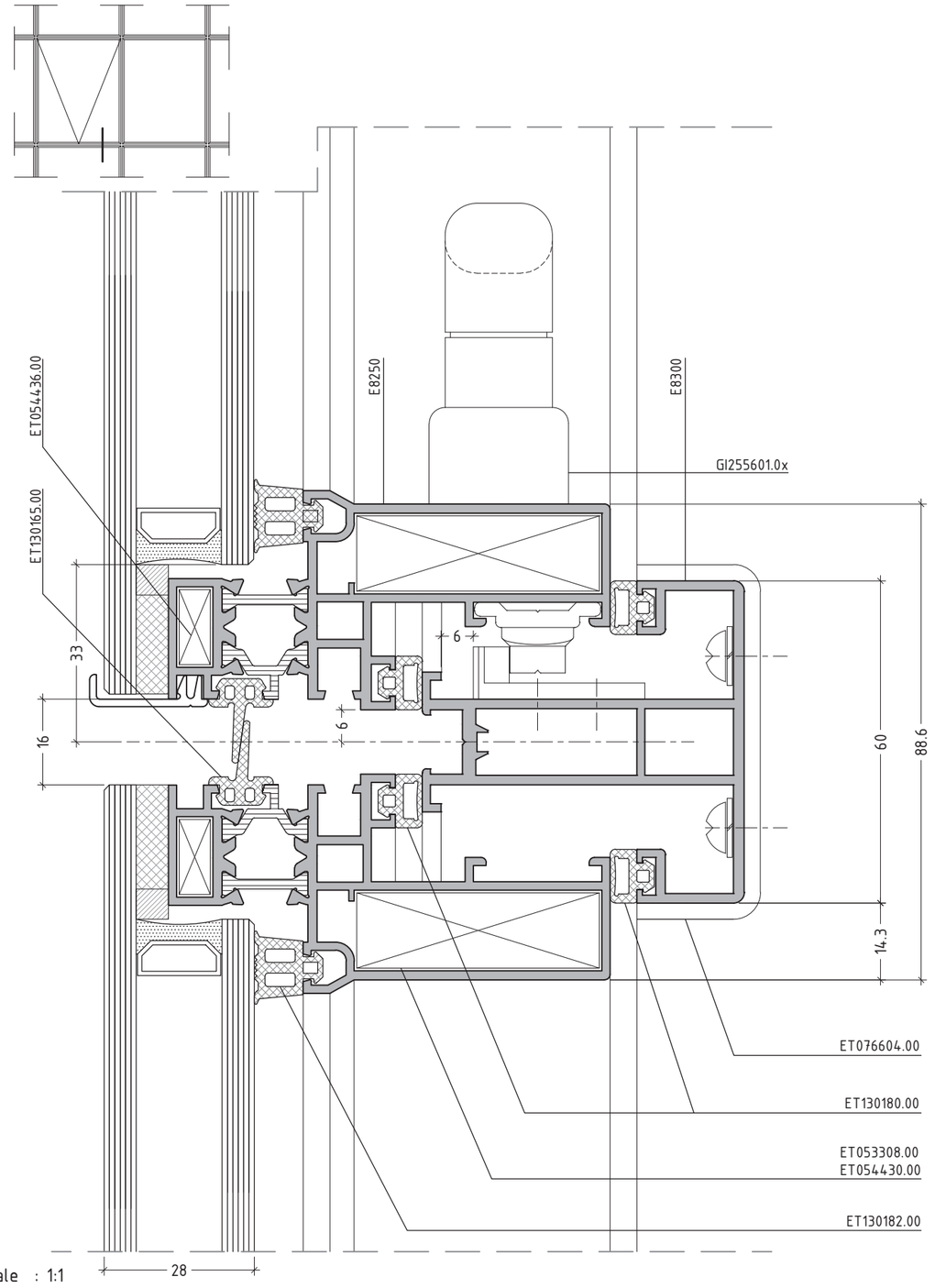


E8000.SG



scale : 1:1

E8000.S-10



scale : 1:1

E8000.S-11

ACCESSORIES

IMAGES / DESCRIPTIONS

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 130180.00		●

Mullion sealing EPDM gasket

Ελαστικό στεγάνωσης κολώνας

ET 130180.60		●

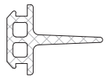
Mullion sealing EPDM gasket with sash E8288

Ελαστικό στεγάνωσης κολώνας με φύλλο E8288

ET 130165.00		●

Sealing EPDM gasket for sash profiles

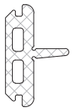
Ελαστικό στεγάνωσης φύλλων



ET 130169.00		●

Sealing EPDM gasket for sash profile E8282

Ελαστικό στεγάνωσης φύλλου E8282



code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 130187.00		●

Glazing EPDM gasket 4.0 mm

Ελαστικό υάλωσης
4.0 mm

ET 130181.00		●

Glazing EPDM gasket 5.0 mm

Ελαστικό υάλωσης
5.0 mm

ET 130167.00		●

Glazing EPDM gasket
8.0 mm

Ελαστικό υάλωσης
8.0 mm

ET 130182.00		●

Glazing EPDM gasket
10.0 mm

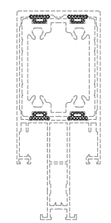
Ελαστικό υάλωσης
10.0 mm

E8000.A-02

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 130194.00		●

Epdm gasket for longitudinal connector

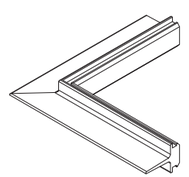
Ελαστικό συνδέσμου δυο κολωνών



ET 060165.00		●

EPDM corner for ET130165.00

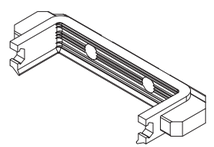
Γωνία EPDM για ελαστικό ET130165.00



ET 076604.00		●

EPDM gasket for mullion & transom

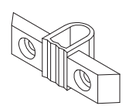
Ελαστική φωλιά τραβέρσας



ET 076605.00		●

EPDM plug for expansion joint mullion

Ελαστικό εξάρτημα αρμού διαστολής κολώνας

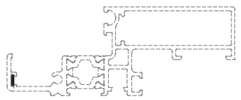


E8000.A-03

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 056604.00		inox

Alignment square (5x1.25)

Γωνία ευθυγρ. (5x1.25)

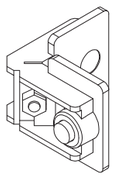


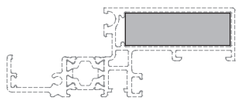
E8282

ET 053308.00		silver

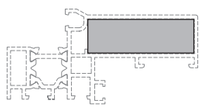
Die cast alum. joint corner bracket

Γωνία χυτή διαιρούμενη





E8282 & E8200

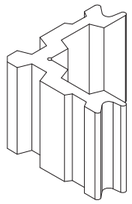


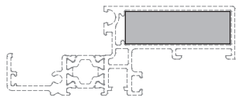
E8250 & E8203

ET 054430.00		MF

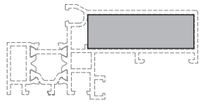
Extruded alum. joint corner bracket 45.7mm

Γωνία αλουμινίου 45.7mm





E8282 & E8200

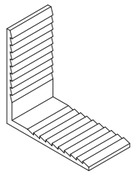


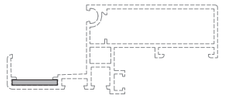
E8250 & E8203

ET 058803.00		MF

Extruded alum. joint corner

Γωνία ευθυγράμμισης αλουμινίου





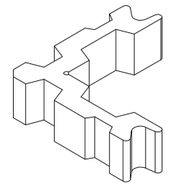
E8200

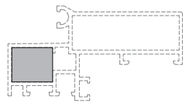
E8000.A-04

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 054432.00		MF

Extruded alum. joint corner bracket 17.3mm

Γωνία αλουμινίου 17.3mm



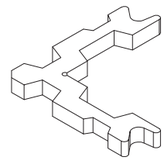


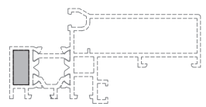
E8203

ET 054436.00		MF

Extruded alum. joint corner bracket 6.3mm

Γωνία αλουμινίου 6.3mm



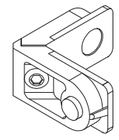


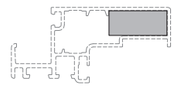
E8250

ET 053316.00		silver

Die cast aluminium corner joint bracket

Γωνία χυτή διαιρούμενη



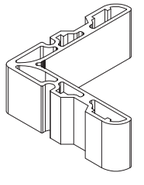


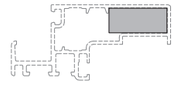
E8288

ET 054255.00		MF

Extruded aluminium joint corner (24.7 mm), without hole

Γωνία αλουμινίου 24.7mm





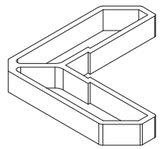
E8288

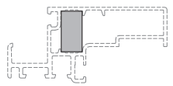
E8000.A-05

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 054800.00		MF

Extruded alum. joint corner bracket 8.8mm

Γωνία αλουμινίου 8.8mm



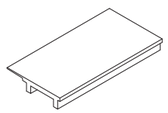


E8288

ET 073001.00		●

Plastic glazing shim for E8200

Πλαστικό τακάκι υάλωσης για E8200



ET 074658.00		●

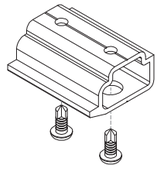
EPDM plug for sealing the joint between mullion-transom

Τάπα σφράγισης αρμού κολώνας-τραβέρσας

ET 071104.00		MF

Shim between transom and frame

Αποστάτης τραβέρσας - φύλλου

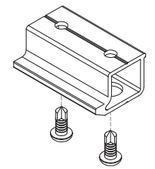


E8000.A-06

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 072150.00		MF

Shim between transom and frame - E8288

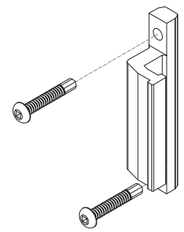
Αποστάτης τραβέρσας φύλλου - E8288



ET 071103.00		MF

Sash frame retaining device - single

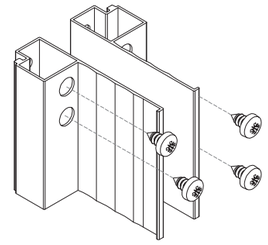
Στήριγμα αλουμ. πλαισίου φύλλου - μονό



ET 071105.00		MF

Drainage fitting between mullions

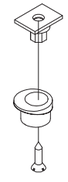
Πρόσθετη υδροροή στην σύνδεση δυο κολωνών



GI 255602.00		

Additional adjustable striker

Πρόσθετη ασφάλεια ρυθμιζόμενη

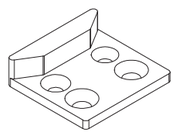


E8000.A-07

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
GI 255603.00		

Striker for GI.255602.00

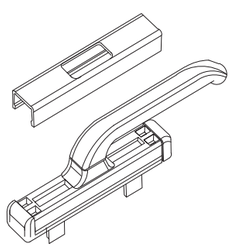
Αντίκρυσμα πρόσθετης ασφάλειας GI.255602.00



GI 255601.01		●
GI 255601.02		●

Cremone bolt for projected window

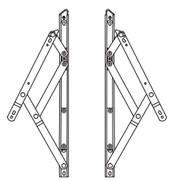
Χειρολαβή προβαλλόμενου παραθύρου



ET 990858.00		MF

Pair of arms for projected window (up to 80kg)

Κουμπάσο για προβαλλόμενο παράθυρο (έως 80kg)



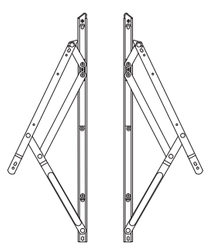
Length: 405mm –
Angle of opening 25°
Height of frame 500 – 1200mm

Μήκος: 405mm
Γωνία ανοίγμ. 25°
Ύψος παραθ. 500 – 1200mm

ET 994545.00		MF

Pair of arms for projected window (up to 105kg)

Κουμπάσο για προβαλλόμενο παράθυρο (έως 105kg)



Length: 535mm –
Angle of opening 19°
Height of frame 1100 – 1600mm

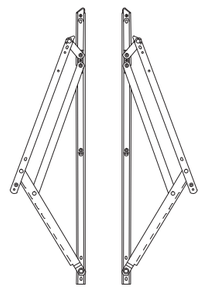
Μήκος: 535mm
Γωνία ανοίγμ. 19°
Ύψος παραθ. 1100 – 1600mm

E8000.A-08

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 991913.00		MF

Pair of arms for projected window (up to 130kg)

Κουμπάσο για προβαλλόμενο παράθυρο (έως 130kg)



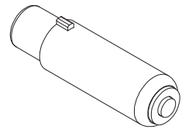
Length: 665mm –
Angle of opening 15°
Height of frame 1500 – 2000mm

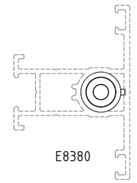
Μήκος: 665mm
Γωνία ανοίγμ. 15°
Ύψος παραθ. 1500 – 2000mm

ET 071113.00		MF

Fixing part between transom and mullion

Στήριγμα τραβέρσας

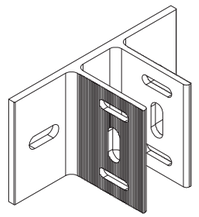




ET 071215.00		MF

Concrete fixing bracket E8000

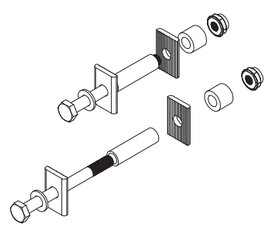
Βάση στήριξης μπετού E8000



ET 071219.00		INOX

Fixing set for transom

Στήριξη σταθερού σημείου

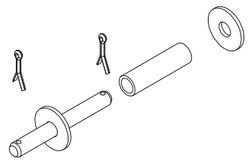


E8000.A-09

code/description κωδικός/περιγραφή	package/pcs συσκευασία/τμχ	colour χρώμα
ET 071220.00		INOX

Rolling support point

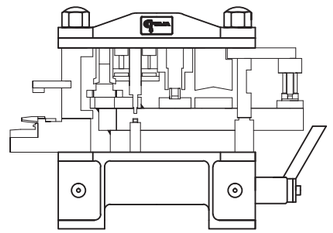
Στήριξη κυλιόμενου σημείου



ET 162004.00		

Punching machine for E8000

Πρέσα διάτρησης για E8000



E8000.A.-010

CE MARKING

STANDARDS / REQUIREMENTS

CE MARKING

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

WHAT IS THE PURPOSE OF CE MARKING?
The CE marking represents "the European passport" of the product, its main objectives are:

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

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

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

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

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

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

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

LEGAL ACTS

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

MAIN METHODS FOR OBTAINING TEST RESULTS BY THE MANUFACTURER

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

1

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

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE MANUFACTURER OWNS THE TEST REPORT

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

2

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

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE PARTNER OWNS THE TEST REPORT

↓

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

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

3

THE SYSTEM PROVIDER SELECTS SAMPLES FOR TESTING

↓

NOTIFIED TESTING LABORATORY TESTS THE SAMPLE

↓

THE SYSTEM PROVIDER OWNS THE TEST REPORT

↓

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

↓

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

↓

MANUFACTURER ISSUES DECLARATION OF PERFORMANCE AND AFFIXES CE MARKING

Declaration of Performance

Manufacturer's corporate name

DoP: No E8000XX01

Intended use: Curtain Walling

Essential Characteristics	Performance	Notified Body	AVCP	hEN
Reaction to fire of profile	NPD	-	3	EN 13830:2003
Fire resistance	NPD	-		
Fire propagation	NPD	-		
Watertightness	RE_{1500Pa}	0757		
Resistance to own dead load: [kN]	NPD	-		
Wind load resistance: [kN/m^2]				
Design load	±1.60	0757		
Safety load	±2.40	0757		
Impact resistance	I5/E5	-		
Thermal shock resistance	NPD	-		
Resistance to horizontal loads: [kN at m sill height]	NPD	-		
Air permeability	AE	0757		
Thermal transmittance U_{CW} [W/(m^{2}K)]	2.10	-		
Airborne sound insulation [dB]	NPD	-		

The performance of the product(s) identified above is in conformity with the set of declared performances. This declaration of performance is issued in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Name	Place and date of issue	Signature

Signed for and on behalf of the manufacturer by:

CE

20

No E8000XX01

Window for communication in domestic and domestic locations

Manufacturer's corporate name

EN 13830:2003

Essential Characteristics	Performance
Watertightness	RE_{1500Pa}
Wind load resistance: [kN/m^2] Design load Safety load	 ±1.60 ±2.40
Impact resistance	I5/E5
Air permeability	AE
Thermal transmittance	2.1 (W/m^2K)

Notified Body 0757

STANDARDS

GENERAL

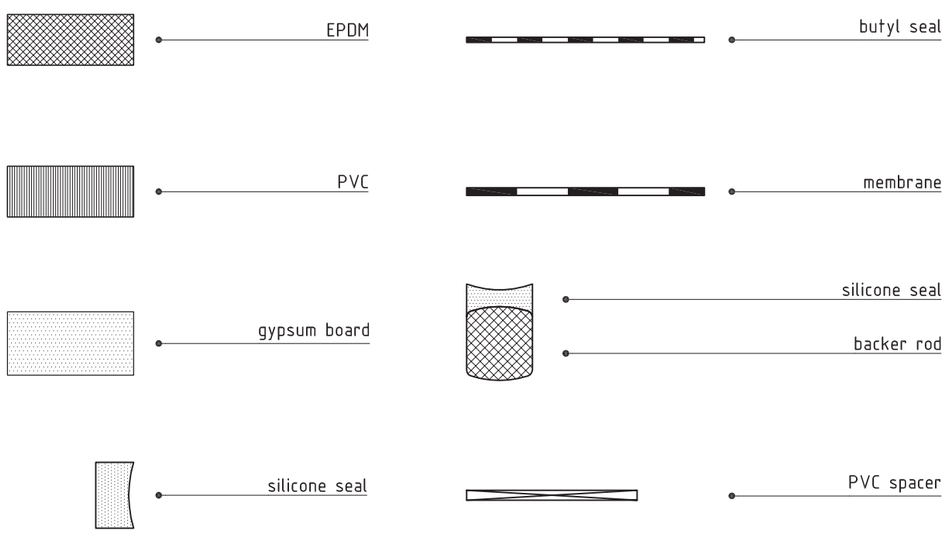
- EN 12020 (1÷2) – ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED PRECISION PROFILES IN ALLOYS EN AW-6060 AND EN AW-6063
- EN 755 (1÷9)– ALUMINIUM AND ALUMINIUM ALLOYS – EXTRUDED ROD/BAR, TUBE AND PROFILES
- EN 573 (1÷3) – ALUMINIUM AND ALUMINIUM ALLOYS – CHEMICAL COMPOSITION AND FORM OF WROUGHT PRODUCTS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

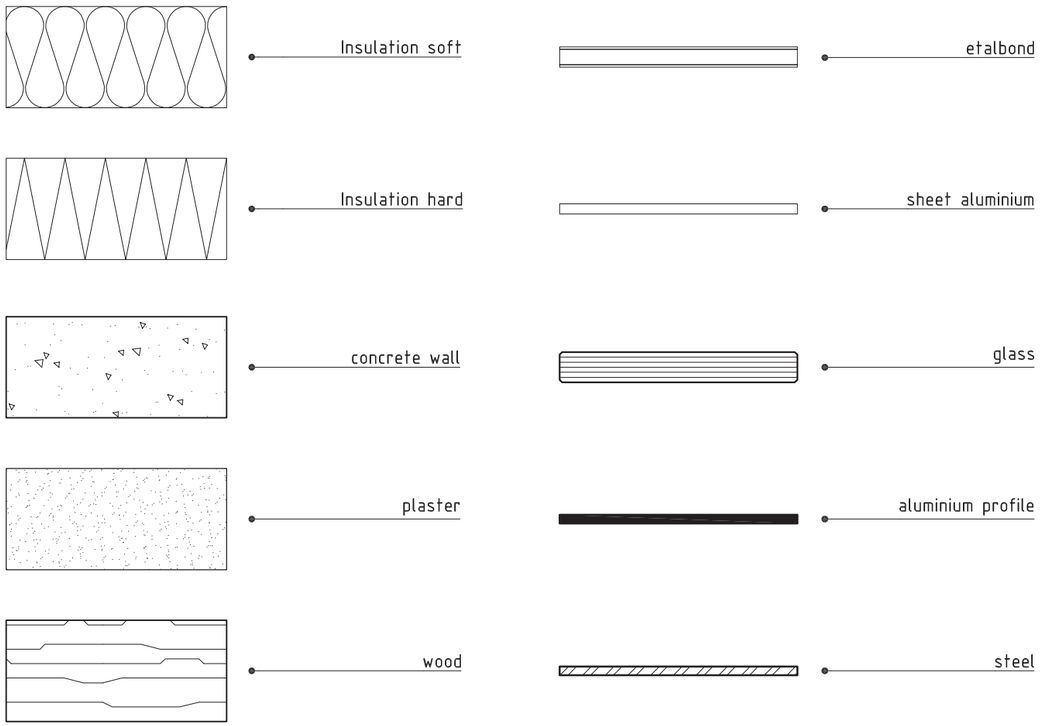
CURTAIN WALLING

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 10077 (12) – THERMAL PERFORMANCE OF WINDOWS, DOORS AND SHUTTERS – CALCULATION OF THERMAL TRANSMITTANCE
15. EN 12412-2 – THERMAL PERFORMANCE OF WINDOWS, DOORS AND SHUTTERS – DETERMINATION OF THERMAL TRANSMITTANCE BY HOT BOX METHOD – PART 2: FRAMES
16. EN ISO 10140-1– ACOUSTICS – LABORATORY MEASUREMENT OF SOUND INSULATION OF BUILDING ELEMENTS – PART 1: APPLICATION RULES FOR SPECIFIC PRODUCTS
17. 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





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

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

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

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