

Al Jazeera Tower 14th Floor – Office 1405 West Bay Tel.: +974 40429225 P.O.Box : 15846 C.R.: 58325 DOHA – QATAR godoy@diamanteprojects.es www.diamanteprojects.com

























EPSILON O

Aluminium fastenings and substructure system for attaching natural stone cladding on ventilated facades

EPSILON U

Aluminium fastenings and substructure system for attaching natural stone cladding with small breakup facade on ventilated façades

LEST

Aluminium fastenings and substructure system for attaching natural stone cladding with small breakup facade on ventilated façades

APLOMADO II + FIX II

Stainless Steel fastenings and substructure system for attaching natural stone cladding on ventilated facades

EPSILON T40

Epsilon T40 is a ventilated facade cladding system using narrow width ceramic panels and concealed or visible mechanical fixings

EPSILON TS

The Epsilon TS system is an aluminium profile system for attaching fine thickness ceramic cladding to ventilated facades

EPSILON T10060

Epsilon T10060 is a ventilated facade profile system for bonded or riveted cladding, or using special narrow thickness alfa fastenings

EPSILON OMEGA T

The Epsilon Omega T system is an aluminium profile system for attaching aluminium panels on ventilated facades

ECO

Direct point-supported fastenings for installing natural stone cladding on ventilated facades

CLASIC

The CLASIC system is based on individual anchors with vertical and depth adjustment for installing natural stone cladding on ventilated facades

FIX

Security clip fastenings system for stone facings made of stainless steel

PERFIX Y ROOF

Systems for the construction of walls of Ashlar masonry and masonry of double walls tied

An introduction to ventilated facades

Ventilated façades have a number of forerunners in traditional construction methods. These include the ventilated roofs known as Catalonian-style roofs, partition walls and the English cavity wall.

Ventilated façades are basically composed of two parts: an inner layer and an outer layer that provides protection against the elements. These two parts are separated by a gap that allows air to circulate and keep the inner temperature constant, eliminating any water that may have entered the gap by means of evaporation, and providing a space to install the movable connectors or separators between these two layers, known as anchors.

Modern developments have driven the need to separate building envelopes from the main structure, which must be uniformly insulated without any structural elements that act as a thermal bridge, protected from weather conditions and at the same time providing an attractive outer finish to the building using the wide range of stone panelling available on the market.

Building construction is a sector in constant technological change. New lighter and resistant materials that cost less and save energy call for innovative solutions. Fachadas del Norte, S.L. provides anchoring and fixing solutions aimed at meeting these new technological demands.

Ventilated façades are a high-performance construction solution used on walls.

The technique consists of:

1. Using the envelope not only as a decorative element, but also as a protective wall against aggressive environmental conditions.

2. A single and continuous ventilated air gap for the whole building.

3. A single wall (the cladding around the building, with the insulation material attached to the outside).



STROW SISTEMAS // Fachadas del Norte S.L.

Fachadas del Norte S.L. is a company dedicated to the manufacture of anchoring and fixing systems for installing ventilated façades with stone or ceramic cladding.

Our factory is a solid industrial platform that is constantly being renewed and is capable of offering a wide range of innovative, guaranteed products of the very highest quality, a result of our constant technical development and our long experience in the market.

The quality of our products and the professionalism of our company have resulted in our systems being installed in *more than 2,000,000 square metres of façades throughout Spain, Europe, Africa and South America.*

Fachadas del Norte S.L. stands out for its close collaboration with its clients, allowing us to identify market needs and develop new products that respond to everchanging situations in the modern world.

We offer the constant support of our technical department, with highly qualified personnel capable of effectively

resolving any type of technical difficulty. Our policy of maintaining close contact with our clients, regardless of their size, guarantees the provision of constant support and the ability to manufacture any type of special element if required.

Fachadas del Norte S.L. has got the quality certification ISO 9001:2000.







The *Epsilon O* vertical profile system is economic and easy to install. It has been scrupulously designed to resist all types of mechanical stresses and corrosion problems that can arise in construction work. As it is a profile system, it can be installed on solid, perforated or hollow supporting walls.

The *Epsilon O* system can be adjusted vertically and horizontally.

The system can be loaded immediately, and can be assembled regardless of the weather conditions. Also, thanks to reducing the number of fixing points on the support, more continuous thermal insulation is achieved by eliminating a large number of thermal bridges.



Aluminium AW 6063 T5 lacqued "Seaside" Black

Aluminium AW 6063 T5 y 6060 T6 Natural Silver Anodized 15 μm

Stainless Steel AISI-304 y AISI-304 L

System Regulation



Scheme of placement



EPSILON "O"

Aluminium Fastening and Substructure System for attaching natural stone and prefabricated concrete claddings on ventilated façades











Heading:

- 1: Profile Epsilon "O".
- 2: Angular Load Anchors.
- 3: Stainlees steel A2 through bolt anchor.
- 4: Short Security Socket-Pan.
- 5: Angular Support Anchors.
- 6: Lag Screw Stainlees Steel A2.
- 7: Nylon Plug.
- 8: Self-drilling Screw DIN 7976 (5,5x22 mm).

Hidden Clip Fasteners Detail



9: Long Security Socket-Pan.10: Double Fastener Continuation.11: Double Fastener Start-End.

Visible Clip Fasteners Detail

System Components



Angular Load Anchors 65 - 200 mm



Angular Support Anchors 65 - 200 mm



Sigma Hidden Clip Fasteners S.32



Sigma Visible Clip Fasteners S.46



Sigma Pivot Fasteners S.32



Sigma Taking Out and Backfill

Pivot Fasteners Detail





Diamante

The *Epsilon U* system is a very simple, economic and easy-to-install vertical profile system. The Epsilon U system can be adjusted vertically and horizontally.

The system is fabricated with the same materials than the Epsilon O. For this reason we are talking about a system with allo the guarantees,

excelent raw materials and more economical where, due to the required mechanical performance, It is not necessary to support a large resistance loads.



Aluminium AW 6063 T5 lacqued "Seaside" Black

Aluminium AW 6063 T5 y 6060 T6 Natural Silver Anodized 15 µm

Stainless Steel

AISI-304 y AISI-304 L

EPSILON "U"

Aluminium fastening and substructure system for attaching natural stone and prefabricated concrete claddings with small breakup façade on ventilated façades



System Regulation



System Regulation: A. Fixation Detail of Epsilon U Profile with Security Socket-Pan. B. Long Angular Anchors. C. Short Angular Anchors. $L. L_{max} = 120 mm$

Scheme of placement







Heading:

- 1: Profile Epsilon "O".
- 2: Angular Load Anchors.
- 3: Stainlees steel A2 through bolt anchor.
- 4: Security Socket-Pan.
- 5: Self-drilling Screw DIN 7976 (5,5x22 mm).
- 6: Nylon Plug.
- 7: Angular Support Anchors.
- 8: Lag Screw Stainlees Steel A2.
- Hidden Clip Fasteners Detail



9: Double Fastener Start-End. 10: Double Fastener Continuation. 11: Self-drilling Screw DIN 7976 (5,5x22 mm).

Visible Clip Fasteners Detail

ng Screw DIN 7976 (5,5x22 mm).

System Components



Angular Load Anchors 65 - 200 mm



Angular Support Anchors 65 - 200 mm



Sigma Hidden Clip Fasteners S.32



Sigma Visible Clip Fasteners S.46



Sigma Pivot Fasteners S.32



Sigma Taking Out and Backfill

Pivot Fasteners Detail







This is a subsystem that can be used in conjunction with the *Epsilon O*, Epsilon U or other special systems. The horizontal Lest profile is made of EN AW 6063 T5 aluminium alloy, and is very light and strong thanks to its tubular cross-section. It has a flat ribbed flap used to attach it to the vertical profile, using a self-drilling screw and locking washer, and has a specially designed groove to use the Lest fastenings with a clip system, making it very easy to install.

The horizontal profile is ideal for attaching stone sections of any shape, both for continuous and staggered joints.

This system with horizontal profile can be used with con visible clip fasteners, hidden clip fastenersor pivot fasteners (21 or 32 mm.)

Aluminio AW 6063 T5 con Lacado "Seaside" Negro

Aluminio AW 6063 T5 y 6060 T6 Plata Natural anodizado 15 µm

Acero Inoxidable AISI-304 y AISI-304 L

Vertical Section Detail



Scheme of placement



LEST

Aluminium Fastening and Horizontal Substructure System for attaching natural stone cladding on ventilated façades



System Components



4: Lest Pivot Fasteners.5: Lest Visible Clip Fasteners

Lest Hidden Clip Fasteners



Lest Visible Clip Fasteners









Leyenda: 1: Self-drilling Screw DIN 7976 (5,5x22 mm).

Security Socket-Pan.
 Lest Hidden Clip Fasteners.



LEST with EPSILON "U" + Lest Hidden Clip Fastener detail







The *Aplomado* System is an adjustable anchor for stone. The vertical profiles are a metal substructure to receive the solidarity union of fastenings that engage the stone cladding. The profiles are connected to the floor slabs of the building to which they transmit the stresses affecting the panelling by using slab anchors. Los anclajes de forjado ofrecen una gran capacidad de carga y un amplio rango de regulación. *FIX II* is the fixing system for stone claddings. It concerns five different kind of fastenings that works with the Aplomado's II vertical profile.

The main feature of these systems is their ability to slide horizontally along the profile, which helps to connect panelling that is displaced in relation to the profile (such as panels above and below windows).



Vertical Section Detail



Scheme of placement



APLOMADO II + FIX II

Stainlees Steel Fastenings and Substructure System for attaching natural stone and prefabricated concrete claddings on ventilated façades





9: Nut + Washer

11: Support Anchors

10: FIX II Hidden Fastenings

12: Double Support Anchors

Heading:

- 1: Nut + Washer
- 2: Load Anchors "U"
- 3: Profile 30x30x1
- 4: Abarcón
- 5: Load Anchors "U"
- 6: Stainlees steel A2 through bolt anchor M10x90
- 7: Nylon Plug
- 8: Rod Screw
- Hidden Clip Fasteners Detail





System Components



Pivot Fasteners Detail





Diamante

The *Epsilon T40* vertical profile system is economic and easy to install. It has been scrupulously designed to resist all types of mechanical stresses and corrosion problems that can arise in construction work. As it is a profile system, it can be installed on solid, perforated or hollow supporting walls.

Epsilon T40 System has two channels where to put Delta Fastenings, assuring the position. Besides the ceramic supports and secured with a MS putty and nail view, a fluffy profile is incorporated for proper reception.

The system can be loaded immediately, and can be assembled regardless of the weather conditions. Also, thanks to reducing the number of fixing points on the support, more continuous thermal insulation is achieved by eliminating a large number of thermal bridges.



Aluminium AW 6063 T5 y 6060 T6 Natural Silver Anodized 15 μm

Stainless Steel AISI-304 y AISI-304 L

System Regulation

EPSILON "T40"

Aluminium Fastening and Substructure System for attaching ceramic tiles cladding on ventilated façades



DOCUMENTO DE IDONEIDAD TÉCNICA N. 577/11



EUROPEAN TECHNICAL APPROVAL ETA-13/0628



Scheme of placement







System's Parts



System Components





Angular Support Anchors 60 - 160 mm



Delta Hidden Clip Fasteners 17 mm



Delta Visible Clip Fasteners 22 mm



Delta Replacement Fasteners

Heading:

1: Profile Epsilon "T".

- 2: Profile Epsilon "L".
- 3: Angular Load Anchors.
- 4: Stainlees steel A2 through bolt anchor.
 5: Self-drilling Screw DIN 7976 (5.5 x 22 mm).
- 6: Nylon Plug.

7: Angular Support Anchors.

8: Fastenings Delta Start-End.

Hidden Clip Fasteners Detail



Visible Clip Fasteners Detail

9: Self-drilling Screw DIN 7976 (4,8 x 19 mm).

10: Lag Screw

11: Delta Fastenings.







EPSILON "T

Aluminium Fastening and Substructure System for attaching narrow thickness ceramic tiles cladding on ventilated façades

The Epsilon TS system is a cuttingedge, high-performance vertical profile system that is easy to install. It has been scrupulously designed to resist all types of mechanical stresses and corrosion problems that can arise in construction work. As it is a profiling system, it can be installed on solid, perforated or hollow supporting walls.

The *Epsilon TS* is thinking for narrow thickness ceramic tiles, in such a way that adapts the system to one resistance less than the T40, to have a more balanced, specific, costeffective product.

This system works in conjunction with ALFA Fastenings made in stainless steel. These Fastenings, simple, reduced thickness, work perfectly with this system, constituting a perfect match for the placement of low cost light facades.



Aluminium AW 6063 T5 lacqued "Seaside" Black

Aluminium AW 6063 T5 y 6060 T6 Natural Silver Anodized 15 µm







Scheme of placement









System Components



Angular Load Anchors 60 - 160 mm



Angular Support Anchors 60 - 160 mm







Heading:

- 1: Self-drilling Screw DIN 7976 (5.5 x 22 mm).
- 2: Angular Load Anchors.
- 3: Profile Epsilon "TS".4: Stainlees steel A2 through bolt anchor.
- 5: Profile Epsilon "LS".
- 6: Fastening ALFA Simple Continuation.
- 7: Nylon Plug.
- 8: Angular Support Anchors.
 - Hidden Clip Fasteners Detail

9: Fastenings ALFA Simple Start-End. 10: Lag Screw

- Lag Screw
 Fastening ALFA Double Continuation.
 Fastenings ALFA Double Start-End.
 Self-drilling Screw DIN 7976 (4.8 x 14 mm).

Visible Clip Fasteners Detail









The Epsilon T10060 system is a

cutting-edge, high-performance vertical profile system that is easy to install. It has been scrupulously designed to resist all types of mechanical stresses and corrosion problems that can arise in construction work.

As it is a profiling system, it can be installed on solid, perforated or hollow supporting walls.

The System Epsilon T10060 is

intended as a profile for different solutions. It is a system with many possibilities, glued, riveted or working with ALFA Fastenings, where the TS could not be placed by its lower carrying capacity or dimensional requirements.

It is a system capable of working with most of the material claddings that need a similar system, but with all the solutions, technical support and certification of facades of the Norte, S.L.



Aluminium AW 6063 T5 lacqued "Seaside" Black

Aluminium AW 6063 T5 y 6060 T6 Natural Silver Anodized 15 μm

Stainless Steel AISI-304 y AISI-304 L

Three options, bonded, riveted, fastenings



Ventilated façade profile system for bonded or riveted cladding, or using special narrow thickness ALFA fastenings.





Scheme of placement





Bonding System Parts





- 1: Profile Epsilon T10060.
- 2: Profile Epsilon L5060.
- 3: Glueline.
- 4: Double-Sided Tape.
- 5: Cladding Narrow Thickness.

Bonded Detail Section



System Components



Angular Load Anchors 60 - 160 mm

Detail Bonding System





Riveted System Parts

Profile Epsilon T10060.
 Profile Epsilon L5060.
 Rivet.
 Cladding Narrow Thickness.

Riveted Detail Section





Angular Support Anchors 60 - 160 mm

Detail Riveted System



System with ALFA Fastenings



Heading:
1: Profile Epsilon T10060.
2: Profile Epsilon L5060.
3: ALFA Double Continuation Fastenings.
4: ALFA Simple Continuation Fastenings.
5: Self-drilling Screw DIN 7976 (4.2 x 14 mm).

ALFA Fastenings Detail Section





ALFA Fastenings Detalle with ALFA Fastenings







The Epsilon Omega T system is a cutting-edge, high-performance vertical profile system that is easy to install. It has been scrupulously designed to resist all types of mechanical stresses and corrosion problems that can arise in construction work. As it is a profiling system, it can be installed on solid, perforated or hollow supporting walls.

Epsilon Omega T system works with a section on Omega where a clamp, boot hang, with a rubber protection, which are hung made trays to the

machining of composite is placed. It's perfect for this type of materials system, entirely made of lacquered and anodised aluminium alloys.



Aluminium AW 6063 T5 lacqued "Seaside" Black

Aluminium AW 6063 T5 y 6060 T6 Natural Silver Anodized 15 µm



AISI-304 y AISI-304 L

EPSILON OMEGAT

Aluminium Fastening and Substructure System for hang out alluminium trays cladding on ventilated façades



System Regulation



Scheme of placement





Qmáx = 135 Kg

Qmáx = 135 Ko



System Components



Angular Load Anchors 60 - 160 mm



Angular Support Anchors 60 - 160 mm



Fastening, Hang Boot

Heading:

- Heading:
 1: Stainlees steel A2 through bolt anchor.
 2: Self-drilling Screw DIN 7976 (5.5 x 22 mm).
 3: Angular Load Anchors.
 4: Profile Epsilon Omega "T".
 5: Nylon Plug.
 6: Fastening, boot hang.
 7: Rubber Coating.

8: Self-drilling Screw DIN 7976 (4.8 x 19 mm). 9: Lag Screw. 10: Angular Support Anchors.













ECO

Direct Point-Supported Fastenings for installing natural stone cladding on ventilated façades The ECO system is based on *point-supported individual anchors* that do not require vertical profiles for their alignment.

This system is relatively economic and frequently used for covering concrete walls made of prefabricated elements or built on site. It can be used on walls made of solid or semi-hollow bricks. It is not recommended for hollow cement blocks with side walls less than 40 mm thick. *Standard UNE 41957*.

The *ECO* system is made of *A2* stainless steel (*AISI-304*). This type of steel has the ideal resistance to mechanical stress and atmospheric corrosion.

Consists of a threaded weldless bolt attached to the supporting wall or building on one side, with its other flat side equipped with a device which supports and retain the cladding. This device could be hidden fastenings, with pivot and visible fastenings, for which we have two options, *ECO Strow* with retention spring, for claddings with irregular thickness and *ECO Basic*, a new system for claddings with regular thickness, but cheaper and simpler than ECO Strow.

Stainless Steel AISI-304 y AISI-304 L





Scheme of placement



Placement in the horizontal joint



Placement in the vertical joint

System's Parts



Detail ECO pivot

4.-





4.

Detail ECO visible fastenings

System Components



The *CLASIC* system is based on individual anchors with vertical and depth adjustment. The system consists of a weldless frame, one side of which is attached to a supporting structure or directly onto the building, while the other side is equipped with a fastening in the same material. We made three different models, the first one is clasic normal, the second (Clasic Freno) with a security lock washer serving as a possible slippage of the anchor and fixing brake, and the third, It includes also the brake but in addition is built with greater thickness and a rear nut giving it much more resistance.

This system is frequently used for covering concrete walls made of prefabricated elements or built on site, or in solid and semi-solid brick walls. It is not recommended for walls made of hollow or semi-hollow brick, or hollow cement blocks with side walls less than 40 mm thick.

Stainless Steel AISI-304 and AISI-304 L

Available Lengths in CLASIC "normal", "freno" and "reforzado"

L-50

CLASIC

Direct Point-Supported Fastenings with regulation for installing natural stone cladding on ventilated facades



L-80

Scheme of placement

L-35



L-20

Placement in the horizontal joint



Placement in the vertical joint



Diamante PROJECTS, LLC



System's Parts



CLASIC normal with pivot 1: Stainless Steel Body (AISI 304) 2: Nod 3: Rod Screw M10 4: Cap or elastic PuTTY 5: Pivot System Components



Clasic "normal", "freno" and "reforzado" Pivot



Clasic "normal", "freno" and "reforzado" Start and End



Clasic "normal", "freno" and "reforzado" Hidden Fastenings



Clasic "normal", "freno" and "reforzado Hidden Fastenings Start-End



Clasic "normal", "freno" and "reforzado" Hidden Fastenings Backface



Clasic "normal", "freno" and "reforzado" Visible Fastenings



Clasic "normal", "freno" and "reforzado Visible Fastenings Start-End

Detail CLASIC Pivot





CLASIC reforzado con pivote 1: Stainless Steel Body (AISI 304)

Detail CLASIC Visible Fastening

2: Security Lock Washer

CLASIC freno with pivot

4: Cap or elastic PuTTY

3: Rod Screw M10

5: Pivot 6: Nod

1: Stainless Steel Body (AISI 304) 2: Security Lock Washer

- 3: Rod Screw M12
- 4: Cap or elastic PuTTY
- 5: Pivot
- 6: Two Nods

Detail CLASIC Hidden Fastening









It is a mounting system for stone facings. FIX system is based on individual and specific anchors which are placed as a security of stone facings.

FIX system consists of 7 types of security clip fastenings for new works. They are made of stainless steel A-2 (A/SI-304) offering you appropriate values of mechanical strength and atmospheric corrosion.

These Staples, seamless, they will be fixed to a particular support or the building itself and on the other hand

stone plate.

We also offer for the cladding reparations, two security fastenings, FIX ECO and FIX ECO CLAVO, which are used in those cases where there is a risk of cladding detachment.

Stainless Steel AISI-304 and AISI-304 L

FIX

Security clip fastenings system for stone facings made of stainless steel.







FIX "Ángulo" fastening FIX "Recta" fastening

Fastenings for new works

FIX "Trasdós" fastening FIX "Z Simple" fastening







FIX "L Pivot" fastening



Lag Screw + Nylong Plug

Fastenings for Cladding Reparations



Section Detail with different fastenings

System Components



Detail "Recta" Fastening



Detail "Z Doble" Fastening



Detail FIX ECO or FIX ECO "Clavo"





For load-bearing walls made with stone, as walls of Ashlar blocks, you can use the system of bracing by *PERFIX* stainless steel fastenings.

This system is composed of 4 fastenings that are placed for braced walls either among its parts, or to the bearing structure of the building, floor slabs, beams...

In addition there is a fifth element, which can be used to load directly on this piece the stone wall, anchoring to a slab or reinforced concrete support. Finally, for fastener double walls, the *ROOF*, a system composed by a stainless steel shaft, and pieces of plastic at the ends. These pieces are placed one in the horizontal joint of the outer foil and the other in the horizontal joints of the inner blade, which in turn presents a fastening that allows you to hold the insulation on the inner layer without having to mount it on the outer side to complete the wall, which presents a great advantage over the traditional system.

Stainless Steel AISI-304 y AISI-304 L

Fastenings retention of load-bearing walls

PERFIX Y ROOF

System of fastenings for blocks and tied of masonry walls made of stainless steel



Angular Perfix





Load Fastenings for Stone

Reinforced Angular Perfix



Load Perfix

Roof System for fastener double walls



ROOF Conector



- Perfix

1. ROOF fastenings with anchor bolt for double stone walls facades. Load PERFIX.
 ROOF fastenings for double bricks walls facades.

Detail Section with ROOF



Detail Section with ROOF

2. 3.

Details with Load PERFIX



Detalle with ROOF fastener in double bricks walls

