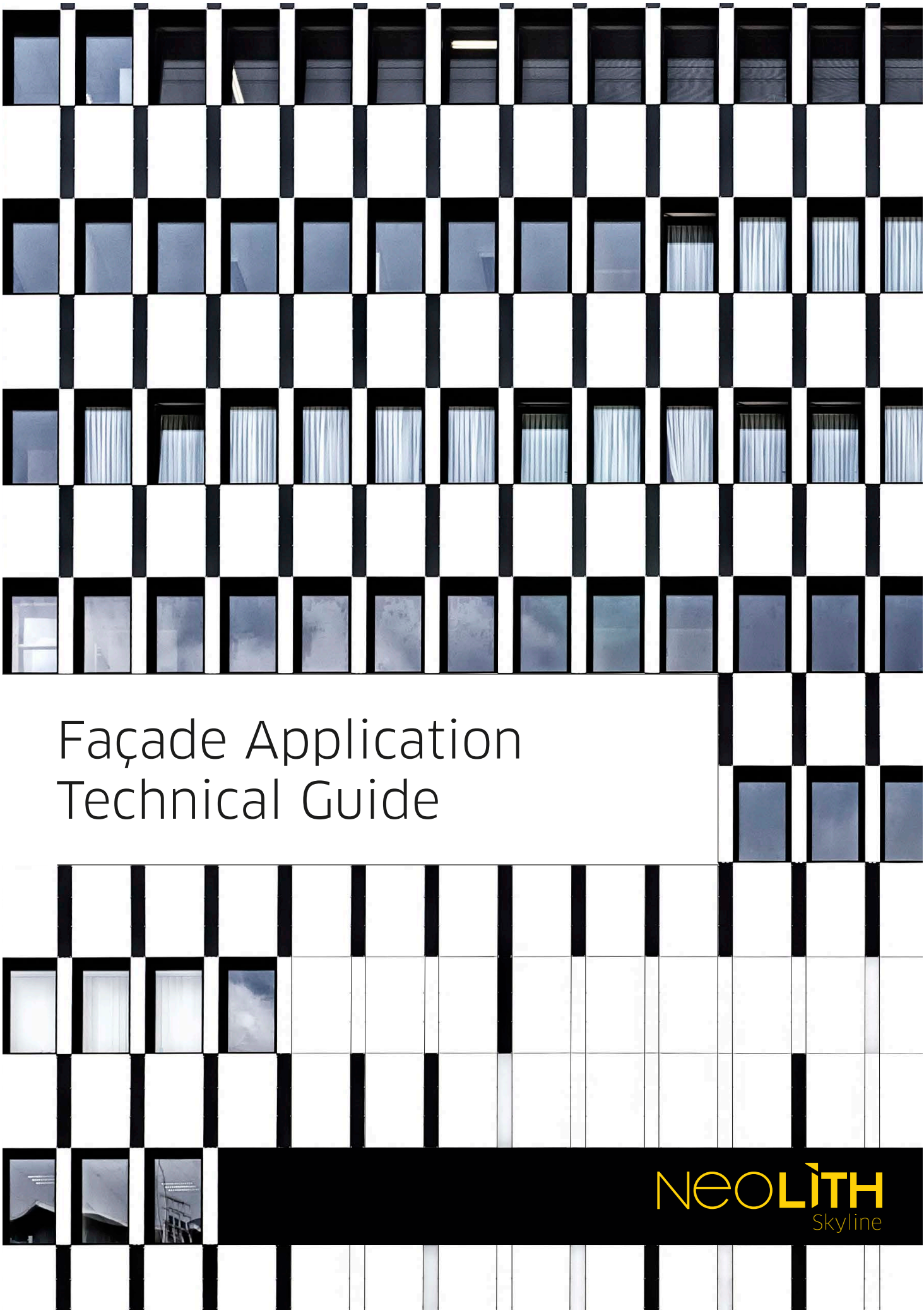


Façade Application Technical Guide

NEOLITH Skyline

NEOLITH Façades Application Technical Guide

2015 Edition

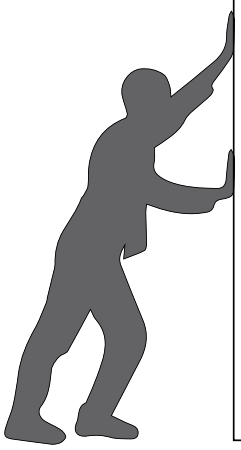
NEOLITH Skyline

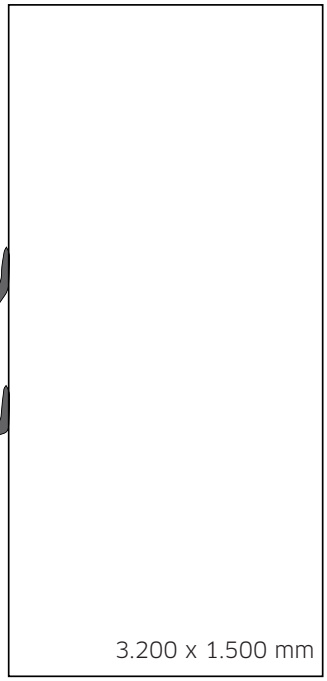
Index

Neolith general information

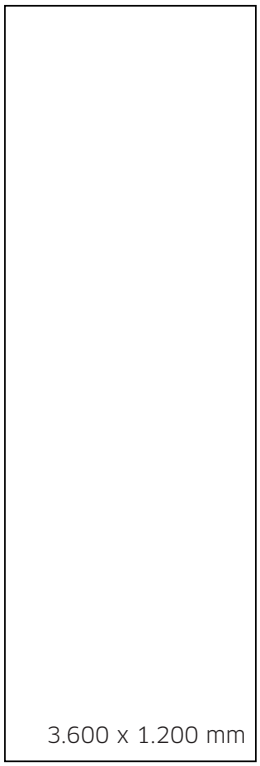
Neolith Installation Systems

0. Formats and Thicknesses

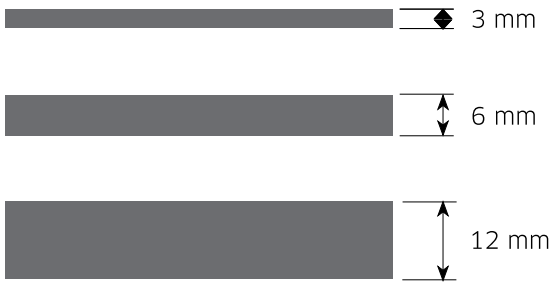




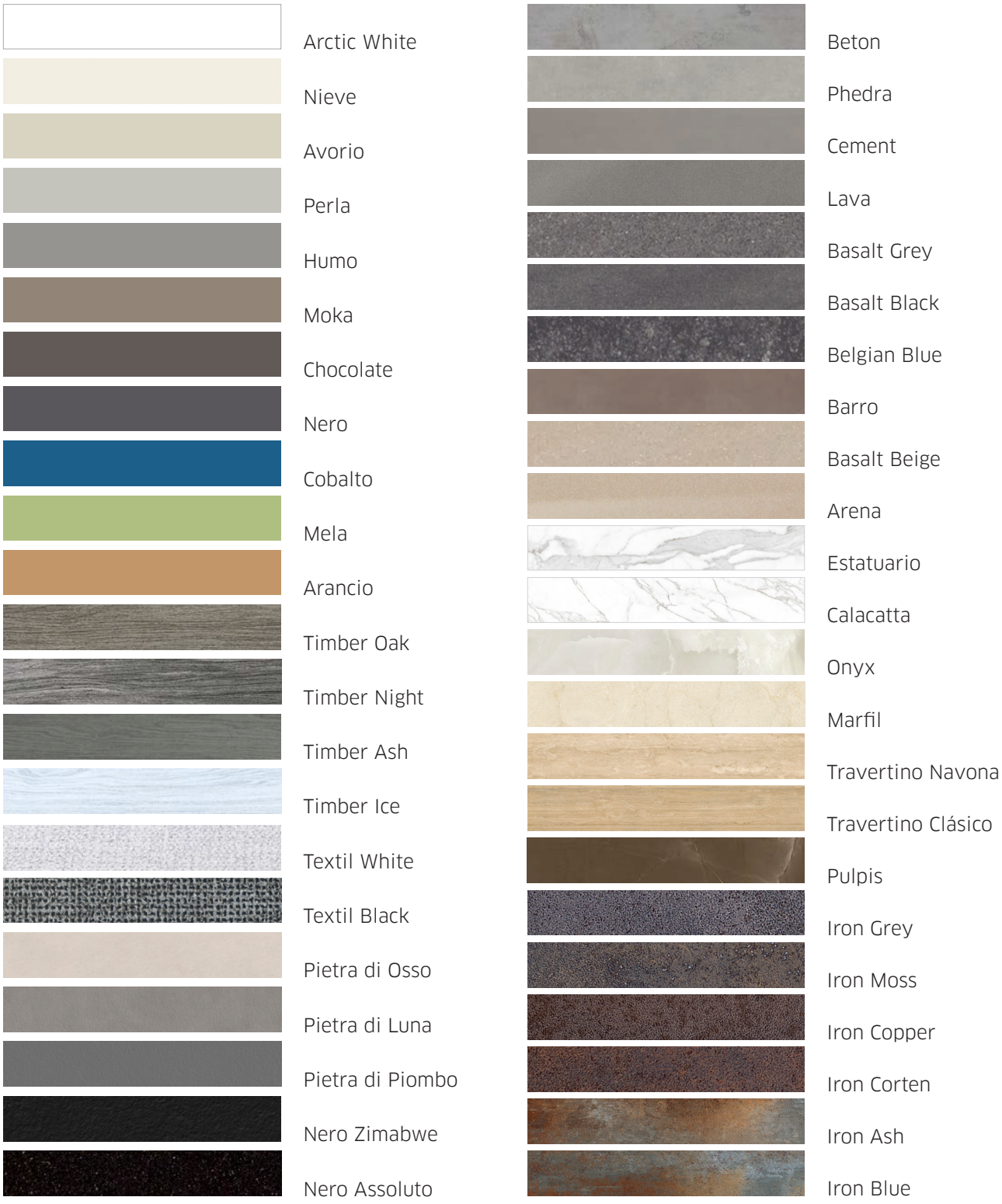
Only in 6 and 12 mm



Only in 3 and 6 mm



0. Color Range



0. Availability per Format and Thickness

		3600x1200 mm		3200x1500 mm	
		3 mm	6 mm	6 mm	12 mm
Colection	Color				
Colorfeel	Arancio	●	●		
	Arctic White	●	●	●	●
	Avorio	●	●	●	●
	Chocolate	●	●		
	Cobalto	●	●		
	Humo	●	●	●	●
	Mela	●	●		
	Moka	●	●		
	Nero	●	●	●	●
	Nieve	●	●	●	●
	Perla	●	●		
Fusion	Arena	●	●	●	●
	Barro	●	●	●	●
	Basalt Beige	●	●	●	●
	Basalt Black	●	●	●	●
	Basalt Grey	●	●	●	●
	Belgian Blue	●	●	●	●
	Cement	●	●	●	●
	Lava	●	●	●	●
	Phedra	●	●	●	●
	Beton			●	●
	Pietra di Luna			●	●
	Pietra di Piombo			●	●
	Pietra di Osso			●	●
	Nero Assoluto			●	●
	Nero Zimbabwe			●	●
Iron	Iron Copper	●	●	●	●
	Iron Corten	●	●	●	●
	Iron Grey	●	●	●	●
	Iron Moss	●	●	●	●
	Iron Blue			●	●
	Iron Ash			●	●
Textil	Textil Black	●	●	●	●
	Textil White	●	●	●	●
Timber	Timber Ash	●	●		
	Timber Ice	●	●		
	Timber Night	●	●		
	Timber Oak	●	●		
Classtone	Estatuario			●	●
	Marfil			●	●
	Pulpis			●	●
	Calacatta			●	●
	Onyx			●	
	Travertino Clásico			●	●
	Travertino Navona			●	●

1. Product Features

Neolith is the largest sintered compact surface available in the market. It is 100% natural product composed of feldspar, silica, clay and other natural minerals and it emulates what nature takes millennia to produce in just a few hours, through an exclusive and high technological sintering process. Neolith offers the most efficient solutions for the most demanding architectural projects, as well as an extensive combination of colors and finishes, making it a designer product that can be used in numerous applications for interiors, exteriors and furnishings.

Neolith presents physical properties that excel for its use on exterior applications, furthermore, its colors made of 100% natural pigments, withstand the passage of time and remain unvariable.

Technical Features:

LightWeight: The thickness of the slabs makes it a very light product and thus facilitates transportation and handling and reduces the load factor on cladding. 7kg/m^2 for the 3mm option.

FORMAT (mm)	3600 x 1200							3200 x 1500	
THICKNESS (mm)	3	3+	5	5+	3+3	5+3	5+5	6+	12
Kg/M^2	7	8	13	14	17	22	27	18	30
Full Slab Weight (Kg)	32	36	55	59	72	94	116	85	143

Table I: Formats and Weights

Waterproof: Neolith sintering process confers the slabs less than 0,08% porosity. It does not absorb any water and it is resistant to stains, making it ideal for humid places.

UV Resistance: Being 100% natural, its colors do not fade away when being exposed to sun light or other extreme weather conditions.

Resistant to High temperatures: It does not burn in contact with fire nor does it emit smoke or toxic substances when being subjected to high temperatures

Resistance to wear and tear: Its hard surface makes it resistant to scratches and abrasion when being exposed to extreme weather conditions (such as sand storms or other similar aggressions).

Bending resistance: It has a high share rate, making it resistant to heavy loads and pressure as well as suitable for some curved applications.

Environmental-friendly: Composed entirely of natural material, completely recyclable. Up to 52% of recycled content. Greenguard, CE, NSF1 certifications. Its use in buildings grants LEED points to the project.

Easy To Clean: Resistant to any kind of chemical cleaning agent such as bleach or ammonia. When used in exterior cladding, this characteristic proves of high-added-value in areas with high pollution levels and risk of graffiti criminality.

Hygienic: Given its practically nul-porosity, it does not trigger any bacteria or fungus which may lead to allergies or illnesses.

1.1. Product Certificates

Neolith is the outcome of a high-tech sintering production process, which meets the highest standards in terms of technological development and energy sustainability. Thanks to the technical features of the product it is suitable for a wide range of interior and exterior applications ranging from commercial to residential projects: façades, flooring, cladding, furnishing, kitchen tops, etc.

TheSize has implanted de ISO 9001 Quality Management System in order to ensure product and service excellence to our clients.

Neolith panels are exposed to rigorous testing process, to certify by accredited laboratories the properties and the feasibility to be installed in different architectural solutions. Neolith has been tested by ISO, ASTM, UNE quality standards, as well as other national schemes around the world.

1.2. Environmental Sustainability: *Green Facts*

TheSize guarantees that the production and lifecycle of its products has the minimum possible impact on the environment, using the cleanest processes and technology to ensure that any waste or emissions generated during the manufacture of the material are kept to an absolute minimum. Any waste from the manufacturing process is properly identified and separated.

Product Composition

100% Natural: Made of clays, feldspar, silica and natural mineral oxides, Neolith will not emit toxic fumes into the environment when exposed to fire or extremely high temperatures.

100% recyclable: Due to its natural composition, Neolith can be recycled and reduced to its aggregates.

Up to 52% recycled content: Up to 52% of any Neolith slab is composed of recycled natural materials.

Near-Zero Porosity: With a porosity of less than 0.08 percent, Neolith is impervious to absorption, making it a hygienic product resistant to bacteria that can cause disease and trigger allergies.

Certifications and Memberships

Greenguard Certification (formerly GREENGUARD Indoor Air Quality Certification): Certifies that Neolith meets strict chemical emissions limits, contributing to a healthier interior.

Greenguard Gold Certification (formerly known as GREENGUARD Children & Schools Certification): Certifies that Neolith is safe indoors for sensitive individuals (such as children and the elderly) and ensures that the product is acceptable for use in environments such as schools and healthcare facilities.

CE (European Commission) Certification: Confirms that Neolith meets European safety, health and environmental protection requirements.

LEED Points Earner: LEED, Leadership in Energy and Environmental Design, is a program that provides third-party verification of green buildings. Neolith satisfies safety prerequisites and earns points to help consumers achieve the desired level of certification for their home or commercial project.

Member of the U.S. Green Building Council (USGBC): The USGBC, the council that oversees LEED, allows advocates for green-building policies and practices to come together.

Neolith's unique sintering process and proprietary design also provide additional green benefits:

- Fewer raw materials, less erosion: Neolith's thin slabs use fewer raw materials, resulting in less soil erosion, without sacrificing any strength.
- CO_2 Emissions Reduction: A slimmer slab means a lighter slab. With Neolith, it's possible to transport more than double the amount of surface per container than with thicker products like marble, granite or quartz. The lighter weight allows for a more fuel efficient journey and considerable reductions in CO_2 emissions.
- No gut remodels: Neolith's slim surface can be applied directly onto existing surfaces, saving remodelers from costly tear-outs while reducing landfill waste. No landfill waste means no waste transportation needed, further reducing net CO_2 emissions.
- Optimized energy consumption: Neolith's resistance to extremely high and low temperatures makes it ideal for ventilated façades. The thermal insulation and ventilation between the Neolith façade and the building itself optimizes the building's energy consumption considerably (up to 40 percent!).
- 15 years–guaranteed: Neolith comes with a manufacturer's guarantee of 15 years and does not need frequent replacement or maintenance treatments like other surfaces materials.

Neolith gives designers, architects and other industry professionals confidence that their aesthetically-appealing design decisions are equally appealing to the environment

1.3 Technical Database

Description:

Neolith is the result of forefront I&D of the architectural surfaces. Natural raw materials are carefully selected and transformed by a proprietary sintering process which applies very high pressures and temperatures (over 1200ºC), leading to a physically and mechanically high-performing product. Its lightweight provides considerable savings during installations process.

Image 1: TheSize facilities in Almazora

Applications:

Thanks to its excellent properties, Neolith is resistant to changing weather conditions and unalterable to UV-rays exposure. It adapts to multiple purposes and can be applied to exterior and interior residential and commercial projects. Its uses include but are not limited to: Ventilated façades, flooring, cladding, kitchen countertops, vanities, furniture, swimming pool claddings, etc…

Certificiates:

Neolith has been extensively tested and independently verified to meet and surpass standards with regards to pollutant emission levels. Furthermore, Neolith has been granted the certificated "Greenguard for Children & Schools", which ensures maximum safety for use in schools and hospitals.

Neolith supports architects and designers to maintain the beauty and aesthetics of a building complementing it with safety and performing properties. Furthermore, Neolith assists in earning LEED points in a project given that it has high recycled content (from 35 to 52%).

PROPERTY	TEST METHOD	3600 x 1200							3200 x 1500	
THICKNESS (mm)		3	3+	5	5+	3+3	5+3	5+5	6+	12
WEIGHT (Kg)	-	32	36	55	59	72	94	116	85	143
BREAKING STRENGTH, AVER. (N)	ISO 10545-4	32	36	55	59	72	94	116	85	143
MODULUS OF RUPTURE, AVER. (N/mm^2)	ISO 10545-4	48	54	49	59	47	57	47	57	57
WATER ABSORPTION	ISO 10545-3	<0,1%								
IMPACT RESISTANCE, AVER.	ISO 10545-5	0,8 (1)								
RESISTANCE TO DEEP ABRASION	ISO 10545-6	<133 mm^3								
THERMAL LINEAR EXPANSION	ISO 10545-8	5,2 - 6,3.10^{-6} $ºC^{-1}$								
RESISTANCE TO THERMAL SHOCK	ISO 10545-9	No visible Defects								
MOISTURE EXPANSION (mm/m)	ISO 10545-10	≤0,1								
FROST RESISTANCE	ISO 10545-12	No Visible Defects								
CHEMICAL RESISTANCE	ISO 10545-13	UHA								
STAIN RESISTANCE	ISO 10545-14	Class 5								
LEAD AND CADMIUM GIVEN OFF BY TILES	ISO 10545-15	Lead: <0,01 mg . dm^{-2} Cadmium: <0,001 mg . dm^{-2}								
HARDNESS (MOHS)	UNE 67-101	>6								
ANTI SLIP PROPERTY (2)	DIN 51330	R9								
STATIC FRICTION COEFFICIENT (2)	ASTM C1028	Dry 0,76 - 0,94 Wet 0,43 - 0,67								
REACTION TO FIRE	DIN EN 13823	Neolith: A1 Neolith+: A2-s1, d0								
UV RESISTANCE	DIN 51094	No Alteration								

(1) Pavement requirement, not applicable to Neolith 3 mm, 3+, 3+3, 5+3 and 5+5
(2) Anti-slip properties can be adjusted on request

Table 2: Neolith Test Results

1.4 Safety Database

From all the available information about Neolith, The Size has prepared a Safety Data Sheet as specified in the REACH Regulation (EC) Nº 1907/2006.

The purpose of this guide is to provide employees general information and guidance on how to handle the product during all activities, to promote and improve working conditions and to minimize potential risks through the implementation of the risk management measures proposed in this document.

Because of the product characteristics, employees should be aware that during cutting and/or polishing of Neolith, they may come in contact with breathable airborne crystalline silica (quartz). Prolonged or massive inhalation of breathable crystalline silica may cause pulmonary fibrosis, commonly known as silicosis. The main symptoms include coughing and difficulty breathing. Therefore TheSize recommends wet cutting and polishing to reduce the exposure to breathable crystalline silica dust to a minimum.

According to Regulation (EC) Nº 1907/2006 Version 2 Print date 21.12.2011 Revision date 21.12.2012, the finished product (porcelain tile) presents no risk to human health and the environment. Because of generation of silica dust in the dry manipulation processes the following risks must be taken into account:

Regulation CLP CE Nº 1272/2008 Crystalline silica dust	Classification according Directive 1999/45/CE
Precautionary statements 	
P260: Do not breathe dust generated in the cutting, shaping and polishing of the material. **P264:** Wash hands and face thoroughly after handling **P270:** Do not eat, drink or smoke when manipulating **P280:** Wear gloves, suitable work clothing and goggles **P284:** Wear respiratory protection for particles (P3) **P314:** Consult doctor if feeling unwell **P501** Remove residues in accordance with local regulations	**R20:** Harmfull by inhalation **R48:** Danger of serious damage to health by prolongued exposure **S22:** Do not breathe dust **S38:** In case of insufficient ventilation wear suitable respiratory equipment (P3)

Table 3: Safety Guidelines

Additional Information:

According to information provided, the testing of the product has not detected or cristobalite or tridymite, which are the more silicaceous and dangerous varieties.

More detailed information regarding safety and health standards and recommendations is available on *www.thesize.es* (Downloads: Safety Data Sheets section).

2. Transportation

Neolith slabs must be transported in metal or wooden racks and always in vertical position. The slabs should be correctly fixed to the rack to prevent the movement of the material. The panels must never be transported loose or with broken straps. For short distance, inside workshops or at the construction site, fasten the panels using straps with cardboard protection.

Image 2: A-Frame transportation

In order to unload and move loaded A-frames around, a forklift capable of lifting and moving these A-frames will be required

A fully loaded A-frame of slabs weighs around 3.600 kg. The forklift must be capable of lifting this weight on the tip of its forks.

A metallic A-frame has a maximum loading capacity of 3.600 kg. and mixed A-frame 3.000 kg. The following table shows the maximum amount of slabs allowed on a single A-frame.

	3+	5+	3+3	5+3	5+5	6+	12
Metallic A-Frame 3.800x1.400	90	60	50	38	30	-	-
Metallic A-Frame 3.300x1.800	-	-	-	-	-	44	24
Mixed A-Frame 3.800 x 1.400	90	50	42	30	25	-	-
Mixed A-Frame 3.300 x 1.800	-	-	-	-	-	34	20

Table 4. Slab units per A-Frame

3. Storage

Slabs must be stored in vertical position. It is essential to avoid resting them on objects or debris that prevents the panels from being completely in vertical position.

The optimal condition of storage will be in clean and dry place protected from weather conditions. TheSize recommends storage of Neolith slabs in ambient temperature and humidity conditions and keeping the material in its original packing. There are no limits in terms of storage life times. Wooden support beams are recommended to avoid chipping of the slabs.

Image 3: Vertical storage in A-Frames

Image 4: 12 mm slabs vertical storage

Image 5: Wooden supports beams

4. Handling

Handling and moving panels should only be undertaken by trained personnel using the correct equipment. Handling of the slabs should be done in a vertical and straight position to prevent the slab from bending.

Due to the possible presence of sharp edges, protective gloves should be always worn when handling Neolith panels.

Product can be handled within location via clamps (when thickness of slab exceeds 5mm), aluminum frames with suction cups and manually.

Image 6: Alimunium frame with suction cups

Image 7: Slab handling with Suction Frame

Image 8: Proper manual handling position

Image 9: Clamp handling for 12 mm slabs

For more detailed information about product handling please refer to our website (Downloads - Technical Manuals).

4.1 Cutting Recommendations

Cutting of the slabs should only be done by a machining or construction professional with proper equipment. The homogeneous composition of the material makes it possible to machine both sides and the surface. Cutting Neolith slabs is comparable to machining natural stone although a few differences should be taken into account.

Cutting of the slabs can be done with Diamond-tipped discs or other more sophisticated systems such as waterjet or CNC.

To remove any possible stress that the slab may have, TheSize recommends to cut 3 cm of each side of the slab.

For more specific recommendations about cutting Neolith panels, visit *www.neolith.com* and download the technical manual “Cutting Recommendations”, or watch the specific videos in our website.

4.2 Polish

Polished edges are fabricated by standard granite/marble polishing discs of different grain sizes.

Start off with the lowest grit and finish with the highest grit, if required the edge can be buffed using polishing wax.

For more details about Polishing Neolith visit *www.neolith.com* and download technical manual “Fabrication, Tools, Handling and Maintenance of Neolith Countertops”.

4.3 Drilling

The panel should be drilled by with diamond tipped bits. Supporting sheets (martyr boards) must be used under the panel in order to drill a clean hole, without “breakout”.

Image 10: Fabrication tools

For more detailed information about fabrication please refer to our website (Downloads - Technical Manuals).

5. Cleaning and Maintenance

5.1 Cleaning and Maintenance

Neolith, being 100% natural and non-porous proves to be a very easy to clean material which requires minimum efforts in terms of maintenance.

Furthermore, Neolith also has another surface with water-and-moisture option to prevent staining and/or external agents from attacking the protection and it easy to clean, making it an ideal material for flooring and cladding.

Periodical cleaning just involves washing with water or a diluted commercial detergent (following the manufacturer's dosage), which is enough to restore the surface to its original condition. Occasionally deeper cleaning may be needed in order to restore the original finish, which include:

First Cleaning

This is the cleaning at the end of the refurbishment/remodeling work: It is the most important step, as it influences the results of the subsequent use of the product. Its goal is to remove all traces of foreign materials and residue from the surface of the slabs.

If you used cement based adhesive for the placement, The Size recommends the following operations, once the adhesive has dried:

- Remove dirt with a vacuum cleaner;
- Wet the floor with clean water in order to soak and protect the joints against the corrosive action of the detergent;
- Use an appropriate acid detergent (descaling agents or cement remover) to clean. The detergent has to be diluted in water and the user instructions must be followed while addressing the precautions for safe use (e.g. gloves, adequate ventilation, ...);
- Absorb the solution with a clean cloth or a suitable vacuum cleaner;
- Thoroughly rinse the entire surface with clean, warm water to neutralize the action of the detergent
- Remove any buildup by scraping it off;
- If necessary, clean the surface again using a diluted neutral or alkaline detergent, then rinse with clean warm water and dry the surface.

If an epoxy sealant has been used for the placement, any remaining residue on the slab's surface should be removed before the grout has hardened completely and carefully follow the instructions supplied by the manufacturer.

Warning

- *Some of the components of the adhesives are sensitive to acids. For this reason, it is recommended to ask the manufacturer for guidance on the most suitable detergent for cleaning.*
- *In cases of particularly difficult stains, perform a localized cleaning following the indications given in the table type detergent according to the type of dirt, which is at the end of this document. With particularly difficult stains, clean the area by following the instructions in the table Detergents types according to type of dirt, included at the end of this chapter.*

Everyday cleaning

For cleaning dirt in general, it is advisable to vacuum or sweep the surface and then wipe with a cleaning solution using a detergent in a concentration recommended by the manufacturer. (Avoid products containing hydrofluoric acid and its derivatives)

It not advisable to use waxes, oily soaps, impregnating agents or other treatments (hydro-oil repellent) on the product, because its application is not necessary at all. Some of the detergents currently on the market contain waxes or polishing additives that, after several washes, can leave an oily film on the surface of Neolith.

Special maintenance

This is an intense and thorough cleaning that may be required annually or semiannually. It is done with the same methods as for the everyday cleaning, but using a medium concentration of alkaline detergents.

5.2 Repair

Sintered compact surfaces can be damaged by a variety of reasons. Most often due to collision or impacts produced by a heavy object.

The operation procedure consists of cleaning the surface with acetone or dissolvent and then repairing the cheap with a double component glue or mixed pigment to prepare the same color as Neolith slabs. After, the double component glue would be applied to refill the chip. Finally dry polishing will be needed in order to match the rest of the surface design. For more detailed instructions, please visit *www.neolith.com* and download the “Repairing Neolith Surface Defects“ Guide.

Image 11: Coffe stain on Arctic White coutertop

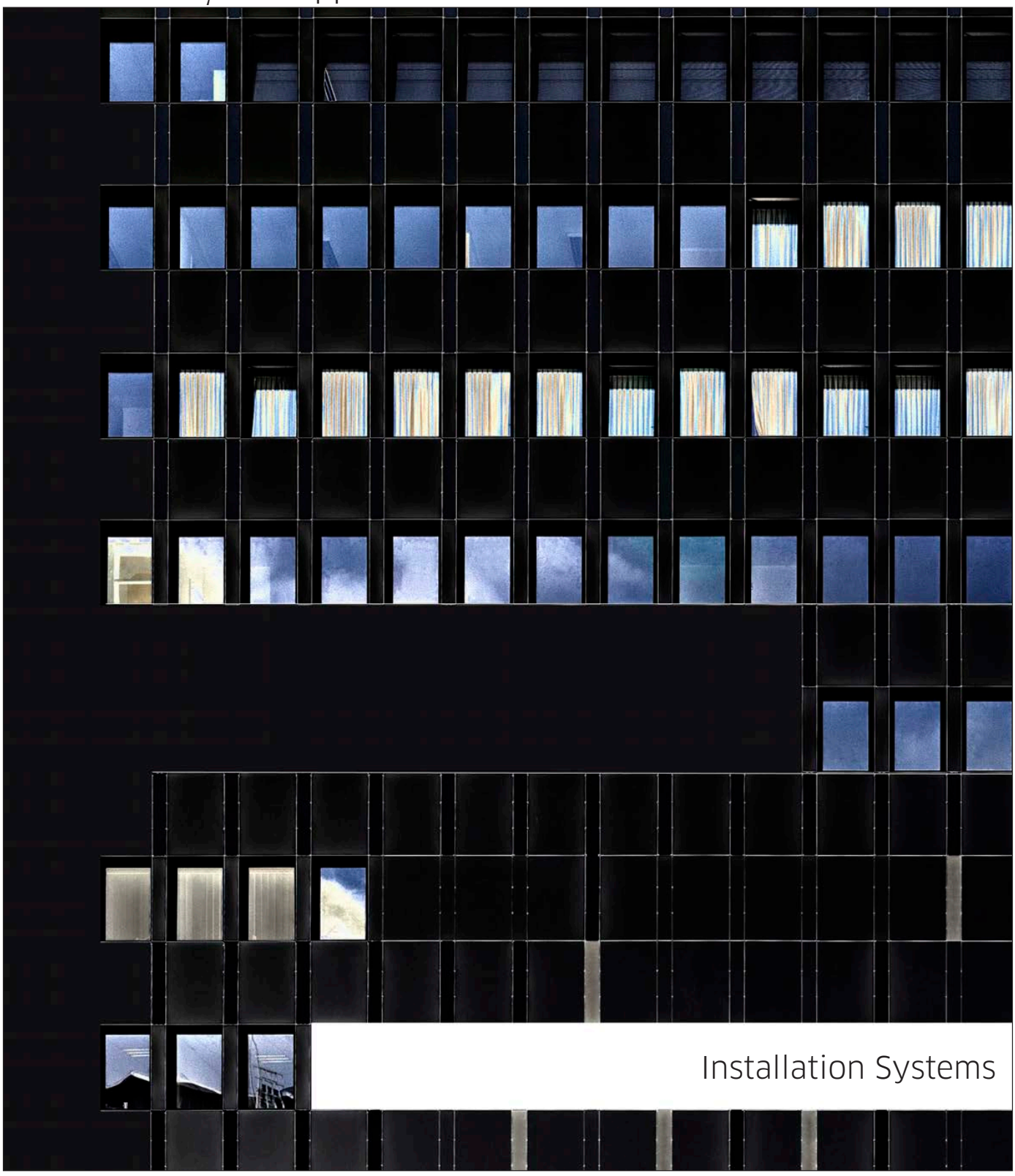
6. Removal Information

Neolith slabs have amongst other application possibilities, the ventilated façade application where they are used together with other components such as aluminum, steel etc. Neolith slabs can be easily extracted and removed from ventilated façades.

6.1 Waste management information

Regulations and laws concerning the production and management of waste generated in construction and demolition vary from country to country. Constructors must ensure they are aware of local regulations with regards to this matter and must always fulfill them.

TheSize encourages the reuse of Neolith slabs in other applications when possible.



Installation Systems

1. General Information

Neolith is a high quality construction material with a wide range of installations applications such as coating for ventilated façades solutions.

Neolith has the best physical and mechanical properties to fulfill the most demanding ventilated façade requirements, granting an extraordinary added value to an architectural solution.

1.1. Ventilated Chamber

Neolith slabs installed as a ventilated façades must be separated from building's wall by a composition of profiles. Generally speaking, chambers have a minimum size of 30mm and are not limited to any maximum size. To allow air circulation between the ventilated façade and the building's wall it is necessary to correctly dimension the opening of the façade.

Coronation & Base ventilation

The dimension of the opening on the coronation and on the bottom areas of the façade should be at least of 20mm. This measure allows for correct air flows which optimize the properties of ventilated façades towards a building.

Subdividing the chamber

In the case country and regional building codes require vertically-oriented division of the ventilation chamber in order to prevent any possible spread of flame in the event of a fire; a possible solution would be to create ventilated compartments approximately every 6 meters to prevent the propagation. It is always recommended to use fire-proof materials.

Properties of the Ventilated Façades

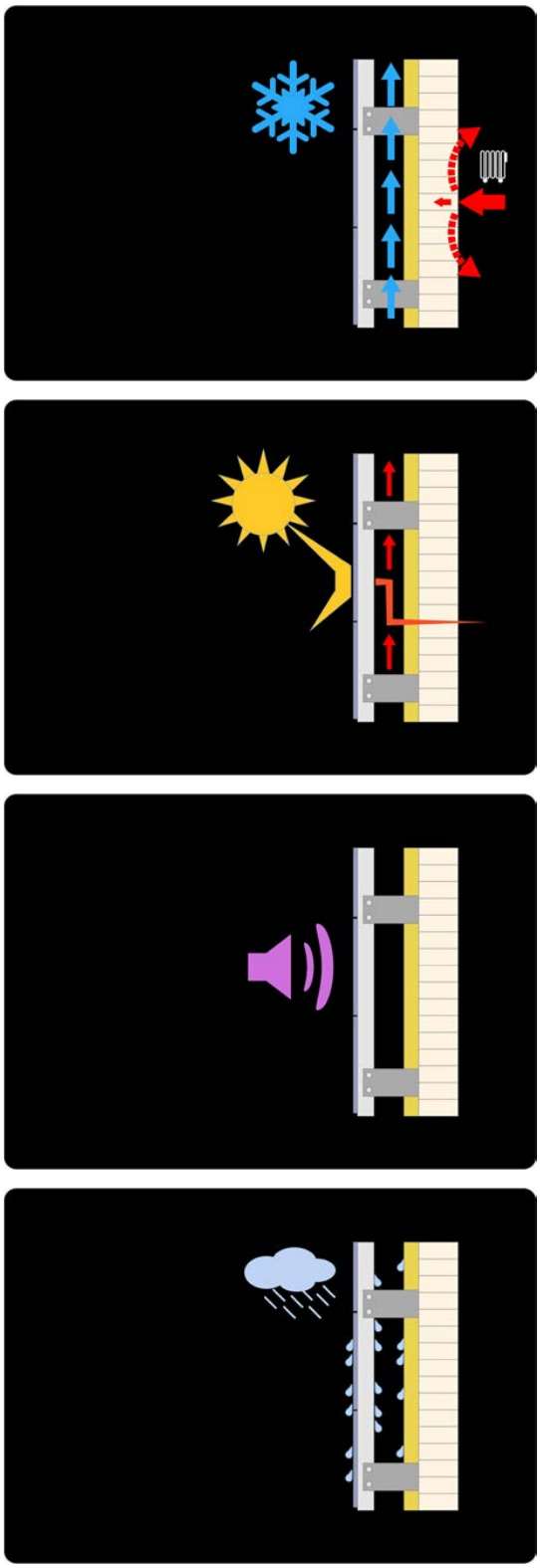


Image 12: Ventilated façades properties

Permeability

Moving air diffuses water vapor from the inside out and facilities the “breathing” of the façade, preventing condensation from forming behind the panels

Thermal insulation

Insulation applied on the external structure eliminates the thermal bridges thus reducing temperature fluctuations inside building, leading to energy savings in some cases, up to 40%.

Solar Protection

Thermal comfort is provided inside the building by preventing overheating in the summer and therefore protecting the building from direct radiations and from other elements

Acoustic Insulation

Given that the ventilated façade system is composed of different layers, there is an increase in the level of noise absorption taken by the different elements

Water Impermeability

Chimney effect provided by the air chamber confers an extra protection due to the air pressure, preventing water infiltration and protecting the building structure

1.2. Expansion joints

Neolith installation process should leave expansion joints around the perimeter of the panels for free deformation. Because of the extraordinary properties of thermal expansion, the space between panels should be at least 3mm (1/8”).

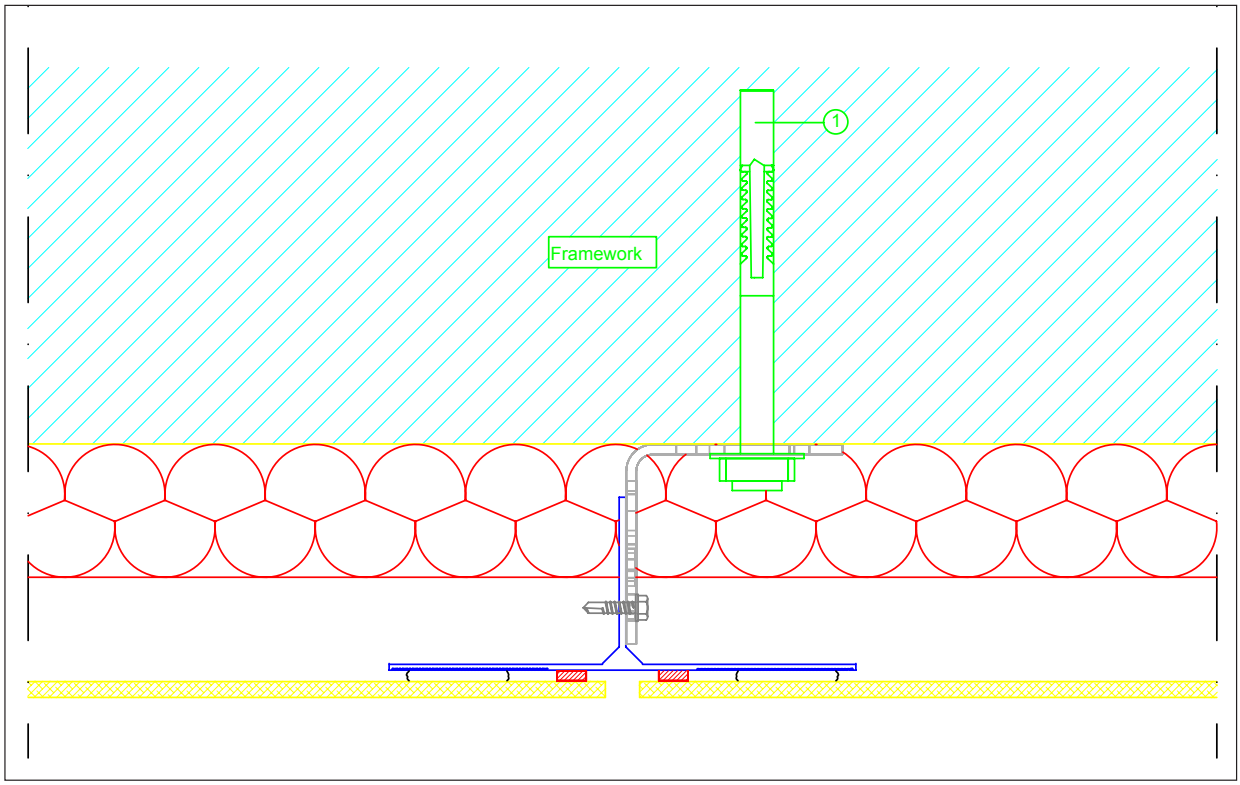


Image 13: Expansion joint on HC System

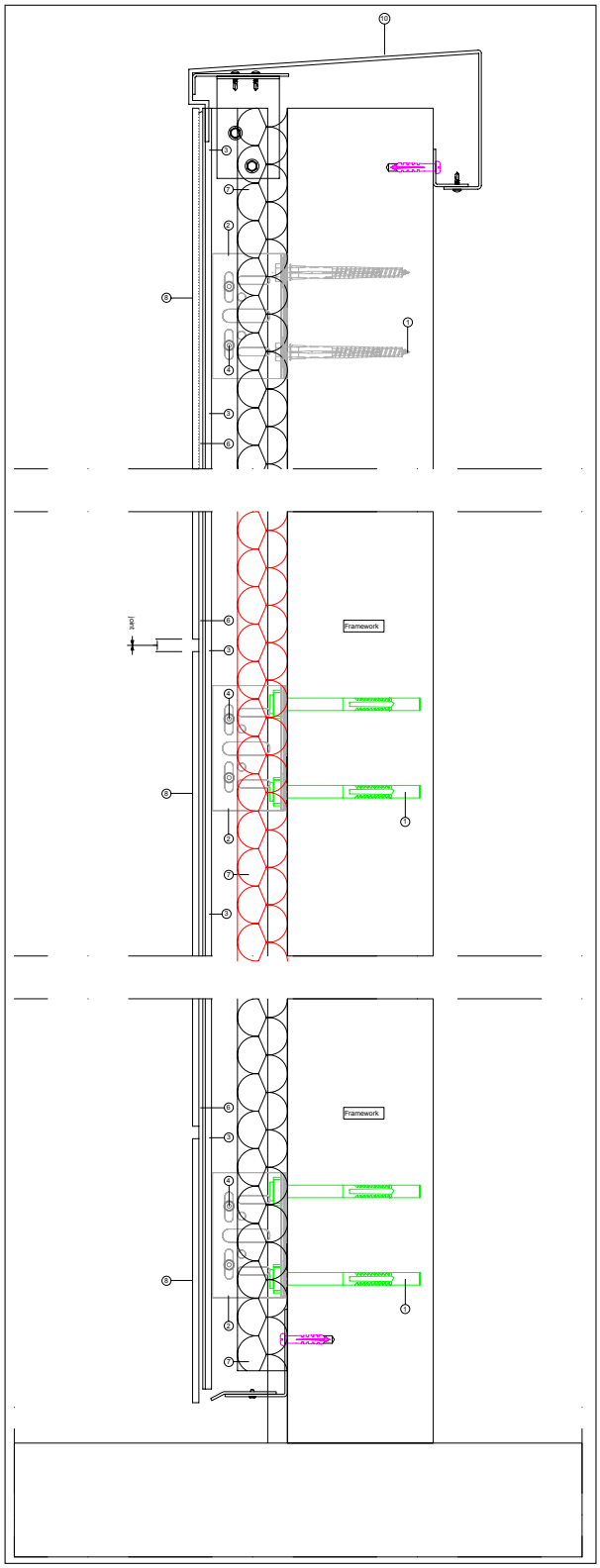


Image 14: HC General elevation section

1.-Bracket MTA 10x90 inox A2
2.-ESC aluminum 100x65x60x3
3.-Vertical aluminum profile “T 100x50x2”
4.-Screw DIN 7504-K 6.3x25 inox A2
5.-Adhesive PanelTack-HM
6.-Insulation
7.-Neolith Slab

1.3. Substructure

With the aim of facilitating air circulation behind the slabs, a substructure of vertical profiles must be installed. This substructure must be designed according to the building codes and wind pressure requirements relative to each market. It is also important to consider the inclination of the façade, the fastening system chosen and the dimension of Neolith panels being installed. Furthermore, protection against corrosion and rotting must be considered regardless of the material or system being employed.

Wood Substructure

If the substructure is built from timber battens, they must be suitably treated. It is recommended to install PVC joints or closed-cell polyethylene foam over the exposed surfaces, as these protect, improve and extend their life spam. This type of substructure may be used only in dry areas with scarcity of rainfall.

Metal Substructure

If located in rainy areas or areas with a high degree of humidity, it is preferable to use metal profiles made by aluminum. In areas suffering the obvious effects from the sea, it is highly recommended to use anodize aluminum profiles.

2. Neolith Fixing Systems

2.1. HC Fixing System

Hidden Fixing with Longitudinal Adhesion

This option developed for Neolith cladding, consists of a hidden support system using chemical elastic longitudinal fixation mounting on vertically “T”-shaped or “L”-shaped profiles, depending on whether the profiles match the joints between Neolith slabs or if they are reinforcing the center of the joint and supporting the bearing through retention or sustentation brackets.

The whole system has been tested in laboratories certified for such a fact, the results having been found satisfactory for the use of Neolith and can be found later on in this manual.

System Properties

TheSize recommends the use of last generation, chemical elastic adhesives, especially developed for fixing and anchoring Neolith slabs (Please, refer to Table 4 below). These must have great vibration damping capacity and structural adhesion without using any rivets or screws. The chemical-elastic anchoring systems have a number of accessories for its proper installation.

- Double-sided tape for initial fastening of Neolith until full curing of the adhesive and the optimum spacing for the adhesive strength.
- Primer for the proper cleaning of the aluminum profile and the backside of Neolith, providing better adhesion.

Brand	Product
Sika	Sikatack
Quilosa	FixPaneles
Botik	Paneltack
Dow Corning	896 PanelFix

Table 4: Recommended Chemical-elastic Adhesives

HC System description

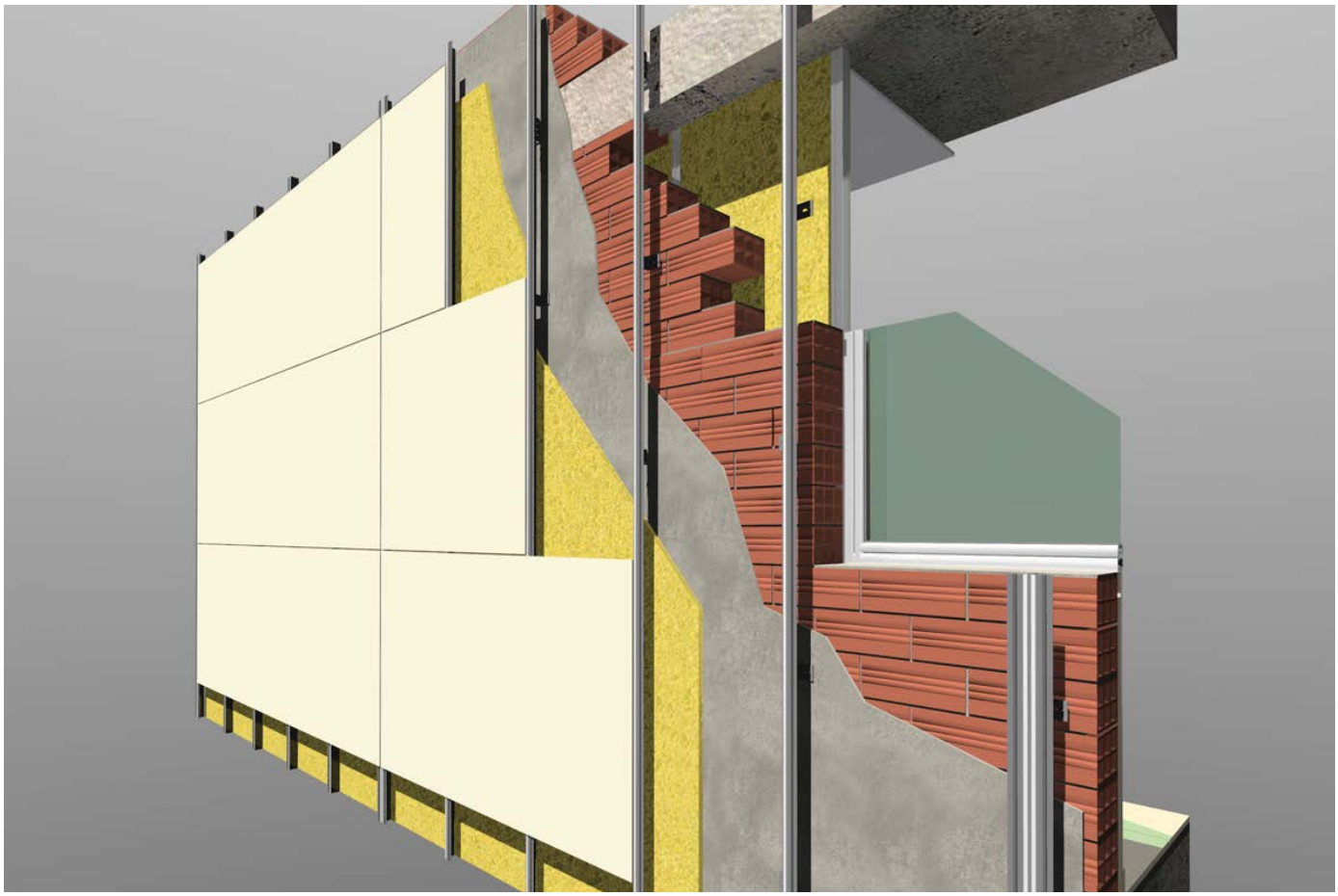


Image 15: HC System mockup

1.-Thermal Insulation
2.-ESC aluminum 100x65x60x3
3.-Vertical aluminum profile “T 100x50x2”
4.-Adhesive PanelTack-HM
5.-Double side tape adhesive
6.-Neolith Slab

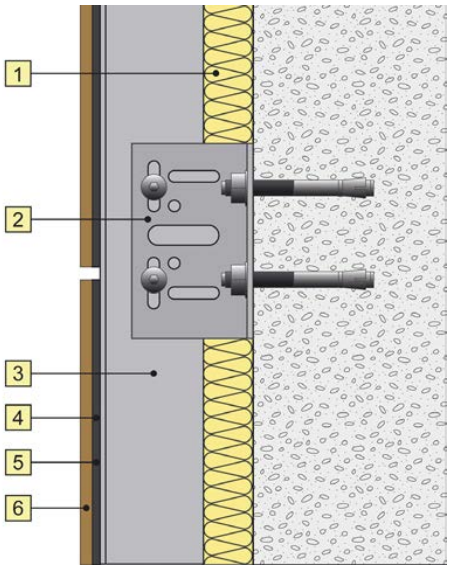


Image 16: HC System vertical section

Advantages of Chemical Elastic Fixation:

- Diffuse binding stresses uniformly without forming critical points where breakage could start.
- Avoid stress concentration at the adhesion surface.
- Achieve a hidden fixing system without aesthetic distortions.
- Avoid galvanic corrosion by electrical insulation and separate those materials likely to suffer from it.
- Reduce or eliminate the transmission of vibrations between the bonded materials.
- Avoid bond failure by fatigue.
- Enable the joining of different type of materials.
- Improve the aesthetics of the joints

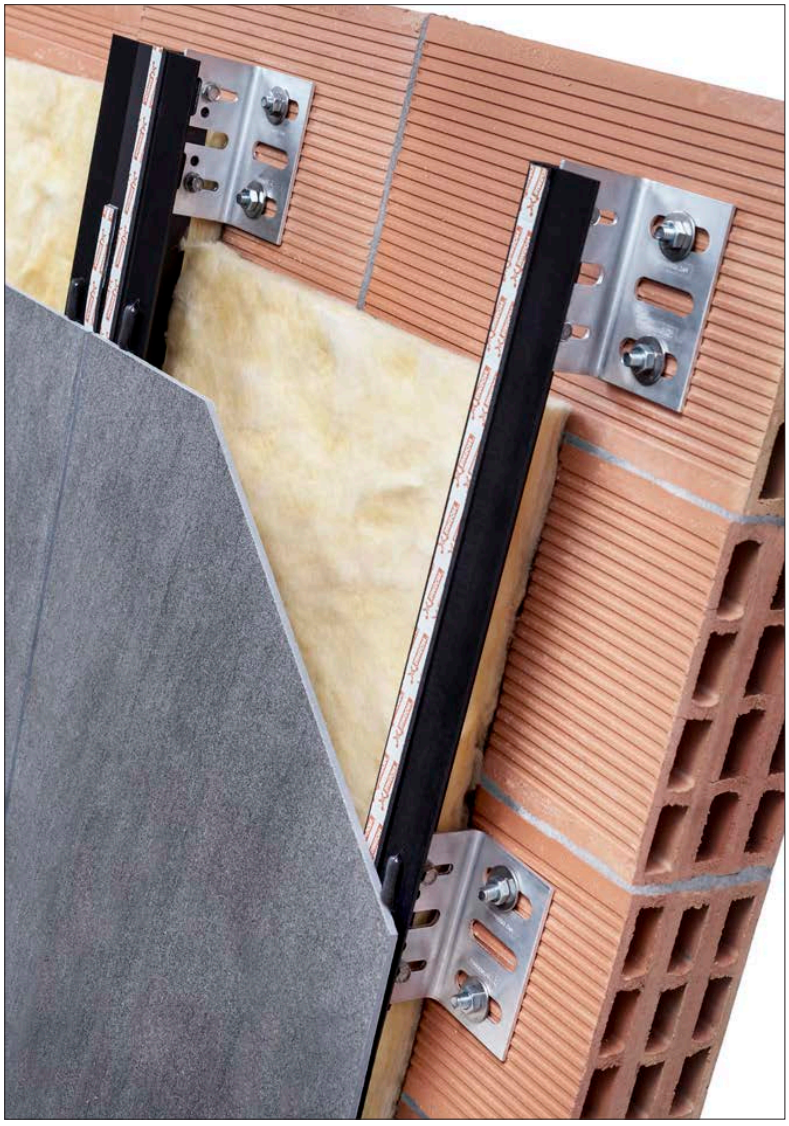


Image 17. HC System detail

Image 18. HC System details

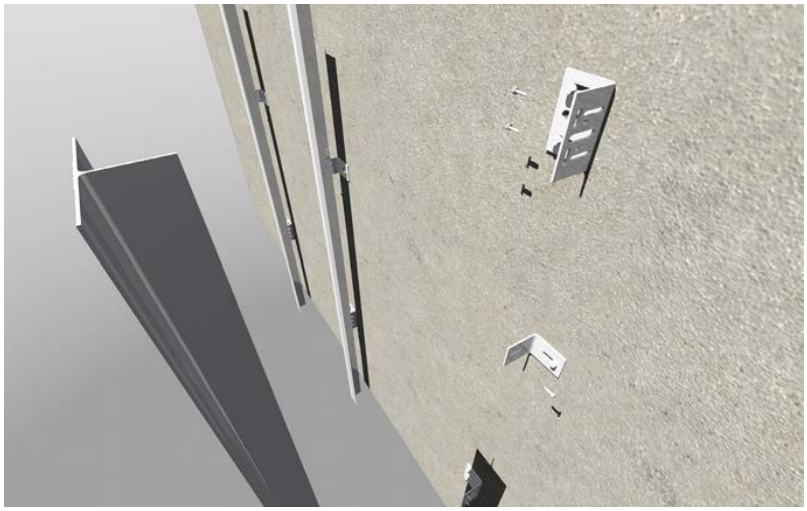


Image 19: HC System installation Step 1

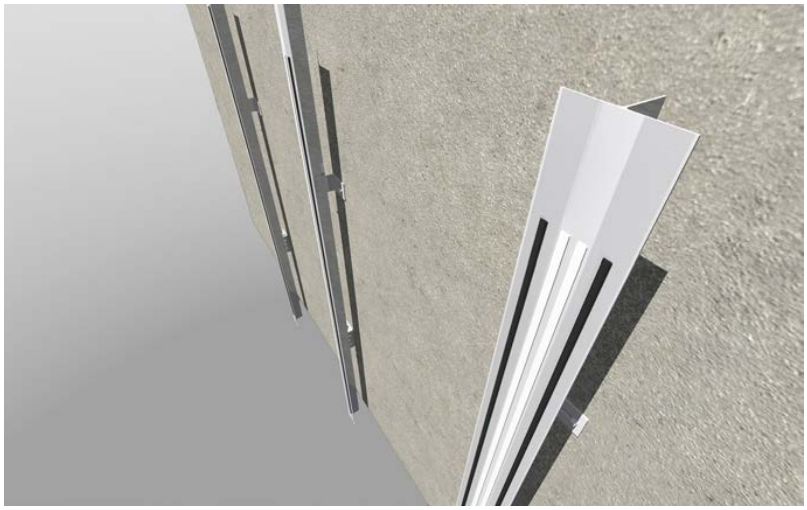


Image 20: HC System installation Step 2

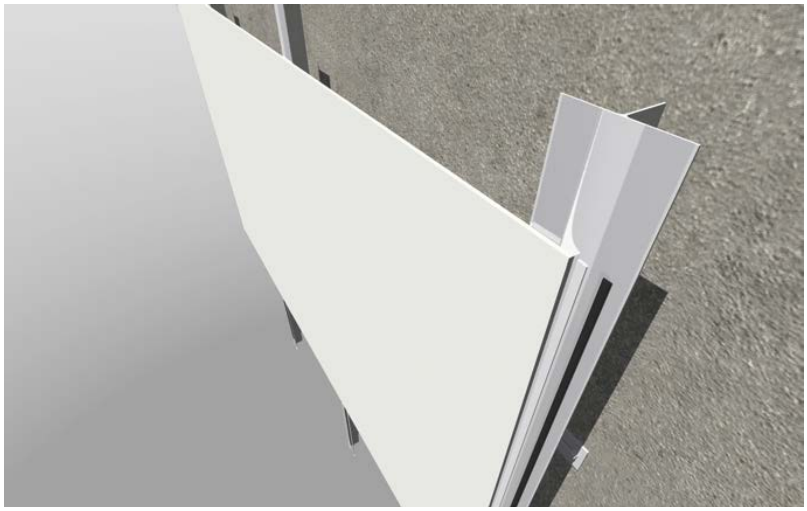


Image 21: HC System installation Step 3

Substructure distribution and installation:

Dimensions of the perpendicular substructure depends on the façade construction. The distances between the substructure battens and their width are determined by the load requirements and by the type of panel used.

Application Method:

Clean the surface with a clean, grease and fluff free cellulose cloth or cleaning paper soaked, wiping the surface in one direction only (dirty cloths must be replaced).

Apply one thin coat of primer uniformly all over the surface with a brush or felt pad. Allow a flash off time of at least 30 minutes .

The back Neolith surface to be bonded must be clean, dry and free from grease.

Bonding-Tape Application:

Apply Double Side Tape over the whole length of the vertical sections and parallel to the edges.

Do not pull off the protective foil at this time.

Apply Structural Adhesive in a triangular bead by using the triangular nozzle supplied (width 8 mm, height 10 mm) with at least 5 mm gap to the fixing tape and to the side of the batten.

Neolith Panel placing:

Remove the protective foil on the Double Side Tape. Place the cladding panel in the required position on the adhesive bead without the panel touching the fixing tape. To simplify mounting, the panels should be carefully designed. Position the panels precisely and press them firmly until they contact the Structural Adhesive Panel fixing tape.

Component details

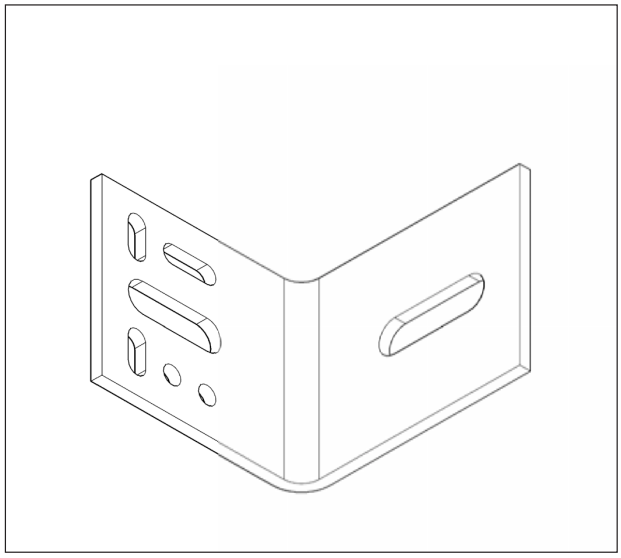


Image 22: Suporting bracket

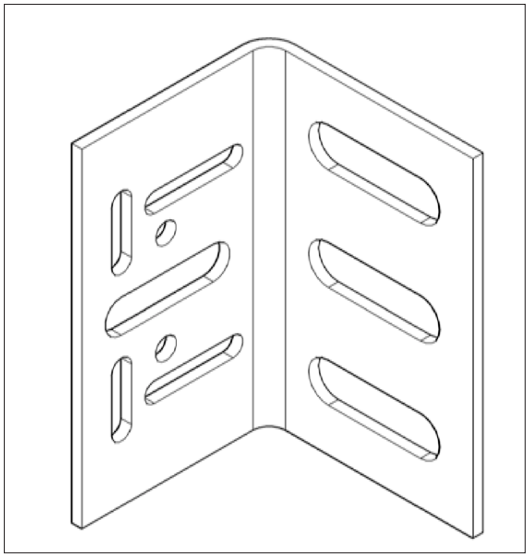


Image 23: Retention bracket

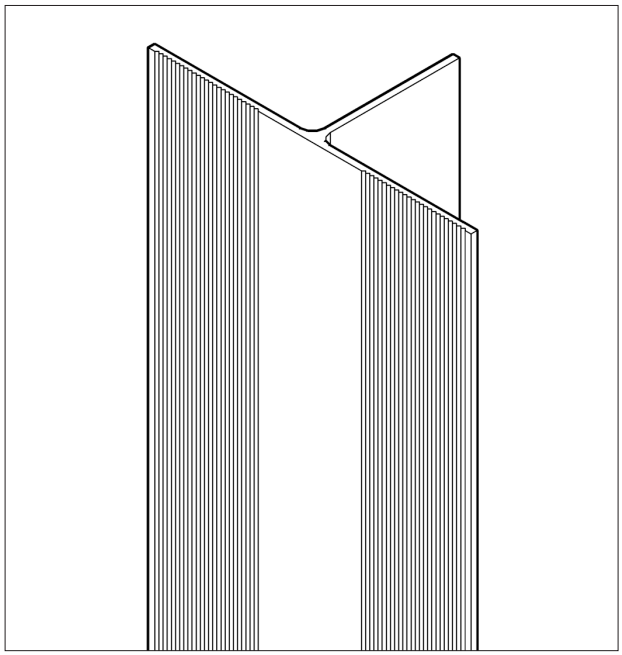


Image 24: Vertical profile

Component details

Components	Materials
Vertical Profile	Al 6063 T5
Brackets	Al 6063 T5
Screws and Fixations	AISI 304/316

Table 5: Component details

Main characteristics of the material

Characteristics Al 6063 T5	
Specific Gravity	2.700 kg/m3
Coefficient of Thermal Expansion from 20 to 100 ºC	23,6 x 10^{-6} K^{-1}
Modulus of elasticity	69.500 N/mm^2
Poisson Coefficient	0,33
Tensile Resistance	215 N/mm
Shear Resistance	140 N/mm^2
Yield stress (Rp 0,2%)	160 N/mm
Elongation (L0-mm)	12%
Elongation (L50-mm)	14%
Brinell Hardness	70

Table 6: Al 6063 T5

Characteristics AISI 304	
Specific Gravity	7.930 Kg/m^3
Coefficient of Thermal Expansion from 20 to 100 ºC	17,3 x 10^{-6} K^{-1}
Modulus of Easticity	190.000 N/mm^2
Poisson Coefficient	0,33
Tensile Resistance	540-750 N/mm
Yield stress (Rp 0,2%)	≥ 230 N/mm
Elongation (L0-mm)	< 45%
Brinell Hardness	183

Table 7: AISI 304

2.2. VM Fixing System

Visible Mechanical Fastening Fixation

This system consists of a metallic self-supporting substructure kit for ventilated façades, designed to support ceramic coatings of different formats and thicknesses. It has been developed for Neolith façades based on a visible mechanical fastening system composed of sustentation and retention brackets, vertical “T” or “L”-shaped profiles and safety clips upon which the cladding system rests.

Flatness of the vertical “T” or “L”-shaped profiles is achieved thanks to the supporting and retention brackets or spacers. Complete flatness will depend on whether the profiles match exactly the joints between the slabs, correcting possible deviations on the interior layer of the façade to cladding.

The clamps responsible for sustaining the structure described above are located on Neolith slab as well as on a grooved area for the application of adhesive, granting greater security to the system.

System properties

The system is composed of retention and support angle brackets, vertical profiles and staples to support the cladding. Thanks to the angle brackets (support/retention)it is possible to ensure a proper leveling of the vertical profiles, correcting likely deviations from the original facade that is going to be covered. To ensure the dimensional stability of the system, an elastic adhesive line is applied along the T-shaped vertical profile. This elastic adhesive ensures the correct fitting of the pieces, improving the system response against wind pressure or suction and gravity loads. Possible vibrations produced by these efforts are also absorbed by this adhesive.

Finally, the staples are fixed to the vertical profile using stainless steel self-drilling screws and allows Neolith pieces to be quickly and easily replaced.

VM System description

Image 25: VM System mockup

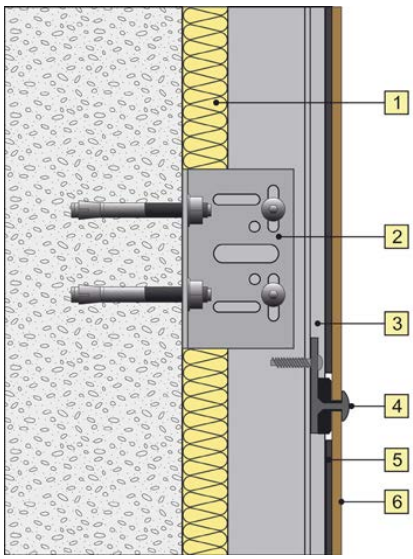


Image 26: VM System vertical section

1.-Thermal Insulation
2.-ESC Aluminum 100x65x60x3
3.-Vertical aluminum profile “T 100x50x2”
4.-Aluminum Clip System
5.-Adhesive PanelTack-HM
6.-Neolith Slab

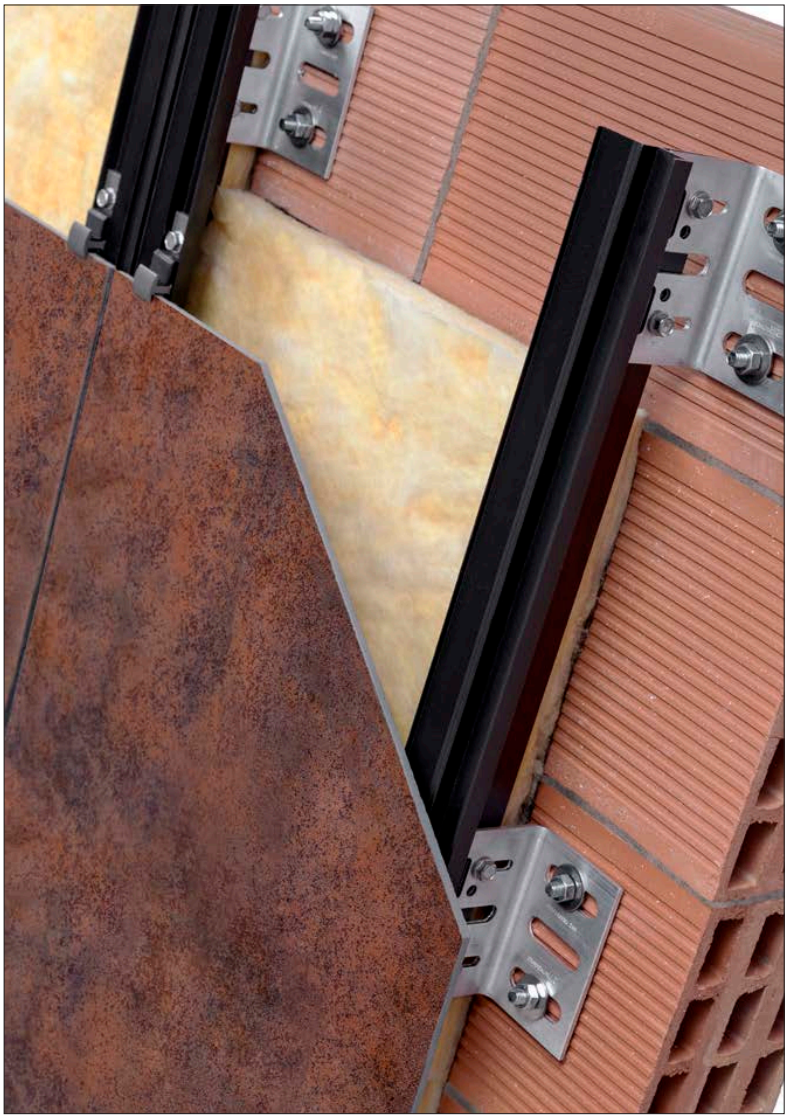


Image 27: VM System detail

Image 28: VM System details

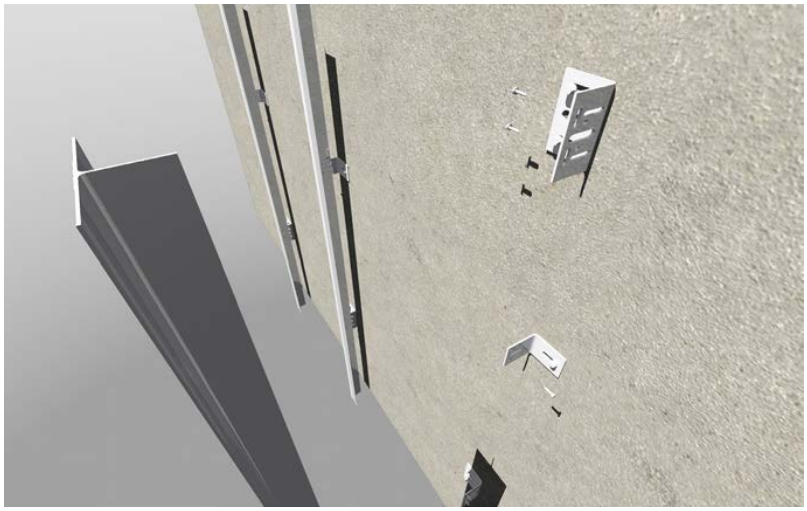


Image 29: VM System installation Step 1

Image 30: VM System installation Step 2

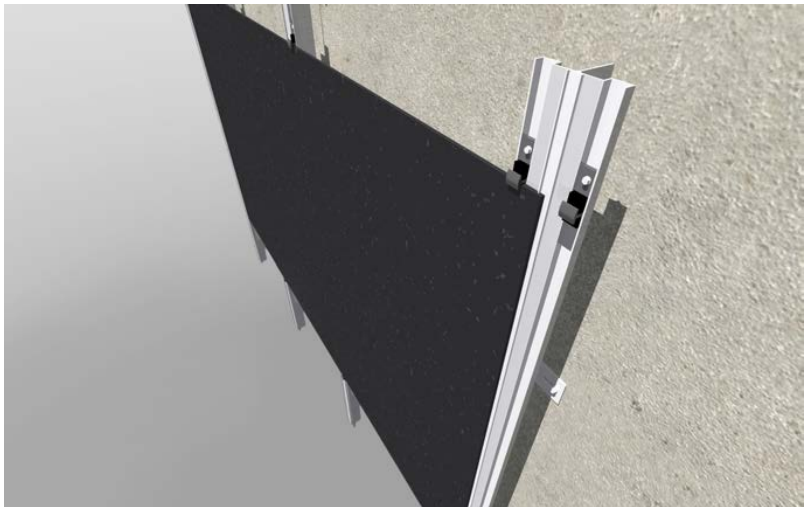


Image 31: VM System installation Step 3

Substructure distribution and installation:

Dimensions of the perpendicular substructure depend on the façade construction. The distances between the substructure battens and their width are determined by the load requirements and by the type of Neolith panel used.

Application Method:

Position and screw Aluminum Clip supporting system, distance between clips are determinate by engineering loads calculus, take in care if clips are bottom-coronation or standard type.

Apply Structural Adhesive in a triangular bead by using the triangular nozzle supplied (width 8

mm, height 10 mm) on fluted channel of T profile.

Place the cladding Neolith panel on the position, insert the slab into the aluminum clip system and precisely and press them firmly until they contact the Structural Adhesive Panel fixing, subsequently close the fixation in the upper part with next line of aluminum clips.

Vertical joint will limited up to 3mm.

Component details

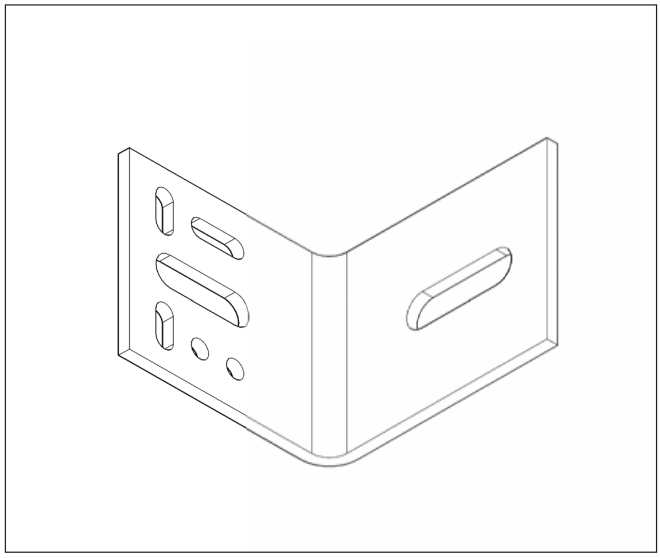


Image 32: Suporting bracket

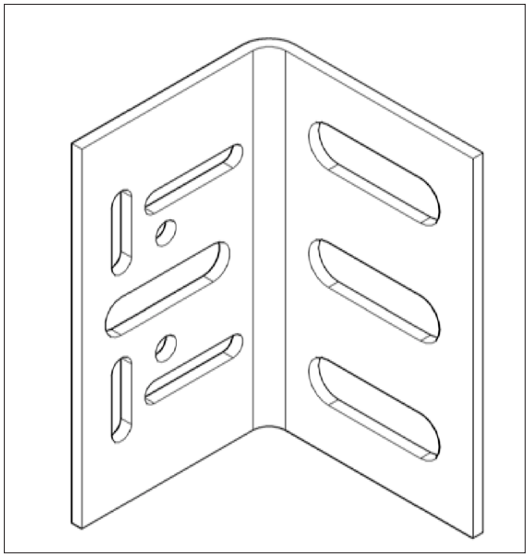


Image 33: Retention bracket

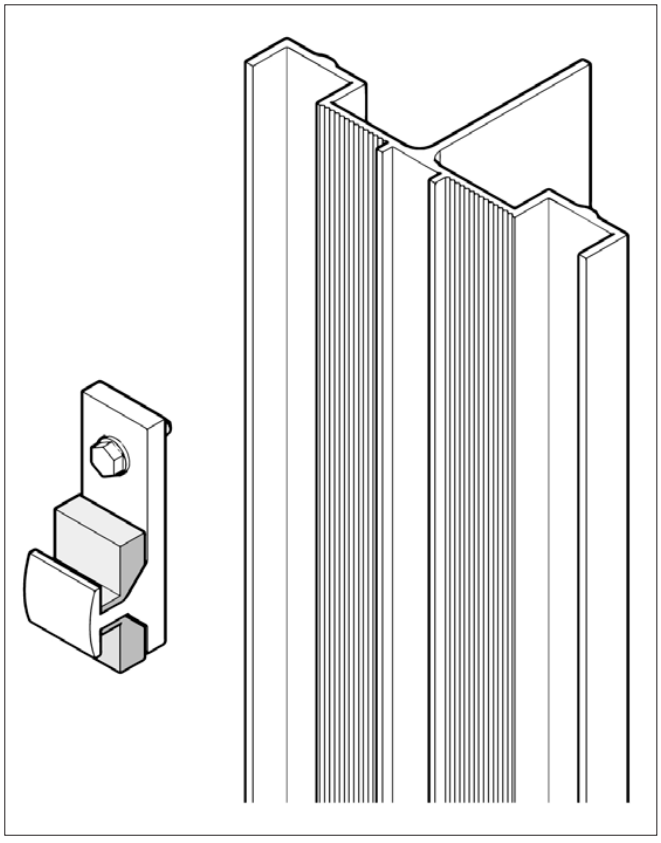


Image 34: VM System vertical profile and mechanical Clip

Summary Components

Components	Materials
Vertical Profile	Al 6063 T5
Brackets	Al 6063 T5
Screws and Fixations	AISI 304/316

Table 8: Component details

Main characteristics of the material

Characteristics Al 6063 T5	
Specific Gravity	2.700 kg/m3
Coefficient of Thermal Expansion from 20 to 100 ºC	23,6 x 10^{-6} K^{-1}
Modulus of elasticity	69.500 N/mm^2
Poisson Coefficient	0,33
Tensile Resistance	215 N/mm
Shear Resistance	140 N/mm^2
Yield stress (Rp 0,2%)	160 N/mm
Elongation (L0-mm)	12%
Elongation (L50-mm)	14%
Brinell Hardness	70

Table 9: Al 6063 T5

Characteristics AISI 304	
Specific Gravity	7.930 Kg/m^3
Coefficient of Thermal Expansion from 20 to 100 ºC	17,3 x 10^{-6} K^{-1}
Modulus of Easticity	190.000 N/mm^2
Poisson Coefficient	0,33
Tensile Resistance	540-750 N/mm
Yield stress (Rp 0,2%)	≥ 230 N/mm
Elongation (L0-mm)	< 45%
Brinell Hardness	183

Table 10: AISI 304

Installation process

The system must be executed by qualified or specialized companies under the supervision of the Project Manager.

1. Safety Conditions: The components of the system should be correctly kept in the building site, foreseeing a place where they cannot be damaged by blows or the action of different atmospheric agents.

2. Prior Verifications: Once the structure of the building is executed or the supporting structure system, it must be verified, from the plans provided by the project management, that the modulation and the initial calculus of materials (cladding, brackets and moorings) considered in the projectual stage are the appropriate ones to start with the installation of the system.

3. Levelling of the supporting structure: This verification must be done with mechanical or digital means, quantifying the out of plumb of the supporting structure. These “out of plumb” with the width of the air chamber, will define the maximum and minimum dimension of separation between brackets.

4. Setting-out in site: Once the prior verifications are done, the separation distances between vertical profiles will be set depending on the dimension of the chosen panels in the project and the calculus limitation.

5. Brackets Fixation: The kind of screws and fixations which are used to join the brackets to the building together will depend on the supporting structure where they will be fixed. In other words, depending on the material of the structure or the enclosure of the building, a different kind of mooring will be recommend.

6. Supporting Brackets:
    - SLAB. In most of the cases, supporting brackets are fixed to reinforced concrete slab with MTA 10x90 metallic stainless A-2 mooring. These moorings are located in the upper and lower oval-hole of the brackets to ensure at least the minimum separation between metallic moorings.
    - ENCLOSURE. In exceptional cases, it is necessary to fix the supporting bracket in areas where there is no slab (window contour, high parameters, corbels...). In these cases, it will be used a stainless A-2 plug nylon set FL 10x90, consisting of a stainless A-2 DIN 571 8x100 screw, a FL 10x90 nylon plug and a stainlessA-2 M-8 9021 washer. Depending on the typology and the resistance of the enclosure, it could be more suitable and/or necessary another kind of nylon plug or chemical mooring with threaded rod (consisting of a 8x120 stainless A-2 threaded rod, 12x80 sieve and epoxy resin without etilen).

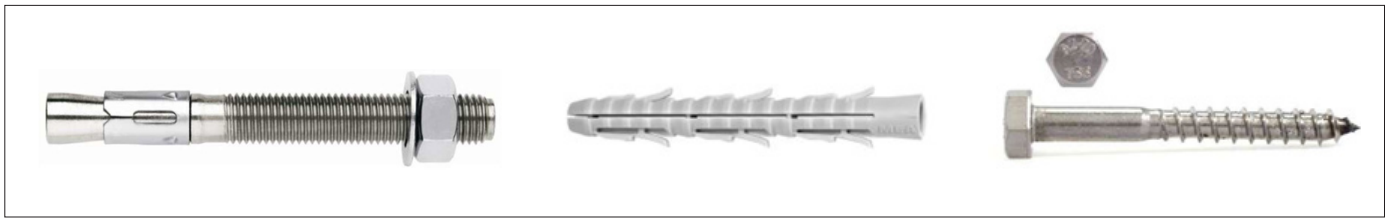


Image 35: MTA 10x90 metallic stainless A-2, A-2 DIN 571 8x100 screw and a FL 10x90 nylon

7. Retention Bracket: Once the moorings for each bracket, after the calculus and verifications, have been chosen; the brackets will be fixed following the initial setting-out, taking into account the following indications:

   Vertical distances between brackets will be specified in each case depending on the calculus of the chosen profile. In no case the maximum distance must be exceed.

   Retention brackets must have a staggered pattern along the profile for a proper functioning.

8. Fixed point: These will be screws type DIN 7504 K 6.3x25 made of stainless steel A-2. They receive gravity and wind loads and transmit them to supporting angle brackets.

   In this case, screws are placed in the circular drillings, with a specific diameter which avoids any movement.

   Every fixed point should have the prescribed tightening torque from the manufacturer's technical specifications.

9. Floating point: It will be used screws type DIN 7504 K 4.8x19 made of stainless steel A-2. They will fix vertical profiles to angle brackets allowing movements caused by thermal expansions.

   To ensure an optimal efficiency, screws will be fixed in the central point of the brackets vertical oval-holes. Even though certain position variations are allowed, direct contact with the upper or lower part of the oval-hole must be avoided. In that case, movements would be completely restricted and the behavior would not be the appropriate.

10. Supporting angle brackets: Fixed point. Two screws receive the gravity load from a profile (either the upper or the lower profile) and they transmit it to the angle brackets. The right positions are prescribed in the following figures.

11. Floating points: A screw will be placed in the center of the recommended oval-hole. Not only the right position of the profile is guaranteed but also some possible differential movements are allowed, forcing the profile to work with a flexo-traction or flexo-compression behavior.

12. Retention Angle Bracket: Floating points. Two screws will be placed in the vertical oval-holes. They will be also placed in both centers in order to allow some differential movements produced by thermal expansions of the material.

13. Fixation of staples, adhesive lines and cladding panels: Once profiles are all installed, staples will be placed, beginning from the starting ones, in the bottom part of the cladding. Then, they will be fixed to the profiles with the stainless steel self-drilling screws specified.

    The adhesive should be now put along the profile, in the grooved areas. It wil be in two lines in the intermediate "T" shaped profiles, and just one line in "L" shaped profiles. Each panel should be adjusted to its right position and finally fixed with with the intermediate and ending staples, depending on the characteristics of the facade.

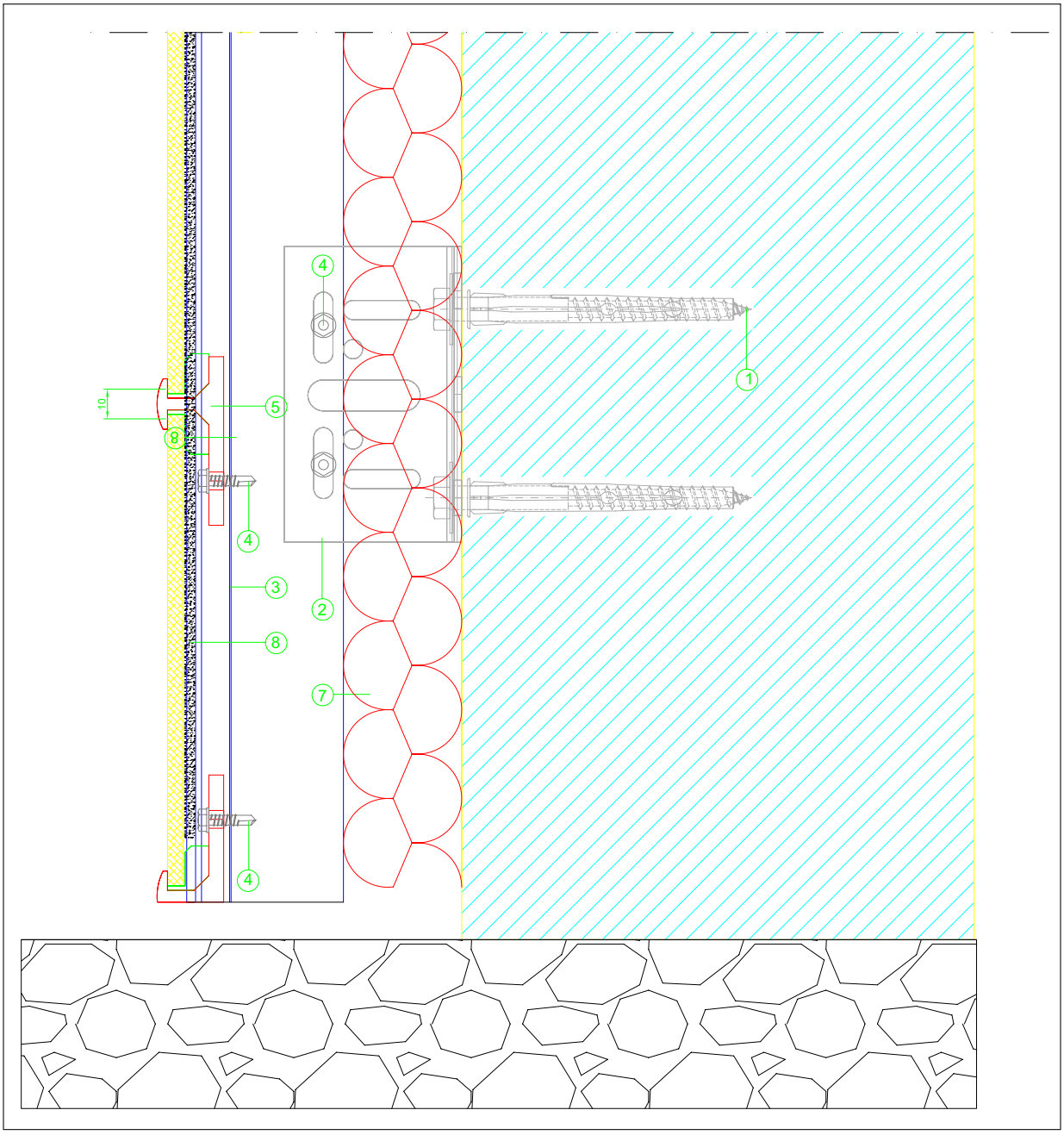


Image 36: VM System vertical system

1.- Chemical mooring with a 8x120 threaded rod
2.- Retention angle bracket 150x65x60x3
3.- "T" shaped vertical profile 110x50x2
4.- Screw type DIN 7504-K 6.3x25 stainless A-2
5.- Screw type FST 4.8x16
6.- Visible stape
7.- Adhesive lines
8.- Isolation
9.- Neolith slab

2.3. Strongfix System

Mixed hidden longitudinal fastening system

The Strongfix system is a mixed hidden longitudinal fastening system (chemical and mechanical), which works by the compression exerted by the system on the back of the Neolith tile.

These tiles are industrially mechanized in a longitudinal profile at the top and bottom of its backside with a double 45º groove in the shape of a dovetail where a couple of aluminum profiles are inserted and fixed with a MS adhesive putty in order to secure the Neolith tile. These metal profiles make up the hanging mechanism of the tiles and result very beneficial given that they are very easy to extract and replace.

The system is composed by aluminum vertical profiles, supporting retaining brackets. Through the brackets it's possible to install the aluminum "T" profiles totally flatness, thus correcting possible wall deviations of the facade to be coated.

The panels are hand set to a horizontal supporting profile with a mechanical longitudinal fixation system composed by two aluminum profiles fixation.

This aluminum set becomes indivisible given the mechanizing method of the tile and the fixing of the profiles. This system eliminates the risk of Neolith slabs becoming detached from the structure in case of breakage. This is the reason why this system is considered the safest in the market.

Furthermore, the way in which the Neolith slabs are hung on the horizontal structure provides for perfect flatness and aesthetic finish.

The Strongfix system also allows for easy extraction and replacement when needed.

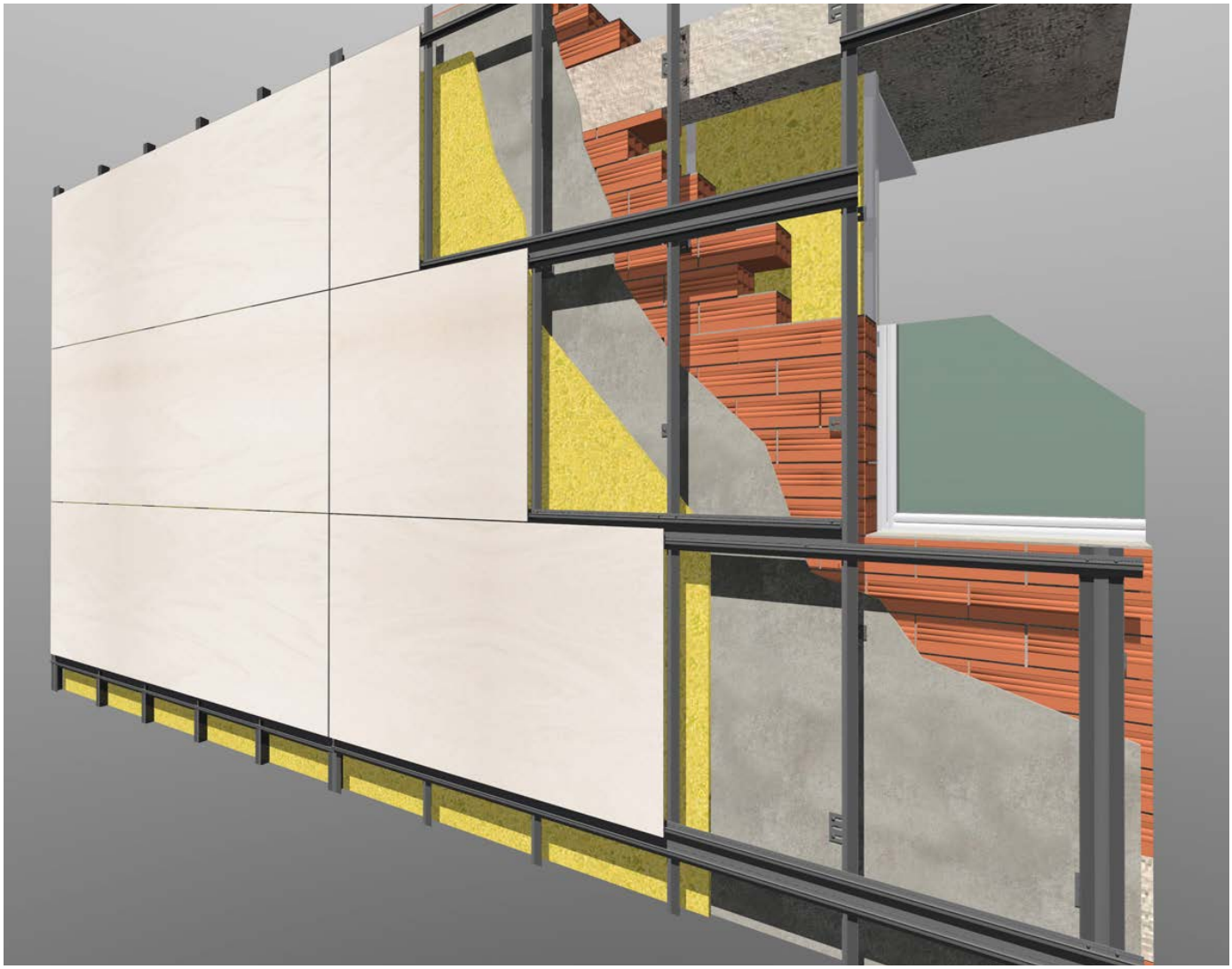
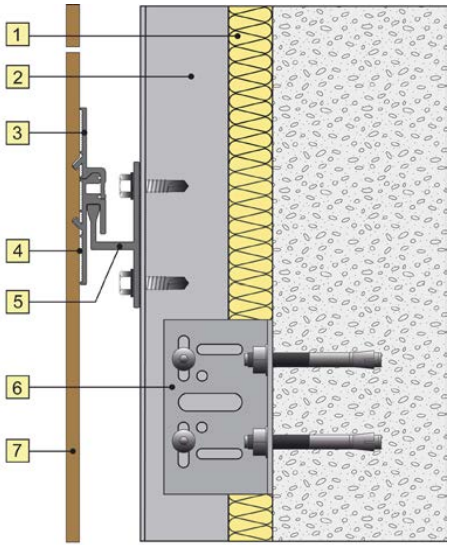


Image 37: Strongfix System mockup



1.- Thermal Insulation
2.- Vertical Aluminum “T 100x50x2”
3.- Aluminum fixing profile
4.- Aluminum fixing profile
5.- Horizontal Strongfix profile
6.- ESC Aluminum 100x65x60x3
7.- Neolith Slab

Image 38: Strongfix System vertical section

Image 39: Strongfix System detail

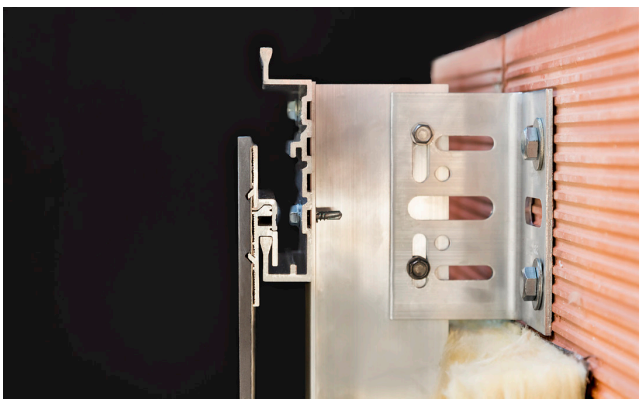


Image 40: Strongfix System details

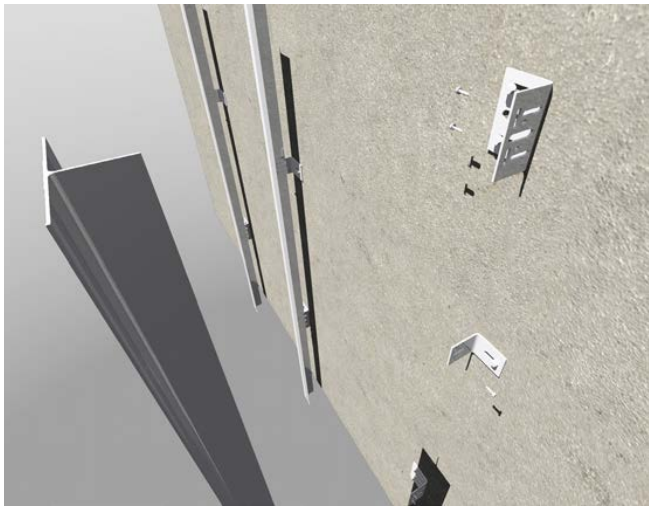


Image 41: Strongfix System installation Step 1

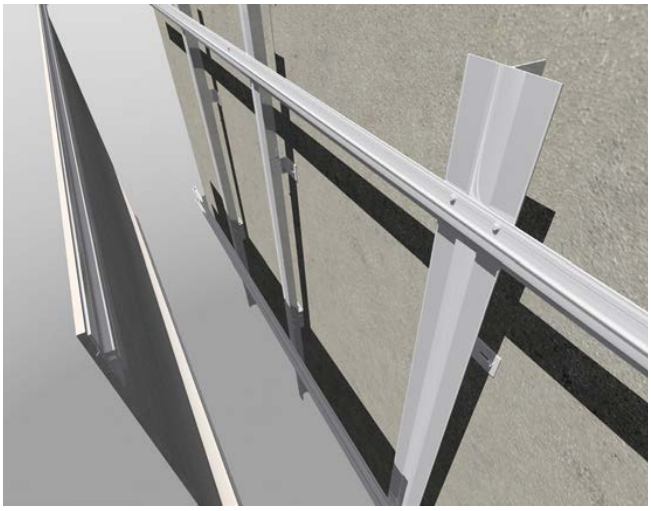


Image 42: Strongfix System installation Step 2

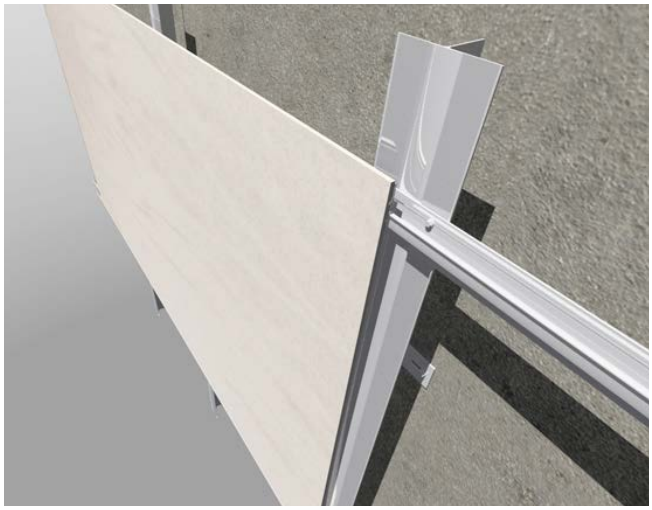


Image 43: Strongfix System installation Step 3

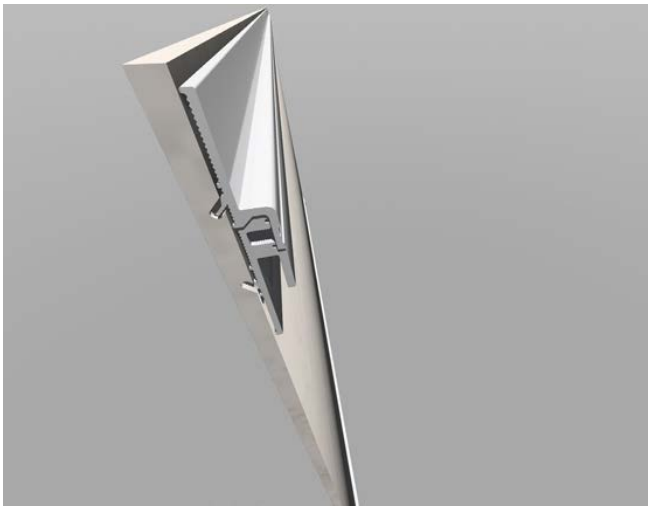


Image 44: Neolith slab with the Strongfix System profiles

Component details

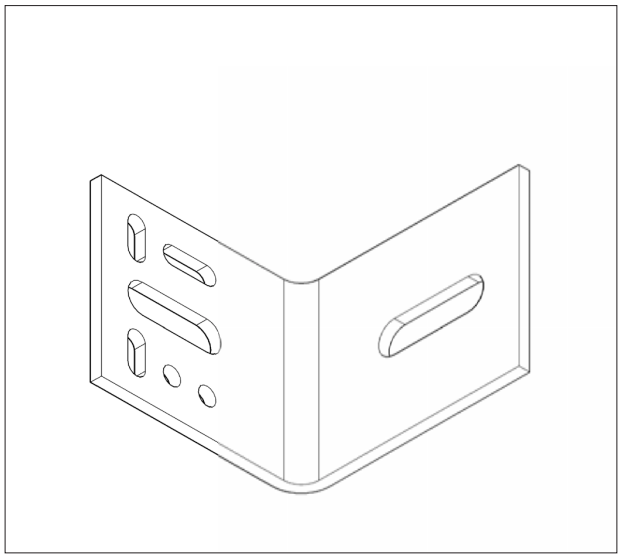


Image 45: Suporting bracket

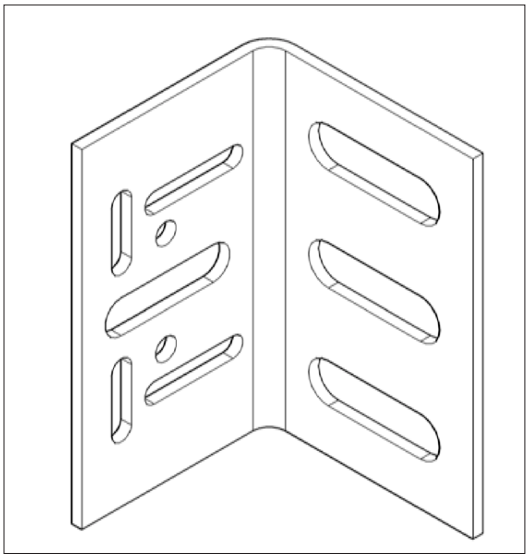


Image 46: Retention bracket

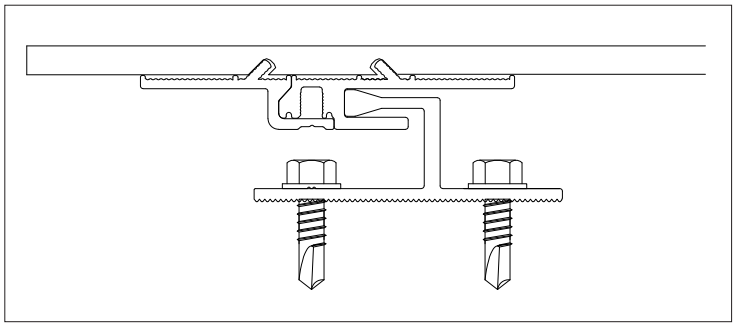


Image 47: Strongfix System detail

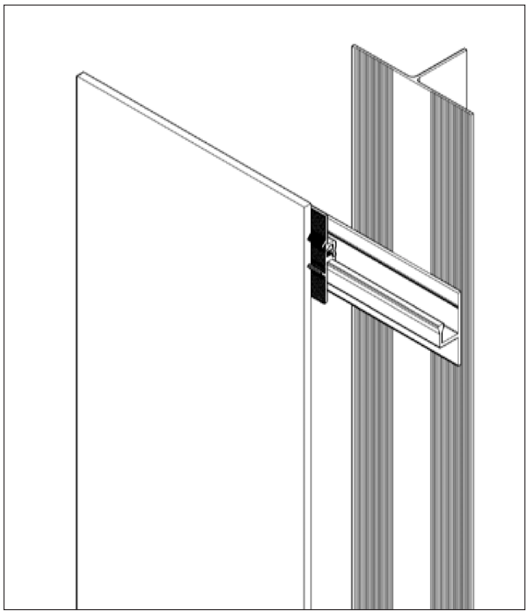


Image 48: Strongfix System detail

Summary Components

Components	Materials
Vertical Profile	Al 6063 T5
Brackets	Al 6063 T5
Screws and Fixations	AISI 304/316

Table 11: Component details

Main characteristics of the material

Characteristics Al 6063 T5	
Specific Gravity	2.700 kg/m3
Coefficient of Thermal Expansion from 20 to 100 ºC	23,6 x 10^{-6} K^{-1}
Modulus of elasticity	69.500 N/mm^2
Poisson Coefficient	0,33
Tensile Resistance	215 N/mm
Shear Resistance	140 N/mm^2
Yield stress (Rp 0,2%)	160 N/mm
Elongation (L0-mm)	12%
Elongation (L50-mm)	14%
Brinell Hardness	70

Table 12: Al 6063 T5

Characteristics AISI 304	
Specific Gravity	7.930 Kg/m^3
Coefficient of Thermal Expansion from 20 to 100 ºC	17,3 x 10^{-6} K^{-1}
Modulus of Easticity	190.000 N/mm^2
Poisson Coefficient	0,33
Tensile Resistance	540-750 N/mm
Yield stress (Rp 0,2%)	≥ 230 N/mm
Elongation (L0-mm)	< 45%
Brinell Hardness	183

Table 13: AISI 304

Installation progress

Image 49: Strongfix System installation Step 1

Image 50: Strongfix System installation Step 2 and 3

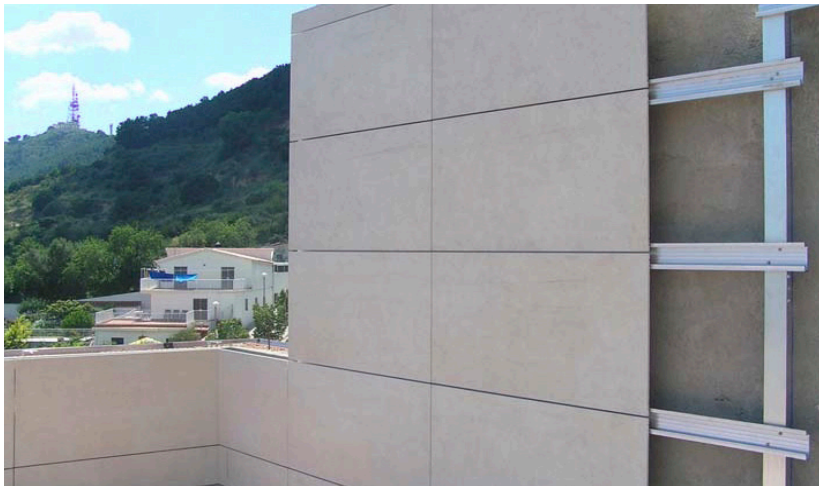


Image 51: Strongfix System installation Step 4

1. **Façade staking:** Aluminum vertical profiles arrangement and staking, which can be installed completely independent to the vertical joints.

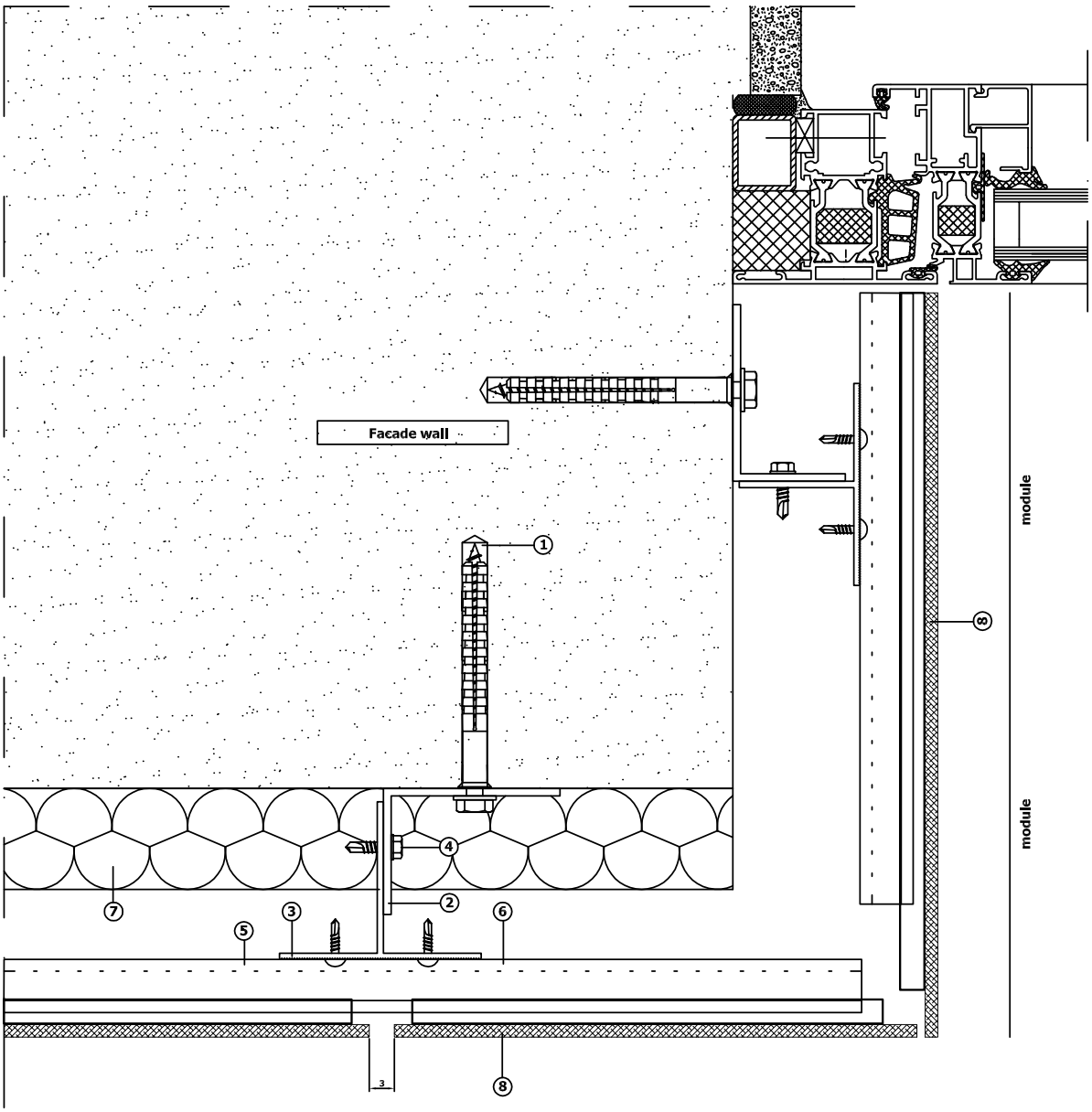
2. **Vertical profiles installation:** The vertical structure is anchored to the wall using retenciton and supporting brackets and anchors.

3. **Horizontal profiles installation:** It is needed to be determined the horizontal profiles position, in response to horizontal cutting façade scheme. This structure is anchored to the vertical structure by 5.5x19cm drilling screws.

4. **Neolith installation:** Neolith cladding installation, it is needed to start by the bottom of the façade. It is a façade system very fast to install which allows to replace the slim tiles if it is required.

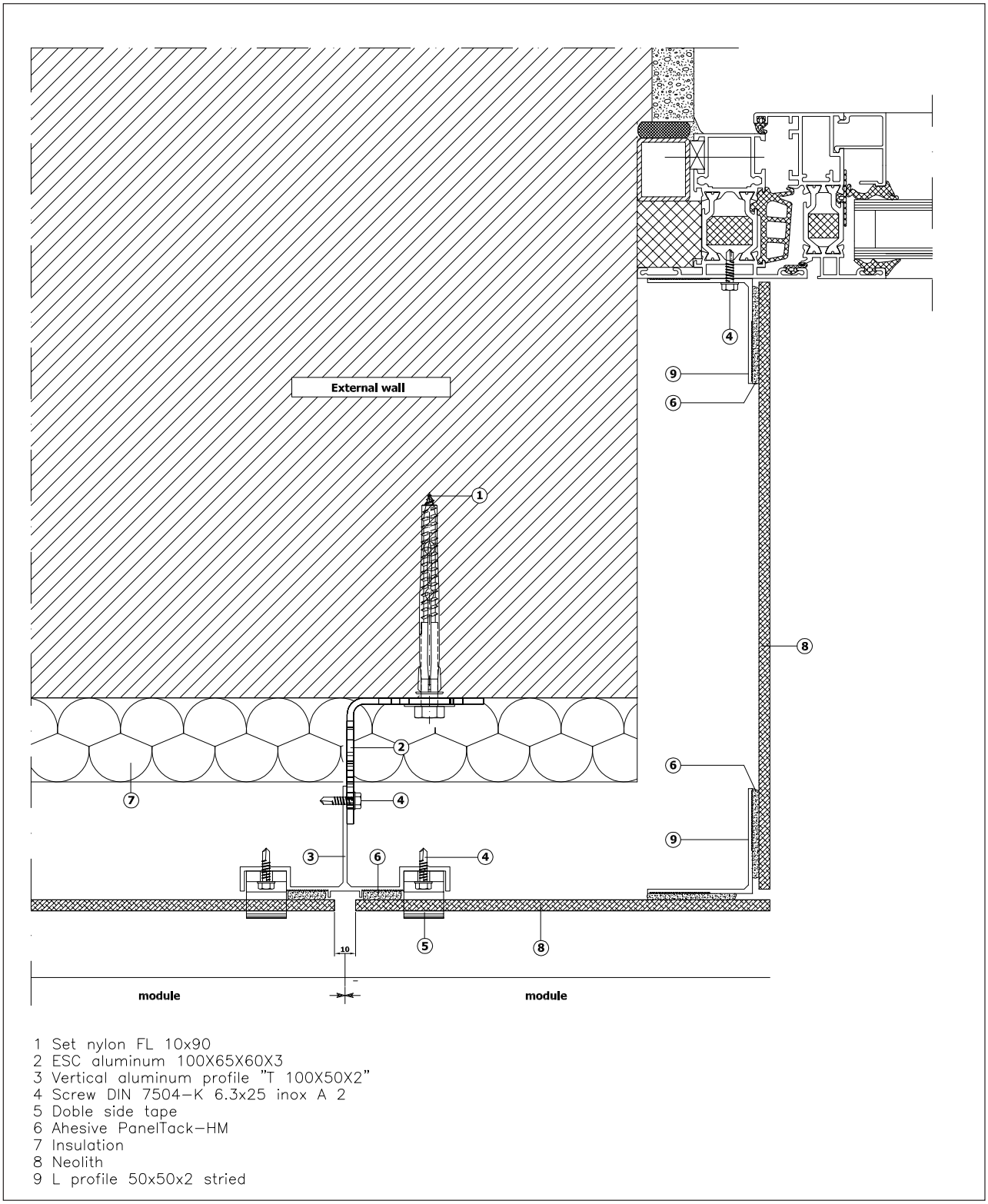
3. Constructive Details

Jamb details. Strongfix system. Horizontal section



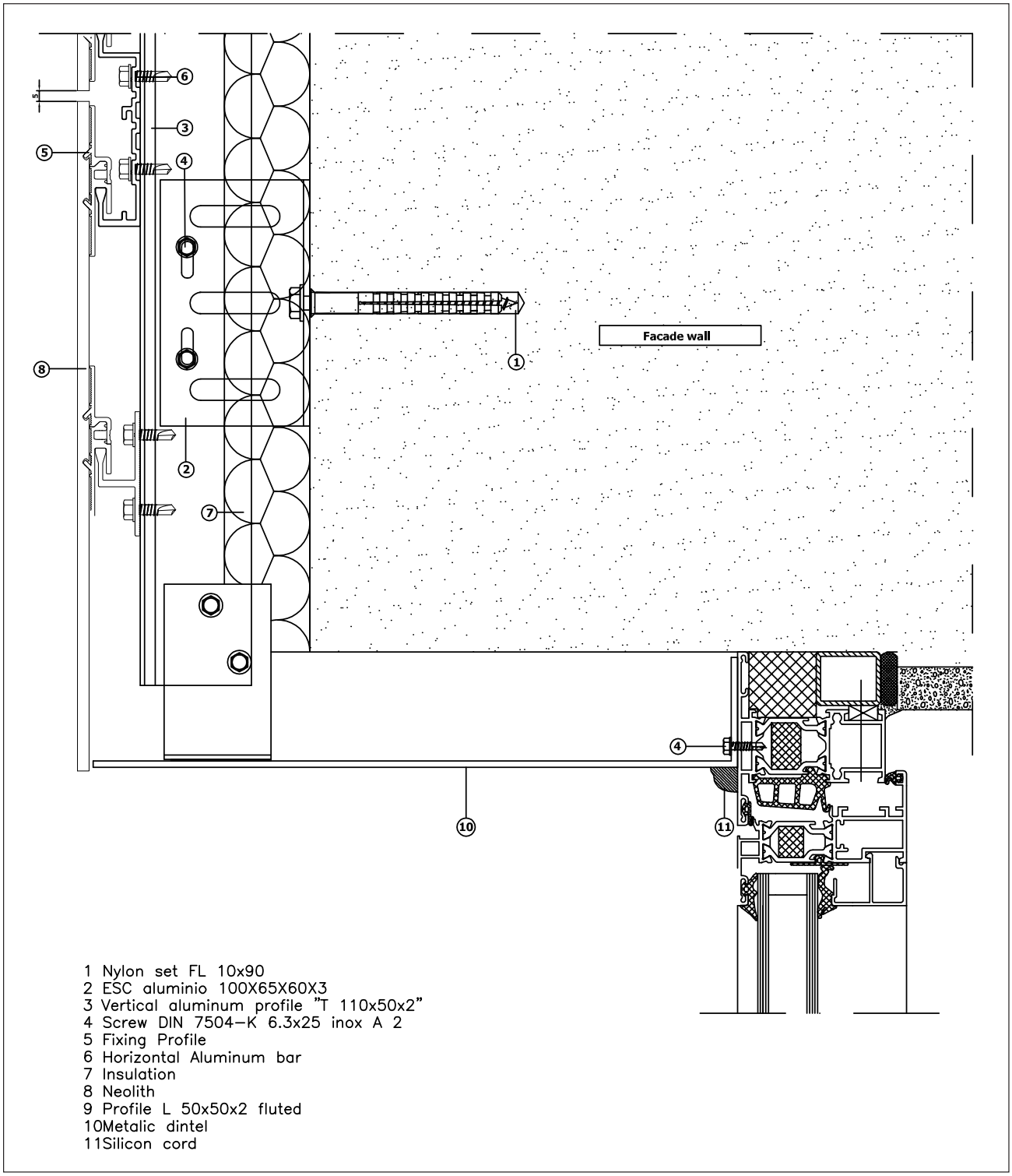
1 Bracket MTA 10x90 inox A2
2 ESC aluminio 100X65X60X3
3 Vertical aluminum profile "T 110x50x2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Fixing Profile
6 Horizontal Aluminum bar
7 Insulation
8 Neolith

Jamb details. VM system. Horizontal section

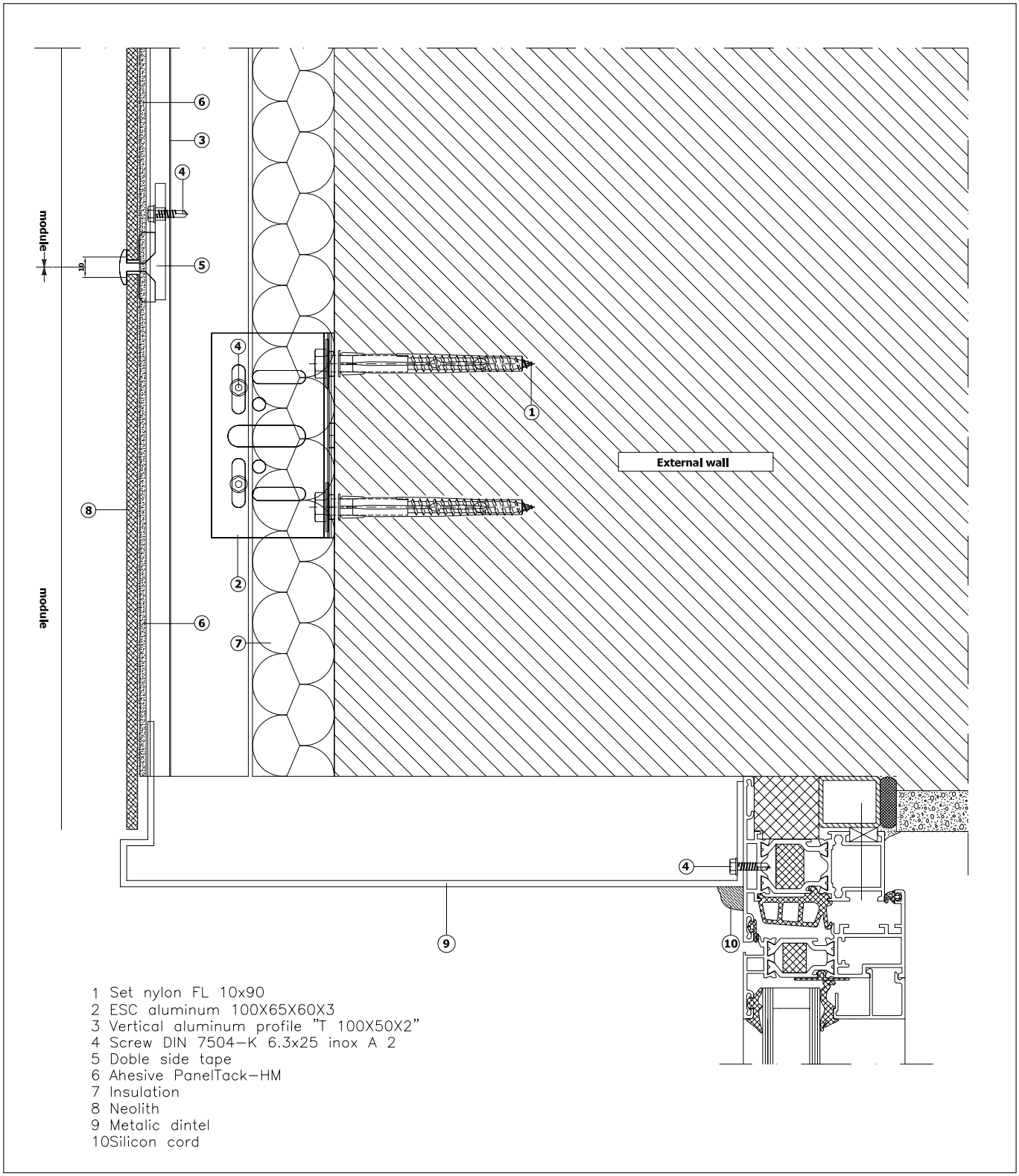


1 Set nylon FL 10x90
2 ESC aluminum 100X65X60X3
3 Vertical aluminum profile "T 100X50X2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Doble side tape
6 Ahesive PanelTack–HM
7 Insulation
8 Neolith
9 L profile 50x50x2 stried

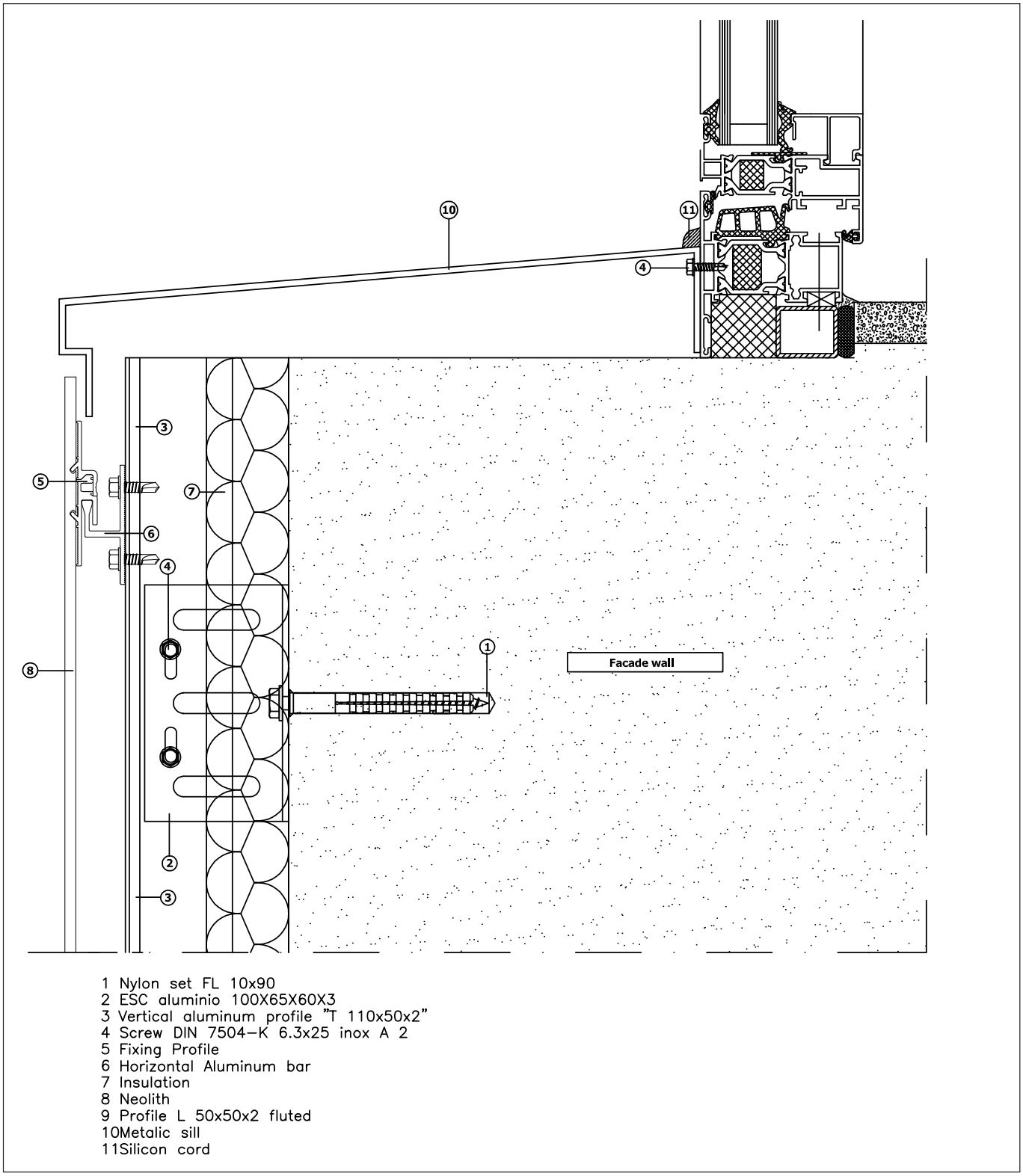
Dintel detail. Strongfix system. Vertical section



Dintel details. VM system. Vertical section



Sill detai. Strongfix system. Vertical section

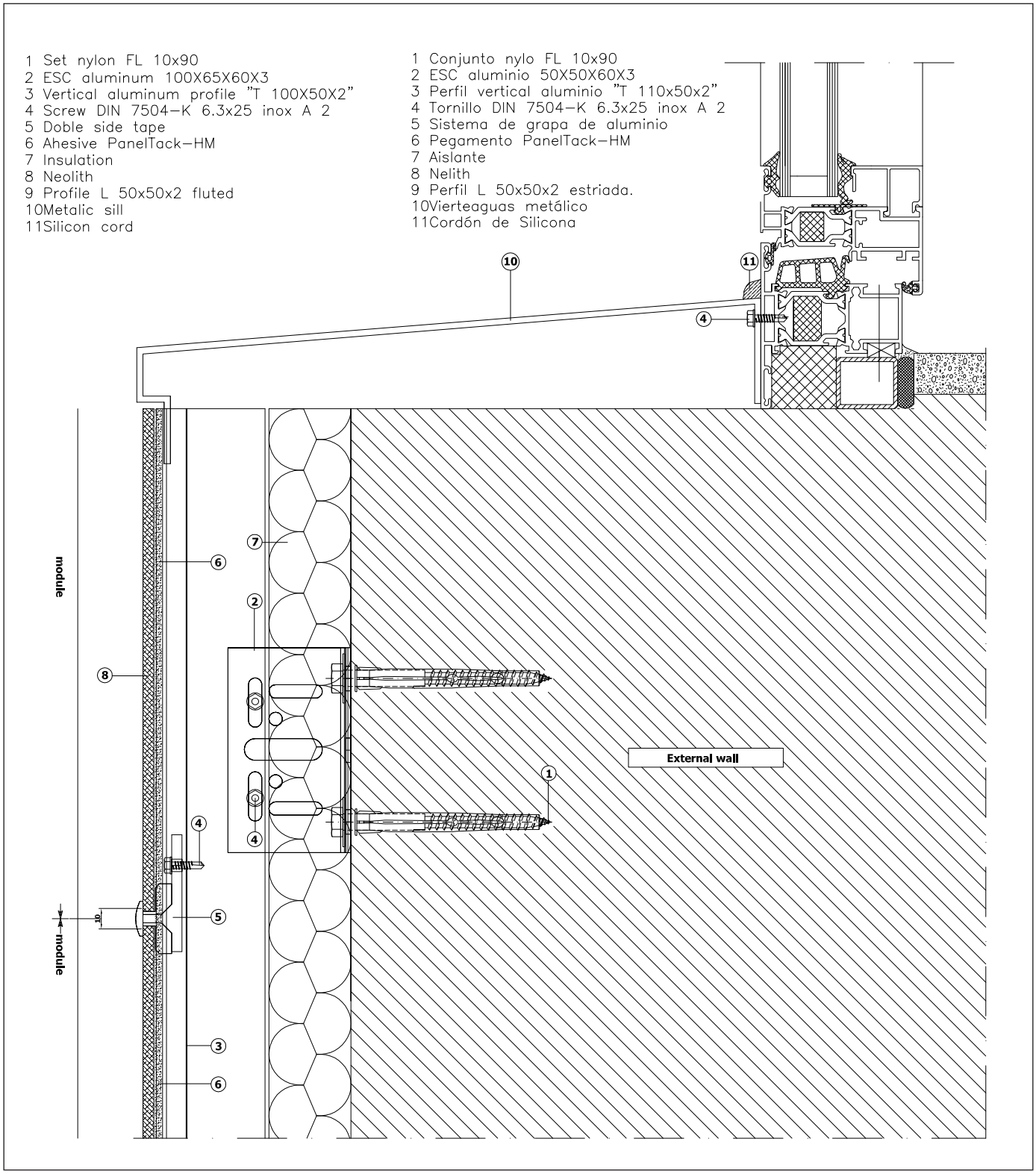


1 Nylon set FL 10x90
2 ESC aluminio 100X65X60X3
3 Vertical aluminum profile "T 110x50x2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Fixing Profile
6 Horizontal Aluminum bar
7 Insulation
8 Neolith
9 Profile L 50x50x2 fluted
10Metalic sill
11Silicon cord

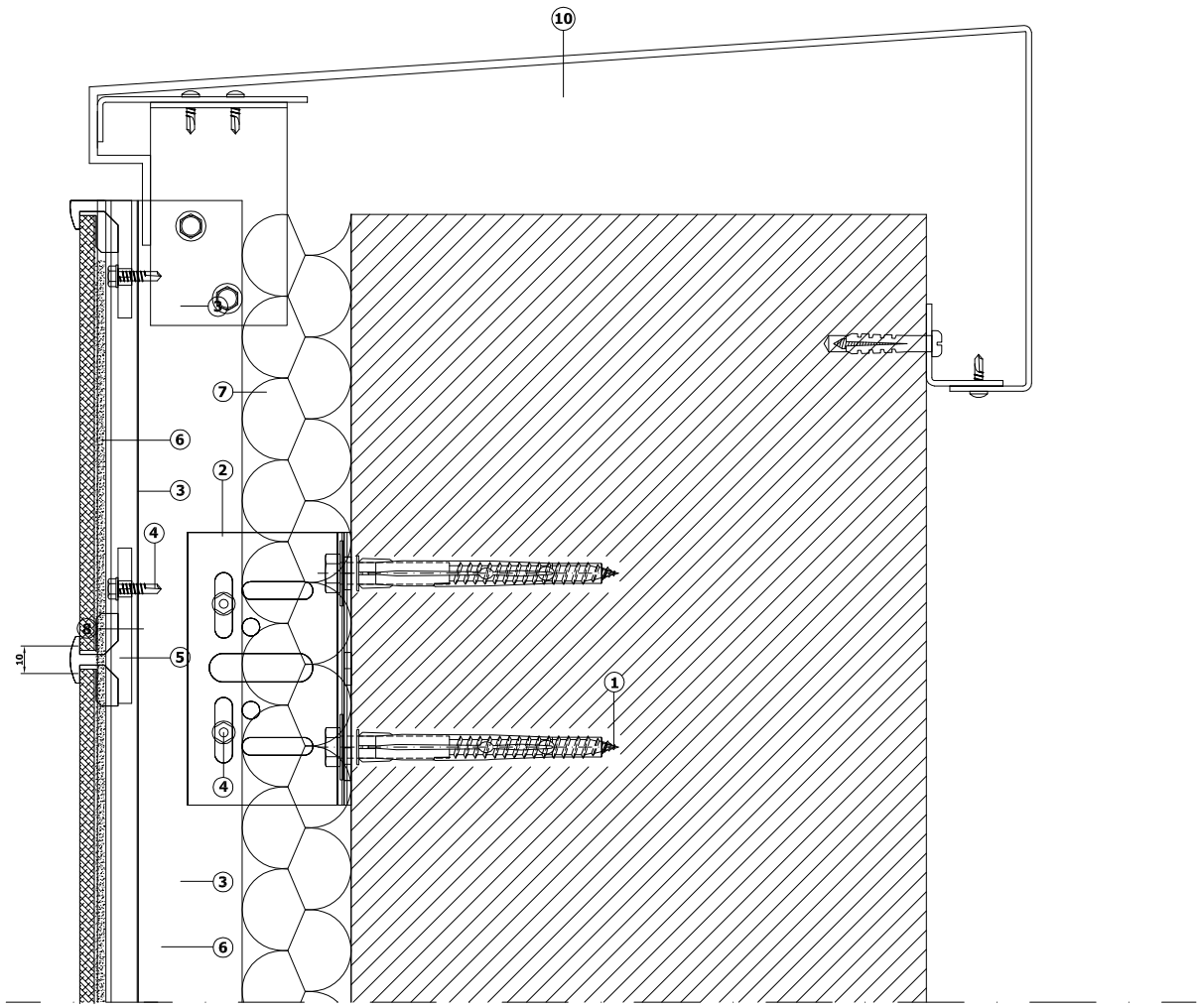
SIII detail. VM system. Vertical section

1 Set nylon FL 10x90
2 ESC aluminum 100X65X60X3
3 Vertical aluminum profile "T 100X50X2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Doble side tape
6 Ahesive PanelTack–HM
7 Insulation
8 Neolith
9 Profile L 50x50x2 fluted
10Metalic sill
11Silicon cord

1 Conjunto nylo FL 10x90
2 ESC aluminio 50X50X60X3
3 Perfil vertical aluminio "T 110x50x2"
4 Tornillo DIN 7504–K 6.3x25 inox A 2
5 Sistema de grapa de aluminio
6 Pegamento PanelTack–HM
7 Aislante
8 Nelith
9 Perfil L 50x50x2 estriada.
10Vierteaguas metálico
11Cordón de Silicona

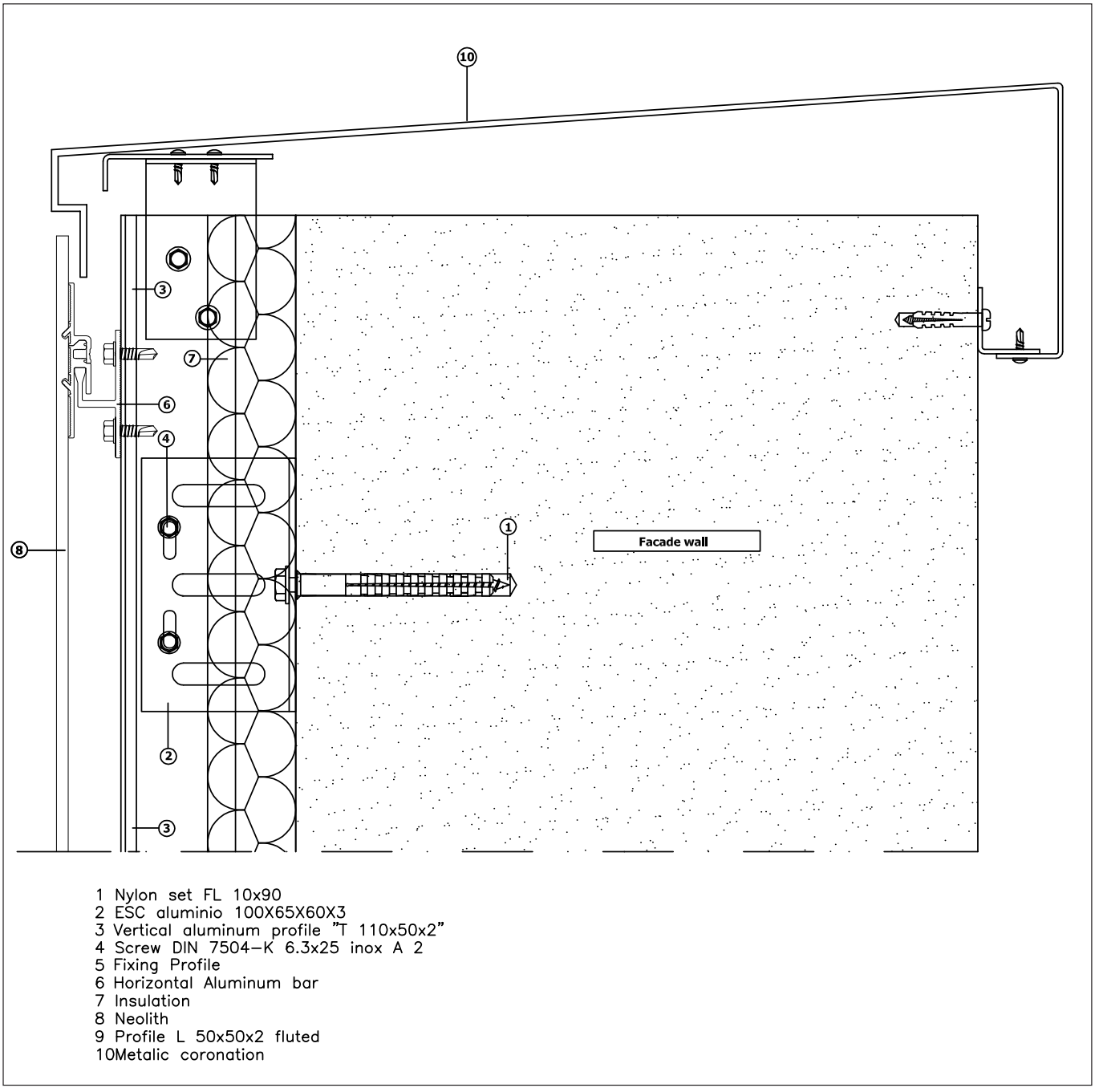


Coronation details. VM system. Vertical section



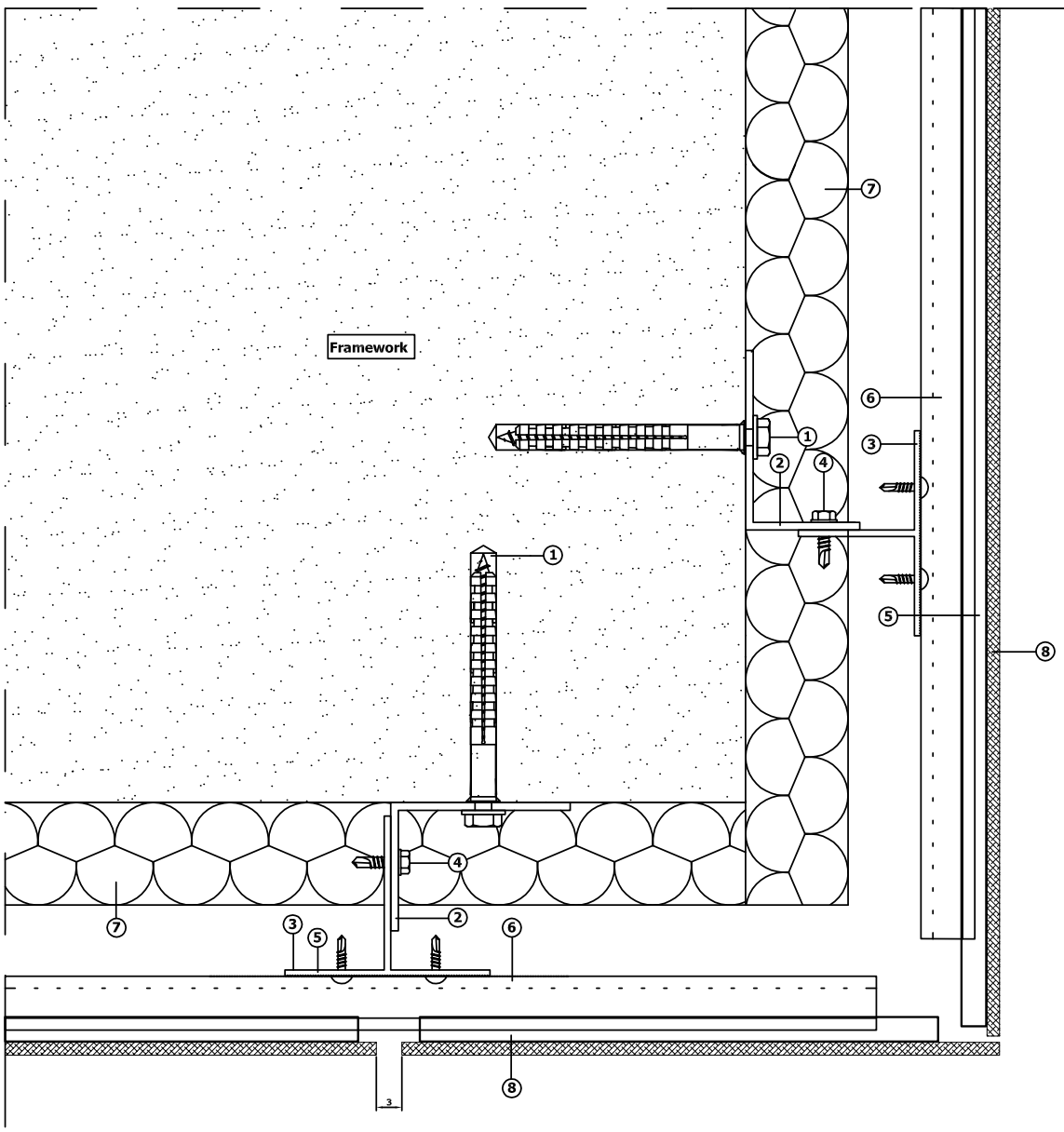
1 Bracket MTA 10x90 inox A2
2 ESC aluminum 100X65X60X3
3 Vertical aluminum profile "T 100X50X2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Aluminum clip system
6 Adhesive PanelTack–HM
7 Insulante
8 Neolith

Coronation detail. Strongfix system. Vertical section



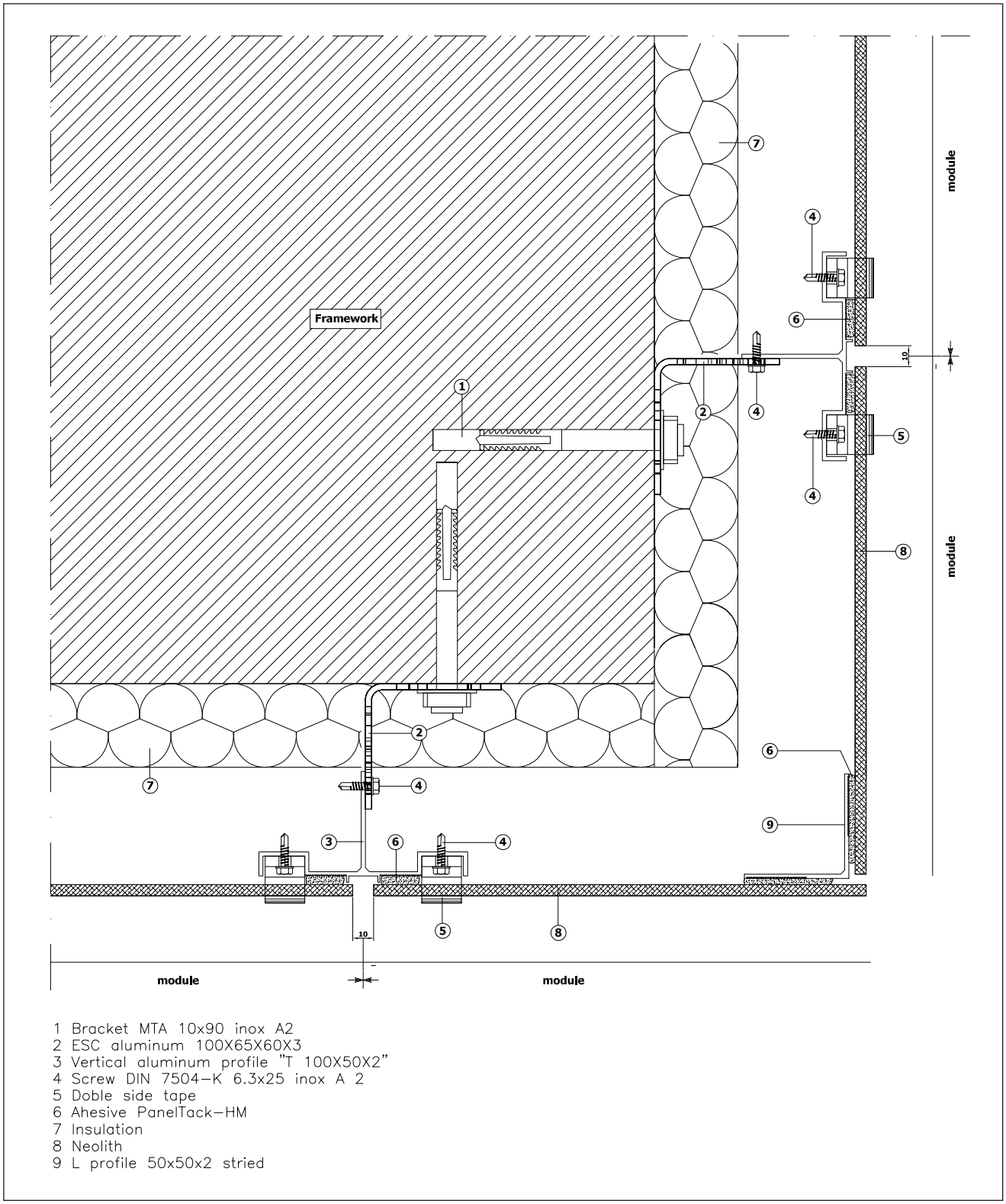
1 Nylon set FL 10x90
2 ESC aluminio 100X65X60X3
3 Vertical aluminum profile "T 110x50x2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Fixing Profile
6 Horizontal Aluminum bar
7 Insulation
8 Neolith
9 Profile L 50x50x2 fluted
10Metalic coronation

Corner detail. Strongfix system. Horizontal section



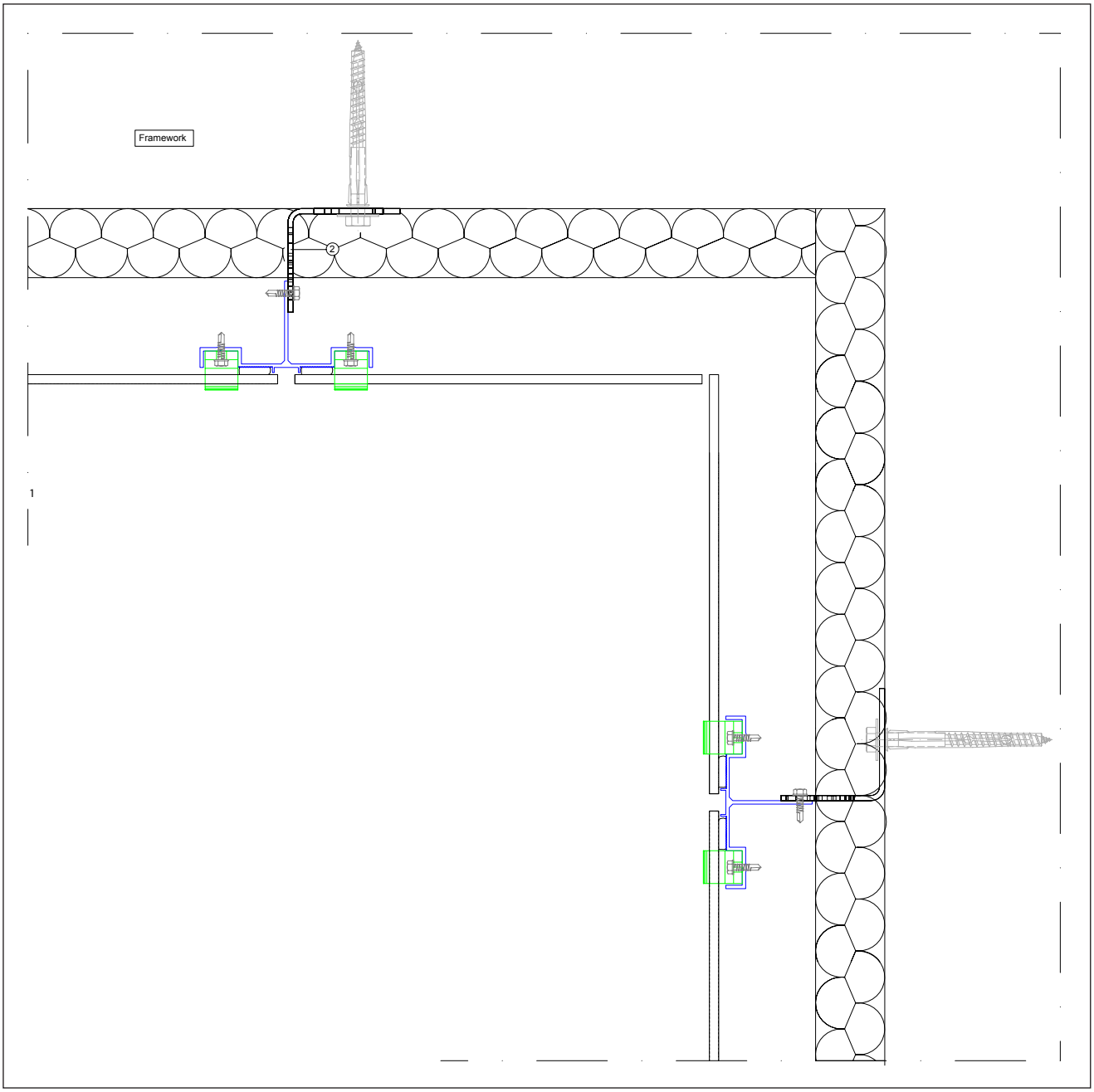
1 Bracket MTA 10x90 inox A2
2 ESC aluminio 100X65X60X3
3 Vertical aluminum profile "T 110x50x2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Fixing Profile
6 Horizontal Aluminum bar
7 Insulation
8 Neolith

Corner detail. VM system. Horizontal section



1 Bracket MTA 10x90 inox A2
2 ESC aluminum 100X65X60X3
3 Vertical aluminum profile "T 100X50X2"
4 Screw DIN 7504–K 6.3x25 inox A 2
5 Doble side tape
6 Ahesive PanelTack–HM
7 Insulation
8 Neolith
9 L profile 50x50x2 stried

Interior corner detail. VM system. Horizontal section



4. Projects

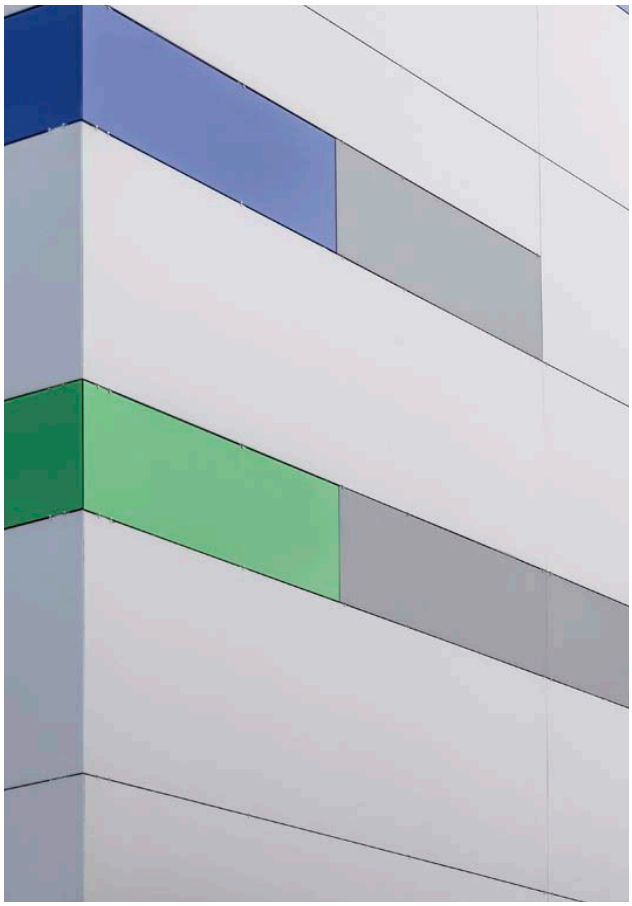


Image 52: Shopping Mall in Madrid, Spain. Façade and flooring. 4.000 sqm. Perla, Colorfeel Collection

Image 53: Shopping Mall in Seoul, South Korea. Façade and interior. 8.000 sqm. Cement, Fusion Collection

Image 54: Office Building in Doha, Qatar. Façade. 13.000 sqm. Nieve, Lava and Rojo Qatar.

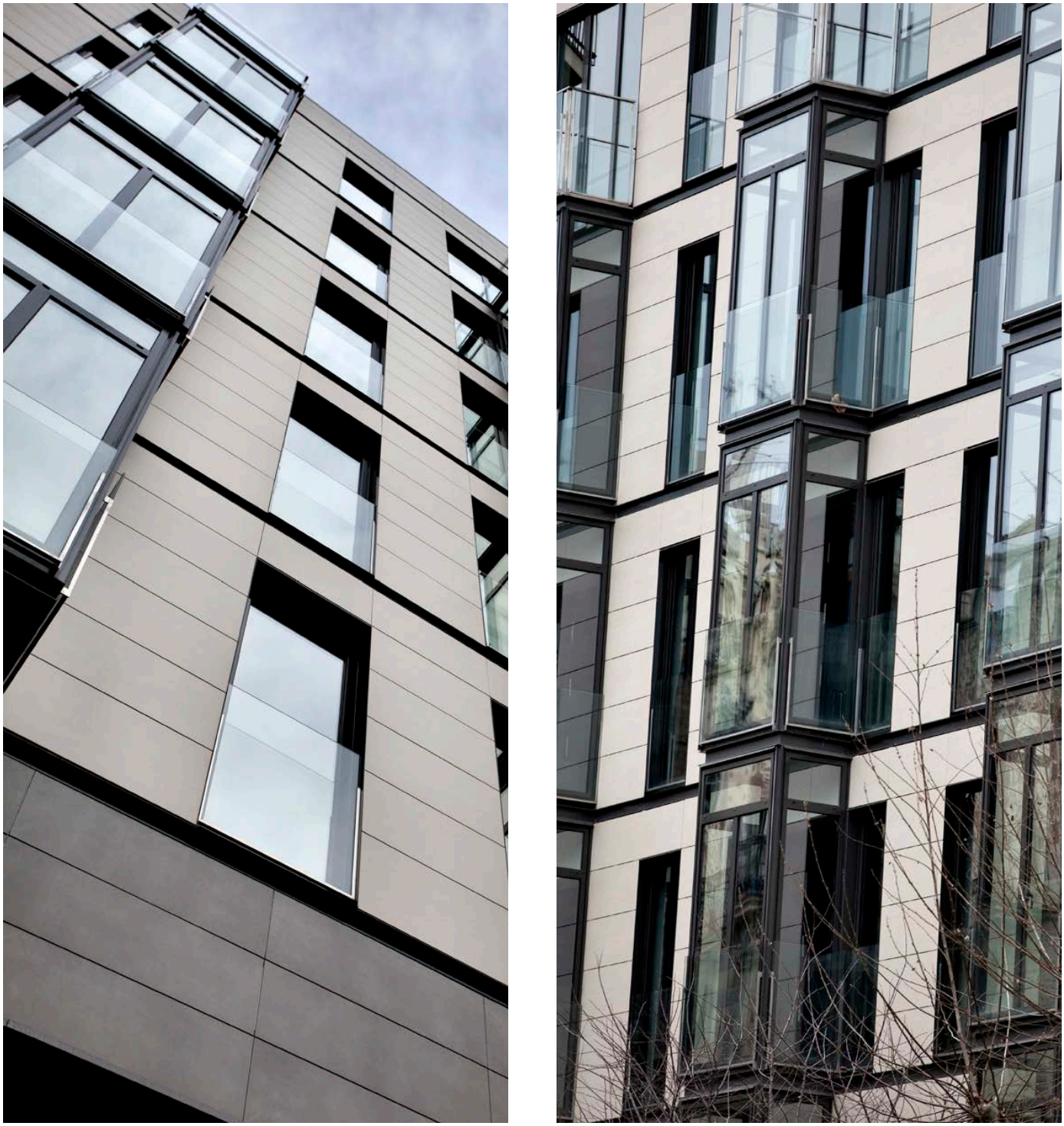


Image 55: Private residential Building in Barcelona, Spain. Façade. 900 sqm. Basalt Beige and Barro, Fusion Collection

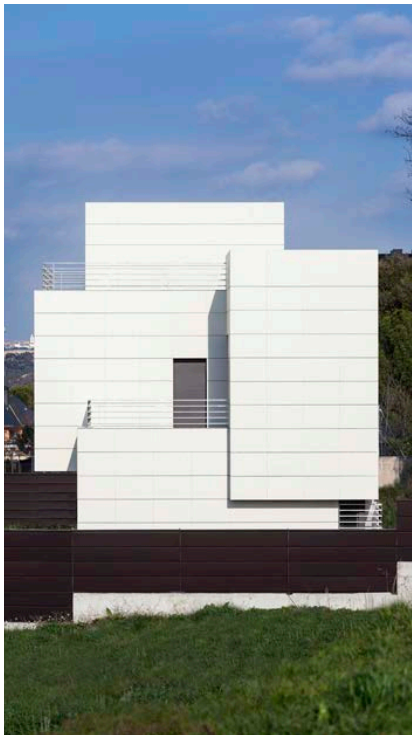


Image 56: Private cottage in Madrid, Spain. Façade. 800 sqm. Nieve, Colorfeel Collection

Image 57: Twin Towers Lusail in Doha, Qatar. Façade. 35.000 sqm. Nieve, Lava, Rojo Qatar, Yellow Qatar and Green Qatar

Image 58: Hospital in Brussels, Belgium. Façade and Interior. 8.000 sqm. Nieve, Colorfeel Collection

5. Standards in accordance testing ETAG 034

This section is intended to provide technical suitability of the product Neolith with Strongfix fastening system developed for use in ventilated facades applications.

The European Regulations in accordance with the EOTA organism (European Organisation for Thecnical Assessment) determines a serie of test with in ETAG Regulation 034 “Edition May 2011 Guideline for European Technical Approval of kits for external walling”, The Size Surfaces in partnership with Wandegar Engineering, explained in the next section the positive technical assessment about the obtained results after testing process marked by EOTA

Testing in accordance with ETAG 034 Regulation:

- **ETAG 034** Edition MAY 2011 GUIDELINE FOR EUROPEAN TECHNICAL APPROVAL of KITS FOR EXTERNAL WALL CLADDINGS.

  Part I: *VENTILATED CLADDING KITS COMPRISING CLADDING COMPONENTS AND ASSOCIATED FIXINGS.*

  Part II: *CLADDING KITS COMPRISING CLADDING COMPONENTS, ASSOCIATED FIXINGS, SUBFRAME AND POSSIBLE INSULATION LAYER.*

- **ISO 7892:1988**. Vertical Building elements. Impact resistance test. Impact bodies and general test procedures.

Test performed and certified by ENSATEC, independent constructing laboratory and outside the company itself to Strongfix fastening system, are additionally attached to this technical document, including:

- VENTILATED FAÇADE TESTING. WINDLOAD RESISTANCE.
- DETERMINATION TO IMPACT RESISTANCE OF SOFT BODY.
- ADHESION RESISTANCE. FREEZE-THAW CYCLES, HEAT, MOISTURE.
- TENSILE STRENGTH OF THE ANCHORING SYSTEM.
- SHEAR STRENGTH OF THE ANCHORING SYSTEMS.

Windload Resistance:

The test for the determination of 6mm + Neolith resistance material and for anchoring system StrongFix, to wind pressure and suction action, determining the deformation and resistance of the architectural solution composed of Neolith and Strongfix fastening system.

Results:

(Pa)	Kg/m2	Mts/sec	Km/h	Miles/Yards
300	30,55	22,31	80,33	49/1610,0
500	50,92	28,81	103,71	64/778,63
1000	101,83	40,74	146,66	91/229,331
1200	122,2	44,63	160,66	99/1459,90
1400	142,57	48,2	173,54	107/1465,70
1500	152,75	49,9	179,63	111/1085,80
3600	366,6	77,3	278,28	172/1610,70

Table 14: List of results of pressure actions and wind suction

Impact resistance of soft body and hard body:

Determination of the impact resistance of soft body and hard body on the ventilated façade solution composed of Neolith adn Strongfix fastening system.

Category	Description
I	Easily accessible zone, at ground level, accessible to the public and vulnerable to impacts of hard bodies, but not subject to abnormal use
II	An area required to impacts of thrown objects or kicks, but in public locations where the unit height will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise the maintenance of it
III	An area not likely to be damaged by normal impacts caused by people, thrown objects or kicks
IV	An area out of reach of ground level

Table 15: Levels of exposition categories

Impact Type		Category IV	Category III	Category II	Category I
0,50 kg	Test 5,4,4,1 Impact 1 Joules	Coating without cracking and / or hairline	-	-	-
0,50 kg	Test 5,4,4,1 Impact 3 Joules	-	Coating without cracking and / or hairline	No damage	No damage
1 KG	Test 5,4,4,1 Impact 10 Joules	-	-	Coating without cracking and / or hairline	No damage
3 KG	Test 5,4,4,2 Impact 10 Joules	No damage	No damage	-	-
3 KG	Test 5,4,4,2 Impact 60 Joules	-	-	No damage	No damage
50 KG	Test 5,4,4,2 Impact 300 Joules	-	-	No damage	-
50 KG	Test 5,4,4,2 Impact 400 Joules	-	-	-	No damage

Table 16: Impact categories

Impact Type		Category IV	Category III	Category II	Category I
0,50 kg	Test 5,4,4,1 Impact 1 Joules	CORRECT	-	-	-
0,50 kg	Test 5,4,4,1 Impact 3 Joules	-	CORRECT	CORRECT	CORRECT
1 KG	Test 5,4,4,1 Impact 10 Joules	-	-	CORRECT	CORRECT
3 KG	Test 5,4,4,2 Impact 10 Joules	CORRECT	CORRECT	-	-
3 KG	Test 5,4,4,2 Impact 60 Joules	-	-	CORRECT	CORRECT
50 KG	Test 5,4,4,2 Impact 300 Joules	-	-	CORRECT	-
50 KG	Test 5,4,4,2 Impact 400 Joules	-	-	-	CORRECT

Table 17: Results

Conclusion: no fissure, cracks, breakage or deformation is detected in the solution composed of Neolith and Strongfix fastening system.

Adhesion resistance, freeze-thaw cycles, heat, moisture:

Test on the behavior of the components of ventilated façade system (Neolith & Strongfix) subject to different weather conditions, on mechanical and adhesive properties of the profiles.

Moisture - Drying Cycles		Freeze-Thaw Cycles	
Conditions	Frequency	Conditions	Frequency
60ºC	7 hours	-15º C temperature	8 hours
Stabilization at 22ºC - 24ºC	1 hour	Submerged at room temperature	16 hours
90% humidity	16 hours	-	-

Table 18: Description of freeze-thaw cycles and moisture and drying for 25 days

Adherence	Load (kgf)	Load (kg/cm2)	Average V. (kg/cm2)	Deviation (%)
Initial	404,3	16,2	16,9	-
	439,1	17,6		
	421,5	16,9		
	415,6	16,6		
	428,7	17,1		
Moisture-Drying Cycles	354,9	14,2	14,6	-13,2
	377,2	15,1		
	361,5	15,5		
	359,8	14,4		
	348,6	13,9		
	371,5	14,9		
Freeze-Thaw Cycles	338,9	13,6	13,2	-21,8
	320,4	12,8		
	330,6	13,2		
	318,2	12,7		
	324,9	13		
	329,6	13,2		
Breaking Type	Cohesive/Adhesive Breaking			

Table 19: Comparative results of the influence of freeze-thaw cycles and moisture-drying

Conclusion: After the freeze-thaw cycles on specimens of 5x5cm, the StrongFix fastening system with Neolith piece is able to withstand a tensile load average of 327.1 kg.

Tensile strength of the anchoring system:

Determinate the behavior of the components which are part of a ventilated façade system subjected to tensile stresses.

Parameters	1	2	3	4	5	Average
Load (kgf)	423,7	414	440,4	428,4	431,5	427,6
Deformation (mm)	10,1	8,9	9,8	10,3	10,3	

Table 20: Results

Conclusion: The tensile strength of the fastening system with self-tapping screws has a resistance of 227.6 kg each pair.

Shear strength of the anchoring system:

Determinate the behavior of the components which are part of a ventilated façade system subjected to shear stresses.

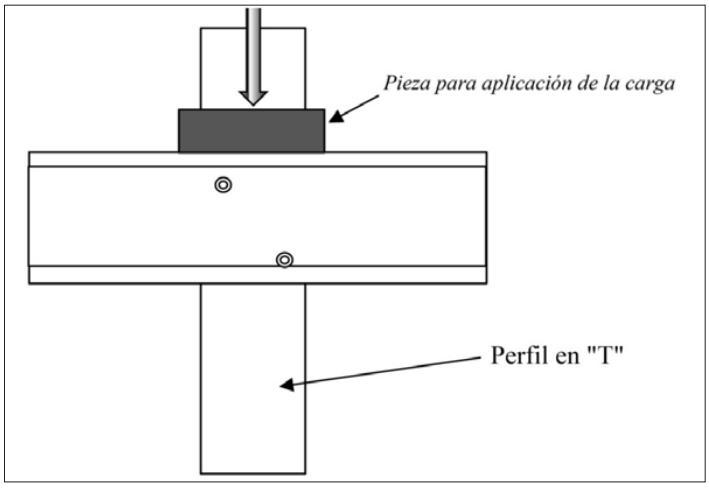


Image 59:

Parameters	1	2	3	4	5	Average
Load (kgf)	1342	1287	1252	1263	1206	1270
Deformation (mm)	14,1	14,8	12	12,6	12,5	

Table 21: Results

Conclusion: The shear strength of the fastening system with self-tapping screws has a resistance of 1270 kg each pair.

NEOLITH
EXTRAORDINARY SURFACE

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