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European Technical Assessment

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General part

Technical Assessment Body issuing the European Technical Assessment:
Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)

Trade name of the construction product

NATURCLAD-W
exposed fixing and hidden fixing

Product family to which the construction product belongs

Kits for external wall claddings mechanically fixed

Manufacturer

PARKLEX PRODEMA INT. S.L.U.
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Manufacturing plant(s)

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This European Technical Assessment contains

23 pages including 4 Annexes, which form an integral part of this assessment. Annex D contains confidential information and is not included in the ETA when is publicly available

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of

EAD 090062-00-0404. Ed. July 2018.
Kits for external wall claddings mechanically fixed

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SPECIFIC PART

1. Technical description of the product

The assessed kits for ventilated external wall claddings mechanically fixed “NATURCLAD-W exposed fixing and hidden fixing” are classified as family A (exposed fixing) and B (hidden fixing), according to table 1.1 of EAD 090062-00-0404: *Kit for external wall claddings mechanically fixed*, edition July 2018 (hereinafter EAD 090062-00-0404).

Kits components are defined in table 1; they are factory produced by the ETA holder or a supplier.

TABLE 1 – DEFINITION OF THE KITS COMPONENTS						
Components		Material			Sizes [mm]	
Cladding element	HPL compact panels for exterior NATURCLAD-W S and NATURCLAD-W F ⁽¹⁾ produced by PARKLEX PRODEMA INT. S.L.U.	High-density, no porous and homogeneous stratified timber panels (figure 4) for external use.			2440 x 1220 x 10 6 ⁽⁶⁾ 8 12 14	
	Respectly EDS ⁽²⁾ and EDF ⁽³⁾ quality and CE marking ⁽⁴⁾ according to Annex ZA of the EN 438-7:2005 ⁽⁵⁾					
Cladding fixings ⁽⁷⁾	Elements used to secure the cladding elements to the subframe ⁽⁸⁾	EXPOSED FIXINGS ⁽⁹⁾	Timber subfr.	Stainless steel A2 self-drilling screw	TW-S-D12 Ø 4.8	L=38 (e _{panel} ≤10mm) L=44 (e _{panel} >10mm)
			Alum. subfr.	Aluminium AlMg5/ Stainless steel A2 rivet	AP 16 Ø 5	L= e _{pan} +e _{per} +Ø _{cuerpo}
				Stainless steel self-drilling screw	SX3-L12 Ø 5,5	L= 28 (e _{panel} ≤10mm) L= 38 (e _{panel} >10mm)
			HIDDEN FIXINGS ⁽¹⁰⁾	Alum. subfr.	Stainless steel A2 self-drilling screws	TB A2 TX30 Ø 6
		Extr. alum. AW 6063 T5 Hanging hook			68.50 x 38 x 50 (th=5)	
		Extr. alum. AW 6063 T5 Horiz. rail			31 x 60 x L (th=3.3)	
		Stainless steel A2 adjustment screw			Ø 8 L=25	
					Stainless steel A2 self-drilling screws (for fix point)	Ø 5.5 L=19.25
Subframe ⁽⁷⁾	Vertical elements ⁽¹¹⁾ used to fasten on the cladding elements by cladding fixings	EXPOSED FIXINGS	Timber subfr.	Wood ⁽¹²⁾ batten	Between 2 panels Intermed. support	80 x 40 40 x 40
		EXPOSED/ HIDDEN FIXINGS	Alum. subfr.	Extruded Aluminium AW 6063 T5 ⁽¹³⁾ profile	Between 2 panels Intermed. support	“T” 80 x 60 (t= 2.5) “L” 40 x 60 (t= 2.5)
	Metallic elements (wall brackets) ⁽¹⁴⁾ used as load transmission between the kit for external wall claddings and the substrate wall	EXPOSED FIXINGS	Timber subfr.	Bended Galvanized steel DX51D – Z275 brackets	L x 50 x 60 (t= 2.5) L= 40-160	
		EXPOSED/ HIDDEN FIXINGS	Alum. subfr.	Extr. alum. AW 6060 T5 Supporting bracket Extr. alum AW 6060 T5 Retention bracket	150 x 40 x L (t= 3) L= 40-160	
					80 x 40 x L (t= 3) L= 40-160	
Subframe fixings ⁽⁷⁾	Screws between brackets and vertical elements and horizontal profiles and vertical element ⁽¹⁵⁾	EXPOSED FIXINGS	Timber subfr.	Hot galvanized hardened steel self-drilling screw	HEX 13 SH Ø 7 L=50	
		EXPOSED/ HIDDEN FIXINGS	Alum. subfr.	Stainless steel A2 self-drilling screw	Ø 5.5 L=25	
Ancillary components ⁽⁷⁾	Tape used to form the joints	EXPOSED FIXINGS	Timber subfr.	Ethylene propylene diene monomer (EPDM)	W=60-100	
Auxiliary components ⁽⁷⁾	Anchorage to substrate ⁽¹⁶⁾	-			-	

(1) Dimensional features, physical – mechanical and weather resistance properties in Annex 1

(2) Panels for exterior use, severe conditions, standard.

(3) Panels for exterior use, severe conditions, fire-retardant

(4) EDS panels – Declaration of Performance 2013071201; EDF panels – Declaration of Performance 2013071202; Certificate of Constancy of Performance 1239/CPR/0801106

(5) EN 438-7:2005 “High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes”

(6) 6 mm thickness is available only for NATURCLAD W S (EDS)

(7) Not manufactured by PARKLEX PRODEMA INT. S.L.U.

(8) See Annex 2

(9) All the thickness (6 mm to 14 mm) of panels are allowed with exposed fixings

(10) Only 10mm, 12mm and 14mm thickness of panels are allowed with hidden fixings

(11) Geometric and mechanical features in Annex B and figure 6.

(12) Technical specifications in Annex B.

(13) Physical and mechanical properties in Annex B.

(14) Geometric and mechanical features in Annex B and figure 5.

(15) Geometric and mechanical features in Annex B.

(16) See Annex C.

When referring to NATURCLAD W in this document it should be understood that both, Standard (S) and Fire Retardant (F) grade are meant.

2. Specification of the intended use in accordance with the applicable EAD

2.1 Intended use

“NATURCLAD-W” kits (exposed and hidden fixing) are intended to be used for ventilated external wall claddings which can be fixed to the external wall of new or existing buildings.

The substrate walls are made of masonry (bricks or blocks), concrete (cast on site or as prefabricated panels), timber or metal frame. Insulation material is defined in accordance with an EN standard or an ETA and is not manufactured by PARKLEX PRODEMA INT. S.L.U.

Kit for ventilated external wall claddings is non-load-bearing construction system. It does not contribute to the stability of the wall on which is installed, neither to ensure the air tightness of the building structure but it can contribute to durability of the works by providing enhanced protection from the effect of weathering.

2.2 Relevant general conditions for the use of the kit

The provisions made in this European Technical Assessment, according to the EAD, are based on an assumed working life of 25 years as minimum, provided that the conditions lay down for the installation, packaging, transport and storage as well as appropriate use, maintenance and repair are met.

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

2.3 Design of kit

The design of the external wall cladding system for ventilated façade using “NATURCLAD-W exposed fixing and hidden fixing” kits should take into account:

- The substrate material to define the suitable anchorages, assuming that the substrate meets the mechanical requirements (resistance to static and dynamic actions) and ensures airtightness, watertightness and water vapour permeability.
- The mechanical characteristic values of the kit components (e.g. cladding elements, cladding fixings and subframe) and the cladding or external wall elements in order to resist the actions (dead loads, wind loads, etc.) applying on the specific work. National safety factor must be used.
- The possible movements of the substrate and the position of the building expansion joints.
- The dilatation of the kit components and of the panels.
- The category of corrosivity of the atmosphere of the works ⁽¹⁷⁾.
- Because joints are not watertight, materials with low water absorption must be used as first layer behind ventilated air space.
- Insulation layer, usually fixed on the external wall should be defined in accordance with a harmonized standard or a European technical assessment.
- The construction of façade specific parts (e.g. base, top, corners, windows etc.)
- If the entire building must comply with the specific building regulations, particularly concerning fire and wind-load resistances, of the Member State where the work is to be built.

2.4 Installation of kit in works

Installation has to be carried out according to the ETA holder’s specifications and using the specific kit components, manufactured by the ETA holder or by suppliers recognized by the ETA holder.

Installation should be carried out by professional, trained staff and under the supervision of the technical responsible of the site.

2.5 Use, maintenance and repair of the works

Maintenance of the assembled systems or kit components includes inspections on site, taking into account the following aspects:

(17) E.g. see table 1 of Standard EN ISO 12944-2: 2018. Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Part 2: Classification of environments.

- Regarding the cladding elements appearance of any damage such as cracking or detachment due to permanent and irreversible deformation.
- Regarding metallic components: presence of corrosion or water accumulation.

Necessary repairs should be done rapidly, using the same kit components and following the repair instructions given by ETA holder.

3. Performance of the product and references to the methods used for its assessment

The assessment of “NATURCLAD-W exposed fixing and hidden fixing” kits according to the Basic Work Requirements (BWR) was carried out in compliance with the EAD 090062-00-0404. The characteristics of the components shall correspond to the respective values laid down in the technical documentation of this ETA, checked by IETcc.

In table 2 a summary of “NATURCLAD-W exposed fixing and hidden fixing” kits performance.

TABLE 2 – SUMMARY OF NATURCLAD-W KITS PERFORMANCE						
Basic Works Requirement	Nº	Essential characteristic		ETA section	Performance	
BWR 2 Safety in case of fire	1	Reaction to fire		3.1	NATURCLAD-W S C-s1, d0 (t ≥ 6 mm)	
					NATURCLAD-W F B-s1, d0 (t ≥ 8 mm)	
	2	Façade fire performance		--	Not assessed	
	3	Propensity to undergo continuous smouldering		--	Not assessed	
BWR 3 Hygiene, health and the environment	4	Watertightness of joints (protection against driving rain)		3.2	Not watertight (open joints)	
	5	Water absorption		--	Not relevant (use in ventilated façades)	
	6	Water vapour permeability		--	Not relevant (use in ventilated façades)	
	7	Drainability		3.3	See § 3.3 and figures 13 to 19	
	8	Content and/or release of dangerous substances		--	Not assessed	
BWR 4 Safety and accessibility in use	9	Wind load resistance		3.4	Exposed f. / wood subframe	3000 Pa
					Exposed f. / aluminium subframe	4000 Pa
					Hidden fixing	3400 Pa
	10	Resistance to horizontal point loads		--	Not assessed	
	11	Impact resistance		3.5	Exposed f. / wood subframe	Category I
					Exposed f. / aluminium subframe	Category I
					Hidden fixing	Category I
	12	Mechanical resistance of cladding elements	Bending strength of cladding element	3.6	See § 3.6	
	15	Mechanical resistance of connection between the cladding element and the cladding fixing	Pull-through resistance	3.7	Exposed fixing	See table 5
	16		Pull-through resistance under shear loads	3.8	Exposed f. / wood subframe	See table 6
					Exposed f. / aluminium subframe	
	17		Axial tension resistance	3.9	Hidden fixing	See table 7
	18		Shear load resistance	3.10	Hidden fixing	See table 8
19		Combined tension and shear load resistance	3.11	Hidden fixing	See table 9	
24	Resistance of profile		3.12	See § 3.12 and annex B		
25	Subframe fixings	Tension/pull out resistance	--	Not assessed		
26		Shear load resistance	--	Not assessed		
27	Brackets resistance (horizontal and vertical)		3.13	See tables 10 and 11		
BWR 5 Protection against noise	28	Airborne sound insulation		--	Not assessed	
BWR 6 Energy economy and heat retention	29	Thermal resistance		--	Thermal insulation is not a kit component	

Durability	30	Hygrothermal behaviour	3.14	Exposed f. / aluminium subframe and Hidden fixing	None of the defects specified in EAD were observed
	31	Behaviour after pulsating load	3.15	Hidden fixing	See table 12
	32	Freeze-thaw resistance of cladding element	3.16	Exposed f. / aluminium subframe	See table 13
				Hidden fixing	See table 14
	33	Behaviour after immersion in water of cladding element	3.17	Exposed f. / aluminium subframe	See table 15
				Hidden fixing	See table 16
	34	Dimensional stability	3.18	See table 17	
	35	Chemical and biological resistance of the cladding elements	--	Not assessed	
36	UV radiation resistance of the cladding elements	3.19	See § 3.19		
37	Corrosion of metal components	3.20	See § 3.20		

3.1 Reaction to fire – BWR 2

The Euro class of NATURCLAD-W panels according to standard EN 13501-1:2018⁽¹⁸⁾ is:

NATURCLAD-W S (EDS) C-s1, d0 (thickness ≥ 6 mm)

NATURCLAD-W F (EDF) B-s1, d0 (thickness ≥ 8 mm)

This classification is valid for the NATURCLAD-W S and F. Mentioned products are high pressure compact laminates available in thicknesses from 6 mm to 14 mm (EDS grade) and 8 mm to 14 mm (EDF grade). The products are produced and tested in accordance with EN 438-7:2005. The reaction to fire declaration is valid as long as the insulation layer placed in the ventilated air space is made of a non-combustible material (e.g. mineral wool) or there is no insulation in the cavity and the substrate are wood based substrates or are substrates of Euro classes A1 and A2-s1,d0.

In other cases, the class of reaction to fire is NPA (No performance assessed).

A European reference fire scenario has not been laid down for facades. In some Member States, the classification of external wall cladding kits according to Standard EN 13501-1 might not be sufficient for the use in facades. An additional assessment of the system according to the national provision (e.g. based on a large-scale test) might be necessary to comply with Member State Regulations, until the existing European classification system has been completed.

3.2 Watertightness of joints (protection against driving rain) – BWR 3

Joints between the cladding elements in the external wall claddings for ventilated façades are open, therefore NATURCLAD-W kits are not watertight⁽¹⁹⁾.

3.3 Drainability – BWR 3

On the basis of the construction details (see figures 13 to 19), the available technical knowledge, experience and the installation criteria, it is considered that the water which penetrates into the air space or the condensation water can be drained out from the cladding kit without accumulation of water, moisture damage or leakage into the substrate.

3.4 Wind load resistance – BWR 4

Wind load resistance has been tested according to § 2.2.9 and the method specified in Annex E of EAD. The kit behaviour exposed to wind pressure is most favourable than when exposed to wind suction. Therefore, wind pressure tests have been avoided and wind pressure resistance of kit can be considered as equal to wind suction resistance.

(18) EN 13501-1:2018 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

(19) Even if the joint are open the ventilated façade does not decrease the protection against rain, because the ventilation gap functions as a compensation room, which ensures that, in a worst-case scenario, driving rain is drained over the back of the cladding, protecting the thermal insulation from wetness. So any moisture that might enter the ventilated space between insulating material and cladding can easily be removed.

The worst case has been tested⁽²⁰⁾: minimum thickness admitted for the kit, maximum span between cladding fixings and subframe components.

a. NATURCLAD-W exposed fixing (family A)

Cladding elements 6 mm (minimum thickness allowable for exposed fixing NATURCLAD-W kit)
 Fixings Maximum distance between cladding fixings in horizontal direction H=400mm.
 Maximum distance between cladding fixings in vertical direction V=400mm in panel with 2 vertical fixings and V=600 mm in panel with 3 vertical fixings.

The test results for the tested specimens are indicated in table 3.

TABLE 3 – WIND SUCTION TEST RESULT			
TEST SPECIMEN	MAXIMUM LOAD Q (Pa)	TYPE OF FAILURE	DISPLACEMENT UNDER MAXIMUM LOAD (mm)
NATURCLAD-W exposed fixing Wood subframe Brackets distance: 800mm Vertical profile distance 400mm	3200 ⁽²¹⁾	No failure	13.11
NATURCLAD-W exposed fixing Aluminum subframe Brackets distance: 800mm Vertical profile distance 400mm	4000 ⁽²²⁾	No failure	19.45

b. NATURCLAD-W hidden fixing (family B)

Cladding elements 10 mm (minimum thickness allowable for hidden fixing NATURCLAD-W kit)
 Fixings Maximum distance between cladding fixings in horizontal direction H=600mm.
 Maximum distance between cladding fixings in vertical direction V=600mm.

The test results for the tested specimen are indicated in table 4.

TABLE 4 – WIND SUCTION TEST RESULT			
TEST SPECIMEN	MAXIMUM LOAD Q (Pa)	TYPE OF FAILURE	DISPLACEMENT UNDER MAXIMUM LOAD (mm)
NATURCLAD-W hidden fixing Aluminum subframe Brackets distance: 800mm Vertical profile distance 1000mm	3600 ⁽²³⁾	No failure	18.17

3.5 Impact resistance – BWR 4

Impact resistance has been assessed according to § 2.2.11 and the method specified in Annex G of EAD.

According with the test results the use category⁽²⁴⁾ of “NATURCLAD-W exposed fixing and hidden fixing” kits for vertical exterior wall claddings is the Category I

3.6 Bending strength of cladding element – BWR 4

Bending strength of the cladding element, tested according to EN ISO 178: 2019, is included in DoP:

- 2013071201 EDS panels
- 2013071202 EDF panels (CCP 1239/CPR/0801106)

NATURCLAD-W panels satisfy the requirements defined in table 3 § 5.4.1 of EN 438-6: 2016⁽²⁵⁾.

(20) Characteristics of component are indicated in Annex 1 and 2

(21) The test had to be stopped at 3200Pa because the equipment did not achieve stabilization. No failure occurs.

(22) Maximum load allowed by the test equipment.

(23) The test had to be stopped at 3600Pa because the equipment did not achieve stabilization. No failure occurs.

(24) The definition of use categories is given in table G.2, annex G of EAD. These categories correspond to the degrees of exposure in use.

Table G.2 – Impact use categories	
Category	Use
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use (e.g.: façade bases in buildings sited in public locations, such as squares, schoolyards or parks. Cleaning gondolas may be used on the façade).
II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit 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 care (e.g.: Façade bases in buildings not sited in public locations – e.g. squares, schoolyards, parks. – or upper façade levels in buildings sited in public locations that occasionally can be hit by a thrown object – e.g. ball, stone, etc.- Cleaning gondola may be used on the façade).
III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects (e.g.: Upper façade levels in buildings – not including base – not sited in public locations, that occasionally can be hit by a thrown object – e.g. ball, stone, etc.- Cleaning gondola may be used on the façade).
IV	A zone out of reach from ground level (e.g. High façade levels that cannot be hit by a thrown object. Cleaning gondola may be used on the façade).

(25) EN 438-6: 2016 “High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 6: Classification and specifications for Exterior-grade compact laminates of thickness 2 mm and greater”.

3.7 Pull-through resistance – BWR 4

Pull-through resistance for NATURCLAD-W exposed fixing kits (Family A) has been assessed according to § 2.2.12.4 and the method specified in section I.1.1 of Annex I of EAD. Tests was carried out used rivet as cladding fixings.

Mean and characteristic values are indicated in table 5.

TABLE 5 - PULL-THROUGH RESISTANCE OF NATURCLAD-W EXPOSED FIXING					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION (Aluminum rivet)	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
6	180	Centre	2054	1938	Panel
		Border	1139	951	Rivet
		Corner	666	605	Panel
	270	Centre	1537	1322	Panel
		Border	925	848	Rivet
		Corner	341	263	Panel
	350	Centre	1582	1260	Panel
		Border	767	682	Panel
		Corner	232	201	Panel
12	180	Centre	2548	948	Rivet deformation
		Border	3218	1930	Rivet
		Corner	1242	848	Panel
	270	Centre	3194	1685	Rivet
		Border	3549	2842	Rivet
		Corner	799	501	Panel
	350	Centre	3312	2918	Rivet
		Border	3035	1746	Rivet
		Corner	718	558	Panel

3.8 Pull-through resistance under shear loads – BWR 4

Pull-through resistance under shear loads for NATURCLAD-W exposed fixing kits (Family A) has been assessed according to § 2.2.12.5 and the method specified in section I.2 of Annex I of EAD.

Mean and characteristic values are indicated in table 6.

TABLE 6 - PULL-THROUGH RESISTANCE UNDER SHEAR LOAD OF NATURCLAD-W EXPOSED FIXING			
PANEL THICKNESS (mm) (mechanically weakest case)	FAILURE LOAD (N)		FAILURE MODE
	F _m	F _{u,5}	
6 Wood subframe	3950.20	3815.83	Screw deformation
6 Aluminium subframe + Aluminium rivet	3415.76	3220.90	Rivet

3.9 Axial tension resistance – BWR 4

Axial tension resistance for NATURCLAD-W hidden fixing kit (Family B) has been assessed according to § 2.2.12.6 and the method specified in section I.3 of Annex I of EAD.

Mean and characteristic values of test are indicated in table 7.

TABLE 7 – AXIAL TENSION RESISTANCE OF NATURCLAD-W HIDDEN FIXING					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
10 (mechanically weakest case)	180	Centre	2723.5	1098.3	Cladding element
	270	Centre	2802.2	2399.1	
	350	Centre	2886.2	2069.8	

3.10 Shear load resistance – BWR 4

Shear load resistance for NATURCLAD-W hidden fixing kit (Family B) has been assessed according to § 2.2.12.7 and the method specified in section I.4 of Annex I of EAD.

Mean and characteristic values of test are indicated in table 8.

TABLE 8 - SHEAR LOAD RESISTANCE OF NATURCLAD-W HIDDEN FIXING			
PANEL THICKNESS (mm) (mechanically weakest case)	FAILURE LOAD (N)		FAILURE MODE
	F _m	F _{u,5}	
10	4826	4216.5	Cladding element

3.11 Combined tension and shear load resistance – BWR 4

Combined tension and shear load resistance for NATURCLAD-W hidden fixing kit (Family B) has been assessed according to § 2.2.12.8 and the method specified in section I.5 of Annex I of EAD.

Mean and characteristic values of test are indicated in table 9.

TABLE 9 – COMBINED TENSION AND SHEAR LOAD RESISTANCE OF NATURCLAD-W HIDDEN FIXING						
PANEL THICKNESS (mm) (mechanically weakest case)	ANGLE	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
				F _m	F _{u,5}	
10	30°	350	Centre	1160	933	Cladding element
	60°	350	Centre	975.9	372.0	

3.12 Resistance of profiles – BWR 4

Resistance of kit profiles has been assessed according to section 2.2.10 of EAD.

The following characteristics of the profiles and the subframe profiles are given in the relevant tables of Annex B:

- Form and dimensions of the profile section.
- Inertia of the profile section.

3.13 Brackets resistance (vertical and horizontal) – BWR 4

Brackets load bearing capacity and deformation under loading (vertical and horizontal load) have been assessed according to § 2.2.12.16 and the method specified in Annex L.

Calculation results of brackets resistance to vertical load are indicated in table 10.

TABLE 10: RESISTANCE TO VERTICAL LOAD OF BRACKETS – CALCULATION RESULT					
BRACKETS DIMENSIONS		F _r (N) ΔL=0.2% de L Residual distortion	F _{1d} (N) ΔL=1mm Displacement	F _{3d} (N) ΔL=3mm Displacement	F _s (N) Failure
ALUMINIUM	(60+40) x 80 x 3	1200	950	1800	Purposeless
	(100+40) x 80 x 3	1000	620	1410	Purposeless

Calculation results of brackets resistance to horizontal load are indicated in table 11.

TABLE 11: RESISTANCE TO HORIZONTAL LOAD OF BRACKETS – CALCULATION RESULT			
BRACKETS DIMENSIONS		F _m (N) ΔL=1mm Residual distortion	F _t (N) Failure
ALUMINIUM	(60+40) x 80 x 3	3760	Purposeless
	(100+40) x 80 x 3	4050	Purposeless

3.14 Hygrothermal behaviour – Durability

The hygrothermal behaviour for NATURCLAD-W fixing kits has been tested according to § 2.2.15.1 and the method specified in section M.1 of Annex M of EAD.

During the test cycles, none of the following defects occurs:

- deterioration such as cracking or delamination of the cladding element that allows water penetration to the insulation
- detachment of the cladding element
- Irreversible deformation

This system is therefore assessed as resistant to hygrothermal cycles.

The joint in NATURCLAD-W fixing kits are not watertight so the insulation layer should be composed by materials with low water absorption (such as insulation products made of MW according to EN 13162).

3.15 Behaviour after pulsating load – Durability

Behaviour after pulsating load for NATURCLAD-W hidden fixing kit (Family B) has been assessed according to § 2.2.15.2 and the method specified in section M.2 of Annex M of EAD.

Mean and characteristic values of test are indicated in table 12.

TABLE 12 – AXIAL TENSION RESISTANCE OF NATURCLAD-W HIDDEN FIXING AFTER PULSATING LOAD					
PANEL THICKNESS	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
10 (mechanically weakest case)	350	Centre	2750.5	1521.7	Cladding element

3.16 Freeze-thaw resistance – Durability

Freeze-thaw resistance for NATURCLAD-W exposed and hidden fixing kit (Family A and B) has been assessed, according to § 2.2.15.3, by means of the following mechanical resistance tests after completion of the freeze-thaw cycles, according to EN 494:2012+A1.

Mean and characteristic values of test are indicated in tables 13 and 14.

TABLE 13 –PULL-THROUGH RESISTANCE OF NATURCLAD-W EXPOSED FIXING AFTER FREEZE-THAW CYCLES					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION (Aluminum rivet)	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
6	180	Border	1139.65	1084.25	Panel
		Corner	612.80	480.15	
	270	Border	754	680.40	
		Corner	331.30	306.82	
	350	Border	637.85	580.20	
		Corner	226.10	190.60	
12	180	Border	3574.65	2963.55	Rivet
		Corner	1088.15	660	Panel
	270	Border	3482.65	2720.55	Panel/Rivet
		Corner	979.65	751	Panel
	350	Border	2986.05	2440.25	Panel/Rivet
		Corner	712.65	445.95	Rivet

TABLE 14 – AXIAL TENSION RESISTANCE OF NATURCLAD-W HIDDEN FIXING AFTER FREEZE-THAW CYCLES					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
10 (mechanically weakest case)	350	Centre	2671.3	1616.4	Cladding element

3.17 Behaviour after immersion in water – Durability

Behaviour after immersion in water for NATURCLAD-W exposed and hidden fixing kit (Family A and B) has been assessed, according to § 2.2.15.4, by means of the following mechanical resistance tests after immersion in water, according to EN 494:2012+A1.

Mean and characteristic values of test are indicated in tables 15 and 16.

TABLE 15 –PULL-THROUGH RESISTANCE OF NATURCLAD-W EXPOSED FIXING AFTER IMMERSION IN WATER					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION (Aluminum rivet)	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
6	180	Border	1144	918.30	Panel
		Corner	628.75	472.50	
	270	Border	833	706.45	
		Corner	323.75	260.70	
	350	Border	644.50	567.75	
		Corner	254.06	206.45	
12	180	Border	3534	2941	Rivet
		Corner	1495	707.40	
	270	Border	2903.45	2477.61	
		Corner	872.4	473.30	
	350	Border	2966.85	2762.20	
		Corner	671.3	580.55	

TABLE 16 – AXIAL TENSION RESISTANCE OF NATURCLAD-W HIDDEN FIXING AFTER IMMERSION IN WATER					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
10 (mechanically weakest case)	350	Centre	2367.2	1764.9	Cladding element

3.18 Dimensional stability – Durability

Dimensional stability at elevated temperature of NATURCLAD-W panels has been determined according to EN 438-2: 2016⁽²⁶⁾ (section 17).

NATURCLAD-W panels satisfy the requirements defined in table 3 § 5.4.1 of EN 438-6:2016. The test results are indicated in table 17.

TABLE 17 – ACCUMULATED DIMENSIONAL VARIATION		
PANEL THICKNESS (mm)	DIRECTION	ACCUMULATED DIMENSIONAL VARIATION (%)
6	Longitudinal	0.136
	Transverse	0.218
12	Longitudinal	0.033
	Transverse	0.043
14	Longitudinal	0.043
	Transverse	0.088

3.19 UV radiation resistance of the cladding elements – Durability

The UV radiation resistance has been tested according to EN 438-2 section 28 on NATURCLAD-W samples with the following references: PALE, AMBAR, ONIX, ANTRA, RUSTIK, RUBI, SILVER, QUARTZ, NUX, BOREAL, CHESNUT, COFFEE, HAZEL, COCOA.

Based on the test results after accelerating ageing from UV radiation the colour stability is satisfactory for the reference of colour tested.

3.20 Corrosion of metal components

Fixings and subframe components are made of:

- Aluminium alloy AW-6060 and 6063 according to EN 573, EN 755 and EN 1999-1-1 and their minimum thickness is 2mm.

The durability class is B according to EN 1999-1-1:2007/A1:2009⁽²⁷⁾ (Table 3.1a and Table.C.1 in Annex C). Therefore, these components may be used in the following external atmospheric exposure: rural environment, moderate industrial/urban environment, but excluding industrial marine environment. These components may be used in other external atmospheric conditions exposure if the components are protected as indicated in EN 1999-1-1.

- A2 (AISI 304) stainless steel according to EN ISO 3506-1.

The category of corrosivity is C4 (High) according to EN 1993-1-4:2006⁽²⁸⁾ (Table A.1 in Annex A) and EN ISO 9223: 2012⁽²⁹⁾ (Table C.1 in Annex C). Therefore, these components may be used in indoor environments with high frequency of condensation and high pollution from production process (e.g. industrial processing plants, swimming pools) and in outdoor environments, temperate zone, with high pollution (e.g. polluted urban areas, industrial areas, coastal areas without spray of salt water) or, subtropical and tropical zone, with medium pollution.

- Galvanized steel DX51D with Z275 treatment according to EN 10346⁽³⁰⁾.

(26) EN 438-2:2016+A1:2019 “High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called Laminates) - Part 2: Determination of properties”

(27) EN 1999-1-1:2007+A1:2009 “Eurocode 9. Design of aluminium structures - Part 1-1: General structural rules”.

(28) EN 1993-1-4:2006 “Eurocode 3 Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels”.

(29) EN ISO 9223:2012 “Corrosion of metals and alloys - Corrosivity of atmospheres - Classification, determination and estimation”.

(30) EN 10346: 2015 “Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions”.

The category of corrosivity is C3 (Medium) and the durability class is H (High) according to EN ISO 14713-1: 2017⁽³¹⁾ (Table 2). Therefore, these components may be used in outdoor environments, temperate zone, atmospheric environment with medium pollution or some effect of chloride, e.g. urban areas, coastal areas with low deposition of chlorides, subtropical and tropical zones with atmosphere with low pollution.

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 2003/640/EC of the European Commission ⁽³²⁾ the system of assessment and verification of constancy of performances (see Annex V to Regulation (EU) N° 305/2011) given in the following table applies:

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Kits for external wall claddings mechanically fixed "NATURCLAD-W S exposed fixing and hidden fixing"	Ventilated external wall claddings	-	2+
Kits for external wall claddings mechanically fixed "NATURCLAD-W F exposed fixing and hidden fixing"	Ventilated external wall claddings	-	1

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the quality plan deposited at the Instituto de Ciencias de la Construcción Eduardo Torroja.



Instituto de Ciencias de la Construcción Eduardo Torroja
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

c/ Serrano Galvache nº 4. 28033 Madrid.
 Tel: (34) 91 302 04 40 Fax. (34) 91 302 07 00
 www.ietcc.csic.es



On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja
 Madrid, 03rd May 2022

Firmado por CASTILLO TAVERA
 ANGEL - DNI 52507605P
 Fecha: 22/06/2022 11:35:09 CLST

Director
 IETcc – CSIC



(31) EN ISO 14713-1: 2017 "Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures - Part 1: General principles of design and corrosion resistance".

(32) 2003/640/EC – Commission Decision of date 4 September 2003, published in the Official Journal of the European Union (OJEU) L226/21 of 10/09/2003

Note: The details shown in figures on this page and on the following pages are approximate and must be defined for each project depending on the site of the building. These details concern the kit for ventilated external wall claddings and may not be used as justification for compliance with the National requirements.

FIGURE 1: NATURCLAD-W EXPOSED FIXING KIT– GENERAL CONFIGURATION

A. TIMBER SUBFRAME

B. ALUMINIUM SUBFRAME

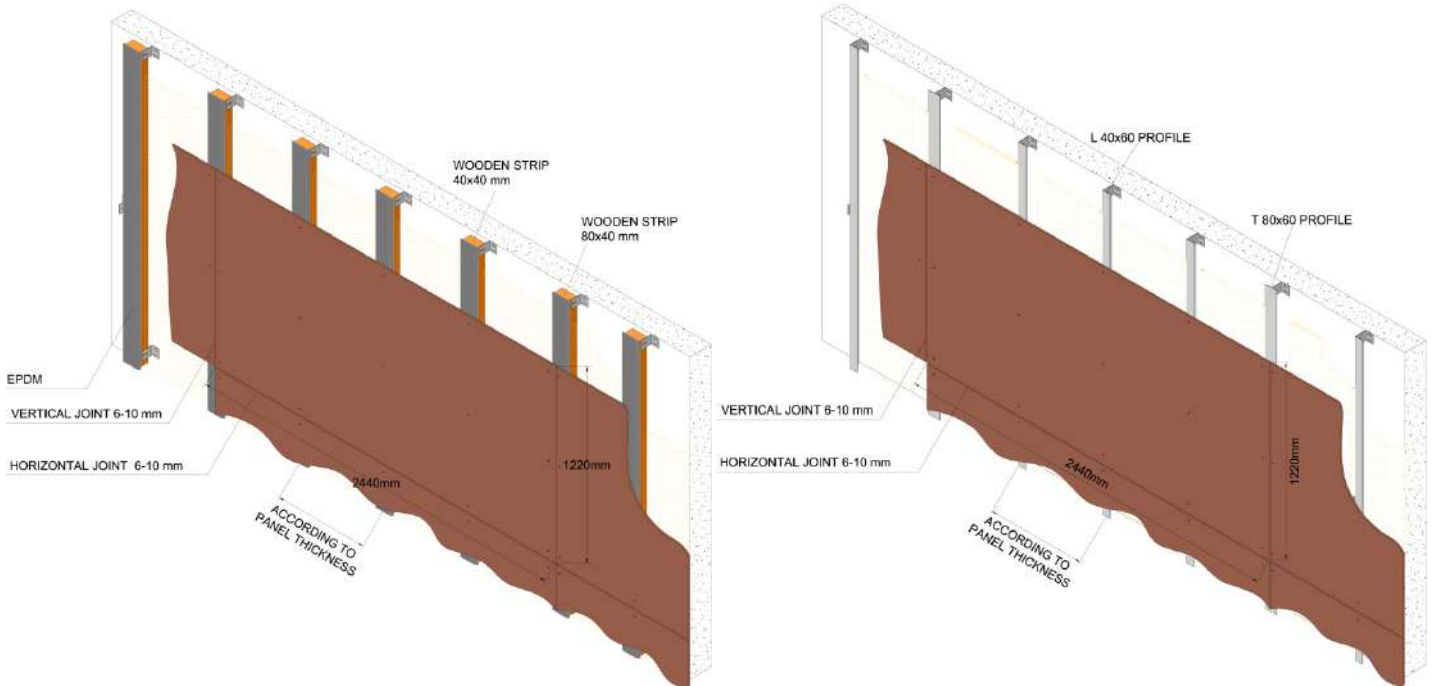


FIGURE 2: NATURCLAD-W HIDDEN FIXING KIT– GENERAL CONFIGURATION

ALUMINIUM SUBFRAME

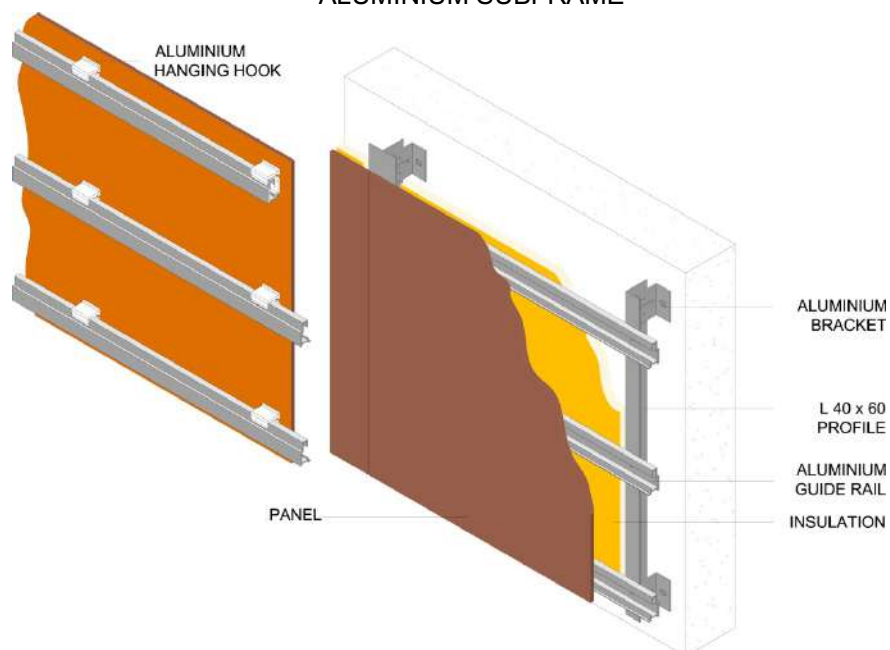
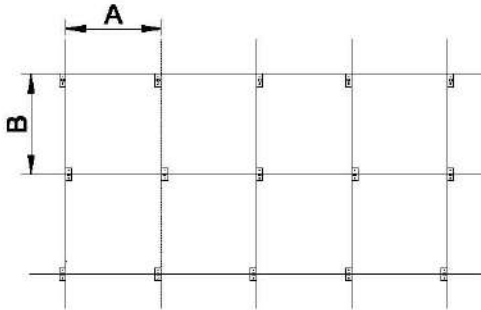
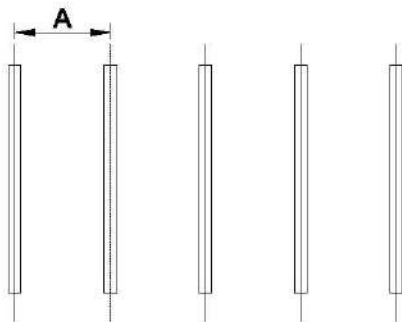


FIGURE 3: INSTALLATION PROCESS

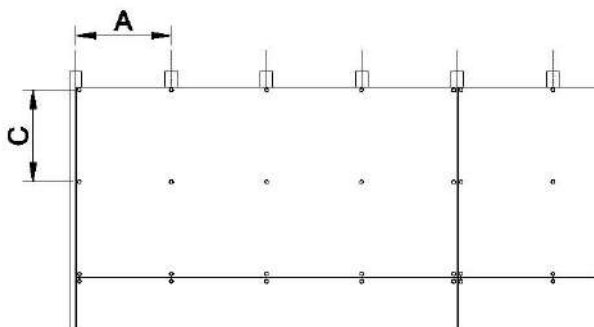
NATURCLAD-W EXPOSED FIXING KIT



1: BRACKETS INSTALLATION



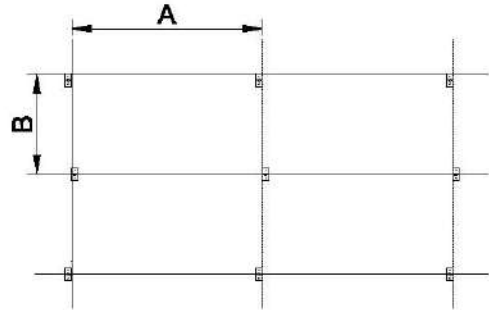
2: VERTICAL PROFILES INSTALLATION



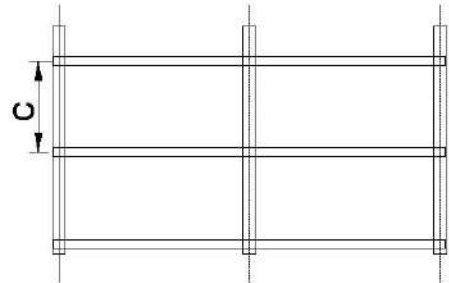
3: PANEL INSTALLATION ON THE VERTICAL BATTEN BY SCREWS OR RIVETS

A y C according to panel thickness
B max = 1000 mm

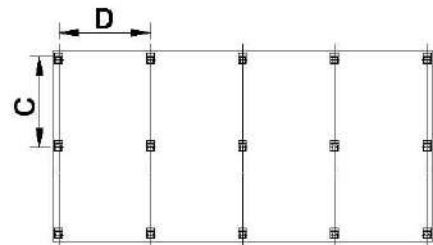
NATURCLAD-W HIDDEN FIXING KIT



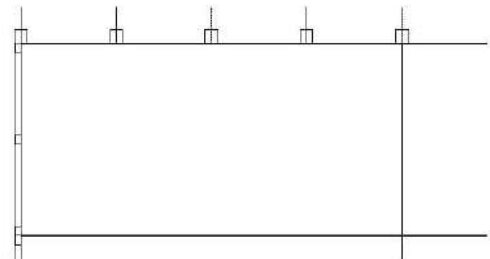
1: BRACKETS INSTALLATION



2: VERTICAL PROFILES AND GUIDE RAILS INSTALLATION



3: HANGING HOOKS INSTALLATION ON THE BACK SIDE OF THE PANEL



4: PANEL INSTALLATION

A, C y D according to panel thickness
B max = 1000 mm

SYSTEM COMPONENTS

FIGURE 4: CLADDING ELEMENTS – LAYERS OF HPL COMPACT PANEL FOR EXTERIOR NATURCLAD-W

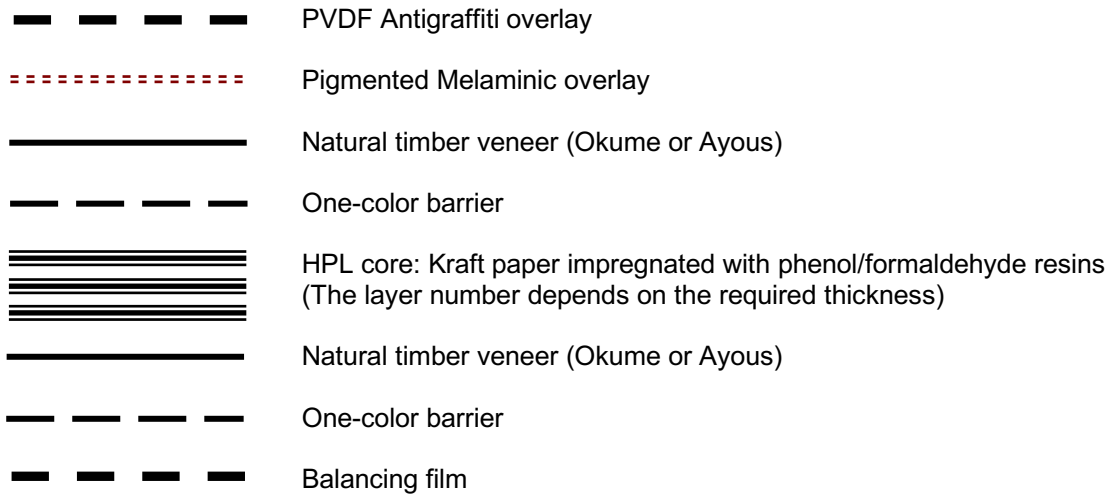


FIGURE 5: SUBFRAME –BRACKETS

BENDED GALVANIZED STEEL BRACKETS
(TIMBER SUBFRAME)

ALUMINIUM BRACKETS
(ALUMINIUM SUBFRAME)

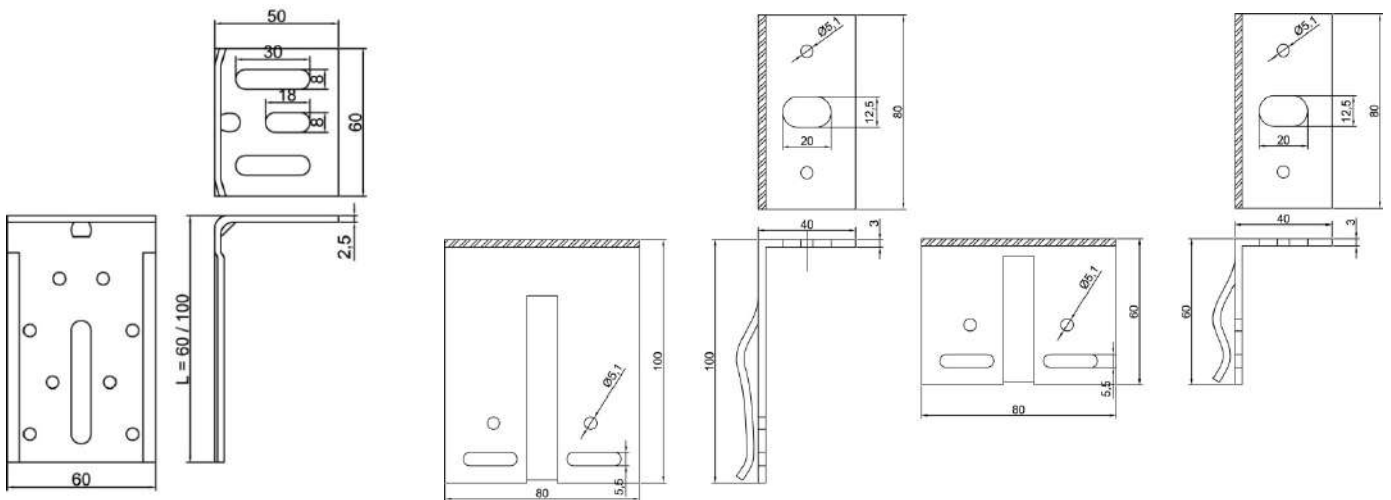


FIGURE 6: SUBFRAME – ALUMINIUM VERTICAL PROFILES

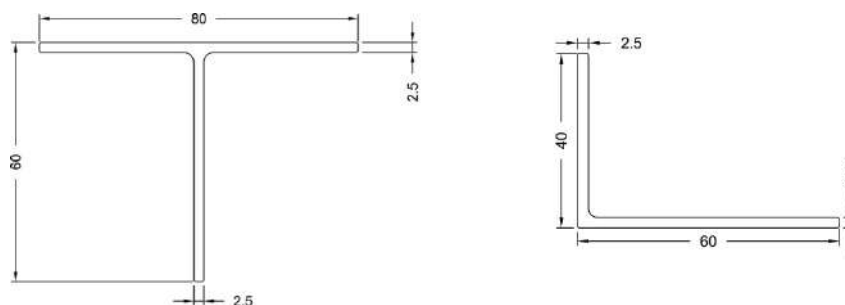


FIGURE 7: NATURCLAD-W EXPOSED FIXING KIT —CLADDING FIXINGS



FIGURE 8: NATURCLAD-W EXPOSED FIXING KIT — FIXED POINT AND FLOATING POINT POSITION

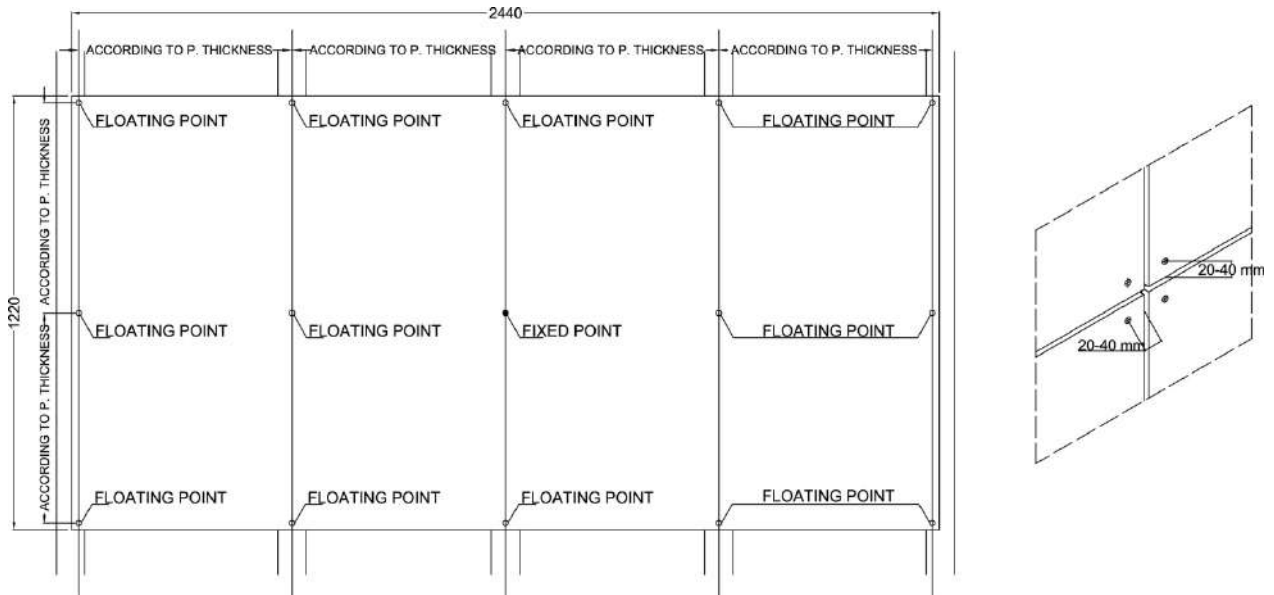


FIGURE 9. NATURCLAD-W EXPOSED FIXING KIT — FIXED POINT AND FLOATING POINT

FIGURE 9.1. TIMBER SUBFRAME (TW-S-D12)

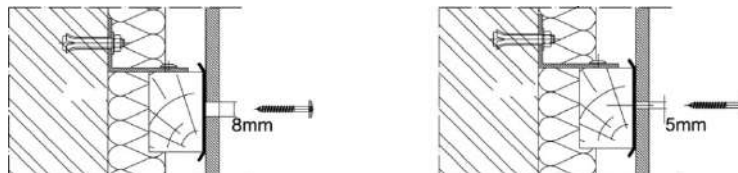


FIGURE 9.2. ALUMINIUM SUBFRAME (SX3-L12)

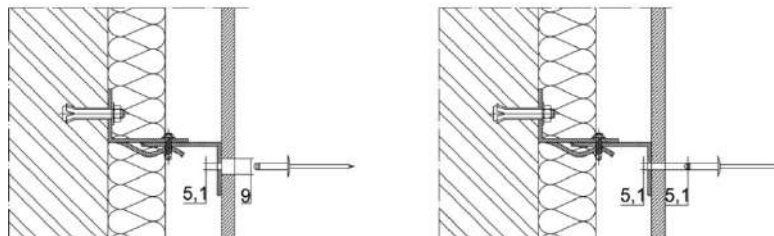
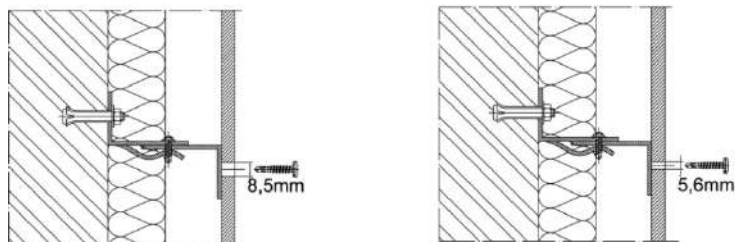


FIGURE 10: NATURCLAD-W HIDDEN FIXING KIT – FIXING ELEMENTS

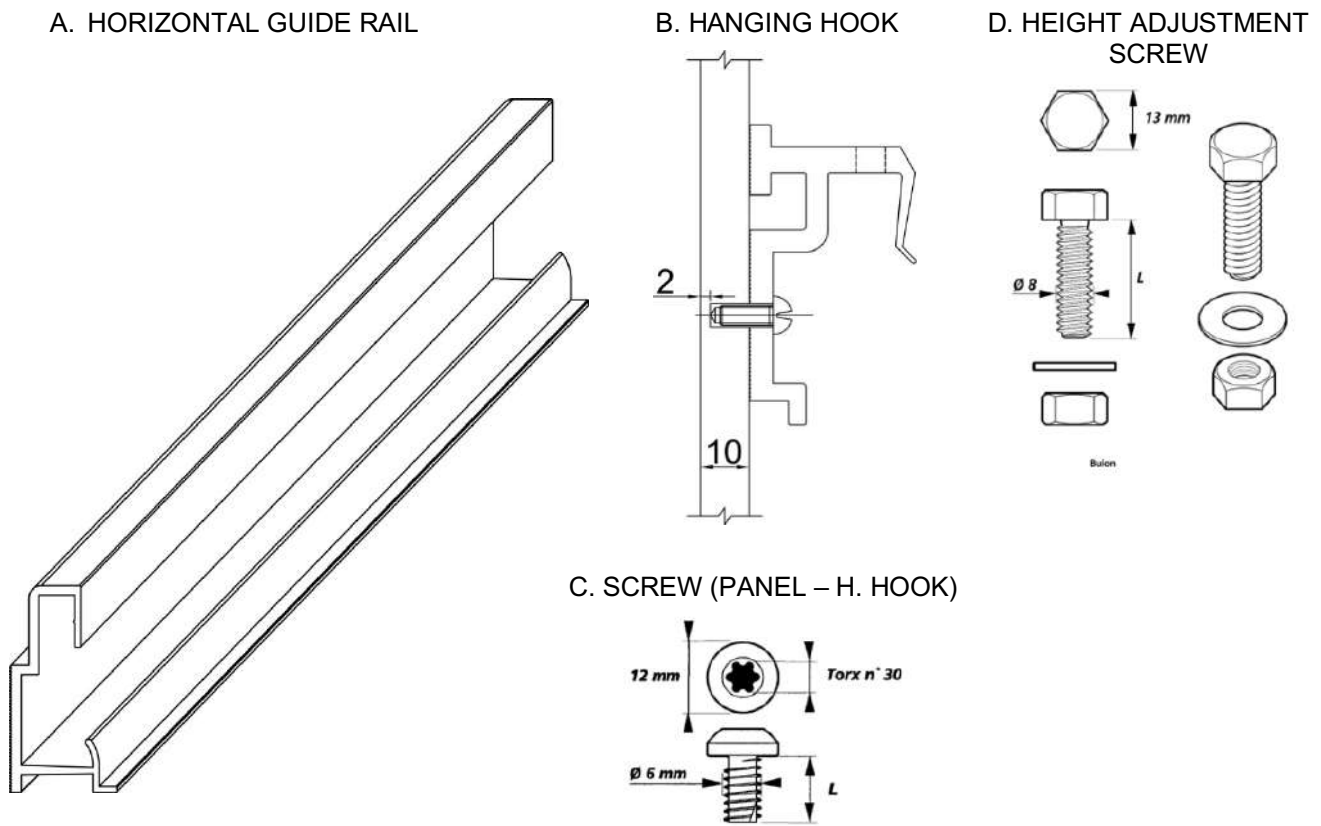


FIGURE 11: NATURCLAD-W HIDDEN FIXING KIT – FIXED POINT AND HEIGHT ADJUSTMENT POINT POSITION

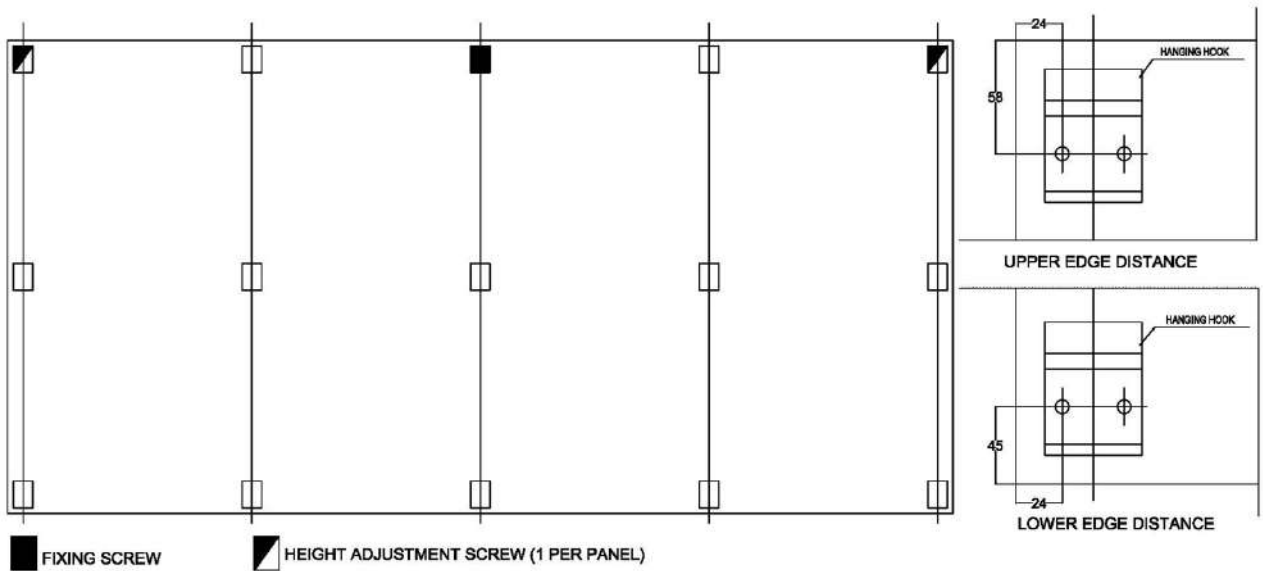


FIGURE 12: NATURCLAD-W HIDDEN FIXING KIT – FIXED POINT AND HEIGHT ADJUSTMENT POINT



NATURCLAD-W EXPOSED FIXING KIT

FIGURE 13. DETAIL OF CROWN AND BASE

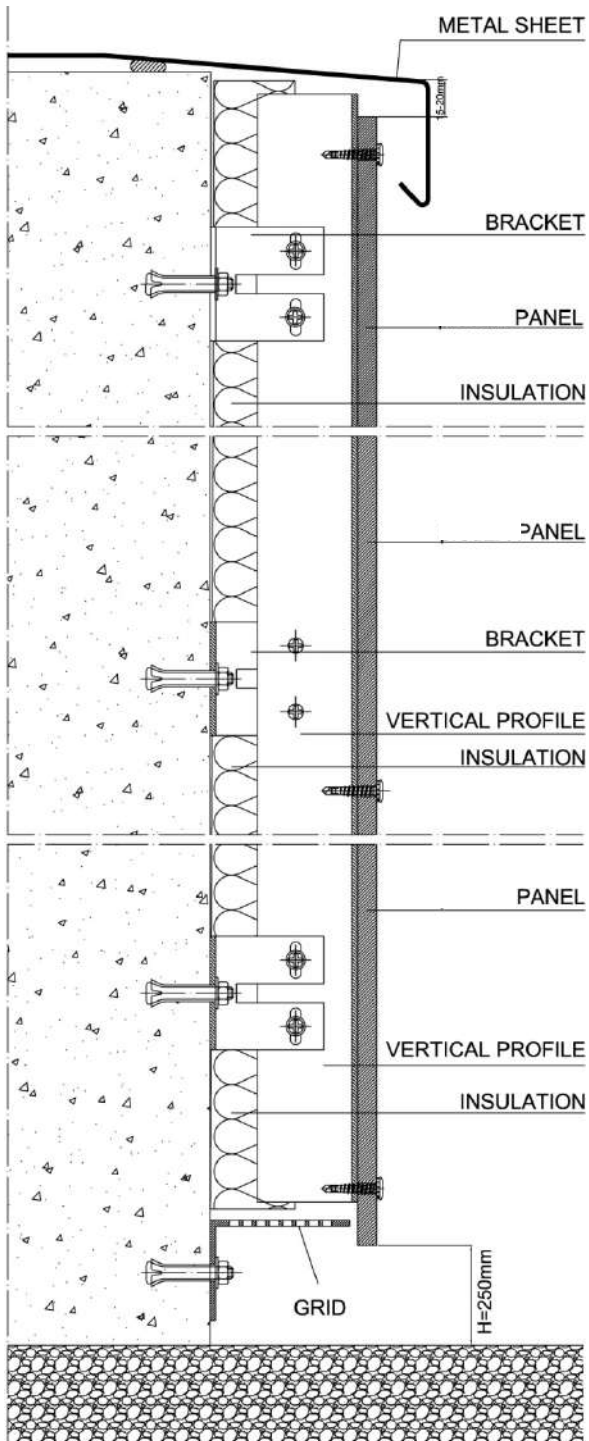


FIGURE 14. EXTERNAL CORNER

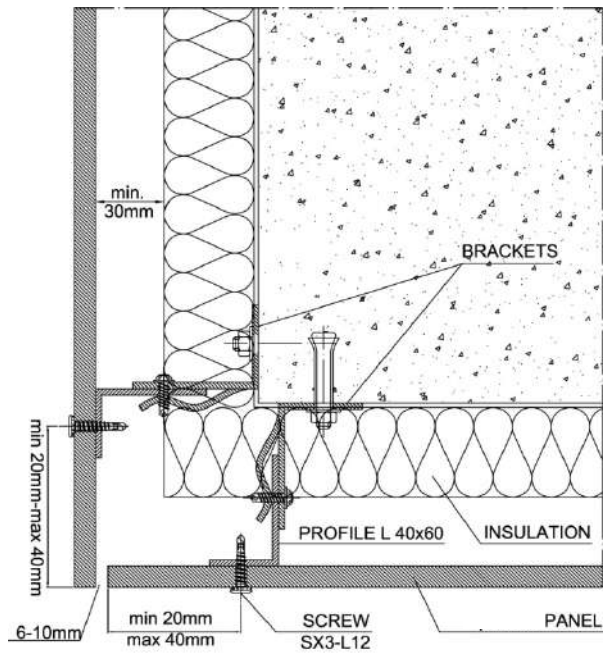
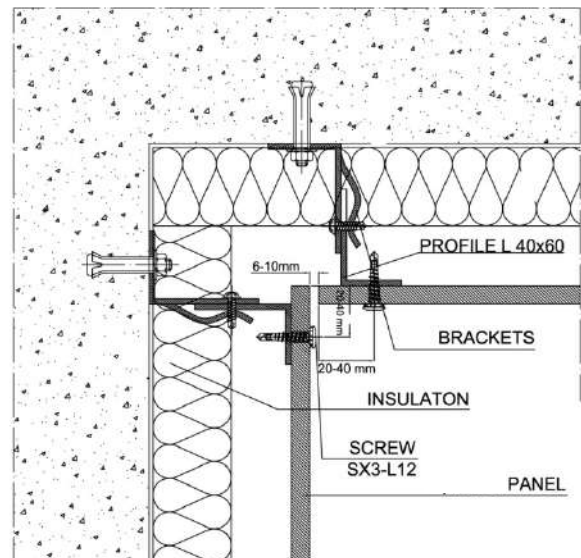


FIGURE 15. INTERNAL CORNER



NATURCLAD-W HIDDEN FIXING KIT

FIGURE 16. DETAIL OF CROWN AND BASE

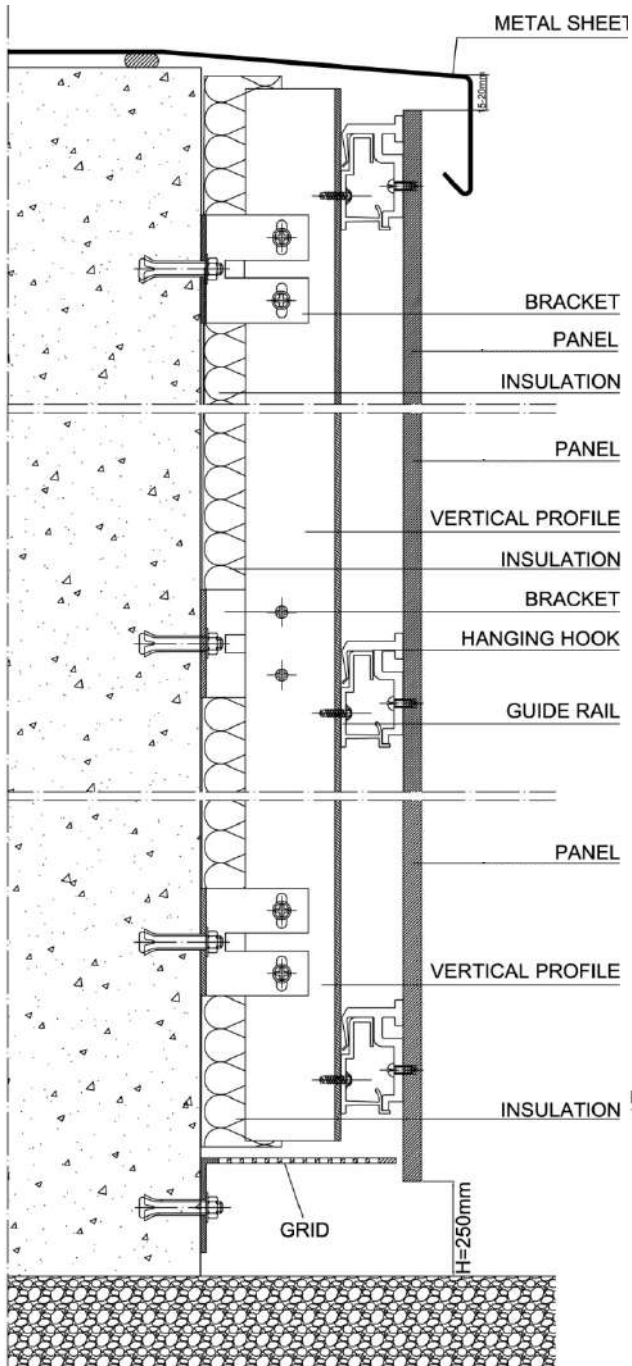


FIGURE 17. EXTERNAL CORNER

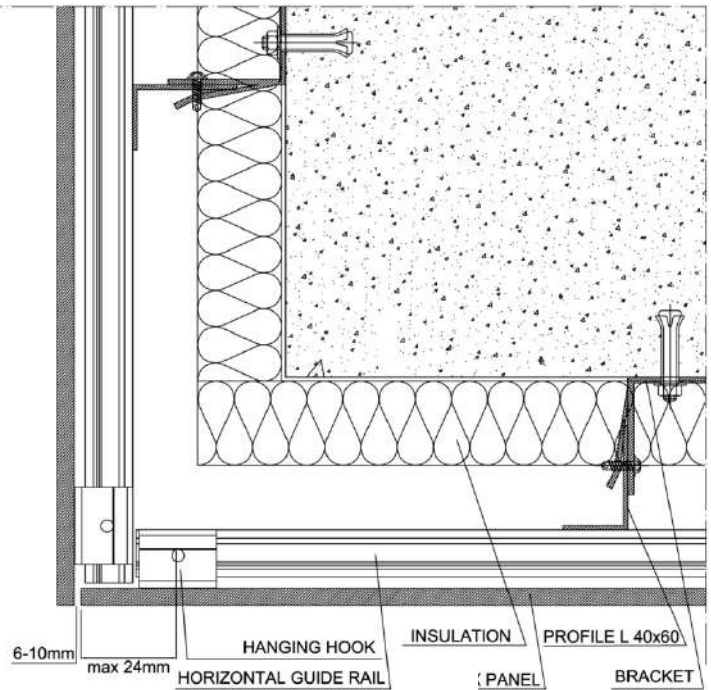


FIGURE 18. INTERNAL CORNER

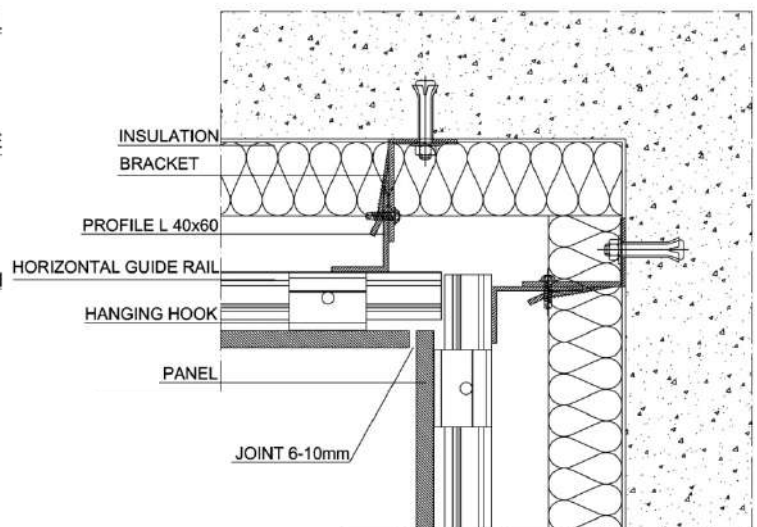
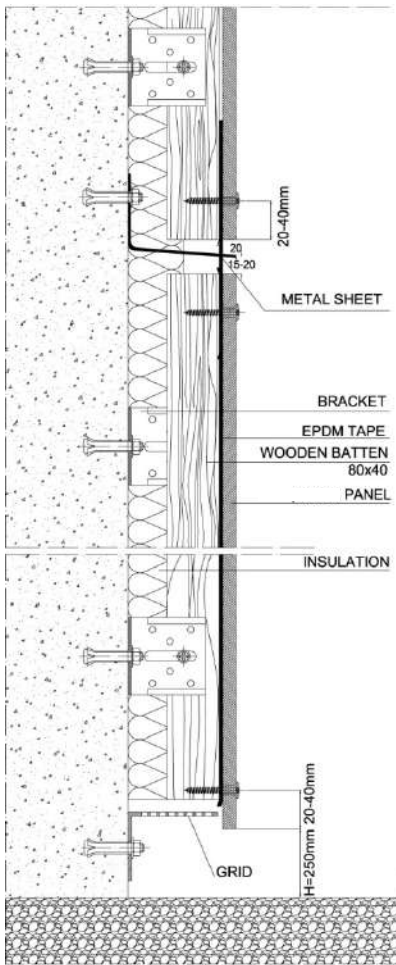
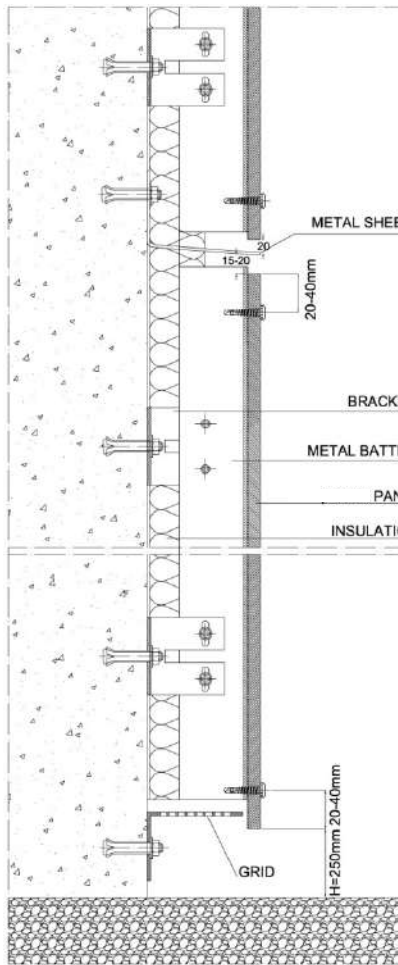


FIGURE 19. AIR SPACE SECTORIZATION

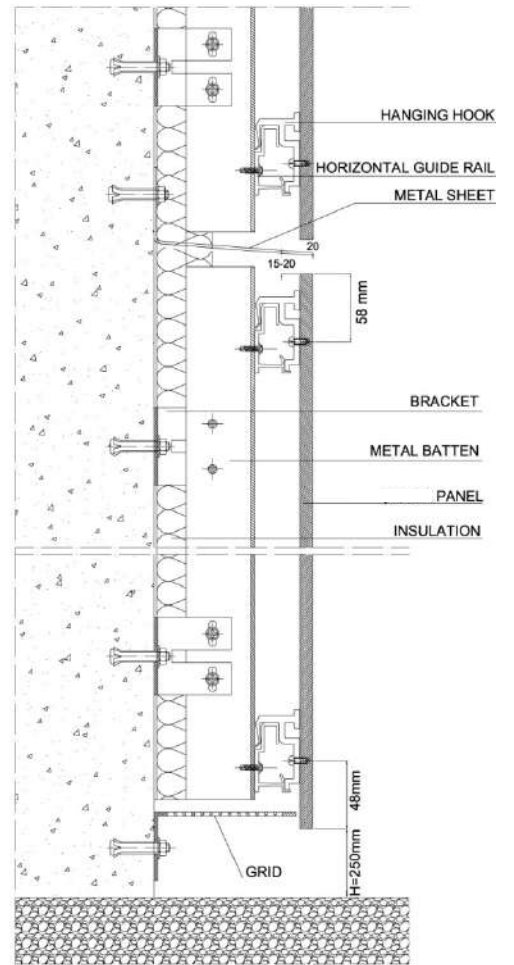
19.1 EXPOSED FIXING KIT
TIMBER SUBFRAME



19.2 EXPOSED FIXING KIT
ALUMINIUM SUBFRAME



19.3 HIDDEN FIXING KIT



Annex A: Cladding element specifications

STANDARD DIMENSIONS ⁽³³⁾				
Length	Width	Tolerance	Thickness	Tolerance
(mm)	(mm)	(mm)	(mm)	(mm)
2440 x 1220		- 0 + 10	6*	± 0.40
			8	± 0.50
			10	
			12	± 0.60
			14	

*available only for EDS grade

GEOMETRY ⁽³⁴⁾				
Thickness	Flatness	Straightness	Squareness	Weight
Nominal (mm)	Tolerance (mm/m)	Deviation (mm/m)	Deviation (mm/m)	Nominal (kg/m ²)
6*	≤ 5.0 mm/m	≤ 1,5 mm/m	≤ 1,5 mm/m	8,1
8				10,8
10	13,5			
12	16,2			
14	18,9			

*available only for EDS grade

PHYSICAL AND MECHANICAL PROPERTIES				
Property	Attribute	Value	Unit	Test
Density	Density	≥ 1,35	g/cm ³	EN ISO 1183-1 ⁽³⁵⁾
Elastic modulus	Stress	≥ 9.000	MPa	EN ISO 178 ⁽³⁶⁾
Flexural strength	Stress	≥ 80	MPa	EN ISO 178
Tensile strength	Stress	≥ 60	MPa	EN ISO 527-2 ⁽³⁷⁾
Resistance to humidity	Mass increase	≤ 8	%	EN 438-2 ⁽³⁸⁾ -15
	Appearance	≥ 4	1 to 5	
Dimensional stability at high temp.	Cumulative dimensional change	L ≤ 0,30 T ≤ 0,60	%	EN 438-2-17
Impact resistance	Mean failure height	≥ 1800	mm e ≥ 6	EN 438-2-21
Resistance to fixings	6 mm	2.000	N	EN 438-7
	8 mm	3.000		
	10 mm	4.000		
	12 mm			
	14 mm			
PCP contents (pentaclorofenol)		Not contain	-	EN 438-7
Formaldehyde emission		E1 Class	-	EN 438-7

WEATHER RESISTANCE PROPERTIES				
Property	Attribute	Value	Unit	Test
Resistance to climatic shock	Appearance	≥ 4	1 to 5	EN 438-2 (19)
	Flexural strength index (Ds)	≥ 0,95		
	Flexural modulus index (Dm)	≥ 0,95		
UV resistance	Contrast	≥ 3	Grey scale	EN 438-2 (28)
	Appearance	≥ 4	1 to 5	
Artificial climate resistance	Contrast	≥ 3	Grey scale	EN 438-2 (28)
	Appearance	≥ 4	1 to 5	
Reaction to fire	-	S	C-s1, d0	EN 13501-1 ⁽³⁹⁾
		F	B-s1, d0	

(33) Available smaller dimensions with the same thickness

(34) Properties according to EN 438-6:2016

(35) EN ISO 1183-1:2019 "Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method".

(36) EN ISO 178:2019 "Plastics - Determination of flexural properties".

(37) EN ISO 527-2:2012 "Plastics. Determination of tensile properties. Part 2: test conditions for moulding and extrusion plastics".

(38) EN 438-2:2016+A1:2018 "High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called Laminates) - Part 2: Determination of properties".

(39) EN 13501-1:2018 "Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests".

Annex B: Cladding fixings and subframe specifications

B.1: Cladding fixings specifications

EXPOSED FIXING KIT

STAINLESS STEEL SCREW TO ALUMINIUM SUBSFRAME	
Designation	SX3-L12 Ø 5.5 x L
Diameter	Ø _{body} = 5.5 mm
Head screw	Ø _{head} = 12 mm
Length	L= 28 mm (e _{panel} ≤10mm) L= 38 mm (e _{panel} >10mm)
Tensile strength (mean value)	14.000 N
Shear strength (mean value)	9.500 N
Pull- out breaking load (mean value on steel sheet – t=1.5mm)	2.700 N

ALUMINIUM RIVET TO ALUMINIUM SUBSFRAME	
Designation	AP16 Ø 5.0 x L
Diameter	Ø _{body} = 5 mm
Head screw	Ø _{head} = 16 mm
Length	e _{panel} + e _{perfil} + Ø _{body}
Tensile strength (mean value)	3.700 N
Shear strength (mean value)	2.400 N
Pull- out breaking load (mean value on aluminium sheet – t=1.8mm)	2.410 N
Shear breaking load (mean value on aluminium)	2.800 N

STAINLESS STEEL SCREW TO TIMBER SUBSFRAME	
Designation	TW-S-D12 Ø 4,8 x L
Diameter	Ø _{body} = 4,8 mm
Head screw	Ø _{head} = 12 mm
Length	L=38 (e _{panel} ≤10mm) L=44 (e _{panel} >10mm)
Tensile strength (mean value)	7.100 N
Shear strength (mean value)	5.400 N
Pull- out breaking load (mean value on wood t=26mm)	3.000 N
Shear breaking load (mean value on wood)	1.100 N

HIDDEN FIXING KIT

Horizontal rail Geometrical and mechanical features

HORIZONTAL GUIDE RAIL	Material	Dimensions (mm)	Thickness (mm)	I _{xc} (cm ⁴)	I _{yc} (cm ⁴)
Aluminium profile to hung the panel with hidden fastening	Aluminium Al 6063 T5	31 x 60 x 3000	3.3	13.76	2.26

Hanging hook

HANGING HOOK	Material	Dimensions (mm)	Thickness (mm)	I _{xc} (cm ⁴)	I _{yc} (cm ⁴)
Aluminium bracket screw to the rear of the panel	Aluminium Al 6063 T5	68.5 x 38 x 50	5	25.69	7.93

Screws hanging hook – panel

Designation	TB A2 TX30
Diameter	$\varnothing_{\text{body}} = 6 \text{ mm}$
Head screw	$\varnothing_{\text{head}} = 12 \text{ mm}$
Length	L=11.5 (e _{panel} = 10)
	L=14.5 (e _{panel} >10mm)
Diameter panel hole	$\varnothing = 5.5 \text{ mm} \pm 0.1 \text{ mm}$
Panel perforated depth	L= 7.5 mm
Pull – out breaking load	170 daN

Screws fixed points

Designation	PERFIX 3 TH8 INA2
Diameter (mm)	5.5
Length (mm)	25
Material	Stainless steel A2 (1.4301)
Standard	EN ISO 3506-4:2009

Screws adjustment points

Designation	TH13 INA2
Diameter (mm)	8
Length (mm)	25
Material	Stainless steel A2 (1.4567)
Standard	EN ISO 3506-4:2009

B.2: Subframe specifications

Wood requirements

Resistance class	$\geq \text{C } 18^{(40)}$
Durability	Class 3 ⁽⁴¹⁾
Processing	Autoclave level 5
Damp control	$\leq 18\%$

Aluminium Physical and mechanical properties

Symbolic designation	EN AW-Al MgSi	
Numeric designation	AW 6060/ AW 6063 ⁽⁴²⁾	
Treatment	T5	
Corrosion protection	Anodic oxidation	Class 15 or 20 ⁽⁴³⁾
	Lacquered (thickness 0.1 mm and 0.15 mm)	Class SEASIDE ⁽⁴⁴⁾
PHYSICAL PROPERTIES		
Specific weight	2,70 g/cm ³	
Coefficient of linear thermal expansion	23,5 · 10 ⁻⁶ K ⁻¹ (20/100 °C)	
Elastic modulus	70.000 MPa	
Poisson coefficient	0,33	
MECHANICAL PROPERTIES		
Tensile strength (R _m)	$\geq 160/175 \text{ N/mm}^2$	
Elastic limit (R _{p0.2})	$\geq 120/130 \text{ N/mm}^2$	
Elongation (A)	$\geq 8 \%$	
Elongation (A _{50mm})	$\geq 6 \%$	
Brinell hardness	60 HB	
According to EN 755-2 ⁽⁴⁵⁾ and EN 12020-1 ⁽⁴⁶⁾		

(40) EN 338:2016 "Structural timber - Strength classes".

(41) EN 335-2:2013 "Durability of wood and wood-based products - Definition of use classes - Part 2: Application to solid Wood"

It may use wood battens with treatment for risk category 2, provided that they are protected in the joint between panels with an EPDM elastomeric belt of a thickness exceeding 10/20 mm the width of the strips. In this case, it is necessary verify that the strips are protected from damp in other points as the start of them.

(42) Aluminium alloy 6063 T5 is classified as class A (No known instance of failure in service or in laboratory tests) according to "Aluminium standards and data" (Aluminium association edition)

(43) Mean thickness 15 μ or 20 μ according to the quality mark QUALANOD

(44) According to the quality mark QUALICOAT





(45) EN 755-2 Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Part 2: Mechanical properties.

(46) EN 12020-1 Aluminium and aluminium alloys. Extruded precision profiles in alloys en aw-6060 and en aw-6063. Part 1: technical conditions for inspection and delivery.

Brackets Geometrical and mechanical features

BRACKET	Material	Dimensions (mm)	Thickness (mm)	Section (mm ²)	x _c (mm)	I _{xc} (cm ⁴)	y _c (mm)	I _{yc} (cm ⁴)
ISOLALU R80 by ETANCO	Aluminium Al 6060 T5	40 x 80 x 40 - 160	3,0	231	11	3,5	11	3,5
		40 x 150 x 40 - 160		591	5	157,9	65	4,9

Vertical elements Geometrical and mechanical features

VERTICAL ELEMENT		Dimensiones (mm)	Espesor (mm)	Sección (mm ²)	Peso (kg/m)	x _c (mm)	I _{xc} (cm ⁴)	y _c (mm)	I _{yc} (cm ⁴)
Wooden strip two panels fixing		≥ 80 x 40	-	3.000	1,6	40	42,67	20	170,67
Wooden strip One panel fixing		≥ 40 x 40	-	1.600	0,8	20	21,33	20	21,33
Aluminium strip (L) Al 6063 T5		L 40 x 60	2,5	244	0,659	8,91	9,27	41,20	3,40
Aluminium strip (T) Al 6063 T5		T 80 x 60	2,5	345	0,932	40,00	11,58	46,29	10,64

Stainless steel screw between vertical elements and brackets

Description	PERCINOX special head self-drilling screw
Diameter	5.5 mm
Length	25 mm
Material	Stainless steel
Standard	EN ISO 3506-1: 2010
Pull-out resistance (mean value on aluminium sheet – t=3mm)	3790 N

Annex C: Auxiliary components

Anchorage to substrate

The fixings between the subframe and the substrate are not part of the kit. Therefore have not been assessed. Even so, it is important to define type, position and number of the anchorages according to the substrate material and the resistance required due to the envisaged actions. When it is possible, CE marking according to the EAD 330232-00-0601, 330499-00-0601, 330747-00-0601, 330076-00-0604, etc. is recommended.

Annex D: Confidential information

Quality control of components of kits manufactured by suppliers or ETA holder.

This information is confidential and it is not included in the European Technical Assessment when that assessment is publicly available.