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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

Trespa Pura ^{NFC}®

Product family to which the construction product belongs

Kits for external wall claddings mechanically fixed

Manufacturer

TRESPA INTERNATIONAL B.V.
Wetering, 20. P.O. Box 110
6000 AC Weert - Nederland
website: www.trespa.info

Manufacturing plant(s)

TRESPA INTERNATIONAL B.V.
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This European Technical Assessment contains

20 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 in ventilated façades “Trespa Pura ^{NFC}® - Flush siding” and “Trespa Pura ^{NFC}® - Lap siding” are classified as family C (Trespa Pura ^{NFC}® - Flush siding) and family E (Trespa Pura ^{NFC}® - Lap siding), according to the EAD 090062-00-0404: *Kit for external wall claddings mechanically fixed*, edition July 2018 (hereinafter EAD 090062-00-0404).

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

TABLE 1 – DEFINITION OF THE KIT COMPONENTS					
Components		Material		Sizes [mm]	
Cladding element	HPL sidings for exterior Trespa Pura ^{NFC} ® (1) produced by TRESPA INTERNATIONAL, B.V. EDF(2) quality and CE marking(3) according to Annex ZA of the EN 438-7:2005(4)	FLUSH	High-pressure decorative laminates fire-retardant for exterior application		3050 x 186 x 8
		LAP			3050 x 187 x 8
Cladding fixings	Elements used to secure the cladding sidings to the subframe(5)	FLUSH	To aluminium and timber subframe	Extr. aluminium EN AW-6082 T6	Universal clip 33.5 x 30 x 7.6 (t=3)
		LAP	To aluminium subframe	Aluminium AlMg5/ Stainless steel A2 rivet	AP 16 Ø 5 L=18
			To timber subframe	Austenitic stainless steel A2 self-drilling screw	TW-S-D12 Ø 4.8 L=38
Subframe(6)	Vertical elements (7) used to fasten on the sidings by cladding fixings	FLUSH/ LAP	Extruded Aluminium AW 6060 T5(8)		Between 2 sidings Intermediate support
			Wood(9)		Between 2 sidings Intermediate support
					75 x 95 75 x 45
	Metallic elements (brackets)(10) used as load transmission between the kit for external wall claddings and the substrate wall	FLUSH/ LAP	Aluminium subfr.	Extr. Aluminium EN AW-6060 T5	Supporting br. Retention br.
					150 x 40 x 40 (t= 3) 150 x 40 x 80 (t= 3) 150 x 40 x 120 (t=3) 80 x 40 x 40 (t= 3) 80 x 40 x 80 (t= 3) 80 x 40 x 120 (t= 3)
			Timber subframe	Bended Galvanized steel S220GD - Z350	100 x 50 x 60 (t= 2.5) 140 x 50 x 60 (t= 2.5) 180 x 50 x 60 (t= 2.5)
Ancillary material	Screws between clips and vertical elements(11)	FLUSH	To alum and timber subfr.	Stainless steel A2 self-drilling screw	SDAW-S7/T20 Ø 3.5 L=32
			To timber subfr.	Stainless steel A2 self-drilling screw	ASSY Ø 3.5 L=30/25
	Screws between brackets and vertical elements(12)	FLUSH/ LAP	Aluminium subfr.	Stainless steel A2 self-drilling screw	PERFIX 5 TH Ø 5.5 L=19.25
			Timber subframe	Hot galvanized hardened steel self-drilling screw	TH 13 Ø 7 L=50
	Tape used to form the joints	FLUSH/ LAP	To timber subfr.	Ethylene propylene diene monomer (EPDM)	W=60-100
	Support profile Proface®	FLUSH VERT. LAYOUT	To aluminium and timber subframe	Extr. Aluminium	40 x 10 (t=2)
	Start profile Proface®	LAP			59.5 x 9-x (t=1.5)
Screws between Support/Start profile and vertical elements(13)	FLUSH/ LAP	To aluminium subfr.	Aluminium AlMg5/ Stainless steel A2 rivets	AP 11 Ø 5 L= 12	
		To timber subfr.	Stainless steel A2 self-drilling screw	TW-S-D11/PH2 Ø 4.2 L=30	
Auxiliary components	Anchorage to substrate(14)	-			-

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

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

(3) Certificate of constancy of performance 0958-CPR-1001/1

(4) 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”

(5) See Annex B

(6) Not manufactured by TRESPA INTERNATIONAL, B.V.

(7) Geometric and mechanical features in Annex B and figure 5

(8) Physical and mechanical properties in Annex B

(9) Technical specifications in Annex B.

(10) Geometric and mechanical features in Annex B and figure 4

(11) Geometric and mechanical features in Annex B

(12) Geometric and mechanical features in Annex B

(13) Geometric and mechanical features in Annex B

(14) See Annex C

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

2.1 Intended use

“Trespa Pura ^{NFC}® - Flush siding” and “Trespa Pura ^{NFC}® - Lap siding” 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), wood based panels (particle boards) and timber or metal frame. Insulation material is defined in accordance with an EN standard or an ETA and is not manufactured by TRESPA INTERNATIONAL, B.V. Kit for ventilated external wall claddings is non-load-bearing construction system. It does not contribute to the stability of the wall on which it 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 producer, 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 “Trespa Pura ^{NFC}® - Flush siding” and “Trespa Pura ^{NFC}® - Lap siding” 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 sidings.
- The category of corrosivity of the atmosphere of the works ⁽¹⁵⁾.
- 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:

- 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.

(15) E.g. see table 1 of Standard EN ISO 12944-2: 1998. Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Part 2: Classification of environments.

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

The assessment of “Trespa Pura ^{NFC}® - Flush siding” and “Trespa Pura ^{NFC}® - Lap siding” 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 “Trespa Pura ^{NFC}® - Flush siding” and “Trespa Pura ^{NFC}® - Lap siding” kits performance.

Basic Works Requirement	Nº	Essential characteristic	ETA section	Performance		
BWR 2 Safety in case of fire	1	Reaction to fire	3.1	B-s2, d0		
	2	Façade fire performance	--	Not assessed		
	3	Propensity to undergo continuous smouldering	--	Not relevant (the thermal insulation is not a kit component)		
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 7, 8 and 9.		
BWR 4 Safety and accessibility in use	9	Wind load resistance	3.4	Flush siding – horizontal	3400 Pa	
				Flush siding – vertical	4000 Pa	
				Lap siding – horizontal	4000 Pa	
	10	Resistance to horizontal point loads	3.5	No permanent deformation on any component		
	11	Impact resistance	3.6	Flush siding	Category III	
				Lap siding	Category I	
	12	Mechanical resistance of cladding elements	Bending strength of cladding element	3.7	See table 5	
	13		Resistance of grooved cladding element	3.8	Flush siding (fam. C)	See table 6
	15	Mechanical resistance of connection between the cladding element and the cladding fixing	Pull-through resistance	3.9	Lap siding (fam. E)	See table 7
	16		Pull-through resistance under shear loads	3.10	Lap siding (fam. E)	See table 8
	21	Mechanical resistance of cladding fixing	Resistance to vertical load	3.11	Flush siding (fam. C)	Deflection after 1 hour ≤ 0.1mm
	22		Pull-through resistance of fixings from profile	--	Flush siding (fam. C)	Not relevant for punctual fixings
	24	Resistance of profile	3.12	See § 3.12		
25	Subframe fixings	Tension/pull out resistance	--	Not assessed		
26		Shear load resistance	--	Not assessed		
27	Brackets resistance (horizontal and vertical)	3.13	See § 3.13			
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	--	Not assessed		
	31	Behaviour after pulsating load	3.14	Lap siding (fam. E)	See table 9	
	32	Freeze-thaw resistance of cladding element		Not assessed		
	33	Behaviour after immersion in water of cladding element		Not assessed		
	34	Dimensional stability	3.15	See § 3.15		
	35	Chemical and biological resistance of the cladding elements	--	Not assessed		
	36	UV radiation resistance of the cladding elements	3.16	See § 3.16		
37	Corrosion of metal components	3.17	See § 3.17			

3.1 Reaction to fire – BWR 2

Euro class B-s2, d0 according to standard EN 13501-1: 2007 + A1:2010⁽¹⁶⁾.

This classification is valid for the commercial reference “Trespa Pura ^{NFC}®” of high-pressure compact laminate sidings in thicknesses of 8 mm in accordance with standard EN 438-7:2005 for high-pressure compact laminate, as long as the insulation layer placed in the ventilated air space is made of a non-combustible material (mineral wool), there is no insulation in the cavity or the layer behind the cladding elements is a mineral substrate like masonry or concrete (A1 or A2-s1, d0) or a particle board (D-s2,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 “Trespa Pura ^{NFC}® - Flush siding” and “Trespa Pura ^{NFC}® - Lap siding” kits are not watertight.

3.3 Drainability – BWR 3

On the basis of the construction details (see figures 7, 8 and 9), 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 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.

The worst case has been tested: minimum thickness, maximum separation between cladding fixings and subframe components.

Test results for the tested specimen are indicated in table 3.

TABLE 3 – WIND SUCTION RESISTANCE TEST RESULTS			
TEST SPECIMEN	MAXIMUM LOAD Q (Pa)	TYPE OF FAILURE	DISPLACEMENT UNDER MAXIMUM LOAD (mm)
a. Trespa Pura ^{NFC} ® – Flush siding – horizontal (family C)	3400	Breakage of the cladding element	8.33
b. Trespa Pura ^{NFC} ® – Flush siding – vertical (family C)	4000 ⁽¹⁷⁾	No failure	6.42
c. Trespa Pura ^{NFC} ® - Lap siding – horizontal (family E)	4000 ⁽¹⁸⁾	No failure	5.96

3.5 Resistance to horizontal point loads – BWR 4

Resistance to horizontal point loads has been tested according to § 2.2.10 and the method specified in Annex F of EAD.

After test no permanent deformation on any component of the kit tested was visually appreciated.

3.6 Impact resistance – BWR 4

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

(16) EN 13501-1:2007 + A1:2010 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

(17) Maximum load allowed by the test equipment.

(18) Maximum load allowed by the test equipment.

According with the test results the use category⁽¹⁹⁾ of kits is indicated in table 4.

TABLE 4: USE CATEGORY OF KITS	
Trespa Pura ^{NFC} ® - Flush siding	Category III
Trespa Pura ^{NFC} ® - Lap siding	Category I

3.7 Bending strength of cladding element – BWR 4

Bending strength of the cladding element has been tested according to EN ISO 178: 2019.

Mean and characteristic values of test are indicated in table 5.

TABLE 5 – BENDING STRENGTH OF CLADDING ELEMENT MEAN AND CHARACTERISTIC VALUES				
SIDING THICKNESS (mm)	FAILURE LOAD (MPa)		FLEXURAL MODULUS (MPa)	
	Mean value	Characteristic value	Mean value	Characteristic value
8 Long.	152.33	135.71	10487,67	9051,61

Trespa Pura ^{NFC}® sidings satisfy the requirements defined in table 3 § 5.4.1 of EN 438-6: 2016⁽²⁰⁾.

3.8 Resistance of grooved cladding element – BWR 4

Resistance of grooved cladding element for Trespa Pura ^{NFC}® - Flush siding (Family C) has been assessed according to § 2.2.12.2 and the method specified in Annex N of EAD.

Mean and characteristic values of test are indicated in table 6.

TABLE 6: RESISTANCE OF GROOVED CLADDING ELEMENT TEST RESULT			
SIDING THICKNESS (mm)	FAILURE LOAD (N)		FAILURE MODE
	F _m	F _{u,5}	
8	394	348	Cladding element

3.9 Pull-through resistance – BWR 4

Pull-through resistance for Trespa Pura ^{NFC}® - Lap siding (Family E) has been assessed according to § 2.2.12.4 and the method specified in section I.1.1 of Annex I of EAD.

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

TABLE 7 - PULL-THROUGH RESISTANCE					
SIDING THICKNESS/FIXING	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
8/Screw	270	Lateral	1574	1195	Cladding element
8/Rivet	270	Lateral	1573	1234	Cladding element

3.10 Pull-through resistance under shear loads – BWR 4

Pull-through resistance under shear loads for Trespa Pura ^{NFC}® - Lap siding (Family E) has been assessed according to § 2.2.12.5 and the method specified in section I.5 of Annex I of EAD.

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

TABLE 8 - PULL-THROUGH RESISTANCE UNDER SHEAR LOADS			
SIDING THICKNESS/SUBFRAME	FAILURE LOAD (N)		FAILURE MODE
	F _m	F _{u,5}	
8/ Wood subframe + screw	4104	3331	Tear in batten
8/ Aluminium subframe + Aluminium rivet	2584	2505	Rivet

(19) 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).

(20) 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".

3.11 Resistance to vertical load – BWR 4

Resistance to vertical load for Trespa Pura ^{NEC}® - Flush siding (Family C) has been assessed according to § 2.2.10 and the method specified in section J.1 of Annex J of EAD

After 24h the deflection measured on the clips at the bottom was less than 0,1mm.

3.9 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.

Mean and characteristic values of brackets resistance to vertical load test are indicated in table 9.

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) ΔL=5 mm Displacement Significant permanent distortion (2 mm)	
		Mean value	Char. value	Mean value	Char. value	Mean value	Char. value	Mean value	Char. value
		GALVANIZED STEEL	60 x 50 x 100	353.6	235.4	790.1	655.8	1831.8	1472.4
60 x 50 x 140	306.1		145.6	383.9	281.0	912.1	728.4	1205.4	1109.0
60 x 50 x 180	200.3		106.4	199.1	192.9	485.3	387.0	666.2	582.2
ALUMINIUM SUPPORTING B.	150 x 40 x 40	3245.4	2609.7	6042.3	4511.3	9084.2	7324.4	9860.6	8716.6
	150 x 40 x 80	3113.1	2562.8	4072.9	3833.6	5923.3	4964.8	6906.8	5408.0
	150 x 40 x 120	2739.8	1265.1	2636.3	1153.3	5041.7	4270.1	6200.6	5403.9

Mean and characteristic values of brackets resistance to horizontal load test are indicated in table 10.

BRACKETS DIMENSIONS		F _m (N) ΔL=1mm Residual distortion		F _t (N) ΔL=5 mm Displacement Significant permanent distortion (≥3 mm)		
		Mean value	Char. value	Mean value	Char. value	
		GALVANIZED STEEL	60 x 50 x 100	2630.00	2010.25	3957.80
60 x 50 x 140	2080.00		1765.23	3839.80	3602.86	
60 x 50 x 180	2352.00		1807.96	3310.40	2839.89	
ALUMINIUM	RETENTION B.	80 x 40 x 40	2190.00	1474.69	3100.52	2421.94
		80 x 40 x 80	1910.00	1494.83	4003.44	2007.47
		80 x 40 x 120	2384.00	2210.73	3198.40	2922.45
	SUPPORTING B.	150 x 40 x 40	2630.00	2247.14	3764.80	3407.80
		150 x 40 x 80	3640.00	2790.27	4848.60	4123.41
		150 x 40 x 120	3990.00	3574.83	5098.80	4611.66

3.14 Behaviour after pulsating load – Durability

Behaviour after pulsating load for Trespa Pura ^{NFC}® - Lap siding (Family E) 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 11.

TABLE 11 – BEHAVIOUR AFTER PULSATING LOAD (PULL-THROUGH RESISTANCE)					
SIDING THICKNESS/FIXING	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F _m	F _{u,5}	
8 - Screw	270	Lateral	1322	861	Cladding element
8 - Rivet	270	Lateral	1441	1088	Cladding element

3.15 Dimensional stability – Durability

Dimensional stability at elevated temperature of the siding has been determined according to EN 438-2: 2005⁽²¹⁾ (section 17).

Trespa Pura ^{NFC}® sidings satisfy the requirements defined in table 3 § 5.4.1 of EN 438-6: 2016, besides the cumulative dimensional change of Trespa Pura ^{NFC}® siding is set at ≤ 0.25 % (length + transversal direction).

3.16 UV radiation resistance of the cladding elements – Durability

UV radiation resistance has been tested according to EN 438-2: 2005 (section 28) on a selection of Trespa Pura ^{NFC}® sidings with the following references:

- P 03.0.0
- PU02
- PU17

The samples tested do not show any visible change after accelerating ageing from UV radiation test.

3.17 Corrosion of metal components

Fixings and subframe components are made of:

- Aluminium alloy AW-6082 and AW-6060 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⁽²²⁾ (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⁽²³⁾ (Table A.1 in Annex A) and EN ISO 9223: 2012⁽²⁴⁾ (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 S220GD with Z350 treatment according to EN 10346⁽²⁵⁾.

The category of corrosivity is C3 (Medium) and the durability class is H (High) according to EN ISO 14713-1: 2019⁽²⁶⁾ (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.

(21) EN 438-2:2005 "High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called Laminates) - Part 2: Determination of properties"

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

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

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

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

(26) 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".

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 ⁽²⁷⁾ 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 Trespa Pura NEFC® - Flush siding and Lap siding	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
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On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja
Madrid, 13th January 2020

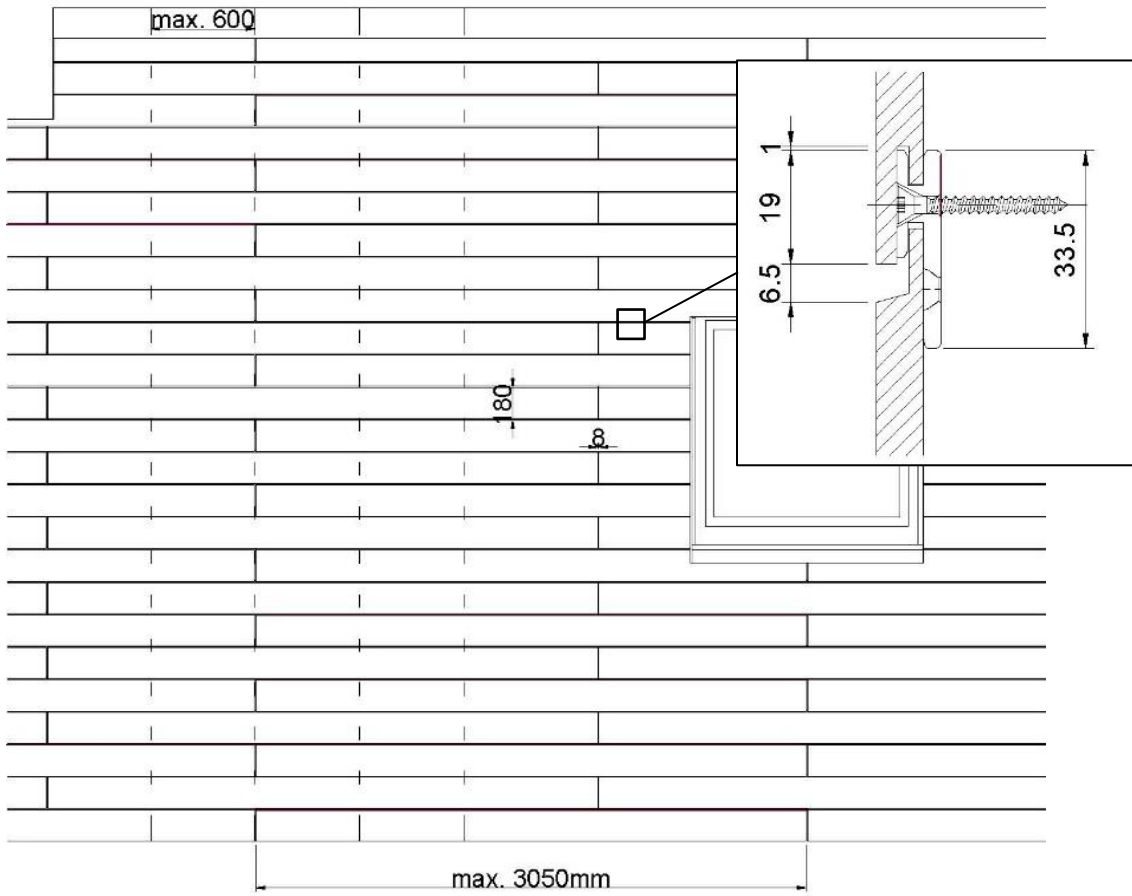


Director

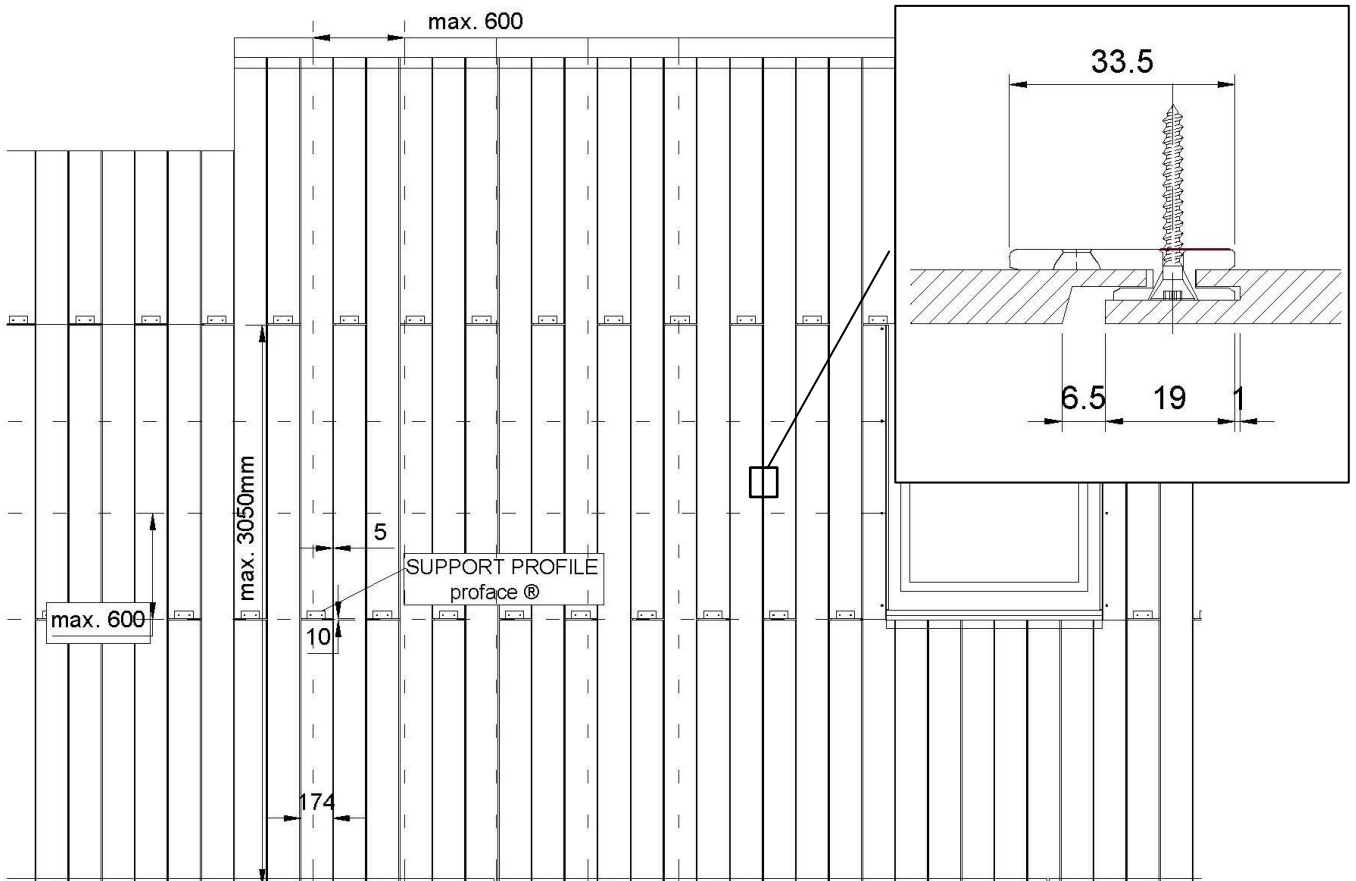
(27) 2003/640/EC – Commission Decision of date 4 September 2003, published in the Official Journal of the European Union (OJEU) L226/21 of 10/09/2003

FIGURE 1: Trespa Pura ^{NFC}® - GENERAL CONFIGURATION

a. Flush siding – horizontal configuration



b. Flush siding – vertical configuration



c. Lap siding – horizontal configuration

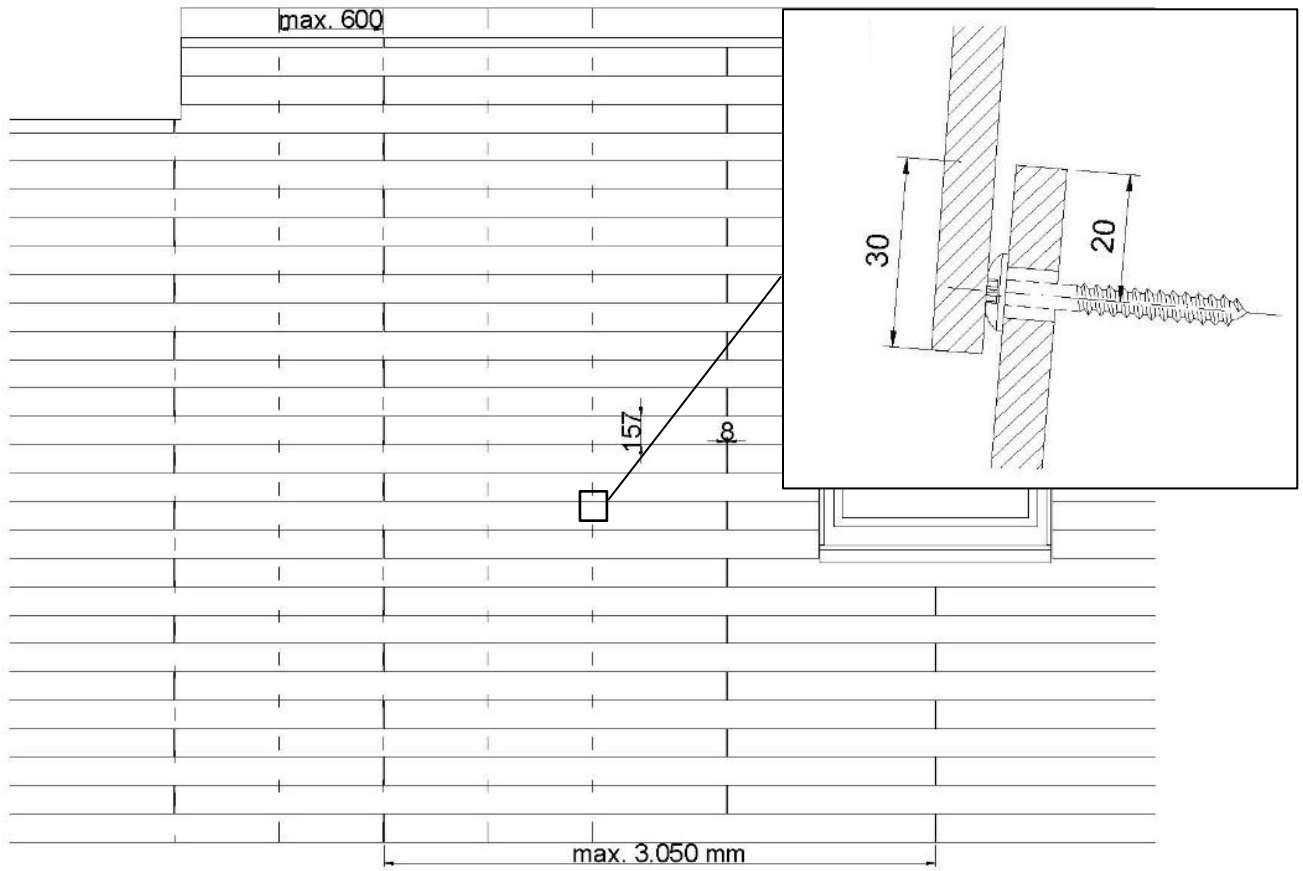


FIGURE 2: Trespa Pura ^{NEC}® Lap Siding fixed and floating point dimensions

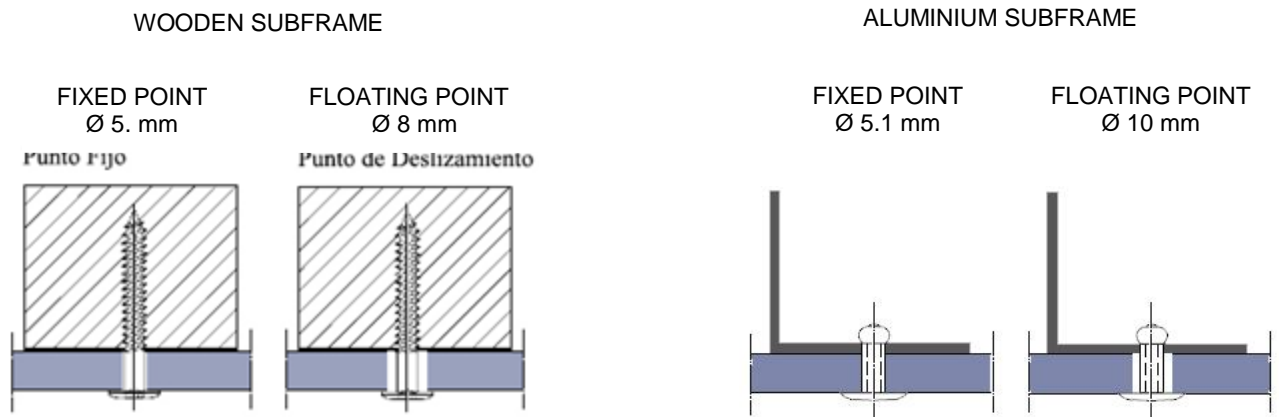


FIGURE 3: Trespa Pura ^{NFC}® FLUSH SIDING COMPONENTS

FIGURE 3.1: CLADDING FIXING
(Universal Clip)

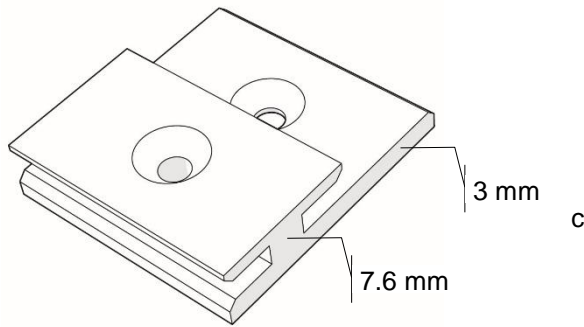
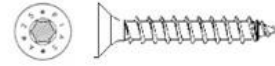


FIGURE 3.2: SCREW
FIXING TO VERTICAL ELEMENT

ASSY Ø 3.5 L=30/25 (to wood)



SDAW-S7/T20 Ø 3.5 (to wood and aluminium)

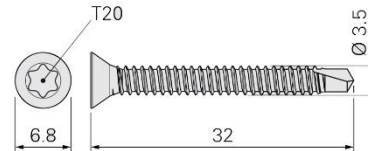


FIGURE 3.3: SUPPORT PROFILE ^{proface}®
(Only for FLUSH SIDING VERTICAL CONFIGURATION)

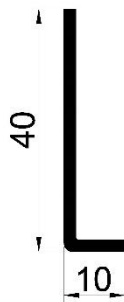
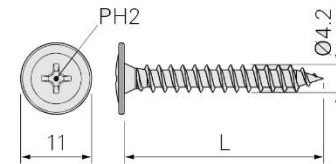


FIGURE 3.4: SCREW BETWEEN
AUXILIARY PROFILES TO
VERTICAL ELEMENT

TW-S-D11/PH2 Ø 4.2 L=30 (to wood)



AP11 Ø5.0 L=12 (to aluminium)

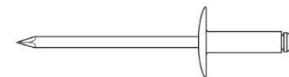
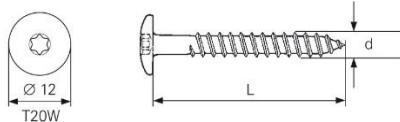


FIGURE 4: Trespa Pura ^{NFC}® LAP SIDING COMPONENTS

FIGURE 4.1: CLADDING FIXING
TO VERTICAL ELEMENT

TW-S-D12 Ø 4.8 L=38 (to wood)



AP 16 Ø 5 L=18 (to aluminium)

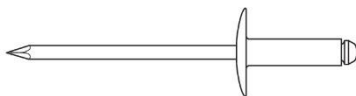


FIGURE 4.2: START PROFILE
^{proface}®

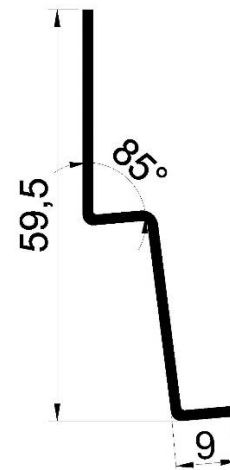


FIGURE 5: WOODEN SUBFRAME ELEMENTS

FIGURE 5.1: GALVANIZED STEEL BRACKET

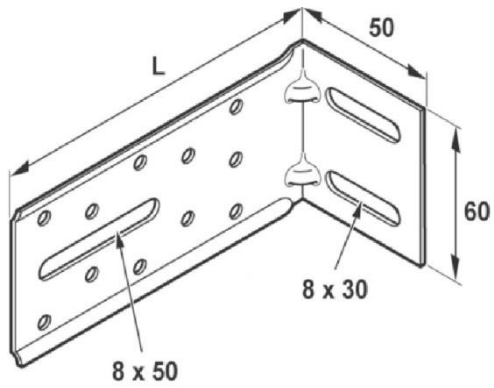


FIGURE 5.2: SCREW BRACKETS TO VERTICAL ELEMENT (BATTEN)
TH 13 Ø 7 L=50



FIGURE 6: ALUMINIUM SUBFRAME ELEMENTS

FIGURE 6.1: ALUMINIUM VERTICAL PROFILES

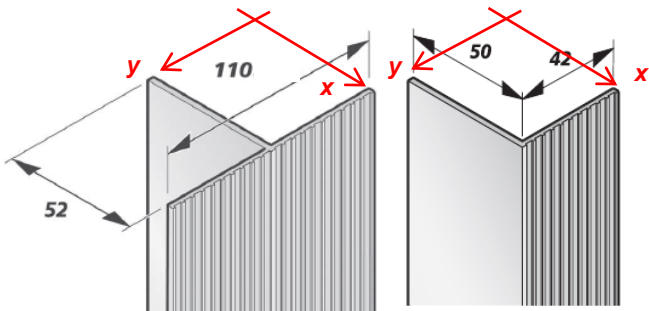
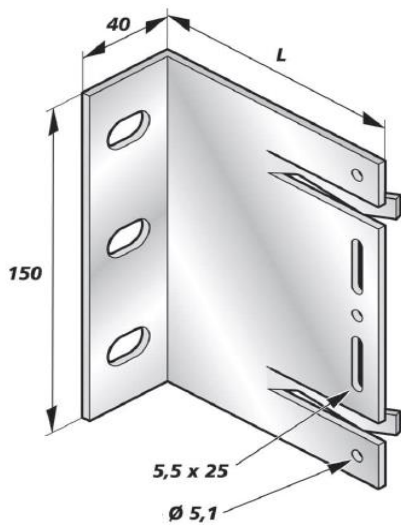


FIGURE 6.2: SCREW BRACKETS TO VERTICAL ALUMINIUM PROFILES
PERFIX 5 TH Ø 5.5 L=19.25



FIGURA 6.3: ALUMINIUM BRACKETS

SUPPORTING BRACKET



RETENTION BRACKET

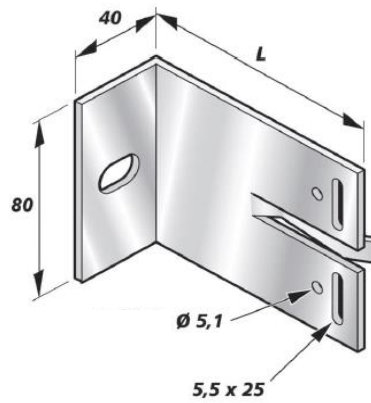
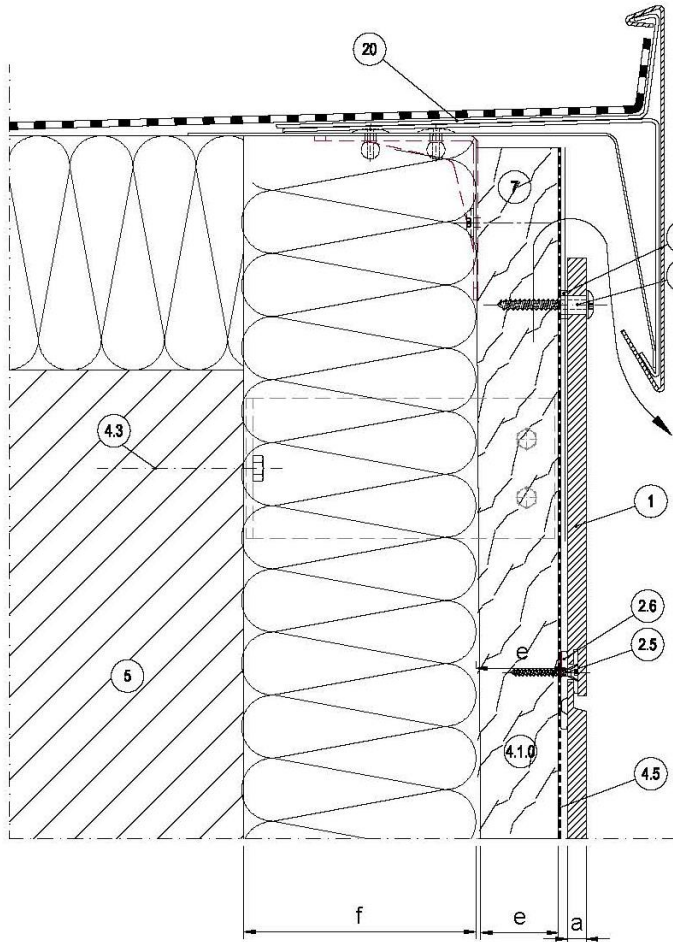


FIGURE 7: Trespa Pura ^{NFC}® FLUSH SIDING – HORIZONTAL CONFIGURATION

DETAIL OF CROWN AND BASE



- 1 Trespa® PURA NFC® siding
- 2.1 Fast Fix Screw
- 2.5 Screw (clip – vertical batten)
- 2.6 Cladding fixing (Universal Clip)
- 2.7 Installation ring
- 4.1.0 Vertical timber batten
- 4.1.1 Bended Galvanized steel Bracket
- 4.2 Thermal Isolator
- 4.3 Anchorage to substrate
- 4.5 EPDM band
- 5 Wall
- 6 Insulation
- 7 Ventilated Cavity
- 8 Perforate angle closure
- 20 Roof Connection

a Siding Thickness 8 mm
 e Cavity depth \geq 30 mm
 f Insulation (Thickness)

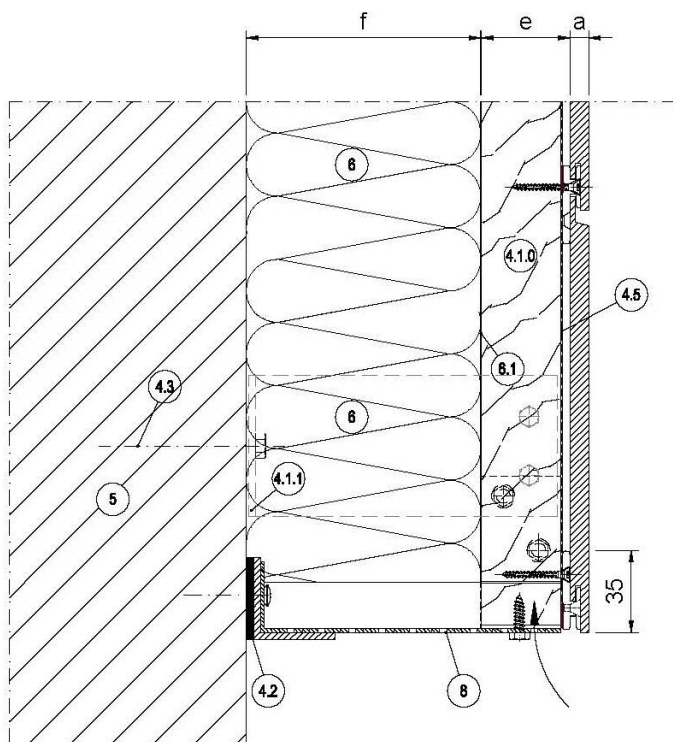


FIGURE 8: Trespa Pura^{NFC}® FLUSH SIDING – VERTICAL CONFIGURATION

DETAIL OF CROWN AND BASE

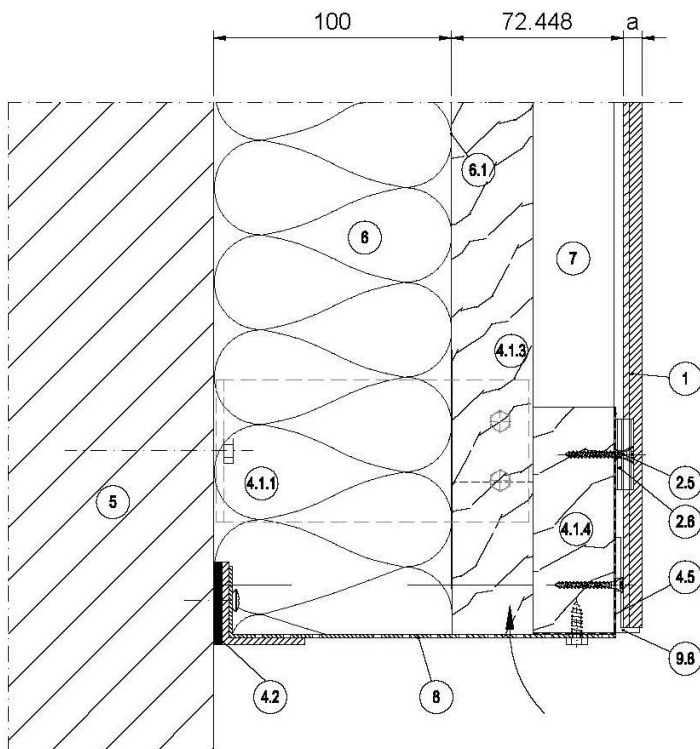
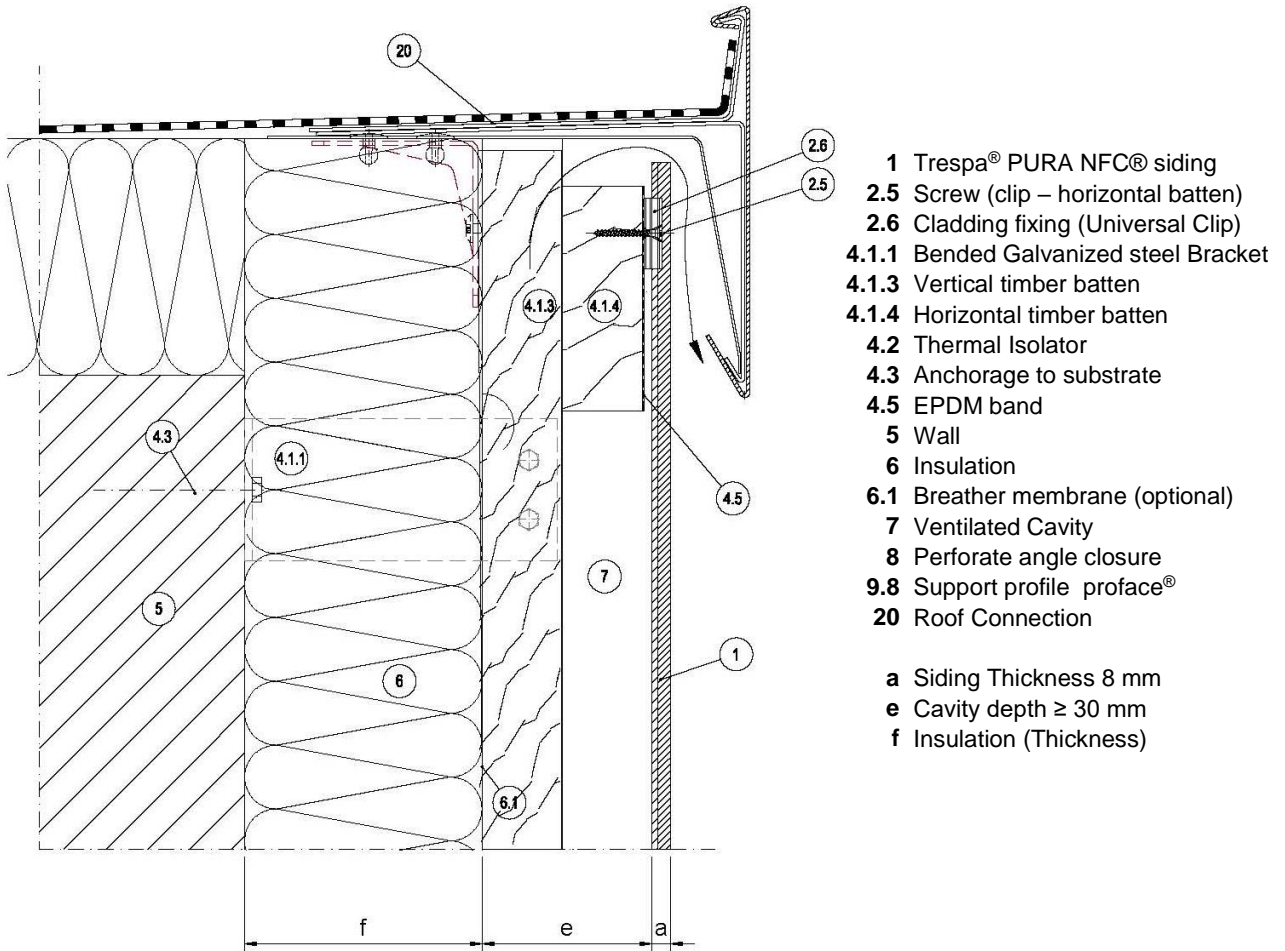
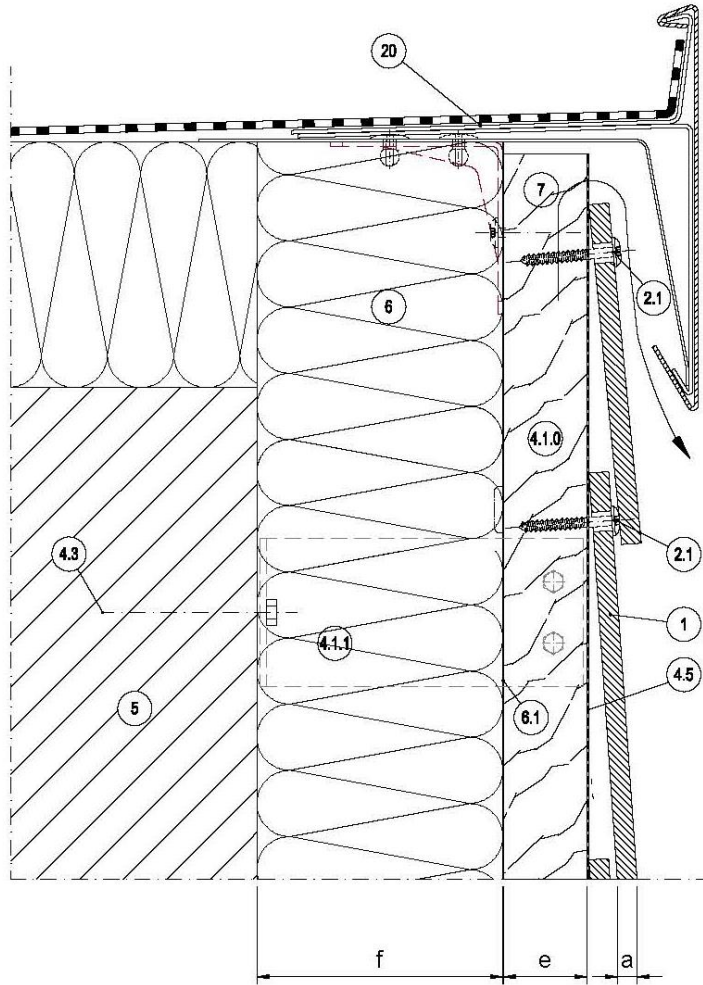


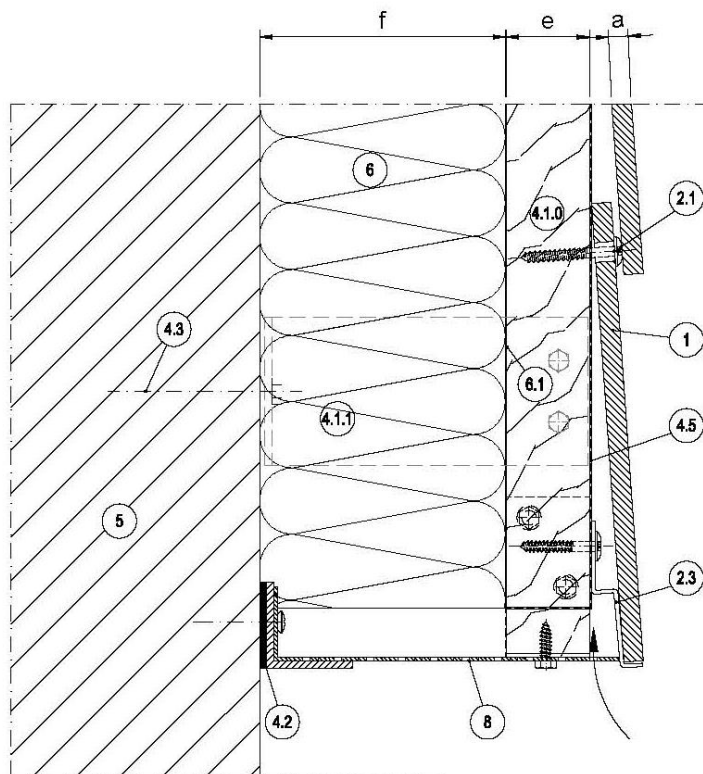
FIGURE 9: Trespa Pura ^{NFC}® LAP SIDING – HORIZONTAL CONFIGURATION

DETAIL OF CROWN AND BASE



- 1 Trespa® PURA NFC® siding
- 2.1 Cladding fixing (self-drilling screw)
- 2.3 Start profile proface®
- 4.1.0 Vertical timber batten
- 4.1.1 Bended Galvanized steel Bracket
- 4.2 Thermal Isolator
- 4.3 Anchorage to substrate
- 4.5 EPDM band
- 5 Wall
- 6 Insulation
- 6.1 Breather membrane (optional)
- 7 Ventilated Cavity
- 8 Perforate angle closure
- 20 Roof Connection

- a Siding Thickness 8 mm
- e Cavity depth \geq 30 mm
- f Thermal Insulation (Thickness)



Annex A: Cladding element specifications

STANDARD DIMENSIONS				
Width (mm)	Length (mm)	Tolerance (mm)	Thickness (mm)	Tolerance (mm)
FLUSH 186	3050	0/+5	8	± 0.50
LAP 187				

GEOMETRY ⁽²⁸⁾			
Thickness	Flatness	Straightness	Weight
Nominal (mm)	Tolerance (mm/m)	Deviation (mm/m)	Nominal (kg/m ²)
8	≤2.0	≤ 1.0	10.8

Physical, mechanical and weather resistance properties

PHYSICAL AND MECHANICAL PROPERTIES				
Property	Attribute	Value	Unit	Test
Density	Density	≥ 1.35	g/cm ³	EN ISO 1183-1 ⁽²⁹⁾
Elastic modulus	Stress	≥ 9.000	MPa	EN ISO 178 ⁽³⁰⁾
Flexural strength	Stress	≥ 120	MPa	EN ISO 178
Tensile strength	Stress	≥ 70	MPa	EN ISO 527-2 ⁽³¹⁾
Resistance to humidity	Mass increase	≤ 3	%	EN 438-2 ⁽³²⁾ -15
	Appearance	≥ 4	1 to 5	
Dimensional stability at high temp.	Cumulative dimensional change	≤ 0.25	%	EN 438-2-17
Impact resistance	Mean failure height	≥ 1800	mm	EN 438-2-21
	Groove Ø	≤ 10	mm	
Resistance to fixings	8 mm	3.000	N	EN 438-7
Formaldehyde emission		E1 Class	-	EN 438-7

WEATHER RESISTANCE PROPERTIES				
Property	Attribute	Value	Unit	Test
Resistance to climatic shock	Appearance	≥ 5	1 to 5	EN 438-2 - 19
	Flexural strength index (Ds)	≥ 0.95		
	Flexural modulus index (Dm)	≥ 0.95		
Colour stability	3000h Xenon 1200V	4 - 5	Grey scale	EN 438-2 - 29
Resistance to SO ₂		4 - 5	Grey scale	DIN 50018
Reaction to fire		B-s2, d0	Euroclass	EN 13501-1 ⁽³³⁾

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

(29) 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".

(30) EN ISO 178:2010 "Plastics - Determination of flexural properties".

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

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

(33) EN 13501-1:2007+A1:2009 "Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests".

Annex B: Fixings and Subframe specifications

Wood requirements

Resistance class	≥ C 18 ⁽³⁴⁾
Durability	Class 2 ⁽³⁵⁾
Processing	Autoclave level 5
Damp control	≤ 18%

Galvanized steel physical and mechanical properties

Type of steel	S220GD
Treatment	Z350
PHYSICAL PROPERTIES	
Density	7850 g/cm ³
Coefficient of linear thermal expansion	1,2 x 10 ⁻⁵ °C ⁻¹
Poisson coefficient	0.3
MECHANICAL PROPERTIES	
Tensile strength (R _m)	300 MPa
Elastic limit (R _{eH})	220 MPa
Elongation (A _{80mm})	20 mm
According to EN 10025-5: 2007 ⁽³⁶⁾ and EN 10346:2015 ⁽³⁷⁾	

Aluminium Physical and mechanical properties

Symbolic designation	Al Si1MgMn	Al Si1MgMn
Numeric designation	EN AW- 6082	EN AW 6060
Treatment	T6	
PHYSICAL PROPERTIES		
Specific weight (g/cm ³)	2,70	
Coefficient of linear thermal expansion (K ⁻¹ - 20/100 °C)	23,5·10 ⁻⁶	
Elastic modulus (MPa)	70.000	
Poisson coefficient	0,33	
MECHANICAL PROPERTIES		
Tensile strength - R _m (N/mm ²)	310	260
Elastic limit - R _{p0,2} (N/mm ²)	260	240
Elongation - A (%)	10	10
Elongation - A _{50mm} (%)	8	8
Brinell hardness (HB)	95	-
According to EN 755-2 ⁽³⁸⁾ and EN 12020-1 ⁽³⁹⁾		

(34) EN 338:2016 Structural timber - Strength classes

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

The wood battens are protected in the joint between sidings with an EPDM elastomeric belt of a thickness exceeding 10/20 mm the width of the battens. Furthermore, it is necessary verify that the battens are protected from damp in other points as the start of them.

(36) EN 10025:2007.Hot rolled products of structural steels - Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

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

(38) EN 755-2: 2016 Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Part 2: Mechanical properties.

(39) EN 12020-1: 2008 Aluminium and aluminium alloys. Extruded precision profiles in alloys EN AW-6060 and EN AW-6063. Part 1: technical conditions for inspection and delivery.

Flush Fixings

Clips Geometrical and mechanical features

Reference	Material	Dimensions (mm)	Thickness (mm)
UNIVERSAL CLIP	Extruded Aluminium EN AW 6082 T6	33.5 x 30 x 7.6	3

Screw between clips and vertical elements

Vertical elements	Aluminium	Wood
Designation	SDAW-S7/T20 Ø 3.5	
Diameter	3.5 mm	
Length	32 mm	
Material	Stainless steel A2 (1.4567)	
Standard	EN ISO 3506-4:2009	
Tensile breaking load	4448 N	
Shear breaking load	3047 N	
Characteristic pull-out load	2440 N ⁽⁴⁰⁾	1378 N ⁽⁴¹⁾
Characteristic shear load	2929 N ⁽⁴²⁾	1453 N ⁽⁴³⁾

Vertical elements	Wood
Designation	WÜRTH ASSY Ø 3.5
Diameter	3.5 mm
Length	30/25 mm
Material	Stainless steel A2 (1.4301)
Standard	EN ISO 3506-4:2009
Characteristic tensile strength	2400N

Lap Fixings

Screws to vertical elements (batten or aluminium profile)



Vertical elements	Wood	Aluminium
Designation	TW-S-D12	AP16 5 x 18 (mandrel A2)
Diameter	4.8 mm	5.0 mm
Length	38 mm	18 mm
Material	Stainless steel A2 (1.4301)	Sleeve - Aluminium AlMg5 Mandrel - Stainless steel A2 (1.4541)
Standard	EN ISO 3506-4:2009	--
Tensile breaking load	7100 N	3720 N
Shear breaking load	5400 N	2414 N

Vertical elements Geometrical and mechanical features

Wooden batten (wood subframe)

Reference	TWO SIDINGS FIXING (at location of joint)	ONE SIDING FIXING (intermediate support)
Minimum width (mm)	≥ 95	≥ 45
Thickness (mm)	≥ 75	≥ 75

Aluminium profiles (aluminium subframe)

Reference	Dimensions (mm)	Thickness (mm)	Section (mm ²)	x _c (mm)	I _{xc} (cm ⁴)	y _c (mm)	I _{yc} (cm ⁴)
Aluminium strip (L) Al 6063 T5	 L 50 x 42	2	180	35.6	46.46	31.7	30.30
Aluminium strip (T) Al 6063 T5	 T 52 x 110	2	320	42.9	6.74	55	22.19

Brackets Geometrical and mechanical features

BRACKETS	Material	Dimensions (mm)	Thickness (mm)
ISOLCO 3000P	Galvanized Steel S220GD - Z350	60 x 50 x 100/140/180	2.5
FACALU (ETANCO)	Extruded Aluminium EN AW 6065 T6	LR80 80 x 40 x 40/80/120	3.0
		LR150 150 x 40 x 40/80/120	

(40) Pull-out load tested using TRESPA PURA Flush Siding universal clip + 2 mm Aluminium sheet

(41) Pull-out load tested using TRESPA PURA Flush Siding universal clip + spruce wood 19.8% moisture

(42) Shear load tested using TRESPA PURA Flush Siding universal clip + 2 mm Aluminium sheet

(43) Shear load tested using TRESPA PURA Flush Siding universal clip + spruce wood 19.8% moisture

Screws between vertical elements and brackets

Vertical elements	Wood	Aluminium
Designation	TIREFOND A VISSER TH13/SHERARDISE	PERFIX 5 TH/A2
Diameter	7 mm	5.5 mm
Length	50 mm	19.25 mm
Material	Hot dip galvanized hardened steel	Stainless steel A2 (1.4301)
Standard	EN ISO 17668:2016	EN ISO 15480:2000
Pull-out	5980 N (450kg/m ³ fir wood –anchorage 50 mm)	6190 N (Stainless steel 1.5mm + Aluminium 3 mm)
Shear breaking load	--	7202 N (Stainless steel 1.5mm + Aluminium 3 mm)

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.