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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® METEON® and TRESPA® METEON® FR
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, www.trespa.com
Manufacturing plant(s)	TRESPA INTERNATIONAL B.V. Wetering, 20. P.O. Box 110 6000 AC Weert - Nederland
This European Technical Assessment contains	24 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

SPECIFIC PART

1. Technical description of the product

The assessed kits for ventilated external wall claddings mechanically fixed are:

- TS150 – visible fixing with screws on timber subframe (family A);
- TS700 – visible fixing with rivets on aluminium subframe (family A);
- TS200 – invisible fixing with brackets on rails on aluminium subframe (family B);
- TS300 – invisible fixing with horizontal rail and profiled edges on aluminium subframe (family C);
- TS650 – invisible fixing with clips and profiled edges on wood subframe (family C);
- TS600 – invisible fixing with clips and profiled edges on aluminium subframe (family C).

Families referred above are described in 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 KIT COMPONENTS

Components		**Material**			**Sizes** [mm]	
Cladding element	HPL panels for exterior TRESPA® METEON® (STD) and TRESPA® METEON® Fire Retardant (FR)(1) produced by TRESPA INTERNATIONAL, B.V., respectly EDS(2) and EDF(3) quality and CE marking(4) according to Annex ZA of the EN 438-7:2005(5)	TS150	High-pressure decorative laminates for exterior application		3050x1530 (t=6,8,10 and 13) 2550x1860 (t=6,8,10 and 13)	
		TS700			3050x1530 (t=6,8,10 and 13) or diagonal 3412	
		TS200			Maximum length 3650 Maximum height 3050 (t=8,10 and 13)	
		TS300			Maximum length 3650 Maximum height 600 (t=8) Maximum height 750 (t=10) Maximum height 900 (t=13)	
		TS600 TS650			Maximum length 3650 Maximum height 200-350 (t=8)	
Cladding fixings (6)	Elements used to secure the cladding elements to the subframe(7)	TS150	Timber subfr.	Stainless steel A2 self-drilling screw	TW-S-D12 Ø 4.8	L=38 (pnl. th= 6-8-10)
						L=44 (pnl. th= 13)
		TS700	Alum. subfr.	Aluminium AlMg5/ Stainless steel A2 rivet	AP 16 Ø 5	L=16 (pnl. th= 6-8)
						L=18 (pnl. th= 10)
						L=21 (pnl. th= 13)
		TS200	Alum. subfr.	Stainless steel A2 self-drilling screws	EJOT PT-S-60	L=9.5 (pnl. th= 8)
						L=11.5 (pnl. th= 10)
						L=14.5 (pnl. th= 13)
				Extr. alum. AW 6060 T5 TS 200 Hanging bracket	70 x 30 x 50 (th=5)	
				Extr. alum. AW 6060 T5 or 6063 T66 TS 200 Horiz. rail	60 x 31.5 (th=2-3)	
				Stainless steel A2 adjustment screw	TH13 Ø 8 L=25	
				Stainless steel A2 self-drilling screws (for fix point)	PERFIX 3 TH8 Ø 5.5 L=25	
		TS300	Alum. subfr.	Extr. alum. AW 6060 T6 TS 302 Intermed./crown rail	37.8 x 45.3 (th=2)	
				Extr. alum. AW 6060 T6 TS 301 base rail	37.5 x 50 (th=2)	
		TS650/ TS600	Timber/ Alum. subfr.	Anti-corrosion cold-forming hardened steel clamp	30 x 25 (th= 0.8)	
		TS650	Timber subfr.	Fix point - Stainless steel A2 self-drilling screw	TW-S-D12 Ø 4.8 L=36	
		TS600	Alum. subfr	Fix point - Aluminium AlMg5/ Stainless steel A2 rivet	AP 16 Ø 5 L=18	

(1) Standards manufacturing formats, dimensional features, physical – mechanical and weather resistance properties in Annex A.
(2) Panels for exterior use, severe conditions, standard.
(3) Panels for exterior use, severe conditions, fire-retardant.
(4) EDS panels – Declaration of performance 002-4 (OCTOBER 2020); EDF panels – Declaration of performance 001-4 (OCTOBER 2020); Certificate of constancy of performance 0958-CPR-1001-1.
(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) Not manufactured by TRESPA INTERNATIONAL, B.V.
(7) Geometric and mechanical features in Annex B and figures 2, 5, 8, 12 and 16.

Subframe [8]	Vertical elements [9] used to fasten on the cladding elements by cladding fixings	TS150 TS650	Timber subfr.	Wood[10] batten	Between 2 panels	34[11]/75[12] x 95
					Intermediate support	34[13]/75[14] x 45
		TS700 TS200 TS300 TS600	Alum. subfr.	Extruded Aluminium AW 6060 T5[15] profile	Between 2 panels	"T" 52 x 110 (t= 2)
					Intermediate support	"L" 50 x 42 (t= 2)
	Metallic elements (wall brackets)[16] used as load transmission between the kit for external wall claddings and the substrate wall	TS150 TS650 [17]	Timber subfr.	Bended Galvanized steel S220GD – Z450 brackets	100 x 50 x 60 (t= 2.5) 140 x 50 x 60 (t= 2.5) 180 x 50 x 60 (t= 2.5)	
		TS700 TS200 TS300 TS600	Alum. subfr	Extr. alum. AW 6060 T5 or 6063 T66 Supporting bracket	150 x 40 x 40 (t= 3) 150 x 40 x 80 (t= 3) 150 x 40 x 120 (t=3)	
				Extr. alum AW 6060 T5 or 6063 T66 Retention bracket	80 x 40 x 40 (t= 3) 80 x 40 x 80 (t= 3) 80 x 40 x 120 (t= 3)	
Subframe fixings [8]	Screws between brackets and vertical elements and horizontal profiles and vertical element[18]	TS150 TS650	Timber subfr	Hot galvanized hardened steel self-drilling screw	HEX 13 SH Ø 7 L=50	
		TS700 TS200 TS300 TS600	Alum. subfr	Stainless steel A2 self-drilling screw	PERFIX 3 TH8 Ø 5.5 L=25	
	Screws between clamps and vertical elements[19]	TS650/ TS600	Timber/ Alum. subfr.	Stainless steel A2 self-drilling screw	SW3-S-D11/R Ø 4.8 L=38	
Ancillary components [8]	Tape used to form the joints	TS150 TS650	Timber subfr.	Ethylene propylene diene monomer (*EPDM*)	W=60-100	
Auxiliary components [8]	Anchorage to substrate[20]	-			-	

When referring to TRESPA® METEON® in this document it should be understood that both, Standard (STD) and Fire Retardant (FR) grade are meant.

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

2.1 Intended use

TRESPA® METEON® kits 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 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[21].

2.3 Design of kit

The design of the external wall cladding system for ventilated façade using TRESPA® METEON® kits should take into account:

(8) Not manufactured by TRESPA INTERNATIONAL, B.V.
(9) Geometric and mechanical features in Annex B and figure 22.
(10) Technical specifications in Annex B.
(11) Installation with horizontal wood battens.
(12) Installation with bended galvanized steel brackets.
(13) Installation with horizontal wood battens.
(14) Installation with bended galvanized steel brackets.
(15) Physical and mechanical properties in Annex B.
(16) Geometric and mechanical features in Annex B and figures 20 and 21.
(17) In TS150 and TS650, vertical batten can be fixed to substrate also using horizontal wood battens, with a section of L x 45 mm (L depends on the insulation thickness).
(18) Geometric and mechanical features in Annex B.
(19) Geometric and mechanical features in Annex B and figure 17.
(20) See Annex C.
(21) In addition, TRESPA INTERNATIONAL B.V. declares that, according to EPD-TRE-20180143-IBB1-EN issued 04-04-2019, the reference service life for TRESPA® METEON® panels is set in 50 years, provided that they are subject to appropriate installation, use and maintenance under normal conditions.

- 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 [(22)].
- 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.

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

The assessment of TRESPA® METEON® 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® METEON® kits performance.

TABLE 2 – SUMMARY OF TRESPA® METEON® KITS PERFORMANCE

Basic Works Requirement	Nº	Essential characteristic	ETA section	Performance
BWR 2 Safety in case of fire	1	Reaction to fire	3.1	EDS D-s2, d0
				EDF B-s1, d0 (t ≥ 8 mm)
				EDF B-s2, d0 (t = 6 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 23 to 27.
	8	Content and/or release of dangerous substances	--	Not assessed

(22) 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.

BWR 4 Safety and accessibility in use	9	Wind load resistance		3.4	TS150	3000 Pa
					TS700	3200 Pa
					TS200	2600 Pa
					TS300	4000 Pa
					TS600/650	Not assessed
	10	Resistance to horizontal point loads		--	Not assessed	
	11	Impact resistance		3.5	TS150	Category I
					TS700	Category I
					TS200	Category I
					TS300	Category I
					TS600/650	Category I
	12	Mechanical resistance of cladding elements	Bending strength of cladding element	3.6	See table 5	
	13		Resistance of grooved cladding element	3.7	TS300 TS600/650	See table 6
	15	Mechanical resistance of connection between the cladding element and the cladding fixing	Pull-through resistance	3.8	TS150	See table 7
					TS700	See table 8
	16		Pull-through resistance under shear loads	3.9	TS150	See table 9
					TS700	See table 10
	17		Axial tension resistance	3.10	TS200	See table 11
	18		Shear load resistance	3.11	TS200	See table 12
	19		Combined tension and shear load resistance	3.12	TS200	See table 13
	21	Mechanical resistance of cladding fixing	Resistance to vertical load	--	TS300 TS600/650	Not assessed
	22		Pull-through resistance of fixings from profile	3.13	TS300	See table 14
	23		Resistance of metal clip	--		Not assessed
	24	Resistance of profile		3.14	See § 3.14	
	25	Subframe fixings	Tension/pull out resistance	--	Not assessed	
	26		Shear load resistance	--	Not assessed	
	27	Brackets resistance (horizontal and vertical)		3.15	See tables 15 and 16	
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		3.16	TS200	None of the defects specified in EAD were observed
	31	Behaviour after pulsating load		3.17	TS200	See table 17
	32	Freeze-thaw resistance of cladding element		3.18	TS200	See table 18
	33	Behaviour after immersion in water of cladding element		--	TRESPA® METEON® cladding kits are not sensitive to water penetration	
	34	Dimensional stability		3.19	See § 3.19	
	35	Chemical and biological resistance of the cladding elements		--	Not assessed	
	36	UV radiation resistance of the cladding elements		3.20	See § 3.20	
	37	Corrosion of metal components		3.21	See § 3.21	

3.1 Reaction to fire – BWR 2

The Euro class of TRESPA® METEON® panels according to standard EN 13501-1: 2007 + A1:2010(23) is:

EDS D-s2, d0
EDF B-s1, d0 (thickness≥ 8 mm)
EDF B-s2, d0 (thickness= 6 mm)

This classification is valid for the TRESPA® METEON® STD and FR. Mentioned products are high pressure compact laminates available in thicknesses from 6 mm to 13 mm. The products are produced and tested in accordance with EN 438-7:2005. The reaction to fire declaration is valid as long as the

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

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 TRESPA® METEON® kits are not watertight(24).

3.3 Drainability – BWR 3

On the basis of the construction details (see figures 23 to 27), 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.
The worst case has been tested: minimum thickness admitted for the kit, maximum span 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)
TRESPA® METEON®	TS150 – 6mm	3000(25)	Breakage of the cladding element	7.32
	TS700 – 6mm	3200(26)	No failure	11.86
	TS200 – 8mm	2600(27)	Breakage of the cladding element	11.11
	TS300 – 8mm	4000(28)	No failure	14.36

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 (29) of kits is indicated in table 4.

(24) 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.
(25) Achieving the 3200 Pa, cladding element broke.
(26) The test had to be stopped at 3200 Pa because the equipment did not achieve stabilization. No failure occurs.
(27) Achieving the 2800 Pa, cladding element broke.
(28) Maximum load allowed by the test equipment. No failure occurs.
(29) 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).

TABLE 4: USE CATEGORY OF KITS		
FIXING SYSTEM		**USE CATEGORY**
TRESPA® METEON®	TS150	Category I
	TS700	Category I
	TS200	Category I
	TS300	Category I
	TS600/650	Category I

3.6 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 STRENGHT OF CLADDING ELEMENT MEAN AND CHARACTERISTIC VALUES				
PANEL THICKNESS (mm)	**FAILURE LOAD (MPa)**		**FLEXURAL MODULUS (MPa)**	
	Mean value	**Characteristic value**	**Mean value**	**Characteristic value**
6 - STD	163	140	10422	9799
13 - STD	144	136	10220	9901
6 - FR	171	153	10508	9697
13 - FR	177	154	11707	10205

TRESPA® METEON® panels satisfy the requirements defined in table 3 § 5.4.1 of EN 438-6: 2016(30).

3.7 Resistance of grooved cladding element – BWR 4

Resistance of grooved cladding element for TRESPA® METEON® - TS300 / TS650 kits (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			
PANEL THICKNESS (mm)	**FAILURE LOAD (N)**		**FAILURE MODE**
	F_m	**$F_{u,5}$**	
8 (mechanically weakest case)	1030	528.21	Cladding element

3.8 Pull-through resistance – BWR 4

Pull-through resistance for TRESPA® METEON® - TS150 / TS700 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.

TS150 kit – Mean and characteristic values are indicated in table 7.

TABLE 7 - PULL-THROUGH RESISTANCE OF TS150 (SCREW)					
PANEL THICKNESS (mm)	**SUPPORT Ø (mm)**	**FIXING POSITION**	**FAILURE LOAD (N)**		**FAILURE MODE**
			F_m	**$F_{u,5}$**	
6	180	Centre	1431	632	Cladding element
		Lateral	785	384	
		Corner	293	120	
	270	Centre	1490	1123	
		Lateral	657	310	
		Corner	299	195	
	350	Centre	1299	1091	
		Lateral	620	415	
		Corner	243	171	
8	180	Centre	2517	873	Cladding element
		Lateral	1548	1294	
		Corner	537	334	
	270	Centre	2741	2160	
		Lateral	1573	1195	
		Corner	584	351	
	350	Centre	2515	1736	
		Lateral	1234	910	
		Corner	346	199	
10	180	Centre	5280	3770	Cladding element
		Lateral	3026	2251	
		Corner	592	346	
	270	Centre	3825	2153	
		Lateral	2412	1148	
		Corner	611	456	
	350	Centre	3913	2571	
		Lateral	2123	1836	
		Corner	543	391	

(30) 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”.

TS700 kit – Mean and characteristic values are indicated in table 8.

TABLE 8- PULL-THROUGH RESISTANCE OF TS700 (RIVET)					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F_m	$F_{u,5}$	
6	180	Centre	2018	1781	Cladding element
		Lateral	1094	524	
		Corner	636	475	
	270	Centre	1443	682	
		Lateral	1029	861	
		Corner	361	299	
	350	Centre	1568	1161	
		Lateral	833	631	
		Corner	297	218	
8	180	Centre	3022	2561	Cladding element
		Lateral	2214	1461	
		Corner	848	349	
	270	Centre	2857	2286	Rivet
		Lateral	1573	1233	Cladding element
		Corner	507	303	
	350	Centre	2678	2346	Rivet/Cl. element
		Lateral	1169	759	Cladding element
		Corner	390	271	
10	180	Centre	3024	2710	Rivet
		Lateral	2843	2166	
		Corner	969	604	Rivet/Cl. element
	270	Centre	2901	1552	Rivet
		Lateral	2461	1842	Rivet/Cl. element
		Corner	791	608	Rivet
	350	Centre	2892	2024	Rivet
		Lateral	2195	1438	Cladding element
		Corner	623	517	Rivet

3.9 Pull-through resistance under shear loads – BWR 4

Pull-through resistance under shear loads for TRESPA® METEON® - TS150 / TS700 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.

TS150 kit – Mean and characteristic values of test are indicated in table 9.

TABLE 9 - PULL-THROUGH RESISTANCE UNDER SHEAR LOADS OF TS150 (SCREW)			
PANEL THICKNESS (mm)	FAILURE LOAD (N)		FAILURE MODE
	F_m	$F_{u,5}$	
6	3758	2995	Tear in batten
8	4104	3331	Tear in batten
10	4132	2823	Tear in batten

TS700 kit – Mean and characteristic values of test are indicated in table 10.

TABLE 10 - PULL-THROUGH RESISTANCE UNDER SHEAR LOADS OF TS700 (RIVET)			
PANEL THICKNESS (mm)	FAILURE LOAD (N)		FAILURE MODE
	F_m	$F_{u,5}$	
6	2718	2585	Rivet
8	2584	2505	Rivet
10	2638	2464	Rivet

3.10 Axial tension resistance – BWR 4

Axial tension resistance for TRESPA® METEON® - TS200 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.

TS200 kit – Mean and characteristic values of test are indicated in table 11.

TABLE 11 – AXIAL TENSION RESISTANCE OF TS200					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F_m	$F_{u,5}$	
8 (mechanically weakest case)	270	Centre	1870	1217	Cladding element
	350	Centre	1428	1037	

3.11 Shear load resistance – BWR 4

Shear load resistance for TRESPA® METEON® - TS200 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.

TS200 kit – Mean and characteristic values of test are indicated in table 12.

TABLE 12 - SHEAR LOAD RESISTANCE OF TS200			
PANEL THICKNESS (mm)	FAILURE LOAD (N)		FAILURE MODE
	F_m	$F_{u,5}$	
8 (mechanically weakest case)	6984	5037	Cladding element

3.12 Combined tension and shear load resistance – BWR 4

Combined tension and shear load resistance for TRESPA® METEON® - TS200 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.

TS200 kit – Mean and characteristic values of test are indicated in table 13.

TABLE 13 – COMBINED TENSION AND SHEAR LOAD RESISTANCE OF TS200						
PANEL THICKNESS (mm)	ANGLE	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
				F_m	$F_{u,5}$	
8 (mechanically weakest case)	30º	350	Centre	1160	933	Cladding element

3.13 Pull-through resistance of fixing from profile – BWR 4

Pull-through resistance of fixing from profile for TRESPA® METEON® - TS300 kit (Family C) has been assessed according to § 2.2.12.11 and the method specified in section J.2 of Annex J of EAD.

TS300 kit – Mean and characteristic values of test are indicated in table 14.

TABLE 14 –PULL-THROUGH RESISTANCE OF FIXING FROM PROFILE OF TS300			
TEST SPECIMEN	FAILURE LOAD (N)		MODE OF FAILURE
	F_m	$F_{u,5}$	
HORIZONTAL RAIL	8711	8068	Breakage of fixings and profile deformation

3.14 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.

3.15 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 15.

TABLE 15: RESISTANCE TO VERTICAL LOAD OF BRACKETS										
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	2556.5	2154.6
		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 16.

TABLE 16: RESISTANCE TO HORIZONTAL LOAD OF BRACKETS						
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	3608.25
		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

3.16 Hygrothermal behaviour – Durability

The hygrothermal behaviour for TRESPA® METEON® - TS200 kit (Family B) 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 TRESPA® METEON® 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).

3.17 Behaviour after pulsating load – Durability

Behaviour after pulsating load for TRESPA® METEON® - TS200 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.

TS200 kit – Mean and characteristic values of test are indicated in table 17.

TABLE 17 – AXIAL TENSION RESISTANCE OF TS200 AFTER PULSATING LOAD					
PANEL THICKNESS	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F_m	$F_{u,5}$	
8 (mechanically weakest case)	350	Centre	1647	1163	Cladding element

3.18 Freeze-thaw resistance – Durability

Freeze-thaw resistance for TRESPA® METEON® - TS200 kit (Family B) has been assessed according to § 2.2.15.3.

After completion of the freeze-thaw cycles, according to EN 494:2012+A1, mechanical tests was carried out.

TS200 kit – Mean and characteristic values of test are indicated in table 18.

TABLE 18 – AXIAL TENSION RESISTANCE OF TS200 AFTER FREEZE-THAW CYCLES					
PANEL THICKNESS (mm)	SUPPORT Ø (mm)	FIXING POSITION	FAILURE LOAD (N)		FAILURE MODE
			F_m	$F_{u,5}$	
8 (mechanically weakest case)	350	Centre	1634	1287	Cladding element

3.19 Dimensional stability – Durability

Dimensional stability at elevated temperature of the panel has been determined according to EN 438-2: 2005[31] (section 17).

TRESPA® METEON® panels satisfy the requirements defined in table 3 § 5.4.1 of EN 438-6:2016, besides the cumulative dimensional change of TRESPA® METEON® panels is set at ≤ 0.25 % (length + transversal direction).

3.20 UV radiation resistance of the cladding elements – Durability

UV radiation resistance has been tested according to EN 438-2:2016+A1 (section 28) on all references of TRESPA® METEON® panels.
The samples tested do not show any visible change after accelerating ageing from UV radiation test.

3.21 Corrosion of metal components

Fixings and subframe components are made of:

- Aluminium alloy 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[32] (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[33] (Table A.1 in Annex A) and EN ISO 9223: 2012[34] (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 Z450 treatment according to EN 10346[35].

The category of corrosivity is C3 (Medium) and the durability class is H (High) according to EN ISO 14713-1: 2019[36] (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 [37] the system of assessment and verification of constancy of performances (see Annex V to Regulation (EU) Nº 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® METEON® FR	Ventilated external wall claddings	-	1
Kits for external wall claddings mechanically fixed TRESPA® METEON®	Ventilated external wall claddings		2+

(31) EN 438-2:`"High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called Laminates) - Part 2: Determination of properties"
(32) EN 1999-1-1:2007+A1:2009 "Eurocode 9. Design of aluminium structures - Part 1-1: General structural rules".
(33) EN 1993-1-4:2006 "Eurocode 3 Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels".
(34) EN ISO 9223:2012 "Corrosion of metals and alloys - Corrosivity of atmospheres - Classification, determination and estimation".
(35) EN 10346: 2015 "Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions".
(36) 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".
(37) 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

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, 22nd July 2021

Firmado por CASTILLO TALAVERA ANGEL - DNI 52507605P
Fecha: 17/09/2021 16:01:53 CEST

Director
IETcc – CSIC

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.

TS150 – VISIBLE FIXING WITH SCREWS ON TIMBER SUBFRAME (FAMILY A)

FIGURE 1: GENERAL CONFIGURATION

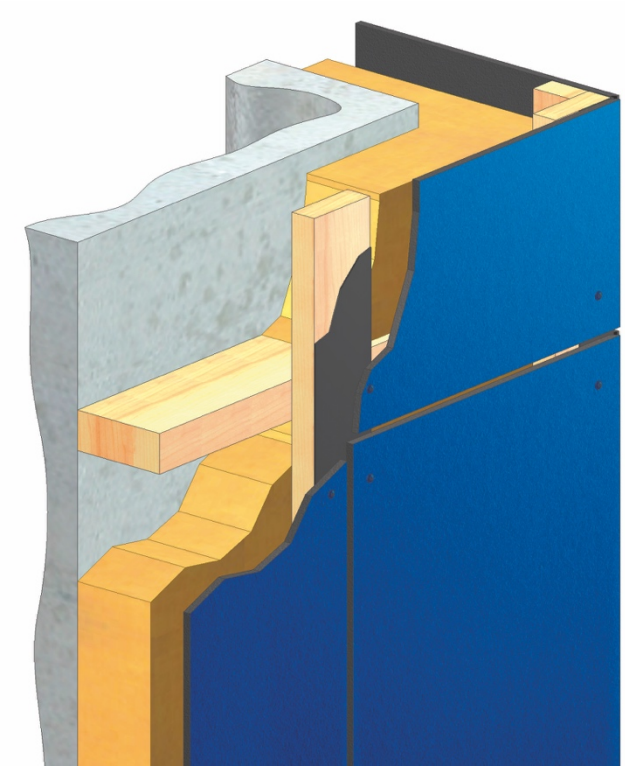
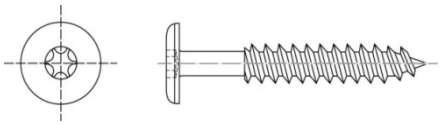
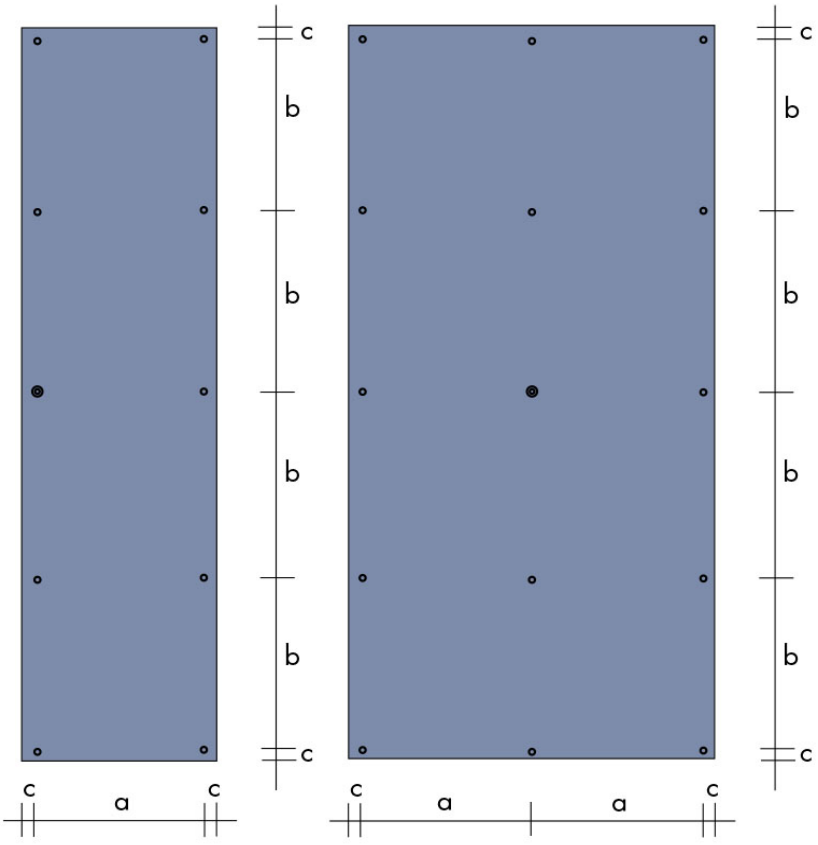


FIGURE 2: VISIBLE FIXING – SCREW



TW-S-D12 Ø 4.8 (SFS)	L=38 (panel th= 6-8-10)
	L=44 (panel th= 13)

FIGURE 3: FIXING DISTANCE and FIXINGS HOLES DIMENSIONS



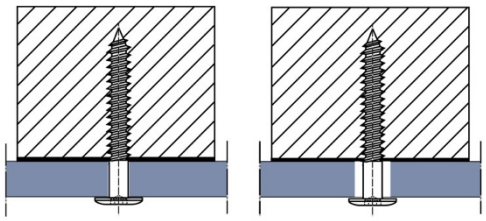
a = horizontal fixing distance
b = vertical fixing distance
c = edge clearance (Min. 20 mm, Max. 10 x panel th.)
◎ = fixed point in panel centre
○ = sliding point

RECOMENDED MAXIMUM FIXING DISTANCE				
Panel thickness (mm)	6	8	10	13
2 fixings in one direction (mm)	450	600	750	950
3 or more fixings in one direction (mm)	550	750	900	1200

Fixing distances must be calculated in accordance with applicable local standards and regulations and should be verified by a structural engineer.
For Specular finish panels (thickness 10 and 13 mm) fixing distance should to be reduced (check www.trespa.info for specifics).

FIXED POINT
hole Ø 5 mm

SLIDING POINT
hole Ø 8 mm



TS700 – VISIBLE FIXING WITH RIVETS ON ALUMINIUM SUBFRAME (FAMILY A)

FIGURE 4: GENERAL CONFIGURATION

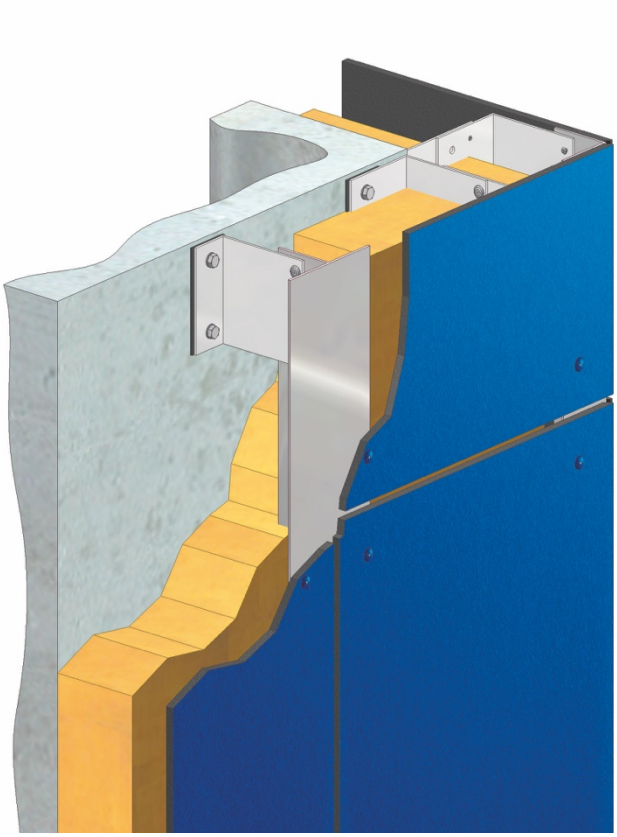
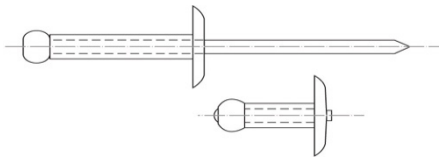
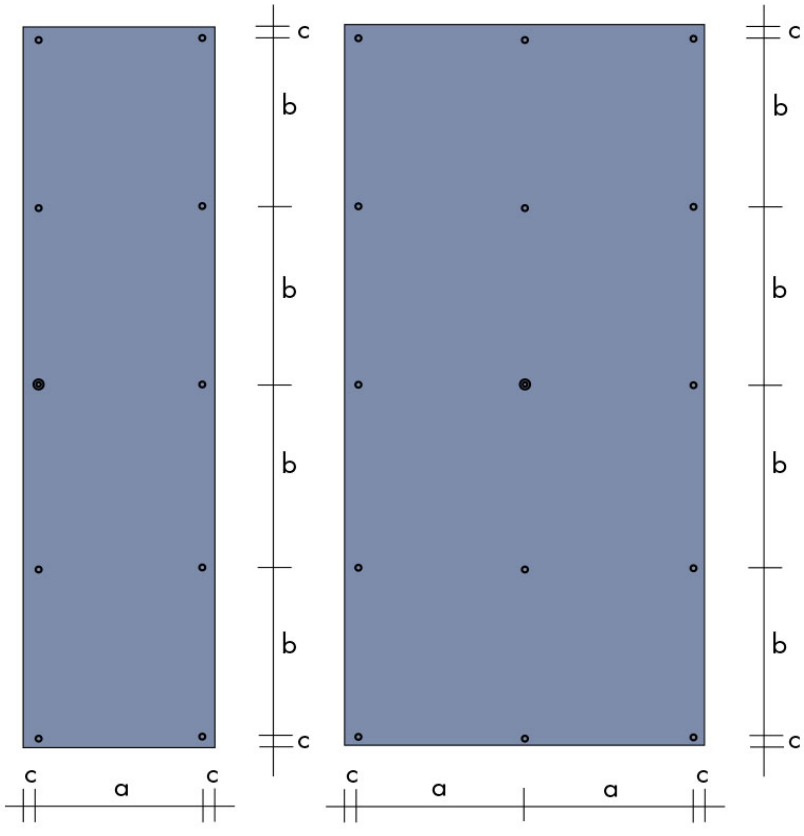


FIGURE 5: VISIBLE FIXING – RIVETS



AP 16 Ø 5 (SFS)	L=16 (panel th= 6-8)
	L=18 (panel th= 10)
	L=21 (panel th= 13)

FIGURE 6: FIXING DISTANCE and FIXINGS HOLES DIMENSIONS



a = horizontal fixing distance

b = vertical fixing distance

c = edge clearance (Min. 20 mm, Max. 10 x panel th.)

◎ = fixed point in panel centre

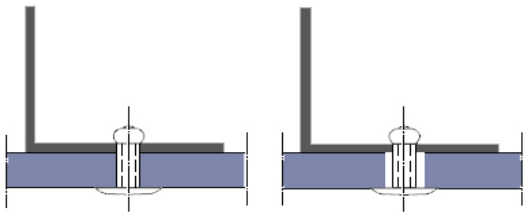
○ = sliding point

RECOMENDED MAXIMUM FIXING DISTANCE				
Panel thickness (mm)	6	8	10	13
2 fixings in one direction (mm)	450	600	750	950
3 or more fixings in one direction (mm)	550	750	900	1200

Fixing distances must be calculated in accordance with applicable local standards and regulations and should be verified by a structural engineer.
Based on surface finish of Specular panels, fixing distances should be reduced (check www.trespa.info for specifics).

FIXED POINT
hole Ø 5.1 mm

SLIDING POINT
Hole Ø 10 mm



TS200 – INVISIBLE FIXING WITH SCREWS – HANGING BRACKET – HORIZONTAL RAIL ON ALUMINIUM SUBFRAME (FAMILY B)

FIGURE 7: GENERAL CONFIGURATION

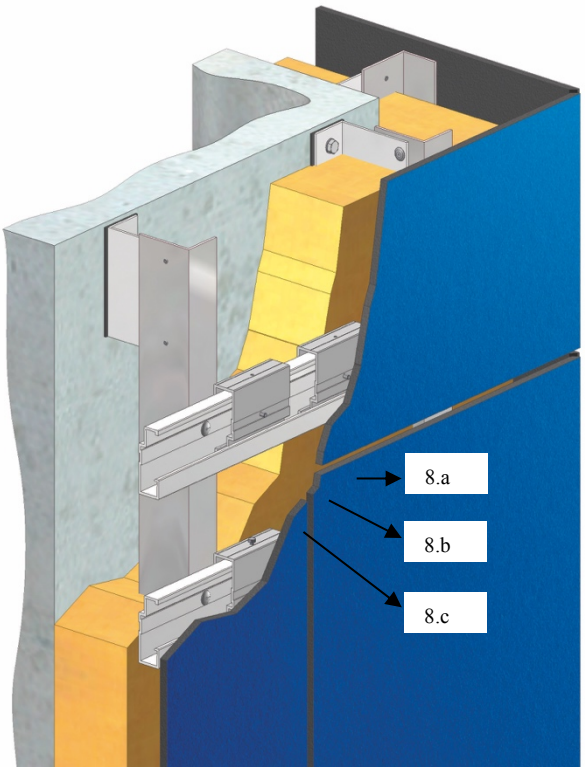
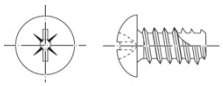


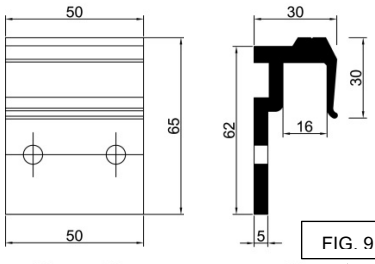
FIGURE 8: INVISIBLE FIXING

8.a: SELF-DRILLING SCREW

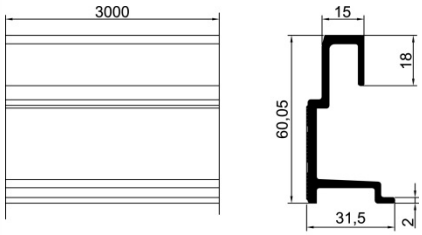


EJOT PT-S-60	L=9.5 (pnl. th= 8)
	L=11.5 (pnl. th= 10)
	L=14.5 (pnl. th= 13)

8.b: HANGING BRACKET



8.c: HORIZONTAL RAIL



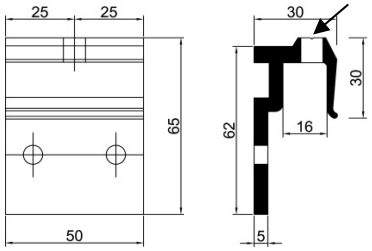


FIG. 9

FIGURE 9: SCREWS

9.a: for FIXED POINT

9.b: for ADJUSTING POINT

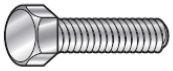
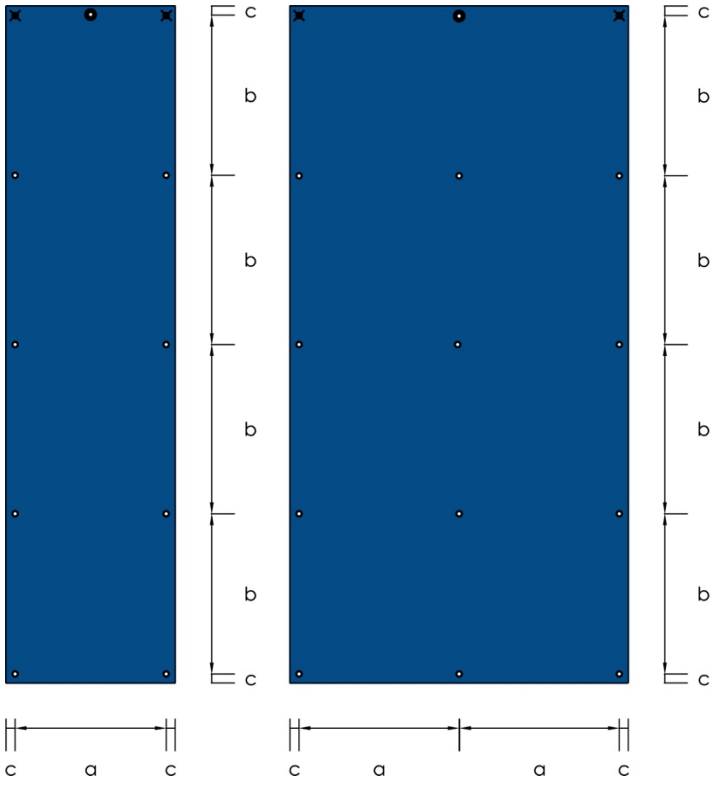


FIGURE 10: FIXING DISTANCE



Fixing and edge clearances

a = Horizontal fixing distance

b = Vertical fixing distance

c = Edge clearance
(Min. 65 mm, Max. 10 x panel th. counted from the center of the first fixing)

⊙ = Fixed point

x = Adjusting point

o = Sliding point:
Lower brackets fixed higher at such a level as to facilitate downward panel movement (2.5 mm/m¹)

MAXIMUM FIXING DISTANCE			
Panel thickness (mm)	8	10	13
2 fixings in one direction (mm)	600	750	950
3 or more fixings in one direction (mm)	750	900	1200

Fixing distances must be calculated in accordance with applicable local standards and regulations and should be verified by a structural engineer.
The maximum permitted fixing distances shown have been designed with a maximum wind-load of 600N/m² and a maximum deflection of L/200.
Based on surface finish of Specular panels, fixing distances should be reduced (check www.trespa.info for specifics).

TS300 – INVISIBLE FIXING WITH HORIZONTAL RAIL ON ALUMINIUM SUBFRAME (FAMILY C)

FIGURE 11: GENERAL CONFIGURATION

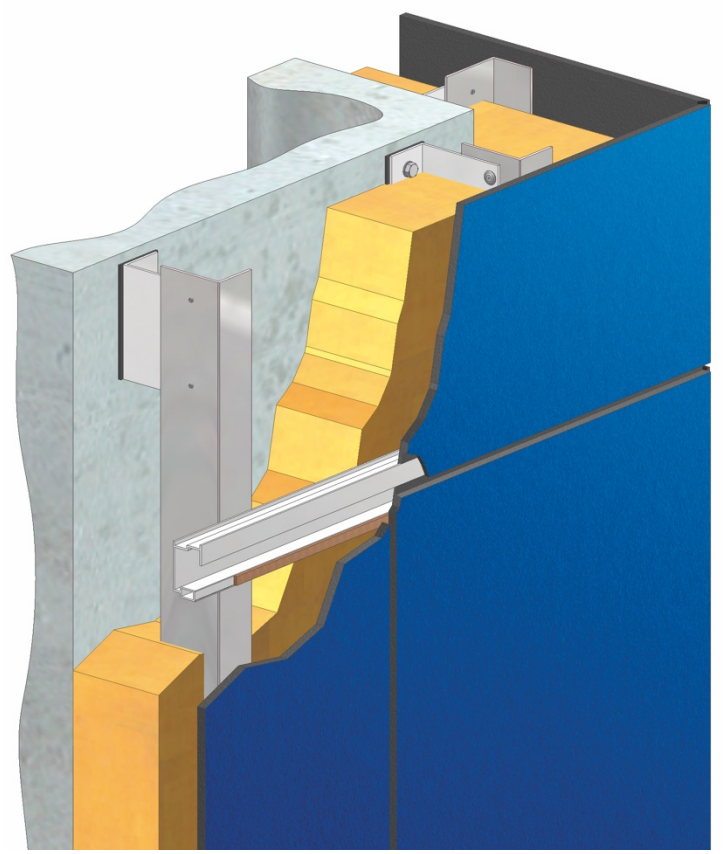
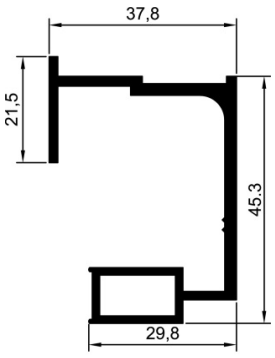


FIGURE 12: INVISIBLE FIXING - HORIZONTAL RAIL

12.a: INTERMEDIATE/CROWN RAIL (TS 302)



12.b: BASE RAIL (TS 301)

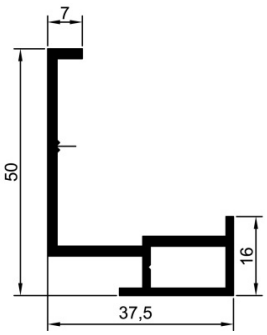
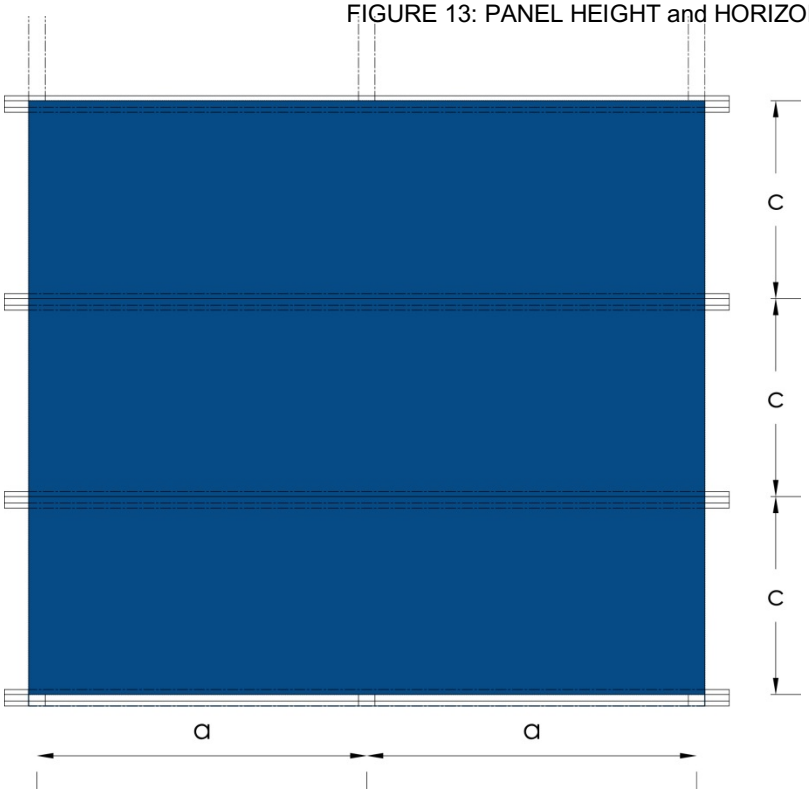


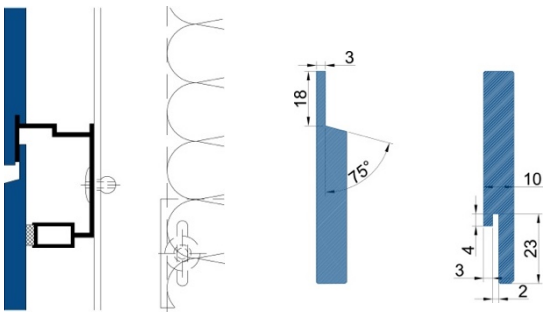
FIGURE 13: PANEL HEIGHT and HORIZONTAL RAIL DISTANCE



RECOMENDED MAXIMUM PANEL HEIGHT			
Panel thickness (mm)	8	10	13
Panel height (mm)	600	750	900

Fixing distances must be calculated in accordance with applicable local standards and regulations and should be verified by a structural engineer.
The maximum permitted fixing distances shown have been designed with a maximum wind-load of 600N/m^2 and a maximum deflection of L/200.
Based on surface finish of Specular panels, fixing distances should be reduced (check www.trespa.info for specifics).

FIGURE 14: JOINT AND PANEL SHAPE DETAILS



TS650/600 – INVISIBLE FIXING WITH CLIPS ON WOOD/ALUMINIUM SUBFRAME (FAMILY C)

FIGURE 15: GENERAL CONFIGURATION

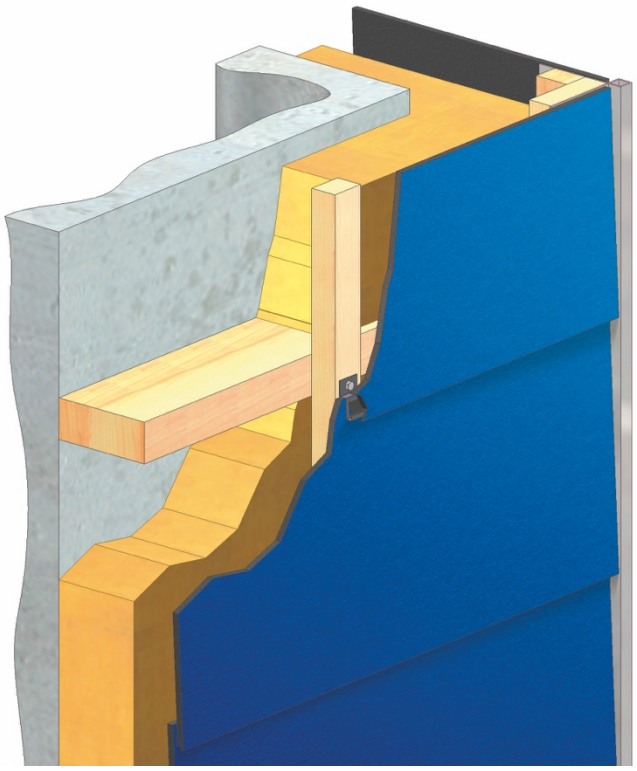


FIGURA 16: INVISIBLE FIXING - CLAMP

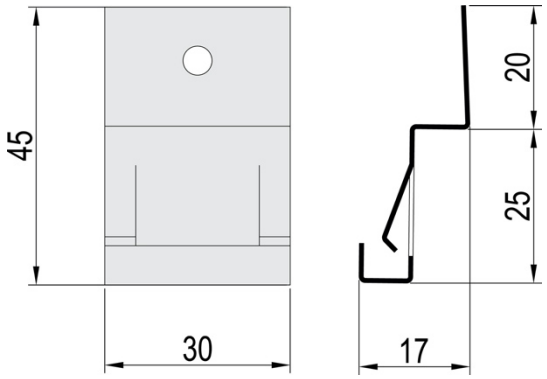


FIGURA 17: SCREWS - CLAMPS AND VERTICAL ELEMENTS

17.a: SW3-S-D11/R Ø 4.8 L=38
(SFS)

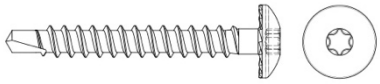
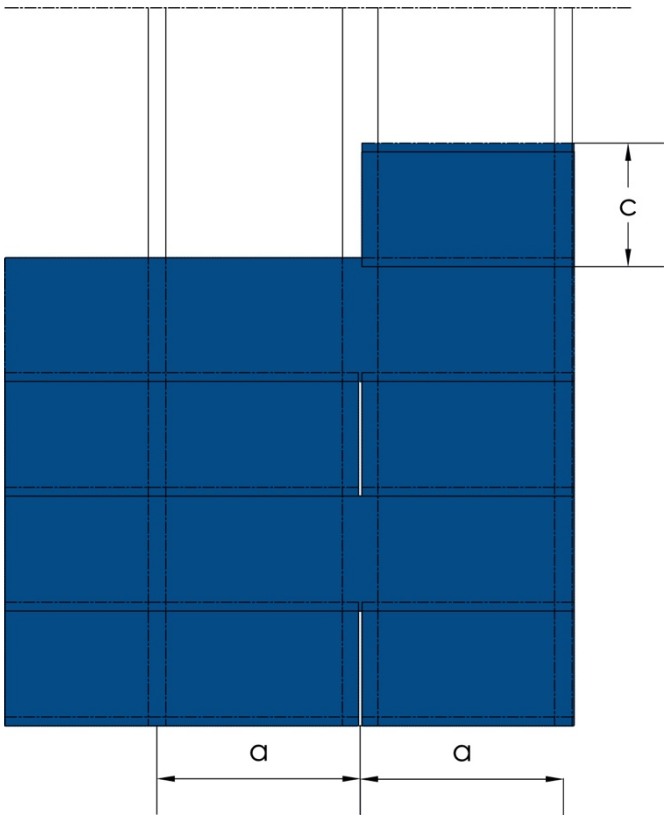


FIGURE 18: PANEL HEIGHT and FIXINGS DISTANCE



RECOMENDED MAXIMUM PANEL HEIGHT AND FIXING DISTANCE	
Panel thickness (mm)	8
Panel height (mm)	200-350
fixings in horizontal direction (mm)	600

Fixing distances must be calculated in accordance with applicable local standards and regulations and should be verified by a structural engineer.

FIGURE 19.a: FIX POINT – OVERLAP DETAIL

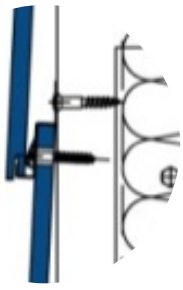
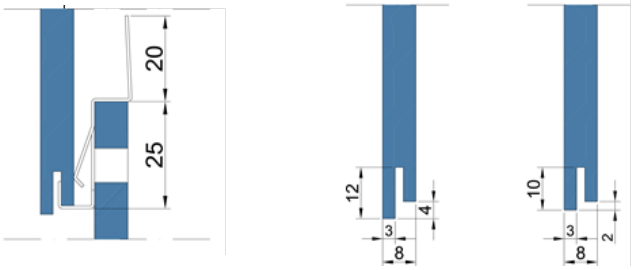


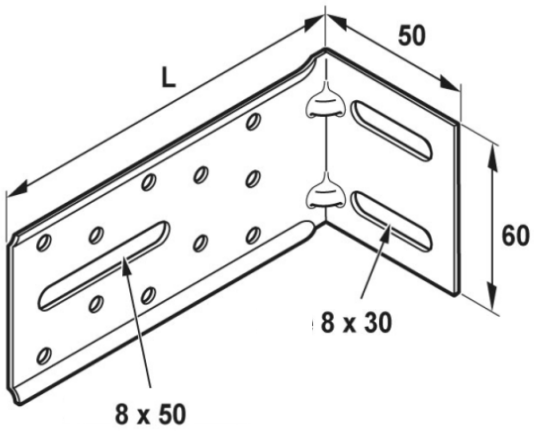
FIGURE 19.b: OVERLAP AND SHAPE PANEL DETAILS



TIMBER SUBFRAME COMPONENTS

FIGURE 20: BENDED GALVANIZED STEEL BRACKET (L depends on the insulation thickness).

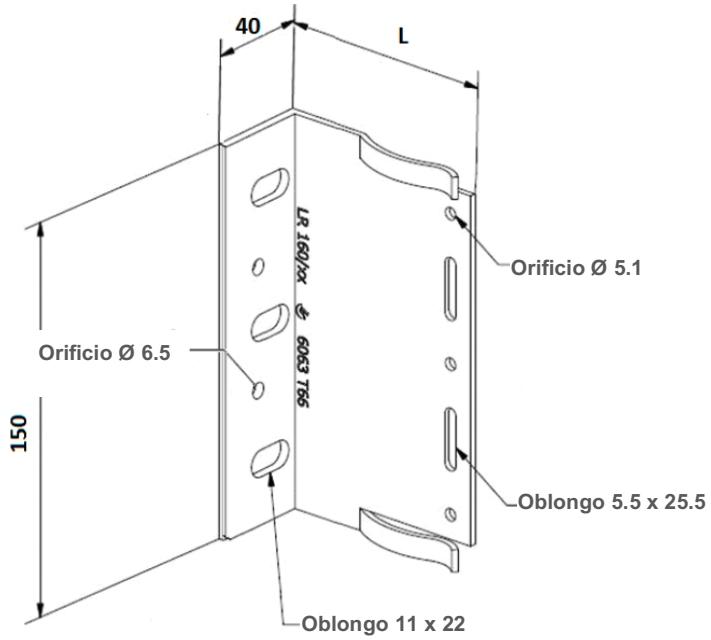
Vertical wood batten can be fixed to substrate also using horizontal wood battens, with a section of L x 450mm.



ALUMINIUM SUBFRAME COMPONENTS

FIGURE 21: BRACKETS

SUPPORTING



RETENTION

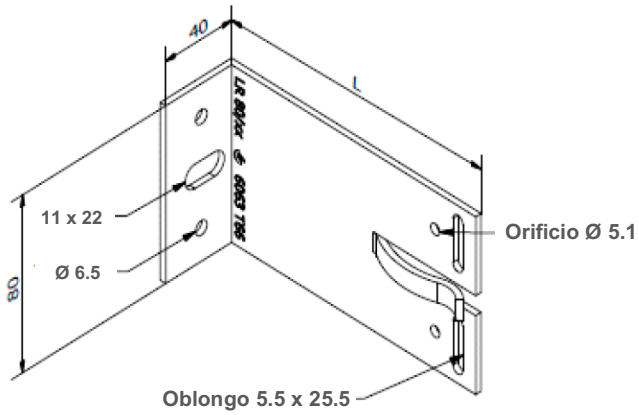
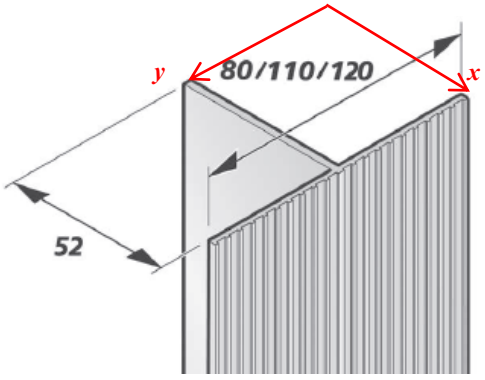


FIGURE 22: VERTICAL PROFILES



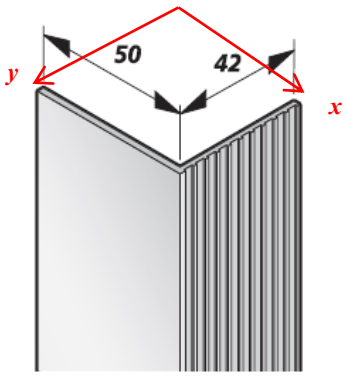


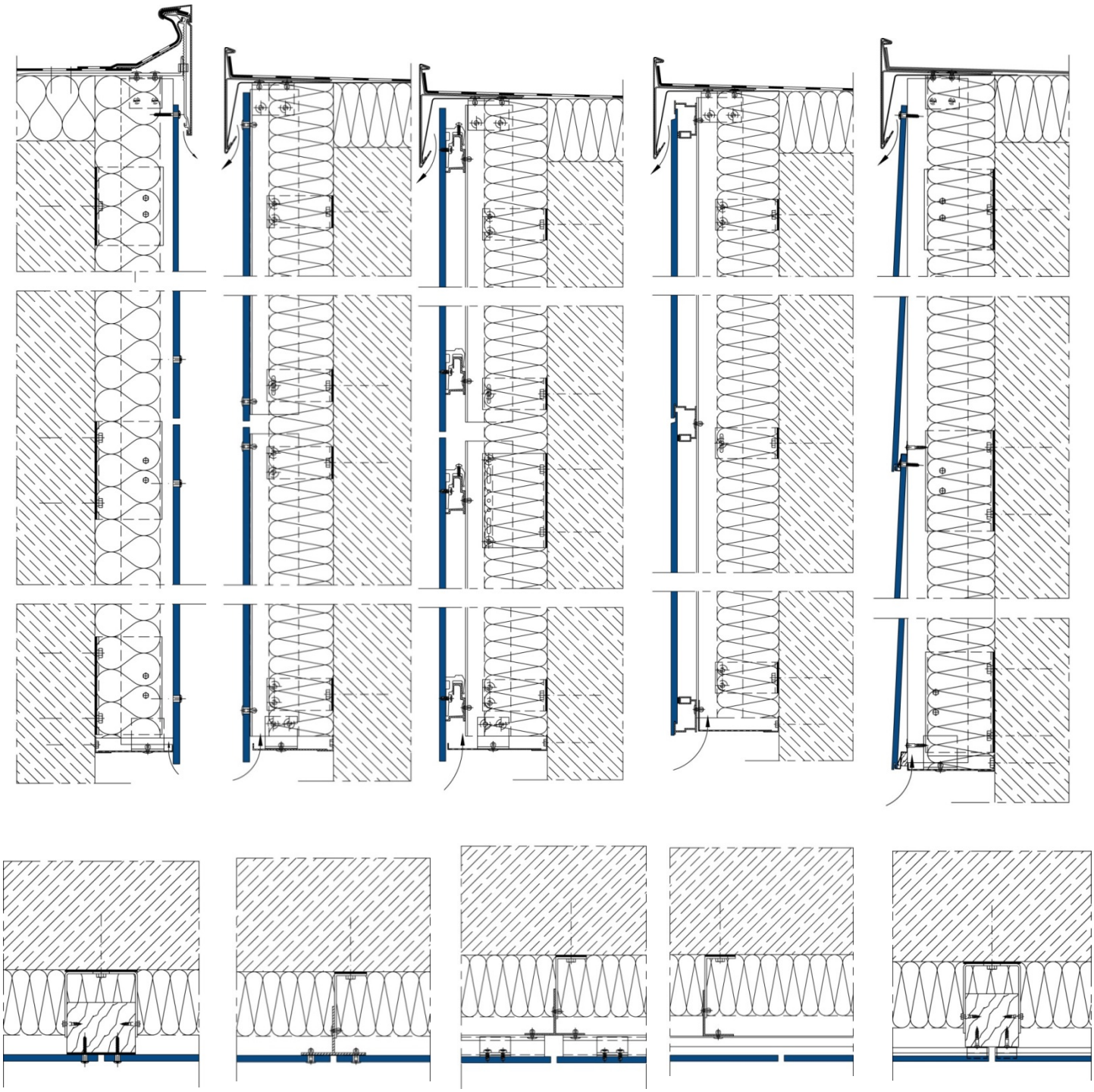
FIGURE 23: TS150

FIGURE 24: TS700

FIGURE 25: TS200

FIGURE 26: TS300

FIGURE 27: TS650/600



JOINTS RECOMENDATIONS

The horizontal and vertical panel connections may either be open or closed and for each of these combinations special joint solutions exist. For more details please visit www.trespa.info/meteon. In all cases, tolerances with respect to the panel, assembly and building itself play an important role in the joint details. Therefore the following guidelines apply:

- Take into account a cumulative dimensional change of 2.5 mm per meter in the length and in the width.
- Allow for at least 5 mm space around every single panel.
- Ensure a minimum joint width of 10 mm between two panels.
- Fit joints larger than 10 mm with grilles, insect mesh, etc. in accordance with applicable building standards and regulations to prevent insects and vermin getting in behind the façade cladding.
- Ensure joints allow for sufficient ventilation and drainage to prevent damage by retained moisture.

Annex A: Cladding element specifications

STANDARD DIMENSIONS						
Manufacturing formats	**Length x Height** (mm x mm)	**Length x Height Tollerance** (mm)	**Thickness** (mm)	**Thickness Tollerance** (mm)	**Diagonal** (mm)	**Diagonal Tollerance** (mm)
FF SF IF ZF	3650 x 1860 2550 x 1860 3050 x 1530 4270 x 2130	± 5	6	± 0,4	4097	± 17
			8	± 0,5	3156	± 13
			10		3412	± 12
			13	± 0,6	4772	± 20

GEOMETRY			
Thickness	**Flatness**	**Straightness of edges**	**Weight**
Nominal (mm)	Tollerance (mm/m)	Deviation (mm/m)	Nominal(kg/m^2)
6	≤ 2,0	≤ 1,0	8,1
8	≤ 2,0	≤ 1,0	10,8
10	≤ 2,0	≤ 1,0	13,5
13	≤ 2,0	≤ 1,0	17,5

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[(38)]
Elastic modulus	Stress	≥ 9000	MPa	EN ISO 178[(39)]
Flexural strength	Stress	≥ 120	MPa	EN ISO 178
Tensile strength	Stress	≥ 70	MPa	EN ISO 527-2[(40)]
Resistance to humidity	Mass increase	≤ 3	%	EN 438-2[(41)]-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
	Indentation Ø	≤ 10	mm	
Resistance to fixings	6 mm	≥ 2000	N	EN 438-7
	8 mm	≥ 3000	N	
	10 mm	≥ 4000	N	
	13 mm	≥ 4000	N	
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)	≥ 0.80		
	Flexural modulus index (Dm)	≥ 0.80		
Colour stability	3000h Xenon 1200V	4 - 5	Grey scale	EN 438-2 – 29 [(42)]
Resistance to SO_2		4 - 5	Grey scale	DIN 50018
Reaction to fire	EDS	D-s2, d0	Euroclass	EN 13501-1[(43)]
	EDF (t = 6 mm)	B-s2, d0		
	EDF (t ≥ 8 mm)	B-s1, d0		

(38) EN ISO 1183-1:2019 “Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pyknometer method and titration method”.
(39) EN ISO 178:2010 “Plastics - Determination of flexural properties”.
(40) EN ISO 527-2: 2012 “Plastics. Determination of tensile properties. Part 2: test conditions for moulding and extrusion plastics”.
(41) EN 438-2:2016+A1:2018 “High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called Laminates) - Part 2: Determination of properties”.
(42) In addition, Trespa uses also FLORIDA cycles to evaluate Colour Stability of the panels, obtaining the same results.
(43) 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: Cladding fixings and Subframe specifications

Cladding Fixings

TS150 – visible fixing – Screws on timber subframe

Designation	TW-S-D12 Ø 4.8 (SFS)
Diameter (mm)	4.8
Length (mm)	L=38 (pnl. th= 6-8-10)
	L=44 (pnl. th= 13)
Material	Stainless steel A2 (1.4567)
Standard	EN ISO 3506-4:2009(44)
Tensile breaking load (N)	7000
Shear breaking load (N)	5400
Pull-out (embedment on wood 26mm) (N)	3023

TS700 – visible fixing – Rivets on aluminium subframe

Designation		AP16 Ø 5 (SFS)
Diameter (mm)		5.0
Length (mm)		L=16 (pnl. th= 6-8)
		L=18 (pnl. th= 10)
		L=21 (pnl. th= 13)
Material	**Sleeve**	Aluminium AlMg5
	Mandrel	Stainless steel A2 (1.4541)
Tensile breaking load (N)		3950
Shear breaking load (N)		2250

TS200 – invisible fixing – Screws, Hanging bracket, Horizontal rail on aluminium subframe

Screws to panel

Designation	EJOT PT-S-60
Diameter (mm)	6
Length (mm)	L=9.5 (pnl. th= 8)
	L=11.5 (pnl. th= 10)
	L=14.5 (pnl. th= 13)
Material	Stainless steel A2 (1.4567) o A4 (1.4401)
Standard	EN ISO 3506-4:2009
Blind drill diameter on panel (mm)	4.9 ± 0.1
Blind drill depth on panel (mm)	D=5.5 (pnl. th= 8)
	D=7.5 (pnl. th= 10)
	D=10.5 (pnl. th= 13)
Average Tensile load (N)	1030 (pnl. th= 8)
	3710 (pnl. th= 10)
Average Shear load (N)	2680 (pnl. th= 8)
	4210 (pnl. th= 10)

Designation	TS 200 Hanging bracket
Thickness (mm)	5
General dimension (mm)	70 x 30
Length (mm)	50
Material	AW 6060 T5
I_x (cm^4)	17.23
I_y (cm^4)	4.58

Horizontal rails

Designation	TS 200 Horizontal rail
Thickness (mm)	2-3
General dimension (mm)	60 x 31.5
Length (mm)	Max. 3000
Material	AW 6063 T66
I_x (cm^4)	13.37
I_y (cm^4)	2.13

(44) EN ISO 3506-4: 2009 Mechanical properties of corrosion-resistant stainless steel fasteners - Part 4: Tapping screws (ISO 3506-4:2009)

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

TS300 – invisible fixing – Horizontal rail on aluminium subframe

Designation	TS 302	TS 301
Thickness (mm)	2	
General dimension (mm)	37.8 x 45.3	37.5 x 50
Length (mm)	Max. 3600	
Material	AW 6060 T6	

TS650/600 – invisible fixing – Clips on wood/aluminium subframe

Designation	TS 600/650 Clamp
Thickness (mm)	0.8
General dimension (mm)	30 x 45
Hole diameter (mm)	5.5
Material	Anti-corrosion cold-forming hardened steel (1.4401)
Standard	EN 10088-2:2008 (45)

Screws between clip and vertical elements

Vertical elements	Aluminium/Timber subframe
Designation	SW3-S-D11/R (SFS)
Diameter (mm)	4.8
Length (mm)	38
Material	Stainless steel A2 (1.4567)
Standard	EN ISO 3506-4:2009
Tensile breaking load (N)	6479
Shear breaking load (N)	5190

(45) EN 10088-2:2008 Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes

Subframe materials

Wood requirements

Resistance class	≥ C 18[46]
Durability	Class 2[47]
Processing	Autoclave level 5 [48]
Damp control	≤ 18%

Galvanized steel physical and mechanical properties

Type of steel	S220GD
Treatment	Z450
PHYSICAL PROPERTIES	
Density	7850 g/cm^3
Coefficient of linear thermal expansion	1,2 x 10^{-5} ºC^{-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: 2019[49] and EN 10346:2015[50]	

Aluminium Physical and mechanical properties

Symbolic designation	EN AW-Al MgSi	EN AW-Al Mg0,7Si
Numeric designation	EN AW 6060	EN AW 6063
Treatment	T5-T6	T66
PHYSICAL PROPERTIES		
Specific weight (g/cm^3)	2,70	
Coefficient of linear thermal expansion (K^{-1} - 20/100 ºC)	23,4·10^{-6}	
Elastic modulus (MPa)	69500	
Poisson coefficient	0,33	
MECHANICAL PROPERTIES		
Tensile strength - R_m (N/mm^2)	160-190	245
Elastic limit - $R_{p0,2}$ (N/mm^2)	120-150	200
Elongation – A (%)	8	8
Elongation - A_{50mm} (%)	6	6
Brinell hardness (HB)	60-70	80
According to EN 755-2:2016[51] and EN 12020-1:2008[52]		

Subframe components

Vertical elements Geometrical and mechanical features

Wooden batten (timber subframe)

Reference	**TWO PANELS FIXING (at location of joint)**	**ONE PANELS FIXING (intermediate support)**
Minimum width (mm)	95	34[53]/75[54]
Thickness (mm)	75	34/75

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 6060 T5		L 50 x 42	2	180	35.6	46.46	31.7	30.30
Aluminium strip (T) Al 6060 T5		T 52 x 110	2	320	42.9	6.74	55	22.19

(46) EN 338:2016 Structural timber - Strength classes
(47) EN 335:2013 Durability of wood and wood-based products - Use classes: definitions, application to solid wood and wood-based products.
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.
(48) EN 599-1:2010 Durability of wood and wood-based products - Efficacy of preventive wood preservatives as determined by biological tests - Part 1: Specification according to use class.
(49) EN 10025-5:2019 Hot rolled products of structural steels - Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance.
(50) EN 10346:2015. Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions.
(51) EN 755-2: 2016 Aluminium and aluminium alloys. Extruded rod/bar, tube and profiles. Part 2: Mechanical properties.
(52) 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.
(53) Using horizontal wood battens to fixe vertical batten to substrate.
(54) Using bended galvanized steel brackets to fixe vertical batten to substrate.

Brackets Geometrical and mechanical features

BRACKETS		Material	Dimensions (mm)	Thickness (mm)
ISOLCO 3000P M8 Y M10 (ETANCO)		Galvanized Steel S220GD – Z450	60 x 50 x 100/140/180	2.5
ISOLALU (ETANCO)	LR80	Extruded Aluminium EN AW 6063 T66 or EN AW 6060 T5	80 x 40 x 40/80/120	3.0
	LR150		150 x 40 x 40/80/120	

Screws between vertical elements and brackets

Vertical elements	Timber subframe	Aluminium subframe
Designation	TIREFOND A VISSER TH13/SHERARDISE	PERFIX 3 TH8 INA2
Diameter (mm)	7	5.5
Length (mm)	50	25
Material	Hot dip galvanized hardened steel	Stainless steel A2 (1.4301)
Standard	EN ISO 17668:2016(55)	EN ISO 15480:2000
Pull-out	5980 N (450kg/m^3 fir wood –anchorage 50 mm)	4250 N (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.

(55) EN ISO 17668:2016 Zinc diffusion coatings on ferrous products - Sherardizing - Specification (ISO 17668:2016)