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European Technical Assessment

ETA 15 / 0655 of 23/10/2024

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General Part

Technical Assessment Body issuing the ETA:

Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)

Trade name of the construction product:

STB-REM, STB -T-REM, STB-CH, STB-T-CH, STB-T-CH-PRO, STB-SZ, STB-T-SZ (kits based on TMCS STACBOND® FR, STACBOND® A2)

Product family to which the construction product belongs:

Kits for external wall claddings mechanically fixed

Manufacturer:

ECO BIERZO COMPOSITE S.L.
Polígono Industrial La Rozada
Calle Isaac Prado Bodelón s/n, parcela 2
24516 Parandones, Toral de los Vados (León).
Spain www.stacbond.com

Manufacturing plant(s):

ECO BIERZO COMPOSITE S.L.
Polígono Industrial La Rozada
Calle Isaac Prado Bodelón s/n, parcela 2
24516 Parandones, Toral de los Vados
(León).Spain

This European Technical Assessment contains:

27 pages including 3 Annexes which form an integral part of the assessment. Annex C 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:

European Assessment Document (EAD) 090062-01-0404. Ed. October 2021. Kits for external wall claddings mechanically fixed

This version is a corrigendum to:

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SPECIFIC PARTS

1. Technical description of the product (kit)

The assessed kits for ventilated external wall claddings mechanically fixed are “STB-REM” and “STB-T-REM” (family A), “STB-CH”, “STB-T-CH” and STB-T-CH-PRO (family G), “STB-SZ” and “STB –T-SZ” (family F) ⁽¹⁾. All claddings are based on Thin Metal Composite Sheets “STACBOND® FR”, and “STACBOND® A2”) which are manufactured by the ETA-holder. These claddings are mechanically fastened to their subframes, fixed to the external walls of new or existing buildings (retrofit). An insulation layer can be fixed on the external wall. The kits comprise other components as specified in Table 0, which are factory produced by the ETA – holder² or by suppliers.

Table 0a: Definition of components of the kits

Component		Kit	Material (Reference)	Size (mm) [Tolerances]	
Subframe (vertical, horizontal and other profiles used to fix the cladding elements)	Family A	STB-REM	<u>Ref.05.19.003 / 05.19.003F (e.g.)</u> : Ω -shape section vertical or horizontal profiles made of raw finished extruded alloyed aluminium 6063 T5/T6. Inertia: $I_x \geq 6.08 \text{ cm}^4$.	Length: ≥ 6000 Thickness: $\geq 2,0$ for references: 05.19.003, 05.19.043, 05.19.061 05.19.092 Thickness: $\geq 2,5$ for references: 05.19.003F, 05.19.043F, 05.19.061F y 05.19.092F	
		STB-T-REM	<u>Ref. 05.19.043 / 05.19.043F (e.g.)</u> : T-shape section vertical or horizontal profiles made of raw finished extruded alloyed aluminium 6063 T5/T6. Inertia: $I_x \geq 9.66 \text{ cm}^4$ <u>Ref. 05.19.054, and ref. 05.19.055 (e.g.)</u> : L-shape section vertical or horizontal profiles made of raw finished extruded alloyed aluminium 6063 T5/T6 – only for borders of façade. Inertia $I_x \geq 8.02 \text{ cm}^4$		
	Family F	STB-SZ	<u>Ref.05.19.121</u> : S-shape section profiles made of raw finished extruded alloyed aluminium 6063 T5/T6. Inertia $I_x = 0.00104 \text{ cm}^4$ <u>Ref.05.19.122</u> : Z-shape section profiles made of raw finished extruded alloyed aluminium 6063 T5/T6. Inertia $I_x = 0.00104 \text{ cm}^4$ <u>Ref. 05.19.003 / 05.19.003F (e.g.)</u> : Same Ω profile described above <u>Ref. 05.19.099</u> : Optional base SZ profile made of raw finished extruded alloyed aluminium 6063 T5/T:		
			STB-T-SZ		<u>Ref. 05.19.121</u> : Same S profile described above <u>Ref. 05.19.122</u> : Same Z profile described above <u>Ref. 05.19.043 / 05.19.043F (e.g.)</u> : Same T profile described above <u>Ref. 05.19.099</u> : Same base SZ profile described above
					STB-CH
	Family G	STB-T-CH	<u>Ref. 05.19.061 / 05.19.061F (e.g.)</u> : TΩ -shape section vertical or horizontal profiles made of raw finished extruded alloyed aluminium 6063 T5/T6. Inertia: $I_x \geq 8,12 \text{ cm}^4$		
		STB-T-CH-PRO	<u>Ref. 05.19.092 / 05.19.092F (e.g.)</u> : TΩ -shape section vertical profiles made of raw finished extruded alloyed aluminium 6063 T5/T6: Inertia: $I_x \geq 15,11 \text{ cm}^4$.		

(1) Families described at Table 1.1.1 of EAD 090062-01-0404 ed. October 2021 (hereafter EAD).

(2) Formerly known until 30.04.2024 as Sistemas Técnicos del Accesorio y Componentes (STAC) S.L.



Table 0b (continuation): Definition of components of the kits

Component		Kit	Material (Reference)	Size (mm) [Tolerances]
Cladding	Riveted boards (family A)	STB-REM	<u>STACBOND® FR</u> : Composed by two external alloyed aluminium sheets EN AW 3005 H42/H44 or 3105 H42/H44/H46 or 5005 H42/H44 (painted) or EN AW 1050 (M01-Mirror-finished) and an internal core made mainly of mineral compounds plus recycled low density polyethylene (LDPE)	Standard length: 3200, 4000, 5000, 6000 Tol: [0,0 /+3]
		STB-T-REM	<u>STACBOND® A2</u> : Composed by two external alloyed aluminium sheets EN AW 3005 H42/H44 or 3105 H42/H44/H46 or 5005 H42/H44 (painted) or EN AW 1050 (M01-Mirror-finished) and an internal core made of mineral A2 core, bonded with organic polymer	Standard width: 1000,1250, 1500,1600, 2000 Tol: [0,0 /+2]
	Fixed cassettes (family-F)	STB-SZ STB-T-SZ	Cassettes with lateral simple folded flanges ≥ 30 mm depth, top horizontal folded flange, and bottom horizontal simple folded flange made from STACBOND® FR or STACBOND® A2, described above.	Standard thickness: 4 Tolerances: [± 0,15;+0,1]
	Suspended cassettes (family G)	STB-CH STB-T-CH STB-T- CH-PRO	Cassettes with top horizontal double folded flange, bottom horizontal simple/double folded flange. Lateral simple folded flanges 40 mm depth (reinforced slot width 10,5 mm) or 44,5 mm depth (not reinforced slots width 15 mm), made from STACBOND® FR or STACBOND® A2, described above	
Fixings ⁽³⁾	Riveted boards (family A)	STB-REM	<u>Ref. STB-R0100</u> : Open end blind rivet 5.0 x 12 Al/inox (AlMg5) (d _k =14 mm), according to ISO 15977 with A2 stainless steel break pull mandrel diameter d= 5 mm and length 12 mm, and protruding aluminium head (optionally lacquered)	--
		STB-T-REM	<u>Optionally Ref. STB-T0100</u> : Self screwing screw 4.8x19 stainless steel optionally lacquered	
		STB-REM	<u>Ref.05.19.020</u> : T-Profile made of folded sheet of alloyed aluminium 5005 H24 for joining the vertical and horizontal profiles, plus the following rivets or screws: - Ref. STB-R0300: Blind rivet according to ISO 15977 4,8x15 with A2 stainless steel break pull mandrel diameter - Optionally Ref. STB-T0100: Self screwing screw 4.8x19 stainless steel optionally lacquered	Thickness: 3 mm
	Fixed cassettes (family F)	STB-SZ STB-T-SZ	<u>Ref. STB-R0300</u> : Same rivet described above <u>Ref STB-T0600 / T0610</u> : Self-screwing screws type DIN 7504N / DIN 7504K 4,2x19 stainless steel A2 optionally coated for fixing profile Z to the vertical profile	
	Elements used to fix cladding and/or subframe elements	STB-CH	<u>Ref. 05.19.019</u> : Reinforcing plate made of aluminium alloy EN AW 1050 H22 (raw finished) fixed to each slot of vertical flanges on its backside with at least three rivets (extremes and centre):only for slots with tongue width 10,5	Thickness: 2 mm
		STB-T-CH STB-T- CH-PRO	<u>Ref. 05.19.050</u> : Plate made of aluminium alloy EN AW 1050 H22 (raw finished) fixed at the backside corners of the cassettes with rivets R0300?	
		STB-CH	<u>Ref. 05.019.013</u> : Hanger of alloyed aluminium EN AW 6063 T5/T6 extruded and raw finished profile plus EPDM foam protective piece fixed to vertical profiles by ref. STB-T0600: Self-screwing screws type DIN 7504 N 4,12x16 stainless steel A2	Thickness: 2,5 mm
	Suspended cassettes (family G)	STB-T- CH	<u>Ref. 05.19.062</u> : Hanger of alloyed aluminium EN AW 6063 T5/T6 extruded and raw finished profile plus EPDM foam protective piece fixed to TΩ vertical profiles by ref. STB-T0600: Self-screwing screws type DIN 7504 N 4,12x16 stainless steel A2	Thickness: 2,5mm
		STB-T-CH-PRO	<u>Ref. 05.19.088</u> : Hanger of alloyed aluminium EN AW 6063 T5/T6 extruded and raw finished profile plus-EPDM foam, movable in vertical axis, with allocating device for preinstalled screw fixed to T-CH-PRO vertical profiles	Thickness: 2,5mm
		STB-CH STB-T-CH	<u>Ref. 05.19.013</u> : Hanger of alloyed aluminium EN AW 6063 T5/T6 extruded and raw finished profile plus EPDM foam protective piece fixed to Ω, TΩ and T vertical profiles by ref: STB-T0600/T0610 self-screwing screws type DIN 7504N 4,12x16 stainless steel A2 / DIN 7504K 4,2x19 stainless steel A2	Thickness: 2,5 mm

(3) For further information see Table 15



Table 0c (continuation): Definition of components of the kits (continuation)

Component	Kit	Material (Reference)	Size (mm) [Tolerances]	
Subframe fixing devices	STB-REM Riveted boards (family A)	Ref. 05.19.004, 05.19.005, 05.19.006, 05.19.007: TT-shape profiles made of extruded and mechanized alloyed aluminium EN AW 6063 T5/T6, raw finished sheet with perforation (and lateral tongues) for fastening vertical profiles (e.g. upper position) with fixings described below.	Depth: 59-104 Height: 50 Width: 140 Thickness 3	
	STB-SZ Fixed cassettes (family F)	Ref. 05.19.030, 05.19.031, 05.19.032, 05.19.033, 05.19.034, 05.19.035, 05.19.036, 05.19.037, 05.19.038, 05.19.039: TT-shape profiles made of extruded and mechanized alloyed aluminium EN AW 6005A T6, raw finished sheet with perforation (and lateral tongues) for fastening vertical profiles (e.g. upper position) with fixings described below.	Depth: 119-254 Height: 80 Width: 140 Thickness: 5	
	STB-CH Suspended cassettes (family G)	Ref. 05.19.046, 05.19.047: U – shape profiles made of folded raw finished sheets alloyed aluminium 5005 H-24, with perforation (e.g. upper position) with fixings described below:	Depth: 57-72 Height: 52 Width: 52 Thickness 3	
	STB-T-REM Riveted boards (family A)	Ref. 05.19.041, 05.19.042, 05.19.044, 05.19.045, 05.19.051, 05.19.052: L – shape profiles made of bent raw finished sheets alloyed aluminium 5005 H-24, with perforation (and lateral tongues) for fastening vertical or horizontal profiles with fixings described below	Depth: 68-140 Height: 55/120 Width: 40 Thickness 3	
		Ref. 05.19.053, 05.19.054, 05.19.055, 05.19.056: L – shape profiles made of bent raw finished sheets alloyed aluminium 5005 H-24, with perforation (and lateral tongues) for fastening vertical or horizontal profiles with fixing as described below	Depth: 116-236 Height: 55 Width: 40-50 Thickness 5	
		Ref. 05.19.078, 05.19.079, 05.19.080, 05.19.081, 05.19.082, 05.19.083, 05.19.084: L-shape profile made of bent sheet of stainless steel 1.4301 (AISI 304) with perforations (and lateral tongues) for fastening vertical profiles with fixings described below	Depth 68-229 Height: 55 Width: 40 Thickness 1.5 (ref. 05.19.078 to, 05.19.081 and 05.19.112 to 115)	
		Ref. 05.19.112, 05.19.113, 05.19.114, 05.19.115, 05.19.116, 05.19.117, 05.19.118, 05.19.119: L-shape profile made of bent sheet of stainless steel 1.4016 (AISI430) with perforations (and lateral tongues) for fastening vertical profiles with fixings described below	Thickness: 2.5 (ref. 05.19.082 to 05.19.113 to 05.19.119)	
		STB-T-CH-PRO Suspended cassettes (family G)		
	Fixings between subframe elements	STB-REM Riveted boards (family A)	For Omega shape vertical profile: Threaded bolt, washer and nut: Hexagon head screw ISO 4017 – M6x60/70 - 8.8: Hexagon head screw (also known as DIN 931) class of thread A (metric 6 mm and 60/70 mm length) of galvanized steel 8.8.	--
		STB-SZ Fixed cassettes (family F)	Washer ISO 7089 -6 140 HV: Flat washer (also known as DIN 125) class A of galvanized steel, nominal diameter 6 mm (int.) hardness 140 HV	
		STB-CH Suspended cassettes (family G)	Hexagonal nut ISO 4032 M6-8.8: Hexagonal bolt (also known as DIN 934) type 1, of galvanized steel, thread 6 and quality class 8.8 Optionally: Self-drilling screw with hexagonal heads, washers and self-threading threads [Ø x L] 5.5 x 22 (ISO 15480) i.e. SFS SDA 5/3.5-h 13- S4-5.5x22 stainless steel 2 units (1 each side)	
		STB-T-REM Riveted boards (family A)	For T-L shape vertical profile: Self-drilling screw with hexagonal heads, washers, and self-threading threads [Ø x L] 5.5 x 22. (ISO 15480) i.e. SFS SDA 5/3.5-H 13--S4 5.5x22 stainless steel	--
STB-T-SZ Fixed cassettes (family F)				
STB-T-CH STB-CH Suspended cassettes (family G)				



2. Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

2.1 Intended use

The kits are intended to be used for ventilated external wall claddings which can be fixed to the external walls of new or existing buildings. The assessed kits are non-load-bearing construction systems, and therefore, they do not contribute to the stability of the wall on which are installed, neither to ensure the air tightness of the building structure. But they 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 kits

The provisions made in this European Technical Assessment are based on an assumed working life of 25 years as minimum according to the EAD, 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 mean for choosing the right product in relation to the expected economically reasonable working life of the works.

2.3 Design of the kits in works

The design of external wall cladding for ventilated façade using the kits should consider:

- The mechanical characteristic values of the components (e.g. cladding, fixings and subframe) in order to resist the actions applying on the specific work.
- The substrate material to define the suitable anchorages.
- The possible movements of substrate and the position of the building expansion joints.
- The dilatation of components of the kits and of the panels.
- The category of corrosivity of the atmosphere of the works ⁽⁴⁾.
- Because joints are not watertight, the first layer behind ventilated air space must be composed by materials with low water absorption.
- The construction of singular parts of façade (e.g. base, top, corners, windows, etcetera).
- If the entire building must comply with the specific building regulations, particularly concerning fire and wind load resistance, of the Member States in which the work has been built.

2.4 Installation of the kits in works

Installation should be carried out according to the ETA holder's specifications and using the specific components of the kits, manufactured by the ETA holder or by suppliers recognized by the ETA holder. Installation should be carried out by appropriately qualified 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 system or components of the kit includes inspections on site, taking into account the following aspects:

- Regarding the panels: Appearance of any damage such as cracking, delamination 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.

(4) e.g. See Table 1 of Standard EN ISO 12944-2:2017. 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 the kits for ventilated external wall claddings according to the Basic Work Requirements (BWR) was carried out in compliance with the applicable EAD. Characteristics of the components shall correspond to respective values laid down in the technical documentation of this ETA, checked by IETcc.

• Basic Work Requirement 2: Safety in case of fire

1 Reaction to fire:

Kits have been assessed ⁽⁵⁾ according to Tests/Classifications Reports cited below:

1.1 Kits STB-REM, STB-T-REM:

- Based on STACBOND[®] FR: B-s1,d0. (Tests/Classification/reports 5125T24 issued by AFITI, 2024).
- Based on STACBOND[®] A2: A2-s1,d0. (Classification/Tests reports 4972T23 issued by AFITI, 2023).

1.2 Kits STB-CH, STB-T-CH, STB-T-CH-PRO:

- Based on STACBOND[®] FR: B-s1,d0. (Classification/Tests reports 5125T24 issued by AFITI, 2024).
- Based on STACBOND[®] A2: A2-s1,d0. (Classification/Tests reports 4972T23 issued by AFITI, 2023).

1.3 Kits STB – SZ, STB-T- SZ:

- Based on STACBOND[®] FR: B-s1,d0. (Classification/Tests reports 5125T24 issued by AFITI, 2024).
- Based on STACBOND[®] A2: A2-s1,d0. (Classification/Tests reports 4972T23 issued by AFITI, 2023).

These classifications are referred to Standard EN 13501-1 ⁽⁶⁾ and have been obtained from tests results carried out according to their applicable Standards EN ISO 1716 ⁽⁷⁾, EN ISO 11925-2 ⁽⁸⁾, EN 13823 ⁽⁹⁾. In relation to the reaction to fire on rear side, it is considered above classifications are applicable.

2 Façade fire performance of kits cladded with TMCS_STACBOND[®] FR/ STACBOND[®] A2:

2.1. Cladding kits based on STACBOND[®] A2:

- France: LEPiR 2.
Appreciation de laboratoire EFR 23-002575, based on Rapport d'essai LEPiR 2 14-X-2010 issued by EFECTIS France and Rapport de classement EN 13501-1 N. 4710t22-22 issued by Afiti. Subject of test: STACBOND[®] A2 cassettes cladding system.
- Hungary: MSZ 14800-6:2020 Fire resistance test. Part 6: Fire spread testing on building façades.
Test report n. 93387904 / HU 22J4K5 001 issued by TÜVRheinland. Subject of test: STACBOND[®] A2 cassettes cladding system.
- Poland: Degree of the fire spread classification report in accordance with PN-B-02867:2013-06
Classification report n. 01522.1/22/Z00NZP issued by ITB. Subject of test: Cladding of external walls made of composite panels STACBOND[®] A2 (cassette)
Classification report n. 01522.2/22/Z00NZP issued by ITB. Subject of test: Cladding of external walls made of composite panels STACBOND[®] A2 (riveted)

2.2. Cladding kits based on STACBOND[®] FR:

- Poland: Degree of the fire spread classification report in accordance with PN-B-02867:2013-06
Classification report n. 01255.1/22/Z00NZP issued by ITB
Subject of test: Cladding of external walls made of composite panels STACBOND[®] FR (cassette)
Classification report n. 01255.2/22/Z00NZP issued by ITB
Subject of test: Cladding of external walls made of composite panels STACBOND[®] FR (riveted).

3 Propensity to undergo continuous smouldering: No performance assessed.

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

(6) EN 13501-1:2019. Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

(7) EN ISO 1716:2021. Reaction to fire tests for products. Determination of the gross heat of combustion calorific value.

(8) EN ISO 11925-2:2011. Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test.

(9) EN 13823:2021. Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.



- **Basic Work Requirement 3: Hygiene, health and the environment**

4. **Watertightness of joints (protection against driving rain):**

Purposeless for claddings kits with open joints. Kits are not watertight according to cl. 2.2.4 of EAD.

5 **Water absorption of cladding:**

No performance assessed.

6 **Water permeability and water vapour permeability:**

No performance assessed, as it is not relevant for ventilated façades according to cl. 2.2.6 of EAD.

7. **Drainability:**

According to cl. 2.2.7 of EAD, on the basis of the standard construction details the installation criteria of these kits and the technical knowledge and experience, it may be said the water which penetrates through joints into the air space or the condensation water can be drained out from the cladding without accumulation or moisture damage into the substrate.

8 **Content, emission and/or release of dangerous substances:** No performance assessed.

- **Basic Work Requirement 4: Safety and accessibility in use**

9 **Wind load resistance:**

The kit behaviours exposed to wind pressure are 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. Wind suction resistance of cladding kits has been determined by structural calculations supplemented by tests carried out according to cl. 2.2.9 of EAD, on several rigs of most unfavourable modules but representative enough of the different cladding kits based on STACBOND® FR and STACBOND® A2 panels. Summaries of tests results are indicated in Tables at the following pages:

- Family A:
 - STB-REM: Tables 1, 2a and 2b (results extended to STB-T-REM).
 - STB-T-REM: Tables 3, 4a and 4b.
- Family F:
 - STB-SZ: Table 5a (results extended to STB-T-SZ).
 - STB-T-SZ: Table 5b.
- Family G:
 - STB-CH: Tables 6a and 6b (results extended to STB-T-CH, STB-T-CH-PRO).

Criteria for the validation of the calculation:

1. STACBOND® A2 and STACBOND® FR have same calculation criteria and wind test results can be considered extended to each other, provided that:
 - Max. Tensile strength for calculation on aluminium sheets: mín. $R_{p0,2}/1,5= 80 \text{ MPa}/1,5=51 \text{ MPa}$
2. Maximum wind load obtained by testing $Q_{\text{test}} \geq Q_{\text{cal}}$ in kN/m^2 .
3. Maximum admissible displacement in the centre of the rear side of the cladding element shall be:
 - Instantaneous displacement:
 - $f_{\text{test, inst}} \leq f_{\text{cal}} = L/30$, (where L is the maximum horizontal distance between vertical profiles or length of cladding element), and
 - $f_{\text{test, inst}} \leq f_{\text{cal}} = 40\text{mm}$ (in any case)
 - Permanent accumulated displacement:
 - $f_{\text{test, perm}} \leq 1.5 \text{ mm}$ (in any case)
4. Failure criteria: f_1 : Breakage of any cladding element • f_2 : Failure of fixing • f_3 : Failure of detachment of the frame • f_4 : Significant permanent deflection affecting stability or agreed to applicant $\geq 3 \text{ mm}$



Table 1: Wind suction resistance results of STB REM / STB-T-REM cladding kit (unidirectional vertical substructure)

Cladding kit composition modules		Test Results			
Rig	STB REM-Non continuous riveted boards to vertical profiles	Load Q_{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
1 ¹³	STACBOND® FR 4 mm. LxH=900x772 mm riveted on corners. Maximum wind load resistance Q_{cal}: 1.4 kN/m² - Perimeter 4 rivets max. vertical distance: 734 mm - Perimeter 4 rivets max. horizontal distance: 862 mm - Border rivets distance: 19 mm - Distance between 2 Ω -vertical profiles ref.05.19.003: 920 mm - Distance between 3 U-brackets ref. 05.19.046: 995 mm	1.4	None	27.38	1.13
	STB REM-Continuous boards riveted to vertical profiles STACBOND® FR 4 mm LxH=1820x772 mm riveted on corners and middle of horizontal borders to profiles. Maximum wind load resistance Q_{cal}: 1.6 kN/m² - Perimeter rivets max. vertical distance: 734 mm - Perimeter rivets max. horizontal distance: 920 mm - Border rivets distance: 19 mm - Distance between 3 Ω -vertical profiles ref.05.19.003: 920 mm - Distance between 3 U-brackets ref. 05.19.046: 938 mm	1.6	None	21.93	0.59

Table 2a: Wind suction resistance results of STB REM / STB-T-REM cladding kit (bidirectional substructure)

Cladding kit composition modules		Test results			
Rig	STB REM-Non continuous riveted boards	Load Q_{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
2 ¹³	STACBOND® FR 4 mm LxH=900x772 mm riveted on corners. Maximum wind load resistance Q_{cal}: 1.2 kN/m² - Perimeter rivets max. vertical distance: 734 mm - Perimeter rivets max. horizontal distance: 431 mm - Border rivets distance: 19 mm - Distance between 2 Ω -vertical profiles ref.05.19.003: 920 mm - Distance between 2 Ω -horizontal profiles ref.05.19.003: 792 mm - Distance between 3 U-brackets ref. 05.19.046: 938 mm	1.2	None	13.27	1.32

Table 2b: Wind suction resistance results of STB REM / STB-T-REM cladding kit (bidirectional substructure)

Cladding kit composition modules		Test results			
Rig	STB REM-Non continuous riveted boards	Load Q_{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
M4-A2-1 ¹³	STACBOND® A2 4 mm LxH=900x1082 mm riveted on perimeter. Maximum wind load resistance Q_{cal}: 2.2 kN/m² - Perimeter rivets max. vertical distance: 348 mm - Perimeter rivets max. horizontal distance: 431 mm - Border rivets distance: 19 mm - Distance between 2 Ω -vertical profiles ref.05.19.003: 920 mm - Distance between 2 Ω -horizontal profiles ref.05.19.003: 792 mm - Distance between 3 U-brackets ref 05.19.046: 938 mm	2.2	None	21.97	1.24

Table 3: Wind suction resistance results of STB T-REM cladding kit (bidirectional substructure)

Cladding kit composition modules		Test results			
Rig	Non continuous boards riveted	Load Q_{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Deflection ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
3 ¹³	STACBOND® FR 4 mm LxH=900x772 mm riveted on perimeter. Maximum wind load resistance Q_{cal}: 2.2 kN/m² - Perimeter rivets max. vertical distance: 734 mm - Perimeter rivets max. horizontal distance: 431 mm - Border rivets distance: 19 mm - Distance between 2 T-vertical profiles ref. 05.19.043: 920 mm - Distance between 2 T-horizontal profiles ref. 05.19.043: 792 mm - Distance between 3 L-brackets ref. 05.19.041: 938 mm	2.2	None	17.57	1.02
	Continuous boards riveted STACBOND® FR 4 mm LxH=1820x772 mm riveted on perimeter. Maximum wind load resistance Q_{cal}: 2.2 kN/m²	2.2	None	18.57	1.01

(10) Maximum design admissible load should be calculated taken into account other criteria if required like national regulations, ETA holder's program INFINICLAD, etc. (e.g. if $\gamma=1.5$ as security coefficient, and Q_{cal} for service limit state=0.8 kN/m², then Q_{cal} for ultimate limit state 0.8 kN/m²·1.5= 1.2 kN/m². Also, other panel dimensions can be used, as long as the modules indicated on the tables are respected, for example, a larger panel can be used if these modules are respected. These panels can be validated either with the criteria of validation on this ETA, national regulations, or via ETA holder's program INFINICLAD, generating on this last case a calculation note, that will justify these dimensions.

(11) E.1.1.4. of EAD: Breakage of any cladding element cladding fixing, profile or bracket failure of fixing, failure of detachment of the frame, and significant permanent deflection. For this last one, it may be considered other than the declared by ETA-holder for ending the test ($d_p \geq 3$ mm).

(12) Indicated accumulated deflection values measured at centre of front side of cladding (or distance between vertical profiles if continuously supported).

(13) Source: EvR.-ETA 15-0655 v4 issued on the 16/01/2019



<ul style="list-style-type: none"> - Perimeter rivets max. vertical distance: 734 mm - Perimeter rivets max. horizontal distance: 460 mm - Border rivets distance: 19 mm - Distance between 2 T-vertical profiles ref. 05.19.043: 920 mm - Distance between 2 T-horizontal profiles ref. 05.19.043: 792 mm - Distance between 3 L-brackets ref. 05.19.041: 938 mm 	Remarks: - At 3.2 kN/m ² , end of test with no failure. - Calculation criteria and results can be extended to cladding kit based on STACBOND® A2
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Table 4a: Wind suction resistance results of STB T REM cladding kit (unidirectional vert.substructure)

Cladding kit composition modules		Test results			
Rig	Non continuous riveted boards	Load Q _{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
B1 ¹⁴	STACBOND® FR 4 mm LxH=1019x940 mm riveted on profiles. Maximum wind load resistance Q_{cal}: 1.2 kN/m² - Perimeter rivets max. vertical distance: 227 mm - Perimeter rivets max. horizontal distance: 927 mm - Border rivets distance: 15 mm - Distance between 2 T-vertical profiles ref. 05.19.043: 1002 mm - Distance between 3 L-brackets ref. 05.19.041: 938 mm	1.2	None	28.99	1.17
	Remarks: - At 2.4 kN/m ² , reached significant permanent displacement 3.47 mm > 3.0 mm. At 2.8 kN/m ² , end of test - Calculation criteria and results can be extended to cladding kit based on STACBOND® A2				
	Continuous boards riveted	Load Q _{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Deflection ⁽¹²⁾ (mm)	
	STACBOND® FR 4 mm LxH=1892x940 mm riveted on perimeter. Maximum wind load resistance Q_{cal}: 1.4 kN/m² - Perimeter rivets max. vertical distance: 227 mm - Perimeter rivets max. horizontal distance: 1005 mm - Border rivets distance: 19 mm - Distance between 3 T-vertical profiles ref. 05.19.043: 920 mm - Distance between 3 T-horizontal profiles ref. 05.19.043: 792 mm - Distance between 3 L-brackets ref.05.19.041: 938 mm	1.4	None	28.02	1.09
Remark: At 2.6 kN/m ² : reached significant permanent displacement 3.03 > 3.0 mm. At 2.8 kN/m ² , end of test - Calculation criteria and results can be extended to cladding kit based on STACBOND® A2					

Table 4b: Wind suction resistance results of STB T REM cladding kit (unidirectional vert.substructure)

Cladding kit composition modules		Test results			
Rig	Non continuous riveted boards	Load Q _{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
B1 ¹⁴	STACBOND® A2 4 mm LxH=1019x940 mm riveted on profiles. Maximum wind load resistance Q_{cal}: 1.2 kN/m² - Perimeter rivets max. vertical distance: 227 mm - Perimeter rivets max. horizontal distance: 972 mm - Border rivets distance: 15 mm - Distance between 2 T-vertical profiles ref. 05.19.043: 1019 mm - Distance between 3 L-brackets ref. 05.19.041: 945 mm	1.2	None	29.37	0.75
	Remarks: - At 2.8 kN/m ² , reached significant permanent displacement 3.01 mm > 3.0 mm, end of test - Calculation criteria and results can be extended to cladding kit based on STACBOND® FR				
	Continuous boards riveted	Load Q _{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
	STACBOND® A2 4 mm LxH=1892x940 mm riveted on perimeter. Maximum wind load resistance Q_{cal}: 1.4 kN/m² Perimeter rivets max. vertical distance: 227 mm - Perimeter rivets max. horizontal distance: 1005 mm - Border rivets distance: 19 mm - Distance between 3 T-vertical profiles ref. 05.19.043: 920 mm - Distance between 2 T horizontal profiles ref. 05.19.043: 792 mm - Distance between 3 L- brackets ref. 05.19.041: 938 mm	1.4	None	27.99	1.25
Remarks: -At 2.6 kN/ m2: significant permanent displacement 3.29 > 3.0 mm. At 2.8 kN/m ² , end of test - Calculation criteria and results can be extended to cladding kit based on STACBOND® FR					

Table 5a: Summary of wind suction resistance results of STB SZ / STB-T-SZ cladding kit.

Cladding kit composition modules		Test Results			
Rig	STB-SZ: Mechanically fastened cassettes	Load Q _{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
6 ¹³	STACBOND® FR 4 mm based cassette LxH=1820x575 mm. Maximum wind load resistance Q_{cal}: 1.6 kN/m² - Simple folded vertical flanges 30 mm depth - Simple folded bottom flange - Distance between 3 Ω-vertical profiles ref.05.19.003: 920 mm - Distance between 3 U-brackets ref. 05.19.046: 938 mm - S-profile ref. 05.19.001. - Z-profile ref. 05.19.002	1.6	None	9.52	0.32
	Remarks: - Deflections measured at centre of one half (not at centre of cassette) - At 3.0 kN/m ² , end of test with no failure. Deflections: permanent 0.74 mm and instantaneous 19.74 mm - Test carried out on STB-SZ on Ω-vertical profiles. Due to its lower inertia results can be extended to STB-T- SZ (based on T-vertical, and S, Z profiles with higher inertia) cladding kit. - No significant difference of Q _{cal} between A2 and FR claddings				
M5-A2-1 ¹³	STACBOND® A2 4 mm based cassette LxH=1820x575 mm. Maximum wind load resistance Q_{cal}: 1.6 kN/m² - Simple folded vertical flanges 30 mm depth - Simple folded bottom flange - Distance between 3 Ω-vertical profiles ref.05.19.003: 920 mm	1.6	None	10.96	0.65
Remarks: - Deflections measured at centre of one half (not at centre of cassette) - At 2.4 kN/m ² , end of test with no failure. Deflections: permanent 1.15 mm and instantaneous 17.02 mm					

(14) Source: Evaluation Report linked to ETA 15-0655 v.7 issued on the 15/07/2024



<ul style="list-style-type: none"> - Distance between 3 U-brackets ref. 05.19.046: 938 mm - S-profile ref. 05.19.001. - Z-profile ref. 05.19.002 	<ul style="list-style-type: none"> - Test carried out on STB-SZ on Ω-vertical profiles. Due to its lower inertia results can be extended to STB-T- SZ (based on T-vertical and S, Z profiles, with higher inertia) cladding kit. - No significant difference between of Q_{cal} A2 and FR claddings
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Table 5b: Summary of wind suction resistance results of STB-T-SZ cladding kit

Cladding kit composition modules		Test Results			
Rig	Mechanically fastened cassettes	Load Q_{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
B.4. 2.1 ¹⁴	STACBOND® FR 4 mm based cassette LxH=1102x902 mm. Maximum wind load resistance Q_{cal}: 1.4- kN/m² <ul style="list-style-type: none"> - Simple folded vertical flanges 30 mm depth - Simple folded bottom flange - Distance between 3 T-vertical profiles ref. 05.19.043: 920 mm - Distance between 3 L-brackets ref. 05.19.041: 938 mm - S-profile ref. 05.19.121. - Z-profile ref. 05.19.122 	1.4	None	17.58	1.41
Remarks:		<ul style="list-style-type: none"> - At 1.8 kN/m², no failure. Deflections: permanent 2.57 mm and instantaneous 19.49 mm - At 2.0 kN/m², end of test with no failure. - Calculation criteria and results can be extended to cladding kit based on STACBOND® A2 			

Table 6a: Summary of wind suction resistance results of STB CH / STB-T-CH / STB-T-CH PRO (cassettes without reinforced slots)

Cladding kit composition modules		Test Results			
Rig	STB CH Suspended cassettes	Load Q_{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
4 ¹³	STACBOND® FR 4 mm based cassette LxH=900x2160 mm. Maximum wind load resistance Q_{cal}: 1.2 kN/m² <ul style="list-style-type: none"> - Simple folded vertical flanges 45 mm depth - Simple folded bottom flange - 5 not reinforced slots distanced 490 mm - Tongue width of slot: 15 mm - Distance between 2 Ω-vertical profiles ref.05.19.003: 920 mm - Distance between 3 U-brackets ref. 05.19.046: : 938 mm 	1.2	None	23.79	0.33
Remarks:		<ul style="list-style-type: none"> - At 1.8 kN/m², reached significant instantaneous displacement L/30 - At 2.0 kN/m², end of test due to failure (breakage of slot) - Test carried out on STB-CH on Ω-vertical profiles. Due to its lower inertia results can be extended to STB-T- CH (based on TΩ-vertical profiles with higher inertia). 			
M2-A2-1 ¹³	STACBOND® A2 4 mm based cassette LxH=900x2165 mm Maximum wind load resistance Q_{cal}: 1.2 kN/m² <ul style="list-style-type: none"> - Simple folded vertical flanges 45 mm depth - Simple folded bottom flange. 5 not reinforced slots distanced 490 mm - Tongue width of slot: 15 mm - Distance between 2 Ω-vertical profiles ref.05.19.003: 910 mm - Distance between 4 U-brackets ref. 05.19.046: : 775 mm 	1.2	None	27.06	0.43
Remarks:-		<ul style="list-style-type: none"> - At 1.4 kN/m², reached significant instantaneous displacement L/30 - At 2.0 kN/m², end of test due to failure (breakage of slot) - Test carried out on STB-CH on Ω-vertical profiles. Due to its lower inertia results can be extended to STB-T- CH (based on TΩ-vertical profiles with higher inertia). 			
M3-A2-1 ¹³	STACBOND® A2 4 mm based cassette LxH=900x800mm Maximum wind load resistance Q_{cal}: 2.2 kN/m² <ul style="list-style-type: none"> - Simple folded vertical flanges 45 mm depth - Simple folded bottom flange: 45 mm. 5 4 not reinforced slots distanced 155 mm. - Tongue width of slot: 15 mm - Distance between 2 Ω-vertical profiles ref.05.19.003: 920 mm - Distance between 3 U-brackets ref. 05.19.046: 938 mm 	2.2	None	19.18	1.52
Remarks		<ul style="list-style-type: none"> - At 2.4 kN/m², reached significant permanent displacement 3.4 > 3.0 mm - At 2.6 kN/m², reached significant permanent displacement 33.4>L/30 mm - Test carried out on STB-CH on Ω-vertical profiles. Due to its lower inertia results can be extended to STB-T- CH (based on TΩ-vertical profiles with higher inertia). - Calculation criteria and results can be extended to cladding kit based on STACBOND® FR 			

Table 6b: Summary of wind suction resistance results of STB CH/ STB-T-CH / STB-T-CH PRO (cassettes with reinforced slots)

Cladding kit composition modules		Test Results			
Rig	STB CH Suspended cassettes	Load Q_{test} (kN/m ²) ⁽¹⁰⁾	Type of failure ⁽¹¹⁾	Maximum displacement ⁽¹²⁾ (mm)	
				Instantaneous	Permanent
5	STACBOND® FR 4 mm based cassette LxH=900x2160 mm Maximum wind load resistance Q_{cal}:1.4 kN/m² <ul style="list-style-type: none"> - Simple folded vertical flanges 40 mm depth - Simple folded bottom flange. 5 reinforced slots distanced 490 mm - Tongue width of slot: 10.5 mm - Distance between 2 Ω-vertical profiles ref.05.19.003: 920 mm - Distance between 3 U-brackets ref. 05.19.046: 938 mm 	1.4	None	27.30	0.69
Remarks		<ul style="list-style-type: none"> - At 1.6 kN/m², reached significant instantaneous displacement 30.1 mm> L/30 At 2.6 kN/m². Failure f1. Broken central lower slot - Test results extended to STB-T- CH (based on TΩ-vertical profiles with higher inertia). - Calculation criteria and results can be extended to cladding kit based on STACBOND® A2 			



10 Resistance to horizontal point loads:

It has been assessed according to cl. 2.2.10 of EAD on the kit configuration cited below. Results are shown in Table 7.

Table 7: Resistance of horizontal point loads (riveted board 1200x1100 mm riveted only on corners)

TMCS	Deformation (mm)			Remarks
	Initial loaded 500 N	After 1 minute loaded 500 N	After 1 minute unloaded	
STACBOND® FR	0.00	8.81	0.03	No reduction of performances
STACBOND® A2	0.00	6.72	0.06	No reduction of performances

11 Impact resistance

It has been assessed according to cl. 2.2.11 of EAD on kits clad with STACBOND® FR and STACBOND® A2. Results and use categories obtained are described below in Table 8. In any case, cladding product presented sharp or cutting edges or surfaces able to cause injury to occupants or people nearby.

Table 8: Impact test results results of kits STB CH/STB-REM*

Kit	TMCS	Impact	Energy	Ball	Remarks
STB-CH Cassettes LxH (mm) a: 1500 x 1100 b: 1200 x 1100 c: 900 x 1100 d:900 x 2165	STACBOND® FR, A2	hard body	1 J	0.5 kg	No deterioration (superficial damage without cracking). Result extended to rest of other assessed kits of family A, F and G
			3 J	0.5 kg	
			10 J	1.0 kg	
STB-REM Boards LxH (mm) a: 1500 x 1100 b: 1200 x 1100 c: 900 x 1100	STACBOND® FR, A2	soft body	10 J	3.0 kg	
			60 J	3.0 kg	
			300 J	50 kg	
			400 J	50 kg	No deterioration (significant permanent deflection without cracking). Result extended to rest of other assessed kits of family A, F and G
Use category					(I) A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use. Result extended to rest of other assessed kits of family A, F and G

12 Mechanical resistance

They have been assessed according to the respective parts of cl. 2.2.12 to 2.2.15 of EAD, on the relevant components of the applicable kit family when applicable, as indexed below:

- Related to the cladding element:
 12. Bending strength of cladding element (TMCP): Table 9
 13. Resistance of the grooved cladding element: Not applicable for families A, F, G.
 14. Resistance of the cladding element at dowel hole: Not applicable for families A, F, G.
 15. Resistance to long term or permanent dead load: No Performance Assessed (NPA)
- Resistance of the connection between the cladding element and the cladding fixing:
 16. Pull through resistance (family A): Table 10.
 17. Pull through resistance under shear loads (family A): Table 11.
 18. Axial resistance: Not applicable for families A, F, G.
 19. Shear load resistance: Not applicable for families A, F, G.
 20. Combined tension and shear load resistance: Not applicable for families A, F, G.
 21. Resistance of slot (family G): Table 12.
- Mechanical resistance of cladding fixing:
 22. Resistance to vertical load (family F): No performance assessed.
 23. Pull-through resistance of fixings from profile (family F): Table 13.
 24. Resistance of punctual cladding fixing: (family F): Table 14
- Mechanical resistance of subframe components:
 25. Resistance of profiles: Table 15.
 26. Subframe fixings. Tension/pull out resistance: Table 16.
 27. Subframe fixings. Shear resistance: Table 17.
 28. Bracket resistance (horizontal and vertical loads): Tables 17 and 18



12.1 Bending strength of cladding element:

It has been assessed according to cl. 2.2.12.1 and 2.2.16.9 of EAD on kits cladded with TMCS (thin metal composite sheets) STACBOND® FR and STACBOND® A2. Results and use categories obtained are described below in Table 9.

Table 9: Bending strength of cladding element

TMCS	Resistance (MPa)		Remarks
	R _m	R _c	
STACBOND® FR	95.16	92.31	Values covers thickness and density ranges of assessed TMCS
STACBOND® A2	95.55	91,24	

* Key: R_m=mean value; R_c= characteristic value

16. Pull through resistance (family A): It has been assessed according to cl. 2.2.12.5 of EAD on samples of TMCS (thin metal composite sheets) STACBOND® FR and STACBOND® A2 and rivets described at Table 0. Results and use categories obtained are described below in Table 10.

Table 10: Pull-through resistance of cladding element. Kits family A: STB-REM, STB-T-REM

Type of board	Supporting ring Ø (mm)	Fixing position	Failure load (N)		Type of failure
			F _{u,m}	F _{u,c} *	
STACBOND® FR	50	Centre No nec.	3528.9	3281.1	Puncturing
		Corner	1465.9	1177.5	Puncturing
	120	Centre	2608.6	2400.0	5 fixings broken
		Lateral	1791.2	1538.11	4 fixings broken (1 deformed boards)
	230	Corner	372.5	287.11	None (5 deformed boards)
		Centre	2636.4	2285.9	5 fixings broken
		Lateral	1134.1	928.6	None (5 deformed boards)
		Corner	170.8	127.8	None (5 deformed boards)
	310	Centre	2690.6	2592.8	3 fixings broken 2 fixings pulled
		Lateral	1426.0	1206.2	2 fixings broken (3 deformed boards)
		Corner	139.0	122.3	None (5 deformed boards)
	STACBOND® A2	50	Centre No nec.	2557.6	2493.7
Corner			857.23	790.2	Puncturing
120		Centre	2191.3	2090.1	Puncturing
		Lateral	766.9	743.6	Puncturing
230		Corner	232.2	224.4	Deformed boards
		Centre	2217.2	2016.3	Puncturing
		Lateral	757.1	590.6	Puncturing
		Corner	148.5	109.6	Puncturing
310		Centre	2259.6	2190.8	Puncturing
		Lateral	669.0	628.5	Puncturing
		Corner	126.9	102.4	Puncturing

* Key: F_{u,m}: Mean value. F_{u,c}: Characteristic value



17. Pull through resistance under shear loads (family A): It has been assessed according to cl. 2.2.12.6 of EAD on samples of TMCS (thin metal composite sheets) STACBOND® FR and STACBOND® A2 and rivets described at Table 0. Results and use categories obtained are described below in Table 11.

Table 11. Pull-through resistance under shear loads (family A)

Type of board		Failure load* (kN)		
		Kits STB-REM, STB-T-REM		
		F _{u,m}	F _{u,c}	Failure
STACBOND® FR	Border	2634,7	2486,5	Teared panel
	Corner	2618,1	2486,5	
STACBOND® A2	Border	2740,8	2460,6	
	Corner	3017,1	2843,1	

* Key: F_{u,m}: mean value; F_{u,c}: characteristic value

21. Resistance of slot (family G):

It has been assessed according to cl. 2.2.12.10 of EAD on samples of TMCS (thin metal composite sheets) STACBOND® FR and STACBOND® A2 and cladding fixing elements described at Table 0. Results and use categories obtained are described below in Table 12.

Table 12: Mechanical fixing resistance of slots (family G)

Type of specimen	Kit STB-CH/STB-T-CH			Kit STB-T-CH-PRO		
	Failure load* (kN)		Failure	Failure load* (kN)		Failure
	F _m	F _{u,5}		F _m	F _{u,5}	
STACBOND® FR reinforced slot (tongue 10.5 mm)	0.97	0.81	Deformation of reinforcement –slot and breakage of reinforced slot	Not applicable (NPA)	Not applicable (NPA)	Not applicable (NPA)
STACBOND® FR non reinforced slot (tongue 15 mm)	1.01	0.93	Deformation and breakage of slot	0.92	0.84	Deformation and breakage of slot
STACBOND® A2 reinforced slot (tongue 10.5 mm)	1.05	0.97	Deformation of reinforcement –slot and breakage of reinforced slot	Not applicable (NPA)	Not applicable (NPA)	Not applicable (NPA)
STACBOND® A2 non reinforced slot (tongue 15 mm)	0.99	0.89	Deformation and breakage of slot	0.80	0.68	Deformation and breakage of slot

* Key: F_{u,m}: mean value; F_{u,c}: characteristic value

23. Pull-through resistance of fixings from profile (family F):

It has been assessed according to cl. 2.2.12.12 of EAD on samples of profile Z and fixings described at Table 0. Results and use categories obtained are described below in Table 13

Table 13: Pull-through resistance of fixings from profiles

Sample	Failure* load (KN)	
	F _{u,m}	F _{u,c}
Screw +Profile Z Ref.05.19.122:	2.94	2,54

* Key: F_{u,m}: mean value; F_{u,c}: characteristic value

24. Resistance of punctual (linear) cladding fixing (family F):

It has been assessed according to cl. 2.2.12.13 of EAD. Results obtained are described below:

Table 14: Resistance of punctual (linear) fixings

Sample	Failure* horizontal load (kN)		Failure* vertical load (kN)	
	F _{u,m}	F _{u,c}	F _{u,m}	F _{u,c}
Profile S	1.09	1.06	Not applicable (NPA)	
Profile Z	0.46	0.35	3.40	2.30

* Key: F_{u,m}: mean value; F_{u,c}: characteristic value



25. Pull out resistance of subframe fixings:

It has been assessed according to cl. 2.2.12.15 of EAD on samples as described at Table 0 of ETA. Results obtained are described below.

Table 15a: Pull-out resistance of fixings from profiles

Sample	Failure load (KN)	
	F _{u,m}	F _{u,c}
Screw +Profile Ω Ref. Ref.05.19.003	2.49	2.0
Screw +Profile T-100 Ref. Ref.05.19.043	2.40	1.9

26. Resistance of profiles:

It has been assessed according to cl. 2.2.12.14 of EAD. Results obtained are described below:

Table 15b: Resistance of aluminium profiles

Ref.	Type	Area (mm ²)	Moment of Inertia (mm ⁴)	E modulus (GPa) (EN 1999 1-1)	Alloy EN AW	Mechanical characteristics (minimum)				
			I _x			R _m (MPa)	R _{p 0.2} (MPa)	A (%)	A _{50mm} (%)	HBW
05.19.003	Extruded Ω-shape Wing thickness ≥ 2 mm	337.8	60381	70	6063 T5/T6	≥ 270	≥ 225	≥ 8	≥ 6	90
05.19.003F	Extruded Ω-shape Wing thickness ≥ 2.5 mm	355.8	66470							
05.19.043	Extruded T-shape Wing thickness ≥ 2 mm	271.0	96614	70	6063 T5/T6	≥ 270	≥ 225	≥ 8	≥ 6	90
05.19.043F	Extruded T-shape Wing thickness ≥ 2.5 mm	284.6	10330							
05.19.059	Extruded L-shape Wing thickness ≥ 2 mm	202.2	80228	70	6063 T5/T6	≥ 270	≥ 225	≥ 8	≥ 6	90
05.19.059F	Extruded L-shape Wing thickness ≥ 2.5 mm	212.3	85800							
05.19.061	Extruded T Ω -shape Wing thickness ≥ 2 mm	274.4	81257	70	6063 T5/T6	≥ 270	≥ 225	≥ 8	≥ 6	90
05.19.061F	Extruded T Ω -shape Wing thickness ≥ 2.5 mm	307.4	87000							
05.19.092	Extruded T -shape Wing thickness ≥ 2 mm	307.4	151152	70	6063 T5/T6	≥ 270	≥ 225	≥ 8	≥ 6	90
05.19.092F	Extruded T -shape Wing thickness ≥ 2.5 mm	322.8	162100							
05.19.121	Extruded S-shape	173.7	10.40	70	6063 T5/T6	≥ 270	≥ 225	≥ 8	≥ 6	90
05.19.122	Extruded Z-shape	222.7								

27. Shear load resistance of subframe fixings: No performance assessed

28. Bracket resistance:

It has been assessed according to cl. 2.2.12.17 of EAD on brackets as described at Table 0 of ETA. Results obtained are described below:



Table 16: resistance to vertical loads

Alu- L-bracket asymetrical sample ST-Lw=116 Ref.05.19.051	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,23 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	178,34	238,336	434,20	814,62	Extended to all U,TT- Alu brackets of Lw between 116 - 68 mm (ref.05.19.041)
Characteristic value Fi,c	8,9	119,13	154,5	457,6	
Alu- L-bracket asymetrical sample ST-Lw=140 Ref.05.19.052	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,28 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	137,84	201,14	345,74	696,92	Extended to all U,TT- Alu brackets of Lw between 140 -117 mm
Characteristic value Fi,c	13,4	97,8	184,0	524,4	
Alu- L-bracket asymetrical sample ST-Lw=164 ref.05.19.053	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,33 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	244,22	374,54	672,83	1110,83	Extended to all U,TT- Alu brackets of Lw between 164 - 141 mm
Characteristic value Fi,c	13,4	97,8	184,0	524,4	
Alu- L-bracket asymetrical sample ST-Lw=188 ref.05.19.054	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,38 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	217,72	238,91	472,49	772,93	Extended to all U,TT- Alu brackets of Lw between 188- 165 mm
Characteristic value Fi,c	83,8	143,4	286,1	413,6	
Alu- L-bracket asymetrical sample ST-Lw=212 ref.05.19.055	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,42 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	216,66	200,55	393,01	647,30	Extended to all U,TT- Alu brackets of Lw between 212 - 189 mm
Characteristic value Fi,c	64,8	138,8	274,8	482,2	
Alu- L-bracket asymetrical sample ST-Lw=236 ref.05.19.056	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,47 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	140,88	183,28	335,10	569,43	Extended to all u,TT- Alu brackets of Lw between 236 -213 mm
Characteristic value Fi,c	65,8	118,1	253,5	446,5	
S. steel - L-bracket symetrical sample ST-Lw=61 Ref.19078	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,12 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	571,04	925,48	1797,26	2181,64	-
Characteristic value Fi,c	196,9	607,1	1163,1	1322,1	
S. steel - L-bracket symetrical sample ST-Lw=157 Ref.19082	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,31 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	405,24	562,38	1267,38	1729,14	Extended to stainless steel brackets of Lw between 157 -85 mm (ref.05.19.079)
Characteristic value Fi,c	119,9	206,9	987,1	1336,6	
S. steel - L-bracket symetrical sample ST-Lw=229 Ref.19085	Load (N)				Remarks
	Fi,r. Permanent def. $\Delta L = (0,2\% \cdot L_w = 0,46 \text{ mm})$	F _{1,d}	F _{3,d}	F _{i,u}	
Mean value Fi,m	262,46	211,60	525,82	796,56	Extended to stainless steel brackets of Lw between 229-181mm (ref.05.19.083)
Characteristic value Fi,c	92,7	139,7	477,8	681,2	



Table 17: Bracket resistance to horizontal loads

Alu - L-bracket asymetrical sample ST-Lw=116 Ref.19051	Load (N)		Remarks
	F _{i,1}	F _{i,u}	
Mean value F _{i,m}	2004,79	3221,09	Extended to all U,TT-brackets and Alu brackets of Lw between 68 mm (ref. 05.19.041) and 140 mm (ref.05.19.052)
Characteristic value F _{i,c}	1521,00	2148,3	
Alu - L-bracket asymetrical sample ST-Lw=188 Ref.19054	Load (N)		Remarks
	F _{i,1}	F _{i,u}	
Mean value F _{i,m}	4131,34	6131,36	Extended to all U,TT- Alu brackets of Lw between 164 mm (ref. 05.19.053) and 236 mm (ref.05.19.056)
Characteristic value F _{i,c}	3517,12	5970,0	
S. steel - L-bracket symetrical sample ST-Lw=-133 Ref.19081	Load (N)		Remarks
	F _{i,d}	F _{i,u}	
Mean value F _{i,m}	2417,44	4497,26	Extended to stainless steel aisi 430 brackets and to brackets with same of higher thickness and Lw between 133 mm and 61 m (ref.05.19.078)
Characteristic value F _{i,c}	2085,17	4171,2	
S. steel - L-bracket symetrical sample ST-Lw=-157 Ref.19082	Load (N)		Remarks
	F _{i,d}	F _{i,u}	
Mean value F _{i,m}	6930,27	11206,00	Extended to stainless steel aisi 430 brackets and to brackets with same of higher thickness and Lw between 157 mm and 229 m (ref.05.19.085)
Characteristic value F _{i,c}	4034,63	10273,4	

29. Resistance to seismic loads (out of plane fund.l vibration period): No performance assessed.

30. Resistance to seismic loads. Out of plane acceleration: No performance assessed.

31. Resistance to seismic loads. In-plane displacement: No performance assessed.

- **Basic Work Requirement 5: Protection against noise**

32. Airborne sound insulation: No performance assessed

- **Basic Work Requirement 6: Energy economy and heat retention**

33. Thermal resistance. Not relevant as the cladding kit does not include the thermal insulation

- **Aspects of Durability**

They have been assessed according to cl. 2.2.16 of EAD, which address cl. 2.2.16.9 when cladding kits are based on TMCS. The related characteristics (expressed in general as decay after required exposures) and obtained results are indexed below and shown in Tables 18 to 24.

34. Hygrothermal behaviour

- 34.1 Kit family:
 - A: STB-REM and STB-T-REM: Not applicable¹⁵
 - F: STB-SZ and STB-T-SZ: Not applicable⁵
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵
- 34.2. Cladding material made of TMCS STACBOND® FR and A2: See § 43

(15) Kit components like substructure and fixings are metallic and therefore considered as not made of sensitive components to this exposures. In the case of the assessed kits cladding material is made of TMCS STACBOND® FR and A2 and clause 2.2.16.9 of EAD applies.



35. Behavior after pulsating loads

- 35.1. Kit family:
 - A: STB-REM and STB-T-REM: Not applicable⁵
 - F: STB-SZ and STB-T-SZ: Resistance of punctual (linear) cladding fixings: Table 18.
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵
- 35.2. Cladding material made of TMCS STACBOND® FR and A2: See § 43

36. Freeze-thaw resistance

- 36.1. Kit family:
 - A: STB-REM and STB-T-REM: Not applicable⁵
 - F: STB-SZ and STB-T-SZ: Not applicable⁵
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵
- 36.2. Cladding material made of TMCS STACBOND® FR and A2: See § 43

37. Behaviour after immersion in water

- 37.1. Kit family:
 - A: STB-REM and STB-T-REM: Pull-through resistance: Not applicable⁵
 - F: STB-SZ and STB-T-SZ: Not applicable⁵
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵
- 37.2. Cladding material made of TMCS STACBOND® FR and A2: See § 43

38. Dimensional stability

- 38.1. Kit family:
 - A: STB-REM and STB-T-REM: Not applicable⁵
 - F: STB-SZ and STB-T-SZ: Not applicable⁵
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵
- 38.2. Cladding material made of TMCS STACBOND® FR and A2: See § 43

39. Chemical and biological resistance

- 39.1. Kit family:
 - A: STB-REM and STB-T-REM: Not applicable⁵
 - F: STB-SZ and STB-T-SZ: Not applicable⁵
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵
- 39.2. Cladding material made of TMCS STACBOND® FR and A2: Not applicable⁵

40. Chemical and biological resistance

- 40.1. Kit family:
 - A: STB-REM and STB-T-REM: Not applicable⁵
 - F: STB-SZ and STB-T-SZ: Not applicable⁵
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵
- 40.2. Cladding material made of TMCS STACBOND® FR and A2: Not applicable⁵

41. UV radiation resistance

- 41.1. Kit family:
 - A: STB-REM and STB-T-REM: Not applicable⁵
 - F: STB-SZ and STB-T-SZ: Not applicable⁵
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Not applicable⁵



- 41.2. Cladding material made of TMCS STACBOND® FR and A2: See § 43

42. Corrosion

- 42.1. Metallic components of kits:
 - A: STB-REM and STB-T-REM: See Table 19
 - F: STB-SZ and STB-T-SZ: See Table 19
 - G: STB-CH, STB-T-CH and STB-T-CH-PRO: Table 19
- 42.2. Cladding material made of TMCS STACBOND® FR and A2: See Table 20

43. Accelerated ageing behaviour of kits when cladding element is made of TMCS

- 43.1. STACBOND® FR/A2: Decay of delamination resistance by peeling test (torque peel strength):
 - After hygrothermal cycles: Table 21
 - After immersion 6 h in boiling water (torque peel strength): Table 21
 - After immersion in water 500 h at 20 °C: Table 21
 - After freeze-thaw cycles: Table 21
 - After long term exposure to heat: Table 21
- 43.2. STACBOND® FR/A2: Decay of flexural resistance (bending strength in four point tests):
 - After hygrothermal cycles: No performance assessed
 - After immersion 6 h in boiling water (torque peel strength): No performance assessed
 - After immersion in water 500 h at 20 °C: No Performance assessed
 - After freeze-thaw cycles: No Performance assessed
 - After long term exposure to heat: No Performance assessed
- 43.3. STACBOND® FR/A2: Decay of other characteristics:
 - Flexural stiffness after short term exposure (1 h 80 °C): Table 22
 - Resistance of routed and returned edge of TMCP after TPB test: Table 23
 - Resistance of slot and its fixing devices after pull-out-pulsating loads: Table 24

Table 18: Resistance of punctual (linear) cladding fixing (family F) after pulsating loads cycles

Sample configuration	Failure horizontal load after cycles(kN)*									
	F ₁	F ₂	F ₃	F ₄	F ₅	F _{u,m}	Ratio _m	F _{u,c}	Ratio _c	Failure
Screw STB-R0300+Profile S Ref.05.19.121	0.84	0.88	0.85	0.88	0.83	0.86	0.78	0.81	0.76	Deformation of flange
Screw STB-R0300+Profile Z Ref.05.19.122	0.50	0.47	0.49	0.51	0.47	0.49	1.09	0.44	1.21	

* Key: F_i: individual value; F_{u,m}: mean value; F_{u,c}: characteristic value; Ratio_m= F_{u,m} after/before cycles; Ratio_c= F_{u,c} after/before cycles

Table 19: Corrosion resistance of subframe components made of aluminium or stainless steel profiles

Kit	Type	Alloy	Protection	Corrosion resistance
Aluminium profiles	Vertical profiles	EN AW 6063 T5/T6	Raw finished	Durability rating: B (Eurocode 9) ⁽¹⁶⁾
	Bracket	EN AW 6063 T5/T6 EN AW 6005 A T6	Raw finished	
Stainless steel profile	Bracket	1.4301	Raw finished	Corrosion Resistance Class II
		1.4016	Raw finished	Corrosion Resistance Class I

According to ch. 4 Durability of Eurocode 9, under normal atmospheric conditions (e.g. rural, moderate industrial or urban areas), aluminium alloys profiles as listed above can be used without the need for surface protection to avoid loss of bearing capacity. In severe environments, especially those with a high chloride content, attention must be paid to the risk of galvanic corrosion. Some form of insulation between aluminium and more noble metals (e.g. carbon steel, stainless steel, copper) is recommended.

Table 20: Corrosion resistance of cladding element made of coil coated aluminium after exposure to spray salt fog

Component		Corrosion infiltration	Blistering
Cladding material	Material		
STACBOND® FR STACBOND® A2	PVDF, HDPE, FEVE	No esthetical defects after 500 and 1000 h*	

Key: Index 3 according to EN 1396: Aluminium and aluminium alloys. Coil coated sheet and strip for general applications. Specifications

(16) (Eurocode 9): EN 1999-1-1:2007+A1:2009 Design of aluminium structures. General structural rules. Annex C. Table.C.1. and Table 3.1



Table 21: Decay of delamination resistance (torque peel) after exposures

Panel	Specimen	Peel torque moment (N.mm/mm)												
		Initial		38 Hygrothermal cycles		39. 6h water 90° C		40. 500 h water 20°C		41. 2500 h. 80°C		42. Freeze-Thaw cycles		
		Front sheet	Rear sheet	Front sheet	Rear sheet	Front sheet	Rear sheet	Front sheet	Rear sheet	Front sheet	Rear sheet	Front sheet	Rear sheet	
stacbond® FR 4 mm	1	23,00	139	132,5	131	67	131	69,00	69,50	89,5	135,00	59,00	135,00	
	2	7,50	152	143,5	136	81	133	42,50	133,50	95,5	126,50	30,50	140,00	
	3	26,50	137	113,5	131	70,5	153	53,00	138,50	86,5	122,50	32,50	135,00	
	Mean value	19	143	130	133	73	139	55	114	91	128	41	137	
	0.75 Initial value	14,25	107,00											102,50
	1.15 Aged value	--	--	149,31	152,57	83,76	159,85	63,06	130,91	104,08	147,20	46,77	157,17	
	0.85 Aged value	--	--	110,36	112,77	61,91	118,15	46,61	96,76	76,93	108,80	34,57	116,17	
Aged v.> 0.75 init.v.	--	--	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	
stacbond® A2 4 mm	1	71,03	56,98	78,33	52,34	70,92	60,03	23,95	20,68	42,30	52,34	27,43	25,11	
	2	62,12	54,80	73,62	55,78	63,68	58,09	16,92	23,68	83,96	55,78	29,84	25,64	
	3	62,68	58,50	75,98	44,94	70,11	55,12	14,44	22,62	83,45	44,94	30,92	26,57	
	Mean value	65,27	56,76	75,98	51,02	68,24	57,75	18,44	22,33	69,90	51,02	29,40	25,77	
	0.75 Initial value	48,96	42,57											
	1.15 Aged value	--	--	87,37	58,67	78,47	66,41	21,20	25,68	80,39	58,67	33,81	29,64	
	0.85 Aged value	--	--	64,58	43,37	58,00	49,09	15,67	18,98	59,42	43,37	24,99	21,91	
Aged v.> 0.75 init.v.			T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE<75% T INI	T AGE<75% T INI	T AGE>75% T INI	T AGE>75% T INI	T AGE<75% T INI	T AGE<75% T INI		



Table 22: Decay of flexural stiffness

Sample	STACBOND® FR 4 mm			STACBOND® A2 4 mm		
	d20 (1 h.20°C)	d80 (1h. 80°C)	Remarks	d20 (1 h.20°C)	d80 (1h. 80°C)	Remarks
Main value (mm)	24,10	28,80		23,75	24,51	

Table 23a: Initial resistance to 3PB test of routed and returned edge (flange)

Composition of sample	F _m	F _{u,5}	0,20*Fu,4	0,50*Fu,5	0,75*Fu,5
STACBOND® FR	81,84	74,08	14,82	37,04	55,56
STACBOND® A2	82,34	76,48	15,29	38,24	57,36

Table 23b: Resistance to 3PB test of routed and returned edge (flange) after cycles

Composition of sample	F _m	F _{u,5}	Remarks
STACBOND® FR	75,33	65,37	Ratio m= 0.92 Ratio c = 0.88
STACBOND® A2	85,09	76,26	Ratio m= 1.03 Ratio c = 0.99

Table 24: Pull-out resistance of slot -pulsating loads

Sample configuration		Failure load (kN)*			Ratio
Kits STB-CH / STB-T-CH		F _{u,m}	F _{u,c}	Failure	
Hanger piece ref 05.019.013 + Self-screwing screws STB-T0600 + STACBOND® FR	reinforced slot (tongue 10.5 mm)	1,05	0,70	Deformation of reinforcement – slot and breakage of reinforced slot	Ratio _m = 0,92 Ratio _c = 1,16
	non reinforced slot (tongue 15 mm)	0,78	0,65	Deformation and breakage of slot	Ratio _m = 1,29 Ratio _c = 1,43
Hanger piece ref 05.019.013 + Self-screwing screws STB-T0600 + STACBOND® A2	reinforced slot (tongue 10.5 mm)	1,02	0,70	Deformation of reinforcement – slot and breakage of reinforced slot	Ratio _m = 1,03 Ratio _c = 1,39
	non reinforced slot (tongue 15 mm)	1,03	0,97	Deformation and breakage of slot	Ratio _m = 0,96 Ratio _c = 0,92
Kit STB-T-CH-PRO sample configuration		F _{u,m}	F _{u,c}	Failure	
Hanger piece ref 05.19.088 +preinstalled screw STB-T0600 + STACBOND® FR	non reinforced slot (tongue 15 mm)	0,79	0,70	Deformation and breakage of slot	Ratio _m = 1,16 Ratio _c = 1,20
	non reinforced slot (tongue 15 mm)	0,77	0,72		Ratio _m = 1,04 Ratio _c = 0,94



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

4.1 System of assessment and verification of constancy of performances

According to the decision 2003/640/EC of the European Commission ⁽¹⁷⁾ 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:

Table 25: System AVCP applied

Product(s)	Intended use(s)	Level(s) or class (es)	System (s)
Kits based on STACBOND® FR and STACBOND® A2	kits for external wall claddings	All / any	1

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

The ETA is issued for the kits on the basis of agreed data / information which identify the products that have been assessed and judged. Detailed description and conditions of the manufacturing process of the kits, and all the relevant design and installation criteria of the kits are specified in the manufacturer's technical documentation deposited with the IETcc. It is the manufacturer's responsibility to make sure that all those who use the kits are appropriately informed of specific conditions according to sections 1, 2, 4 and 5 and including the annexes of this ETA.



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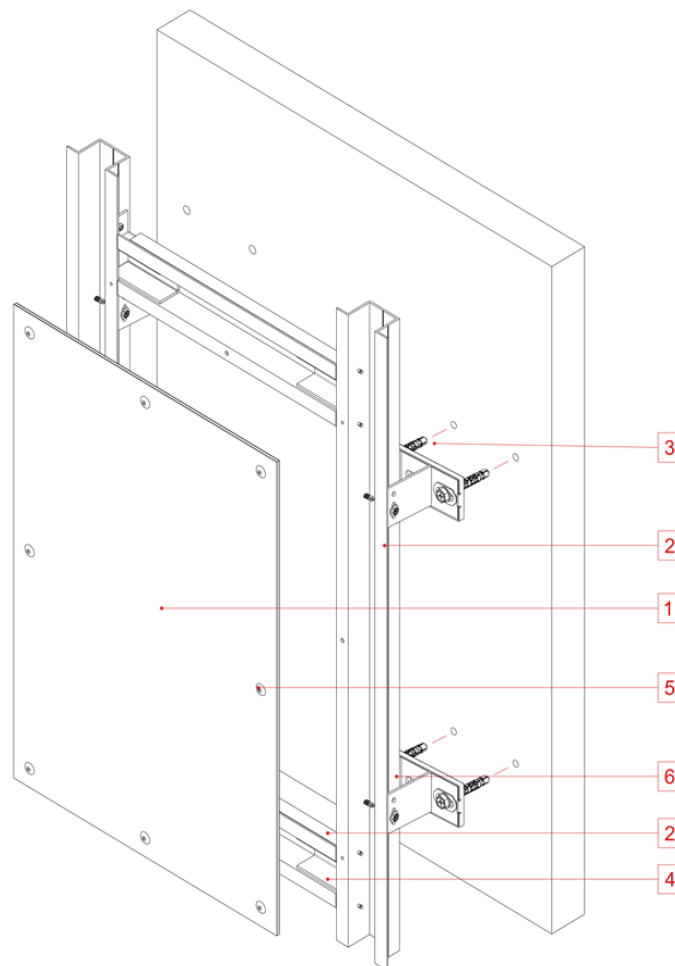
On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja
 Madrid, 23th October 2024

Director

(17) Published in the Official Journal of the European Union (OJEU) L226/21 of 10.09.2003. See www.new.eur-lex.europa.eu/oj/direct-access.html



Annex A: General schemes

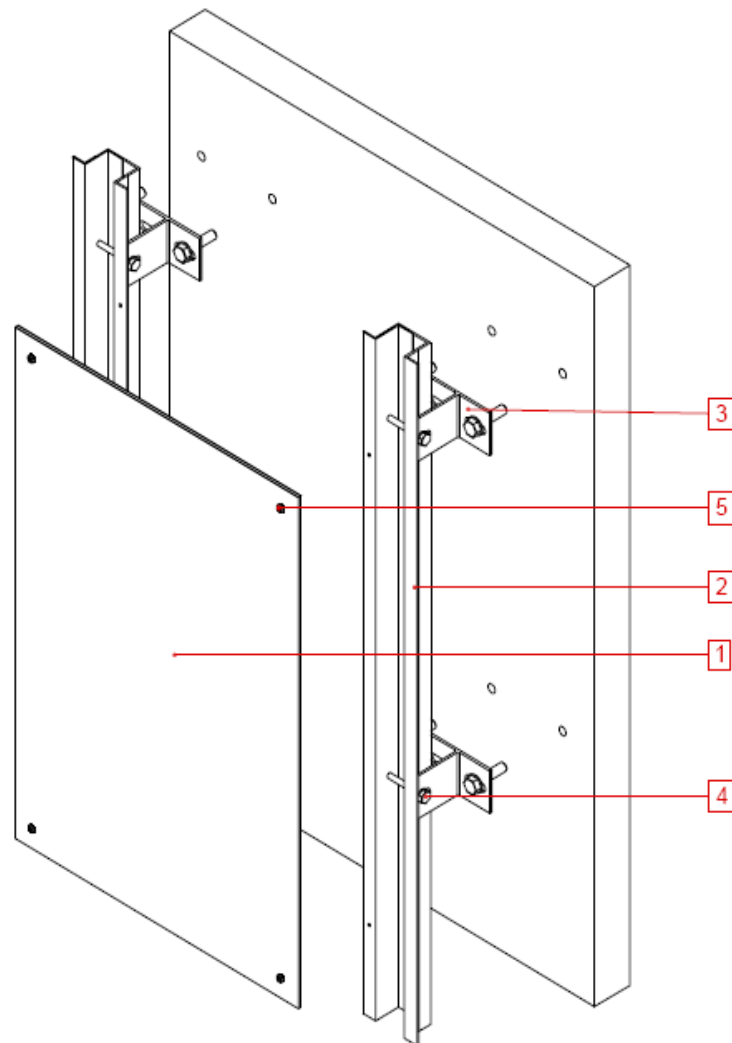


- 1 Board made of STACBOND® FR / STACBOND® A2
- 2 Omega Profile ref. 05.19.003 or ref. 05.19.003F
- 3 Double T Bracket from ref. 05.19.004 to ref. 05.19.007 or ref. 05.19.030 to ref. 05.19.039
- 4 Studs joining profile ref. 05.19.020
- 5 Blind rivet 5.0 x 12 Al/inox (AlMg5) ($d_k=14$ mm) ref. STB-R0100
- 6 Hexagon head screw ISO 4017 – M6x60/70 - 8.8

Figure 1a. Example of STB – REM cladding kit (bidirectional substructure)



1:2 (A4)

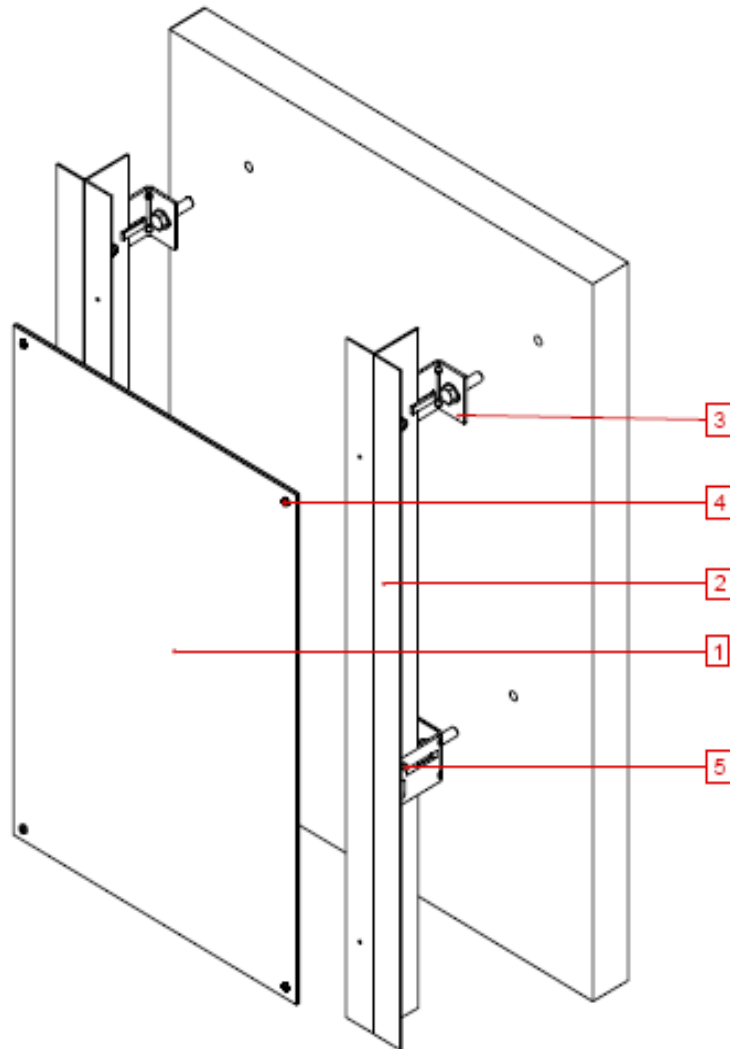


- 1 Board made of STACBOND® FR / STACBOND® A2
- 2 Omega Profile ref. 05.19.003 or ref. 05.19.003F
- 3 Double T Bracket i.e ref. 05.19.004 to ref. 05.19.007 or ref. 05.19.030 to ref. 05.19.039
- 4 Hexagon head screw ISO 4017 – M6x60/70 - 8.8 / ALTERNATIVE 2 unit (1 each side) Self-drilling screw with hexagonal heads, 5.5x 20 stainless steel (ref. STB-T0300, optionally lacquered)
- 5 Blind rivet 5.0 x 12 Al/inox (AIMg5) (d_k=14 mm) (ref. STB-R0100, optionally lacquered)

Figure 1b. Example of STB – REM cladding kit



1:2 (A4)



- 1 Board made of STACBOND® FR / STACBOND® A2
- 2 T profil ref. 05.19.043 or ref. 05.19.003F
- 3 L Bracket i.e ref. 05.19.041 or 05.19.042 or 05.19.044 or 05.19.045; ref. 05.19.051 to 05.19.056 or ref. 05.19.078 to 05.19.085
- 4 Blind rivet 5.0 x 12 Al/inox (AlMg5) ($d_k=14$ mm) (ref. STB-R0100, optionally lacquered)
- 5 Self-drilling screw with hexagonal heads, 5.5x 20. stainless steel (ref. STB-T0300, optionally lacquered)

Figure 2. Example of STB –T- REM cladding kit



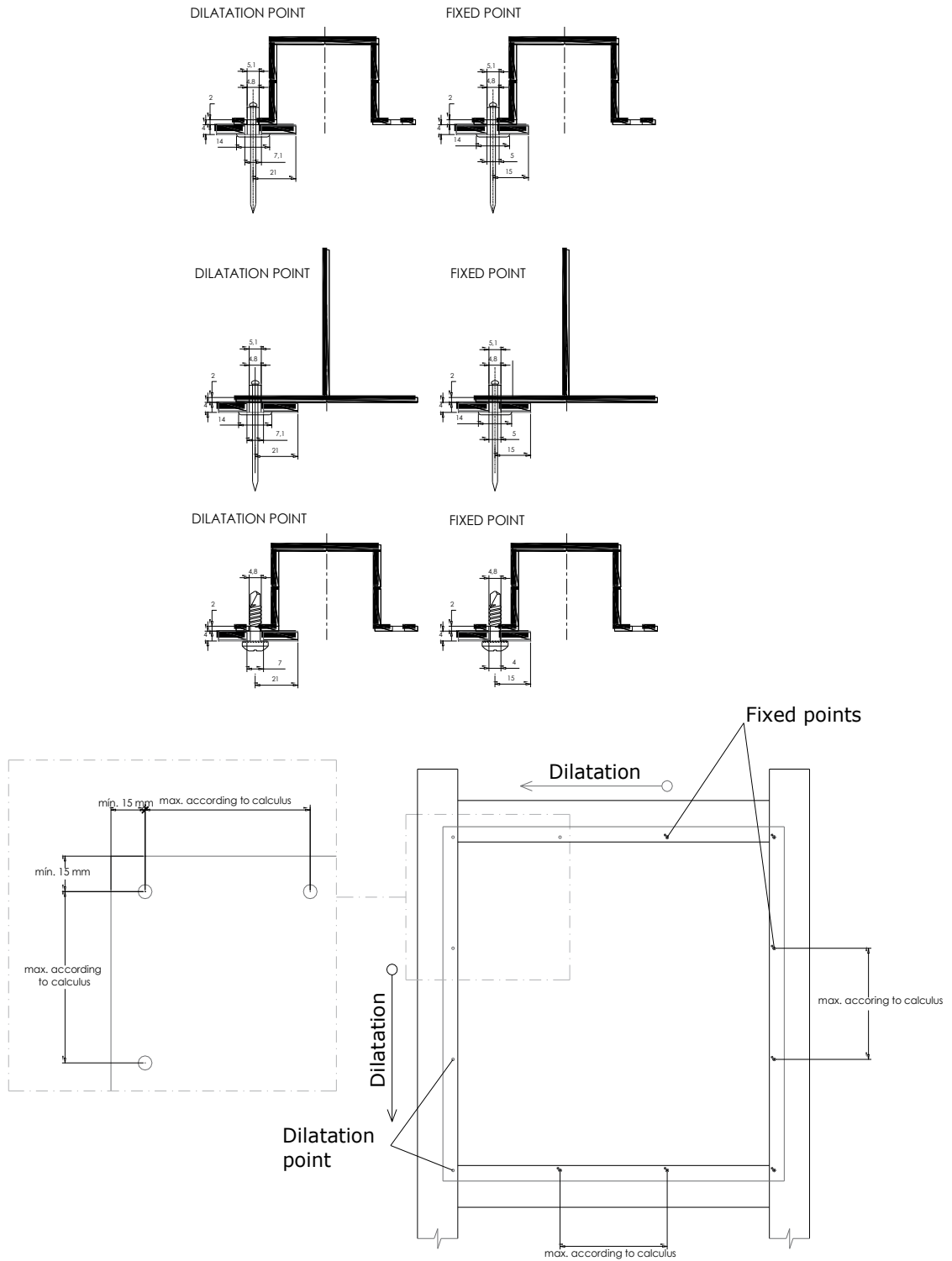
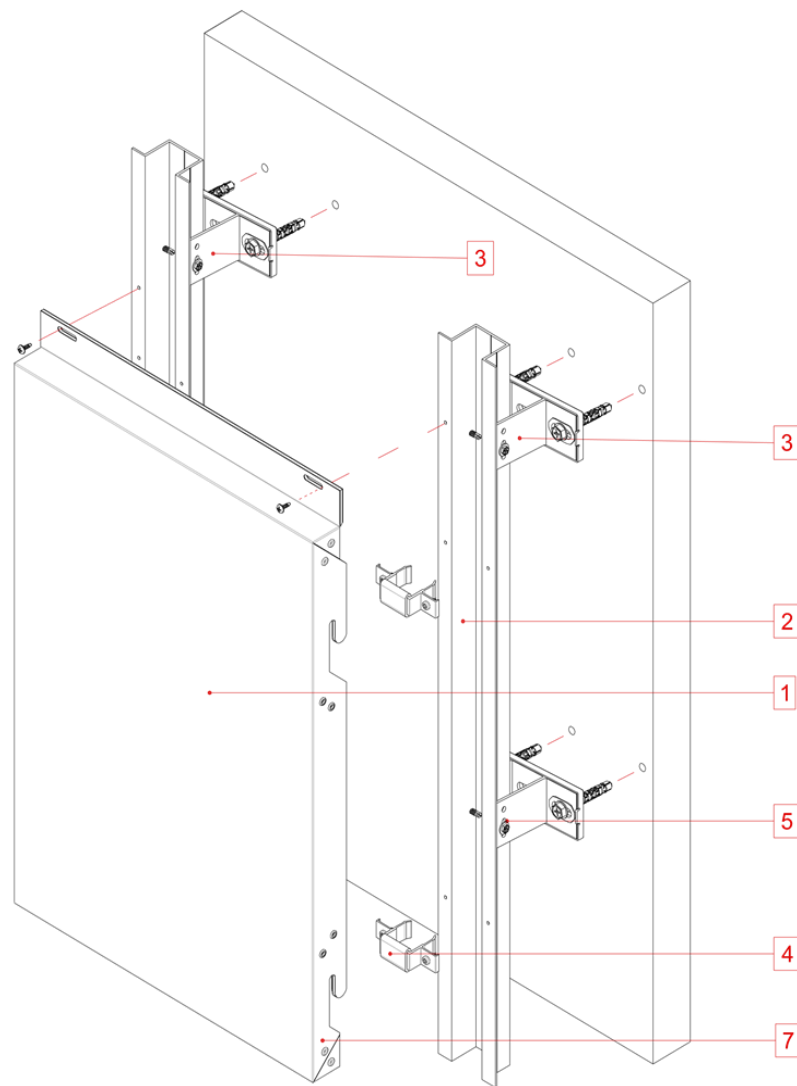


Figure 3. Details of STB – REM / STB –T- REM cladding kit





- 1 Cassette made of STACBOND® FR / STACBOND® A2
- 2 Omega Profile ref. 05.19.003 or ref. 05.19.003F
- 3 Double T Bracket i.e ref. 05.19.004 to 05.19.007 or ref. 05.19.030 to 05.19.039
- 4 External Hanging piece ref. 05.19.013 or 05.19.130
- 5 Hanging reinforcement ref. 05.19.019 if required
- 6 Hexagon head screw ISO 4017 – M6x60/70 - 8.8 / ALTERNATIVE 2 unit (1 each side) Self-drilling screw with hexagonal heads, 5.5x 20 stainless steel ref. STB-T0300, optionally lacquered)

Figure 4a. Example of STB – CH cladding kit (cassette with reinforced slots)



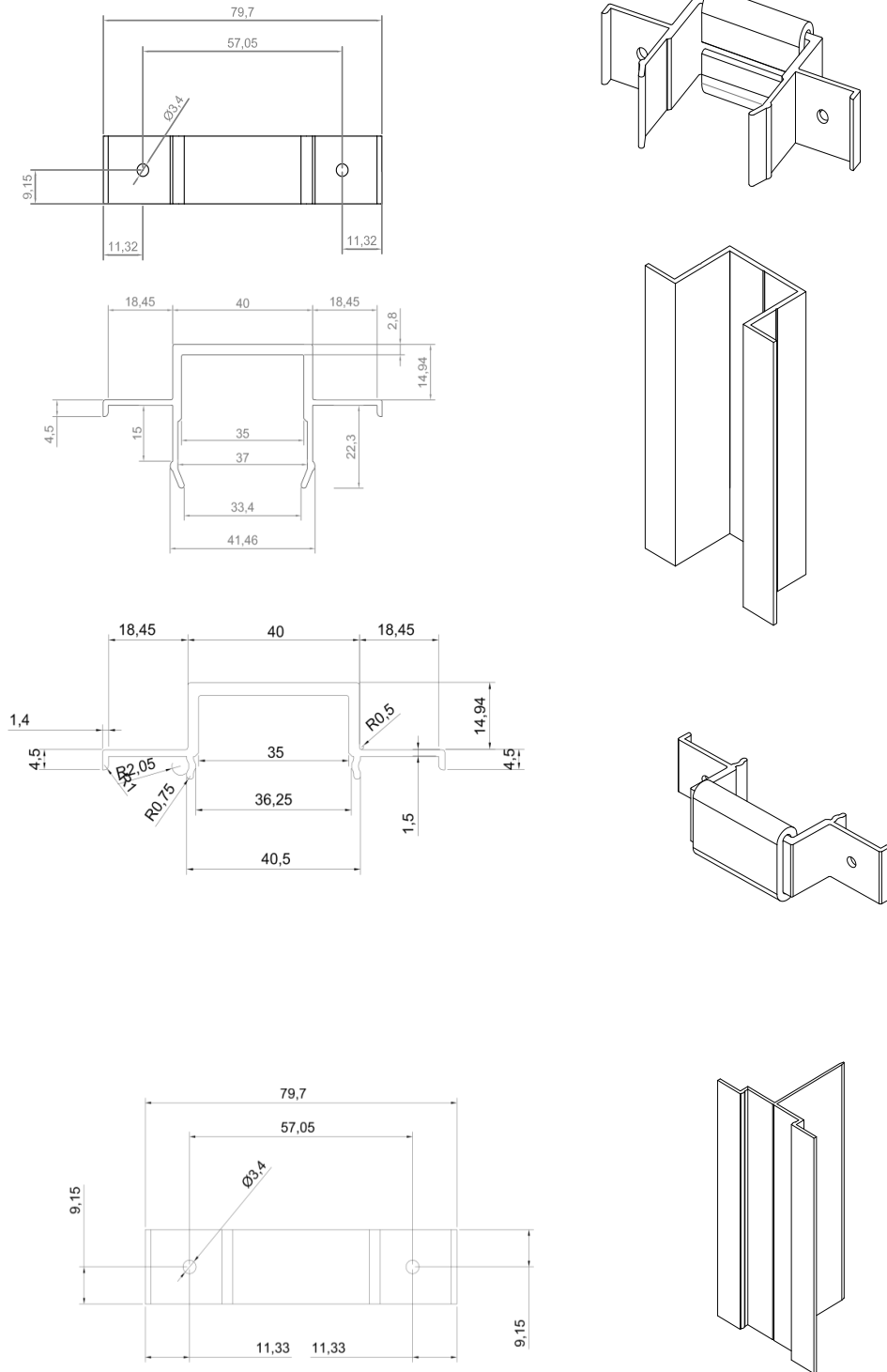
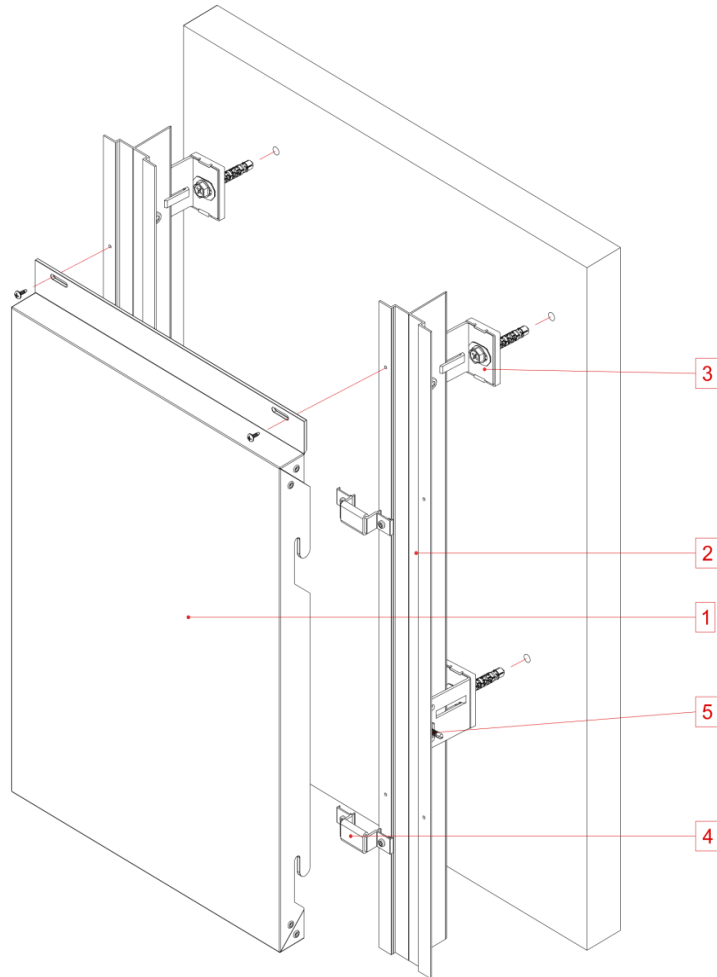


Figure 4b. Profiles for STB-CH and STB – T-CH cladding kit

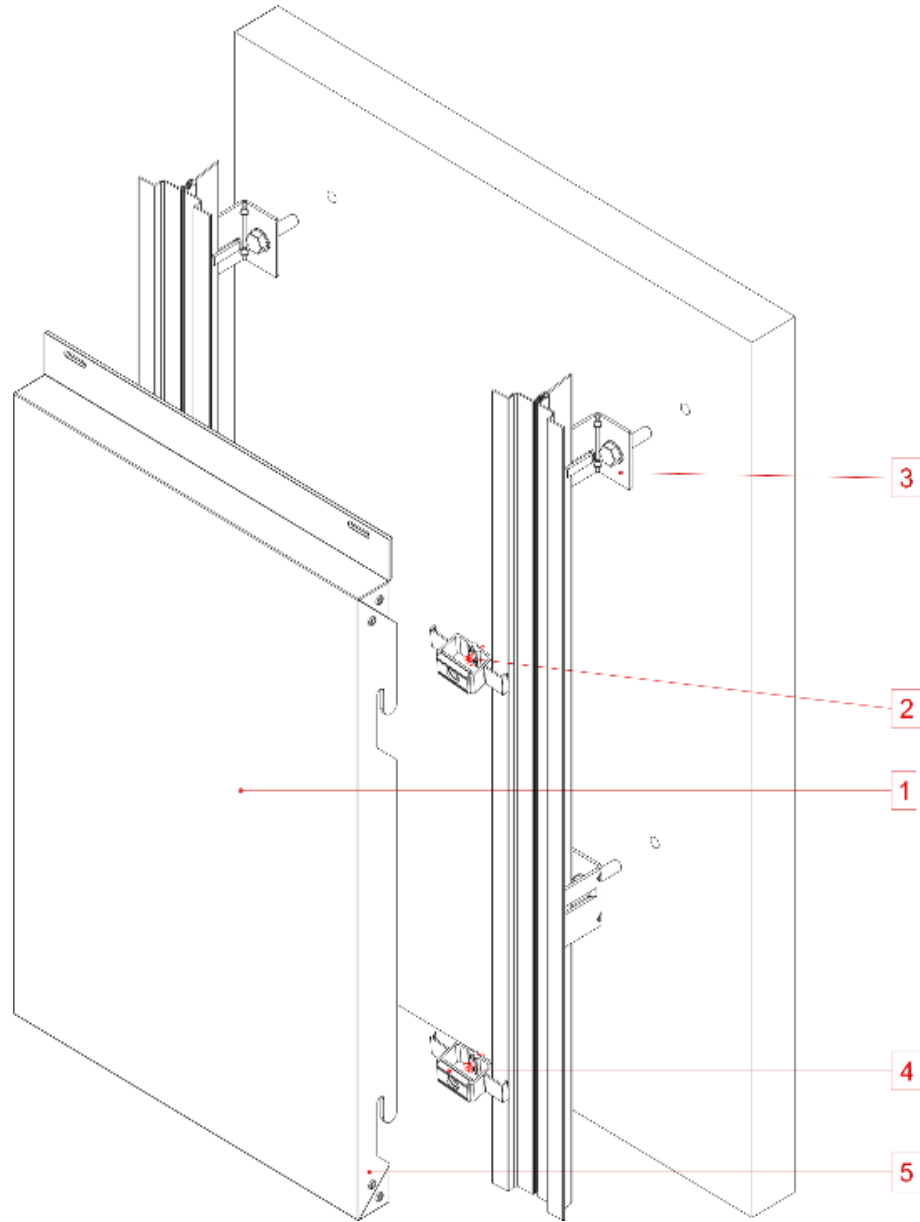




- 1 Cassette made of STACBOND® FR / STACBOND® A2
- 2 T-Omega Profile ref. 05.19.061 / 05.19.061F
- 3 L Bracket i.e ref. ref. 05.19.041 a 05.19.042; 05.19.044 a 05.19.045; ref. 05.19.051 a 05.19.056 o ref. 05.19.078 a 05.19.085
- 4 External Hanging piece ref. 05.19.062 or 05.19.130
- 5 Hexagon head screw ISO 4017 – M6x60/70 - 8.8 / Alternative 2 unit (1 each side) Self-drilling screw with hexagonal heads, 5.5x 20 stainless steel ref. STB-T0300, optionally lacquered)

Figure 4c. Example of STB – T.CH

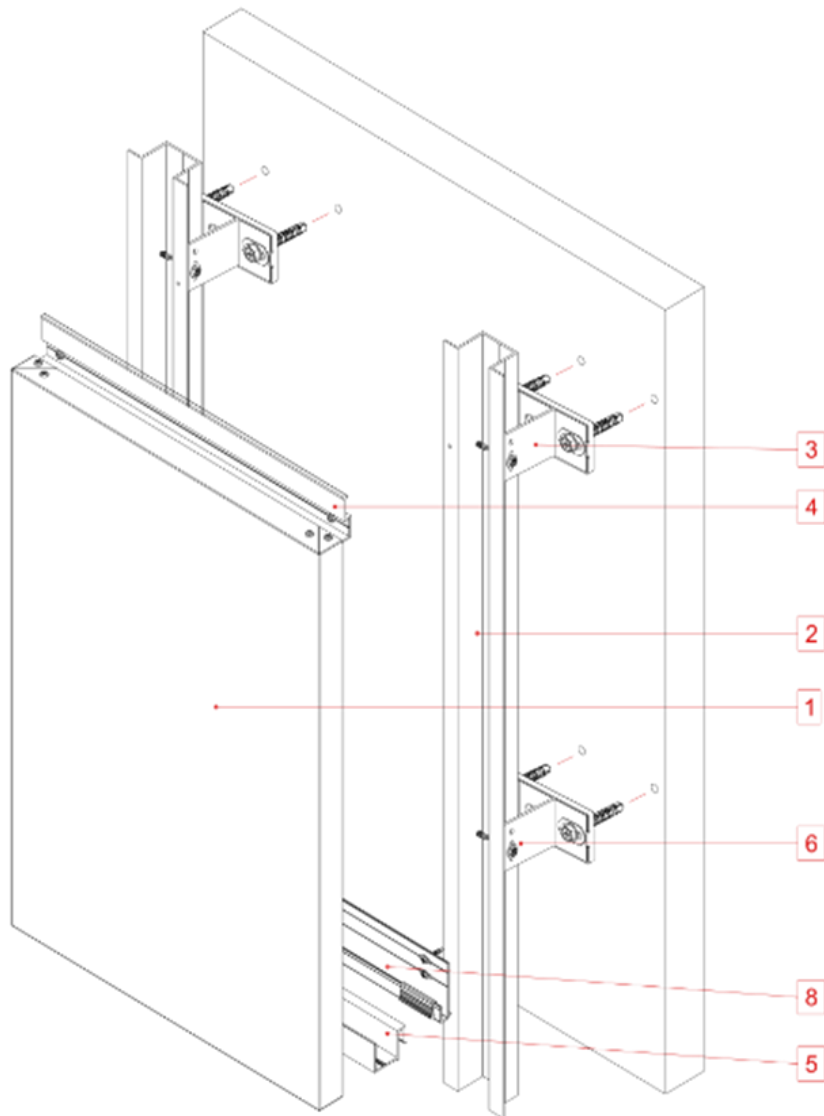




- 1 Cassette made of STACBOND® FR / STACBOND® A2
- 2 External Hanging piece ref. 05.19.88
- 3 L Bracket i.e ref. ref. 05.19.041 a 05.19.042; 05.19.044 a 05.19.045; ref. 05.19.051 a 05.19.056 o ref. 05.19.078 a 05.19.085
- 4 Screw included at external hanging piece
- 5 Aluminium flat small sheet for cassette construction

Figure 4d. Example of STB-T-CH-PRO

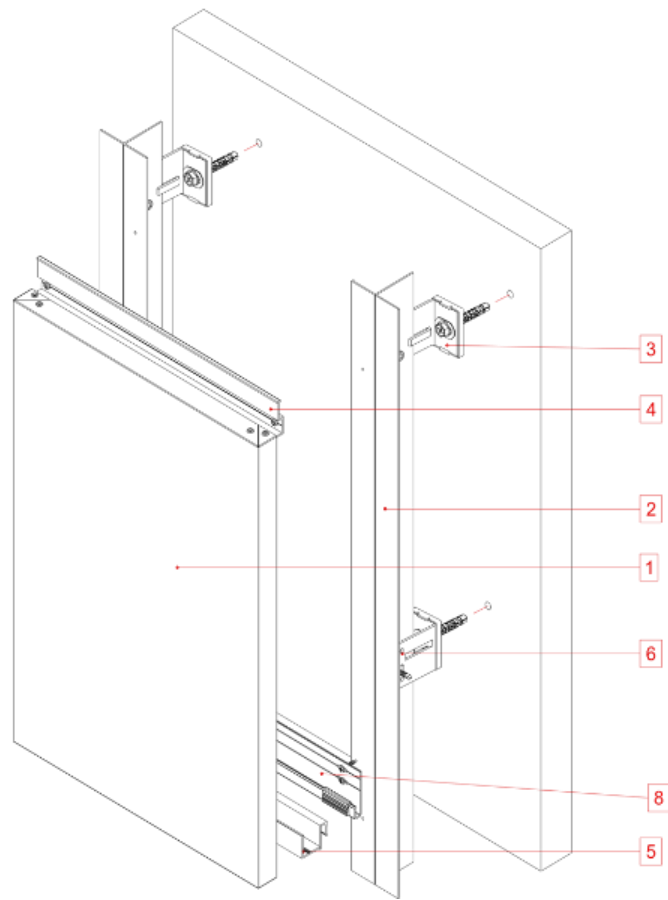




- 1 Cassette made of STACBOND® FR / STACBOND® A2
- 2 Omega profile ref. 05.19.003 o 05.19.003F
- 3 TT Bracket i.e ref. 05.19.004 a 05.19.007 o ref. 05.19.030 al 05.19.039
- 4 S profile ref. 05.19.121
- 5 Z profile ref. 05.19.122
- 6 Hexagon head screw ISO 4017 – M6x60/70 - 8.8 / Alternative 2 unit (1 each side) Self-drilling screw with hexagonal heads, 5.5x 20 stainless steel ref. STB-T0300, optionally lacquered)

Figure 5. Example of STB –SZ cladding kit





- 1 Cassette made of STACBOND® FR / STACBOND® A2
- 2 Omega profile ref. 05.19.043 o 05.19.043F
- 3 L Bracket i.e ref. 05.19.041 o 05.19.042 o 05.19.044 o 05.19.045; ref. 05.19.051 a 05.19.056 o ref. 05.19.078 a 05.19.085
- 4 S profile ref. 05.19.121
- 5 Z profile ref. 05.19.122
- 6 Hexagon head screw ISO 4017 – M6x60/70 - 8.8 / Alternative 2 unit (1 each side) Self-drilling screw with hexagonal heads, 5.5x 20 stainless steel ref. STB-T0300, optionally lacquered)

Figure 5. Example of STB –T-SZ cladding kit



Annex B: Complementary physical and mechanical data of cladding kit elements

Table B.1: Physical declared data of cladding components

Panel	Material	Characteristics	Value
STACBOND® FR STACBOND® A2	Removable protection film	Aspect:	White
	Coating layer (PVDF) /(FEVE)/(PE)/(PU)/(HDPE)	Thickness (µm)	2-layers: From 20 to 33 3-layers: From 30 to 50
	External sheet of alloyed aluminium EN AW 3005 H42/H44 or 3105 H42/H44/H46 or 5005 H42/H44 (painted)	E Modulus (MPa) Thickness (mm) painted Linear thermal expansion coefficient (K ⁻¹):	70 000 0.48 [± 0.02] 24 x 10 ⁻⁶
	Core made mainly of mineral compounds, and recycled low density polyethylene (stacbond® FR)	Aspect: Thickness (mm):	Dark Greylish 3.0
	Full mineral core binded by organic poymer (stacbond® A2)	Aspect: Thickness (mm):	White or white greylish 3.0
	Rear sheet of alloyed aluminium EN AW 3005 H42/H44 or 3105 H42/H44/H46 or 5005 H42/H44 (painted)	E Modulus (MPa) Thickness (mm): painted Linear thermal expansion coefficient (K ⁻¹):	70 000 0.48 [± 0.02] 24 x 10 ⁻⁶
	Coating layer (transparent)	Thickness (µm):	Confidential (Annex C)

Table B.2: Mechanical declared data of cladding material

Panel	Material	Characteristic	Value
STACBOND® FR STACBOND ® A2	Alloyed aluminium sheet EN AW 3005 H42	Tensile strength R _m (MPa)	≥ 145
		Yield strength R _{p 0.2} (MPa)	≥ 110
		Elongation A ₅₀ (%)	≥ 5
	Alloyed aluminium sheet EN AW 3005 H44	Tensile strength R _m (MPa)	≥ 170
		Yield strength R _{p 0.2} (MPa)	≥ 130
		Elongation A ₅₀ (%)	≥ 4
	Alloyed aluminium sheet EN AW 3105 H42	Tensile strength R _m (MPa)	≥ 130
		Yield strength R _{p 0.2} (MPa)	≥ 105
		Elongation A ₅₀ (%)	≥ 6
	Alloyed aluminium sheet EN AW 3105 H44	Tensile strength R _m (MPa)	≥ 150
		Yield strength R _{p 0.2} (MPa)	≥ 120
		Elongation A ₅₀ (%)	≥ 4
	Alloyed aluminium sheet EN AW 3105 H46	Tensile strength R _m (MPa)	≥ 175
		Yield strength R _{p 0.2} (MPa)	≥ 150
		Elongation A ₅₀ (%)	≥ 3
	Alloyed aluminium sheet EN AW 5005 H42	Tensile strength R _m (MPa)	≥ 125
		Yield strength R _{p 0.2} (MPa)	≥ 80
		Elongation A ₅₀ (%)	≥ 4
	Alloyed aluminium sheet EN AW 5005 H44	Tensile strength R _m (MPa)	≥ 145
		Yield strength R _{p 0.2} (MPa)	≥ 110
		Elongation A ₅₀ (%)	≥ 3
Peeling transversal resistance between sheet (external or rear) and core (N.mm/mm) ASTM D 913			≥ 7
Peeling transversal resistance between sheet (external or rear) and core (N.mm/mm) ASTM D 913			≥ 5



**Table B.3a: Complementary durability resistance of cladding material
FPB tests after ageing on samples 380x80x4 mm**

STACBOND® FR				Test at 23°C							
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,39	0,039	0,156	158,0	105,57	15,84	0,4	0,06	2,43	0,36	431,6
2	0,4	0,040	0,160	162,0	105,63	15,84	0,41	0,06	2,43	0,36	444,8
3	0,38	0,038	0,152	153,9	108,59	16,29	0,38	0,06	2,34	0,35	435,5
4	0,4	0,040	0,160	162,0	104,8	15,72	0,38	0,06	2,22	0,33	488,3
5	0,4	0,040	0,160	162,0	105,23	15,78	0,37	0,06	2,20	0,33	491,0
MV	0,39	0,04	0,16	159,6	105,96	15,89	0,39	0,06	2,32	0,35	458,3
SD	0,01	0,001	0,003	2,96	1,35	0,20	0,01	0,00	0,10	0,01	23,76
STACBOND® FR				Test at -20°C							
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,45	0,045	0,181	183,1	103,33	15,5	0,36	0,05	2,47	0,37	481,2
2	0,44	0,044	0,175	177,4	102,48	15,4	0,38	0,06	2,51	0,38	462,0
3	0,45	0,045	0,178	180,7	103,89	15,6	0,38	0,06	2,54	0,38	463,9
4	0,45	0,045	0,180	182,0	107,8	16,2	0,4	0,06	2,73	0,41	433,3
5	0,45	0,045	0,180	182,5	104,66	15,7	0,38	0,06	2,52	0,38	473,0
MV	0,45	0,04	0,18	181,1	104,43	15,7	0,38	0,06	2,55	0,38	462,7
SD	0,005	0,000	0,002	1,84	1,83	0,27	0,013	0,00	0,09	0,01	14,82
STACBOND® FR				Test at 80°C							
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,38	0,038	0,152	153,9	104,24	15,6	0,45	0,07	2,60	0,39	397,0
2	0,38	0,038	0,152	153,9	103,57	15,5	0,44	0,07	2,53	0,38	408,4
3	0,38	0,038	0,152	153,9	102,78	15,4	0,44	0,07	2,57	0,39	400,8
4	0,36	0,036	0,144	145,8	103,2	15,5	0,3	0,05	2,56	0,38	357,8
5	0,37	0,037	0,148	149,9	102,75	15,4	0,44	0,07	2,64	0,40	377,8
MV	0,37	0,04	0,15	151,5	103,31	15,5	0,41	0,06	2,58	0,39	388,4
SD	0,008	0,001	0,003	2,96	0,55	0,08	0,057	0,01	0,04	0,01	16,71
Remark: MV: Mean value; SD: Standard deviation											



**Table B.3b: Complementary durability resistance of cladding material
FPB tests after ageing on samples 380x80x4 mm**

STACBOND® A2			Test at 23°C								
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,40	0,040	0,160	162,0	104,12	15,62	0,35	0,05	1,98	0,30	551
2	0,38	0,038	0,152	153,9	101,73	15,26	0,35	0,05	2,02	0,30	511
3	0,39	0,039	0,156	158,0	103,18	15,48	0,32	0,05	1,98	0,30	528
4	0,38	0,038	0,152	153,9	102,68	15,40	0,35	0,05	2,05	0,31	502
5	0,38	0,038	0,152	153,9	102,28	15,34	0,36	0,05	2,05	0,31	505
MV	0,39	0,04	0,15	156,3	102,80	15,42	0,35	0,05	2,02	0,30	519
SD	0,008	0,0008	0,003	2,96	0,81	0,12	0,01	0,00	0,03	0,00	18,20
STACBOND® A2			Test at -20°C								
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,45	0,045	0,181	183,1	103,33	15,5	0,36	0,05	2,47	0,37	481,2
2	0,44	0,044	0,175	177,4	102,48	15,4	0,38	0,06	2,51	0,38	462,0
3	0,45	0,045	0,178	180,7	103,89	15,6	0,38	0,06	2,54	0,38	463,9
4	0,45	0,045	0,180	182,0	107,8	16,2	0,4	0,06	2,73	0,41	433,3
5	0,45	0,045	0,180	182,5	104,66	15,7	0,38	0,06	2,52	0,38	473,0
MV	0,45	0,04	0,18	181,1	104,43	15,7	0,38	0,06	2,55	0,38	462,7
SD	0,005	0,000	0,002	1,84	1,83	0,27	0,013	0,00	0,09	0,01	14,82
STACBOND® A2			Test at 80°C								
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,14	0,014	0,056	56,7	70,3	10,5	0,3	0,05	1,61	0,24	240
2	0,15	0,015	0,060	60,8	62,98	9,4	0	0,00	1,42	0,21	237
3	0,17	0,017	0,068	68,9	56,45	8,5	0,31	0,05	1,65	0,25	285
4	0,18	0,018	0,072	72,9	62,56	9,4	0,33	0,05	1,90	0,29	258
5	0,19	0,019	0,076	77,0	66,31	9,9	0,36	0,05	2,08	0,31	248
MV	0,17	0,02	0,07	67,23	63,72	9,6	0,26	0,04	1,73	0,26	253,61
SD	0,019	0,002	0,007	6,86	4,58	0,69	0,132	0,02	0,23	0,03	15,70
Remark: MV: Mean value; SD: Standard deviation											



**Table B.3c: Complementary durability resistance of cladding material
FPB tests after ageing on samples 380x80x4 mm**

STACBOND® FR				Test at 23°C after 50 freeze-thaw cycles							
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,40	0,040	0,161	162,6	112,57	16,9	7,73	1,16	30,57	4,59	39,5
2	0,3999	0,040	0,160	162,0	112,8	16,9	7,55	1,13	30,17	4,53	39,7
3	0,3962	0,040	0,158	160,5	112,65	16,9	7,63	1,14	30,26	4,54	39,3
4	0,3914	0,039	0,157	158,5	114,97	17,2	7,65	1,15	30,87	4,63	37,9
5	0,3909	0,039	0,156	158,3	113,27	17,0	7,67	1,15	30,67	4,60	38,2
MV	0,40	0,04	0,16	160,4	113,25	17,0	7,65	1,15	30,51	4,58	38,91
SD	0,004	0,000	0,002	1,58	0,89	0,13	0,059	0,01	0,26	0,04	0,68
STACBOND® A2				Test at 23°C after 50 freeze-thaw cycles							
	Load			Bend. Strength	Deformation						E Bend Modulus
	Maximum load	10% Maximum load	40% Maximum load		Maximum load	At 10% Maximum load		At 40% Maximum load			
	[kN]			MPa	[%]	mm	[%]	mm	[%]	mm	GPa
1	0,38	0,038	0,154	155,7	115,14	17,3	7,38	1,11	29,37	4,41	39,3
2	0,3879	0,039	0,155	157,1	114,59	17,2	7,51	1,13	30,15	4,52	38,5
3	0,3983	0,040	0,159	161,3	112,17	16,8	7,44	1,12	29,66	4,45	40,3
4	0,3899	0,039	0,156	157,9	113,64	17,0	7,44	1,12	29,93	4,49	38,9
5	0,3915	0,039	0,157	158,6	114,75	17,2	7,32	1,10	30,05	4,51	38,7
MV	0,39	0,04	0,16	158,1	114,06	17,1	7,42	1,11	29,83	4,47	39,1
SD	0,005	0,000	0,002	1,70	1,07	0,16	0,064	0,01	0,28	0,04	0,62
Remark: MV: Mean value; SD: Standard deviation											

Annex C: Confidential information

This confidential information and is not included in the European Technical Assessment when that assessment is publicly available: C.1. Quality control of components of kits manufactured by suppliers or ETA holder.

