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European Technical Assessment

ETA 19 / 0655
of 04/08/2021

English translation prepared by IETcc. Original version in Spanish language

General Part

Technical Assessment Body issuing the ETA:	Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc).
Trade name of the construction product:	ALBOND RB.
Product family to which the construction product belongs:	Kits for external wall claddings mechanically fixed.
Manufacturer:	ALBOND ALÜMINYUM SANAYI VE TIC. A.S. Hatip Mahallesi Ali Osman Çelebi Bulvar N. 140. 59860 Çorlu (Turkey). www.albond.com.tr
Manufacturing plant(s):	ALBOND ALÜMINYUM SANAYI VE TIC. A.S. Hatip Mahallesi Ali Osman Çelebi Bulvar N. 140. 59860 Çorlu (Turkey).
This European Technical Assessment contains:	14 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). 090062-00-0404. Ed. July 2018. Kits for external wall claddings mechanically fixed.
This version replaces:	ETA 19/0655 version 1 issued on the 26/02/2021

SPECIFIC PARTS

1. Technical description of the product (kit)

The assessed kit for ventilated external wall cladding mechanically fixed named “albond RB” (family A) [1] is based on thin metallic composite panels “albond®” PE and “albond® FR” which are manufactured by the ETA-holder. This cladding material is mechanically fastened to a subframe, fixed to the external walls of new or existing buildings (retrofit). An insulation layer can be fixed on the external wall. The kit comprise other components as specified in Table 0, which are factory produced by the ETA – holder or by suppliers.

Table 0 – Definition of components of the kit

Component		**Reference**	**Material**	**Size** (mm) [Tolerances]
Subframe elements	Vertical profiles	Ref.01.01.001	T-shape section vertical profiles made of raw finished extruded alloyed aluminium 6063 T5/T6	Length: ≥ 6000 Thickness: ≥ 2
		Ref.01.01.002	L-shape section profiles made of raw finished extruded alloyed aluminium 6063 T5/T6	
	Brackets	Ref.01.01.004	L-shape (single height) bracket made of raw finished extruded alloyed aluminium 6063 T5 (load bearing of vertical profile)	Thickness: 2
		Ref.01.01.005	L-shape (double height) bracket made of raw finished extruded alloyed aluminium 6063 T5 (mainly for retention of vertical profile)	Thickness: 2
Cladding	Riveted Board (family A)	Serie 9000	Board size “A” made from albond® PE or albond® FR described below, to be drilled and riveted on vertical borders to two vertical profiles, with rivets described below, distanced ≤ 500 mm.	Length: ≤ 493 Height: ≤ 1038
			Board size “B” made from albond® PE or albond® FR described below, to be drilled and riveted on vertical borders and intermediate axe to three vertical profiles, with rivets described below, distanced ≤ 500 mm.	Length: ≤ 996 Height: ≤ 1038
			Board size “C” made from albond® PE or albond® FR described below, to be drilled and riveted on vertical borders and intermediate axes to five vertical profiles, with rivets described below, distanced ≤ 500 mm.	Length: ≤ 2018 Height: ≤ 1038
			albond® PE: Composed by two external alloyed aluminium sheets EN AW 3105 H44/H46 or 5005 H44/H46, and an internal core made of recycled low density polyethylene (LDPE). albond® FR: Composed by two external alloyed aluminium sheets EN AW 3105 H44/H46 or 5005 H44/H46, and an internal core made of recycled low density polyethylene (LDPE) plus mineral compounds.	Standard width: 1000,1250,1500 Max. width:1600 Tol: [0.0, +0.2] Standard thickness: 4 Tolerances: Tol: [± 0.2]
Fixings	Elements used to fix cladding and/or subframe elements	Ref. 01.01.003	Blind rivet 5x12 mm: Open end blind rivet, with alu/alu or alu/stainless steel break pull mandrel diameter 5 mm and length 12 mm, and protruding aluminium head (optionally lacquered)	--
		Ref. 01.01.006	Self-screwing screw made of stainless steel A2: Hexagon washer head drilling screws with tapping screw thread EN ISO 15480 (also known as DIN 7504 K) plus complementary EPDM washer if needed (5,5 x 19)	--

[1] Families described at Table 1.1 of EAD 090062-00-0404 (hereafter EAD) ed. July 2018.

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

2.1. Intended use

The kit is intended to be used for ventilated external wall claddings which can be fixed to the external walls of new or existing buildings. The assessed kit is a non-load-bearing construction system, and therefore, it does not contribute to the stability of the wall on which is installed, neither to ensure the air tightness of the building structure. But it can contribute to durability of the works by providing enhanced protection from the effect of weathering.

2.2. Relevant general conditions for the use of the kit

The provisions made in this European Technical Assessment 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 kit in works

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

- The mechanical characteristic values of the components (e.g. panels, 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 kit and of the panels.
- The category of corrosivity of the atmosphere of the works [(2)].
- 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, etc.)
- 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 kit in works

Installation should be carried out according to the ETA holder's specifications and using the specific components of the kit, 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 o 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.

[2] 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 kit for ventilated external wall claddings according to the Basic Work Requirements (BWR) was carried out in compliance with the EAD 090062-00-0404. 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:

   Kit has been assessed [3] according to cl. 2.2.1 of EAD, as described below:

   Kit Albond RB, based on:
   - albond® PE: No performance assessed.
   - albond® FR: B-s1,d0. (Classification/Tests report RA19-0033 issued by CSTB).

   This classification is referred to Standard EN 13501-1 [4] and has been obtained from tests results carried out according to Standards EN ISO 11925-2 [5], and EN 13823 [6].

2. Façade fire performance of kit cladded with TMCP albond® PE / albond® FR:

   No performance assessed.

3. Propensity to undergo continuous smouldering:

   No performance assessed.

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

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

   Purposeless for claddings kit with open joints. Kit is not watertight according to cl. 2.2.4 of EAD.

5. Water absorption of cladding:

   No performance assessed. Not relevant for ventilated façades according to cl. 2.2.5 of EAD.

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 the kit 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.

[3] A European reference fire scenario has not been laid down for facades. In some Member States, the classification of the cladding kit according to Standard EN 13501-1 might not be sufficient for the use in façades. An additional assessment of the kit 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.
[4] EN 13501-1:2007+A1:2010. Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.
[5] EN ISO 11925-2:2011. Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test.
[6] EN 13823:2012. Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.

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

9. Wind load resistance:

The behaviour of the kit exposed to wind pressure is most favourable than when exposed to wind suction. Therefore, wind pressure test has been avoided and wind pressure resistance of kit can be considered as equal to wind suction resistance. It has been determined by tests carried out according to cl. 2.2.9 of EAD, on rigs of the cladding kit based on albond® PE/ FR. A summary of test results is indicated in the Table 1:

Table 1: Summary of wind suction resistance results

Rig	Riveted board type size A (L: Length. H: Height)	Suction (Pa) [7]	Type of failure [8]	Maximum Deflection [9] (mm) (centre of board)	
				Permanent d_p	Instantaneous d_i
Ref.: n.2 at Ev.Rep	**albond® PE riveted board LxH=493x1038 mm** - Perimeter rivets max. vertical distance:500 mm - Perimeter rivets max. horizontal distance: 455 mm - Border rivets distance: 19 mm - Distance between vertical profiles (2):486 mm - Distance between brackets: 938 mm - Maximum admissible instantaneous deflection: 30 mm - Maximum admissible permanent deflection: 3 mm	600	None	0.00	1.48
		1000	None	0.01	2.07
		1200	None	0.23	3.63
		1600	None	0.34	5.87
		2000	None	0.39	7.80
		2400	None	0.52	10.08
		2800	None	0.63	12.24
		3200	None	0.92	14.20
		3400	None	1.04	15.26
	albond® FR riveted board LxH=493x1038 mm - Perimeter rivets max. vertical distance:500 mm - Perimeter rivets max. horizontal distance: 455 mm - Border rivets distance: 19 mm - Distance between vertical profiles (2):486 mm - Distance between brackets: 938 mm - Maximum admissible instantaneous deflection: 30 mm - Maximum admissible permanent deflection: 3 mm	600	None	0.01	1.47
		1000	None	0.04	2.78
		1200	None	0.21	3.71
		1600	None	0.31	5.82
		2000	None	0.42	7.89
		2400	None	0.51	10.47
		2800	None	0.61	12.78
		3200	None	1.04	14.89
		3400	None	1.26	16.06
Rig	**Riveted board type size B (L: Length. H: Height)**	**Suction (Pa) [7]**	**Type of failure [8]**	**Maximum Deflection [9] (mm)** (centre of right middle of board)	
				Permanent d_p	Instantaneous d_i
Ref.: n.2 at Ev.Rep	**albond® PE riveted board LxH=996x1038 mm** - Perimeter rivets max. vertical distance:500 mm - Perimeter rivets max. horizontal distance: 479 mm - Border rivets distance: 19 mm - Distance between vertical profiles (3):486 mm - Distance between brackets: 938 mm - Maximum admissible instantaneous deflection: 30 mm - Maximum admissible permanent deflection: 3 mm	600	None	0.01	2,01
		1000	None	0.11	3.56
		1200	None	0.47	4.40
		1600	None	0.58	6.63
		2000	None	0.61	8.50
		2400	None	0.80	10.64
		2800	None	0.90	12.83
		3200	None	1.12	14.89
		3400	None	1.25	16.14
	albond® FR riveted board LxH=996x1038 mm - Perimeter rivets max. vertical distance:500 mm - Perimeter rivets max. horizontal distance: 479 mm - Border rivets distance: 19 mm - Distance between vertical profiles (3):486 mm - Distance between brackets: 938 mm - Maximum admissible instantaneous deflection: 30 mm - Maximum admissible permanent deflection: 3 mm	600	None	0.02	1.40
		1000	None	0.17	2.85
		1200	None	0.24	3.71
		1600	None	0.36	5.64
		2000	None	0.49	7.57
		2400	None	0.69	9.98
		2800	None	0.89	12.21
		3200	None	1.22	14.38
		3400	None	1.45	15.63
Rig	**Riveted board type size C (L: Length. H: Height)**	**Suction (Pa) [7]**	**Type of failure [8]**	**Maximum Deflection [9] (mm)** (centre of 2nd quarter of board)	
				Permanent d_p	Instantaneous d_i
Ref.: n.3 at Ev.Rep	**albond ® PE riveted board LxH=2018x1038 mm** - Perimeter rivets max. vertical distance:500 mm - Perimeter rivets max. horizontal distance: 479 mm - Border rivets distance: 19 mm - Distance between vertical profiles (5):486 mm - Distance between brackets: 938 mm - Maximum admissible instantaneous deflection: 30 mm - Maximum admissible permanent deflection: 3 mm	600	None	0.04	1.80
		1200	None	0.24	4.43
		1600	None	0.36	6.00
		2000	None	0.46	7.66
		2400	None	0.58	9.34
		2800	None	0.74	10.83
		3200	None	0.98	12.38
		3600	Wrap of vertical profile	1.41	14.37
	albond ® FR riveted board LxH=2018x1038 mm - Perimeter rivets max. vertical distance:500 mm - Perimeter rivets max. horizontal distance: 479 mm - Border rivets distance: 19 mm - Distance between vertical profiles (5):486 mm - Distance between brackets: 938 mm - Maximum admissible instantaneous deflection: 30 mm - Maximum admissible permanent deflection: 3 mm	600	None	0.07	1.22
		1200	None	0.09	3.23
		1600	None	0.11	4.49
		2000	None	0.13	5.88
		2400	None	0.16	7.27
		2800	None	0.22	8.49
		3200	None	0.38	9.81
		3600	Wrap of vertical profile	0.68	11.53

7 Maximum admissible load should be calculated taken into account other criteria if required (e.g. national regulations, etc.)

8 The following types of failures have been considered: Breakage of any cladding element, 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).

9 Deflection values measured at centre of rear side of cladding or at other position as specified at the table).

10 Resistance to horizontal point loads:

It has been assessed according to cl. 2.2.10 of EAD on the kit. Results are shown in Table 2.

Table 2: Resistance of horizontal point loads				
PANEL TYPE	**Deformation (mm)**			**Remarks**
	Initial loaded 500 N	**After 1 minute loaded 500 N**	**After 1 minute unloaded**	
albond® PE	0.00	3.94	0.02	No reduction of performances
albond® FR	0.00	3.83	0.05	No reduction of performances

11 Impact resistance:

It has been assessed according to cl. 2.2.11 of EAD. Results and use categories obtained are described below in Table 3. In any case, cladding product presented sharp or cutting edges or surfaces able to cause injury to occupants or people nearby.

Table 3. Impact test results				
Panel Type	**Impact**	**Energy**	**Ball**	Remarks
albond® PE albond® FR	**hard body**	**1 J**	**0. 5 kg**	No deterioration (superficial damage without cracking)
		3 J	**0.5 kg**	No deterioration (superficial damage without cracking)
		10 J	**1.0 kg**	No deterioration (superficial damage without cracking)
albond® PE albond® FR	**soft body**	**10 J**	**3.0 kg**	No deterioration (superficial damage without cracking)
		60 J	**3.0 kg**	No deterioration (superficial damage without cracking)
		300 J	**50 kg**	No deterioration (significant permanent deflection without cracking)
		400 J	**50 kg**	No deterioration (significant permanent deflection without cracking)
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.

- Mechanical resistance of the cladding element:

  The applicable and/or assessed characteristics are shown at the index below:

12. Bending strength of cladding element (TMCP): See Durability of this ETA.
13. Resistance of the grooved cladding element: Not applicable for family A.
14. Resistance of the cladding element at dowel hole: Not applicable for family A.

- Resistance of the connection between the cladding element and the cladding fixing:

15. Pull through resistance: Table 4.
16. Pull through resistance under shear loads: Table 5.
17. Axial resistance: Not applicable for family A.
18. Shear load resistance: Not applicable for family A.
19. Combined tension and shear load resistance: Not applicable for family A.
20. Resistance of slot: Not applicable for family A.

- Mechanical resistance of cladding fixing:

21. Resistance to vertical load: Not applicable for family A.
22. Pull-through resistance of fixings from profile: Not applicable for family A.
23. Resistance of metal clip: Not applicable for family A.

- Mechanical resistance of subframe components:

24. Resistance of profiles: Table 6
25. Tension/pull out resistance of subframe fixings: Table 7
26. Shear resistance of subframe fixings: Table 7
27. Bracket resistance (vertical and horizontal loads): Table 8 and 9

Table 4: Pull-through resistance of cladding element. - Failure load (N)					
Type of board	**Supporting ring Ø (mm)**	**Fixing position**	**Mean value**	**Characteristic value**	**Type of failure**
			F_m	**$F_{u,5}$ ***	
ALBOND PE	180	Centre	2695,53	2579,2	5 punctioned boards
		Lateral	1020,4	881,5	5 cracked boards
		Corner	382,4	201,1	None (5 deformed boards)
	270	Centre	3205,6	2925,7	5 fixings broken
		Lateral	1096,2	989,6	5 cracked boards
		Corner	118,7	80,5	None (5 deformed boards)
	350	Centre	3182,6	2880,0	5 cracked boards
		Lateral	1175,7	1092,4	5 cracked boards
		Corner	131,6	81,2	None (5 deformed boards)
ALBOND FR	180	Centre	2645,2	2355,8	5 fixings broken
		Lateral	1024,2	992,0	5 cracked boards
		Corner	371,0	185,9	None (5 deformed boards)
	270	Centre	2734,2	2641,3	5 punctioned boards
		Lateral	959,3	931,9	5 cracked boards
		Corner	233,3	153,5	None (5 deformed boards)
	350	Centre	2750,2	2603,1	5 punctioned boards
		Lateral	946,2	524,9	5 cracked boards
		Corner	142,4	102,0	None (5 deformed boards)

*** Key:** F_m: Mean value. $F_{u,5}$: Characteristic value (75% confidence that 95% of test results will be higher than this value)

Table 5: Pull-through resistance under shear load									
Type of board		**Failure* load (N)**							**Failure**
		F_1	**F_2**	**F_3**	**F_4**	**F_5**	**F_m**	**$F_{u,5}$**	
ALBOND PE	Border	2677,9	2435,4	1575,2	2696,2	2899,9	2456,9	1246,1	Teared panel
	Corner	2253,8	3059,4	2489,3	2324,4	2722,7	2569,9	1806,3	
ALBOND FR	Border	2105,5	2444,4	1317,4	1307,8	1593,5	1753,7	579,6	
	Corner	3313,4	3303,7	1769,4	2218,4	2309,1	2582,8	967,4	

*** Key:**
$F_{1\text{-}5}$: Individual values. F_m: Mean value. $F_{u,5}$: Characteristic value (75% confidence that 95% of test results will be higher than this value)

Table 6: Resistance of aluminium profiles [10]										
Profile ref.	**Type**	**Effective moment of Inertia (cm^4)**		**E modulus (MPa)** (EN 1999 1-1)	**Alloy EN AW**	**Mechanical characteristics (minimum)**				
		I_x	**I_y**			**R_m (MPa)**	**$R_{p\ 0,2}$ (MPa)**	**A (%)**	**A_{50mm} (%)**	**HBW**
01.01.001	T-shape	16,7	7,34	70000	6063 T5/T6	≥ 160	≥ 120	≥ 8	≥ 6	60
01.01.002	L-shape	3,5	5,25							

[10] EN 755-2. 2016: Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties.

Table 7: Tension / pull out / shear resistance of subframe fixings.			
Kit *(components)*	Type of fixing *(example)*	Dimensions [d x L] mm	Mechanical properties (characteristic values): (Source: Supplier Technical sheet)
Albond RB *Bracket to vertical profile*	Self-screwing screw made of stainless steel A2: Hexagon washer head drilling screws with tapping screw thread EN ISO 15480:2019 (also known as DIN 7504 K) plus complementary EPDM washer if needed	5,5 x 19	- Pull out load (F,u.): ≥ 0.95 kN (thickness 2.0 mm) - Tensile breaking load Z_b ≥ 7,11 N - Shear breaking load Q_b : ≥ 3,56 kN

Table 8: Resistance to vertical load (shear) of bracket						
Brackets	**Results**					**Remarks**
	Fm (daN) ΔL=1mm	**F_{1d}** (daN) ΔL=1mm	**Fm** (daN) ΔL=3mm	**F_{1d}** (daN) ΔL=3mm	**F_s**(daN) failure	
Ref.01.01.004, Ref.01.01.005	233,9	159,5	564,1	409,7	No breakage. Purposeless	L shape

Table 9: Resistance to horizontal load (tension) of brackets				
Brackets	**Results**			**Remarks**
	F_m (daN) ΔL=1mm	**F_{1d}** (daN) ΔL=1mm	**F_s**(daN) failure	
Ref.01.01.004, Ref.01.01.005	158,2	80	No breakage. Purposeless	L shape

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

28. Airborne sound insulation:
No performance assessed.

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

29. Thermal resistance:
Not relevant as the cladding kit does not include the thermal insulation according to cl.2.2.14 of EAD.

- **Durability**

According to cl. 2.2.15 of EAD, which considers cl. 2.2.15.9 when cladding kits are based on TMCP, the assessment of durability is addressed to applicable characteristics 38 to 55 as described below:

30. Hygrothermal behaviour of the kit: Not relevant for the assessed kit.

31. Behaviour after pulsating loads: Not relevant for the assessed kit

32. Freeze-thaw resistance: See applicable characteristics from ∫.38 to ∫.55

33. Behaviour after immersion in water: See applicable characteristics from ∫.38 to ∫.55

34. Dimension stability: Not relevant for the assessed kit

35. Chemical and biological resistance: Not relevant for the assessed kit.

36. UV and radiation resistance: See applicable characteristics from ∫.38 to ∫.55.

37. Corrosion. Resistance of substructure:

Table 10: Corrosion resistance of subframe components made of aluminium profiles				
Kit	**Type**	**Alloy EN AW**	**Protection**	**Corrosion resistance (Eurocode 9)** [11]
Aluminium profiles	Vertical profiles	6063 T5/T6	Raw finished	Durability rating: B
	Bracket	6063 T5/T6	Raw finished	Durability rating: B
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.				

38. Decay of delamination resistance after hygrothermal cycles:

Table 11: Decay of resistance				
Sample	**Characteristic**	**Mean value after ageing**		**Remarks**
albond® PE albond® FR	Delamination resistance	Front sheet: > 75% Initial value	Rear sheet > 75% Initial value	No cracks, or breakage

39. Decay of delamination resistance after immersion in boiling water 6 h at 90 ºC:

Table 12: Decay of resistance				
Sample	**Characteristic**	**Mean value after ageing**		**Remarks**
albond® PE albond® FR	Delamination resistance	Front sheet: > 75% Initial value	Rear sheet > 75% Initial value	No cracks, or breakage

40. Decay of delamination resistance after immersion in water 500 h at 20 ºC:

Table 13: Decay of resistance				
Sample	**Characteristic**	**Mean value after ageing**		**Remarks**
albond® PE albond® FR	Delamination resistance	Front sheet: > 75% Initial value	Rear sheet > 75% Initial value	No cracks, or breakage

41. Decay of delamination resistance after freeze-thaw cycles:

Table 14: Decay of resistance				
Sample	**Characteristic**	**Mean value after ageing**		**Remarks**
albond® PE albond® FR	Delamination resistance	Front sheet: > 75% Initial value	Rear sheet > 75% Initial value	No cracks, or breakage

42. Decay of delamination resistance after long term exposure to heat (2500 h at hot dry air 80 ºC):

Table 15: Decay of resistance				
Sample	**Characteristic**	**Mean value after ageing**		**Remarks**
albond® PE albond® FR	Delamination resistance	Front sheet: > 75% Initial value	Rear sheet > 75% Initial value	No cracks, or breakage

43. Decay of flexural resistance after hygrothermal cycles*:

Table 16: Decay of resistance			
Sample	**Characteristic**	**Mean value after ageing**	**Remarks**
albond® PE	Flexural resistance	> 75% Initial value	No cracks, or breakage
* Characteristics not applicable to panel albond® FR			

44. Decay of flexural resistance after immersion in boiling water 6 h at 90 ºC*:

Table 17: Decay of resistance			
Sample	**Characteristic**	**Mean value after ageing**	**Remarks**
albond® PE	Flexural resistance	> 75% Initial value	No cracks, or breakage
* Characteristics not applicable to panel albond® FR			

[11] 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

45. Decay of flexural resistance after immersion in water 500 h at 20 ºC:

Table 18: Decay of resistance			
Sample	**Characteristic**	**Mean value after ageing**	**Remarks**
albond® PE	Flexural resistance	> 75% Initial value	No cracks, or breakage
* Characteristics not applicable to panel albond® FR			

46. Decay of flexural resistance after freeze-thaw cycles:

Table 19: Decay of resistance			
Sample	**Characteristic**	**Mean value after ageing**	**Remarks**
albond® PE	Flexural resistance	> 75% Initial value	No cracks, or breakage
* Characteristics not applicable to panel albond® FR			

47. Decay of flexural resistance after long term exposure to heat (2500 h at hot dry air 80 ºC):

Table 20: Decay of resistance			
Sample	**Characteristic**	**Mean value after ageing**	**Remarks**
albond® PE	Flexural resistance	> 75% Initial value	No cracks, or breakage
* Characteristics not applicable to panel albond® FR			

48. Decay of flexural stiffness:

Table 21: Decay of flexural stiffness			
Sample	**Characteristic**	**$d_{80\ ME}$ (1 h 80°C)**	**Remarks**
albond® PE albond® FR	Increase of deflection after 1 h 80 ºC	≤ 1,25 $d_{20\ ME}$	No cracks, or breakage

49. Decay of resistance to routed and returned edge after TPB test flexural, pulsating loads:
Not relevant for the assessed kit.

50. Decay of resistance to slot and its fixing devices after pulsating loads:
Not relevant for the assessed kit.

51. Corrosion infiltration after exposure to spray salt:

Table 22: Corrosion resistance (infiltration) of cladding element made of coil coated aluminium			
Sample	**Characteristic**	**Defects**	**Remarks**
PVDF lacquered aluminium sheet	Corrosion infiltration	No defects* after 500 and 1000 h	Index 3 according to EN 1396 [12]

52. Degree of blistering after exposure to humidity:

Table 23: Corrosion resistance (blistering) of cladding element made of coil coated aluminium			
Sample	**Characteristic**	**Defects**	**Remarks**
PVDF lacquered aluminium sheet	Corrosion infiltration	No defects* after 500 and 1000 h	Index 3 according to EN 1396 [12]

[12] EN 1396:2015: Aluminium and aluminium alloys - Coil coated sheet and strip for general applications - Specifications

53. Retention of bright and colour:

Table 24: Retention of bright and colour					
Characteristic	**Commercial ref.**	**Humidity**	**UVB & water 1500 h**	**Heat**	**Remarks**
Retention of bright (gloss units)	Blue Silver metallic	Gloss $_{AGED}$ ≥ 0.8 Gloss $_{INI}$	Gloss $_{AGED}$ ≥ 0.8 Gloss $_{INI}$	Gloss $_{AGED}$ ≥ 0.8 Gloss $_{INI}$	OK
Retention of colour ΔE	Blue Silver metallic	OK --	OK --	OK --	OK Not required

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 [13] 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)**
Kit based on albond® PE	External wall claddings	All / any	2+
Kit based on albond® FR	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 kit 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 kit, and all the relevant design and installation criteria of the kit 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 kit is appropriately informed of specific conditions according to sections 1-5.

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On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja

Madrid, 4th August 2021

Firmado por CASTILLO TALAVERA ANGEL - DNI 52507605P
Fecha: 08/09/2021 15:40:08 CEST

Director IETcc-CSIC

Annex A: General Schemes
Remark: Check www.albond.com.tr for further information

[13] 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

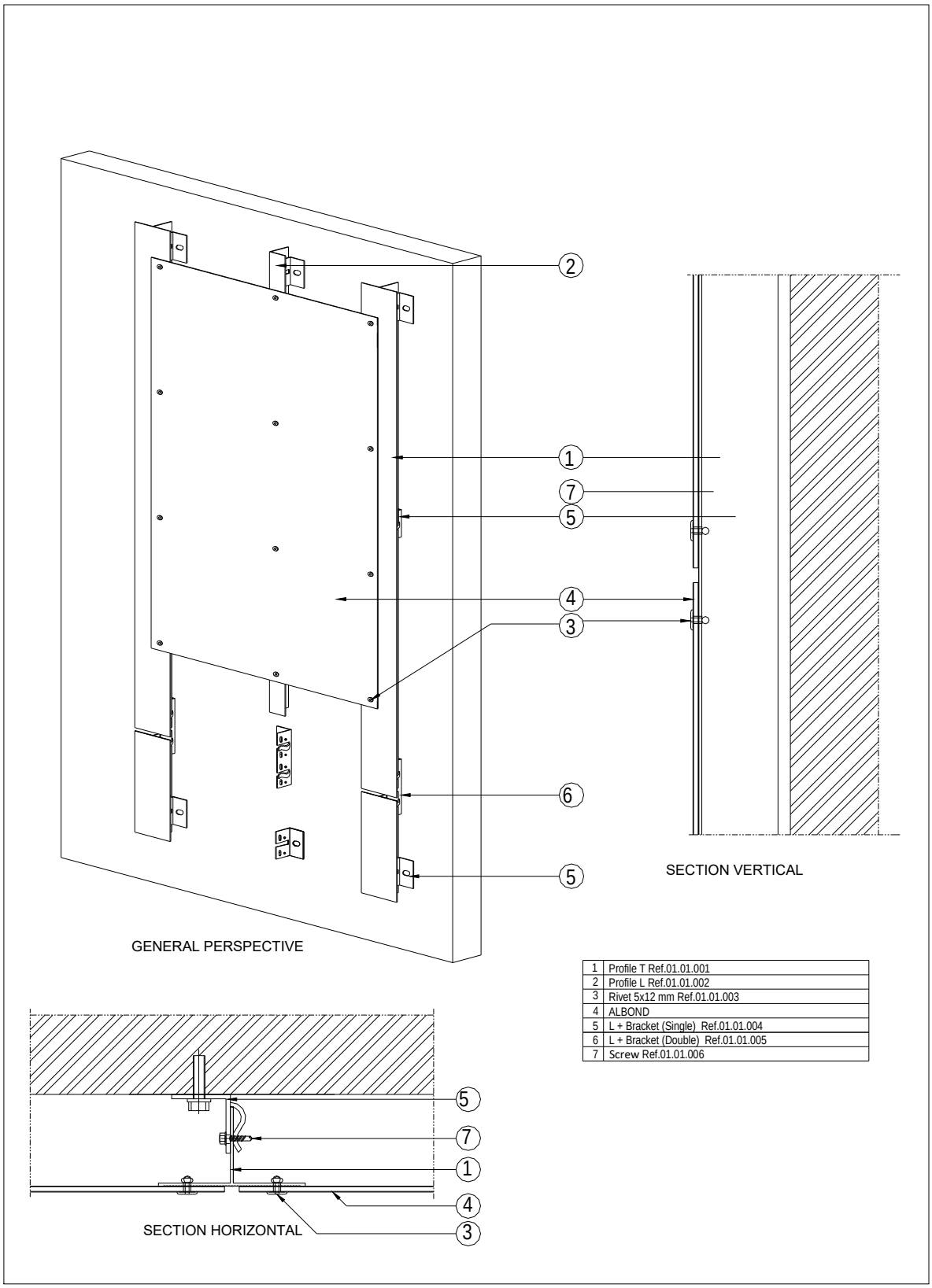

Figure 1. Example of ALBOND RB cladding kit

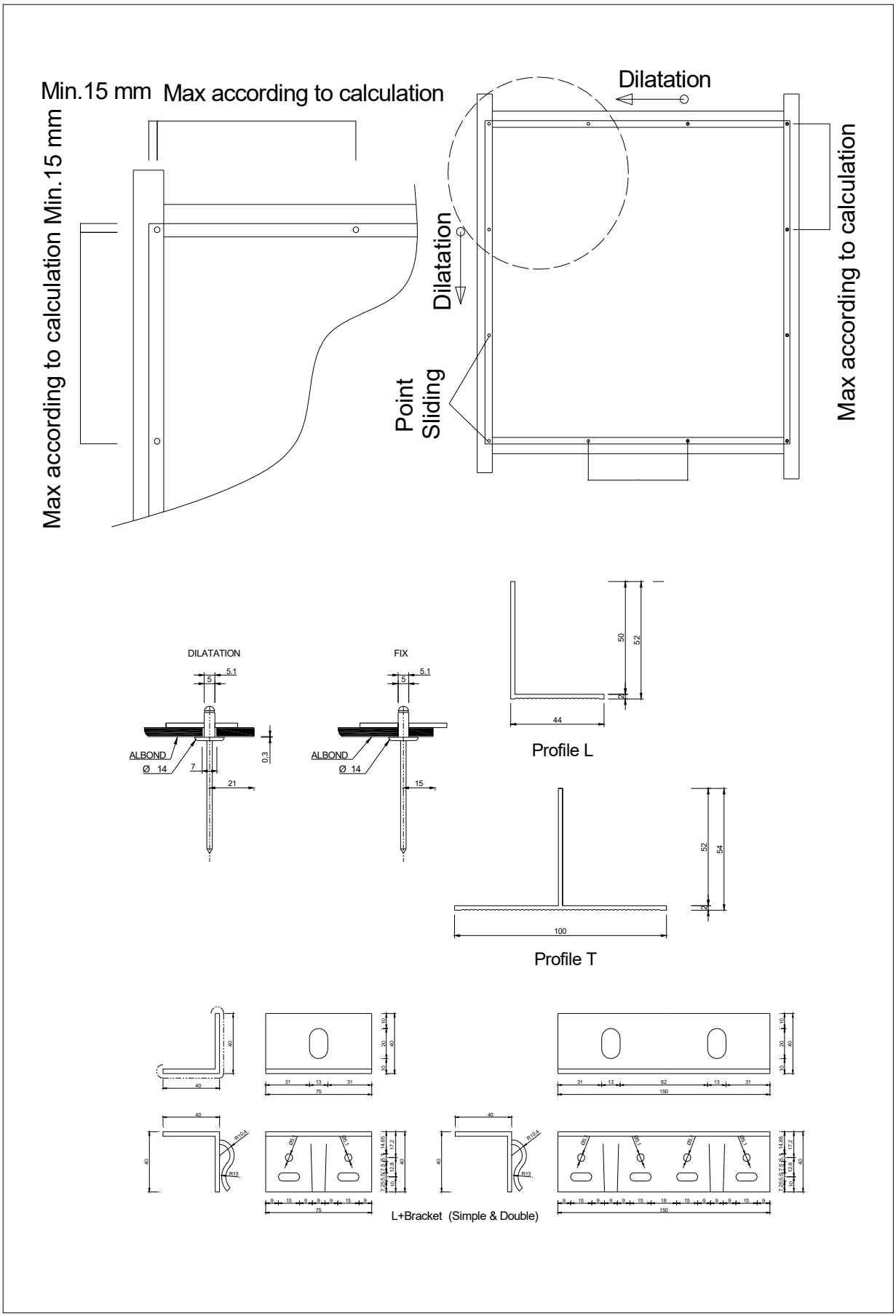

Figure 2. Details of cladding formation (above) and details of main subframe components (below)

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

Table B.1: Physical declared data of cladding components				
Panel	**Material**		**Characteristics**	**Value**
albond® PE albond® FR	Removable protection film		Aspect:	White
	Coating layer (PVDF)	By-layer	Thickness (µm)	≥ 22
		Multilayer	Thickness (µm)	≥ 35
	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): Linear thermal expansion coefficient (K^{-1}):	70 000 0.50 [± 0.02] 24 x 10^{-6}
	Full core made of low recycled density polyethylene (albond® PE)		Aspect: Thickness (mm):	Black 3.0
	Core of low density recycled polyethylene and mineral compounds (albond® FR)		Aspect: Thickness (mm):	Grey 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): Linear thermal expansion coefficient (K^{-1}):	70 000 0.50 [± 0.02] 24 x 10^{-6}
	Protective coating layer		Thickness (µm):	Confidential (Annex C)

Table B.2: Mechanical declared data of cladding material			
Panel	**Material**	**Characteristic**	**Value**
albond® PE albond® FR	Alloyed aluminium sheet EN AW 3105 H44	Tensile strength R_m (MPa)	≥ 150
		Yield strength $R_{p\ 0,2}$ (MPa)	≥ 120
		Elongation A_{50} (%)	≥ 3
	Alloyed aluminium sheet EN AW 3105 H46	Tensile strength R_m (MPa)	≥ 175
		Yield strength $R_{p\ 0,2}$ (MPa)	≥ 150
		Elongation A_{50} (%)	≥ 2
	Alloyed aluminium sheet EN AW 5005 H44	Tensile strength R_m (MPa)	≥ 145
		Yield strength $R_{p\ 0,2}$ (MPa)	≥ 110
		Elongation A_{50} (%)	≥ 2
	Alloyed aluminium sheet EN AW 5005 H46	Tensile strength R_m (MPa)	≥ 165
		Yield strength $R_{p\ 0,2}$ (MPa)	≥ 135
		Elongation A_{50} (%)	≥ 2
	Peeling resistance between sheet (external or rear) and core (N.mm/mm) ASTM D 913		≥ 7.0

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 the kit manufactured by suppliers or ETA holder.