

## European Technical Assessment

**ETA 21/0511**  
of 25.08.2021



### General part

Technical Assessment Body issuing the ETA: ITeC	
ITeC has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)	
<b>Trade name of the construction product</b>	<b>FTS 506 kit</b>
<b>Product family to which the construction product belongs</b>	Subframe and fixing kit for fastening cladding elements and also external wall elements in ventilated or non-ventilated façades
<b>Manufacturer</b>	<b>LOUVELIA FACADE SOLUTIONS, S.L.</b> Av. Alcalde Caballero 16 ES-50014 Zaragoza Spain
<b>Manufacturing plant(s)</b>	Virgen del Buen Acuerdo, 2 Pol. Ind. Alcalde Caballero ES-50014 Zaragoza Spain
<b>This European Technical Assessment contains</b>	22 pages including 6 annexes which form an integral part of this assessment.
<b>This European Technical Assessment is issued in accordance with Regulation (EU) 305/2011, on the basis of</b>	European Assessment Document, EAD 090034-00-0404 <i>Kit composed by subframe and fixings for fastening cladding and external wall elements.</i>

### **General comments**

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## Specific parts of the European Technical Assessment

### 1 Technical description of the product

This ETA refers to the kit FTS 506 for fastening skin elements<sup>1</sup> (cladding elements and external wall elements).

FTS 506 kit components are given in table 1.1.

Detailed information and data of all the components are given in the annexes of this ETA.

The following ventilated façade elements or components are not considered in this ETA:

- The skin elements<sup>2</sup>.
- The fixings between the subframe and the supporting structure<sup>3</sup>.
- The other layers of the façade, like insulation and internal layers.

The configuration of the assembled system is shown in Annex 1.

FTS 506 kit is made of mechanical components. Adhesives are not needed for assembly.

FTS 506 kit is a non-load bearing construction element. It does not contribute to the stability of structure on which they are installed.

**Table 1.1:** Kit components.

N.	Generic component		FTS 506 (*)	Technical description in Annexes
1	Cladding fixing	Skin element fixing	Aluminium alloy profiles	Annex 2
		Screw	Stainless steel screws	Annex 5
2	Subframe	Vertical profile	Aluminium alloy profiles	Annex 3
		Bracket	Aluminium alloy brackets	Annex 4
		Subframe fixing	Stainless steel screws	Annex 5
		Ancillary components	Elastomeric filler: SOLTEC® HM-Pro	Annex 5
			Small polymeric wedges	

(\*) Kit belonging to type 4 according to EAD 090034-00-0404.

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

FTS 506 kit is intended to be used as mechanical fastening of skin elements (claddings or external wall elements) in façades with air space, ventilated or not, and intended to be used on supporting structures<sup>3</sup> which meet the mechanical strength requirements.

FTS 506 kit is intended to be used for the fixing of skin elements ceramic tiles according to EN 14411 and/or natural stone according to EN 1469 (see clause A6.1 of Annex 6 for more information on the skin element specifications). These skin elements shall include grooves.

<sup>1</sup> From now on this term refers to both cladding elements and external wall elements.

<sup>2</sup> If the skin elements are cladding elements, other EADs may apply (e.g. EAD 090062, EAD 090020, etc.).

<sup>3</sup> The term "supporting structure" refers to both of following descriptions:

- The wall, which in itself already meets the airtightness and mechanical strength requirements (resistance to static and dynamic loads). The substrate walls are made of masonry (clay, concrete or stone), concrete (cast on site or as prefabricated panels), timber or metal frame.
- The supporting structure of the building, which in itself does not meet the airtightness requirement but meets the mechanical strength requirements (resistance to static and dynamic loads). Usually, the supporting structures of the building are made of concrete (cast on site or prefabricated), timber or metal frame.  
In this case, the airtightness requirements are met by the internal leaves of the façade.

The skin elements are not part of the kit object of this ETA. The safety in use of the skin elements has to be assessed separately.

The provisions made in this European Technical Assessment are based on an assumed working life of at least 25 years for FTS 506 kit. The indications given on the working life cannot be interpreted as a guarantee given by the producer but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

FTS 506 kit is made of non-load bearing construction components. It does not contribute directly to the stability of the wall on which they are installed.

FTS 506 kit is not intended to ensure the airtightness of the building envelope.

Detailed information and data regarding design, installation, maintenance and repair criteria are given in Annex 6.

### 3 Performance of the product and reference to the methods used for its assessment

The assessment of FTS 506 kit for the intended use was performed following EAD 090034-00-0404 *Kit composed by subframe and fixings for fastening cladding and external wall elements*.

**Table 3.1:** Summary of the FTS 506 kit performance (see also detailed performances in relevant clauses).

<b>Product:</b> FTS 506 kit		<b>Intended use:</b> Mechanical fastening of skin elements (claddings or external wall elements) in façades with air space, ventilated or not.		
<b>Basic Works Requirement</b>	<b>ETA clause</b>	<b>Essential characteristic</b>	<b>Performance FTS 506</b>	
BWR 2 Safety in case of fire	3.1	Reaction to fire	A1	
	3.2	Wind load resistance	See clause 3.2	
	---	Resistance to vertical load of the kit	Not assessed	
	3.3	Resistance to vertical load of skin element fixing	See clause 3.3	
	3.4	Resistance to horizontal load of skin element fixing	See clause 3.4	
	---	Resistance to pulsating load of skin element fixings	Not assessed	
	BWR 4 Safety and accessibility in use	---	Resistance of skin element fixings in case of inaccuracies of installation	Not relevant
		3.5	Pull-through resistance of fixings from profile	See table 3.3
		3.6	Pull-out resistance of subframe fixings from profile	See table 3.4
		3.7	Inertia and resistance of profiles	See Annex 2 and Annex 3
3.8		Resistance of vertical load of brackets	See table 3.5	
3.9		Resistance of horizontal load of brackets	See table 3.6	
3.10		Mechanical characteristics of subframe fixings	See table 3.4	
3.11	Corrosion	See clause 3.11		

**Complementary information:**

Requirements with respect to the mechanical resistance and stability of non-load bearing parts of the works are not included in the Basic Works Requirement *Mechanical resistance and stability* (BWR 1) but are treated under the Basic Works Requirement *Safety and accessibility in use* (BWR 4).

The fire resistance requirement is applicable to the wall (made of masonry, concrete, timber or metal frame) and not to the FTS 506 kit itself.

### 3.1 Reaction to fire

Reaction to fire of FTS 506 kit according to Commission Delegated Regulation (EU) 2016/364 and EN 13501-1 is class A1 without need of testing according to Decision 96/603/EC as amended.

The elastomeric filler and the small polymeric wedges are considered as small components (see clause A5.2), therefore their contribution to the reaction to fire is neglected.

*Note: A European reference fire scenario has not been laid down for façades. In some Member States, the classification of external wall claddings according to EN 13501-1 might not be sufficient for the use in façades. An additional assessment of external wall claddings according to national provisions (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.*

### 3.2 Wind load resistance

FTS 506 kit wind load resistance has been determined according to clause 2.2.2 of EAD 090034-00-0404 considering the wind suction resistance tests and the mechanical resistance of the components (see clauses 3.3 to 3.10). Test results are given in table 3.2.

For other assembled systems, wind load resistance obtained by calculation on the basis of the mechanical resistance of the kit components should not be higher than the maximum load obtained in the tests.

According to the calculated values for the test specimen the weakest point is the connection between horizontal profile and vertical profile (pull-out resistance of fixings on profiles), and the possible deflection of profiles (L/200). This information is valid assuming that the skin element is not the weakest component.

**Table 3.2:** Wind suction test results.

Test	System	Maximum load Q (Pa)	Deflection under maximum load (mm)	Deflection after 1 min recovery (mm)
Suction (1)	FTS 506	2400 (3)	9,43 (5)	2,94 (7)
Suction (2)		4000 (4)	16,13 (6)	3,98 (8)

(1) Test specimen: natural stone as a skin element, in the middle of the specimen one central 1000 mm x 1000 mm skin element, two skin elements 700 mm x 500 mm and one 1000 mm x 500 mm both on the top and bottom of the specimen and one 700 mm x 1000 mm both on the left and right centre sides; four vertical profiles at 750 mm and 800 mm distances; two intermediate horizontal profiles of 4 mm at 1000 mm and two start-end horizontal profiles of 4 mm at 500 mm distance; twelve brackets, four of 120 x 100 x 60 x 3 mm and eight of 60 x 100 x 60 x 3 mm (750 mm span) and subframe fixings.

(2) Test specimen: natural stone as a skin element, three 1000 mm x 450 mm, two skin elements 700 mm x 300 mm and one 1000 mm x 300 mm both on the top and bottom of the specimen and three 700 mm x 450 mm both on the left and right centre sides; four vertical profiles at 750 mm and 800 mm distances; four intermediate horizontal profiles of 4 mm at 450 mm and two start-end horizontal profiles of 4 mm at 300 mm distance; twelve brackets, four of 120 x 60 x 60 x 3 mm and eight of 60 x 60 x 60 x 3 mm (750 mm span) and subframe fixings.

(3) Longitudinal breakage of the central skin element at 2400 Pa.

(4) Wind suction test is stopped at 4000 Pa due to machine limitation. At the end of the test, the specimen remains intact, and no deterioration or breakage is observed.

(5) Maximum displacement measured in the middle point of the test specimen (on the centre 1000 mm x 1000 mm skin element).

(6) Maximum displacement measured in the middle point of the test specimen (on the centre 1000 mm x 450 mm skin element).

(7) Maximum deformation measured on the connection of the horizontal profile with the vertical profile.

(8) Maximum deformation measured on the centre between the bottom start-end horizontal profile and intermediate horizontal profile.

### 3.3 Resistance to vertical load of skin element fixing

Resistance to vertical load of FTS 506 kit skin element fixings (continuous horizontal profiles, see Annex 2) has been evaluated by calculation. The calculation has been made considering:

- horizontal profiles of 4 mm (mechanically weakest case),
- worst case scenario in deflection (one span) and stress (one or two spans),
- maximum distance between vertical profiles 800 mm,
- maximum admissible deflection ( $L/200$ ),
- elastic limit (see table A2.1),
- safety factors are not considered.

The obtained values are given in table 3.3.

**Table 3.3:** Resistance to vertical load of horizontal profiles.

Profile	Vertical load resistance p (kN/m)	Failure mode
FTS-506-PH-Start-End-4mm	0,91	Profile deflection
FTS-506-PH-Intermediate-4mm	1,14	

### 3.4 Resistance to horizontal load of skin element fixing

Resistance to horizontal load of FTS 506 skin element fixings (continuous horizontal profiles, see Annex 2) has been evaluated by calculation. The calculation has been made considering:

- horizontal profiles of 4 mm (mechanically weakest case),
- worst case scenario in deflection (one span) and stress (one or two spans),
- maximum distance between vertical profiles 800 mm,
- maximum admissible deflection ( $L/200$ ),
- elastic limit (see table A2.1),
- safety factors are not considered.

The obtained values are given in table 3.4.

**Table 3.4:** Resistance to horizontal load of horizontal profiles.

Profile	Horizontal load resistance q (kN/m)	Failure mode
FTS-506-PH-Start-End-4mm	0,74	Profile deflection
FTS-506-PH-Intermediate-4mm	0,99	

### 3.5 Pull-through resistance of fixings

Pull-through resistance of fixings has been assessed by testing skin element fixings under horizontal load.

Mean and characteristic values are given in table 3.5.

**Table 3.5:** Pull-through resistance of subframe screws.

Test specimen	Pull-through resistance (N)	
	F <sub>m</sub>	F <sub>c</sub>
Profile: Thickness 2,0 mm, AW-6063 aluminium alloy. Self-drilling screw: Ø5,5 mm, A2 stainless steel.	5674	5349
Where:		

**Table 3.5:** Pull-through resistance of subframe screws.

Test specimen	Pull-through resistance (N)	
	F <sub>m</sub>	F <sub>c</sub>
Profile: Thickness 2,0 mm, AW-6063 aluminium alloy. Self-drilling screw: Ø5,5 mm, A2 stainless steel.	5674	5349

F<sub>m</sub> = mean value; F<sub>c</sub> = characteristic value with a 75% confidence that 95% of results will be higher than this value.

### 3.6 Pull-out resistance of fixings on profile

Pull-out resistance of fixings on profiles has been tested.

Mean and characteristic values are given in table 3.6.

**Table 3.6:** Pull-out resistance and shear strength of subframe screws.

Test specimen	Pull-out resistance (N)		Shear strength (N)	
	F <sub>m</sub>	F <sub>c</sub>	F <sub>m</sub>	F <sub>c</sub>
Profile: Thickness 2,0 mm, AW-6063 aluminium alloy. Self-drilling screw: Ø5,5 mm, A2 stainless steel. (*)	2195	2071		
Profile: Thickness 1,8 mm, AW-6063 aluminium alloy. Self-drilling screw: Ø5,5 mm, A2 stainless steel. (*)	2155	1784	5234	4956
Profile: Thickness 1,8 mm, AW-6063 aluminium alloy. Self-drilling screw: Ø4,8 mm, A2 stainless steel.	1938	929		

Where:

F<sub>m</sub> = mean value; F<sub>c</sub> = characteristic value with a 75% confidence that 95% of results Will be higher than this value.

(\*) Shear strength not tested. Minimum shear strength value from tested screw.

### 3.7 Inertia and resistance of profiles

The following characteristics of the profiles are given in Annex 2 and Annex 3:

- Form and dimensions of the profile's sections.
- Inertia of the profile's sections.
- Minimum elastic limit of the profile's material.

### 3.8 Resistance to vertical load of brackets

Resistance to vertical load of brackets has been tested; mean and characteristic values are given in table 3.7.

**Table 3.7:** Bracket resistance to vertical load.

Bracket H x L x B x t (mm)	Resistance (N) at 1 mm of displacement		Resistance (N) at 3 mm displacement		Resistance (N) at $\Delta L = 0,2\% \cdot L$ mm permanent deflection		Ultimate resistance (N)	
	F <sub>m</sub>	F <sub>c</sub>	F <sub>m</sub>	F <sub>c</sub>	F <sub>m</sub>	F <sub>c</sub>	F <sub>m</sub>	F <sub>c</sub>
60 x 60 x 60 x 3 (*)	933	739	2150	1813	1256	987	4138	3746
60 x 80 x 60 x 3	367	269	933	739	844	719	3188	3029
60 x 100 x 60 x 3 (*)								
60 x 120 x 60 x 3	267	169	550	382	817	705	1839	1667
60 x 140 x 60 x 3 (*)								
60 x 160 x 60 x 3	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
60 x 180 x 60 x 3 (*)								
60 x 200 x 60 x 4	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
60 x 220 x 60 x 4 (*)								
120 x 60 x 60 x 3 (*)	1500	1163	5900	5563	2457	1701	13557	12754
120 x 80 x 60 x 3	1033	519	2767	2572	1871	1359	9414	8708
120 x 100 x 60 x 3 (*)								
120 x 120 x 60 x 3	500	500	1567	1372	1529	1370	5229	4796
120 x 140 x 60 x 3 (*)								
120 x 160 x 60 x 3	159	112	448	378	341	190	848	757
120 x 180 x 60 x 3 (*)								
120 x 200 x 60 x 4	220	180	575	517	524	266	1165	1096
120 x 220 x 60 x 4 (*)								
180 x 60 x 60 x 3 (*)	1567	788	6867	6478	4667	3965	17900	17008
180 x 80 x 60 x 3	900	563	3367	2978	3250	2574	10713	10142
180 x 100 x 60 x 3 (*)								
180 x 120 x 60 x 3	567	372	2333	1632	2033	1750	5511	5027
180 x 140 x 60 x 3 (*)								
180 x 160 x 60 x 3	453	365	1016	969	793	660	1714	1613
180 x 180 x 60 x 3 (*)								
180 x 200 x 60 x 4	507	357	1184	1085	912	722	1994	1836
180 x 220 x 60 x 4 (*)								

Where:

L = length; H = height; B = base; t = thickness

F<sub>m</sub> = mean values; F<sub>c</sub> = characteristic values giving 75% confidence that 95% of results will be higher than this value.

(\*) Tested bracket which gives value to the other stronger brackets.

(\*\*) Bracket not considered for this use.

### 3.9 Resistance to horizontal load of brackets

Resistance to horizontal load of brackets has been tested; mean and characteristic values are given in table 3.8.

**Table 3.8:** Bracket resistance to horizontal load.

Bracket H x L x B x t (mm)	Resistance (N) at 1 mm of permanent deflection		Ultimate resistance (N)	
	F <sub>m</sub>	F <sub>c</sub>	F <sub>m</sub>	F <sub>c</sub>
60 x 60 x 60 x 3 (*)	1380	472	3440	3050
60 x 80 x 60 x 3				
60 x 100 x 60 x 3	1367	896	3417	3162
60 x 120 x 60 x 3				
60 x 140 x 60 x 3 (*)				
60 x 160 x 60 x 3	2340	1480	4213	4016
60 x 180 x 60 x 3 (*)				
60 x 200 x 60 x 4	3838	2695	7343	6881
60 x 220 x 60 x 4 (*)				
120 x 60 x 60 x 3 (*)	1800	1371	5050	2683
120 x 80 x 60 x 3				
120 x 100 x 60 x 3 (*)	2300	1766	4200	3810
120 x 120 x 60 x 3				
120 x 140 x 60 x 3 (*)	2767	2068	5233	4482
120 x 160 x 60 x 3	1440	1148	2382	2251
120 x 180 x 60 x 3 (*)				
120 x 200 x 60 x 4	1888	1074	3565	3385
120 x 220 x 60 x 4 (*)				
180 x 60 x 60 x 3 (*)	1933	1405	4967	4457
180 x 80 x 60 x 3				
180 x 100 x 60 x 3 (*)	2100	1239	4233	3724
180 x 120 x 60 x 3				
180 x 140 x 60 x 3 (*)	2367	1857	4467	4016
180 x 160 x 60 x 3	1723	1492	2980	2843
180 x 180 x 60 x 3 (*)				
180 x 200 x 60 x 4	2629	2042	4708	4222
180 x 220 x 60 x 4 (*)				

Where:

H = height; L = length; B = base; t = thickness

F<sub>m</sub> = mean values; F<sub>c</sub> = characteristic values giving 75% confidence that 95% of results will be higher than this value.

(\*) Tested bracket which gives value to the other stronger brackets.

### 3.10 Mechanical characteristic of subframe fixings

Shear load strength of subframe fixings has been tested (see table 3.6).

Tensile strength of subframe fixing at least meets the values given in the table 3.6 for pull-out resistance.

### 3.11 Corrosion

The skin element fixings (horizontal profiles), the subframe vertical profiles and the brackets of FTS 506 kit are made of aluminium alloy AW-6063 according to EN 573-3, EN 1999-1-1 and EN 755-2. The durability is class B and the minimum thickness is 1,8 mm. Therefore, these components may be used in the following external atmospheric exposure: rural environment, moderate industrial/urban environment, but excluding industrial marine environment. These components may be used in other external atmospheric conditions exposure if the components are protected as indicated in EN 1999-1-1.

The subframe drilling screw is made of A2 stainless steel according to EN ISO 3506-1. Therefore, this component may be used in dry internal conditions or exposure in permanent damp internal conditions and also in external atmospheric exposure with high category of corrosivity of the atmosphere (included industrial and marine environment, C4 as defined in ISO 9223), provided that no particular aggressive conditions exist. Such particular aggressive conditions are e.g. permanent or alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

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

According to the decision 2003/640/EC, as amended of the European Commission<sup>4</sup>, the systems of AVCP (see EC delegated regulation (EU) No 568/2014 amending Annex V to Regulation (EU) 305/2011) given in the following table apply.

**Table 4.1:** Applicable AVCP system.

Product	Intended use	Level or class	System
Subframe and fixing kits for fastening cladding and external wall elements	External finishes of walls	Any	2+
	For uses subject to regulations on reaction to fire	A1 (*)	4

(\*) Class A1 for FTS 506 kit, according to Commission Decision 96/603/EC as amended.

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

## 5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan* deposited with the ITeC<sup>5</sup>, with which the factory production control shall be in accordance.

Issued in Barcelona on 25 August 2021

by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart  
Technical Director, ITeC

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<sup>5</sup> The *Control Plan* is a confidential part of the ETA and is only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

## ANNEX 1: FTS 506 assembled system



Figure A1.1a: FTS 506 assembled kit.

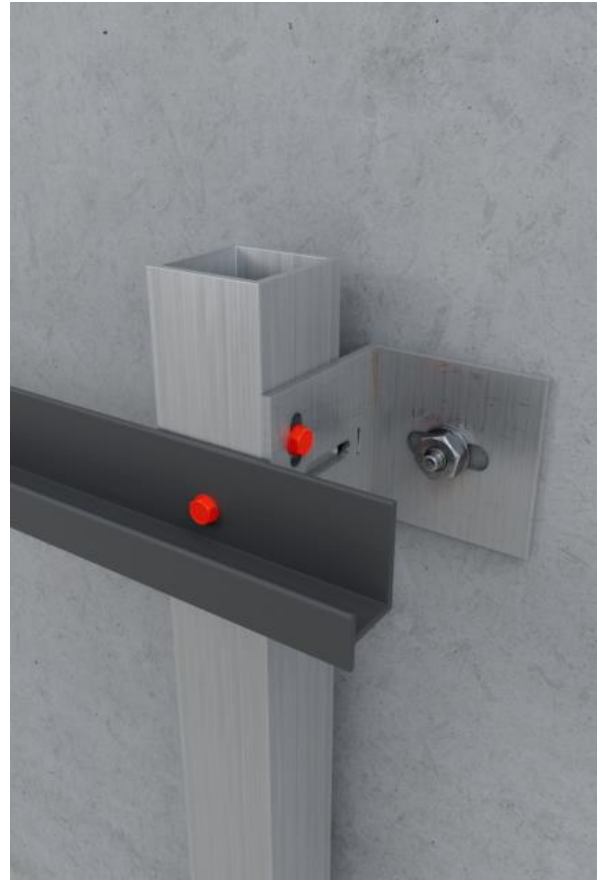
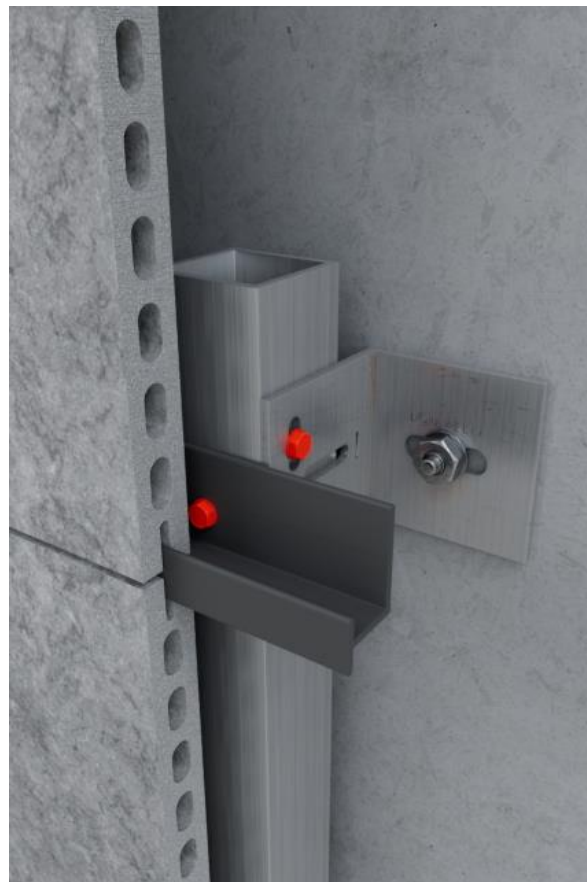


Figure A1.1b: FTS 506 assembled kit.



**Figure A1.2a:** FTS 506 assembled system with natural stone as a skin element.

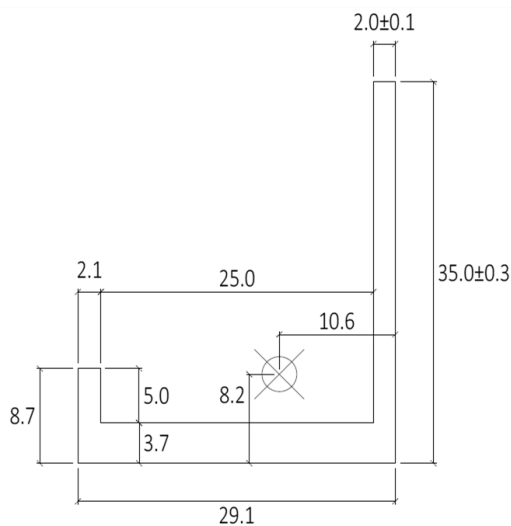


**Figure A1.2b:** FTS 506 assembled system with ceramic tile as a skin element.

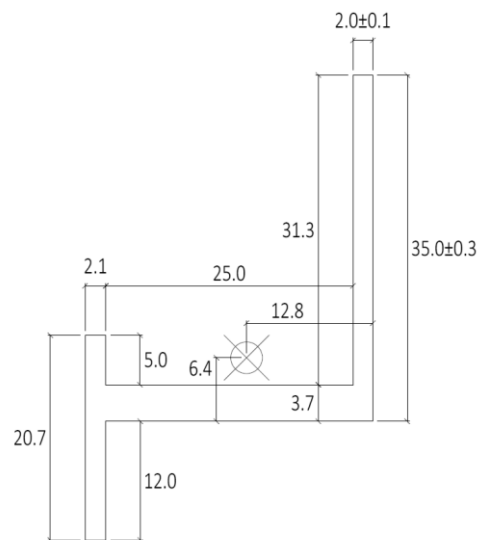
## ANNEX 2: Horizontal profiles (skin element fixings)

**Table A2.1:** Geometric and material properties of the FTS 506 kit horizontal profiles.

Geometric properties						
Type of profile	Form and dimensions (mm)	Figure	Weight per linear metre (kg/m)	Cross section (mm <sup>2</sup> )	Inertia of profile section (cm <sup>4</sup> )	
					I <sub>xx</sub>	I <sub>yy</sub>
Profile FTS-506-PH-Start-End-4mm	29 x 35 x 2,0	Figure A2.1	0,51	181	1,74	1,83
Profile FTS-506-PH-Intermediate-4mm	29 x 47 x 2,0	Figure A2.2	0,55	204	2,18	2,45
Profile FTS-506-PH-Start-End-6mm	29 x 35 x 2,0	Figure A2.3	0,66	247	2,17	2,34
Profile FTS-506-PH-Intermediate-6mm	29 x 47 x 2,0	Figure A2.4	0,72	271	2,62	2,93
Material properties						
Characteristic	Value		Reference			
Material	EN AW-6063		EN 755-2 EN 1999-1-1			
Treatment	T66					
Durability class	B					
Specific weight (kg/m <sup>3</sup> )	2700					
Elastic limit (MPa)	200					
Elongation (%)	6					
Tensile strength (MPa)	245					
Modulus of elasticity (MPa)	70000					
Poisson coefficient	0,3					
Coefficient of thermal expansion between 50 °C and 100 °C (µm/(m·°C))	23,0					



**Figure A2.1:** Profile FTS-506-PH-Start-End-4mm.



**Figure A2.2:** Profile FTS-506-PH-Intermediate-4mm.

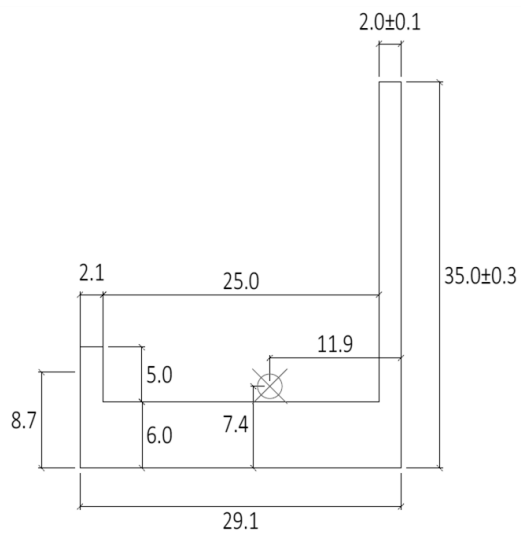


Figure A2.3: Profile FTS-506-PH-Start-End-6mm.

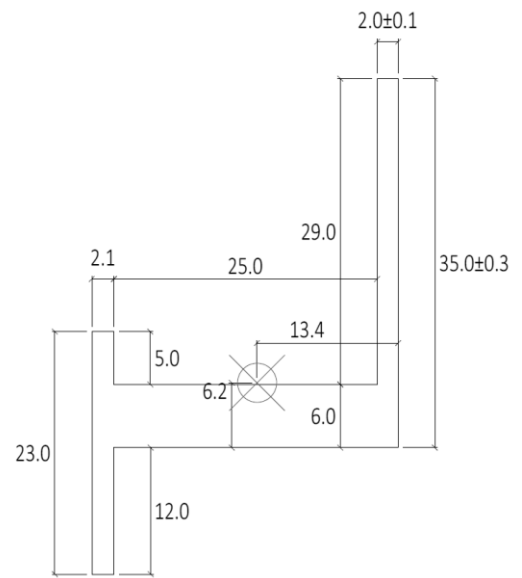


Figure A2.4: Profile FTS-506-PH-Intermediate-6mm.

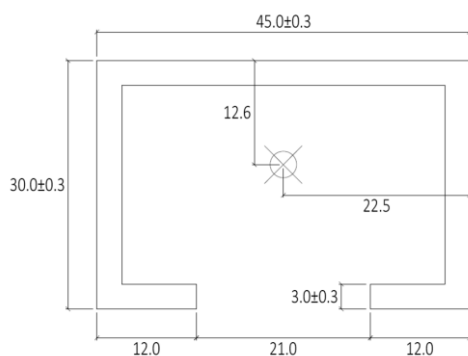
### ANNEX 3: Subframe profiles

**Table A3.1:** Geometric and material properties of the FTS 506 kit vertical profiles.

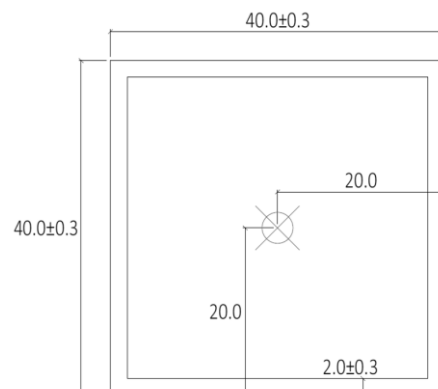
Geometric properties						
Type of profile	Form and dimensions (mm)	Weight per linear metre (kg/m)	Cross section (mm <sup>2</sup> )	Inertia of profile section (cm <sup>4</sup> )		
				I <sub>xx</sub>	I <sub>yy</sub>	
Profile FTS-506-PV-C	45 x 30 x 3,0	Figure A3.1 (*)	0,95	351	4,27	10,69
Profile FTS-506-PV-SQ	40 x 40 x 2,0	Figure A3.2	0,82	304	7,34	7,34
Profile FTS-501A-PV-L	40 x 60 x 1,8	Figure A3.3	0,48	177	6,80	2,52
Profile FTS-501A-PV-T	60 x 60 x 1,8	Figure A3.4	0,57	213	7,75	3,24
Profile FTS-501A-PV-T	80 x 60 x 1,8	Figure A3.5	0,67	249	8,42	7,68

(\*) The horizontal profiles can be fixed to this profile both on its flange and on its web.

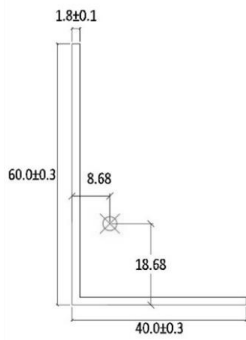
Material properties			
Characteristic	Value	Reference	
Material	EN AW-6063	EN 755-2 EN 1999-1-1	
Treatment	T66		
Durability class	B		
Specific weight (kg/m <sup>3</sup> )	2700		
Elastic limit (MPa)	200		
Elongation (%)	6		
Tensile strength (MPa)	245		
Modulus of elasticity (MPa)	70000		
Poisson coefficient	0,3		
Coefficient of thermal expansion between 50 °C and 100 °C (µm/(m·°C))	23,0		



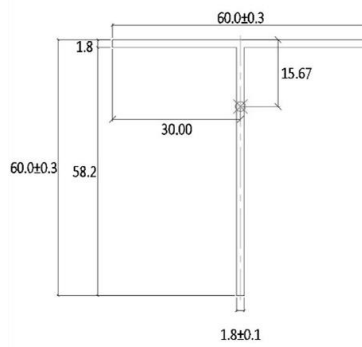
**Figure A3.1:** Profile FTS-506-PV-C (\*).



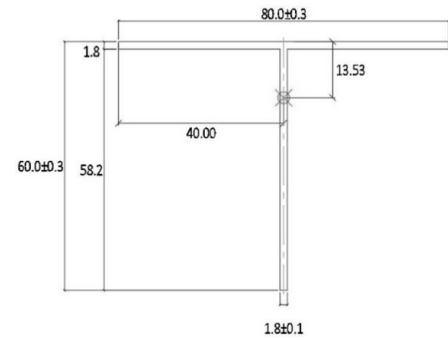
**Figure A3.2:** Profile FTS-506-PV-SQ.



**Figure A3.3:**  
Profile FTS-501A-PV-L.



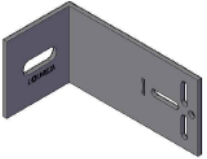


**Figure A3.4:** Profile FTS-501A-PV-T.



**Figure A3.5:** Profile FTS-501A-PV-T.

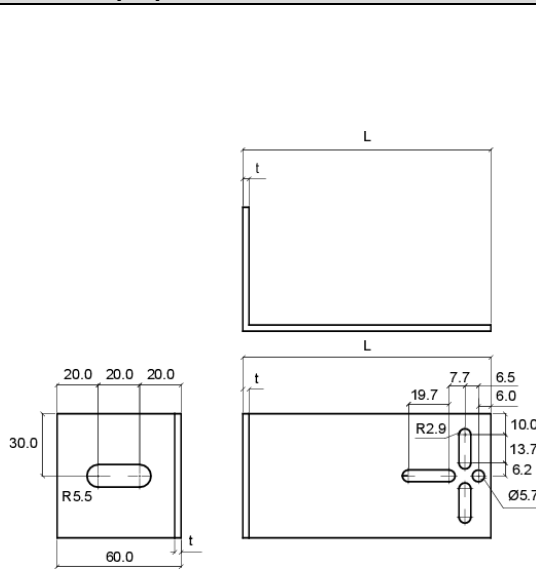
## ANNEX 4: Subframe brackets

**Table A4.1:** Bracket geometric and material properties. L = length; B = base; t = thickness.

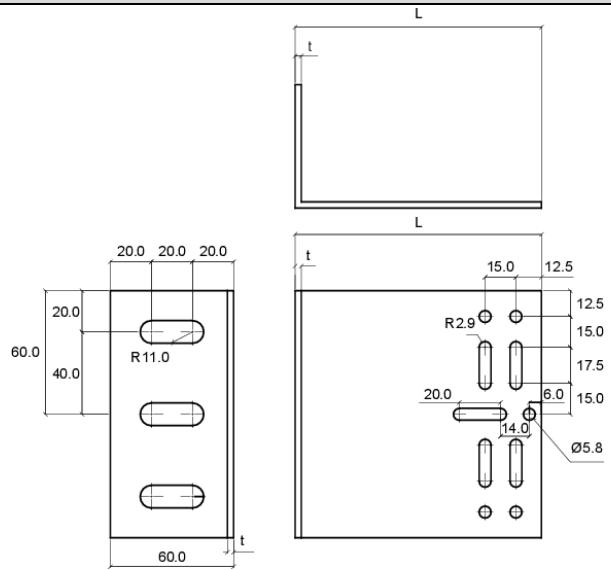
Geometric properties			
Type of bracket		Form and dimensions (mm)	Mass per unit (kg)
<b>Height 60</b> 	60 x L x 60 x 3,0	L = 60	0,051
		L = 80	0,060
		L = 100	0,070
		L = 120	0,080
		L = 140	0,090
	60 x L x 60 x 4,0	L = 160	0,100
		L = 180	0,109
		L = 200	0,158
		L = 220	0,171
		Figure A4.1	
<b>Height 120</b> 	120 x L x 60 x 3,0	L = 60	0,099
		L = 80	0,119
		L = 100	0,138
		L = 120	0,158
		L = 140	0,177
	120 x L x 60 x 4,0	L = 160	0,197
		L = 180	0,216
		L = 200	0,313
		L = 220	0,339
		Figure A4.2	
<b>Height 180</b> 	180 x L x 60 x 3,0	L = 60	0,154
		L = 80	0,183
		L = 100	0,212
		L = 120	0,241
		L = 140	0,270
	180 x L x 60 x 4,0	L = 160	0,300
		L = 180	0,328
		L = 200	0,475
		L = 220	0,514
		Figure A4.3	
Material properties			
Characteristic	Value	Reference	
Material	EN AW-6063	EN 755-2 EN 1999-1-1	
Treatment	T5		
Durability class	B		
Specific weight (kg/m <sup>3</sup> )	2700		
Elastic limit (MPa)	130		
Elongation (%)	6		
Tensile strength (MPa)	175		
Modulus of elasticity (MPa)	70000		
Poisson coefficient	0,3		
Coefficient of thermal expansion between 50 °C and 100 °C (µm/(m·°C))	23,0		

**Table A4.1:** Bracket geometric and material properties. L = length; B = base; t = thickness.

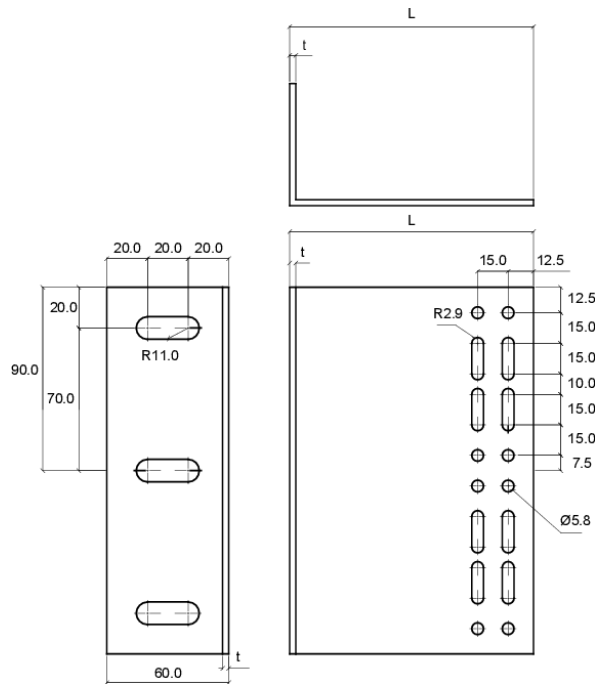
**Geometric properties**



**Figure A4.1:** Bracket of height 60.



**Figure A4.2:** Bracket of height 120.



**Figure A4.3:** Bracket of height 180.

## ANNEX 5: Subframe fixings and other components

### A5.1 Subframe screws

Table A5.1: Subframe fixings.

Fixing elements		Geometry		Material		Reference
Position	Type	Description	Type	Class	---	
Between skin element fixings (horizontal profiles) and vertical profiles	Self-drilling screws	ST 5,5 x L	Stainless steel	A2-70	EN ISO 3506-1 EN ISO 3506-4 EN ISO 15480 EN ISO 10666	
Between vertical profiles and brackets						

### A5.2 Ancillary components

#### A5.2.1 Elastomeric filler

Table A5.2: SOLTEC® HM-Pro.

Typical Product Data	Value
Chemical base	Elastomeric filler, based on hybrid polymer
Colour	White; grey; black; brown
Cure mechanism	Moisture-curing
Density at 20 °C	1,48 kg/l approx.
Application temperature ambient	5 °C to 40 °C
Skin time at 23 °C / 50% RH	10 min to 20 min
Cure time at 23 °C / 50% RH	4 mm after 24 h
Hardness Shore A	50
Modulus at 100%	1,3 MPa
Modulus at break	3,8 MPa
Elongation at break	375 %
Service temperature	- 40 °C to 90 °C
Shelf-life storage between 5 °C and 25 °C	18 months
UV Resistance	Very good
Maximum length of bead piece	100 mm
Minimum distance between bead pieces	200 mm

#### A5.2.2 Small polymeric wedges

Ancillary small polymeric wedge of 100 x 20 x 2 mm placed horizontal between horizontal profile and skin element. One wedge is placed at each end of the skin element (minimum distance 200 mm).

### A5.3 Other components

Other products that do not pertain to the kits but are needed for the execution of the FTS 506 kit in the works are the fixings between the brackets and the substrate. The main specifications to be met by these products to be used with the kit are:

- Fixings must be chosen according to the substrate or supporting structure material (concrete, masonry, timber or metal frame, etc.) and the resistance required due to wind load and dead load (pull-out and shear strength respectively).
- Fixings between the brackets and the substrate may be CE marked according to an ETA on the basis of the relevant EAD (see [www.eota.eu](http://www.eota.eu)) as long as this CE marking is mandatory in the Member State where the kit is used.

## ANNEX 6: Design, installation, maintenance and repair criteria

### A6.1 Design

The design of the subframe and fixings for fastening external skin elements using FTS 506 kit should consider:

- For fastening cladding elements (the subframe is fixed on structural floors and also on a subframe wall), all the kit components defined in Annexes 2 to 5 may be used.
- The FTS 506 kit is used for skin elements with groove thickness between 4 and 6 mm and thickness of the inner tongue between 7 mm and 13 mm.
- The maximum weight and area shall be determined according to the mechanical properties of the kit components declared in this ETA (see clauses 3.3 to 3.10).
- Elastomeric filler and small polymeric wedges must be installed according to clause A5.2.
- It is assumed that the substrate wall meets the necessary requirements regarding the mechanical strength (resistance to static and dynamic loads) and airtightness, as well as the relevant resistance regarding watertightness and water vapour.
- It is assumed that the skin element meets the necessary requirements regarding the mechanical resistance and hygrothermal behaviour.
- The verification of the designed system by means of calculation, taking into account the mechanical characteristic values of the kit components in order to resist the actions (dead loads, wind loads, etc.) applying on the specific works. National safety factors and other national provisions must be followed.
- The selection and verification of the anchors between the brackets and the external walls (substrate), taking into account the substrate material and the minimum resistance required (pull-out and shear resistance) according to the envisaged actions obtained from the mechanical calculation of the designed system.
- The accommodation of the designed system movements to the substrate or structural movements.
- The execution of singular parts of the façade.
- The corrosion protection of the designed system metallic components taking into account the category of corrosivity of the atmosphere of works (e.g. acc. ISO 9223).
- The drainability of the ventilated air space between the skin elements and the insulation layer or the external wall accordingly.
- An insulation layer is usually fixed on the external wall and should be defined in accordance with a harmonized standard or a European technical assessment.
- When the skin element joints are not watertight, the first layer behind ventilated air space (e.g. insulation layer) should be composed by materials with low water absorption.

### A6.2 Installation

Installation of the subframe and fixings for fastener external skin elements using FTS 506 kit should be carried out:

- According to the specifications of the manufacturer and using the components specified in this ETA.
- In accordance with the design and drawings prepared for the specific works. The manufacturer should ensure that the information on these provisions is given to those concerned.
- By appropriately qualified staff and under the supervision of the technical responsible of the specific works.

### **A6.3 Maintenance and repair**

Maintenance of the subframe and fixings for fastener external skin elements using FTS 506 kit includes inspections on site, taking into account the following aspects:

- the appearance of any permanent irreversible deformation.
- the presence of corrosion or presence of water accumulation.

When necessary, any repair to localized damaged areas must be carried out with the same components and following the repair instructions given by the manufacturer.