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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-13/0340 of 2024/05/27

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011:ETA-Danmark A/S

Trade name of the construction product:	Rockpanel A2 finish Colours (9 mm), Rockpanel A2 finish Structures (9 mm) and Rockpanel A2 finish ProtectPlus (9 mm)
Product family to which the above construction product belongs:	Prefabricated mineral wool boards with organic or inorganic finish and with specified fastening system
Manufacturer:	ROCKWOOL B.V. Konstruktieweg 2 NL-6045 JD Roermond Tel. +31 475 353 000 Fax +31 475 353 550
Manufacturing plant:	ROCKWOOL B.V. / Rockpanel Konstruktieweg 2 NL-6045 JD Roermond
This European Technical Assessment contains:	17 pages including 4 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	European Assessment Document (EAD) no. EAD 090001-00-0404 for Prefabricated compressed mineral wool boards with organic or inorganic finish and with specified fastening system
This version replaces:	The previous ETA with the same number issued on 2019-11-19

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

General
Rockpanel A2 finish Colours, Rockpanel A2 finish Structures and Rockpanel A2 finish ProtectPlus are prefabricated compressed mineral wool panels with thermo-hardening synthetic binders. The boards are fastened to timber, aluminium or steel subframes. Fastening to the timber subframe is carried out with corrosion resistant screws. Fastening to the aluminium or steel subframe is carried out with corrosion resistant rivets or self-drilling screws.
Mechanical fasteners, gaskets, aluminium and steel profiles are specified by the ETA-holder.

The Rockpanel A2 Colours panels are surface treated on one side with water-borne primer- and water-borne coloured paint layers, in a range of colours.

The Rockpanel A2 Structures panels are surface treated on one side with water-borne primer- and water-borne coloured paint layers, in a limited range of colours.

The Rockpanel A2 ProtectPlus panels are surface treated on one side with water-borne primer- and water-borne coloured paint layers, which have been provided with an extra anti-graffiti clear coat on the colour paint. The finishes "Woods", "Stones", "Chameleon" and "Textured" contain an additional design layer on top of the coloured paint.

The physical properties of the panels are indicated in Table 1.

Table 1:

Property	Value
Thickness, nominal	9 mm
Length, max	3050 mm
Width, max	1250 mm
Density, nominal	1250 kg/m^3
Bending strength, length and width	$f_{05} \geq 25.5$ N/mm^2
Modulus of elasticity	m(E) $\geq$ 4740 N/mm^2
Thermal conductivity EN 10456	0.55 W/(m*K)
Cumulative dimensional change %	Length: 0.064 Width: 0.064
Coefficient of thermal expansion, length and width	$\alpha = 9.7$ (10^{-6} °K^{-1})
Coefficient of moisture expansion 23°C/50% RH to 92% RH, length and width	0.206 mm/m after 4 days

Finishes
The finishes are indicated in Table 2. The coatings are provided in a number of colours.

Table 2:

Rockpanel A2 Colours: (water-borne polymer emulsion paint)	Colour coating in a range of colours
Rockpanel A2 Structures: (water-borne polymer emulsion paint)	Colour coating RAL 7005, 7016, 7021, 7024, 7035 and 9010
Rockpanel A2 ProtectPlus (water-borne polymer emulsion paint with anti-graffiti clear coat)	Clear coat pure or Clear coat with wood design "Woods" e.g. Teak, Alder etc. or Clear coat with design "Textured" e.g. Carrara White, Sapphire Blue etc. or Clear coat with stone design "Stones" e.g. Mineral Chalk, Basalt Anthracite etc. or with metallic particles "Metals" e.g. Aluminium, Brass etc. and clear coat with design "Chameleon"

The colour fastness of the panels is indicated in Table 3.

Table 3:

Property	Value (ISO 105 A02)
Colour fastness after 5000 hours artificial weathering (TR010 climate class S)	Rockpanel A2 Colours: 3-4 or better Rockpanel A2 Structures: 3-4 or better Rockpanel A2 ProtectPlus: 4 or better

Subframes
The panels are attached to the building by fixing to a subframe of aluminium, steel or wood.

The minimum thickness of the vertical aluminium profiles is 1.5 mm (rivets) or 1.8 mm (self-drilling screws). The aluminium is AW-6060 according to EN 755-2. The $R_m/R_{p0.2}$ value is $\geq$ 170/140 for profile T6 and $\geq$ 195/150 for profile T66.

The minimum thickness of the vertical steel profiles is either 1.0 mm [a] (steel quality is S320GD +Z EN 10346 number 1.0250, or equivalent for cold forming), or 1.5 mm [a] (steel quality EN 10025-2:2004 S235JR number 1.0038).

[a] *The minimum coating thickness (Z or ZA) is determined by the corrosion rate (amount of corrosion loss in thickness*

per year) which depends on the specific outdoor atmospheric environment. The International Zinc association can be consulted for more information. The coating designation (classification which determines the coating mass) shall be agreed between the contractor and the building owner. Alternatively, a hot dip galvanized coating according to EN ISO 1461 can be used.

The vertical timber battens should have a minimum thickness of 28 mm (solid wood). Also LVL battens (Laminated Veneer Lumber) with a minimum thickness of 27 mm, according to EN 14374, can be used (Ultralam R, CE 0672-CPD-I).

Appropriate preservative treatment of subframes
Use the appropriate part of EN 335 to identify the "use class" of a given service environment and geographical location. Table 1 in EN 335 will assist in determining the biological agents that can attack timber in certain situations. The user can then consider the type and duration of performance required select an appropriate level of durability and ensure that the timber or wood-based product specified has either, as a natural (see EN 350-2) or an acquired characteristic durability as the result of appropriate preservative treatment (see EN 351-1).

In the event vertical profiles cannot be applied, horizontal profiles can be used carried out with ventilated cavities e.g. by a double crossed sub-construction.

Joints
Horizontal joints on metal sub-constructions
The horizontal joints between the panels can be open in case of steel supports or aluminium rail supports.

Horizontal joints on timber sub-constructions
In case of open horizontal joints an EPDM foam gasket must be applied on the vertical battens with a width 15 mm at both sides wider than the batten.

The horizontal joints between the panels are made with a Rockpanel “A” extruded aluminium chair profile or equivalent in case of closed joints for panels mechanically fixed on timber battens. The chair profile has an overlap of at least 15 mm on the board above the profile. (See annex 1, figure 1a). In case of a closed joint an EPDM foam gasket is fixed to the timber battens.

Fasteners
The panels are mechanically fixed to a vertical timber, aluminium or steel subframe. The mechanical fastening to timber battens is carried out with Rockpanel stainless steel screws 4.5 x 35 mm no. 1.4401 or 1.4578 (EN 10088) with heads in the colour of the panels.
Fastening to aluminium is carried out with EN AW-5019 (AlMg5) rivets, head diameter 14 mm, body diameter 5 mm, head colour coated or with an austenitic stainless steel (A4 in accordance with EN ISO 3506) self-drilling screw, head diameter 15 mm, body diameter 5.8 mm, head colour coated.
Fastening to the steel subframe is carried out with either EN 10088 (no. 1.4578) rivets, head diameter 15 mm, body diameter 5 mm, head colour coated, or EN 10088 (no. 1.4567) rivets, head diameter 14 mm, body diameter 5 mm, head colour coated or a stainless steel EN 10088 (no. 1.4404) self-drilling screw, head diameter 12 mm, body diameter 4.3 mm, head colour coated. The screw is available in 5.5 x 25 for a clamping thickness up to 9 mm, or 5.5 x 35 mm for a clamping thickness up to 19 mm.
For correct fixing, a riveting tool with rivet spacer must be used, see Table 5 and Table 7 of the ETA.

The maximum fixing distances and hole diameter, appear from Tables 8 and 9 of the ETA.

The installation method with the use of fixed points and moving points appears from Annex 3, Table 8 and Figure 2 of the ETA.

Design value of the axial load appears from Annex 3, Table 7 and Table 10, 10-1, 10-2 and 10-3 of the ETA.

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

The boards are intended for external cladding and for fascias and soffits. The cladding on vertical timber battens, aluminium or steel subframe with mechanically fixed boards shall be carried out with ventilated cavities at the back. See Annex 1.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the kit of 50 years.

In addition, for aluminium support systems intended to be used for facades:
In some member states national climate conditions may reduce the service life of the aluminium support system to 35 years or more.

An additional assessment of the aluminium support system might be necessary to comply with Member State regulations or administrative provisions.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, 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.

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

Characteristic	Assessment of characteristic
3.2 Safety in case of fire (BWR 2)	
Reaction to fire	The aluminium profiles are classified as **Euroclass A1** Classification of panels: See Table 4
3.3 Hygiene, health and the environment (BWR 3)	
Dangerous substances	Formaldehyde concentration 0.0105 mg/m^3 Formaldehyde class E1 The used fibres are not potential carcinogenic No biocides are used in the Rockpanel boards No flame retardant is used in the boards No cadmium is used in the boards.
Water vapour permeability	**No Performance Assessed**
Water permeability incl. joints for non-ventilated applications	**No Performance Assessed**
Drainability	**Drainable**
3.4 Safety and accessibility in use (BWR 4)	

The following concerns performances for wind load resistance and mechanical resistance including pull-out and pull-through resistance of fasteners and mechanical resistance of boards, wind suction and pressure resistance and shear resistance of mechanical fixing. Pull-off resistance and mechanical resistance of the board for glued kits, initial and shear properties of bonded kits are not relevant
In absence of national regulations the design values X_d may be calculated as indicated in the ETA (see Table 10, 10-1, 10-2 and 10-3). Below the safety factors are listed which have been used in the calculation of the design values.

Design values of axial loads Design value X_d obtained by dividing the characteristic value X_k by a partial factor γ_M : $X_d = X_k / \gamma_M$ The design value X_d of a material property can be expressed in general terms as $X_d = \eta * X_k / \gamma_M$ For Rockpanel γ_m = 1.6. The conversion factor η = 0.8 [aged bending strength] divided by the f_{05}. As a result γ_M = 2.0	**Rivets aluminium or stainless steel** To an aluminium subframe, design value X_d: 468/304/200 N Annex 3 Table 10 row (16). **Self-drilling screw for aluminium:** To an aluminium subframe, design value X_d: 371/162/136 N Annex 3 Table 10-1 row (16). **Self-drilling screw for steel:** To a steel subframe, design value X_d: 407/174/72 N Annex 3 Table 10-2 row (16). **Rockpanel screw for timber:** Design value X_d depends on the modification factor k_{mod}, the strength class of the wood and the different materials factors γ_M. Boards to a solid timber subframe: see Annex 3 Table 10-3 row (25)(26).
Characteristic shear strength Average values	**Rivet fixings** Failure load: 2390 N, Deformation: 3.2 mm **Self-drilling screw for aluminium:** Failure load: 2129 N, Deformation: 4.0 mm **Self-drilling screw for steel:** Failure load: 1912 N, Deformation: 4.0 mm **Torx screw fixing on timber** Failure load: 2283 N, Deformation: 9.0 mm

*) In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

Characteristic	Assessment of characteristic
Wind load resistance (M/E/C)	
Average strength N For the locations see Table 7	**Rivets aluminium or stainless steel: 2267 / 900 / 439** (according to Annex 3 Table 10) **Self-drilling screw for aluminium: 2094 / 791 / 531** (according to Annex 3 Table 10-1) **Self-drilling screw for steel: 2215 / 1001 / 610** (according to Annex 3 Table 10-2) **Rockpanel screws for timber: 1732 / 744 / 386** (according to Annex 3 Table 10-3)
Average failure load N/m^2 For the locations see Table 7	**Rivets aluminium or stainless steel: 4030 / 3750 / 3918** (according to Annex 3 Table 10) Maximum deformations in de wind load tests: 28 / 26 / 27 Kit failure due to failure of the boards. **Self-drilling screw for aluminium: 3851 / 3293 / 4741** (according to Annex 3 Table 10-1) Maximum deformations in de wind load tests: 25 / 22 / 28 Kit failure due to failure of the boards. **Self-drilling screw for steel: 4073 / 4169 / 5443** (according to Annex 3 Table 10-2) Maximum deformations in de wind load tests: 27 / 27 / 29 Kit failure due to failure of the boards. **Rockpanel screws for timber: 3158 / 3098 / 3444** (according to Annex 3 Table 10-3) Maximum deformations in de wind load tests: 16 / 21 / 21 Kit failure due to failure of the boards.
Impact resistance	**Panels without a horizontal joint:** Rockpanel A2 9 mm finish Colours or finish Structures or finish ProtectPlus: classified category II according EAD 090062-00-0404 **Panels with a horizontal joint:** Rockpanel A2 9 mm finish Colours or finish Structures or finish ProtectPlus: classified category III according EAD 090062-00-0404 See Annex 4 Table 11 for the definition of use category
Mechanical resistance	See section 1, Table 1

3.8 Aspects of durability

Resistance to Hygrothermal cycles	**Pass**
Dimensional stability	**See Table 6**
Immersion in water without UV	**Not relevant**
Humidity and NaCl	**Not relevant**
Humidity and SO2	**Not relevant**
Resistance to Xenon Arc exposure	**Pass**

Reaction to fire

Table 4. Euroclass classification of construction with Rockpanel A2 finish Colours, Rockpanel A2 finish Structures and Rockpanel A2 finish ProtectPlus

Fixing method	Ventilated or non-ventilated	Vertical aluminium or steel profiles	Vertical wooden subframe
Mechanically fixed	Ventilated	**A2-s1,d0** open 6 mm horizontal joint	
	Ventilated, plank application width ≥ 100 mm, with 9 mm windboard in front of insulation.	**A2-s1,d0** open 6 mm horizontal joint	
	Ventilated, with EPDM gasket on the battens		**A2-s2,d0** open 6 mm horizontal joint

Field of application

Further to the limitations described in section 1 of the ETA, the following field of application applies.

Euroclass classification

The classification mentioned in Table 4 is valid for the following end use conditions:

Mounting:

- Mechanically fixed to a wooden or metal subframe
- The panels are backed with min. 50 mm mineral wool insulation with density 30-70 kg/m^3 according to EN 13162 with a cavity between the panels and the insulation
- The windboard mentioned in Table 4 is specified minimum A2 (according EN 13501-1) and $K_1$10 (according EN 13501-2) and placed between the subframe and the insulation.

Substrates:

- Concrete walls, masonry walls, timber framing and a wall made of metal frame e.g. LWSF.

Insulation:

- Ventilated constructions: The subframe is backed with min. 50 mm mineral wool insulation with density 30-70 kg/m^3 according to EN 13162 with a cavity of minimal 20 mm for metal subframes and 28 mm for timber subframes between the panels and the insulation
- Results are also valid for all greater thickness of mineral wool insulation layer with the same density and the same or better reaction to fire classification
- Results are also valid for the panels without insulation, if the substrate chosen according to EN 13238 is made of panel with Euro-class A1 or A2 (e.g. fibre-cement panels).

Subframe:

- Vertical softwood battens without fire retardant treatment, thickness minimum 28 mm
- Test results are also valid for the same type of panel with a metal subframe
- Test results are also valid for the same type of panel with vertical LVL battens, without fire retardant treatment, thickness minimum 27 mm

Fixings:

- Results are also valid with higher density of the fixing devices
- Test results are also valid for the same type of panel fixed by rivets made of the same material of screws and vice versa

Cavity:

- Unfilled
- The depth of the cavity is minimum 20 mm for a metal subframe, and 28 mm for a timber subframe
- Test results are also valid for other higher thickness of air space between the back of the board and the insulation behind the subframe

Joints:

- Horizontal joints can be open or closed with an aluminium profile. For metal subframes the vertical joints are without a gasket backing. For timber subframes the vertical battens are with an EPDM foam gasket (3 mm non compressive thickness)
- The result from a test with an open horizontal joint is also valid for the same type of panel used in applications with horizontal joints closed by steel or aluminium profiles
- Max joint width: 8 mm

The classification is also valid for the following product parameters:

Thickness:

- Nominal 9 mm

Density

- Nominal 1250 kg/m^3

Aspects related to the performance of the product

All materials shall be manufactured by ROCKWOOL B.V. or by subcontractors under the responsibility of ROCKWOOL B.V.

The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with ETA-Danmark, which describes the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

Installation details and application details for the man on site are given by ROCKWOOL B.V. / Rockpanel in the manufacturer's application guide technical dossier which forms part of the documentary material for this ETA. On every pallet label and/or on the protective film of every board the website is printed which guides the end user to the most actual information.

The boards are in general mounted with a joint width of between 5 and 8 mm.

If the joints are to be sealed, only durable sealants should be used with a good adhesion on the edges of the boards and a good UV-stability. To prevent sticking to the subframe, a PE-film or tape can be used.

The boards for external cladding shall not be fixed over building or settlement joints. Where settlement joints are located in the building the same movements of the building and substructure shall be possible in the external cladding.

The panels should not be taken into account when designing a timber stud wall to resist racking forces.

The holes for the fixings are drilled into the panels not less than 15 mm (on timber subframe) and 20 mm (on metal subframe) from a vertical edge and 50 mm from a horizontal edge. The panels are fixed making sure that the screws are not over-tightened. For correct fixing, a riveting tool with rivet spacer must be used. For correct fixing of the self-drilling screw on aluminium a center sleeve should be used.

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

4.1 AVCP system

According to the decision 2003/640/EC of the European Commission as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 1, since there is a clearly identifiable stage in their production which results in an improvement of fire performance due to the limiting of organic material.

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

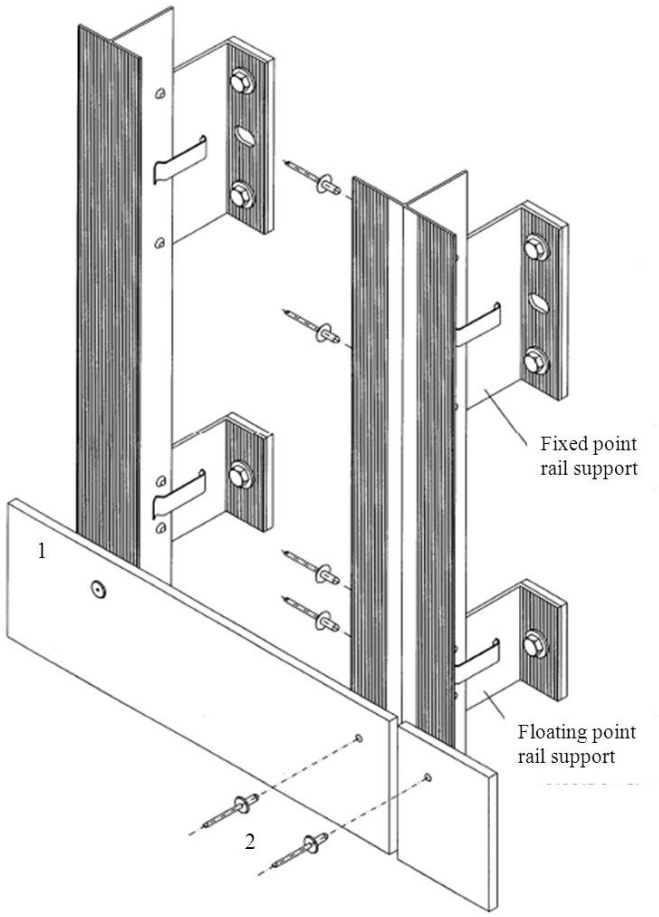
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2024-05-27 by

Thomas Bruun
Managing Director, ETA-Danmark

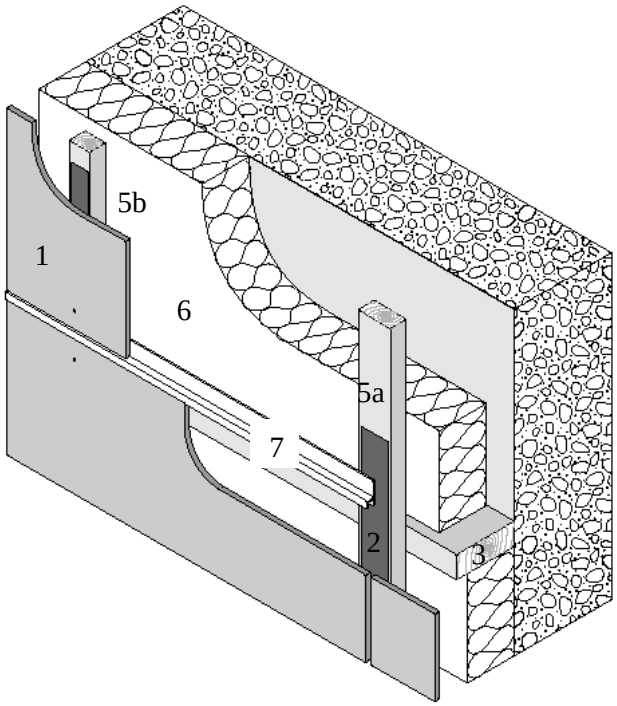
Annex 1
Pre-fabricated compressed mineral wool boards with organic or inorganic finish

Figure 1. Ventilated intended use on vertical metal subframe



1. Compressed mineral wool board with organic or inorganic finish
2. Rivet fixing or self-drilling screw fixing

Figure 1a. Ventilated intended use on vertical timber battens

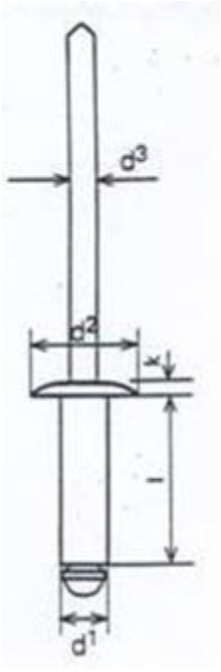


1. Compressed mineral wool board with organic or inorganic finish
2. EPDM foam gasket
3. Timber beam
4. Vapour barrier
5. Batten: a- joint and b – intermediate
6. Insulation
7. Rockpanel “A” – extruded aluminium chair-profile or equivalent.

Annex 2
Fastener specification

A2.1 Fastener specification for metal sub-frames

Table 5. Rivet aluminium or stainless steel



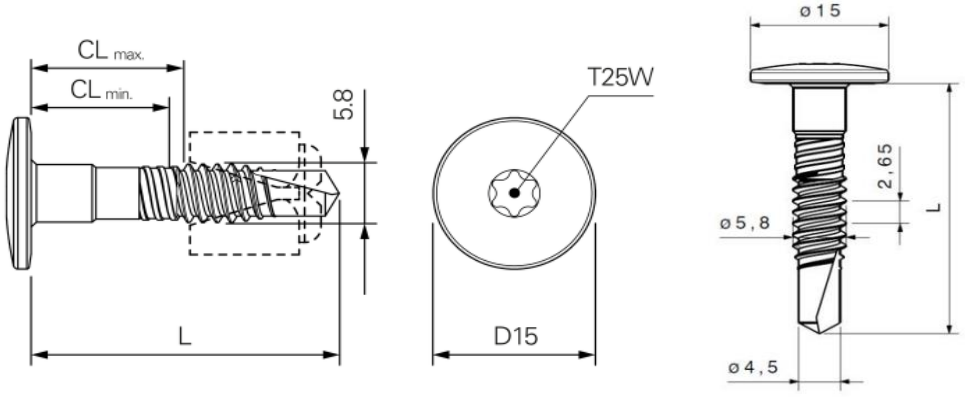
	SFS Aluminium	SFS Stainless steel A4	MBE Aluminium	MBE Stainless steel
Code	AP14-50180-S	SSO-D15-50180	1290406	FN-A4-5x18 K15
Body	Aluminium EN AW-5019 (AlMg5) in accordance with EN 755-2	Stainless steel material number 1.4578 in accordance with EN 10088	Aluminium EN AW-5019 (AlMg5) in accordance with EN 755-2	Stainless steel material number 1.4578 in accordance with EN 10088
Mandrel	Stainless steel material number 1.4541 in accordance with EN 10088	Stainless steel material number 1.4571 in accordance with EN 10088	Stainless steel material number 1.4541 in accordance with EN 10088	Stainless steel material number 1.4571 in accordance with EN 10088
Pull-out strength	$F_{mean,n}$ = 2038	$F_{mean,n}$ = 1428	$F_{mean,10}$ = 2318	$F_{mean,n}$ = 1428
	s = 95	s = 54	s = 85	s = 54
	$F_{u,5}$ = 1882	$F_{u,5}$ = 1339	$F_{u,5}$ = 2155	$F_{u,5}$ = 1339
d^1	5	5	5	5
d^2	14	15	14	15
d^3	2.7	3.25	2.7	3.25
l	18	18	18	18
k	1.5	1.5	1.5	1.5
Profile	Aluminium t ≥ 1.5 mm	Steel t ≥ 1.0 mm [a] [b]	Aluminium t ≥ 1.8 mm	Steel t ≥ 1.0 mm [a] [b]

[a]: The minimum thickness of the vertical steel profiles is 1.0 mm. The steel quality is S320GD +Z EN 10346 number 1.0250 (or equivalent for cold forming). For minimum coating thickness see [c]
[b]: The minimum thickness of the vertical steel profiles is 1.5 mm. The steel quality is EN 10025-2:2004 S235JR number 1.0038. For minimum coating thickness see [c]
[c]: The minimum coating thickness (Z or ZA) is determined by the corrosion rate (amount of corrosion loss in thickness per year) which depends on the specific outdoor atmospheric environment. The International Zinc association can be consulted for more information. The coating designation (classification which determines the coating mass) shall be agreed between the contractor and the building owner. Alternatively a hot dip galvanized coating according to EN ISO 1461 can be used.

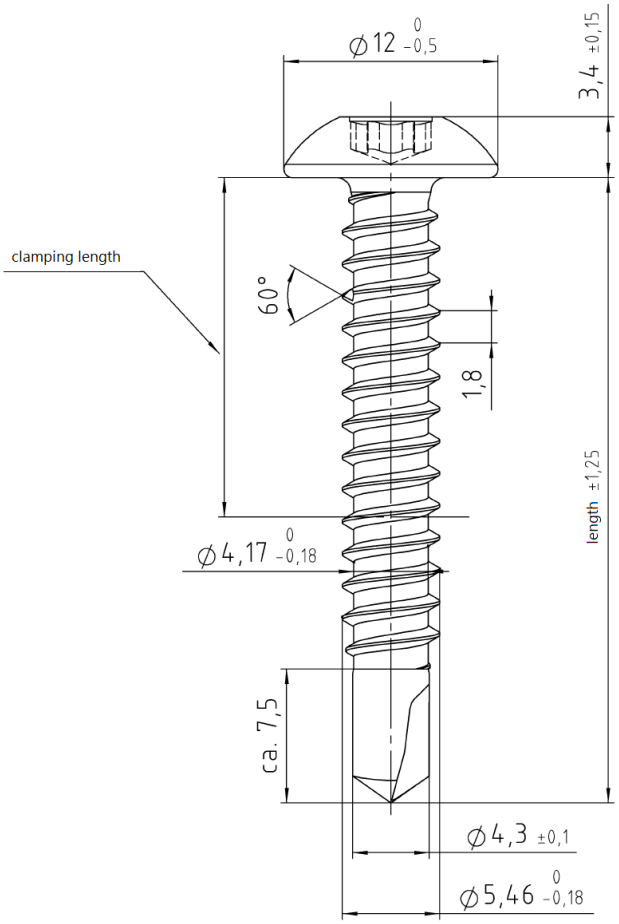
Table 5-1. Self-drilling screw for aluminium code: SDA4-D15-CS10/8-5.8x29-A4

Stainless steel A4 in accordance with EN ISO 3506

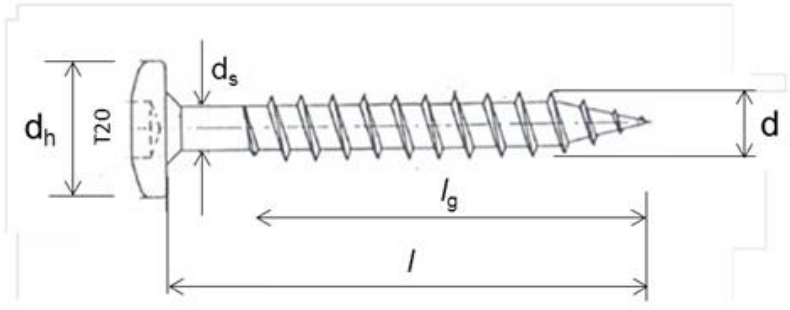
Length: 29 mm → clamping length: 9.8 – 11.0 mm



[a]: The minimum thickness of the aluminium profiles is 1.8 mm.

Table 5-2. Self-drilling screw for steel sub-constructions code JT6-FR-3-5.5 x L	
Stainless steel A4 in accordance with EN ISO 3506	
Length: 25 mm → clamping length 9 mm 35 mm → clamping length 19 mm	

A2.2 Fastener specifications for wooden subframes

Table 5-3. Torx screws 4.5 x 35 mm	
Stainless steel in accordance with EN 10088 – Material number 1.4401 or 1.4578 Definitions in accordance with EN 14592:2008+A1:2012	
d = 4.3 – 4.6 d_s = 3.3 – 3.4 d_h = 9.6 – 0.4 l = 35.0 – 1.25 l_g = 26.25 – 28.5	

Annex 3
Performance

Dimensional stability

Table 6. Deformation Rockpanel A2 in accordance with EN 438-2		
	Rockpanel A2	
characteristic	Length of the board	Width of the board
deformation	0.061 %	0.066 %
dry heat 23°C / 50% to 23°C / 0% (mm/m)	-0.240	-0.290
coefficient of thermal expansion (10^{-6} °K^{-1})	9.7	9.7
coefficient of moisture expansion 42% change RH (mm/m) 50% to 92% RH after 4 days	0.204	0.207

Fixing positions

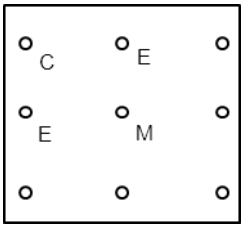
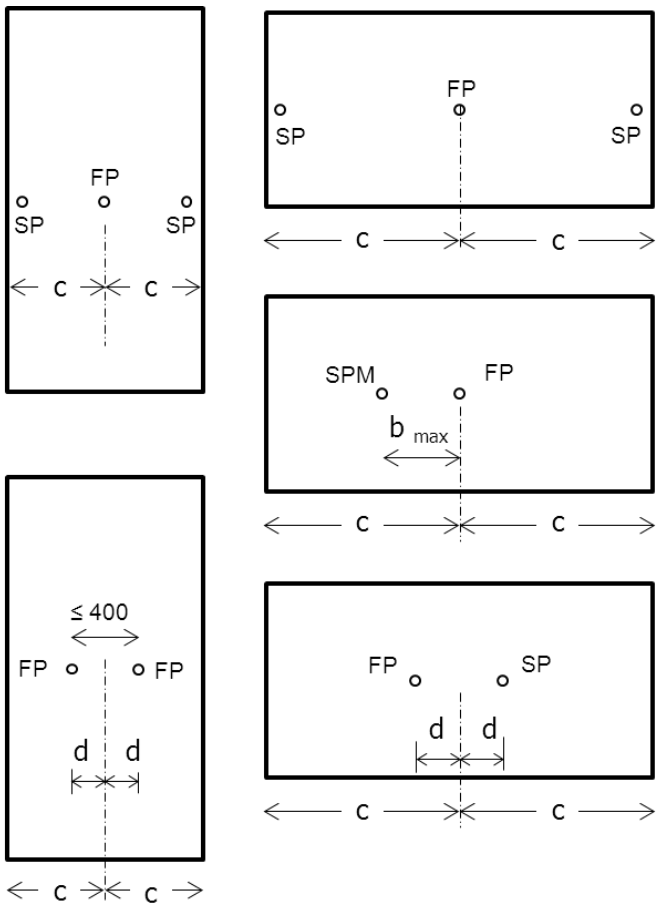
Table 7. Fixing positions M / E / C used in this document	
	M: fixing in intermediate position E: edge fixing C: corner fixing See figure 2 for examples of possible installation methods *Remark* *Rivet fixing only with a riveting tool with rivet spacer*

Figure 2. Examples of possible installation methods with the use of fixed points and slotted points



FP – fixed point
SP – slotted point
MP – moving point
All the other fixing points are 'moving points'
b_{max}: see Table 9

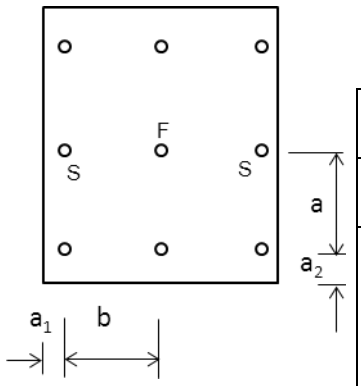
FP:
Fixed point may be realized by the use of a metal (aluminium or stainless steel) sleeve in a hole with the diameter of a moving point.

SP:
Slotted points may be realized by the use of a metal (aluminium or stainless steel) side sleeve in a hole with the diameter of a moving point. Maximum distance between slide sleeve and fixed point amounts 600 mm.

SPM:
Slotted point with the use of a slide sleeve (see also SP)

Annex 3 continued

Table 8. Hole diameters mm



	Rivet	Self-drilling screw for aluminium	Self-drilling screw for steel	Torx screw for timber
F – Fixed point	5.1	5.8	4.3	3.2
S – Slotted holes	5.1 x 8.0	N.A.	4.3 x 8.0	3.4 x 6.0
Moving points – all the other positions	8.0	10.0 (with the use of a centering sleeve)	8.0	6.0

Table 9. Minimum edge distances and maximum distances between fastenings in mm

	b_{max}	a_{max}	a_1	a_2
Rivet	600	600	≥ 20	≥ 50
Self-drilling screw for metal	600	600	≥ 20	≥ 50
Torx screw on timber	600	600	≥ 15	≥ 50

Table 10. Characteristic axial load X_k and design value of the axial load $X_d = X_k / \gamma_M$ for the combination **rivet** and 9 mm Rockpanel A2 boards [a]

Board thickness		9 mm			*(1)*
Location of the fixing in the board		M-middle	E-edge	C-corner	*(2)*
Pull-through N					*(3)*
	Characteristic pull-through N	935	608	400	*(4)*
	Material factor Rockpanel γ_M	2.0	2.0	2.0	*(5)*
	Design value X_d of the pull-through N	**468**	**304**	**200**	*(6)*
Wind suction					*(7)*
	Average wind load in N/m²	4030	3750	3918	*(8)*
	Average strength N	2267	900	439	*(9)*
	Material factor Rockpanel γ_M	2.0	2.0	2.0	*(10)*
	Design value X_d of the pull-through N	**1134**	**450**	**220**	*(11)*
Pull-out strength (lowest value of rivet/subframe combination)					*(12)*
	Pull-out $F_{u,5}$ N	≥ 1300	≥ 1300	≥ 1300	*(13)*
	Material factor aluminium γ_M	1.25	1.25	1.25	*(14)*
	Design value X_d of the pull-out N	1040	1040	1040	*(15)*
Design value of the axial load $X_d = X_k / \gamma_M$ for the combination rivet and 9 mm boards		**468**	**304**	**200**	*(16)*
	Board span b	600			*(17)*
	Fixing distance a	600			*(18)*

[a]: For correct fixing, a riveting tool with rivet spacer must be used;
[b]: Calculation according EAD 090062-00-0404 annex D: $F_{u,5} = F_{mean} – 1.64s$

Table 10-1. Characteristic axial load X_k and design value of the axial load $X_d = X_k / \gamma_M$ for the combination **self-drilling screw on aluminium** and 9 mm Rockpanel A2 boards [a]					
Board thickness		9 mm			*(1)*
Location of the fixing in the board		M-middle	E-edge	C-corner	*(2)*
Pull-through N					*(3)*
	Characteristic pull-through N	741	324	271	*(4)*
	Material factor Rockpanel γ_M	2.0	2.0	2.0	*(5)*
	Design value X_d of the pull-through N	**371**	**162**	**136**	*(6)*
Wind suction					*(7)*
	Average wind load in N/m^2	3851	3293	4741	*(8)*
	Average strength N	2094	791	531	*(9)*
	Material factor Rockpanel γ_M	2.0	2.0	2.0	*(10)*
	Design value X_d of the pull-through N	**1047**	**395**	**266**	*(11)*
Pull-out strength (lowest value of screw/subframe combination)					*(12)*
	Pull-out $F_{u,5}$ N	≥ 1410	≥ 1410	≥ 1410	*(13)*
	Material factor aluminium γ_M	1.25	1.25	1.25	*(14)*
	Design value X_d of the pull-out N	1128	1128	1128	*(15)*
Design value of the axial load $X_d = X_k / \gamma_M$ for the combination self-drilling screw and 9 mm boards		**371**	**162**	**136**	*(16)*
	Board span b	600			*(17)*
	Fixing distance a	600			*(18)*

[a]: For correct fixing, the SFS center sleeves must be used.

Table 10-2. Characteristic axial load X_k and design value of the axial load $X_d = X_k / \gamma_M$ for the combination **self-drilling screw on steel** and 9 mm Rockpanel A2 boards					
Board thickness		9 mm			*(1)*
Location of the fixing in the board		M-middle	E-edge	C-corner	*(2)*
Pull-through N					*(3)*
	Characteristic pull-through N	814	347	145	*(4)*
	Material factor Rockpanel γ_M	2.0	2.0	2.0	*(5)*
	Design value X_d of the pull-through N	**407**	**174**	**72**	*(6)*
Wind suction					*(7)*
	Average wind load in N/m^2	4073	4169	5443	*(8)*
	Average strength N	2215	1001	610	*(9)*
	Material factor Rockpanel γ_M	2.0	2.0	2.0	*(10)*
	Design value X_d of the pull-through N	**1107**	**500**	**305**	*(11)*
Pull-out strength (lowest value of screw/subframe combination)					*(12)*
	Pull-out $F_{u,5}$ N	≥ 1100	≥ 1100	≥ 1100	*(13)*
	Material factor steel γ_M	1.3	1.3	1.3	*(14)*
	Design value X_d of the pull-out N	846	846	846	*(15)*
Design value of the axial load $X_d = X_k / \gamma_M$ for the combination self-drilling screw and 9 mm boards		**407**	**174**	**72**	*(16)*
	Board span b	600			*(17)*
	Fixing distance a	600			*(18)*

Table 10-3. Characteristic axial load X_k and design value of the axial load $X_d = X_k / \gamma_M$ for the combination **solid timber, Torx Screw** and 9 mm Rockpanel A2 boards (with the use of gaskets), with $\alpha \geq 30°$ [c]							
Board thickness				9 mm			*(1)*
Location of the fixing in the board				M-middle	E-edge	C-corner	*(2)*
Pull-through N							*(3)*
	Characteristic pull-through N			1181	714	483	*(4)*
	Material factor Rockpanel γ_M			2.0	2.0	2.0	*(5)*
	Design value X_d of the pull-through N			**591**	**357**	**242**	*(6)*
Wind suction							*(7)*
	Average wind load in N/m^2			3158	3098	3444	*(8)*
	Average strength N			1732	744	386	*(9)*
	Material factor Rockpanel γ_M			2.0	2.0	2.0	*(10)*
	Design value X_d of the pull-through N			**866**	**372**	**193**	*(11)*
Withdrawal capacity (gasket thickness 0.5 mm)							*(12)*
	Characteristic withdrawal capacity $F_{ax,k,Rk}$ [b] [c] [d]						*(13)*
	Strength class wood (EN 338)	C18	ρ_k = 320 kg/m^3	777	777	777	*(14)*
		C24	ρ_k = 350 kg/m^3	835	835	835	*(15)*
	Modification factor for k_{mod}			k_{mod} [a]			*(16)*
	Axial withdrawal capacity $F_{ax,k,Rk}$ * k_{mod} [a] [b] [c] [d]						*(17)*
	Strength class wood (EN 338)	C18	ρ_k = 320 kg/m^3	777 * k_{mod}	777 * k_{mod}	777 * k_{mod}	*(18)*
		C24	ρ_k = 350 kg/m^3	835 * k_{mod}	835 * k_{mod}	835 * k_{mod}	*(19)*
	Material factor (NA to) EN 1995-1-1+C1+A1/A2:2014			γ_M = 1.30 [withdrawal capacity]			*(20)*
	Design value X_d of the axial withdrawal capacity N						*(21)*
	Strength class wood (EN 338)	C18	ρ_k = 320 kg/m^3	597 * k_{mod}	597 * k_{mod}	597 * k_{mod}	*(22)*
		C24	ρ_k = 350 kg/m^3	642 * k_{mod}	642 * k_{mod}	642 * k_{mod}	*(23)*
Design value of the axial load $X_d = X_k / \gamma_M$ N				**minimum value of the rows:**			*(24)*
	Strength class wood (EN 388)	C18	ρ_k = 320 kg/m^3	**(6) (11) (22)**	**(6) (11) (22)**	**(6) (11) (22)**	*(25)*
		C24	ρ_k = 350 kg/m^3	**(6) (11) (23)**	**(6) (11) (23)**	**(6) (11) (23)**	*(26)*
Board span b				600			*(27)*
Fixing distance a				600			*(28)*

[a]: modification factor k_{mod} depends on the service class (humidity conditions) and the load-duration class according to the National Annex of EN 1995-1-1.
[b]: with reduced thread diameter to fulfil the minimum l_{ef} demand (d = l_{ef} / 6 – 0.001 = 23.75 / 6 - 0.001 = 3.957 mm).
[c]: α is the angle between the screw axis and the wood grain direction: $\alpha \geq 30°$.
[d]: calculation in accordance with EN 1995-1-1+C1+A1/A2:2014 formula (8.38), (8.39) and (8.40)

Annex 4

Impact resistance

Table 11. Impact resistance: Definition of use categories	
Use category	Description
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use.
II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.
III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.
IV	A zone out of reach from ground level

The hard body impact with steel ball represents the action from heavy, non-deformable objects, which accidentally hit the kit.