

ETA-Danmark A/S Göteborg Plads 1 DK-2150 Nordhavn Tel. +45 72 24 59 00 Fax +45 72 24 59 04 Internet www.etadanmark.dk 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-24/0910 of 2025/01/28

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, 8 mm finish Colours, Rockpanel A2, 8 mm finish Nordic and Rockpanel A2, 8 mm finish ProtectPlus
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:	19 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:	-

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1. Technical description of product

General

Rockpanel A2, 8 mm finish Colours, Rockpanel A2, 8 mm finish Nordic and Rockpanel A2, 8 mm 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 nails or 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 physical properties of the panels are indicated in Table 1.

Table 1:

Property	Value
Thickness, nominal	8 mm
Length, max	3050 mm
Width, max	1250 mm
Density, nominal	1170 kg/m^3
Bending strength,	$f > 27 N/mm^2$
length and width	$1_{05} \ge 27$ IN/IIIII
Modulus of elasticity	$m(E) \ge 4015 \text{ N/mm}^2$
Thermal conductivity	0.47 W/(m*K)
EN 10456	$0.47 \text{ W}/(11^{\circ}\text{K})$
Cumulative dimensional	Length: 0.072 %
change %	Width: 0.072 %

Finishes

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

The Rockpanel A2, 8 mm 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, 8 mm Nordic panels are surface treated on one side with water-borne coloured coating layers, in a range of colours.

The Rockpanel A2, 8 mm ProtectPlus panels are surface treated on one side with water-borne primer and a water-borne coloured paint, which has been provided with an extra anti-graffiti clear coat on top of the colour paint. The finishes "Woods", "Stones" and "Chameleon" contain an (additional) design layer on top of the coloured paint. In the event of "Textured" the front side of the board has a slightly textured surface with depths between the product tolerances of +/- 0,5

mm.

Table 2:

Tuble 2.	
Rockpanel A2	Colour coating in a range
Colours:	of colours
(water-borne polymer	
emulsion paint)	
Rockpanel A2 Nordic:	Colour coating in a range
(water-borne polymer	of colours
emulsion paint)	
Rockpanel A2	Clear coat pure or Clear
ProtectPlus:	coat with wood design
(water-borne polymer	"Woods" e.g. Teak, Alder
emulsion paint with	etc. or Clear coat with
anti-graffiti clear coat)	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" or Clear coat
	with design "Textured"
	e.g. Carrara White,
	Sapphire Blue etc.

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

Table 3:

Colour fastness after 5000 hours artificial weathering (TR010 climate class S)		
finish Value (ISO 105 A02)		
finish Colours:	3-4 or better	
finish Nordic: No Performance Declared		
finish ProtectPlus: 4 or better		

Subframes

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

The minimum thickness of the vertical aluminium profiles is 1.5 mm (rivets) or 1.8 mm (self-drilling screws). The aluminium quality is minimal 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 minimal S280GD +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 25 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 subconstruction.

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.

In case of closed joints for panels mechanically fixed on timber battens, a Rockpanel "A" extruded aluminium chair profile or equivalent can be used to close the joints. 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 or Rockpanel High Performance nails: 2.7/3.1 x 35 mm, stainless steel quality 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 (AIMg5) rivets, head diameter 14 mm, body diameter 5 mm, head colour coated or with an austenitic stainless steel self-drilling screw (A4 in accordance with EN ISO 3506), 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 5.5×25 for a clamping thickness up to 9 mm, or 5.5×35 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 are shown in Tables 8 and 9 of the ETA.

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

The design value of the axial load is shown in Table 7 and Table 10 to 10-5 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 fascia's and soffits. The cladding on vertical timber battens with mechanically fixed boards can be carried out with or without ventilated cavities at the back. The cladding on a vertical aluminium or steel subframe 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 regarding the working life cannot be interpreted as a guarantee from the manufacturer nor by the Assessment Body, but are 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				
Characteristic	Assessment of character	ristic		
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	The kit does not contain/release dangerous substances except: 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	A2, 8 mm Colours:	$S_d < 1.7~m$ at 23°C and 85 %RH		
	A2, 8 mm Nordic:	$S_d < 1.65$ m at 23°C and 85 % RH		
	A2, 8 mm ProtectPlus:	$S_d < 3.2 \mbox{ m at } 23^\circ C$ and 85 %RH		
	The designer shall consider the relevant needs for ventilation, heating and insulation to minimise condensation in service.			
Water permeability incl. joints for non- ventilated applications	No Performance Assess	ed		
Drainability	No Performance Assess	ed		

*) 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.

3.4 Safety and accessibility in use (BWR 4)

The following concerns performances for mechanical resistance including pull-out and pull-through resistance of fasteners, wind suction and wind pressure resistance and shear resistance of fasteners and mechanical resistance of boards.

In absence of national regulations the design values X_d may be calculated as indicated in the ETA (see Table 10 to 10-5). Below the safety factors are listed which have been used in the calculation of the design values.

Design values of axial loads

The design value X_d is obtained by dividing the characteristic value X_k by a partial factor $\gamma_M : X_d = X_k / \gamma_M$ 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 $\gamma_m = 1.6$. The conversion factor $\eta = 0.8$ [aged bending strength divided by the f₀₅]. As a result $\gamma_M = 2.0$

Aluminium subframe	Rivet	Self-drilling screw
	Annex 3 Table 10	Annex 3 Table 10-1
Design value of axial loads	481 / 324 / 193 N	493 / 297 / 152 N
Characteristic shear strength	Failure load: 2718 N	Failure load: 2347 N
Average values	Deformation: 3.3 mm	Deformation: 4.0 mm
Wind load resistance	Middle / Edge / Corner	Middle / Edge / Corner
- Average strength [N]	1645 / 791 / 387 N	1486 / 746 / 303 N
- Average failure load [N/m ²]	3025 / 3350 / 3507 N/m ²	2732 / 3159 / 2748 N/m ²
- Maximum deformations [mm]	29 / 31 / 30 mm	24 / 26 / 27 mm

Characteristic

Assessment of characteristic

Steel subframe	Rivet	Self-drilling screw	
	Annex 3 Table 10-2	Annex 3 Table 10-3	
Design value of axial loads	463 / 340 / 221 N	416 / 333 / 225 N	
Characteristic shear strength	Failure load: 2913 N	Failure load: 2293 N	
Average values	Deformation: 2.9 mm	Deformation: 2.2 mm	
Wind load resistance	Middle / Edge / Corner	Middle / Edge / Corner	
- Average strength [N]	1455 / 1162 / 675 N	1568 / 978 / 537 N	
- Average failure load [N/m ²]	2676 / 4916 / 6122 N/m ²	2883 / 4140 / 4872 N/m ²	
- Maximum deformations [mm]	21 / 42 / 40 mm	33 / 36 / 34 mm	

Timber subframe	High Performance nail	Torx screw	
	Annex 3 Table 10-4	Annex 3 Table 10-5	
Design value of evial loads	Design value X_d depends on the modification factor k_{mod} , the strength		
Design value of axial loads	class of the wood and the different	wood and the different materials factors $\gamma_{\rm M}$.	
Characteristic shear strength	Failure load: 1423 N	Failure load: 2254 N	
Average values	Deformation: 7.5 mm Deformation: 7.1 mm		
Wind load resistance	Middle / Edge / Corner	Middle / Edge / Corner	
- Average strength [N]	973 / 595 / 322 N	1337 / 560 / 296 N	
- Average failure load [N/m ²]	2661 / 3777 / 4084 N/m ²	2438 / 2332 / 2645 N/m ²	
- Maximum deformations [mm]	8 / 38 / 34 mm	10 / 23 / 24 mm	

Impact resistance	Panels without a horizontal joint:Rockpanel A2, 8 mm finish Colours, finish Nordic or finishProtectPlus: classified category III according EAD 090062-00-0404			
	Panels with a horizontal joint: Rockpanel A2, 8 mm finish Colours, finish Nordic 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 SO ₂	Not relevant
Resistance to Xenon Arc exposure	Pass

Reaction to fire

Table 4. Euroclass classification of different constructions with Rockpanel A2, 8 mm boards					
Fixing method	Finish	Set-up	Timber subframe	Metal subframe	
	Colours	Non-ventilated	A2-s1,d0	-	
	Colours, Nordic,	Ventilated, 25 mm, with EPDM	A2-s2,d0		
ProtectPlus	gasket on the battens [a] [c]	open 8 mm joint	-		
Mechanical	Nordic	Ventilated, 25 mm, with EPDM gasket on the battens and windboard in front of the insulation [a] [b]	A2-s1,d0 open 8 mm joint	-	
	Colours,	Ventilated, 28 mm, with vertical		A2-s1,d0	
	ProtectPlus	planks (≥100 mm)	-	open 10 mm joint	

[a]: Width of the gasket 15 mm at both sides wider than the batten

[b]: The windboard is specified minimum A2-s1,d0 (according EN 13501-1) and K_110 (according EN 13501-2) and placed between the subframe and the insulation.

[c]: A breathable membrane (minimum class B-s1,d0 according EN 13501-1) can be added between the subframe and the insulation.

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 timber or metal subframe
- The panels are backed with min. 50 mm mineral wool insulation with density 30-70 kg/m³ according to EN 13162 with a cavity between the panels and the insulation. See section Insulation below.

Substrates:

• Concrete walls, masonry walls and timber framing.

Insulation:

- Ventilated constructions: The subframe is backed with min. 50 mm mineral wool insulation with density 30-70 kg/m³ according to EN 13162 with a cavity of minimal 20 mm for metal subframes and minimal 25 mm for timber subframes between the panels and the insulation.
- Non-ventilated constructions: The panels are backed with min. 40 mm mineral wool insulation with density 30-70 kg/m³ between the battens and min. 50 mm with density 30-70 kg/m³ behind the battens without an air gap.
- Results are also valid for a greater thickness of mineral wool insulation with the same density and the same or better reaction to fire classification.
- The results also apply to panels without insulation, if the substrate chosen according to EN 13238 is made of a panel with Euroclass A1 or A2 (e.g. fibre-cement panels).

Subframe:

- Vertical softwood battens without fire retardant treatment, thickness minimum 25 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:

- The results are also valid when using smaller mounting distances.
- 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 or filled with insulation of mineral wool with a density of 30-70 kg/m³ according to EN 13162.
- The depth of the cavity is minimum 28 mm for a metal subframe, and minimum 25 mm for a timber subframe.
- Test results are also valid for other higher thicknesses 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 for a timber subframe and 10 mm for a metal subframe.

The classification is valid for the following product parameters:

Thickness:

Nominal 8 mm

Density

• Nominal 1170 kg/m³

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 at least 5 and up to 10 mm. See section Joints.

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 2025-01-28 by

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



Figure 1a. Ventilated intended use on vertical timber battens



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

- 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 alu	minium or sta	ainless steel			
		SFS	SFS	MBE	MBE
		Aluminium	Stainless steel A4	Aluminium	Stainless steel
0	Code	AP14-50180-S	SSO-D15-50180	FN-Al5-5x18 K14	FN-A4-5x18 K15
	Body	Aluminium EN	Stainless steel	Aluminium EN	Stainless steel
		AW-5019	material number	AW-5019	material number
d ³		(AIMg5) in	1.4578 in	(AIMg5) in	1.4578 in
		accordance with	accordance with	accordance with	accordance with
		EN 755-2	EN 10088	EN 755-2	EN 10088
	Mandrel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
		material number	material number	material number	material number
1 12 1		1.4541 in	1.4571 in	1.4541 in	1.4571 in
×1 ×1		accordance with	accordance with	accordance with	accordance with
		EN 10088	EN 10088	EN 10088	EN 10088
ÎÎ	Pull-out	$E_{-} = 1882 N$	$F_{-} = 1330$	E . – 1882 N	$F_{-} = 1330$
1.	strength	$\Gamma_{u,5} = 1002$ IN	$\Gamma_{u,5} = 1559$	$\Gamma_{u,5} = 1002 \text{ IV}$	$\Gamma_{u,5} = 1559$
-	d ¹	5	5	5	5
	d^2	14	15	14	15
× ×	d^3	2.7	3.25	2.7	3.25
9	1	18	18	18	18
	k	1.5	1.5	1.5	1.5
	Profile	Aluminium	Steel	Aluminium	Steel
		$t \ge 1.5 \text{ mm}$	$t \ge 1.0 \text{ mm}$	$t \ge 1.5 \text{ mm}$	$t \ge 1.0 \text{ mm}$
			[a] [b]		[a] [b]

[a]: The minimum thickness of the vertical steel profiles is 1.0 mm. The steel quality is S280GD +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.



[a]: The minimum thickness of the aluminium profiles is 1.8 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 w	ith 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	+	
$l_g = 26.25 - 28.5$	d _h 2 - 1	
	. [- [- <u></u>	
	\leftarrow	
	K}	



Annex 3 Performance

Dimensional stability

Table 6. Deformation Rockpanel A2, 8mm in accordance with EN 438-2				
	Rockpanel A2, 8 mm			
Characteristic	Length of the board	Width of the board		
Cumulative dimensional change %	0.072 %	0.072 %		

Fixing positions

Table 7. Fixing positions M / E / C used in this document	
° _C ° _E ° ° _E ° _M °	M: fixing in intermediate position E: edge fixing C: corner fixing See figure 2 for examples of possible installation methods
0 0 0	Remark: Rivet fixing only with a riveting tool with rivet spacer



Tal	ble 8. I	Hole dia	ameters	s mm						
						Rivet	Self-drilling	Self-	High	Torx
							screw for	drilling	performance	screw for
		0	~				aluminium	screw for	nail	timber
	Ŭ	0	Ŭ				[a]	steel		
					F-Fixed	5.1	5.8	4.3	2.5	3.2
		F	~		point					
	s	0	s							
				a	S – Slotted	5.1 x 8.0	N.A.	4.3 x 8.0	2.8 x 4.0	3.4 x 6.0
	0	0	0		holes					
	-	-		a2						
а	b b			^	Moving	8.0	10.0	8.0	3.8	6.0
ŭ				1	points – all		(with the use			
\rightarrow					the other		of a			
					positions		centering			
							sleeve)			

Annex 3 continued

[a]: The self-drilling screw for aluminium should always be fastened with 2 fixed points on the same horizontal level, max width 600 mm.

Table 9. Minimum edge distances and maximum distances between fastenings in mm					
	b _{max}	a _{max}	a ₁	a ₂	
Rivet	600	600	≥ 20	\geq 50	
Self-drilling screw for metal	600	600	≥ 20	\geq 50	
High Performance nail for timber	600	400	≥15	\geq 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** on an **aluminium subframe** and 8 mm Rockpanel A2 boards [a]

Board thickness		(1)		
Location of the fixing in the board	M-middle	E-edge	C-corner	(2)
Pull-through N				(3)
Characteristic pull-through N	962	647	444	(4)
Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(5)
Design value X_d of the pull-through N	481	324	222	(6)
Wind suction				(7)
Average wind load in N/m ²	3025	3350	3507	(8)
Average strength N	1645	791	387	(9)
Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(10)
Design value X_d of the pull-through N	822	396	193	(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	101	374	103	(16)
combination rivet and 8 mm boards	401	324	193	(10)
Board span b		(17)		
Fixing distance a		(18)		

[a]: For correct fixing, a riveting tool with rivet spacer must be used;

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 an aluminium subframe and 8 mm Rock	panel A2 boards [a]				
Board thickness		8 mm		(1)	
Location of the fixing in the board	M-middle	E-edge	C-corner	(2)	
Pull-through N				(3)	
Characteristic pull-through N	986	593	457	(4)	
Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(5)	
Design value X_d of the pull-through N	493	297	229	(6)	
Wind suction				(7)	
Average wind load in N/m ²	2732	3159	2748	(8)	
Average strength N	1486	746	303	(9)	
Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(10)	
Design value X_d of the pull-through N	743	373	152	(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 8 mm boards	493	297	152	(16)	
Board span b	600			(17)	
Fixing distance a	600				

[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 rivet on					
a steel su	bframe and 8 mm Rockpanel A2 boards [a]				
Board thi	ckness		8 mm		(1)
Location	of the fixing in the board	M-middle	E-edge	C-corner	(2)
Pull-throu	igh N				(3)
	Characteristic pull-through N	926	679	441	(4)
	Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(5)
	Design value X_d of the pull-through N	463	340	221	(6)
Wind suction					(7)
	Average wind load in N/m ²	2676	4916	6122	(8)
	Average strength N	1455	1162	675	(9)
	Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(10)
	Design value X_d of the pull-through N	728	581	337	(11)
Pull-out s	trength (lowest value of rivet/subframe combination)				(12)
	Pull-out F _{u,5} N	1300	1300	1300	(13)
	Material factor steel $\gamma_{\rm M}$	1.3	1.3	1.3	(14)
	Design value X_d of the pull-out N	1000	1000	1000	(15)
Design va	lue of the axial load $X_d = X_k / \gamma_M$ for the	163	340	221	(16)
combination rivet and 8 mm boards		403	340	221	(10)
	Board span b	600			(17)
	Fixing distance a		600		(18)

[a]: For correct fixing, a riveting tool with rivet spacer must be used;

Table 10-3. Characteristic axial load X_k and design value of	f the axial load $X_d =$	X_k / γ_M for the	combination se	elf-	
drilling screw on a steel subframe and 8 mm Rockpanel A	A2 boards				
Board thickness		8 mm		(1)	
Location of the fixing in the board	M-middle	E-edge	C-corner	(2)	
Pull-through N				(3)	
Characteristic pull-through N	883	667	451	(4)	
Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(5)	
Design value X_d of the pull-through N	416	333	225	(6)	
Wind suction				(7)	
Average wind load in N/m ²	2883	4140	4872	(8)	
Average strength N	1568	978	537	(9)	
Material factor Rockpanel γ_{M}	2.0	2.0	2.0	(10)	
Design value X_d of the pull-through N	784	489	269	(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	416	222	225	(16)	
combination self-drilling screw and 8 mm boards	410	333	225	(10)	
Board span b		600			
Fixing distance a	600		(18)		

Table 10-4. Characteristic axial load X_k and design value of the axial load $X_d = X_k / \gamma_M$ for the combination solid timber. Noil						lid	
Board thi	ckness		Rockpanel A2 t		8 mm	with $\alpha \ge 60$ [0]	(1)
Location	of the fixing in the board			M-middle	E-edge	C-corner	(1) (2)
Pull-throu	igh N						(3)
	Characteristic pull-throug	h N		765	541	396	(4)
	Material factor Rockpanel	2.0	2.0	2.0	(5)		
	Design value X_d of the pull-through N			383	271	198	(6)
Wind suc	tion						(7)
	Average wind load in N/n	n^2		2661	3777	4084	(8)
	Average strength N			973	595	322	(9)
	Material factor Rockpane	l γ _M		2.0	2.0	2.0	(10)
	Design value X_d of the pull-through N			487	297	161	(11)
Withdrawal capacity (gasket thickness 0.5 mm)						(12)	
	Characteristic withdrawal	capacity	y F _{ax,k,Rk} [b] [c]				(13)
	Strength class wood	C18	$\rho_k=320\;kg/m^3$	403	403	403	(14)
	(EN 338)	C24	$\rho_k=350\;kg/m^3$	482	482	482	(15)
	Modification factor for	r k _{mod}			(16)		
	Axial withdrawal capacity	/ F _{ax,k,Rk}	• k _{mod} [a] [b] [c]				(17)
	Strength class wood	C18	$\rho_k=320\;kg/m^3$	403 • k _{mod}	403 • k _{mod}	403 • k _{mod}	(18)
	(EN 338)	C24	$\rho_k=350\;kg/m^3$	482 • k _{mod}	$482 \cdot k_{mod}$	$482 \cdot k_{mod}$	(19)
	Material factor (NA to) E	EN 1995-1-	1+C1+A1/A2:2014	$\gamma_{\rm M} = 1.30$ [withdrawal capacity]			(20)
	Design value X_d of the axi	al with	Irawal capacity N	1			(21)
	Strength class wood	C18	$\rho_k=320\ kg/m^3$	$310 \cdot k_{mod}$	$310 \cdot k_{mod}$	$310 \cdot k_{mod}$	(22)
	(EN 338)	C24	$\rho_k=350\ kg/m^3$	$370 \cdot k_{mod}$	$370 \cdot k_{mod}$	$370 \cdot k_{mod}$	(23)
Design value of the axial load $X_d = X_k / \gamma_M N$			minim	um value of the	e rows:	(24)	
	Strength class wood	C18	$\rho_k = 320 \text{ kg/m}^3$	(6) (11) (22)	(6) (11) (22)	(6) (11) (22)	(25)
	(EN 388)	C24	$\rho_k = 350 \text{ kg/m}^3$	(6) (11) (23)	(6) (11) (23)	(6) (11) (23)	(26)
	Board span b			600			(27)
Fixing distance a				400			(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]: α is the angle between the screw axis and the wood grain direction: $\alpha \ge 80^{\circ}$.

[c]: calculation in accordance with EN 1995-1-1+C1+A1/A2:2014 formula (8.23) and DIN EN 1995-1-1/NA:2013-08 Table NA.16

Table 10-5. Characteristic axial load X_k and design value of the axial load $X_d = X_k / \gamma_M$ for the combination solid						lid	
timber, T	orx Screw and 8 mm Rock	xpanel A	2 boards (with the second s	he use of gaskets	s), with $\alpha \ge 30^\circ$	[c]	(1)
Board thi	ckness				<u>8 mm</u>		
Location	of the fixing in the board			M-middle	E-edge	C-corner	(2)
Pull-through N				1	1	1	(3)
	Characteristic pull-throug	h N		866	559	407	(4)
	Material factor Rockpane	1 ум		2.0	2.0	2.0	(5)
	Design value X_d of the pu	ll-throug	gh N	433	280	203	(6)
Wind suc	tion						(7)
	Average wind load in N/r	n ²		2438	2332	2645	(8)
	Average strength N			1337	560	296	(9)
	Material factor Rockpane	l γ _M		2.0	2.0	2.0	(10)
	Design value X_d of the pull-through N			669	280	148	(11)
Withdrawal capacity (gasket thickness 0.5 mm)					(12)		
	Characteristic withdrawal	capacit	y F _{ax,k,Rk} [b] [c] [d]				(13)
	Strength class wood	C18	$\rho_k = 320 \ kg/m^3$	858	858	858	(14)
	(EN 338)	C24	$\rho_k=350\ kg/m^3$	922	922	922	(15)
	Modification factor for	r k _{mod}		k _{mod} [a]			(16)
	Axial withdrawal capacity	Fax,k,Rk	• k _{mod} [a] [b] [c] [d]			(17)
	Strength class wood	C18	$\rho_k=320\;kg/m^3$	858 • k _{mod}	858 • k _{mod}	858 • k _{mod}	(18)
	(EN 338)	C24	$\rho_k=350\ kg/m^3$	922 • k _{mod}	922 • k _{mod}	922 • k _{mod}	(19)
	Material factor (NA to) I	EN 1995-1-	1+C1+A1/A2:2014	$\gamma_{\rm M} = 1.30$ [withdrawal capacity]			(20)
	Design value X_d of the ax	ial with	Irawal capacity N	N			(21)
	Strength class wood	C18	$\rho_k = 320 \ kg/m^3$	660 • k _{mod}	660 • k _{mod}	660 • k _{mod}	(22)
	(EN 338)	C24	$\rho_k = 350 \ kg/m^3$	709 • k _{mod}	$709 \cdot k_{mod}$	709 • k _{mod}	(23)
Design value of the axial load $X_d = X_k / \gamma_M N$			minim	um value of the	e rows:	(24)	
	Strength class wood	C18	$\rho_k=320\ kg/m^3$	(6) (11) (22)	(6) (11) (22)	(6) (11) (22)	(25)
	(EN 388)	C24	$\rho_k=350\ kg/m^3$	(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 = 24.75 / 6 = 4.12 mm).

[c]: α is the angle between the screw axis and the wood grain direction: $\alpha \ge 30^{\circ}$.

 $\label{eq:calculation} \ensuremath{\left[d\right]}\xspace: calculation in accordance with EN 1995-1-1+C1+A1/A2:2014 formula (8.38), (8.39) and (8.40)$

Annex 4

Impact resistance

Table 11. Impact resistance: Definition of use categories					
Use category	Description				
Ι	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.