Paroc Panel System

11/2024

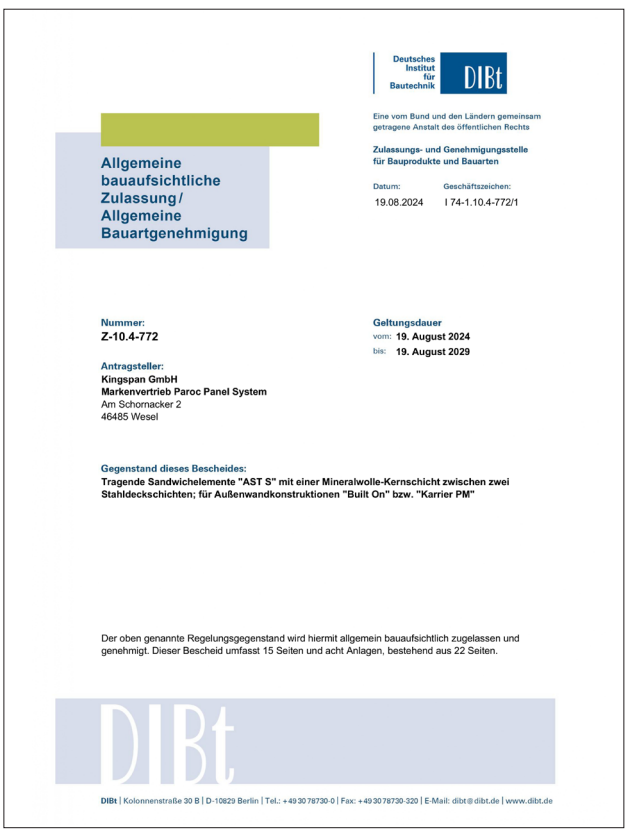
BUILT-ON™ FACADE SYSTEM

Sandwich panel facades with additional cladding

PRODUCT INFO

Paroc AST® S Built-On panels with German national certification

Paroc AST® S Built-On Wall Panels have got national technical approval ‘abZ’ (Allgemeine bauaufsichtliche Zulassung) and general construction technique permit ‘aBG’ (Allgemeine Bauartgenehmigung). This certificationcovers non-standard products and design solutions, e.g. innovations, that can be used and applied Germany-wide in compliance with the Building Codes.



Deutsches Institut für Bautechnik

Eine vom Bund und den Ländern gemeinsam getragene Anstalt des öffentlichen Rechts

Zulassungs- und Genehmigungsstelle für Bauprodukte und Bauarten

Allgemeine bauaufsichtliche Zulassung/ Allgemeine Bauartgenehmigung

Datum: 19.08.2024

Geschäftszeichen: I 74-1.10.4-772/1

Nummer: Z-10.4-772

Geltungsdauer vom: 19. August 2024 bis: 19. August 2029

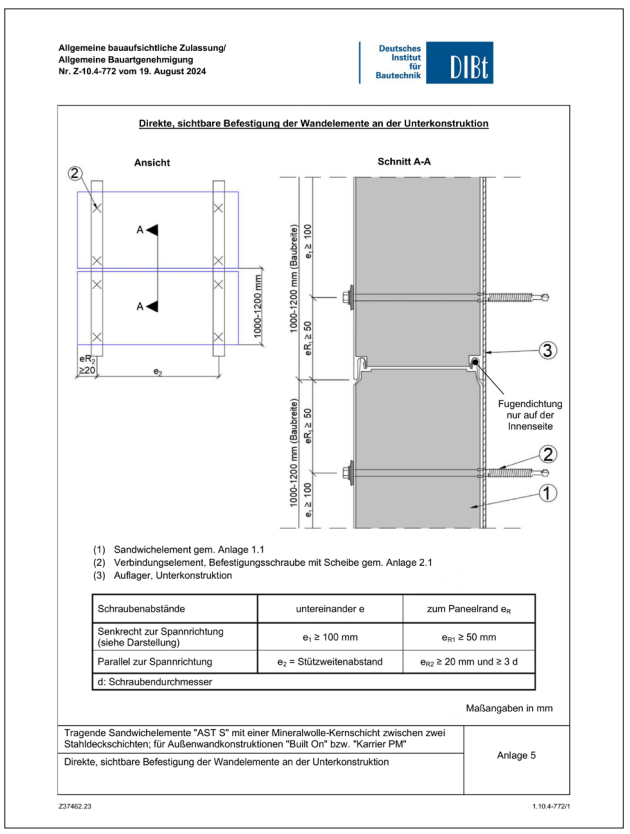
Antragsteller: Kingspan GmbH, Markenvertrieb Paroc Panel System, Am Schornacker 2, 46485 Wesel

Gegenstand dieses Bescheides: Tragende Sandwichelemente "AST S" mit einer Mineralwolle-Kernschicht zwischen zwei Stahldeckschichten; für Außenwandkonstruktionen "Built On" bzw. "Karrier PM"

Der oben genannte Regelungsgegenstand wird hiermit allgemein bauaufsichtlich zugelassen und genehmigt. Dieser Bescheid umfasst 15 Seiten und acht Anlagen, bestehend aus 22 Seiten.

DIBt

DIBt | Kolonnenstraße 30 B | D-10829 Berlin | Tel.: +49 30 78730-0 | Fax: +49 30 78730-320 | E-Mail: dibt@dibt.de | www.dibt.de



Allgemeine bauaufsichtliche Zulassung/ Allgemeine Bauartgenehmigung Nr. Z-10.4-772 vom 19. August 2024

Deutsches Institut für Bautechnik

Direkte, sichtbare Befestigung der Wandelemente an der Unterkonstruktion

Ansicht

Schnitt A-A

(1) Sandwichelement gem. Anlage 1.1
(2) Verbindungselement, Befestigungsschraube mit Scheibe gem. Anlage 2.1
(3) Auflager, Unterkonstruktion

Schraubenabstände	untereinander e	zum Paneelrand e_R
Senkrecht zur Spannrichtung (siehe Darstellung)	$e_1 \geq 100$ mm	$e_{R1} \geq 50$ mm
Parallel zur Spannrichtung	e_2 = Stützweitenabstand	$e_{R2} \geq 20$ mm und ≥ 3 d
d: Schraubendurchmesser		

Maßangaben in mm

Tragende Sandwichelemente "AST S" mit einer Mineralwolle-Kernschicht zwischen zwei Stahldeckschichten; für Außenwandkonstruktionen "Built On" bzw. "Karrier PM"

Direkte, sichtbare Befestigung der Wandelemente an der Unterkonstruktion

Anlage 5

Z37462.23 1.10.4-772/1

The national technical approval **abZ**, granted by the DIBt (German Institute for Building Technology) since 1968, is the ‘classic’ among the verifications of suitability for use of building products. It regulates those product properties that are of regulatory relevance, as well as the areas of application of the product and aspects relating to processing, transport, storage, marking and confirmation of conformity.

The **aBG** - building codes of the German federal states aim to ensure the safety of the built environment. This may require regulating not only product properties, but also the installation process of building products, aspects related to planning, design and construction, as well as operation and maintenance.

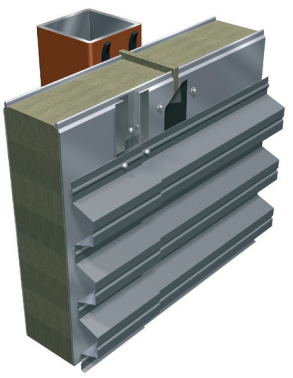
Our AST® S Build-On panels have been certified as load-bearing sandwich elements for external wall construction. This certification reassures architects, contractors, and fire engineers of compliance and reliability, especially for projects requiring strict adherence to fire and safety codes.Understanding the challenges posed by German regulatory standards, our abZ/ aBG-certified panels offer a straightforward solution for safe, efficient, and compliant construction of data centres, logistics, production and any other building projects.Although this certification is valid for Germany, it is also often sought after by German investors with projects in other countries.

The abZ/aBG approval for AST® S Build-On panels with designation ‘Z-10.4-772’ can be downloaded from the DIBt website under this link or by scanning the QR code.

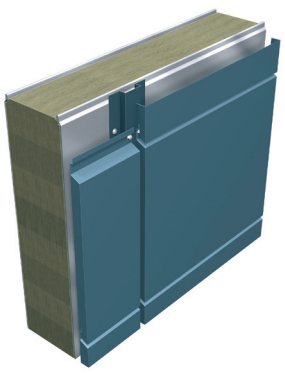
BUILT-ON™ Facade System

Combine sandwich panels with other cladding materials! Cassettes, ceramic tiles, HPL, glass, timber or bricks, that create new possibilities for rainscreen facade design.

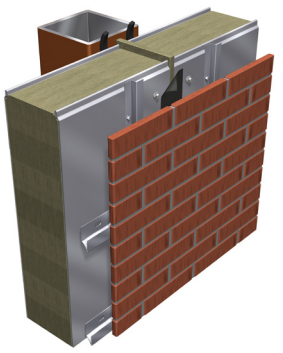
Ceramic Tiles



Corrugated Steel Sheet



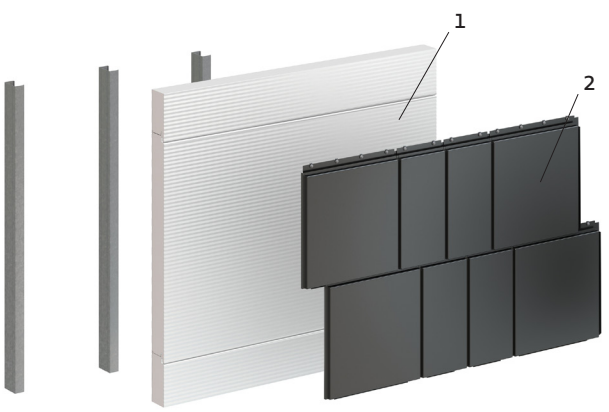
Aluminium or Steel Cassettes



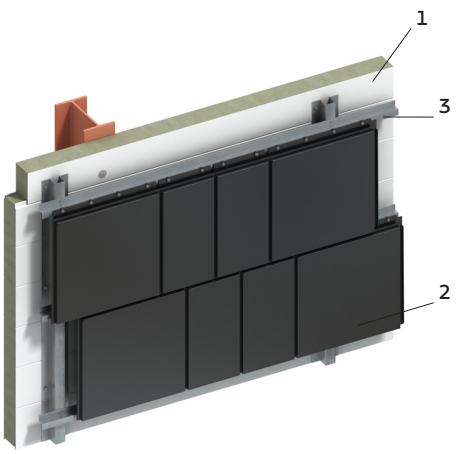
Stofix Brick-Cladding

System Components

1. Paroc Panel System Built-On panel
2. Additional Cladding
3. Support Profiles



Cladding installed directly to Q uadCore™ Built-On Panel



Cladding installed to AST® Built-On Panel with support profiles

Sandwich Panels

Due to the unique strength properties of Paroc Panel System, you can easily attach additional cladding materials directly to panel facing. You can choose panel types AST® L, AST® S, AST® F, AST® E and QuadCore™ QK with:

- Declared cross panel tensile strength
  - AST® > 0.1-0.23 MPa
  - QuadCore™ > 0,05Mpa

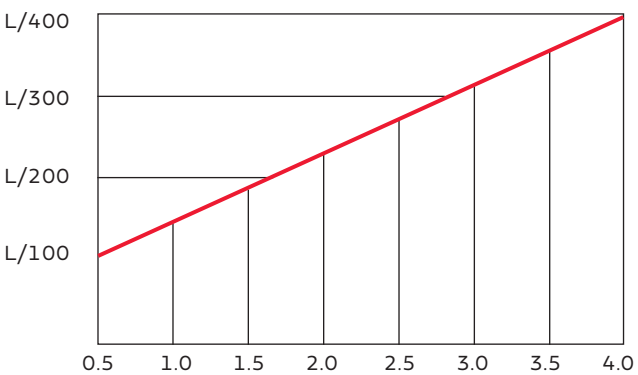
- Exterior steel sheet thickness
  - AST®≧ 0.6 or 0.7 mm.
  - QuadCore™ ≧ 0,6 mm.

Design of panel structures

Panels can be installed horizontally or vertically. Maximum allowed panel deflection is depending on cladding material (to be checked with cladding manufacturer) as follows:

- Corrugated steel sheet L/100
- Timber L/100
- Glass L/400
- Ceramic tiles L/400
- Render L/400
- Cassettes L/100... L/400 according to the diagram beside:

Allowed deflection for panels with cassette cladding



Temperature between panels and cladding has to be checked case by case.

Dead load of the additional facing structure is to be taken into account in the dimensioning of panel fixing. Check also if the wall structure has fire requirements according to local fire regulations. If so, please always contact Paroc Panel System. If the additional cladding is not water tight horizontal and vertical exterior panel joints need to be sealed.

The dimensioning must take into account the additional load due to the cladding structure when calculating the sandwich panel fasteners.

Wrinkling

The resistance of the sandwich panel must be reduced by a factor of k = 0.8 when dimensioning the bending moment caused by wind pressure.

Material specification

STEEL FACINGS
Hot-dip zinc coated steel with a total area weight of 275 g/m^2 of zinc, according to EN 14509.
The standard gauge is 0,60 mm on the external and 0,50 mm on the internal side.

INSULATION CORES
AST® – stone wool core with excellent fire and structural performance.

QuadCore™ - a new self-blended polyisocyanurate core that provides very high thermal, fire and environmental performance and longevity.

SEALS
Side joints of AST® panels have two factory applied anticondensation and weather seals fitted into the groove to seal the junction between the panels.

PANEL PROFILES
AST®
Profiles on the external weather sheet are: Line 150, Line 200, Line 600, Micro, Smooth, Micro+Line 200, Micro+Line 600 and Line 150, Line 200, Line 600 or Smooth in the internal liner sheet.

QuadCore™
The panels feature a microprofiled surface (Micro) on the external weather sheet and Minibox or Deep Minibox profile on the internal liner sheet.

Coatings

EXTERNAL WEATHER SHEET
External coating for AST® Built-on panels is Spectrum® or PVDF. Polyester can be used only with ventilated facade systems with limited guarantee.

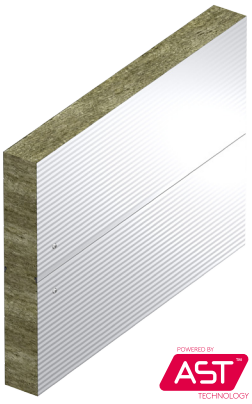
Recommended coating for external side of QuadCore™ QK panels is Spectrum®. Polyester can be used only with ventilated façade systems with limited guarantee.

Spectrum® – a 50 µm polyurethane coated semi-gloss finish with a slight granular effect. Kingspan Spectrum® offers outstanding durability and weather resistance performance, excellent corrosion and UV-resistance as well as high colour and gloss retention.

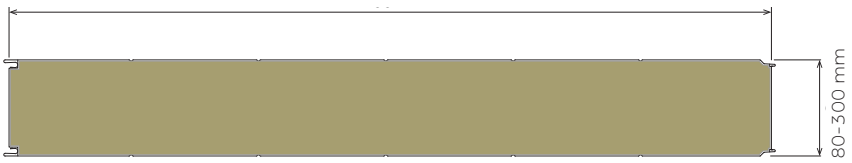
PVDF – polyfluoro vinylidene coating with nominal thickness of 27-40 µm. Dedicated to surfaces that require increased corrosion resistance, for external and internal use.

Visit our website **www.parocpanels.com** for standard and non-standard colour indications.

AST® Built-On Panel



External profile:
Line 150, Line 200, Line 600, Micro, Smooth, Micro+Line 200, Micro+Line 600
Module width: 1200 mm

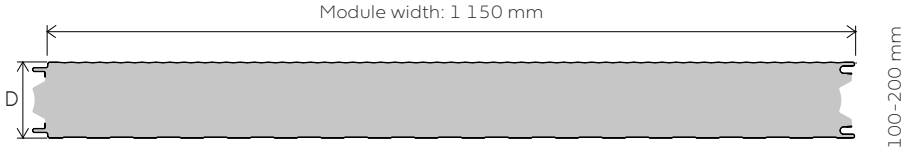


Internal profile: Line 150, Line 200, Line 600, Smooth

Panel Thickness (mm)		80	100	120	150	175	200	240	300
U-value (W/m²K):	**AST® L / AST® L LEC**	0,45	0,37	0,30	0,24	0,21	0,18	0,15	0,12
	AST® S / AST® S LEC	0,48	0,38	0,32	0,26	0,22	0,19	0,16	0,13
	AST® F / AST® F LEC	0,53	0,43	0,36	0,29	0,25	0,22	0,18	0,14
	AST® E / AST® E LEC	0,53	0,43	0,36	0,29	0,25	0,22	0,18	0,14
Weight kg/m²	**AST® L / AST® L LEC**	15	17	18	21	22	24	27	31
	AST® S / AST® S LEC	17	19	21	23	25	28	32	37
	AST® F / AST® F LEC	19	21	24	27	30	33	38	45
	AST® E / AST® E LEC	19	22	24	28	31	34	39	47
Panel Length[1] (mm)		2100-12000 (in 1 mm increments)							
Panel Width (mm)		1200							
Steel thickness (mm):	external	0,60 or 0,70							
	internal	0,50, 0,60 or 0,70							

QuadCore™ QK Built-On Panel

External profile: Micro
Module width: 1 150 mm



Internal profile: Minibox, Deep Minibox

Panel Thickness (mm)		100	120	150	170	200
U-value (W/m²K):	**QuadCore™**	0.19	0.15	0.12	0.11	0.09
Weight kg/m²		12.29	13.05	14.19	14.95	16.09
Panel Length[1] (mm)		2000-14500 (in 1 mm increments)				
Panel Width (mm)		1150				
Steel thickness (mm):	external	0.60				
	internal	0.50				

[1] Other lengths available on reguest.

Reaction to fire of the panel wall is the same as panel itself. Fire resistance classification of wall on internal fire is the same as panel wall fire resistance classification. On external fire, fire classification depends of cladding systems and materials. Please contact Kingspan, Paroc Panel System technical team or visit our website for more details.

The Alti Futura Shopping Centre in Norway
with Built-on facade made of Dri-Design cassettes
fixed directly to sandwich panel.

Dimensioning of suspensions

Suspensions are dimensioned according to Paroc Panel System's Technical Guide, section Suspensions.
Define maximum line loads (pressure, tension and shear) for hat profiles. Maximum loads for fasteners as well as dimensioning rules and amount of fixings into panel surface are dimensioned using coefficient Cp1 according to EN 1991-1-4_wind.

If separate suspensions, such as signs, are fixed with penetrating fixing screws and support plates on both sides of panels, they have to be dimensioned for tension and pressure on both sides of the panels.

Hat and Z profiles

Hat and Z profiles may be made of zinc coated steel ≥ 0,9 mm or aluminum with thickness ≥ 2,0 mm. Profile height shall be at least 20 mm.
Recommended profiles support width is 40 mm/side and minimum allowed support width for hat profiles is 20mm/side.

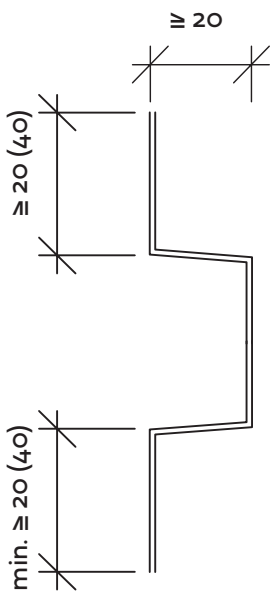
Maximum distance between profiles is 600 mm when installed lengthways the panels, and 1200 mm when installed across the panels. In the edge zones the distance is maximum 600 mm.

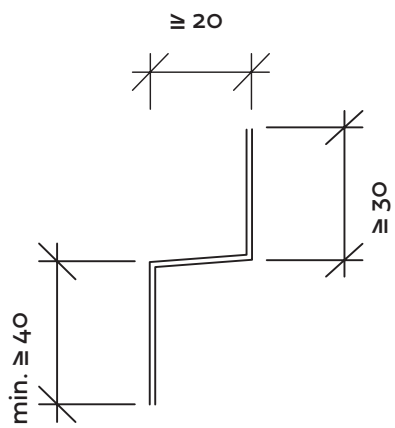
When profiles are installed across the panels, recommended profile length is 2380 mm or 3580 mm. Align profile joints with panel joints.

When profiles are installed along with panel length, they shall have moving joints at maximum c/c 3600 mm.

Aluminium rails need to be pre-drilled, round in the middle and oval in the ends. Zinc coated rails is recommended to have pre-drilled min 7 mm holes.

Hat and Z profiles dimensions





Fixing of profiles

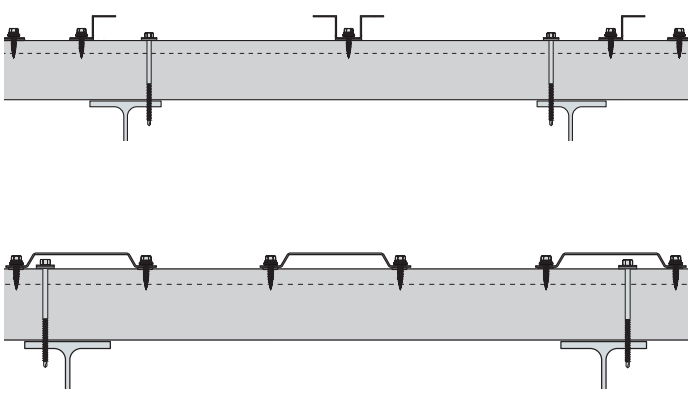
- **AST® S, AST® F, AST® E:**
  Cladding material + profiles ≤ 45 kg/m²
- **AST® L:**
  Cladding material + profiles ≤ 30 kg/m²
- **QuadCore™:**
  Cladding material + profiles 40 kg/m²

Profiles are fastened with AP-FS-12 overlapping screws, Bulb-Tite or Peel rivets or AP-FS-40 screws to panels' exterior steel sheets. In case screws are used there shall be predrilled holes in the hat profiles or alternatively the screws can have a thread-free zone under the screw head for about 2-5 mm and a washer with rubber sealant.

Cladding material + profiles > 45 kg/m²
An additional securing system is to be built by hanging profiles vertically from load-bearing floors/beams with stainless steel fasteners through the panel. Always contact Paroc Panel System in these cases.

Fixing of cladding on materials

Cladding materials are fixed to hat profiles according to manufacturer's instructions.



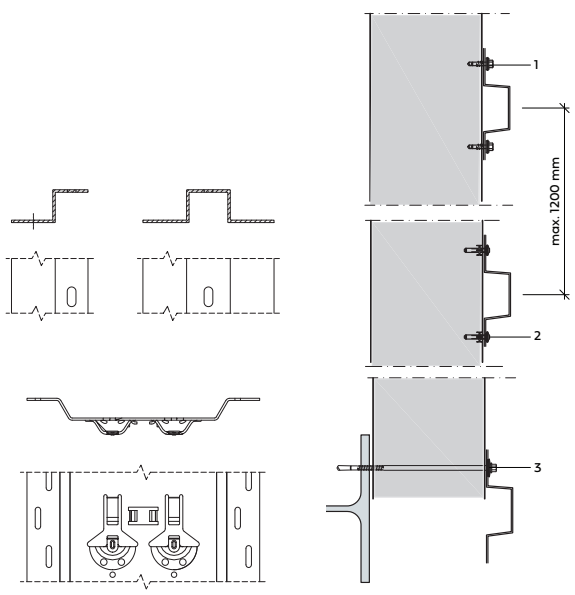
1. In case screws are used there shall be predrilled holes in the profiles or alternatively the screws can have a thread-free zone under the screw head for about 2-5 mm and a washer with rubber sealant.
2. Recommended fixing type is AP-FS-12 overlapping screws, Bulb-Tite rivets or AP-FS-40 screws.
3. Fixing to frame through the panel is recommended where it is possible.

Fixing of aluminum profiles

Sealing tape has to be applied between the panels and aluminum profiles.

Fixing of timber battens

When using pressure impregnated timber containing aggressive substances, a butyl rubber seal has to be applied between the panels and timber beams. Note also that pressure impregnated timber must be fixed with stainless steel fasteners.



Fastener Selector

Fastener	Desing load resistance, [kN] [1]		Allowed force, [kN] [2]	
	Shear $V_{R,d}$	Tensile $N_{R,d}$	Shear $F_{v,all}$	Tensile $F_{t,all}$
Steel 0,5 mm / AP-FS-12 / max. t= 2 AP-FS-40 / t= 1...7	0,7	0,35	0,5	0,25
Steel 0,6 -0,7 mm / AP-FS-12 / max. t= 2	0,7	0,45	0,5	0,3
Steel 0,6- 0,7 mm / AP-FS-33 / t= 4... 6 AP-FS-34 / t= 2... 5 AP-FS-40 / t= 1 ...7	0,7	0,6	0,5	0,4
Steel 0,5 -0,7 mm Rivet AP-FS-23 / t=1,5...12 Rivet AP-FS-27 / t=18... 25	0,7	0,6	0,5	0,4

[1] Design load resistance contains partial coefficient for material, γ_m = 1,33.

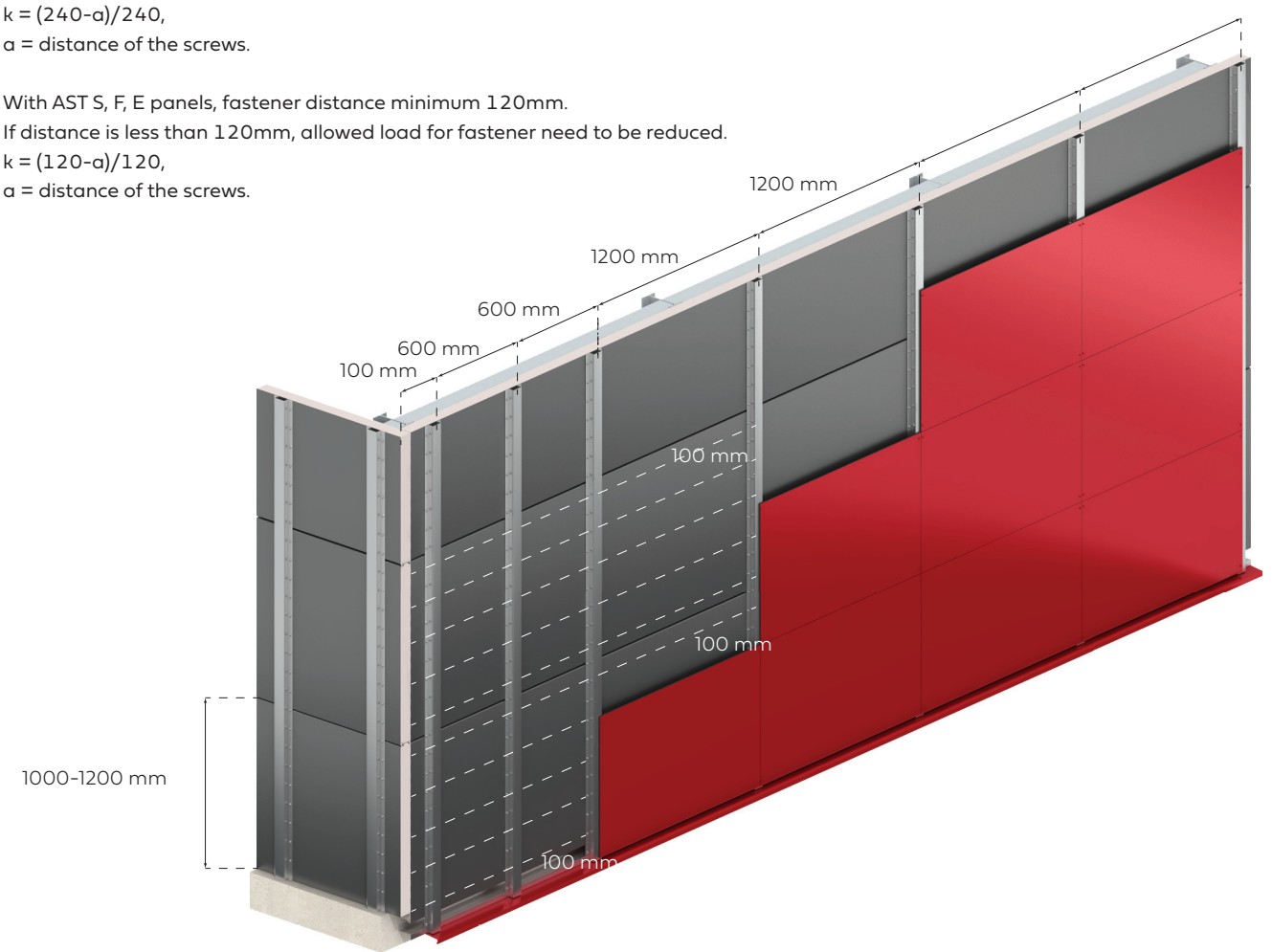
[2] Allowed force / fastener taken into account partial coefficient for material, γ_m = 1,33 and for load, γ_f = 1,5.

Support profiles assembly

Support profiles (Omega /BX-rail/ Z / Hat)
Fixing distance from panel edge (from joint) and from panel end (cut) = minimum 100mm.

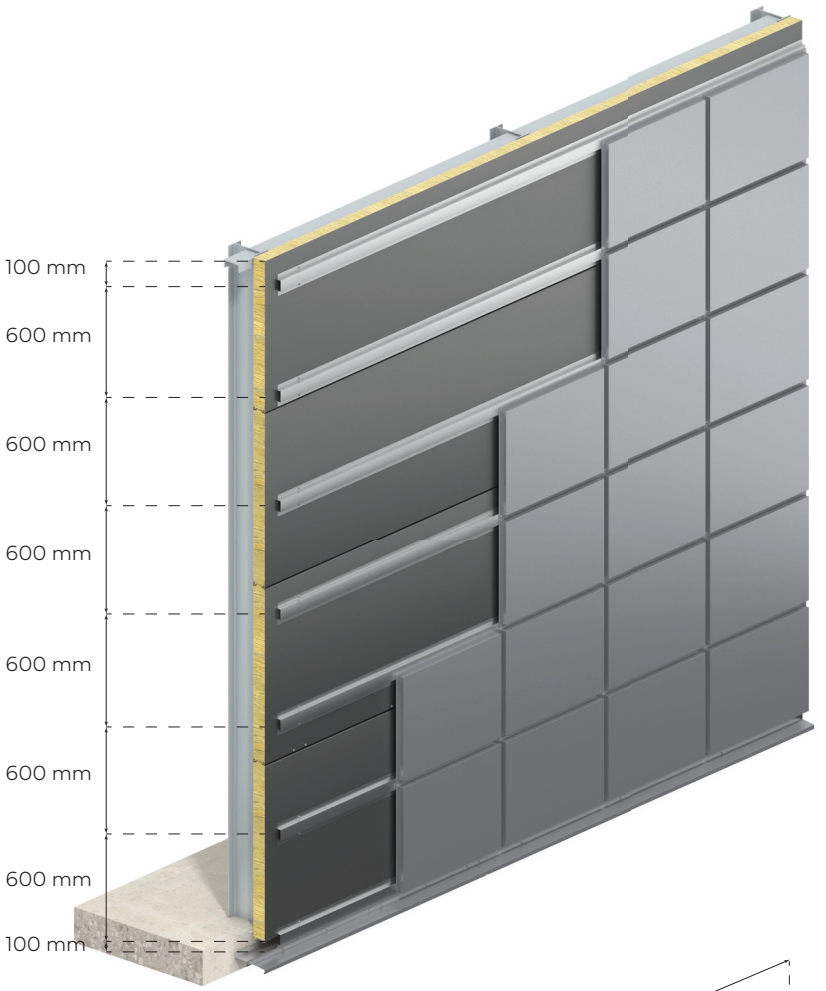
With AST L and QuadCore panels fastener distance minimum 240mm,
if distance is less than 240mm, allowed load for fastener need to be reduced.
k = (240-a)/240,
a = distance of the screws.

With AST S, F, E panels, fastener distance minimum 120mm.
If distance is less than 120mm, allowed load for fastener need to be reduced.
k = (120-a)/120,
a = distance of the screws.



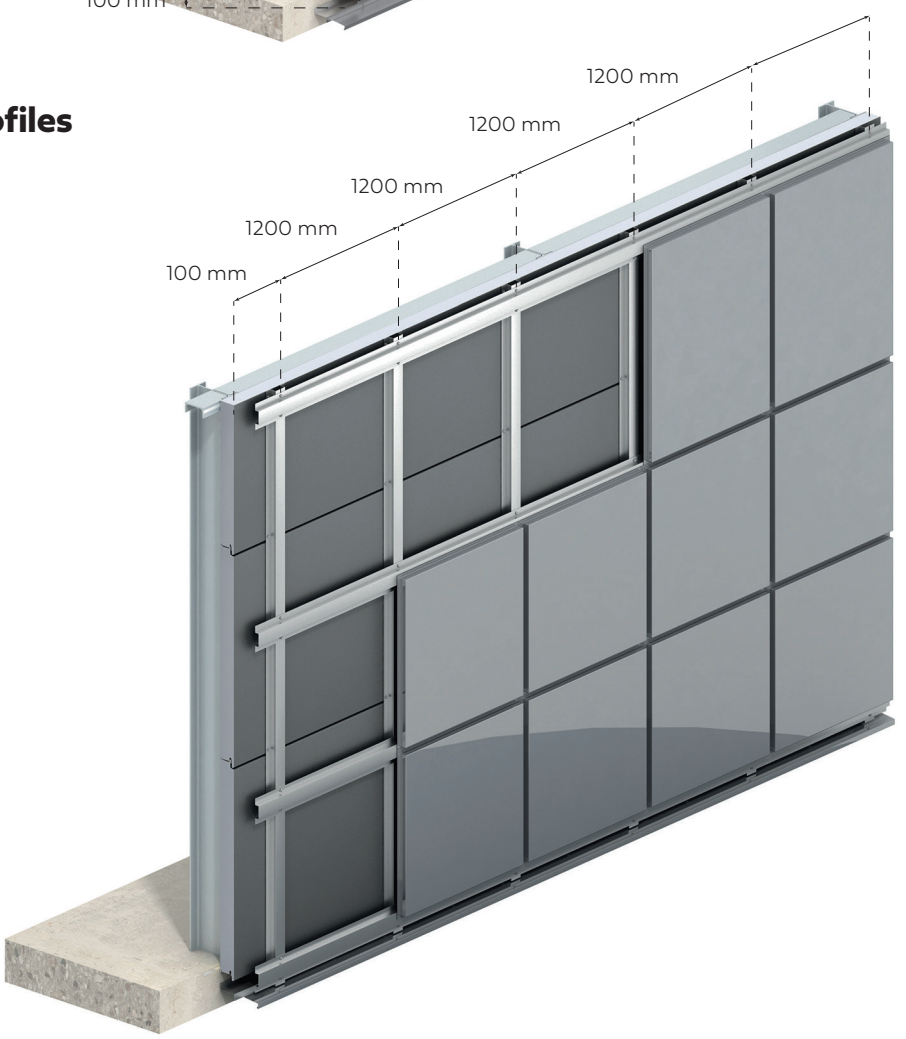
Installation of panels/profiles

Horizontal/horizontal



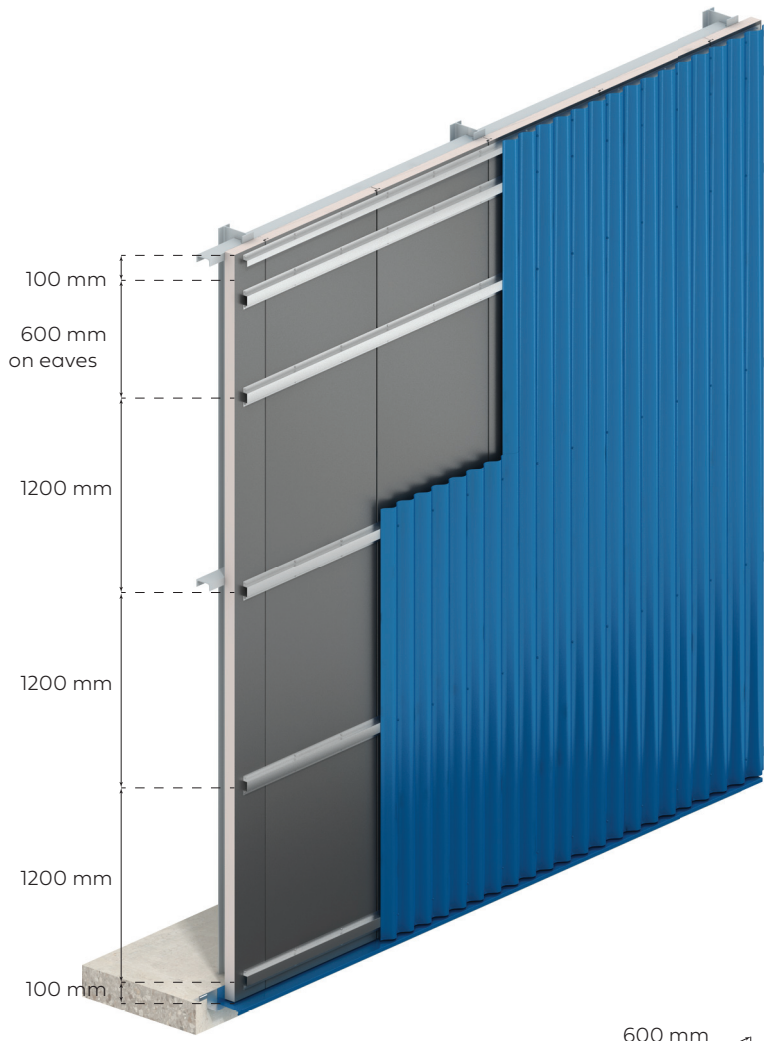
Installation of panels/profiles

Horizontal/vertical+horizontal



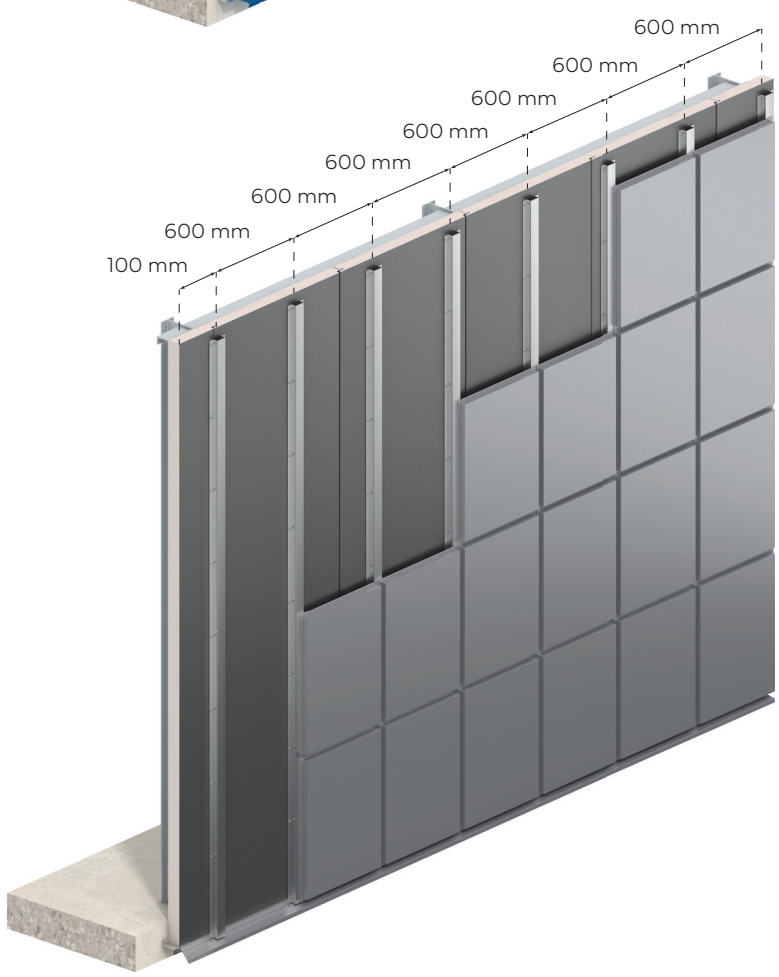
Installation of panels/profiles

Vertical/horizontal



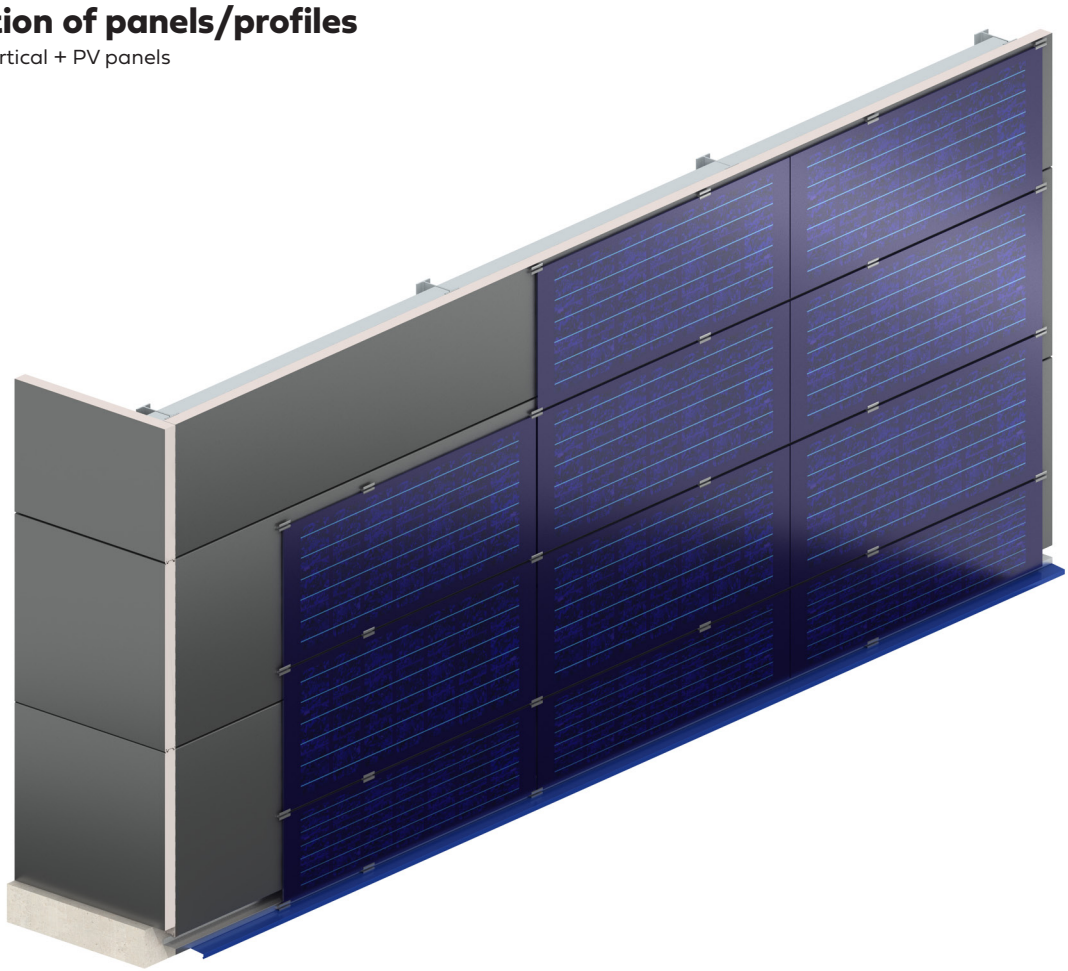
Installation of panels/profiles

Vertical/vertical



Installation of panels/profiles

Horizontal/vertical + PV panels



Hundige Storcenter in Denmark
features built-on façade solution
with glass hook-on sandwich panels

Paroc
Panel
System

Paroc Panel System
Sysilahden teollisuusalue 2
Parainen, FI-21600

+358 (0)46 876 8716
panelinfo@parocpanels.com
www.parocpanels.com

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