Materials Services
Materials Poland

Together, we create architecture

Product offering for the construction industry

thyssenkrupp

On the cover:
Trespa® Meteon HPL Panels

Together, we create architecture
Product offering for the construction industry*

Facades

Glazing

Other products

* All information and recommendations are presented to the best of our knowledge and experience. However, we do not guarantee complete data correctness and accuracy. We reserve the right to introduce changes in the content presented.

Alucobond® panels

Alucobond® is a composite panel consisting of two layers of aluminium (thickness: 0.5 mm each), permanently bonded to the core. The decorative layer is covered with PVdF varnish. The most important advantages include: flexibility and high resistance to weather conditions.

The following types of Alucobond® panels are available::

- PE: with low-density polyethylene core (not fire-rated)
- Plus: with a core made of polyethylene mixed with a mineral filler (fire-rated as B-s1-d0)
- A2: with a core made of aluminium hydroxide (fire-rated as A2-s1-d0)

Colour versions

- uniform colours (Solid series)
- metallic colours
- Spectra series colours (chameleons - hues changing depending on the angle of light incidence)
- Sparkling series colours (increased amount of chips ensuring the “sparkling” effect colour)
- Ligno series colours (high-quality imitation wood)
- colours imitating anodised coatings
- NaturAl series colours:
  - NaturAl PURE – coatings in the natural aluminium colour, with brushed surface and a “mirror” surface
  - NaturAl FINESSE – brushed aluminium in colour versions imitating other metals (copper, titanium-zinc)
- Urban series colours (deep matt, smooth, non-reflective)
- Terra series colours (matt with a clear surface texture)
- Design - unique patterns highlighting the design individuality

Panel formats

- Alucobond® Plus:
  width: 1000 mm, 1250 mm, 1500 mm, 1575 mm, 1750 mm
  standard length: 2000 mm – 5000 mm (longer panels available on request)
- Alucobond® A2:
  width 1250 mm, 1500 mm
  standard length: 2000 mm – 5000 mm (longer panels available on request)

Advantages

- All types of panels clad with aluminium sheet made of EN AW 5005 aluminium alloy as per PN-EN 573-3
- High resistance to weather conditions and UV radiation
- Exceptional surface flatness
- High rigidity (no risk of cladding warping during facility operation)
- Low weight as compared to solid materials (e.g. aluminium, steel)
- Excellent forming capacity: ability to create spatial elements - possibility to design Facades of any shapes
- Sound attenuation capacity: better comfort for users of buildings whose Facades are made of Alucobond® panels
- Easy to machine and assemble
- Rich design and colour ranges
- Material available in the A2 (non-flammable) version

Alucobond®, Seven Clans Casino Red LakeCopper. [Minnesota, USA]

Alucobond® panels

Panels – basic technical data				
Property	Unit	Value		Standard
Panel type		Alucobond Plus	Alucobond A2	
Surface weight	kg/m²	7,5 ± 10%	7,5 ± 10%	AT-15-4058/2010, p. 5.2
Bending strength	MPa	≥ 95	≥ 90	PN-EN ISO 178
Elasticity coefficient at bending	MPa	≥ 15000	≥ 20000	PN-EN ISO 178
Elastic modulus (MPa)	MPa	70000		PN-EN 1999-1-1
Core adhesion to sheet metal checked with the tear-off method (N/mm)	N/mm	≥ 3	≥ 2,2	AT-15-4058/2010, p. 5.3
Thermal expansion coefficient		2,4 mm/m at the temperature difference of 100°C		PN-EN 1999-1-1

Comparison of Alucobond® panel thickness and weight with other materials demonstrating the same rigidity		
Material type	Thickness (mm)	Weight (kg/m²)
Alucobond	4	7,6
Aluminium	3,3	8,9
Steel	2,4	18,7
Fibre-cement	5,8	11,7

Storage

- During storage, protect pallets with Alucobond® panels against precipitation, condensation and soaking or condensing moisture.
- Only pallets of identical sizes can be stacked (maximum number of stacked pallets – 6).
- Avoid storing panels for a period of time longer than 6 months, because removal of the protective film after long-term storage may prove problematic.
- When removing the panels, lift them to avoid moving them over one another.
- When laying the panels on one another, ensure that no elements are placed between them, as it may result in panel surface damage.

Applications

- Building facade cladding (residential and public utility buildings, offices, shopping centres)
- Column cladding
- Soffits
- Gable and attic structures
- Balcony fillings
- Tunnel structures

Installation

In order to avoid potential differences in hues (applies to metallic colours, versions with special colour effects as well as NaturAl and Spectra colours). It is recommended that panels should be installed in the same direction, as per the marking placed given on the protective film.
Note: There may be some differences in hues on panels from different production lots (does not apply to uniform colours, i.e. Solid). Colour compatibility can be ensured by placing an order covering the entire demand for a specific project.

Alucobond® Ligno, Glen Innes Youth Music and Arts Centre „Te Oro" [Auckland, New Zealand]

Alucobond® panels

Protective film

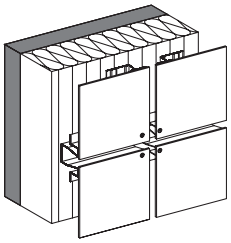
It is recommended that the protective film should be removed as soon as possible after installation to avoid the risk of leaving adhesive residues on the surface due to the impact of UV radiation. Long-term adhesion of the film to a panel may hinder its subsequent removal.

Machining

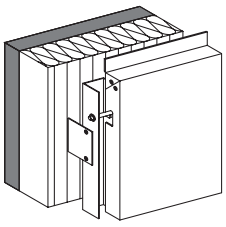
Alucobond® panels can be machined using the following methods:

- **cutting:** jigsaws, belt saws and circular saws with trapezoidal or rectangular teeth, made of carbides;
- **milling:** manual milling machines or CNC machines. Use cutters made of high-speed steel or carbides, intended for aluminium processing;
- **drilling:** high-speed steel drills are used as standard for metal and plastic processing;
- **trimming:** standard shearing machine;
- **punching;**
- **bending:** The minimum bending radius is as follows: Alucobond® Plus – 10 x thickness, Alucobond® A2 – 25 x thickness. The bent material springing effect during Alucobond® panel processing operations are larger as compared to solid panel processing.
- **rolling**

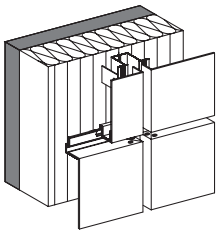
Mounting systems



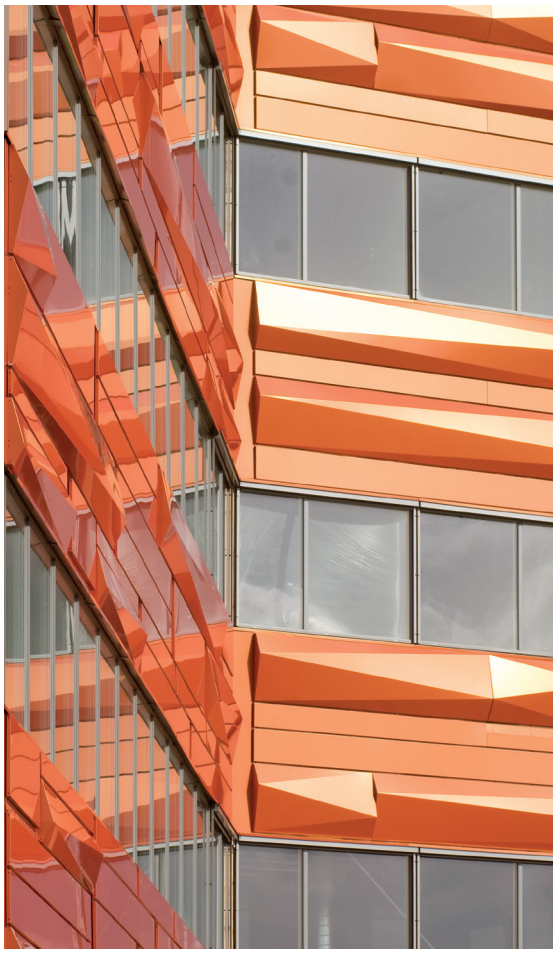
Flat panels riveted
or bolted to aluminium
substructures



Cassettes on stainless steel
pins
Vertical layout of panels



Cassettes for the SZ20 system
Horizontal layout of panels



Advice House at Lysholt Park (Spectra Cupral 913). [Vejle, Denmark]

Trespa® panels

Trespa® panels belong to a group of materials generally dubbed as HPL, i.e. High Pressure Laminates. They are formed by pressing wood-like fibres soaked with thermosetting resins, constituting the panel core (Dry Forming [DF] technology), and decorative paper with its surface hardened using the patented ECB (Electron Beam Curing) technology, in high temperature (min. 150°C) and high pressure (min. 7 Mpa) conditions. This results in obtaining a homogeneous, smooth material with enhanced density and a consistent decorative surface.

The following types of Trespa® panels are available:

- Virtuon – for indoor applications;
- Meteon – for outdoor applications.

Due to identical production processes, Trespa® Meteon and Trespa® Virtuon are equally resistant to external environmental conditions. The only difference is that Trespa® Meteon panels are additionally resistant to UV radiation.

Surface colours and structures

- Trespa® Virtuon: uniform, metallic colours (on one or both sides) Surface structures: ST (Satin), RT (Rock) – imitation stone, SK (Silk) – smooth matt
- Trespa® Meteon: uniform, metallic, wood-like colours (on one or both sides) plus the Naturals version (imitation of other coatings) Surface structures: ST (Satin), RT (Rock) – imitation stone, MT (Matt) – smooth matt, MR (Matt-Rock) – imitation stone – matt version

List of available panel thickness versions, colours, structures and formats

Panel type	Available thickness (mm)	Colours	Surface structure	Available utility formats (mm)
Trespa® Meteon	6, 8, 10, 13	uniform	ST, RT	1530 x 3050, 1860 x 2550, 1860 x 3650, 2130 x 4270
		metallic	ST, RT	
		wood-like	ST, MT	
		naturals	MT[2], MR[1]	
Trespa® Virtuon	6, 8, 10, 13	uniform	ST, RT[1], SK[1]	1530 x 3050, 1860 x 2550, 1860 x 3650, 2130 x 4270
		metallic	ST, RT[1]	

[1] available for selected colours
[2] glossy surface elements for selected colours

NEW

Lumene series - eight uniform colours, each available in three new surface structure designs: Diffuse, Oblique, Specular

Lumene

Meteon colours from the Lumen series	Surface	Dimensions (mm)	Thickness (mm)
L05.0.0; L05.1.2; L06.5.1; L09.6.4; L11.4.4; L21.5.1; L25.8.1; L90.0.0	Matt (Diffuse)[1]	3650 x 1860 2550 x 1860 3050 x 1530	8, 10, 13
	Matt with high-gloss elements (Oblique)[1]		
	Gloss (Specular)		

[1] directional surface

Trespa® panels

Panels – basic technical data			
Property	Unit	Value	Standard
Density	kg/m³	≥ 1350	PN-EN ISO 1183
Dimensional stability at elevated temperatures	%	≤ 0,25	PN-EN 438-2
Increase in weight due to increased humidity	%	≤ 3	PN-EN 438-2
Elastic modulus	MPa	≥ 9000	PN-EN ISO 178
Bending strength coefficient	MPa	≥ 120	PN-EN ISO 178
Tensile strength coefficient	MPa	≥ 70	PN-EN ISO 527-2
Pull-out resistance			
panel thickness: 6 mm	N	≥ 2000	PN-EN ISO 13894
panel thickness: 8 mm		≥ 3000	
panel thickness: 10 mm		≥ 4000	
Colour fastness	Greyscale	4-5	PN-EN 438-2
Fire reaction class			
CGS type		D-s2-d0	PN-EN 13501-1
CGF type		B-s2-d0 (dla gr. 6 mm)	
		B-s1-d0 (dla gr. ≥ 8 mm)	

Storage

Panel reloading and transport operations should be conducted by qualified personnel with suitable equipment. Handle the panels with care to prevent decorative surface damage. The panel handling method is similar to that of hardwood.

Warehousing

Store the panels in a dry, clean room at temperatures above 0°C.
Pallets and panels should be placed on a level surface, ensuring their full support.
If possible, store the panels in their closed, original packaging.
For long-term storage, remove the metal strips.
Prevent the formation of a moisture layer between individual panels.
Do not place any layers of materials not resistant to moisture (e.g. paper) between the panels.
To prevent uneven (one-sided) exposure of panels to moisture and temperature,
it is necessary to:
• remove the protective film within 24 hours of removing panels from stacks secured with their packaging;
• lay the panels flat, one on top of another;
• avoid gaps between panels.

Płyty HPL Trespa® Meteon wood decor NW16 Milano Terra, Nowe Orłowo Estate [Gdynia, Poland]

Trespa® panels

Handling

- Handle the panels with caution.
- Do not slide the panels. Lift them before moving to a different location.
- Prevent dirt from permeating and accumulating on and between panels.
- Use adhesive paper for labelling/coding and remove it immediately after installation.

Machining

- Trespa® panels should be processed by means of techniques and tools used in hardwood processing.

Cutting: tools with alternating teeth or trapezoidal flat teeth:

- hand saws;
- circular saws;
- jigsaws with carbide blades

Drilling: it is recommended that high-speed steel drills with carbide (point angle 60-80°) should be used.

Milling: tools with carbide or diamond cutters:

- straight or diagonal cutters for edge cutting and chamfering;
- blank or rounded cutters for round edges;
- circular saw diamond discs for grooves

Installation

Trespa® panels can be attached to an aluminium (recommended solution), steel or wooden substructure, in a visible (using rivets or screws) or concealed manner (adhesives or mechanical installation using anchor bolts).

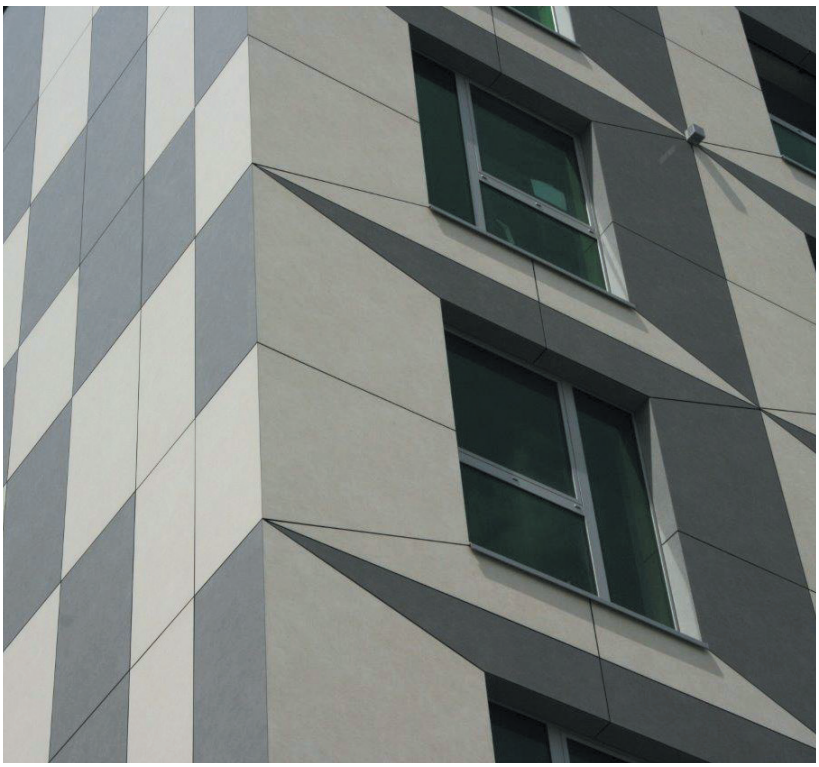
Advantages

- Resistance to weather conditions (UV radiation, acid rain, water, etc.)
- High colour fastness
- High mechanical resistance
- Resistance to chemicals (including ammonia)
- Resistance to organic solvents
- Resistance to chemicals (e.g. used in laboratories)
- Resistance to concentrated cleaning agents (e.g. used in hospitals)
- Ease of removing graffiti and other resistant dirt
- Resistance to decay and biological corrosion
- Easy to machine and assemble
- Easy to keep clean

Applications

Trespa® Meteon
- Facade cladding – ventilated Facades in buildings of max. height 25 m
- Balcony and railing fillings
- Soffits
- Roof soffit panels

Trespa® Virtuon
- Interior wall cladding (offices, public utility buildings, laboratories, hospitals, operating theatres)
- Railing fillings
- Sanitary cubicles
- Laboratory furniture



Trespa®, Double Tree by Hilton [Kraków, Poland]

Fibre-cement panels

Fibre-cement panels combine extensive architectural capabilities and excellent technical properties. It is a cutting-edge material made of natural, environmentally-friendly raw materials. All positive product properties ensure that it meets stringent requirements both in terms of structure and design.
Large-format fibre-cement panels for ventilated Facades have proven themselves in practice. They are made of a non-flammable plastic, consisting of a cement binder reinforced with fibres, which, in a hardened condition, are resistant to distortion and adverse weather conditions.

Basic fibre-cement components:
- Portland cement;
- organic fibres (cellulose) and artificial fibres;
- dyes;
- water

Proportionally, the binder, i.e. Portland cement, has the largest share in the raw material composition. In order to optimise product properties, admixtures are added, e.g. lime dust and recycled fibre-cement. Organic (made of cellulose, also used in the paper-making industry) and synthetic (polyvinyl alcohol [PVA] used in a similar form in the textile industry for the production of clothing and protective fabrics, non-woven fabrics and surgical fabrics) reinforcement fibres are used.
The panels also contain air, trapped in microscopically small pores.

Fibre-cement panel collections cover a wide range of products:

Through-coloured panels

- coated with a translucent coat ensuring extra depth to all hues and making the natural fibre-cement structure visible;
- covered with opaque acrylic paint whose hue matches the panel colour. The panel surface is smooth, with a uniform shade;
- panels with a clear fibre-cement structure with a rough, unpolished surface of a brushed structure

Surface coated panelso

- smooth surface: grey fibre-cement coated with opaque acrylic paint;
- grainy surface: grey fibre-cement coated with opaque acrylic paint. Also available in a version varnished on both sides (for balcony railing fillings).

Raw panels

- fibre-cement panels without additional treatment, in a natural, grey colour, with a smooth surface

Fibre-cement is also offered in the form of facade boards. Such factors as the wood structure and wide range of colours make these panels an alternative to traditional wood or plastic solutions.

Advantages

- High resistance to weather conditions (UV radiation, temperature fluctuation)
- Non-flammable
- Moisture resistance
- Frost resistance
- Durability
- Panels with anti-graffiti coating

Applications

- Facades (residential buildings, public utility buildings, office buildings, shopping and leisure centres)
- Balcony structures
- Tunnel structures
- Soffits

Fibre-cement panels

List of available panel thickness versions and formats		
Panel type	Available thickness (mm)	Available utility formats (mm)
surface coated panels (smooth surface)	8, 12	1250 x 3100
	8	1220 x 2500, 1220 x 3040
surface coated panels (grainy surface)	8, 10, 12	1500 x 3100
through-coloured panels (smooth surface)	8, 12	1250 x 3100
	8	1220 x 2500, 1220 x 3040
through-coloured panels (brushed surface)	6, 8	1220 x 3050, 1200 x 2500, 1200 x 3050, 1200/1250x2500/3050
raw	6, 8	1200 x 2500, 1200 x 3050
facade panels	8	180 x 3600
	10	190 x 3600

Technical data of through-coloured and surface coated panels with a grainy structure			
Property	Unit	Value	Standard
Dry product density	kg/m^3	≥ 1650	PN-EN 12467
Bending strength			
– dry product along fibres	MPa	24	PN-EN 12467
– dry product across fibres	MPa	17	PN-EN 12467
Elastic modulus			
– dry product along fibres	MPa	17000	PN-EN 12467
– dry product across fibres	MPa	15000	PN-EN 12467
Stretching at 0-100% humidity	mm/m	1-3	
Durability		Category A	PN-EN 12467
Strength		Class 4	PN-EN 12467
Fire resistance		A2-s1-d0	PN-EN 13501-1
Thermal expansion	mm/m·°C	0,01	
Thermal conductivity coefficient	W/m·K	0,407	

[Norway]

[Finland]

Fibre-cement panels

Technical data of surface coated panels with a smooth surface			
Property	Unit	Value	Standard
Dry product density	kg/m^3	≥ 1650	PN-EN 12467
Bending strength			
– dry product along fibres	MPa	26	PN-EN 12467
– dry product across fibres	MPa	17	PN-EN 12467
Elastic modulus			
– dry product along fibres	MPa	15000	PN-EN 12467
– dry product across fibres	MPa	15000	PN-EN 12467
Stretching with humidity 0-100%	mm/m	1-3	
Durability		Category A	PN-EN 12467
Strength		Class 4	PN-EN 12467
Fire resistance		A2-s1-d0	PN-EN 13501-1
Thermal expansion	mm/m·°C	0,01	
Thermal conductivity coefficient	W/m·K	0,6	

Technical data of surface coated panels with a smooth surface			
Property	Unit	Value	Standard
Dry product density	kg/m^3	≥ 1580	PN-EN 12467
Bending strength			
– dry product along fibres	MPa	32	PN-EN 12467
– dry product across fibres	MPa	22	PN-EN 12467
Elastic modulus			
– dry product along fibres	MPa	> 14000	PN-EN 12467
– dry product across fibres	MPa	> 14000	PN-EN 12467
Stretching with humidity 0-100%	mm/m	1-3	
Durability		Category A	PN-EN 12467
Strength		Class 4	PN-EN 12467
Fire resistance		A2-s1-d0	PN-EN 13501-1
Thermal expansion	mm/m·°C	0,01	
Thermal conductivity coefficient	W/m·K	0,4	

Bulldog [Czech Republic]

[Denmark]

Fibre-cement panels

Transport and storage

Fibre-cement facade panels with a paint coating should be stored and transported in a flat position, and panels must be laid with their entire surface resting on a level and dry surface. Paper elements separating individual layers must be replaced each time panels are laid on new stacks and moved between stacks (front side on the bottom) to protect their valuable coating. Until installed, the panels should be covered with a construction film or a similar material in order to protect them against moisture and dirt. Panels should be removed from stacks by lifting them upwards. Panels should always be carried in an upright position (edge up). Panels should be lifted from a pallet, but not pulled over another panel located underneath. Failure to do so may result in panel surface damage. Do not exceed the maximum number of panels in one stack.

Cutting

The best fibre-cement cutting results are obtained using diamond powder or carbide alloy covered blades, with machining properties and scope of applications of group K 10 (as per PN-ISO 2336).
Feed rate: from 20 m/min (diamond powder covered blade)
Feed rate: from 3.0 to 3.5 m/min (carbide alloy covered blade)
Cutting speed: 60 m/s (diamond powder covered blade)
Cutting speed: 2.0 – 2.5 m/s (carbide alloy covered blade)
After cutting, edges should be impregnated with a protective agent supplied.

Installation

Fibre-cement panels can be attached to an aluminium (recommended solution), steel or wooden substructure, in a visible (using rivets or screws) or concealed manner (adhesives or mechanical installation using anchor bolts).

[Czech Republic]

ROCKPANEL® panels

ROCKPANEL® panels are manufactured from a natural renewable raw material, i.e. basalt. Basalt fibres with an addition of a small amount of an organic binder are pressed under high pressure. The resulting lightweight facade cladding is easy to process and assemble. Product dimensions remain stable regardless of temperature changes; it is also resistant to humidity fluctuations. The material does not require additional edge protection to protect it against weather conditions. ROCKPANEL® panels are durable and flexible, reflecting modern trends such as utilising natural shapes and ecological solutions and can be installed economically and quickly.

The following types of ROCKPANEL® panels are available:

- Durable – panels designed for use on standard Facades;
- Xtreme – panels with increased mechanical resistance, suitable for use, e.g. on the ground floor;
- FS-Xtra – panels with increased fire resistance (non-flammable – fire reaction class A2), thickness: 9 mm

ROCKPANEL® panels are available in the following colour versions:

- ROCKPANEL® Colours: uniform colours according to RAL and NCS palettes (also available with the Protect Plus anti-graffiti coating);
- ROCKPANEL® Woods: wood-like patterns (standard coating with the Protect Plus coating);
- ROCKPANEL® Metallics: metallic colours (available with the Protect Plus coating, except for Aluminium White and Aluminium Grey)
- ROCKPANEL® Chameleon: hues change depending on the angle of light incidence (standard coating with the Protect Plus coating);
- ROCKPANEL® Brilliant: uniform colours with the “sparking” effect (standard coating with the Protect Plus coating);
- ROCKPANEL® Natural: the “rawest” product on offer, i.e. durable, uncoated panels changing under the influence of weather conditions in the vicinity of a building. Sunlight causes natural panel ageing and colour changes, comparable to other natural materials such as wood, concrete, steel, etc. Each microclimate exerts a unique impact on ROCKPANEL® Natural panels.
- ROCKPANEL® Ply: panels covered with primer, which makes it possible to coat them with any selected colour; they constitute a solid base for each set of colours.

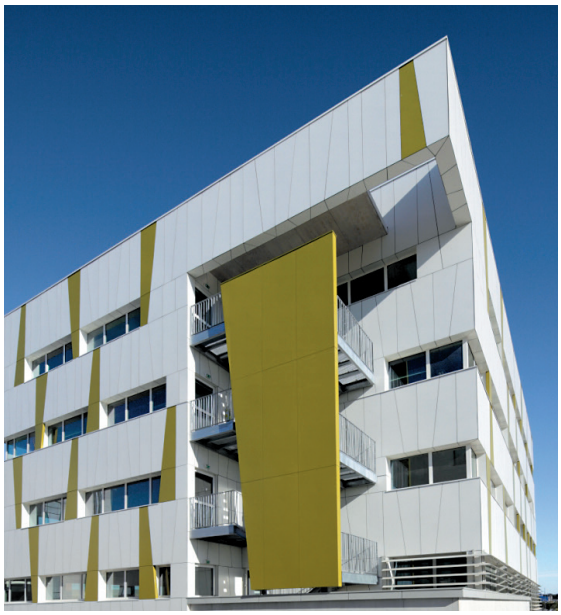
Advantages

- High resistance to weather conditions (UV radiation, temperature and humidity fluctuations)
- High dimensional stability
- Easy to clean
- Rich design and colour ranges
- Protective anti-graffiti coating
- Easy machining (no need to secure edges after cutting)
- Quick and easy installation
- Ability to bend and create curves
- Low weight
- Fire resistance (available in A2 non-flammable version)

Applications

- Ventilated Facades (residential buildings, public utility buildings, office buildings, shopping and leisure centres)
- Tunnel and arcade structures
- Headliners, attics and gable structures

ROCKPANEL® Natural, Brunner’s headquarters [Germany]



ROCKPANEL® Colours, office building [Montpellier, France]

ROCKPANEL® panels

List of available panel thickness versions and formats: ROCKPANEL®		
Panel type/colour line	Available thickness versions (mm)	Available utility formats(mm)
ROCKPANEL® Colours	8, 9*	1200 x 3050 order up to 100 m² of a given format and colour version: 1200 x 2500 1250** x 2500/3050 order up to 300 m² of a given format and colour version: 1200 /1250** x 1700-3050
ROCKPANEL® Woods	8, 9*	
ROCKPANEL® Metallic	8, 9*	
ROCKPANEL® Chameleon	8, 9*	
ROCKPANEL® Natural	8, 10*	
ROCKPANEL® Ply	6, 8, 10	

* FS-Xtra version panel thickness, ** 1250 mm wide ROCKPANEL® Chameleon panels are not available

Basic technical data			
Property	Unit	Value	Standard
Density			
ROCKPANEL® Durable	kg/m³	1050 ± 150	
ROCKPANEL® Xtreme		1200 ± 100	
ROCKPANEL® FS-Xtra		1250 ± 100	
ROCKPANEL® Ply		1000 -100/+150	
Dimensional stability			
ROCKPANEL® Durable	mm/(m·K)	11 · 10-3	PN-EN 438-2
ROCKPANEL® Xtreme		13 · 10-3	
ROCKPANEL® FS-Xtra		9,7 · 10-3	
ROCKPANEL® Ply		9,7 · 10-3	
Change in length under the influence of moisture when conditions fluctuate from 23°C/50% of relative humidity to 23°C/95% of relative humidity			
ROCKPANEL® Durable	mm/m (after 4 days)	0,302	
ROCKPANEL® Xtreme		0,29	
ROCKPANEL® FS-Xtra		0,206	
ROCKPANEL® Ply		0,241	
Water absorption through an edge subjected to cutting after 28 days.			
przy 20°C i 65% wilg. wzgl.	%	< 1,3	PN-EN 438-2
przy 2°C i 90% wilg. wzgl.		< 0,2	
Young's modulus			
ROCKPANEL® Durable	MPa	4015	PN-EN 310
ROCKPANEL® Xtreme		5260	
ROCKPANEL® FS-Xtra		4740	
ROCKPANEL® Ply		3065	
Bending strength coefficient			
ROCKPANEL® Durable	MPa	≥ 27	PN-EN 310, PN-EN 1058
ROCKPANEL® Xtreme		≥ 34,5	
ROCKPANEL® FS-Xtra		≥ 25,5	
ROCKPANEL® Ply		≥ 15	
Minimum bending radius			
for 6 mm thick Durable panels	mm	1900	
for 8 mm thick Durable panels		2500	
Fire reaction class			
ROCKPANEL® Durable, Xtreme i Ply		B-s2-d0	PN-EN 13501-1
ROCKPANEL® FS-Xtra		A2-s1-d0	

* depending on the substructure used, the panels can achieve parameters corresponding to the B-s1, d0 class.

ROCKPANEL® panels

Storage

ROCKPANEL® panels are insensitive to moisture; however, during storage, they are exposed to moisture and night cooling conditions other than present on their installation site. Before installing the panels, it is necessary to wait until possible moisture or steam condensate is discharged to the outside.
It is recommended that the panels should be stored on a flat pallet placed on level ground, in a dry and frost-protected location. The panels should not lie directly on the ground. Do not stack more than 2 pallets on each other.
When removing the panels, lift them to avoid moving them over one another. During storage protective foam spacers can be reused to protect panel surfaces.

Machining

Basic machining methods for ROCKPANEL® panels include:
Cutting: standard woodworking tools are used:
• hand saw, e.g. a saw with hardened teeth;
• circular saw, e.g. widia disc with small teeth;
• fretsaw, e.g. metal-cutting blade with fine teeth or a blade with tungsten teeth
Drilling: ROCKPANEL® panels do not require pre-drilling holes before mounting on wooden structures. If rivets are used, it is recommended that 5.5 mm diameter drills for fixed points and 8 mm diameter drills for sliding points should be employed. Pre-drilling can be performed using an HSS steel drill.

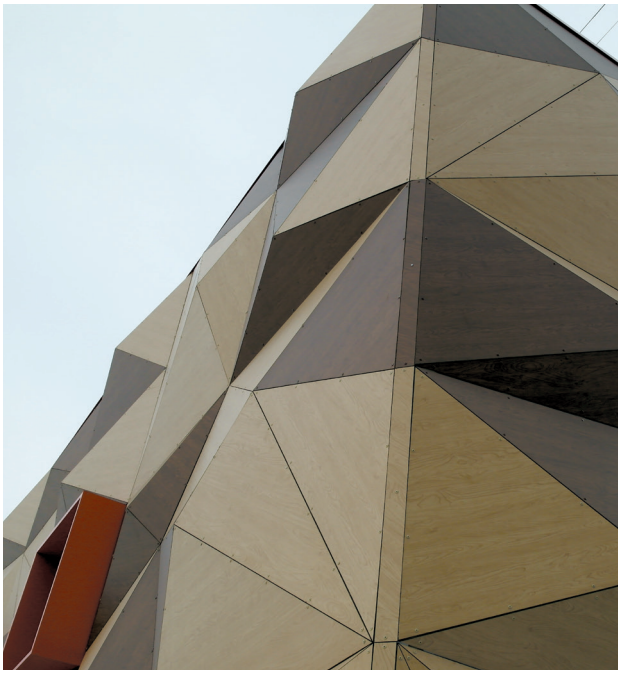
Edge finish

ROCKPANEL® panels are resistant to weather conditions; they do not delaminate or rot. There is no need for additional moisture protection of cut and drilled edges. However, chamfering is advisable, slightly rubbing them with the non-decorative side of the ROCKPANEL® panel trimmings. If required by appearance-related considerations, side edges can be additionally painted with water-borne wood paint.

Installation

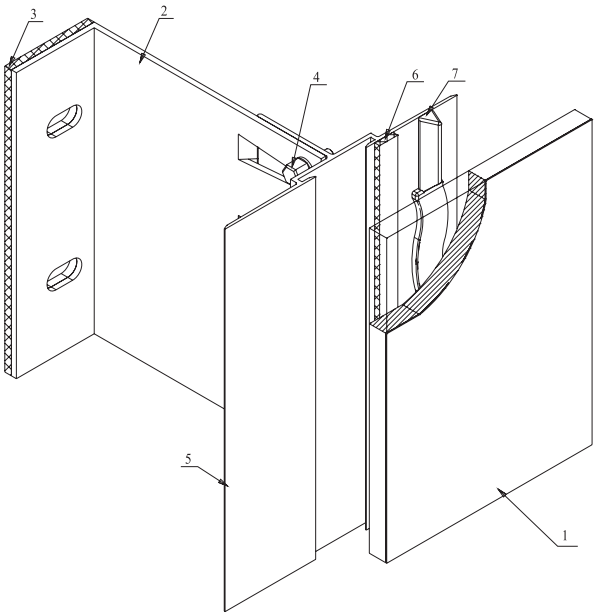
ROCKPANEL® panels can be attached to an aluminium (recommended solution), steel or wooden substructure, in a visible (using rivets, screws or nails) or concealed manner (adhesives or mechanical installation using anchor bolts).

ROCKPANEL® Colours (engraved), University Campus [Sheffield, England]


ROCKPANEL® Woods, Navigator Campus [Kazan, Russia]

Substructure systems for facade cladding

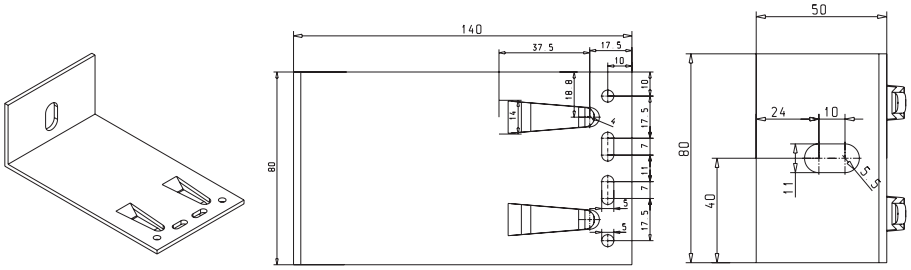
Substructure systems include elements such as bracket pads, single and double brackets as well as passive and stainless steel brackets and aluminium profiles. Systems provided by our company are attested and come with ITB technical approvals.



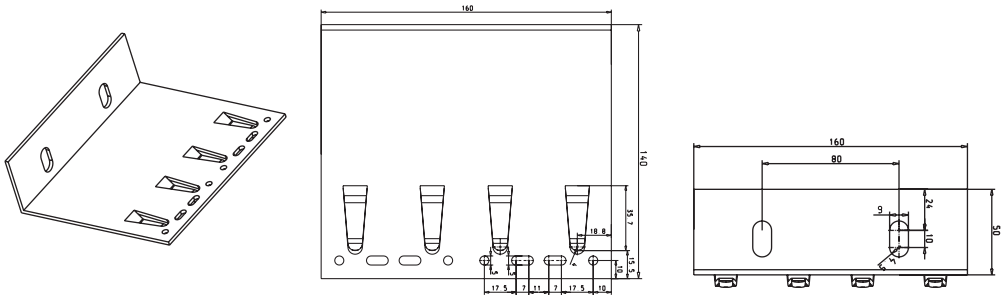
1 – TrespaMeteon panel
2 – double aluminium bracket
3 – insulating pad
4 – screw or rivet
5 – T-type aluminium profile
6 – mounting tape
7 – system assembly adhesive

We offer:

- single aluminium brackets with a reach in the range of 40 – 310 mm

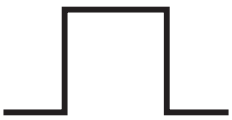


- double aluminium brackets with a reach in the range of 40 – 310 mm



- stainless steel brackets;
- passive brackets with a reach in the range of 170 – 280 mm

Aluminium profiles

Name	Sketch	Weight (kg/mb)
Z profile for SZ20 system		0,668
S profile for SZ20 system		0,601
Startup profile for SZ20 system		0,559
Hat profile for SZ20 system		1,019
F compensation profile		0,5
T profile 60x50		0,726
T profile 100x50		0,813
Angle bar 60x45		0,501
SZ20 system profile assembly clip (packaging – 100 pcs.)		-
Slip sheet for mounting profiles in the system SZ20 (packaging – 100 pcs.)		-

Non-flammable rock wool insulation (mineral)

Basic raw materials in the mineral rock wool production process primarily include basalt and gabbro (alkali, medium- or coarse-grained intrusive rock). The manufacturing process starts with feeding correct proportions of raw materials and placing them in a special cast iron furnace in which coke, used as fuel, generates high temperatures of approx. 1400-1500°C during combustion. At such temperatures, mineral rocks take the form of liquid lava. The resulting liquid rock mass flows out of the furnace and gravitationally descends onto discs rotating at a speed of several thousand revolutions per minute. The discs break up the raw material, transforming it into fibres that are air-cooled and collected in the settling chamber in the form of a wool "carpet". When fibres are formed, binders and hydrophobic agents are added. From the settling chamber, the wool "carpet" is conveyed to the process line, where it is formed by compressing and disturbing fibres in many directions.
Then the mineral rock wool passes through the polymerisation chamber in which it is heated up to temperatures of approx. 200°C, so that full polymerisation of added resins and stabilisation of the material occurs in the final process before its final treatment. The wool "carpet" is cooled down. At the end of the line, the rock wool is cut to the size specified in the production plan, and then placed in film packaging. During the last stage of the process, packages with panels or rolls are transferred to a warehouse.

Our offer includes mainly products used as thermal insulation for ventilated Facades.

PANELROCK – rock wool panels providing thermal insulation of:
- low (up to 12 m high) walls with Facades made of panels (e.g. sheet metal, siding, boards);
- low (up to 12 m high) walls with stone or glass Facades;
- framework structure walls;
- curtain walls;
- three-layer walls;
- partition walls;
- three-layer foundation walls

Declared thermal conductivity coefficient λ= 0.036 W/m·K

PANELROCK F – rock wool panels with glass non-woven fabric cladding for thermal insulation of:
- low (up to 12 m high) walls with Facades made of panels (e.g. sheet metal, siding, boards);
- low (up to 12 m high) walls with stone or glass Facades;
- framework structure walls;
- curtain walls;
- three-layer walls;

Declared thermal conductivity coefficient λ= 0.036 W/m·K

Advantages

- Non-flammable
- Hydrophobic: the material does not absorb water or moisture from air
- Thermoinsulating power: heat transfer coefficient λ = 0.034 - 0.038 W/m·k
- Steam permeability facilitating removal of moisture accumulated indoors to the outside, which leads to building microclimate improvement
- Soundproofing insulation – insulates both from airborne and impact sounds
- Durability
- Fully recyclable (100% of production waste is recycled in the form of briquettes and reused as a charge material – raw material)

Applications

All types of buildings (single-family, multi-family, public and commercial utility buildings, sports facilities, warehouses) as thermal insulation for:
- roofs (flat and diagonal);
- attics;
- external walls (made in BSO technology, ventilated, three-layer, with framework structure)
- partition walls;
- floors

Non-flammable rock wool insulation (mineral)

Format	Thickness	PANELROCK / PANELROCK F				VENTI MAX / VENTI MAX F				WENTIROCK / WENTIROCK F			
		Thermal resistance RD	Number of panels per package	Number of packages per pallet	Number of m^2 per package / pallet	Thermal resistance RD	Number of panels per package	Number of packages per pallet	Number of m^2 per package / pallet	Thermal resistance RD	Number of panels per package	Number of packages per pallet	Number of m^2 per package / pallet
(mm)	(mm)	(m^2/W·K)				(m^2/W·K)				(m^2/W·K)			
600 x 1000	50	1,35	8	30	4,8/144	-	-	-	-	1,35	8	30	4,8/144
	60	1,65	8	25	4,8/120	-	-	-	-	1,6	8	25	4,8/120
	80	-	-	-	-	2,2	6	25	3,6/90	2,15	6	25	3,6/90
	100	-	-	-	-	2,75	4	30	2,4/72	2,7	4	30	2,4/72
	120	-	-	-	-	3,3	4	25	2,4/60	3,2	4	25	2,4/60
	140	-	-	-	-	3,85	3	25	1,8/45	-	-	-	-
	150	-	-	-	-	4,15	4	20	2,4/48	4,05	4	20	2,4/48
	160	-	-	-	-	4,45	3	25	1,8/45	4,3	3	25	1,8/45
	180	-	-	-	-	5	3	20	1,8/36	4,85	3	20	1,8/36
	200	-	-	-	-	5,55	3	20	1,8/36	5,4	3	20	1,8/36

VENTI MAX – rock wool panels providing thermal insulation of:
- walls with Facades made of panels (e.g. sheet metal, siding, boards);
- walls with stone and glass Facades;
- framework structure walls;
- curtain walls;
- three-layer walls;
- partition walls;
- three-layer foundation walls

Declared thermal conductivity coefficient λ= 0.034 W/m·K

VENTI MAX F – rock wool panels with glass non-woven fabric cladding for thermal insulation of:
- walls with Facades made of panels (e.g. sheet metal, siding, boards);
- walls with stone and glass Facades;
- framework structure walls;
- curtain walls;
- three-layer walls;

Declared thermal conductivity coefficient λ= 0.034 W/m·K

WENTIROCK – rock wool panels providing thermal insulation and soundproofing of:
- walls with Facades made of panels (e.g. sheet metal, siding, boards);
- walls with stone and glass Facades;

Declared thermal conductivity coefficient λ= 0.037 W/m·K

WENTIROCK F – rock wool panels with glass non-woven fabric cladding for thermal insulation of:
- walls with Facades made of panels (e.g. sheet metal, siding, boards);
- walls with stone and glass Facades;

Declared thermal conductivity coefficient λ= 0.037 W/m·K

Multiwall polycarbonate

Polycarbonate resin is a unique engineering thermoplastic material, combining excellent mechanical, optical and thermal properties. Its versatility makes it a suitable solution for numerous applications. It is available, among others, in the form of single- or multi-cell boards and panels.

A wide range of special products is available:
- EASY CLEAN – self-cleaning panels;
- DRIPGARD – panels featuring a layer protecting against condensate formation and dripping;
- SOLAR CONTROL IR – panels preventing infra-red rays from penetrating into rooms;
- VENETIAN – panels with white stripes printed on the inside to reduce the amount of light illuminating rooms

Technical data			
Physical properties	Test method	Unit	Value
Density	ISO 1183	g/cm^3	1,2
Water absorption, 50% RH / 23°C	ISO 62	%	0,15
Water absorption, saturation / 23°C	ISO 62	%	0,35
Mechanical			
Stress at the yield point 50mm/min	ISO 527	MPav	60
Tensile strength at break 50mm/min	ISO 527	MPa	70
Elongation at the yield point 50mm/min	ISO 527	%	6
Elongation at break 50mm/min	ISO 527	%	120
Elastic modulus during stretching of 2mm/min	ISO 527	MPa	2300
Bending stress at the yield point 2mm/min	ISO 178	MPa	90
Bending stress at break 2mm/min	ISO 178	MPa	2300
Hardness H358/30 95	ISO 2039/1	MPa	95
Thermal			
Vicat softening temperature, indicator B/120	ISO 306	°C	145
HTD/Ae, 1.8 MPa edge 120*1*04/sp=100	ISO 75	°C	127
Thermal conductivity	ISO 8302	W/m·°C	0,2
Linear thermal expansion coefficient 23-80°C	ISO 11359-2	1/°C	7.00 E-05
Electric			
Volume resistivity (specific resistance)	IEC 60093	Ohm.cm	10 E15

Advantages

- Good thermal insulation parameters
- High light transmission
- High impact strength
- Double-sided UV protection (eliminates the risk of incorrect assembly)
- Yellowing of panels 2–3 times lower than in the case of panels manufactured using the traditional co-extrusion method
- High resistance to weather conditions
- High rigidity
- Low weight
- Wide selection of panel structures and thickness versions
- Cold bending capability
- Durability (possibility of obtaining up to 15 years of warranty coverage)

Applications

- Porch, greenhouse, winter garden, pergola and loggia walls
- Umbrella roofs as well as bus stop shelter roof and canopies above entrances
- Vestibules
- Glazing for canopies, marketplaces, swimming pools, etc.
- Glazing for sports facility roofs
- Transparent door and window fillings
- Skylights and smoke dampers – flat and curved
- Interior design and construction elements
- Partition walls, suspended ceilings
- Other structures, e.g. solar collectors, protective covers

Multiwall polycarbonate

Range

Multiwall panels			
Structure	Thickness (mm)	Weight (kg/m²)	Heat transfer coefficient U (W/m²· K)
2-wall panels	4,5	1,00	3,86
2-wall panels	6	1,30	3,56
2-wall panels	8	1,50	3,26
2-wall panels	10	1,70	3,02
5-wall panels	10	1,75	2,48
3-wall panels	16	2,70	2,27
5-wall panels with X structure	16	2,70	1,88
9-wall panels with X structure	16	2,50	1,77
9-wall panels with X structure	18	2,70	1,69
9-wall panels with X structure	20	2,80	1,59
5-wall panels with X structure	20	3,20	1,69
9-wall panels with X structure	25	3,00	1,40
5-wall panels with X structure	25	3,40	1,51
5-wall panels with X structure	32	3,80	1,32
9-wall panels with X structure	40	4,30	1,10
9-wall panels with X structure	45	4,50	1,04
9-wall panels with X structure	50	4,80	0,99
9-wall panels with X structure	55	5,00	0,90

Multiwall panels			
Structure	Thickness (mm)	Weight (kg/m²)	Heat transfer coefficient U (W/m²· K)
3-wall panels	20	2,50	2,20
5-wall panels with X structure	40	4,00	1,40
9-wall panels	40	4,15	1,00

Multiwall polycarbonate

Multiwall polycarbonate

Polyester laminate

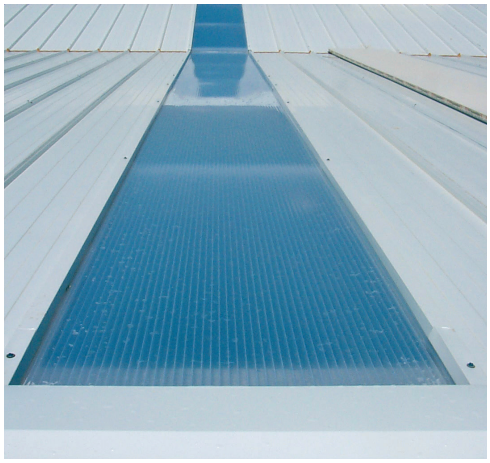
Polyester resin reinforced with glass fibres used combined with multiwall polycarbonate for roofing and glazing applications in various types of facilities. It enhances fire resistance of the entire roofing structure up to class NRO (B_{roof}(t1)).

Accessories for multiwall panels mounting

PC profiles	
Cross-section	Name
	Closing profile made of PC b/b for panels with a thickness of 4 mm
	Closing profile made of PC b/b for panels with a thickness of 6 mm
	Closing profile made of PC b/b for panels with a thickness of 8 mm
	Closing profile made of PC b/b for panels with a thickness of 10 mm
	Closing profile made of PC b/b for panels with a thickness of 16 mm
	Connecting profile made of PC b/b for panels with a thickness of 4 mm
	Connecting profile made of PC b/b for panels with a thickness of 6 mm
	Connecting profile made of PC b/b for panels with a thickness of 8 mm
	Connecting profile made of PC b/b for panels with a thickness of 10 mm
	Connecting profile made of PC b/b for panels with a thickness of 16 mm

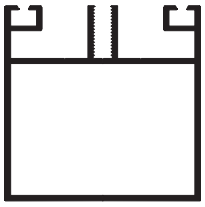
Multiwall polycarbonate

Multiwall polycarbonate

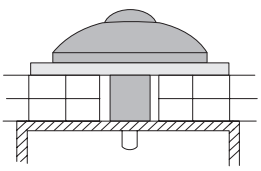


Multiwall polycarbonate

AL profiles

Cross-section	Name	Weight (kg/mb)
	Closing profile for panels with a thickness of: 6 mm	0,22
	Closing profile for panels with a thickness of: 8 mm	0,23
	Closing profile for panels with a thickness of: 10 mm	0,24
	Closing profile for panels with a thickness of: 16 mm	0,26
	Closing profile for panels with a thickness of: 20 mm	0,27
	Closing profile for panels with a thickness of: 25 mm	0,29
	Upper profile	0,39
	Bottom profile	0,67
	Bottom structural profile	1,346
	Basic profile for curved skylights	0,304
	Hinged closing profile for panels with a thickness of: 10 mm	0,717
	Hinged closing profile for panels with a thickness of: 16 mm	0,746

Mushroom-shaped washers

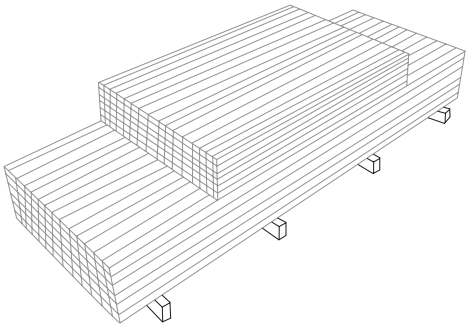
Cross-section	Name
	Mushroom-shaped washer made of PA for fixing panels with a thickness of 6, 10 or 16 mm

Multiwall polycarbonate

Seals	
Sketch	Name
	EPDM bottom seal, adhesive, SD-12, width 60 mm (roll length 30 running metres)
	EPDM bottom seal, S-228 (roll length 100 running metres)
	EPDM upper seal, S-229 (roll length 100 running metres)

Storage

Panels of the same length should be laid together horizontally or (if they are of different lengths) stacked so that the longest panel is at the bottom in order to avoid a situation in which protruding parts of the panels are not supported.

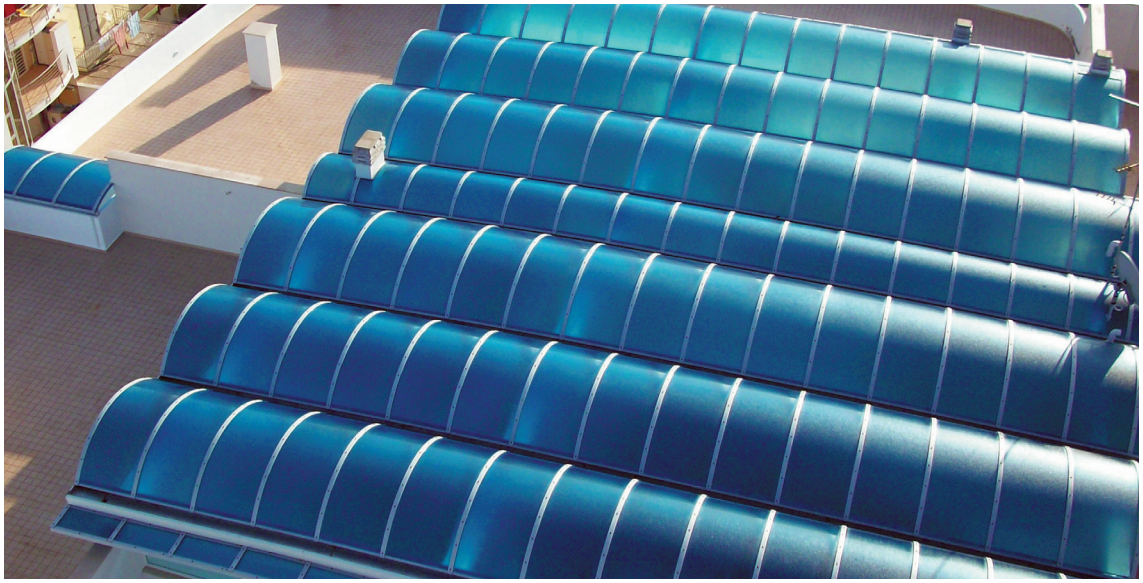


Cutting

Panels with a smaller thickness (up to 10 mm) can be cut using a knife. However, the knife must be sharp.

Drilling

While drilling, support the panel directly under a drill to avoid vibrations.



Multiwall polycarbonate

Solid polycarbonate

Solid polycarbonate (also known as “safety glass”) is a building material with excellent mechanical, thermal, optical and electrostatic properties. It combines high impact strength and flexibility with low weight. It can be used in a wide temperature range (-40/+135°C). Two types of this material are available: without UV protection (for indoor applications) and with double-sided UV protection for outdoor applications).

Advantages

- very high impact strength: up to 200-300 times greater than glass
- excellent transparency: light transmission up to 92% for solid colourless panels
- reduced flammability compared to other plastics
- high temperature resistance – possible operation in the range of -40/+135°C
- double-sided protection against UV radiation (for panels intended for outdoor applications)
- panels secured on both sides with protective polyethylene film
- additional properties of special panels: increased resistance to scratching, increased chemical resistance, reduced flammability, etc.
- susceptibility to thermoforming and cold bending

Applications

External construction
- roof structures for halls, supermarkets, bus stop shelters and telephone booths
- passageway roofs, bus stop shelter roofs and canopies above entrances
- protective glazing
- roof coverings and roof skylights
- skylights and flaps – flat and pressed
- noise barriers

Internal construction
- vertical glazing in industrial, commercial sports and recreational facilities
- transparent, safety glazing of doors and windows
- interior design and construction elements (partition walls, suspended ceilings)
- safety glazing

Advertising
- advertising boards, signboards;
- illuminated graphics, LED backlighting
- projection boards
- advertising panels
- spatial letters
- advertising pylons

Industry
- transparent protective shields for crowd control units
- helmet shields
- other safety applications
- car window rain guards
- protective devices for machines
- industrial camera guards

Acoustic properties as per DIN 52210-75 Rw (dB)

Thickness (mm)	Solid PC	Glass
4	24	30
5	25	30
6	26	31
8	28	32
12	31	34

Weight comparison in kg/m2

Thickness (mm)	Solid PC	Glass
3	3,60	7,50
4	4,80	10,00
5	6,00	12,50
6	7,20	15,00
8	9,60	20,00
9,5	11,40	23,80
12	14,40	30,00
15	18,00	37,50

Solid polycarbonate

Solid polycarbonate

Technical data			
Physical properties	Test method	Unit	Value
Density	ISO 1183	g/cm^3	1,2
Water absorption, 50% RH / 23°C	ISO 62	%	0,15
Water absorption, saturation / 23°C	ISO 62	%	0,35
Mechanical			
Stress at the yield point 50mm/min	ISO 527	MPav	60
Tensile strength at break 50mm/min	ISO 527	MPa	70
Elongation at the yield point 50mm/min	ISO 527	%	6
Elongation at break 50mm/min	ISO 527	%	120
Elastic modulus during stretching of 2mm/min	ISO 527	MPa	2300
Bending stress at the yield point 2mm/min	ISO 178	MPa	90
Bending stress at break 2mm/min	ISO 178	MPa	2300
Impact energy			
Charpy impact strength test, with a notch, 23°C, 3 mm	ISO 179/1C	kJ/m^2	75
Izod impact strength test, without a notch, 23°C, 3 mm	ISO 180/1U	kJ/m^2	bez pęknięć
Izod impact strength test, with a notch, 23°C, 3 mm	ISO 180/1A	kJ/m^2	70
Thermal			
Vicat softening temperature, indicator B/120	ISO 306	°C	145
Deformation temperature under load (type A), 1,8 Mpa	ISO 75	°C	127
Thermal conductivity	ISO 8302	W/m·°C	0,2
Linear thermal expansion coefficient 23-80°C	ISO 11359-2	1/°C	$7.00 \cdot 10^{-5}$
Electrical			
Volume resistivity (specific resistance)	IEC 60093	Ohm.cm	min. 10^{15}
Ground fault protection	IEC 60243-1	kV/mm	18

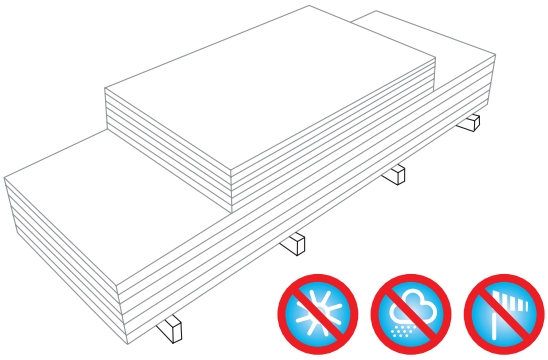
Solid polycarbonate

Solid polycarbonate

Storage, processing, assembly

Storage

Solid polycarbonate panels should be stored in conditions protecting them against weather conditions such as rain, sun, etc. Panels of the same length should be stacked horizontally or (if they are of different lengths) longer panels should be laid on the bottom, and shorter ones on the top to avoid bending of unsupported parts. Do not stack in locations where it is possible to climb them or drive onto them. Similarly with other materials used for glazing, panels should be transferred and transported carefully to avoid scratches and damage to their edges. Each panel packaging protects it against similar damage.



Basic machining methods

Cutting: e.g. with circular saws, belt saws, jigsaws and metal saws. Keep in mind the following recommendations.
The panel must always be securely fixed and adequately supported to avoid unwanted vibrations and damage to edges during cutting or sawing.
The protective film should be left on the panel to prevent scratches and other surface damage.
After machining of panel edges, they should be clean and without any irregularities. If possible, dust and chips should be removed by blowing panels with compressed air.
Always use low feed values to obtain a smooth cutting surface.
Always start cutting with a fixed, high rotational speed.
For trimming panels with a thickness below 3 mm, use belt saws or jigsaws instead of circular saws.

Drilling: standard high-speed steel drills or drills with angular wedge blades can be used. Drill bits with carbide tips are also suitable because they retain their cutting properties. Keep in mind that heat is generated during drilling operations, which may compromise the panel internal structure. To make a clean hole without burrs and without stress, the amount of heat generated during drilling must be maintained at an absolutely minimum level. This can be achieved by following several basic recommendations.
Frequently clean the hole to remove chips and, simultaneously, dissipate the excess heat generated by friction.
The drill must be removed often from a hole and cooled down with compressed air.
A panel or another product must be correctly fixed and supported to reduce vibrations and thus obtain a hole with the required diameter.
The minimum distance between a hole drilled in a panel and its edge must not be less than twice the hole diameter.
All holes must have a diameter greater than screws, pins or fasteners to allow for free material expansion.

Installation

Solid polycarbonate panels should be installed during the last stage of construction works, and the finishing works schedule should be adequately adjusted to this end.
Correct precautions should be taken to avoid surface damage during storage, cutting, transport and installation.
After installing the panels and removing the protective film, they should be protected against paint, mortar and other impurities by covering them with a polyethylene film or another film attached to structural elements.
Check the compatibility of panels with supplied tapes, seals and sealants.
As solid polycarbonate panels demonstrate variability of dimensions under the influence of changes in temperature, while seating them, the possibility of free expansion and shrinkage of materials must be taken into account to prevent buckling and thermal stresses. It should be assumed that each panel expands by approx. 3 mm per each running metre of length.

Other offerings

Advertising

- Extruded PMMA panels
- Poured PMMA panels
- Poured PMMA panels for special applications
- Poured PMMA blocks
- PET polyester panels
- PETG polyester panels
- Solid polycarbonate panels
- SAN panels
- PVC foam
- PVC foam panels with a hardened surface
- Polystyrene panels
- Hard PVC panels and films
- PP and PET films
- Adhesive films
- TKEbond and TKEbond Basic composite panels
- DIBOND®, Hylite® composite panels
- Cardboard-foamboard panels
- Lightweight sandwich panels
- Multiwall polycarbonate panels

Industry

- PP (extruded and pressed polypropylene – panels, rolls, profiles, welding wire)
- PE (extruded and pressed polyethylene – panels, rolls, profiles, welding wire)
- Hard PVC (panels, rolls, welding wire)
- Soft PVC strips
- Structural plastics PA (cast and extruded), POM, PET, PTFE (panels, rolls, sleeves)
- ABS, ABS/PMMA (panels for thermoforming)
- HIPS (high-impact polystyrene panels)
- PS-GP (polystyrene panels)

Servicing of plastics

- Cutting with a table saw
- Cutting with a vertical saw
- Cutting with a shearing machine

Metals

- Carbon steel
- Stainless steel
- Non-ferrous metals
- Construction reinforcements
- Sheet pile
- Steel structures
- Welding materials
- High-quality steels
- Service

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Materials Poland

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Amount of share capital and paid-in capital: 15 mln PLN
Register: District Court in Toruń,
VII Economic Division of the National Court Register
KRS: 20529, NIP: 9561627586

Distribution of plastics

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MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 • ISO 45001

08/2022 - 250 pcs. (ECHO)