

Installation Manual

TBE 40-60mm

Translucent Building Elements

PC 2540-4



PC 2540-4-MC



PC 2540-6



PC 2540-7



PC 2540-10



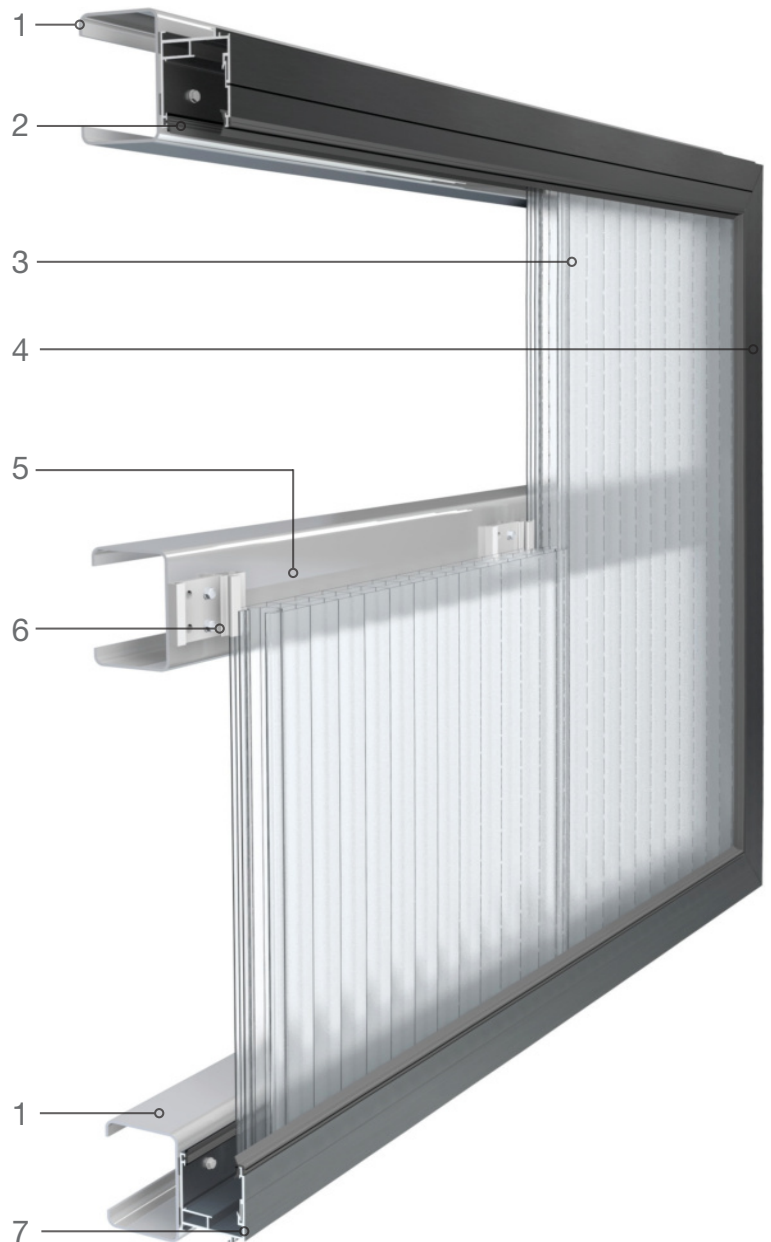
PC 2540-10 DX



PC 2550-10



PC 2560-12



Overview

- 1 Substructure by others
- 2 Top/side frame profile
- 3 Translucent building element
- 4 Top/side frame profile
- 5 Substructure for multi-field constructions by others
- 6 Fastener for multi-field constructions
- 7 Base profile with drainage holes

Mounting situations



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Before start of installation

Please check the complete delivery of materials and note our general information storage and installation instructions! The substructure on site must be checked for line and level before the translucent building elements are installed. For pitched roof installations a slope of at least 15° must be observed and the corresponding base profile has to be used (Fig. 4). The sealing to substructure and all fixings are not part of the Rodeca system and must be adapted to conditions on site. Due to production tolerances, it is possible that the assembled profiles (aluminium parts and thermal break) are misaligned (Fig.1). Before installation, the profiles must be checked and if necessary trimmed by the installer. Anodized and powder-coated profiles can have pressure marks or drill holes due to the process. These profiles must also be trimmed on site (Fig. 2). It is necessary to ensure that profiles with drainage holes are used as base profiles (Fig. 3 & 4).

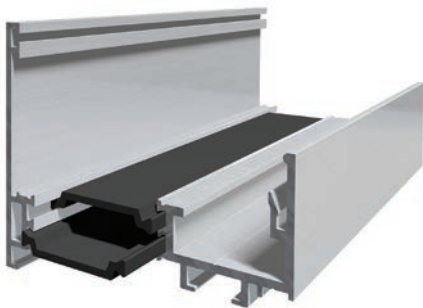


Fig. 1



Fig. 2



Fig. 3

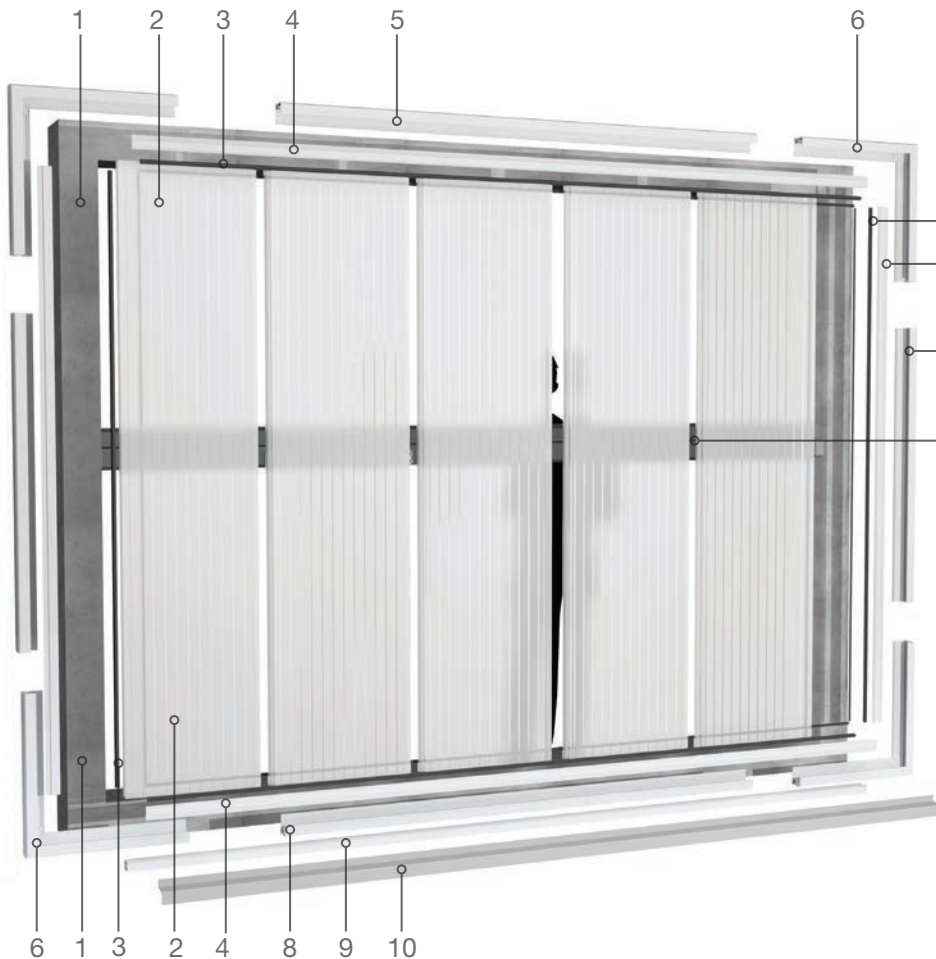


Fig. 4

- 1 Substructure
- 2 Translucent building element
- 3 Gasket
- 4 Front plate
- 5 Top / side frame profile
- 6 prefabricated corners
- 7 Fastener for multi-field constructions
- 8 Base profile
- 9 Adapter profile optional
- 10 Window sill optional

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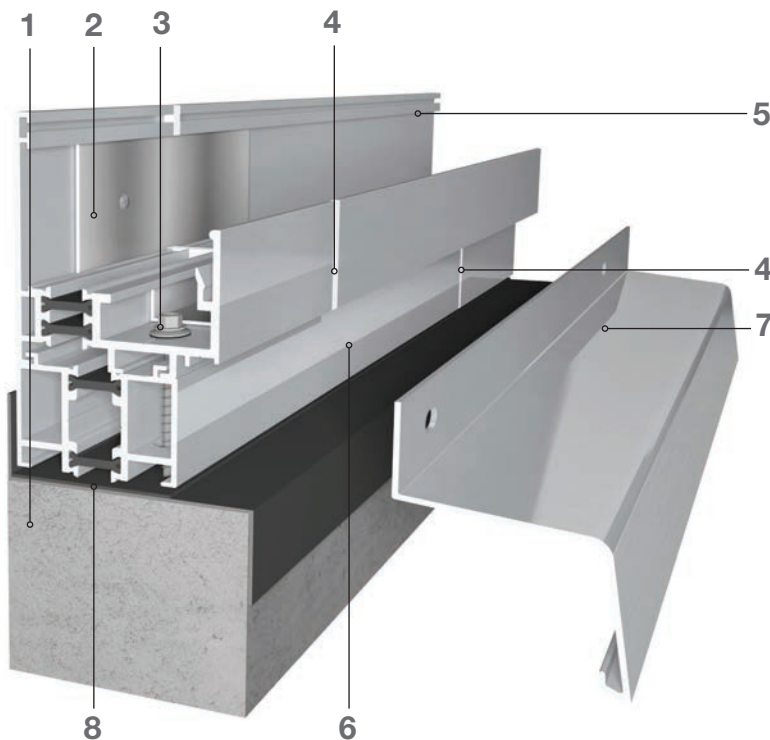
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Installation of aluminium frame profiles

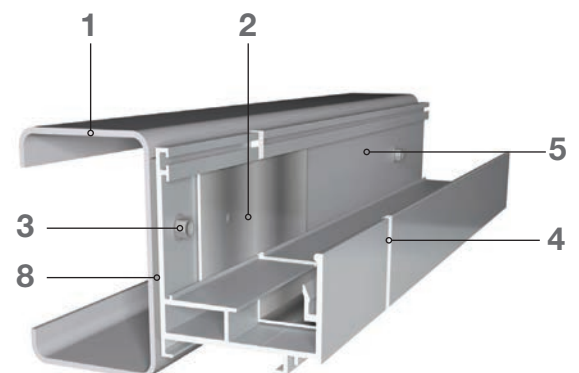
The aluminium frame profiles **(5)** are to be fixed to a suitable continuous substructure **(1)**.

All sealants to substructure are not part of the Rodeca system and must be specified on site **(8)**. Screw holes are to be pre-drilled approx. 20% larger than the screw diameter **(3)**. The distance between the fastenings should be approx. 350mm or respectively should be determined according to static requirements. The insulating bar of thermally separated profiles must not be drilled through. Washers with seals only need to be used in water-bearing areas. We recommend the use of stainless steel screws. For installation as "rainscreen" (s. Fig. 2), as well as "pitched rainscreen" (s. Fig. 3) the height of the screw head must not be higher than 5mm. The selection of screws, the proof of the aluminium profiles and the substructure must be carried out on a project-specific basis. In case of joints between aluminium profiles, the specified profile connectors **(2)** must be used, which are fixed on one side with pop rivets, small screws or similar. All expansion joints must be sealed completely with a suitable sealant **(4)**. Ensure that there is an expansion joint of approx. 3-5mm (this value applies to an installation temperature of +20°C).

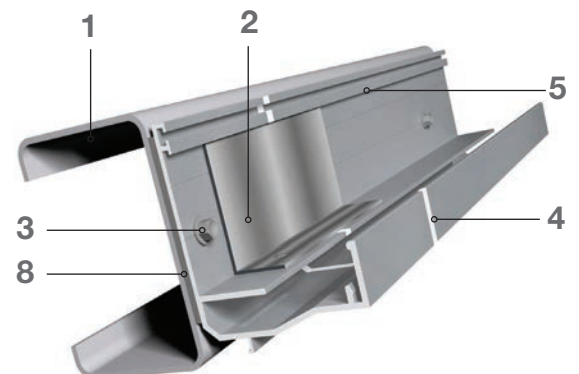
In case of using an adapter profile **(6)** the base profile must be connected to the adapter profile and screwed together to the substructure. Joints **(4)** between the adapter profile and the base profile are to be installed offset to each other. If required, a window sill **(7)** can be fixed at the adapter profile with window sill screws.



Installation in reveal (Fig.1)



Rainscreen installation (Fig. 2)



Pitched rainscreen installation (Fig. 3)

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Corner connections

Corner connections can be ordered either as prefabricated sections, or mitred on site and connected with the provided corner connectors. Drainage holes in prefabricated sections that are used as a base profiles must be drilled on site. For this purpose, three holes with a min. diameter of 5mm have to be drilled next to each other in the same channel as on the base profiles.



Rear gasket

Before glazing, the rear gasket must be applied by pushing the gasket into the inner rear channel of the aluminium frame profile. In order to compensate for shrinkage, gaskets must always be installed compressed.



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Fig. 1

Cutting

If the translucent building elements were not ordered cut to size, the sizes of the panels have to be calculated according to the Technical Manual dependent on the aluminium frame system being used. The panels can be cut to length using standard tools such as jigsaws or circular saws with fine-toothed saw blades (s. Fig. 2). The protective film should remain as long as possible on the panels, i.e. as long as the installation is not hindered by the film. Any swarf particles are to be removed with oil and water-free compressed air.

Translucent building elements are placed one after another into the circumferential aluminum profiles which are fixed to the substructure. The panels have to be connected by using the integrated tongue and groove connection (s. Fig. 1).

The following steps are necessary in advance:



Fig. 2

Taping

In order to minimize the penetration of dirt into the chambers of the panel, the panel ends must be covered carefully with adhesive tape (s. Fig. 3). Rodeca recommends to seal the upper end with a vapor-permeable tape (Anti-Dust-Tape) and the lower end with Rodeca Butyl-Tape. The tongue and groove must also be sealed carefully and completely. The application instructions of the tape manufacturers must be observed. If translucent building elements are used in building projects where there is an increased amount of dust and dirt due to the environment or production, special measures must be taken. Please observe the general information on this. The protective film should be peeled away from panel ends prior to taping (s. Fig.4). Care should be taken not to damage the sealing tapes when panels are placed into the aluminium frame profiles.

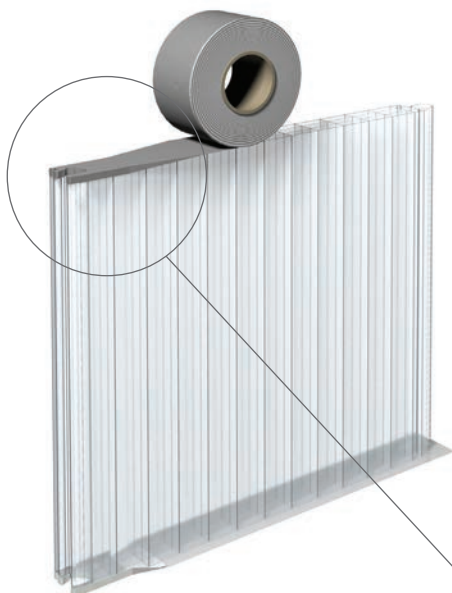


Fig. 3

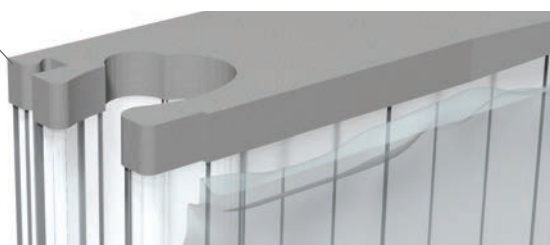


Fig. 4

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Fig. 1

Glazing

Even if no cutting of the panel seems necessary, the panel's tongue with which the installation begins must be removed (s. Fig. 2).



Fig. 2

The panels must be placed at an angle into the head or base profile. The panel is then pushed into the side frame profile. (Fig.1). The panel must be installed with the front lip facing away from the prevailing wind direction. The protective film must be peeled away from the sides of the panel to prevent entrapment in the coupling. This is difficult to remove if not (s. Fig. 3).

Fastener

The fastener, if required, must be positioned at the horizontal substructure and must be pushed against the panel. The fasteners are to be screwed to the substructure with at least 2 screws. Screws without washer and a screw head height of maximum 5mm are to be used. Please ensure that the entire fasteners surface sits fully on the substructure.



Fig. 3

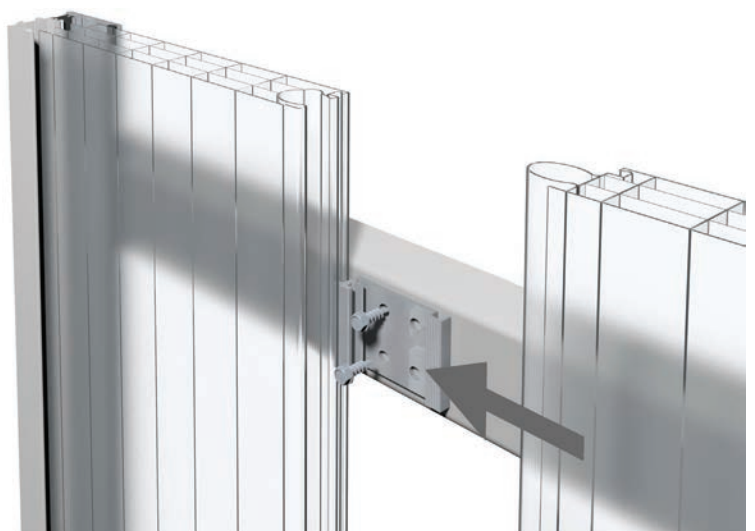


Fig. 4

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The following panels are to be placed into the frame profiles as described. Depending on the length of panel, it is necessary to use a hammer and softwood to connect the panels. Take care that the fasteners are positioned exactly inside the notches of the panels (s. Fig. 2). It is important to ensure that the fastener sits exactly in the groove of the panels. When installing panels with several supports, the fasteners must be fixed immediately after each panel is installed. When installation is interrupted the latest installed panel must be secured properly.



Fig. 1

We recommend to seal the panels fastener groove in the location of the frame profiles with PC-compatible silicone (s. Fig.1).

Front plates

After installation of the panels, the front plates are mounted by inserting into the provided channel of the frame profile until completely locked (Fig. 3). A softwood block and hammer can be used taking care to not damage the finish.



Fig. 2



Fig. 3

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External gasket

In order to compensate for shrinkage, the front external gasket must be installed compressed (s. Fig.1).

For this purpose, loops can be formed which are later pushed into place. Ensure that the gasket locks in completely. A wooden wedge can also be used for this (s. Fig.2).

It is important to install the external gasket onto the the front plate immediately. The gasket is pushed on securing the front plate via tension to the panel face.

The protective film of the panels must be removed at this point.

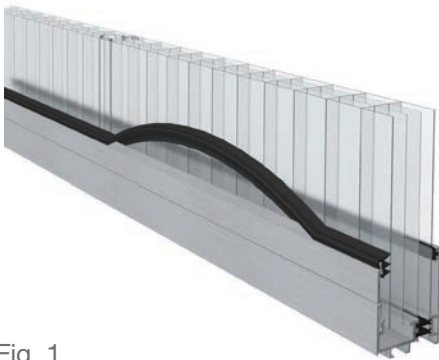


Fig. 1

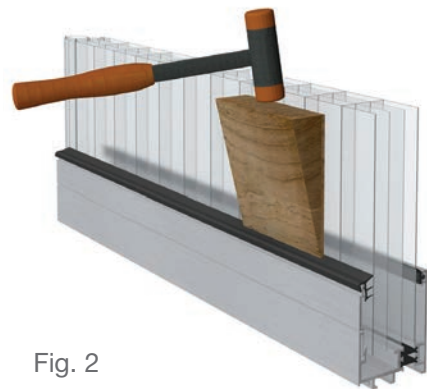


Fig. 2



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General information

The raw material

Polycarbonate (PC) is a crystal clear, high impact thermoplastic.

Advantages

Temperature resistance between -40 to +115°C, temporarily up to +130 °C

High impact resistance nearly unchanging within these temperatures

Good long term performance through UV protection

UV co-extrusion

With this technique a high concentrated UV protection film is homogeneously melted onto the basis material while production process.

This offers the following advantages:

- No adhesion problems of UV protection film
- Same temperature behaviour of base and UV material
- No impairment of high impact (like e.g. with coated or painted surfaces)
- Makes small cold bending radiuses possible.
- Better resistance against environmental influences and ageing.
- The thickness of the Coextrusion layer may influence the colouring.

Outside Performance

Through the coextruded UV-protection film – which is always applied on the outer wall and if desired (surcharge) for some of the products is also available both-sided – our products offer best weather resistance and very good long term performance.

Warranty

Rodeca offers 10 years warranty (according to written warranty) to its uv-coextruded products regarding to yellowing index – ageing – hail

Light transmission

Customized on project demand Rodeca can produce products with light transmission from almost 0% up to 80% light transmission (depending on material thickness and number of layers). Due to in-house compounding and raw material refinement special requests and colours can be realized. Please inquire project demands which vary from our standards.

G-Value (Solar gain value, overall energy transmittance)

The overall energy transmittance indicates how much of external solar energy reaches the interior of the room. For optimum passive use of solar energy, the g-value should be as high as possible and as deep as possible for optimum sun protection.

Up-values and Uf-values (heat transmission coefficient - Up=U-value panel; Uf =U-value frame)

Throughout the multi-walled design of our translucent building elements translucent facades with thermally broken aluminium profiles can be designed very energy efficient.

UV transmission

UV-radiation is stopped almost to 100% up to 380 Nm because of high UV-stabilization with coextruded UV-protection. The remaining transmission in the area of UV radiation is less than 1%. This property can be very important for UV sensitive goods.

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IR-radiation transmission

Our panels with Heatbloc-surface let through day light and reflect and stop at the same time selectively the heating radiation. The effect is cooler rooms through lower solar gain values.

Reflection of radar radiation

In the near of radar-units (e.g. at airports) it is important to have none or minimized influence through building elements. Rodeca products do not have influence on reflection and do not affect radar-units.

Service temperature

Service temperature is between minus 40 °C up to plus 115 °C (temporarily up to 130 °C). Please take into consideration service temperature especially with rain screen claddings respectively the use of dark foils for deposition of translucent building elements. Adequate distances and sufficient ventilation need to be considered in planning. That way danger of heat accumulation and associated deformations can be avoided.

Thermal properties

The high deformation resistance from shortly up to 130 °C is one of the advantages which Rodeca products with coextruded surface offer. Rodeca products can be used in spaces where other thermoplastics cannot be used anymore. Interesting to know is that white surfaces on roof applications already can heat up to +100°C. (It is essential to respect thermal expansion/shrinking of polycarbonate and to avoid heat accumulation.)

Colouring

The usual colours are:

- **Crystal** with structure for panels for higher light transmission, light refraction. Additionally the surface is less sensitive to scratches.
- **Opal** for optimized diffused light.
- **Color Series** - transparent or semitransparent colours, similar to RAL from approx. 300 m² on request
- **BiColor Series** - two coloured finish, inner wall coloured, similar to RAL from approx. 150 m² on request
- **DuoColor** - two coloured finish of translucent building elements custom made in transparent or semi-transparent colours similar to RAL from approx. 300 m² on request
- **DecoColor** - two coloured finish, outer wall coloured, similar to RAL from approx. 150 m² on request

Qualities

Depending on application area and demand Rodeca produces different qualities.

- **LONGLIFE** quality for one sided UV protection. The terms can be extracted from our 10 years warranty declaration for LBE, MFP and U-Panels "longlife"
- **LONGLIFE PLUS** quality for one sided UV protection quality for special requirements. The terms can be extracted from our 10 years warranty declaration for LBE, MFP and U-Panels "longlife plus".

Impact resistance/fracture behaviour

Rodeca products made of PC are due to the raw material practically indestructible through beat, impact, stone throwing etc. Polycarbonate is 200 times more impact resistant than glass. Polycarbonate building elements do not splinter and comply with German regulations on workplaces (Arbeitsstättenverordnung).

Hail resistance

Currently doesn't exist a DIN standard, so our Rodeca elements were tested at EMPA (Swiss testing laboratory) with a simulated hail test with a shot radius of 20 mm and no holes occurred. According to the current testing results we achieve the highest class (class 5) of the Swiss hail test with factory-new goods.

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Ball rebound safety

Ball rebound safety was tested and passed according to DIN 18032 part 3. Please inquire the test report if required.

Fire resistance

Polycarbonate has a very high ignition temperature of approx. 450 °C and in case of fire the smoke development is very little. Rodeca products are classified according to the European standard DIN EN 13501 and are classified as hardly inflammable. Additionally the fire resistance of our products is classified according to various national standards. Please inquire the test certificates when needed.

Meltable area

In many fire protection concepts Rodeca panels are considered as melt-surface according to DIN 18230-1 because the softening point of PC is below 300°C.

Sound insulation

Polycarbonate panels have a sound insulation value up to 22 dB according to DIN EN ISO 10140-2. With a double wall construction a considerably higher value can be achieved. The value refers to the panel only and may differ due to structural conditions.

Chemical resistance

PC elements possess a very high resistance to chemicals but can be affected through some chemical bounds. Chemical resistance of polycarbonate against other used chemicals has to be checked by customer on site. This is especially important for cooling substances, lubricants, surfactants, sealants, ammonia, etc. A policy on the compatibility of polycarbonate with chemicals can be found i.a. at: <http://www.buerkle.de/en/knowhow/information/chemical-resistance.html>

Painting

In case that the polycarbonate panels for advertising reasons or similar will be painted or screen printed the compatibility of the painting system needs necessarily be tested from customer before use. The aluminium frame profiles can be powder coated according to the project needs. Additionally Rodeca offers the possibility to deliver TPE gaskets in custom made colours.

Vinyl wrap

For advertising purposes large scale letters can be glued onto the panels' surface. It is important that the foil and the glue doesn't contain substances which harm and affect polycarbonate. Please clarify before usage with the vinyl wrap supplier or the advertising company if the ingredients/glues of the foil intended to use are compatible with Polycarbonate.

Cleaning/Maintenance

For durable maintenance of technical and visual properties a regular care, maintenance and cleaning of the translucent building elements is mandatory. The cycles of care, maintenance and cleaning depends on the particular building site and the usage conditions.

Cleaning of translucent building elements: Pure water cleaning systems (osmosis process) have proven themselves. In addition to surface cleaning with soft brushes, if dirt is present in the area of the coupling, the deposited dirt can be cleaned using a high-pressure cleaner in conjunction with the pure water method.

Alternatively, water with a small percentage of neutral cleaning agents. No use of glass cleaner, rubbing agents or sharp edged subjects. No alkaline or tensile agents to be used.

Storage/Transport

Rodeca panels made of polycarbonate have to be protected before sun and wet conditions before installation and must be stored on a plain and even underground. In case of non-observance stock damages may occur. The stacking height of translucent building elements shouldn't exceed 200 cm.

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Packaging

The translucent building elements are delivered – depending on the finish – with one-sided or both-sided protective foil. The delivery is carried out – depending on length – from one to four pieces for hand unloading in a recyclable plastic wrapping or on pallet (for forklift unloading). Please unpack briefly before installation to avoid contamination in the hollow chambers. The protective film must be removed after processing and installation. If the Translucent Building Elements are provided with both-side protective film, the protective film on the interior side is applied as transport protection.

Processing

The Polycarbonate Elements can be smoothly cut with common tools, e.g. pad saw (saw blade with fine indentation) Incidental shavings are to be removed with oil free and water free compressed air.

Expansion/Shrinking

The expansion coefficient of polycarbonate is 0,065 mm per °C and per m and hence three times as high as the expansion coefficient of aluminium.

Rule of thumb: 3mm per m for 50 °C difference in temperature. Due to temperature differences the length and width of the panel change. The changes in length of the panel need to be considered constructional. Rodeca has considered the length expansion in its system accessories. Thermally caused corrugations can not be excluded completely.

Sealing

Sealings and sealing tapes need to be polycarbonate compatible and approved for usage from respective producer otherwise damages on the panels are possible.

Silicone: Must be absolutely neutral and solvent free, e. g. Rodeca PC-Silicone 2001. The aluminium profiles need to be protected (according to state of the art technique) against galvanic corrosion and an adequate sealing of building has to be done.

Condensation

Polycarbonate is a material that is permeable for vapour diffusion so that condensation may occur. This is not a quality defect. Depending from weather/climate this appearance is of temporary nature which is directly linked to temperature and humidity. Condensation doesn't effect the quality of the panels.

Formation of algae

Algae can just occur in connection of dirt and humidity. Taping of the polycarbonate panels prevents appearance of dirt while stocking and transport.

Sealing of panel ends

The ends of the panels must be closed before installation - directly after unpacking - with suitable sealing to avoid dust and dirt in the chambers.

With a sealing that is permeable for vapour diffusion (or permeable to water) you run risk that dust, diesel exhaust particulates, gases or other fine particles can diffuse into the panel chambers. For projects with increased particulate matter emission respectively environmental pollution are additionally precautions to be taken. With a joint sealing and additional sealing methods the optical properties of the translucent building materials can be maintained. Every element needs to be sealed singularly. A general recommendation for sealing of panel ends can't be given due to the different installation situations. The complete lack of panel ends sealing cannot be recommended from our experience.

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Aluminium frame profiles

Aluminum frame profiles shall be treated in accordance with the unloading and storage regulations. Mill finish aluminium with oxidative staining is not accepted as reclamation reason. Due to production reasons, the end faces of thermally separated frame profiles are to be trimmed by the customer. Coated or anodised frame profiles can have bores or discolourations of the clamping points of the anodizing process at the lateral ends and are to be shortened if necessary on site. This is not accepted as reclamation reason. Coated profiles can have color deviations to other components in the same color. The chemical resistance of aluminum must be observed. Care and maintenance of aluminum profiles can preserve the optical properties and texture.

Safety

The regional building regulations as well as the general safety regulations for non supporting wall and roof coverings are effective. For a perpetration (according to workplace ordinance (German „Arbeitsstättenrichtlinie“) it is mandatory to use a board of 50 cm width.

Tolerances according to EN 16153

Panels

Length + 12 mm (up to 3 m) / +0.40 % of panel length (above panel length of 3 m)

Thickness \pm 0.5 mm

Width -2 mm / +6 mm

Weight - 5 %

Concavity length \pm 5 mm per linear meter of panel length

Concavity width \pm 5 mm per linear meter of panel width

Rectangularity < 5 mm per linear meter of panel length

All tolerances are based on room temperature of approx. 20 °C.

Variations in colour saturation and shade between several production batches cannot be precluded (production-related). Variations are always possible and will not be accepted as reason for complaint.

Disposal of waste/Environmental protection

Rodeca takes leftovers from off-cuts etc. back. Packaging is fully recyclable.

Joint permeability

Rodeca panels were tested on joint in terms of wind and driving rain. For complete constructions project specific blower door tests have been passed. .

System accessories

For almost all installation situations Rodeca supplies appropriate and well engineered accessories as well as ventilation flaps and windows in many different versions.

ETA (European Technical Assessment)

Rodeca panel (LBE) systems are CE marked as specified by the European directive No. 305/2011 and according to ETA 19/0452. The European Technical Assessment - ETA for short - is a European product certification. It is requested in particular for construction products for which there is no harmonized standard. At the same time, ETA authorizes a CE marking. It is mandatory that usability of single certificates is checked in advance from planner /client.

Environmental Product Declaration (EPD)

To enable qualified building certification, we provide an EPD for our light building elements. The Type III declaration according to ISO 14025 and EN 15804 provides reliable data on the environmental characteristics of the products and thus facilitates the sustainability assessment of buildings. Among other things, it contains important information on the life cycle of the products. This includes, in particular, the environmental key figures required for a certification scheme of buildings. These were calculated for all tongue and groove panels and shown from the cradle to the grave.

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Miscellaneous

Data subject to technical change.

The aforesaid information and our application technological advice in words, written and through tries, are carried out to best of one's knowledge. This information is non-binding advice even in regards to property rights of third parties. Our advice does not release you from your responsibility to proof self dependently our current advices - especially our safety data sheets and technical information - and to test if our products in regards to applicability for the intended system and use. Application, use and handling of our products – produced from you based on our application technological advice - take place out of our control and therefore you are solely responsible. The sale of our products is carried out according to our current general terms and conditions. Please check before handling if our products are applicable for the intended purpose.

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