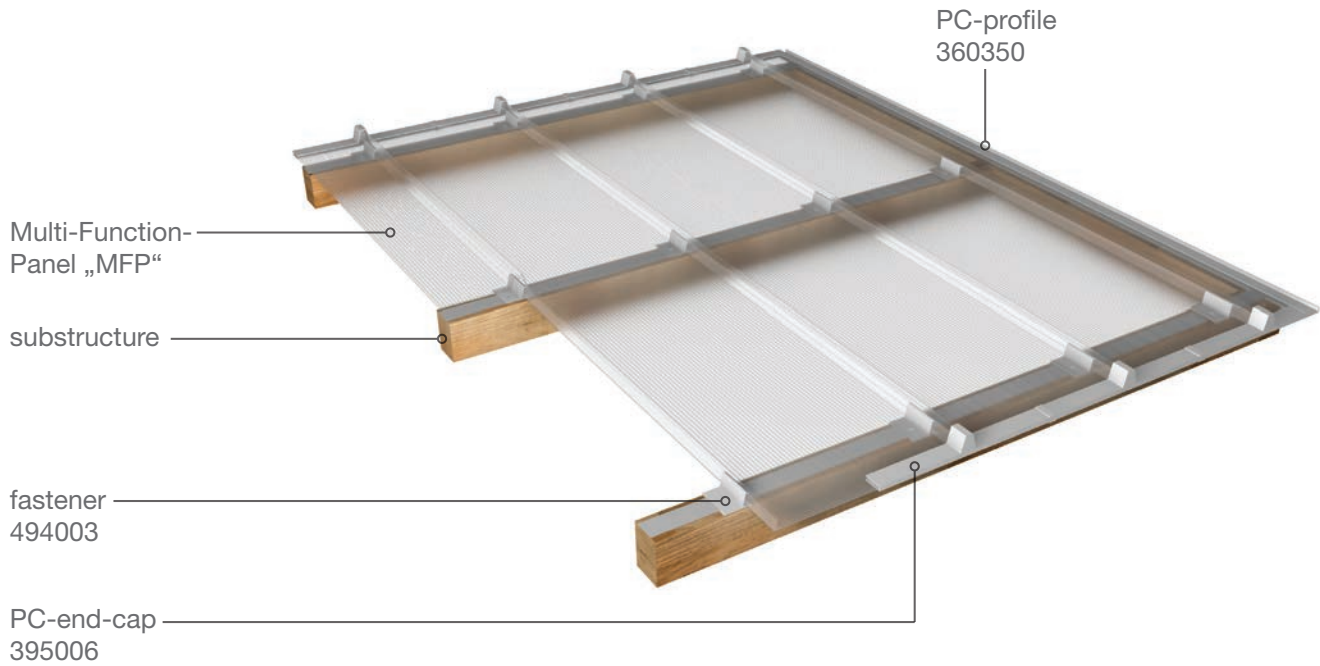


# Installation manual

## PC 2253-2

### Multi-Functions-Panels



### PC 2253-2 roof system from 5° roof pitch

Building width:	250 mm
Thickness:	3 mm
Up-value:	approx. 4.5 W/m <sup>2</sup> K
Weight:	approx. 1.7 kg/m <sup>2</sup>
Layers / chambers:	2 layers / 1 chamber
Flammability classification:	B-s1, d0 according to EN 13501
Production tolerances:	EN 16153
Light transmission:	crystal approx. 81 % silver approx. 24 %
Colours:	crystal, silver
Standard:	Color on request



# Installation manual

## PC 2253-2

### Before start of installation

Please check the delivery of completeness and observe our general information and our storage and installation instructions! The substructure on site must be checked for line and level before the multi-function-panels are installed. For pitched roof installations a slope of at least 5° must be observed. The sealing to substructure and all fixings are not part of the Rodeca system and must be adapted to conditions on site.

### Installation of the lateral PC-profiles

On both sides, the lateral PC-profiles are connected to the substructure with suitable screws including neoprene washers with a distance of approx. 30-50 cm **(1)**.



fig. 1

### Glazing

We recommend to centre the roof surface prior to installation so that on both edges of the surface equally sized and wide panels can be installed **(2)**. Panels can be cut with conventional tools, like jigsaws or circular saws with fine-toothed saw blades **(3)**. A compressor or air line will be required to remove swarf particles from the chambers.

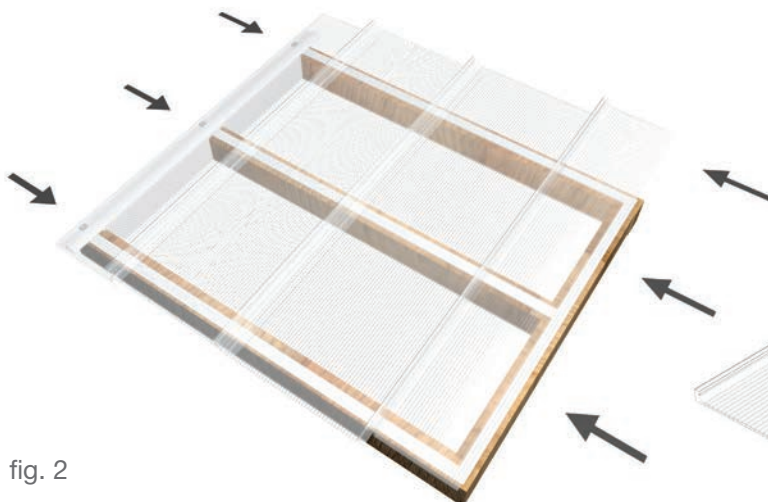


fig. 2

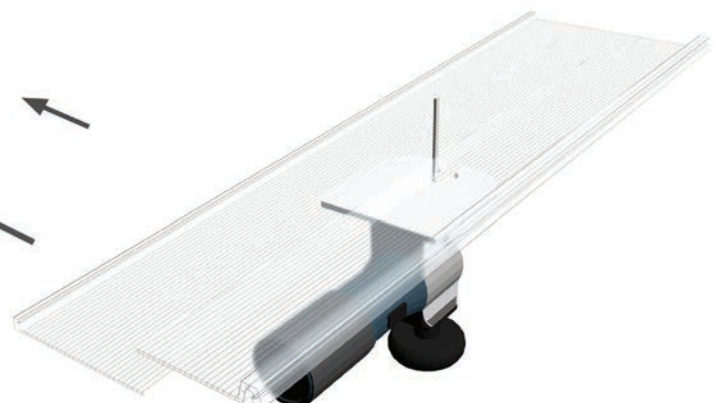


fig. 3

# Installation manual

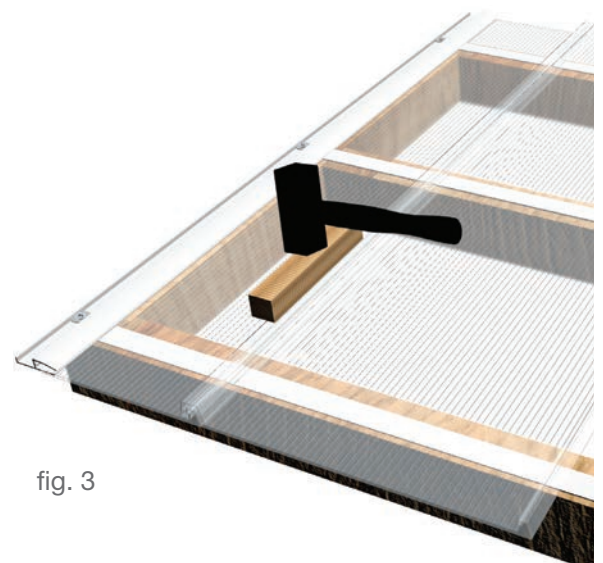
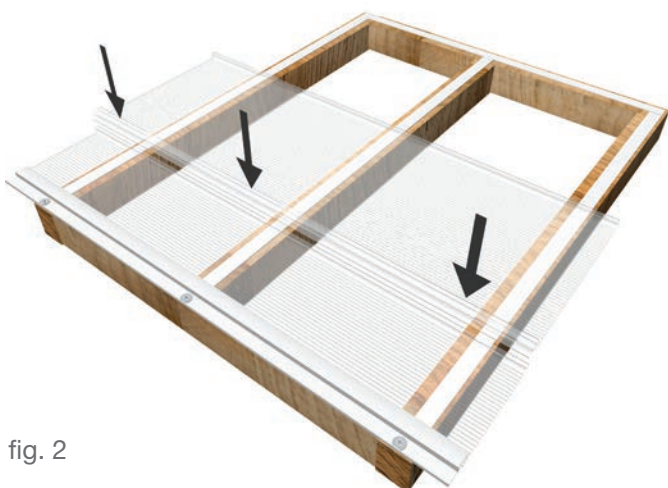
## PC 2253-2

### Fastener

The first panel has to be pushed inside the lateral PC-profile. Afterwards, the fastener has to be placed onto the substructure. Make sure that it is placed directly to the tongue of the panel. The fastener has to be fixed on the substructure with flat head or countersunk screws. **(1 & 2)**.



The following panels must be aligned and connected at the tongue and groove joint with an audible click. It might be necessary to use hammer and softwood to connect the panels. Take care that the fastener is positioned exactly inside the notches of the panels **(3 & 4)**.



# Installation manual

## PC 2253-2

The lateral PC-profile is to be attached to the substructure as described above. The last panel is pushed into the PC-profile and is to be connected to the adjacent panel at the tongue and groove connection **(1)**.

fig. 1

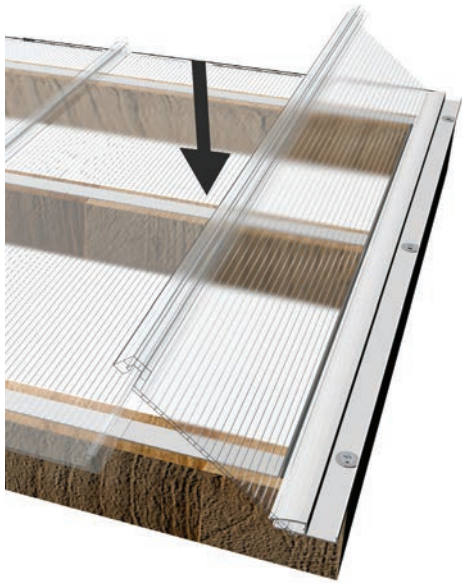
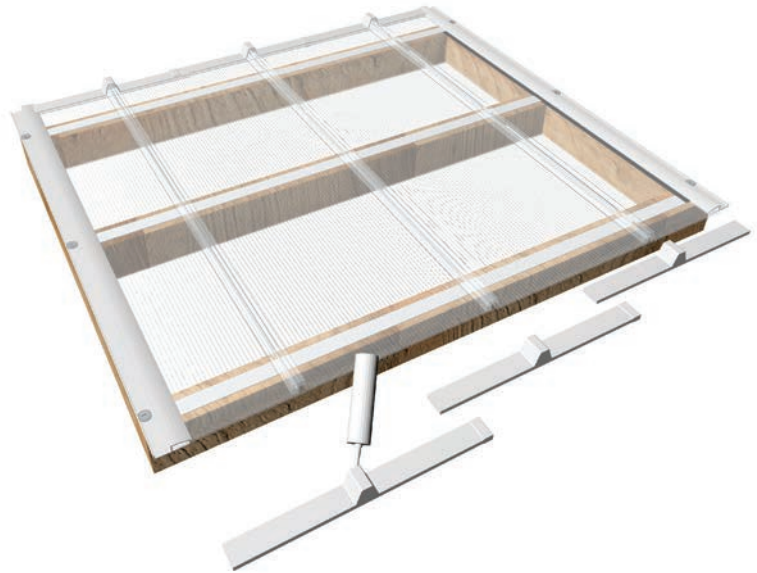
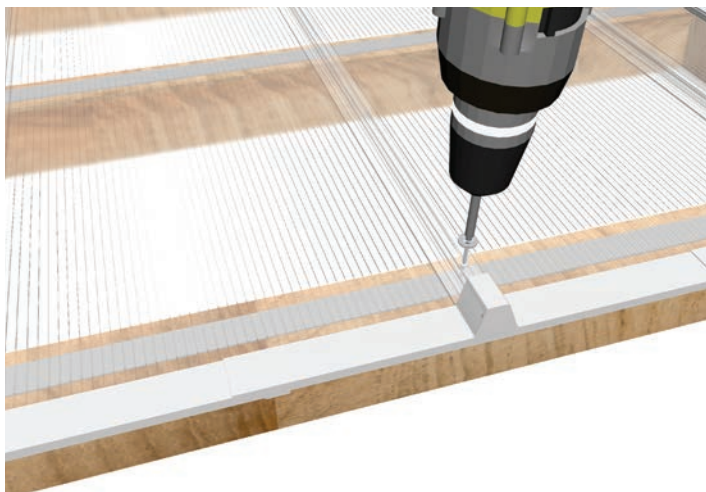


fig. 2



### PC-end-caps

The ends of the panels must be sealed with Rodeca PC-Silicone. Afterwards, the end-caps must be pushed overlapped on the panel ends **(2)**. Joints between PC-end-cap and lateral PC-profile should be also sealed with silicone.



### Secure against sliding

The roofing system is to be secured additionally by screws with integrated disc washer. Then the screws fitting must be pre-drilled through the coupling of the installed panels. All holes are additionally sealed with Rodeca-PC-Silicone **(3)**.

fig. 3

# Installation manual

## PC 2253-2

### 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 refineration 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.

#### 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.

# Installation manual

## PC 2253-2

### 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:

- CLEAR 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

### 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.

### 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.

### 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>

# Installation manual

## PC 2253-2

### 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.

### 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.

### 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 may only be removed during treatment and processing. It must be removed at the latest after completion of the assembly! The protective film does not replace any building protection film. Long-term exposure and a larger supply of heat mean that the film can no longer be removed! Heat accumulation and heat with the protective film still in place must be avoided.

### 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.

### 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.

# Installation manual

## PC 2253-2

### 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.

### 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.

### 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. 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.

### 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 ± 0.5 mm

Width -2 mm / +6 mm

Weight - 5 %

Concavity length ± 5 mm per linear meter of panel length

Concavity width ± 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.

### 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.



# Installation manual

## PC 2253-2

### 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.

### 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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Qualität made in Germany – Design with Rodeca !