

More
about

MODEK

polycarbonate and other thermoplastics

Polycarbonate is a versatile material used extensively as a rooflight glazing. It is very resistant to impact, transmits high levels of light, is relatively easy to use and it has a good fire rating.

Polycarbonate is one of the newer plastics to be used in the construction industry around the world. **MODEK** has been closely involved with the manufacture and distribution of profiled polycarbonate roof sheeting in South Africa for the past 15 years. We use the highest-grade polycarbonate polymer available and modern co-extrusion technology, ensuring a high-product quality and allowing for any transportable length of sheet to be made.

Benefits of choosing **MODEK** polycarbonate

Polycarbonate offers exceptional impact resistance, high levels of light transmission, good workability and good fire rating.

MODEK polycarbonate sheeting is resistant to chemical attack and corrosion in most industrial and marine environments. Tests have found the following:

- **MODEK** polycarbonate is highly resistant to corrosion and high concentrations of mineral acids, many organic acids, oxidising and reducing agents, neutral and acid salt solutions, many oils and fats, saturated aliphatic and cyclo-aliphatic hydrocarbons and alcohols.
- **MODEK** polycarbonate is not resistant to strong acids and alkalis, methyl alcohol, aromatic hydrocarbons and chlorinated hydrocarbons nor to lengthy immersion in hot water.
- **MODEK** polycarbonate must not be used in conjunction with plasticised PVC. This will result in stress corrosion cracking and cause damage to the **MODEK** PC sheet.
- **MODEK** polycarbonate sheets are ideal for coastal applications.

As with almost all plastics, polycarbonate is adversely affected by UV rays over time due to photo degradation. In photo degradation, aggressive shortwave UV rays are absorbed by the polyester resin, where they “excite” the molecular bonds of the polymers, causing them to separate and resulting in a yellowing of the sheet.

MODEK's polycarbonate sheeting is manufactured using a layer of highly UV stabilised Polycarbonate is co-extruded on the weathering side of all **MODEK** Polycarbonate roof sheets. This layer will not crack or delaminate, and ensures years of clear performance in the harsh South African climate. This UV layer eliminates up to 99% of UV radiation transmitted through the sheet, so protecting materials and people beneath it. This layer will not crack or delaminate, and ensures years of clear performance in the harsh South African climate.

Choosing the right **MODEK** polycarbonate product

MODEK's polycarbonate products can be selected along a range of criteria, depending on the requirements of the application in question.

COLOUR AND CLARITY

More than 70% of the heating effect of the sun is carried between 350 and 800 nanometres (generally, the visible light spectrum). More than 85% of these wavelengths are transmitted through a clear polycarbonate sheet. It is possible to vary levels of light transmission, and therefore the amount of heat that is transmitted, by changing the colour of the polycarbonate sheeting or by choosing a more opaque, diffusing sheet.

It is commonly available in clear and tinted options, with clear and most tints providing direct light, while clear patterned and opal tint provides diffused light and gives a soft quality to the light. The standard colours available are clear, white (opal 50) and bronze. Silver (Heat Stop), blue and green are also available subject to order quantity.

MODEK has introduced a new range of **Poly-carbonate Diffuser** profile material. These sheetings are designed to increase visible light in the building and to reduce solar gain and internal, hot spots. All profiles are manufactured using this material.

Please see Using rooflighting for heating for more information.

SHEET FORM

Polycarbonate (PC) comes in two sheet forms, each with its own particular characteristics and properties:

Solid (flat or domed), Profiled.

Solid (flat or domed) polycarbonate offers good optical clarity and superb workability. It can be cold-curved on site, is suitable for use with a variety of glazing bar systems, and can be moulded into various shapes such as domes and pyramids.

Profiled polycarbonate matches profiled roof cladding and allows the sky to be viewed through a corrugated material, a feature popular with many designers. **MODEK** polycarbonate comes in all the profile shapes generally used for non-translucent roofing and cladding in South Africa.

That said, extrusion and vacuum-forming techniques allow a huge variety of profiles to be produced. As a result **MODEK** can manufacture new or additional roofing profiles, although it should be noted that the time and cost incurred is likely to be considerable.

Nominal thickness

Because of the inherent variances of tolerance experienced when profiling a thermoplastic extrusion, the actual thickness of a sheet varies slightly from one point to another. As a result, the internationally accepted unit of measurement for polycarbonate sheeting is the nominal thickness of the sheet, established by representative

measurements (taken by vernier or micrometer) at various points across the full width of the sheet.

MODEK manufactures three nominal thickness specifications: 0.8mm, 1.00mm and 1.25mm. A layer of UV protection PC is co-extruded on the weathering side of all **MODEK** polycarbonate roof sheets.

0.8mm nominal thickness is manufactured as a lightweight polycarbonate sheet to be used mainly in lighter, domestic applications and applications where exposure to wind is minimal and spanning requirements are less than normal. The 0.8mm nominal thickness products are restricted to certain profiles only.

1.20mm nominal thickness is the standard weight specification for all industrial installations. This specification will meet the rigorous conditions found in an industrial environment, particularly that of deflection under load (positive and negative), handling on-site, spanning capabilities and general robustness of profile.

Other thermoplastics

PVC was used for industrial rooflight applications in the 1970s and 1980s, but has poorer impact resistance and weathering performance than other alternatives. PVC will not meet the non-fragility requirements without the addition of extra safety measures in the rooflight construction. It is now used very rarely in industrial or commercial applications, although it is popular DIY material in the USA. It is not expensive, has a reasonable strength-to-weight ratio and is straightforward to work with, thereby deserving its success as a DIY material for small, low-rise domestic projects.

In summary

- **MODEK** polycarbonate is a robust, UV-blocking material that is well suited to most domestic and industrial applications
- When choosing **MODEK** polycarbonate, you will need to specify colour, clarity/opacity, sheet form and/or profile, and nominal thickness required
- **MODEK's** technical department can help you choose the right polycarbonate product for a given application