

MODEK GRP and PC Installation specs

Research has found that most wind damage associated with translucent roof sheets is as a result of sheets being pulled over the fastenings.

This is normally related to the following aspects of the installation:

- Purlin or girt spacings
- Diameter of fastening washer
- Frequency and accuracy of fastenings

Fixing configurations

It is not practical to give standard purlin spacings and fastening specifications for all applications, but as a guide, the following recommendations will apply to most standard installations:

Guide to maximum support centres Single Skin (GRP 1.8kg/m ² • PC 1.25mm) roofing		
Profile depth	Chequerboard	Continuous run
18 - 25mm	1200mm	900mm
26 - 30mm	1500mm	1000mm
31 - 55mm	1800mm	1500mm

For side cladding with all profiles, the maximum girt spacing should be 1 500 mm.

- The term chequerboard refers to MODEK sheets laid where the side and end laps of each sheet are fixed to, and supported by, an adjacent metal or FC sheet.
- The term continuous run refers to sheets laid in a pattern where they are fixed side-by-side to one-another, or in a verge to verge configuration.

Fixing details

ROOF PITCH < 10°:

- All **MODEK** sheets are to be fastened to supports through each crown of the profile (primary fixings), and side stitched to adjacent sheet not exceeding 400 mm (secondary fixings).

ROOF PITCH > 10°:

- All **MODEK** sheets can be fastened to supports in the trough of the profile (primary fixings), and

side stitched to adjacent sheet not exceeding 500 mm (secondary fixings).

Primary Fixings:

All primary fixings to be used in conjunction with a metal washer with suitable sealing ring or soft washer under. The diameter of washer to be minimum 20 mm up to 30 mm. It is advisable to apply a bead of silicone under the washer to prevent possible leaks at fixing points. Primary fixings to be specified by specialist for either steel or timber supports.

Note:

- PVC soft washers **NOT** to be used with **MODEK** PC sheets.
- To avoid distorting the sheet profile, packing pieces should be located between the sheet and the supporting structure, when fastening through the crown.

Secondary Fixings:

Side stitching to be M6 roofing bolts or "Bulb-tite" fasteners. Self tapping screws and "pop rivets" are unsuitable for use as side stitching fasteners.

General Notes:

- If fastenings are not fixed square onto the sheets, the edge of a skew washer can impart a guillotine effect on the sheet and cause failure at lower loads.
- Do not locate a primary fixing closer than 50 mm to the end of a MODEK sheet.
- All fastening holes to be drilled through the **MODEK** sheet with a 1 mm - 2 mm clearance for GRP and a 2 mm -5 mm clearance for PC. This applies to sheets of up to 3.6 metre length. Longer lengths will require greater clearance at fastening holes. Calculate clearance required for each application based on coefficient of linear expansion: GRP = $24 \times 10^{-6}M/^\circ C$; PC = $67 \times 10^{-6}M/^\circ C$
- All fastenings to be tightened sufficiently, but to allow for thermal movement of **MODEK** sheeting.

Storage

Storage:

MODEK sheets must be stored on clean battens or pallets laid on firm, level ground, under cover. Batten centres should not exceed 1.5 metres.

- The cantilever, or eaves overhang, should not exceed 200 mm.

Weather tightness:

The profile of the **MODEK** sheet should match the end and side laps of the adjacent metal or FC roof sheets. These laps should be sealed with a sealing mastic or a closed cell white self-adhesive tape by applying the sealant to the bottom sheet before laying the top sheet over.

Where **MODEK** sheets are installed in a continuous run, the side and end laps should be double sealed with a sealing mastic or a closed cell white self-adhesive tape to avoid dirt and moisture getting into the laps.

Note:

- **PVC-based sealant or strips NOT to be used with MODEK PC sheets, all sealants / tapes to be PC compatible.**
- **Side laps should be installed facing away from prevailing winds.**
- **Sealed end laps should be 250 mm minimum on roofs < 10° pitch and 150 mm minimum on roofs > 10° pitch. Note: Unsealed end laps are not permitted on roofs of < 10° pitch (SABS 0400-1990).**
- **Unsealed end laps should be between 150 mm and 250 mm minimum on roofs > 10° pitch.**

Safety:

When working on a roof for installation or maintenance purposes, do not walk on **MODEK** roof lights. Always use crawling boards to distribute your weight evenly. It is advised to use appropriate fall arrest safety equipment.

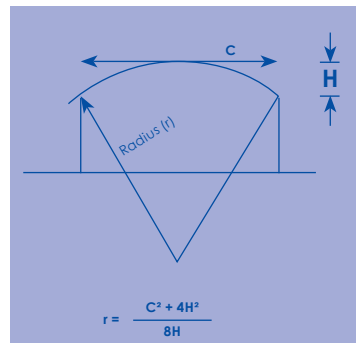
Avoid working on a roof in excessively windy conditions, and take precautions to avoid **MODEK** sheets being damaged by wind when handling. Use gloves when handling **MODEK** sheets.

Longitudinal Bending Radii:

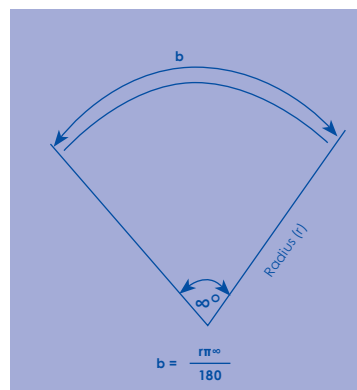
MODEK sheets are only supplied in straight lengths. As a general rule the S-rib profiles are suitable to be used for curved applications, such as barrel vaults, providing that a minimum bending radius of 4.0 meters is adhered to. Box rib profiles may be used in curved applications providing that a minimum bending radius of 14.0 meters is adhered to.

Should you require to calculate the radius of a curved roof, or the length of a curved sheet, the following formulae would apply:

Calculation of Radius:



Calculation for Length of Sheets:



On all curved roof applications, sheets must be fixed over one or more intermediate purlins as may be required.

Wind loads

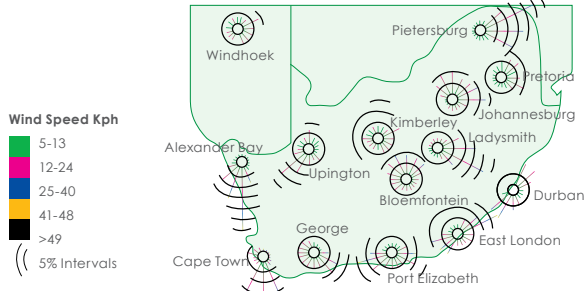
Experience has shown that consideration of wind loads, though important, is often overlooked. For this reason, a few words of advice on this subject are included here to encourage the use of adequate installation and fixing procedures.

Beware of areas which may be in the immediate wake of obstructions such as a tower or surface which may be swept by high winds. Beware also of potential high wind speeds in narrow gaps between buildings. Negative surface loads which may occur on the lee-ward side of a roof should also be taken into account.

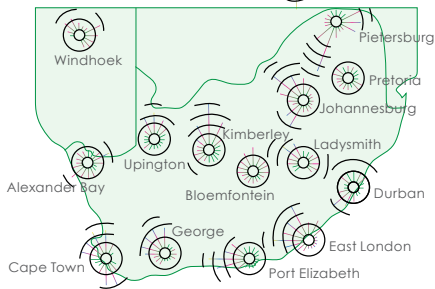
Where excessive overhangs occur at eaves and other projecting sections, where the wind has access, the positive vertical wind pressure must be added to the eaves suction load to obtain the total load.

On large projects which take some time to complete, consideration must be given to the risk of wind damage which may occur to partially clad buildings during adverse weather conditions. There are natural variations of wind speeds and directions by region and by season. The South African seasonal wind charts below (as published by the South African Weather Services) give data which could assist in the initial assessment of fastening and installation details.

January - wind roses



July - wind roses



Maintenance, handling and storage.

MODEK sheets are usually supplied loose to local South African destinations. In some cases sheets can be bundled, wrapped and strapped for ease of handling.

HANDLING AND CUTTING:

Take extra care when handling **MODEK** PC sheets, as their resistance to scratching is low. **MODEK** GRP sheets can be cut with a fine toothed hacksaw, angle grinder with standard masonry cutting disc or 40 / 60 grit diamond blade. **MODEK** PC sheets can be cut with a tungsten-tipped circular saw blade. Sheets can be notched with standard metal snips. Holes may be drilled with standard high speed steel bits, and not punched. Protective gloves and eye protection should be worn when handling, cutting or drilling **MODEK** sheets. Dust protective masks should be worn when cutting sheets.

STORAGE:

MODEK sheets must be stored on clean battens or pallets laid on firm, level ground, under cover. Batten centres should not exceed 1.5 metres. If it becomes necessary to store **MODEK** sheets outside, the duration of this storage should be kept to a minimum, and the **MODEK** sheets must be protected using opaque waterproof covers. If moisture is allowed to collect between sheets, the solar energy passing through the sheets is intensified, (as in a "solar battery") causing the moisture to boil. This will result in premature discolouration of the **MODEK** sheets.

MAINTENANCE:

Regular maintenance should be carried out in order to maintain designed light transmission of **MODEK** roof sheets. Periodically clean **MODEK** sheets using warm water and detergent, and wash down with fresh water. Periodically inspect fastenings and flashings and re-tighten or renew as necessary.

Typical example of an architectural technical spec

<p>MODEK translucent profile sheets GRP / Ampagard Polycarbonate translucent sheeting to suit _____ profile as manufactured by MODEK.</p>
<p>GRP The sheeting is to be manufactured in strict accordance with the South African Bureau of Standards specification No. 1150/1984 and is to carry the mark of approval. The weathering surface is to be coated with a UV stabilised gelcoat.</p>
<p>Mass, colour and translucency GRP The sheeting to be of nominal mass of _____ kg/m² and of a _____ colour permitting a light transmission of _____%.</p>
<p>Ampagard polycarbonate The sheeting is to be extruded using a sheeting grade of polycarbonate polymer, and shall have a co-extruded weathering surface layer of UV grade polycarbonate polymer.</p>
<p>Thickness, colour and translucency Ampagard polycarbonate The sheeting to be of nominal thickness of 1.25 mm and of a _____ colour permitting a light transmission of _____%.</p>

National building regulations - SABS 0400

The following extracts from the NBR SABS 0400 give further insight into the following areas relating to translucent roof sheeting when used in a building:

- Special provision of natural lighting with the associated "deemed-to-satisfy" rules (pages 101 -102).
- The regulations pertaining to the use of combustible roof coverings on a building (pages 175-176).
- Those building materials deemed to be non-combustible (page 207).

From this it is appropriate that both PC and GRP be considered to be combustible materials, notwithstanding the different attributes of the two materials in a fire.