

## GD 17 A GUIDE TO SITE INSTALLATION OF INSULATED ROOF PANELS

### INTRODUCTION

This guidance document introduces the reader to key issues that need to be addressed for the installation of an insulated roof panel system. The guidance should be read in conjunction with each panel manufacturer's own instructions which must be followed together with any specification documents relating to that particular contract.

Insulated panels include through fixed and secret fixed panels where the fasteners are not visible. They provide quick installation times, factory production quality and a 'one pass' fixing sequence.

Long length panels reduce the number of end laps and therefore potential leak locations but specialist lifting equipment will almost certainly be necessary. Panel cut back lengths at lap joints and eaves will vary to suit differing scenarios and conditions

It is imperative that the work is carefully planned to ensure that it can be done in a safe manner and in line with good site practice. Method statements and risk assessments need to be prepared and the site operatives must be fully aware of their contents and trained in the installation of insulated panels.

### HANDLING AND STORAGE

Insulated panels are typically delivered to site in plastic wrapped packs with edge protection. The panels are packed with weather faces together to reduce pack height. The height of a pack and the number of panels it contains depends upon the thickness of the panels and each manufacturer will provide information concerning their requirements

The packs can be off-loaded directly to the roof, after an assessment by the structural engineer, or to a storage area which should be dry and protected from site operations.

Bearers should be used on the ground and between packs. These bearers are typically placed at approximately 2 metre centres but manufacturers will give individual advice. Packs may be stacked to the recommended height with wooden bearers placed above each other.

At ground level, panels should be stored at a slight slope ensuring that water is able to drain and they should not be stored for extended periods on site

Forklifts should only be used to unload packs within its weight limits and the panel manufacturer's recommendations regarding the length of panels that can be handled in this manner.

Handle panels carefully to avoid marking the weather sheet or liner. Lift panels from the pack - do not drag them. Carry panels by the male (filled) edge - do not lift panels by the female edge or just the top sheet as this is likely to cause damage and reduce the end lap seal effectiveness.

Once panels have been fixed any protective film should be removed and disposed of in an agreed manner according to site requirements. Leaving the film in place is not recommended as the adhesive is likely to leave a residue on the panels and the film degrades with UV light.

Observe site health and safety procedures and the results of manual handling and other assessments.

Long length panels reduce the number of end laps and therefore potential leak locations but specialist lifting equipment will almost certainly be necessary. Advice and guidance about the use of specialist lifting and positioning equipment should be sought from companies who can specify and supply the appropriate mechanical handling equipment.

## PREPARATION

Before fixing any panels check the squareness and accuracy of the steelwork. Panel manufacturers have their own guidelines on steelwork tolerances that must be followed and should have been agreed at the design stage. Misalignment of sub structure and excessive tolerances can lead to complications at the fixing stage such as fasteners not engaging with sagging purlins, panels holding away from the sub structure or the sub structure pulling to meet the panel.

For guidance refer to Steel Construction Institute Technical Paper P346 *Best Practice for the Specification and Installation of Metal Cladding and Secondary Steelwork* which can be downloaded from the MCRMA website.

Panels require the purlins to be accurately positioned prior to the installation of panels, especially where there are three or more panels being used on a slope.

Many purlins have a relatively narrow bearing surface onto which the panels have to be laid and there are both panel and steel tolerances to consider. The panels need to butt up to each other to avoid cold spots where condensation can form and be adequately supported to achieve their structural integrity.

It is vital that the purlins provide adequate bearing for the panels to suit the manufacturer's requirements and that where panels lap they are either sufficiently wide or have ledger plates fitted to support panels and rooflights

Check panels for damage before fixing and remove any excess insulation from side and end laps to ensure an adequate fit.

## FASTENERS

Fasteners should be obtained from a source recommended by the panel manufacturer and typically will be the self-drilling, self-tapping type incorporating integral or painted coloured heads and washers. They will be either carbon or austenitic stainless steel, depending on the warranty conditions and specification.

Fasteners need to pass through the external skin of both panels at end laps and consideration needs to be given to the use of heavy drilling fasteners where purlin cleats occur and at the eaves if there is a wrap over gutter installation.

They should be installed to the manufacturer's recommendations and calculations need to be carried out to assess the wind loads for that particular site and building so that the appropriate number of fasteners can be used to withstand the loads.

Panels need to have the full complement of fasteners installed as work proceeds and not be 'fly fixed'. The practice of 'fly fixing' will result in the partial installation not complying with the system non-fragility category expected. This may also lead to unexpected failure during the installation process and contribute to an accident such as a fall from height.

## SEALANTS

Sealants are to be installed to the manufacturer's recommendations and will involve 3 runs of sealant for end laps and a single run for the side laps.

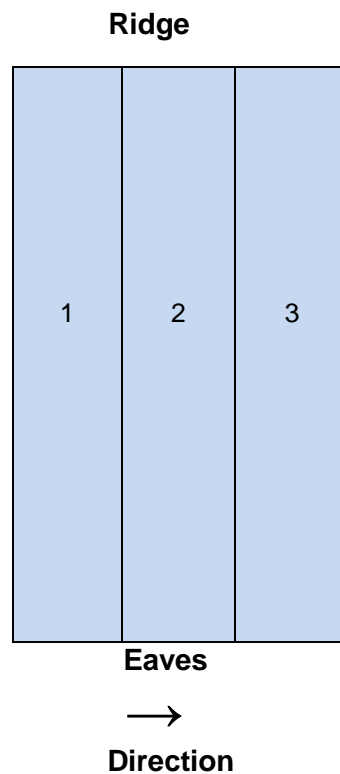
In general sealants should be 6mm x 5mm Class A butyl. At end laps a line of sealant should be installed either side of, and close to the fastener line, and another within 15mm of the exposed end of the overlap.

Side lap seals need to meet and lap onto the lowest end lap seal.

## INSTALLATION SEQUENCE

These installation sequences describe the general methods for laying and fixing insulated roof panels.

### Roof: Ridge to eaves - single panel length roof

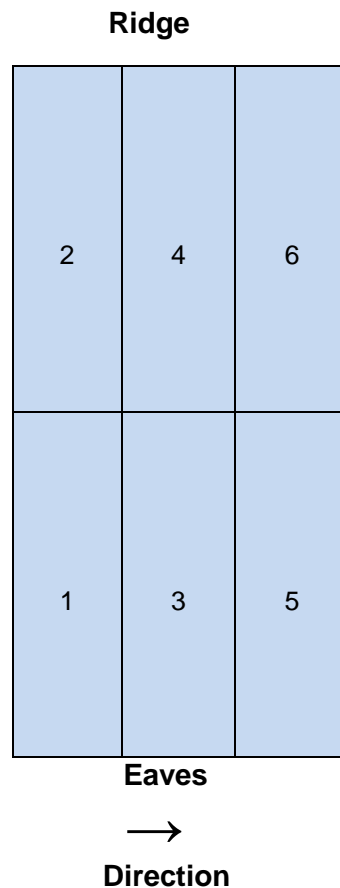


- Lay the first panel with the female edge to the gable, away from the prevailing wind if possible. Use a string line or laser to lay the panel straight and true. Fix the panel to manufacturer's recommendations.
- Apply 6 x 5mm butyl sealant along the top of the male crown. The surfaces receiving the sealant must be dry and joints in the sealant must be lapped by 25mm rather than butted.
- Lay the second panel with its female crown over the male crown of the first panel. Fix the panel.
- Stitch the lap with self drilling fixings at centres recommended by the manufacturer, typically 450mm. The seal should be on the weatherside of the side lap fasteners.
- Continue to lay panels along the roof, checking the alignment of the cladding and correcting any deviations.

- Use foam filler pieces and butyl sealant to form weathertight junctions and fix the required flashings.

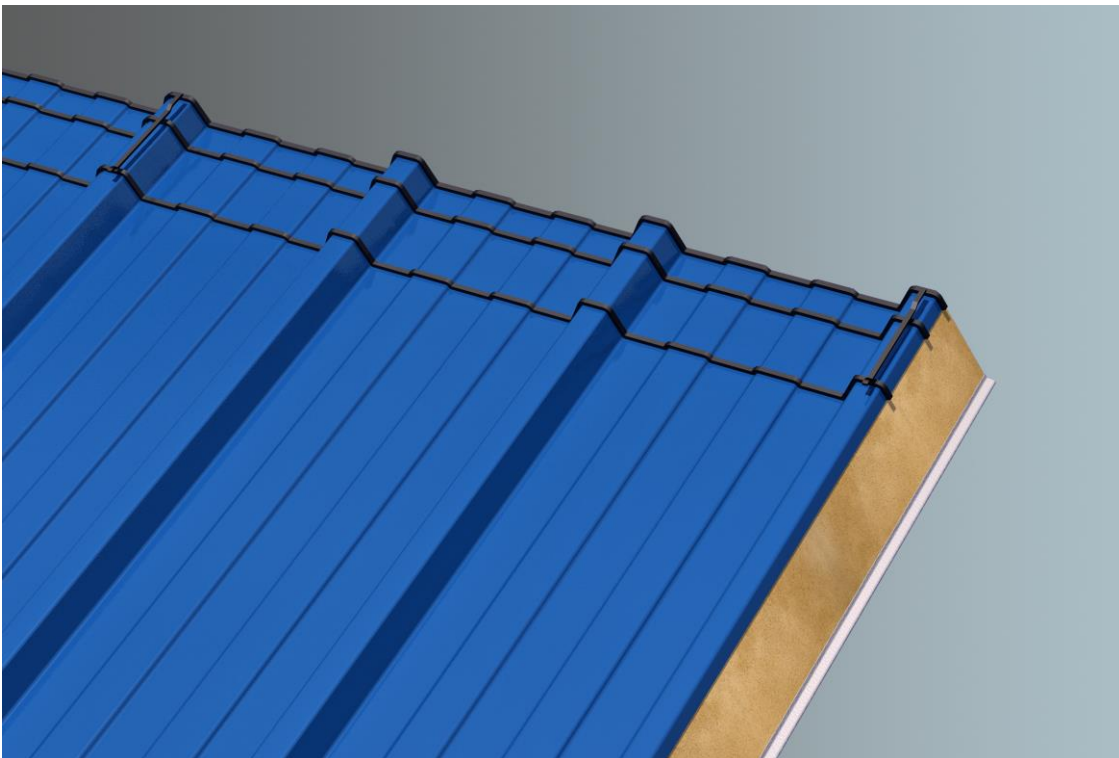
### Roof: Ridge to eaves – multi panel lengths

On a two-tier roof lay the panels in the order shown below:

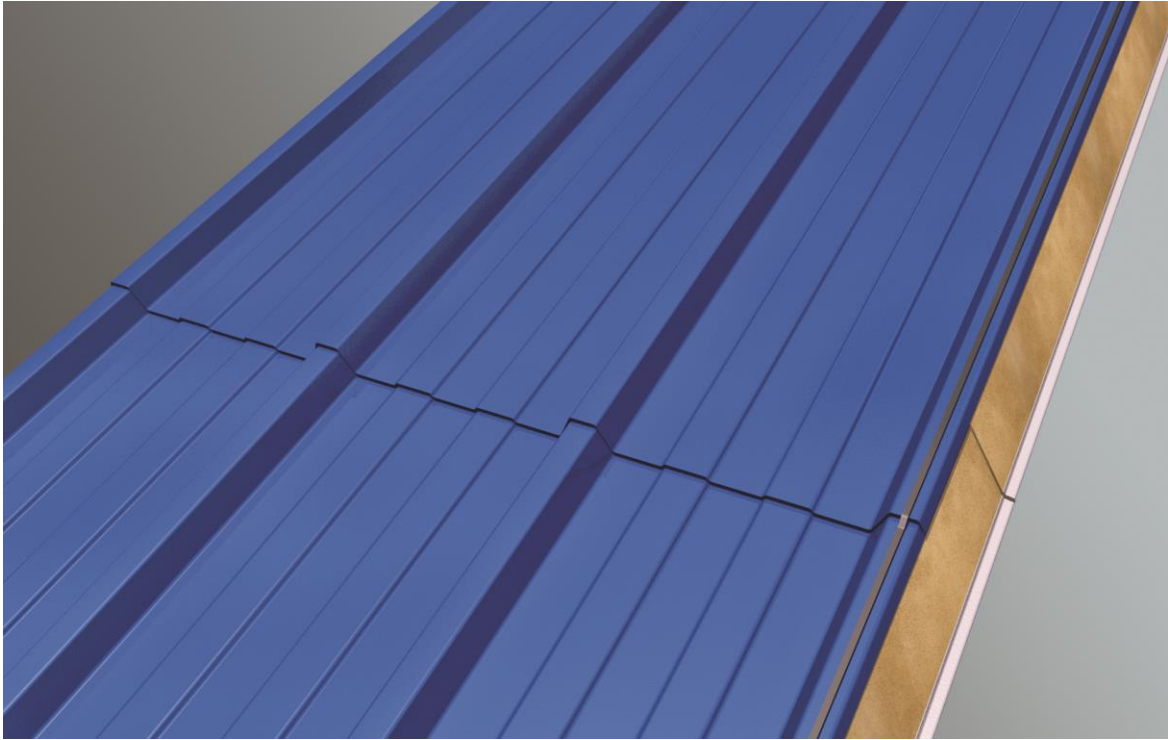


- Lay panel one with the female edge to the gable, away from the prevailing wind. Use a string line or laser to lay the panel straight and true. Fix the panel at every purlin except the top one.
- Apply three runs of 6 x 5mm butyl sealant to the head of panel one, one on each side of the fixing line and one 15mm from the end of the lap (figure 1, page 7).
- Apply a run of 6 x 5mm butyl sealant to the male crown of panel one for the length of the lap (figure 1, page 7).
- Lay panel two with the female edge to the gable and the tail lapping panel one. Fix the panel with one fixing in each main valley at every purlin.
- Tail stitch the end lap as shown in the manufacturer's instructions.

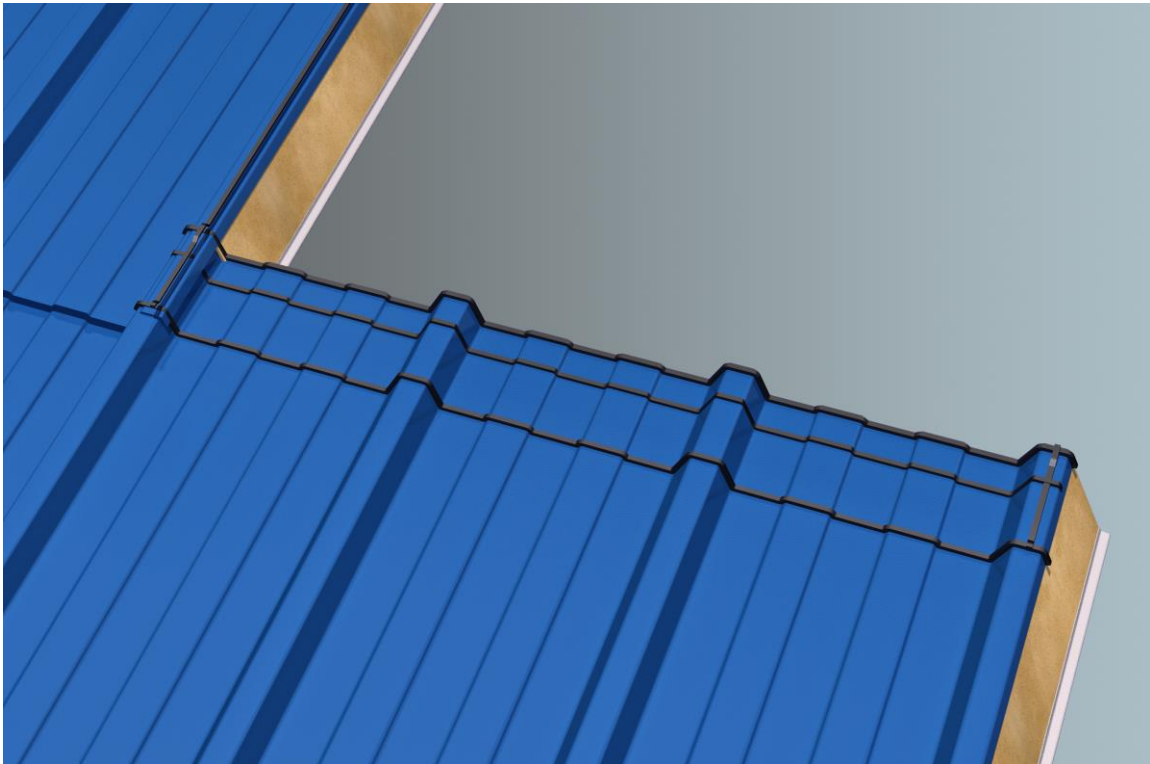
- Apply a run of 6 x 5mm butyl sealant to the male crown of panels one and two (figure 2, page 8).
- Lay panel three with its female crown lapping the male crown of panel one. Fix the panel at every purlin except the top one.
- Stitch the side lap with self drilling fixings at 450mm centres.
- Apply three runs of 6 x 5mm butyl sealant to the head of the panel (as panel one).
- Apply an additional run of 6 x 5mm butyl sealant along the male crown of panel three for the length of the lap (figure 3, page 8).
- Lay panel four with its female crown lapping the male crown of panel two and its end lapping the head of panel three. Fix the panel with one fixing in each main valley at every purlin.
- Stitch the side lap with self drilling fixings at 450mm centres.



*Figure 1*



*Figure 2*



*Figure 3*



## Cutting panels

Where panels have to be cut on site:

- Use a powered reciprocating or circular saw. Do not use an abrasive cutting wheel.
- Support the panel along the line of the cut.
- Protect the pre-coated finish of the panel. Clean any swarf or debris from the pre-coated finish of the panel immediately.
- Apply clear protective lacquer supplied by the manufacturer.

## Completion

When all the panels have been installed check:

- All fixings are correctly fitted and tightened.
- The fixings do not distort the panels.
- Minor scratches have been treated.
- The surface of the roof is clean and free of any swarf or debris.

Manufacturers are best placed to offer advice about their particular products and MCRMA member companies can advise on the suitability and performance of their materials, systems and assemblies to ensure that the installation of insulated roof panels is carried out correctly and in a safe manner. Additional project specific advice may also be obtained from one of the independent roofing and cladding inspectors featured on the MCRMA web site.

## DISCLAIMER

Whilst the information contained in this bulletin is believed to be correct at the time of publication, the Metal Cladding and Roofing Manufacturers Association Limited and its member companies cannot be held responsible for any errors or inaccuracies and, in particular, the specification for any application must be checked with the individual manufacturer concerned for a given installation.

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