

CORRECT METHODS FOR INSTALLING COMPOSITE PANELS, ROOFLIGHTS AND FABRICATIONS

Continuing the review of good site practice, this month MCRMA looks at the correct methods for installing composite panels, rooflights and fabrications.



*Tritherm composite panels on the Nimbus business park.
Photo courtesy of Architectural Profiles Limited*

Flat composite panels present an extremely clean finish with a 'high tech' modern appearance and showcase impressive coatings well. For walling applications this type of panel is usually used in long lengths and may be fixed vertically or horizontally.

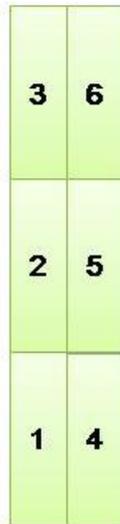
For important applications, it is important to ensure that when installing composite panels that the side underlap and overlap of the panels are correctly sequenced to enable the panels to sit or nest together without forming a gap in the joint. This is particularly important when underlaps and overlaps occur at junctions of side and end laps ie, a four point joint. Incorrect sequencing of the panels can result in this joint or junction having holes or gaps, which would allow water to enter into the building unless large quantities of sealant are used.

Robust, watertight joint

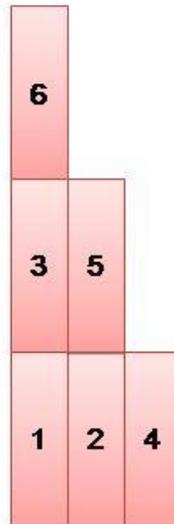
The adoption of the correct installation sequence can minimise the gaps and can result in a robust watertight joint. Composite panels, which may be prone to this characteristic, should be installed in columns starting at the eaves and working up the slope to the ridge. The adjacent column of panels should then be installed in the same way ensuring that the side overlap nests over the underlap on the adjacent panel.

During the installation sequence seals and fasteners must be built-in and fitted accordingly. Composite panels which have this distinguishing feature should not be installed in a step formation where each row of panels, starting at the eaves, is incrementally advanced across the roof. The diagram overleaf demonstrates the difference and highlights the correct method of installation.

Sequencing of Composite panels to minimise gaps at junctions



Recommended sequence to minimise gaps at junctions of panels



Sequence which will introduce large gaps at junctions of panels

Composite panel layout direction

Rooflights for use within composite panel roof systems are factory made and are constructed using multiple layer arrangements to meet with current Building Regulations. The rooflight units incorporate high density foam strips which act as spacers between the layer constructions. The foam provides a ridged section through which fasteners can be installed.

The high density foam spacer provides sufficient resistance to stop the fastener from crushing the cross sectional area of the rooflight during installation and during its service life. The foam spacer also ensures that the sealing washer under the head of the fastener is held under compression and therefore provides a weather and airtight seal.

Failure to install the fastener through the high density foam spacer will result in the premature failure of the sealing mechanism and leaks will occur. The use of high visibility red topped fasteners, which are used to identify the area of the rooflight can also act as visual indicators that the fasteners are positioned correctly within the zone of the high density spacers.

It's all in the details

The quality of detailing defines the success of a metal cladding system. It is essential that all details are well designed, manufactured and installed. The common materials used for fabrications with metal cladding systems are manufactured from the same materials as the roof and wall cladding that is, coated steel or aluminium. The fabrications can be in the same colour as the area or in a contrasting colour for aesthetic effect.

The minimum material thicknesses for external fabrications generally adopted by the industry are 0.7mm for steel and 0.9mm for aluminium. Flat widths greater than around 200mm require a stiffening bend or backing with a rigid material. Wide girths of steel or aluminium, perhaps on fascias, can be given extra support, for example, by bonding to a ply or insulation board or by bonding on stiffeners to the reverse side. Large flat unsupported fabrications tend to 'quilt' at fasteners adversely affecting the appearance.



*Trisomet 333 System insulated wall panels on the Pond Hall building at Sellafield.
Photo courtesy of Tata Steel*

A degree of expansion

During the design and installation phase it is important to recognise that for aluminium flashings and profiles there is a need to incorporate a degree of expansion. A rule of thumb for thermal movement in aluminium is 1mm per metre of length. For dark colours this should be increased to 1.5mm per metre. For example, a 3 metre flashing in a light colour needs an allowance of 3mm at each end for movement.

In flashings and standing seams if expansion joints are not used and joints are rigidly fixed, the fabrication will act like a very long section amplifying the movement. For example, four 3 metre sections fixed rigidly together will act like a 12 metre fabrication with 12mm of expansion/contraction trying to happen in a stiff material.

If the expansion/contraction is not allowed to happen, temperature variations will cause thinner fabrications to ripple and buckle, laps and fasteners could weaken and leaks occur. Ultimately, fabrications could detach. In extreme cases, it has been known for rigidly fixed aluminium fabrications to fracture.



*Tritherm composite panels on the Harlow business park.
Photo courtesy of Architectural Profiles Limited*

Data variations

Manufacturers are best placed to offer advice about their particular products and any variation from their published data during the design or construction process could result in the component or system failing prematurely or not complying with the guarantee or warranty conditions.

Any uncertainty about the use or application of a product or system should be referred back to the manufacturer for detailed written advice. Additional project specific advice for demanding or complex constructions may also be obtained from one of the independent consultants featured on the MCRMA web site.

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