



INSULATED PANEL 333

Roofing Installation Guide

CLADCO
ROOFING

INSULATED PANEL 333

INSULATED PANEL CLADDING/COVERING.

Insulated steel faced roof panel: Tata Steel, LPCB approved Trisomet®.

Cladding systems in England and Wales to be designed and installed to meet the Building Regulations 2000, Approved Document L2 2013.

Cladding systems in Scotland to be designed and installed to meet the Building Standards (Scotland) Regulations **Technical Handbook**: Section 6 Energy.

– **Support structure**: Steel purlins.

– **Bearing width (minimum)**: 60 mm end lap extension plates maybe required where three or more panels comprise the total roof slope.

– **Pitch**: 4 degree minimum.

– **Manufacturer**: Tata Steel, Shotton, Deeside, Flintshire, CH5 2NH. Technical Department
T: +44 (0) 1244 892199.

– **Product reference**: Trisomet .

– **Fire**: LPS1181 Grade EXT-B Certificate No. 460a/30. Internal lining Class O as tested to with BS 476 parts 6 and 7. Class B s2 in accordance with EN 13501-1. External face Class AA in accordance with BS 476-4.

– **Fragility**: Class B in accordance with ACR (M) 001:2005.

– **British Board of Agr ment (BBA)**: Colorcoat to BBA Certificate No. 91/2717.

– **External facing material**: Colorcoat HPS200 Ultra pre-finished steel using Galvalloy metallic coating, 0.5 mm nominal thickness, based on a zinc (95 %): aluminium (5 %) eutectic alloy that conforms to EN 10346:2009.

– **External profile**: 32 mm high trapezoidal profile with a 333 mm pitch.

– **Colour**: See Colorcoat HPS200 Ultra range of colours.

– **Internal facing material**: Colorcoat High Reflect or Colorcoat PE 15

pre-finished steel using hot-dip galvanised steel EN 10346:2009 substrate.

– **Internal profile**: Lightly planked.

– **Core insulation**: PIR closed cell foam (CFC and HCFC free, zero ODP and GWP <5) to specification used in LPCB approval.

– **Cover width**: 1000 mm.

– **Panel thickness**: 40, 60, 80, 100, 120 or 135 mm.

– **Primary fasteners**: Austenitic stainless steel self-drilling fasteners with thread free zone and 19 mm sealing washers from:

EJOT UK Limited,
T: +44 (0) 1977 687040 or
SFS intec Ltd,
T: +44 (0) 113 208 5500.

– **Fastener location**: Fix-through profile trough.

– **Number and location of fasteners**: At all support positions, locate in the centre of every trough (ie, three fasteners per support).

– **End-lap size (minimum)**: 150 mm.

– **End-laps**: Tail stitch at crown positions, 50 mm from the end of lap.

– **Side laps to be stitched at 450 mm centres**: Austenitic stainless steel self-drilling fasteners with 14 mm sealing washers from:

EJOT UK Limited,
T: +44 (0) 1977 687040 or
SFS intec Ltd,
T: +44 (0) 113 208 5500.

– **U-value**: 0.46 W/m K for 40 mm panel; 0.33 W/m K for 60 mm panel; 0.25 W/m K for 80 mm panel; 0.20 W/m K for 100 mm panel; 0.16 W/m K for 120 mm panel or 0.15W/m K for 135 mm panel.

GENERAL REQUIREMENTS

Design

Roof cladding to be designed to comply with design and installation guidance in the Tata Steel literature.

Thermal bridging: To reduce thermal bridging follow the construction details found in the Tata Steel literature.

300 Profile fillers:

– **Material**: EPDM.

– **Colour**: Black.

– **Thickness**: 25 mm.

– **Fixing**: Compression fix between sheets and flashings/supports. Seal into place as top and bottom with gun grade butyl mastic.

Flashing and trim details

– **System type**: Use Tata Steel construction details to reduce thermal bridging.

– **Material and finish**: To match outer sheet, 0.7 mm minimum gauge.

– **Manufacturer**: Tata Steel,
T: +44 (0) 1244 892199.

– **Lap joint treatment**: End joints to be lapped by 150 mm and sealed, unless specified otherwise. Where possible, arrange with laps away from the prevailing wind. Where butt joints are required, butt joint and seal flashings and/or trims on 150 mm wide butt straps made from sheet of the same material and finish.

– **Method of fixing**: Fix to cladding with sealed rivets or integral nylon colour-headed austenitic stainless steel self-drilling fasteners at 450 mm minimum centres, supplied by:

EJOT UK Limited,
T: +44 (0) 1977 687040 or
SFS intec Ltd,
T: +44 (0) 113 208 5500.

– **Design**: Maximum unstiffened leg on flashing to be 200 mm. Visible free edges to be finished with a stiffened edge or welt.

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SEALING LAPS ON EXTERNAL SHEETS

– **Sealant tape:** 6 x 5 mm high grade butyl mastic (25 year guarantee supplied by:

Premier Sealants (White strip),
T: +44 (0) 1724 864100
EJOT UK Limited (Blue Strip).
T: +44 (0) 1977 687040
SFS intec Ltd, (Pink Strip),
T: +44 (0) 113 208 5500.

– **Position:** Position sealant in straight, unbroken lines across the profile. Place into troughs. Do not allow to stretch or to sag into position.

– **Seal quality:** Ensure continuity and effectiveness of seal, especially at corner of sheets.

– **End-lap sealant-tape positions:** Two lines of butyl mastic (25 year guarantee) should be placed between sheets before fixing rows 10 mm from the sheet ends at the top and bottom of the lap.

– **Side laps:** A continuous run of butyl mastic (25 year guarantee) on top of the under lap crown positioned to the weather side of stitching fastener.

AIR SEALING

The panel edges at ridge, eaves and verge must be seated onto a 6 mm diameter bead of high grade butyl mastic (25 year guarantee) supplied by:

Premier Sealants (White strip),
T: +44 (0) 1724 864100
EJOT UK Limited (Blue Strip).
T: +44 (0) 1977 687040
SFS intec Ltd, (Pink Strip),
T: +44 (0) 113 208 5500.

The metal lining layer must be reasonably air-tight so that the air permeability does not exceed 10 m³/h/m² at an applied pressure of 50 Pa in accordance with the Building Regulations 2000, Approved Document L2 2013. Under laboratory testing sealed liner sheets show evidence of air leakage as low as 0.46 m³/h/m². A reasonable practical expectation for a finished system would be 3 to 5 m³/h/m². A reasonable practical expectation for a finished system would be 3 to 5 m³/h/m². Ensure internal flashings are fully sealed to ensure continuity and effectiveness of seal, especially at

corners of sheets such as at roof/wall junctions and at all penetrations of pipes, ducts, etc.

PLATINUM PLUS® SYSTEM GUARANTEE

A Platinum® system guarantee specification needs to be registered prior to tender package being distributed.

Obtaining a 25 year Platinum Plus guarantee could not be simpler; simply request the guarantee from Tata Steel.

Tata Steel acts as the one point of contact from beginning to end. We will provide you with a detailed NBS specification, warranties for all specified elements and full support for the duration of the guarantee period.

TECHNICAL DEPARTMENT

For further information or to register your Platinum Plus® system guarantee specification please telephone the Technical Department
T: +44 (0) 1244 892199.

FASTENERS, SEALANTS AND FILLERS

FASTENER SELECTION TABLE

Primary fixing for Trisomet® (3-Rib) to steel purlins

Application	Panel core thickness (mm)	SFS intec Ltd	EJOT UK
Cold rolled purlins, Roof 1.2 - 5.0 mm Wall 1.3 - 3.0 mm	40	SXC5-S19-5.5 x 75 + COLOUR	CF19 JT3-D6H 5.5/6.3 x 67 + COLOUR
	60	SXC5-S19-5.5 x 95 + COLOUR	CF19 JT3-D6H 5.5/6.3 x 107 + COLOUR
	80	SXC5-S19-5.5 x 115 + COLOUR	CF19 JT3-D6H 5.5/6.3 x 127 + COLOUR
	100	SXC5-S19-5.5 x 135 + COLOUR	CF19 JT3-D6H 5.5/6.3 x 147 + COLOUR
	120	SXC5-S19-5.5 x 160 + COLOUR	CF19 JT3-D6H 5.5/6.3 x 167 + COLOUR
	135	SXC5-S19-5.5 x 193 + COLOUR	CF19 JT3-D6H 5.5/6.3 x 197 + COLOUR
Hot-rolled purlins, 4 – 14mm	40	SXC14-S19-5.5 x 80 + COLOUR	CF19 JT3-D12H 5.5/6.3 x 75 + COLOUR
	60	SXC14-S19-5.5 x 100 + COLOUR	CF19 JT3-D12H 5.5/6.3 x 95 + COLOUR
	80	SXC14-S19-5.5 x 120 + COLOUR	CF19 JT3-D12H 5.5/6.3 x 115 + COLOUR
	100	SXC14-S19-5.5 x 140 + COLOUR	CF19 JT3-D12H 5.5/6.3 x 155 + COLOUR
	120	SXC14-S19-5.5 x 165 + COLOUR	CF19 JT3-D12H 5.5/6.3 x 175 + COLOUR
	135	SXC14-S19-5.5 x 193 + COLOUR	CF19 JT3-D12H 5.5/6.3 x 195 + COLOUR
Side-lap stitcher	All	SL2-S-S14-5.5 x 25 + COLOUR	CF15 JT3-2-6.3 x 25 + COLOUR
Metal flashings to panel	All	SL2-S-S14-5.5 x 25 + COLOUR	CF15 JT3-2-6.3 x 25 + COLOUR

When fixing to timber, fastener pullout values may limit the ability of the roof to resist wind uplift loads.

If in doubt, consult the Technical Department T: +44 (0) 1244 892199.

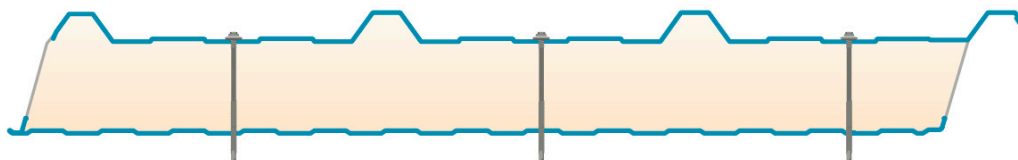
All fasteners can be sourced from: SFS intec Ltd, T: +44 (0) 113 2085 500 or EJOT UK Limited, T: +44 (0) 1977 687040.

FASTENERS

The primary fasteners for securing the Trisomet® roof panel to structural steel purlins have been purpose designed to facilitate speed of fixing, give this structural security with reduced risk of over compression, and have minimal thermal bridging. Time consuming pre-drilling of the panel or purlin is not necessary, as the high-thread fastener selfdrills: the lower thread taps into the purlin and the higher thread taps into the outer skin, thereby clamping the panel securely in a single operation.

Side-lap stitching, should be at maximum of 450 mm centres. The stitcher can either be a painted sealed rivet, an integral nylon colour, or a powder coated headed austenitic stainless steel self-drilling fastener. When a flashing needs to be secured to the panel, side lap fasteners can be used.

Standard fastener layout at all support positions



FASTENERS, SEALANTS AND FILLERS

SEALANTS AND FILLERS

The end lap of Trisomet® requires three rows of 6 x 5 mm high grade butyl mastic (min. 25 year guarantee) this generally comes in rolls of 9.6 m with 30 rolls per box. (Wall end lap specifications vary see previous construction details).

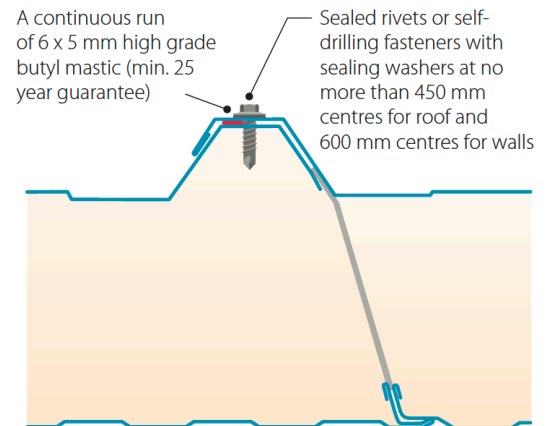
Position the sealant in straight, unbroken lines, following the profile, taking care to avoid any stretch. Ensure the continuity and the effectiveness of the seal, especially at corners of sheets. The two lines of strip sealant must be placed between the sheets before fixing: two rows 10 mm from the sheet ends at the top and bottom of the lap.

The side lap of the panel is sealed with the same 6 x 5 mm sealant run continuously to weather side of the stitching fastener.

For panel ends at ridges and hips, black EPDM large flute profile fillers should be located between the panel's external skin and the cover flashing to provide continuity of weather seal and to prevent access by insects and small birds. These fillers should be sealed to top and bottom with gun applied solvent release bedding sealant.

All sealants can be sourced from the following suppliers:

Premier Sealants (White strip),
T: +44 (0) 1724 864100EJOT UK
Limited (Blue Strip).
T: +44 (0) 1977 687040
SFS intec Ltd, (Pink Strip).
T: +44 (0) 113 208 5500.

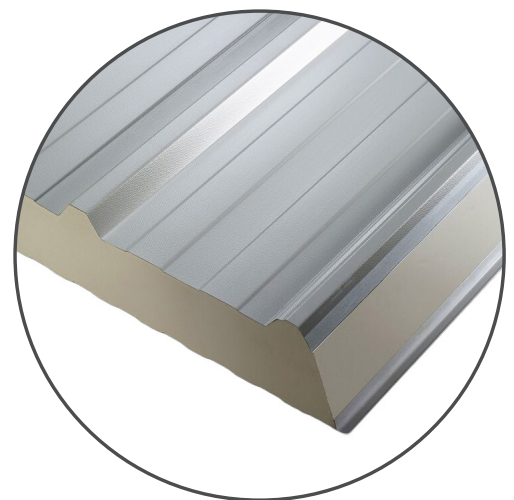


ROOF INSTALLATION

INSTALLATION: ROOF PANEL

The steps given below are instructions for a typical construction and should be used only as a guide. Specific technical details, method statements and site-specific risk assessments should be produced and applied for each building. An extended list of construction details is available from Tata Steel, and advice can be given via our technical department on any bespoke details that may be required.

The following steps apply to a roof made up of multiple panels with end lap joints. Wherever practical, panels of the same length from ridge to eaves should be used to avoid end laps. This provides a cleaner finish and a more economical installation.



ROOF INSTALLATION

INSTALLATION: ROOF PANEL

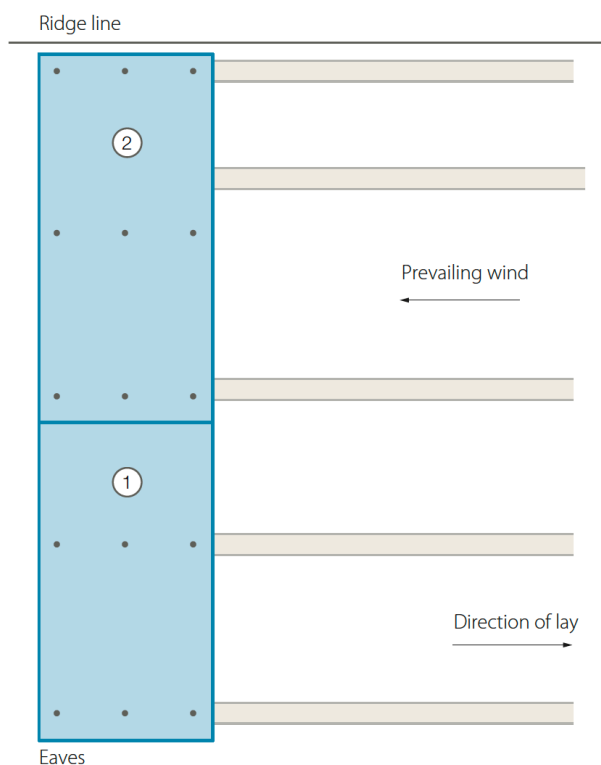
1. Carry out preparation work on internal ridge, internal eaves, trims, etc, and ensure that these are lined and levelled and sealed as specified. Lay down air seals onto the top flange of the eaves beam and the ridge purlins.

2. Position the eaves (or bottom) corner panel, and ensure it is correctly aligned and lapping in the right direction. Wherever possible, the panels should be laid with the exposed joints of the side laps facing away from the prevailing wind (see Figure 1). Fix the panel using primary

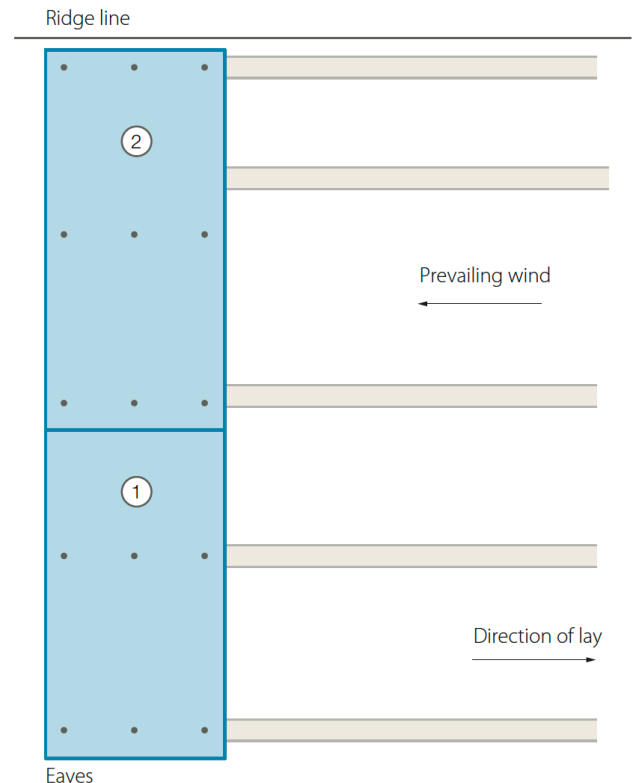
fasteners in the trough of the trailing edge. Make sure the fasteners are not over tightened and clean away drilling swarf to avoid rust marks.

3. Ensuring that the top of the lower panel (panel 1) is clean and dry, apply three rows of sealant across the panel width with a strip of sealant at the underlap position as shown in the illustration on the next page. The first seal should be placed above the fixing line, the second directly below and the third 10 mm from the end of the specified lap (150 mm recommended). The seal should be carefully applied to ensure coverage in the corners of the profile.

FIRST PANEL LAID

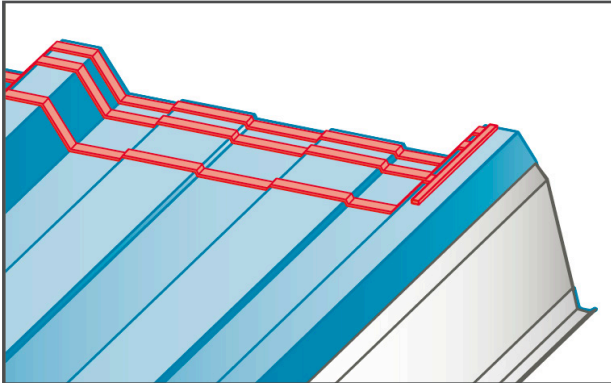


SECOND PANEL LAID

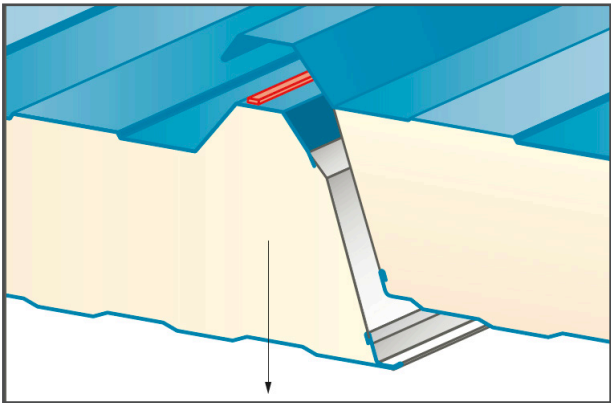


ROOF INSTALLATION

END LAP WITH THREE ROWS OF SEALANT



SIDE LAP



4. Ensure that the cutback of panel 2 is clean and dry before positioning the panel over panel 1. Be careful not to disturb the seals. Align the profiles of the two panels before securing at specified fastener layout.

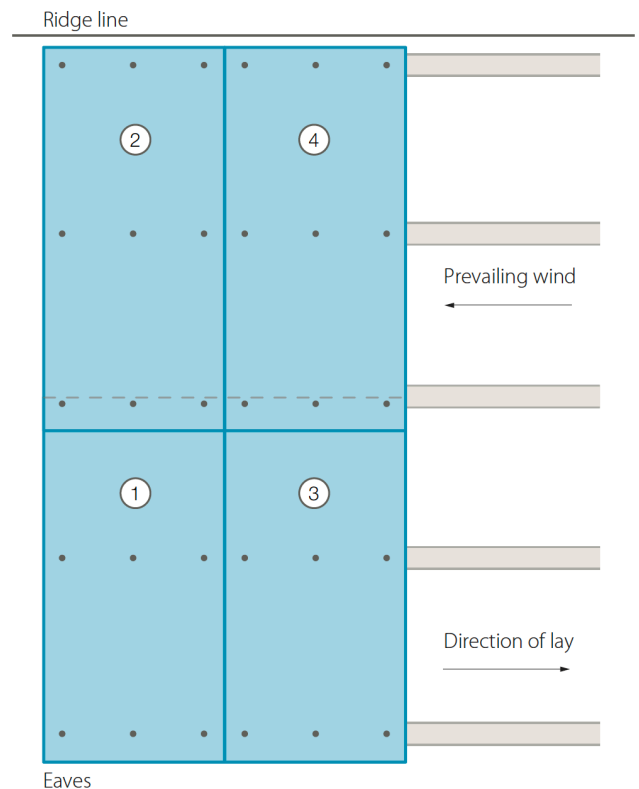
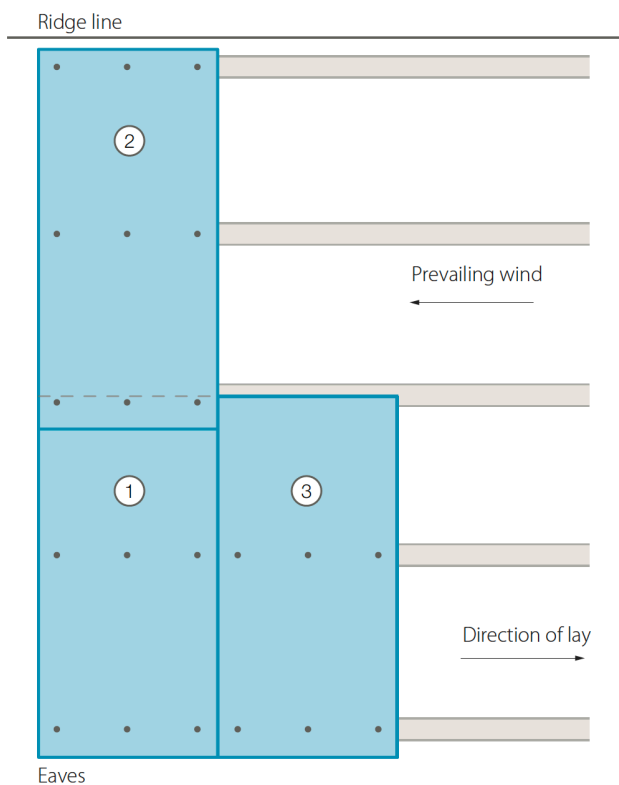
5. Run the side lap seal continuously from ridge to eaves ensuring this is placed to the weather side of the side lap. Side lap panel 3 by dropping panel into position and securing with specified fastener layout.

6. Apply the end-lap seals as described in step 3.

7. Ensure that the cutback of panel 4 is clean and dry. Position the end of panel 4 over panel 3 and drop down the Side lap as before. Ensure that the profiles of the two panels are aligned before securing into the purlins. Secure the side lap using sealed rivets or stitching screws at a minimum of 450mm centres.

8. Continue steps 5, 6 and 7 until the elevation is complete. Seal and position profile fillers at ridge and fit the external flashings and ensure they are sealed as specified.

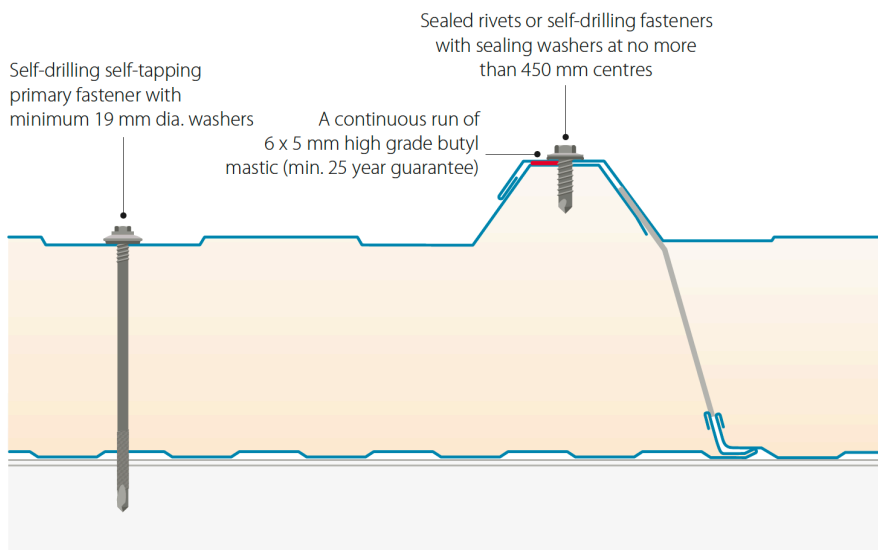
THIRD PANEL LAID



CONSTRUCTION DETAILS – ROOF

The details within this section are recommendations and have been designed to give practical solutions to minimise thermal bridging and air loss at junctions. For each junction detail, Ψ values (Psi) and f values have been calculated in accordance with BS EN ISO 10211 and recommendations within MCRMA technical paper 18.

SIDE LAP

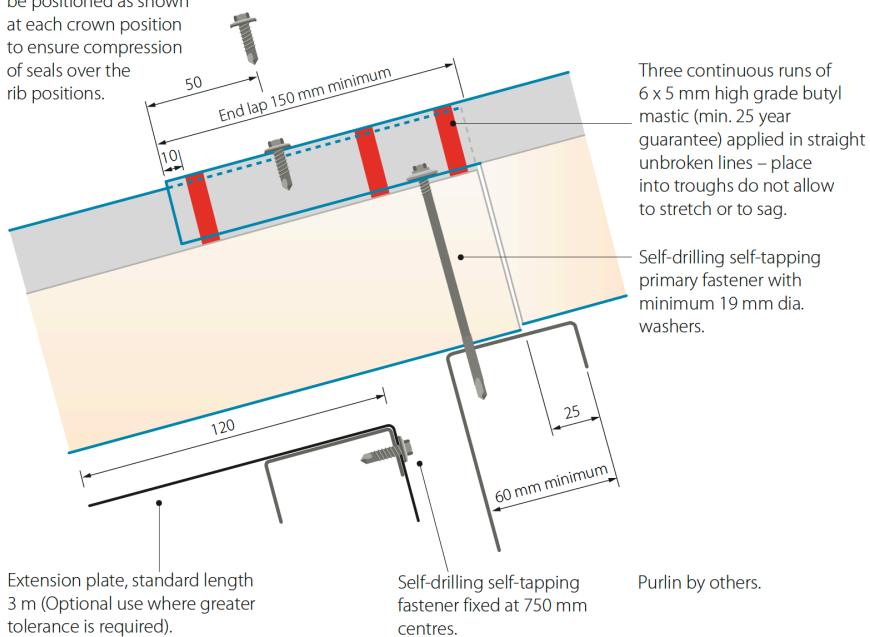


SIDE LAP

The side lap joint design enables panels to be dropped-in place when side lapping, this provides fast and efficient installation.

END LAP

End lap stitchers to be positioned as shown at each crown position to ensure compression of seals over the rib positions.

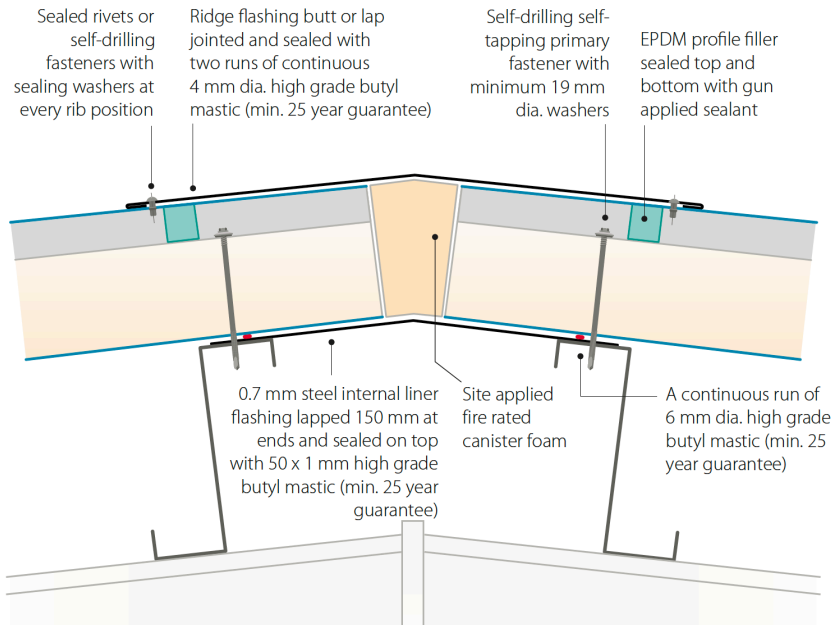


END LAP

Three primary fasteners should be used at the end lap. Fasteners are positioned in the centre of each trough. Tail stitchers should be used at every crown 50 mm from the end of the lap. Care must be taken to ensure the correct land on the purlin so that both panels edges are supported and the fastener is able to be positioned through both panels as shown.

CONSTRUCTION DETAILS – ROOF

RIDGE



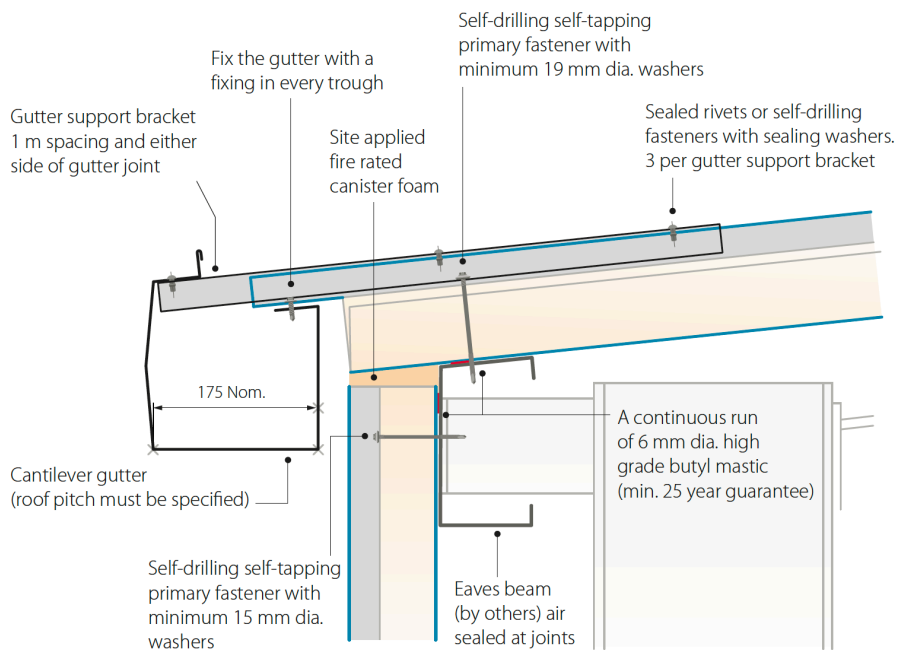
RIDGE

Fillers should be positioned back from the edge of the ridge flashing by approximately 80 mm to avoid the risk of bird attack.

Psi value (W/mK)	f factor
0.009	0.975

Stated calculation results are dependant on components being as shown. Computer modelled in accordance with EN ISO 10211.

EAVES



EAVES

The Cantilever Gutter System is manufactured to suit the pitch of the roof and downpipes can be positioned as required.

For further information on the Cantilever Gutter System and assistance with rainflow calculations please contact the Technical Department:

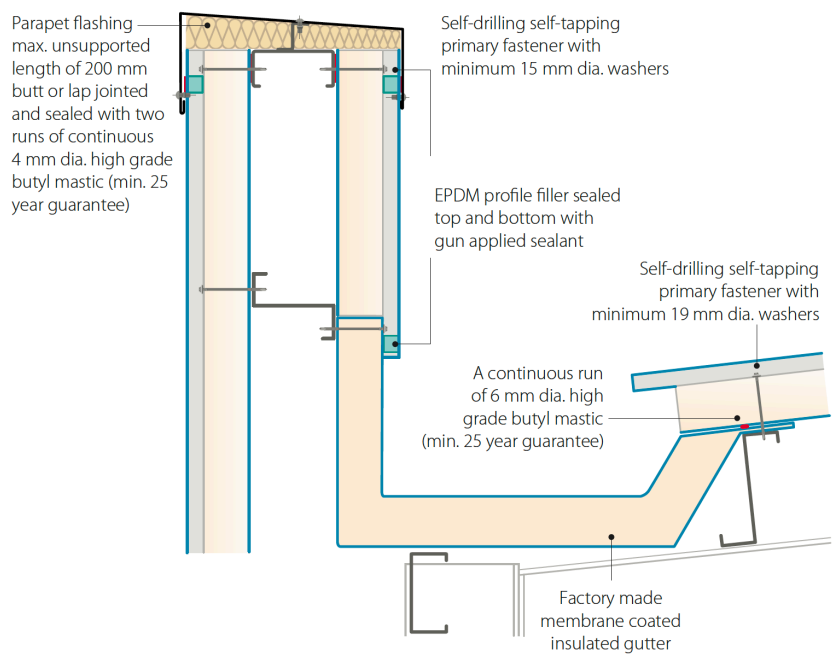
T: +44 (0) 1244 892199.

Psi value (W/mK)	f factor
0.222	0.903

Stated calculation results are dependant on components being as shown. Computer modelled in accordance with EN ISO 10211.

CONSTRUCTION DETAILS – ROOF

PARAPET



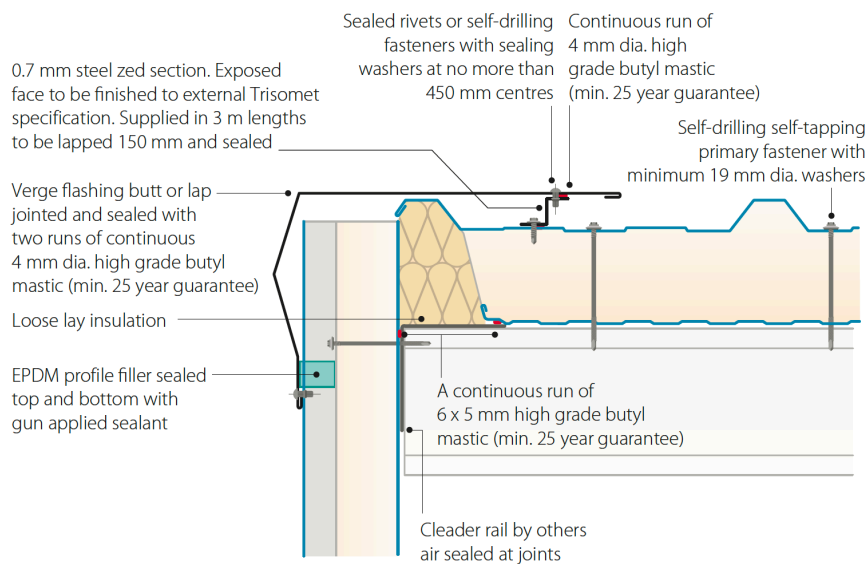
PARAPET

The parapet height should be a minimum of 950 mm from roof level to be considered as sufficient edge protection as recommended by the HSE.

Psi value (W/mK)	f factor
1.365	0.615

Stated calculation results are dependant on components being as shown. Computer modelled in accordance with EN ISO 10211.

VERGE START



VERGE START

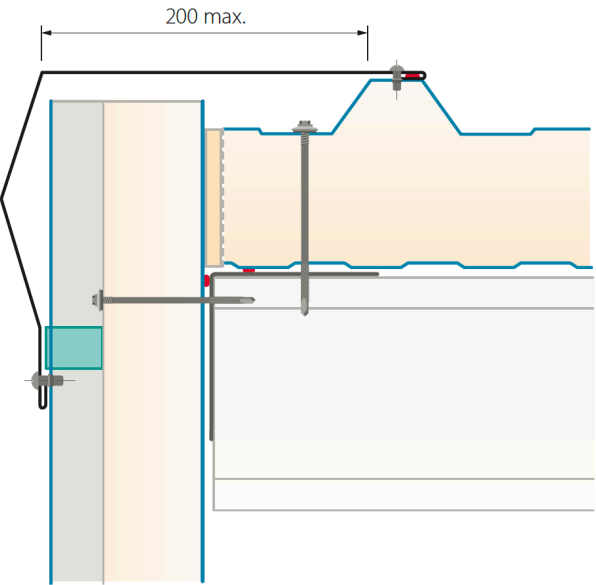
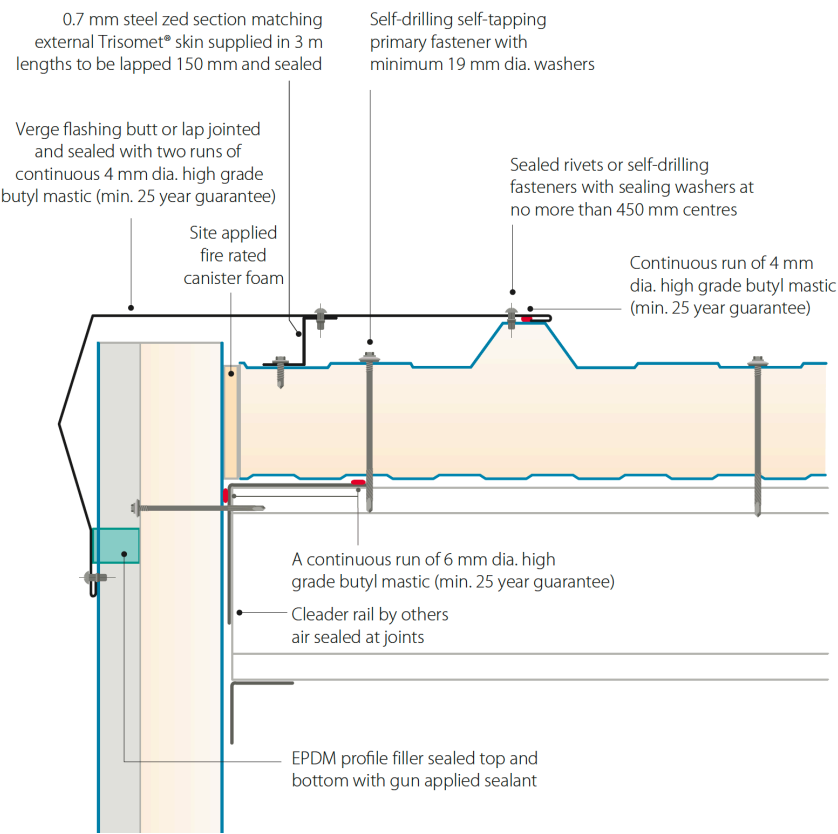
The Z section used to support the Verge Flashing is made from the same Colorcoat® material as the external face of the panel, so that it matches the durability performance of the roof.

Psi value (W/mK)	f factor
0.062	0.948

Stated calculation results are dependant on components being as shown. Computer modelled in accordance with EN ISO 10211.

CONSTRUCTION DETAILS – ROOF

VERGE END



VERGE END

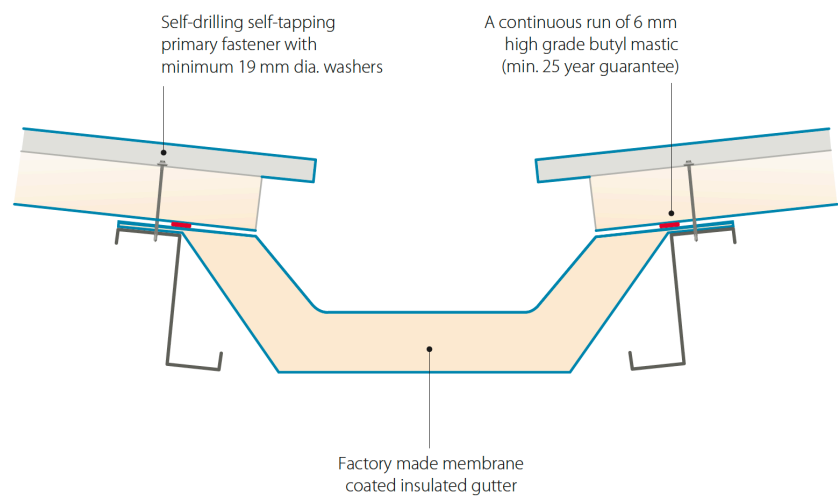
It is recommended that single skin flashing have a maximum unsupported leg length of 200 mm to maintain the strength for a flat appearance.

Psi value (W/mK)	f factor
0.098	0.948

Stated calculation results are dependant on components being as shown. Computer modelled in accordance with EN ISO 10211.

CONSTRUCTION DETAILS – ROOF

VALLEY GUTTER



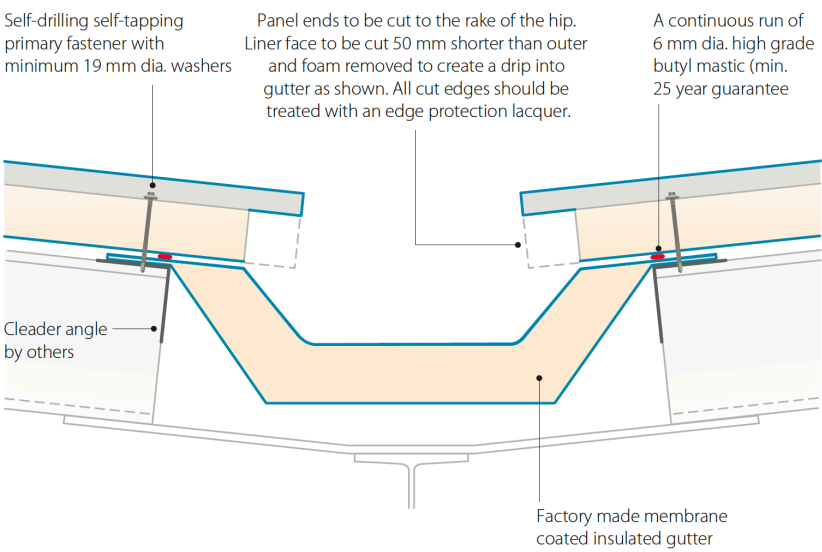
VALLEY GUTTER

Ensure a full design is carried out in accordance with BS EN 12056-3:2000 and all manufactures recommendations are followed to ensure correct detailing at this important junction.

Psi value (W/mK)	f factor
0.098	0.948

Stated calculation results are dependant on components being as shown. Computer modelled in accordance with EN ISO 10211.

VALLEY HIP



VALLEY HIP

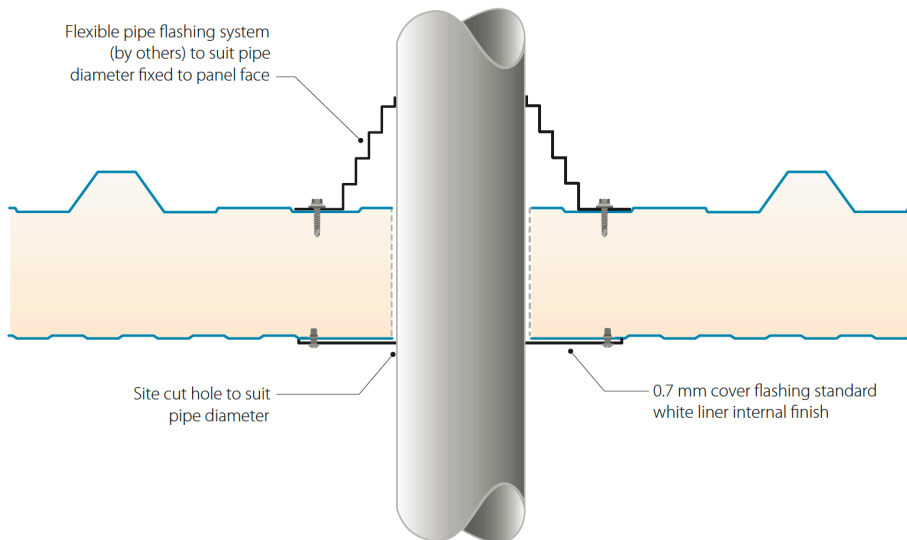
The cut back to the panel end is created to avoid water running down the face of the panel and generating the risk of tracking into the panel side lap.

Psi value (W/mK)	f factor
0.736	0.559

Stated calculation results are dependant on components being as shown. Computer modelled in accordance with EN ISO 10211.

CONSTRUCTION DETAILS – ROOF

STANDARD PIPE SEAL (DEKTITE)

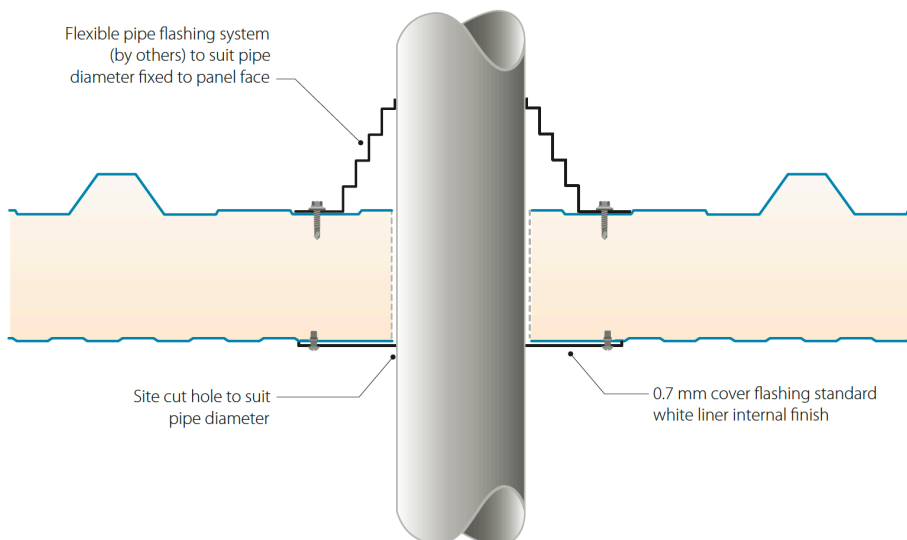


STANDARD PIPE SEAL AND HOT PIPE SEAL (DEKTITE)

The pipe flashings are available in various specifications to facilitate different opening sizes and temperature ranges. Further details on these specifications and for order placement please contact our Platinum Plus system guarantee approved suppliers, who are:

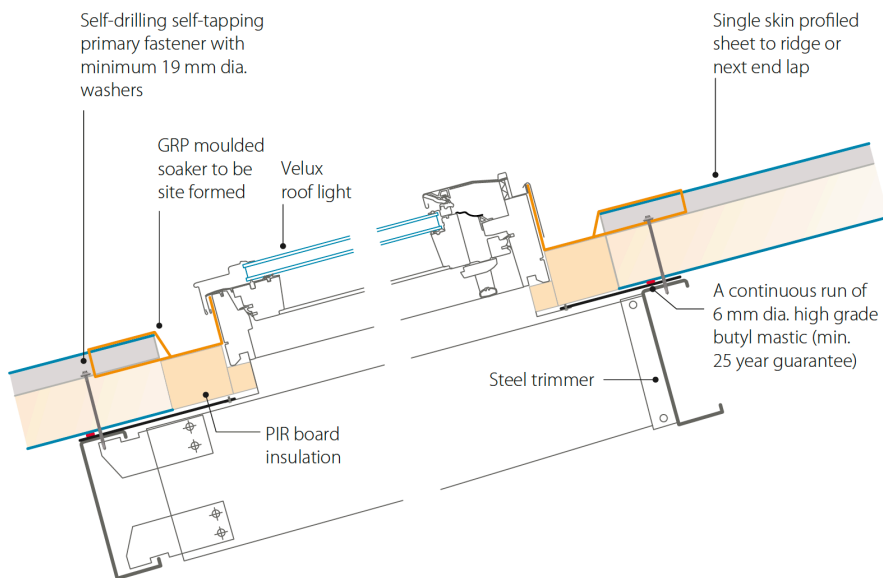
SFS intec Ltd, T: +44 (0) 113 208 5500
or EJOT UK, T: +44 (0) 1977 687040.

HOT PIPE SEAL (DEKTITE)



CONSTRUCTION DETAILS – ROOF

VELUX ROOF LIGHT



Note: correct, width, length and upstand lip should be specified

VELUX ROOF LIGHT

The detail shown indicates a Velux system. These systems will require specialist advice for installation and maintenance. Therefore Tata Steel recommend that this specialist advice be obtained from Velux, details below.

Velux

T: +44 (0) 1592 778 297

E: velux-gb@velux.com

www.velux.com

Recommended companies for GRP moulding

M R Site Services

Unit 6, Worcester Trading Estate

Blackpole, Worcester

Worcestershire, WR3 8HR

T: +44 (0) 1905 755055

F: +44 (0) 1905 755053

Jones and Woolman

Unit 6, Hayes Trading Estate

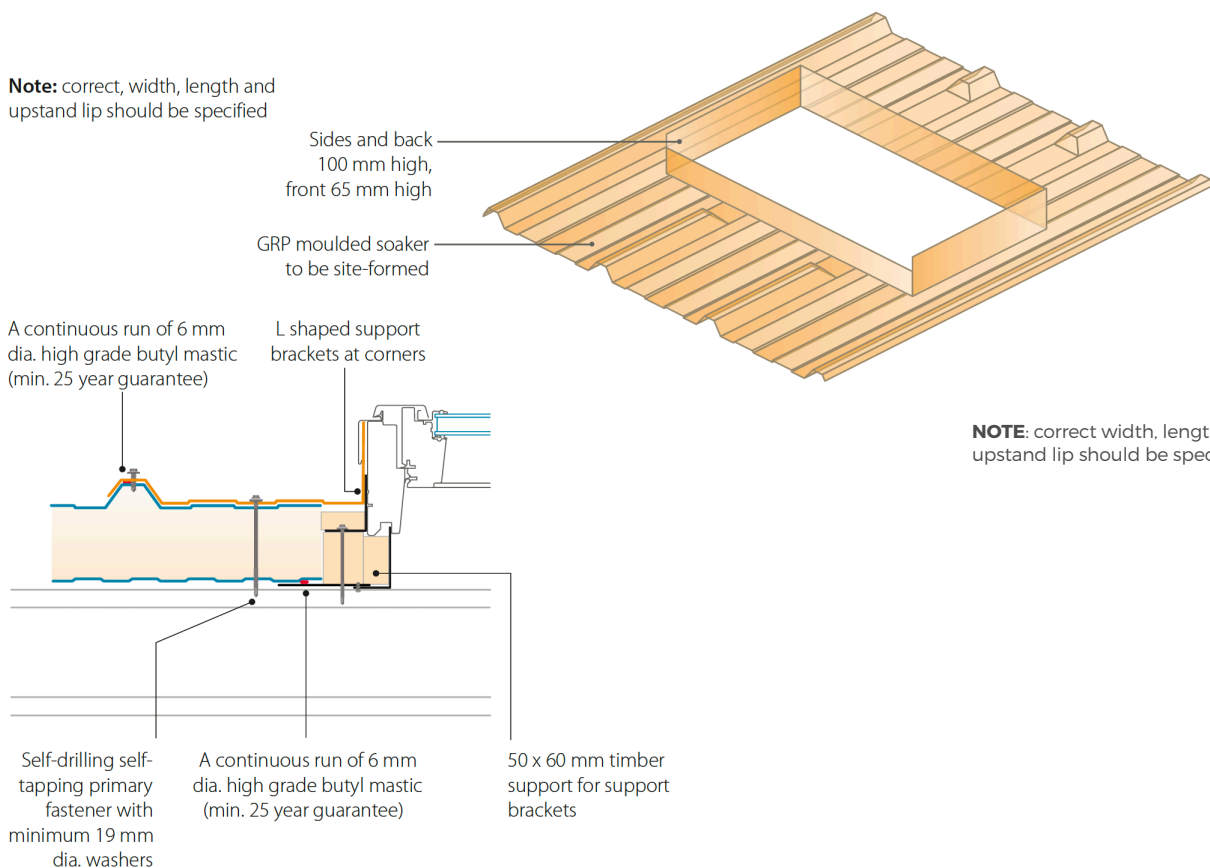
Hingley Road, Halesowen

West Midlands, B63 2RR

T: +44 (0) 1922 712111

F: +44 (0) 1922 712539

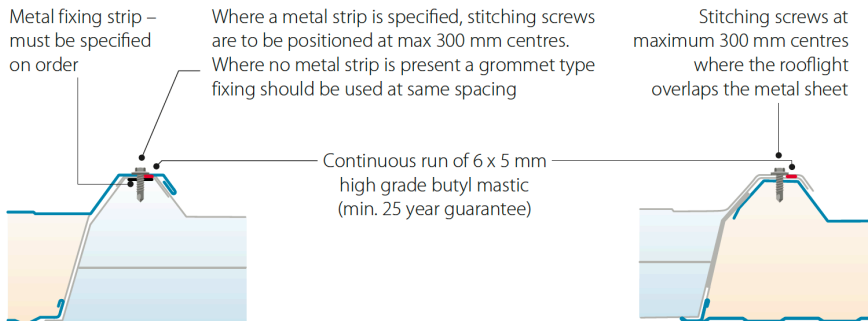
Note: correct, width, length and upstand lip should be specified



NOTE: correct width, length and upstand lip should be specified

CONSTRUCTION DETAILS – ROOF

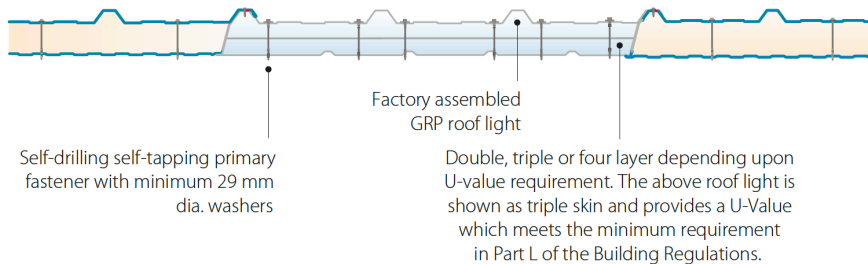
ROOF LIGHT SIDE LAP



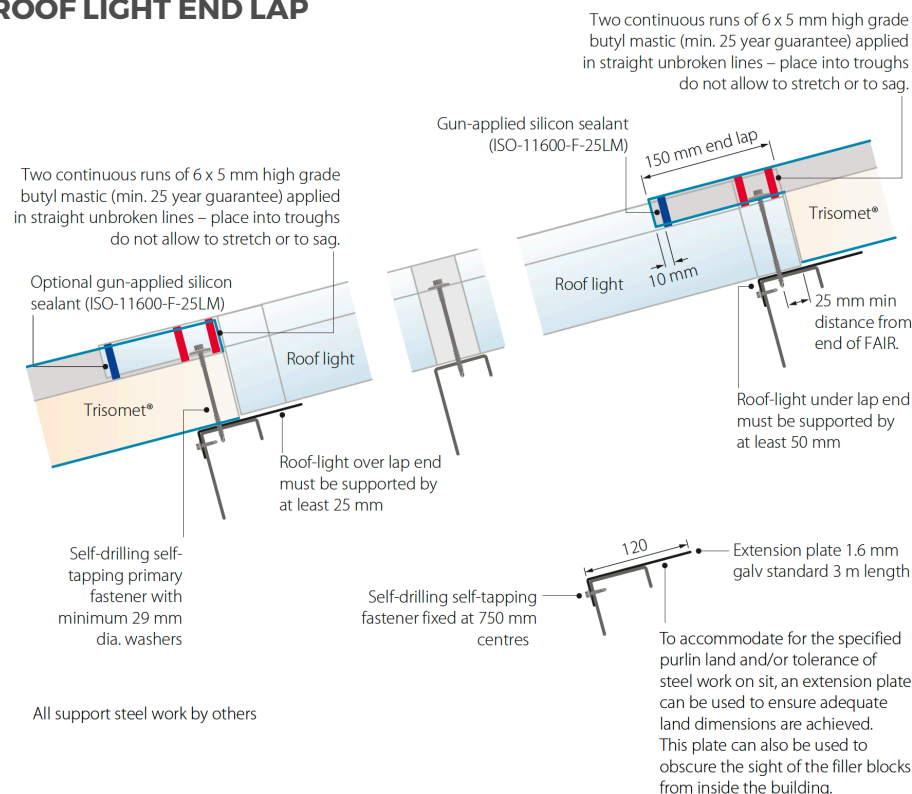
In order to achieve a 2.2 W/m²K. U-value and comply with the current building regulations for heated buildings a minimum of a triple skin roof light construction should be specified. The central core can be adapted to provide the level of insulation required. U-values

NOTE: it is not recommended to lap roof lights in series as this may cause misalignment due to varying tolerance between the panel and roof light units.

Fixing arrangement at all support positions



ROOF LIGHT END LAP

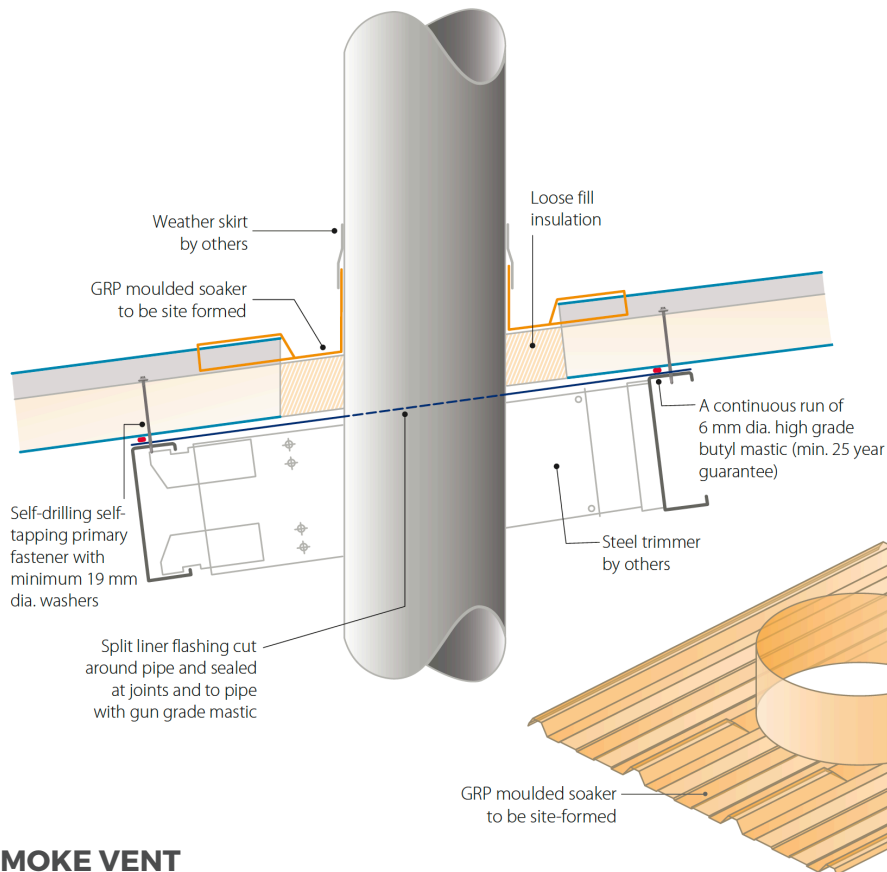


ROOF LIGHT END LAP

When ordering roof lights accurate purlin positions must be provided so fillers can be correctly positioned within the roof light construction.

CONSTRUCTION DETAILS – ROOF

LARGE PIPE SEAL



LARGE PIPE SEAL

A large opening is designated by a penetration that encompasses more than one rib profile, hence requiring a formed soaker flashing to avoid water entrapment.

Recommended companies for GRP moulding

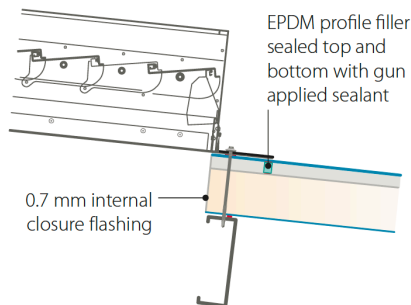
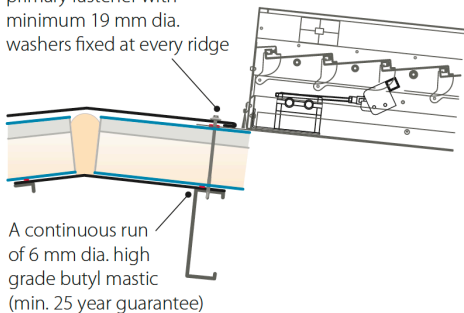
M R Site Services
Unit 6, Worcester Trading Estate
Blackpole, Worcester
Worcestershire, WR3 8HR
T: +44 (0) 1905 755055F:
+44 (0) 1905 755053

Jones and Woolman
Unit 6, Hayes Trading Estate
Hingley Road, Halesowen
West Midlands, B63 2RR

T: +44 (0) 1922 712111
F: +44 (0) 1922 712539

SMOKE VENT

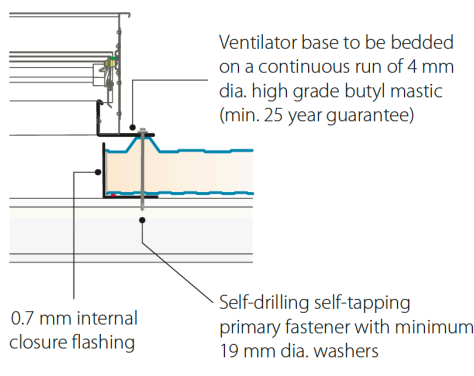
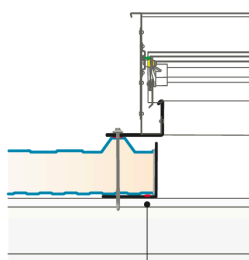
Self-drilling self-tapping primary fastener with minimum 19 mm dia. washers fixed at every ridge



SMOKE VENT

The detail shown indicates a Colt International system. These systems will require specialist advice for installation and maintenance. Therefore Tata Steel recommend that this specialist advice be obtained from Colt, details below.

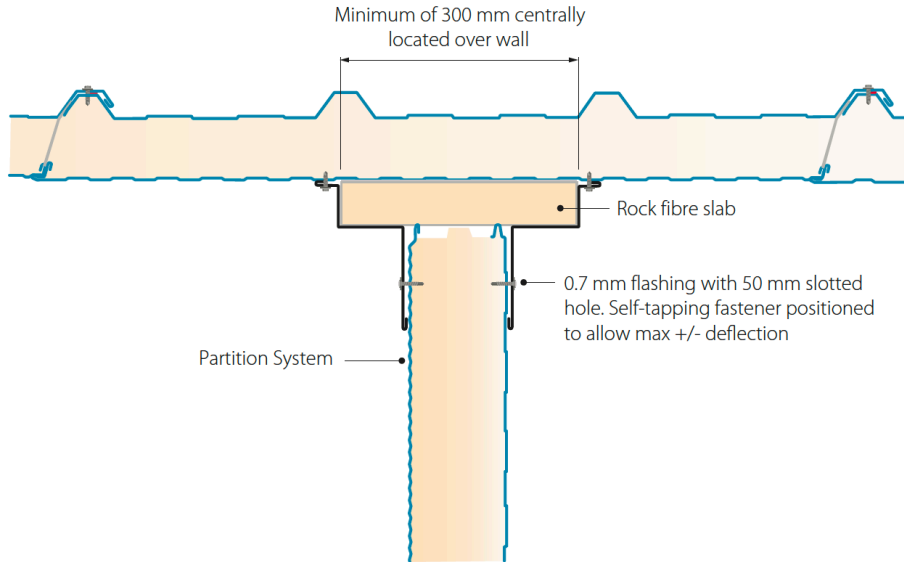
Colt International Ltd
T: +44 (0) 2392 451111
E: info@coltgroup.com
www.coltinfo.co.uk



All support steelwork by others

CONSTRUCTION DETAILS – ROOF

JUNCTION WITH INTERNAL PARTITION WITH UNDERSIDE OF ROOF

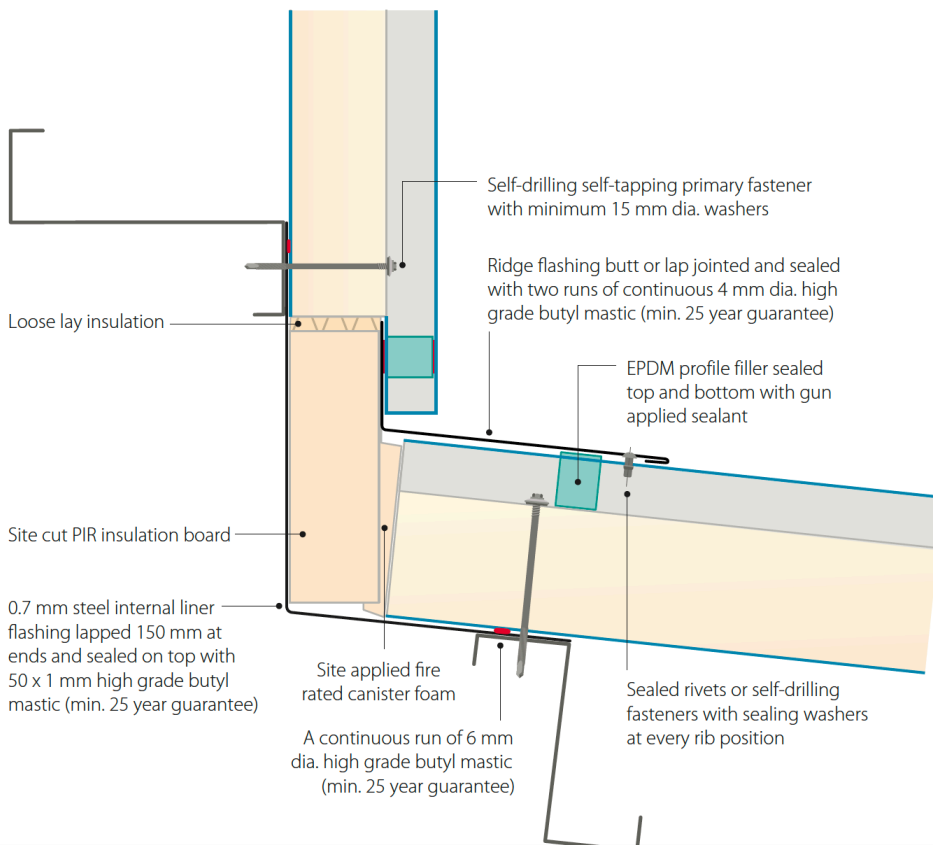


JUNCTION WITH INTERNAL PARTITION WITH UNDERSIDE OF ROOF

This detail is supported in Approved Document B of the Building Regulations where the following is quoted in Clause 8.3 of Section 8 'Compartmentation'.

Note: 'Double-skinned insulated roof sheeting with a thermoplastic core should incorporate a band of material of limited combustibility at least 300mm wide centred over the wall'.

ROOF SAFETY SYSTEM



ROOF SAFETY SYSTEM

The detail shown indicates a Latchways system, however an alternative system is also available from QBM. These systems will require specialist roof layout design and installation, together with a maintenance and inspection programme. Therefore Tata Steel recommend that this specialist advice be obtained from one of two companies below.

Latchways
T: +44 (0) 1380 732700
E: hayley.potter@latchways.com
www.latchways.com

QBM
T: +44 (0) 1924 440237
E: technical@qbmdistributors.co.uk
www.qbmdistributors.co.uk



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ROOFING