

ISOLINE ONDUTILE®

*Secondary roofing system for
all tile and slate roofs*



Assured roof underlay system
providing enhanced levels of
insulation and ventilation.

Onduline®

Lightweight roofing systems



www.onduline.co.uk

ISOLINE ONDUTILE

ISOLINE ONDUTILE from Onduline is a proven roof underlay system to create a guaranteed water tight roof. Made from the same corrugated bitumen sheets as ONDULINE CLASSIC, ISOLINE ONDUTILE is fixed below the primary tile and slate roof covering creating a weatherproof secondary roof. Enabling the primary tiled or slate roof to be used safely below the manufacturer's minimum recommended roof pitch.



BENEFITS

Immediate weather protection

ISOLINE ONDUTILE is quick to install, requires no specialist equipment or trade skills and provides immediate weather protection to the building prior to fixing tiles.

Moisture control

Tile battens positioned above the corrugations allows moisture to efficiently drain to the eaves, which with enhanced ventilation maintains excellent moisture control within the tile batten cavity.

Reduced roof pitch

Allows tiles to be fixed below manufacturer's minimum pitch by providing assured secondary weathering below the primary roof covering.

Thermal insulation

The provision of an ISOLINE ONDUTILE deck in practice significantly improves the thermal performance of the roof structure.

Sound insulation

The ISOLINE ONDUTILE system provides a 27% reduction in sound penetration through the roof covering, a considerable benefit for buildings on airport flight paths and inner city locations.

Ventilation

Sheet corrugations supply 17,000mm² per linear metre ventilation above the sheet into the tile batten cavity, and below into the roof space. Making a significant contribution to the roof ventilation.

Safety

ISOLINE ONDUTILE forms a tough, non-reflective and safe working environment during roofing works.

Versatility

The ISOLINE ONDUTILE underlay is flexible enough to be used on existing uneven roof structures and its intrinsic stiffness eliminates the risk of noise generated by lightweight membranes under fluctuations in wind pressure.

Security

In the event of damage to the primary roof covering ISOLINE ONDUTILE significantly reduces the risk of expensive consequential damage to the building and contents.

ISOLINE ONDUTILE

Systems types and specifications

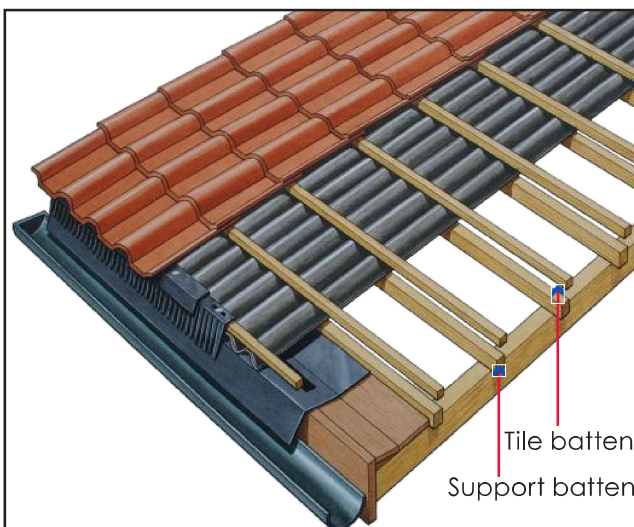
The minimum pitches / laps for tiles are normally specified by the manufacturer with reference to BS5534, Part 1 Design 1990. There are design situations, however, when these specifications cannot be attained such as when a window line of the main building restricts the roof pitch of the lower roof extension. In these cases the use of ISOLINE ONDUTILE allows the same tile used on the main roof to be utilised satisfying both Planning and Building Control requirements. Accordingly the use of the ISOLINE ONDUTILE system creates additional floor area and living space, lowering the roof pitch, not your expectations.

Deciding on the right specification for ISOLINE ONDUTILE is simple. First note the tile or slate type to be used, then select the appropriate ISOLINE ONDUTILE system fixing specification from either: ISOLINE ONDUTILE Type A or Type B options as detailed below:

Next check the **ISOLINE ONDUTILE minimum recommended roof pitch** to match the tile / slate type to be used and finally note the **mechanical fixing requirements**.

Type A - Fixing specification:

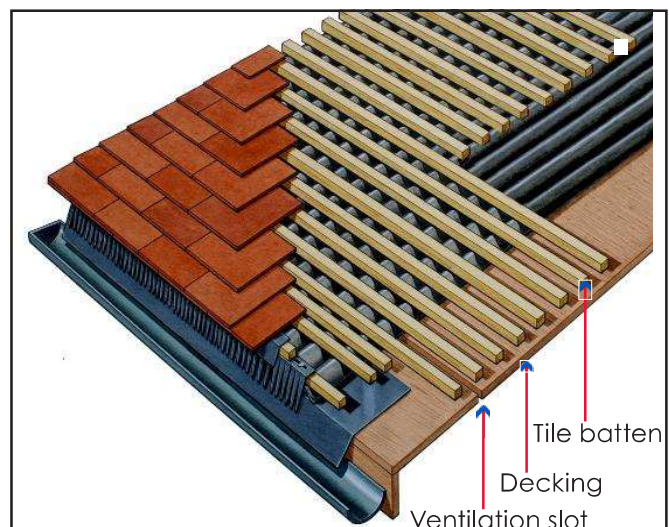
Designed for use with concrete interlocking tiles, pantiles, fibre cement and natural slates. The system forms a composite structure comprising of support battens nailed to the rafters set at the same gauge/centres as required for the tile battens.



ISOLINE ONDUTILE Type A

Type B - Fixing specification:

Developed for small double lap plain tile and small slate types which, due to the closeness of the tile battens, make the alignment of support battens and tile battens impractical. Therefore the cross batten supports are replaced with 20mm exterior quality plywood deck fixed to the rafters. Ventilation into the tile batten cavity is provided by means of slots in the decking above the eaves tray line and below the high level abutment.



ISOLINE ONDUTILE Type B

ISOLINE ONDUTILE system base sheet fixing specifications:

ISOLINE ONDUTILE TYPE A for large element concrete and clay tiles and slates.
ISOLINE ONDUTILE TYPE B for small element plain tiles & slates and heavy slab slate types.

ISOLINE ONDUTILE

WARM ROOF

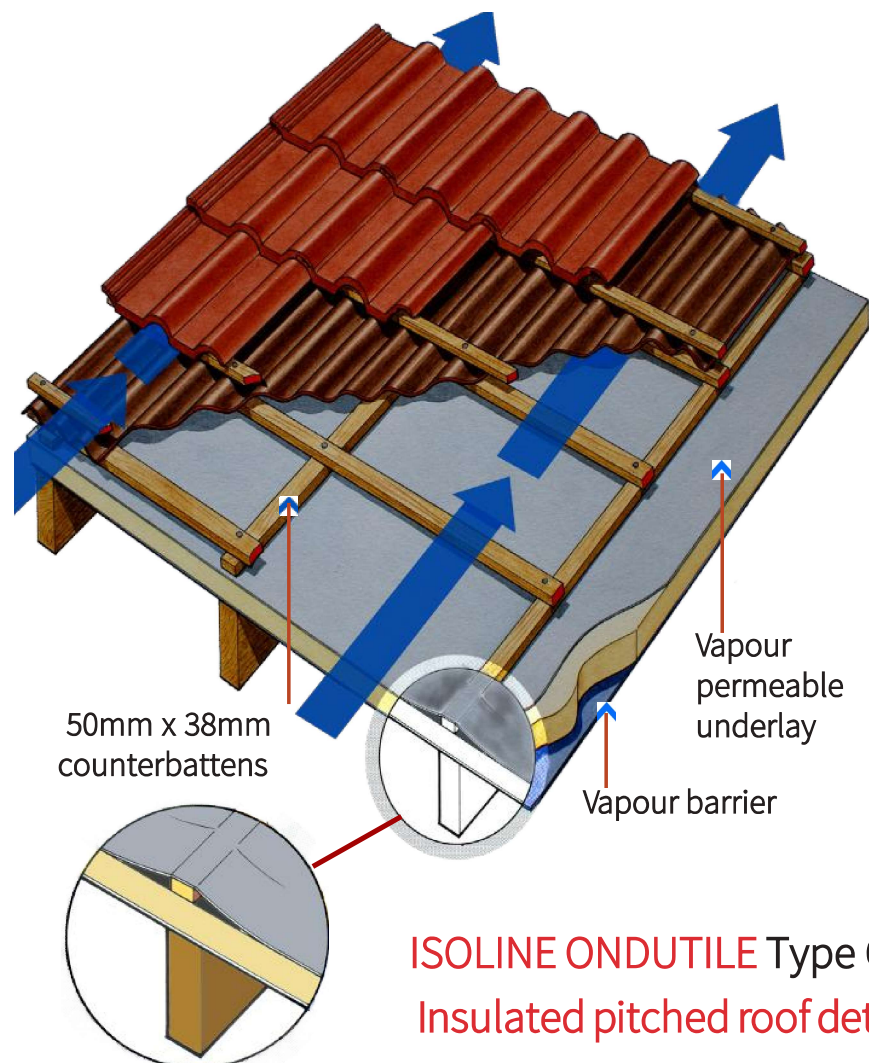
ISOLINE ONDUTILE Type C Insulated warm roof specification

As the ISOLINE ONDUTILE secondary roofing system forms a cold roof section it cannot form an integral part of a warm roof section, given the corrugated ONDULINE CLASSIC sheet is not vapour permeable as a result the ISOLINE ONDUTILE system must be laid above the warm roof with high and ventilation provided below the Onduline Classic sheet and into the tile batten cavity.

The ISOLINE ONDUTILE roof section is fixed onto 50mm x 38mm counterbattens laid over the rigid insulation boards which are securely fixed through the insulation into the rafters. Special fixings such as helical fasteners supported by independent approval (WIM LAS/BBA) are normally used. If specified by the insulation manufacturer a vapour permeable membrane should be laid over the counterbattens draining into the eaves gutter.

The ISOLINE ONDUTILE system is fixed to the counter battens which now replace the rafters as the primary fixing point to the roof structure. The ISOLINE ONDUTILE fixings into these counter battens must be either ring shank nails or screws of adequate strength, durability and pull out resistance to satisfy the roof loadings and comply with relevant European and British Standards and Codes of Practice.

Either Type A or B ISOLINE ONDUTILE fixing specifications can be used from this point in accordance to B.S. and relevant Codes of Practice.



ISOLINE ONDUTILE

VENTILATION

Tile and Slate design considerations

We recommend consideration is given to the primary tile used on your project and your local authority and the tile or slate manufacturer or supplier to ensure the material is structurally suitable for low pitch applications and will not suffer frost damage (spalling). and seek details of enhanced tile fixings to combat the associated increased wind uplift loading.

Negative considerations acting on the tiles or slate when used below the manufacturers minimum recommended pitch:

- 01:** Increased moisture content within the tile batten cavity that can promote deterioration to both the tile battens and fixings.
- 02:** The higher moisture content of the tile can result in frost damage and spalling of the tiles or slates.
- 03:** Increased wind uplift loadings acting on the roof area due to lower roof slope can require enhanced tile and slate fixings. (Contact the technical department of the tile manufacturer).

ISOLINE ONDUTILE Roof Ventilation

The increased use of labour saving machines and on suite showers etc, has significantly increased the amount of water vapour in dwellings. When this effect is combined with improvements to insulation, double glazing and draft-proofing, a roof void condensation risk may be produced unless adequate ventilation is provided.

The ISOLINE ONDUTILE secondary roof system forms a cold roof section and therefore ventilation is required below the Onduline Classic sheets fully integrated with high and low roof tile ventilation provision.

Ventilation requirement to B.S. 5250: 1989

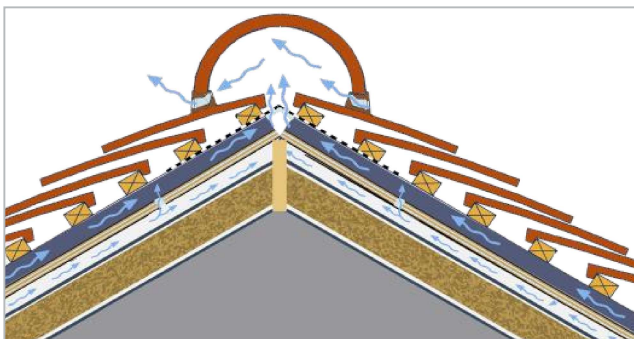
Roof pitches less than 15° degrees:

Low level ventilation at eaves should not be less than 25,000mm² per linear metre. ISOLINE ONDUTILE requires additional ventilation at soffit.

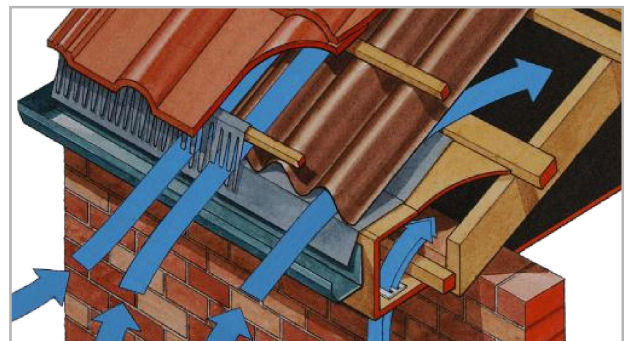
Roof pitches 15° or more:

Low level ventilation at eaves should not be less than 10,000mm² per linear metre ISOLINE ONDUTILE requires no additional ventilation.

High level ventilation: In each case should not be less than 5000mm² per linear metre.



ISOLINE ONDUTILE forms a cold roof section and high and low ventilation should be provided below the sheet



Three Onduline components provide ventilation at the eaves tray, ventilation comb 80 mm and batten cloaking piece.

Note: The full ventilation requirements are set out in B.S. 5250 'Control of Condensation in Buildings' and Approved Document Part F1 'Means of ventilation'.

ISOLINE ONDUTILE

ROOF SLOPES

Reduction in the ISOLINE ONDUTILE systems minimum roof slope recommendations:

The combination of the experience of gained on the weathering performance of the ISOLINE ONDUTILE system since its introduction in the UK in 1979, allied to the improvements made by the tile manufacturing technology as represented by the availability of new hybrid tile and slate types has allowed us to reassess the systems minimum roof pitch recommendations for the UK.

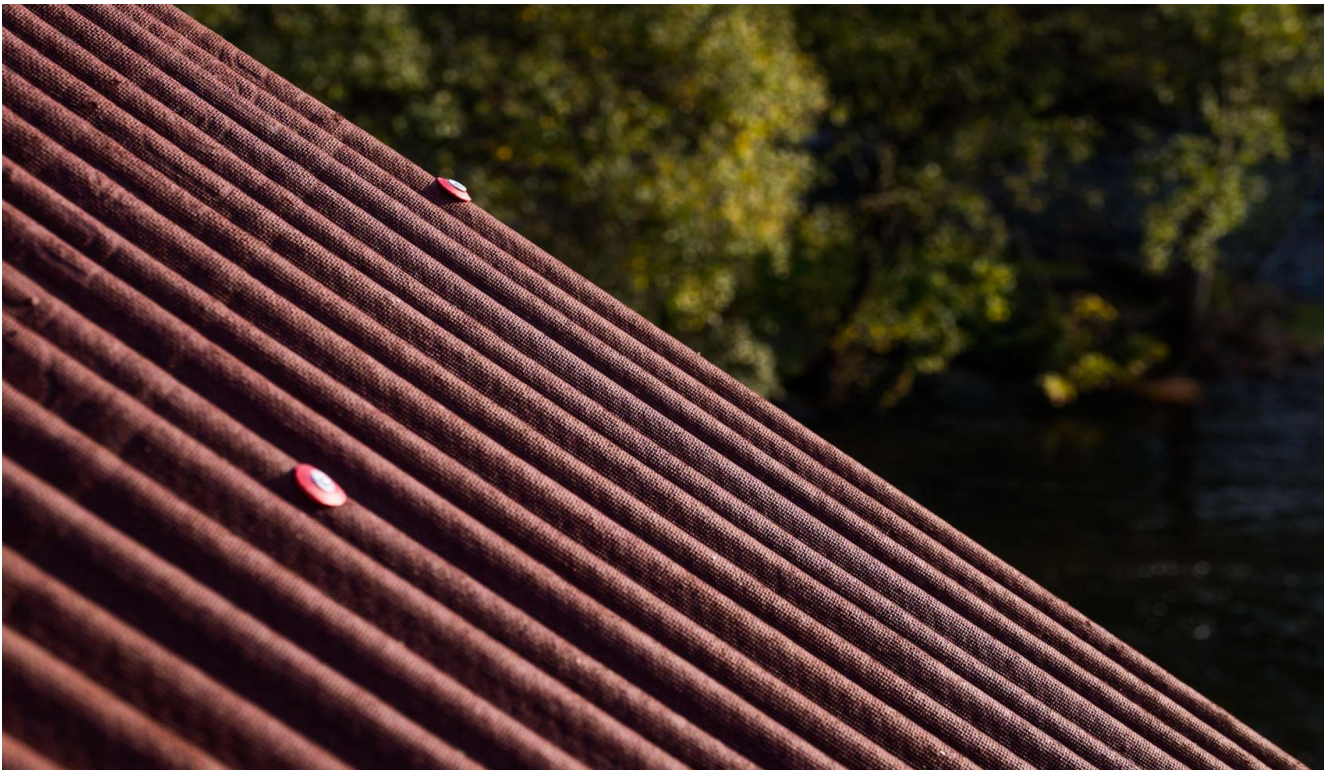
The use of the ISOLINE ONDUTILE system creates additional floor area and living space, lowering the roof pitch, not your expectations.

ISOLINE ONDUTILE minimum recommended roof slopes

Interlocking concrete tiles: 12.5° BBA Accredited

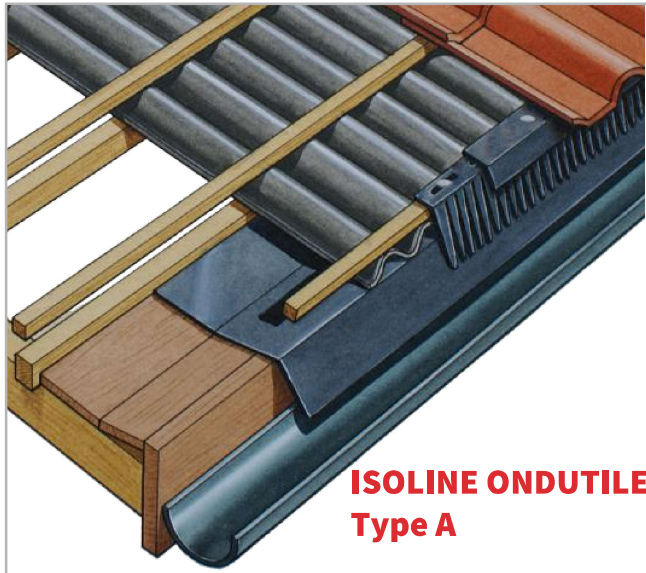
Clay pantiles, natural and fibre cement slates: 17.5° BBA Accredited

Plain double lap tiles: 22.5° BBA Accredited



ISOLINE ONDUTILE

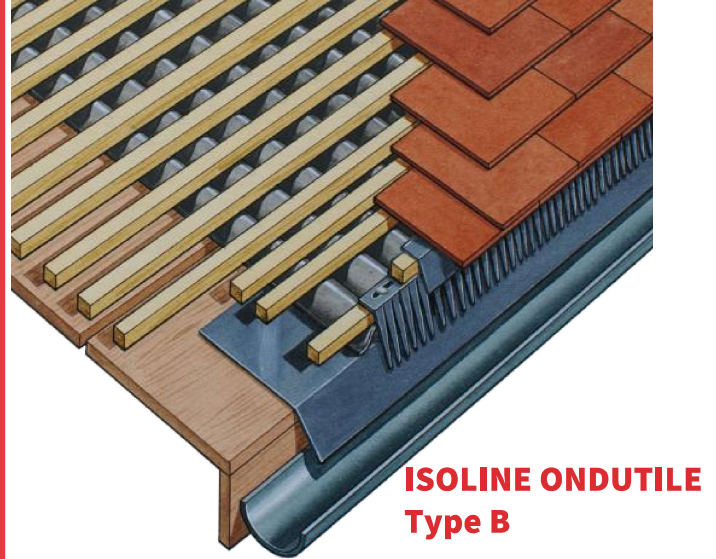
How to fix ISOLINE ONDUTILE Type A & Type B systems at Eaves



Eaves fixing for Type A specification. Fig. 1

The inherent flexibility of SOLINE ONDUTILE allows it to be bent upwards at the eaves to reduce the distance between the two water shed points from the eaves tray and tile. Therefore use a full tile at the fascia to ascertain correct eaves tile rake and fascia height. Allow a maximum 30mm tile overhang from fascia line. Construct eaves detail using tilting fillet or batten support to 12mm plywood base and fix ISOLINE ONDUTILE eaves tray. This has integral fold lines, which are bent down to form a permanent drip edge into the gutter. Butyl tape can be used to seal the eaves tray laps. ISOLINE ONDUTILE are then laid flush with the fascia line, and nailed through the tile batten and overlay with ISOLINE ONDUTILE batten cloaking piece. Use Deep flow gutter to reduce the risk of rainwater over-shooting the gutter due to increased height of roof section.

Lay sheets with a single corrugation side lap and 200mm sheet end lap. Fixings must only penetrate the top of sheet corrugations. Start alternate courses with sheet cut in half vertically to create a broken bond sheet pattern, avoiding 4 ply material build up on end laps will adversely effect the line of the tile battens. Cut ISOLINE ONDUTILE sheets up the line of corrugation by scoring with Stanley knife and folding to seperate. Cut across the width of the sheet using a rotary power saw.



Eaves fixing for Type B specification. Fig. 2

Fix a 20mm decking to rafters in accordance with the relevant British Standards and Codes of Practice, fix the ISOLINE ONDUTILE eaves tray in position. If ventilation has not been incorporated in the soffit, high and low level ventilation slots in the decking can be formed to enhance ventilation.

The ISOLINE ONDUTILE sheets can then be laid at the eaves, position sheets flush with the fascia line. The tile battens are then fixed, allowing a maximum tile overhang of 35mm. Nail tile battens through the top of the corrugation into the decking either side of the rafters, then fix the ventilator comb between the eaves battens and finish by overlaying eaves battens with an ISOLINE ONDUTILE batten cloaking piece. Use Deep flow gutter to reduce the risk of rainwater over-shooting the gutter.

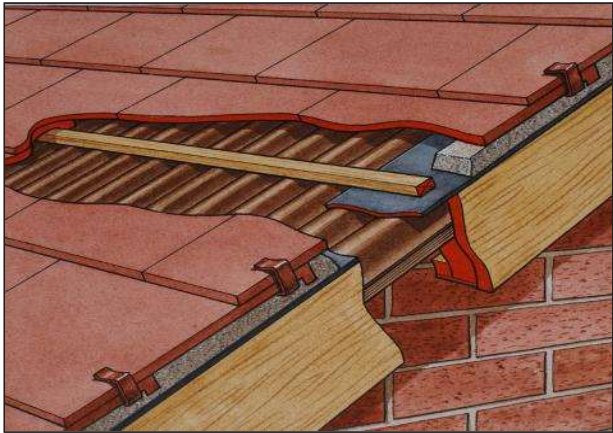
Note: When fixing tile battens to a deck 75mm ring shank nails are supplemented with 85mm ones over ISOLINE ONDUTILE laps and at the eaves and ridge.

Fixing Tiles and Slates

The ISOLINE ONDUTILE system is designed to allow tiles and slates to be laid below the manufacturers minimum recommended roof pitch (refer ISOLINE ONDUTILE minimum roof pitch section on page 6). In all other respects the manufacturers fixing specifications must be adhered too utilising enhanced fixings as required to counter increased wind uplift.

ISOLINE ONDUTILE

How to fix ISOLINE ONDUTILE at Verge, Ridge, Hip Side and End wall abutments.



Verge detail:

Fig. 3

ISOLINE ONDUTILE can be used with wet or dry verge systems. The wet system, illustrated, utilises a 150mm undercloak and timber barge boards.

ISOLINE ONDUTILE can also be fixed onto brick verges by laying the ISOLINE ONDUTILE sheets and support battens onto the inner block course. The outer brickwork course is then laid level with the top of the corrugation. A DPC is then dressed from the outer course onto the ISOLINE ONDUTILE. Tile battens and undercloak can now be fixed and the tiles laid in accordance with the manufacturer's instructions.



Ridge and hip detail

Fig.4

At ridge and hips, lay Ondutiss roofing membrane across the butt joint in the sheets and dress down a minimum of 300mm either side of ridge. When using ventilation products, the Ondutiss cover can be trimmed to enhance the flow of the ventilation into the tile batten cavity.



Side wall abutment:

Fig.5

Form Ondutiss membrane flashing on top of the ISOLINE ONDUTILE sheet providing a 3-corrugation cover onto the sheet and dress up the wall behind the line of the primary flashing and secure with tile battens. The side wall abutment is then finished with a conventional two part wall abutment flashing in accordance with LDA details.



End wall abutment

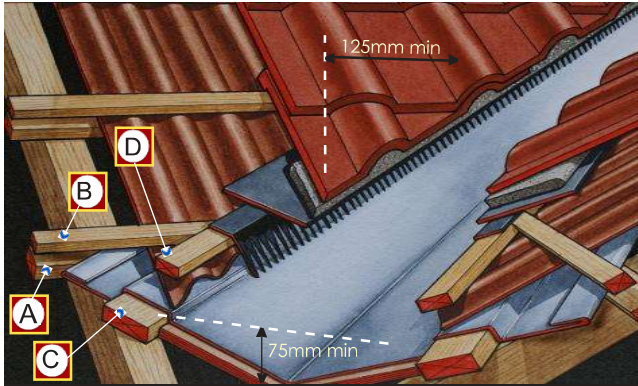
Fig.6

Use Ondutiss improved roofing membrane or similar to form a felt apron flashing from the top of the sheet to form an upstand to the wall behind the line of the primary flashing. The tile battens and tiles can then be fixed and the primary two-part lead flashing can be applied in accordance with LDA details.

Abutment ventilators can also be used by providing additional support below the ISOLINE ONDUTILE sheet as required, the ventilator can then be laid directly onto the sheet and fixed in accordance with the manufacturer's instructions after first checking that the unit is suitable for use at a reduced pitch.

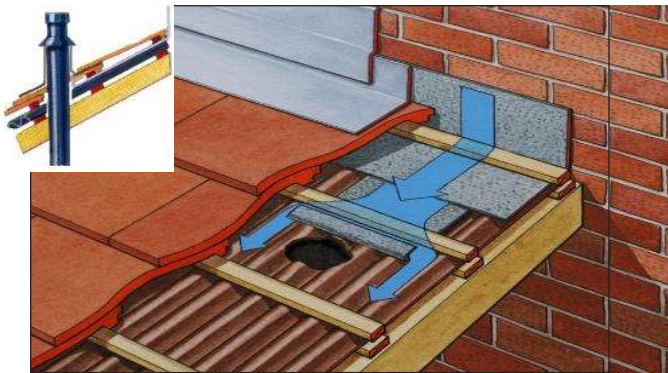
ISOLINE ONDUTILE

How to fix ISOLINE ONDUTILE at Valley, Soil vent pipe and at change of pitch in roof slope details.



Valley detail for Type A specification Fig.7

Lay Valley boards allowing for greater width due to the increased depth of finished roof section. Fix trimming battens (C) to support battens (A) up line of valley. Valley lining can then be laid. Cut and fix ISOLINE ONDUTILE sheet, overlay with upper trimming battens (D) and tile battens (B). Fix ventilator comb and undercloak. The tiles can then be cut and laid on a mortar bed in accordance with manufacturer's instructions. On gutters with high velocity rain water run off, eaves filler or plastic woven ventilator mat can be used to seal the lower corrugation.



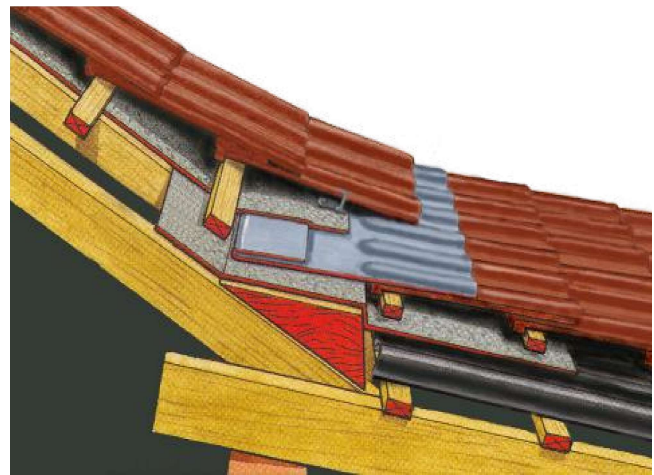
Tile Ventilator or soil vent pipe flashing unit detail Fig.8

Position ventilator between tile battens and cut neat hole in the ISOLINE ONDUTILE and decking on plain tile applications, the Ventilator socket can then be fitted. If the unit is close to the ridge / abutment a roofing membrane can be dressed down from under the cover of the abutment cover and welted back to divert rainwater run off to the corrugations either side of the opening. Alternatively if the opening is further down the roof an Onduline apron flashing can be used for this purpose. It is recommended to check with the manufacturer of the ventilation or pipe flashing unit that it is suitable for use at a reduced pitch.



Valley detail for Type B specification Fig. 9

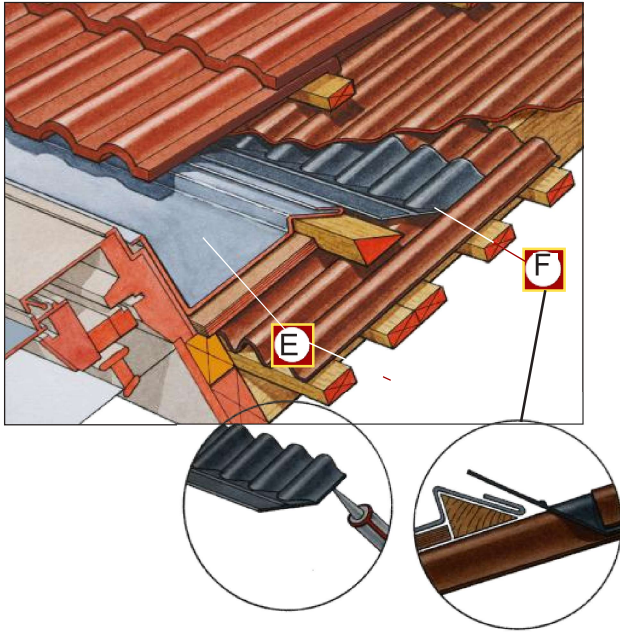
Lay tilting fillet to decking up line of valley. Allow for wider valley width due to increased depth of finished roof section. Valley lining can then be laid. Cut and fix ISOLINE ONDUTILE. Overlay with tile battens (B) and trimming batten (D) up line of valley. Fix ventilator and undercloak. Cut and lay tiles on a mortar bed in accordance with manufacturer's instructions. For slate or flat profile tiles: To increase depth of mortar bed to tiles, fix undercloak below trimming/tile battens. Ventilator comb can be replaced by woven plastic ventilation mat laid below corrugations to provide ventilation whilst preventing insects from accessing the roof space.



Change of pitch from conventional to lower ISOLINE ONDUTILE roof section Fig.10

Fix support battens and ISOLINE ONDUTILE on lower shallow pitched roof. Lay tilting fillet from upper steep pitched roof to finished height of tile course on lower roof (allow space for tile fixing). Overlay ISOLINE ONDUTILE with Ondutiss membrane and dress up over tilting fillet and under felt from upper roof. Fix tiles to lower roof and lay lead apron flashing to LDA specifications. Finally dress felt from upper roof over lead apron. Tiles can then be laid on upper roof.

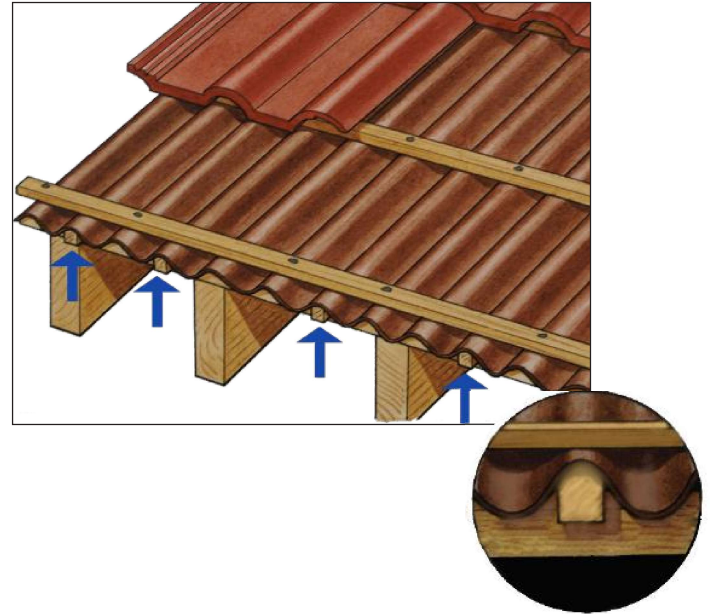
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Roof Window Detail

Fig. 11

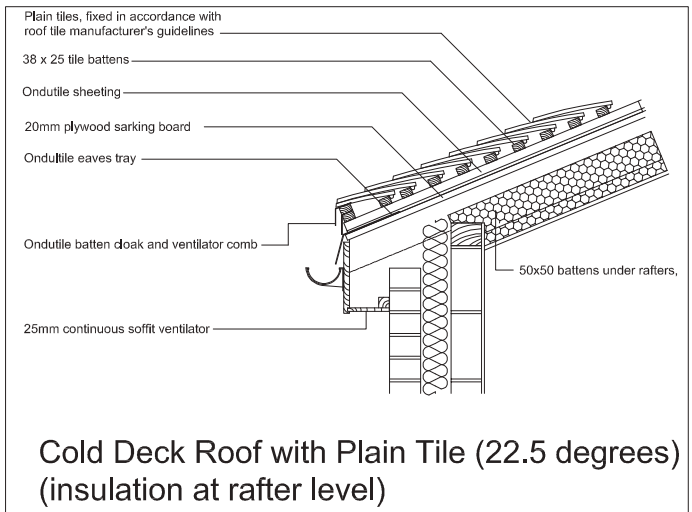
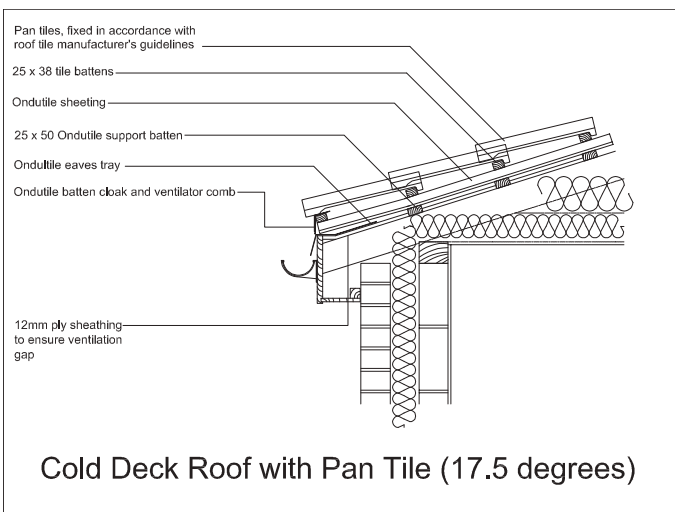
Fix roof light units on raised timber curb to ensure the roof light flashing kit aligns with the roof tiles. Weather unit to rear by creating a water check 'dam' in the corrugation which is constructed by forming a 300mm lap joint in the ISOLINE ONDUTILE to the rear of the roof light back gutter (E) into which an Onduline Apron / Closure Flashing is inserted which is consolidated by fixing the tile battens. The 'Dam' created directs any water into the corrugations either side of the opening. The roof window must be installed in accordance with manufacturer's instructions.



Corrugation support when using heavy roofing elements

Fig.12

Situations can arise when fixing ISOLINE ONDUTILE to curved bays or on steep roof pitches where additional support is required to the corrugation. In these cases rounded timber inserts are used below the ISOLINE ONDUTILE corrugation on every fifth course. They should not be used as mechanical fixing points as the timber insert section is insufficient to resist splitting when nailing.



ISOLINE ONDUTILE

The suggested ISOLINE ONDUTILE fixing specification set out in the table below are divided into three geographic areas reflecting the highest predicted wind loadings acting on the roof in different geographic areas, professional advice should be sought for sites situated on exposed or high elevation locations to calculate the fixing specification.

Region: Mechanical fixing specification

Area 3 Greater than 52 m/s and equal or less than 54 m/s

Area 2 Greater than 46 m/s and equal or less 52 m/s

Area 1 Equal or less than 46 m/s (metres per second)

The ISOLINE ONDUTILE mechanical fixing specification is designed in consideration of these wind loadings, it details both ISOLINE ONDUTILE Type A and B systems on typical rafter centers set at 450 mm or 600 mm detailing the minimum fixing requirements for Classic 38 mm sheets as follows:.

ISOLINE ONDUTILE Type A - Sheets fixed on support battens for interlocking tiles, pantiles, fibre cement and most natural and resin slates.

Ondutile Type B - Sheets fixed on decking for double lap plain tiles and small slates, ISOLINE ONDUTILE projects are recommended for exposed sites.

Region		Batten or Decking Size	Rafter Centre 450mm	Rafter Centre 600mm
1	A	Ondutile support batten: 50 x 25mm	75mm x 3.35mm (Smooth)	75mm x 3.35mm (Ring)
		Tiling batten size: 38 x 50mm	85mm x 3.75mm (Smooth)	85mm x 3.75mm (Ring)
	B	Ondutile support decking: 20mm	75mm x 3.35mm (Smooth)	Nail to rafters at 250mm centres
		Tiling batten size : 38 x 25mm	75 - 85mm x 3.35mm (Ring) *	Nail battens at 300mm centres
2	A	Ondutile support batten: 50 x 25mm	75mm x 3.35mm (Ring)	90mm x 3.75mm (Ring)
		Tiling batten size: 38 x 50mm	85mm x 3.75mm (Ring)	Consult specialist fixing supplier*
	B	Ondutile support decking: 20mm	75mm x 3.35mm (Smooth)	Nail to Rafters at 250mm centres
		Tiling batten size: 38 x 25mm	75 / 85mm x 3.35mm (Smooth) *	Nail battens at 300mm centres
3	A	Ondutile support batten: 50 x 25mm	75mm x 3.35mm (Ring)	90mm x 3.75mm (Ring)
		Tiling batten size: 50 x 25mm	85mm x 3.75mm (Ring)	Consult specialist fixing supplier*
	B	Ondutile support decking 20mm	75mm x 3.35mm (Ring) @ 250mm.	Consult specialist fixing supplier*
		Tiling batten size 38 x 25mm	75 / 85mm x 3.75mm (Ring) 250mm	Consult specialist fixing supplier **

Note:

* When fixing tile battens to the deck 75mm ring shank nails should be supplemented with 85mm ring shank nails over the ISOLINE ONDUTILE sheet laps and at the eaves and ridge.

** Should the specified 85 mm nails not be available locally, they can be substituted with 90 mm fixings however, it should be considered that these can penetrate the ISOLINE ONDUTILE support batten into the roof space.

ISOLINE ONDUTILE

Mechanical fixings notes

Design notes: This mechanical fixing specification for the ISOLINE ONDUTILE system is based on standard building types located in typical urban environments. For non-standard structures or those in exposed locations or above 300m, a full calculation is required to determine the fixing schedule in accordance with the relevant British Standards and professional advice should be taken.

Batten fixings: Nails were traditionally used to secure battens and decking and these are normally protected with a zinc alloy coating as specified in BS EN 10230-1. Increasingly nail guns or screws fixings are being used for this purpose they must be in conformity for use with structural roofing fixing requirements as required by the relevant B.S. and Codes of Practice.

Tile & Slate fixings: Traditionally galvanised iron, steel nails and even wooden pegs have been used to secure roofing tiles and slates, by their nature over time they were prone to atmospheric degradation which can ultimately result in the failure of the tile roof covering. For this reason increasingly aluminium or stainless steel fixings are being used, we therefore recommend that the tile and slate manufacturers mechanical fixing instructions are followed to ensure the correct fixings clips and accessories are used to provide a durable and long lasting lapped roof covering in conformity to BS 5534. The manufacturer should be asked for guidance on the possible need to enhance the tile or slate fixing specification in respect of low pitch roofs in order to counter increased wind uplift loadings.

ISOLINE ONDUTILE fixing specification:

Batten Nails: Nails used for securing battens, boarded and decked (sarking) roofs should be in conformity with BS EN 10230 -1 and should be hot dipped galvanised (smooth shank) and sheradised (ring shank) or of similar approved protective coating. Care should be taken to ensure that the fixing nail penetrates the top of the corrugation and support batten centrally.

Tiling battens: Tiling battens and counter battens should be structurally sound and be in conformity with Annex C of BS5534 and be not less in section to the specified minimum dimensions as listed in BS 5534.

Preservatives: Battens must be treated with preservative treatment as detailed in Annex D of BS5534 and not adversely affect the protective coating of fixings.

ONDUTISS roof underlays:

Onduline's corrugated sheets are resistant to the build up of condensation. However any single thickness roofing material is at risk of condensation formation during the winter months.

Generally air movement generated by the installation of high and low level ventilation will reduce this risk.

Onduline ONDUTISS underlays and ventilation accessories will significantly assist in this provision.



Application

Onduline roofing systems must be laid in strict accordance with the relevant Fixing Guides.

Conditions Of Use

As a result of product development, specifications and product dimensions may be changed without prior notice. ISOLINE ONDUTILE has been developed in consultation with major roof tile manufacturers for use on roofs below their normally recommended minimum pitch.

Guarantee

The ISOLINE ONDUTILE system is guaranteed to remain weatherproof for thirty years when fixed in strict accordance with our fixing instructions and maintained as directed. The guarantee is limited to the replacement cost of Onduline material only and does not extend to the primary tile / slate roof covering, labour, related construction or third party costs.

Caution

Covering of roofs can be a hazardous operation. All work must be carried out with due regard to health and safety regulations as set out in HSG33 (Roof work).



Onduline®
Lightweight roofing systems



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