



Why the Careful Selection of Underlay Is So Important

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A pitched roof is a system traditionally comprising roof tiles or slates, timber battens, sometimes counterbattens and underlay laid over timber rafters. The underlay is generally laid directly over the rafters unsupported, therefore careful selection of the type of underlay is extremely important.

The primary functions of pitched roof underlays are to provide a completely waterproof barrier to prevent water from entering the building and to take a share of the wind load to reduce the uplift forces acting on the roof tiles.

Vapour permeable underlays, often referred to as 'breather' underlays or membranes, have been used in construction in

Europe since the 1970's and were first certified by BBA in 1982 for use as sheathing membranes in timber frame buildings and for use in tiled or slated ventilated cold roof construction to assist in preventing harmful condensation in the roof space.

A waterproof layer

BS 5534 recommends that an underlay should provide a secondary barrier to the ingress of wind-driven rain, snow and dust and transport any moisture that might be deposited onto the surface of the underlay to the roof drainage system. It must also provide temporary weather protection to a building before the installation of the roof tiles, though, if the period of

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exposure to UV before covering with roof tiles is longer than is recommended by the manufacturer, the roof and underlay should be protected

using a temporary covering – usually any inexpensive underlay will be suitable.

Firstly, it is important to lay the underlay with a drape to direct water away from the batten nail holes and to provide troughs for the water to run towards the gutters. It can be quite difficult to lay modern, vapour permeable underlays with a drape, so an alternative method is to install counterbattens over the underlay, spaced at and fixed directly over the rafters, so that water can run between the underlay and tile battens. The depth of the counterbattens is not too important; anything from 10mm deep x 50mm wide is normally suitable, though, in practice, standard 25mm x 50mm battens will be used.

Nail tape, installed between the underlay and counterbattens, will prevent water from penetrating the underlay through the batten nail holes. The size and spacing of the tile or slate battens are important and are specified by the roof tile manufacturer.

Underlay support trays

At the eaves, underlay support trays should be fitted so that the underlay does not sag behind the fascia, which can otherwise lead to water ponding and eventual leaks. Underlay support trays also provide a durable and UV-resistant drip edge into the gutter.

At abutments such as walls, chimneys and roof window upstands it is important to turn the underlay up the abutment sufficiently and consider taping the underlay to the wall or upstand using a suitable durable adhesive tape.

on the tiles. If the underlay cannot sufficiently resist the wind uplift load, then a greater share is borne by the roof tiles, possibly resulting in dislodgement of the tiles. The share of the wind load borne by the underlay is considerable, therefore the underlay must be strong enough to resist these uplift forces. An underlay must always be specified that is appropriate for the design of building and, importantly, its location.

BS 5534 provides a zonal classification system for underlays; this sets minimum wind uplift load resistance requirements, based on five UK wind zones, with the lowest wind load, Zone 1, being centred around London and the south of England, up to Zone 5 covering the very far north of Scotland. Underlay manufacturers must test their underlay and then classify each type, with the geographic location and wind zone in the form of a table on the packaging.

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For penetrations through the underlay, such as pipes and ventilation terminals, cut the underlay in an 'X' and turn it up the pipe or terminal. Fit a diverter in the underlay directly above the penetration so that any water on the underlay is directed away from the penetration as it runs down the roof slope.

Underlay wind load resistance requirements

Where the underlay is laid unsupported directly over the rafters, it must provide a barrier to reduce the wind uplift load acting

However, this is not the whole story; when choosing an underlay, designers and installers must be mindful of 'limitations' that apply to underlay zonal tables. These are as follows: -

- ❑ The ceiling must be 'well sealed', as defined in BS 9250 (referred to as 'continuous' in BS 5534)
- ❑ The ridge height must not be greater than 15 metres
- ❑ The roof pitch must be between 12.5° and 75°

- ❑ The site altitude must not be greater than 100 metres
- ❑ There should be no significant site topography (as defined in BS 5534)

Some projects will fall outside one or more of these parameters; for example, there are many areas of the UK that have altitudes above the 100-metre restriction. In these cases, the predicted wind load may exceed the maximum declared load resistance in the Zonal Classification table for the location. Where this is the case, a wind uplift calculation should be carried out to determine what strength the underlay needs to be. Alternatively, use an underlay that is classified for unrestricted use in all UK wind zones; for example, the Wabis Climateq range of vapour-permeable underlays are suitable for use in all UK zones when installed with sealed laps.



Climateq can be used without any additional roof space ventilation. Please contact Wabis Technical Support for further information.

A secondary, but equally important, function of counterbattens is to create a space for air movement between the underlay and tiles or slates to aid the dispersal of water vapour from the structure. Whilst there will be some air flow through the roof covering, incorporating a continuous air inlet at eaves and a continuous air outlet at ridge or high level will remove unwanted water vapour far more efficiently.

In summary:

- ❑ Ensure the underlay is either laid with a drape or with counterbattens and nail tape to prevent leakage through the batten nail holes. Seal around all junctions and penetrations and fully support the underlay at eaves.

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Condensation control

Wabis Climateq vapour-permeable underlays can also be installed as part of a vapour control system to prevent harmful condensation forming in the roof space for both ventilated cold roofs and non-ventilated warm roof constructions.

For example, in a cold roof with a well-sealed ceiling, Climateq underlay installed with the Wabis dry ridge system makes an ideal combination to reduce any condensation risk. In a warm roof system with a well-sealed ceiling,

- ❑ Check if a project is likely to exceed any of the Zonal Classification Tables conditions. If there is any doubt about the suitability of an underlay, contact Wabis Technical Support for assistance.
- ❑ Install the underlay as part of a vapour control system to prevent excess condensation forming in the roof space. Always follow Wabis technical guidance and installation recommendations. ■■■