

Designing and Constructing Efficient Pitched Roofs

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As we enter 2020, I am amazed that we have reached this point in time yet we still carry on constructing pitched roofs in the same old way, that is with underlay simply draped over rafters, when we have such great modern technology in our underlays.

underlay ends up in the batten cavity for a period before it dissipates out through the roof tiling; consequently, we are now seeing increasing evidence of excessive amounts of condensation on the undersides of the roof tiles.

BS5534 Permeability test

There is a test method in BS 5534: British Standard for slating and tiling, for determining the permeability of external roof coverings such as tiles and slates. When tested, if the airflow rate through the tiling,

Clay and concrete tiles are generally considered to be sufficiently air-open, though increasing cases of efflorescence on the backs of concrete tiles and even some cases of delamination on the backs of clay tiles is a sign that relying on the tiles or slates alone to dissipate water

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We now have some extremely efficient vapour permeable underlays. These require little or no traditional roof space ventilation, with the result that condensation is efficiently controlled within the roofspace loft (the void between the insulation and underlay), when using these products. However, all the water vapour that passes out of the structure through the

BS 5250: British Standard Code of practice for control of condensation in buildings, recognises that vapour permeable underlays will lower the risk of water vapour in the loft, but may increase the risk of condensation in the batten space unless there is enough air movement through the external covering.

measured at 2 Pascals pressure difference, is greater than 7.8A m³/h (‘A’ being the effective area of the test rig) then the roof covering is regarded as sufficiently permeable. If the airflow is less than this, then BS 5250 recommends that either counterbattens are installed with low-level and high-level batten space ventilation, or the loft be ventilated.

vapour may no longer be enough, as permeable underlays have become more efficient. Therefore, there is a case for considering the use of counterbattens in all roofs and particularly where there is no traditional roofspace ventilation.

Batten cavity ventilation

In mainland Europe, the risk of excessive condensation forming on the undersides of roof tiles

and slates is well understood. The batten cavity is routinely ventilated at low and high level to encourage air flow to remove water vapour and thus prevent condensation from forming.

Counterbattens

Counterbattens offer several advantages; firstly, they remove the need to drape the underlay which, as many roofers will know, can be difficult to do when using modern lightweight underlays. Ideally, to ensure complete waterproofness of the underlay layer, bituminous tape should be installed between the

and so do not allow air to pass between the battens.

Eaves ventilation

Traditionally, the roofspace or loft would have been ventilated at eaves. However, where this is not required due to the roof design and vapour permeable underlay, it is still worth considering installing eaves ventilation to ventilate the batten cavity. This, combined with ridge ventilation in the form of a dry ridge system, will promote the flow of air within the batten cavity to remove unwanted moisture.

ridge system will also assist in ventilating the batten cavity.

So, I hear you ask, what is the point of vapour permeable underlays if ventilation is still a good idea? Ventilation of the roofspace efficiently removes unwanted water vapour and prevents condensation. But it also reduces the efficiency of the insulation, particularly if the ceiling is not well sealed. Therefore, particularly in new construction where a well-sealed ceiling with an efficient air and vapour control layer

combined with high quality raw materials. This attention to quality ensures long-term durability, reducing the risk of condensation as well as ensuring high wind and rain resistance.

Most roof coverings; particularly clay and concrete tiles and slates, have a service life of 100 years or more, therefore it surely makes sense to use good quality and durable materials under the tiles or slates. Remember, if the underlay fails, it means removing the entire roof to replace it.



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underlay and counterbattens to seal the perforations made through the underlay by the batten nails.

Secondly, and just as importantly, counterbattens will ensure a flow of air through the batten cavity (the void between the underlay and roof tiles or slates) when used in combination with eaves and ridge ventilation. This is particularly relevant when using flat tiles or slates, which sit flat on the battens

Dry ridge systems have long been an accepted alternative to mortar bedding and they offer the great advantage of mechanically securing the ridge and hip tiles. In addition, dry ridge systems provide continuous ventilation.

The usual installation method is to set the underlay short at each side of the apex to promote ventilation of the roofspace. Though if counterbattens are installed, the dry

is installed, moving the ventilation away from the roofspace and into the batten cavity greatly improves the thermal performance of the roof structure.

Of course, it is equally important to use good quality materials when constructing a roof. Wabis produces some of the most efficient and highest quality underlays on the market, using modern manufacturing techniques

In summary:

- ❑ Always use good quality underlay, such as the Wabis Focus range; poor quality underlay will fail and means the entire roof must be removed.
- ❑ Consider the use of counterbattens to promote air flow within the batten cavity.
- ❑ Install eaves and ridge ventilation to promote air flow between the counterbattens and underlay. ■