

Ventilation requirements for cold and warm pitched roofs with LR underlay and air impermeable roof coverings

(Withdrawn – January 2024)

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Question

What are the ventilation requirements for cold and warm pitched roofs with LR underlays and air impermeable roof coverings?

Considerations

- Performance standard 7.2.15 Ventilation, vapour control and insulation states ‘roofs shall have adequate precautions against condensation’,
- In roofs with LR membranes moisture can move by both diffusion and convection from the loft into the batten space,
- Air impermeable roof coverings such as self-supporting metals sheets with standing seams can restrict the transfer of vapour from the batten space to atmosphere due to their high resistance to water vapour and airtightness,
- There is a risk of interstitial condensation and moisture accumulation on the underside of air impermeable roof coverings,
- Excessive and prolonged interstitial condensation within a roof structure can cause hygroscopic materials such as timber to absorb sufficient moisture to encourage mould growth and decay if above 20% moisture content (decay threshold). It can also cause damage to coverings, insulation, metal fixings, linings and supporting construction.

Answer

BS 5250 Management of moisture in buildings – code of practice provides guidance on application of design principles for roofs and should be used by designers to control condensation risks to within safe limits.

Section 12.4.3.2 of BS 5250 describes a method for determining the air permeability of roof coverings. The outer weatherproof covering is deemed to allow sufficient air movement and be air permeable if the airflow at a differential of 10 Pa is greater than $17.4 \text{ m}^3/\text{h Ar}$, where Ar is the area of the outer weatherproof covering under test in m^2 (as defined in BS 5534:2014+A2:2018).

If the airflow is not greater than $17.4 \text{ m}^3/\text{h Ar}$, then the outer weatherproof covering is deemed air impermeable.

Confirmation should be sought from manufacturers on the air permeability of their coverings.

Where air impermeable coverings are used on a cold pitched roof with an LR underlay the following should be provided in accordance with BS 5250:

- Ventilation openings to the roof void in accordance with sections 12.5, 12.6 and 12.7; and
- Subject to manufacturers recommendations, ventilation openings to the batten space above the underlay, created with minimum 25mm deep counter battens, having a minimum free area of not less than $25000\text{mm}^2/\text{m}$ at eaves level and $5000\text{mm}^2/\text{m}$ at ridge level.

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Where air impermeable coverings are used on a warm pitched roof with an LR underlay the following should be provided in accordance with BS 5250:

- Air and vapour control layer at ceiling level and
- Subject to manufacturers recommendations, ventilation openings to the batten space above the underlay, created with minimum 25mm deep counter battens, having a minimum free area of not less than 25000mm²/m at eaves level and 5000mm²/m at ridge level.



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