Condensation management considerations for ventilation of roof spaces (NCC 2022 Volume 2)

The National Construction Code (NCC) 2022 ABCB Housing Provisions Part 10.8.3 Ventilation of Roof Spaces has been expanded since NCC 2019 Volume 2 and outlines several new requirements to meet deemed to satisfy. This clause is specifically applicable to climate zone 6, 7 & 8 only.

1. *In climate zone 6, 7 and 8, a roof must have a roof space that:*
   - (a) *is located:*
     - i. *immediately above the primary insulation layer; or*
     - ii. *immediately above sarking with a vapour permeance of not less than 1.14 µg/N.s, which is immediately above the primary insulation layer; or*
     - iii. *immediately above ceiling insulation that meets the requirements of 13.2.3(3) and 13.2.3(4); and*
   - (b) *has a height of not less than 20mm; and*
   - (c) *is either:*
     - i. *ventilated to outdoor air through evenly distributed openings in accordance with Table 10.8.3; or*
     - ii. *located immediately underneath the roof tiles of an unsarked tiled roof.*

Primary insulation layer as defined by the NCC is the most interior insulation layer of a wall or roof construction.

To meet Part 10.8.3 Ventilation of Roof spaces there are several options:

Option 1: Standard hip and gable roofs will generally have a roof space above the primary insulation (Pink® Ceiling Batts) and the underside of the roofing. This allows the option to add Sisalation® products or Permastop® Blanket in a metal roof system to gain an additional thermal performance.

In this system type it is important to ensure that adequate ventilation is provided to roofing at the eaves and/or ridge as per the requirements of Table 10.8.3. At the perimeter, a minimum of an R3.0 Pink Perimeter batt or greater is strongly recommended. This can be used to ensure the minimum 20mm gap is kept between the roofing and the product (see figure 10.8.3).

It is important to note that a lower R-value batt at the perimeter will drive the need for higher R-value Batts around the rest of the ceiling to compensate.

Option 2: Where there is limited roof cavity such as in cathedral and skillion type roofs, a 20mm air gap must be provided between the primary ceiling insulation (Pink® Batts) and the roof. This can be achieved with the use of battens facilitating a 20mm air gap. Again, adequate ventilation must be provided at each of two opposing ends or at the eaves/ridge dependent on roof pitch, as per the requirements of Table 10.8.3.

Other alternative solutions to the above are:

- Sisalation® Vapawrap™ Vapour Permeable Metal Roof with a 20mm vented cavity above the membrane meeting Table 10.8.3. It's possible to achieve this with a corrugated metal roof and a sufficiently ventilated ridge.
- The same solution as Option 1, however metal framed roofs are required to meet NCC Vol 2 Housing provisions 13.2.3 (3). One solution is to allow for continuous insulation across joists/bottom of chords, the cavity must be vented above this layer. Please note the vapour permeance of each layer is required to have a vapour permeance no less than the primary insulation layer. Use of Pink® Batts is strongly recommended to meet NCC Vol 2 Housing provision 13.2.3 (4).
- Have minimum of 20mm cavity directly below an unsarked tile roof and above the Pink® Ceiling Batts.

Table 10.8.3: Roof space ventilation requirements (NCC Vol 2 Housing Provision)

Roof pitch	Ventilation openings
< 10°	25,000mm²/m provided at each of two opposing ends
≥ 10° and < 15°	25,000mm²/m provided at the eaves and 5,000mm²/m at high level
≥ 10° and < 75°	7,000mm²/m provided at the eaves and 5,000mm²/m at high level, plus an additional 18,000mm²/m at the eaves if the roof has a cathedral ceiling

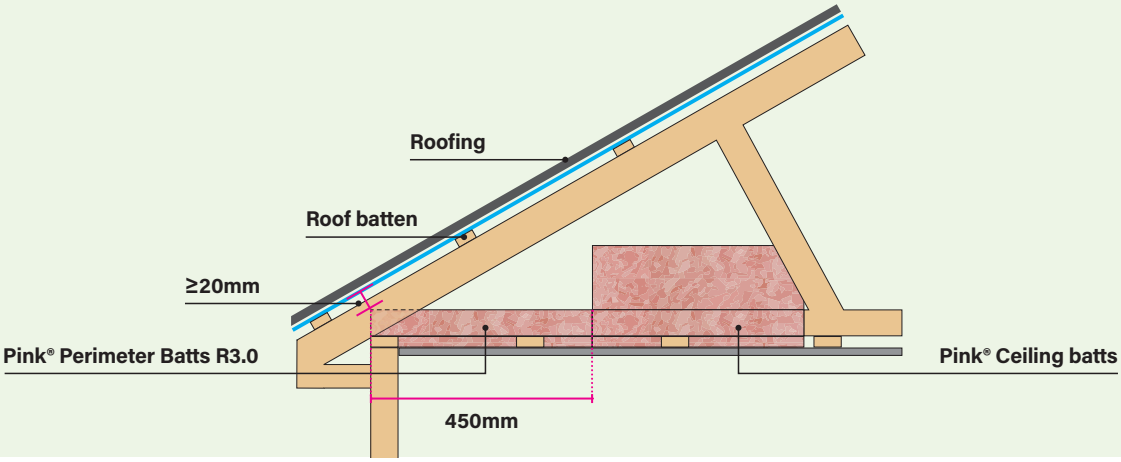
Table notes

1. *Ventilation openings are specified as a minimum free open area per metre length of the longest horizontal dimension of the roof.*
2. *For the purposes of this Table, high level openings are openings provided at the ridge or not more than 900mm below the ridge or highest point of the roof space, measured vertically.*

For metal roofing refer to the NASH Ventilation in Steel Roofing – Approaches to satisfy NCC 2022 Condensation Management requirements for residential roofs in Climate Zones 6, 7 and 8, or your select ventilation system manufacturer to confirm compliance of vented openings.

In perimeter areas of the roof, use of Pink® Perimeter Batts R3.0 is strongly recommended to maintain a 20mm cavity to ensure the ventilation of the roof space is not impeded. Refer to Explanatory Figure 10.8.3 in ABCB housing provisions for further information.

Figure 10.8.3: Example of roof space with low level ventilation



Please note the requirements of NCC Vol 2 Housing Provisions 10.8.3 do not apply to the following systems.

1. *The requirements of (1) do not apply to a:*
   - **(a)** *concrete roof; or*
   - **(b)** *roof that is made of structural insulated panels; or*
   - **(c)** *roof that is subject to Bushfire Attack Level FZ requirements in accordance with AS 3959.*

It is strongly recommended the selected ventilation manufacturer is consulted to ensure compliance is met.