



Exhaust Systems & Ventilation of Roof Spaces

NCC2022 Housing Provisions Standard
– Part 10.8 Condensation Management

How to comply with Clauses
10.8.2 & 10.8.3 in Climate Zones
6, 7 & 8

The National Construction Code 2022 Housing Provisions Standard, section 10.8 titled 'CONDENSATION MANAGEMENT' has amendments to the sections: 10.8.2 Exhaust Systems & 10.8.3 Ventilation of Roof Spaces clauses.

To assist in reducing condensation risk in homes, the National Construction Code prescribes a number of measures to reduce the build-up of internal moisture. Key to these measures is the mandatory requirement to exhaust all moisture sources to outdoor air in all Australian climate zones. Secondly, in the colder climate zones of 6/7/8, there is a requirement to ventilate the roof space to manage the accumulation of moisture in the attic space.

These changes apply to residential detached (Class 1) homes and compliance to this new clause can be achieved with installation of roof ventilators in accordance with the recommendations in this brochure.

NCC2022 Housing Provision Standards References

10.8.2 Exhaust Systems

NCC2022 Condensation Management clause 10.8.2 lists the following requirements for discharge of exhaust systems:

- (2) Exhaust from a bathroom, kitchen, kitchen rangehood, sanitary compartment, or laundry must be discharged directly or via a shaft or duct to outdoor air.
- (3) Where a venting clothes dryer is installed, it must discharge directly or via a shaft or duct to outdoor air.

* Refer to subclauses 5 & 6 for further requirements. NCC Clause Note 10.8.2 - for the purpose of this publication this clause has not been reproduced in full, please refer to the NCC for a full copy.

10.8.3 Ventilation of Roof Spaces

NCC2022 Condensation Management clause 10.8.3 provides the following options for ventilation of roof spaces:

- (i) In Climate Zones 6, 7 & 8, a roof must have a roof space that
- (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.

* Refer to subclause 2 for exclusions. NCC Clause Note 10.8.3 - for the purpose of this publication this clause has not been reproduced in full, please refer to the NCC for a full copy.

TABLE 10.8.3

Roof pitch	Ventilation openings
< 10°	25,000 mm ² /m provided at each of two opposing ends
≥ 10° and < 15°	25,000 mm ² /m provided at the eaves and 5,000 mm ² /m at high level
≥ 15° and < 75°	7,000 mm ² /m provided at the eaves and 5,000 mm ² /m at high level, plus an additional 18,000 mm ² /m at the eaves if the roof has a cathedral ceiling

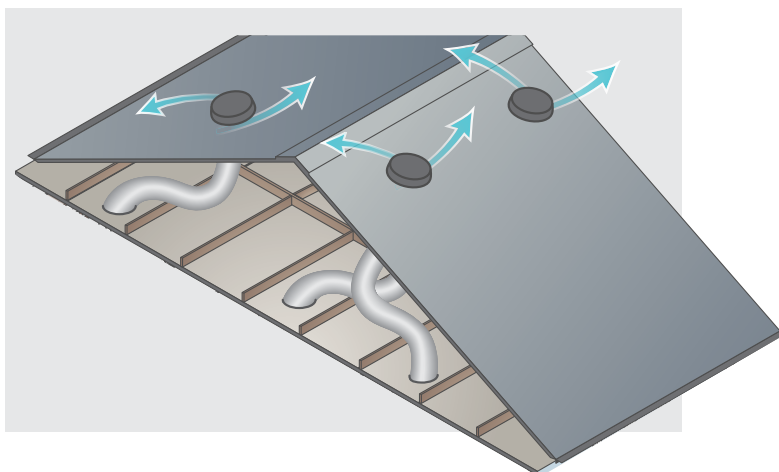
1. Ventilation openings are specified as a minimum free open area per metre length of the longest horizontal dimension of the roof.
2. For the purposes of this Table, high level openings are openings provided at the ridge or not more than 900mm below the ridge or highest point of the roof space, measured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

Clause Interpretations

10.8.2 Exhaust Systems

Exhaust from the kitchen, bathroom, toilet and laundry must be vented to outside air.

The intent of this clause is to ensure that moist air from inside the home is ducted directly to outside air and not the roof space.



10.8.3 Ventilation of Roof Spaces

The intent of this clause is to reduce the risk of condensation formation in the roof space by reducing the accumulation of moist air in the roof space.

+ **Longest horizontal dimension of the roof** does not refer to the ridge. In a hipped roof (which is a common type of roof), this would be the gutter.

+ **Climate Zones 6, 7 & 8** refer to Mild Temperate, Cool Temperate & Alpine respectively. The Southern parts of Australia (areas in NSW, SA, VIC, ACT, TAS & WA) fall into these zones.

+ **Evenly distributed openings** refer to an equal distance between the roof vents that are to be placed on top of the roof. It also refers to the spacing between eave vents that are attached to the eaves except in the case of roof pitches $<10^\circ$, where the eave vents must be at two opposing ends.

+ Table 10.8.3 explanation – Roof Pitch $<10^\circ$

– One (1) Bradford Ventilation Metal eave vent provides $35,000\text{mm}^2$ of openness factor. Therefore, $25,000\text{mm}^2/\text{m}$ in this table can be met with 1 Metal eave vent.

– Two opposing ends refers to the opposite ends of a roof.

+ Table 10.8.3 explanation – Roof Pitch $\geq 10^\circ$ and $<15^\circ$

– For a 8m roof ridge line having the longest side being 10m, we need to multiply $25,000\text{mm}^2/\text{m}$ by 10 to calculate the required openness of $250,000\text{mm}^2$. As per the above explanation, each metal eave vent provides $35,000\text{mm}^2/\text{unit}$ of openness factor, therefore $250,000\text{mm}^2$ divided by $35,000\text{mm}^2/\text{unit}$, will equal 7.14 eave vents, and for practical reasons, this should be rounded up to 8 Metal eave vents to ensure that sufficient replacement air is supplied.

– For the same roof, we require $5,000\text{mm}^2$ of high-level openings per metre. Therefore, we calculate the requirement: $5,000\text{mm}^2/\text{m}$ multiplied by 10m = $50,000\text{mm}^2$.

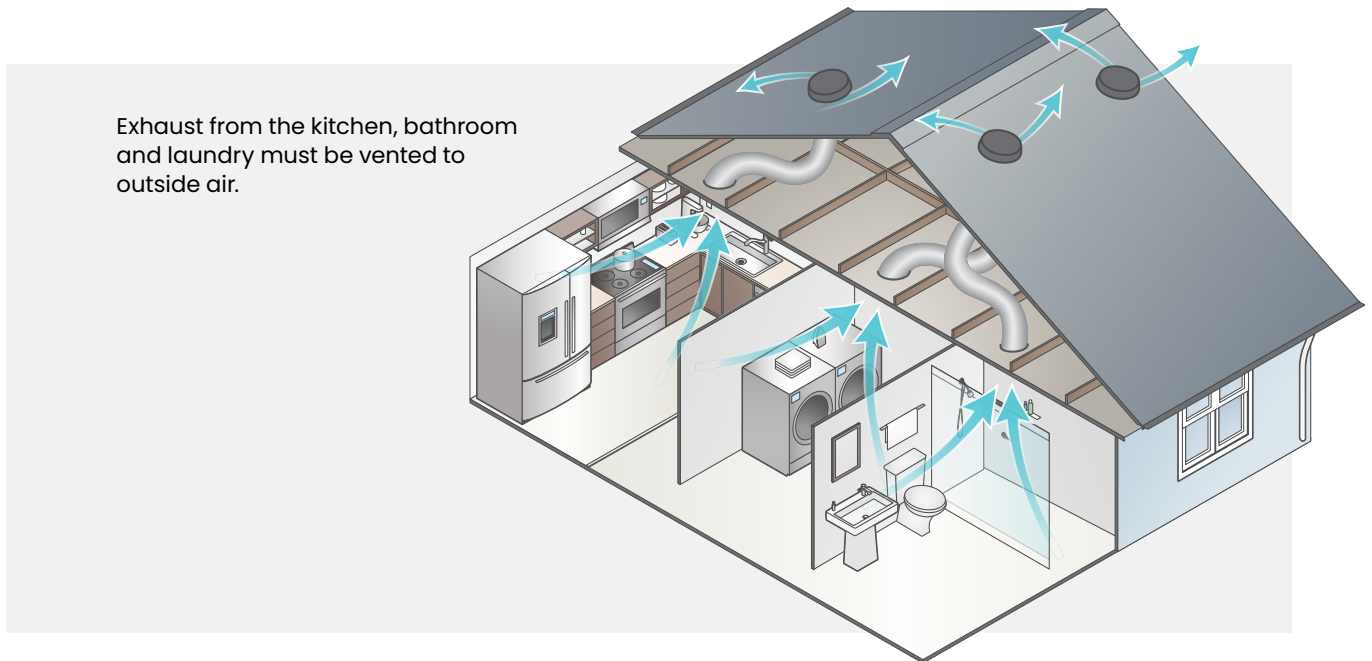
– 1 Bradford Ventilation WindMaster is equivalent to $62,500\text{mm}^2/\text{m}$ of openness factor. 1 Bradford Ventilation SupaVent is equivalent to $46,000\text{mm}^2/\text{m}$.

Therefore for the example above, a home roof with 10m longest roof edge requires an openness of $50,000\text{mm}^2$ at upper roof and $250,000\text{mm}^2$ at the eaves, which can be satisfied by using Bradford Ventilation: 1x WindMaster, OR 2x SupaVent roof vents, and; 8x Metal eave vents at each of the opposing side evenly distributed.

Bradford Ventilation Solutions for NCC2022 & How to Comply with Clause 10.8.2

10.8.2 Exhaust Systems

For residential homes, one Roof Valve BAL or Roof Valve per kitchen, bathroom, toilet and laundry exhaust system is required to meet compliance.



Bradford Ventilation Solutions for NCC2022 & How to Comply with Clause 10.8.3

10.8.3 Ventilation of Roof Spaces

The following table provides roof space ventilation solutions for residential homes with roof pitches 45°.

TABLE NVS – Natural Ventilator Solution Table for 10.8.3

Bradford Ventilation Products			
Roof Pitch	WindMaster Roof Ventilator	SupaVent Roof Ventilator	Eave Vent
< 10°			1 eave vent for every 0.7m of horizontal roof length*
≥ 10° and < 15°			1 eave vent for every 1.4m of horizontal roof length
≥ 15° and < 75°	1 WindMaster for every 12.5m of horizontal roof length	1 SupaVent for every 9.2m of horizontal roof length	1 eave vent for every 5m of horizontal roof length
≥ 15° and < 75° Cathedral			1 eave vent for every 1.4m of horizontal roof length

* These must be equally divided between the two opposing ends of the roof. Should the eave vents end up being an odd number, they must be rounded up.

^ Due to the product design of the varipitch, the maximum pitch for these products is 45°.

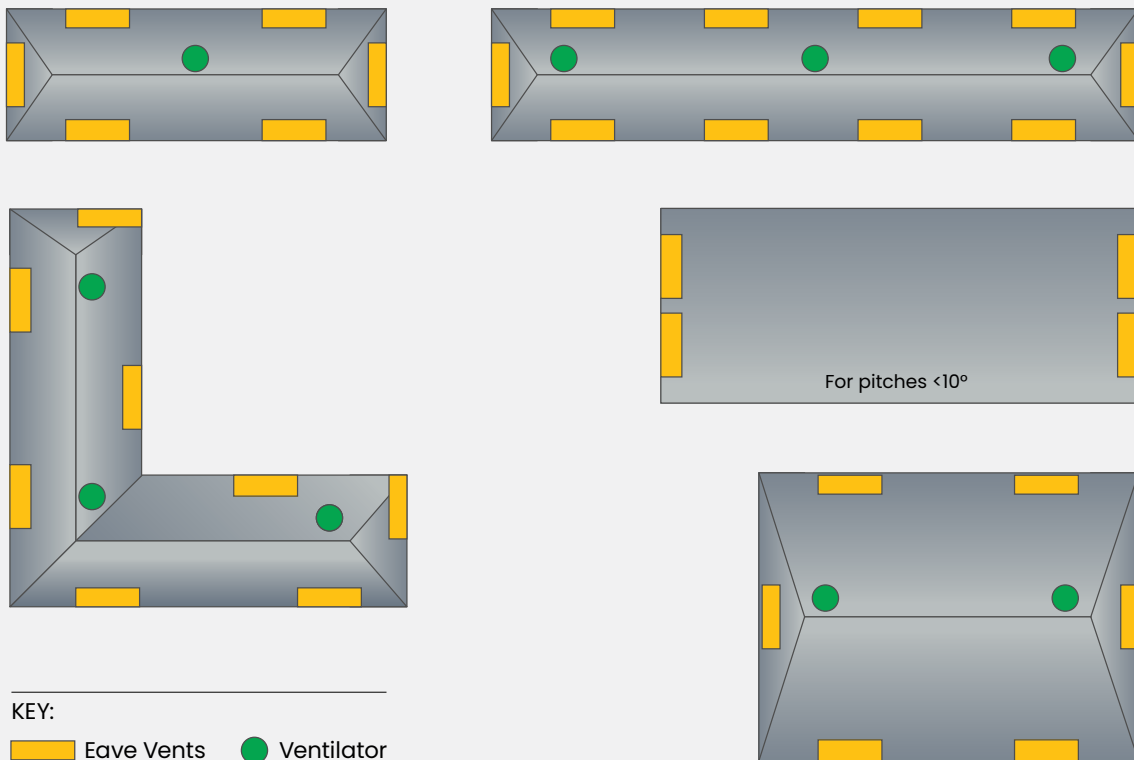
TABLE PVS – Powered Ventilator Solution Table for 10.8.3

Longest Horizontal Roof Dimension	Number of AiroMatic or Maestro BAL Ventilators Required ¹	Number of Bradford Metal Eave Vents Required
0 to <50m	1	4
50m to <100m	2	6

¹ At pre-fixed speed.

² The unobstructed area for air replacement is an alternate solution to replace Bradford Metal Eave Vents and assumes evenly distributed openings in accordance with the NCC requirement.

Roof ventilators and eave vents must be installed through evenly distributed openings between each unit. Examples of this could be applied to a number of roof applications as demonstrated below:



Important Selection Considerations

- + The graphics above are examples of ventilation layouts for condensation management in NCC Climate Zones 6, 7 & 8.
- + The NCC gives an open area requirement per metre length of the longest horizontal dimension of the roof. Use the Solution Tables above to calculate the required number of vents to comply.
- + WindMaster & SupaVent ventilators should be installed not more than 900mm below the ridge or highest point of the roof space, measured vertically.

Benefits of using Bradford Ventilation Products to Comply with NCC2022 Housing Provisions Standard

- + BAL and non-BAL ventilators are available for both Clause 10.8.2 and 10.8.3 applications.
- + Provides extraction support systems that are ideal for homes with no eave space.
- + We offer a range of ventilators to comply with Clause 10.8.2 and 10.8.3.

Calculation of the 10.8.3 Clause

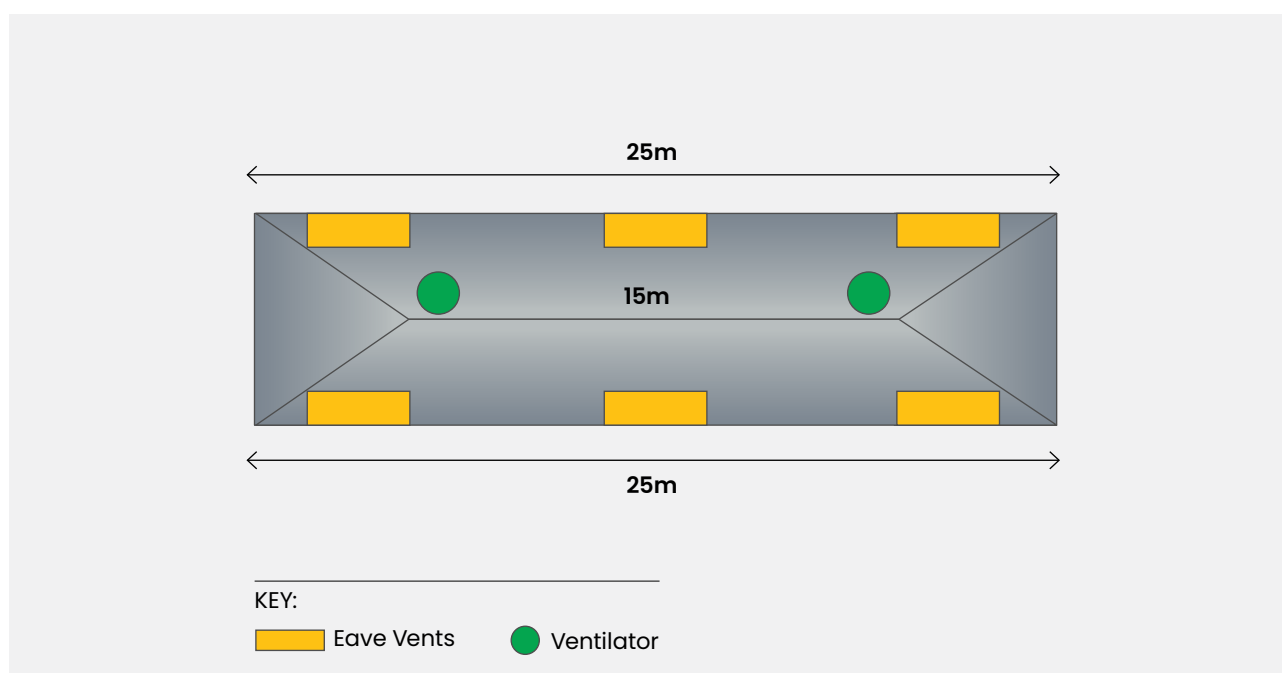
A Practical Example

Compliance with this clause using roof ventilation is achieved by calculating the longest horizontal dimension of the roof. In a hipped roof, this would be the gutter.

The following example is based upon a residential home with a roof ridgeline of 15m, a longest horizontal dimension length of 25m, and a pitch of 20°.

Practical Application of the Code

1. Based on the **longest horizontal dimension of the roof of 25m** and using table NVS : **1x WindMaster per 12.5m**, the calculation is as follows: $25/12.5 = 2x \text{ WindMasters}$, spaced apart evenly.
2. Based on the table NVS, the number of eave vents required are **1 eave vent for every 4.9m of horizontal roof length**. The calculation is as follows: $25/4.9 = 5.1$, as it is required to have evenly distributed openings, it must be rounded up to 6 metal eave vents to ensure sufficient replacement air.
3. Products required to comply to this example: **2 WindMaster vents and 6 eave vents**. This is illustrated in the graphic below.



Bradford Product Solutions

To Comply with Clause 10.8.2

Roof Valve

The Roof Valve with duct collar is a low-profile static roof ventilator that allows the release of air from the bathroom, toilet or laundry via a flexible duct. The 150mm throat makes it ideal for partnering with 150mm exhaust duct.



Roof Valve BAL

The Roof Valve BAL is a BAL-rated, low-profile static roof ventilator that allows the release of air from kitchen, bathroom, toilet or laundry via a flexible duct. The 150mm throat makes it suitable for the purpose of ducting in bushfire zones up to BAL40.



To Comply with Clause 10.8.3 – DTS Solution

WindMaster™

The WindMaster is a wind driven natural ventilator designed to exhaust heat & moisture from the roof space of your home, without the use of electrical energy. It has a 300mm throat and is Australian made. It has a 15-year warranty for peace of mind and comes in 24 colours to match most roofs.



SupaVent™

The SupaVent is a natural ventilator designed to exhaust heat and moisture from the roof space, without the use of electrical energy. The SupaVent is ideal near coastal homes due to its stainless steel bearings and plastic componentry. It has a 250mm throat and is Australian made. It has a 15-year warranty for peace of mind and comes in 14 colours to match most roofs.



To Comply with Clause 10.8.3

Metal Eave Vents

Eave vents are designed to work in conjunction with roof vents to allow external air to be drawn into the roof space to improve cross flow ventilation. This helps roof mounted vents to work more effectively and efficiently.

Metal Eave Vents: Made from metal and are suitable for homes in bushfire zones up to BAL40.



To Comply with Clause 10.8.3 – Performance Solution

AiroMatic®

AiroMatic is factory-set to a powerful fixed speed for continuous, high-performance ventilation. It also includes a built-in Air iQ smart box that can alternatively be set to automatically detect heat and humidity to protect the home when it matters most. It is equivalent to 4 natural ventilators at pre-fixed speed settings. It has a 250mm throat and is Australian made for peace of mind.



Maestro BAL™

Maestro BAL is a high-performance, smart ventilator that automatically detects and removes heat & moisture from the roof space. It is ideal for homes in bushfire zones up to BAL40. It is equivalent to 4 natural ventilators at pre-fixed speed settings. It has a 300mm throat and is Australian made for peace of mind.

