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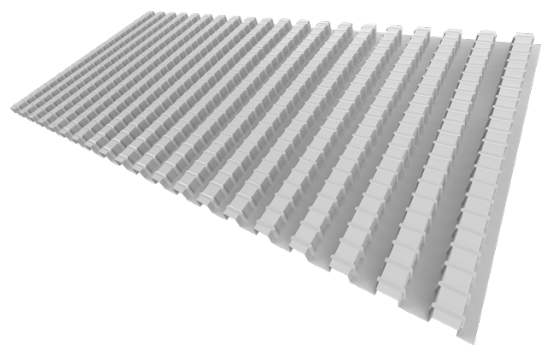
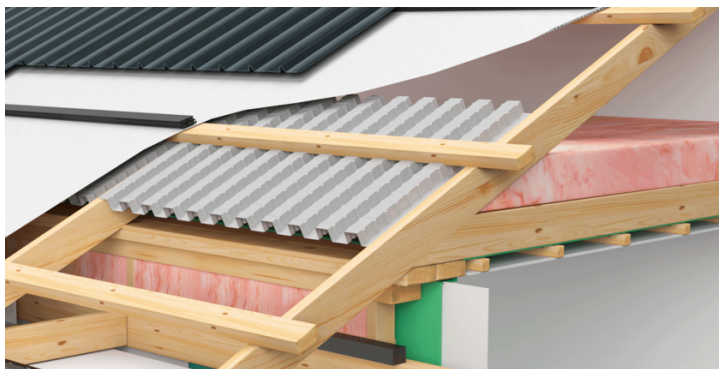


## Introduction

The Vent NZ G502 Roll Panel Vent is designed to meet the requirements of NZS 4246:2016 to be installed in the junction of a building wall and roof. The VENT G502 Roll Panel was developed in the UK to ensure a minimum of 25 mm air gap is achieved between the roofing underlay/rigid substrate and the insulation layer at the junction of the external wall and the roof as required by BS EN 5250:2021 *Management of moisture in buildings*. The requirement to ensure a minimum 25 mm air gap is also stated in NZS 4246: 2016 *Energy efficiency – Installing bulk thermal insulation in residential buildings*.

The Vent G502 Roll Panel Vent (as so known as Eaves Baffle or insulation guard) is an injection molded lightweight PET plastic castellated profile, available in 6000 mm long x 650 mm wide in either clear, grey or black colour choice. It is installed across the top of the roof trusses and rafters made from timber or lightweight steel. The G502 is not intended for use in a skillion roof. Once installed the G502 provides an unimpeded, continuous 25 mm air gap.

### G502 Roll Panel Vent



## Methodology

This evaluation has been prepared to provide assurance of compliance with the New Zealand Building Code for the G502 Roll Vent.

This evaluation is based on establishing the benefits of Vent G502, why it should be used and how it will contribute to meeting the requirements of Building Code



Clause H1 and the requirements NZS 4246:2016 Energy efficiency – Installing bulk thermal insulation in residential buildings, as well as consideration of Clauses B2 and F2 of the Building Code.

This evaluation is limited to the scope of use described in the Vent NZ G502 “Management of Condensation in Buildings” [Dec 2011].

## **Relevant Building Code clauses and cited documents**

The applicable Building Code requirements are:

### **Clause B2 Durability**

**B2.3.1** Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the specified life of the building, if stated, or

...

b. 15 years if

(i) those building elements ... are moderately difficult to access or replace, or

(ii) failure of those building elements to comply with the building code would go undetected during the normal use of the building, but would be easily detected during normal maintenance.

...

### **Clause F2 Hazardous building materials**

**F2.3.2** The quantities of gas, liquid, radiation or solid particles emitted by materials used in the construction of buildings shall not give rise to harmful concentrations at the surface of the material where the material is exposed, or in the atmosphere of any space.

### **Clause H1 Energy efficiency provisions**

**H1.3.1** The building envelope enclosing spaces where the temperature or humidity (or both) are modified must be constructed to–

a. provide adequate thermal resistance ...

**H1.3.2E** Buildings must be constructed to ensure that their building performance index does not exceed 1.55.



## NZS4246: 2016

### Paragraph 6.2.10 Keeping insulation clear of the roofing and roof underlays

A minimum gap of 25 mm shall be maintained between the insulation and the underside of the roofing and flexible roof underlay to prevent wicking of water into the insulation.

## Assessment of Building Code compliance

The G502 castellated Roll Panel Vent, creates a continuous 25 mm clearance between the insulation layer and the flexible or rigid underlay at the outer wall/eave junction, ensuring that the airflow at the junction is not impeded.

This is done by ensuring that the insulation is prevented from being pressed up to the underside of the roof purlins regardless of the thickness of the bulk insulation required in accordance with H1 /AS1 or H1/VM1.

The following analysis considers how the Vent G502 contributes to compliance with the relevant clauses of the Building Code.

### Clause H1 Energy efficiency provisions

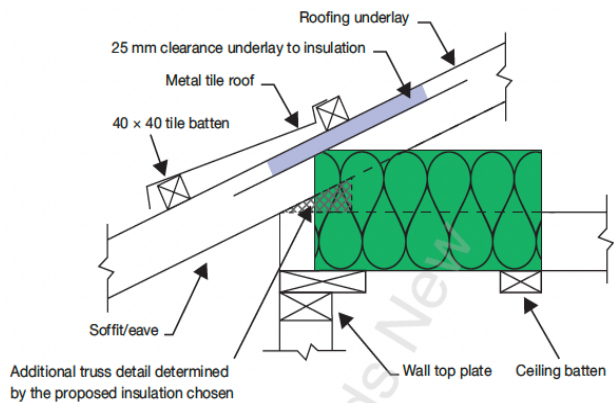
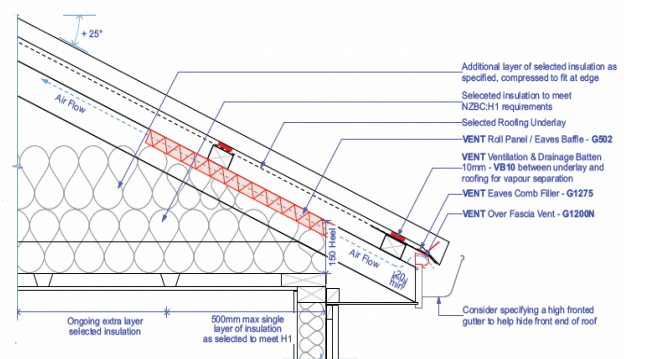
#### NZS 4246:2016

NZS 4246:2016 provides solutions for installing bulk thermal insulation and is cited in H1/AS1. The Vent G502 was designed to meet the requirements of clause 6.2.10 *Keeping insulation clear of roofing and roof underlay*. NZS 4246:2016 requires a minimum gap of 25 mm shall be maintained between the insulation and the underside of the roofing and flexible roof underlay to prevent wicking of water into the insulation. NZS 4246:2016 makes comment in respect to significant reduction in thermal performance, where an air gap exists between the insulation and the ceiling lining. Where the Vent G502 is installed this reduction in thermal performance would be minimised or removed.

NZS 4246:2016 provides indicative details of how to best meet the standard where ventilation to the roof space is considered. The NZS 4246:2016 and Vent G502 details are as follows:



## NZS4246 and Vent G502 details

NZS 4246: 2016	Vent G502
	<p>Fig B: G502 Application with G2500N Over Fascia Vent, roof pitch &gt;15°</p> 

Whilst the details are indicative, they are in keeping with common construction methods used in New Zealand construction. The main objective is to maintain a minimum 25 mm air gap between the flexible wrap/roof cladding and segments and blanket ceiling insulation to prevent moisture wicking into the bulk insulation.

NZS 4246:2016 encourages thinner layers of insulation or a maintaining a ventilated space above the wall top plate. Vent G502 encourages the insulation to be fitted over the top plate based on the knowledge they have established through testing and calculation. The rigid Vent G502 allows the installer to compress or easy install the insulation with no concerns of encroaching on the minimum ventilation gap, which meets and exceeds the requirements of NZS4246. Based on the prescribed generic detail, Vent G502 meets the requirements of NZS 4246:2016.

### Clause H1

Vent G502 contributes to compliance with Building Code Clause H1 (H1.3.1(a) and H1.3.2E) primarily because it allows segment and blanket ceiling insulation to be easily installed above the wall top plate whilst still maintaining ventilation to the roof space.

The evidence of minimising heat lose has been assessed by Sustainable Engineering Limited [VENT, 08/2020]. In their review "Roll Panel Vent Detailed Thermal Calculations", based on ISO 10211 'Thermal bridges in building construction', they estimated the



difference of leaving the ceiling insulation short of fully covering the wall top plate, the impact of the insulation compression and the function of the roofing underlay.

The Sustainable Engineering Limited analysis concludes that when using 180 mm thick insulation, the Vent G520 would decrease the roof overall heat loss by 35%. They compared this with when the common practice of the insulation being held back, finding that this could result in heat loss of 65%.

The Sustainable Engineering report also found that with Vent G502, thermal bridging reduced significantly and the surface temperature improved due to insulation coverage of the top plate. Sustainable Engineering recommend the Vent G502 rather than the hold back method because of the significant improvements in the performance of the ceiling insulation.

Therefore, Vent G502 will contribute to the compliance with Building Code Clause H1.

## **Clause B2 Durability**

The Vent G502 is manufactured from Polyethylene terephthalate (PET) plastic. It belongs to the family of Polyesters. Polyester is highly resistant to impact, moisture and solvents, as well as being recyclable.

The castellated profile with strengthening ridges provides a strong rigid and pliable shell which compresses well under the purlin loads.

The Vent G502 has been UV tested for 294 hours to ASTM-G154:2012 by Halt & Hass [22/03/2023], however the likelihood of exposure to UV in excess of a week would be unusual in the construction sequence.

Once the roof cladding is installed the Vent G502 is fully protected from most atmospheric conditions and therefore will meet the durability requirements of the Building Code.

## **Clause F2 Hazardous Building Materials**

Vent G502 is manufactured from injection molded PET Plastic. The PET plastic is commonly used in packaging for food, non-food and bottles. Once cooled after the



molding process the Vent G502 is inert and will not give off any harmful toxic or harmful gases or liquids and will therefore meet the requirements of Clause F2 of the Building Code.

## Conclusion

Used internationally for over 30 years the G502 has meet the separation requirements of BS EN 5250 1, clause 12.5.41 "Air ways inside the roof structure should be at least 25 mm deep". The G502 meets the requirements of NZS 4246:2016 by maintaining a 25 mm air gap by restricting the bulk insulation from contacting the flexible or rigid roof underlay, preventing wicking and a direct moisture pathway onto the insulation.

The correct installation of the G502 will contribute to compliance with Building Code Clause H1 Energy Efficiency based on H1/AS1 or H1/VM1, without compromising the breathability of the roof cavity as well as meeting the requirements of Clauses B2 and F2 of the Building Code.

## References

- BRANZ. [11/2018] *Roof Space Ventilation in New Zealand Houses*. BRANZ Facts. Retrieved from <https://d39d3mj7qio96p.cloudfront.net/media/documents/BRANZ-Facts-Roof-ventilation-1-NZ-roofs.pdf>. [Accessed 22/01/2024].
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