

FAIRVIEW'S VITRAFIX VENTILATED TOP HAT VERSUS STANDARD TOP HAT

Engineering a Better Cavity System for Modern Façades



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DEFINING ARCHITECTURE SINCE 1963

INTRODUCTION

As façade performance requirements evolve under stricter building codes and sustainability expectations, sub-framing components must do more than simply support cladding. They need to manage air flow, moisture, and heat — all while maintaining structural integrity and installation efficiency.

Traditional non-ventilated top hats have long been the industry standard for cladding support systems. However, their enclosed design limits airflow, restricts drainage, and can contribute to long-term moisture and heat buildup issues.

Vitrafix's Ventilated Top Hat system represents a step-change in façade engineering. By combining structural strength equal to conventional profiles with engineered ventilation pathways, Fairview's design delivers a more efficient, resilient, and simplified façade solution.

70% of facade failures in Australia relate to **poor cavity ventilation and moisture management**

Ventilated top hats are a simple, certified upgrade to improve façade longevity and compliance. The structural equivalence has been confirmed to AS/NZS 4600:2018 – meaning no compromise on performance.

This paper compares the performance, function, and installation benefits of Vitrafix's Ventilated Top Hats with standard non-ventilated profiles, highlighting why this innovation sets a new benchmark in façade substructure design.

1. STRUCTURAL PERFORMANCE

“Strength Without Compromise”

Top hats play a critical role in façade design and installation. They offer predictable structural strength, rigidity and consistent performance under wind loads, cladding weight, and fixing forces.

Vitrafix’s Ventilated Top Hats have been engineered to maintain the same strength and spanning capacity as non-ventilated profiles. Using advanced computational modelling and precision-formed steel, the ventilation slots are positioned and sized to avoid compromising the profile’s moment of inertia or cross-sectional integrity.

Result:

Non-ventilated top hats: Reliable strength but no ventilation.

Vitrafix Ventilated top hats: Same strength plus built-in ventilation — no trade-off between structure and performance.

For specifiers, this means structural design calculations, wind load performance, and compliance with AS/NZS 1170 remain consistent, eliminating the need for re-engineering or additional reinforcement.

See [Structural Design Certification](#):

2. AIRFLOW AND VENTILATION EFFICIENCY

A façade cavity’s ability to breathe directly influences the building envelope’s health and energy efficiency.

Non-ventilated top hats create enclosed voids that trap air behind cladding panels. Air movement occurs only at the system’s perimeters, often leading to “dead zones” within the cavity. Stagnant air can increase surface temperatures, encourage condensation, and slow moisture evaporation.

Vitrafix’s Ventilated Top Hat introduces continuous, evenly spaced ventilation slots that enable high-efficiency airflow through the cavity. The open channels encourage convective air movement, helping equalise temperature and pressure while allowing the system to “self-ventilate.”

Performance outcome:



NON-VENTILATED:
Limited airflow; higher risk of heat and moisture accumulation.



VENTILATED:
Continuous airflow; cooler, drier, and healthier cavity environment.

This enhanced ventilation also contributes to improved thermal regulation, particularly in Australia’s hot climates, where reducing cavity heat buildup can lower the building’s cooling demand.

3. MOISTURE DRAINAGE & CAVITY HEALTH

In any ventilated façade, moisture management is as important as airflow. Even small amounts of condensation or water ingress can lead to corrosion, mould growth, or degradation of insulation layers.

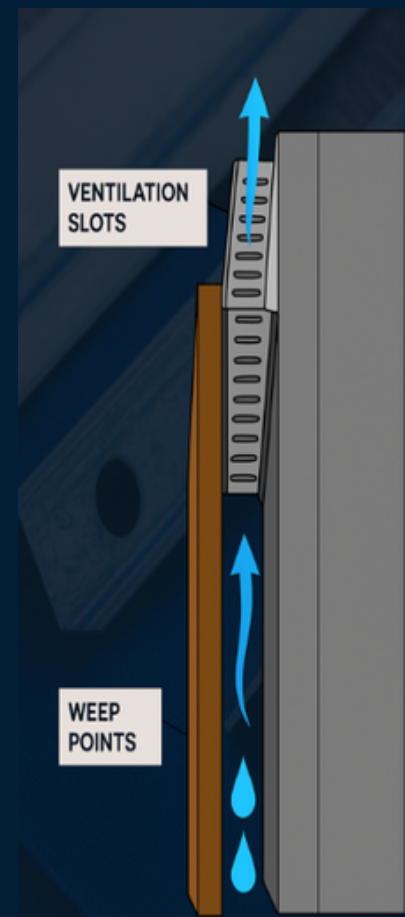
Non-ventilated top hats rely entirely on external accessories — such as drainage clips, cavity battens, or proprietary vent strips — to manage water egress. These additional parts complicate the wall assembly and are prone to inconsistent installation.

By contrast, Vitrafix's Ventilated Top Hats integrate moisture drainage capability directly into the profile. The ventilation slots and drainage pathways allow water to drain freely through the cavity and exit via designated weep points at the base of the façade.

Comparison:

- Non-ventilated systems: Require separate drainage accessories; risk of poor installation or blockage.
- Vitrafix Ventilated: Built-in drainage; fewer components, consistent performance, and lower maintenance risk.

The result is a façade cavity that remains dry, durable, and compliant with the NCC's weatherproofing performance requirements under AS/NZS 4284.



4. PRESSURE EQUALISATION AND WEATHERPROOFING

Air pressure differentials across a façade system can drive moisture into joints and panel interfaces during wind events. The concept of a pressure-equalised cavity — where the cavity pressure matches external pressure — is a cornerstone of advanced façade design.

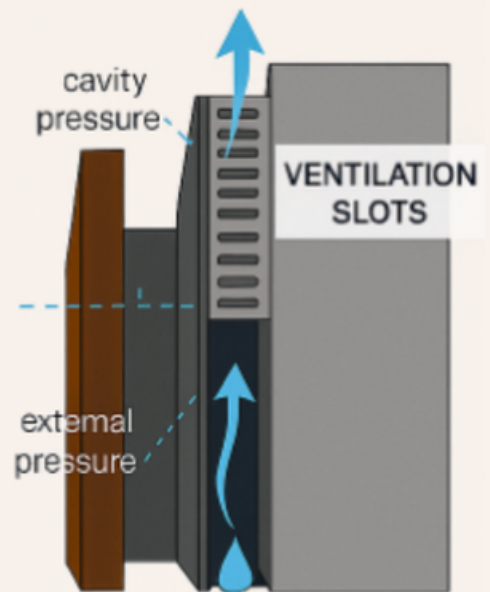
Standard top hats, being closed sections, inhibit airflow and therefore limit pressure balancing. This can result in fluctuating pressures across the cladding surface, increasing the risk of water ingress during storms.

Vitrafix's Ventilated Top Hats allow rapid equalisation of pressure by providing consistent air exchange between the cavity and the external environment. This effect helps stabilise pressure zones across the façade surface, improving resistance to water penetration.

Outcome:

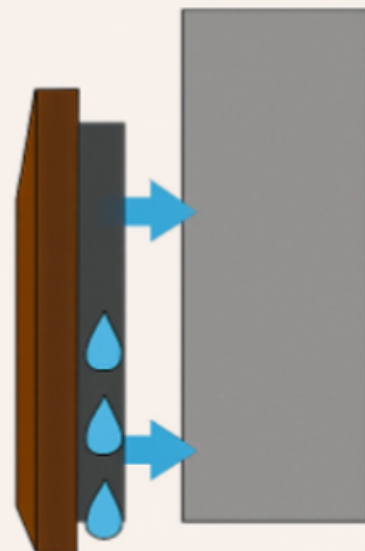
- Non-ventilated: Minimal pressure equalisation; greater dependency on sealants and joint detailing.
- Ventilated: Natural pressure balance within cavity; improved weatherproofing resilience.

FAIRVIEW VENTILATED



Natural pressure balance within cavity; improved weatherproofing resilience

NON-VENTILATED



Minimal pressure equalisation; greater dependency on sealants and joint detailing

5. SIMPLIFIED WALL BUILD-UP AND REDUCED SYSTEM COMPLEXITY

Modern façade assemblies often require multiple components to achieve ventilation and drainage performance, such as vent clips, perforated battens, or drainage mats. Each added component increases cost, time and the potential for installation error.

Vitrafix’s Ventilated Top Hat consolidates these functions into one profile, reducing wall build-up complexity while maintaining compliance. No additional vent strips or drainage accessories are needed to achieve a ventilated cavity, simplifying the supply chain and improving installation consistency.

Comparison of installation process:

Feature	Standard Top Hat System	Vitrafix Ventilated Top Hat
Ventilation components	Required (vent strips/clips)	Integrated in profile
Drainage management	Requires accessories	Built-in drainage path
Installation time	Longer, more steps	Faster, fewer components
Risk of error	Higher	Lower
Material cost	Higher overall	Reduced accessories cost

Result: A more efficient, lower-risk system that saves both time and labour costs while ensuring reliable ventilation and drainage performance.



6. LIGHTWEIGHT STRENGTH FOR IMPROVED INSTALLATION EFFICACY

Both systems use cold-formed steel for structural support, but Vitrafix's ventilated profile takes this further with optimised geometry that improves strength-to-weight ratio.

The lightweight yet robust design offers several on-site advantages:



Easier manual handling
and transport



Faster alignment
and fixing

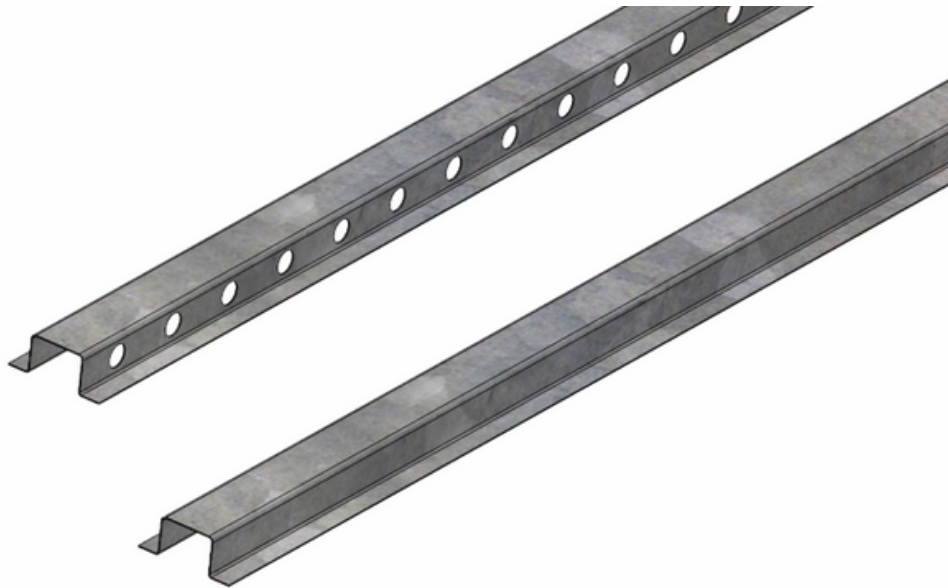


Reduced installer
fatigue



Lower overall façade
substructure weight

While non-ventilated profiles deliver the same load capacity, their lack of airflow benefits means additional accessories add weight and complexity. The Ventilated Top Hat achieves equivalent or greater system performance with a lighter, more streamlined assembly.



Example: Using perforated top hats at 300 mm centres for 1000m² reduces the overall material consumption by approximately 267 kg (around 6% lighter than solid sections), without compromising performance. This contributes to improved sustainability and easier handling on site.

7. THERMAL REGULATION AND HEAT REMOVAL

In hot conditions, façade cavities without ventilation can experience significant heat buildup, increasing the temperature of the substrate and interior walls. This can affect occupant comfort, accelerate material degradation, and increase cooling energy use.

Vitrafix's Ventilated Top Hat actively assists heat removal by allowing warm air to escape through its ventilation channels, drawing in cooler air from below. The continuous airflow cycle supports the stack effect, ensuring consistent heat dissipation throughout the cavity.

Performance outcome:

- Non-ventilated: Heat trapped behind cladding, higher surface temperatures.
- Ventilated: Improved airflow removes heat buildup, enhancing energy efficiency and material longevity.

8. WHOLE-OF-SYSTEM ADVANTAGES

When considering a façade holistically, the benefits of ventilation extend beyond individual components.

With Vitrafix's Ventilated Top Hat:

- Moisture, heat, and pressure are managed naturally within the cavity.
- The system requires fewer accessories and less labour.
- Structural integrity remains uncompromised.
- The façade performs more efficiently over its lifetime.

Non-ventilated systems, while proven, represent an older approach that depends on additional accessories and perfect sealing to manage environmental effects — an increasingly difficult standard under modern construction conditions.



9. DESIGN COMPLIANCE

Tested and certified under:

- AS/NZS 4600:2018 (Cold-formed steel structures)
- AS/NZS 1170.2:2021 (Wind actions)
- AS 4055:2021 (Wind loads for housing)

Fully compliant with NCC 2022 structural adequacy requirements.

10. QUALITY & ASSURANCE

- Both designs are certified by a structural engineer.
- Manufacturing tolerances and geometry identical to solid profiles.



CONCLUSION

The comparison between Vitrafix's Ventilated Top Hats and standard non-ventilated profiles reveals a clear evolution in façade engineering. Fairview's design successfully integrates ventilation, drainage, and pressure equalisation within a profile that retains the full strength and durability of traditional systems.

By simplifying the wall build-up, improving airflow and heat management, and enhancing installation efficiency, the ventilated top hat offers tangible benefits to architects, engineers, and installers alike.

In practical terms, this innovation delivers:

- Equal structural performance,
- Superior moisture and heat management,
- Simpler, faster installation
- Improved façade longevity and compliance.

As buildings continue to demand higher environmental and performance standards, Vitrafix's Ventilated Top Hat provides a forward-thinking, fully engineered solution that outperforms traditional systems — enabling façades that breathe, drain, and endure better than ever before.



FAIRVIEW

Supported by a team of driven, innovative and collaborative professionals, Fairview is committed to providing aesthetically pleasing and compliant cladding panels for the construction industry. With almost 30 years' experience in the façade industry, Fairview is dedicated to consistently facilitating the successful delivery of innovative facades that meet the requirements and vision of each project.

With one of the largest stock holds in Australia, Fairview have the ability to ensure a consistent and timely supply to our dedicated installer network. The company's flexible and innovative approach allows us to work closely with our clients to deliver the best possible project outcomes.



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