

CEM I TO CEM II: WHY THE GENESIS NXG FORMULATION CHANGED

The evolution of Genesis fibre cement: what it means for specifiers, builders and asset owners



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INTRODUCTION

Fairview's Genesis fibre cement facade panel range is transitioning from Genesis to Genesis NXG as part of a formulation update. Panel dimensions, thickness, profiles and colour bases remain unchanged. The system continues to comply with the same NCC structural and weatherproofing requirements as the existing Genesis range.



Strength cc. EN 12467

Consistent



Water uptake

> 40% less



Warping in water and CO2

> 40% less



Dimension stability

> 50% more



Resistance to fading

> 50% more



Colour range

Consistent



The change applies to the **autoclaved Genesis products, namely Raw, Hewn and Groove**, and is supported by external engineering assessments and accelerated ageing tests that validate the performance characteristics of the current formulation.

This paper outlines the transition from Genesis to Genesis NXG, including the shift from CEM I to CEM II, key product characteristics and considerations relevant to architects, engineers, builders and installers.

1. CEM I TO CEM II: WHY THE FORMULATION CHANGED?

The transition from Genesis to Genesis NXG aligns with developments in Europe, where manufacturers have led the shift toward **lower-carbon cement formulations** to support more sustainable construction. At the core of this wider industry shift is the move from CEM I to CEM II cement. CEM I consists almost entirely of Portland cement, while CEM II incorporates supplementary cementitious materials, such as limestone or fly ash, into its formulation. This evolved formulation results in lower CO2 emissions during manufacturing, without compromising the performance the Genesis range is known for.

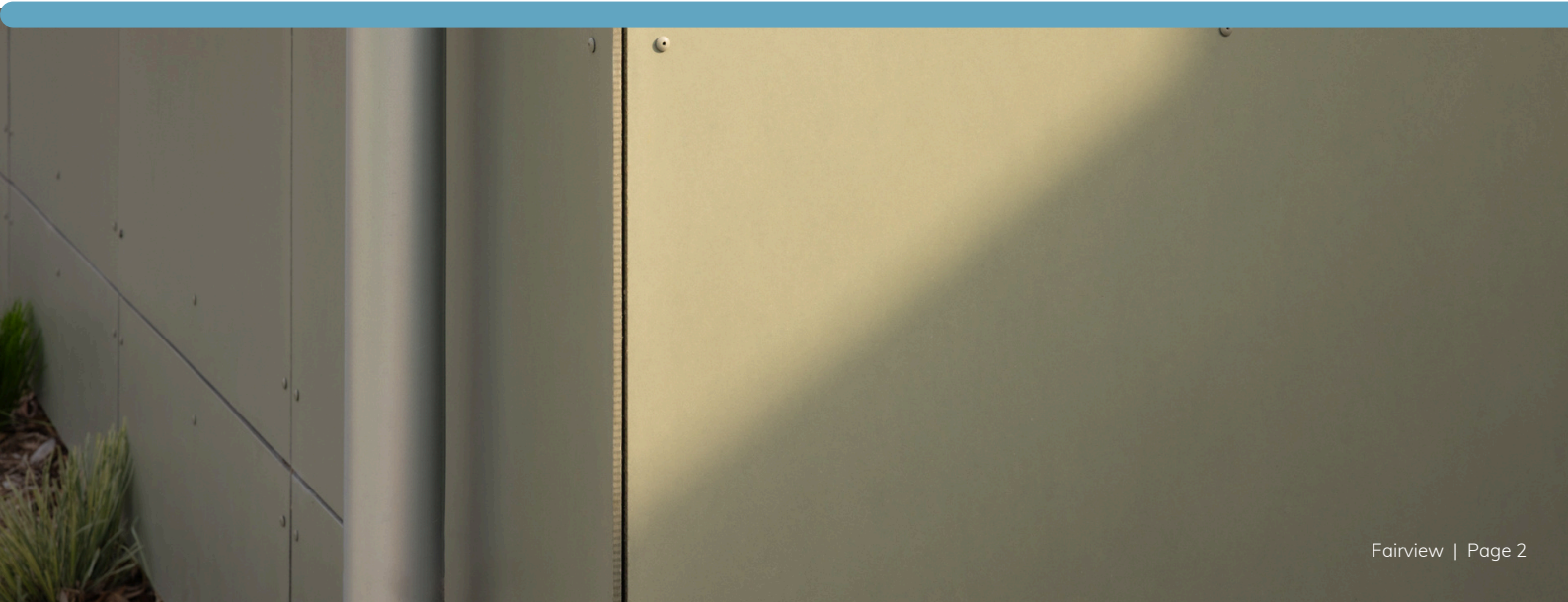
2. GENESIS NXG SIMPLIFIED

At its core, Genesis NXG reflects Fairview's transition from CEM I to CEM II cement, aligning the Genesis range with broader industry efforts to reduce embodied carbon and support more sustainable construction practices.

As part of this transition, Fairview re-engineered both the formulation and manufacturing process, resulting in a tighter, more integrated matrix structure. The panel's hydrophobic surface treatment were also updated to work in conjunction with the new cement system. These changes were developed through extensive engineering investigation and testing to ensure the product continues to meet its intended performance requirements. The performance characteristics outlined in this paper reflect the combined effect of these changes rather than the formulation update in isolation.

The updated formulation has been introduced to the autoclaved Genesis product range — Genesis Raw, Hewn and Groove — which together represent a significant portion of the Genesis portfolio. Genesis Signature products currently retain their existing formulations, coatings, specifications and compliance, making this a targeted enhancement to the autoclaved range rather than a portfolio-wide change. The transition is expected to be progressively extended across the broader Genesis and Signature ranges in the future.

Genesis NXG panels carry a new colour reference code, marked with a "-2" or "-NXG" suffix (for example, GR-xxxx-2). The colour palette has also been updated, with Ash Grey replacing one existing colour option, while the total number of available base colours remains unchanged.



3. THREE KEY PERFORMANCE IMPROVEMENTS

The transition to CEM II cement was undertaken to support lower embodied carbon outcomes. As part of this process, the product formulation and manufacturing process were re-engineered, resulting in the characteristics outlined in this paper, which were verified through internal laboratory testing.



Improved **UV and Colour Stability**



Higher **Density and Strength**

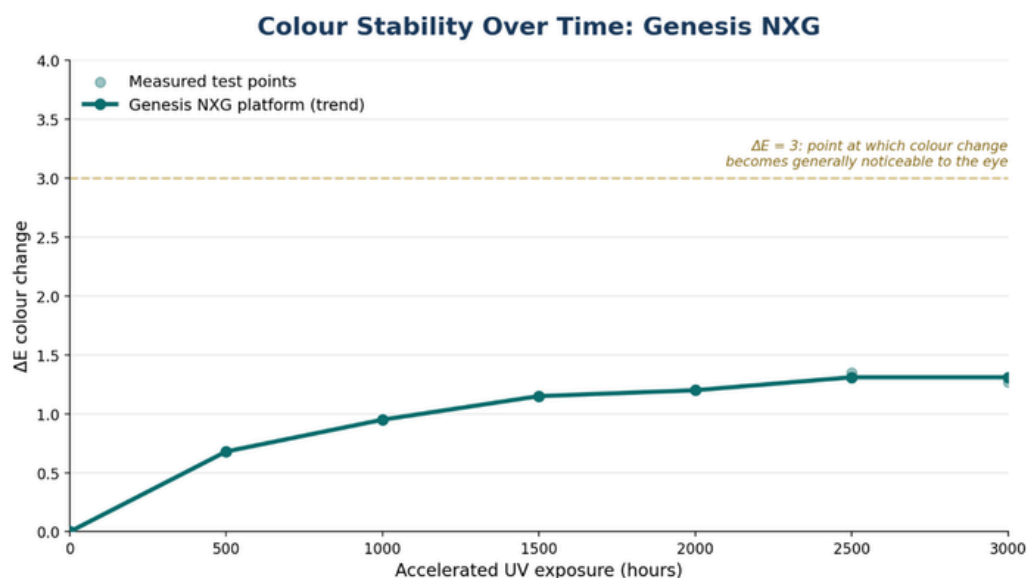


Lower **Water Absorption and Moisture Movement**

3.1. Improved UV and Colour Stability

Coloured fibre cement is exposed to sunlight for the life of a building, and colour stability is one of the clearest indicators of a façade material's long-term performance. Samples were artificially aged under laboratory UV exposure to simulate several years of real-world sun exposure, with colour change measured using ΔE (Delta E), the standard industry metric for quantifying visible colour difference. A ΔE of 3 is generally considered the threshold at which colour change becomes just noticeable to the human eye, with values below 1 imperceptible under normal viewing conditions.

Darker coloured panels experience the most demanding UV exposure and are typically the most challenging shades for maintaining long-term colour stability. The darkest colours within the Genesis NXG palette were assessed following 3,000 hours of accelerated UV exposure, recording an average ΔE of 2.7. These results demonstrate excellent colour stability under demanding conditions and represent a 50-70% improvement over traditional CEM I cladding formulations. The enhanced performance is attributed largely to the advanced hydrophobic treatment, which protects pigments more effectively against ongoing UV and moisture exposure.



3.2. Higher Density and Strength

The Genesis NXG formulation produces a denser panel. A denser matrix improves stiffness and impact resistance while maintaining the same strength classification as the original Genesis panel.

This is supported by independent structural assessment carried out by Rickard Engineering (Job No. 25010, 15 July 2025).

Minimum Characteristic Property	Genesis	Genesis NXG
E-module along grain, wet (GPa)	9	9.23
E-module across grain, wet (GPa)	9	10.07
Modulus of rupture along grain, wet (MPa)	15	14.64
Modulus of rupture across grain, wet (MPa)	15	17.95

Three of the four structural properties exceed the original certified values. The remaining property, Modulus of Rupture along the grain, is only marginally lower and was assessed by Rickard Engineering as being within acceptable tolerance, requiring no changes to the existing design guidance, span tables, or fixing requirements.



3.3. Lower Water Absorption and Reduced Moisture Movement

The combination of the refined matrix and the upgraded hydrophobic surface treatment significantly reduce moisture absorption. Internal testing recorded more than 40% less water uptake than the market average formulation, together with a more than 50% improvement in dimensional stability and over 40% less warping under combined moisture and CO₂ exposure—the two leading causes of warping and cracking in fibre cement panels.

These enhancements result to a more dimensionally stable panel with reduced moisture-related movement and lower potential for edge efflorescence during wet weather. The overall weatherproofing performance of the facade system continues to depend on the complete drained and ventilated rainscreen assembly, and compliance with NCC structural and weatherproofing requirements remains unchanged.

4. PERFORMANCE SUMMARY

Testing indicates that Genesis NXG maintains or improves the key performance characteristics of the original Genesis formulation. The most notable improvement is enhanced UV colour stability, supported by increased density, improved structural consistency and reduced water absorption.

Property	Genesis NXG vs. Old Formulation	What it means on a building
Strength	Same category; equal or better measured properties	No change to span tables or fixing patterns
Density	Same category; equal or better measured properties	Improved impact and wear resistance
UV / Colour Stability	Same category; equal or better measured properties	Less discoloration on panels over the life of the facade
Moisture Absorption	Same category; equal or better measured properties	Improved long-term dimensional and panel stability

5. SUSTAINABILITY CONSIDERATIONS

The Genesis NXG formulation reflects a broader industry shift toward lower-carbon manufacturing, aligning Fairview with sustainability standards already established across the European fibre cement industry. The updated cement base reduces embodied carbon by replacing a portion of energy-intensive material with alternative components, keeping pace with this wider industry trend.

Fairview's internal technical documentation confirms that the NXG matrix incorporates a specific additive designed to reduce the negative effects of CO₂ exposure on the board, making this a deliberate feature of the formulation rather than an incidental outcome.

The improved durability of Genesis NXG also supports whole-of-life sustainability. Better colour stability, lower water absorption and improved dimensional stability can extend service life and reduce the need for recoating, maintenance, or premature panel replacement.





CONCLUSION

The transition from Genesis to Genesis NXG represents a considered evolution of the Genesis product range, reflecting the broader industry move toward lower-carbon cement formulations while preserving the proven performance of the original system. Backed by independent engineering assessment and internal performance testing, Genesis NXG delivers improved colour stability, increased density and reduced water absorption, with structural performance that meets or exceeds the original certified values. For the autoclaved Genesis products — Raw, Hewn and Groove — Genesis NXG provides measurable performance improvements without changing system design, installation methods or NCC compliance.

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 facade 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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