

Product Technical Statement



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ALSYNITE ONE NZ LTD

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Product Overview

Topglass® GC Ultra Safe is a premium translucent Glass Fibre Reinforced Polyester (GRP) roofing and cladding sheet manufactured by Alsynite One NZ Ltd.

The product has been specifically developed for applications requiring enhanced structural performance for maintenance access, improved impact resistance and long-term durability. Additional woven glass reinforcement is incorporated within the resin matrix to improve structural performance and resistance to mechanical damage when compared with conventional GRP roof light sheeting.

The weather-exposed surface is protected by a 130 µm EXO-SET® 206 Premium Gelcoat, providing long-term resistance to ultraviolet radiation, weathering and surface erosion.

Topglass® GC Ultra Safe is manufactured in accordance with AS 4256.3:2006 (R2018) Plastic Roof and Wall Cladding Materials – Glass Fibre Reinforced Polyester (GRP). The product has been successfully installed throughout New Zealand for more than 10 years and is supported by independent laboratory testing, including AS/NZS 4040.1 concentrated load testing for maintenance access applications, together with independent engineering assessment.

The standard nominal mass of the sheet is approximately 3660 g/m² and the product is available in a range of corrugated and trapezoidal profiles designed to match common metal roofing systems used throughout New Zealand and the Pacific region.

Key Product Characteristics

- Manufactured in accordance with AS 4256.3:2006 (R2018)
- Premium translucent GRP roofing and cladding sheet
- Nominal mass approximately 3660 g/m²
- Additional woven glass reinforcement
- Enhanced impact resistance and durability
- Independently tested to AS/NZS 4040.1 concentrated loading
- Independently assessed for maintenance access applications
- 130 µm EXO-SET® 206 Premium Gelcoat surface protection
- Excellent UV resistance and long-term weathering performance
- Optional Vinyl Ester resin system for severe corrosive environments
- Available in corrugated and trapezoidal profiles

Typical Applications:

- Industrial buildings
- Warehouses and distribution centres
- Manufacturing facilities
- Agricultural buildings
- Covered walkways and canopies
- Educational facilities
- Community buildings
- Corrosive and coastal environments (subject to resin selection)



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Sources of Information & Supporting Evidence

The information contained within this Product Technical Statement is based on independent testing, engineering assessment and applicable industry standards relevant to the manufacture and use of Glass Fibre Reinforced Polyester (GRP) roofing and cladding systems.

Topglass® GC Ultra Safe is manufactured in accordance with AS 4256.3:2006 (R2018) Plastic Roof and Wall Cladding Materials – Glass Fibre Reinforced Polyester (GRP). Performance claims relating to strength, durability, maintenance access and fire performance are supported by independent laboratory testing and engineering assessment.

Sources of Information

The preparation of this Product Technical Statement has considered the following:

Standards and Industry Documents

- AS 4256.3:2006 (R2018) – Plastic roof and wall cladding materials – Glass fibre reinforced polyester (GRP)
- AS 1562.3:2006 – Design and installation of sheet roof and wall cladding
- AS/NZS 4040.1 – Methods of testing sheet roof and wall cladding
- AS/NZS 1170.1 – Structural design actions
- New Zealand Building Code

Independent Testing and Assessment

- BRANZ physical property testing
- BRANZ fire performance testing
- Independent engineering assessment by Knack Engineering Ltd

Manufacturer Documentation

- Manufactured in accordance with AS 4256.3:2006 (R2018)
- Alsynite One installation instructions
- Alsynite One technical literature
- Alsynite One warranty documentation

Manufacturing

Topglass® GC Ultra Safe is manufactured in accordance with AS 4256.3:2006 (R2018). Product performance claims are supported by independent laboratory testing, engineering assessment and more than 10 years of successful field performance throughout New Zealand.



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Product Performance & Independent Testing

Topglass® GC Ultra Safe is supported by independent laboratory testing undertaken to assess the physical, mechanical and performance characteristics of the product. Testing has been carried out by recognised laboratories and forms part of the evidence supporting the product's suitability for roofing and cladding applications requiring enhanced structural performance, maintenance access, impact resistance, durability and long term weathering performance.

Physical Property Testing

The physical and mechanical properties of Topglass® GC Ultra Safe are supported by independent testing undertaken by VIPAC Engineers & Scientists and BRANZ. Collectively, the testing programme included evaluation of:

- Impact Resistance
- Compressive Strength
- Flexural Strength
- Tensile and Shear Strength
- Specific Gravity
- Thermal Conductivity and Coefficient of Thermal Expansion

The results demonstrated that Topglass® GC Ultra Safe possesses the mechanical properties necessary for demanding roofing and cladding applications while maintaining the lightweight characteristics associated with Glass Fibre Reinforced Polyester (GRP) sheeting.

Mechanical Properties

Testing undertaken by BRANZ recorded the following material properties:

- Compressive Strength - 384 MPa
- Flexural Strength - 181 MPa
- Tensile Strength - 167 MPa

These results demonstrate the ability of Topglass® GC Ultra Safe to resist compressive, bending and tensile forces encountered during normal service conditions. The additional woven glass reinforcement incorporated within the sheet contributes to improved structural performance when compared with conventional translucent GRP roof light sheeting.

Impact Resistance

Impact resistance testing was undertaken by BRANZ as part of the independent product evaluation programme. Topglass® GC Ultra Safe achieved a pass result for impact resistance testing, demonstrating its suitability for applications where enhanced resistance to accidental impact and mechanical damage is desirable. The increased glass reinforcement content within the sheet provides improved resistance to impact when compared with conventional GRP roofing products.

Reference: BRANZ Test Report DC13065-001.

BRANZ physical property testing facility and equipment used during evaluation of Topglass® GC Ultra Safe.



Trafficability Assessment

Alsynite One commissioned Knack Engineering Ltd to undertake an independent engineering assessment of Topglass® GC Ultra Safe to determine its suitability for maintenance access applications.

The assessment considered:

- NZ Building Code Clause B1 Structure
- NZBC Verification Method B1/VM1
- AS/NZS 1170.1 Structural Design Actions
- AS/NZS 4040.1 Resistance to Concentrated Loads

The engineering review identified a concentrated load requirement of 1.65 kN for maintenance access applications.

AS/NZS 4040.1 Concentrated Load Testing

Independent concentrated load testing was undertaken in accordance with AS/NZS 4040.1 – Methods of Testing Sheet Roof and Wall Cladding – Resistance to Concentrated Loads to evaluate the suitability of Topglass® GC Ultra Safe for maintenance access applications.

The following configurations were tested:

- Corrugate Profile – 2.5 m span
- DP955 Trapezoidal Profile – 3.0 m span

Both specimens were subjected to a concentrated load of **3.5 kN**, representing more than twice the concentrated load requirement identified by the engineering assessment for maintenance access applications. Both specimens successfully sustained the applied load for 60 seconds without failure and returned to their original shape following removal of the load.

Reference: AS/NZS 4040.1 Test Report.

Engineering Conclusion

Following review of the independent testing and supporting evidence, Knack Engineering concluded that Topglass® GC Ultra Safe satisfies the requirements of the relevant standards, New Zealand Building Code verification methods and accepted industry practice for use as a trafficable roof cladding, subject to the scope, assumptions and limitations contained within the engineering assessment.



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Fire Performance

Fire performance testing has been undertaken on Alsynite One fibreglass roofing systems to assess suitability for applications where fire performance is a design consideration.

Testing was undertaken by BRANZ in accordance with:

- AS 3837:1998
- ISO 5660 Parts 1 and 2

Testing and subsequent calculations undertaken in accordance with NZBC Verification Method C/VM2 resulted in a:

Group Number Classification 3. *Reference: BRANZ Test Report FH5701-001-02*

Fire performance requirements vary depending on building use, occupancy type and project-specific regulatory requirements. The suitability of any fire performance classification should therefore be confirmed by the project designer.

Contribution to New Zealand Building Code

When designed, specified, installed and maintained in accordance with Alsynite One requirements, **Topglass® GC Ultra Safe may contribute to compliance** with the following clauses of the New Zealand Building Code.

B1 Structure

Topglass® GC Ultra Safe is manufactured in accordance with AS 4256.3:2006 (R2018) and is supported by independent testing and engineering assessment. The product has been independently assessed by Knack Engineering Ltd and subjected to AS/NZS 4040.1 concentrated load testing, demonstrating suitability for maintenance access applications within the scope of the engineering assessment.

B2 Durability

Topglass® GC Ultra Safe incorporates premium polyester resin systems, additional woven glass reinforcement and a 130 µm EXO-SET® 206 Premium Gelcoat weathering surface designed to provide long-term resistance to ultraviolet radiation, weathering and surface erosion.

C3 Fire Affecting Areas Beyond the Fire Source

Fire performance testing has been undertaken by BRANZ in accordance with AS 3837:1998 and ISO 5660 Parts 1 and 2. Testing and subsequent calculations undertaken in accordance with NZBC Verification Method C/VM2 resulted in a Group Number Classification 3.

E2 External Moisture

When installed in accordance with Alsynite One installation requirements, Topglass® GC Ultra Safe forms part of a roofing or cladding system intended to provide protection from the penetration of external moisture.

F2 Hazardous Building Materials

Topglass® GC Ultra Safe is manufactured from Glass Fibre Reinforced Polyester (GRP) materials and is not considered to present a health hazard to building occupants when installed and used in accordance with Alsynite One requirements.



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Limitations of Use

Topglass® GC Ultra Safe is intended for use as a translucent roofing and cladding material when designed, specified and installed in accordance with Alsynite One requirements.

The information contained within this Product Technical Statement is subject to the following limitations:

- The product is intended for maintenance access applications only and is not intended for occupied roof decks, public access roofs or other applications where continuous pedestrian traffic is expected.
- Trafficability assessments and concentrated load testing relate only to the tested product configurations, support arrangements and loading conditions described within the supporting documentation.
- Installation shall be undertaken in accordance with current Alsynite One installation instructions and good trade practice.
- Project-specific engineering design may be required depending on building location, wind loading, support spacing and intended use.
- Fire performance requirements vary depending on building use, occupancy type and regulatory requirements and should be assessed by the project designer.
- Building Code compliance remains subject to project-specific design and assessment.
- The product should be inspected and maintained in accordance with Alsynite One recommendations throughout its service life.

Referenced Standards and Supporting Documents

The following documents have been referenced in the preparation of this Product Technical Statement:

- AS 4256.3:2006 (R2018) – Plastic roof and wall cladding materials – Glass fibre reinforced polyester (GRP)
- VIPAC Engineers & Scientists Mechanical Properties Test Report
- AS 1562.3:2006 – Design and installation of sheet roof and wall cladding
- AS/NZS 4040.1 – Methods of testing sheet roof and wall cladding – Resistance to concentrated loads
- AS/NZS 1170.1 – Structural design actions
- BRANZ Test Report DC13065-001
- BRANZ Fire Test Report FH5701-001-02
- Knack Engineering Advisory MUL-003
- Topglass GC Installation Instructions
- Alsynite One Warranty Documentation

Disclaimer

This Product Technical Statement has been prepared by Alsynite One NZ Ltd to provide technical information relating to Topglass® GC Ultra Safe.

The information contained within this document is based on independent testing, engineering assessment and product information available at the date of publication. Assessment of suitability for a particular application and compliance with the New Zealand Building Code remains the responsibility of the project designer, engineer and relevant regulatory authorities.

Alsynite One NZ Ltd reserves the right to amend product specifications, technical information and supporting documentation without notice.



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