



## BRANZ Appraised

Appraisal No. 528 [2017]

## SYMONITE CLADDING SYSTEM

Appraisal No. 528 [2017]

This Appraisal replaces BRANZ Appraisal No. 528 [2006]

Amended 5 September 2018



### BRANZ Appraisals

Technical Assessments of products for building and construction.



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## Product

- 1.1 The Symonite Cladding System is a drained and ventilated external wall cladding for specific design buildings of timber frame or timber frame infill construction. The system incorporates fabricated cladding panels manufactured from Reynobond® FR, Alucobond® Plus, Alpolic®/fr or Reynodual® panels.
- 1.2 Reynobond® FR, Alucobond® Plus and Alpolic®/fr aluminium composite sheets are 4 mm thick and have their edges folded to create a deeper cladding panel. A wide variety of colour options are available for the panels.
- 1.3 Reynodual® is a coil-coated double sheet aluminium panel consisting of two aluminium sheets bonded together with a total thickness of 3 mm.
- 1.4 The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the supporting timber framing with a nominal 20 mm cavity. The cavity allows for any occasional ingress of water that may get past the external skin to drain to the exterior of the building, and any remaining moisture to dry by evaporation.

## Scope

- 2.1 The Symonite Cladding System has been appraised for use as a drained and ventilated external wall cladding for buildings within the following scope:
  - buildings of importance level 1 to 5 as described by AS/NZS 1170, except that housing and communal residential buildings that fall within the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 are excluded; and,
  - constructed with timber framing, or timber framing infill complying with the NZBC; and,
  - subjected to maximum wind pressures for weathertightness design of 2.5 kPa Ultimate Limit State [ULS]; and,
  - where the cavity is drained and ventilated at least at every second floor level or 10 m height, whichever is the lesser; and,
  - where the cladding incorporates Reynobond® FR, Alucobond® Plus or Alpolic®/fr panels, it is located 1 m or more from the relevant boundary (refer Paragraphs 12.1 and 12.2)
- 2.2 All buildings incorporating the Symonite Cladding System must be subject to specific structural engineering, fire and weathertightness design. Building designers are responsible for the incorporation of the Symonite Cladding System into their design in accordance with the instructions of Symonite Panels Limited, using the details given in the Technical Literature, and for designing all details not covered by this Appraisal.

- 2.3 The installation of the Symonite Cladding System is to be carried out by people trained by Symonite Panels Limited specifically for the task.
- 2.4 Window and door joinery installations in the Symonite Cladding System must be subject to specific weathertightness design. Building designers are responsible for verifying the performance of the joinery installation details. *[The Appraisal of the Symonite Cladding System relies on the joinery being the subject of specific engineering design with regards to wind load and deflection for the design wind pressure.]*

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, the Symonite Cladding System, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the New Zealand Building Code (NZBC):

**Clause B1 – STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4. The Symonite Cladding System meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 9.1 – 9.2.

**Clause B2 – DURABILITY:** Performance B2.3.1 [b] 15 years. The Symonite Cladding System meets this requirement. See Paragraphs 10.1 – 10.5.

**Clause E2 – EXTERNAL MOISTURE:** Performance E2.3.2. The Symonite Cladding System meets this requirement. See Paragraphs 12.1 and 12.2.

**Clause F2 – HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. The Symonite Cladding System meets this requirement and will not present a health hazard to people.

## Technical Specification

System components and accessories supplied by Symonite Panels Limited are as follows:

### Cladding Panels

- 4.1 Cladding panels are manufactured from Reynobond® FR, Alucobond® Plus, Alpolic®/fr and Reynodual® sheets by routing and folding to shape and size. Panels are reinforced by aluminium angles and stiffeners which are riveted or adhered to the panel. Symonite Panels Limited should be contacted regarding the maximum sizes that may be achieved by panels. Panels are attached to the structure through aluminium fixing brackets.

### Reynobond® FR Sheets

- 4.2 Reynobond® FR sheets comprise a mineral-filled core faced with 0.5 mm thick aluminium alloy on both faces. Sheets are 4 mm thick.
- 4.3 The rear aluminium sheet faces have a polyester based service coating. The exterior faces are finished with a continuously coil coated baked enamel coating.

### Alucobond® Plus Sheets

- 4.4 Alucobond® Plus sheets comprise a mineral-filled core faced with 0.5 mm thick aluminium alloy on both faces. Sheets are 4 mm thick.
- 4.5 The rear aluminium sheet faces have a polyester based service coating. The exterior faces are finished with continuously coil coated PVdF or FEVE paint.

### Alpolic®/fr Sheets

- 4.6 Alpolic®/fr sheets comprise a mineral-filled core faced with 0.5 mm thick aluminium alloy on both faces. Sheets are 4 mm thick.
- 4.7 The rear aluminium sheet faces have a polyester based service coating. The exterior faces are finished with continuously coil coated Lumiflon® based fluoro carbon paint.

### **Reynodual® Sheets**

- 4.8 Reynodual® sheets consist of two 1.5 mm thick aluminium sheets bonded together with a 80 µm thick adhesive to give a total thickness of 3 mm. The front face is coated with an anti-corrosion treatment and DURAGLOSS 5000 [35 µm], PVDF 70/30 [25 µm] or polyester [26 µm]. The rear side is finished with an anti-corrosion treatment and a varnish protection.

### **Accessories**

- 4.9 Accessories used with the Symonite Cladding System that are supplied by Symonite Panels Limited include:
- Screws for panel fixing
  - Aluminium angle fixing brackets
  - Plastic packers
  - PEF backing rod
  - Sikaflex® AT-Façade
  - Sikasil® WS-305 CN
  - Dow Corning 688
  - Sikaflex® 552 AT

## **Handling and Storage**

- 5.1 Handling of the aluminium composite panels and the associated accessories must be in accordance with the Symonite Cladding System Technical Literature and Symonite Panels Limited's instructions.

## **Technical Literature**

- 6.1 Refer to the Appraisals listing on the BRANZ Website for details of the current Technical Literature for the Symonite Cladding System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and within the scope of this Appraisal must be followed.

## **Design Information**

### **General**

- 7.1 The Symonite Cladding System is used on buildings that have been subject to specific engineering, weathertightness and fire design.
- 7.2 All aluminium components of the Symonite Cladding System must be kept out of contact with treated timber that contains copper (e.g. CCA, copper azole or ACQ).

## **Framing**

- 8.1 The building designer is responsible for the framing design including timber strength and treatment requirements.

### **Structure**

#### **Impact Resistance**

- 9.1 The system will resist human impact loads likely to be encountered. The surfaces of Reynobond® FR, Alucobond® Plus and Alpolic®/fr sheets are susceptible to impacts from hard and sharp bodies. Care must therefore be taken when installing the system. The likelihood of impact damage to the system during use should be considered at the design stage, and appropriate protection such as the installation of bollards or barriers should be considered for vulnerable areas.

#### **Design Method**

- 9.2 Design of Symonite Cladding System installations is carried out by Chartered Professional Engineers using technical information supplied by Symonite Panels Limited.

## Durability

### Serviceable Life

- 10.1 When installed and maintained in accordance with the specifications and installation instructions as defined in the Technical Literature, the Symonite Cladding System, incorporating Reynobond® FR, Alucobond® Plus, Alpolic®/fr and Reynodual® sheets, has an expected serviceable life of greater than 15 years, see Table 1.

**Table 1: Expected Serviceable life of maintained Symonite Cladding System in New Zealand.**

Panel System	Exposure Zone [NZS 3604:2011]		
	Zone B	Zone C	Zone D <sup>1,4</sup>
Reynobond® FR	>15 Years	>15 Years	15 Years <sup>2</sup>
Alucobond® Plus	>15 Years	>15 Years	15 Years <sup>2,3</sup>
Alpolic®/fr	>15 Years	>15 Years	15 Years <sup>2</sup>
Reynodual®	>15 Years	>15 Years	15 Years <sup>2</sup>

#### Notes:

1. Beachfront areas with rough seas and surf beaches may have a higher corrosivity and can be defined as category E of AS/NZS 2728 and C5 of ISO 9223.
  2. Maintenance is essential.
  3. The durability of the PVdF or FEVE based coatings only is likely to be greater than 10 years. The use of the 3-coat paint system is very likely to improve the performance. Therefore the combined durability of the surface coating and the underlying aluminium sheet is likely to exceed 15 years in this severe marine environment.
  4. In industrially or agriculturally contaminated atmospheres, corrosive environments and geothermal hot spots, specific design is required.
- 10.2 Significant acceleration of corrosion can occur due to industrial contamination and corrosive atmospheres and contamination from agricultural chemicals or fertilisers. Specific design is required under these microclimatic conditions.
- 10.3 Some dark colours of PVdF or FEVE coatings may experience some fading after prolonged UV exposure.

### Maintenance

- 10.4 Regular maintenance is essential for Symonite Cladding System installations to maximise the serviceable life of the system.
- 10.5 An inspection of Symonite Cladding System installations should be undertaken at least annually to determine the condition of the whole building. Items to be checked include, but are not limited to:
- Dirt – any accumulation of dirt should be washed from the surface of the panels.
  - Scratches and dents – these need to be identified and repaired.
  - Joint sealant – identify any failures and repair.

## Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to the Reynobond® FR, Alucobond® Plus and Alpolic®/fr panels from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.
- 11.2 Reynodual® is considered a non-combustible material and need not be separated from flues and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from fire places, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS1 – C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

## Control of External Fire Spread

- 12.1 Reynobond® FR, Alucobond® Plus and Alpolic®/fr panels have not been tested in accordance with NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8. The Symonite Cladding System incorporating Reynobond® FR, Alucobond® Plus and Alpolic®/fr panels is suitable for cladding applications where fire spread on the façade is not required to be controlled as identified by NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8 for the relevant building Risk Groups.
- 12.2 Reynodual® uncoated aluminium sheets have been subjected to testing in accordance with AS 1530.1 and met the criteria to be deemed not combustible. The entire wall cladding system has not been tested in accordance with NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8. For all buildings where fire spread on the façade is required to be controlled by NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8, specific fire engineering design is required for cladding systems incorporating Reynodual® panels.

## External Moisture

- 13.1 The Symonite Cladding System has been tested in accordance with the requirements of AS/NZS 4284. This test method is designed to verify the performance of commercial building facades.
- 13.2 The design of the Symonite Cladding System is subject to the following restrictions:
- Drainage and compartmentalisation of the cladding system must be at the first level down from the top of the building, and every second level after that, or every 10 m, whichever is the lesser.
  - Vertical compartmentalisation with airtightness exceeding 0.1 MNs/m<sup>3</sup> is required of the cladding cavity within 500 mm of every corner, at 2m centres after that, to a maximum of 5 m centres where cladding panels are located further than 2.5 m from any edge of the cladding, or areas where air flows are interrupted.
  - A building with wind exposure of less than 1.1 kPa ULS must have a building wrap complying with NZBC Clause E2/AS1, Table 23, or a rigid air barrier.
  - A building with any exposure to wind above a 1.1 kPa ULS must have building wrap or a rigid air barrier [RAB] that has an airflow resistance of greater than 0.1 MNs/m<sup>3</sup>.
  - A building with exposure to wind on any part of its façade above a 1.55 kPa ULS must use a RAB as the backing for a cavity.
  - A competent weathertightness specialist must design all cladding penetration details for each project.
- 13.3 The Symonite Cladding System when installed in accordance with this Appraisal and the Technical Literature, prevents the penetration of moisture that could cause undue dampness or damage to building elements.
- 13.4 The cavity must be sealed off from the roof, inter-floor and sub-floor spaces to meet code compliance with NZBC Clause E2.3.5.
- 13.5 The Symonite Cladding System allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC Clause E2.3.6.
- 13.6 The details given in the Technical Literature for weather sealing are based on the design principle of a drained and ventilated cladding to prevent moisture entry for all joints, penetrations and junctions. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.
- 13.7 The use of the Symonite Cladding System where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions and penetrations to remain weather resistant.

## Installation Information

### Installation Skill Level Requirements

- 14.1 Installation and finishing of components and accessories supplied by Symonite Panels Limited must always be carried out in accordance with the Symonite Cladding System Technical Literature and this Appraisal by trained installers, approved by Symonite Panels Limited.

### Inspection

- 14.2 For inspection, reference must be made to the specific building design documentation and Symonite Panels Limited's installation information.

## Basis of Appraisal

### Tests

- 15.1 A weathertightness test on the Symonite Cladding System was performed at an IANZ accredited laboratory in accordance with AS/NZS 4284, in the presence of BRANZ commercial building weathertightness staff. The testing assessed the performance of the window head, jamb and sill details, compartmentalised vertical joint, drained horizontal joint, stiffener, internal and external corners and terminations. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the details above will meet the performance requirements of the New Zealand Building Code External Moisture Clause E2 when used within the scope of this Appraisal up to a ULS of 2.5 kPa.

### Other Investigations

- 16.1 The Symonite Cladding System Technical Literature has been reviewed by BRANZ and found to be satisfactory.
- 16.2 Site visits were carried out to assess the practicability of installation, and to examine completed installations.
- 16.3 Opinions on structural, weathertightness and durability aspects were given by BRANZ technical experts.

### Quality

- 17.1 The manufacture of the Reynobond® FR and Reynodual® sheets by ALCOA Architectural Products has not been examined by BRANZ, but the quality control systems of ALCOA Architectural Products have been assessed and registered as meeting the requirements of ISO 9001:2008 by BSI.
- 17.2 The manufacture of the Alucobond® Plus sheets has not been examined by BRANZ, but has been assessed by an independent organisation. This assessment has been reviewed by BRANZ and found to be satisfactory.
- 17.3 The manufacture of the Alpolic®/fr sheets by Mitsubishi Plastics Inc has not been examined by BRANZ, but the quality control systems of Mitsubishi Plastics Inc have been assessed and registered as meeting the requirements of ISO 9001:2008 by Japan Chemical Quality Assurance Ltd.
- 17.4 Symonite Panels Limited is responsible for the quality of product supplied.
- 17.5 Quality of panel installation on site is the responsibility of Symonite Panels Limited.
- 17.6 Designers are responsible for the building design, including structural design of the panels and fixings, and weathertightness design of penetrations.
- 17.7 Building owners are responsible for the maintenance of the Symonite Cladding System in accordance with the instructions of Symonite Panels Limited.



## Sources of Information

- AS/NZS 1170: 2011 Structural design actions.
- AS/NZS 4284: 2008 Testing of building façades.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

## Amendments

### Amendment No. 1, dated 14 March 2017.

This Appraisal has been amended to update Paragraph 2.1.

### Amendment No.2, dated 5 September 2018.

This Appraisal has been amended to include Reynodual® panels.





In the opinion of BRANZ, **Symonite Cladding System** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Symonite Panels Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the Technical Literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **Symonite Panels Limited:**
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions.
  - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by **Symonite Panels Limited**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Symonite Panels Limited** or any third party.

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**For BRANZ**



**Chelydra Percy**

Chief Executive

Date of Issue:

03 March 2017