



BRANZ Appraised

Appraisal No.307 [2005]

BRANZ Appraisals

Technical Assessments of products
for building and construction

BRANZ APPRAISAL

No. 307 (2005)

This Appraisal replaces BRANZ
Appraisal No. 307 (2000) issued
30 June 2000.

Amended 9 July 2008

SKELLERUP BUTYLCLAD, EPICLAD & EPICLAD FBS ROOF MEMBRANE SYSTEMS

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Product

1.1 Butylclad, Epiclad and Epiclad FBS Roof Membranes are synthetic rubber waterproofing membranes designed to be used on roofs, decks, balconies, parapets and gutters. Butylclad is based on an EPDM Butyl Rubber blend and is manufactured by Skellerup Roofing & Waterproofing. Epiclad and Epiclad FBS are based on EPDM rubber co-polymer with the FBS being fleece backed; these products are manufactured by Carlisle Syntec Systems Inc.

1.2 These products are supplied as single-ply, flexible synthetic rubber sheet in roll form. These products are installed as a single layer system.



SKELLERUP
ROOFING & WATERPROOFING

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Scope

2.1 Butylclad, Epiclad and Epiclad FBS Roof Membranes have been appraised for use as waterproofing membranes for buildings within the following scope:

- scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with timber supporting structures designed and constructed in accordance with the NZBC; and,
- with nominally flat or pitched roofs constructed to drain water to gutters and drain outlets complying with NZBC; and,
- with substrates of plywood sheet; and,
- with decks that have a maximum size of 40 m².

2.2 Butylclad, Epiclad and Epiclad FBS Roof Membranes have also been appraised for use as waterproofing membranes for external reinforced concrete and plywood roofs and decks for buildings within the following scope:

- up to 3 storeys with a maximum height from ground to eaves of 10 m and with a floor plan area limited only by seismic and structural control joints; and,
- with the reinforced concrete structure designed and constructed in accordance with the NZBC; and,
- with timber supporting structures designed and constructed in accordance with the NZBC; and,
- with nominally flat, curved or pitched roofs constructed to drain water to gutters and drain outlets complying with NZBC.

2.3 This Appraisal is limited to roofs and decks within the following scope:

- constructed to suitable falls (Refer Paragraph 13.1 – 13.9); and,
- with no steps within the deck level, no integral roof gardens and no down pipe discharging directly onto the deck.

2.4 The design and construction of the substrate and movement and control joints is specific to each building, and therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.

2.5 The membranes must be installed by trained applicators, approved by Skellerup Roofing & Waterproofing.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Skellerup Butylclad, Epiclad and Epiclad FBS Roof Membrane Systems, 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 NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. Skellerup Butylclad, Epiclad and Epiclad FBS Roof Membrane Systems meet this requirement. See Paragraph 9.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Roofs, decks, balconies, parapets and gutters incorporating Skellerup Butylclad, Epiclad and Epiclad FBS Roof Membrane Systems meet these requirements. See Paragraphs 12.1 – 12.9.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Skellerup Butylclad, Epiclad and Epiclad FBS Roof Membrane Systems meet this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an Acceptable Solution in terms of New Zealand Building Code compliance and the products comply with NZBC Acceptable Solution E2/AS1 Paragraph 8.5. These products are also appraised as an Alternative Solution as outlined in Paragraph 2.2.

Technical Specification

4.1 Materials supplied by Skellerup Roofing & Waterproofing are as follows:

Membrane Type	Colour/Thickness (mm)	Roll Lengths (m)	Roll Widths (m)
Butylclad	Grey 1.0	25	1.25
	Black 1.0	25	0.9, 1.25
	Black or Grey 1.5	20	1.25
Epiclad	Black 1.14	15.2*	2.1, 3.0, 6.0
	Black 1.5	15.2*	3.0, 6.0
Epiclad FBS	Black 1.14	15.2*	3.0
	Black 1.52**	15.2*	3.0

* Roll lengths of 30 metres are available on indent

** Available on indent

Skellerup BMA (Butylclad Membrane Adhesive)

- A specially formulated solvent-based adhesive for all Butylclad applications. Supplied in 4, 20 and 209 litre containers.

Skellerup Epiclad EPDM Adhesive

- A specially formulated solvent-based adhesive for all Epiclad applications. Supplied in 20 litre drums.

Skellerup Epiclad FBS Adhesive

- A specially formulated solvent-based one part adhesive for all Epiclad FBS applications. Supplied in 20 litre drums.

BMA Solvent

- A toluene based solvent used to clean substrates or when mixed 50/50 with Skellerup BMA adhesive as a primer for all substrates. Supplied in 20 litre drums.

Skellerup Lap Primer

- A primer to provide a clean surface for Epiclad EPDM and Butylclad prior to the application of lap and flashing tapes. Supplied in 1 litre drums.

Skellerup Superseal Self Adhesive Lap Tape

- A self adhesive blend of rubbers and inert fillers that can be used when lapping either Butylclad, Epiclad or Epiclad FBS. Supplied in 50 mm x 30 m or 76 mm x 30 m lengths.

Skellerup Lap Sealant

- A tough, durable elastomeric joint sealant suitable for use over a wide range of external and internal building applications and sealing the edges of either Butylclad or Epiclad EPDM membrane. Supplied in a 300 ml cartridge.

Butylclad/Epiclad Flashing Tape

- A self adhesive semi-cured Butyl tie gum that is very elastic for moulding or flashing of details work. Supplied as a 150 mm wide x 30.4 m roll.

Epiclad FBS Overlay Tape

- A self adhesive tape that is used to overlay Epiclad FBS butt jointed sheets. Overlay tape can also be used for repair of Butylclad or Epiclad lap joints. Supplied as a 150 mm wide x 30.4 m roll.

Handling and Storage

5.1 Handling and storage of all materials whether on or off site is under the control of the Skellerup Roofing & Waterproofing trained installers. Dry storage must be provided for all products.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Butylclad, Epiclad and Epiclad FBS Roof Membranes. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 Butylclad, Epiclad and Epiclad FBS Roof Membranes are for use on roofs and decks where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.

7.2 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to BRANZ publication "Good Practice Guide to Membrane Roofing".

7.3 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of NZS 4203. In all cases, framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and that all sheet edges are fully supported.

7.4 When fully bonded to continuous substrates, Butylclad, Epiclاد and Epiclاد FBS Roof Membranes will be suitable for use on roofs, decks and balconies on buildings in NZS 3604 Building Wind Zones, up to and including 'Very High'.

7.5 Butylclad, Epiclاد and Epiclاد FBS Roof Membranes have adequate resistance to wear caused by foot traffic associated with normal membrane installation and maintenance. Thicker grades will perform better on decks or other areas subject to regular foot traffic.

7.6 Where the products are likely to be subject to heavier use and there is the risk of damage, the membrane must be protected by covering with decking, pavers or by other suitable means.

7.7 Epiclاد FBS membrane is particularly suited for over-cladding existing roofs, bitumen-based coverings and other situations where a higher level of preparation of the substrate to receive the membrane is not possible. Skellerup Roofing & Waterproofing should be consulted as to the suitability of an existing substrate prior to using Epiclاد FBS membrane.

Substrates

Plywood

8.1 Plywood must be treated to H3 (CCA treated). **LOSP treated plywood must not be used.** Plywood must comply with NZBC Acceptable Solution E2/AS1 Paragraph 8.5.3 and 8.5.5. Where specific design is used (i.e. outside the scope of E2/AS1), the plywood thickness and fixing size may increase and centres may decrease to meet specific wind loadings.

Concrete

8.2 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101.

Durability

Serviceable Life

9.1 Butylclad, Epiclاد and Epiclاد FBS Roof Membranes when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 20 years.

Maintenance

10.1 No maintenance of the membranes is normally required provided significant substrate movement does not occur.

10.2 In the event of damage to the membrane, the membrane must be repaired by removing the damaged portion and applying a patch as for new work.

10.3 Drainage outlets must be maintained to operate effectively.

Outbreak of Fire

11.1 The membranes must be protected from heat sources such as flues and chimneys in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

External Moisture

12.1 Roofs, decks and balconies must be designed and constructed to shed precipitated moisture. They must also take account of snowfalls in snow prone areas. A means of meeting code compliance with NZBC Clause E2.3.1 is given by the Technical Literature which matches details in NZBC Acceptable Solution E2/AS1.

12.2 When installed in accordance with this Appraisal and the Technical Literature, Butylclad, Epiclاد and Epiclاد FBS Roof Membranes will prevent the penetration of water and will therefore meet code compliance with Clause E2.3.2. The membranes are impervious to water and will give a weathertight roof, deck, or balcony.

12.3 The minimum fall to roofs is 1 in 40, decks is 1 in 60 and gutters is 1 in 100. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane.

12.4 Butylclad, Epiclاد and Epiclاد FBS Roof Membranes are impermeable; therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with Clause E2.3.6.

12.5 Roof and deck falls must be built into the substrate and not created with mortar screeds applied over the membrane.

12.6 Allowance for deflection and settlement of the substrate must be made in the design of the deck to ensure falls are maintained and no ponding of water can occur.

12.7 Drainage flanges must be used for any outlet and must be fitted with a grate or cage to reduce potential sources of blockages. An overflow must be provided where the deck or balcony does not drain to an external gutter or spouting.

12.8 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by blockage of deck drainage.

12.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

Water Supplies

13.1 Butylclad, Epiclاد and Epiclاد FBS Roof Membranes have not been appraised for compliance with the provisions of NZBC G12.3.1. Skellerup Roofing & Waterproofing must be consulted for advice if the roof is intended for the collection of potable water supplies.

Installation Information

Installation Skill Level Requirement

14.1 Installation of the membranes must be completed by trained applicators, approved by Skellerup Roofing & Waterproofing.

14.2 Installation of substrates must be completed by tradespersons with an understanding of roof, deck and balcony construction, in accordance with instructions given within the Skellerup Roofing & Waterproofing Technical Literature and this Appraisal.

Preparation of Substrates

15.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents. All surface defects must be filled to achieve an even and uniform surface.

15.2 The relative humidity of concrete substrates must be 75% or less before membrane application. The concrete can

be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 424.

15.3 The moisture content of the plywood and the timber substructure must be a maximum of 20% and plywood sheet must be dry at time of membrane application. This will generally require plywood sheets to be covered until just before the membrane is laid, to prevent rain wetting.

15.4 Substrates must be primed with a 50/50 solution of Skellerup BMA and BMA Solvent and left to dry before the membrane is installed.

Membrane Installation

16.1 The membrane must be installed in accordance with the Technical Literature.

16.2 Plywood joints must be taped with 25 mm wide PVC pressure sensitive tape.

16.3 The membrane must be unrolled without tension onto the prepared substrate and allowed to 'relax' for at least 20 minutes prior to installation.

16.4 Adhesive must be applied to both the membrane and the substrate, one half at a time. When the adhesive is tack dry, the sheet is rolled onto the substrate. The process is then repeated for the other half of the sheet. All joints require lap bonding using Superseal Lap Tape.

Inspections

17.1 The Technical Literature must be referred to during the inspection of membrane installations by Building Consent Authorities and Territorial Authorities.

17.2 Critical areas of inspection for waterproofing systems are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions.

Health and Safety

18.1 Safe use and handling procedures for the membrane systems are provided in the Technical Literature. The products must be used in conjunction with the relevant Material Safety Data Sheet for each membrane.

covered tensile strength, elongation, tear resistance, factory seam strength, resistance to heat ageing, brittleness point, ozone resistance, water absorption, water vapour permeability and resistance to UV exposure.

19.3 The adhesives, primers and seam tapes used with Butylclad, Epiclاد and Epiclاد FBS Roof Membranes meet the intended performance requirements of NZBC Acceptable Solution E2/AS1 Paragraph 8.5.4(c). *Note: At the time of issue of this Appraisal BRANZ EM5 as outlined in Paragraph 8.5.4(c)(i) was not published.*

Other Investigations

20.1 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine the performance of Butylclad on installations completed as early as 1973.

20.2 The Technical Literature has been examined by BRANZ and found to be satisfactory.

20.3 Reported information on the performance of Butyl and EPDM rubber and its resistance to accelerated and natural weathering, and the long-term field experience with Butyl and EPDM rubber roof membranes in New Zealand and overseas has been examined.

Quality

21.1 The manufacture of the Butylclad membrane has been inspected by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.2 The quality of manufacture of the Butylclad membrane is the responsibilities of Skellerup Roofing & Waterproofing. Skellerup Roofing & Waterproofing are a TELARC quality assured supplier (Registration No. 782, dated June 2005.)

21.3 The manufacture of the Epiclاد and Epiclاد FBS membranes has not been inspected by BRANZ but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.4 The quality of manufacture of Epiclاد and Epiclاد FBS membranes is the responsibility of Carlisle Syntec Systems Inc. Carlisle Syntec Systems Inc. has been assessed and accredited as meeting the requirements of BS EN ISO 9001: 2000 by BSI Management Systems, Registration Number FM 79424.

21.5 The quality of supply of the products to the market is the responsibility of Skellerup Roofing & Waterproofing.

21.6 Quality on site is the responsibility of the Skellerup Roofing & Waterproofing approved applicators.

21.7 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Skellerup Roofing & Waterproofing and this Appraisal.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

19.1 Tests have been carried out on Butylclad membrane by Skellerup Roofing & Waterproofing in their laboratory which is covered by Skellerup Quality Management Systems certified to ISO 9001:2000. This testing covered material thickness, tensile strength, elongation at break, water absorption, water vapour permeance and heat ageing followed by tensile and elongation as detailed in NZBC Acceptable Solution E2/AS1 Paragraph 8.5.4(b). Results and test methods have been reviewed by BRANZ and found to be satisfactory.

19.2 Tests have been carried out on the Epiclاد and Epiclاد FBS membranes by Carlisle Syntec Systems Inc. This testing

Sources of Information

- AS/NZS 2269:1994 Plywood – Structural.
- ASTM E96-02 Water vapour transmission of materials in sheet form.
- ASTM D297-93 Test methods for rubber products - chemical analysis.
- ASTM D746-79 Test method for brittleness temperature of plastics and elastomers by impact.
- ASTM D4637-87 Standard specification for vulcanized rubber sheet used in single-ply roofing.
- BS 903:1989, Part A2 Method of testing vulcanized rubber. Determination of tensile cross grain properties.
- BS 903:1989, Part A3 Methods for testing vulcanized rubber. Determination of tear strength.
- NZS 3101: 1995 The design of concrete structures.
- NZS 3109:1987 Specification for concrete construction.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4203:1992 Code of practice for general structural design and design loadings for building.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.
- BRANZ Good Practice Guide – Membrane Roofing, Reprint October 2003.



BRANZ

In the opinion of BRANZ, Skellerup Butyclad, Epiclad and Epiclad FBS Roof Membrane Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Skellerup Roofing & Waterproofing A division of Viking Group Ltd, 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. **Skellerup Roofing & Waterproofing:**
 - 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.
3. 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.
4. 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 **Skellerup Roofing & Waterproofing**.
5. 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.
6. BRANZ provides no certification, guarantee, indemnity or warranty, to **Skellerup Roofing & Waterproofing** or any third party.

For BRANZ

P Robertson
Chief Executive

Date of issue: 9 August 2005

Amendment No. 1, dated 9 July 2008.

This Appraisal has been amended to update the Appraisal Holder details.