



**BRANZ Appraised**  
Appraisal No. 680 [2020]

**BIFORM SOLID  
COMPOSITE DECKING**

# biform

## SOLID COMPOSITE DECKING

### Appraisal No. 680 [2020]

This Appraisal replaces BRANZ  
Appraisal No. 680 [2015]

#### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



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### Product

- 1.1 Biform Solid Composite Decking is a wood/plastic composite (WPC) decking for timber-framed decks. The decking is available in three options – FORM 130, FORM 140 and Forest Board.

### Scope

- 2.1 Biform Solid Composite Decking has been appraised for use as an alternative exterior decking material for decks designed and constructed in accordance with NZS 3604.
- 2.2 The FORM 140 size of Biform Solid Composite Decking has also been appraised as exterior decking when used on decks subject to a specific engineering design.

### Building Regulations

- 3.1 In the opinion of BRANZ, Biform Solid Composite Decking, if designed, used, installed, and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

**Clause B1 STRUCTURE:** Performance B1.3.1, B1.3.2, and B1.3.4. Biform Solid Composite Decking meets the requirements of loads arising from self-weight, imposed loads, and impact [i.e. B1.3.3 (a), (b) and (j)]. See Paragraphs 8.1–8.3.

**Clause B2 DURABILITY:** Performance B2.3.1 [b] 15 years. Biform Solid Composite Decking meets this requirement. See Paragraph 9.1.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Biform Solid Composite Decking meets this requirement.



## Technical Specification

- 4.1 Biform Solid Composite Decking is manufactured by extrusion of a mixture of recycled polyethylene, wood fibre and an anti-fungal additive.
- 4.2 The decking is supplied as a solid profile with one smooth face and one grooved face. The edges on both sides of the FORM 130 and FORM 140 decking are extruded with a centred rebate to accommodate a concealed decking clip. The decking is available in the following sizes:
  - **FORM 130 decking** – 130 mm wide, 19 mm thick and 4.85 m long.
  - **FORM 140 decking** – 140 mm wide, 25 mm thick and 4.85 m long.
  - **Forest Board** - 138 mm wide, 20 mm thick and 4.85 m long.
- 4.3 The decking is available in three colours: Red Brown, Cedar Brown and Mid-Grey.

### Accessories

- 4.4 Accessories used with FORM 130 and FORM 140 decking, which are supplied by Biform Ltd are:
  - **FORM 130 and FORM 140 Fixing Clips** - manufactured of black HDPE. FORM 130 Fixing Clips are 43 mm long x 15 mm wide. FORM 140 Fixing Clips are 39 mm long x 17 mm wide.
  - **Stop Clip** - manufactured of black HDPE, 41 mm long x 20 mm wide.
  - **Fixing Clip and Stop Clip Fixings** – 40 mm x 6 g square drive, blackened 304 or 316 stainless steel screw.
  - **Decking Fixings** – 50 mm x 10 g or 65 mm x 10 g square drive, 316 stainless steel winged composite deck screws.
- 4.5 Accessories used with Forest Board, which are supplied by Biform Ltd are:
  - **Decking Fixings** - 65 mm x 9 g star drive, 316 stainless steel composite deck screws.

## Handling and Storage

- 5.1 Biform Solid Composite Decking must be transported and stacked flat. The decking must be well supported with 8 to 10 supports along the length of the stack. When stored, they must be off the ground and sheltered from direct sunlight. The decking must always be carried on edge.

## Technical Literature

- 6.1 Refer to the Appraisals listings on the BRANZ website for details of the current Technical Literature for Biform Solid Composite Decking. The Technical Literature must be read in conjunction with this Appraisal. All aspects of use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

## Design Information

### Deck Framing Design

#### Deck Planning - FORM 130 and FORM 140

- 7.1 On decks of 5 m length or more, a 'picture frame' design is recommended to encase the decking. Instead of staggering the decking joints through the deck, a breaker board should be installed at right angles. On very large decks, multiple breaker boards can be installed as required. Additional timber must be planned and allowed for in the framing to support the breaker boards. Where butt joints in the body of the deck are unavoidable, Stop Clips must be used. Advice regarding the design and installation of decks can be obtained from Biform Ltd.
- 7.2 FORM 130 and FORM 140 Fixing Clips provide a 5 mm gap between the decking.

#### Deck Planning - Forest Board

- 7.3 Forest Board is installed conventionally with face fixings [2 screws per joist]. The boards are end butt-jointed on joists. A 5 mm gap between adjacent boards is recommended for drainage and thermal expansion.

### Clearances

- 7.4 Biform Solid Composite Decking must be designed and installed with a minimum ground clearance of 300 mm over unpaved ground and 50 mm minimum over waterproof membrane decks and balconies.

### Timber Framing

- 7.5 Biform Solid Composite Decking is designed to be laid over conventional timber deck framing consisting of bearers and joists. Joists are set out at maximum 400 mm centres for FORM 130 decking and Forest Board and maximum 450 mm centres for FORM 140 decking.
- 7.6 Construction of the deck framing must be in accordance with NZS 3604 or to a specific engineering design using NZS 3603 and AS/NZS 1170. Timber framing must be treated as required by NZBC Acceptable Solution B2/AS1.
- 7.7 Decking must not overhang the support framing at ends of a deck by more than 10 mm for FORM 130 decking and Forest Board and 20 mm for FORM 140 decking.

### Structure

- 8.1 All thicknesses of Biform Solid Composite Decking are suitable for use on decks designed for 2 kPa floor loads as required by NZS 3604, Paragraph 7.4.1.2.
- 8.2 FORM 140 decking can be used on specifically engineered decks with a maximum serviceability live load of 5 kPa and a maximum point load of 1.8 kN, provided the deck span does not exceed 450 mm and the decking is continuous over a minimum of two spans.
- 8.3 Biform Solid Composite Decking has adequate resistance to both imposed and impact loads likely to be encountered in normal residential use. As with timber decking alternatives, some denting or scratching could occur. The likelihood of impact damage to the material if used in public access areas should be considered at the design stage.

### Durability

#### Serviceable Life

- 9.1 Biform Solid Composite Decking can be expected to have a serviceable life in excess of 15 years, comparable to timber decking. Minor loss of colour can be expected during stabilisation over the first few months, and some further loss of colour is to be expected over time due to exposure to weathering.

### Maintenance

- 10.1 Regular cleaning [at least annually] of the Biform Solid Composite Decking surface is recommended to remove grime, dirt, and any organic material, and to maximize the life and appearance of the surface finish. Build-up of residue, mould or dirt can be removed by brushing with a soft brush, warm water, and sugar soap. Abrasive cleaners, thinners, solvents or petrol must not be used. Stains from BBQ grease, oil, or tannin in some vegetation, can be removed with a degreaser following the manufacturer's instructions. Complete by washing with warm water and sugar soap.
- 10.2 Biform Solid Composite Decking is manufactured with an anti-fungal additive to resist fungal growth on decks in damp and humid conditions. As with timber decking, mould or mildew can develop if damp leaf mould is allowed to collect over a period of time. Advice from Biform Ltd should be sought regarding the best method of treatment if this should occur.
- 10.3 The dragging of heavy objects across Biform Solid Composite Decking should be avoided as this will risk scratching the surface.
- 10.4 Biform Solid Composite Decking can be sanded if necessary with 80 to 100 grit sandpaper. Sanding must only be done in the same direction as the grain along the length of the material. This will initially alter the local colour of the material, but the colour difference will recede with new weathering over a few months.



### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Biform Solid Composite Decking from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### Fire Affecting the Areas Beyond the Fire Source

- 12.1 FORM 130 and FORM 140 decking achieve a critical radiant flux of 5.7 kW/m<sup>2</sup> and Forest Board achieves 5.4 kW/m<sup>2</sup> when tested in accordance with ISO 9239 Part 1. This exceeds the minimum critical radiant flux requirements specified in the NZBC. Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 for further information.

### Access Routes

- 13.1 Biform Solid Composite Decking without applied coatings has been tested to the Oil-Wet Ramp test method contained in AS 4586, which is an Alternative Solution. The decking achieved a slip resistance classification of R11 for both the grooved and smooth faces. In public access areas, it is recommended that the decking be laid at right angles to the main direction of pedestrian traffic. HB 197 provides guidance on the use of slip resistant materials in various scenarios.

## Installation Information

### Installation Skill Level Requirements

- 14.1 All design and building work must be carried out in accordance with the Biform Solid Composite Decking Technical Literature and this Appraisal by competent and experienced tradespersons conversant with Biform Solid Composite Decking. Where the work involves Restricted Building Work [RBW] this must be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License class.

### Installation

- 15.1 Specific installation instructions supplied with the Biform Solid Composite Decking system regarding deck design, laying, and fixing must be followed when installing the product. The quality of a finished deck will be dependent on the skill and experience of the installer.
- 15.2 Biform Solid Composite Decking may be cut on site by hand saw, power saw with a fine toothed blade, jig-saw or router. Holes and cut-outs may be formed by using a hole-saw or router.
- 15.3 FORM 130 and FORM 140 decking must be fixed at every joist using a Fixing Clip and the stainless steel screws supplied as part of the Biform Solid Composite Decking system. Forest Board must be fixed with a pair of 65 mm x 9 g composite deck screws to every joist.
- 15.4 Where required, such as on edge boards and breaker boards, the decking may be fixed through the face with Biform composite deck screws.

### Expansion Allowance

- 15.5 Decking should be laid out in the same area where they will be installed. This will allow the decking to all reach a similar ambient temperature and degree of expansion before being cut to length and fixed in place. Where the decking is fixed with concealed fixings and may be subject to creep, the use of Stop Clips is recommended. These are screw fixed to the side of the joist and the edge of the decking.

### Health and Safety

- 16.1 There are no special health and safety requirements, though normal care should be taken when cutting deck components.

## Basis of Appraisal

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

### Tests

- 17.1 Accelerated weathering testing has been completed by BRANZ following test method ASTM G155. Results for this testing were satisfactory.
- 17.2 Testing to determine the critical radiant flux has been completed in accordance with ISO 9239 Part 1 by a National Association of Testing Authorities (NATA) registered laboratory.
- 17.3 Testing of Biform Solid Composite Decking without applied coatings to the Oil-Wet Ramp test method contained in AS 4586 has been completed by CSIRO.

### Other Investigations

- 18.1 An assessment was made of the durability of Biform Solid Composite Decking and an opinion has been provided by BRANZ technical experts.
- 18.2 Load testing following ultraviolet (UV) exposure was carried out to establish sufficient span and load capacity.
- 18.3 Site inspections have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.
- 18.4 The Technical Literature for Biform Solid Composite Decking has been assessed by BRANZ and found to be satisfactory.

### Quality

- 19.1 The manufacture of Biform Solid Composite Decking has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ undertakes an ongoing review of product quality on an inwards goods basis.
- 19.2 The quality management system of the manufacturer of Biform Solid Composite Decking, has been assessed and is registered as meeting the requirements of ISO 9001.
- 19.3 The quality of materials, components, and accessories supplied by Biform Ltd is the responsibility of Biform Ltd.
- 19.4 The quality of installation on-site of components and accessories supplied by Biform Ltd is the responsibility of the deck installer.
- 19.5 Designers are responsible for the building design, and deck installers are responsible for the quality of installation of deck support framing and deck components.
- 19.6 Building owners are responsible for the maintenance of Biform Solid Composite Decking in accordance with the advice of Biform Ltd.

## Sources of Information

- AS 4586: 2013 Slip resistance classification of new pedestrian surface materials.
- AS/NZS 1170 series, Structural design actions.
- HB 197: 1999 An Introductory Guide to the Slip Resistance of Pedestrian Surface Materials.
- ISO 9239 Reaction to fire tests for flooring Part 1: 2010 Determination of the burning behaviour using a radiant heat source.
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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17 December 2020

BIFORM SOLID COMPOSITE  
DECKING



In the opinion of BRANZ, **Biform Solid Composite Decking** 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 **Biform 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. **Biform Ltd**:
  - 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 **Biform Ltd**.
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 **Biform Ltd** or any third party.

For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

17 December 2020