



BRANZ Appraised

Appraisal No. 861 [2019]

KIRIN INSULATED PANEL SYSTEM - INTERNAL PARTITIONS AND CEILINGS

Appraisal No. 861 [2019]

This Appraisal Replaces BRANZ
Appraisal No. 861 [2014]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 The Kirin Insulated Panel System is for use as internal partitions and ceilings. The system incorporates Kirin Insulated Panels, which are sandwich panels fabricated by injecting polyisocyanurate (PIR) foam between coil-coated steel or stainless steel faces.
- 1.2 The Kirin Insulated Panels come in thicknesses ranging from 50 to 200 mm, widths of 1000 mm and lengths of up to 11.85 m. Several different options are available for the exposed surface finish of the steel, including both profile and colour.

Scope

- 2.1 The Kirin Insulated Panel System has been appraised for use as non-loadbearing internal partition and ceiling systems 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 are excluded; and
 - constructed with concrete framing complying with NZS 3101 or steel framing complying with NZS 3404.
- 2.2 The Kirin Insulated Panel System has not been assessed for use where fire rated partitions and ceilings are required.
- 2.3 The structural, fire and thermal design of the Kirin Insulated Panel System for each specific structure is the responsibility of the building designer.
- 2.4 The installation of the Kirin Insulated Panel System is carried out by installers trained by Kirin Insulated Panel New Zealand Limited.



Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Kirin Insulated Panel 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 Kirin Insulated Panel System meets the requirements for loads arising from self-weight and wind [i.e. B1.3.3 (a) and (h)]. See Paragraphs 8.1 - 8.3.

Clause B2 - DURABILITY: Performance B2.3.1 (b) 15 years. The Kirin Insulated Panel System meets this requirement. See Paragraphs 9.1 - 9.4.

Clause C3 - FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (a). The Kirin Insulated Panel System meets this requirement. See Paragraphs 11.1 - 12.1.

Clause F2 - HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Kirin Insulated Panel System meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 Components and accessories for the Kirin Insulated Panel System, which are supplied by Kirin Insulated Panel New Zealand Limited, are:

Kirin Insulated Panels

4.2 Kirin Insulated Panels comprise polyisocyanurate cored, steel faced panels manufactured in widths of 1000 mm wide and to a maximum length of 11.85 m. The thicknesses of the Kirin Insulated Panels are nominally 50, 75, 100, 125, 150, 175 and 200 mm.

4.3 The metal sheet faces are available in different surface profiles, steel sheet thicknesses of 0.5, 0.6, 0.7 or 0.8 mm, and a variety of coatings including PVDF, PVDF-HB, PUR and stainless steel. Silicon modified polyester anti-bacterial and anti-static coatings are also available, but these are outside the scope of this Appraisal. The panels are supplied in a range of white and off-white colours.

Accessories

4.4 Accessories used with the Kirin Insulated Panel System are supplied by Kirin Insulated Panel New Zealand. These items include:

- screws and rivets for panel fixing
- screws and rivets for trim fixing
- steel sheets for trim manufacture
- sealants

Handling and Storage

5.1 If possible Kirin Insulated Panels should be stored in a clean and dry location until they are installed. If this is not possible then they must remain wrapped in their delivery packaging until just before installation. The associated fixings and sealants must be stored in a clean, dry location.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Kirin Insulated Panel 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

Concrete Framed Structures

7.1 The Kirin Insulated Panel System is suitable for use with concrete framed buildings that have been specifically designed in accordance with NZS 3101 and AS/NZS 1170.

Steel Framed Buildings

7.2 The Kirin Insulated Panel System is suitable for use with steel framed buildings that have been specifically designed in accordance with NZS 3404 and AS/NZS 1170.

Structure

Mass

8.1 The mass of the Kirin Insulated Panels per square metre is given in Table 1.

Table 1: Panel Mass kg/m².

Nominal Thickness (mm)	Mass [kg/m ²]	
	Roof Panels	Wall Panels
50	13.30	12.30
75	14.50	13.50
100	15.60	14.60
125	16.70	15.70
150	17.80	16.80
200	20.10	19.10

Impact Resistance

8.2 The surfaces of Kirin Insulated Panels 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 barriers should be considered for vulnerable areas.

Design

8.3 Kirin Insulated Panel System installations must be subject to specific engineering design. The allowable spans for the more commonly used 50 mm, 75 mm and 100 mm thick Kirin wall and ceiling panels with 0.6 mm skins are given in Tables 2 and 3 below. For information on the thicker panels and other skin thicknesses, Kirin Insulated Panel New Zealand Limited should be contacted.

8.4 Fastener sizing and spacing must be subject to specific engineering design.

Table 2: Allowable Spans for Kirin Flat Faced Wall/Ceiling Panels [m]

Design Load [kg/m ²]	Panel Thickness [mm]		
	50	75	100
50	4.65	6.00	6.95
100	3.20	4.24	4.90
150	2.50	3.45	4.00
200	2.00	2.90	3.50
250	1.70	2.45	3.10
300	1.40	1.95	2.60
350	1.20	1.70	2.20
400	1.05	1.45	1.95



Table 3: Allowable Spans for Kirin Profiled Roof/Ceiling Panels [m]

Design Load [kg/m ²]	Panel Thickness [mm]		
	50	75	100
50	5.80	6.70	7.50
100	4.00	4.75	5.30
150	3.10	3.85	4.35
200	2.55	3.35	3.75
250	2.15	2.90	3.35
300	1.85	2.50	3.05
350	1.60	2.20	2.80
400	1.45	2.00	2.50

Durability

Serviceable Life

- 9.1 When installed and maintained in accordance with the specifications and installation instructions contained within the Technical Literature, the Kirin Insulated Panel System has an expected serviceable life of greater than 15 years.
- 9.2 Where Kirin Insulated Panels will experience regular use of chemical cleaning agents, or be in the presence of vapours that may attack galvanised steel components during service, then Kirin Insulated Panel New Zealand Limited should be contacted to determine the correct panel coating selection is made to ensure the required service life of the system is achieved.

Maintenance

- 9.3 Regular maintenance is essential for Kirin Insulated Panel System installations to maximise the serviceable life of the system.
- 9.4 An inspection of Kirin Insulated Panel 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
 - painted surfaces - evaluate the surface condition and determine if repainting is necessary
 - scratches and dents - these need to be identified and repaired
 - corrosion of cut edges of trims - check the condition of cut edges
 - trim tightness - check that the trims are tight against the panel.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to Kirin Insulated Panels from heat sources such as heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solution C/AS2 and NZBC verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

Control of Internal Fire Spread

- 11.1 The Kirin Insulated Panel System has been tested in accordance with ISO 9705 and has a Group Number of 1-S. Refer to Table 4.3 of NZBC Acceptable Solution C/AS2 to determine where the Kirin Insulated Panel System may be used according to its Group Number. When an applied finish is used over the Kirin Insulated Panel System, the Group Number must be obtained from the manufacturer or supplier of the finish product or system, for the complete lining system.
- 11.2 The foam core of the Kirin Insulated Panels meets the flame propagation criteria of AS 1366.2 as specified in NZBC Acceptable Solution C/AS1, Paragraph 4.2.2 and NZBC Acceptable Solution C/AS2, Paragraph 4.17.2.



Thermal Resistance

- 12.1 For building code calculations the value for the thermal conductivity of the core material of the Kirin Insulated Panels should be taken as being 0.020 W/mK.

Health and Safety

- 13.1 Cutting Kirin Insulated Panels should be carried out in well ventilated areas, and a dust mask and eye protection must be worn.

Installation Information

General

- 14.1 Installation of the Kirin Insulated Panel System must be carried out in accordance with the Kirin Insulated Panel System Technical Literature by trained installers.

Inspections

- 14.2 For inspection, reference must be made to the specific building design documentation.

Basis of Appraisal

Tests

- 15.1 Structural testing has been carried out by BRANZ to determine the properties of Kirin Insulated Panels. The test methods and results have been reviewed by BRANZ and found to be satisfactory.
- 15.2 Fire testing to ISO 9705 has been carried out by BRANZ for Kirin Insulated Panel New Zealand Limited to determine the performance of Kirin Insulated Panel Systems under fire conditions.
- 15.3 Determination of flame propagation testing in accordance with AS 2122.1 was carried out on samples of the foam core of the Kirin Insulated Panels for Kirin Insulated Panel New Zealand Limited. The results were assessed against the requirements of AS 1366.2 by BRANZ and found to be satisfactory.
- 15.4 Thermal conductivity testing was carried out by BRANZ to ASTM C518 on Kirin panel samples.

Other Investigations

- 16.1 The Kirin Insulated Panel System Technical Literature has been reviewed by BRANZ and found to be satisfactory.
- 16.2 Site visits have been carried out to assess the practicability of installation.
- 16.3 Opinions on structural and durability aspects were given by BRANZ technical experts.

Quality

- 17.1 The quality of manufacture of the Kirin Insulated Panels, components and accessories by Kirin Industrial Co. Ltd. is the subject of FM Approvals Certification. This has been reviewed by BRANZ and found to be satisfactory.
- 17.2 Kirin Insulated Panel New Zealand Limited are responsible for the quality of product supplied.
- 17.3 Quality on-site is the responsibility of the installer.
- 17.4 Designers are responsible for the building design, and installers are responsible for the quality of installation of the Kirin Insulated Panel System components and accessories in accordance with the Technical Literature.
- 17.5 Building owners are responsible for the maintenance of the Kirin Insulated Panel System after installation.



Sources of Information

- AS 1366.2: 1992 Rigid cellular plastics sheets for thermal insulation - Rigid cellular polyisocyanurate [RC/PIR]
- AS 2122.1:1993 Combustion characteristics of plastics - Determination of flame propagation - Surface ignition of vertically oriented specimens of cellular plastics.
- ASTM C518 - 10 Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus.
- AS/NZS 1170 Structural design actions.
- AS/NZS 1715: 2009 Selection, use and maintenance of respiratory protective equipment.
- AS/NZS 1716: 2012 Respiratory protective devices.
- NZS 3101: 2006 Concrete structures standard.
- NZS 3404: 2009 Steel structures standard - Materials, fabrication and construction.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraised
Appraisal No.861 [2019]

BRANZ Appraisal
Appraisal No. 861 [2019]
13 August 2019

KIRIN INSULATED PANEL
SYSTEM - INTERNAL PARTITIONS
AND CEILINGS



In the opinion of BRANZ, **Kirin Insulated Panel System - Internal Partitions and Ceilings** 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 **Kirin Insulated Panel New Zealand 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. **Kirin Insulated Panel New Zealand 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 **Kirin Insulated Panel New Zealand 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 **Kirin Insulated Panel New Zealand Limited** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

13 August 2019