



**BRANZ Appraised**  
Appraisal No.561 [2007]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 561 (2007)**

## **ROKCORE PANEL SYSTEM - EXTERNAL FAÇADES**

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## Product

1.1 The Rokcore Panel System is for use as a single skin external wall façade. The system incorporates Rokcore panels, which are sandwich panels fabricated by adhering coil-coated steel faces to a mineral wool (rockwool) core.

1.2 The Rokcore panels come in thicknesses ranging from 50 to 240 mm, widths of 300 to 1200 mm and lengths of up to 12 m. Several different options are available for the exposed surface finish of the steel, including both profiles and colour.



## Scope

2.1 The Rokcore Panel System has been appraised for use as a non-loadbearing external façade system for buildings within the following scope:

- category I to V buildings as defined in NZS 4203, 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; and
- subjected to maximum wind pressures for weathertightness design of 2.5 kPa Ultimate Limit State (ULS).

2.2 The Rokcore Panel System may be used where fire rated walls are required.

2.3 The structural, weatherproofing, fire and thermal design of the Rokcore Panel System for each specific structure is the responsibility of the building designer.

2.4 The installation of the Rokcore Panel System is carried out by installers trained by Bradcore Panel Systems.

## Building Regulations

3.1 In the opinion of BRANZ, the Rokcore 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 Rokcore 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 – 8.4.

## Design Information

**Clause B2 – DURABILITY:** Performance B2.3.1 (b) 15 years. The Rokcore Panel System meets this requirement. See Paragraphs 9.1 – 9.5.

**Clause C3 – SPREAD OF FIRE:** Performance C3.3.1 and C3.3.5. The Rokcore Panel System meets these requirements. See Paragraphs 11.1 – 12.4.

**Clause E2 – EXTERNAL MOISTURE:** Performance E2.3.2. The Rokcore Panel System meets this requirement. See Paragraphs 13.1 – 13.3.

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

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

## Technical Specification

4.1 Components and accessories for the Rokcore Panel System, which are supplied by Bradcore Panel Systems, are:

### Rokcore Panels

4.2 Rokcore panels comprise mineral wool cored, steel faced panels manufactured in modules of 300 mm up to 1200 mm wide and to a maximum length of 12 m. The thicknesses of the Rokcore panels are nominally 50, 80, 100, 120, 150, 175, 200 and 240 mm.

4.3 The fibres of the mineral wool cores of the Rokcore Panels are oriented perpendicular to the metal sheet faces, and are designated as 50C, 50F, 75C and 75F. The 50 and 75 refer to the shear strength in kN/m<sup>2</sup>. The C and F vary in core density and composition with the F core being of a higher density than the C core. The fibres are adhesive fixed to the metal sheets.

4.4 The metal sheet faces are available in different surface profiles, steel sheet thicknesses of 0.5, 0.6 or 0.7 mm, and a variety of coatings including polyester (PE), foodsafe, PVDF, PVDF-HB, and stainless steel. The panels are supplied in a range of colours.

### Accessories

4.5 Accessories used with the Rokcore Panel System are supplied by Bradcore Panel Systems. These items include:

- screws and spikes for panel fixing
- screws, rivets and spikes for flashing fixing
- standard profiles for joints between sheets
- standard flashings for external walls
- standard flashings for internal walls
- steel sheets for flashing manufacture
- sealants
- insulation and paint.

## Handling and Storage

5.1 Handling of the Rokcore panels and the associated accessories must be in accordance with the Rokcore Panel System Technical Literature and Bradcore Panel Systems Safe Work Method Statements.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Rokcore 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.

## General

### Concrete Framed Structures

7.1 The Rokcore Panel System is suitable for use with concrete framed buildings that have been specifically designed in accordance with NZS 3101 and NZS 4203 or AS/NZS 1170.

### Steel Framed Buildings

7.2 The Rokcore Panel System is suitable for use with steel framed buildings that have been specifically designed in accordance with NZS 3404 and NZS 4203 or AS/NZS 1170.

## Structure

### Mass

8.1 The mass of the Rokcore panels per square metre is given in Table 1.

**Table 1: Panel Mass kg/m<sup>2</sup>**

Nominal Thickness (mm)	Panel Mass (kg/m <sup>2</sup> )			
	50C	75C	50F	75F
50	15	16	16	16
80	17	20	19	20
100	19	22	21	22
120	20	25	23	25
150	23	29	27	29
175	25	32	30	32
200	27	35	33	35
240	31	40	38	40

### Impact Resistance

8.2 The surfaces of Rokcore panels are susceptible to damage from hard and sharp body impacts. 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

8.3 The design method for the Rokcore Panel System is contained in the Technical Literature.

8.4 The maximum design load for the selection of Rokcore Panel screw fixings is 1 kN, as at this level deformation of the panel starts to occur. The fastener and the structural frame material at the point of connection must be capable of achieving this load.

## Durability

### Serviceable Life

9.1 When installed and maintained in accordance with the specification and installation instructions contained within the Technical Literature, the standard Rokcore Panel System, as covered by this Appraisal, has an expected serviceable life of 10 years in Corrosion Zone 1, and at least 15 years in Corrosion Zones 2, 3 and 4 (further than 50 m from geothermal hotspots) as defined in NZS 3604. The standard Rokcore Panel System is not suitable for use in the Sea-spray Zone or within 50 m of geothermal hotspots in Zone 4.

**Table 2: Summary of Maximum Heights (metres) for Given Fire Resistance Ratings of Vertically Oriented Rokcore Panels**

Note: Heights may be limited by structural and serviceability requirements.

Core Type	Panel Thickness (mm)	FRR				
		-/60/60	-/90/90	-120/120	-/180/180	-/240/240
50F, 75F	80	10	8	-	-	-
	100	10	8	8	-	-
	120	10	8	8	-	-
	150	10	10	10	8	-
	200	10	10	10	10	10
	240	12	12	12	12	10
50C, 75C	100	6	-	-	-	-
	120	6	-	-	-	-
	150	8	8	-	-	-
	200	8	8	8	8	-
	240	10	10	10	10	10

9.2 Where a serviceable life of more than 10 years is required in areas that are located within NZS 3604 Corrosion Zone 1, or where it is desired to use the system in the Sea-spray Zone or within 50 m of a geothermal hotspot in Zone 4, alternative Rokcore Panel Systems, not covered by this Appraisal, are available, and Bradcore Panel Systems should be contacted for appropriate product selection.

9.3 Some dark colours of PVDF coatings may experience some fading after prolonged UV exposure.

#### Maintenance

9.4 Regular maintenance is essential for Rokcore Panel System installations to maximise the serviceable life of the system.

9.5 An inspection of Rokcore 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
- flashing fixing screws – check the tightness of the screws
- corrosion of cut edges of flashings – check the condition of cut edges
- flashing tightness – check that the flashings are tight against the panel.

See the Technical Literature for details on repair techniques.

#### Outbreak of Fire

10.1 The Rokcore Panel System has not been assessed for construction associated with heating appliances and must not be used as such.

#### Control of Internal Fire and Smoke Spread

11.1 For the purposes of complying with the requirements for internal surface finishes, Rokcore Panels have a Spread of Flame Index (SFI) of 0 (zero) and a Smoke Developed Index (SDI) of 2 (two). This means that they can be used in buildings containing any purpose group in accordance with NBZC Acceptable Solution C/AS1 Part 6, Table 6.2.

#### Control of External Fire Spread

12.1 Methods of and details for constructing fire resistant Rokcore Panel Systems are given in the Technical Literature.

12.2 In order to satisfy the requirements of NZBC C4 Structural Stability During Fire, designers must ensure that the fire rated elements are supported by building elements having at least the same fire resistance rating as the fire rated element they are supporting.

12.3 Requirements for Fire Resistance Ratings (FRR's) of external walls are given in NZBC Acceptable Solution C/AS1 Part 7. Rokcore Panel System walls can achieve FRR's of up to -/240/240 for non-loadbearing walls. Fire Resistance Ratings for the different panel core types and vertical panel orientation are given in Table 2. Note that the maximum heights given in Table 2 may be limited by structural and/or serviceability requirements. Fire Resistance Ratings for the different core types and horizontal panel orientation (for horizontal spans limited to 8 metres) are given in Table 3.

12.4 50 mm thick 50F and 75F Rokcore Panels can achieve FRRs of -/30/30 and 80 mm thick 50C and 75C Rokcore Panels can achieve FRR's of -/60/60, however Bradcore Panel Systems should be contacted to determine the maximum height allowable when used vertically and the maximum length when used horizontally.

**Table 3: Fire Resistance Ratings for Horizontally Oriented Rokcore Panels**

Note: Heights are limited by structural and serviceability requirements. All horizontal spans limited to 8 metres.

Core Type	Thickness (mm)	FRR (min)
50F, 75F	80	-/90/90
	100	-/120/120
	120	-/120/120
	150	-/180/180
	200	-/240/240
	240	-/240/240
50C, 75C	100	-/60/60
	120	-/60/60
	150	-/90/90
	200	-/180/180
	240	-/240/240

## External Moisture

13.1 The Rokcore Panel System has been tested in accordance with the requirements of AS/NZS 4284 and has been found suitable up to an Ultimate Limit State (ULS) wind load of 2.5 kPa (refer to Paragraph 2.1). This test method is designed to verify the performance of commercial building facades.

13.2 The Rokcore Panel System, if installed and maintained in accordance with the requirements of the Technical Literature and this Appraisal, will provide an external wall, including openings around windows and doors, which will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

13.3 If the Rokcore Panel System is installed horizontally in areas with Serviceability Limit State wind loads of greater than 0.7 kPa, then special flashing details shall be used at the base of the joint between the two panels to ensure that moisture will not be driven into the bottom channel. Contact Bradcore Panel Systems for details.

## Thermal Resistance

14.1 The thermal resistance of Rokcore Panels are given in Table 4. These values do not include surface resistances or thermal bridging effects such as joints, framing and panel connections.

## Health and Safety

15.1 If the Rokcore panels are to be cut using high-speed cutting tools, then it is strongly recommended that a particulate respirator conforming to AS/NZS 1715 and AS/NZS 1716 be worn.

## Tests

17.1 BRANZ expert opinion on NZBC E2 code compliance for the Rokcore Panel System was based on testing and/or evaluation of all of the details within the scope of this Appraisal. The Rokcore Panel System was tested at the CSR laboratory in Sydney, and observed by a BRANZ weathertightness expert, to AS/NZS 4284 with a design wind pressure of 2.5 kPa Ultimate Limit State. The testing was completed in two stages: the first being the static AS/NZS 4284 test; the second being the dynamic AS/NZS 4284 test. 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 system will meet the performance requirements of the New Zealand Building Code External Moisture Clause E2 when used within the scope of this Appraisal.

17.2 Fire testing has been carried out to determine the performance of Rokcore Panel Systems under fire conditions. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

17.3 The simultaneous determination of ignitability, flame propagation, heat release and smoke release test, AS/NZS 1530.3, was carried out on Rokcore Panel samples for Bradcore Panel Systems. The results have been reviewed by BRANZ and found to be satisfactory.

17.4 Testing to determine the thermal resistance of Rokcore Panels was carried out to AS/NZS 4859.1.

## Other Investigations

18.1 The Technical Literature for the Rokcore Panel System has been examined by BRANZ and found to be satisfactory.

18.2 Site visits have been carried out to assess the practicability of installation.

18.3 Structural, durability, weathertightness and fire resistance opinions have been given by BRANZ technical experts.

# Installation Information

## General

16.1 Installation of the Rokcore Panel System must be in accordance with the Rokcore Panel System Technical Literature.

## Inspections

16.2 For inspection, reference must be made to the specific building design documentation and Bradcore's installation information.

**Table 4: Thermal Resistance Values for Rokcore Panels**

Core Type	Thermal Conductivity (W/mK)	Thermal Resistance (R-value), m <sup>2</sup> K/W @ 15°C							
		Panel Thickness (mm)							
		50	80	100	120	150	175	200	240
Rokcore 50C	0.043	1.18	1.87	2.33	2.78	3.44	3.99	4.53	5.37
Rokcore 50F	0.047	1.08	1.72	2.15	2.57	3.21	3.73	4.26	5.09
Rokcore 75C/F	0.046	1.09	1.73	2.15	2.57	3.20	3.72	4.23	5.04

## Quality

19.1 The quality of manufacture of the Rokcore panels, components and accessories by Bradcore Panel Systems has been examined by Bureau Veritas for BRANZ and found to be satisfactory.

19.2 Bradcore Panel Systems are responsible for the quality of product supplied.

19.3 Quality on-site is the responsibility of the building contractor.

19.4 Designers are responsible for the building design, including weathertightness design of penetrations.

19.5 Installers are responsible for the quality of installation of the Rokcore Panel System components and accessories in accordance with the Technical Literature.

19.6 Building owners are responsible for the maintenance of the Rokcore Panel System after installation.

## Sources of Information

- AS/NZS 1170 Structural design actions.
- AS/NZS 1530.3 - 1999 Simultaneous determination of ignitability, flame propagations, heat release and smoke release.
- AS/NZS 1715 – 1994 Selection, use and maintenance of respiratory protective devices.
- AS/NZS 1716 – 2003 Respiratory protective devices.
- AS/NZS 4859.1: 2002 Materials for the thermal insulation of buildings - general criteria and technical provisions.
- European Recommendations for Sandwich Panels, CIB Publication 257, 2000.
- NZS 3101:1995 The design of concrete structures.
- NZS 3404:1997 Steel structures standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4203:1992 General structural design and design loadings for buildings.
- Approved Document for New Zealand Building Code External Moisture Clause E2, Building Industry Authority, Third Edition, June 2004.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to and including June 2007 Amendment.



**BRANZ**

**In the opinion of BRANZ, Rokcore Panel 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 Bradcore Panel Systems, 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. Bradcore Panel Systems:
  - 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 Bradcore Panel Systems.
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 Bradcore Panel Systems or any third party.

For BRANZ

C Preston  
Chief Executive

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