

FIRE TEST REPORT

FR21125-01-1

THE FIRE RESISTANCE IN ACCORDANCE WITH AS 1530.4:2014 OF SIX PERIMETER EDGE SEALS INSTALLED IN A STEEL STUD PLASTERBOARD LINED WALL

CLIENT

H.B. Fuller Company Australia Pty. Ltd
16-22 Red Gum Drive
Dandenong
South VIC 3175
Australia

Knauf Gypsum Pty Ltd
17 - 47 Turner Street
Port Melbourne,
VIC 3207
Australia

All tests and procedures reported herein, unless indicated, have been performed in accordance with the laboratory's scope of accreditation

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

TEST SUMMARY

Objective

To determine the fire resistance of control joint sealing systems in accordance with AS 1530.4:2014, *Fire-resistance tests for elements of construction: Section 10, Service penetrations and control joints*, with reference to AS 4072.1-2005.

Test Sponsor

H.B. Fuller Company Australia Pty. Ltd
16-22 Red Gum Drive
Dandenong
South VIC 3175
Australia

Knauf Gypsum Pty. Ltd
17 - 47 Turner Street
Port Melbourne
VIC 3207
Australia

Description of Test Specimen

The test specimen consisted of a nominally 3,000 mm high x 3,000 mm wide x 96 mm thick steel framed wall lined on each face with a single layer of Knauf 16 mm thick Firestop plasterboard. Each of the framing cavities were filled with nominally 50 mm thick, R1.3 EARTHWOOL GLASSWOOL, with a stated density of 11 kg/m^3.

The plasterboard panels were installed to provide six nominally 1,100 mm long/high perimeter edge seals. The two horizontal seals positioned at the head of the wall were nominally 40 mm wide x 16 mm deep, the two horizontal seals positioned at the base and the two vertical perimeter seals were nominally 20 mm wide x 16 mm deep. The perimeter edge seals located on the left side of the wall were sealed with Fulaflex™ FR and were refenced A-C, the perimeter edge seals located on the right side of the wall were sealed with Firesound and were referenced D-F.

Date of Test

11 March 2026

Test Results

The fire resistance in minutes, in accordance with AS 1530.4:2014, of the six perimeter edge seals installed in a steel stud, plasterboard lined wall, was as follows:

Specimen Ref	Perimeter Edge Seal Details Width x Depth	Integrity (min)	Insulation (min)	FRL*
A	Horizontal Perimeter Edge Seal (head) FulaFlex™ FR - 40 mm x 16 mm	120 NF	113	-/90/90
B**	Vertical Perimeter Edge Seal FulaFlex™ FR - 20 mm x 16 mm	120 NF	113	-/90/90
C	Horizontal Perimeter Edge Seal (base) FulaFlex™ FR - 20 mm x 16 mm	120 NF	116	-/90/90
D	Horizontal Perimeter Edge Seal (head) Firesound - 40 mm x 16 mm	120 NF	120 NF	-/90/90
E**	Vertical Perimeter Edge Seal Firesound - 20 mm x 16 mm	120 NF	109	-/90/90
F	Horizontal Perimeter Edge Seal (base) Firesound - 20 mm x 16 mm	120 NF	120 NF	-/90/90

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

NF = No Failure.

The test was terminated after 120 minutes.

*The test was conducted on a wall system with an established FRL of -/90/90. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it is installed.

**Specimens included 1 mm thick, Fosroc bond breaker tape applied to the framing section prior to application of the sealant.

The test standard requires the following statement to be included:

"The results of these fire tests may be used to directly assess fire hazard, but it should be recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions."

"This report details methods of construction, the test conditions and results obtained when the specific element of construction described herein was tested following the procedure outlined in this standard. Any significant variations with respect to size, constructional details, loads, stresses, edge, or end conditions, other than those allowed under the field of direct application in the relevant test method, is not covered by this report."

"Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result."

LIMITATION

The results reported here relate only to the item/s tested.

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

CONTENTS

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

FIGURES

TABLES

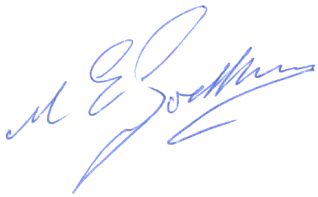
PHOTOS

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

SIGNATORIES

Author

S. Whatham
Fire Testing Engineer
Authorised to author this report



Reviewed by

M. E. Godkin
Senior Fire Testing Engineer
Authorised to review this report

Authorised by

S. Whatham
Fire Testing Engineer
Authorised to release this report to client

DOCUMENT REVISION STATUS

ISSUE NO.	DATE ISSUED	DESCRIPTION
01	21 April 2026	Initial Issue

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

1. TEST PROCEDURE

The control joint test was conducted in accordance with AS 1530.4:2014, “Methods for fire tests on building materials, components and structures, Part 4 *Fire-resistance tests for elements of construction: Section 10, Service penetrations and control joints,* with reference to AS 4072.1-2005 for which the fire resistance of the specimen is the time, expressed in minutes, to Integrity and Insulation failure under one or more of the following criteria.

1.1 Integrity Failure Criteria

Failure shall be deemed to occur if;

a) there is sustained flaming for a period greater than 10 seconds on the unexposed face; or

b) flames and/or hot gases cause flaming or glowing of the cotton fibre pad.

1.2 Insulation Failure Criteria

Failure shall be deemed to occur if;

a) the maximum temperature at any point on the unexposed surface of the control joint exceeds the initial temperature by 180 K; or

b) the maximum temperature on the unexposed surface of the surround element, 25 mm from the control joint edge exceeds the initial temperature by 180 K.

2. DESCRIPTION OF THE TEST SPECIMEN

2.1 General

The test specimen consisted of a nominally 3,000 mm high x 3,000 mm wide x 96 mm thick steel framed wall lined on each face with a single layer of Knauf 16 mm thick Firestop plasterboard. Each of the framing cavities were filled with nominally 50 mm thick, R1.3 EARTHWOOL GLASSWOOL, with a stated density of 11 kg/m^3.

The plasterboard panels were installed to provide six nominally 1,100 mm long/high perimeter edge seals. The two horizontal seals positioned at the head of the wall were nominally 40 mm wide x 16 mm deep, the two horizontal seals positioned at the base and the two vertical perimeter seals were nominally 20 mm wide x 16 mm deep. The perimeter edge seals located on the left side of the wall were sealed with Fulaflex™ FR and were refenced A-C, the perimeter edge seals located on the right side of the wall were sealed with Firesound and were referenced D-F.

2.1.1 Conditioning

The wall was constructed by BRANZ on 10 and 11 December 2025. The jointing compound was applied on 11 and 15 December 2025. The FulaFlex™ FR and the Firesound sealants were applied to the specimens on 15 December 2025. The specimens were kept under ambient laboratory conditions until testing on 11 March 2026.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

2.1.2 Specimen Selection

BRANZ was responsible for the supply of the steel framing and the construction of the wall assembly as per the client's specification. The client was responsible for the selection and supply of the plasterboard linings, cavity insulation and the FulaFlex™ FR and the Firesound sealants and was responsible for the installation of the six perimeter edge seal specimens.

2.1.3 Drawings and Specification

Drawings of the wall and the specimens are shown in Figure 1 to Figure 3.
Where discrepancies between the dimensions in the report text and those shown in the attached drawings exist, the text takes precedence.

2.2 Wall Construction Details

2.2.1 Steel Framing

The steel framing comprised 0.7 BMT Rondo track nominally 64 mm deep x 50 mm high for the head track and 0.50 BMT Rondo track nominally 64 mm deep x 28 mm high for the base track. The top track was secured to the specimen holder with six M16 bolts and the bottom track was secured to the specimen holder with six M12 bolts. The six Rondo 64 mm deep x 36 mm wide x 0.5 BMT studs were positioned at nominally 600 mm centres.

The studs were positioned flush to the bottom of the bottom track and cut short by 15 mm to the underside of the top track to allow for expansion. There was no mechanical fixing of the studs to the top or bottom track. The two perimeter studs were secured to the specimen holder with six M12 bolts.

2.2.2 16 mm Knauf Firestop Plasterboard

The wall was lined on both faces with a single layer of horizontally orientated, 16 mm thick Knauf Firestop plasterboard. The panels were fastened to the steel framing with 6g x 30-18 mm long plasterboard screws at 300 mm centres on the studs and at 200 mm centres at the vertical butt joint positions (one per face). The first and last screw on each stud was positioned nominally 50 mm from the board edge to avoid fixing to the track section.

The lower panels were set onto 20 mm packers to give the two 20 mm wide horizontal base perimeter seals. The two vertical perimeter seals were created by reducing the length of the panels so that their edges stopped 20 mm short of the concrete lined specimen holder. The final, upper panels were cut to allow for the 40 mm wide horizontal head perimeter seals. At mid width of the head and the base, 300 mm long sections of plasterboard were fitted to the track section to form two separate seals at each position.

The horizontal plasterboard sheet joints and the vertical plasterboard butt joints were sealed with jointing tape and two coats of a stopping compound.

The perimeter edges that were not part of the specimens were sealed to the specimen holder using FulaFlex™ FR or Firesound sealants.

The 16 mm thick Knauf Firestop plasterboard had the following measured properties:

Measured thickness	16.1	mm
Measured weight per unit area	14.02	kg/m^2
Measured moisture content by weight	0.56	%

An elevation view of the framing and lining layout is shown in Figure 1.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

2.2.3 50 mm thick R1.3 EARTHWOOL GLASSWOOL Insulation

The framing cavities were filled with a layer of 50 mm thick, 11 kg/m^3 density R1.3 EARTHWOOL GLASSWOOL.

2.3 Specimen Details

The openings for the six perimeter edge seal specimens on each side of the wall such that one long edge of the specimen would be opposite to the internal face of the concrete lined specimen holder. The framing (studs) at the two vertical perimeter edge seals were applied with a strip of Fosroc, 1 mm thick bond breaker tape.

The sealant was applied on both faces of the wall; directly to the framing section/bond breaker tape within the opening and then trowel finished flush with the face of the plasterboard panel.

An elevation view of the specimen configuration is shown in Figure 2.

Table 1 lists the measured dimensions of the control joint system components.

Table 1: Perimeter Edge Seal Details

Specimen Ref	Perimeter Edge Seal System	Sealant Location	Sealant Dimensions as Measured (mm)		
			Width	Depth	Length
A	Horizontal Perimeter Edge Seal (head) FulaFlex™ FR	Both Faces	39.3	16.1	1,100
B	Vertical Perimeter Edge Seal FulaFlex™ FR & Fosroc bond breaker	Both Faces	20.3	16.1	1,100
C	Horizontal Perimeter Edge Seal (base) FulaFlex™ FR	Both Faces	20.0	16.1	1,100
D	Horizontal Perimeter Edge Seal (head) Firesound	Both Faces	39.2	16.1	1,100
E	Vertical Perimeter Edge Seal Firesound & Fosroc bond breaker	Both Faces	20.5	16.1	1,100
F	Horizontal Perimeter Edge Seal (base) Firesound	Both Faces	20.5	16.1	1,100

*values shown for Width are the calculated average from three measurements taken on each face of the seal.

**values shown for Depth are the calculated average of measurements taken from two samples of the 16 mm Firestop plasterboard.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Figure 1: Framing and Lining Layout - Elevation View

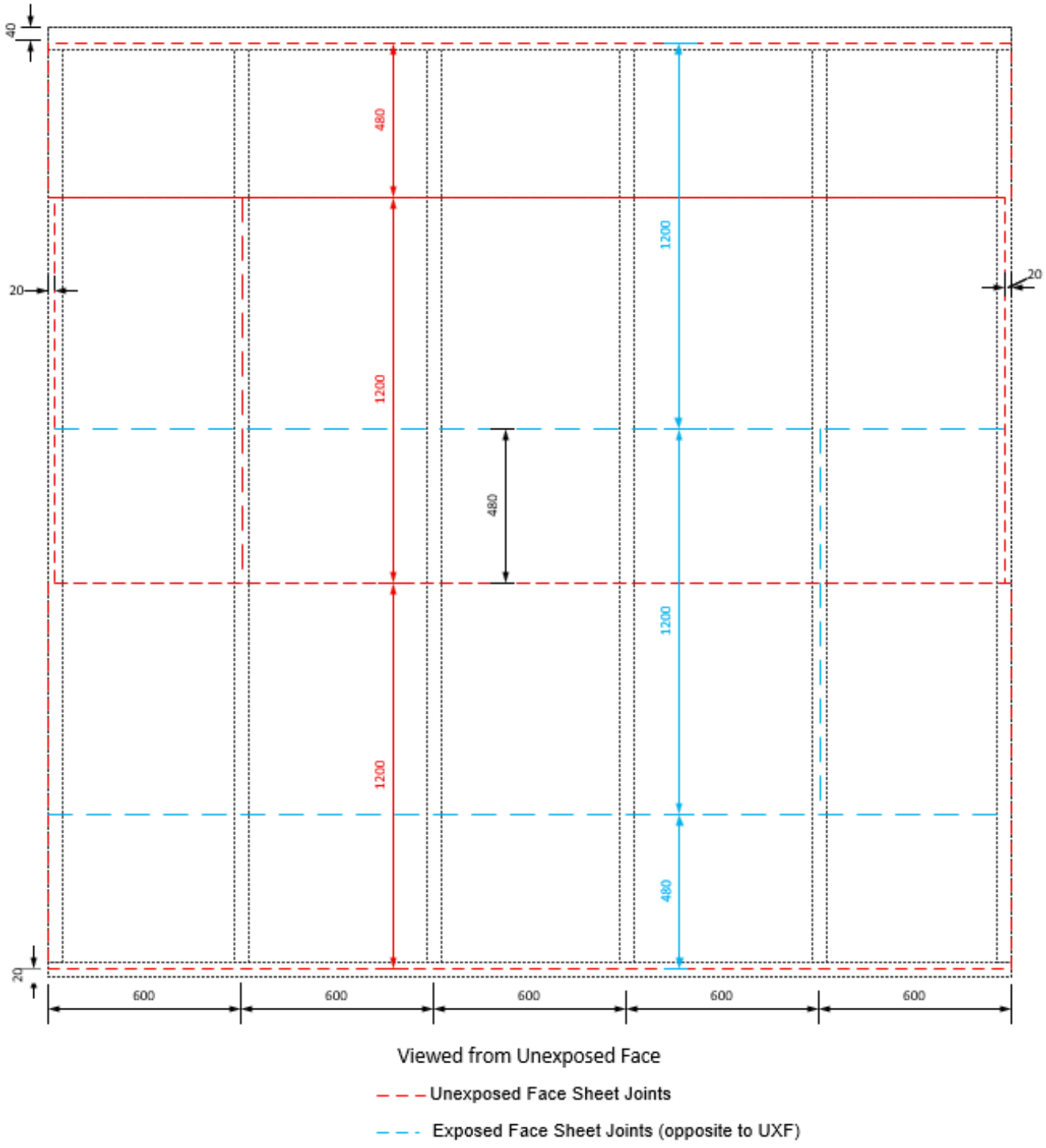
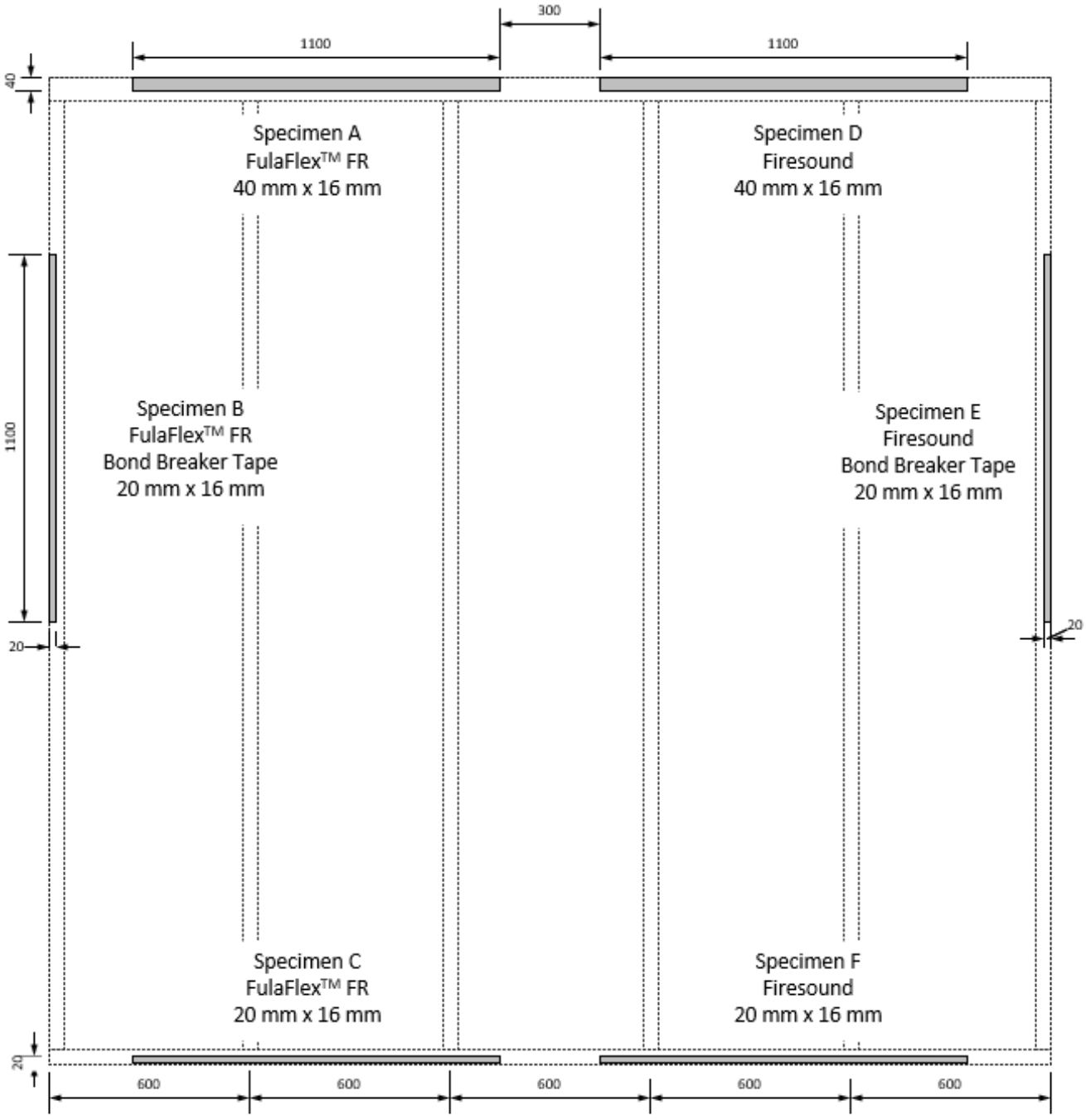
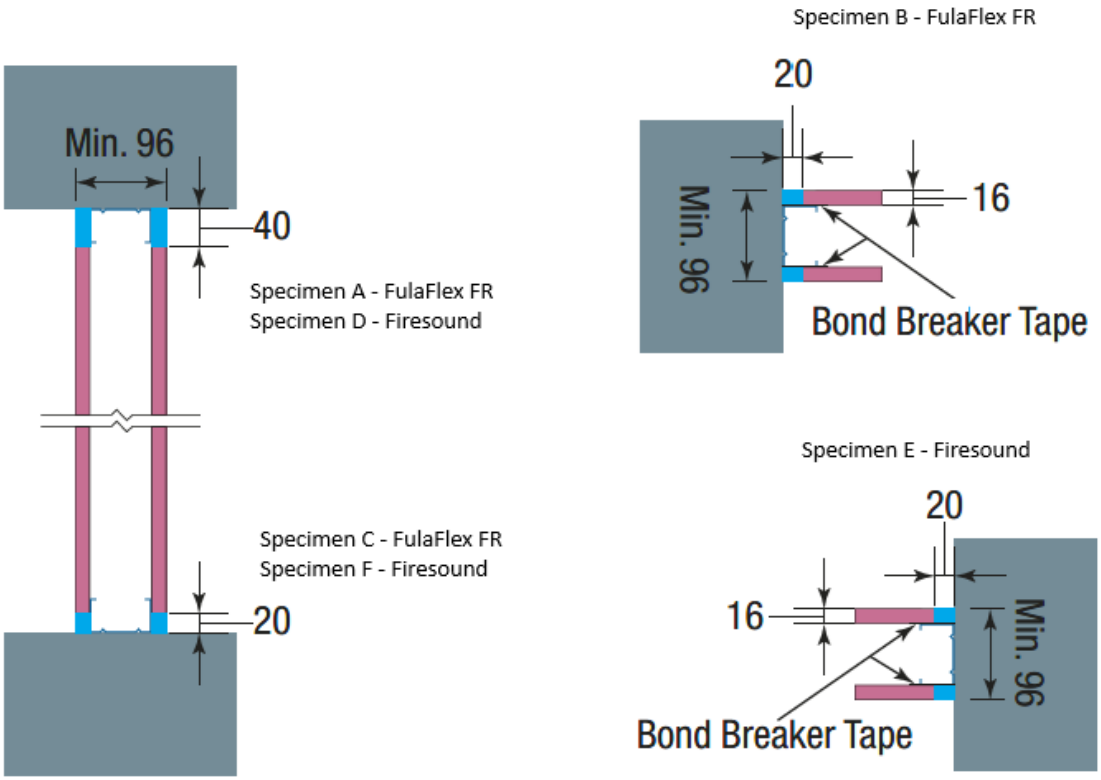


Figure 2: Specimen Layout - Elevation View



branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Figure 3: Client Supplied Drawing - Specimen - Section View



3. TEST CONDITIONS AND RESULTS

3.1 General

The specimen was tested on 11 March 2026, at the BRANZ laboratories at Judgeford, New Zealand, representatives of the client witnessed the test.

The ambient temperature at the beginning of the test was 14°C.

The specimen was placed against the vertical furnace and the temperature and pressure conditions were controlled to the limits defined in AS 1530.4:2014.

The test was terminated after the specimen had been exposed to the standard fire resistance conditions for 120 minutes.

3.2 Furnace Conditions

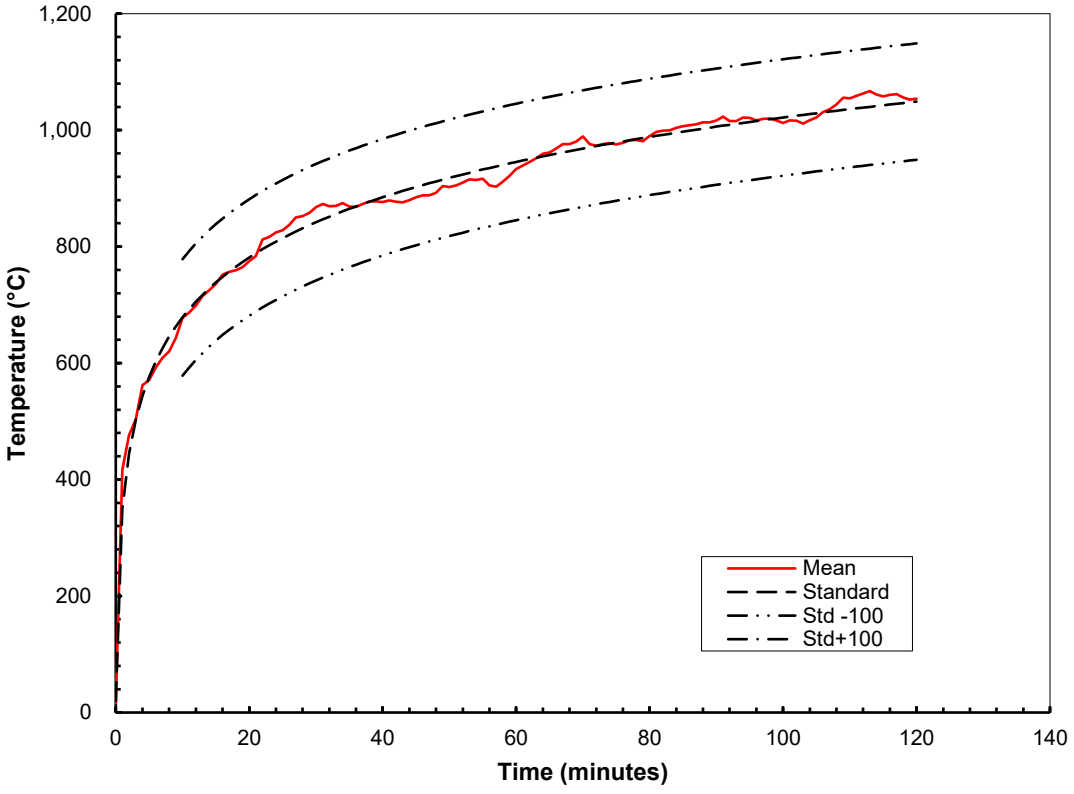
3.2.1 Furnace Temperature Measurement

Temperature measurement within the furnace was made using twelve mineral insulated metal sheathed (MIMS) chromel-alumel thermocouples uniformly distributed in a vertical plane approximately 100 mm from the exposed face of the specimen.

The furnace thermocouples were connected to a computer-controlled data logging system which recorded the temperatures at 15 second intervals.

Figure 5 shows the furnace temperature curve and the permitted upper and lower limits in accordance with AS 1530.4:2014.

Figure 4: Furnace Temperature



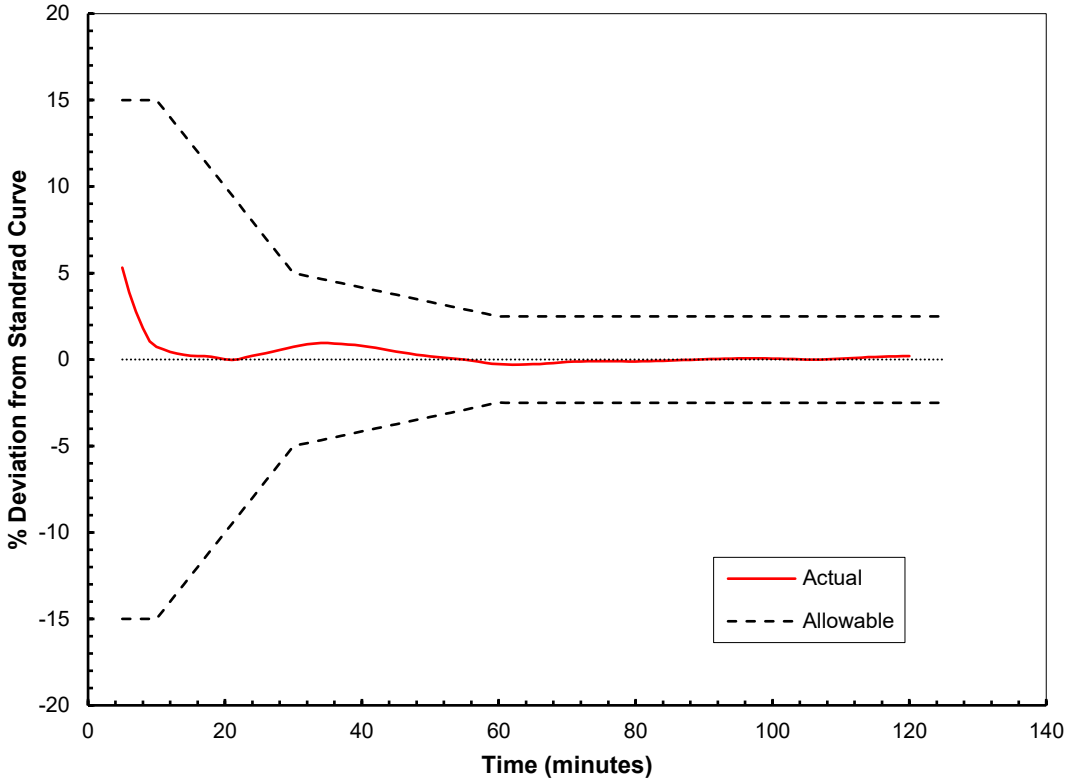
branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

3.2.2 Furnace Control

The percentage deviation of the area under the curve of the furnace mean temperature from the standard temperature/time curve was within the standard requirements.

Figure 6 shows the percentage deviation of the mean furnace temperature from the Standard curve.

Figure 5: Percentage Deviation from Standard Curve



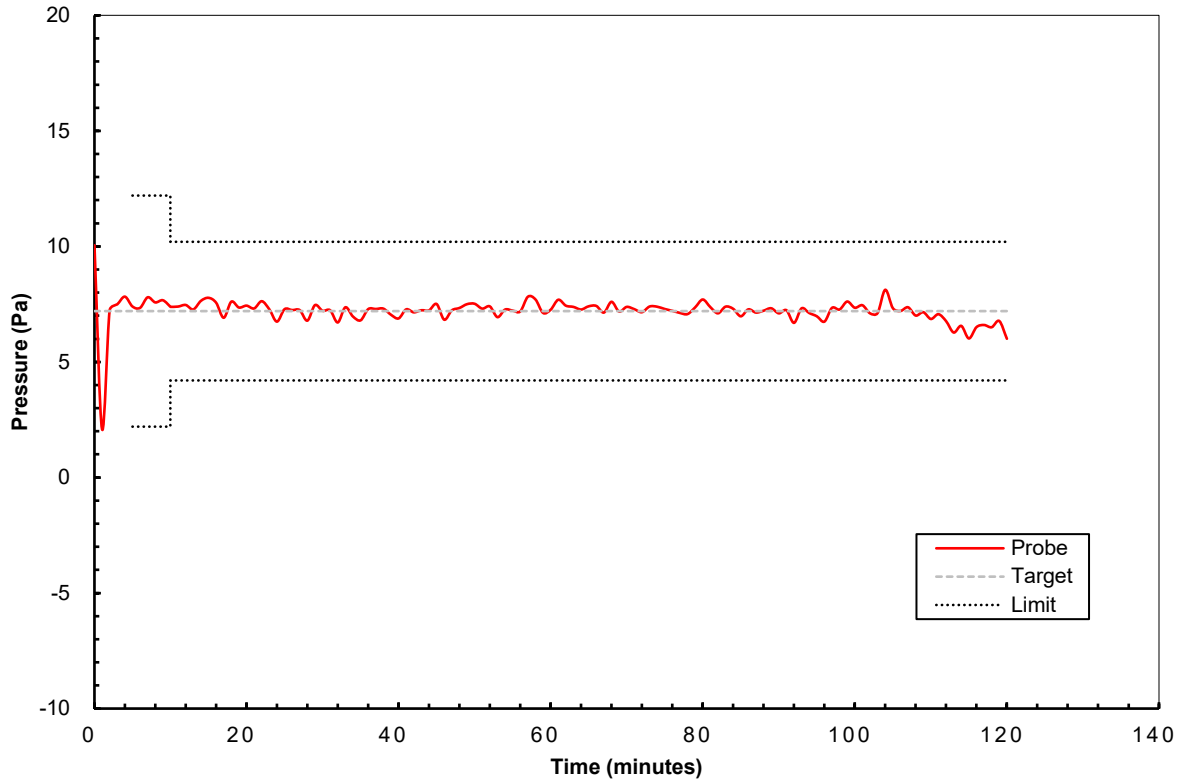
3.2.3 Pressure Measurements

The furnace pressure was controlled to be 15 Pa at mid-height of the vertical specimens as defined in the test standard. This corresponds to a pressure of 7.2 Pa at the pressure probe which was 975 mm below mid height of the vertical specimens. The differential pressure was monitored using a micromanometer connected to a computer-controlled data acquisition system which recorded the pressure at 15 second intervals.

Figure 7 shows the pressure measured at the probe during the test.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Figure 6: Mean Furnace Pressure



In summary the furnace conditions complied with the test standard.

3.3 Specimen Temperature Measurement

The temperature on the unexposed face of the control joint specimens and the wall was measured with chromel-alumel thermocouples attached to the specimens. The arrangement consisted of thermocouples placed as specified in clause 10.5 of the test standard AS 1530.4:2014.

The locations of the thermocouples are shown in Figure 8.

Figure 9 to Figure 13 show the temperature rise of each specimen.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Figure 7: Unexposed Face Thermocouple Positions

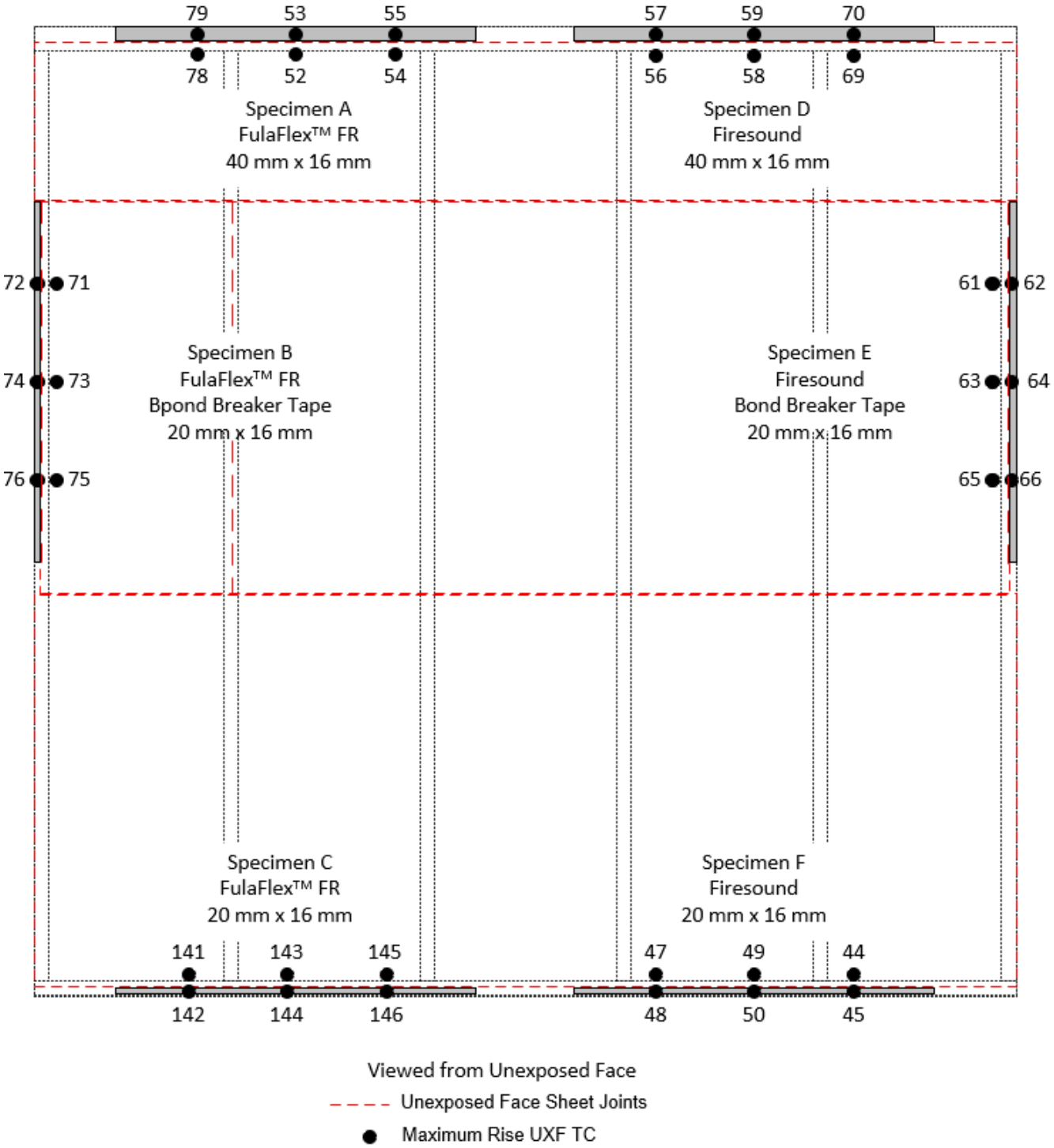


Figure 8: Specimen A - Temperature Rise

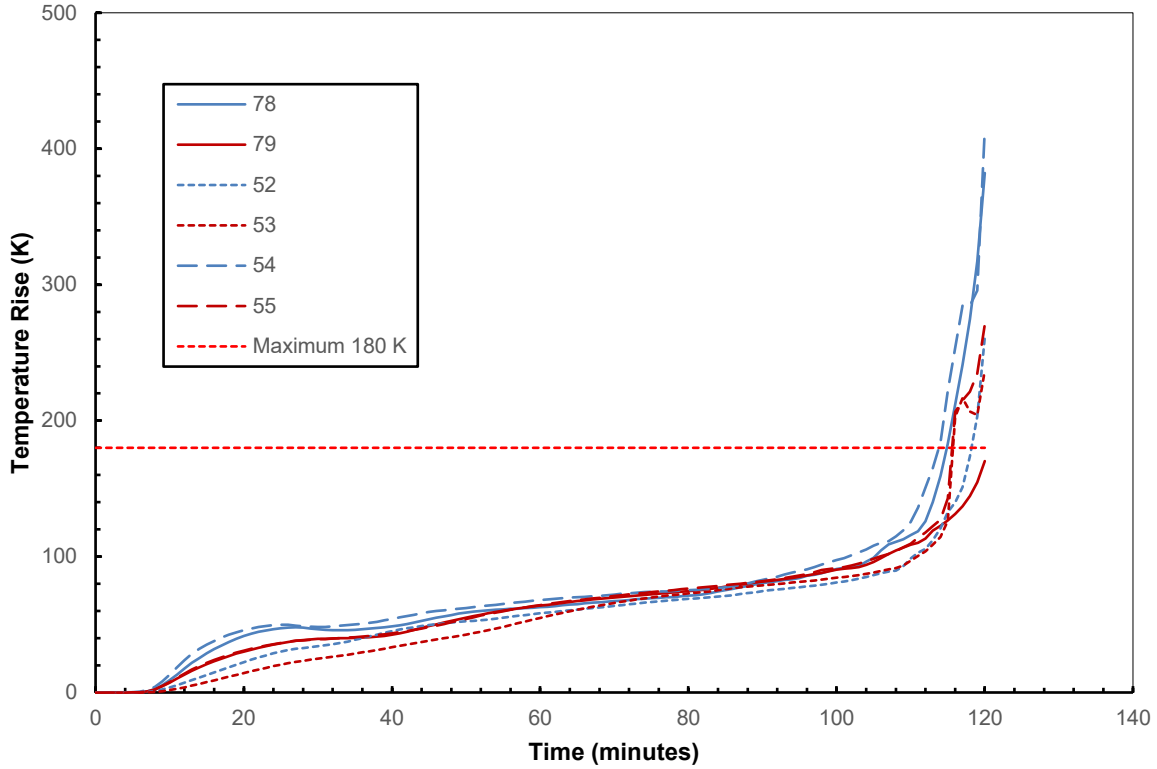
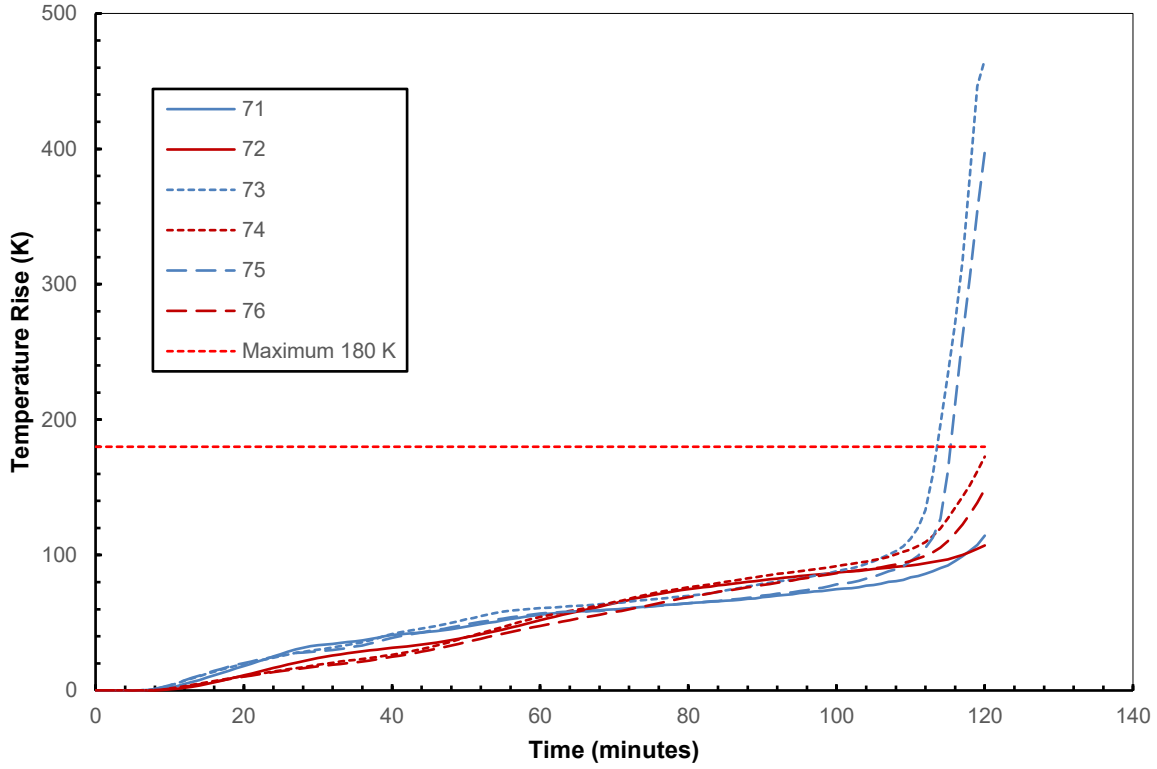


Figure 9: Specimen B - Temperature Rise



branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Figure 10: Specimen C - Temperature Rise

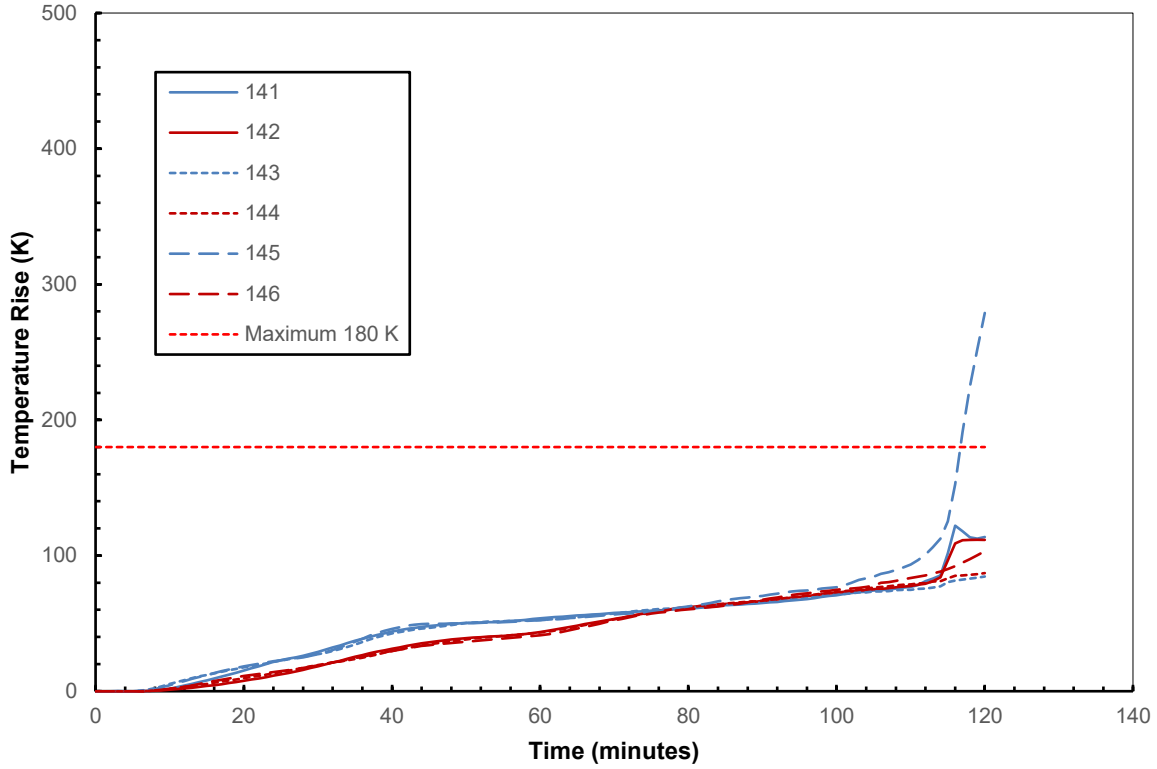
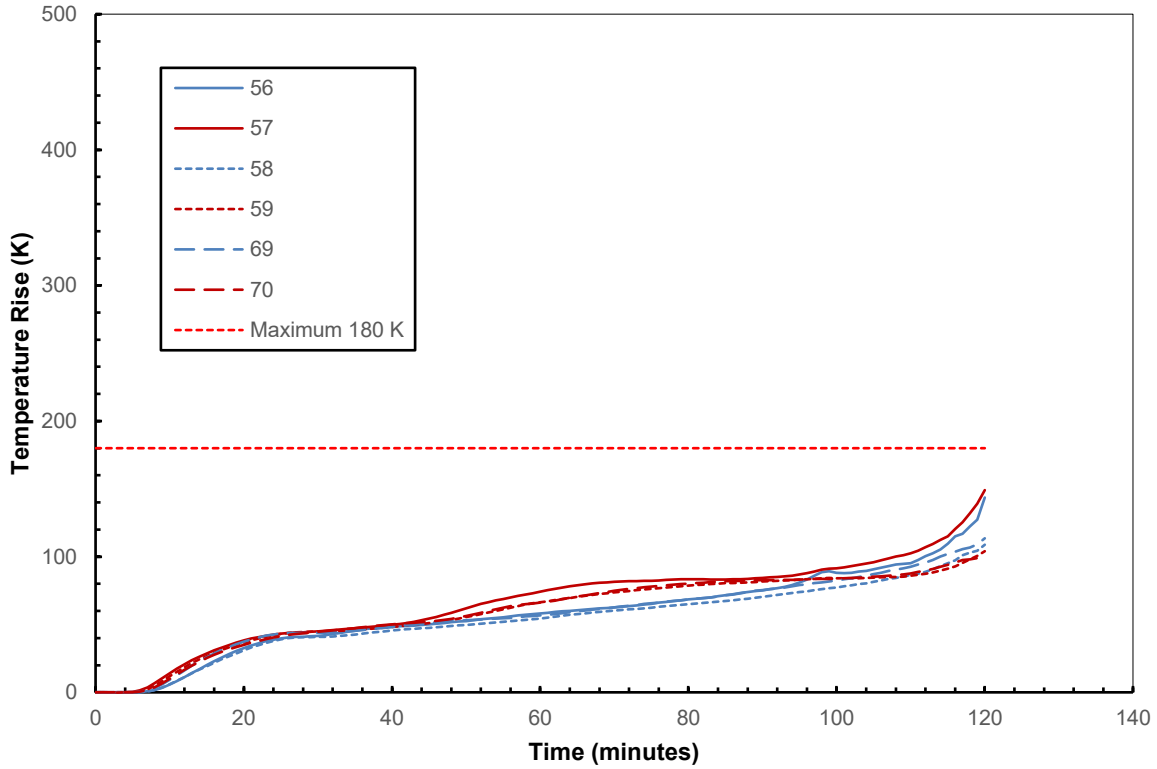


Figure 11: Specimen D - Temperature Rise



branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Figure 12: Specimen E - Temperature Rise

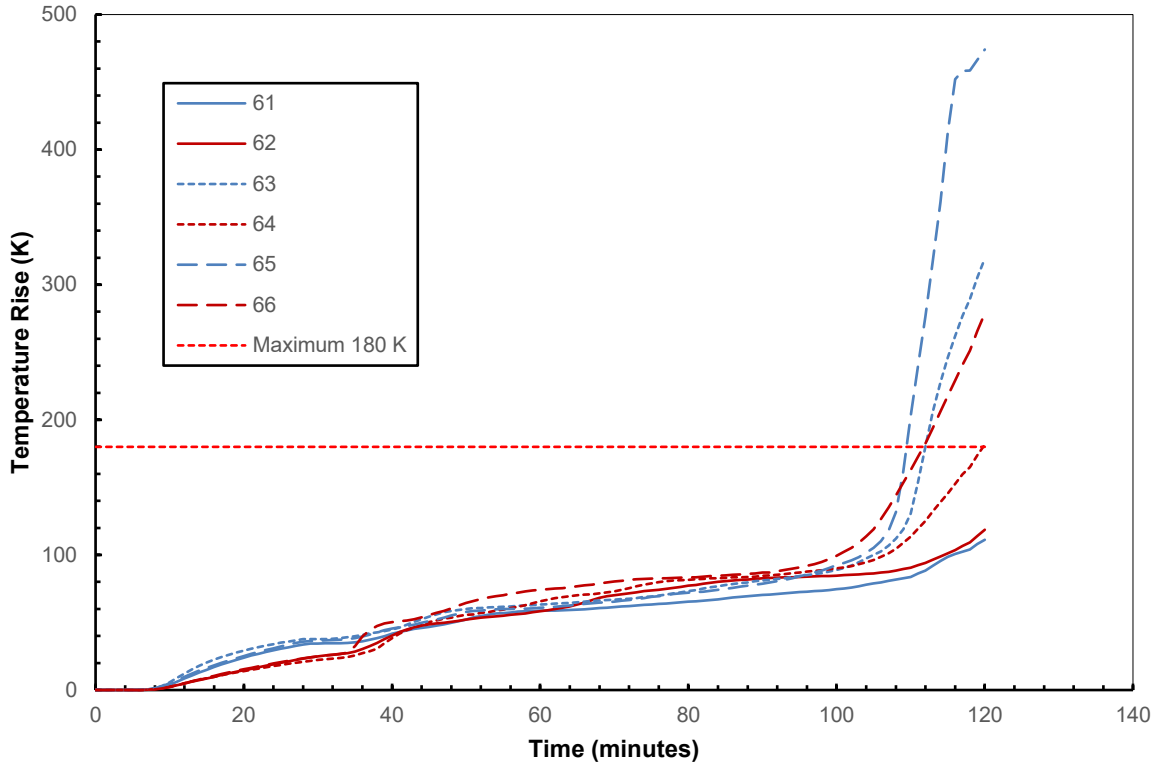
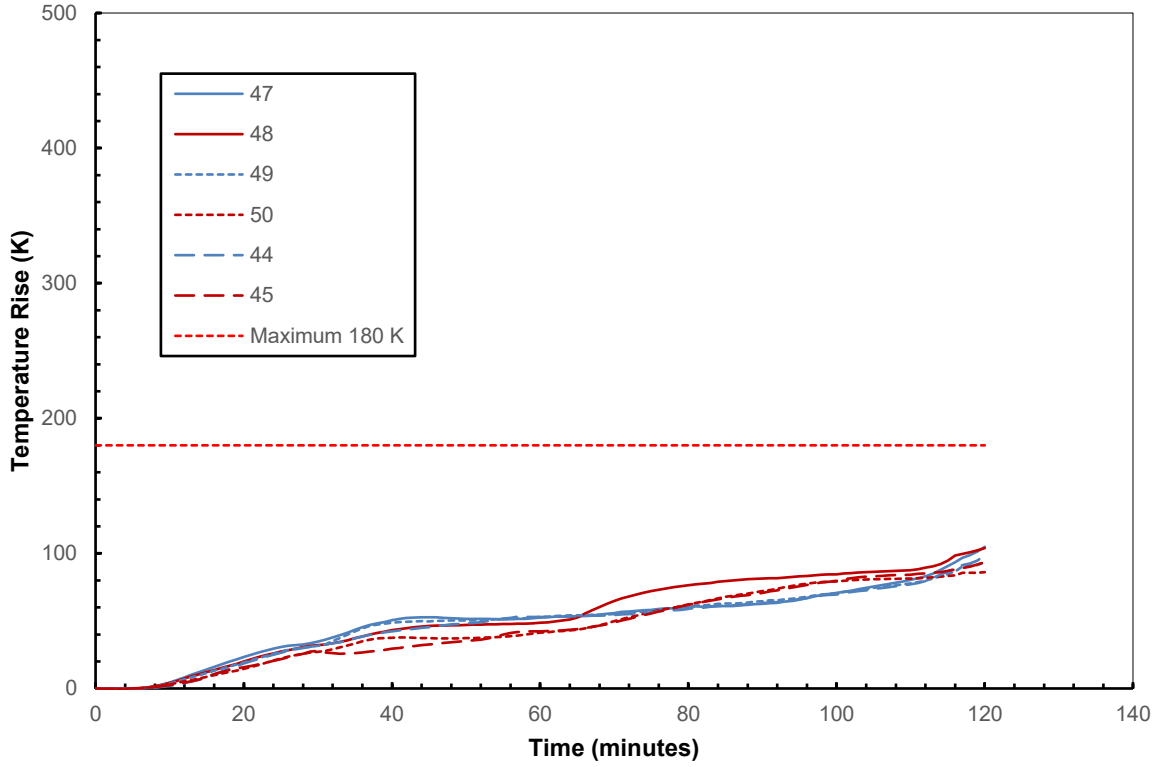


Figure 13: Specimen F - Temperature Rise



3.4 Specimen Integrity

Integrity was recorded as follows in Table 2.

Table 2: Specimen Integrity

Specimen Ref	Time (minutes) Until Integrity Failure Occurred
A	120 - No failure
B	120 - No failure
C	120 - No failure
D	120 - No failure
E	120 - No failure
F	120 - No failure

3.5 Specimen Insulation

Insulation failures were recorded as follows in Table 3.

Table 3: Specimen Insulation

Specimen Ref	Time (minutes) Until Failure Occurred (T>180K)
A	113 - TC54
B	113 - TC73
C	116 - TC145
D	120 - No failure
E	109 - TC65
F	120 - No failure

3.6 Observations

Observations related to the Integrity performance of the specimens were at the times stated in minutes and seconds as shown in Table 4.

U = Observations from the unexposed face.
E = Observations from the exposed face.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Table 4: Observations

Time (Min:Sec)	Test Face	Observations
00:00	-	The test commences.
30:00	U	The wall is deflecting towards the furnace, the sealant in the base horizontal seal Specimen F has started to split from the plasterboard edge as the bottom track has moved.
32:00	U	Smoke issue commences, predominately from the vertical seal Specimen E where the same splitting of the sealant from the board edge has occurred.
45:00	U	The jointing tape and stopping compound are beginning to delaminate across the width of the lower horizontal sheet edge joint.
48:00	U	The sealant in the head horizontal seal Specimen A is beginning to swell/bulge.
60:00	-	All of the specimens continue to maintain Integrity.
75:00	U	The sealant in the head horizontal seal Specimen D is beginning to swell/bulge.
80:00	U	The jointing tape and stopping compound have burnt away from the middle third of the vertical sheet butt joint and there are similar, smaller areas like this on the horizontal sheet edge joint below.
85:00	U	Areas of discoloration (hot spots) are visible at approx. mid height of the wall which would be one of the horizontal sheet joint positions on the exposed face
89:00	U	The sealant in all of the specimens has swollen up.
95:00	U	The lower horizontal sheet edge joint and the vertical sheet butt joint are sealed with ceramic blanket to prevent sustained flaming or hot gases influencing the specimens above.
100:00	U	The central area of the wall continues to blacken and the jointing tape and stopping compound have begun to burn away from the upper horizontal sheet edge joint.
115:00	U	The paper from the plasterboard has almost entirely charred off in the central area of the wall, and there are large parts of the board joints that are glowing bright orange.
116:00	U	The sealant in Specimen A has reacted/expanded significantly due to the heat being vented from the joint below.
120:10	-	The test is discontinued

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

4. SUMMARY

The fire resistance in minutes, in accordance with AS 1530.4:2014, of the six perimeter edge seals installed in a steel stud, plasterboard lined wall, was as follows:

Specimen Ref	Perimeter Edge Seal Details Width x Depth	Integrity (min)	Insulation (min)	FRL*
A	Horizontal Perimeter Edge Seal (head) FulaFlex™ FR - 40 mm x 16 mm	120 NF	113	-/90/90
B**	Vertical Perimeter Edge Seal FulaFlex™ FR - 20 mm x 16 mm	120 NF	113	-/90/90
C	Horizontal Perimeter Edge Seal (base) FulaFlex™ FR - 20 mm x 16 mm	120 NF	116	-/90/90
D	Horizontal Perimeter Edge Seal (head) Firesound - 40 mm x 16 mm	120 NF	120 NF	-/90/90
E**	Vertical Perimeter Edge Seal Firesound - 20 mm x 16 mm	120 NF	109	-/90/90
F	Horizontal Perimeter Edge Seal (base) Firesound - 20 mm x 16 mm	120 NF	120 NF	-/90/90

NF = No Failure.

The test was terminated after 120 minutes.

*The test was conducted on a wall system with an established FRL of -/90/90. The maximum FRL of any test specimen cannot exceed the FRL achieved by the wall system in which it is installed.

**Specimens included 1 mm thick, Fosroc bond breaker tape applied to the framing section prior to application of the sealant.

The test standard requires the following statement to be included:

"The results of these fire tests may be used to directly assess fire hazard, but it should be recognized that a single test method will not provide a full assessment of fire hazard under all fire conditions."

"This report details methods of construction, the test conditions and results obtained when the specific element of construction described herein was tested following the procedure outlined in this standard. Any significant variations with respect to size, constructional details, loads, stresses, edge or end conditions, other than those allowed under the field of direct application in the relevant test method, is not covered by this report."

"Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result."

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

5. PERMISSIBLE VARIATIONS

In accordance with AS 1530.4:2014 clause 10.12, the permissible variations that are relevant to the tested penetration systems reported in test report FR21125-01-1 are as follows.

5.1 General

The results of the fire test contained in the test report are directly applicable, without reference to the testing authority, to similar constructions where the following changes have been made.

5.2 Separating Elements

Results obtained from framed wall systems may be applied to the performance of a system in concrete, masonry, or solid gypsum blocks of greater or equal thickness to that of the tested prototype.

Results obtained from framed wall systems may be applied to similar walls having studs of the same material with sizes greater than the tested prototype.

Results obtained from a prototype test may be applied to framed wall systems of similar construction but having thicker facings of the same material applied to the studs.

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

PHOTOS

Photo 1: The Unexposed Face of the Assembly Prior to Testing

Photo 2: The Unexposed Face of the Test Assembly After a Duration of 30 Minutes

Photo 3: The Unexposed Face of the Test Assembly After a Duration of 60 Minutes

Photo 4: The Unexposed Face of the Test Assembly After a Duration of 90 Minutes

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz

Photo 5: The Unexposed Face of the Test Assembly After a Duration of 120 Minutes

Photo 6: The Exposed Face of the Test Assembly Immediately After Testing

branz.nz | 1222 Moonshine Rd, RD1, Porirua 5381, Private Bag 50 908, Porirua 5240, New Zealand | Phone +64 4237 1170 | branz@branz.co.nz