Test report # PF23003

Test Number 23003

Client: Firestop Centre Ltd

Fire resistance test for linear gaps in horizontal concrete separating element

Test method: AS 1530.4:2014

Report Date 25/02/2023

1. Table of Contents

1.1 Document revision schedule

Revision #	Date	Description
1	22/02/2023	Initial Issue for Client review
2	25/02/2023	Issued to Client

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alexey Kokorin (Technical Manager)		25/02/2023
Authorized by:	Andrew Bain (Authorized signatory)		25/02/2023

ACCREDITED
TESTING LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

2. Contact details

2.1 Registered Testing Authority

Fire TS Lab - Passive Fire Inspection and Test Services Ltd

Accreditation N$^{o:}$ 1335

1/113 Pavilion Drive, Mangere, Auckland, 2022

New Zealand

Contact e-mail: tests@firelab.co.nz

2.2 Client/Applicant

Firestop Centre Ltd

Unit J, 657 Great South Road, Penrose, Auckland, 1061

New Zealand

Contact e-mail: greg@firestopcentre.co.nz

2.3 Manufacturer/supplier

Same as Client

3. Test Results

Specimen #	Joint	Actual Integrity (min)	Actual insulation (min)	FRL
A	50mm Linear Gap with CGS-50 Compressed Gap Seal	80	76	-/60/60

All specimens had an asymmetrical assembly with the underneath face exposed to the fire.

NF – No failure during the test

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The test results relate to the specimens of the product in the form in which they were tested. Differences in the composition or thickness of the product may significantly affect the performance during the test and may therefore invalidate the test results. Care should be taken to ensure that any product, which is supplied or used, is fully represented by the specimens, which were tested.

The specimens were supplied by the sponsor and the Laboratory was not involved in any of selection or sampling procedures.

The results of this fire test 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.

4. Test Details

Test Specification Fire Resistance:
Failure shall be deemed to have occurred when one of the following occurs:

a) the temperature at any location on the unexposed face of the test specimen exceeds the initial temperature by more than 180 °C

b) Integrity failure shall be deemed to have occurred upon ignition of the cotton pad when glowing or flaming occurs or for a period of 30 seconds.

c) Flaming to the unexposed face for 10 seconds or longer shall be deemed to be an Integrity failure.

Testing scope:
AS 1530-2014 Part 4 Section 10 Service penetrations and control joints

Documentation:
Testing products were verified and tested based on Client description, refer to Specimens description below.

Testing date:	**Installation completion date:**
19/01/2023	18/01/2023

Specimens conditioning and delivery to Laboratory:

Separating element was built by Laboratory in line with Client instructions. Installation of fire stopping system was performed by Client. The Laboratory was not involved in sampling of the materials. Laboratory verified materials during construction of the specimen.

Termination of The Test:
The test was discontinued at 85 minutes.

Use of Reports:

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This report details the methods of construction, test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in AS 1530.4. Any significant variation with respect to size, constructional details, loads, stresses, edge or end conditions, other than that 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.

5. Equipment

Furnace:
1200X1200 Indicative Furnace designed to operate to AS1530.4:2014

Temperature:
Furnace Temperature measurements were controlled with four 3mm Type K MIMS thermocouples set within 50-100 mm from the face of the specimens in line with AS1530.4-2014. All thermocouples are calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

Pressure measurement:
Kepware Siemens Data logging system including multi-channel recording data at 5 second intervals. Calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

Ambient Temperature:
Ambient temperature was recorded 15 minutes before the test was commenced, at the start of the test and monitored during the test. All thermocouples are calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their MRA to the accuracy required by AS 1530.4-2014.

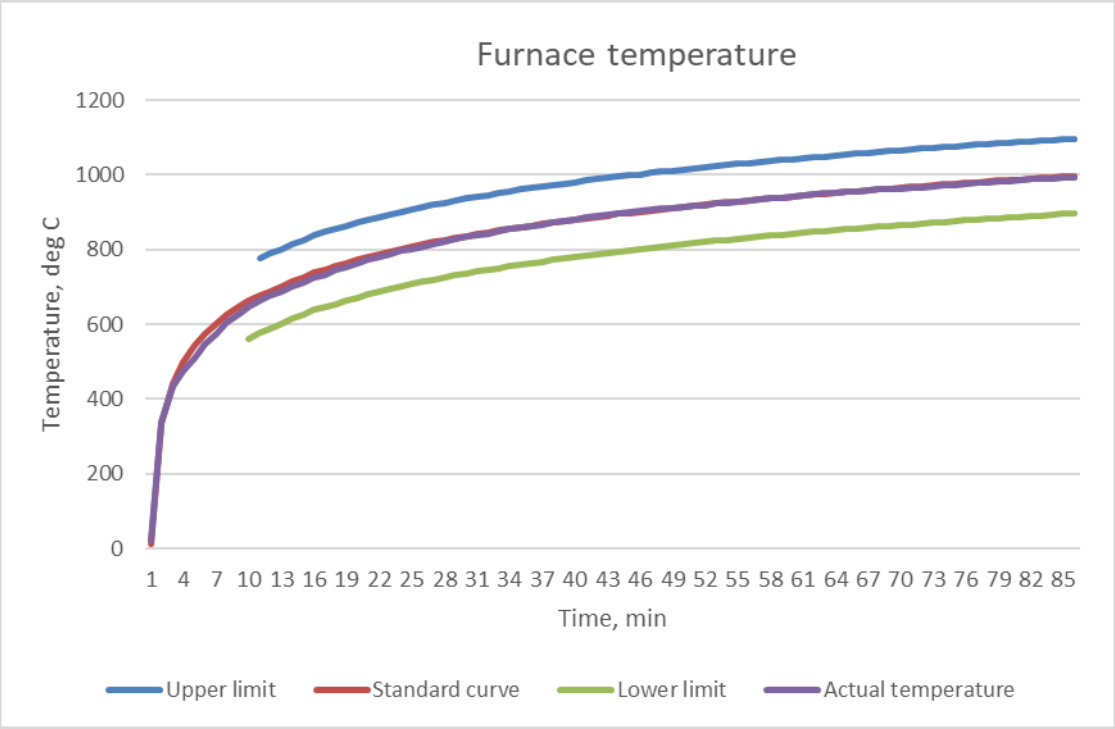
Specimen thermocouples:
Specimen thermocouples were installed to the unexposed face. Type K copper disk thermocouples fixed within the required locations referenced from AS1530.4-2014. Thermocouples are calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their MRA to the accuracy required by AS 1530.4-2014.

Dimensional measurements:
All linear measurements were made with equipment calibrated by ISO/IEC 17025 accredited laboratory - a signatory to the International Laboratory Accreditation Corporation (ILAC) through their Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

6. Test Conditions

6.1 Furnace Temperature

The furnace was controlled to follow the temperature/time relationship specified in AS 1530.4-2014.

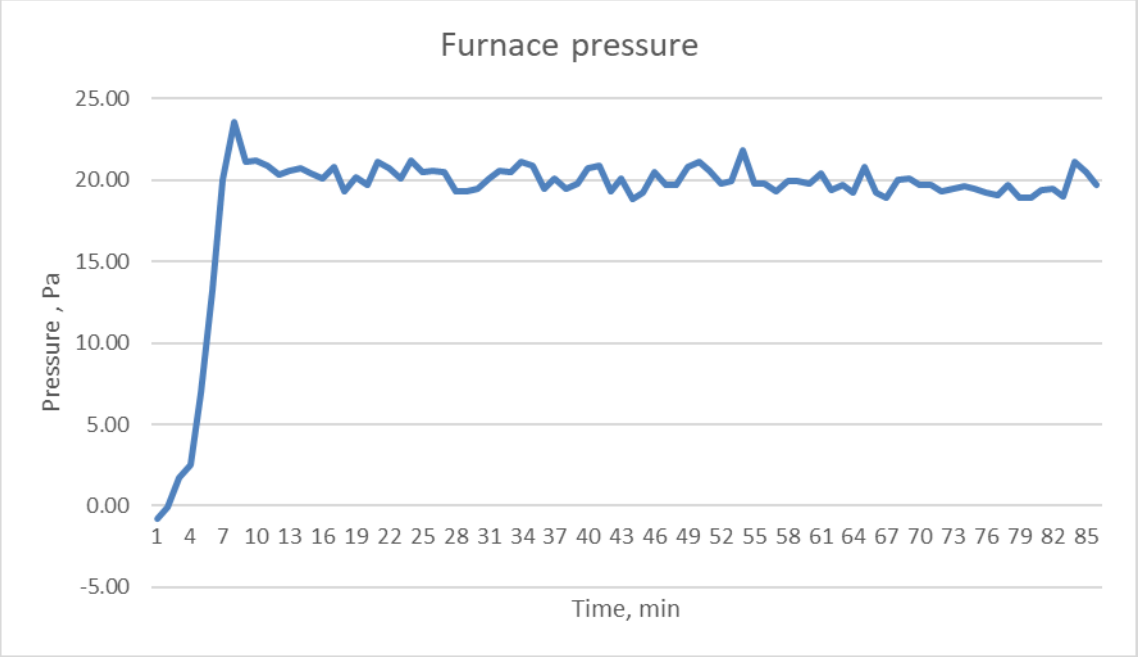


6.2 Ambient Temperature

The ambient temperature of the test area 15 minutes before the test and at the commencement of the test was 24 °C.

6.3 Pressure Readings

After the first 5 minutes of the test, the furnace pressure was maintained at 20 ± 3 Pa with respect to atmosphere. The probe was located 100mm below the specimen.



7. Schedule of materials

All firestopping products were supplied by Client.

Separating Element		
1.1	Item / Product Name	Concrete Slab with linear gaps
	Measurements	Width / Height (W/H): 1350mm x 1460mm
		Thickness (T):120mm
SE	Specification	A 120mm thick concrete slab was cut into four sections, measuring 320mm,320mm,300mm and 300 mm respectively . The concrete slabs were placed on the refractory frame, with three gaps measuring 25mm, 50mm and 50mm.

Fire Protection Products		
2.1	Item / Product Name	Firestop CGS-50 Compressed Gap Seal
	Measurements	Width(W): 70mm
		Thickness (T): 85mm
	Additional Info	Fixed to concrete slab, flush with exposed face.

8. Separating element

120mm thick concrete slab was cut into four sections, measuring 320mm,320mm,300mm and 300 mm respectively. The concrete slabs were placed on the refractory frame, with three gaps measuring 25mm, 50mm and 50mm.

9. Test Specimens instrumentation

9.1 Thermocouple Positions Table

Sp#	TC#	THERMOCOUPLE LOCATION DESCRIPTION
A	1	On separating element, 400mm left from the centre of the specimen, 25mm from the aperture edge
A	2	On separating element, mid width of specimen, 25mm from the aperture edge
A	3	On separating element, 400mm right from the centre of the specimen, 25mm from the aperture edge
A	4	On separating element, 400mm left from the centre of the specimen, 25mm from the aperture edge
A	5	On separating element, mid width of specimen, 25mm from the aperture edge
A	6	On separating element, 400mm right from the centre of the specimen, 25mm from the aperture edge
A	7	On gap seal, 400mm left from the centre of the specimen, mid-height of gap seal
A	8	On gap seal, mid width of specimen, mid-height of gap seal
A	9	On gap seal, 400mm right from the centre of the specimen, mid-height of gap seal

10. Observations

Time Minutes	Test Face	SPECIMEN	Observations
1	U	A	Visible smoke between specimen joint
5	U	A	Large increase in amount of smoke
9	U	A	Cotton pad test for 30 seconds above specimen A - PASS
12	U	A	Visible activation of intumescent
58	U	A	Cotton pad test for 30 seconds above specimen A - PASS
76	U	A	Small visible red spot in seal
80	U	A	Cotton pad test for 30 seconds above red spot - FAIL
85			TEST DISCONTINUED

Key: U = unexposed face. E = Exposed face.

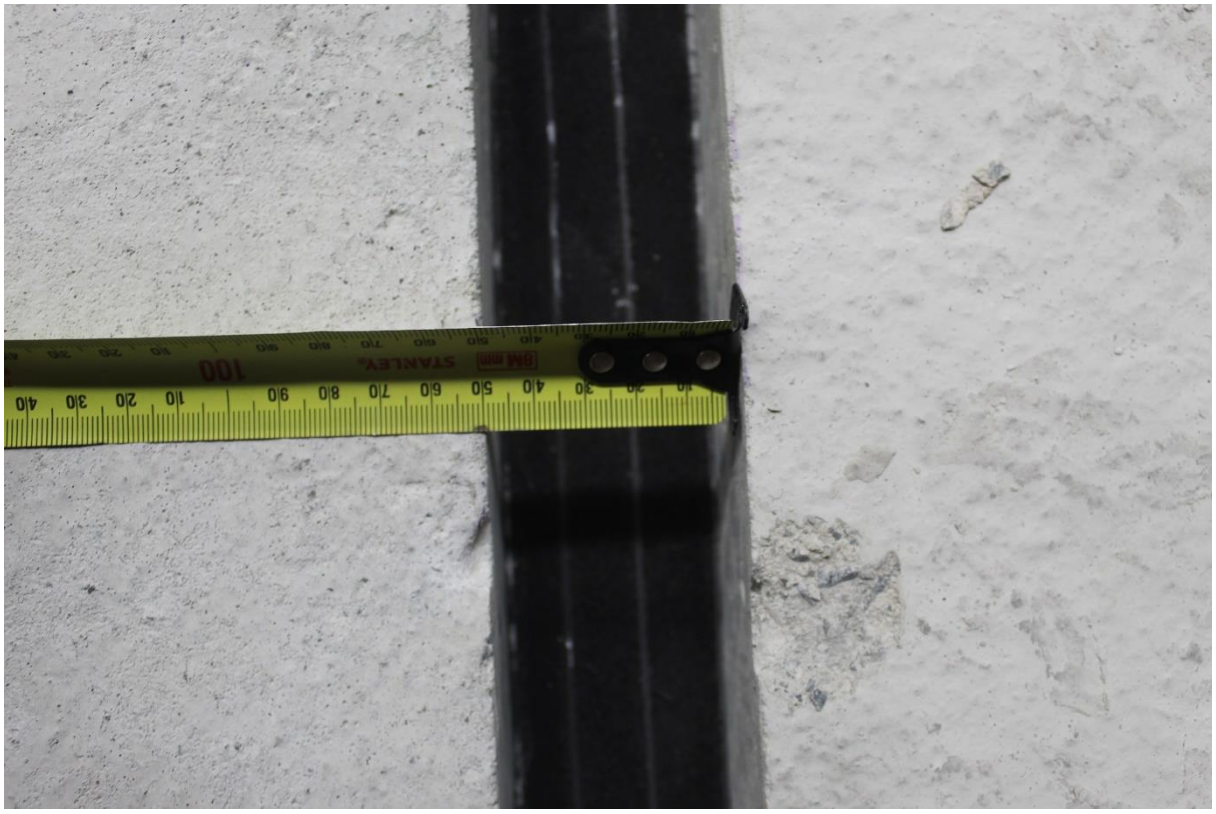
11. Specimens

Unexpoesd face:

Exposed face:

Note: Specimens B and C were excluded from the test report

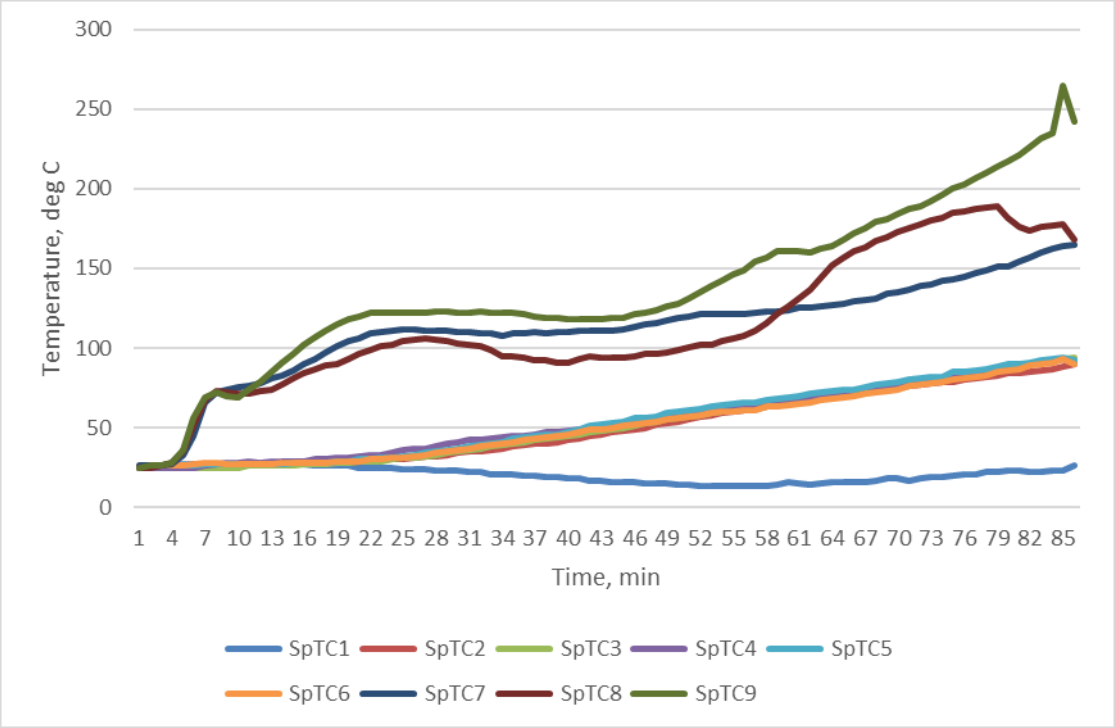
11.1 Specimen A



Penetration System		
A	Service	Firestop CGS-50 Compressed Gap Seal
	Joint Details	Gap Seal (2.1)
	Aperture Size	50mm x 150mm
	Local Fire-stopping Protection	
	Application	Asymmetrical
	Protection Used	50mm gap was formed between two concrete panels. The compressed gap seal (2.1) was installed into the gap. The seal was flush with the exposed face of the concrete slab.

Test results	
Structural adequacy	**Not applicable**
Integrity	**80 min**
Insulation	**76 min**

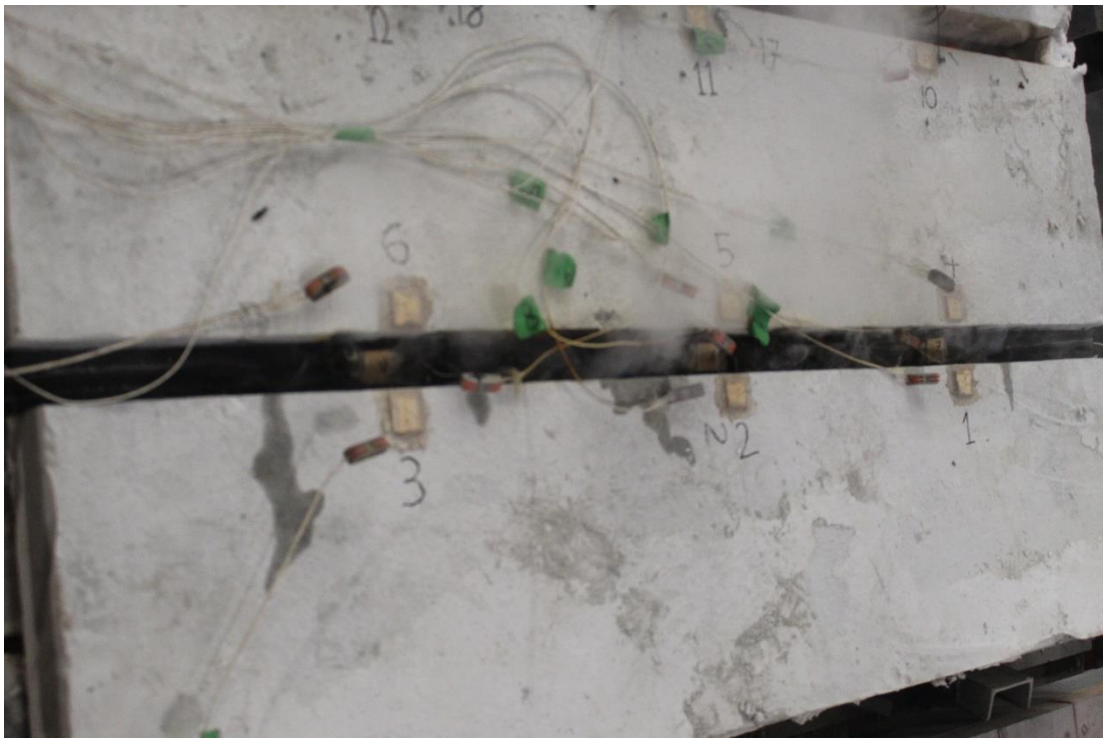
Specimen A Thermocouples Readings



12. Additional photographs

12.1 During and after the test

30 minutes:



60 minutes:

Specimen A - Small visible red spot in seal – 76 Minutes

Specimen A – Integrity failure – 80 Minutes

After the test: