

Test report # PF22077

Test Number 22077

Client: RLA Polymers Pty Ltd

Fire resistance tests for wall linear gaps

Test method: AS 1530.4:2014

Report Date 30/03/2023

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1.1 Document revision schedule

Revision #	Date	Description
1	23/03/2023	Initial Issue for Client review
2	30/03/2023	Issued to Client

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alexey Kokorin (Technical Manager)		30/03/2023
Authorized by:	Andrew Bain (Authorized signatory)		30/03/2023



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

2. Contact details

2.1 Registered Testing Laboratory

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

RLA Polymers Pty Ltd

215 Colchester Road, Kilsyth, Victoria, 3137

Australia

Contact e-mail: childebrand@rlapolymers.com.au

2.3 Manufacturer

RLA Polymers Pty Ltd

215 Colchester Road, Kilsyth, Victoria, 3137

Australia

3. Test Results

Specimen #	Joint	Actual Integrity (min)	Actual insulation (min)	FRL
A	40mm horizontal linear gap	123 NF	123 NF	-/120/120
B	20mm Cable Bundle	123 NF	123 NF	-/120/120
C	DN150 Copper pipe	123 NF	70	-/120/60
D	DN100 Copper pipe	123 NF	96	-/120/90
E	Single Cable	123 NF	123 NF	-/120/120
F	5mm Cable Bundle	123 NF	123 NF	-/120/120
G	35mm Cable Bundle	123 NF	123 NF	-/120/120
H	32 NB Steel pipe	123 NF	123 NF	-/120/120
I	20mm Cable Bundle	123 NF	123 NF	-/120/120
J	35mm Cable Bundle	123 NF	123 NF	-/120/120

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 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.

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

AS 4072.1-2005 Part 1 Appendix A - Typical examples of fire-stopping systems for movement joints.

Documentation:

Testing products were verified and tested based on Client description, refer to Specimens description below. No additional documentation was provided.

Testing date:

28/02/2023

Installation completion date:

22/01/2023

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 Laboratory in line with Client instructions. 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 123 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 Mutual Recognition Agreement (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 Mutual Recognition Agreement (MRA) to the accuracy required by AS 1530.4-2014.

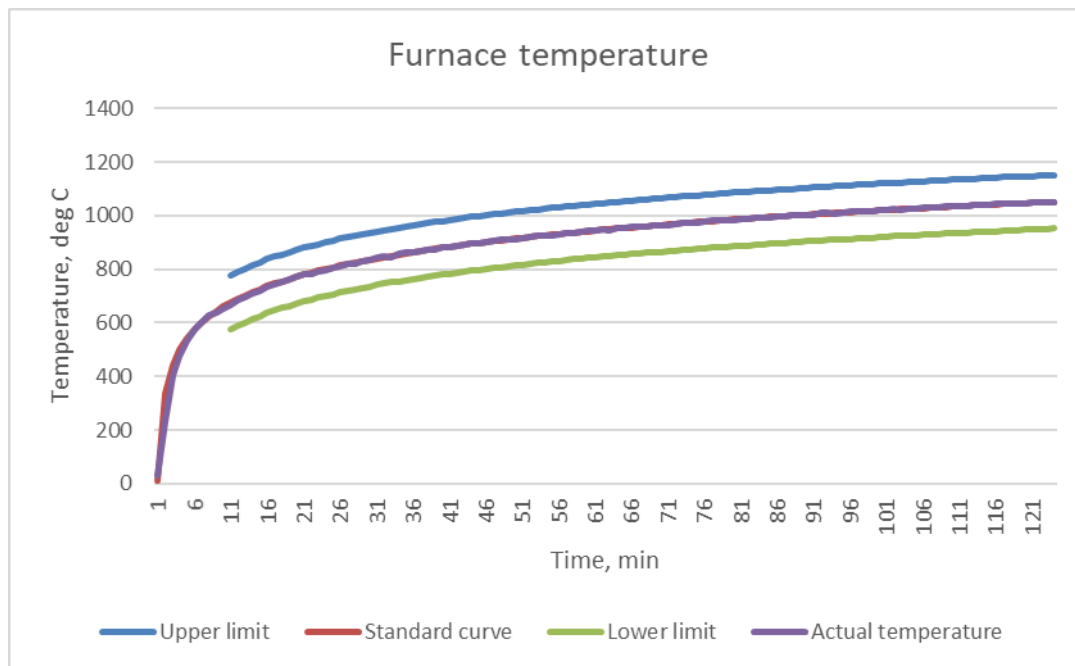
Dimensional measurements:

All linear measurements are 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.

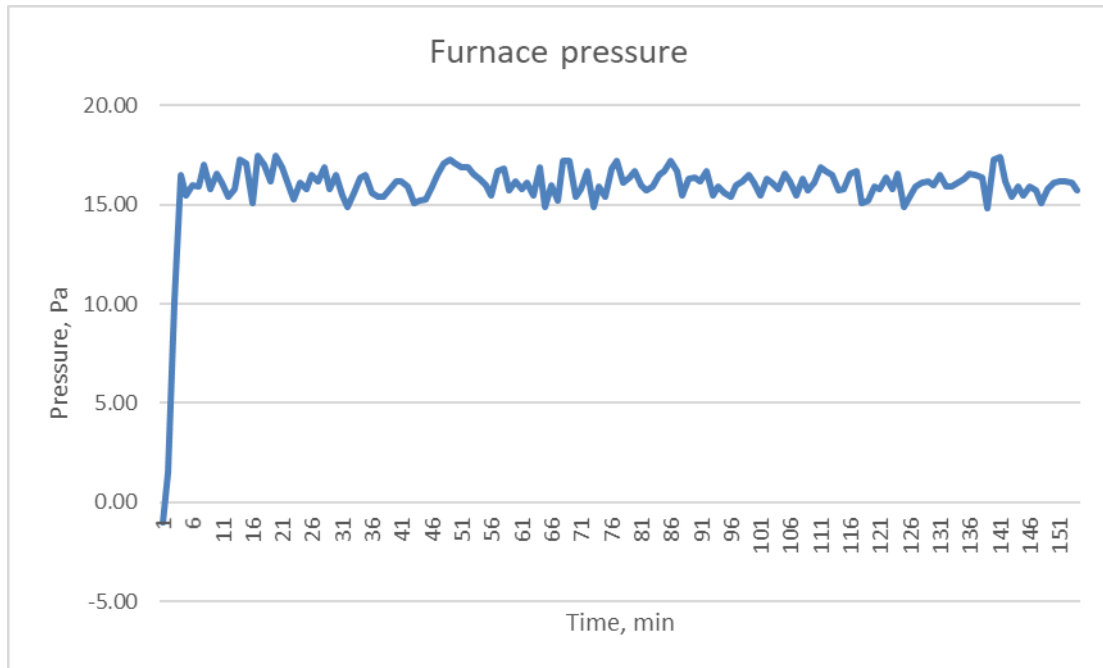


6.2 Ambient Temperature

The ambient temperature of the test area 15 minutes before the test and at the commencement of the test was 23 °C.

6.3 Pressure Readings

After the first 5 minutes of the test, the furnace pressure was maintained at 16 ± 3 Pa with respect to atmosphere. The probe was located 500mm above the furnace floor.



7. Schedule of materials

Separating Element		
1.1	Item / Product Name	Steel Stud and Plasterboard Separating element
	Measurements	Width / Height (W/H): 1200mm x 1200mm
		Thickness (T): 116mm

1.2	Item / Product Name	Rondo Steel Stud
	Measurements	Width / Height (W/H): 64mm x 35.5mm
		Thickness (T): 0.50BMT
Additional Info	Used to construct separating element	
1.3	Item / Product Name	Rondo Steel Deflection Track
	Measurements	Width / Height (W/H): 64mm x 50mm
		Thickness (T): 0.75BMT
Additional Info	Used to construct separating element	
1.4	Item / Product Name	USG Boral Firestop Plasterboard
	Measurements	Width / Height (W/H): 1200mm x 3000mm
		Thickness (T): 13mm
Additional Info	Used to construct separating element	
1.5	Item / Product Name	Concrete Slab
	Measurements	Width / Length (W/L): 1200mm x 490mm
		Thickness (T): 150mm
Additional Info	Used to construct separating element	

Services		
2.1	Item / Product Name	Dynamix Cat6 Grey Cable

	Measurements	Outer Diameter (OD): 6.5mm (nominal)
	Additional Info	Specimen B – 8 x cables installed in deflection head aperture Specimen G – 16 x cables installed through aperture Specimen I – 8 x cables installed through aperture Specimen J – 16 x cables installed through aperture

2.2	Item / Product Name	DN150 Copper Pipe
	Measurements	Outer Diameter (OD): 153mm
		Inner Diameter (ID): 148mm
		Thickness (T): 2.5mm
Additional Info	Specimen C	

2.3	Item / Product Name	DN100 Copper Pipe
	Measurements	Outer Diameter (OD): 102mm
		Inner Diameter (ID): 98mm
		Thickness (T): 2.25mm
Additional Info	Specimen D	

2.4	Item / Product Name	Nexans OLEX TPS Cable
	Measurements	Width / Height (W/H): 12.5mm x 5mm
	Additional Info	Specimen E – 1 x cable installed through aperture Specimen F – 2 x cables installed through aperture

2.5	Item / Product Name	32NB Steel Pipe
	Measurements	Outer Diameter (OD): 42.5mm
		Inner Diameter (ID): 36mm
		Thickness (T): 3.25mm
Additional Info	Specimen H	

Sealants		
3.1	Item / Product Name	RLA FirePro FR Sealant
	Measurements	600mL Sausage
	Installation	Specimen A, B, C, D, E, F, G, H, I, J – Installed around penetrations. Used to fill blank seals.

Fixings		
4.1	Item / Product Name	GIB Grabber Self-Tapping Screws
	Measurements	32mm
	Installation	Used to fix plasterboard to steel stud
4.2	Item / Product Name	GIB Grabber Self-Tapping Screws
	Measurements	41mm
	Installation	Used to fix plasterboard to steel stud
4.3	Item / Product Name	Zenith Metal Screw – Button Head Philips drive
	Measurements	8g x 25mm
	Installation	Used to fix framing components
4.4	Item / Product Name	Unbranded Stainless-Steel Cable Ties
	Measurements	10mm x 1000mm
	Installation	Used to fix wrap around services

Wrap		
5.1	Item / Product Name	Shinagawa Refractories Ceramic Fibre Blanket
	Measurements	Width / Height (W/H): 610mm x 7200mm
		Thickness (T): 25mm
		Density (ρ): 128Kg/m ³
Additional Info	Specimen C, D, H – Wrapped around service, extending 300mm from separating element	

8. Test Specimens details

8.1 Thermocouple Positions Table

SPECIMEN	TC#	THERMOCOUPLE LOCATION DESCRIPTION
A	1	Blank seal, 400mm from left side of refractory frame
A	2	Blank seal, 700mm from left side of refractory frame
A	3	Blank seal, 1000mm from left side of refractory frame
A	4	Separating element, 25mm below blank seal, 400mm from left side of refractory frame
A	5	Separating element, 25mm below blank seal, 700mm from left side of refractory frame
A	6	Separating element, 25mm below blank seal, 1000mm from left side of refractory frame
B	7	Concrete slab, 25mm from separating element, 25mm above cable bundle
B	8	Separating element, 25mm below cable bundle
B	9	Sealant cone, right side of cable bundle, 25mm from separating element
B	10	Sealant cone, bottom side of cable bundle, 25mm blank seal
C	11	Separating element, 25mm above specimen C
C	12	Separating element, 25mm right of specimen C
C	13	Ceramic wrap, top side of specimen, 25mm from separating element
C	14	Ceramic wrap, right side of specimen, 25mm from separating element
C	15	Ceramic wrap, top side of specimen, 25mm from end of wrap
C	16	Ceramic wrap, right side of specimen, 25mm from end of wrap
C	17	Copper pipe, top side of specimen, 25mm from end of wrap
C	18	Copper pipe, right side of specimen, 25mm from end of wrap
D	19	Separating element, 25mm above specimen C
D	20	Separating element, 25mm right of specimen C
D	21	Ceramic wrap, top side of specimen, 25mm from separating element

D	22	Ceramic wrap, right side of specimen, 25mm from separating element
D	23	Ceramic wrap, top side of specimen, 25mm from end of wrap
D	24	Ceramic wrap, right side of specimen, 25mm from end of wrap
D	25	Copper pipe, top side of specimen, 25mm from end of wrap
D	201	Copper pipe, right side of specimen, 25mm from end of wrap
E	202	Separating element, 25mm above specimen E
E	203	Separating element, 25mm right of specimen E
E	204	Sealant cone, top side of cable bundle, 25mm from separating element
E	205	Sealant cone, right side of cable bundle, 25mm from separating element
E	206	Single cable, top side of cable, 25mm from sealant cone
E	207	Single cable, bottom side of cable, 25mm from sealant cone
F	208	Separating element, 25mm above specimen F
F	209	Separating element, 25mm right of specimen F
F	210	Sealant cone, top side of cable bundle, 25mm from separating element
F	211	Sealant cone, right side of cable bundle, 25mm from separating element
F	212	Cable bundle, top side of cable bundle, 25mm from sealant cone
F	213	Cable bundle, bottom side of cable bundle, 25mm from sealant cone
G	214	Separating element, 25mm above specimen G
G	215	Separating element, 25mm right of specimen G
G	216	Sealant cone, top side of cable bundle, 25mm from separating element
G	217	Sealant cone, right side of cable bundle, 25mm from separating element
G	218	Cable bundle, top side of cable bundle, 25mm from sealant cone
G	219	Cable bundle, right side of cable bundle, 25mm from sealant cone
H	220	Separating element, 25mm above specimen H
H	221	Separating element, 25mm right of specimen H
H	222	Ceramic wrap, top side of specimen, 25mm from separating element
H	223	Ceramic wrap, right side of specimen, 25mm from separating element
H	224	Ceramic wrap, top side of specimen, 25mm from end of wrap

H	225	Ceramic wrap, right side of specimen, 25mm from end of wrap
H	226	Copper pipe, top side of specimen, 25mm from end of wrap
H	227	Copper pipe, right side of specimen, 25mm from end of wrap
I	228	Separating element, 25mm above specimen F
I	229	Separating element, 25mm right of specimen F
I	230	Sealant cone, top side of cable bundle, 25mm from separating element
I	231	Sealant cone, right side of cable bundle, 25mm from separating element
I	232	Cable bundle, top side of cable bundle, 25mm from sealant cone
I	233	Cable bundle, bottom side of cable bundle, 25mm from sealant cone
J	234	Separating element, 25mm above specimen F
J	235	Separating element, 25mm right of specimen F
J	236	Sealant cone, top side of cable bundle, 25mm from separating element
J	237	Sealant cone, right side of cable bundle, 25mm from separating element
J	238	Cable bundle, top side of cable bundle, 25mm from sealant cone
J	239	Cable bundle, bottom side of cable bundle, 25mm from sealant cone
B	240	Cable bundle, top side of cable bundle, 25mm from sealant cone
B	241	Cable bundle, right side of cable bundle, 25mm from sealant cone
A	242	Concrete slab, 25mm from separating element, 400mm from left side of refractory frame
A	243	Concrete slab, 25mm from separating element, 700mm from left side of refractory frame
A	244	Concrete slab, 25mm from separating element, 1000mm from left side of refractory frame

8.2 Observations

Time Minutes	Test Face	SP#	Observations
2	U	G, I, J	Smoke from between cables
8	U	A	Smoke from between cables
9	U	C, D	Smoke from end of pipe
10	E	B, E, F, G, I, J	Visible charring/discolouring of sealant cone
10	E	B, E, F, G, I, J	Cables have combusted and are deforming
20	U	ALL	No notable changes
30	E	A	Combustion of sealant, visible discolouring
45	U	ALL	No notable changes
60	U	ALL	No notable changes
75	U	ALL	No notable changes
90	U	ALL	No notable changes
95	U	A	Visible expansion of sealant cone, crack in sealant
120	U	H	Crack between sealant and wrap junction
120	U	C	Discolouring of copper pipe 200mm from wrap
123			TEST DISCONTINUED

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

9. Separating element

The separating element was constructed by the laboratory following client-approved drawings. A 150mm concrete slab (1.5) was fixed to the top of the refractory frame, with each side of the slab protruding evenly from the unexposed and exposed faces of the frame. The Steel stud frame was constructed using three studs (1.2) and two tracks (1.3). The tracks were fixed to the bottom of the concrete slab and bottom of the refractory frame, with the studs installed between the tracks. The studs were located at 25mm, 582mm and 1140mm from the right side of the refractory frame (unexposed view). The steel frame components were all fixed using screws (4.3). Two layers of plasterboard were fixed to each face of the separating elements. The plasterboard was cut to a height of 1010mm, resulting in a horizontal deflection gap measuring 40mm. The first layers were fixed using screws (4.1) at 600mm centres.

The first layers were fixed using screws (4.2) at 300mm centres. The penetration apertures were then cut from the separating element.

10. Specimens

Unexposed faced:



Exposed face:



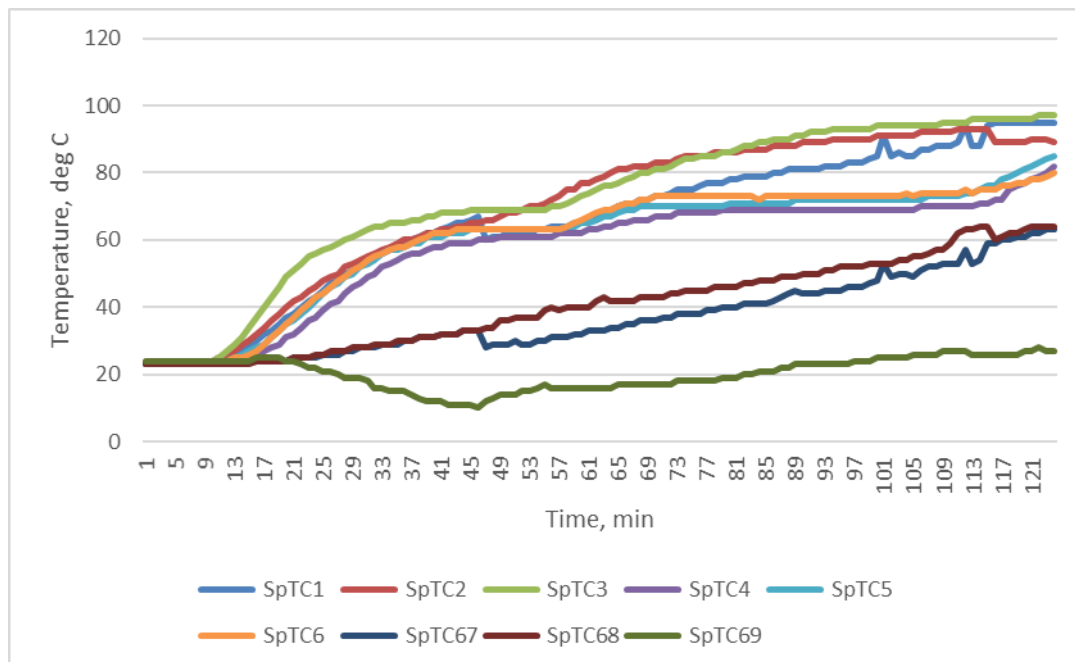
10.1 Specimen A

Penetration System		
A	Service	40mm Horizontal Linear Gap seal
	Joint Details	Sealant (3.1)
	Aperture Size	20mm x 1000mm
	Local Fire-stopping Protection	
	Application	Symmetrical
	Protection Used	The top of the plasterboard was measured to be 40mm below the concrete slab, exposing the deflection head track. Sealant (3.1) was applied on top of the deflection head track, flush with the plasterboard, resulting in a 26mm (nominal) seal.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min

Specimen A Thermocouples Readings



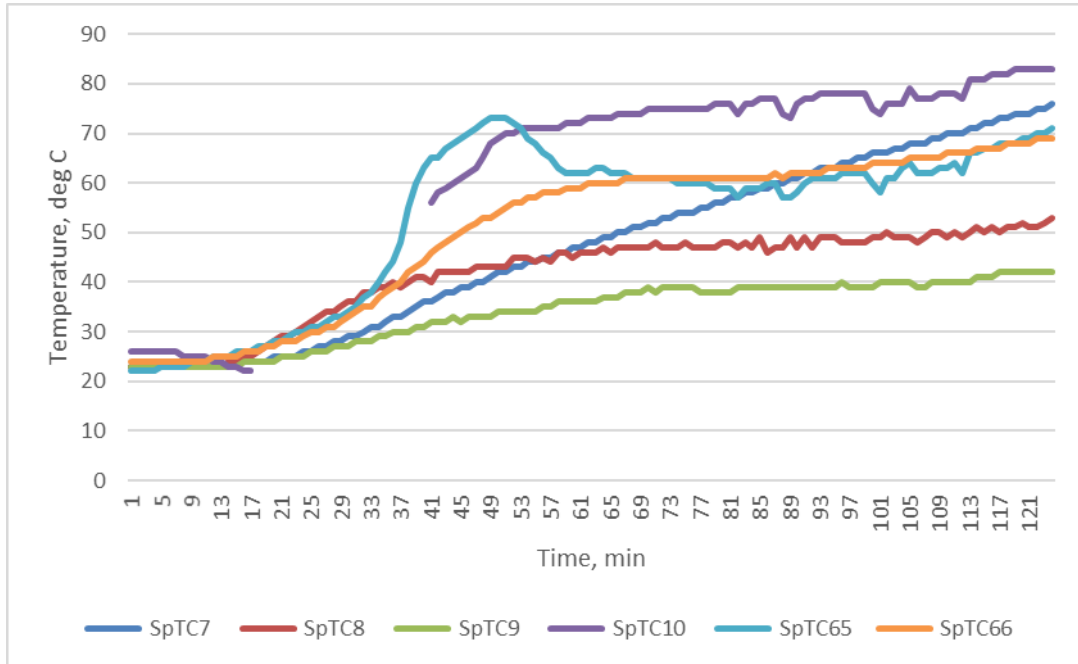
10.2 Specimen B

Penetration System		
B	Service	20mm Cable Bundle
	Service Details	8 x Cable (2.1), Sealant (3.1)
	Service Support	Unistrut structure at 400mm
	Aperture Size	30mm
	Annular Spacing	Min: 2mm, Max: 4mm
	Local Fire-stopping Protection	
Application	Symmetrical	
Protection Used	Aperture was cut into the deflection head track, between the concrete slab and the plasterboard. 8 x cables (2.1) were bundled together (25mm nominal bundle OD), then passed through the aperture, extending 500mm from the exposed face. Sealant was applied on top of the deflection head track, flush with the plasterboard, resulting in a 26mm (nominal) seal. An additional 50mm x 70mm cone of sealant was applied between the cable bundle and separating element. The cone extended 50mm from the cable bundle onto the separating element, and 70mm along the cable bundle.	

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min

Specimen B Thermocouples Readings



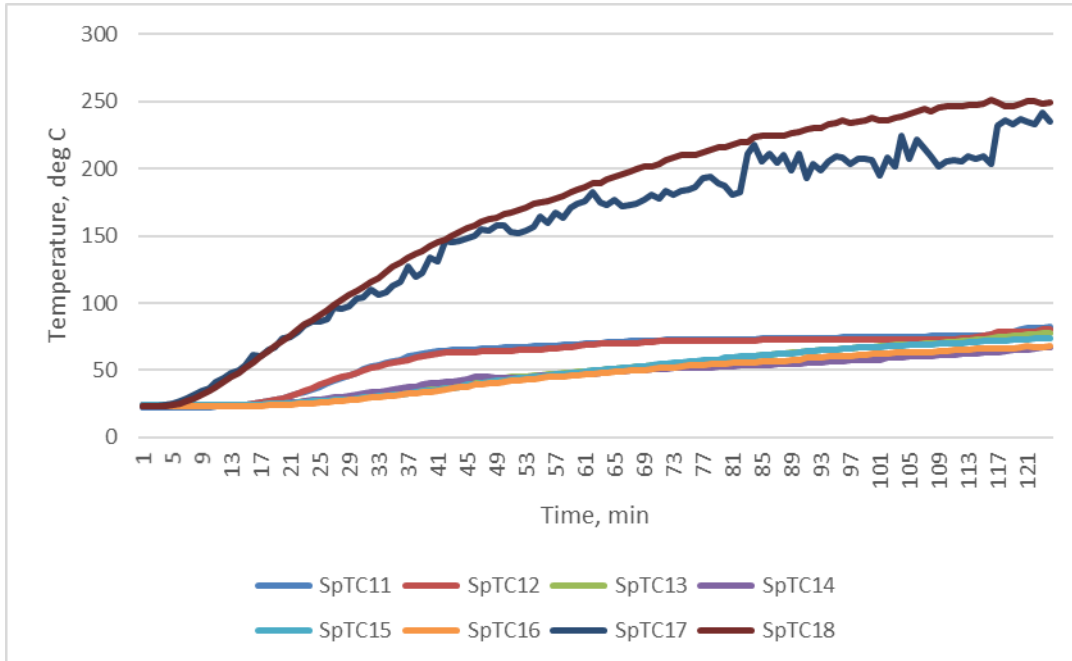
10.3 Specimen C

Penetration System		
C	Service	DN150 Copper pipe
	Service Details	Pipe (2.2), Sealant (3.1), Ceramic Fibre Blanket (5.1), Cable Ties (4.4)
	Service Support	Unistrut structure at 400mm
	Aperture Size	153mm
	Annular Spacing	Min: 0mm, Max: 1mm
	Local Fire-stopping Protection	
	Application	Symmetrical
	Protection Used	Aperture was cut into the separating element. The pipe (2.8) was placed through the aperture, extending 500mm from the exposed face. A 50mm x 70mm cone of sealant was applied between the pipe and separating element. The cone extended 50mm from the pipe onto the separating element, and 70mm along the pipe. Once the sealant had cured, the cable tray was wrapped with ceramic blanket (5.1). Two revolutions were applied around the pipe, with 150mm (nominal) overlap. The wrap extended 300mm from the separating element, and was secured using two cable ties, spaced 100mm from each end of the wrap.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	70 min

Specimen C Thermocouples Readings

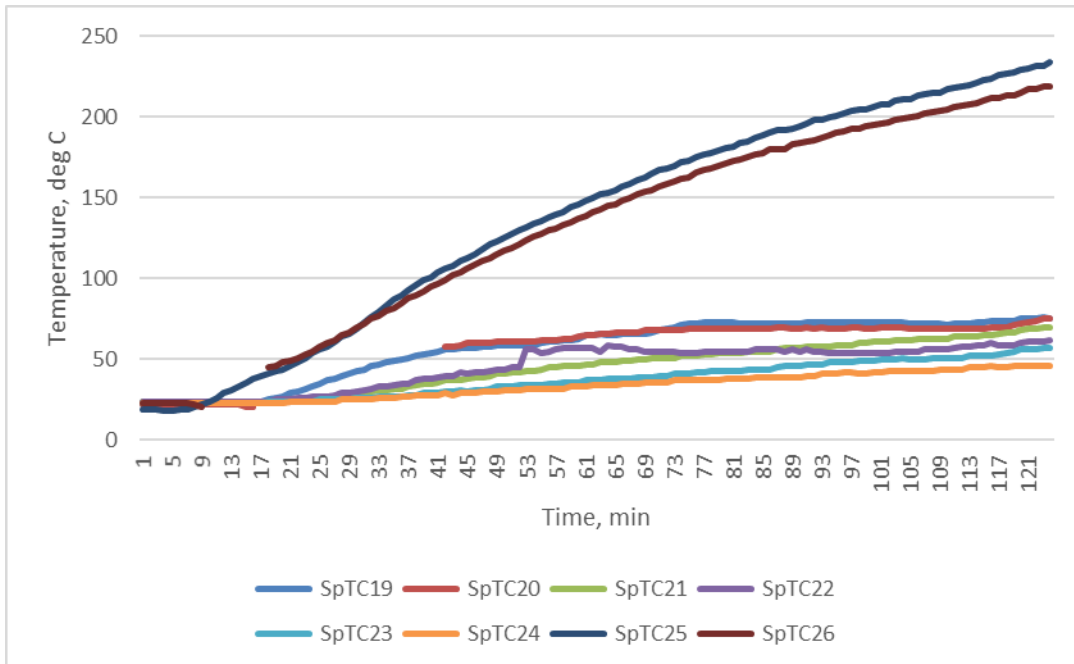


10.4 Specimen D

Penetration System		
D	Service	DN100 Copper pipe
	Service Details	Pipe (2.3), Sealant (3.1), Ceramic Fibre Blanket (5.1), Cable Ties (4.4)
	Service Support	Unistrut structure at 400mm
	Aperture Size	102mm
	Annular Spacing	Min: 0mm, Max: 1mm
	Local Fire-stopping Protection	
Application	Symmetrical	
Protection Used	Aperture was cut into the separating element. The pipe (2.8) was placed through the aperture, extending 500mm from the exposed face. A 50mm x 70mm cone of sealant was applied between the pipe and separating element. The cone extended 50mm from the pipe onto the separating element, and 70mm along the pipe. Once the sealant had cured, the cable tray was wrapped with ceramic blanket (5.1). Two revolutions were applied around the pipe, with 150mm (nominal) overlap. The wrap extended 300mm from the separating element, and was secured using two cable ties, spaced 100mm from each end of the wrap.	

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	96 min



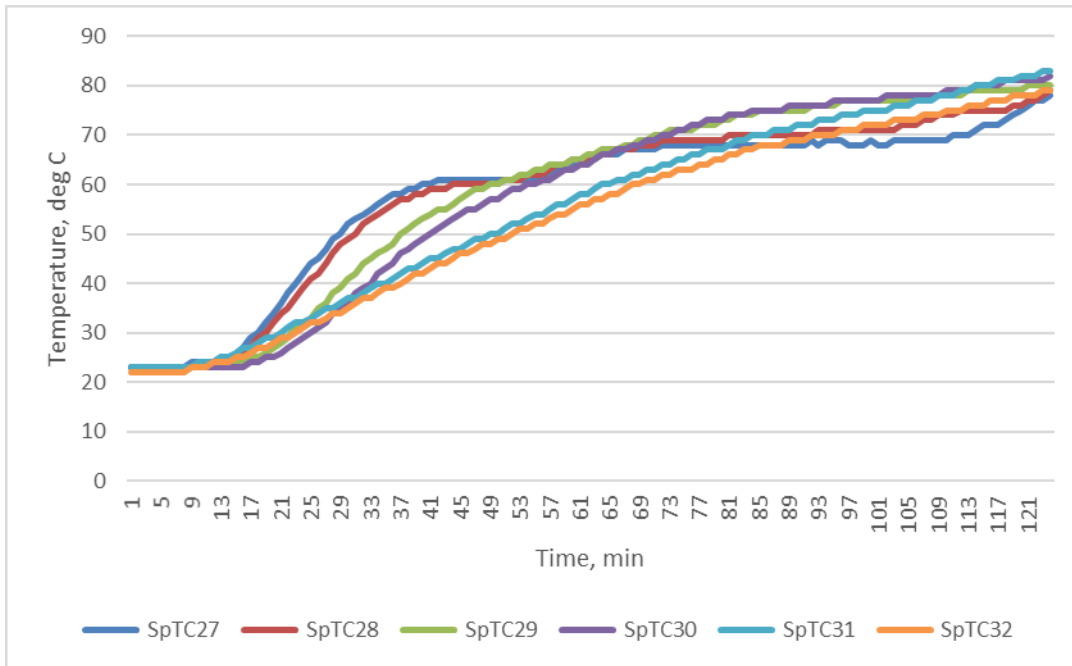
Specimen D Thermocouples Readings

10.5 Specimen E

Penetration System		
E	Service	Single Cable
	Service Details	1 x Cable (2.4), Sealant (3.1)
	Service Support	Unistrut structure at 400mm
	Aperture Size	25mm
	Annular Spacing	Min: 10mm, Max: 16mm
	Local Fire-stopping Protection	
	Application	Symmetrical
Protection Used	Aperture was cut into the separating element. 1 x cable (2.4) was passed through the aperture, extending 500mm from the exposed face. Sealant was installed in the annular gap, flush with the plasterboard, resulting in a 26mm (nominal) seal. An additional 50mm x 70mm cone of sealant was applied between the cable and separating element. The cone extended 50mm from the cable onto the separating element, and 70mm along the cable.	

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min



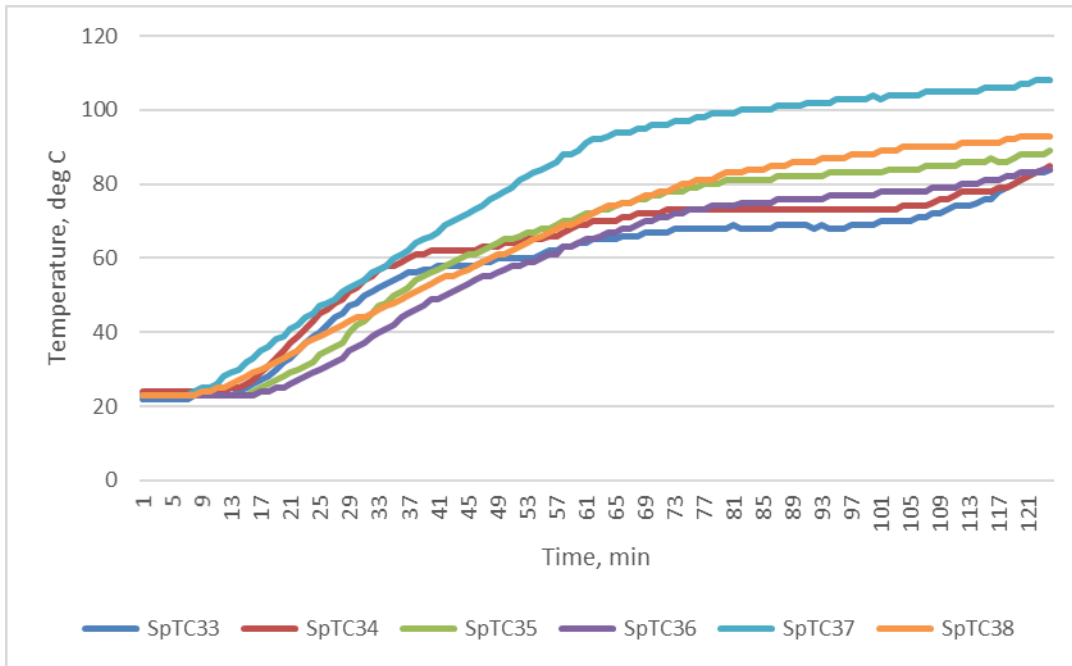
Specimen E Thermocouples Readings

10.6 Specimen F

Penetration System		
F	Service	5mm Cable Bundle
	Service Details	2 x Cable (2.4), Sealant (3.1)
	Service Support	Unistrut structure at 400mm
	Aperture Size	25mm
	Annular Spacing	Min: 8mm, Max: 10mm
	Local Fire-stopping Protection	
	Application	Symmetrical
	Protection Used	Aperture was cut into the separating element. 2 x cables (2.1) were bundled together (14mm nominal bundle OD), then passed through the aperture, extending 500mm from the exposed face. Sealant was installed in the annular gap, flush with the plasterboard, resulting in a 26mm (nominal) seal. An additional 50mm x 70mm cone of sealant was applied between the cable bundle and separating element. The cone extended 50mm from the cable bundle onto the separating element, and 70mm along the cable bundle.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min



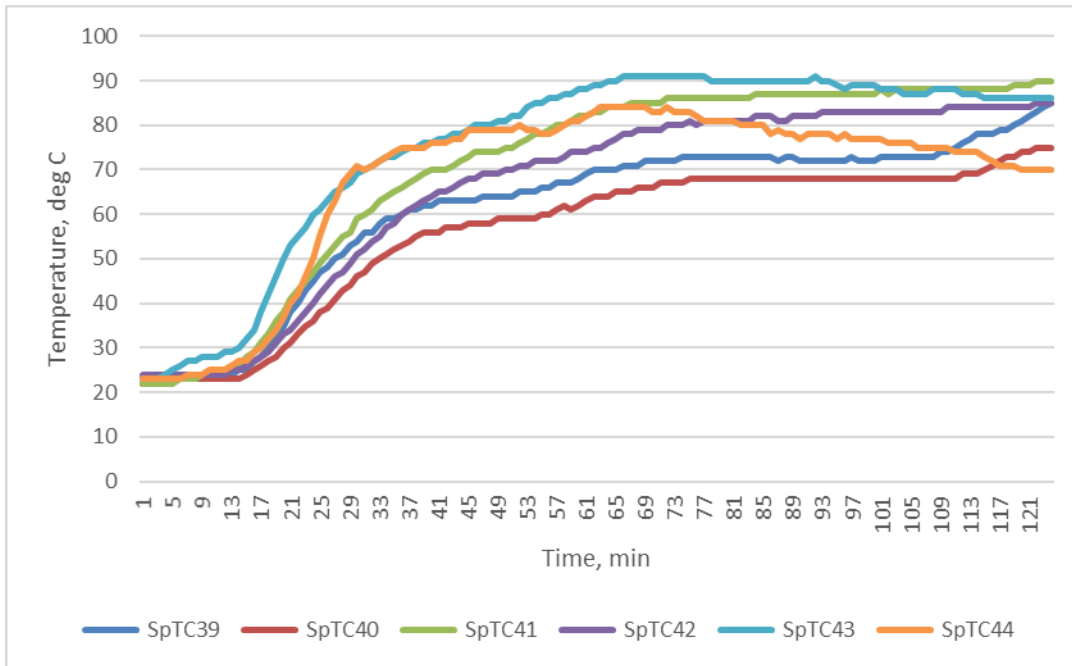
Specimen F Thermocouples Readings

10.7 Specimen G

Penetration System		
G	Service	35mm Cable Bundle
	Service Details	16 x Cable (2.1), Sealant (3.1)
	Service Support	Unistrut structure at 400mm
	Aperture Size	50mm
	Annular Spacing	Min: 5mm, Max: 8mm
	Local Fire-stopping Protection	
Application	Symmetrical	
Protection Used	Aperture was cut into the separating element. 16 x cables (2.1) were bundled together (40mm nominal bundle OD), then passed through the aperture, extending 500mm from the exposed face. Sealant was installed in the annular gap, flush with the plasterboard, resulting in a 26mm (nominal) seal. An additional 50mm x 70mm cone of sealant was applied between the cable bundle and separating element. The cone extended 50mm from the cable bundle onto the separating element, and 70mm along the cable bundle.	

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min



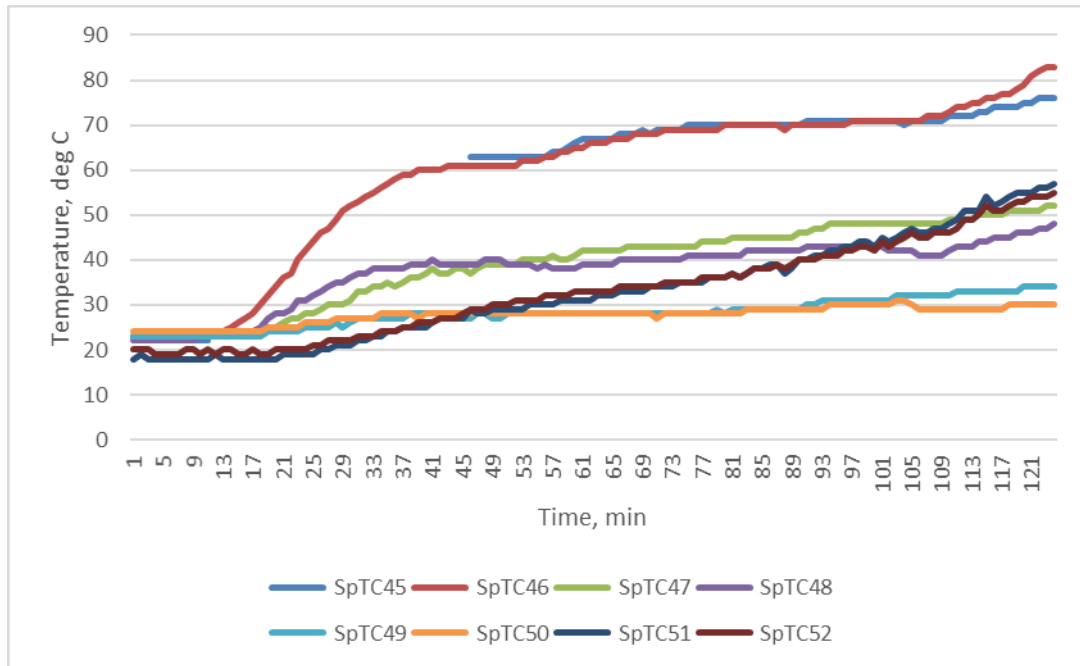
Specimen G Thermocouples Readings

10.8 Specimen H

Penetration System		
H	Service	32 NB Steel pipe
	Service Details	Pipe (2.3), Sealant (3.1), Ceramic Fibre Blanket (5.1), Cable Ties (4.4)
	Service Support	Unistrut structure at 400mm
	Aperture Size	58mm
	Annular Spacing	Min: 7mm, Max: 9mm
	Local Fire-stopping Protection	
Application	Symmetrical	
Protection Used	Aperture was cut into the separating element. The pipe (2.8) was placed through the aperture, extending 500mm from the exposed face. A 50mm x 70mm cone of sealant was applied between the pipe and separating element. The cone extended 50mm from the pipe onto the separating element, and 70mm along the pipe. Once the sealant had cured, the cable tray was wrapped with ceramic blanket (5.1). Two revolutions were applied around the pipe, with 150mm (nominal) overlap. The wrap extended 300mm from the separating element, and was secured using two cable ties, spaced 100mm from each end of the wrap.	

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min



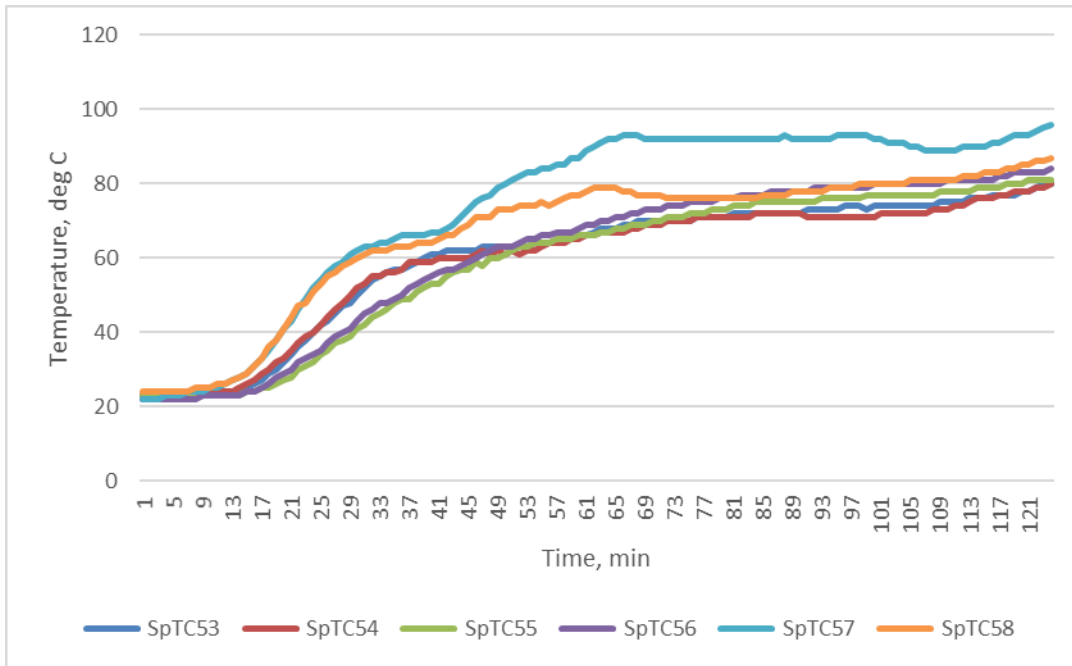
Specimen H Thermocouples Readings

10.9 Specimen I

Penetration System		
I	Service	20mm Cable Bundle
	Service Details	8 x Cable (2.1), Sealant (3.1)
	Service Support	Unistrut structure at 400mm
	Aperture Size	30mm
	Annular Spacing	Min: 0mm, Max: 4mm
	Local Fire-stopping Protection	
	Application	Symmetrical
	Protection Used	Aperture was cut into the separating element. 8 x cables (2.1) were bundled together (25mm nominal bundle OD), then passed through the aperture, extending 500mm from the exposed face. Sealant was installed in the annular gap, flush with the plasterboard, resulting in a 26mm (nominal) seal. An additional 50mm x 70mm cone of sealant was applied between the cable bundle and separating element. The cone extended 50mm from the cable bundle onto the separating element, and 70mm along the cable bundle.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min



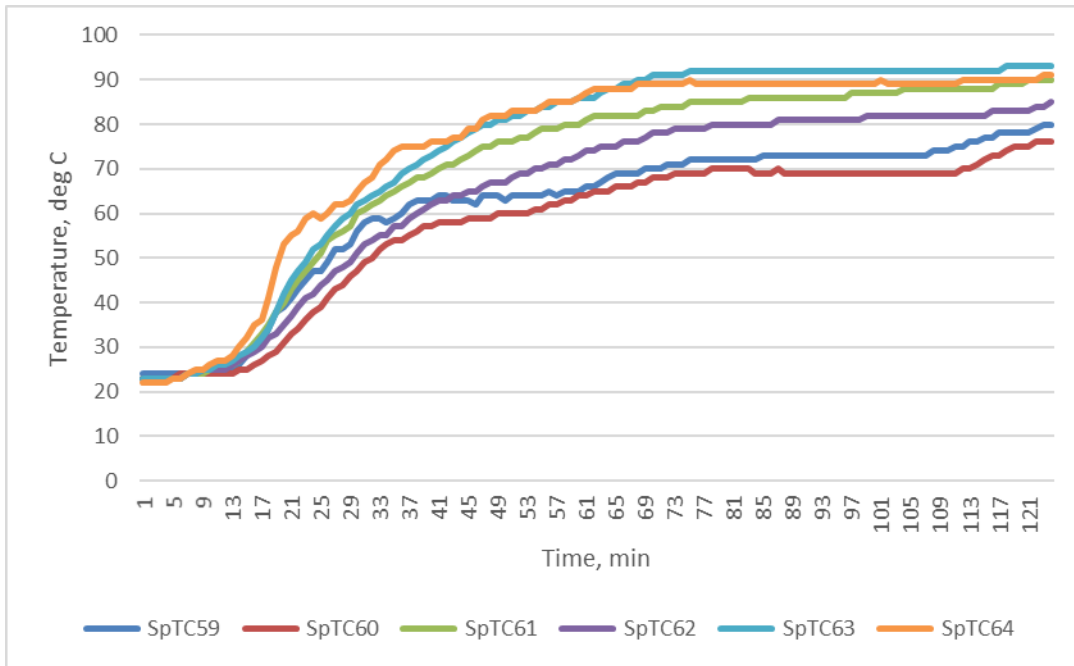
Specimen I Thermocouples Readings

10.10 Specimen J

Penetration System		
J	Service	35mm Cable Bundle
	Service Details	16 x Cable (2.4), Sealant (3.1)
	Service Support	Unistrut structure at 400mm
	Aperture Size	30mm x 70mm
	Annular Spacing	Min: 5mm, Max: 10mm
	Local Fire-stopping Protection	
Application	Symmetrical	
Protection Used	Aperture was cut into the separating element. 16 x cables (2.1) were bundled together (20mm x 50mm nominal bundle OD), then passed through the aperture, extending 500mm from the exposed face. Sealant was installed in the annular gap, flush with the plasterboard, resulting in a 26mm (nominal) seal. An additional 50mm x 70mm cone of sealant was applied between the cable bundle and separating element. The cone extended 50mm from the cable bundle onto the separating element, and 70mm along the cable bundle.	

Test results

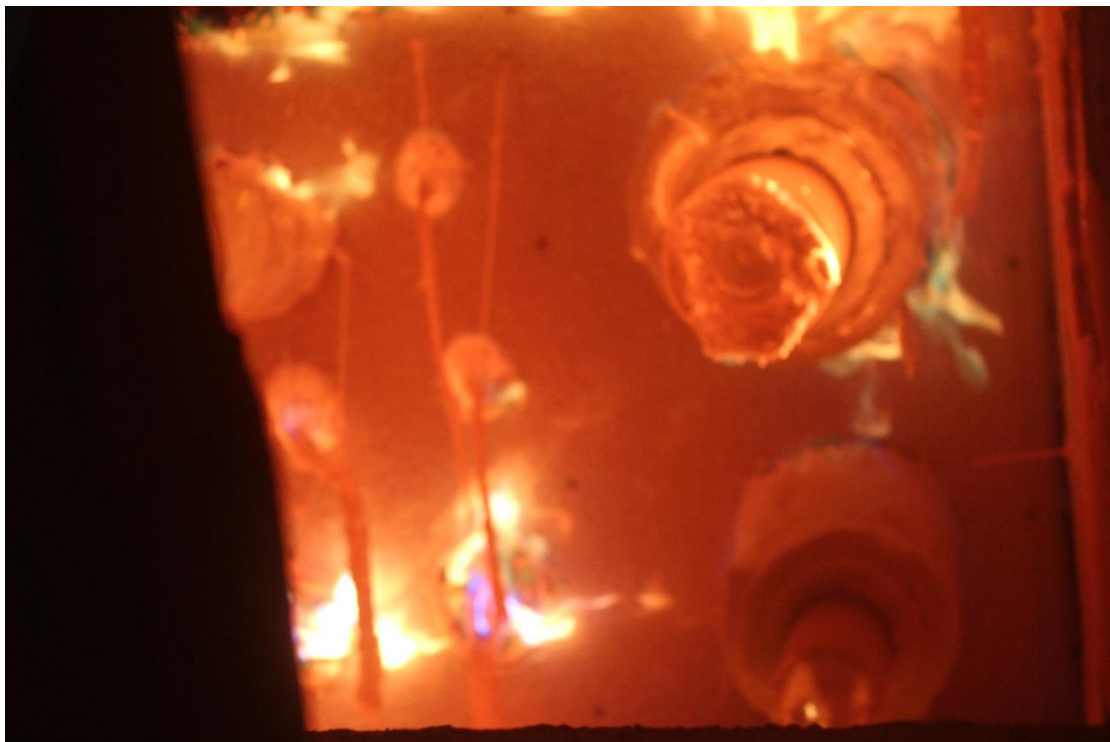
Structural adequacy	Not applicable
Integrity	No failure at 123 min
Insulation	No failure at 123 min



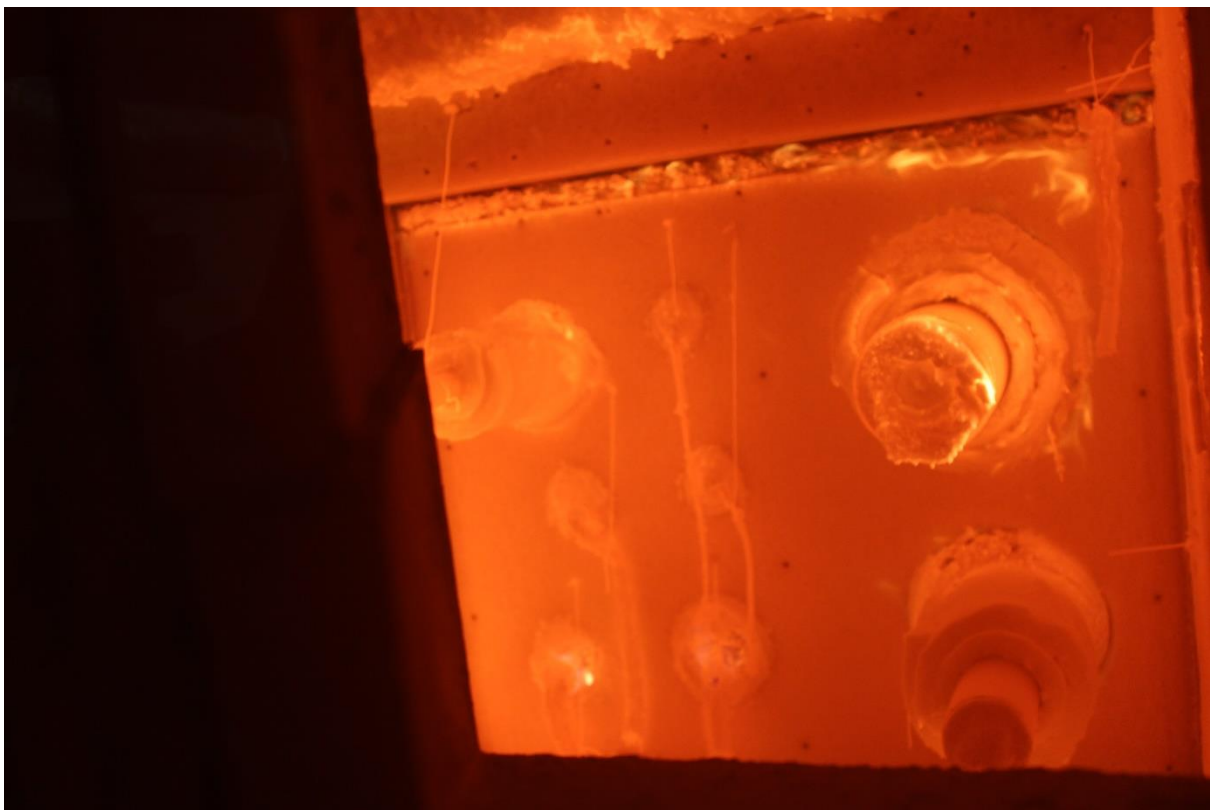
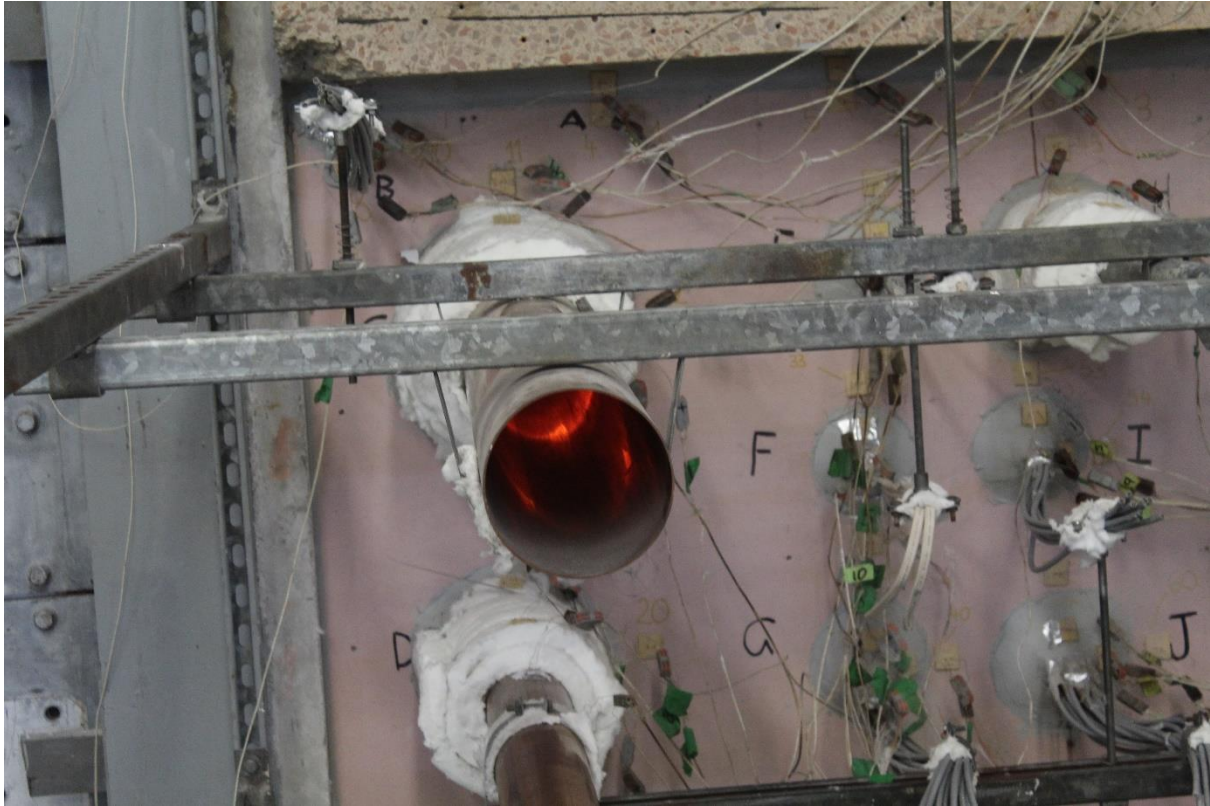
Specimen J Thermocouples Readings

11. Additional photographs

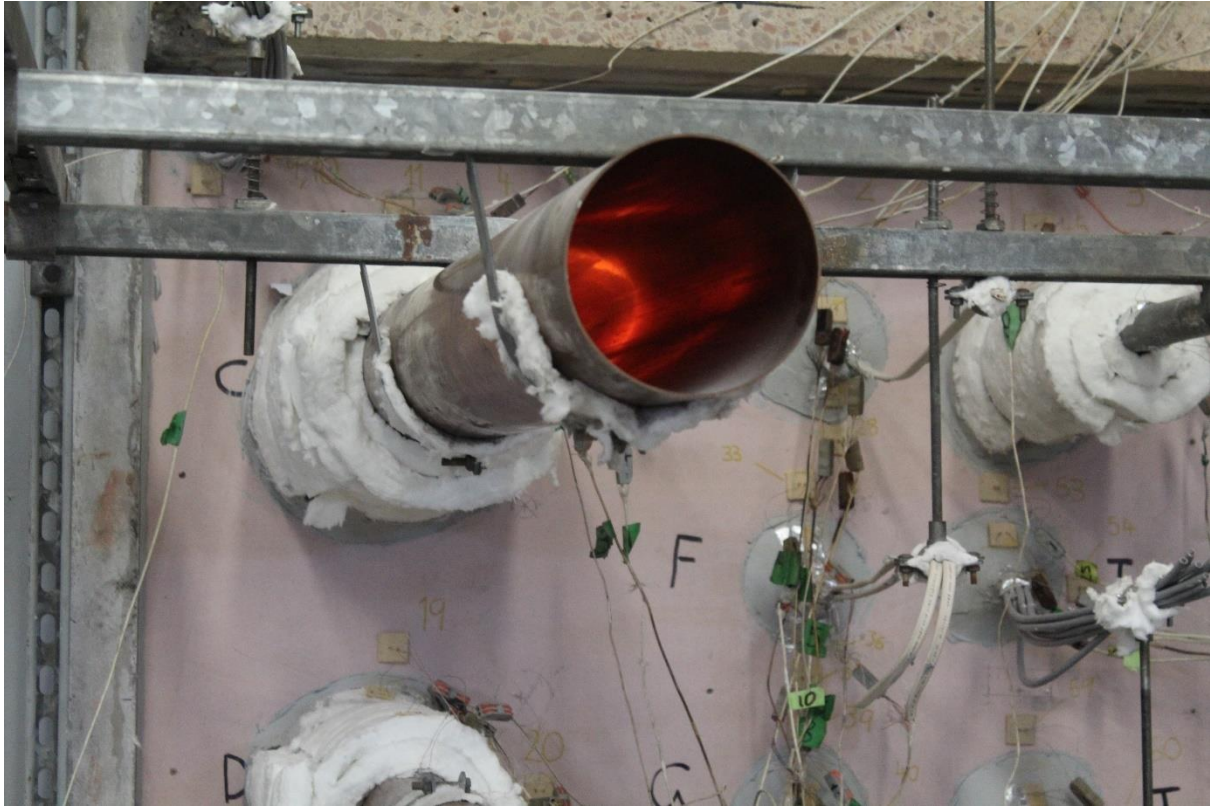
11.1 During and after the test 30 minutes:



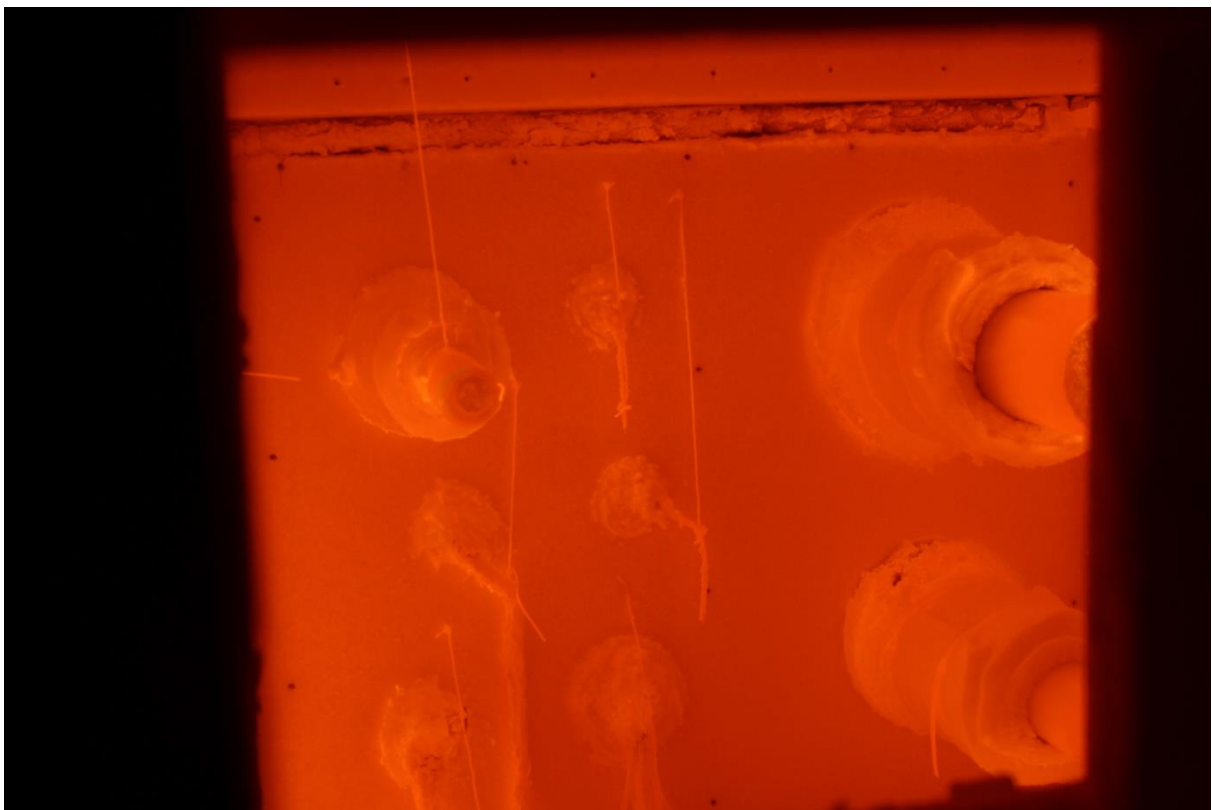
60 minutes:



90 minutes:



120 minutes:



After the test:

