

TEST REPORT

PF24026

**Fire resistance test for penetrations through
the vertical separating element**

Client:	Agnitek Pty Ltd
Test method:	AS1530.4-2014
Report Date:	05/07/2024
Test number:	PF24026



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1.1 Document revision schedule

Revision #	Date	Description
1	26/06/2024	Initial issue for Client review
2	05/07/2024	Issued to Client

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alexey Kokorin		05/07/2024
Authorised by:	Andrew Bain (Authorized signatory)		05/07/2024



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

2. Report Summary

Service penetration was tested passing through 64mm steel stud wall with one layer of 13mm FR plasterboard each side.

Specimen #	Service	Actual Integrity (min)	Actual Insulation (min)	FRL
1	DN150 Copper Tube	61 NF	12	-/60/-
2	DN32 Copper Tube	61 NF	24	-/60/-
3	DN100 Copper Tube	61 NF	10	-/60/-
4	PE Insulated Pair Coil + 25mm Pipe + 2 TPS Cables	61 NF	42	-/60/30
5	3 PE Insulated Pair Coils + 25mm Pipe + 2 TPS Cables	61 NF	31	-/60/30
6	FR Pair Coil + 25mm Pipe + 2 TPS Cables	61 NF	60	-/60/60
7	3 FR Pair Coil+ 25mm Pipe + 2 TPS Cables	61 NF	54	-/60/45
8	25mm uPVC Flexible Conduit	61 NF	54	-/60/45
9	25mm uPVC Flexible Conduit filled with 3 x 2.5mm ² 2C+E Flat TPS Cable	61 NF	57	-/60/45

NF – No failure during the test

3. General Information

3.1 Testing Scope

Applicable Standards:

AS 1530.4-2014 Section 10: Service penetrations and control joints

AS 4072.1-2005 (r. 2016) Components for the protection of openings in fire-resistant separating elements. Part 1: Service penetrations and control joints

Departures from Testing Method:

No departures from the testing method

Performance Criteria:

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 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.

Documentation:

Testing products were verified and tested based on the Client description, refer to the Specimens description below. Documents provided by the Client:

- 1) 32mm Copper pipe.pdf
- 2) 100mm Copper pipe.pdf
- 3) 150mm Copper pipe.pdf
- 4) 1x Pair coil with PE insulation (front).pdf
- 5) 3x Pair coil with PE insulation (front).pdf
- 6) 1x Pair coil with FR insulation (front).pdf
- 7) 3x Pair coil with FR insulation (front).pdf
- 8) flexi-conduit (empty).pdf
- 9) flexi-conduit w 3x TPS cables.pdf

3.2 Contact Details

Accredited Testing Laboratory

Fire TS Lab - Passive Fire Inspection and Test Services Ltd

Accreditation Number - 1335

1/113 Pavilion Drive, Mangere, Auckland, 2022

New Zealand

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

Client/Applicant:

Agnitek Pty Ltd

8 Clare St, Bayswater, VIC, 3153

Australia

Contact e-mail: info@agnitek.com.au

Manufacturer:

Same as Client/Applicant

3.3 Specimen Preparation, Conditioning and Timeline

Specimens conditioning and delivery to Laboratory:

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

Testing date:

17/06/2024

Installation completion date:

17/05/2024

Termination of The Test:

The test was discontinued at 61 minutes.

3.4 Use of the Report

This report shall not be reproduced, except in full.

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.

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. Specimen Description

4.1 Supporting Construction

Separating element		
1.1	Item	64mm Steel Stud with one layer of 13mm FR plasterboard each side
	Dimensions	Width / Height (W/H): 1200mm × 1200mm
		Wall Thickness (T): 90mm
		Cavity: 64mm

Materials		
1.2	Item / Product Name	Rondo Steel Track
	Dimensions	Width / Height (W/H): 64mm × 30mm
		Thickness (T): 0.55 BMT
	Installation	Installed to top and bottom of refractory frame
1.3	Item / Product Name	Rondo Steel Stud
	Dimensions	Width / Height (W/H): 64mm × 34mm
		Thickness (T): 0.50 BMT
	Installation	Fixed to steel tracks, used to construct steel stud frame
1.4	Item / Product Name	Powers Fasteners Slotted Hex Head Tapper
	Dimensions	6.5mm × 32mm
	Installation	Used to fix steel track to refractory frame
1.6	Item / Product Name	GIB Fyreline Plasterboard
	Dimensions	Width / Height (W/H): 1200mm × 1200mm
		Thickness (T): 13mm
	Installation	1 × layer installed to each side of steel stud frame
1.7	Item / Product Name	AGNI-Seal
	Installation	Applied over fixings and perimeter of plasterboard
1.8	Item / Product Name	41mm GIB Grabber Self Tapping Screw
	Dimensions	6g × 41mm

	Installation	Used to fix plasterboard to steel stud frame
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4.2 Specimens

Services		
2.1	Item / Product Name	Kembla AS1432 DN150 Copper Tube
	Dimensions	Inner Diameter (ID): 148mm
		Outer Diameter (OD): 152.5mm
		Thickness (T): 2mm
2.2	Item / Product Name	Kembla AS1432 DN32 Copper Tube
	Dimensions	Inner Diameter (ID): 32mm
		Outer Diameter (OD): 19mm
		Thickness (T): 1.5mm
2.3	Item / Product Name	Kembla NZS3501 DN100 Copper Tube
	Dimensions	Inner Diameter (ID): 101mm
		Outer Diameter (OD): 105mm
		Thickness (T): 1.5mm
2.4	Item / Product Name	Ardent Copper Pair Coil 3/8" x 3/4"
	Dimensions	Insulation Thickness: 10mm
		Copper Tube OD: 9.5mm and 19mm
		Tube Wall Thickness: 1mm
2.5	Item / Product Name	Ardent Copper Fire Rated Pair Coil 19mm 3/8" – 5/8"
	Dimensions	Insulation Thickness: 19mm and 21mm
		Copper Tube OD: 9.5mm and 16mm
		Tube Wall Thickness: 1mm
2.6	Item / Product Name	25mm Marley EASI uPVC Flexible Conduit
	Dimensions	Inner Diameter (ID): 25mm
		Outer Diameter (OD): 19.5mm
		Thickness (T): 2.5mm
2.7	Item / Product Name	Electra Cables 2.5mm ² x 2C+E Flat TPS Cable
	Dimensions	Width / Height (W/H): 12mm x 6mm

2.8	Item / Product Name	Marley Arma Above Ground uPVC Conduit 25mm
	Dimensions	Inner Diameter (ID): 20.5mm
		Outer Diameter (OD): 25mm
		Thickness (T): 2mm
2.9	Item / Product Name	ProPipe Air Conditioning & Refrigeration Drain Pipe 20mm PN12
	Dimensions	Inner Diameter (ID): 23mm
		Outer Diameter (OD): 26mm
		Thickness (T): 1.5mm

Sealants

3.1	Item / Product Name	AGNI-Seal
	Dimensions	600mL Sausage
	Installation	Installed in annular space

Fixings

4.1	Item / Product Name	Stainless Steel Cable Ties
	Dimensions	Width / Height (W/H): 4.6mm x 200mm
	Installation	Used to fix AGNI-Wrap around service
4.2	Item / Product Name	Stainless Steel Clips
	Installation	Used to fix AGNI-Wrap to separating element
4.3	Item	25mm GIB Grabber Self Tapping Screw
	Dimensions	6g x 25mm
	Installation	Used to fix AGNI-Wrap to separating element

Intumescent

9.1	Item	AGNI-Wrap
	Dimensions	Width (W): 25mm
		Thickness (T): 2.5mm
	Installation	Installed around service, against separating element

5. Test Conditions

5.1 Equipment

Furnace:

1200X1200mm Indicative Furnace designed to operate to AS1530.4:2014

Temperature:

Furnace Temperature measurements were controlled with 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:

Keypare 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.

5.2 Furnace Data

Furnace Temperature:

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

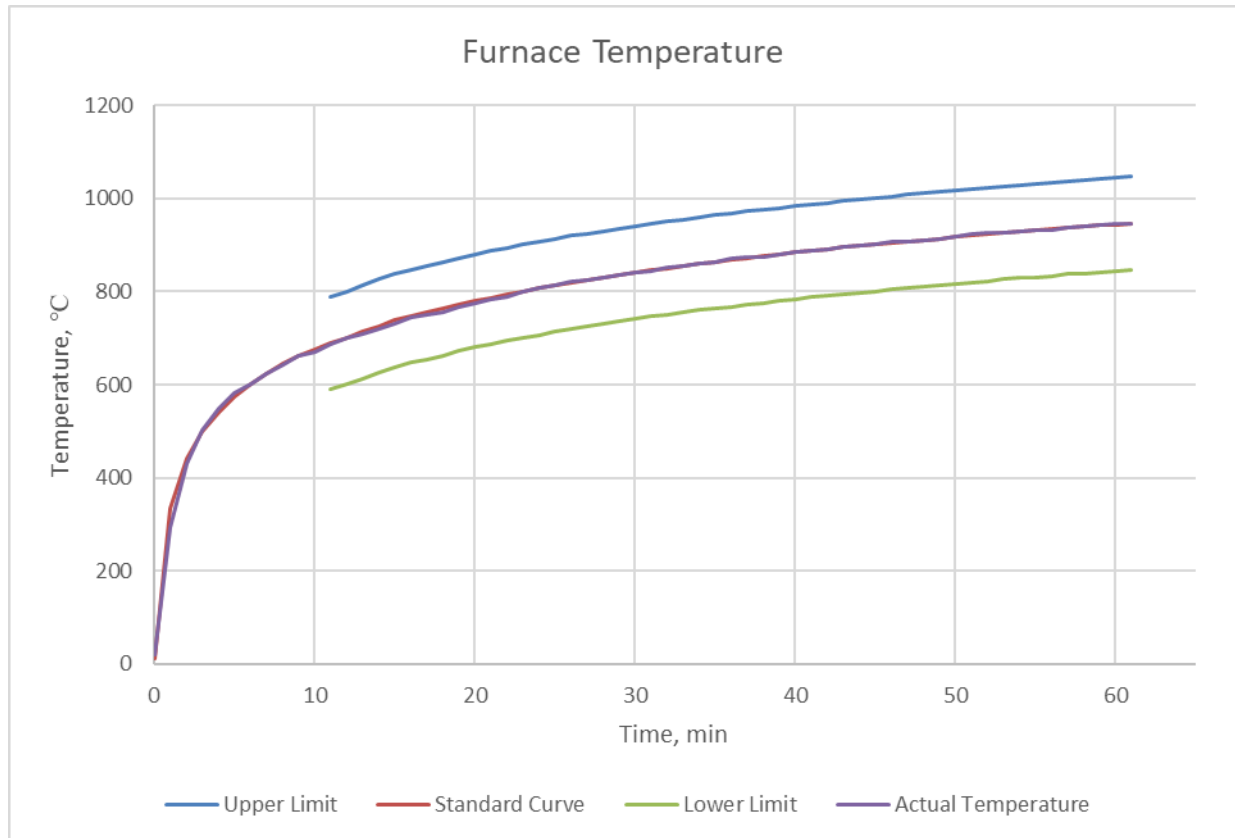


Figure 1 – Furnace Temperature during the test

Ambient Temperature:

The ambient temperature of the test area 15 minutes before the test and at the commencement of the test was 19°C.

Furnace Pressure:

After the first 5 minutes of the test, the furnace pressure was maintained at 15 ± 3 Pa with respect to atmosphere. The probe was located 500mm above the furnace floor.

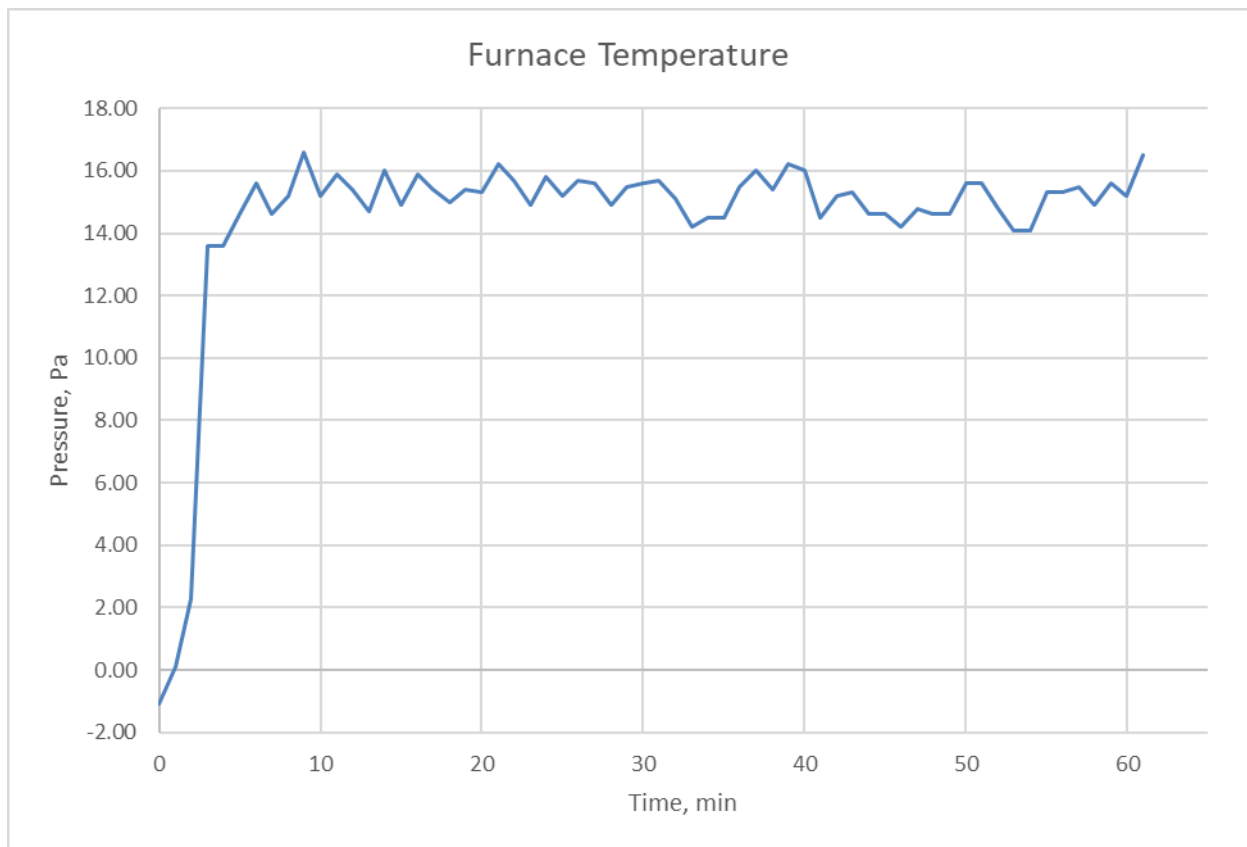


Figure 2 – Furnace Pressure during the test

5.3 Thermocouple locations

SP#	TC#	THERMOCOUPLE LOCATION DESCRIPTION
1	1	Separating element, 25mm above sealant cone
1	2	Separating element, 25mm right of sealant cone
1	3	Sealant cone, top side of specimen, 25mm from separating element
1	4	Sealant cone, right side of specimen, 25mm from separating element
1	5	Pipe, top side of specimen, 25mm from sealant cone
1	6	Pipe, right side of specimen, 25mm from sealant cone
1	7	Pipe, top side of specimen, 100mm from separating element
1	8	Pipe, top side of specimen, 200mm from separating element
1	9	Pipe, top side of specimen, 300mm from separating element
1	10	Pipe, top side of specimen, 400mm from separating element
1	11	Pipe, top side of specimen, 500mm from separating element
2	12	Separating element, 25mm above sealant cone
2	13	Separating element, 25mm right of sealant cone
2	14	Sealant cone, top side of specimen, 25mm from separating element
2	15	Sealant cone, right side of specimen, 25mm from separating element
2	16	Pipe, top side of specimen, 25mm from sealant cone
2	17	Pipe, right side of specimen, 25mm from sealant cone
2	18	Pipe, top side of specimen, 100mm from separating element
2	19	Pipe, top side of specimen, 200mm from separating element
2	20	Pipe, top side of specimen, 300mm from separating element
2	21	Pipe, top side of specimen, 400mm from separating element
2	22	Pipe, top side of specimen, 500mm from separating element
3	23	Separating element, 25mm above sealant cone
3	24	Separating element, 25mm left of sealant cone
3	25	Sealant cone, top side of specimen, 25mm from separating element
3	201	Sealant cone, left side of specimen, 25mm from separating element
3	202	Pipe, top side of specimen, 25mm from sealant cone
3	203	Pipe, left side of specimen, 25mm from sealant cone
3	204	Pipe, top side of specimen, 100mm from separating element

3	205	Pipe, top side of specimen, 200mm from separating element
3	206	Pipe, top side of specimen, 300mm from separating element
3	207	Pipe, top side of specimen, 400mm from separating element
3	208	Pipe, top side of specimen, 500mm from separating element
4	209	Separating element, 25mm above AGNI-Wrap
4	210	Separating element, 25mm right of AGNI-Wrap
4	211	AGNI-Wrap, top side of specimen, 19mm from separating element
4	212	AGNI-Wrap, right side of specimen, 19mm from separating element
4	213	TPS cable, left side of specimen, 25mm from AGNI-Wrap
4	214	PVC pipe, top side of specimen, 25mm from AGNI-Wrap
4	215	Pair coil, top side of specimen, 25mm from AGNI-Wrap
5	216	Separating element, 25mm above aperture
5	217	Separating element, 25mm right of aperture
5	218	AGNI-Wrap, top side of specimen, 19mm from separating element
5	219	AGNI-Wrap, right side of specimen, 19mm from separating element
5	220	Pair coil, top side of specimen, 25mm from AGNI-Wrap
5	221	PVC pipe, top side of specimen, 25mm from AGNI-Wrap
5	222	TPS cable, top side of specimen, 25mm from AGNI-Wrap
6	223	Separating element, 25mm above aperture
6	224	Separating element, 25mm left of aperture
6	225	AGNI-Wrap, top side of specimen, 19mm from separating element
6	226	AGNI-Wrap, right side of specimen, 19mm from separating element
6	227	TPS cable, top side of specimen, 25mm from AGNI-Wrap
6	228	PVC pipe, top side of specimen, 25mm from AGNI-Wrap
6	229	Pair coil, top side of specimen, 25mm from AGNI-Wrap
7	230	Separating element, 25mm above aperture
7	231	Separating element, 25mm left of aperture
7	232	AGNI-Wrap, top side of specimen, 19mm from separating element
7	233	AGNI-Wrap, left side of specimen, 19mm from separating element
7	234	Pair coil, left side of specimen, 25mm from AGNI-Wrap
7	235	Pair coil, top side of specimen, 25mm from AGNI-Wrap

7	236	PVC pipe, top side of specimen, 25mm from AGNI-Wrap
7	237	TPS cable, top side of specimen, 25mm from AGNI-Wrap
8	238	Separating element, 25mm above aperture
8	239	Separating element, 25mm right of aperture
8	240	AGNI-Wrap, top side of specimen, 19mm from separating element
8	241	AGNI-Wrap, bottom side of specimen, 19mm from separating element
8	242	Flexible conduit, top side of specimen, 25mm from AGNI-Wrap
8	243	Flexible conduit, bottom side of specimen, 25mm from AGNI-Wrap
9	244	Separating element, 25mm above aperture
9	245	Separating element, 25mm left of aperture
9	246	AGNI-Wrap, top side of specimen, 25mm from separating element
9	247	AGNI-Wrap, bottom side of specimen, 25mm from separating element
9	248	Flexible conduit, top side of specimen, 25mm from AGNI-Wrap
9	249	Flexible conduit, left side of specimen, 25mm from AGNI-Wrap

6. Test Results

6.1 Observations during the test

Time min	Test face	SP#	OBSERVATIONS/REMARKS
1	U	4, 5, 6, 7	Smoke from aperture and space between pair coil, pipe, cable and AGNI-Wrap
5	E	8, 9	Flexible conduit not visible
6	U	4, 6	Smoke from specimen not visible
8	U	1, 3	Expansion of sealant
12	E	ALL	Sealant and AGNI-Wrap expanded, deformation of pair coils and cables, PVC pipes not visible
15	U	2	Sealant cone expanding
16	U	4, 5	Pair coil insulation expanding
23	U	6, 7	Pair coil insulation expanding
25	U	4, 6, 8	Smoke from specimen, PE insulation discoloured
25	U	1, 2, 3	Sealant along the edge of sealant cone on pipe discoloured
28	U	5	AGNI-Wrap expanding, AGNI-Wrap, AGNI-Seal and SE on top side of bundle discoloured
30	U	4	AGNI-Wrap, AGNI-Seal and SE discoloured
30	U	8	Conduit deformed next to SE
35	U	4, 5, 6, 7	PVC pipe discoloured and deformed
38	U	9	Sealant in annular space expanding
40	U	4, 5	TPS cable melting and deforming next to AGNI-Wrap, PE insulation deformed, further discolouration of AGNI-Wrap, AGNI-Seal and SE
40	U	7	Discolouration of SE above aperture
48	U	1, 3	Further expansion of sealant, discolouration of pipe, smoke from gaps in sealant
48	U	2	Discolouration of sealant on top side of sealant cone
50	U	4	Discolouration of SE above aperture
50	U	8, 9	Further expansion of sealant in annular space

51	U	6	Detachment of PVC pipe from HAVC bundle
55	U	SE	Discolouration of SE around specimen 8 and 9
58	U	SE	Discolouration of SE above specimen 4 and 7, right side of specimen 6 and around specimen 2, 3 and 5
60	U	SE	Discolouration of SE below specimen 1
60	U	6	Expansion of sealant in annular space
61			Test Discontinued

NOTE: E – Exposed Face (inside furnace)
U – Unexposed Face (outside furnace)
SE – Separating element

6.2 Specimen 1

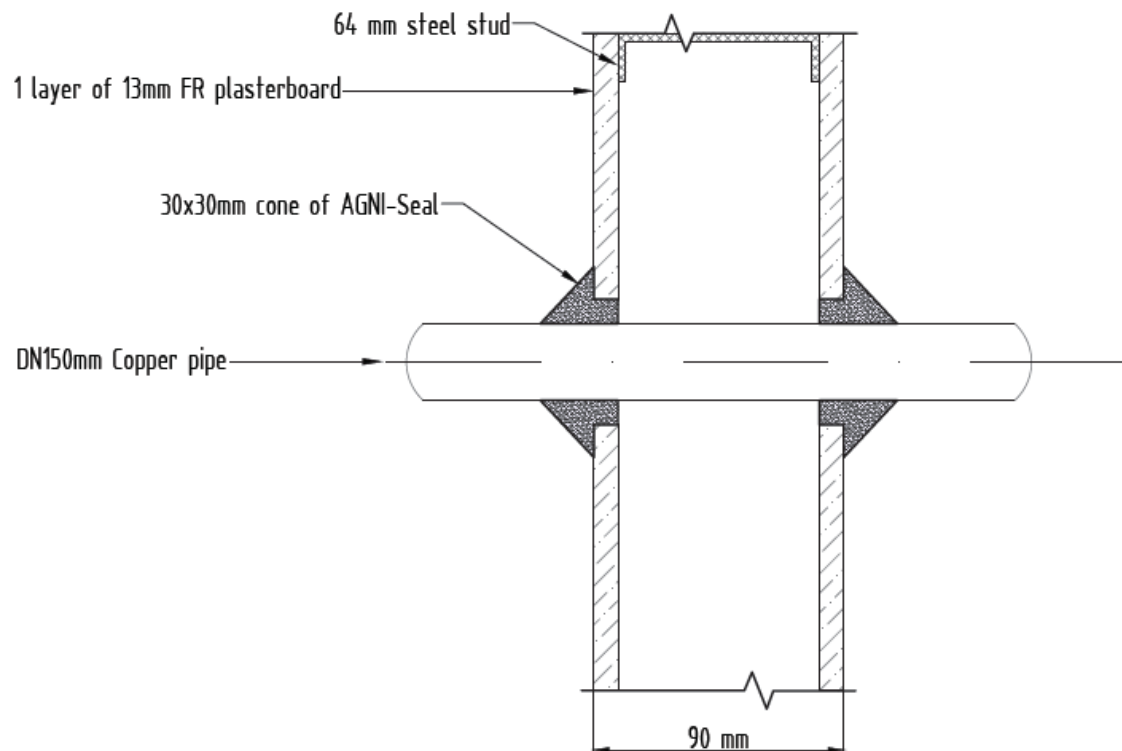


Figure 3 – Specimen 1

Service penetration details	
Service	DN150 Copper Tube
Service Support	Unistrut structure at 360mm
Aperture Diameter	170mm
Annular Spacing	Min: 8mm, Max: 9.5mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space and a 30mm × 30mm cone of sealant between pipe and separating element.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	12 minutes

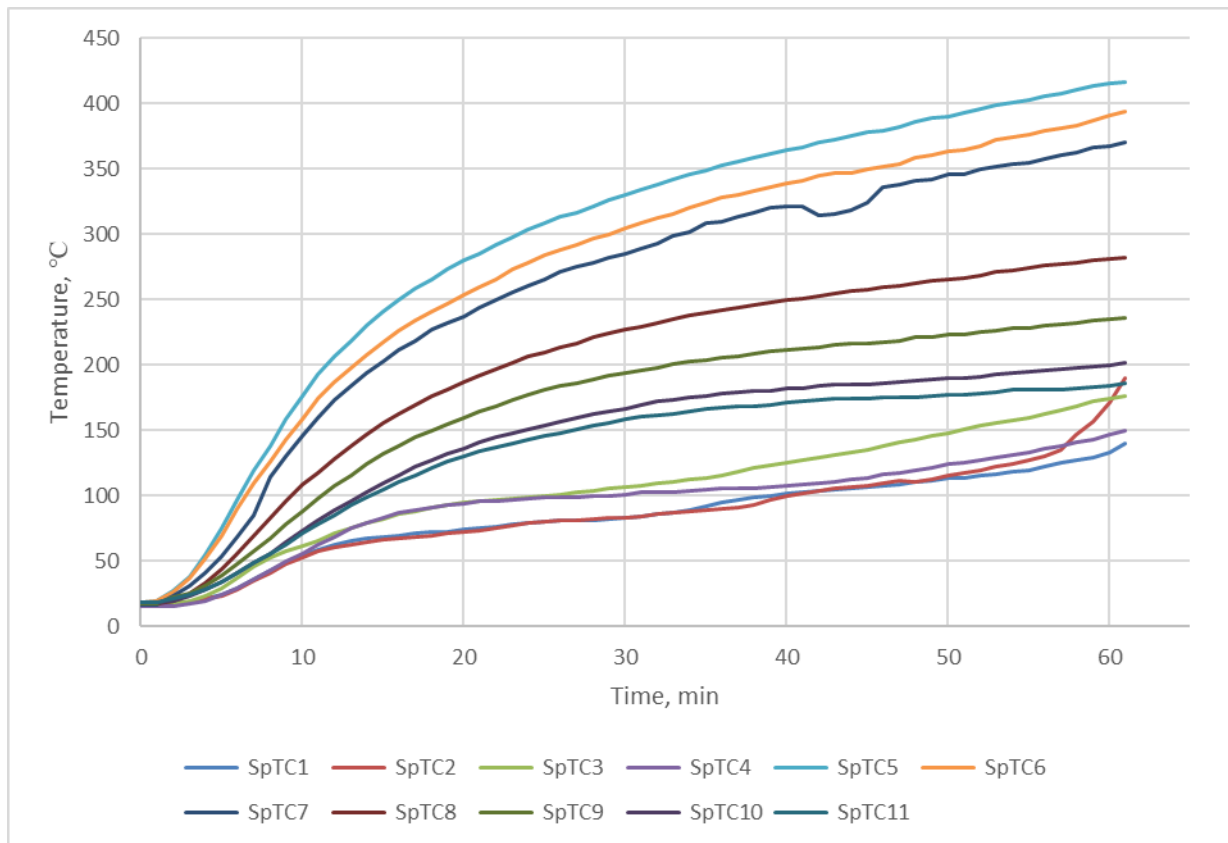


Figure 4 – Specimen 1 thermocouple readings

6.3 Specimen 2

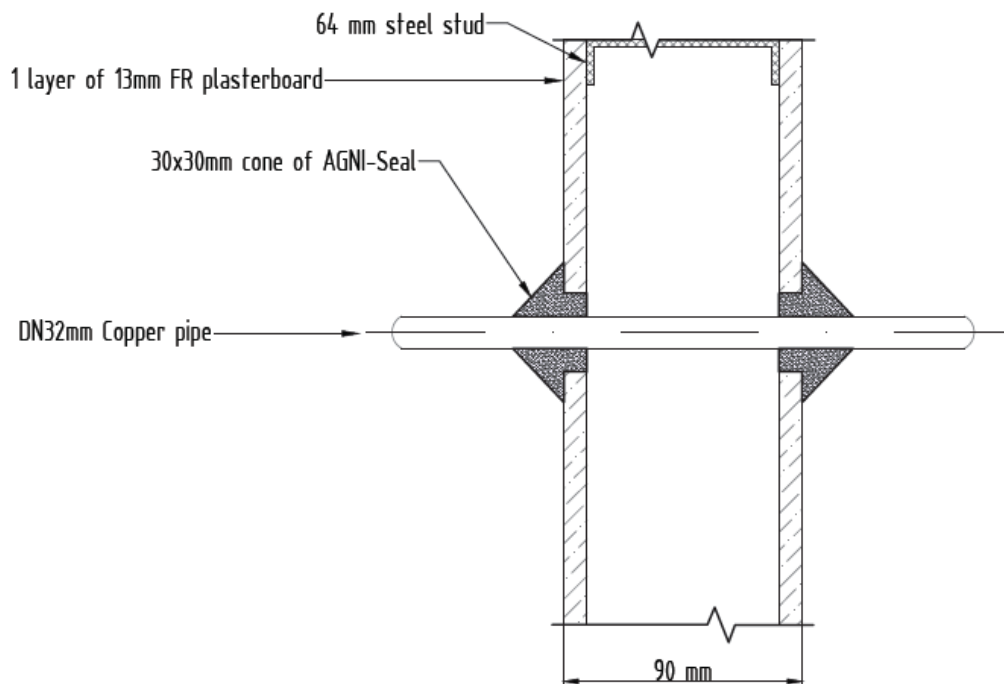


Figure 5 – Specimen 2

Service penetration details	
Service	DN32 Copper Tube
Service Support	Unistrut structure at 360mm
Aperture Diameter	53mm
Annular Spacing	Min: 9.5mm, Max: 11.5mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space and a 30mm × 30mm cone of sealant between pipe and separating element.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	24 minutes

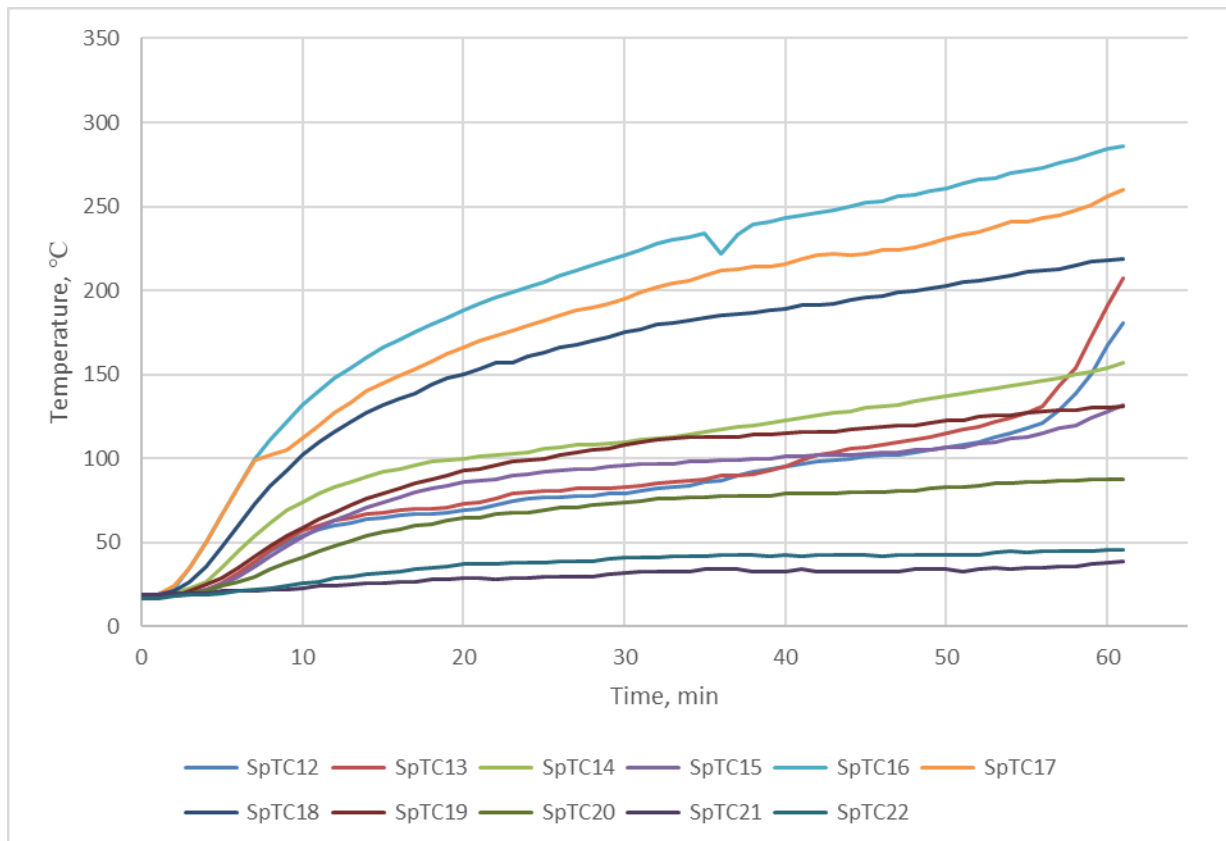


Figure 6 – Specimen 2 thermocouple readings

6.4 Specimen 3

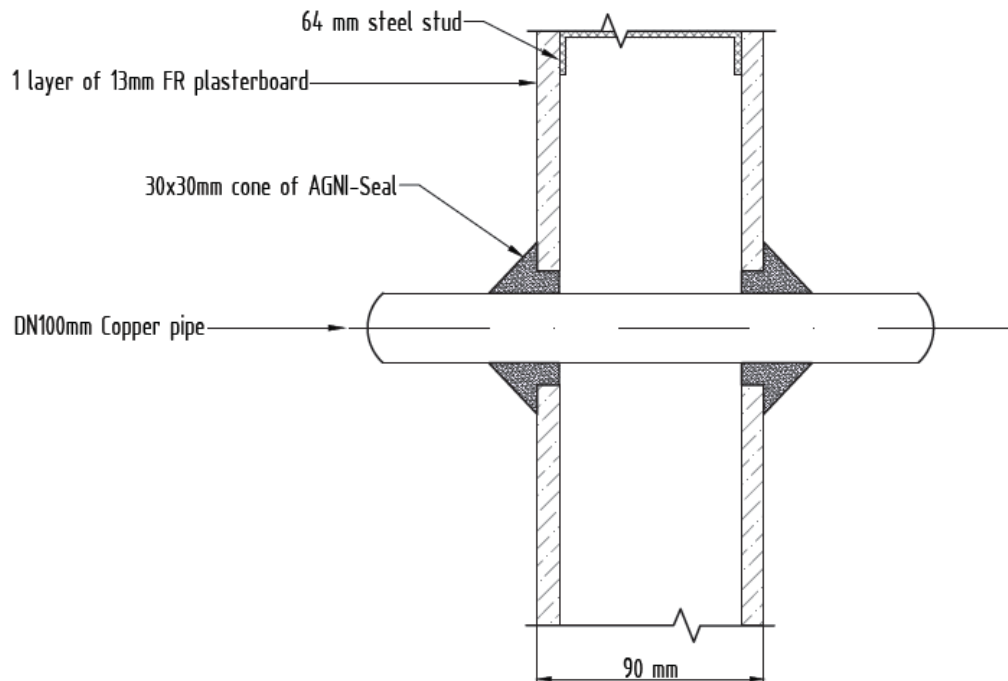


Figure 7 – Specimen 3

Service penetration details	
Service	DN100 Copper Tube
Service Support	Unistrut structure at 360mm
Aperture Diameter	120mm
Annular Spacing	Min: 6mm, Max: 9mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space and a 30mm × 30mm cone of sealant between pipe and separating element.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	10 minutes

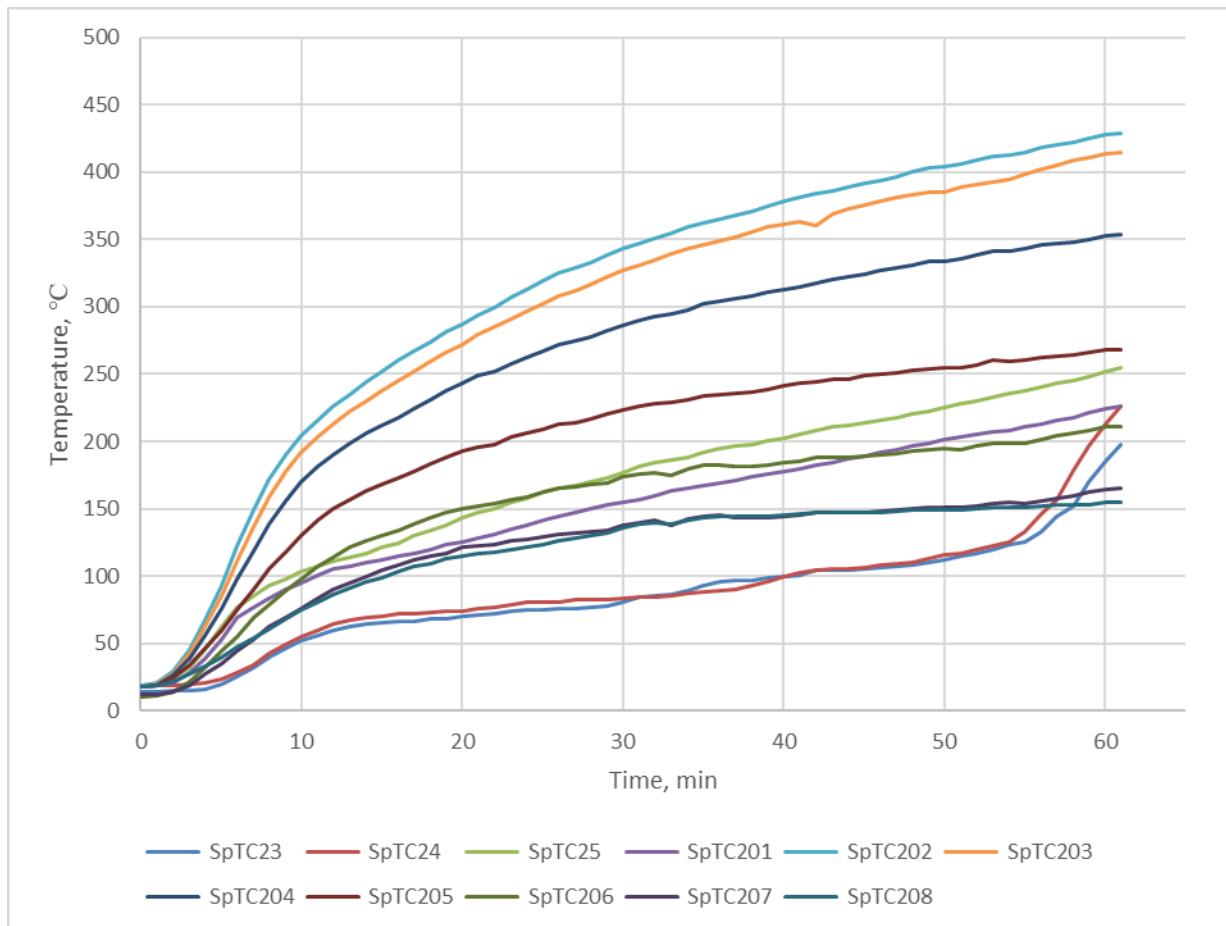


Figure 8 – Specimen 3 thermocouple readings

6.5 Specimen 4

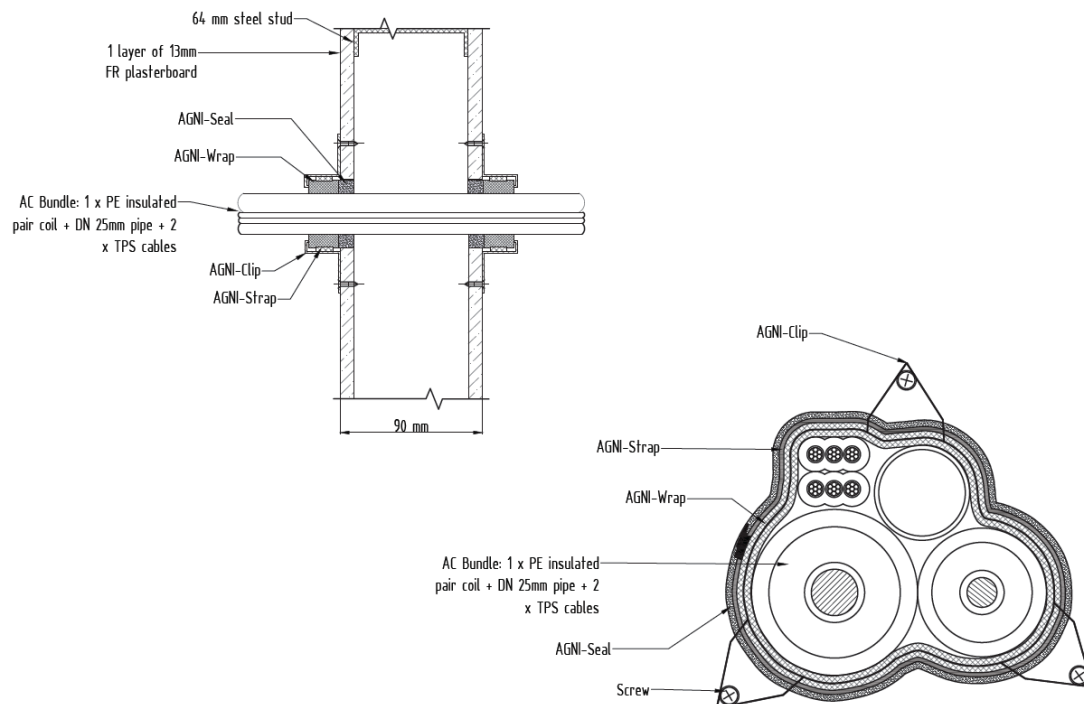


Figure 9 – Specimen 4

Service penetration details	
Service	PE Insulated Pair Coil + 25mm Pipe + 2 TPS Cables
Service Support	Unistrut structure at 360mm
Aperture Diameter	70mm
Annular Spacing	Min: 3mm, Max: 16mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space, AGNI-Wrap wrapped around the HAVC bundle twice with 10mm overlap. The AGNI-Wrap was secured using a cable tie then fixed to the separating element with 3 screw and clip fixings.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	42 minutes

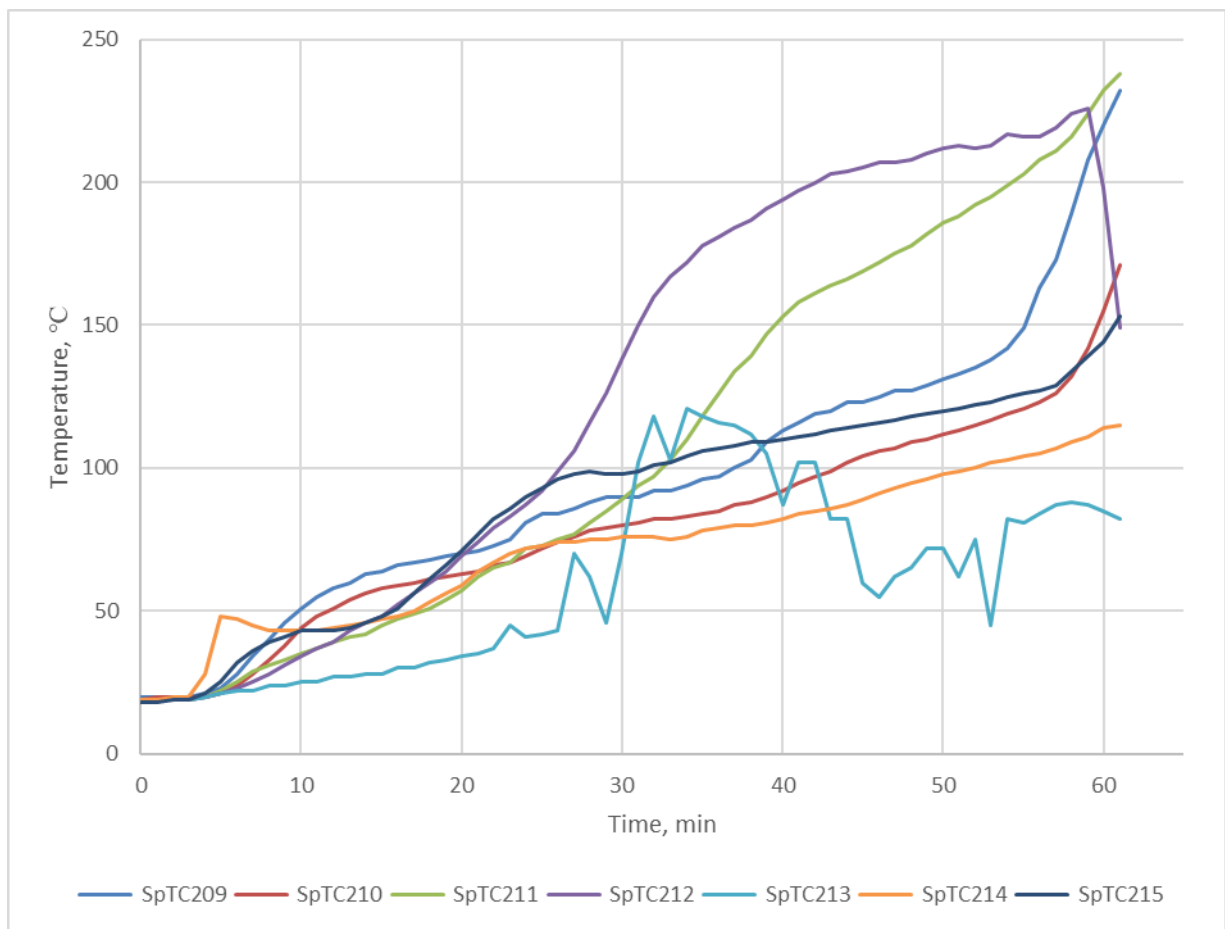


Figure 10 – Specimen 4 thermocouple readings

6.6 Specimen 5

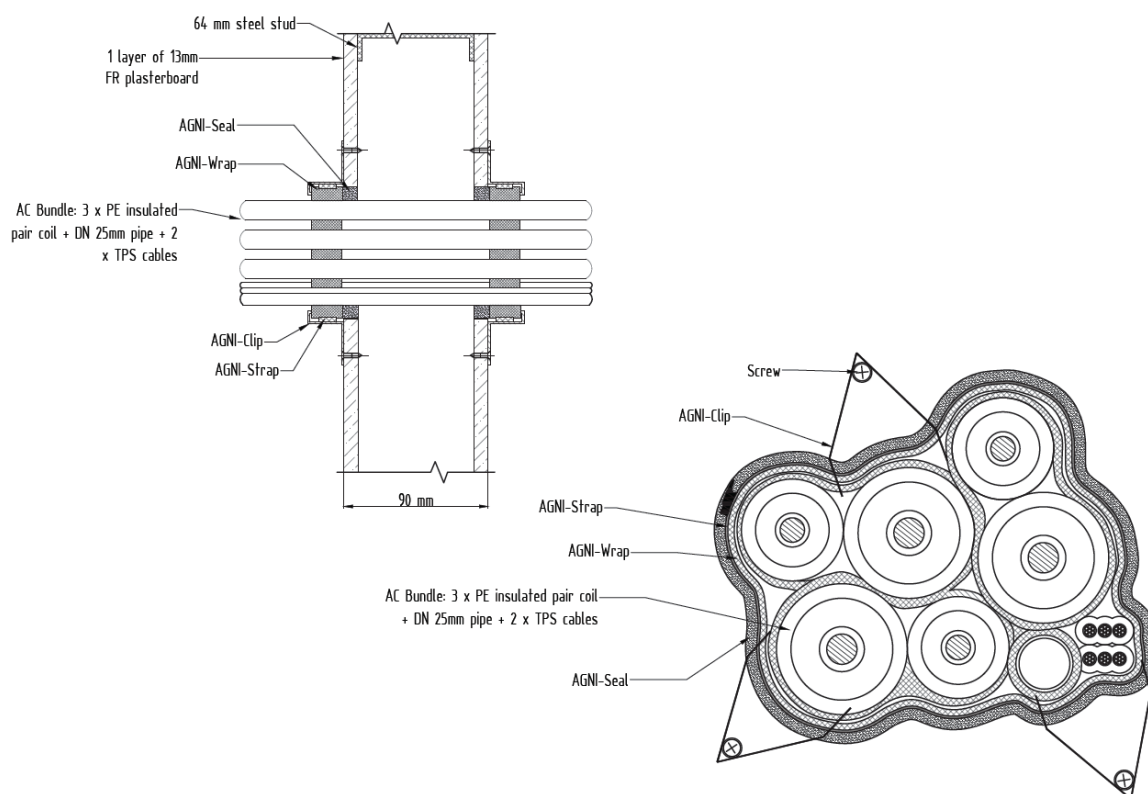


Figure 11 – Specimen 5

Service penetration details	
Service	3 PE insulated Pair Coils + 25mm Pipe + 2 TPS Cables
Service Support	Unistrut structure at 530mm
Aperture Diameter	115mm
Annular Spacing	Min: 8mm, Max: 30mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space. AGNI-Wrap wrapped 2 pair coils individually with 10mm overlap. AGNI-Wrap wrapped a bundle of pair coil, 25mm OD pipe and 2 TPS cables with 10mm overlap. AGNI-Wrap wrapped the wrapped pair coils and bundle with 10mm overlap. AGNI-Wrap was secured with a cable tie and fixed to separating element with 3 screw and clip fixings.

Test results

Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	31 minutes

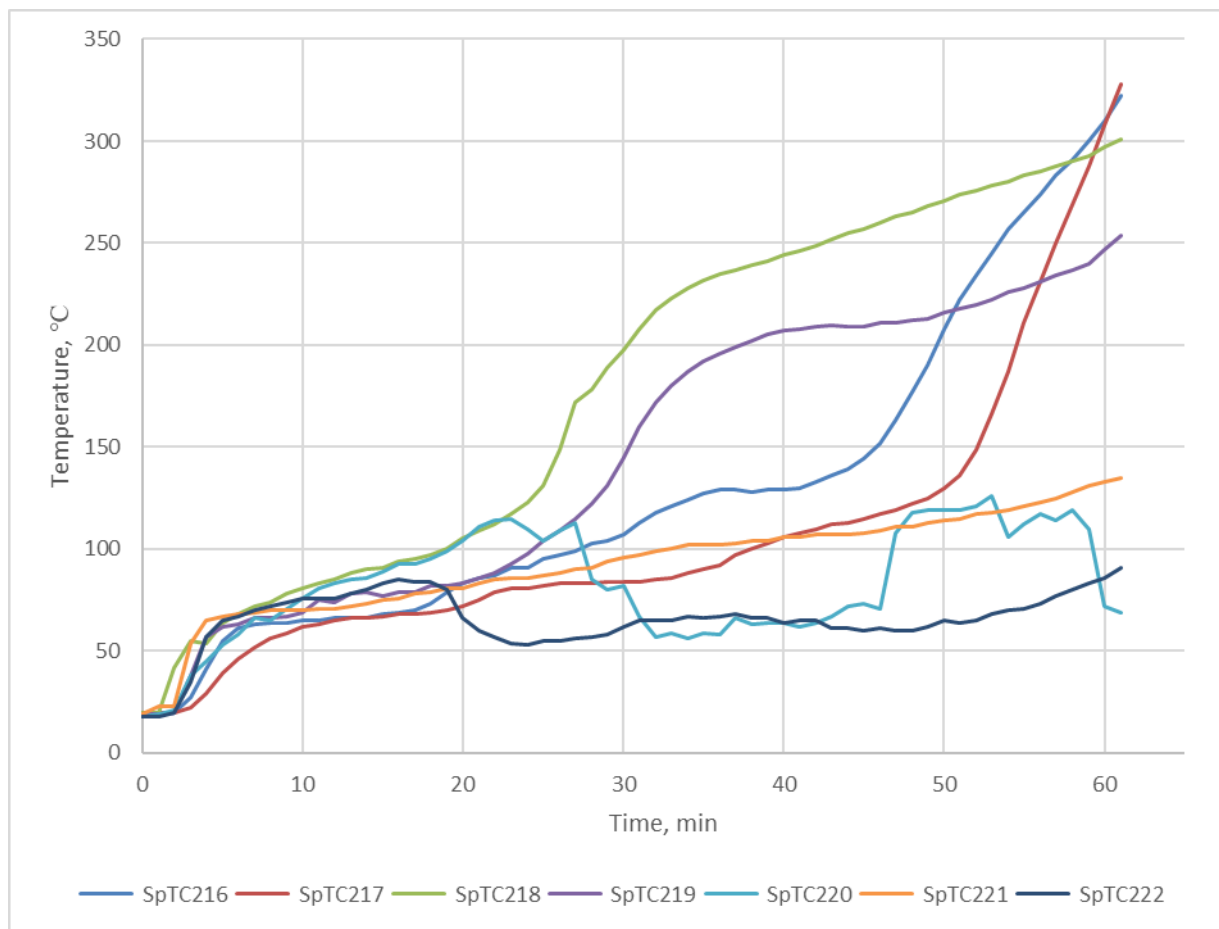


Figure 12 – Specimen 5 thermocouple readings

6.7 Specimen 6

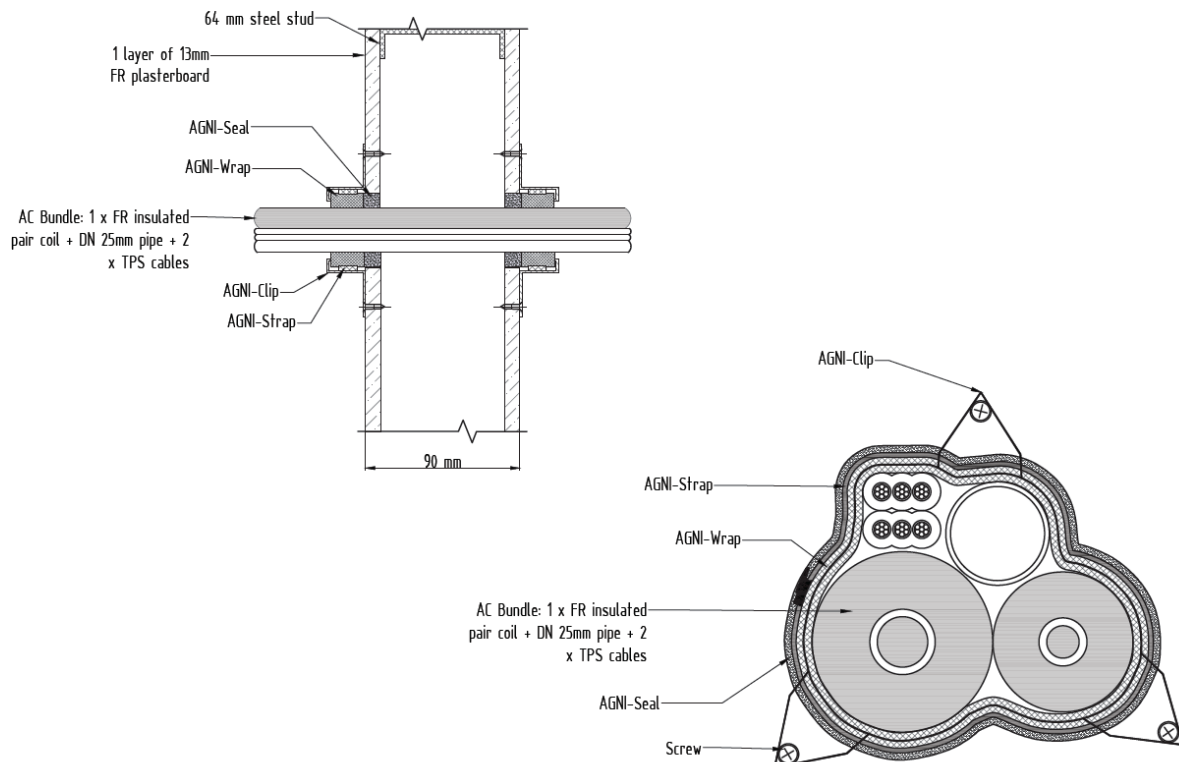


Figure 13 – Specimen 6

Service penetration details	
Service	Fire Retardant Pair Coil + 25mm Pipe + 2 TPS Cables
Service Support	Unistrut structure at 360mm
Aperture Diameter	102mm
Annular Spacing	Min: 12mm, Max: 29mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space, AGNI-Wrap wrapped around the HAVC bundle twice with 10mm overlap. The AGNI-Wrap was secured using a cable tie then fixed to the separating element with 3 screw and clip fixings.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	60 minutes

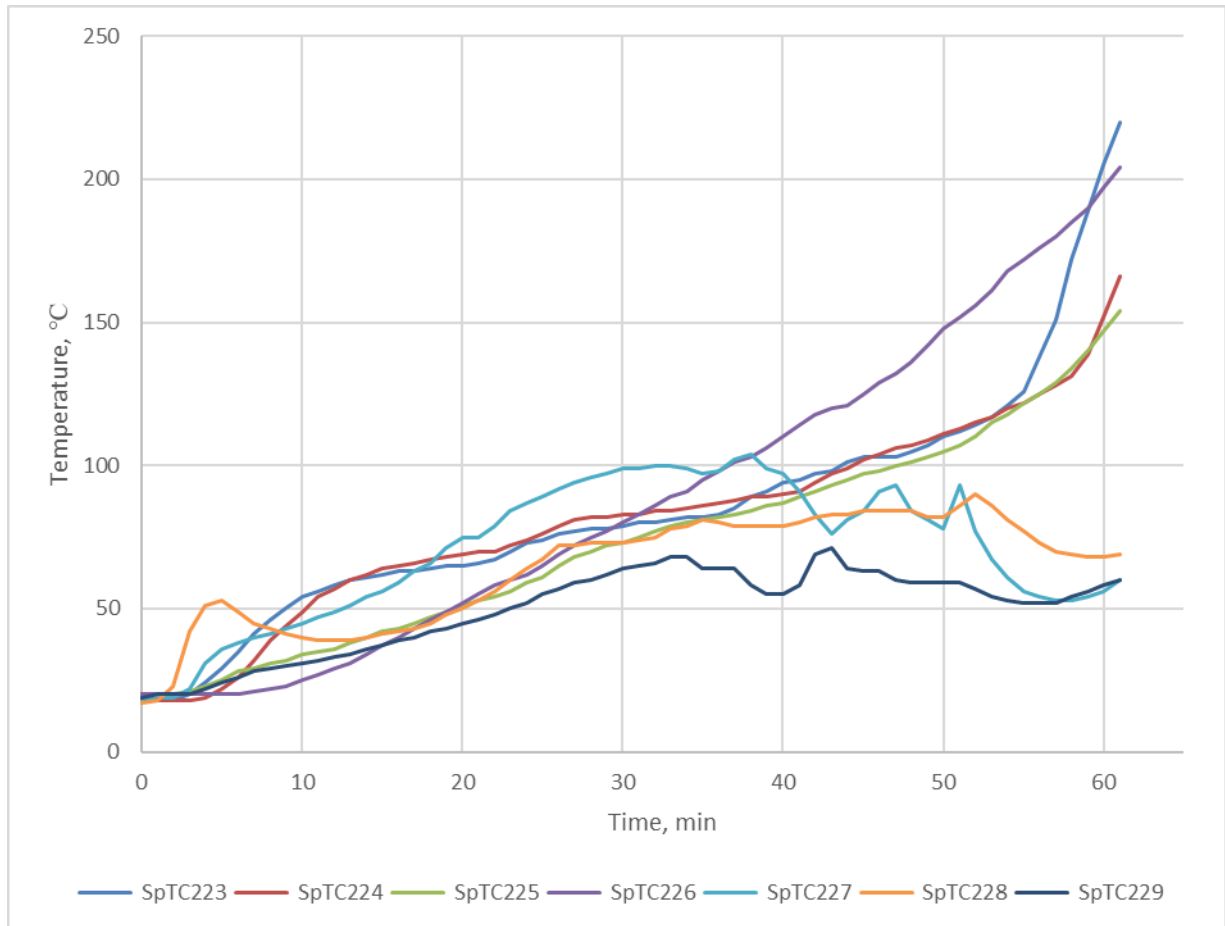


Figure 14 – Specimen 6 thermocouple readings

6.8 Specimen 7

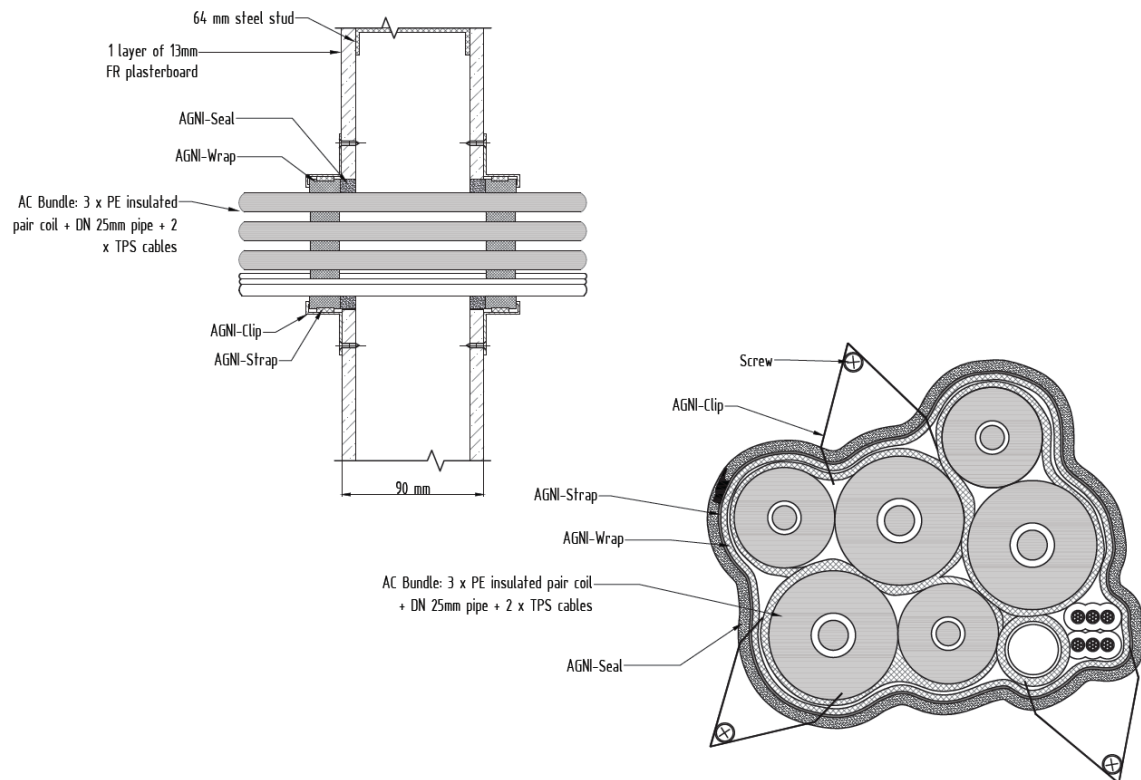


Figure 15 – Specimen 7

Service penetration details	
Service	Three Fire Retardant Pair Coils + 25mm Pipe + 2 TPS Cables
Service Support	Unistrut structure at 360mm
Aperture Diameter	140mm
Annular Spacing	Min: 6mm, Max: 18mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space. AGNI-Wrap wrapped 2 pair coils individually with 10mm overlap. AGNI-Wrap wrapped bundle of pair coil, 25mm OD pipe and 2 TPS cables with 10mm overlap. AGNI-Wrap wrapped the wrapped pair coils and bundle with 10mm overlap. AGNI-Wrap was secured with a cable tie and fixed to separating element with 3 screw and clip fixings.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	54 minutes

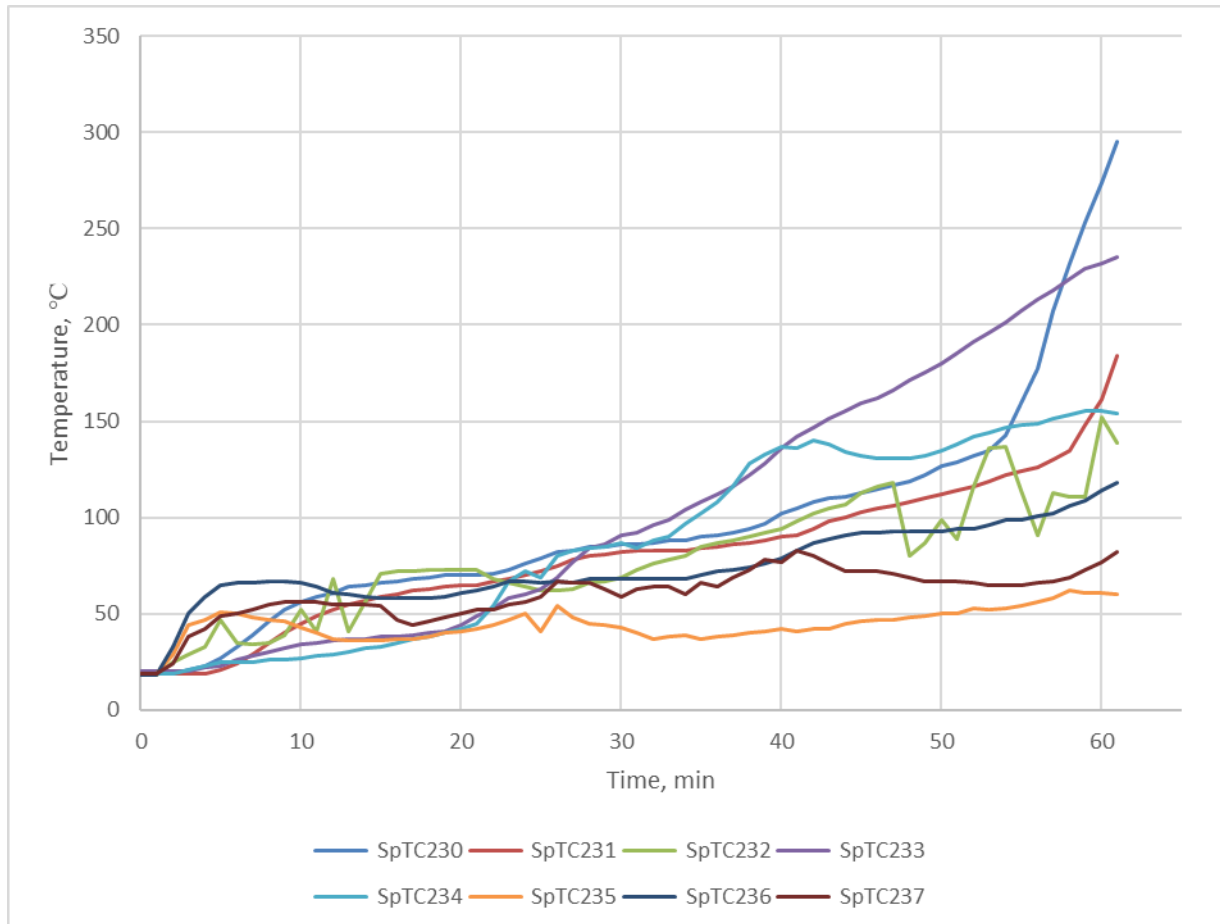


Figure 16 – Specimen 7 thermocouple readings

6.9 Specimen 8

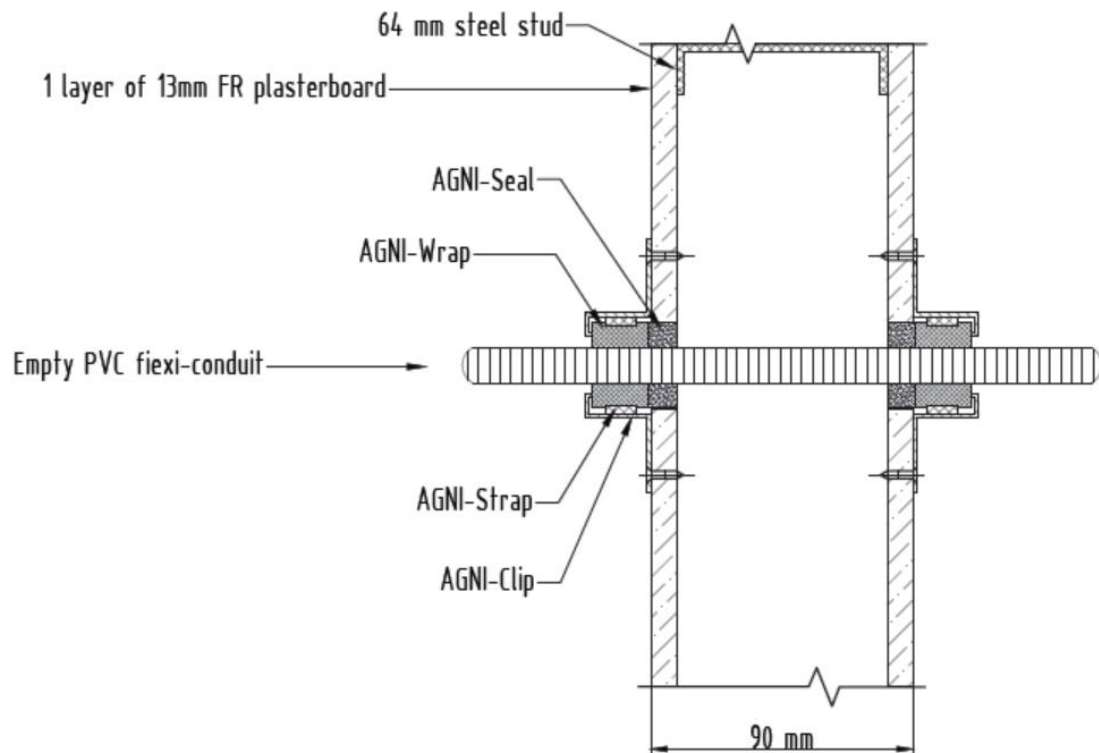


Figure 17 – Specimen 8

Service penetration details	
Service	25mm uPVC Flexible Conduit
Service Support	Unistrut structure at 530mm and 1800mm
Aperture Diameter	55.5mm
Annular Spacing	Min: 14.5mm, Max: 16mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space, AGNI-Wrap wrapped around the conduit with 10mm overlap. AGNI-Wrap was secured using a cable tie then fixed to the separating element with 2 screw and clip fixings.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	54 minutes

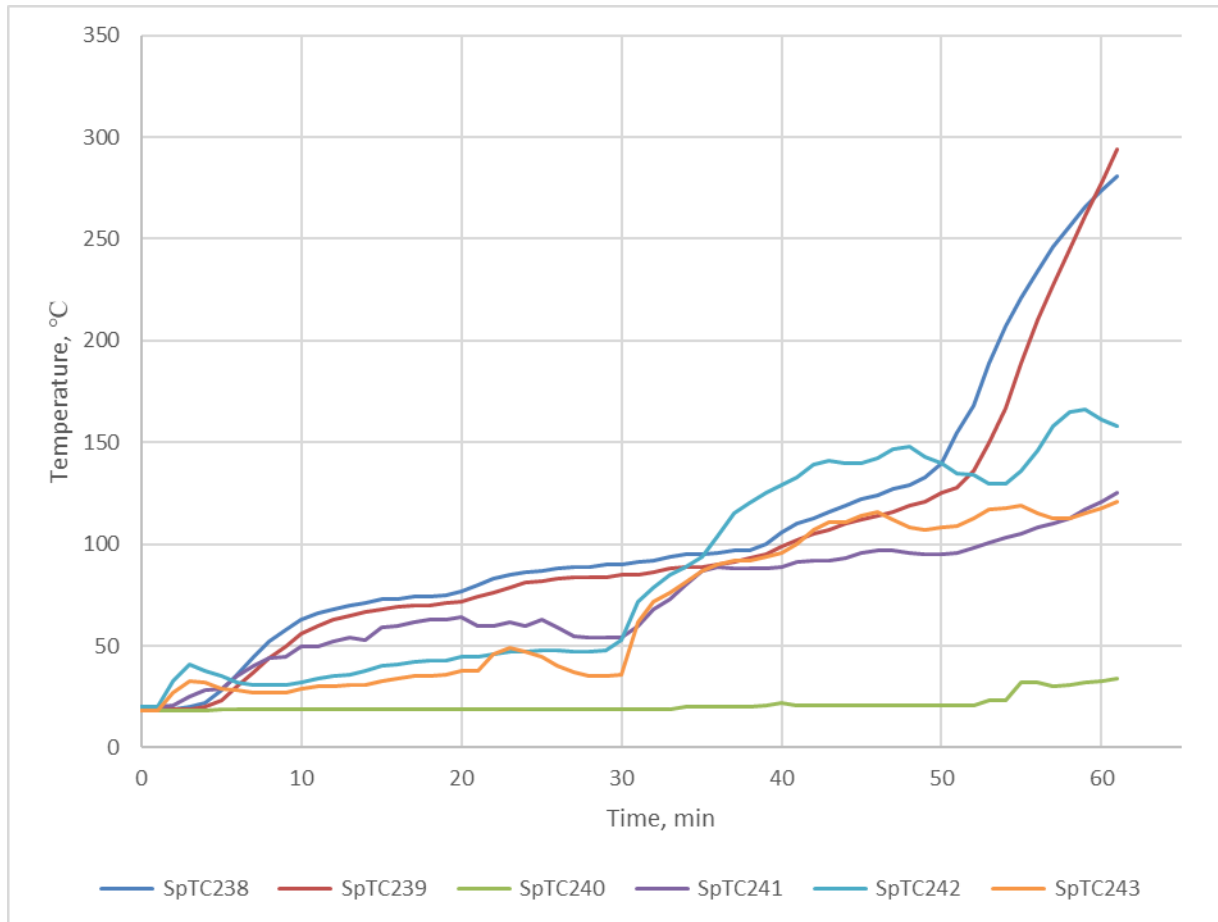


Figure 18 – Specimen 8 thermocouple readings

6.10 Specimen 9

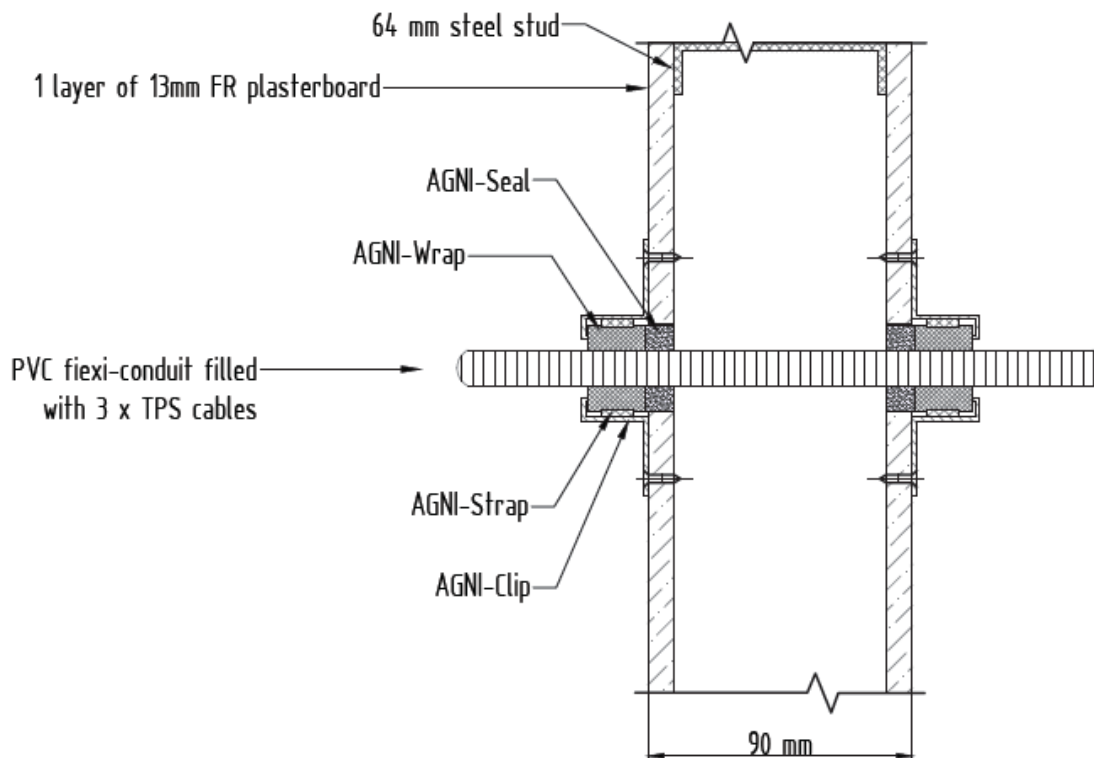


Figure 19 – Specimen 9

Service penetration details	
Service	25mm uPVC Flexible Conduit filled with 3 × 2.5mm ² 2C+E Flat TPS Cables
Service Support	Unistrut structure at 530mm and 1800mm
Aperture Diameter	56mm
Annular Spacing	Min: 14.5mm, Max: 16.5mm

Local Fire-stopping system	
Application	Symmetrical – installed on both faces of separating element
System description	13mm (nominal) deep seal in annular space, AGNI-Wrap wrapped around the conduit with 10mm overlap. AGNI-Wrap was secured using a cable tie then fixed to the separating element with 2 screw and clip fixings.

Test results	
Structural adequacy	Not applicable
Integrity	No failure at 61 minutes
Insulation	57 minutes

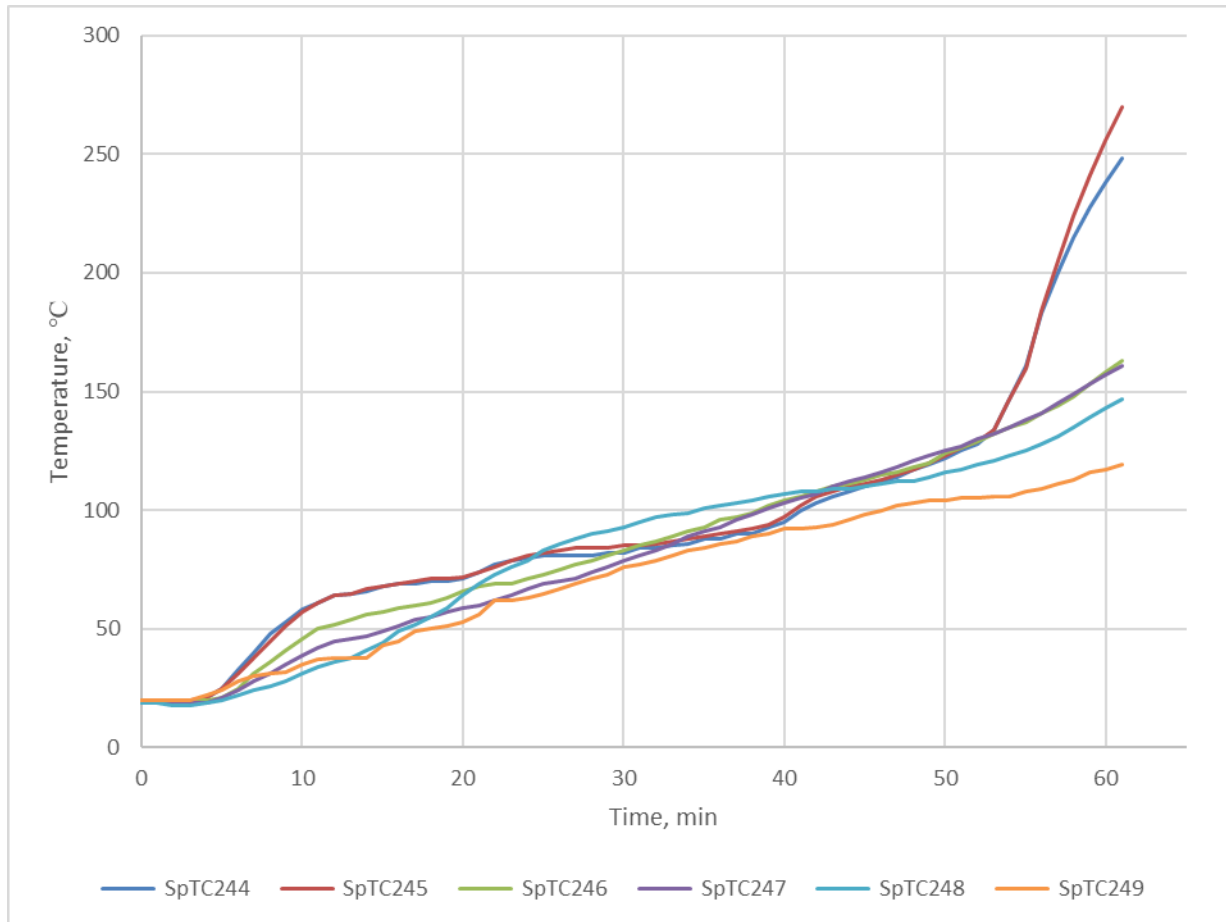


Figure 20 – Specimen 9 thermocouple readings

7. Photos

7.1 Photos before the test

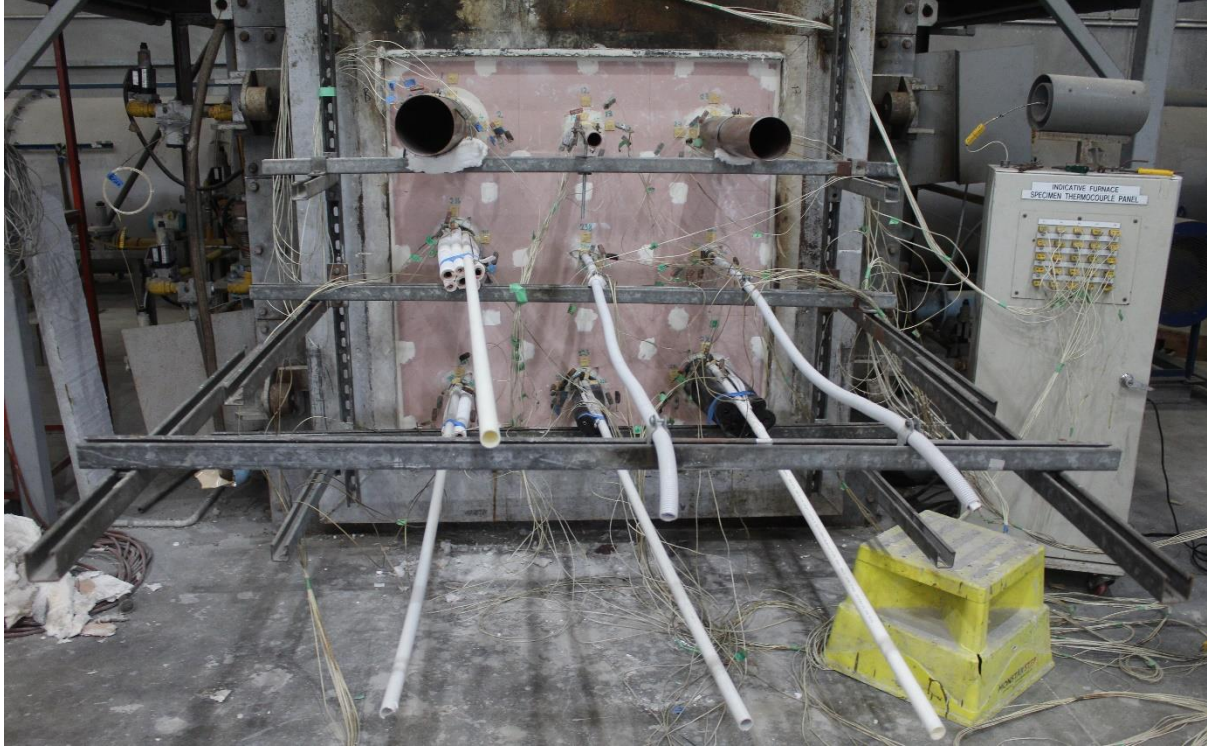


Figure 22 – Unexposed face prior to test commencement



Figure 23 –Exposed face prior to test commencement

7.2 During and after the test



Figure 24 – Unexposed face at 15 minutes

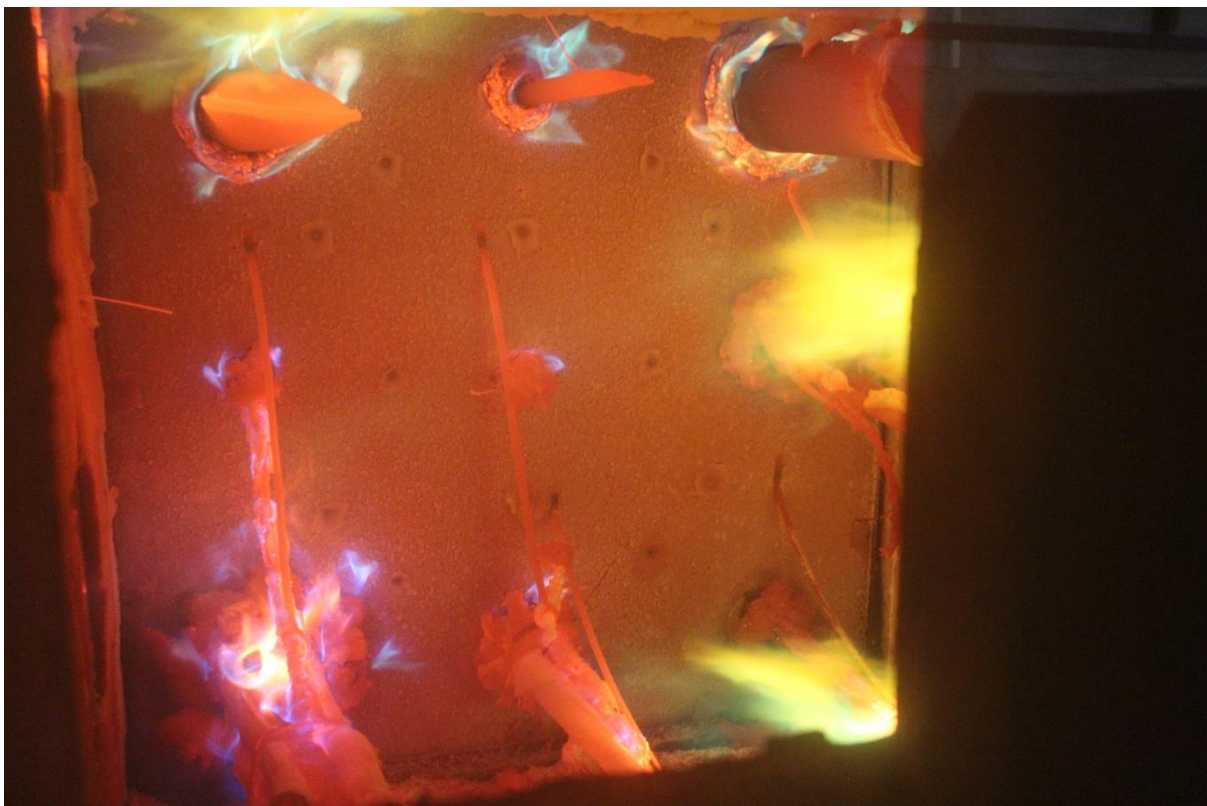


Figure 25 – Exposed face at 15 minutes



Figure 26 – Unexposed face at 30 minutes

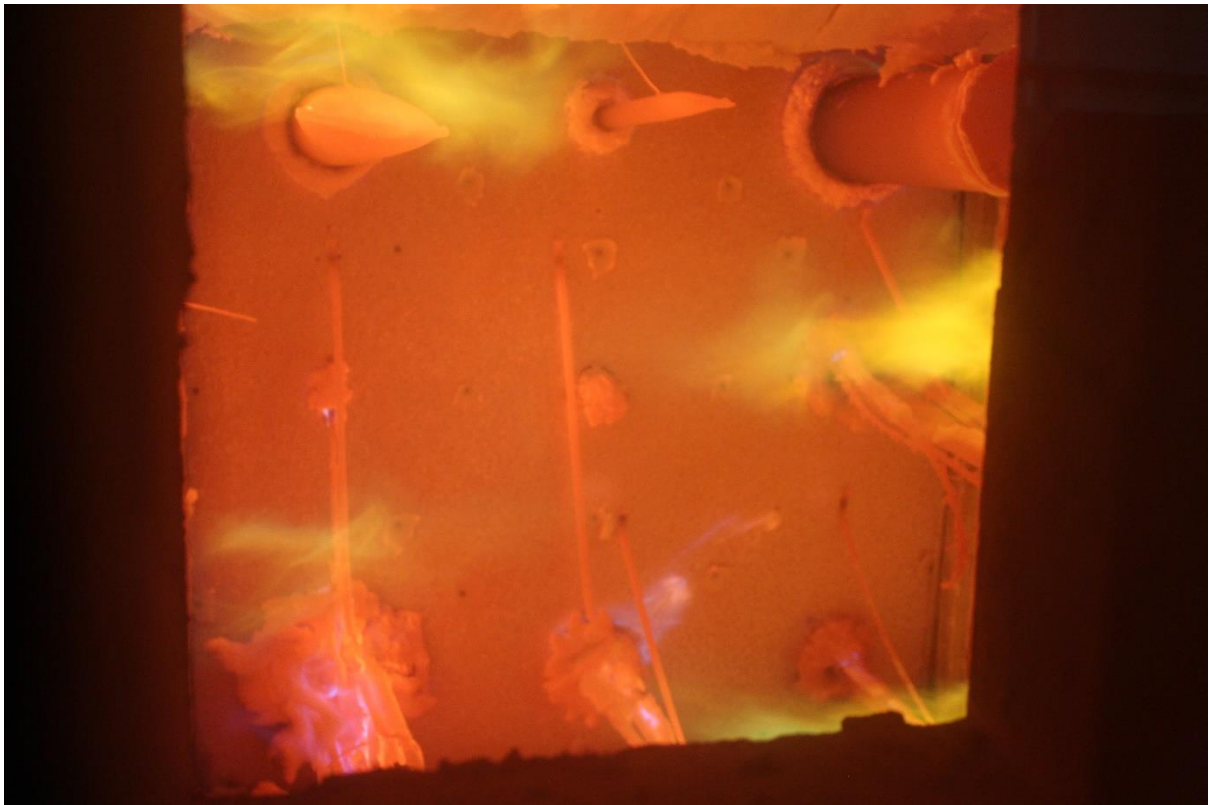


Figure 27 – Exposed face at 30 minutes

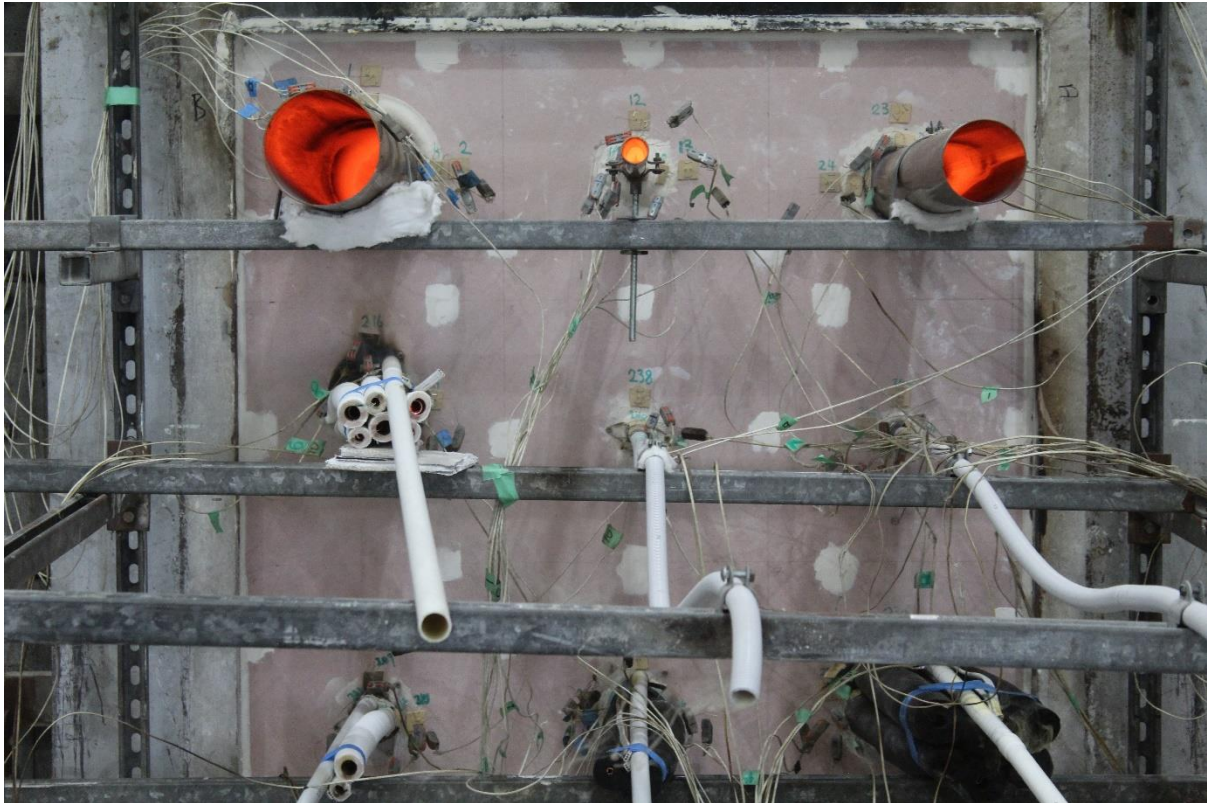


Figure 28 – Unexposed face at 45 minutes

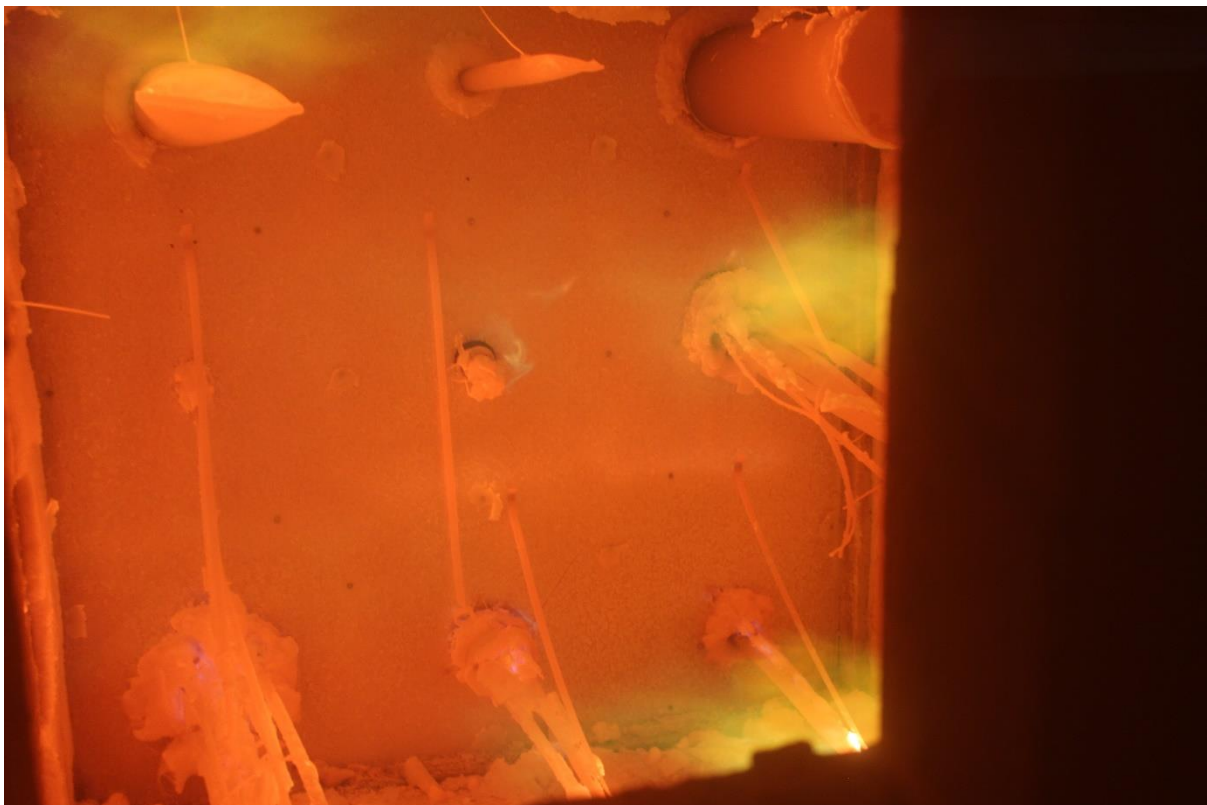


Figure 29 – Exposed face at 45 minutes



Figure 30 – Unexposed face at 60 minutes



Figure 31 – Exposed face after the test