

Test report # PF22053

Test Number 22053

Client: Boss Products (Australia) Pty Ltd

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

Test method: AS 1530.4:2014

Report Date 17/10/2022



1. Table of Contents

1. Table of Contents	2
1.1 Document revision schedule	3
1.2 Signatories	3
2. Contact details.....	4
2.1 IANZ registered Testing Authority	4
2.2 Client/Applicant	4
2.3 Manufacturer/Supplier	4
3. Test Results	5
4. Test Details	6
5. Equipment	8
6. Test Conditions.....	9
6.1 Furnace Temperature	9
6.2 Ambient Temperature	9
6.3 Pressure Readings.....	10
7. Schedule of materials.....	11
8. Separating element	14
9. Test Specimens instrumentation	15
9.1 Thermocouple Positions Table	15
10. Observations	16
11. Specimen	17
12. Additional photographs.....	20
12.1 During and after the test	20

1.1 Document revision schedule

Revision #	Date	Description
1	06/10/2022	Initial Issue for Client review
2	17/10/2022	Reviewed as per Client request. Issued

1.2 Signatories

Report	Name	Signature	Date
Prepared by:	Alexey Kokorin (Technical Manager)		17/10/2022
Authorized by:	Andrew Bain (Authorized signatory)		17/10/2022



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

2. Contact details

2.1 IANZ registered Testing Authority

Fire TS Lab - Passive Fire Inspection and Test Services Ltd

Accreditation N°: 1335

1/113 Pavilion Drive, Mangere, Auckland, 2022

New Zealand

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

2.2 Client/Applicant

Boss Products (Australia) Pty Ltd

Unit 1, 16 Atkinson Rd, Taren Point NSW 2229

Australia

E-mail: John.bacon@bossfire.com.au

2.3 Manufacturer/Supplier

PFP materials:

Boss Products (Australia) Pty Ltd

Unit 1, 16 Atkinson Rd, Taren Point NSW 2229

Australia

3. Test Results

Service	Actual Integrity (min)	Actual insulation (min)	FRL
HST300/15 C-Purlin	128 NF	128 NF	-/120/120

The specimen had symmetrical assembly

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 1530.4-2014 Section 10 Service penetrations and control joints

Documentation:

Testing products were verified and tested based on Client description, refer to Specimens description in current report.

Testing date:

20/09/2022

Installation completion date:

30/08/2022

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 representative. 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 128 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.

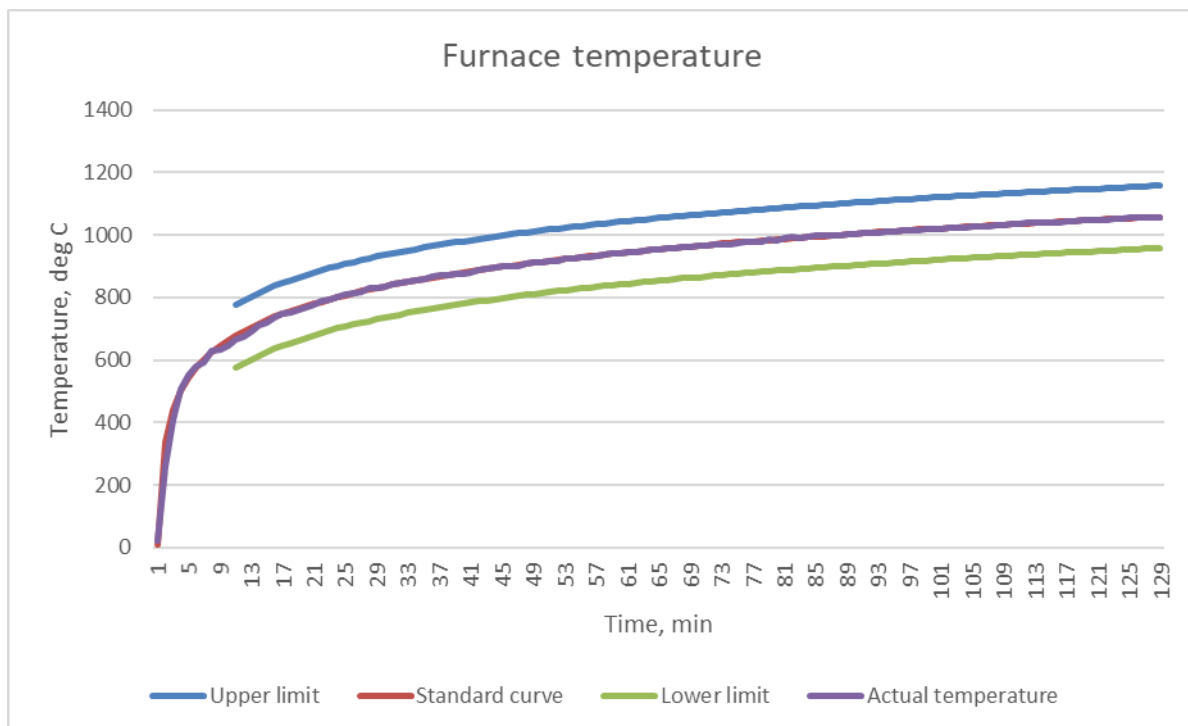
Dimensional measurements:

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.

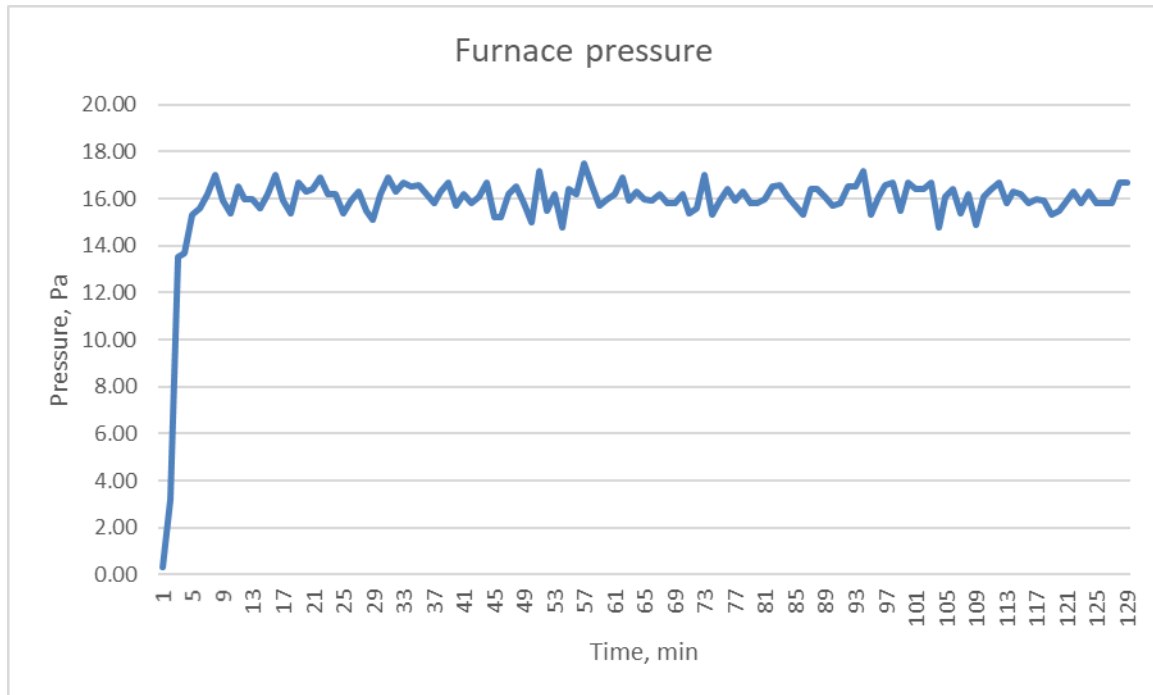


6.2 Ambient Temperature

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

6.3 Pressure Readings

The probe was located 500mm above the furnace floor.



7. Schedule of materials

Separating Element		
1.1	Item / Product Name	92mm Steel Stud with 2x layers of 13mm plasterboard each side
	Measurements	Width / Height (W/H): 1200mm x 1200mm
		Thickness (T): 142mm
1.2	Item / Product Name	Rondo 92mm Stud
	Measurements	Width / Height (W/H): 92mm x 35.5mm
		Thickness (T): 0.75mm
	Installation	Used to construct separating element
1.3	Item / Product Name	Rondo 92mm Deflection Head Track
	Measurements	Width / Height (W/H): 92mm x 50mm
		Thickness (T): 0.75mm
	Installation	Used to construct separating element
1.4	Item / Product Name	GIB Fyrelite Plasterboard
	Measurements	Width / Height (W/H): 1200mm x 3000mm
		Thickness (T): 13mm
	Installation	Used to construct separating element

Services		
2.2	Item / Product Name	C-Steel Purlin (HST300/15)
	Measurements	Width / Height (W/H): 100mm x 300mm
		Thickness (T): 1.45mm
	Additional Info	Specimen B

Sealants		
3.1	Item / Product Name	BOSS Firemastic-300
	Measurements	600mL Tube
	Installation	Applied to perimeter of boards
3.2	Item / Product Name	BOSS Ablative Coating
	Measurements	5L bucket
	Installation	Applied to uncoated edges of batts
Fixings		
4.1	Item / Product Name	Potters Flat head Self tapping Screws.
	Measurements	17.25mm, 10-16x16
	Installation	Used to fix frame components, used to fix brackets to firebox
4.2	Item / Product Name	GIB Grabber Self-Tapping Screws
	Measurements	32mm
	Installation	Used to fix plasterboard to frame
4.3	Item / Product Name	GIB Grabber Self-Tapping Screws
	Measurements	41mm
	Installation	Used to fix plasterboard to frame
4.6	Item / Product Name	Zenith Bugle Head Timber Batten Screws
	Measurements	14-10x100mm
	Installation	Used to fix batts to separating element
4.7	Item / Product Name	Zenith Flat Washer
	Measurements	1/4" x 5/8"
	Installation	Used to fix batts to separating element

Fire Stopping Materials		
5.1	Item / Product Name	BOSS Batt
	Measurements	Width / Height (W/H): 600mm x 1200mm

		Thickness (T): 50mm (nominal)
	Installation	Installed in square aperture, installed into and around Purlin
5.2	Item / Product Name	BOSS Thermal Defence Wrap
	Measurements	Width (W): 300mm
		Thickness (T): 6.5mm (nominal)
	Installation	Installed around purlin

8. Separating element

The separating element was constructed by the laboratory following drawings supplied by the client. The frame consisted of two studs, top and bottom plates, four nogs, and jack studs between nogs.

The steel framing was fixed using screws (4.1). The steel frame was lined with two layers of plasterboard (1.4) on both the unexposed and exposed faces. The first layer of plasterboard was fixed with screws (4.2) at 600mm. The second layer of plasterboard was fixed with screws (4.3) at 300mm. Screw holes were finished with GIB Trade Finish Plaster. The apertures were cut from the plasterboard, flush with the steel frame, resulting in the following apertures: 170mm x 325mm

9. Test Specimens instrumentation

9.1 Thermocouple Positions Table

TC#	THERMOCOUPLE LOCATION DESCRIPTION
11	On separating element, mid-width of Batt, 25mm above the Batt
12	On separating element, mid-height of Batt, 25mm left of the Batt
13	On top edge of Batt, mid-width of batt, mid-depth of batt
14	On right edge of Batt, mid-height of batt, mid-depth of batt
15	On Batt, mid-width of batt, 25mm below top edge of batt
16	On Batt, mid-height of batt, 25mm left of right edge of batt
17	On top side of wrap, mid-width of purlin, 25mm from the batt
18	On right side of wrap, mid-height of purlin, 25mm from the batt
19	On top side of purlin, mid-width of purlin, 25mm from end of wrap
20	On right side of purlin, inside channel opening, mid-height of purlin, 25mm from end of wrap
21	On batts within purlin, mid-width of batts, mid height of batts
22	On top side of wrap, mid-width of purlin, 255mm from the batt
23	On right side of wrap, mid-height of purlin, 255mm from the batt
24	On top side of wrap, mid-width of purlin, 305mm from the batt
25	On right side of wrap, mid-height of purlin, 305mm from the batt
212	On top side of wrap, mid-width of purlin, 555mm from the batt
211	On separating element, mid-width of Specimen C, mid-height of specimen A

10. Observations

Time Minutes	Test Face	Observations
3	E	Combustion of the specimen
12	E	Wrap has combusted, visibly deteriorating
15	U	Visible smoke from junction between purlin and batt
30	U	Junction between batt and wrap is starting to open, visible discolouring
	E	Batt attached to separating element beginning to deform, batt inside purlin is flaming
45	U	No notable changes
45	E	Further cracking in batt attached to separating element
45	E	Flaming between batt attached to separating element and purlin
60	E/U	No notable changes
75	U	Visible smoke from end of purlin inside channel
90	E/U	No notable changes
105	E/U	No notable changes
115	E/U	No notable changes
128		TEST DISCONTINUED

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

11. Specimen

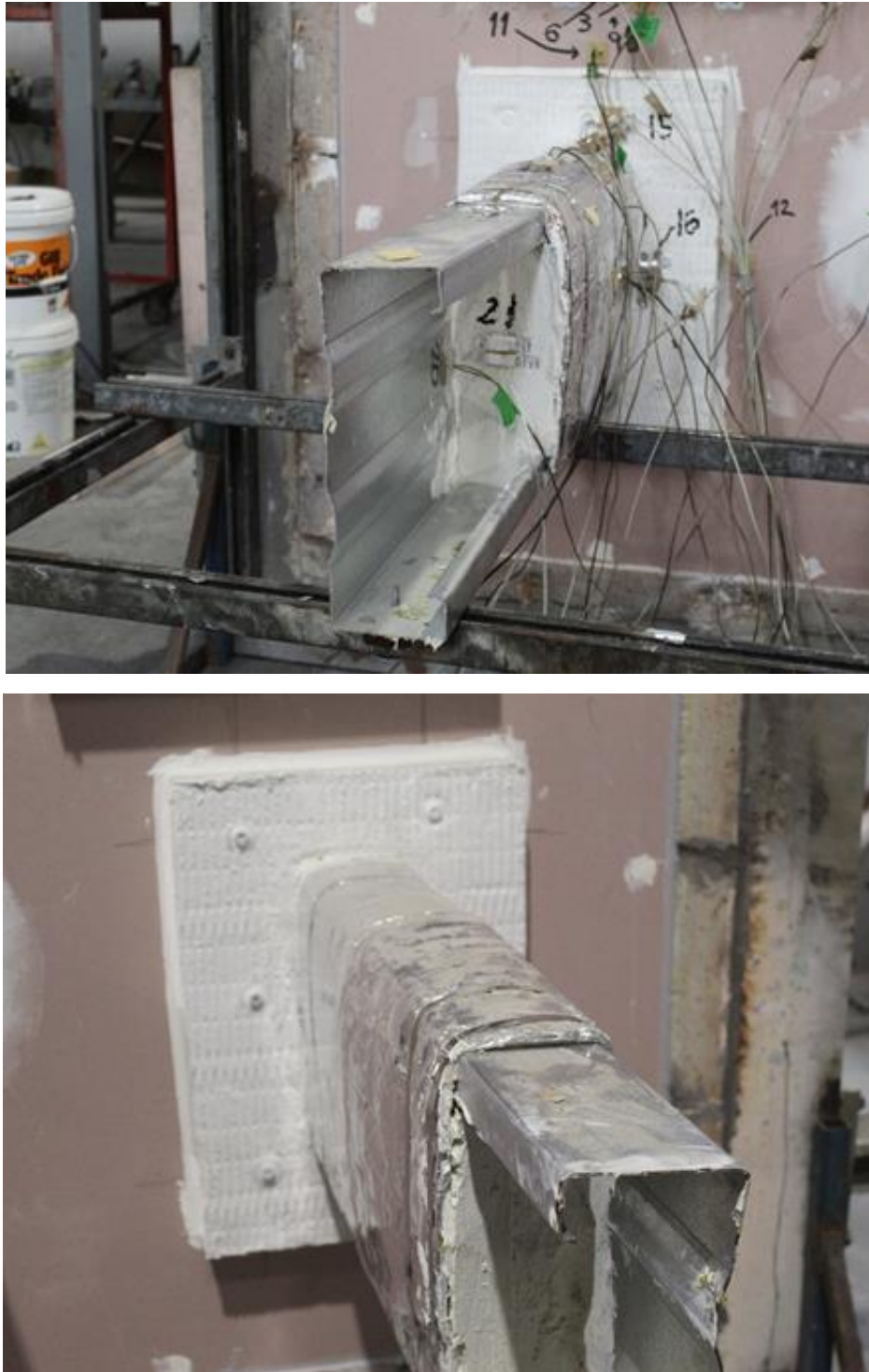


Fig. 3 – Unexposed and exposed face.

Penetration System		
	Service	HST300/15 C-Purlin
	Service Details	Purlin (2.2), Sealant (3.1), Sealant (3.2), Screws (4.6), Screws (4.7), Batt (5.1), Wrap (5.2)
	Service Support	Unistrut structure at 300mm and 750mm from separating element
	Aperture Size	170mm x 325mm
	Annular Spacing	Min: 0mm, Max: 35mm
	Local Fire-stopping Protection	
	Application	Symmetrical
	Protection Used	<p>The specimen was installed by client representatives, and observed by the laboratory. The Purlin (2.2) was inserted into the aperture, resting on the separating element, protruding 820mm from both faces of the separating element. Two batts (5.1) were trimmed to a size of 350mm x 475mm. The profile of the purlin was traced onto the batt, and cut along the profile. The exposed edges of the batt were painted with ablative coating (3.2). The batts were then placed around the purlin, pressed against the separating element. A bead of sealant (3.1) was applied between the batt and the separating element, beneath the batt. The batts were fixed to the separating element using six screws (4.6) and washers (4.7), approximately 125mm from the vertical edges of the batt. A bead of sealant was applied around the perimeter of the batt and the separating element.</p> <p>Two batts were inserted into the purlin opening, extending 580mm from the batt around the purlin. Exposed edges were painted with ablative coating. A bead of sealant was applied between the batts and the inside of the purlin.</p> <p>The purlin was wrapped with 1 layer of wrap (5.2), overlapping by 50mm. The wrap extended 300mm from the separating element. A second layer of wrap was installed on the purlin, overlapping the first layer by 20mm, and overlapping itself by 50mm. The junction between layers was joined with aluminium foil tape. The total length of the wrap extended 580mm from the batt around the purlin. The wrap was secured around the purlin with steel cable ties at 100mm, 480mm and 530mm from the batt around the purlin. A bead of sealant was applied between the wrap and the batt fixed to the separating element.</p>

Test results

Structural adequacy	Not applicable
Integrity	No failure at 128 min
Insulation	No failure at 128 min

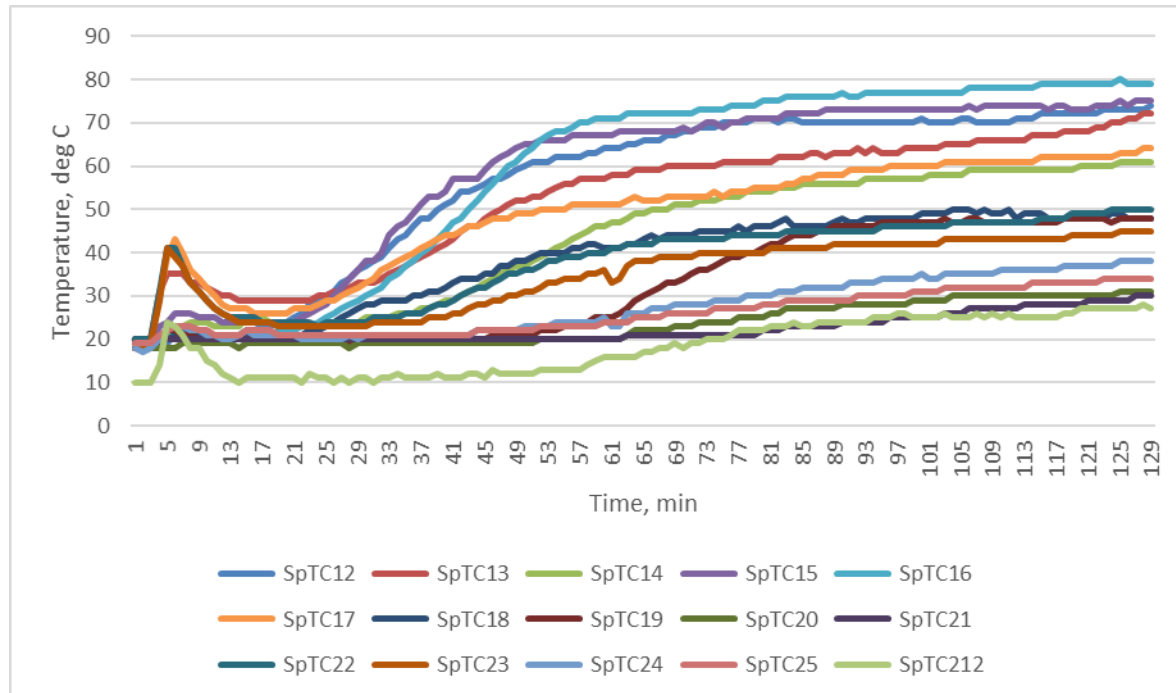


Fig. 4 –Thermocouples readings.

12. Additional photographs

12.1 During and after the test

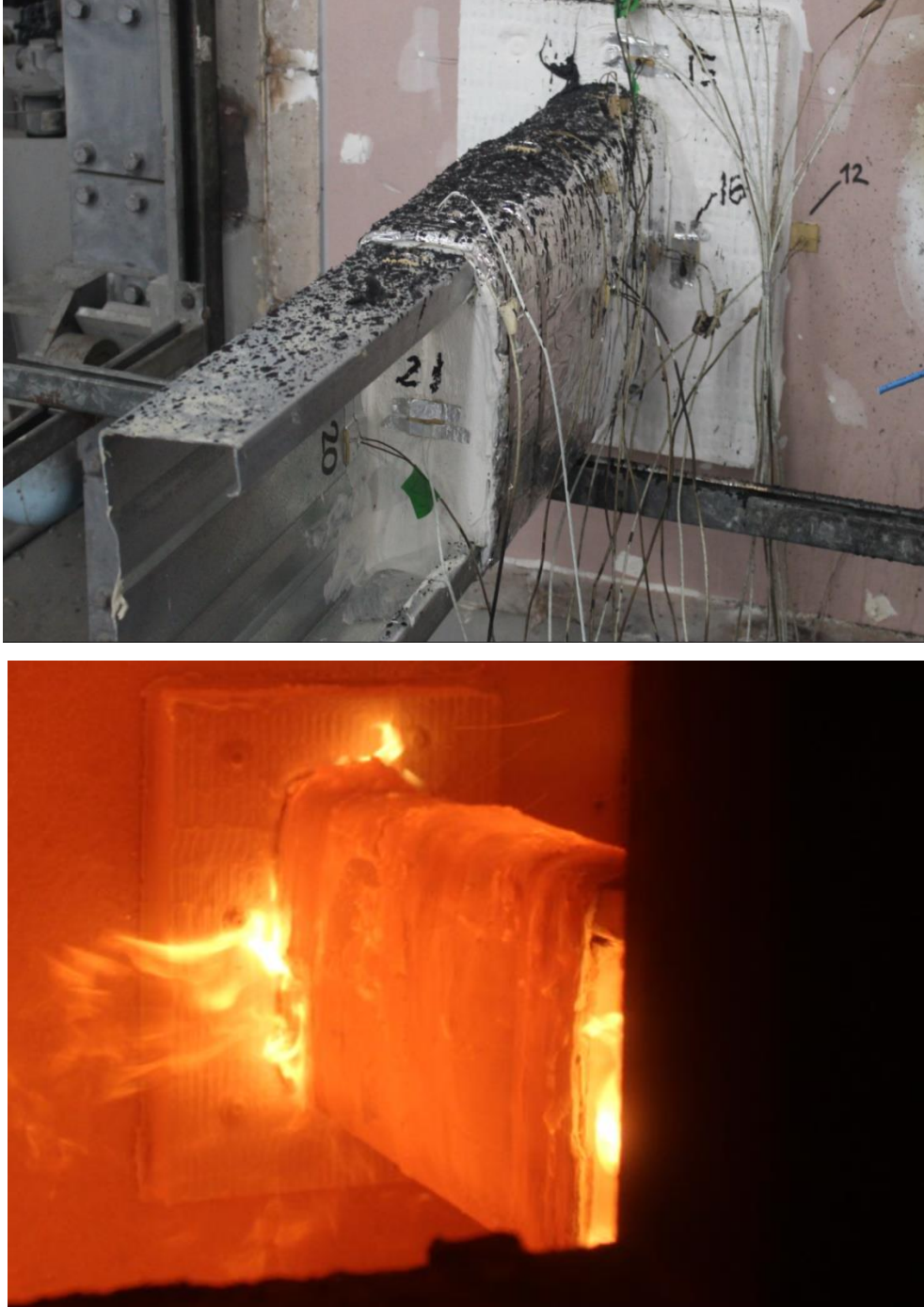


Fig. 5 – 30 minutes



Fig. 6 – 60 minutes

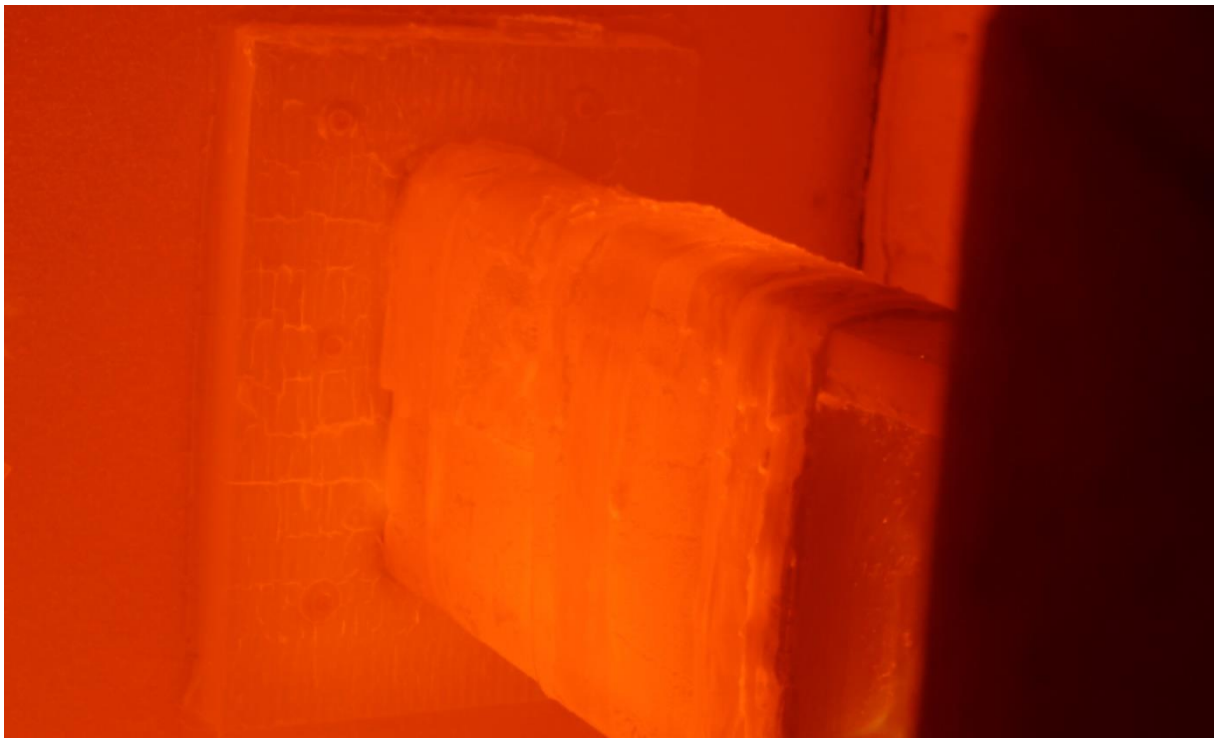


Fig. 7 – 90 minutes



Fig. 8 – 120 minutes



Fig. 9 – After the test - 128 minutes