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Report

Fire Performance Testing of an External Cladding System

BS 8414-1:2015 + A1:2017

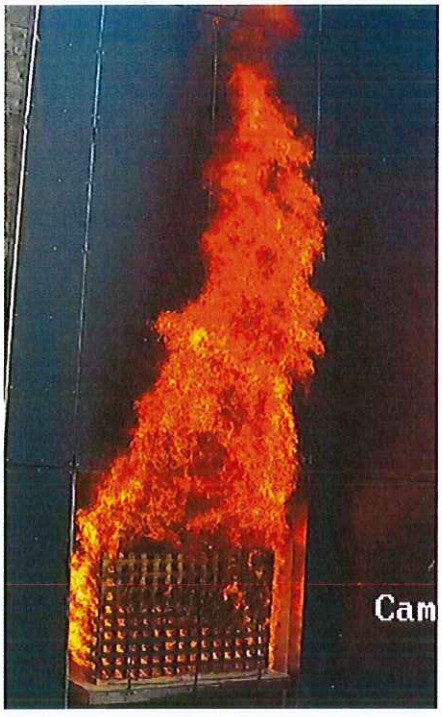
Test Sponsor : **Kingspan Insulation Ltd**

Project : **System Development**

Sample : **10mm Trespa Meteon FR Panel with 100mm Kingspan Kooltherm K15 Insulation**

Report No. : **DLR1709 Rev.0**

Report Date : **04/02/2020**



Al Futtaim Element Materials Technology Dubai L.L.C
Façade Testing & Advisory Services Division

UKAS TESTING
4559

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1. Introduction

This report describes the tests performed at the Al Futtaim Element Materials Technology Dubai L.L.C (AFE) laboratory in Dubai at the request of:

Kingspan Insulation Ltd.,
Pembridge, Leominster,
Herefordshire, England.

Contact: highrisetechnical@kingspan.com Contact no.: +44 1544 387 382

AFE Project / Sample No.: PD106193 / DC3418

The test sample consisted of an external wall cladding system (10mm Trespa FR Meteon FR Panel with Siderise Cavity Barriers and 100mm Kingspan Kooltherm K15 Insulation), installed by representatives of Kingspan Insulation Ltd.

AFE is accredited to ISO/IEC 17025 : 2017 by the United Kingdom Accreditation Service (UKAS), which assesses the technical competence of the laboratory, as well as its quality management systems.

This test report is personal to the client, confidential, non-assignable and shall not be reproduced, except in full, without the prior, written approval of AFE.

1.1 Purpose of Testing

The test was performed on 04th November 2019 and was to determine the fire performance of a Trespa FR panel cladding system fixed to the masonry face when exposed to external fire under controlled conditions. The test methods, were in accordance with the AFE method statement DMC3418 Rev.0 and were in accordance with the following standards.

- BS 8414-1:2015 + A1:2017

This test report relates only to the actual sample as tested and described herein.

The tests were witnessed wholly or in part by:

Adrian Brazier - Kingspan Insulation Ltd

The test was supervised & conducted by Arun Kumar Murugan of AFE.

1.2 Terms and Definitions

1.2.1 Level 1 Height

2500mm above the top of the combustion chamber opening in the test apparatus. Refer to Section 3 for details.

1.2.2 Level 2 Height

5000mm above the top of the combustion chamber opening in the test apparatus. Refer to Section 3 for details.

1.2.3 Start Temperature, T_s

Mean temperature of the thermocouples at Level 1, five minutes prior to ignition of the heat source.

1.2.4 Start Time, t_s

Time when the temperature recorded by any external thermocouple at Level 1 equals or exceeds 200°C above T_s and remains above this value for at least 30 seconds.

2. Summary of Test Data

The cladding system was tested in accordance with BS 8414-1:2015 + A1:2017.

The test was terminated early as the flames reached above the test sample within 22 minutes from the time of ignition

Table 1 Test Summary

Parameters	Temperature Data
T_s, start temperature	25°C
t_s, start time	180 seconds after ignition of the crib (thermocouple 3)
Peak temperature & time at Level 2 (External)	967°C at 1069 seconds from t_s (thermocouple 13)
Peak temperature & time at Level 2 (Mid-depth of 10mm Trespa Meteon FR Panel)	925°C at 1160 seconds from t_s (thermocouple 21)
Peak temperature & time at Level 2 (Mid-depth of Internal Cavity)	942°C at 1160 seconds from t_s (thermocouple 29)
Peak temperature & time at Level 2 (Mid-depth of 100mm Kingspan Kooltherm K15 Insulation)	455°C at 1160 seconds from t_s (thermocouple 37)

For full details refer to Section 6.

The above results are valid only for the tested sample as received, detailed and constructed as per the drawings with any marked variations as attached in Appendix B of this report, and the conditions under which the tests were conducted.

3. Test Apparatus

3.1 Test Rig

The test specimen was installed on a purpose-built test rig constructed by AFE as per the BS 8414-1:2015 + A1:2017 standard.

The rig comprised of two mutually perpendicular walls (constructed from the masonry bricks of compressive strength: 7.3 N/mm^2, density: 730kg/m^3 and thermal conductivity: 0.18W/mK), one referred to as the main wall with a width of 3275mm and the other as the wing wall with a width of 2685mm.The total height of the test rig was 9180mm.

A combustion chamber with an opening of 1999mm x 2010mm was positioned at the base of the main vertical wall.

Refer to Figure 1 in Appendix A for a schematic diagram of the test rig.

3.2 Heat Source

A timber crib, 1500mm x 1000mm in plane and 1000mm in height, was constructed using Pinus Silvestris softwood sticks as described in BS 8414-1:2015 + A1:2017 with a first layer consisting of 10 long sticks of 1500mm. The next layer consisted of 15 short sticks was evenly distributed to cover an area of 1500mm x 1000mm.

The process was repeated to give a total of 20 layers of sticks, giving a nominal height of 1000mm. The crib was constructed on a solid steel platform positioned 400mm above the floor of the combustion chamber and placed centrally and displaced 100mm from the back wall of the chamber.

The crib was ignited using 16 strips of low density fibreboard, soaked for 5 minutes in 5 litres of white spirit.

3.3 Thermocouples

All thermocouples used conformed to BS EN 60584-1:2013, Type K (Chromel / Alumel). The thermocouples were mineral insulated and had a nominal 1.5mm diameter with insulated junctions. Data acquisition was performed at 3 second intervals.

The locations of the thermocouples on the specimen were as shown in Figures 2 & 3 in Appendix A.

3.3.1 External thermocouples at Levels 1 and 2

Thermocouples were positioned in front of the main wall on the centre line and at 500mm & 1000mm each side of the centre line of the combustion chamber (five locations). Thermocouples were also positioned in front of the wing wall, at 150mm, 600mm & 1050mm from the finished face of the main wall (three locations).

3.3.2 Internal thermocouple locations at Level 2

Thermocouples were positioned within each layer of the main test wall face greater than 10mm on the centre line and at 500 mm and 1000 mm each side of the centre line of the combustion chamber (five locations). Thermocouples were also positioned within each layer of the wing test wall face greater than 10mm at 150mm, 600mm and 1050mm from the finished face of the main test wall face (three locations).

3.4 Ambient Conditions

A digital thermometer was used to measure the air temperatures.

3.5 General

Electronic instrument measurements were scanned by a computer-controlled data logger, and the results processed and stored in a computer.

All relevant test equipment was calibrated and traceable to international standards.

4. Test Sample

4.1 Description

The test specimen mainly comprised of:

- 100mm Kingspan Kooltherm K15 insulation (Batch number:8100342740)
- Siderise RH25G 90/30 horizontal open state cavity barrier.
- Siderise RSV-90/30 vertical open state cavity barrier.
- Aluminium Helping Hand bracket.
- Aluminium 'T' rail and 'L' rail.
- 10mm thick Trespa Meteon FR panel

Main wall - 2815mm wide x 8570mm high.
Wing wall - 1560mm wide x 8570mm high.

The top and side terminations of the cladding system were closed with 3mm thick aluminium sheet. The interface between the cladding system and the combustion chamber was covered with 5mm thick aluminium sheet. The distance of the finished face of the wing wall to the side opening of the combustion chamber was 255mm.
It was noted that no horizontal joint was provided (2400±100) mm above the combustion chamber opening which is a deviation from the test standard requirement.

The photograph below shows an external view of the sample.

The system component information was supplied by Kingspan Insulation Ltd and is detailed in Table 2 below. Refer to the drawings in Appendix B for sample construction details and dimensions.

4.2 Drawings

The tested sample was as shown in Kingspan Insulation Ltd sample drawings numbered:

- D1712-01-DT-3001 Rev. 01
- D1712-01-DT-3002 Rev. 01
- D1712-01-DT-3003 Rev. 01

Copies of these drawings are included in Appendix B in this report.

Table 2 System Components

Component	Description	Installation Details
Bracket	Aluminium Helping Hand Bracket and Polypropylene Iso Pad. See Photos 1 & 3 in Section 4.3 below.	The brackets were fixed to the masonry with Ejot 4H45 masonry anchors. Polypropylene Iso Pad shims were placed between masonry wall and brackets.
Cavity barrier	**Horizontal intumescent cavity barrier:** Siderise RH25G-90/30, open state cavity barrier, See Photos 2 & 4 in Section 4.3 below.	The horizontal cavity barriers were fixed to the masonry with RS350 brackets and Ejot 4H45 masonry anchors. 4 nos. of horizontal continuous cavity barriers were fixed to the main wall and wing wall, at 65mm, 2455mm, 4785mm and 6420mm above the combustion chamber opening.
	Vertical cavity barrier: Siderise RV-90/30, open state cavity barrier, See Photos 2 & 4 in Section 4.3 below.	3 nos. of continuous vertical cavity barriers were fixed to the masonry, two on the main wall and one on the wing wall with RS195 brackets and Ejot 4H45 masonry anchors.
Insulation	100mm Kingspan Kooltherm K15 insulation (Batch number: 8100342740). See Photos 2 & 5 in Section 4.3 below.	Insulation was fixed to the masonry wall with Ejot steel and plastic pins.
Railing	125x60x2mm Aluminium 'T' rail 60x40x2mm Aluminium 'L' rail See Photos 2 & 5 in Section 4.3 below.	Railings were fixed to the Helping Hand brackets with Ejot JT4-4-4.8x19mm screws.
Panel	Trespa Meteon FR panel, 10mm thick. See Photo 6 in Section 4.3 below.	Trespa FR panels were fixed to the railings with stainless rivets 16mm dia head. 10mm joints were provided between the panels. Aluminium bird peak profile was placed at the panel joints.

AFE was not involved in the design, procurement, installation and specification of the materials or system.

Sample installation

AFE monitored the installation of the sample based on the drawings supplied by Kingspan Insulation Ltd, which are included in Appendix B of this report. Any deviation of the installation from these drawings were recorded and reported.

Date of installation: 27 October to 02 November '19

Ambient temperature range: 21 - 34ºC

4.3 Installation Phase Photographs

Photo 1 Helping hand brackets

Photo 2 Cavity barriers, Kingspan Kooltherm K15 insulation and railings

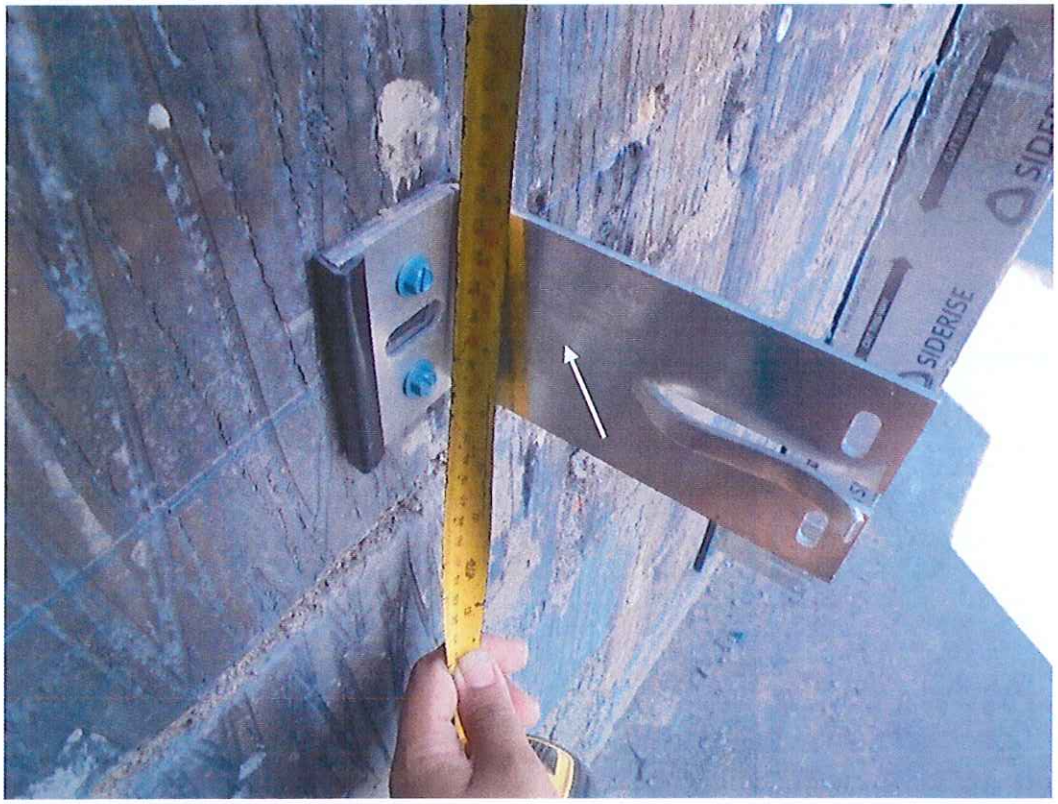


Photo 3 Helping hand bracket

Photo 4 Vertical and horizontal intumescent cavity barriers

Photo 5 Kingspan Kooltherm K15 insulation and railings

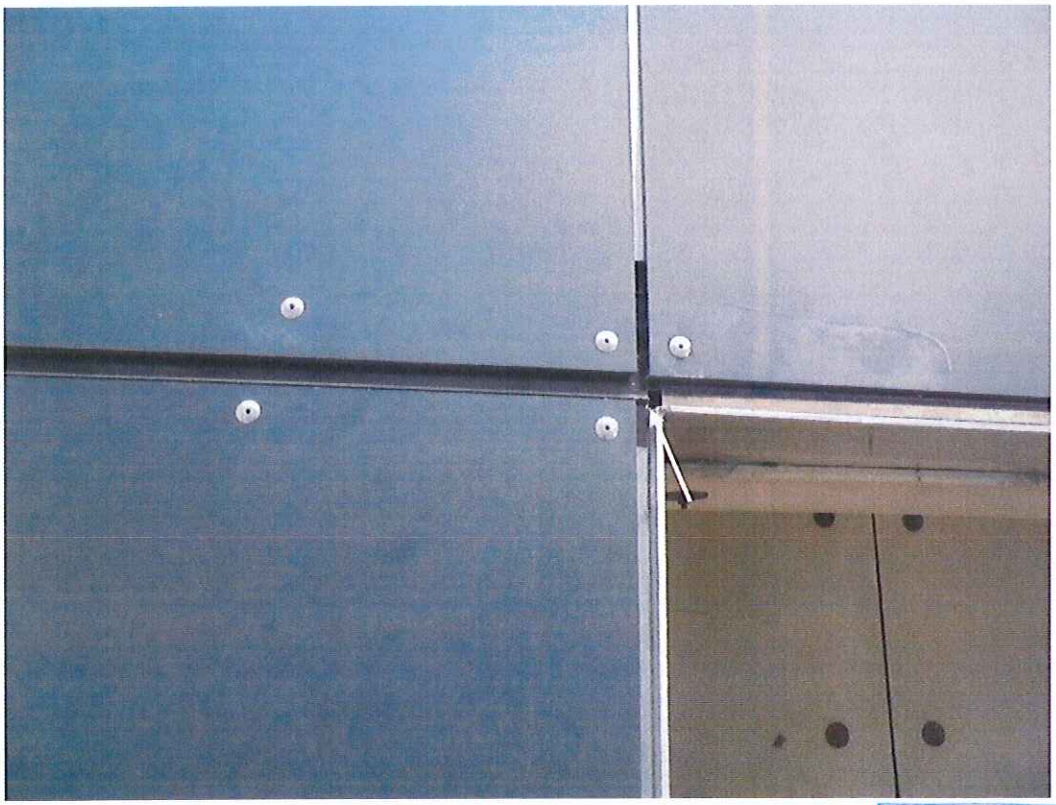


Photo 6 Trespa Meteon FR panel fixing and aluminium bird peak profile

5. Test Procedures

5.1 Testing

The environmental conditions were recorded.

The data acquisition and video recording was started 5 minutes prior to ignition of the fuel source. The fuel source was then ignited.

Significant events were recorded, including;

- changes in flaming conditions
- changes in the mechanical behaviour of the cladding system
- the detachment of any part of the sample
- fire penetration through any fire stops in the cladding system

The heat source was extinguished 30 minutes after time of the ignition. The data acquisition was continued to 60 minutes from the time of ignition.

5.2 Post-test Examination

After the test was terminated, the sample was allowed to cool. The sample was then examined for damage, including the following.

- Spalling
- Melting
- Deformation
- Delamination
- The extent of flame spread over the surface of the cladding system
- The extent of flame spread and/or damage within intermediate layers
- An estimate of flame spread and/or damage within cavities
- The extent to which the external face of the cladding system has burnt away or become detached
- Details of any collapse or partial collapse

Smoke staining and discolouration were not considered damage in this context.

6. Test Data / Observations

Installation date: 27 October to 02 November '19

Ambient temperature during installation: 21 - 34°C

Date of testing: 4 November '19

Ambient temperature during testing: 24°C

Wind speed: 0.03 m/s

6.1 Test Observations

Table 3 below summarises the observations made during the test.

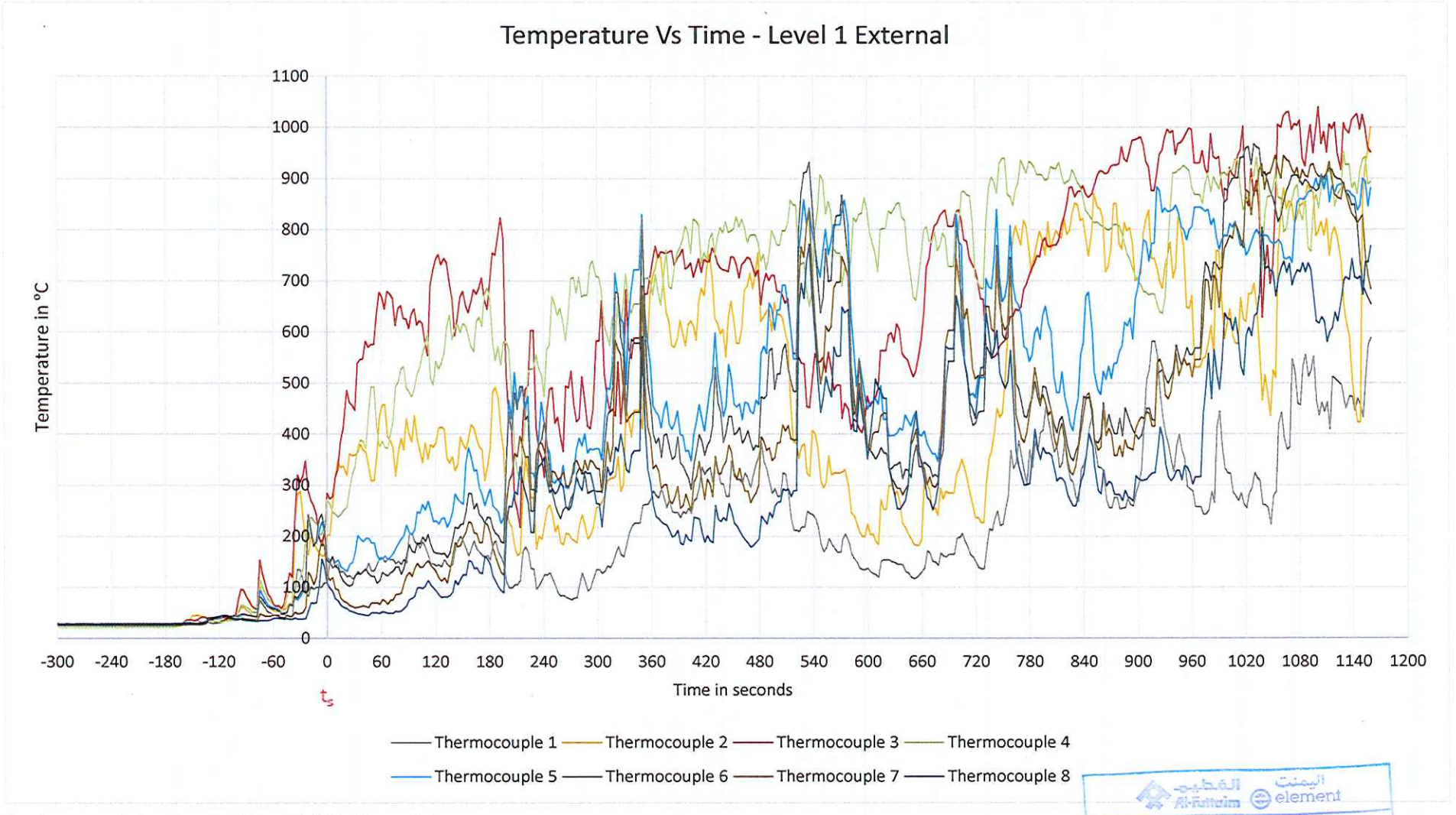
Table 3 Observations During the Test

Time	Seconds	Observation	Photo Ref. (Section 6.2)
08:47:39	-	Ignition of crib	-
08:48:36	-	Flame tip reached above the combustion chamber.	-
08:50:39	00	Start time t_s, 285°C (≥T_s+200°C) at thermocouple 3, Level 1 (main wall).	-
08:51:44	65	Flame tip reached 3m above the combustion chamber.	-
08:53:42	183	Flame tip reached 4m above the combustion chamber.	-
08:54:07	208	Approximately 50% of coating of panels M4 & M5 burned.	-
08:56:06	327	Flame impinged on wing wall panel W2.	Photo 7
08:56:41	362	Debris started to fall from the main wall.	-
08:59:20	521	Self-sustained flames on surface of panel W2.	Photo 8
09:00:02	563	Panels M4 & M5 partially burned.	-
09:01:13	624	Self-sustained flames at panels M3 & M4 vertical joint.	-
09:01:41	662	Debris of panel M4 fell off.	Photo 9
09:02:00	681	Flaming debris of panel M5 fell off.	Photo 10
09:02:11	692	Panels M4 & M5 partially consumed and insulations exposed.	Photo 11
09:02:36	717	Flaming debris observed on the floor.	Photo 12
09:03:39	780	Continuous falling of debris.	-
09:03:57	798	Flaming debris fell off the main wall.	Photo 13
09:04:06	807	Self-sustained flames on the surface of panel W1.	Photo 14
09:05:51	912	High density flaming debris on the floor.	-
09:06:01	922	Self-sustained flames on the surface of panel M9.	-
09:07:15	996	High intensity sustained flames on surface of panels M9 & M10.	-
09:07:50	1031	Flaming debris of panels M9 fell off.	Photo 15

Time	Seconds	Observation	Photo Ref. (Section 6.2)
09:08:13	1054	High intensity sustained flames on surface of panel W2.	-
09:08:17	1058	High intensity sustained flames on surface of panel W3.	-
09:08:21	1062	Flaming debris of panels M10 fell off.	-
09:08:35	1076	Continuous falling of flaming debris.	-
09:09:15	1116	High intensity flaming debris on the floor.	-
09:09:18	1119	Flaming debris of panels W2 fell off.	
09:09:26	1127	Flame spread extended above the test apparatus.	-
09:09:59	1160	Test was terminated.	-

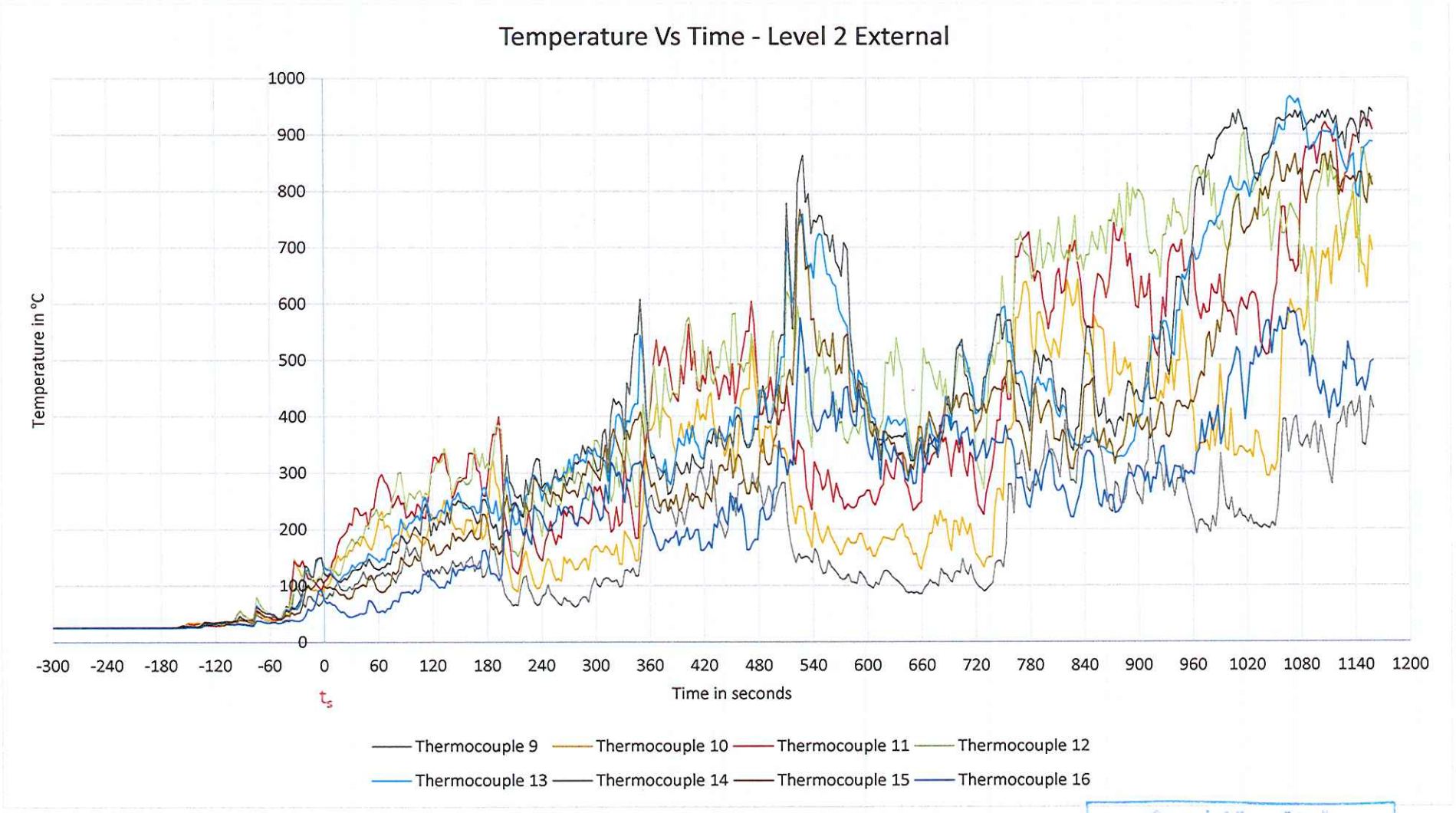
The graphs below show the temperature measurements taken during the test.

Thermocouple Readings on Level 1 – External



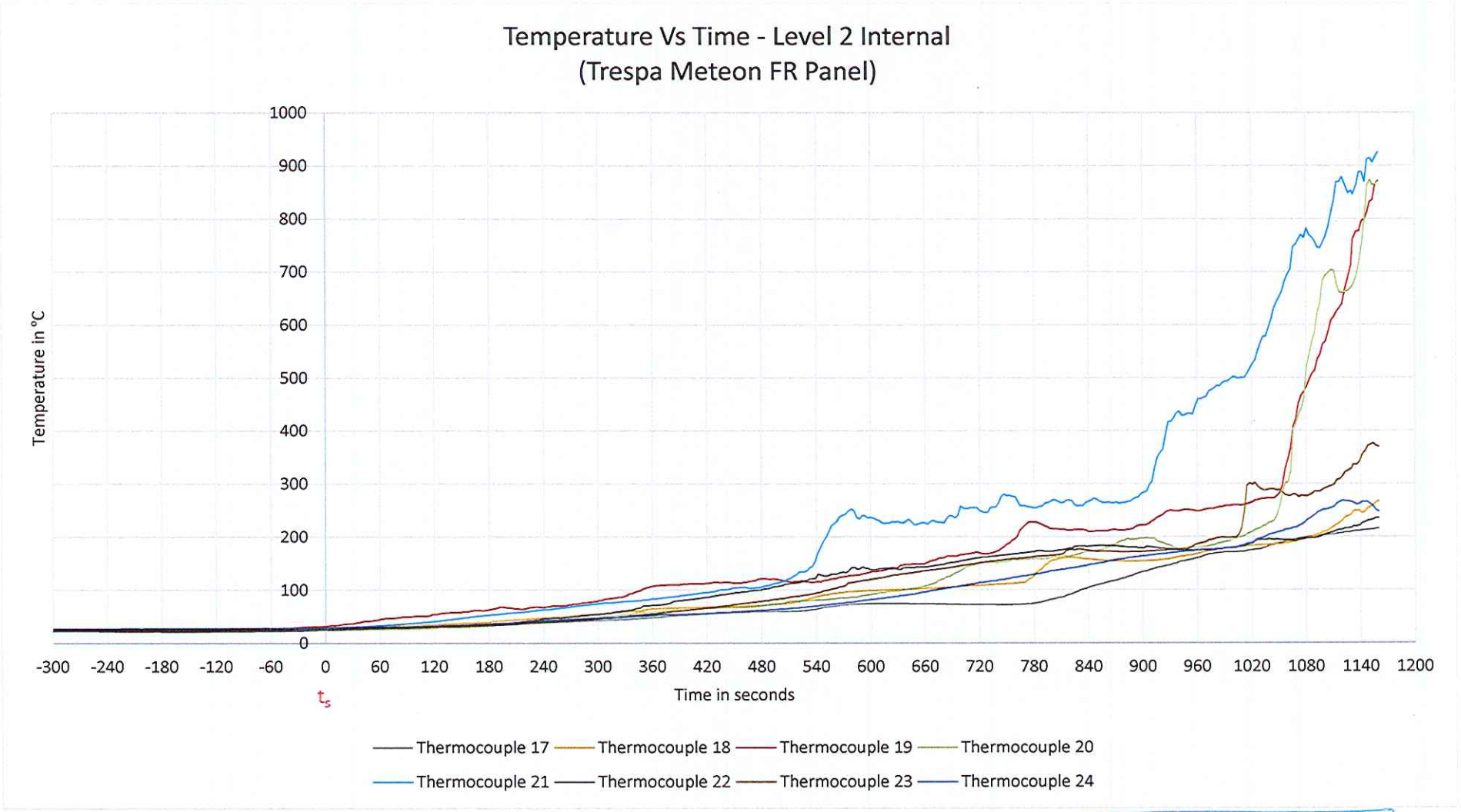
For thermocouple locations see Figures 2 & 3 in Appendix A.

Thermocouple Readings on Level 2 – External



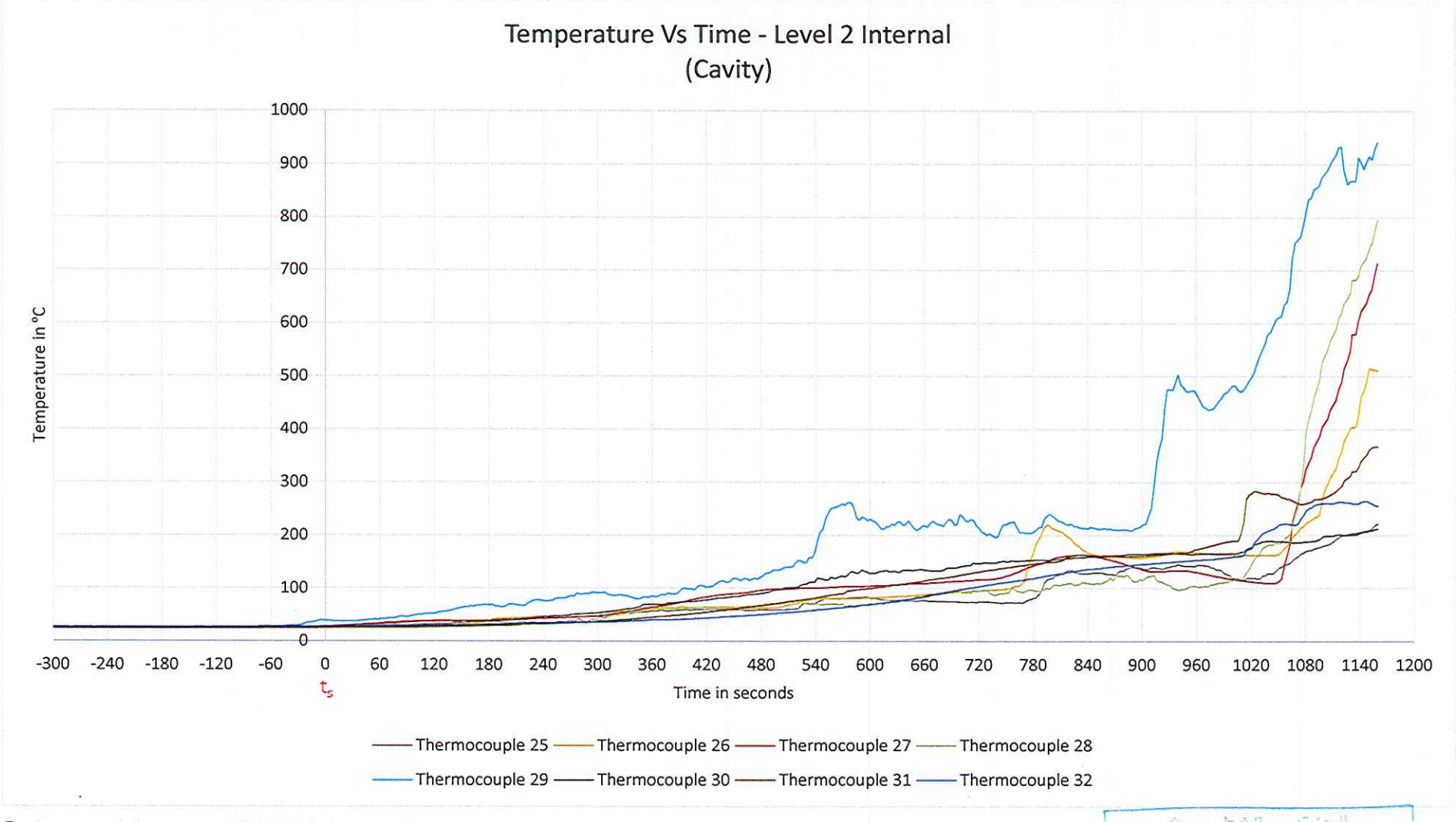
For thermocouple locations see Figures 2 & 3 in Appendix A.

Thermocouple Readings on Level 2 – Internal (Mid-depth of Trespa Meteon FR Panel)



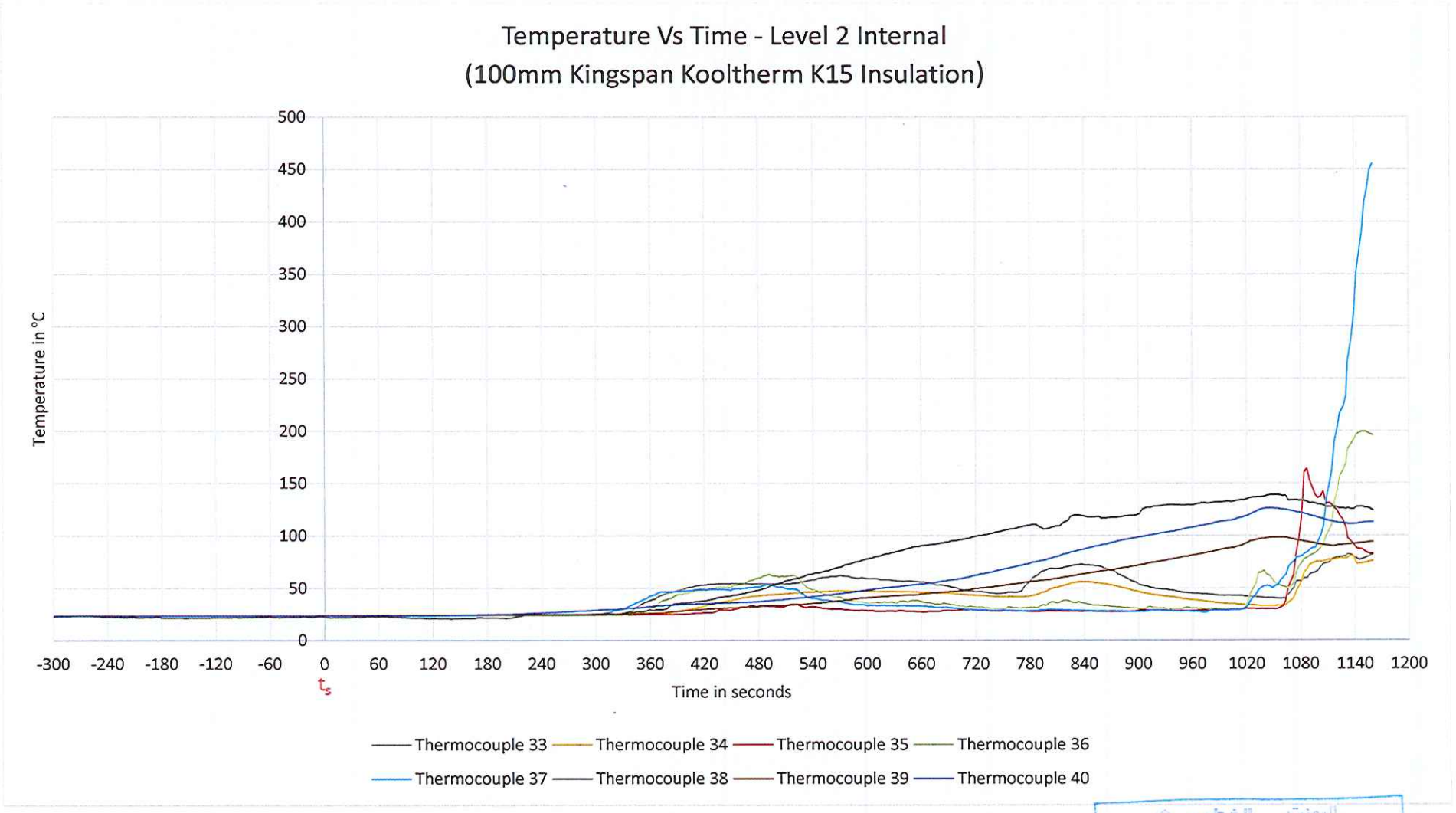
For thermocouple locations see Figures 2 & 3 in Appendix A.

Thermocouple Readings on Level 2 – Internal (Cavity)



For thermocouple locations see Figures 2 & 3 in Appendix A.

Thermocouple Readings on Level 2 – Internal (Mid-depth of 100mm Kingspan Kooltherm K15 Insulation)



For thermocouple locations see Figures 2 & 3 in Appendix A.

6.2 Testing Phase Photographs

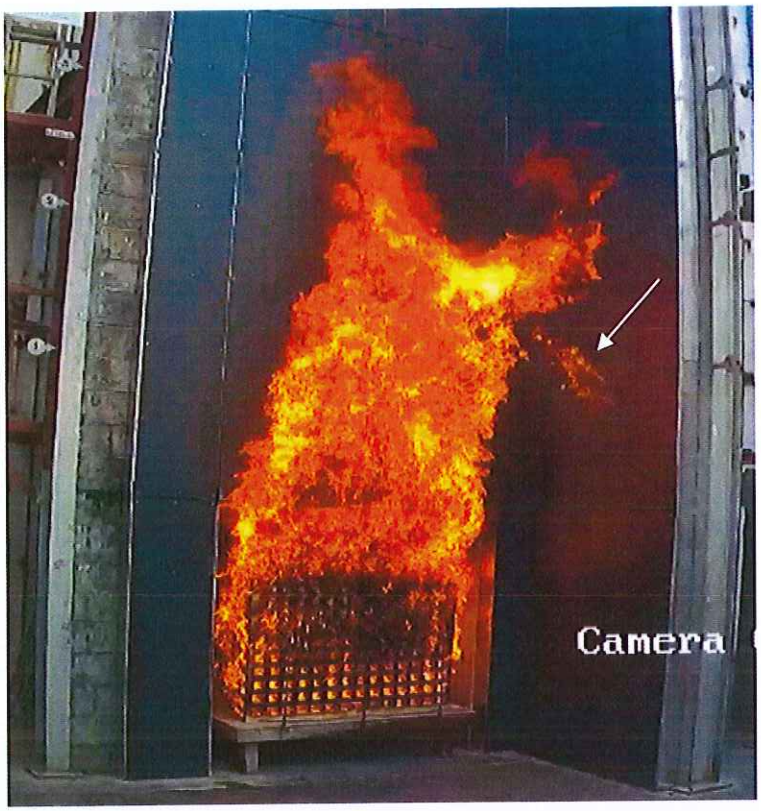


Photo 7 Flame impinged on wing wall panel W2.

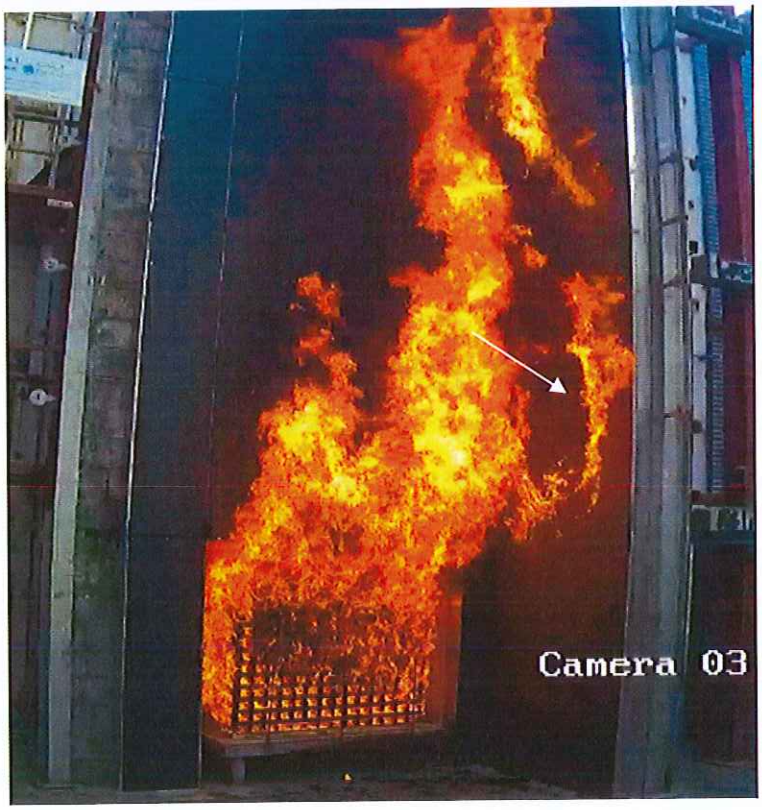


Photo 8 Self-sustained flames on surface of panel W2.

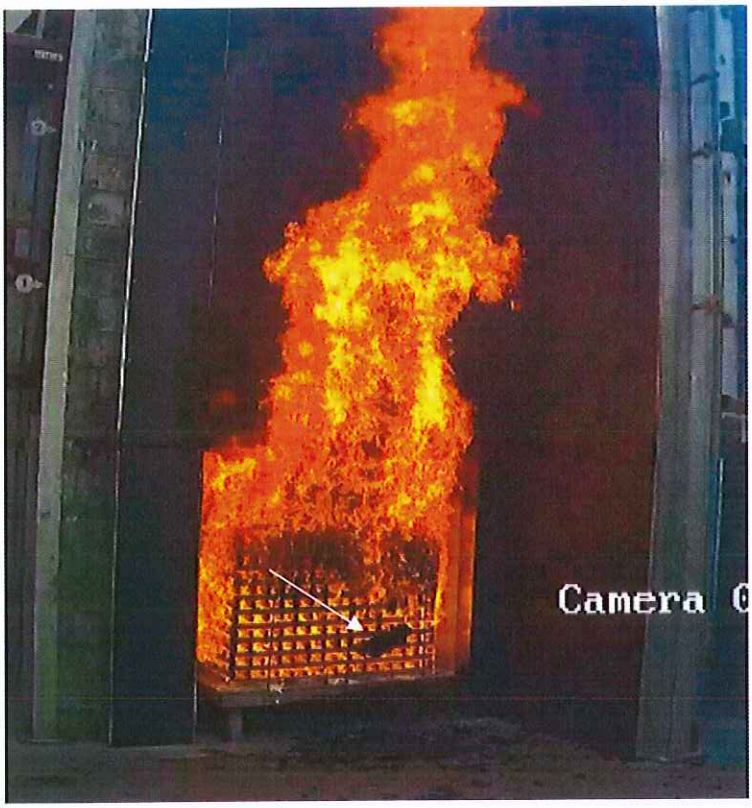


Photo 9 Debris of panel M4 fell off.

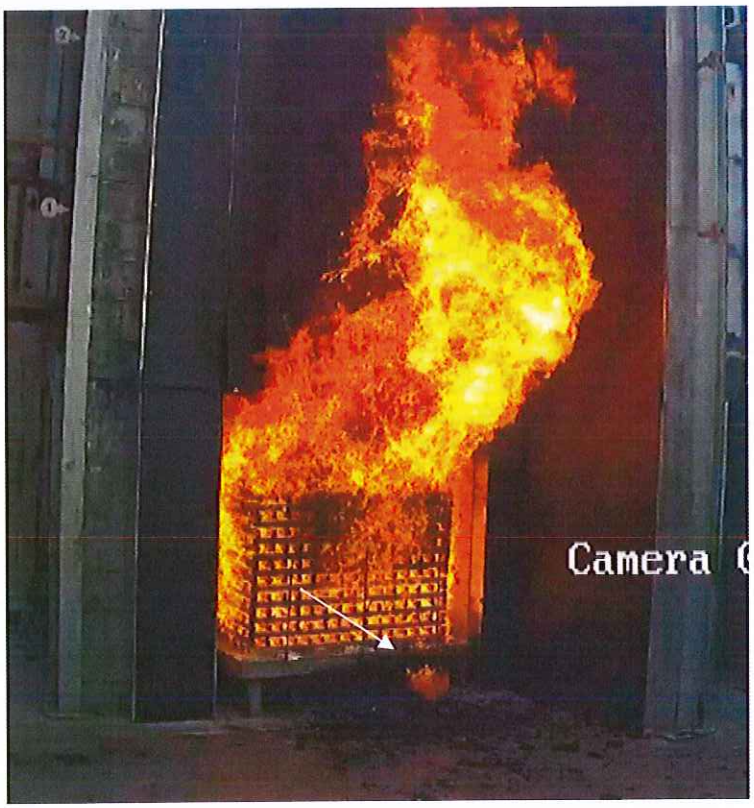


Photo 10 Flaming debris of panel M5 fell off.

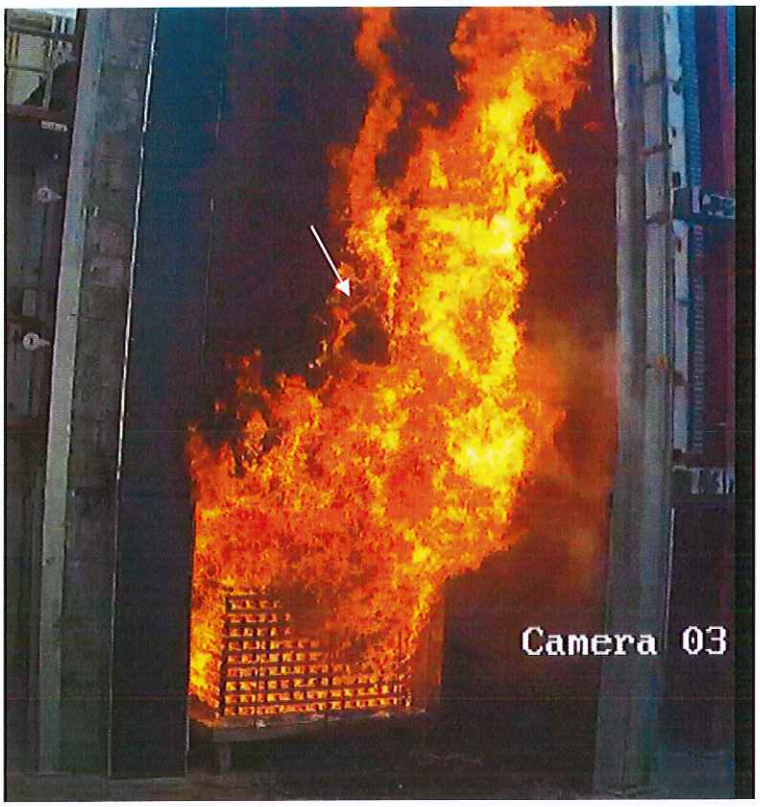


Photo 11 Panels M4 & M5 partially consumed and insulations exposed.

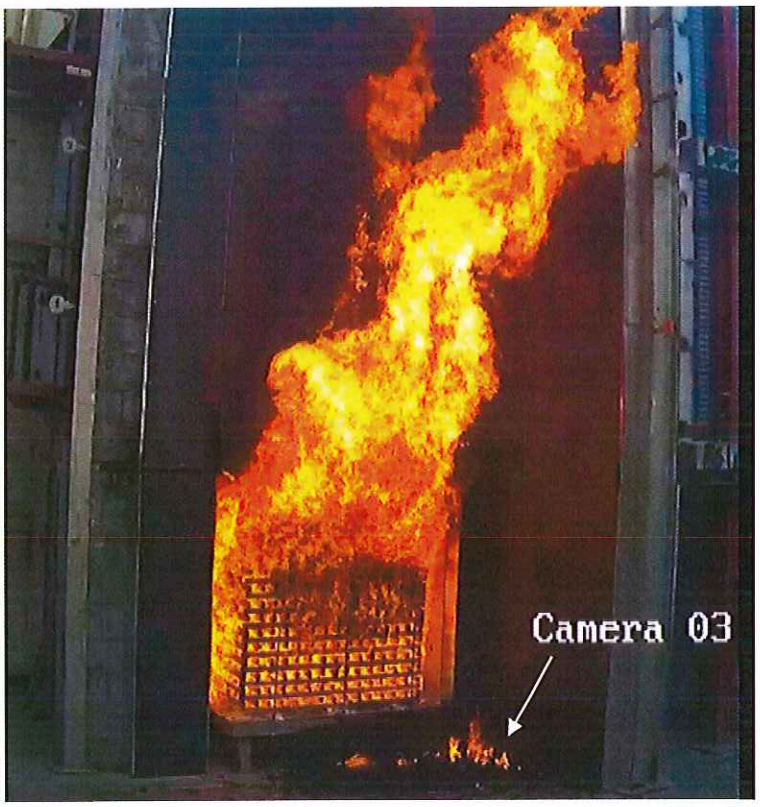


Photo 12 Flaming debris observed on the floor.

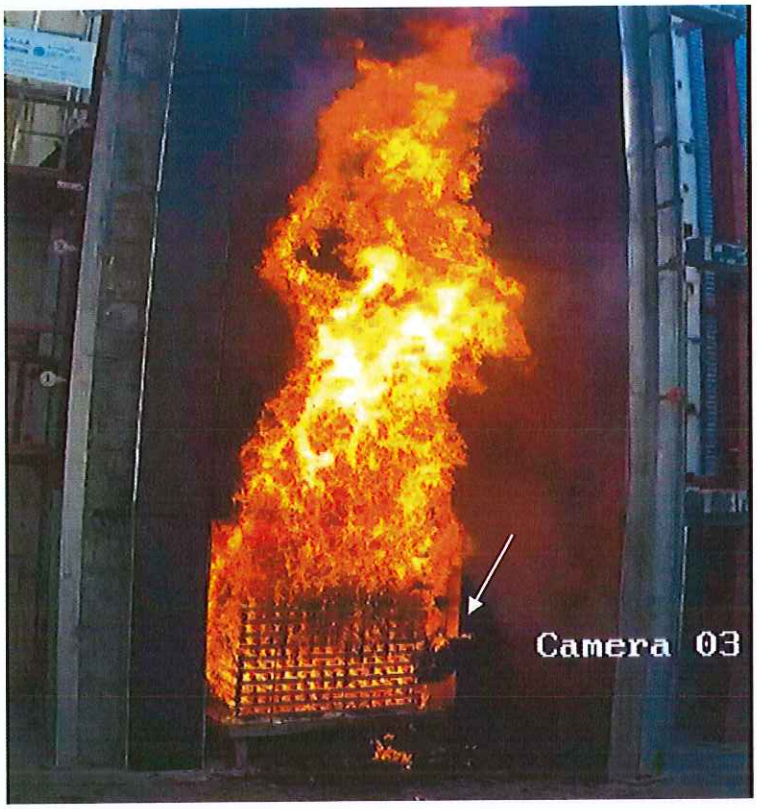


Photo 13 Flaming debris fell off the main wall.

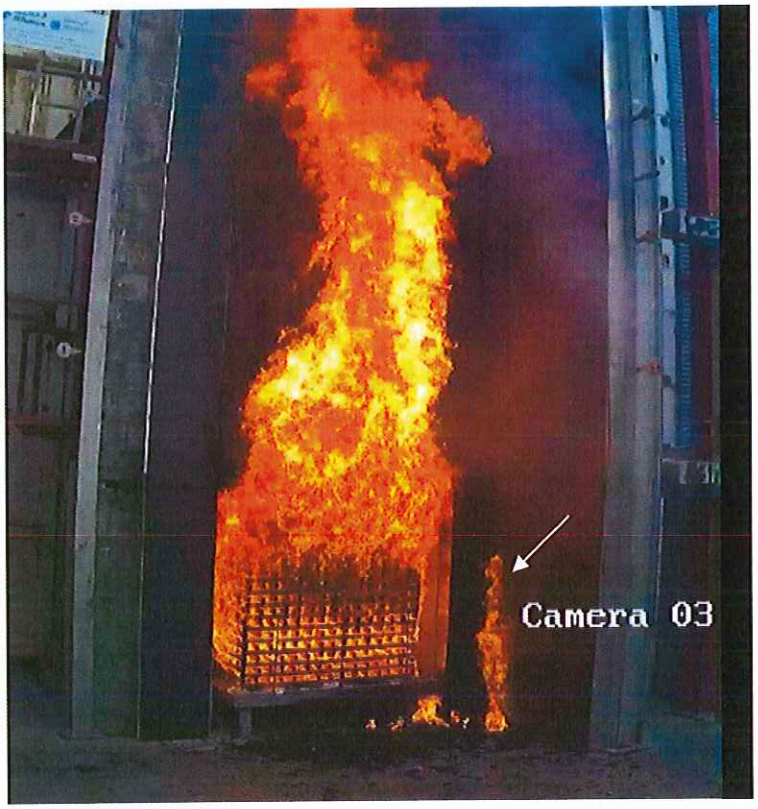


Photo 14 Self-sustained flames on the surface of panel W1.

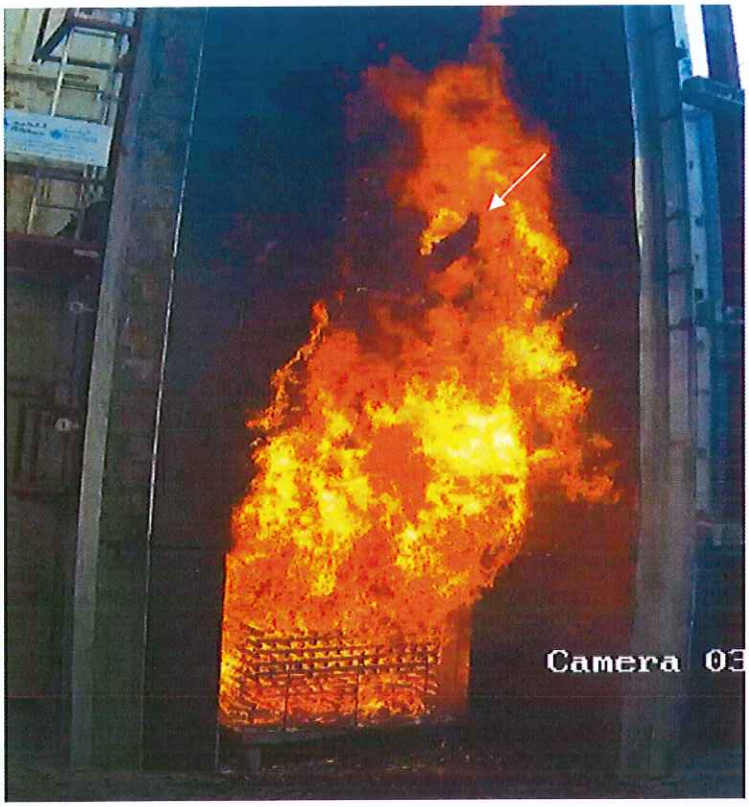


Photo 15 Flaming debris of panels M9 fell off.

6.3 Post-test Examination

Table 4 below summarises the observations made after the test was completed.

Table 4 Post-test Observations

Component	Observation	Photo Ref. (Section 6.4)
Trespa Meteon FR Panel	Panels M1, M3 & M7 – Minor discoloration and buckling on the panels. Panels M2 & M10 – Panel was burned and left as char. Panels M5 & M6 - 100% of the panel was consumed. Panels M4 & M9 – Approximately 75% of the panel was consumed and remaining area was burned. Panels M8– Approximately 25% of the panel was consumed and remaining area was burned. Panel W1– Approximately 25% of the panel was consumed and remaining area was burned. Panel W2 – Approximately 90% of the panel was consumed and remaining area was burned. Panel W3 – Approximately 50% of the panel was consumed and remaining area was burned.	Photo 16
Cavity barrier	**Horizontal intumescent cavity barrier:** Main wall: The 1st horizontal cavity barrier at 65mm above the combustion chamber was activated except the cavity behind Panel M3. Material loss and damage were observed. The 2nd horizontal cavity barrier at 2455mm above the combustion chamber was activated except the cavity behind Panel M3. Material loss and damage were observed. The 3rd horizontal cavity barrier at 4785mm above the combustion chamber was activated except the cavity behind Panel M7. Material loss and damage were observed. The 4th horizontal cavity barrier at 6420mm above the combustion chamber was activated except the cavity behind Panel M7. Cavity barrier was intact and no material loss observed. Wing wall: The 1st horizontal cavity barrier at 2065mm above the ground level was activated. Material loss and damage were observed. The 2nd horizontal cavity barrier at 4455mm above the ground level was activated. Material loss and damage were observed.	Photos 17, 19, 20 & 21

Component	Observation	Photo Ref. (Section 6.4)
	The 3rd horizontal cavity barrier at 6785mm above the ground level was activated. Material loss and damage were observed. The 4th horizontal cavity barrier at 8420mm above the ground level was activated. Material loss and damage were observed.	
	Vertical cavity barrier: Discolouration and buckling to the vertical cavity barriers on the main wall and wing wall was observed.	
Kingspan Kooltherm K15 insulation	Main wall: Insulations behind the panels M4, M5, M6, M8, M9 & M10 were burned. No significant changes on the remaining insulations on the main wall. Wing wall: Insulations behind the panels W2 & W3 were burned. Insulations behind the panel W1 was partially burned and remaining area was discoloured.	Photos 17, 20 & 21
Railing	Main wall: All railings behind panels M4, M5 & M6 were completely melted. Railings behind panels M8, M9 & M10 were partially melted. Remaining area was discoloured and buckled. All other railings were in place and no damage was observed. Wing wall: Railings behind panels W2 were partially melted. Remaining area was discoloured and buckled. Railings behind panels W1 & W3 were discoloured.	Photos 17,20 & 21
Bracket	All brackets were intact. Material loss and discolouration were observed.	Photo 18 & 22

6.4 Post Test Photographs

Photo 16 View of the sample after the test

Photo 17 Cavity barrier, Kingspan Kooltherm K15 insulation and railings

Photo 18 Helping Hand brackets

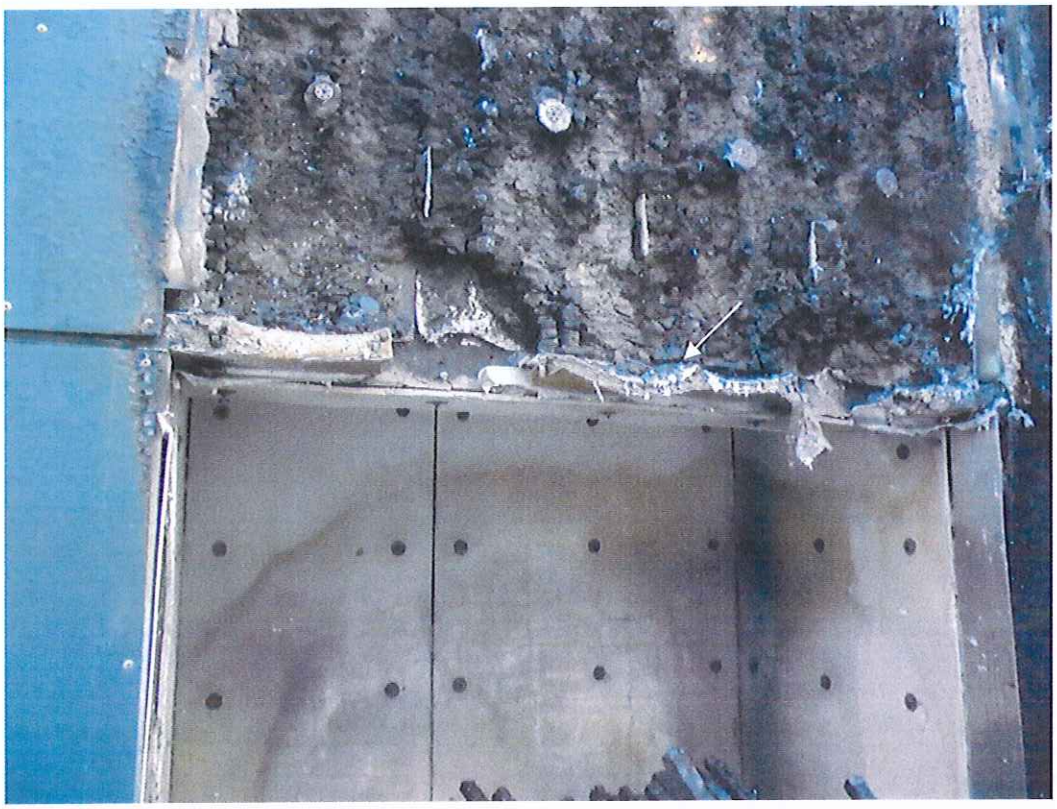


Photo 19 Cavity barrier at the top of combustion chamber

Photo 20 Cavity barrier, Kingspan Kooltherm K15 insulation and railings at level 1

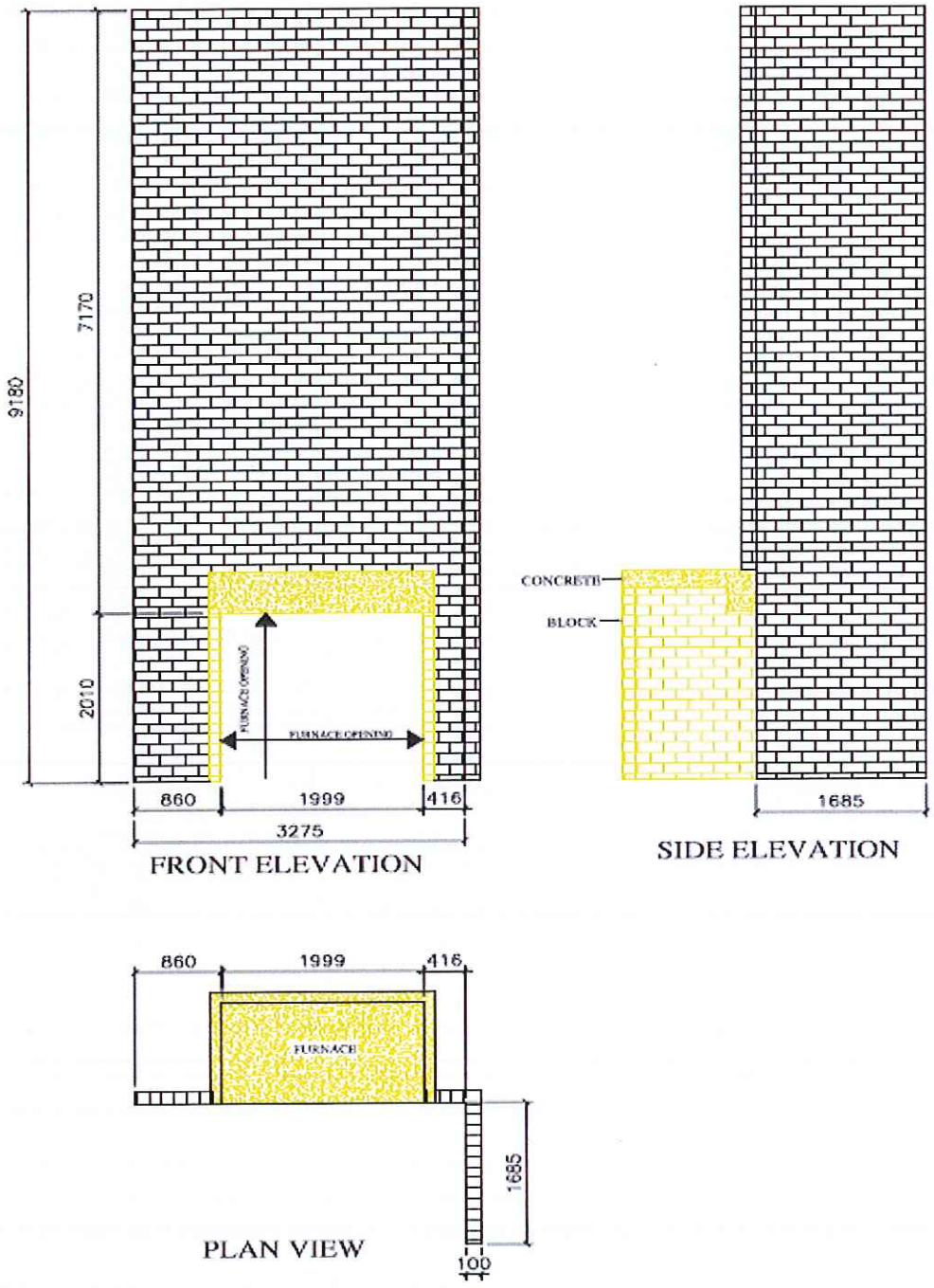
Photo 21 Cavity barrier, Kingspan Kooltherm K15 insulation and railings at level 2

Photo 22 Helping hand brackets

Appendix A

Figures

Figure 1 Schematic View of the Test Rig



Note: All dimensions are in mm, the drawing is not to scale

Figure 2 **Thermocouple, Cavity Barrier Locations & Panel Numbering**

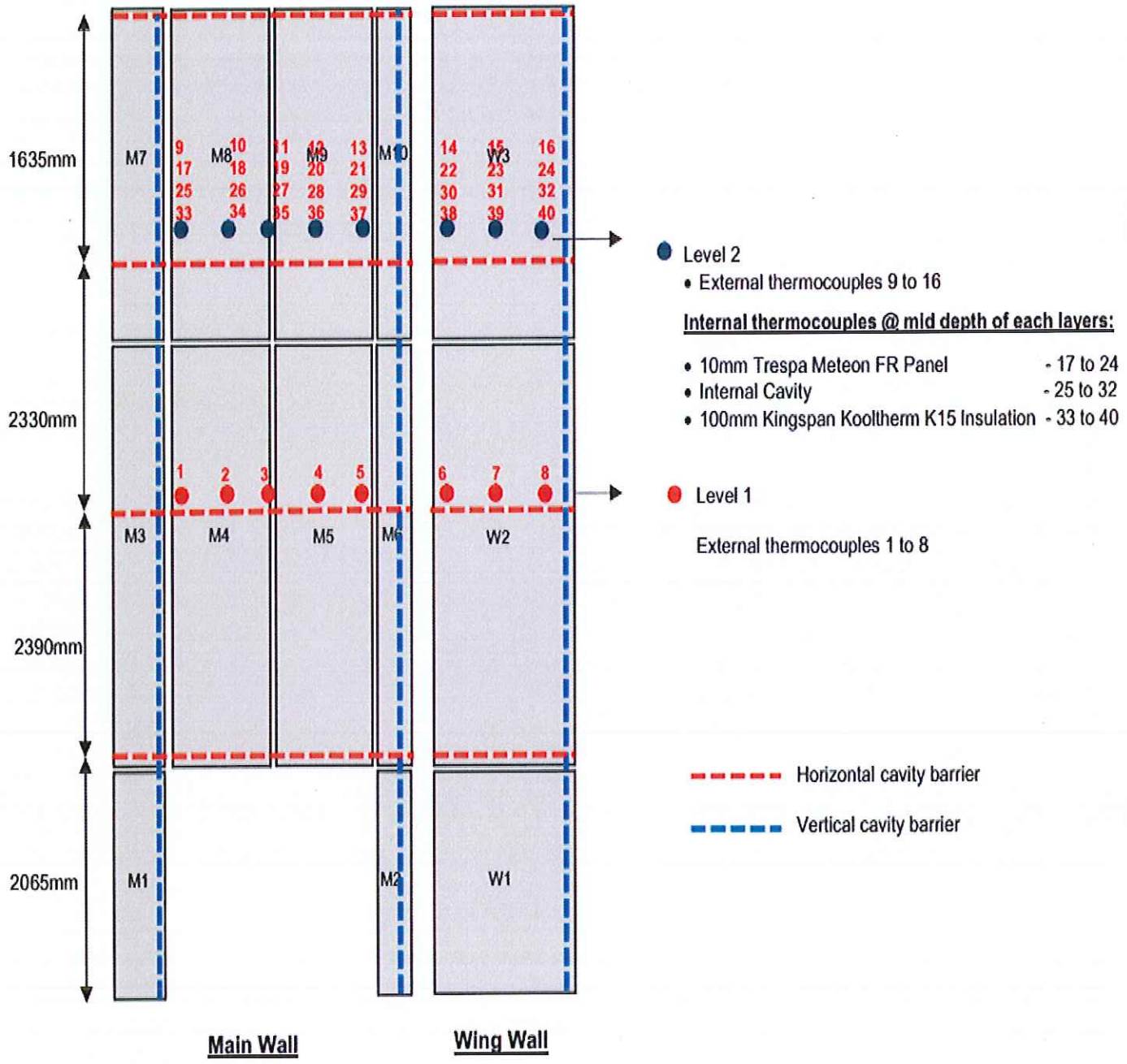
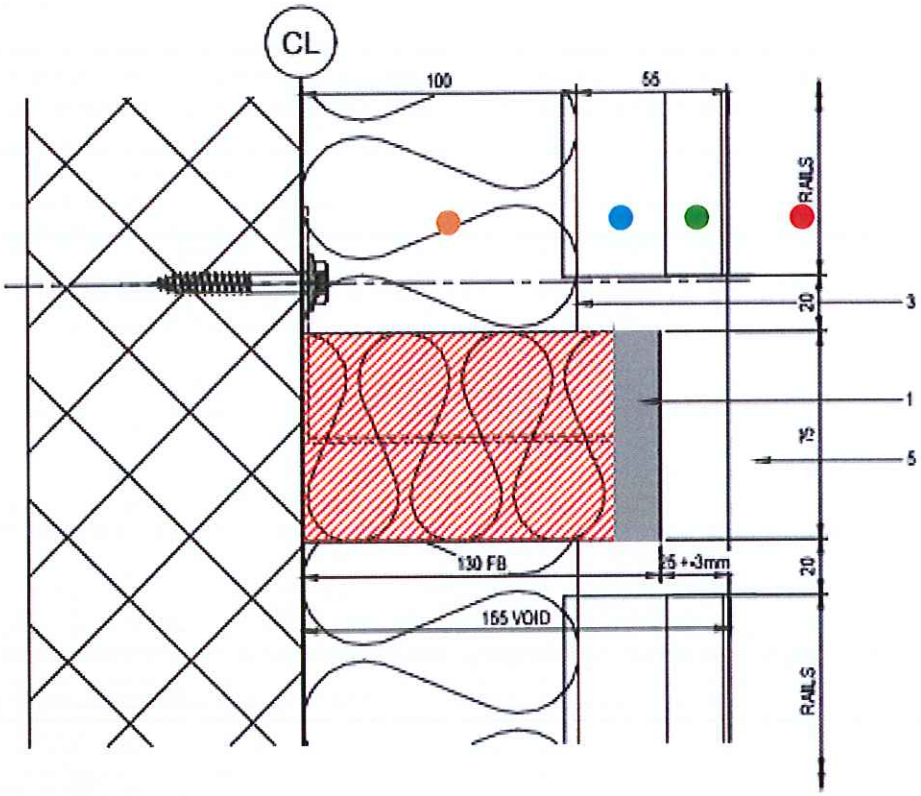
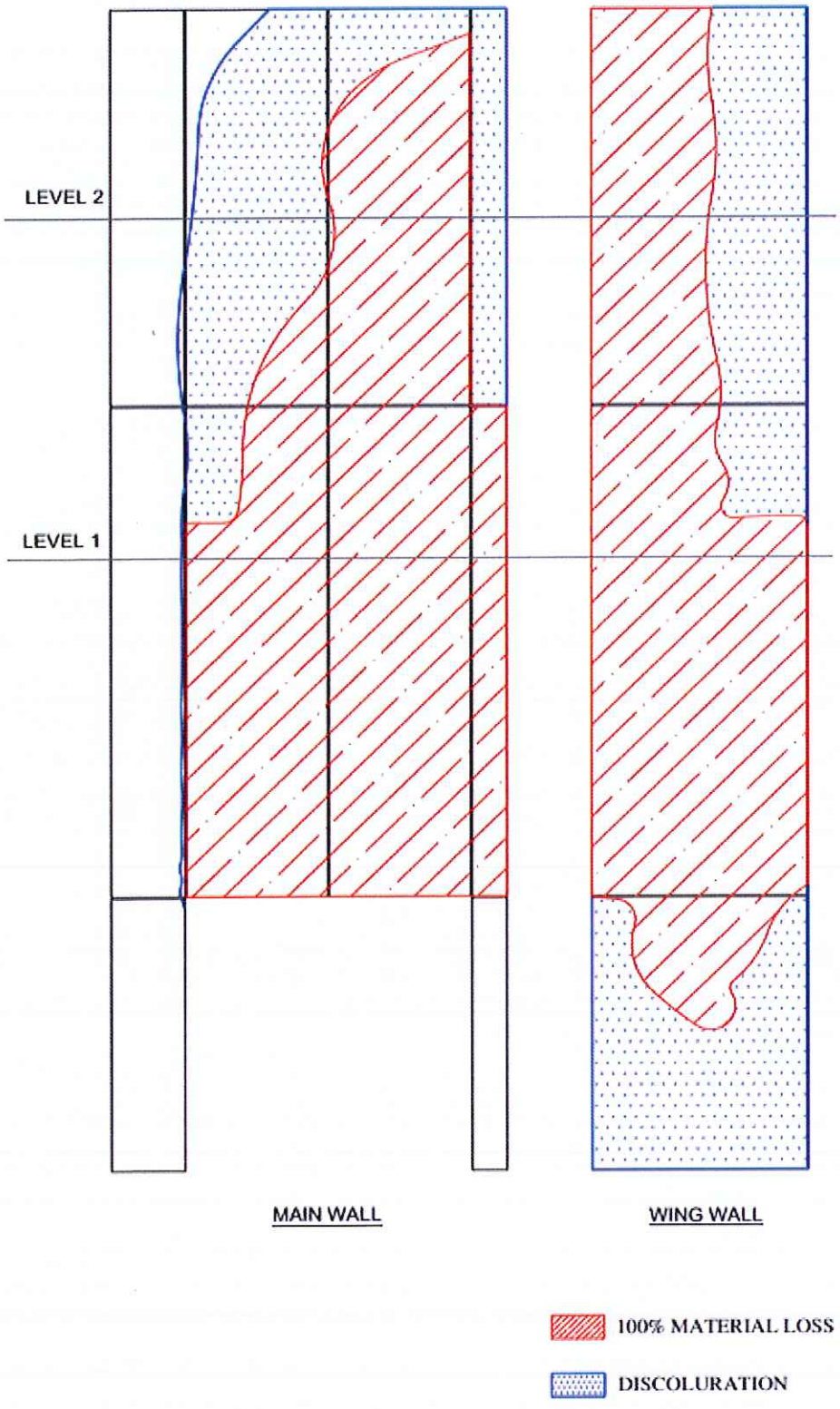


Figure 3 Level 2 Section Drawing Showing the Thermocouple Locations



- Level 2, External thermocouples 9 to 16
- Level 2, Internal thermocouples in Trespa Meteon FR Panel 17 to 24
- Level 2, Internal thermocouples in Cavity 25 to 32
- Level 2, Internal thermocouples in the insulation 33 to 40

Figure 4 Area Map Showing the Condition of the Trespa Meteon FR Panels After the Test



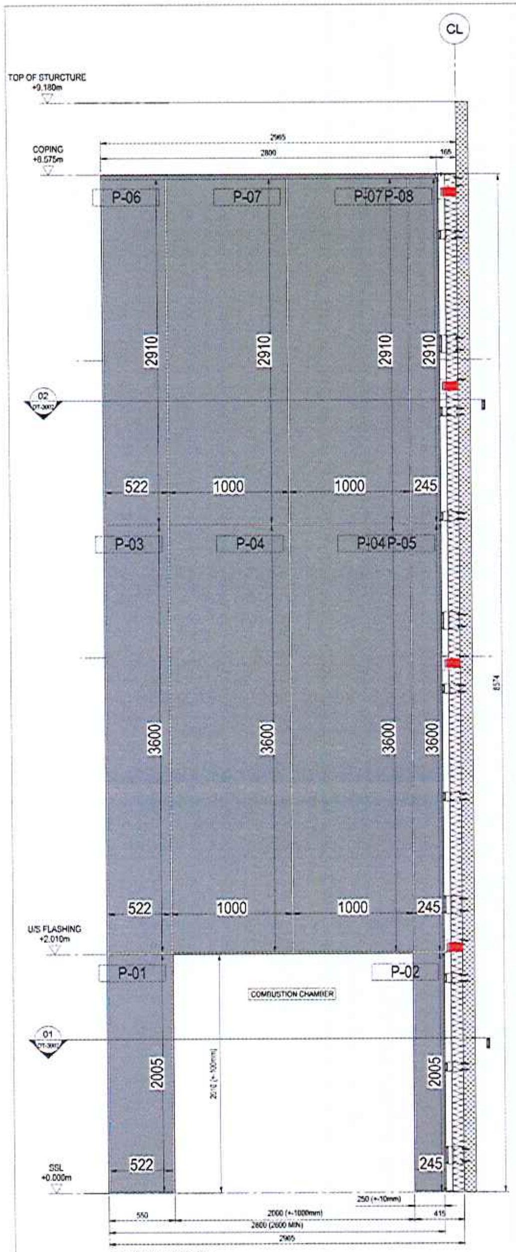
- Approximately 19m² of the total external visible area was completely consumed.
- Approximately 6.5m² of the total external visible area was discoloured.

Appendix B

Drawings

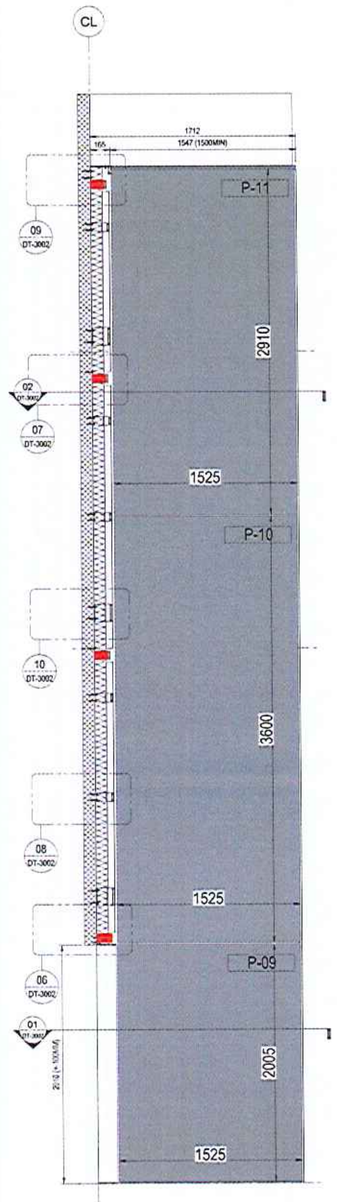
The following three un-paginated sheets are the copies of Kingspan Insulation Ltd drawings numbered:

- D1712-01-DT-3001 Rev. 01
- D1712-01-DT-3002 Rev. 01
- D1712-01-DT-3003 Rev. 01

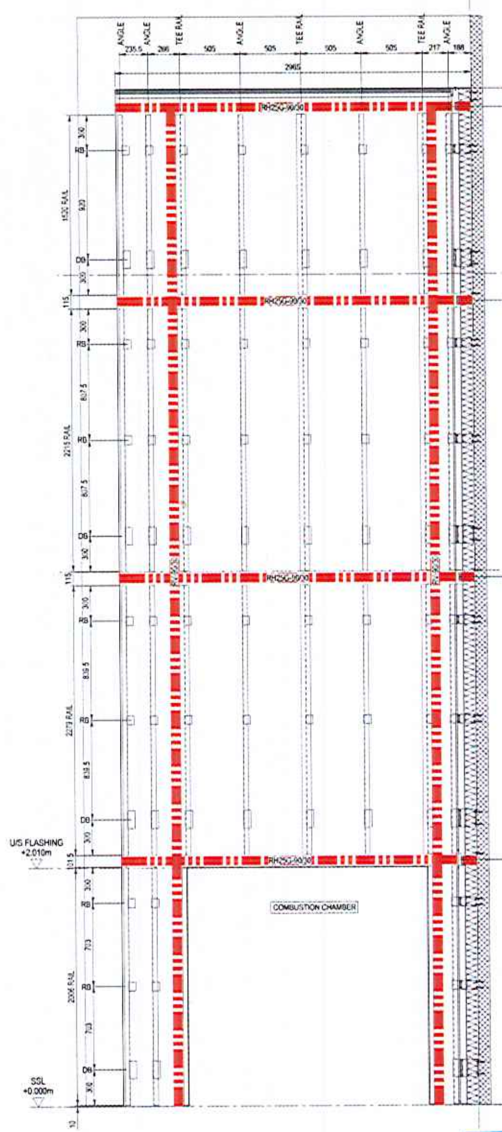


01 MAIN ELEVATION
1:20

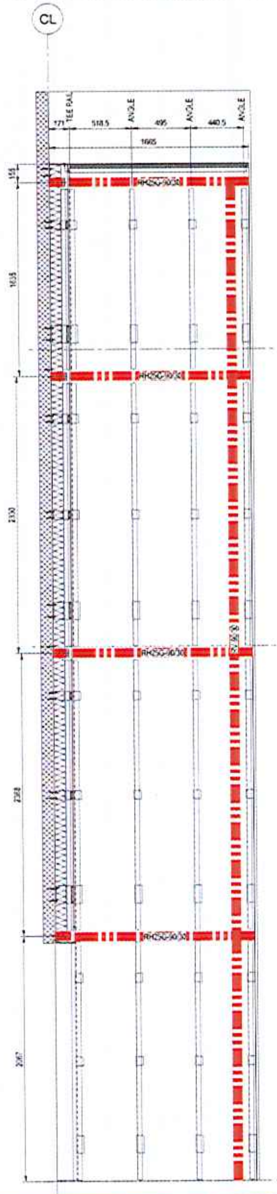
CLADDING:
10mm THK TRESPA METEON FR PANELS GRADE A12.1.8
10mm JOINTS. HORIZONTAL JOINTS TO HAVE BIRD BEAK (TPG PROFILE (3000mm LONG)
STAINLESS STEEL RIVET FIXINGS
COLOUR: ALUMINIUM GREY, SINGLE SIDED



02 WING ELEVATION
1:20



03 MAIN ELEVATION (SUB GRID)
1:20



02 WING ELEVATION (SUB GRID)
1:20

PANEL SCHEDULE			
CODE	WIDTH (mm)	HEIGHT (mm)	QUANTITY
P-01	522	2005	1
P-02	245	2005	1
P-03	522	3600	1
P-04	1000	3600	2
P-05	245	3600	1
P-06	522	2910	1
P-07	1000	2910	2
P-08	245	2910	1
P-09	1525	2005	1
P-10	1525	3600	1
P-11	1525	2910	1
		TOTAL	13

REV NO	DRAWN BY	DRAWN DATE	CHKD BY	CHKD DATE	
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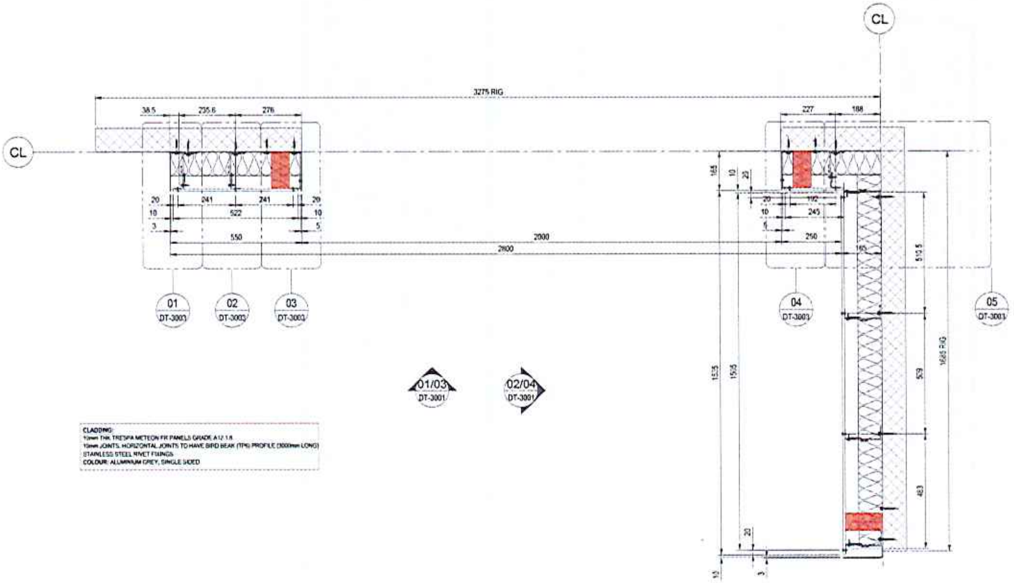
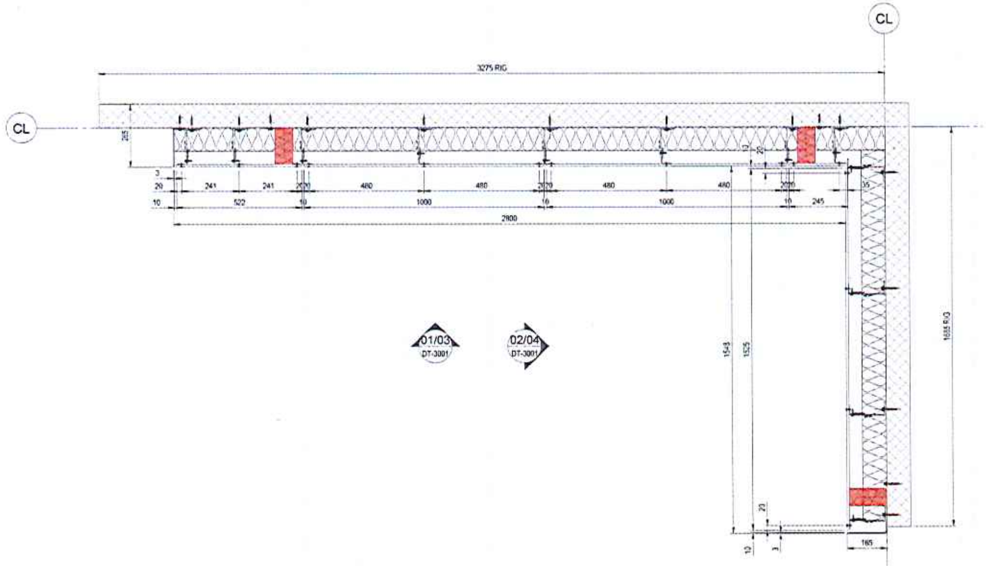
KINGSPAN
BRE BR135

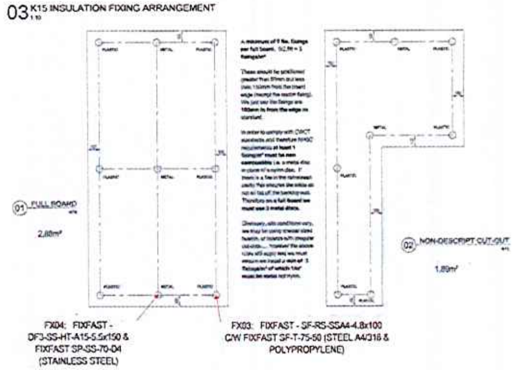
FIRE TEST
TRESPA FACADE ELEVATION
BS8414-01 TEST

SCALE: SHWN	DATE: 10.09.19	DRAWN BY	JP
DRG No: D1712-01-DT-3001		CHECKED	RJU
		REVISION	01
ISSUED FOR: APPROVAL		ORIGINAL SIZE A2	





03 K15 INSULATION FIXING ARRANGEMENT



IMPORTANT NOTICE

DO NOT SCALE - IF IN DOUBT ASK

1. **FIRE BARRIERS** F.O.C
SIDERISE FIRE BARRIERS - HORIZONTALLY AT EACH FLOOR SLAB LOCATION AND VERTICALLY LOCATED AS SHOWN
1.2m HORIZONTAL FIRE BARRIER - SIDERISE RH25G-90/30 (INTRUMESCENT FACE) USING GALV BRACKETS AT 400mm CENTERS
1.2m VERTICAL FIRE BARRIER - SIDERISE RV-90/30 USING GALV BRACKETS AT 600mm CENTERS - 2% COMPRESSION TO REAR FACE OF PANEL REQD
ACCESSORIES: FIRE BARRIERS SHOULD BE TIGHTLY ABUTTED TO PREVENT GAPS. SURFACES SHOULD BE SEALED WITH SIDERISE FOIL TAPE RFT120/45

2. **ALUMINIUM SURROUND**
5mm THK ALUMINIUM FLASHINGS GRADE 1050A H14. NO FINISH.

3. **INSULATION SPECIFICATION** F.O.C
100MM THICK K15 INSULATION, TO BE ABUT TIGHTLY TO ENSURE BOARDS MESH TOGETHER AT JOINTS. PATTERNED SURFACE TO FACE OUTWARDS. FOR PANEL SUPPORT LAYOUT PLEASE SEE FIXING PLAN. JOINTS AND EXPOSED EDGES TO BE TAPED USING VENTURE 1525ACW

4. **ALUMINIUM FLASHINGS**
3MM THK ALUMINIUM FLASHINGS GRADE 1050A H14. NO FINISH.

5. **CLADDING**
10MM THK TRESPA METEON FR GRADE A12 1.8 10MM JOINTS, HORIZONTAL JOINTS TO HAVE BIRD BEAK (TP6) PROFILE (3000MM LONG)
STAINLESS STEEL RIVET FIXINGS
COLOUR: ALUMINIUM GREY, SATING FINISH, SINGLE SIDED

6. **COMBUSTION CHAMBER** F.O.C
BLOCK WORK COMBUSTION CHAMBER FOR FIRE

7. **INSULATION** F.O.C
LOOSE FILL ROCKWOOL INSULATION

⚠ 01 CDM — **WORKING AT HEIGHT**
THE WORK FACE IS AT HEIGHT ENSURE ADEQUATE TEMP WORKS & REFER TO METHOD STATEMENTS

⚠ 02 CDM — **HEAVY COMPONENTS**
MANUAL HANDLING HAZARD - OVER 50Kg OR UNUSUALLY SHAPED COMPONENT

⚠ 03 CDM — **LIFTING OPERATIONS**
REFER TO METHOD STATEMENTS & LIFTING PLANS, ENSURE ADEQUAETLY TRAINED SUPERVISION

⚠ 04 CDM — **DUST CUTTING**
THE OPERATIONS REQUIRED MAY CREATE DUST. ENSURE ADEQUATE PRECAUTIONS ARE TAKEN

⚠ 05 CDM — **SHARP EDGES/BLADES**
RISK OF INJURY FROM SHARP EDGES OR USE OF BLADES

⚠ 06 CDM — **COSHH**
USE OF CHEMICALS, ADHESIVES, SEALANTS, GROUTS & PAINTS, REFER TO COSHH DATA SHEETS & TAKE ADEQUATE PRECUATIONS

⚠ 08 CDM — **NOISE**
SHOT-FIRING, CUTTING, DRILLING OPERATIONS PRODUCING EXCESSIVE NOISE

⚠ 09 CDM — **VIBRATION**
OPERATIONS PRODUCING EXCESSIVE VIBRATION, MONITOR EXPOSURE

01 | JP | 10.09.19 | RJU | 10.09.19 | PANELS REVISED

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KINGSPAN
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FIRE TEST
TRESPA FACADE - PLANS
BS8414-01 TEST

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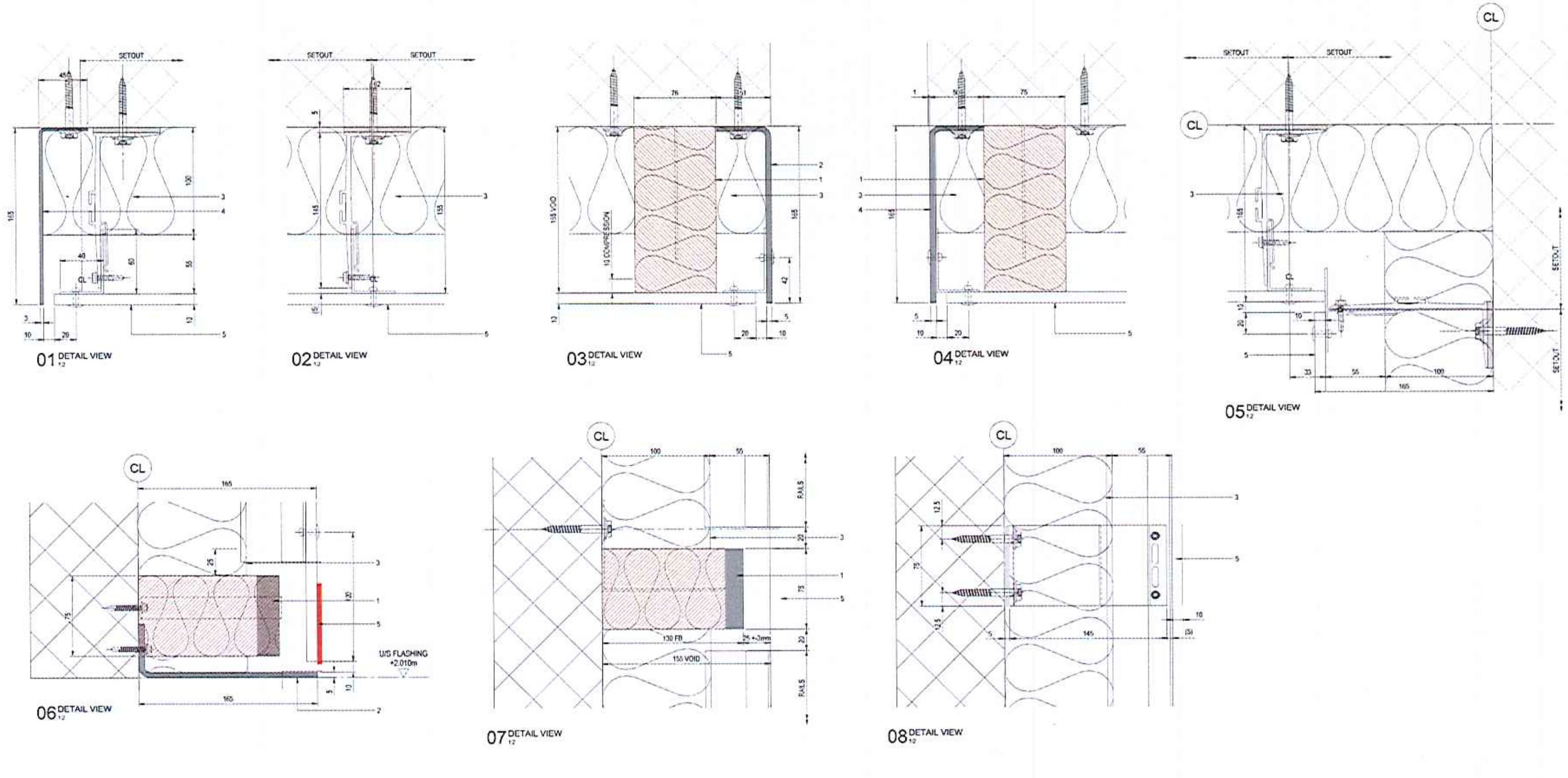

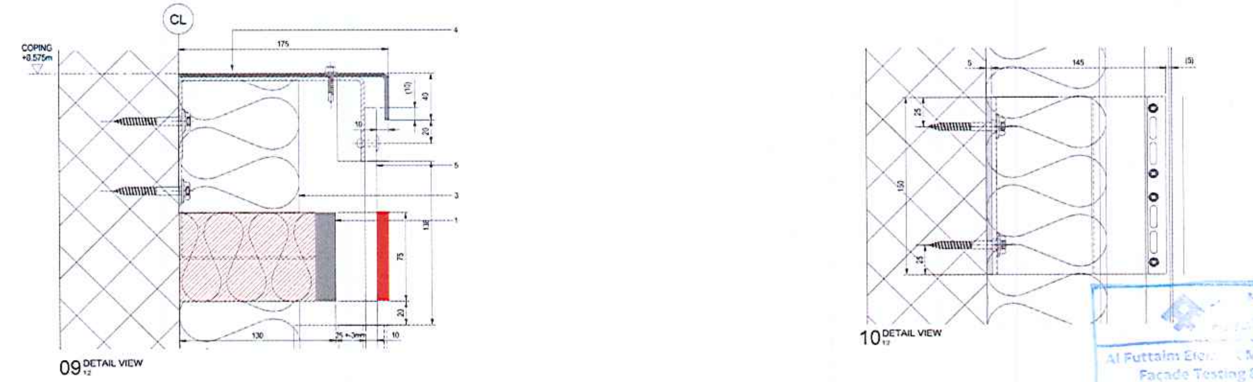

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5mm THK ALUMINIUM FLASHINGS GRADE 1050A H14. NO FINISH.

3. INSULATION SPECIFICATION F.O.C
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4. ALUMINIUM FLASHINGS
3MM THK ALUMINIUM FLASHING(2) GRADE 1050A H14. NO FINISH.

5. CLADDING
10MM THK TRESPA METEON FR GRADE A12 1.6 10MM JOINTS, HORIZONTAL JOINTS TO HAVE BIRD BEAK (TPS) PROFILE (3000MM LONG)
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REFER TO METHOD STATEMENTS & LIFTING PLANS, ENSURE ADEQUAETLY TRAINED SUPERVISION

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SHOT-FIRING, CUTTING, DRILLING OPERATIONS PRODUCING EXCESSIVE NOISE

09 CDM **VIBRATION**
OPERATIONS PRODUCING EXCESSIVE VIBRATION, MONITOR EXPOSURE

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FIRE TEST
TRESPA FACADE - DETAILS

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