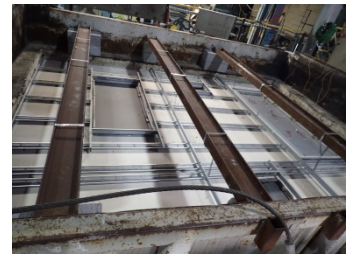


Title:

The Fire Resistance
Performance Of Four
Horizontally Mounted,
Access Panel Doorsets,
tested using the principles
of BS EN 1634-1: 2014.

WF Report No:

393967 Issue 2



Prepared for:

Panel Technologies

49-61 Jodrell Street
Warwickshire
CV11 5EG

Date:

4th March 2019

Summary

Objective To determine the fire resistance performance of four horizontally mounted, access panel doorsets, when tested using the principles of BS EN 1634-1:2014.

Sponsor **Panel Technologies**

49-61 Jodrell Street
Warwickshire
CV11 5EG

Summary of Tested Specimen For test purposes test purposes the access panel doorsets were referenced as Hatch A to D. The doorsets were installed into a suspended ceiling formed from a metal grid.

Hatch A had overall nominal dimensions of 1250 mm by 640 mm the doorset was formed from 0.9 mm thick steel with a powder coated finish.

Hatch B had overall nominal dimensions of 350 mm by 350 mm the doorset were formed from 0.9 mm thick steel with a powder coated finish

Hatch C had overall nominal dimensions of 350 mm by 350 mm the doorset was formed from 0.9 mm thick steel with a powder coated finish

Hatch D had overall nominal dimensions of 1850 mm by 800 mm the doorset was formed from 0.9 mm thick steel with a powder coated finish

If the performance of hatches was to be assessed against the integrity and insulation criteria from BS EN 1634-1: 2014, the test results could be expressed as follows:

Test Results:		Hatch A	Hatch B	Hatch C	Hatch D
Integrity	Sustained flaming	103 minutes	103 minutes	103 minutes	103 minutes
	Gap gauge	80 minutes	103 minutes	103 minutes	103 minutes
	Cotton Pad	24 minutes	20 minutes	22 minutes	103 minutes
Insulation		n/a	n/a	n/a	21 minutes

The test was discontinued after a period of 103 minutes.

Date of Test 18th August 2018.

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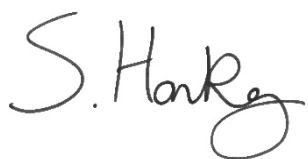
Signatories



Responsible Officer
N. Howard*
Testing Officer



Approved
W. Drazkiewicz*
Technical Manager



Head of Department
S. Hankey *
Business Unit Head

* For and on behalf of **Warringtonfire**.

Report Issued

Date: 4th March 2019

Issue 2: Amendment to panel 'D' overall size. NH. 20th March 2019.

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Test Procedure

Introduction

The access panel doorsets are required to provide a fire separating function and were therefore tested using the principals of BS EN 1634-1: 2014 'Fire resistance tests for doors and shutter assemblies - Part 1: Fire doors and shutters'. This test report should be read in conjunction with that Standard and with BS EN 1363-1: 2012, 'Fire resistance tests - Part 1: General requirements' and BS EN 1363-2: 1999, 'Fire resistance tests - Part 2: Alternative and additional procedures'.

The specimens were judged on their ability to comply with the performance criteria for integrity and where appropriate insulation, using the principals of BS EN 1634-1: 2014.

The scope of the standard covers doors, shutters and openable windows designed for installation within vertical separating elements, however it would seem reasonable to apply the same principles to horizontally installed specimens and therefore this test is reported as using the principals of BS EN 1634-1: 2014

Fire Test Study Group/EGOLF

Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.

Instruction To Test

The test was conducted on the 18th August 2018 at the request of **Panel Technologies** the test sponsor.

Test Specimen Construction

A comprehensive description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimen and information supplied by the sponsor of the test.

Installation

The assembly was installed into a refractory concrete lined, steel restraint frame between the 16th and 18th of August 2018. Representatives Warrington fire conducted the installation.

Sampling

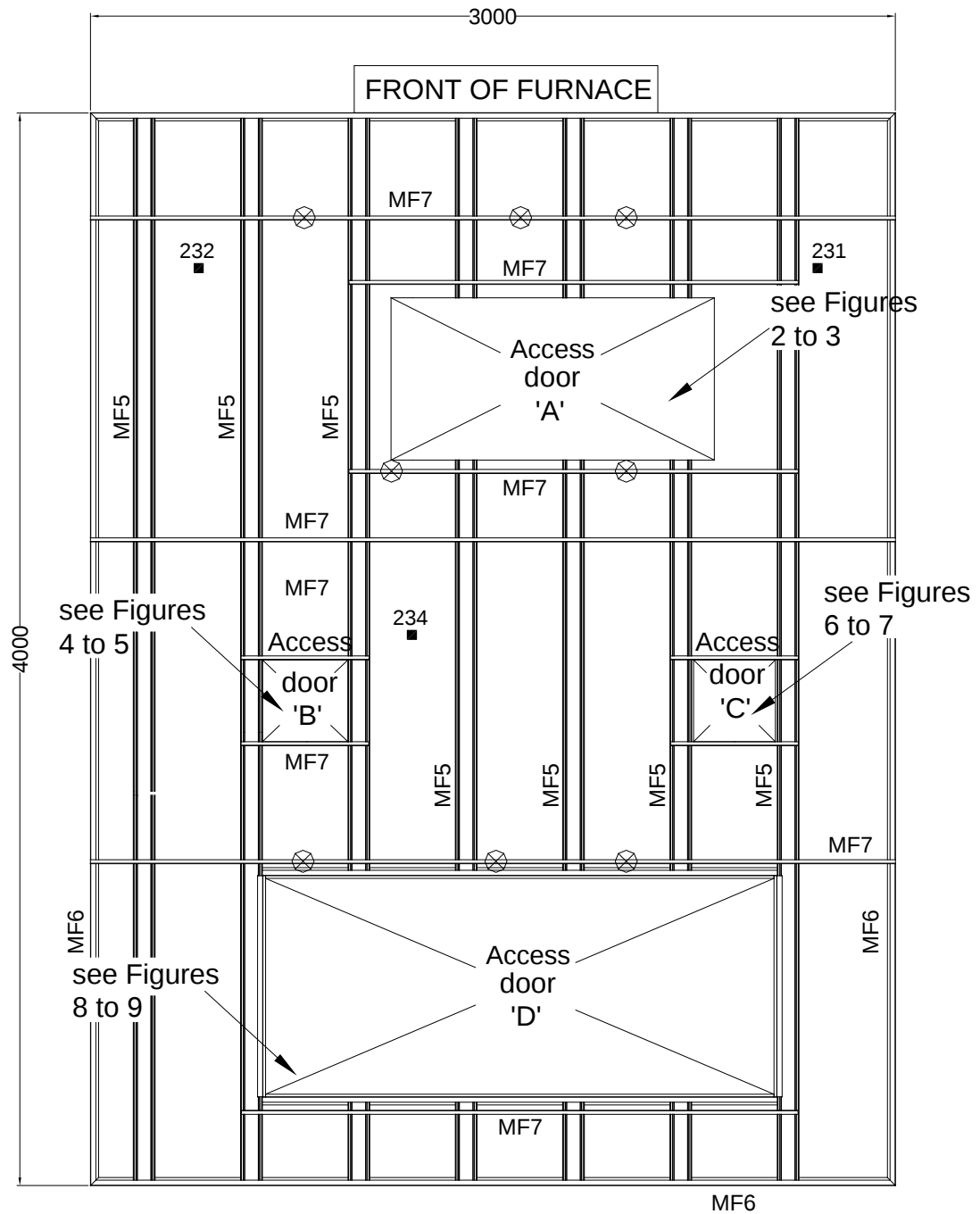
Warringtonfire was not involved in any selection or sampling procedures of the specimen or any of their components.

Conditioning

The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 2 days. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 19.5°C to 23.5°C and 50.5% to 72% respectively.

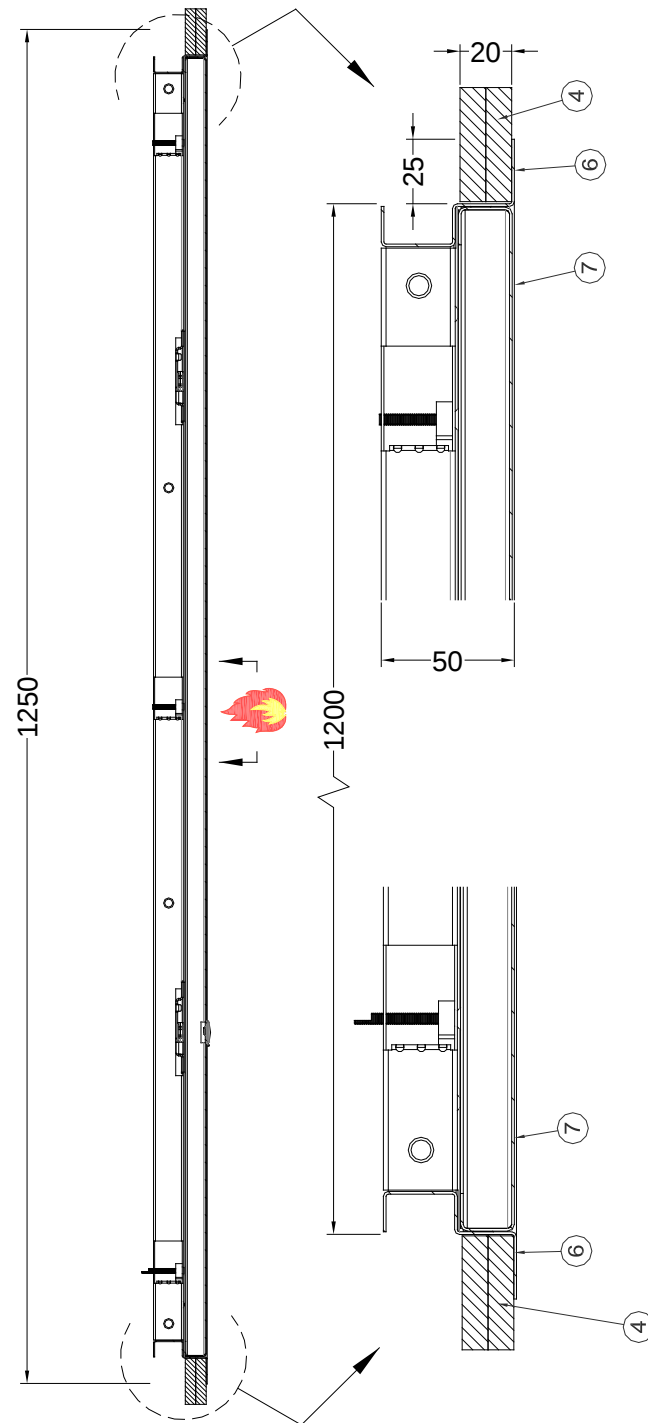
Test Construction

Figure 1- General Elevation of Test Construction



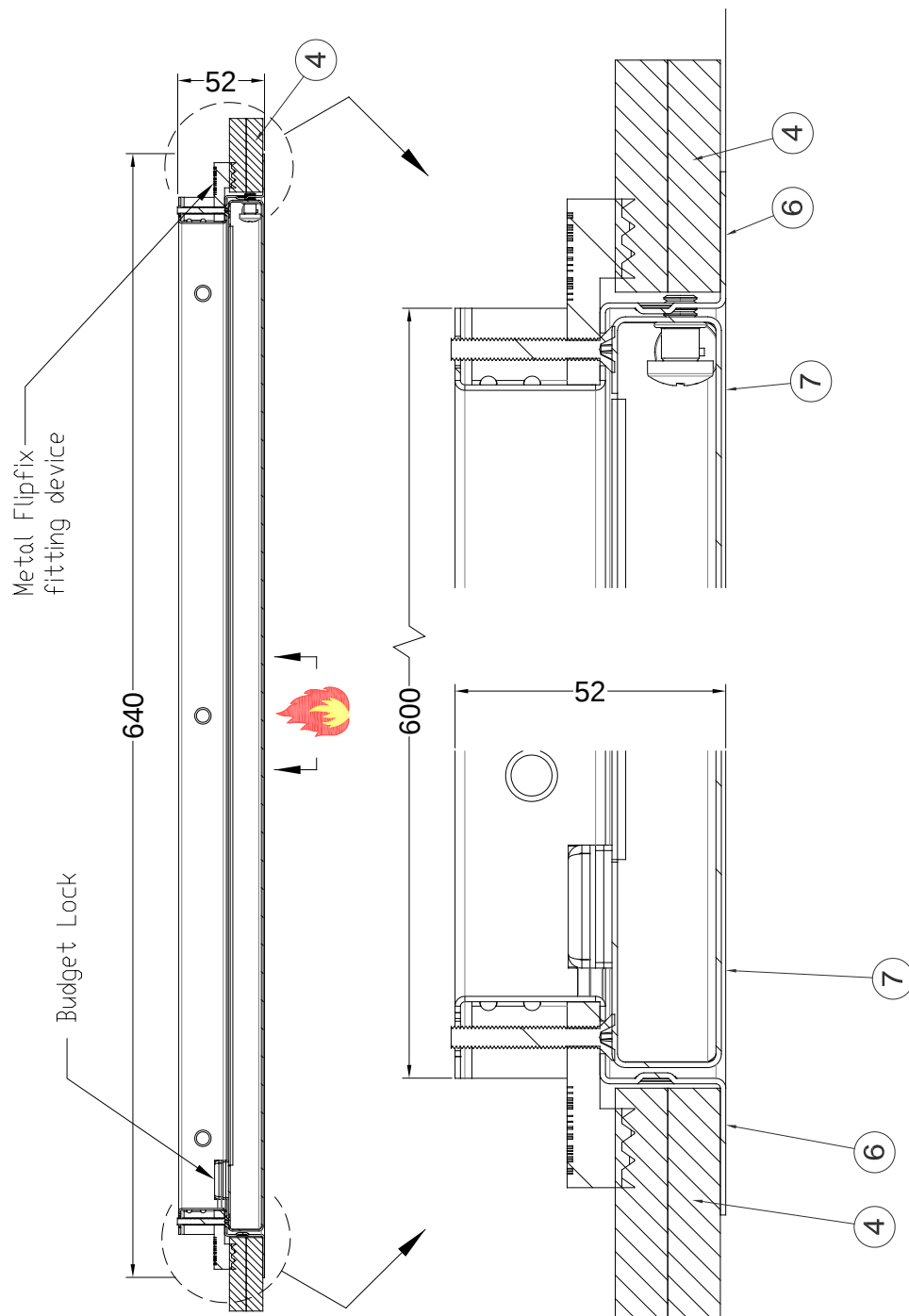
Do not scale. All dimensions are in mm

Figure 2 – Details of Panel A – Horizontal cross section through panel – FF-060-MD-PF OVER 6x6



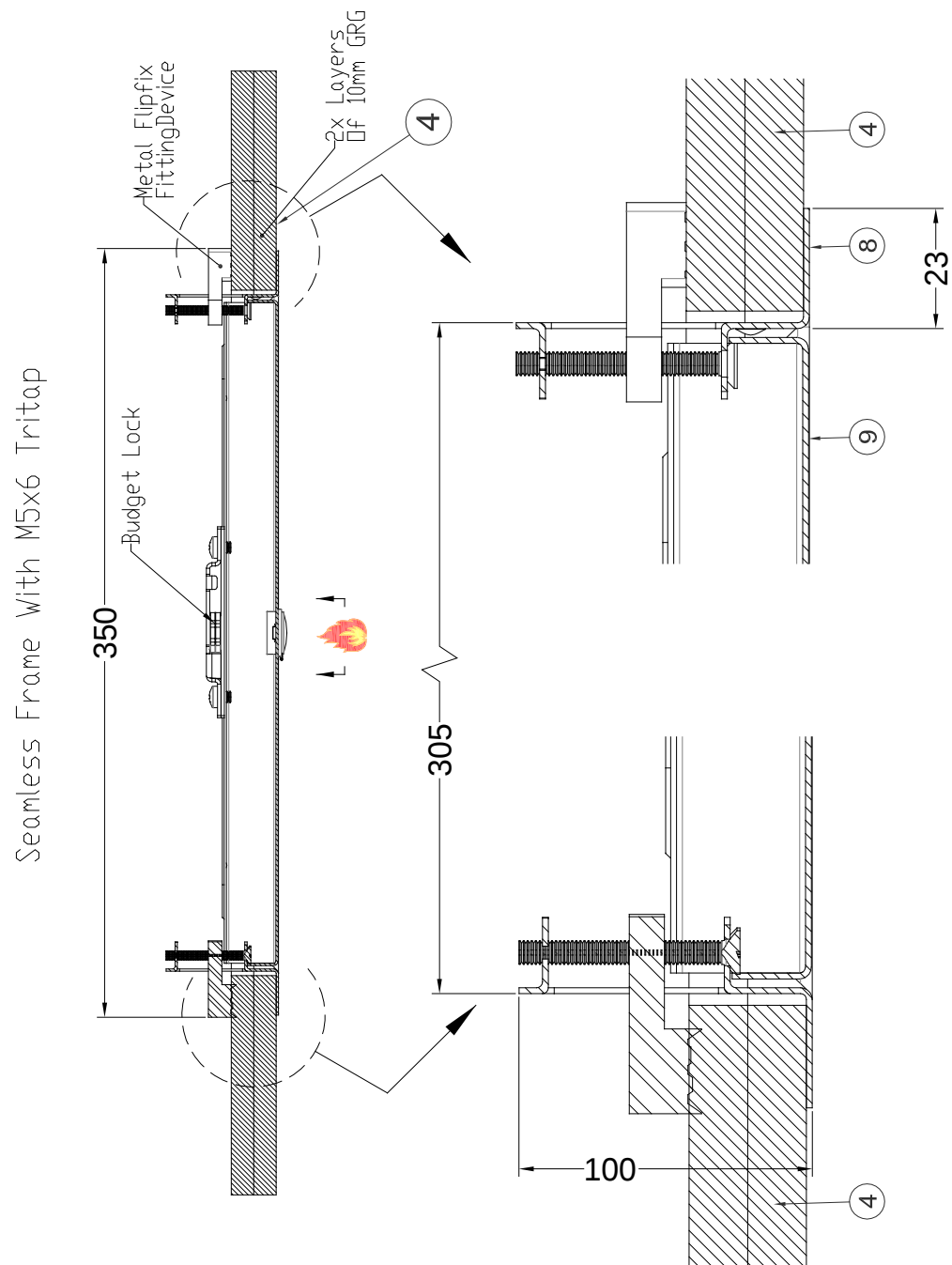
Do not scale. All dimensions are in mm

Figure 3 – Details of Panel A – Horizontal cross section through panel – FF-060-MD-PF OVER 6x6



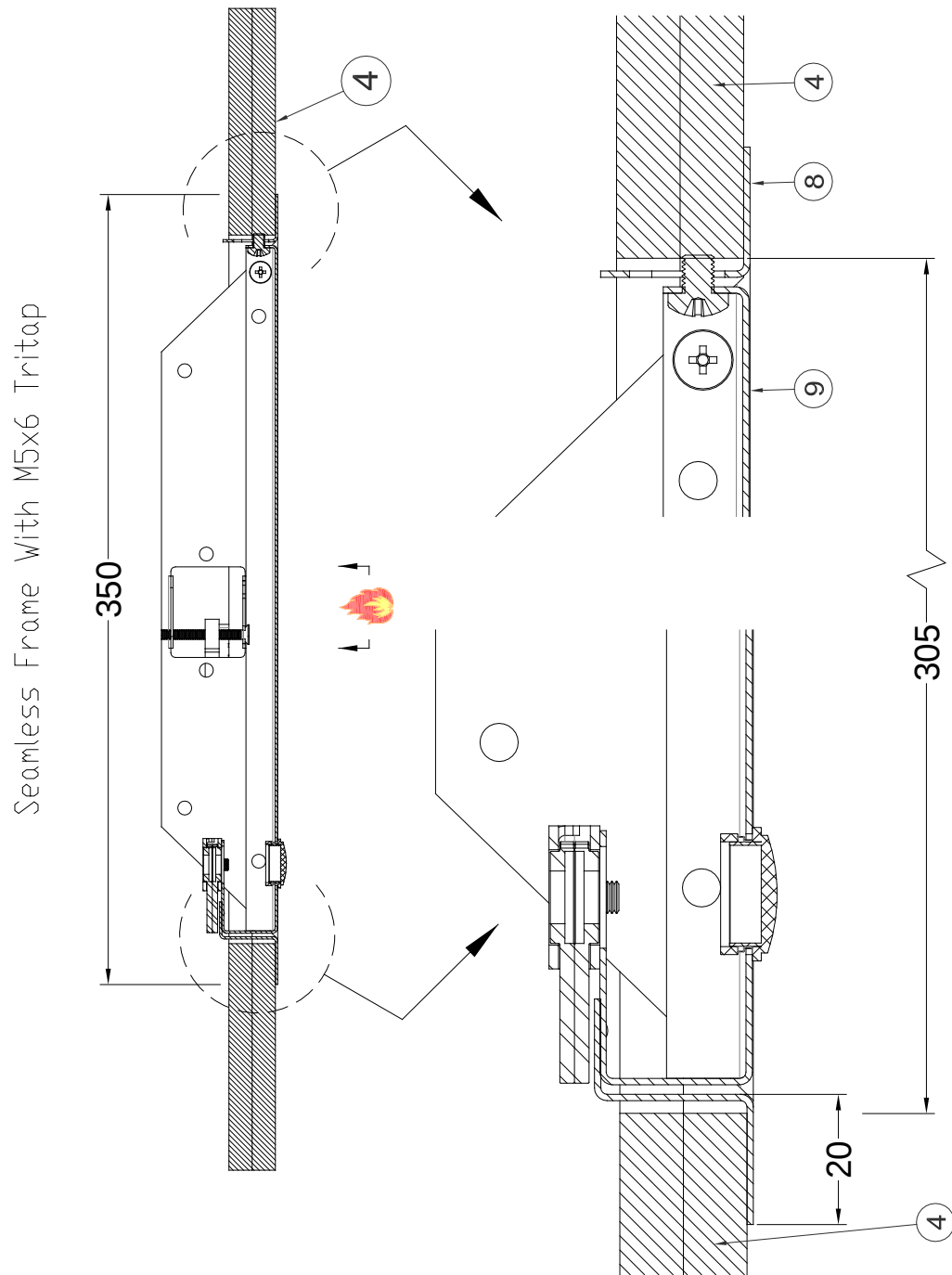
Do not scale. All dimensions are in mm

Figure 4 – Details of Panel B – Horizontal cross section through panel – FF-060-MD-PF-BL (2 flip fix) Welded frame



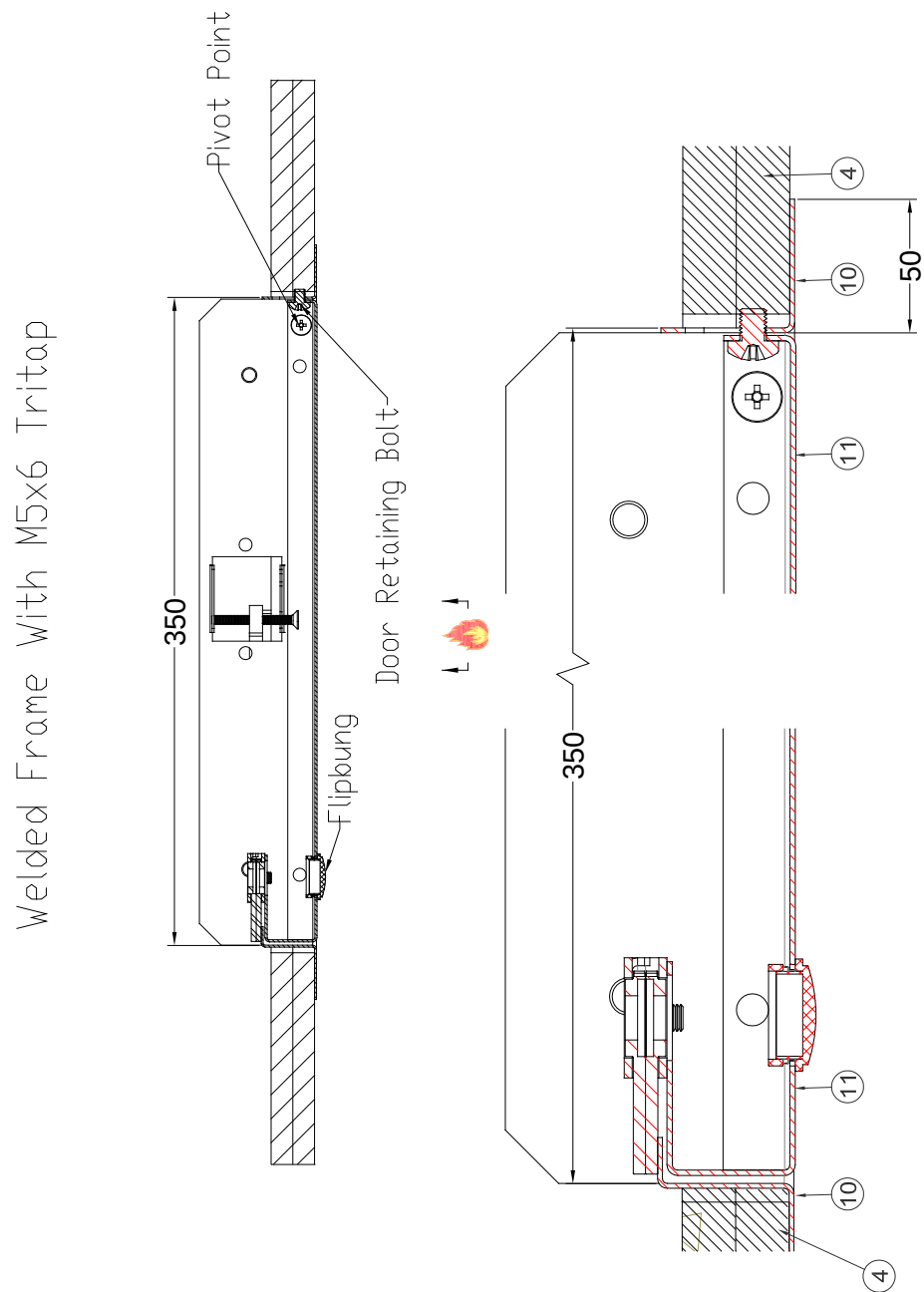
Do not scale. All dimensions are in mm

Figure 5 – Details of Panel B – Horizontal cross section through panel – FF-060-MD-PF-BL (2 flip fix) Welded frame



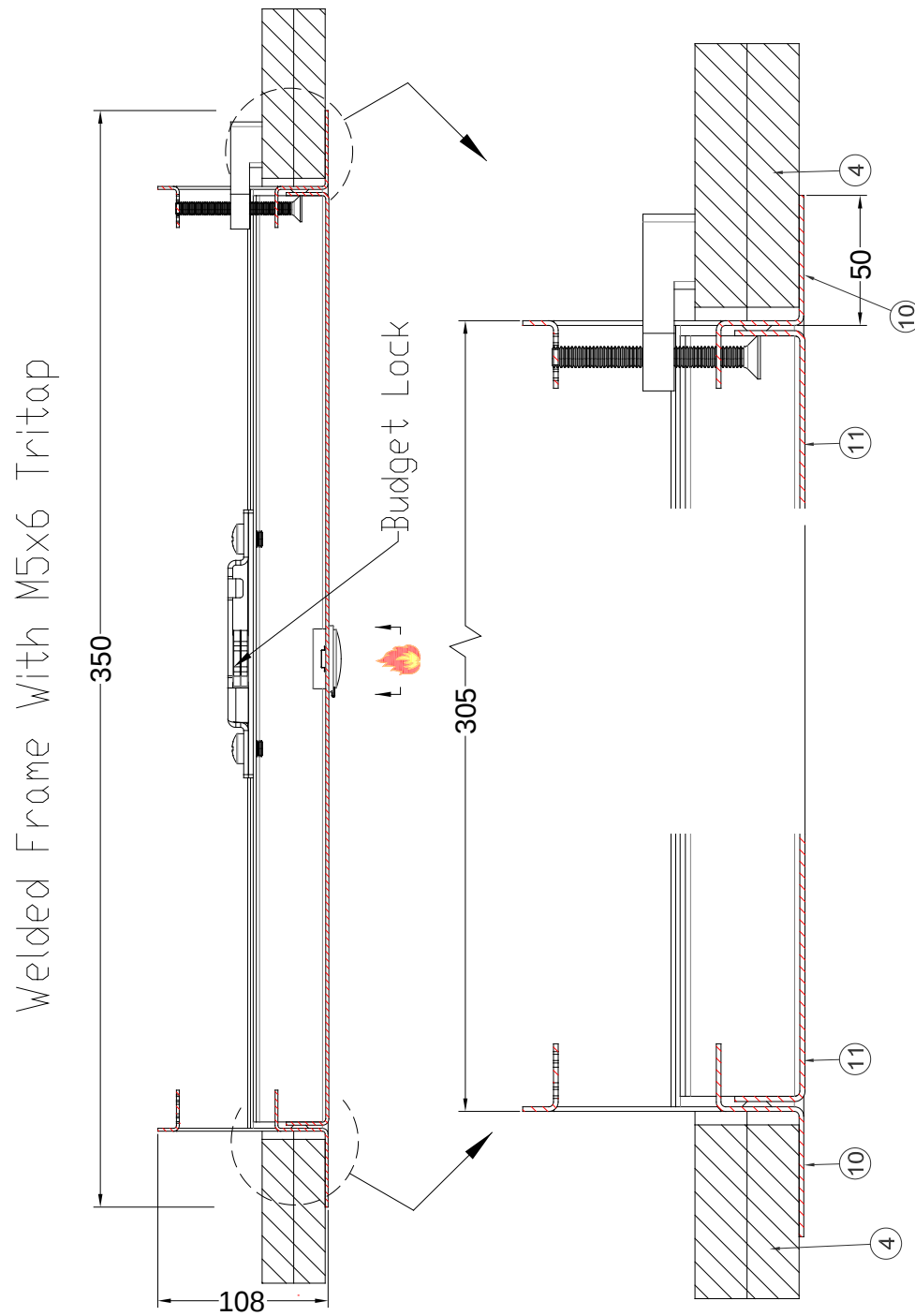
Do not scale. All dimensions are in mm

Figure 6 – Details of Panel C – Horizontal cross section through panel – FF-060-MD-PF-BL (2 flip fix) Seamless weld



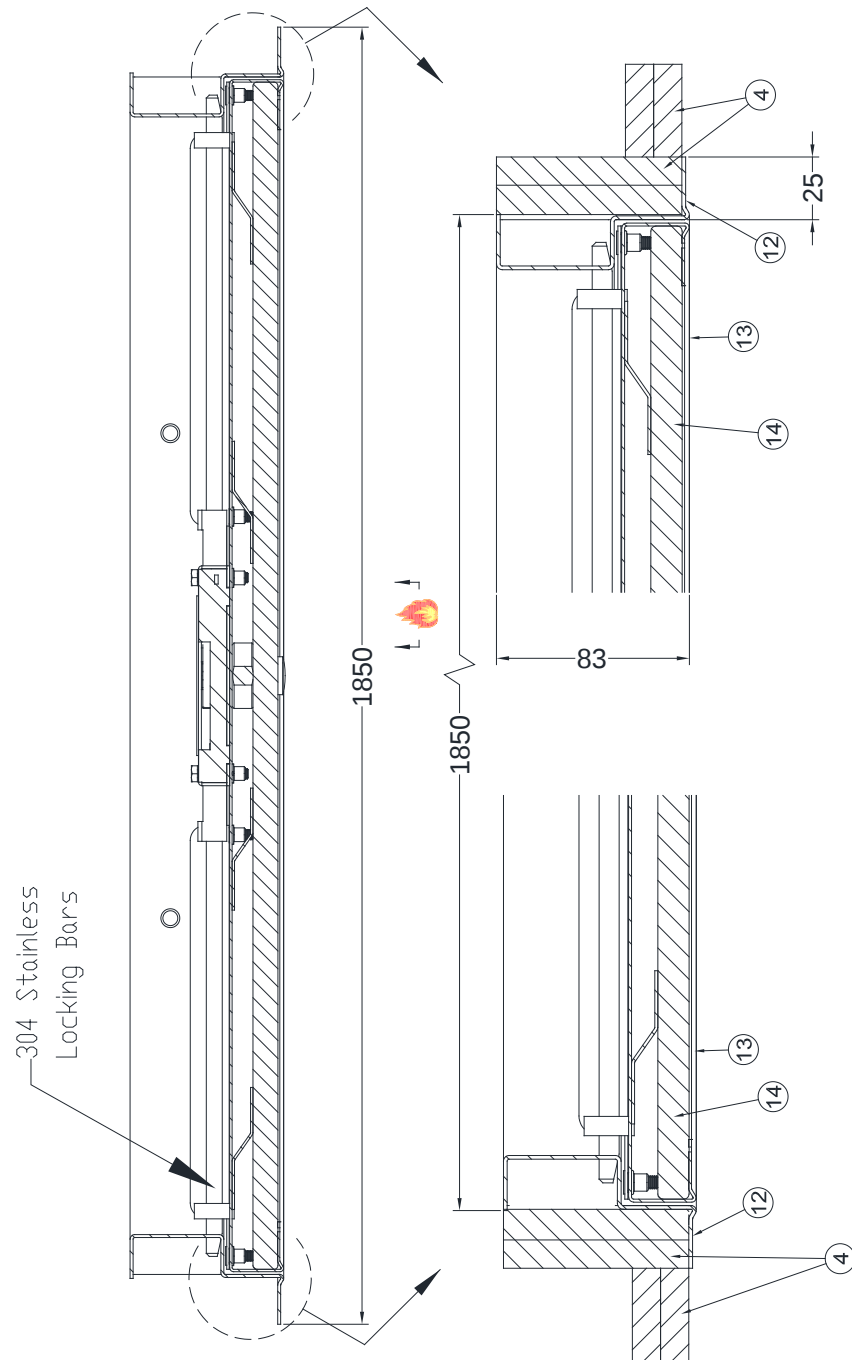
Do not scale. All dimensions are in mm

Figure 7 – Details of Panel C – Horizontal cross section through panel – FF-060-MD-PF-BL (2 flip fix) Seamless weld



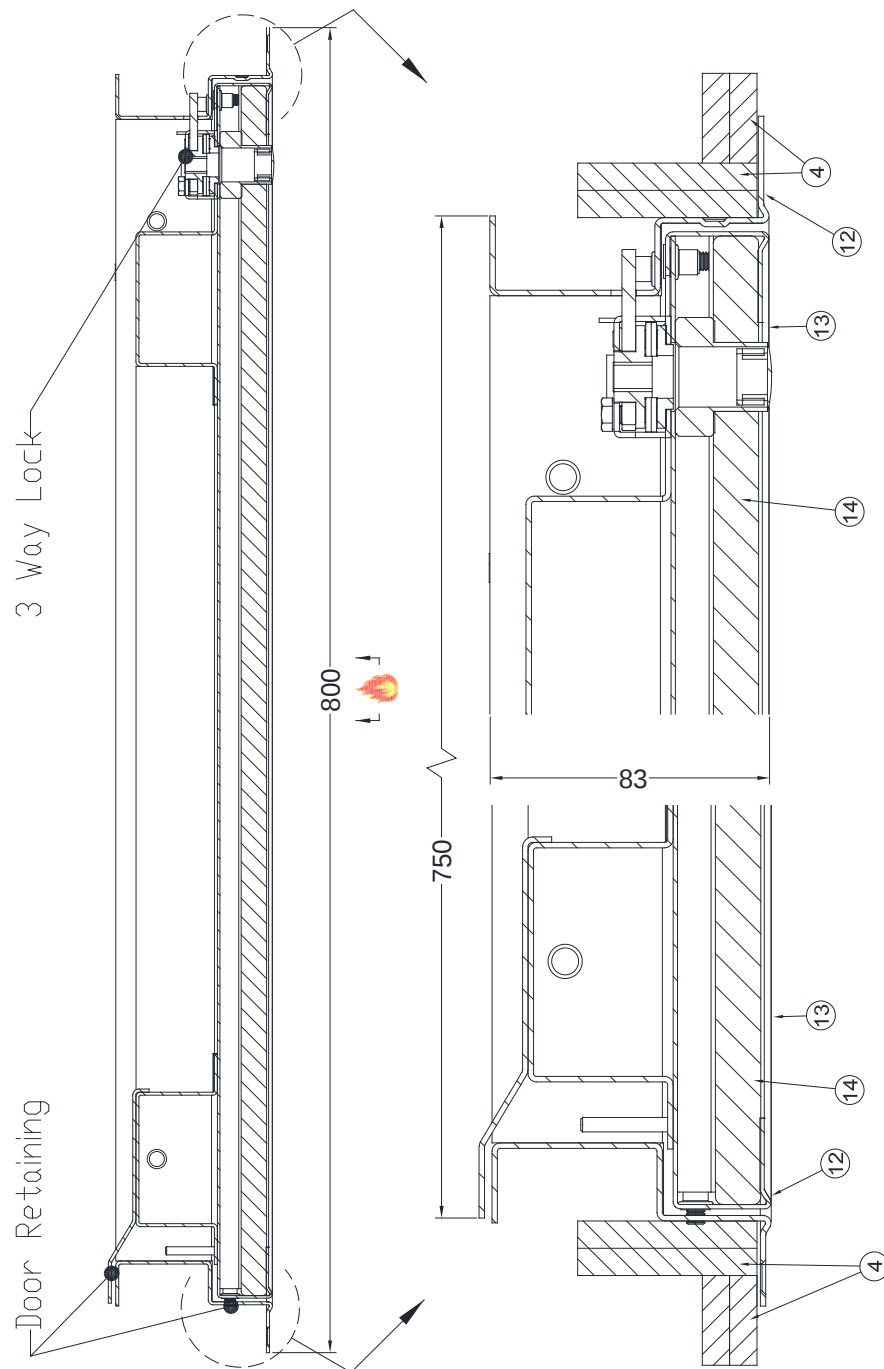
Do not scale. All dimensions are in mm

Figure 8 – Details of Panel D – Horizontal cross section through panel – AP-060-PD-BF-3WL



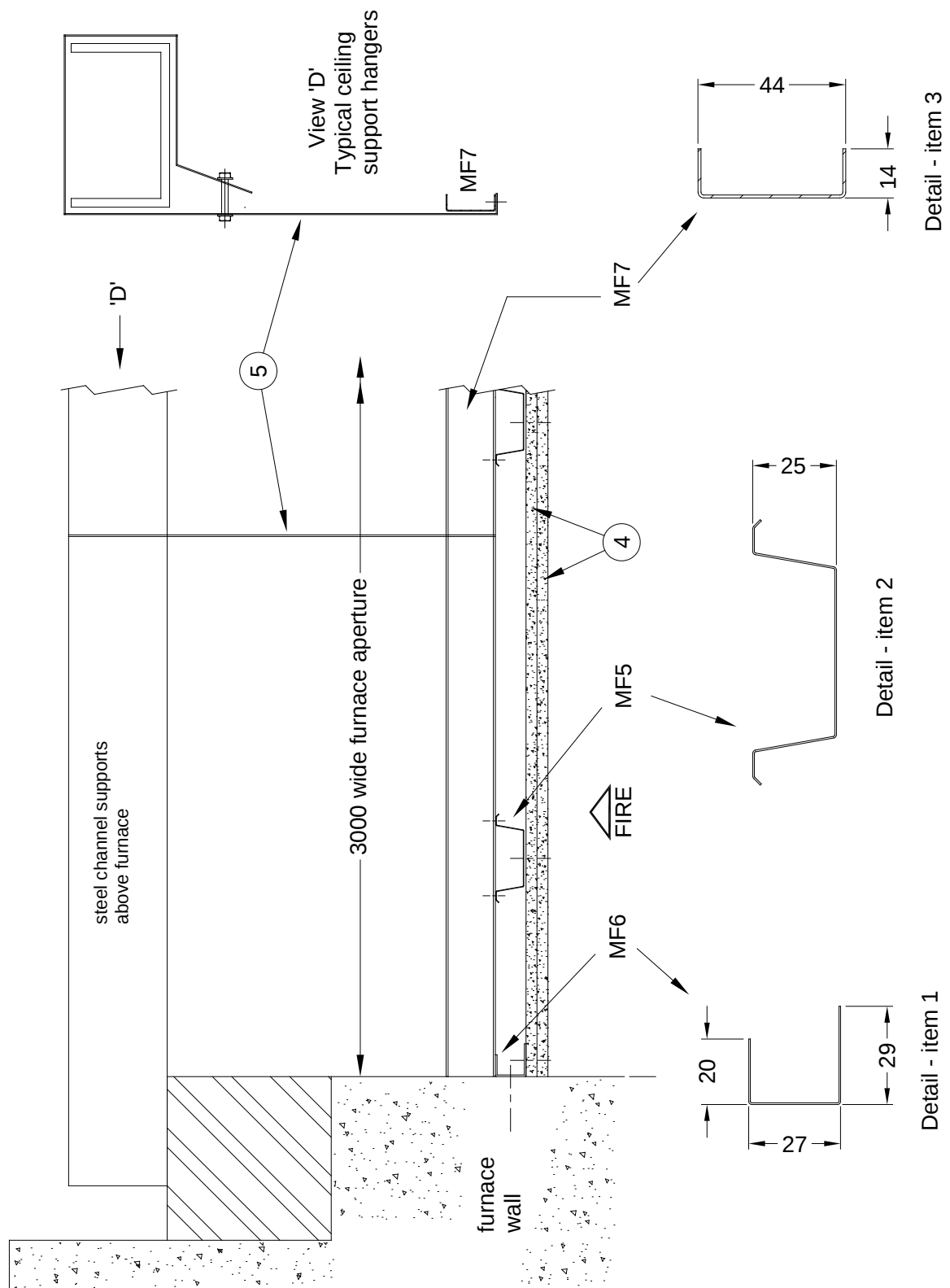
Do not scale. All dimensions are in mm

Figure 9 – Details of Panel D – Horizontal cross section through panel – AP-060-PD-BF-3WL



Do not scale. All dimensions are in mm

Figure 10 – Details of suspended ceiling



Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to 10)
(All values are nominal unless stated otherwise)
(All other details are as stated by the sponsor)

<u>Item</u>	<u>Description</u>
British Gypsum suspended ceiling configuration G100038 (comprising items 1 to 5)	
1. Ceiling perimeter channel	
Reference	: Gypframe MF6
Material	: Galvanised mild steel formed channel
Thickness	: 0.6 mm
Overall section size	: See Figure 8
Fixing method	: Fixed to the concrete lining of the specimen restraint frame using 7.5 mm diameter x 40 mm long Multi-Fix masonry screws at 600 mm centres.
2. Ceiling secondary support sections	
Reference	: Gypframe MF5
Material	: Galvanised mild steel section
Thickness	: 0.6 mm
Overall section size	: See Figure 8
Fixing method	: Sections were fitted longitudinally at 400 mm centres, with each end fitted within the perimeter channel. Sections were also fixed to the primary support channels (see item 3).
3. Ceiling primary support channel	
Reference	: Gypframe MF7
Material	: Galvanised mild steel formed channel
Thickness	: 1.2 mm
Overall section size	: See Figure 8
Fixing method	: Primary sections fitted laterally across the ceiling on top of the longitudinally fitted secondary sections (item 2) at positions shown on Figure 1. Both sections fixed together at each intersection using 2 no. 13 mm Gyproc 13 mm wafer head jack-point steel screws.
4. Ceiling boards	
Manufacturer	: Saint Gobain
Reference	: Glasroc F Multiboard
Material	: Glass-reinforced gypsum plasterboard
Thickness	: 2 no. layers, each layer 10 mm thick
Supplied board size	: 1200 mm x 2400 mm
Density	: 850 kg/m ³ (stated)
Fixing method	: Gyproc drywall screws at 150 mm centres along the perimeter MF6 channels (item 1) and along the MF5 sections (item 2). 25 mm long screws for first layer boards and 34 mm long screws for the second layer. Board joints of each layer were staggered with respect to each other.

<u>Item</u>	<u>Description</u>
5. Ceiling support hangers	
Type	: Metal fixing band
Reference	: Simpson Strong Tie FB20A
Fixing method	: Upper end of the band was secured by being strapped around steel support channels which were installed above the ceiling assembly for the purpose of the test. The lower end of the band was screw fixed to the MF7 primary support channel using a single 13 mm wafer head jack-point steel screw. See Figure 8.
Quantity	: For positions of the hangers, see Figure 1.

Access panel assembly 'A' (consisting of items 6 & 7)**6. Mounting frame**

Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel
Frame size	: 640 mm x 1250 mm
Fixing method	: Clamped within the opening in the ceiling plasterboard panels using 4 no. metal FLipFix devices.

7. Door panel

Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel

Access panel assembly 'B' (consisting of items 8 & 9)**8. Mounting frame**

Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel
Frame size	: 350 mm x 350 mm
Fixing method	: Clamped within the opening in the ceiling plasterboard panels using 2 no. metal FLipFix devices.

9. Door panel

Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel

Access panel assembly 'C' (consisting of items 10 & 11)**10. Mounting frame**

Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel
Frame size	: 350 mm x 350 mm
Fixing method	: Clamped within the opening in the ceiling plasterboard panels using 2 no. metal FLipFix devices.

11. Door panel

Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel

<u>Item</u>	<u>Description</u>
Access panel assembly 'D' (consisting of items 12,13 & 14)	
12. Mounting frame	
Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel
Frame size	: 850 mm x 1850mm
Fixing method	: Screw fixed in place using 3.5 x 50mm Bright Zinc Plated (BZP) Countersunk Pozi Bugle Head Cross Recess Self Drilling Drywall Screws at 300mm centres.
13. Door panel	
Material	: Zinc mild steel, powder coated finish
Thickness	: 0.9 mm steel
14 Door panel insulation	
Manufacturer	: Siniat
Reference	: Megadeco board
Density	: 800 kg/m ³ (stated)
Thickness	: 12.5mm thick
Fixing method	: Inserted into the door tray

Instrumentation

General	The instrumentation was provided in accordance with the requirements of the Standard.
Furnace	The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 2012, Clause 5.1 using eight plate thermometers, distributed over a plane 100 mm below the surface of the test construction.
Thermocouple Allocation	Thermocouples were provided to monitor the unexposed surface of Hatch D and the output of all instrumentation was recorded at no less than one minute intervals.
Thermocouples 211 to 215 (Hatch D)	At five positions on the doorset, one at the approximate centre and one at approximately the centre of each quarter section of the doorset. The locations and reference numbers of the various unexposed surface thermocouples are shown in Figure 1.
Integrity Criteria	Cotton pads and gap gauges were available to evaluate the integrity of the specimen.
Furnace Pressure	The furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 2012, Clause 5.2. The calculated pressure differential relative to the laboratory atmosphere 100 mm below the face of the assembly was 20 (± 3) Pa.
Deflection/Radiation	Due to the nature of the test assembly, it was not possible for safety reasons, to measure deflections and heat radiation. However visual observations of the deflections are noted in the observations.

Test Observations

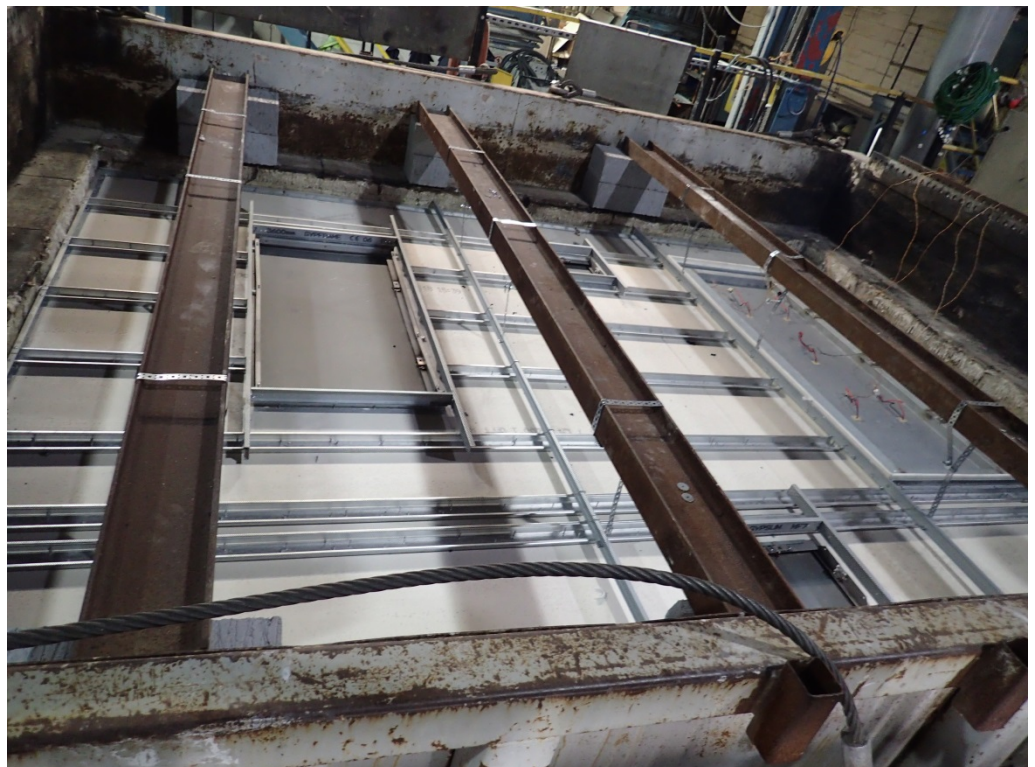
Time		All observations are from the unexposed face unless noted otherwise.
Mins	Secs	The ambient air temperature in the vicinity of the test construction was 17°C at the start of the test with a maximum variation of +3°C during the test.
00	00	The test commences.
01	00	Slight steam release from the hatches.
02	30	The uninsulated large hatch distorts towards the heating conditions.
09	00	The steam release increases from the perimeter of each hatch.
12	00	Viewed from the exposed face: The hatches radiate a bright orange in colour around the perimeter. Glowing embers swirl around the furnace chamber.
18	00	Smoke release is evident from the perimeter of the insulated hatch.
20	00	A cotton pad is applied to hatch 'B' and ignites. Cotton pad integrity failure of Hatch B is deemed to occur.
22	00	A cotton pad is applied to hatch 'C' and ignites. Cotton pad integrity failure of Hatch C is deemed to occur.
24	00	A cotton pad is applied to hatch 'A' and ignites. Cotton pad integrity failure of Hatch A is deemed to occur.
30	00	Each hatch continues to satisfy the sustained flame and gap gauge integrity criteria of the test.
46	00	Hatch A, B and C glow a dull orange in colour.
60	00	Each hatch continues to satisfy the sustained flame and gap gauge integrity criteria of the test.
70	00	A section of board 1st layer falls away into the furnace chamber.
80	00	Hatch A fails the gap gauge integrity criteria due to a gap in excess of 25mm forming. Gap gauge integrity failure of Hatch A is deemed to occur.
103	00	Test discontinued
Post	Test	Hatch D continued to satisfy the sustained flame and gap gauge integrity criteria of the test.

Test Photographs

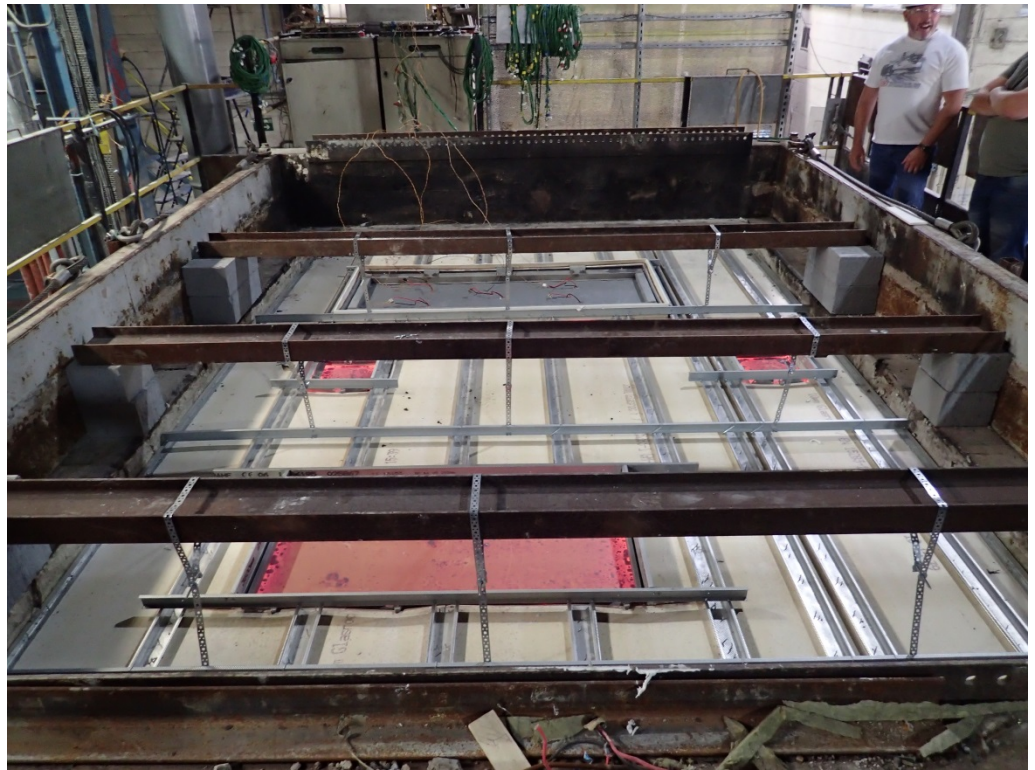
The exposed face of the test assembly prior to the start of the test



The unexposed face of the test assembly prior to the start of the test



The unexposed face of the test assembly after a test duration of 60 minutes



The exposed face of the test assembly shortly after the test



Temperature Data

Mean furnace temperature, together with the temperature/time relationship specified in the Standard

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	145
3	502	572
6	603	583
9	663	654
12	706	690
15	739	747
18	766	761
21	789	785
22	796	791
24	809	803
27	826	823
30	842	841
33	856	856
36	869	867
39	881	887
42	892	893
45	902	902
48	912	911
51	921	918
54	930	930
57	938	938
60	945	946
63	953	953
66	960	959
69	966	965
72	973	971
75	979	977
78	985	981
81	990	992
84	996	1000
87	1001	1005
90	1006	1007
93	1011	1012
96	1016	1015
99	1020	1018
102	1025	1021
103	1026	1068

Individual And Mean Temperatures Recorded On The Unexposed Surface Of Hatch D

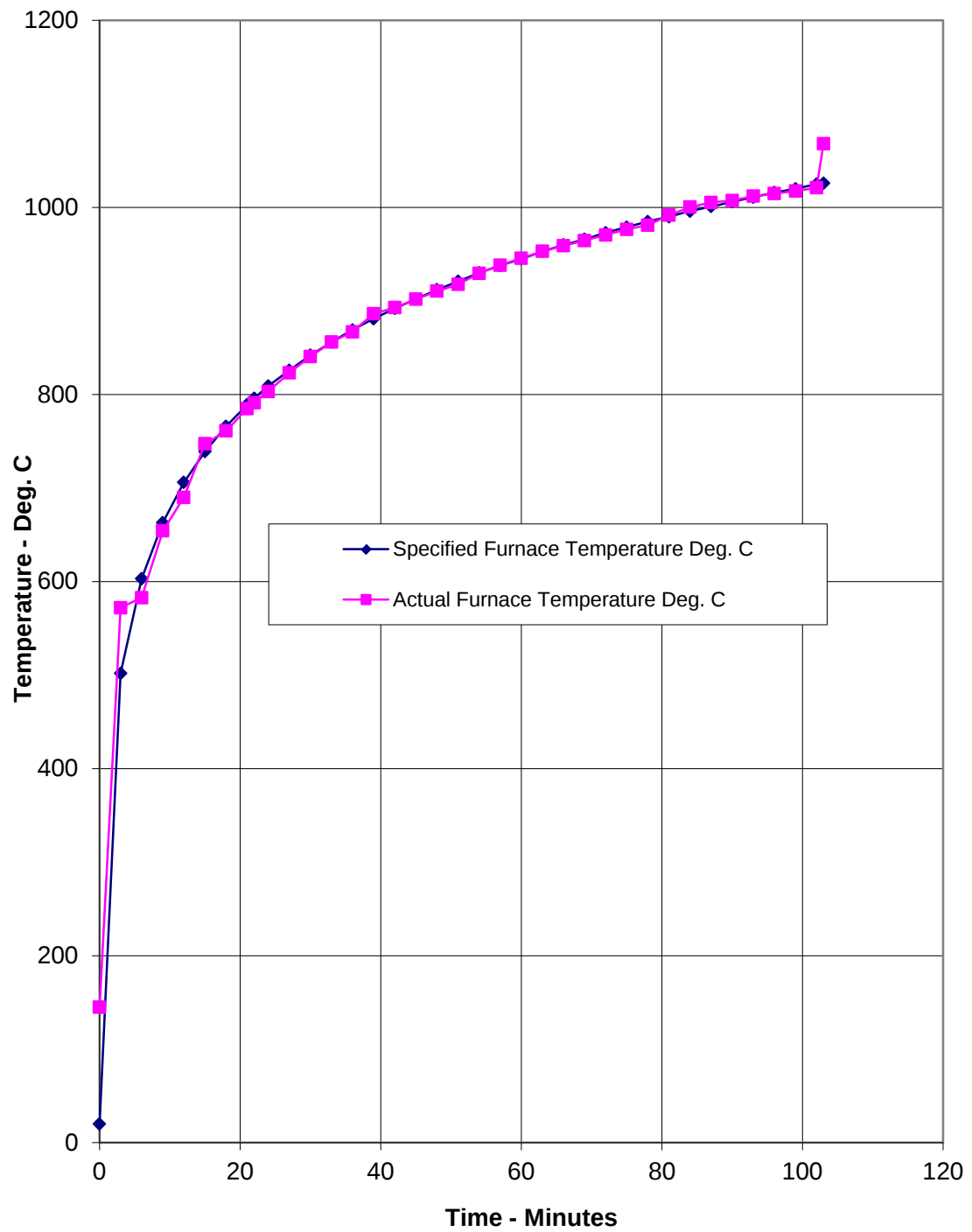
Time Mins	T/C Number 211 Deg. C	T/C Number 212 Deg. C	T/C Number 213 Deg. C	T/C Number 214 Deg. C	T/C Number 215 Deg. C	T/C Number 216 Deg. C	Mean Temp Deg. C
0	19	19	19	19	22	17	19
3	52	62	67	62	62	25	55
6	70	82	80	78	81	29	70
9	89	92	89	89	90	31	80
12	90	89	89	89	90	*	89
15	79	85	86	87	88	*	85
18	77	85	87	86	90	*	85
21	177	185	150	133	139	*	157
22	216	219	194	175	182	*	197
24	272	266	249	237	237	*	252
27	312	307	298	285	286	*	298
30	331	321	319	309	309	*	318
33	339	334	333	321	321	*	330
36	337	336	346	327	328	*	335
39	333	337	348	333	335	*	337
42	330	332	332	339	343	*	335
45	331	332	327	336	344	*	334
48	330	330	326	331	340	*	331
51	331	330	325	329	337	*	330
54	334	330	327	327	335	*	331
57	334	333	330	330	334	*	332
60	338	333	333	332	336	*	334
63	340	336	335	334	338	*	337
66	341	338	336	336	340	*	338
69	344	346	340	337	343	*	342
72	345	345	341	340	345	*	343
75	347	347	344	343	348	*	346
78	346	353	348	344	349	*	348
81	352	351	348	346	352	*	350
84	353	355	350	350	354	*	352
87	355	363	353	353	356	*	356
90	358	363	354	356	359	*	358
93	361	367	357	356	361	*	360
96	362	369	359	358	363	*	362
99	362	372	362	359	364	*	364
102	362	371	361	360	365	*	364
103	364	373	361	361	365	*	365

*Thermocouple Malfunction

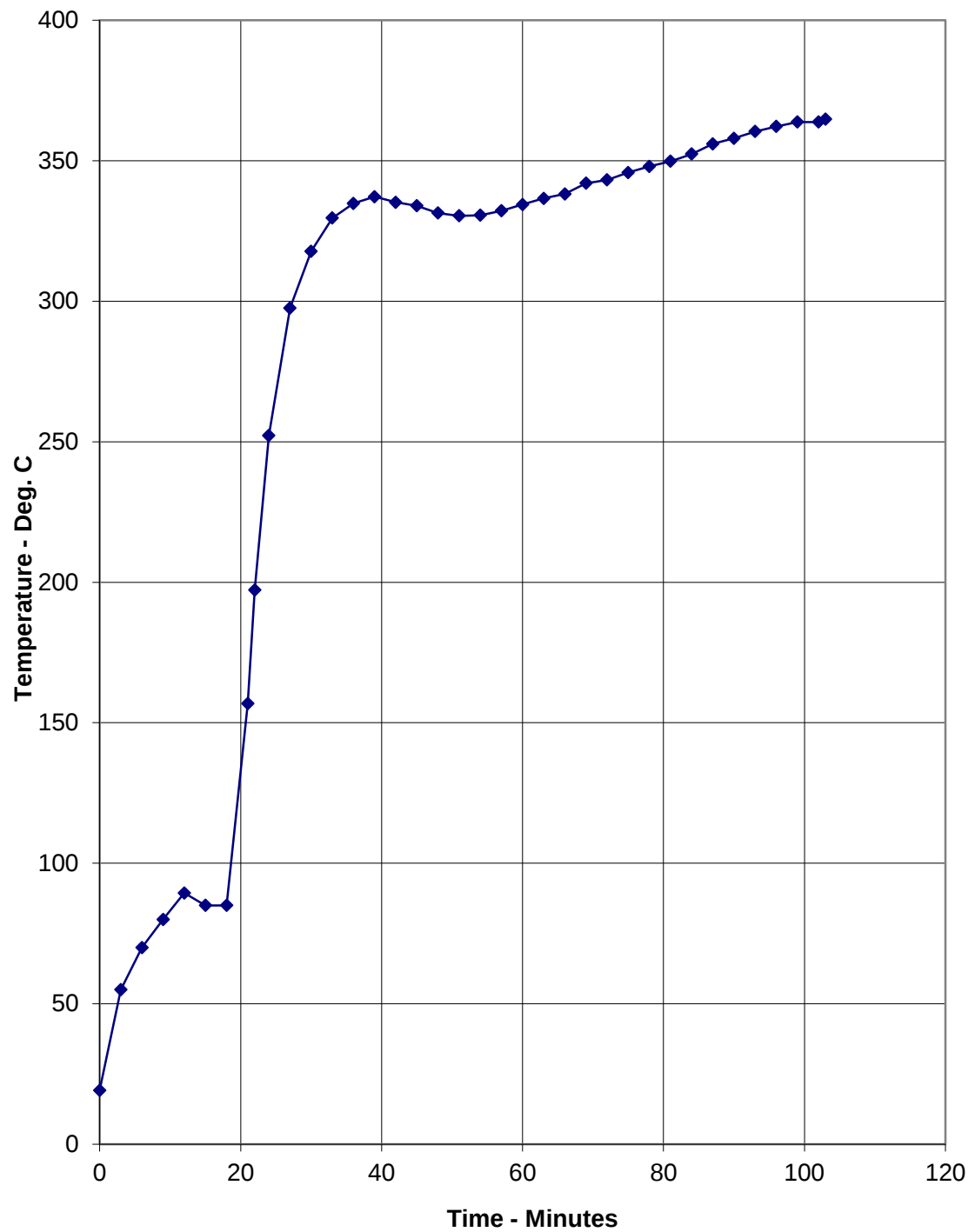
Furnace Pressure Recorded 100 Mm Below The Exposed Face Of The Test Assembly

Time Mins	Recorded Pressure Pascals
0	0
3	0
6	0
9	19
12	20
15	19
18	14
21	17
22	16
24	13
27	19
30	18
33	17
36	19
39	17
42	19
45	18
48	18
51	19
54	20
57	17
60	18
63	19
66	18
69	22
72	18
75	19
78	17
81	19
84	17
87	19
90	18
93	17
96	18
99	15
102	15
103	16

Graph showing mean furnace temperature, together with the temperature/time relationship specified in the Standard



Graph Showing The Mean Temperature On The Unexposed Face Of Hatch D



Performance Criteria and Test Results

Integrity

It is required that the specimen retains its separating function, without:

- causing ignition of a cotton pad when applied
- permitting the penetration of a gap gauge as specified in BS EN 1634-1: 2014
- sustained flaming on the unexposed surface

If the performance of hatches was to be assessed against the above integrity criteria, the test results could be expressed as follows:

	Hatch A	Hatch B	Hatch C	Hatch D
Sustained flaming	103 minutes	103 minutes	103 minutes	103 minutes
Gap gauge	80 minutes	103 minutes	103 minutes	103 minutes
Cotton Pad	24 minutes	20 minutes	22 minutes	103 minutes

Insulation

The mean temperature rise of the unexposed surface shall not be greater than 140°C and that the maximum temperature rise shall not be greater than 180°C (except on the door frame, where the maximum temperature rise shall not exceed 360°C). Insulation failure also occurs simultaneously with integrity failure as specified in BS EN 1634-1: 2014. If the performance of Specimens was to be assessed against those criteria, test results could be expressed as follows:

Hatch A	Hatch B	Hatch C	Hatch D
n/a	n/a	n/a	21 minutes

The test was discontinued after 103 minutes.

On-going Implications

Limitations

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in BS EN 1363-1: 2012, and where appropriate BS EN 1363-2:1999. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report. Annex A of BS EN 1363-1: 2012, provides guidance information on the application of fire resistance tests and the interpretation of test data.

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.

Conclusions

Evaluation against objective

Four horizontally orientated access panel doorsets have been subjected to a fire resistance test using the principals of BS EN 1634-1: 2014, Fire resistance tests for door and shutter assemblies, BS EN 1363-1: 2012, General requirements and BS EN 1363-2: 1999.

If the performance of hatches was to be assessed against the integrity and insulation criteria from BS EN 1634-1: 2014, the test results could be expressed as follows:

	Hatch A	Hatch B	Hatch C	Hatch D
Sustained flaming	103 minutes	103 minutes	103 minutes	103 minutes
Gap gauge	80 minutes	103 minutes	103 minutes	103 minutes
Cotton Pad	24 minutes	20 minutes	22 minutes	103 minutes
Insulation	n/a	n/a	n/a	21 minutes

*The test was discontinued after 103 minutes.