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Title:

The fire resistance performance of three, single leaf, single-acting steel access panels, when tested in accordance with BS EN 1634-1: 2014 +A1: 2018 and BS EN 1363-1: 2012

WF Report No:

434360 Rev A

Prepared for:

Panel Technologies Ltd

49-61 Jodrell Street
Nuneaton
Warwickshire
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Test date:

12th November 2020

This report is a revision to that issued as WF 434360 and dated 08/07/2021. The details of the test report WF 434360 are held on file by Warringtonfire. The original report and any previous revisions are replaced by this revised report WF 434260 Revision A.

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Contents

1 Summary of Performance

The following performance was achieved from the specimens tested. Full details of the testing and specimen construction are described in the report.

Results:

Fire resistance test in accordance with BS EN 1634-1: 2014 +A1: 2018 and BS EN 1363-1: 2012

Access panel A

Integrity	
Cotton pad	-
Continuous flaming	-
Gap gauges	122 (one hundred and twenty two) minutes
Thermal insulation	
Inulation I_2 (mandatory procedure)	Not evaluated
Radiation – time to 15kW/m^2	Not evaluated

Access panel B

Integrity	
Cotton pad	126 (one hundred and twenty six) minutes *
Continuous flaming	126 (one hundred and twenty six) minutes *
Gap gauges	126 (one hundred and twenty six) minutes *
Thermal insulation	
Inulation I_2 (mandatory procedure)	11 (eleven) minutes
Radiation – time to 15kW/m^2	126 (one hundred and twenty six) minutes *

***** No failure of the test criteria at test termination at 126 minutes

Access panel C

Integrity	
Cotton pad	126 (one hundred and twenty six) minutes *
Continuous flaming	126 (one hundred and twenty six) minutes *
Gap gauges	126 (one hundred and twenty six) minutes *
Thermal insulation	
Inulation I_2 (mandatory procedure)	Not evaluated
Radiation – time to 15kW/m^2	Not evaluated

***** No failure of this test criteria at test termination at 126 minutes

Summary of specimens:

Three latched, single leaf single-acting, steel-access panels, all hung opening in towards the furnace

Access panel A leaf size –
597mm high x 595mm wide x 24mm thick

Access panel B leaf size –
2395mm high x 895mm wide x 45mm thick

Access panel C leaf size –
295mm high x 295mm wide x 24mm thick

2 Introduction

The access panels were installed into a flexible supporting construction. In accordance with BS EN 16034: 2014 Annex A.2.2 the leaf was pre-cycled before the fire test. The access panels were instrumented with the standard set of thermocouples. At request of the client all access panels were installed opening in towards the furnace.

3 Specimen verification

The specimens were supplied for testing and delivered to Warringtonfire during November 2020. The component parts of the access panels were identified based on nominal information provided by the client. The conformity of the specimens against these nominal values has been verified and agreed by the laboratory insofar as the structure of the specimen allowed verification to take place. If possible, additional moisture content readings, species verification and density checks were performed on either the original specimen, or, samples provided by the sponsor. These details are outlined in the construction section of this report (Section 6).

3.1 Conditioning

Warringtonfire stored the specimens in climatic conditions approximate to those in normal service.

3.2 Sampling

Warringtonfire was not involved in factory sampling of the products and materials used for the test specimen described in this report, and as such the results apply to the sample as received.

4 Description of supporting construction

The supporting construction comprised a plasterboard clad 132mm thick overall steel stud partition with 70mm thick 85kg/m^3 density insulation fitted between the studs, built in accordance with Clause 7.2.2.4 of BS EN 1363-1: 2012, for a flexible supporting construction (Table 1 Group A). The studs surrounding the apertures created for the access panels incorporated a 67mm x 29mm softwood timber infill to facilitate the fixings for the specimen. The aperture of Access panel B was lined with a double layer of 15mm thick Type F plasterboard. The apertures for Access panel A and Access panel C remained unlined.

The specimens tested are 120 minute products with an anticipated Category B performance, therefore intended fire resistance is 132 minutes and two layers of 15mm thick Gypsum plasterboard Type F are required on each face. The supporting construction was fixed on the horizontal edges only, the vertical edges remained free.

5 Description of specimens

Details of the specimens are shown in Figures 1 to 4 of Appendix 1.

5.1 Access panel leaves

Access Panel A, the leaf measured 595mm high x 597mm wide x 24mm thick.
Access Panel B, the leaf measured 2395mm high x 895mm wide x 45mm thick.
Access Panel C, the leaf measured 295mm high x 295mm wide x 24mm thick.

6 Description of Construction (Refers to Figures 1 to 4 and the clients drawings of the Appendix)

Leaf – Access Panels A and C

	Material	Dimensions (mm)	Key to figures
Profiled steel tray section	Zintec coated profiled steel tray section on the exposed face with a 15mm wide return for mounting the lock body	24 deep x 0.9 thick*	1
Core	None fitted	-	-
Leaf reinforcement	None fitted	-	-

* Stated by client, not verified by laboratory

Leaf – Access Panel B

		Material	Dimensions (mm)	Key to figures
Profiled steel tray section		Zintec coated profiled steel tray section on the exposed face	22.5 deep x 1.2 thick*	2
Stiles and rails		Profiled steel section (see Figures 2 and 3 Appendix 1) welded	43 high x 65 wide x 1.5 thick*	3
Core	Unexposed	GTEC dB Plasterboard	12.5 thick	4
	Exposed	Custom Audio Designs Part Number A325, IsoBase R50	5 thick	5
Core clamps		'Z' profile steel welded to the stiles and rails	27 high x 38.5 wide x 1.2 thick	6

* Stated by client, not verified by laboratory

Door frame – Access Panels A and C

	Species/type	Dimensions (mm)	Key to figures
Frame –closing edge	Profiled Zintec steel 'Z' section featuring an integral stop and architrave	25 deep x 37 wide x 0.9 thick overall featuring a 17 wide integral stop and a 20 wide return oversailing the supporting construction*	7
'Hanging' edge	'L' section profiled Zintec steel	24 deep x 20 wide return oversailing the supporting construction*	8
Top and bottom edges	'L' section profiled Zintec steel incorporating the Flipfix clamps	51 deep x 20 wide return oversailing the supporting construction*	9
Stop	Integral to the frame section	-	-
Frame jointing detail	N/A*	-	-
Frame to supporting construction fire stopping detail	N/A*	-	-
Frame to supporting construction fixing detail	Flipfix clamps - 2No. per top and bottom edge on panel A 1No. per top and bottom edge on panel C	-	10

* Stated by client, not verified by laboratory

Door frame – Access Panel B

	Species/type	Dimensions (mm)	Key to figures
Frame (All four edges)	Profiled Zintec steel sections featuring an integral stop and architrave	73.6 deep x 45 wide x 1.5 thick overall featuring a 47.5 deep x 20 wide integral stop and a 25wide return oversailing the supporting construction*	11
Stop	Integral to the frame section		-
Frame jointing detail	Welded	-	-
Frame to supporting construction fire stopping detail	Intumescent acrylic sealant Mann McGowan Pyromas A*	Continuous bead sealing frame to supporting construction	-
	2No. layers plasterboard Gyproc Tapered Edge Fireline Board 15mm thick fitted with 60mm self tapping steel screws*	Fitted lining aperture on the unexposed face	-
Frame to supporting construction fixing detail	Self tapping steel screws at 300mm centres*	66 long	-

* Stated by client, not verified by laboratory

Intumescent and sealing materials – Access Panel A and C

	Make/type	Size (mm)	Location	Key to figures
Frame reveal	None fitted	-	-	-
Leaf edge	None fitted	-	-	-

Intumescent and sealing materials – Access Panel B

	Make/type	Size (mm)	Location	Key to figures
Frame reveal	Envirograph G10/10 10mm x 2mm, Grey Self Adhesive Intumescent Strip	10 x 2*	Fitted around the leaf face perimeter on the unexposed face	12
	C.R.A International 9mm x 5.5mm, White 'P' Profile Compression Self Adhesive EPDM Seal	8 x 5*	Fitted around the leaf face perimeter on the unexposed face	13
Leaf edge	None fitted	-	-	-

* Stated by client, not verified by laboratory

Hardware – Access Panels A and C

	Make/type	Size (mm)	Location	Key to figures
Hinges	Fast fit spring hinges. Product reference - HINGE-RF-R51* Electroplated Fast Fit Spring Hinge	Ø8 (pin size) 19.1 depth x 19.1 width x 40 height	Fitted at the top and bottom of the leaf	14
Latch	Single Point Lock fitted on leaf edge return	85mm x 22mm x 8mm (case size)	Fitted at mid height of leaf	15

* Stated by client, not verified by laboratory

Hardware – Access Panel B

	Make/type	Size (mm)	Location	Key to figures
Hinges	Fast fit spring hinges. Product reference - HINGE-RF-R51* Electroplated Fast Fit Spring Hinge	Ø8 (pin size) 19.1 depth x 19.1 width x 40 height	Fitted at the top and bottom of the leaf	16
Latch	3 Point Lock fitted on stile, with top and bottom acting shoot bolts running through steel blocks Material number - 3 Point Locking System. Manufactured from Bright Zinc Plated Mild Steel, with 18mm stroke. Product ref. 3WL*	110 x 33 x 16 (centre latch size)	Fitted at mid height of leaf	17

* Stated by client, not verified by laboratory

7 Pre-test measurements and mechanical conditioning

Pre-test measurements and mechanical conditioning were conducted on the samples in the order detailed below.

7.1 Method of installation

The access panels were fixed into pre-prepared openings. The details of the fixings and fire stopping between frame and supporting construction are outlined in the construction section and Figures 2 and 3 of Appendix 1.

7.2 Pre-cycling operability

Operability test of 25 manual cycles was completed on each leaf in accordance with BS EN 16034: 2014 Annex A, section A.2.2.

Minimum angle of opening	90º
Number of operation cycles completed	25

7.3 Specimen self-closing

No closers were fitted. The locking systems were engaged for the test at all positions on all access panels.

7.4 Leaf/frame perimeter gaps

The manufacturer did not declare a working range so the doors were installed to open and close freely, maintaining gaps, where possible, to a range of 1.2–1.8mm along all edges. The gaps between the edge of the leaf and frame were measured prior to test in accordance with BS EN 1634-1 2014 +A1: 2018, Section 10.1.2. A total of 9 readings were recorded. The measurements (in mm) are detailed in Section 8.7.

7.5 Closer forces

No closers were fitted – the leaves were held closed by means of the engaged multi-point locks.

7.6 Final setting

Final setting of the specimens was conducted in accordance with BS EN 1634-1: 2014 +A1: 2018, Section 10.1.4.

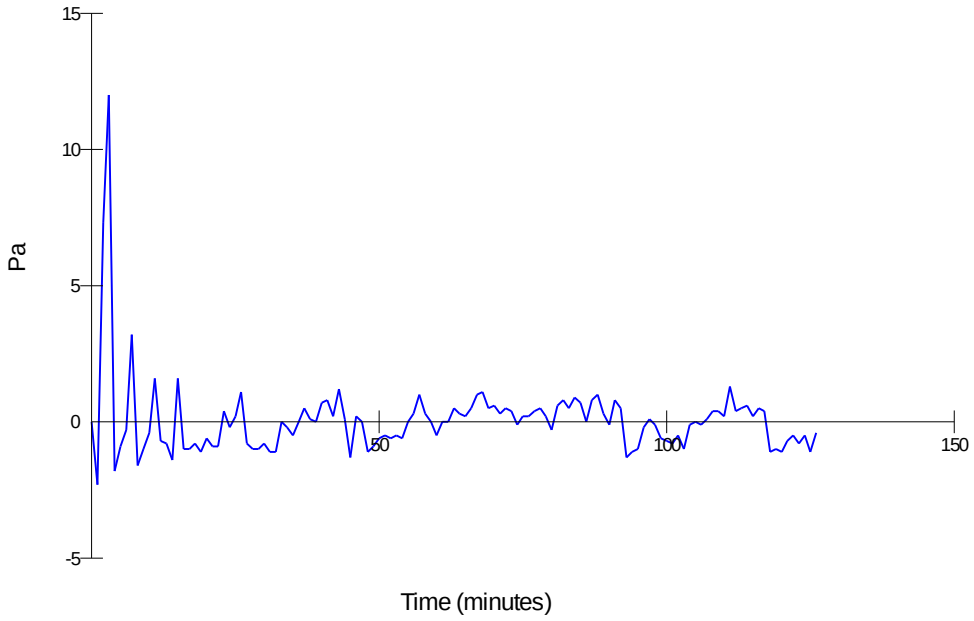
8 Test Conditions

8.1 Ambient temperature

The ambient temperature of the test area at commencement of test was 11°C

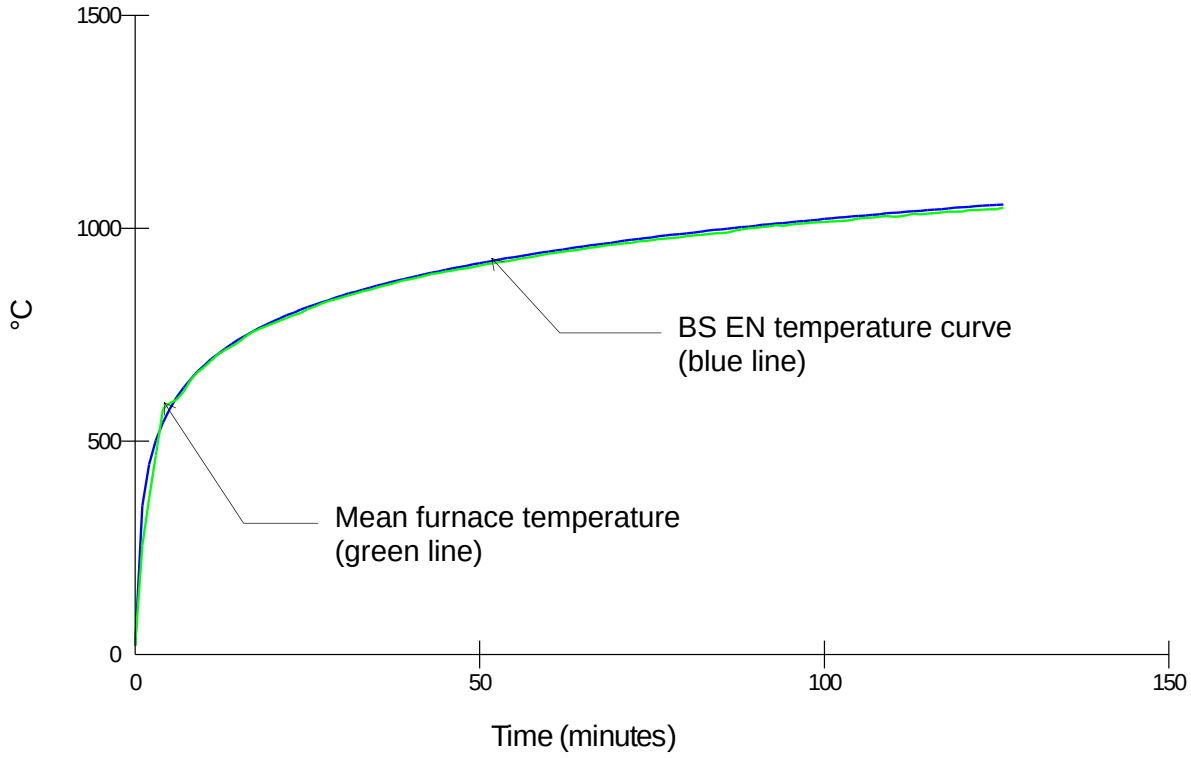
8.2 Pressure readings

After the first 5 minutes of the test, the furnace pressure was maintained at 0 ± 5 Pa and after 10 minutes was maintained at 0 ± 3 Pa with respect to atmosphere, at a point 0.5m from the furnace floor, equating to a pressure of 0 Pa with respect to atmosphere at a point 0.5m from the notional floor level. The pressure readings were recorded and are shown graphically below:



8.3 Furnace temperature

The furnace was controlled to follow the temperature/time relationship specified in BS EN 1363: Part 1: 2012 Section 5.1.1 as closely as possible, using the average of eight plate thermometers suitably distributed within the furnace. The temperatures were recorded and are shown graphically below:



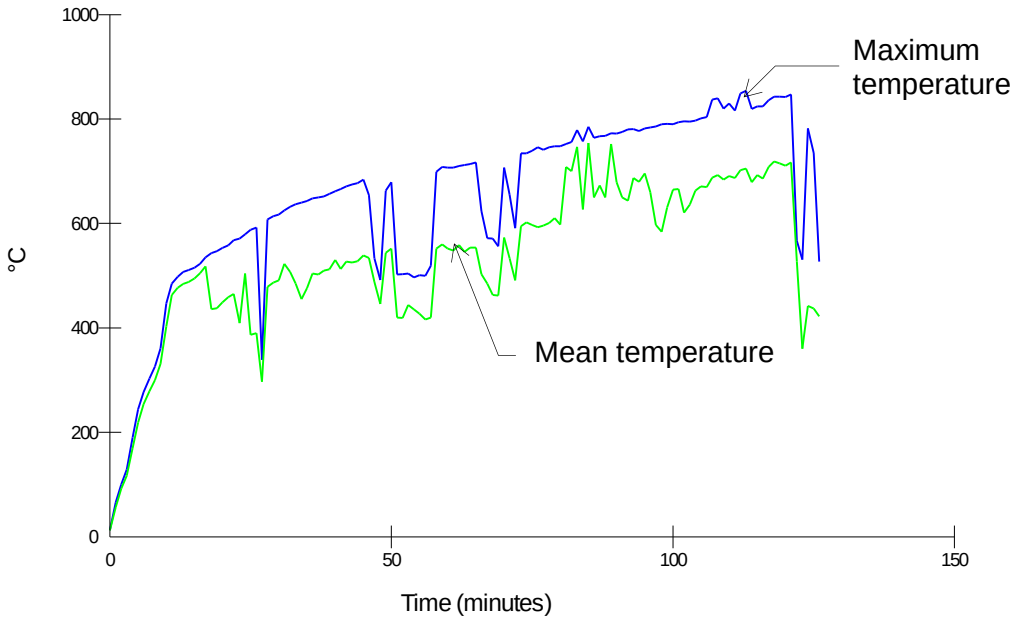
8.4 Unexposed face temperatures

The temperature of the unexposed face of the access panels was monitored by means of the following thermocouples:

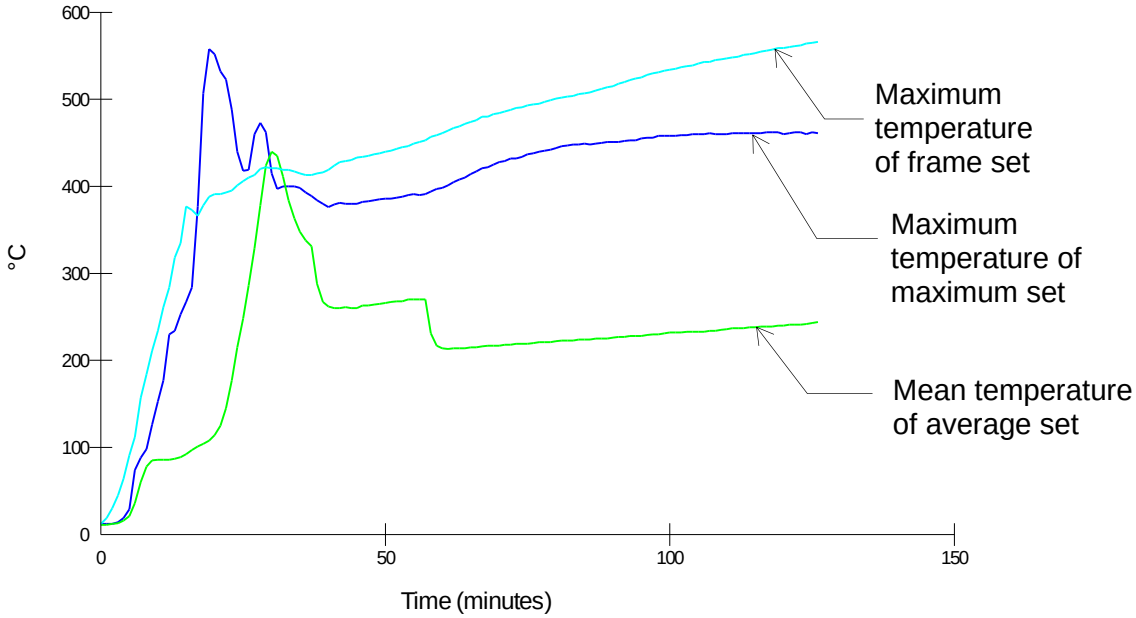
	Access Panels A and C	
	1 discrete area	
Leaf	Discrete area (steel)	3 measuring mean and maximum temperature rise.
	Access Panel B	
	2 discrete areas	
Leaf	Discrete area 1 (Acoustic board)	5 measuring mean temperature rise. 4 measuring maximum temperature rise, standard set 100mm in from the leaf edges.
Frame	Discrete area 2 (steel)	5 measuring maximum temperature rise.

The locations of the thermocouples are shown in Figure 5 of the appendix. The readings recorded are tabulated in Appendix 2 and are shown graphically below.

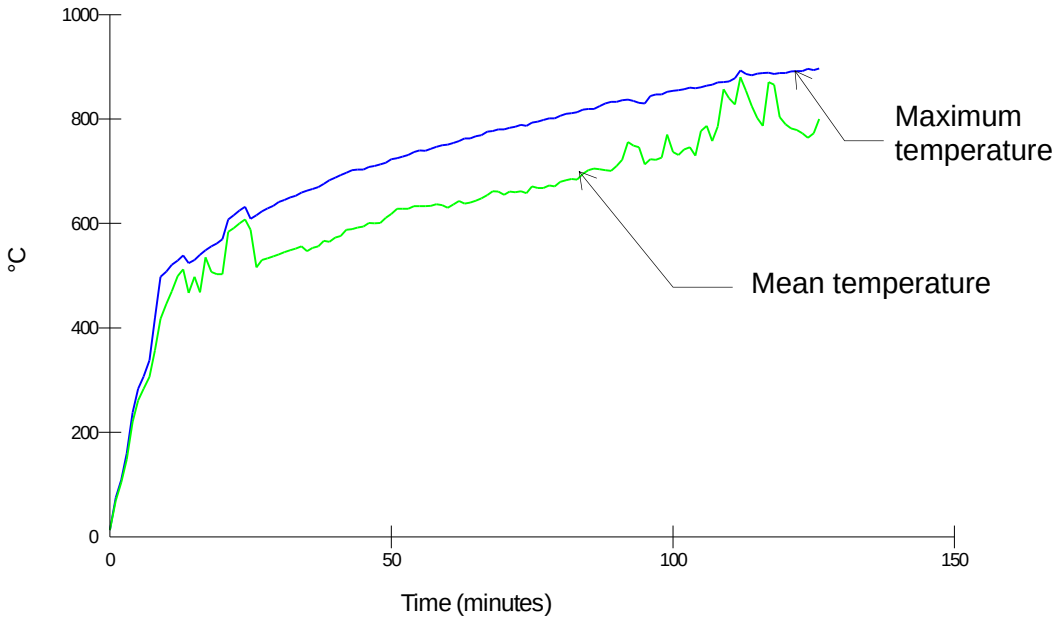
Access Panel A



Access Panel B

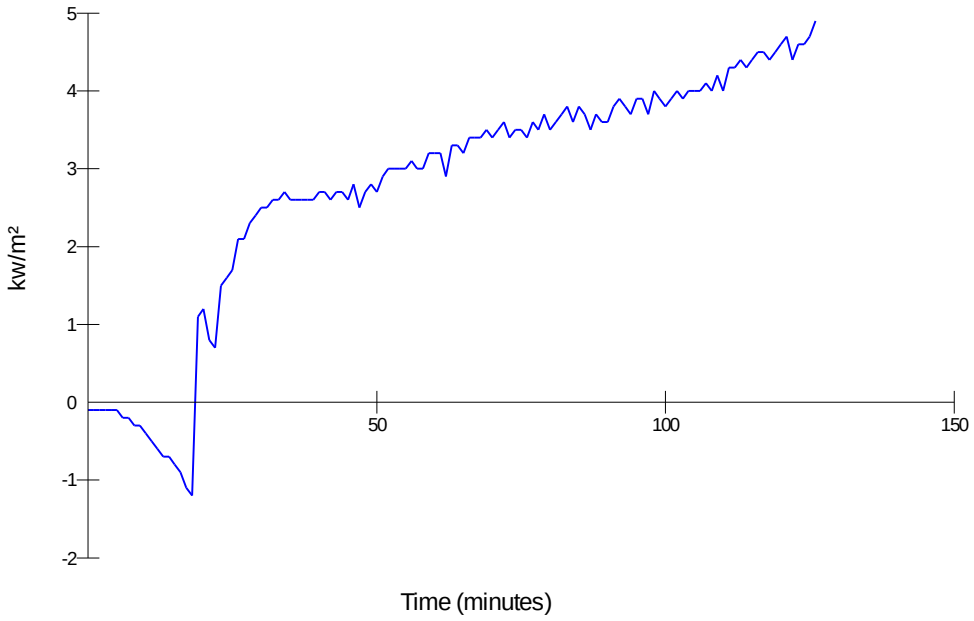


Access Panel C



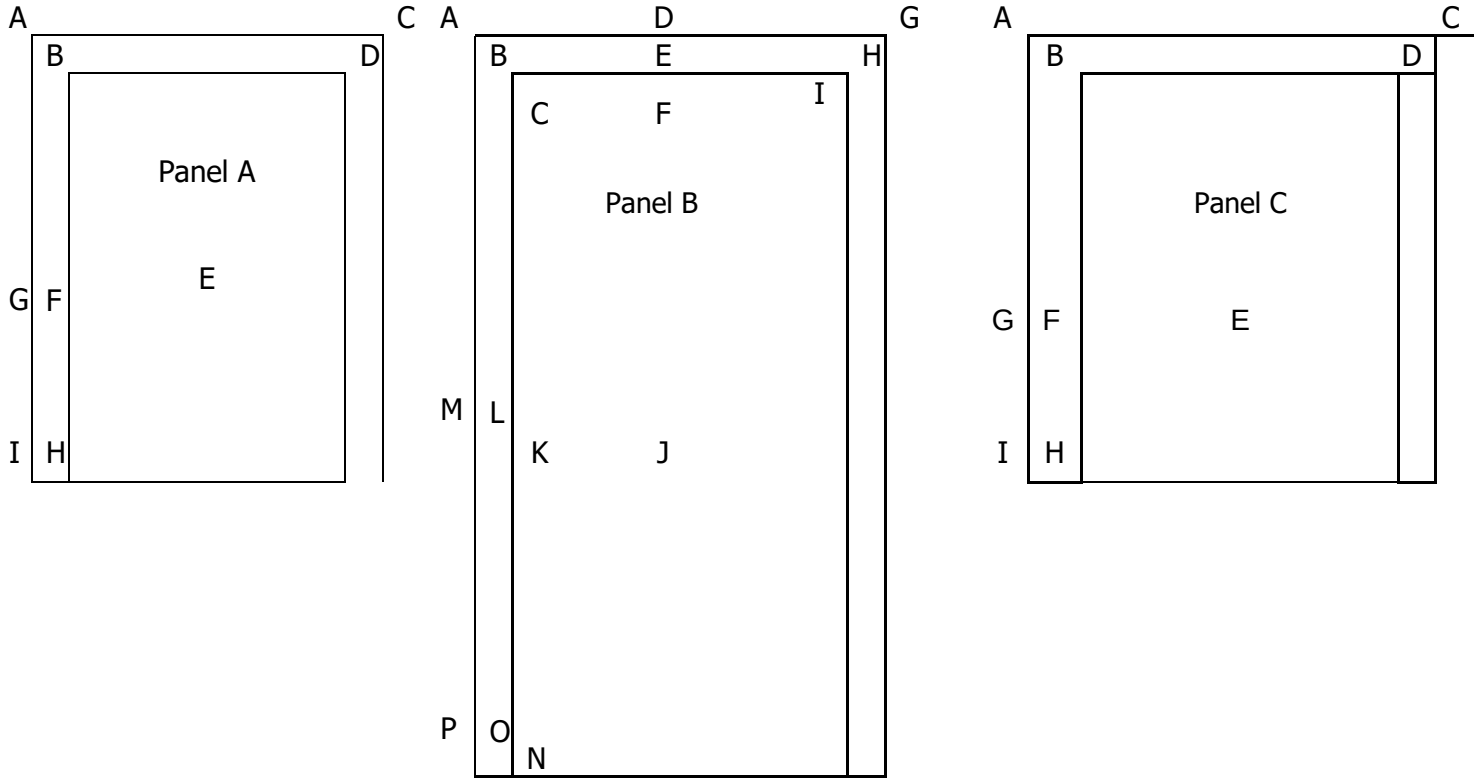
8.5 Radiation

Access panel B



8.6 Leaf and frame distortion data

The following tables show the distortion in mm with an accuracy of ±1mm.
A positive measurement indicates distortion towards the furnace.
A negative measurement indicates distortion away from the furnace.



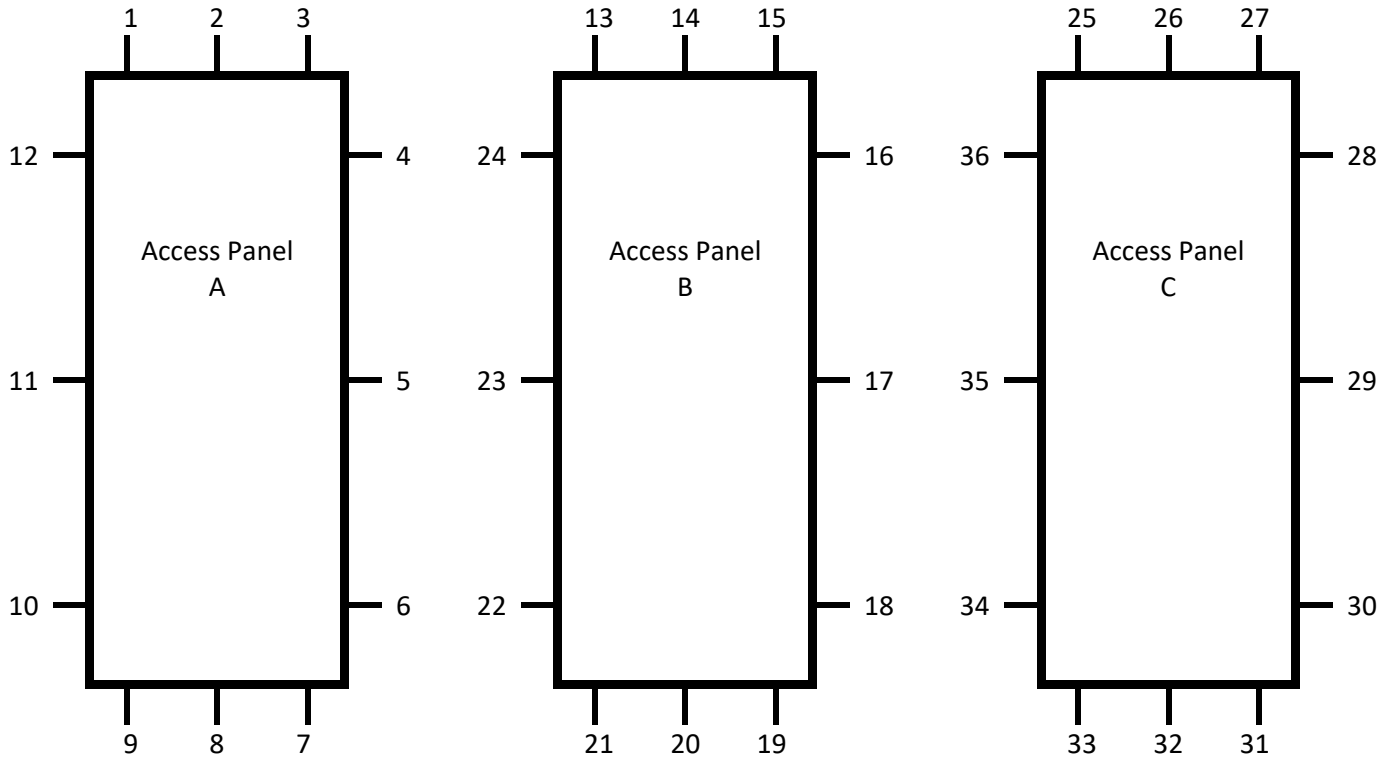
Access Panel A									
Deflections – mm									
TIME mins	A	B	C	D	E	F	G	H	I
15	0	0	1	1	26	26	0	8	2

Doorset B																
Deflections – mm																
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
15	10	44	23	11	51	16	8	45	21	9	23	60	-2	21	72	6
30	-	-	-	-	-	-	-	-	-	-31	15	65	8	-14	72	6
45	-	-	-	-	-	-	-	-	-	-6	20	50	3	11	72	2
60	-	-	-	-	-	-	-	-	-	-6	20	50	3	-	-	-

Access Panel C								
Deflections – mm								
TIME mins	A	B	C	D	E	F	G	H	I
15	9	-13	44	128	3	6	-	-	-

Where a dash (-) applies, a distortion measurement could not be taken

8.7 Leaf edge to frame gaps pre-test measurement



Door Ref	Gap Between Face of Leaf and Doorstop in mm at Position											
A	1	2	3	4	5	6	7	8	9	10	11	12
	-	-	-	-	-	-	-	-	-	-	1.4	1.4
B	13	14	15	16	17	18	19	20	21	22	23	24
	-	-	-	1.6	1.6	1.6	-	-	-	1.6	1.7	1.2
C	25	26	27	28	29	30	31	32	33	34	35	36
	-	-	-	-	-	-	-	-	-	-	1.8	-

9 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	Comments
00:00	Test Started
03:42	A. There is smoke issuing at the top perimeter gaps.
	B. There is smoke issuing at the head
	C. There is smoke issuing at the top perimeter gaps
05:51	B. There is an increase in the smoke issuing at the top perimeter gap
07:58	B. There is smoke issuing and discolouration approximately half way up
09:38	There is an increase in the smoke issuing at the perimeter gaps
13:45	B. There is smoke issuing and discolouration at the top right corner
18:43	B. There is discolouration and erosion of the plasterboard and insulation
27:45	A, C. The distortion measurements have been discontinued
30:15	B. The top half distortion measurements have been discontinued
32:10	B. The paper layer is eroding
36:45	B. The plasterboard is moving down slowly
38:24	A, C. They are visibly glowing
60:00	No change
75:00	No change
90:00	No change
105:00	No change
122:55	A. A 25mm gap gauge test was successfully performed at the top right corner thereby constituting **integrity failure**
126:00	A. The panel has fallen into the furnace thereby constituting further **integrity failure**
126:12	Test terminated

10 Expression of results

Access panel A

Integrity	
Cotton pad	-
Continuous flaming	-
Gap gauges	122 (one hundred and twenty two) minutes
Thermal insulation	
Inulation I_2 (mandatory procedure)	Not evaluated
Radiation – time to 15kW/m^2	Not evaluated

Access panel B

Integrity	
Cotton pad	126 (one hundred and twenty six) minutes *
Continuous flaming	126 (one hundred and twenty six) minutes *
Gap gauges	126 (one hundred and twenty six) minutes *
Thermal insulation	
Inulation I_2 (mandatory procedure)	11 (eleven) minutes
Radiation – time to 15kW/m^2	126 (one hundred and twenty six) minutes *

***** No failure of this test criteria at test termination at 126 minutes

Access panel C

Integrity	
Cotton pad	126 (one hundred and twenty six) minutes *
Continuous flaming	126 (one hundred and twenty six) minutes *
Gap gauges	126 (one hundred and twenty six) minutes *
Thermal insulation	
Inulation I_2 (mandatory procedure)	Not evaluated
Radiation – time to 15kW/m^2	Not evaluated

***** No failure of this test criteria at test termination at 126 minutes

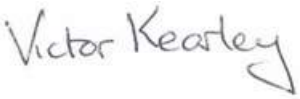
11 Limitations

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 outline in BS EN 1634-1, BS EN 1363-1, and where appropriate BS EN 1363-2. Any significant deviation with respect to size, construction 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.

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they reflect the actual behaviour in fires. The results of this test were obtained using the leaf to frame gaps recorded in Section 8.7. The fire resistance performance of doors of this design may change if substantially different gaps are employed.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. Warringtonfire will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test 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.

	Written by:	**Authorised by:**
Signature:		
Name:	Courtney Clifford	Dr Vic Kearley
Title:	Lead Technical Officer	Technical Author
Date of issue:	07/12/2023	07/12/2023

Revisions

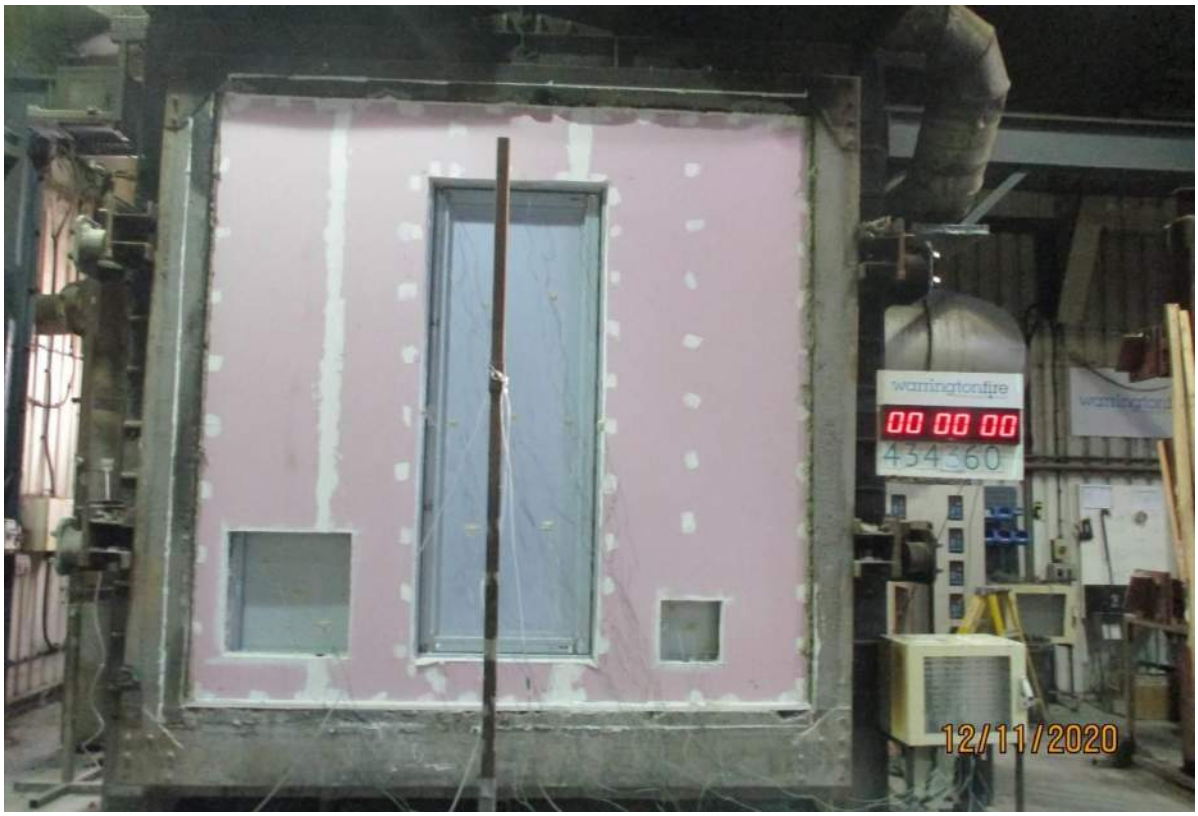
14/11/23 - Rev A	Removal of weld joint detail from Specimens A and C, Page 8 Removal of stopping sealant from Specimens A and C, Page 8

12 Field of direct application of test results

BS EN 1363-1:2012, Fire resistance tests - Part 1: General requirements, states within Section 12.1, Clause v) that “The field of direct application of the results for the specimen being evaluated, either in the form of the full text from the appropriate standard, or only those clauses which are relevant for the specimen tested” shall be included within the test report. The full text of the field of direct application for the results of the specimen being evaluated herein, can be found within the appropriate test standard, which is referenced on the front cover of this report.

13 Photographs

At start of test



At 15 minutes

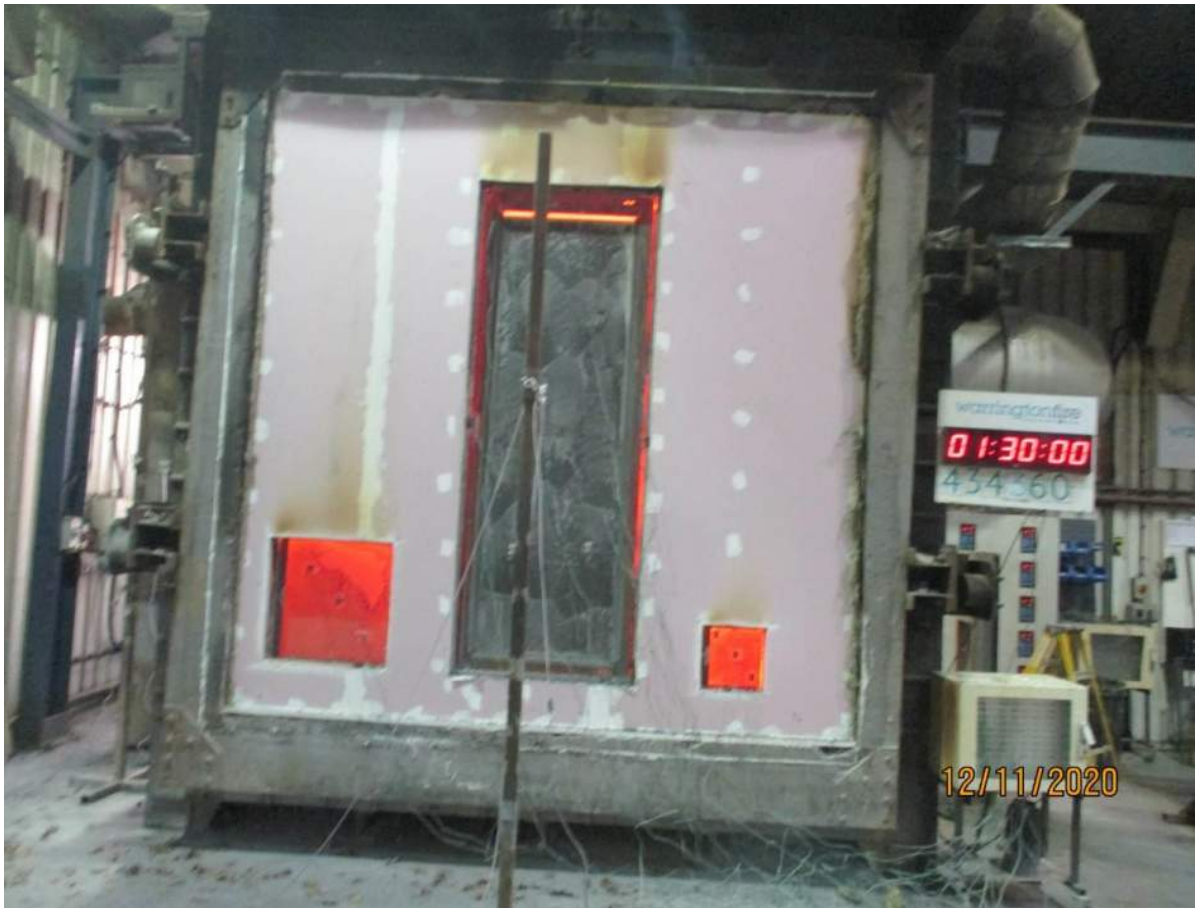
At 30 minutes

At 45 minutes

After 60 minutes

After 75 minutes

At 90 minutes



After 105 minutes

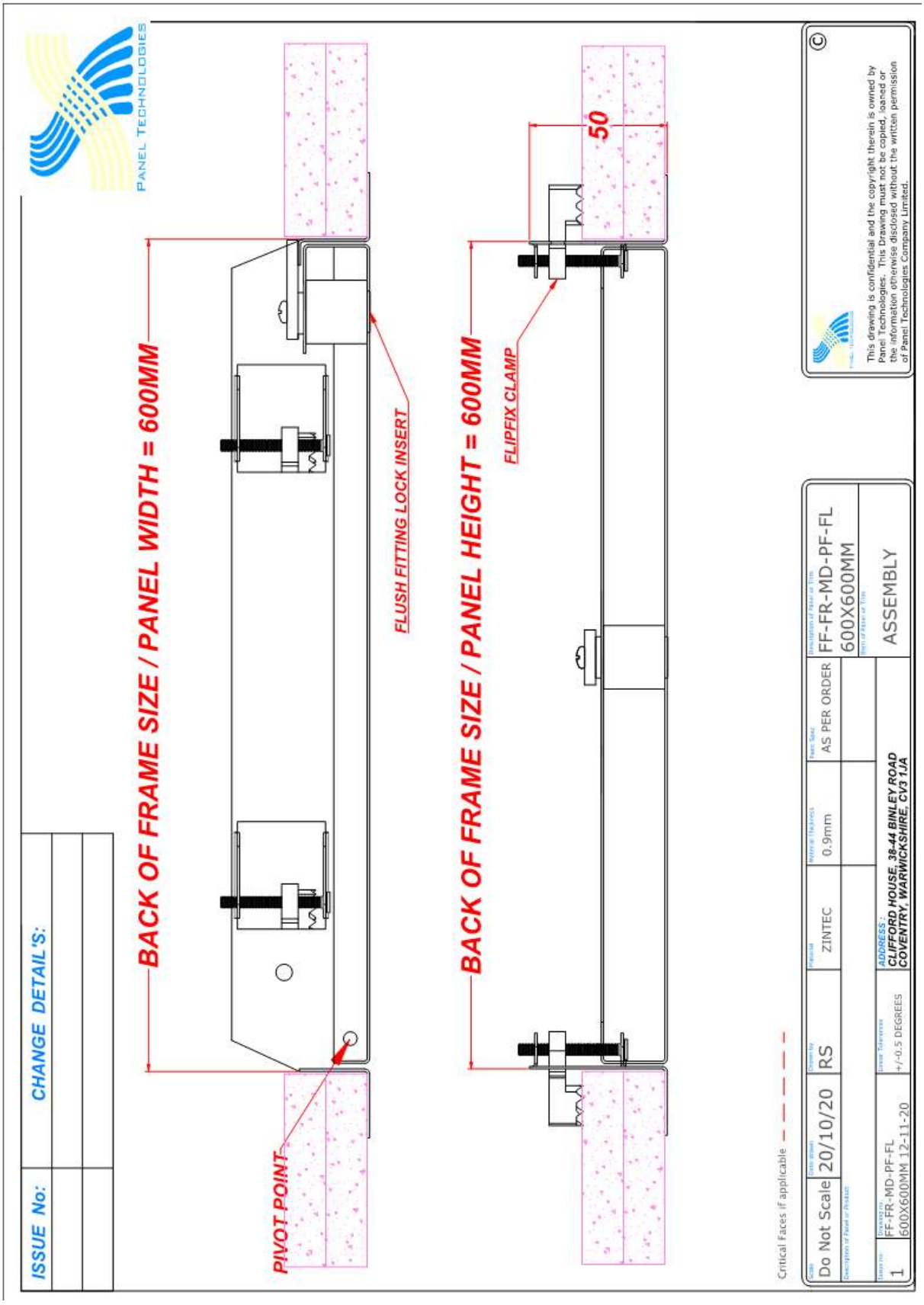
At 120 minutes

After test termination

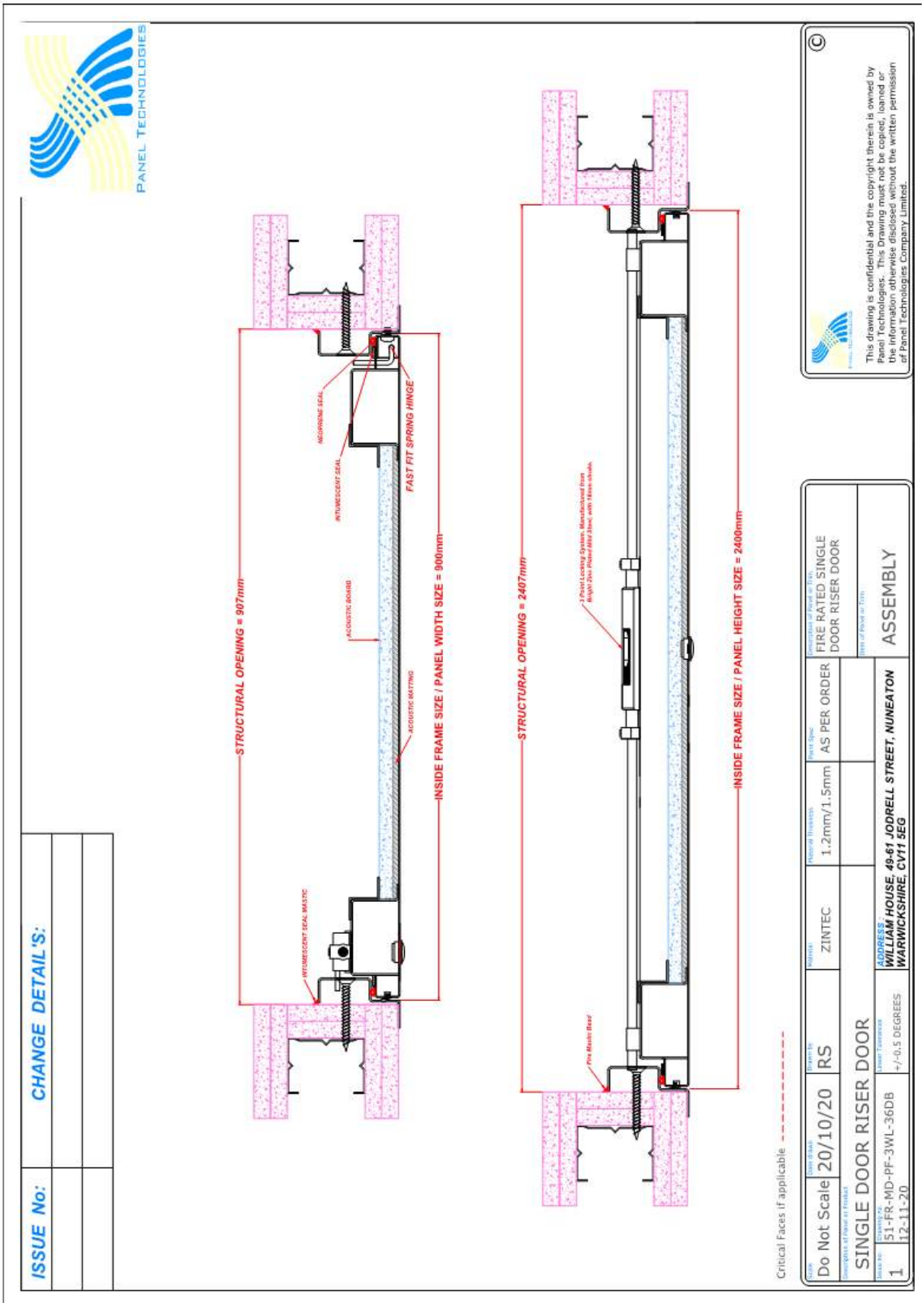
Exposed face – post test

Appendix 1 – Client suppled drawings and Figures 1 to 4

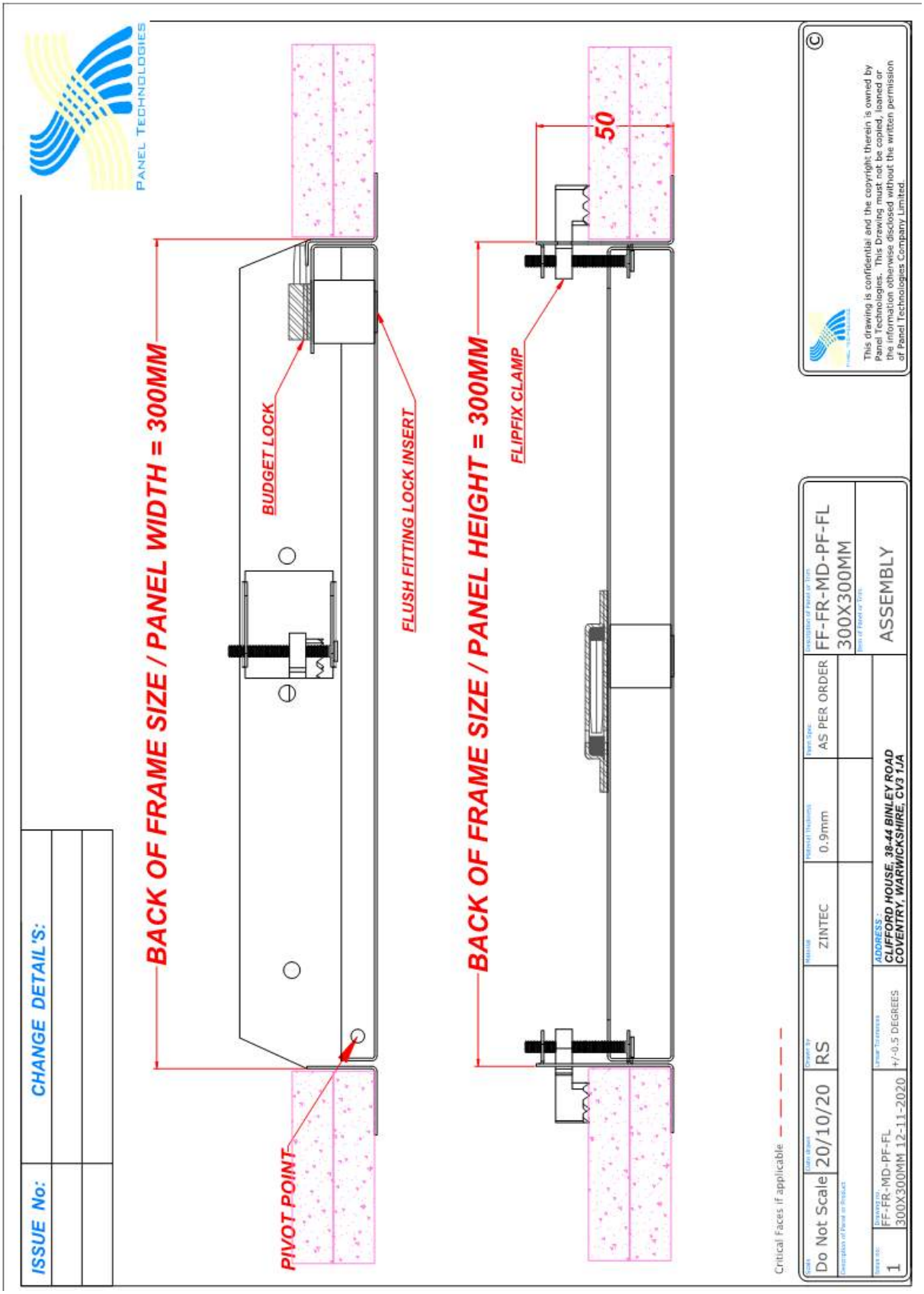
Access Panel A



Access Panel B



Access Panel C



Appendix 2 - raw test data

(see figure 4 of Appendix 1 for channel locations)

Time	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	13	12	12	11	12	12	12	11	11	11	12	11	11
1	64	41	66	12	19	13	16	14	11	11	12	11	11
2	100	80	97	18	30	22	29	20	11	8	12	12	12
3	127	96	129	34	44	33	45	26	13	2	14	13	13
4	190	138	182	56	64	47	64	31	16	-5	19	17	16
5	244	188	224	69	86	59	91	38	21	-1216	29	25	20
6	277	228	258	80	112	76	110	47	33	74	54	46	29
7	303	255	279	89	139	90	157	58	60	88	75	73	49
8	326	277	297	96	165	99	184	69	78	98	96	81	75
9	361	313	318	100	189	107	211	77	83	112	126	84	87
10	447	398	363	110	213	121	234	98	84	136	153	85	89
11	485	483	420	126	232	138	261	187	82	148	177	86	89
12	498	473	461	144	239	156	284	279	82	162	230	88	89
13	507	468	476	161	252	176	304	318	83	181	234	90	89
14	511	465	487	174	264	194	321	335	86	213	253	96	91
15	515	471	498	188	273	209	333	377	92	222	267	102	94
16	523	481	511	201	285	222	350	373	98	257	284	110	102
17	535	498	522	213	298	238	366	366	103	294	377	110	108
18	543	240	525	225	310	249	378	360	106	361	507	111	113
19	547	238	528	238	316	261	388	355	111	427	558	115	117
20	553	257	537	249	318	269	391	355	118	498	552	124	121
21	558	283	537	259	319	276	391	376	134	532	514	146	130
22	568	283	543	268	323	284	393	381	171	523	444	185	144
23	571	297	358	275	326	290	395	373	215	488	411	228	171

Time	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
24	579	381	553	283	330	294	401	364	256	440	410	274	216
25	588	300	273	291	343	295	406	359	309	403	418	334	251
26	592	303	276	298	352	296	410	361	387	384	419	400	285
27	287	339	266	304	356	298	413	347	451	374	417	460	324
28	608	559	271	308	361	308	420	345	473	365	398	469	373
29	614	563	283	312	368	321	422	340	462	357	394	455	429
30	617	565	292	315	368	334	421	338	415	351	394	402	466
31	625	575	368	317	370	345	421	343	368	349	397	358	475
32	632	581	308	320	373	351	419	346	349	347	400	338	460
33	637	586	233	323	375	357	419	326	335	347	400	328	409
34	640	503	222	327	373	365	417	322	330	347	400	322	375
35	643	430	355	329	374	371	415	322	327	347	398	317	358
36	648	401	463	332	373	377	413	321	324	348	393	317	349
37	650	405	451	335	374	379	413	333	321	349	389	318	343
38	652	412	466	337	376	380	415	341	320	351	384	318	339
39	657	413	465	340	378	380	416	339	322	354	380	320	339
40	662	430	498	343	379	378	419	344	321	356	376	323	339
41	666	411	463	346	382	379	424	350	321	357	379	325	338
42	671	431	480	349	386	379	428	233	322	359	381	325	339
43	675	424	477	353	388	379	429	243	324	360	380	327	340
44	677	426	481	355	390	381	430	239	324	361	380	330	339
45	684	439	494	357	392	383	433	235	325	362	380	334	340
46	654	445	503	358	394	383	434	249	328	363	382	338	342
47	533	438	492	360	396	384	435	243	330	365	383	342	343
48	418	429	492	361	397	386	437	258	331	366	384	345	344
49	385	583	663	363	400	386	438	278	332	367	385	349	346
50	334	643	679	365	402	387	440	280	335	368	386	351	347
51	320	438	502	367	404	389	441	269	336	370	386	353	347

Time	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
52	317	437	503	369	406	390	443	280	337	371	387	355	349
53	380	448	504	371	407	392	445	292	339	372	388	357	349
54	364	443	497	374	409	392	446	288	342	373	390	359	351
55	339	442	501	376	412	394	449	274	343	374	391	360	352
56	309	438	500	378	413	400	451	271	342	375	390	361	352
57	283	458	519	380	416	402	453	254	343	377	391	362	353
58	297	661	699	383	418	405	457	300	344	378	394	363	355
59	303	669	708	386	419	407	459	295	346	379	397	365	357
60	282	668	707	388	421	410	461	272	347	379	398	366	357
61	268	669	707	390	424	414	464	279	347	380	401	368	359
62	295	673	710	392	427	416	467	300	349	381	405	369	361
63	254	673	712	393	429	418	469	276	351	383	408	370	362
64	274	674	714	395	430	421	472	285	350	384	410	371	363
65	268	676	717	396	432	424	474	281	352	385	414	372	364
66	298	587	624	398	434	425	476	300	353	386	417	373	365
67	374	510	572	400	437	424	480	306	356	388	421	374	366
68	307	510	571	401	438	427	480	282	356	389	422	375	366
69	339	490	556	403	440	428	483	304	357	390	425	375	367
70	353	660	707	405	442	430	484	281	358	391	428	377	368
71	383	561	655	407	444	434	486	276	358	393	429	377	369
72	357	526	591	408	446	435	488	279	360	394	432	378	370
73	362	690	734	410	448	438	490	276	361	395	432	379	370
74	386	687	734	411	450	438	491	260	362	396	434	379	371
75	359	694	739	413	451	439	493	262	363	396	437	380	372
76	334	699	746	415	453	441	494	258	363	397	438	381	373
77	353	695	741	416	456	441	495	243	365	398	440	382	374
78	359	699	746	418	457	444	497	245	366	399	441	382	374
79	383	700	748	420	459	446	499	245	366	400	442	383	375

Time	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
80	342	704	748	422	460	446	501	251	368	401	444	384	376
81	665	707	752	424	462	446	502	249	371	402	446	384	378
82	638	707	756	426	463	449	503	244	371	403	447	384	378
83	779	707	755	428	465	450	504	241	372	403	448	385	378
84	413	712	757	429	466	451	506	244	373	404	448	386	380
85	785	714	762	431	469	454	507	236	374	405	449	387	381
86	472	715	764	432	471	456	508	243	374	406	448	387	382
87	536	717	767	433	472	458	510	237	375	407	449	388	382
88	462	720	768	434	475	459	512	235	377	408	450	389	383
89	759	723	773	435	476	461	514	229	378	409	451	389	383
90	542	723	772	436	478	463	515	233	377	410	451	390	385
91	448	728	775	438	482	464	518	241	379	411	451	391	386
92	421	731	780	439	484	465	520	240	381	412	452	391	388
93	547	732	781	441	486	467	522	244	381	413	453	392	390
94	537	727	777	440	489	469	524	225	382	415	453	393	389
95	576	730	782	441	491	472	525	223	382	416	455	394	389
96	634	562	784	442	494	472	528	235	385	417	456	394	391
97	534	472	786	445	496	474	530	239	386	417	456	395	392
98	512	450	790	446	498	478	531	238	387	418	458	396	393
99	673	429	791	448	500	479	533	238	388	420	458	396	394
100	788	418	790	450	502	480	534	234	388	421	458	397	395
101	779	424	794	452	505	482	535	229	388	422	458	398	395
102	640	428	796	453	507	485	537	239	388	423	459	398	395
103	694	420	795	454	510	486	538	237	390	423	459	398	396
104	777	416	797	455	511	489	539	225	390	424	460	399	396
105	790	421	801	457	514	491	541	234	391	426	460	399	396
106	784	423	804	458	516	492	543	234	391	427	460	399	397
107	837	422	804	461	519	494	543	234	391	428	461	400	398

Time	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
108	840	430	808	463	521	496	545	244	393	430	460	401	398
109	820	421	811	465	524	497	546	241	393	431	460	402	400
110	830	430	812	468	525	500	547	244	395	433	460	403	401
111	811	434	816	470	527	502	548	246	397	435	461	404	402
112	849	437	820	473	529	504	549	244	398	436	461	405	403
113	854	437	825	475	531	506	551	244	399	437	461	405	403
114	780	439	819	477	531	508	552	253	401	438	461	406	405
115	813	443	824	479	533	511	553	250	402	440	461	407	405
116	785	449	824	481	534	513	555	254	403	441	461	408	406
117	825	464	836	482	535	515	556	251	404	442	462	409	407
118	833	481	843	483	536	517	557	245	403	443	462	410	407
119	826	477	843	483	536	521	559	252	405	444	462	410	409
120	829	462	842	483	537	522	559	254	406	445	460	411	409
121	846	459	847	485	538	524	560	251	407	446	461	412	410
122	495	518	567	487	539	525	561	251	407	447	462	412	410
123	531	282	267	489	541	527	562	248	409	448	462	413	410
124	226	782	318	491	542	530	564	243	411	450	460	414	412
125	247	735	328	493	542	532	565	251	412	451	462	415	413
126	237	527	501	496	544	535	566	260	413	453	461	416	414

Time	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34
min	°C	°C	°C	°C	°C	°C	°C
0	11	11	10	10	13	13	13
1	11	11	11	10	75	62	69
2	12	12	11	11	109	103	100
3	13	13	13	12	160	136	147
4	16	15	15	16	238	205	216
5	21	20	22	22	283	258	243
6	33	33	41	42	307	287	254
7	59	59	66	67	338	308	271
8	75	75	82	81	419	357	296
9	81	81	88	88	498	439	313
10	83	82	89	88	508	481	349
11	84	83	88	88	521	489	401
12	84	82	88	88	529	506	463
13	85	83	89	89	539	516	480
14	87	84	91	94	376	524	501
15	92	86	93	97	450	530	513
16	99	90	95	99	334	540	531
17	103	96	97	100	518	549	538
18	106	99	99	103	419	556	545
19	108	103	104	108	397	562	551
20	112	108	112	116	380	570	559
21	119	118	125	131	608	576	569
22	132	139	150	160	616	582	575
23	158	179	185	191	625	590	586
24	201	216	220	220	632	598	595
25	235	251	253	252	549	609	606
26	269	294	290	292	316	616	615
27	315	344	325	336	345	623	623

Time	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34
min	°C	°C	°C	°C	°C	°C	°C
28	390	402	357	369	343	629	628
29	467	456	380	388	345	634	633
30	483	446	400	404	343	641	640
31	467	400	404	428	345	645	645
32	411	350	392	443	347	650	649
33	375	327	376	433	351	653	653
34	357	314	363	404	353	657	659
35	346	306	348	380	317	660	663
36	338	301	338	364	330	664	666
37	333	297	329	352	331	668	670
38	331	296	324	149	352	673	676
39	329	295	321	51	334	679	683
40	329	296	318	26	349	681	688
41	329	298	315	18	346	688	693
42	330	300	316	16	373	694	697
43	331	302	316	14	364	700	702
44	333	303	313	13	373	699	703
45	334	304	312	12	376	703	703
46	335	306	317	13	386	708	708
47	336	307	318	12	380	710	710
48	337	308	317	12	376	713	713
49	338	309	320	13	401	716	716
50	338	310	323	13	410	723	722
51	340	311	323	12	435	725	723
52	340	312	324	13	430	728	726
53	342	313	325	13	422	731	730
54	343	314	328	13	427	737	735
55	344	316	327	13	423	740	736

Time	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34
min	°C	°C	°C	°C	°C	°C	°C
56	346	315	324	12	425	739	736
57	347	315	321	12	422	743	736
58	348	316	125	13	422	747	742
59	349	318	48	13	407	750	747
60	351	320	27	13	388	751	750
61	352	320	21	13	404	754	750
62	353	321	19	14	416	758	756
63	354	322	19	14	391	763	760
64	355	323	17	13	398	763	759
65	357	324	17	13	403	767	762
66	358	324	17	13	411	769	765
67	357	325	19	14	412	776	773
68	359	326	18	14	438	777	772
69	360	326	17	14	426	780	776
70	361	327	17	14	408	780	777
71	362	327	17	14	421	783	780
72	363	328	17	14	411	785	783
73	364	329	18	14	409	789	787
74	364	329	17	14	399	787	787
75	364	329	18	14	426	793	793
76	365	331	17	14	416	795	794
77	366	332	18	14	410	798	796
78	367	332	18	14	420	801	798
79	367	332	17	14	412	801	799
80	367	333	18	14	430	806	804
81	368	335	19	15	433	810	807
82	369	335	19	15	438	811	807
83	370	335	18	14	429	813	810

Time	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34
min	°C	°C	°C	°C	°C	°C	°C
84	369	336	18	15	452	818	814
85	370	336	18	15	470	819	816
86	371	336	18	15	479	819	816
87	371	337	18	15	467	825	821
88	371	338	19	15	448	830	827
89	372	339	18	15	441	833	828
90	373	339	17	14	468	833	829
91	374	341	18	15	494	836	836
92	374	342	18	15	593	837	837
93	376	342	18	15	579	832	835
94	377	341	17	14	584	823	831
95	378	342	17	14	481	830	829
96	378	343	18	15	491	844	835
97	379	344	18	15	478	847	841
98	380	345	17	15	491	847	840
99	380	345	19	16	612	852	846
100	381	346	21	17	512	854	846
101	382	346	20	17	494	855	844
102	383	346	20	17	519	857	849
103	383	347	21	18	526	860	851
104	384	347	20	17	484	859	847
105	385	347	20	17	619	861	852
106	386	348	19	16	645	864	853
107	387	348	19	16	554	866	853
108	387	349	21	17	630	870	857
109	388	350	20	16	843	871	856
110	388	351	22	18	787	872	861
111	389	352	22	18	740	878	865

Time	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34
min	°C	°C	°C	°C	°C	°C	°C
112	390	352	21	17	893	881	867
113	391	352	21	18	809	886	866
114	391	353	22	18	735	884	855
115	392	354	22	18	661	887	858
116	393	355	22	18	613	888	859
117	394	355	21	18	867	889	857
118	395	355	20	17	860	886	853
119	395	356	21	18	669	888	854
120	396	357	22	18	629	888	854
121	397	357	22	18	599	891	855
122	398	358	21	17	590	892	856
123	399	358	21	16	569	892	857
124	399	358	23	17	536	896	861
125	400	359	23	18	562	894	863
126	401	359	25	20	638	897	866