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Title:

The Fire Resistance Performance Of Two Single-Leaf Timber Doorsets, When Tested In Accordance With BS EN 1634-1:2014 + A1:2018

Date Of Test:

01 October 2019

Issue 1
28 October 2019

WF Report No:

415117

Prepared for:

Gianni Industries Inc

13 Zhongxing Road
Tucheng Dist
New Taipei City 236
Taiwan

UKAS TESTING
0249

Test Specimen

Summary of Tested Specimen

For the purposes of the test the doorsets were referenced as A and B.

Doorset A had overall nominal dimensions of 1010 mm wide by 2090 mm high, incorporating a single door leaf with overall dimensions of 924 mm wide by 2045 mm high by 44 mm thick. The door leaf was formed from a solid graduated density chipboard construction, with 8 mm hardwood lippings to the vertical edges and was hung within a softwood frame, on three stainless steel hinges and was orientated so that the door leaf opened towards the heating conditions. The Doorset was latched via the upper sashlocks and the lower locksets were unlatched for the duration of the test. The Doorset was fitted with the following hardware:

Item No	Description	Reference
4	Lever Handleset	Milano lever
5	Mortice Sash Lock	SEU777/2R
6	Cylinder	J-U6PED4555SN
7	Fail-Secure strike plate	GK361M-ST-1224
8	Fail-Safe strike plate	GK450M-ST-1224
9	Door loop	DL-500
10	Door loop	DL-417ST
11	Hinges	Hi-load 102

Doorset B had overall nominal dimensions of 1010 mm wide by 2090 mm high, incorporating a single door leaf with overall dimensions of 924 mm wide by 2045 mm high by 54 mm thick. The door leaf was formed from a solid graduated density chipboard construction, with 8 mm hardwood lippings to the vertical edges and was hung within a hardwood frame, on three stainless steel hinges and was orientated so that the door leaf opened towards the heating conditions. The Doorset was latched via the upper sashlocks and the lower locksets were unlatched for the duration of the test. The Doorset was fitted with the following hardware:

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11	Hinges	Hi-load 102

Detailed drawings of the test specimen(s) and a comprehensive description of the test construction based on a detailed survey of the specimen(s) and information supplied by the sponsor of the test are included in the Test Specimen and Schedule of Components sections of this report.

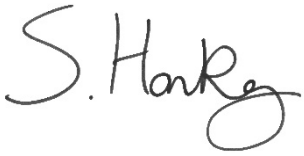
Performance Criteria and Test Results

Integrity	It is required that the specimens retain their separating function, without either causing ignition of a cotton pad when applied, or permitting the penetration of a gap gauge as specified in BS EN 1634-1: 2014, or resulting in sustained flaming on the unexposed surface. **These requirements were satisfied for the periods shown below:**			
	Doorset A		**Doorset B**	
Sustained flaming	36 minutes*		63 minutes	
Gap gauge	36 minutes	No failure*	63 minutes	Area blanked off
Cotton pad	36 minutes*		63 minutes	
Insulation (I_2)	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 with the exception that the limit for temperature rise for any frame member or transom member adjacent to the leaf/leaves of the doorset or openable window shall be 360°C. Insulation failure also occurs simultaneously with integrity failure as specified in BS EN 1634-1: 2014. **These requirements were satisfied for the period shown below:**			
Specimen	36 minutes	No failure*	63 minutes	Due to integrity failure
Insulation (I_1)	The test specimen shall be evaluated against the maximum temperature rise criterion specified in EN 1363-1 (180°C).			
	36 minutes*		63 minutes	
	*Test was discontinued after a period of 68 minutes. Doorset A was blanked off after a period of 36 minutes to allow the test to continue.			
Date of Test	01 October 2019			

Signatories

Responsible Officer
A. Green-Morris*
Technical Officer

Approved
S. Gilfedder*
Test Report Co-Ordinator



Head of Department
S. Hankey*
Business Unit Head

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

Report Issued

Date: 28 October 2019

Revision History

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Revised By:	Approved By:
Reason for Revision:	

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Test Conditions

Standard

BS EN 1634-1:2014+A1:2018 Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows. The specific purpose of the test was to evaluate the effects of the inclusion of various items of building hardware into a previously tested doorset construction. Because of this, no direct field of application for the doorset is included in this report.

Sampling

Warringtonfire was not involved in the sampling or selection of the tested specimens or any of the components.

Installation

The doorsets were received on the 27 September 2019 and mounted within apertures in a blockwork wall construction such that the leaves opened towards the heating conditions of the test. Representatives of **Warringtonfire** conducted the installation on the 27 September 2019

Conditioning

The specimens' storage, construction, and test preparation took place in the test laboratory over a total, combined time of 5 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 17.5^{o}C to 22.5^{o}C and 54.5% to 78.5% respectively.

The test was conducted on the 01 October 2019 at the request of Gianni Industries Inc, the test sponsor.

Pre-Test Conditioning

Prior to testing, the doorsets were subjected to appropriate mechanical pre-test conditioning in accordance with the requirement of EN 16034:2014, Annex A.

Ambient Temperature

The ambient air temperature in the vicinity of the test construction was 17ºC at the start of the test with a maximum variation of +1ºC during the test.

Furnace

The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 2012 Clause 5.1 using nine plate thermometers, distributed over a plane 100 mm from the surface of the test construction.

Thermocouples

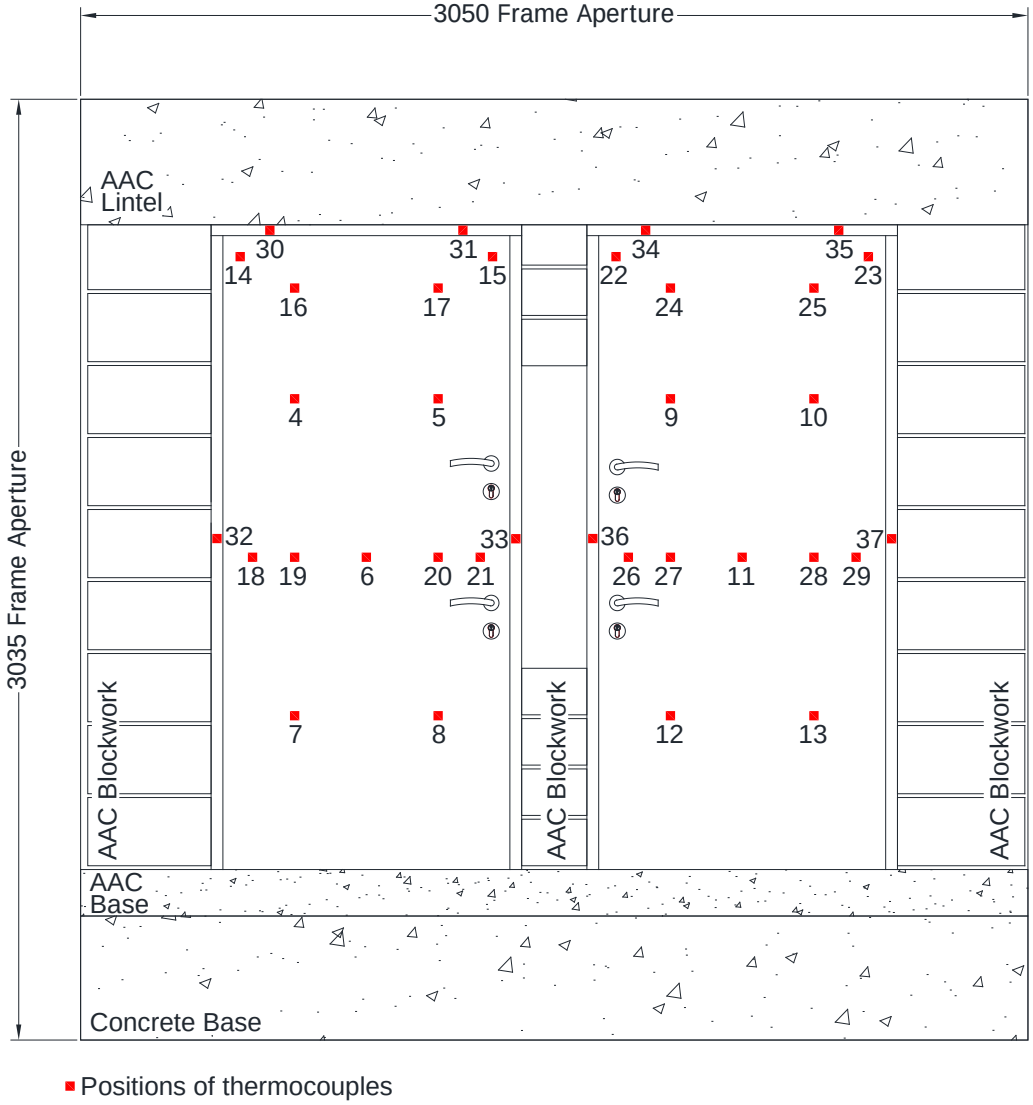
Thermocouples were provided to monitor the unexposed surface of the specimen. The output of all instrumentation was recorded at no less than one minute intervals. The locations and reference numbers of the various unexposed surface thermocouples are shown in Figure 1.

Furnace Pressure

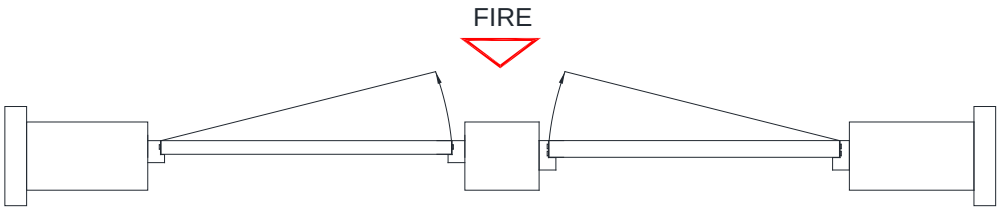
After the first five minutes of testing and for the remainder of the test, the furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 2012, clause 5.2.1 The calculated pressure differential relative to the laboratory atmosphere at the top of the specimens was 13.5 (± 5) Pa between 5 and 10 minutes and 13.5 (± 3) Pa thereafter.

Test Specimen Drawings

Figure 1- General Elevation of Test Construction



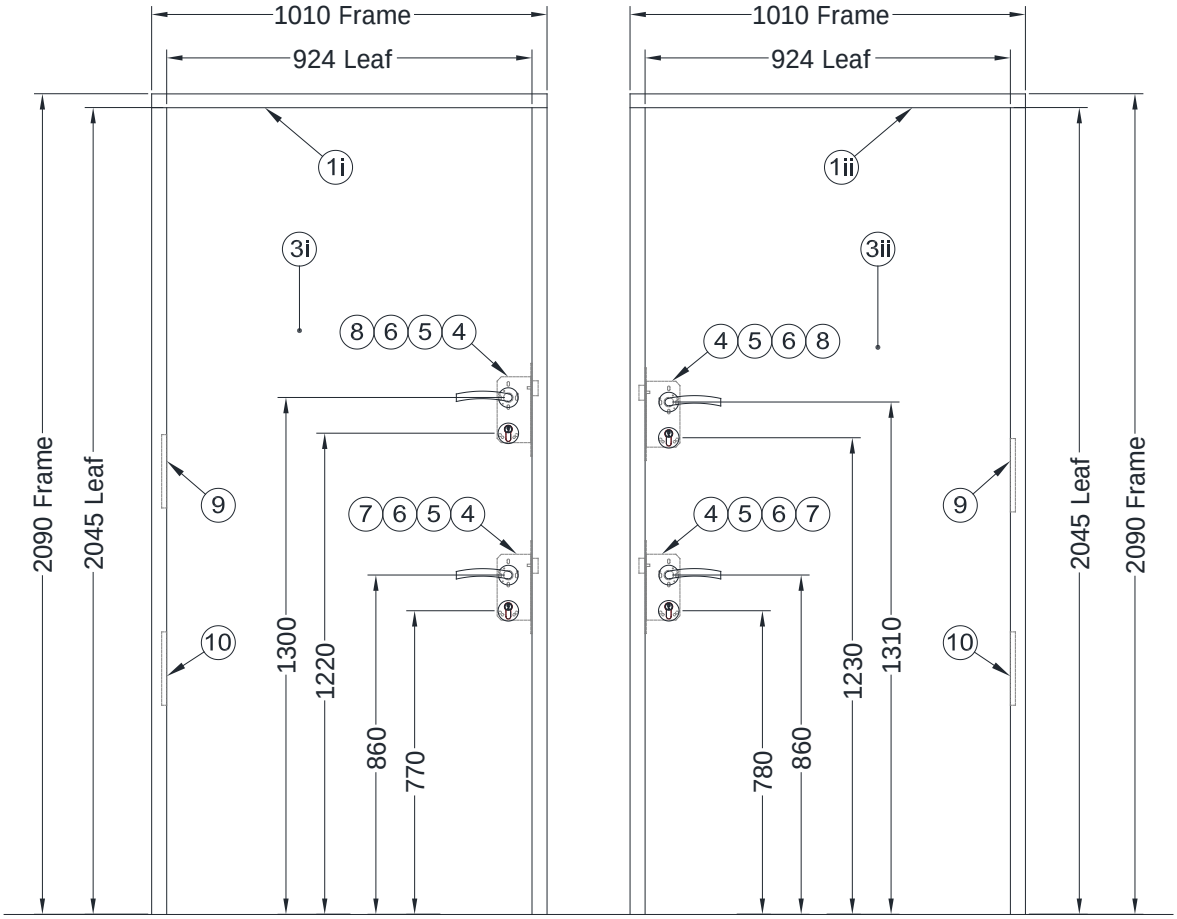
GENERAL ELEVATION OF TEST CONSTRUCTION
UNEXPOSED FACE



HORIZONTAL SECTION THROUGH TEST CONSTRUCTION

Do not scale. All dimensions are in mm

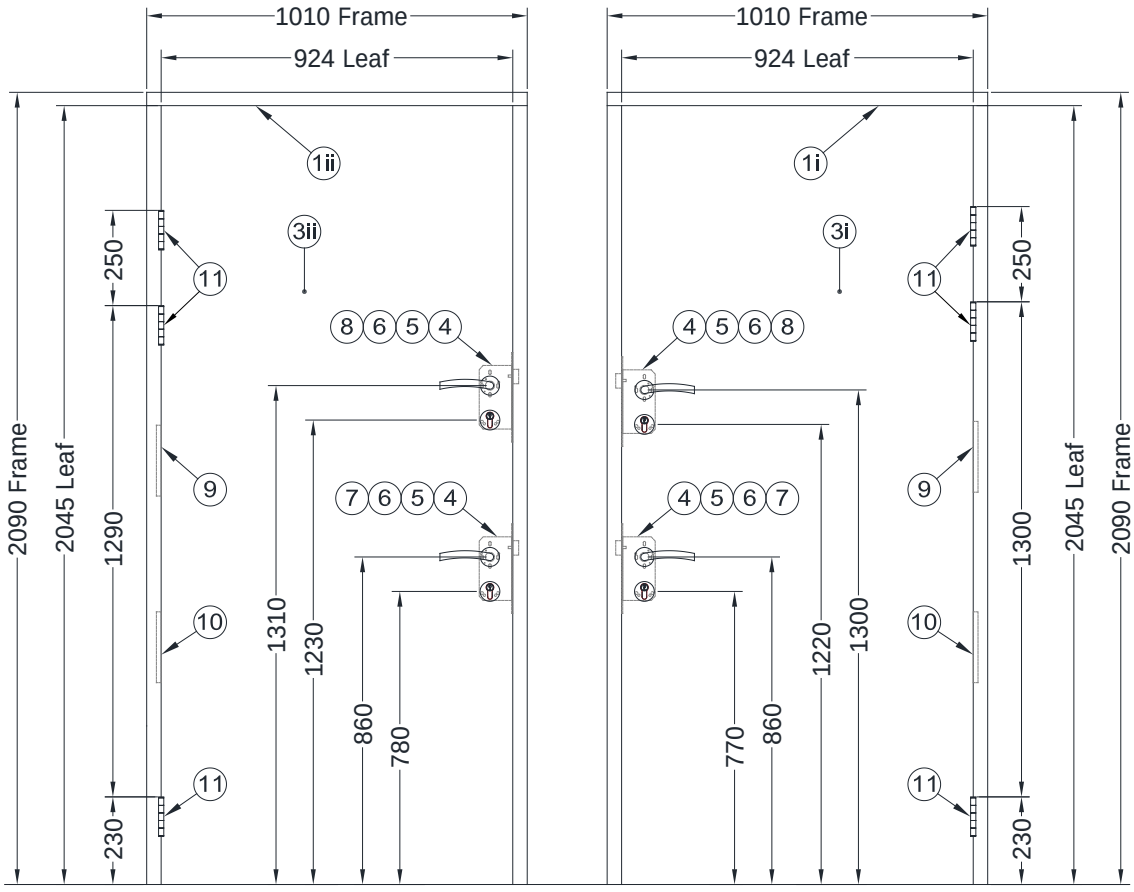
Figure 2 – Details of Doorset



GENERAL ELEVATION OF TEST CONSTRUCTION
UNEXPOSED FACE

Do not scale. All dimensions are in mm

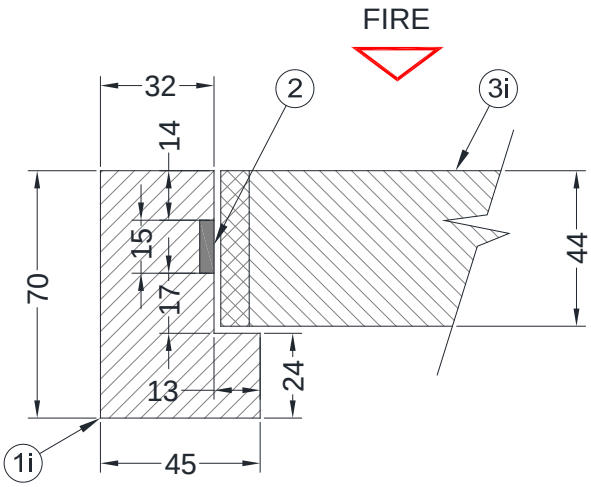
Figure 3 – Details of Doorset



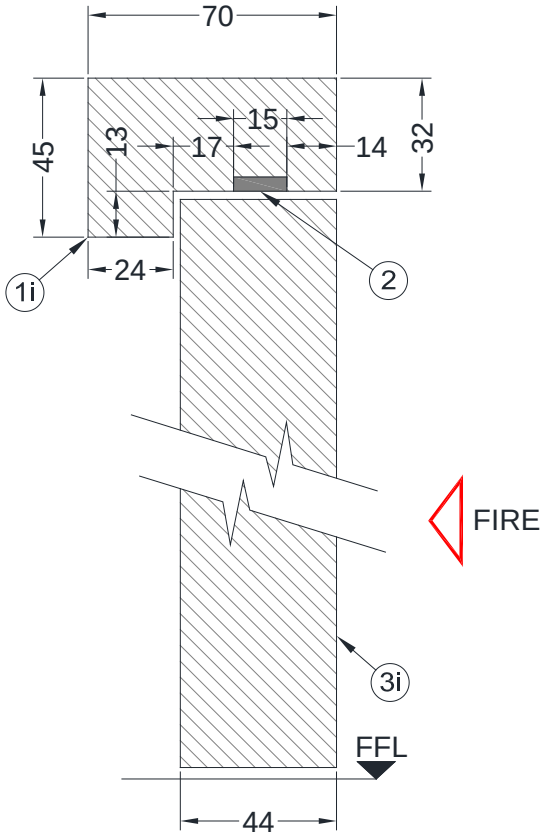
GENERAL ELEVATION OF TEST CONSTRUCTION
EXPOSED FACE

Do not scale. All dimensions are in mm

Figure 4 – Details of Doorset



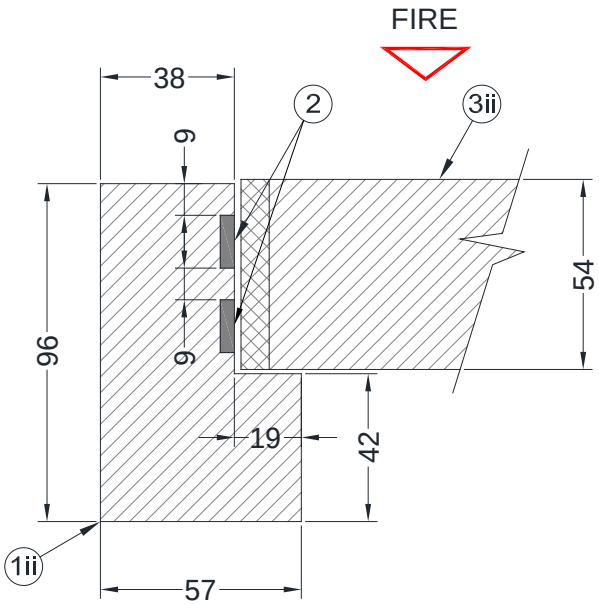
SECTION THROUGH DOOR JAMB:
DOOSET 'A'



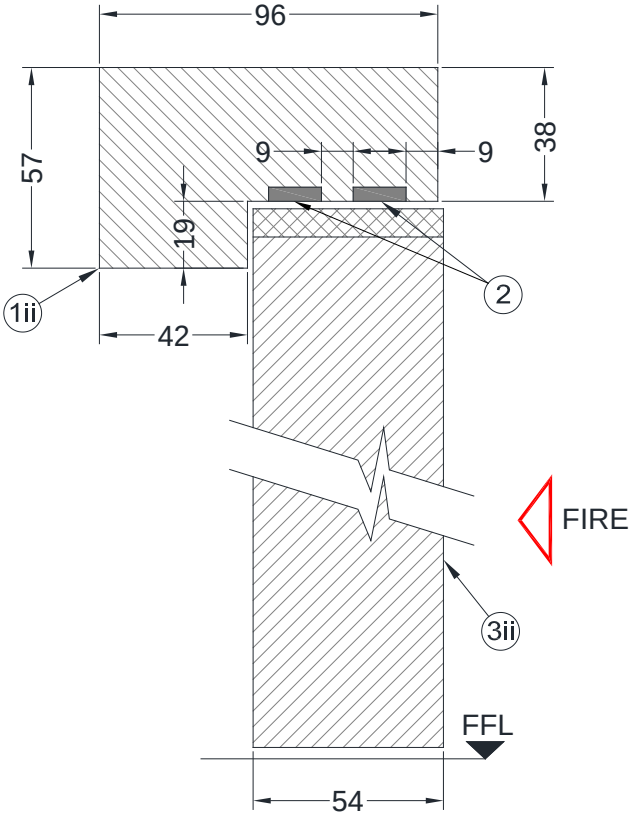
SECTION THROUGH HEAD OF DOOR FRAME AND BASE
OF DOORLEAF 'A'

Do not scale. All dimensions are in mm

Figure 5 – Details of Doorset



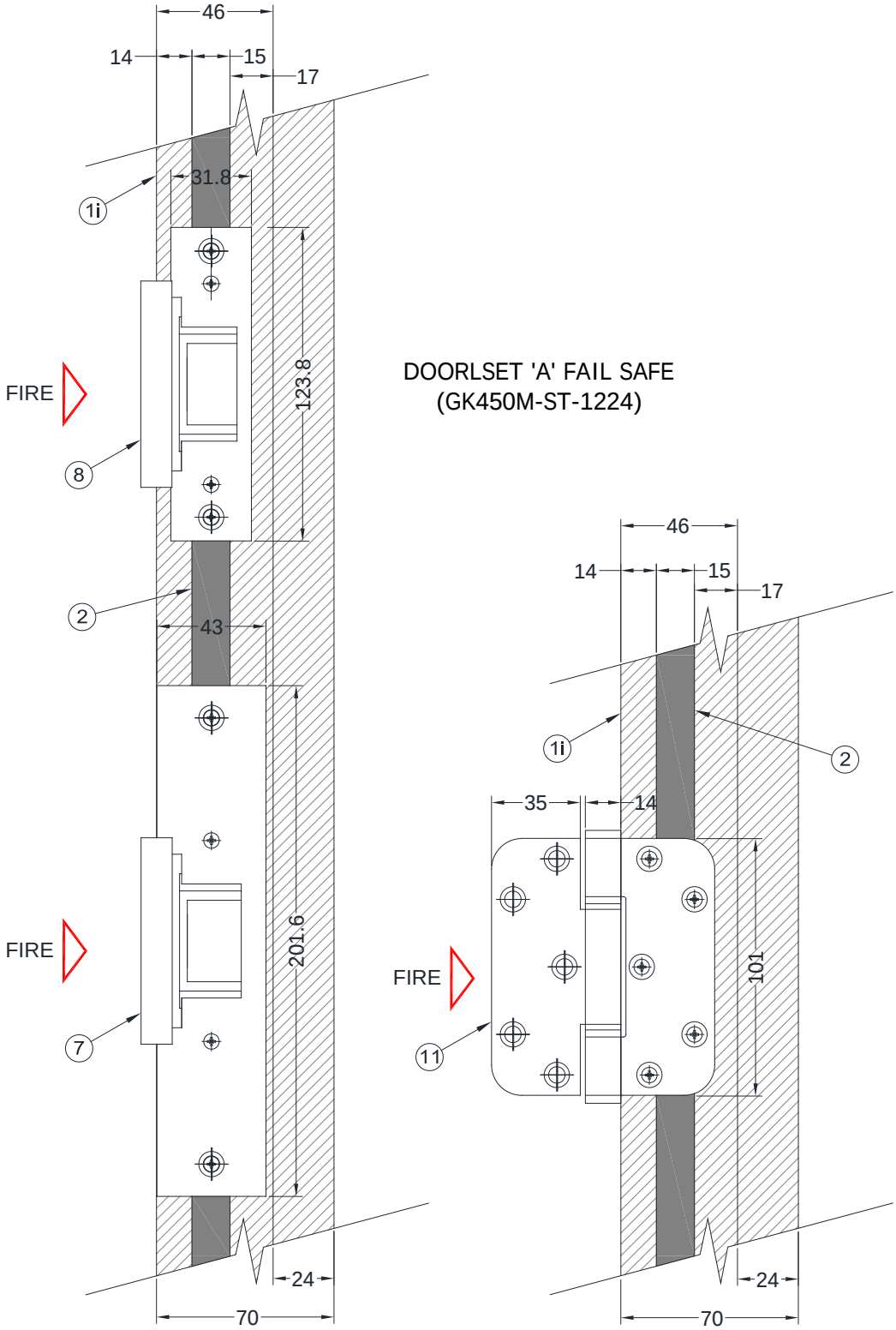
SECTION THROUGH DOOR JAMB:
DOOSET 'B'



SECTION THROUGH HEAD OF DOOR FRAME AND BASE
OF DOORLEAF 'B'

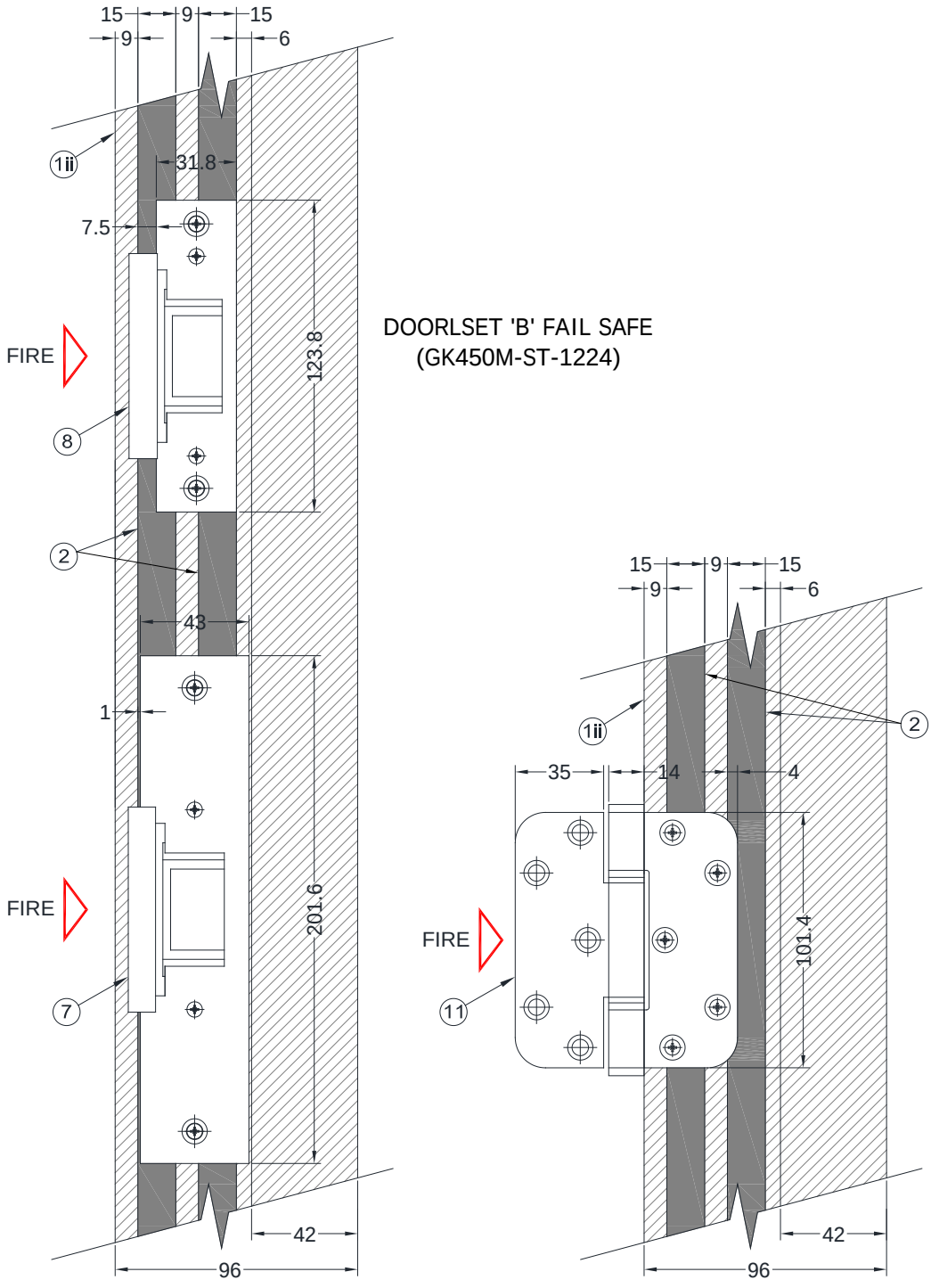
Do not scale. All dimensions are in mm

Figure 6 – Details of intumescent interruption



Do not scale. All dimensions are in mm

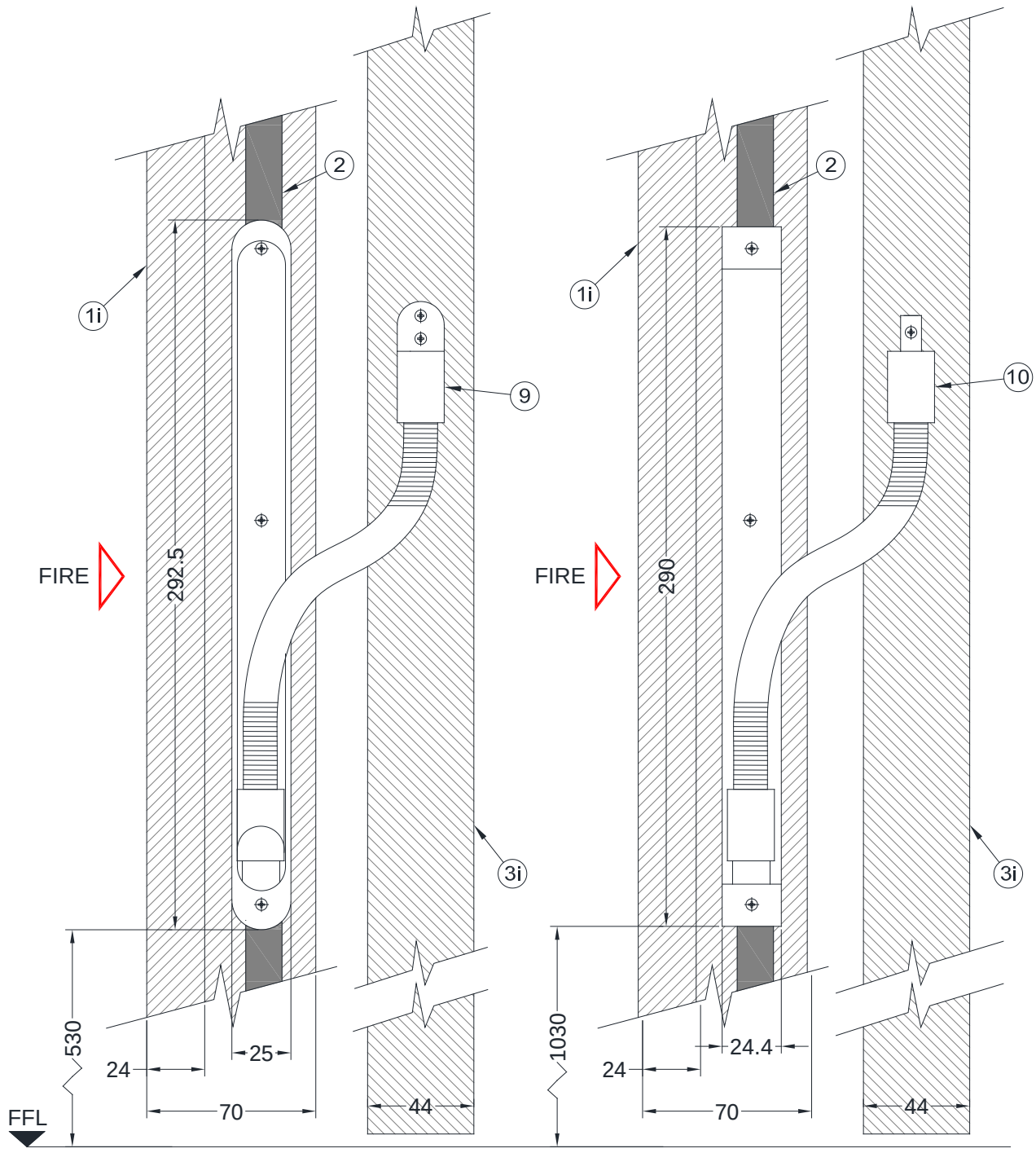
Figure 7 – Details of intumescent interruption



INTUMESCENT SEAL INTERRUPTION

Do not scale. All dimensions are in mm

Figure 8 – Details of intumescent interruption

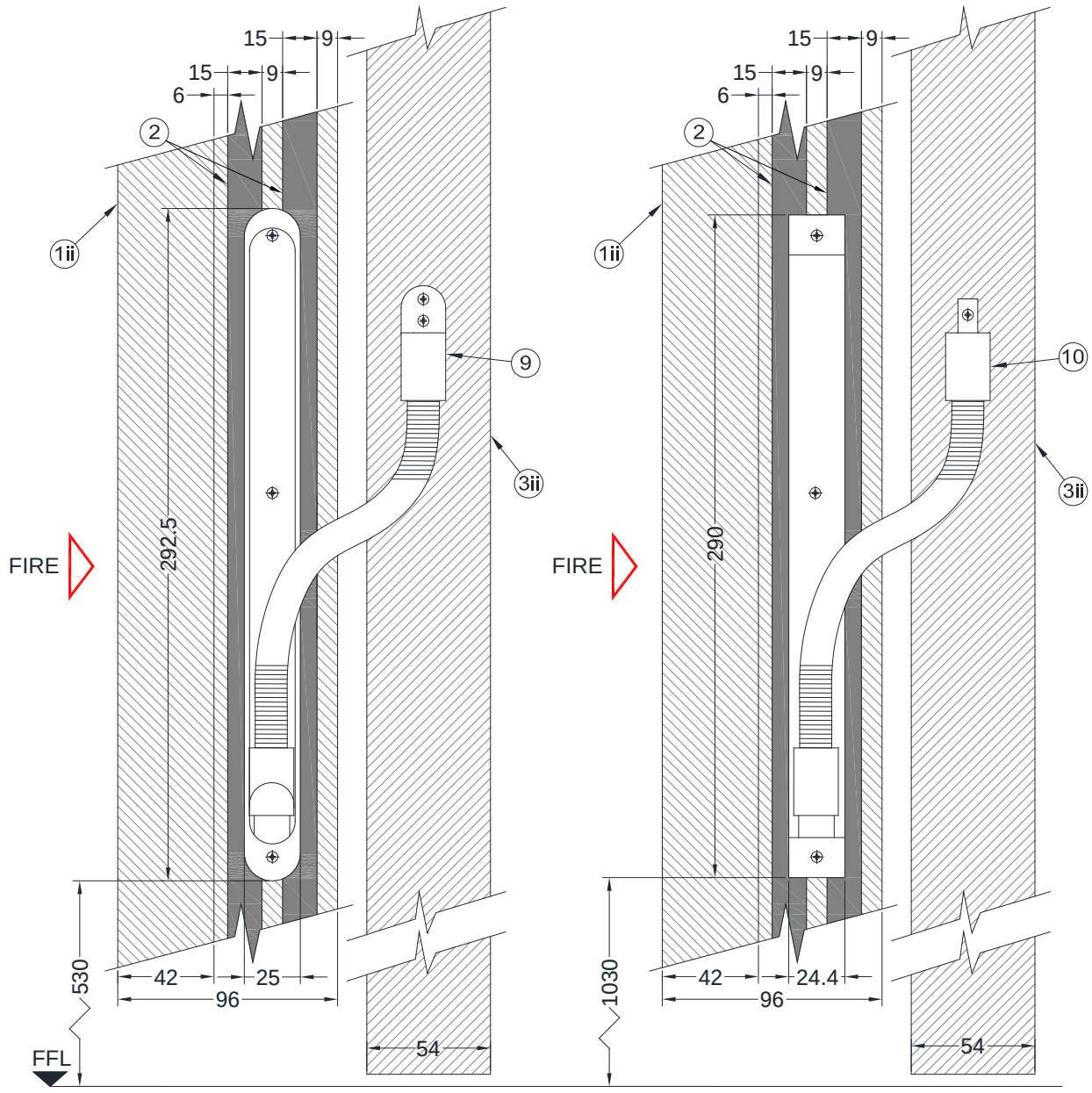


DOOR LOOP: DL-500 DOOR LOOP: DL-417ST

INTUMESCENT SEAL INTERRUPTION
AT DOOR LOOP: DOORSET 'A'

Do not scale. All dimensions are in mm

Figure 9 – Details of intumescent interruption



DOOR LOOP: DL-500

DOOR LOOP: DL-417ST

INTUMESCENT SEAL INTERRUPTION
AT DOOR LOOP: DOORSET 'B'

Do not scale. All dimensions are in mm

Figure 10 – Photos of ironmongery	

Unexposed face	Exposed face
	

Item 4	Item 5
	
Lever Handleset	Latch

Item 7	Item 8
	
Strike (fail secure / showing intumescent interuption	Strike (fail safe) / showing intumescent interuption

Item 9	Item 10
	
Door loop: dl-500 / showing intumescent interuption	Door loop: dl-417st / showing intumescent interuption

Item 11	Item 11
	
Hinge: (door ‘A’)	Hinge: (door ‘B’)

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)

1. Door Frame

i. Door frame 'A'

Material	:	Pine Softwood
Density	:	510 ~ 550 kg/m^3 nominal
Average moisture content	:	7.3% (measured with a Protimeter moisture meter by Warringtonfire)
Overall size	:	70mm x 45mm, with 46mm x 13mm deep rebate
Jambs to head jointing method	:	Stub mortice & screwed, using 75mm long x 4.6mm diameter countersunk head wood screws
Fixing method	:	Through screwed and plugged
Fixings		
i. Type	:	Countersunk head wood screws
Material	:	Steel screws with plastics plugs
Overall size	:	100 mm long by 4.8 diameter
iv. Centres	:	4 off 100mm above and 100mm below centre of each hinged position. 3 off equally spaced along the unhinged jam

ii. Door Frame 'B'

Material	:	Sapele, hardwood
Density	:	620 ~ 660 kg/m^3, nominal
Overall size	:	96mm x 57mm, with 54mm x 19mm rebate
Jambs to head jointing method	:	Stub mortice & screwed, using 75mm long x 4.6mm diameter countersunk head wood screws
Fixing method	:	Through screwed and plugged
Fixings		
i. type	:	Countersunk head wood screws
ii. material	:	Steel screws with plastics plugs
iii. overall size	:	100mm long by 4.8 diameter
iv. centres	:	4 off 100mm above and 100mm below centre of each hinged position. 3 off equally spaced along the unhinged jam

2. Intumescent Seal

Intumescent strip

Manufacturer	:	Pyroplex Ltd
Reference	:	CF 355
Material	:	Graphite intumescent strip within a polyvinyl chloride, PVC, carrier
Overall size		
Doorset 'A'	:	1 x 15mm x 4mm
Doorset 'B'	:	2 x 15mm x 4mm
Fixing method	:	Self adhered into grooves within rebate of frame and the strips were interrupted at furniture positions

3. Door Leaf

Manufacturer	:	Halspan
Reference	:	Prima
Overall thickness		
i. Doorleaf 'A'	:	44mm
ii. Doorleaf 'B'	:	54mm
Construction		

Item		Description
Core	:	Chipboard
Lippings	:	Hardwood 8mm thick, to vertical edges only
i. Species	:	Sapele
ii. Density	:	620 ~ 660 kg/m^3, nominal
Adhesive to lipping		
i. Manufacturer	:	Polyvine
ii. Type	:	Formalhyde
iii. Reference	:	Casamite
iv. Curing Method	:	Cold press
v. Application method	:	Brushed

4. Lever handleset

Manufacturer	:	Smith and Locke
Reference	:	Milano lever on rose handle
Material		
i. Lever handle	:	Polished Chrome
ii. Backplate	:	Polished Chrome
Overall size		
iii. Lever handle	:	120mm long x 18mm dia x 60mm protrusion
iv. Backplate	:	50mm dia x 10mm thick
Fixing method	:	Screw fixed to doorleaf ‘A+B’
Escutcheon		
Manufacturer	:	Smith and Locke
Reference	:	SKU-6917SKU/ Euro Escutcheon
Material	:	Satin Aluminium with plastic inlay
Overall size	:	53mm dia x 11mm thick
Fixing method	:	Screw fixed to doorleaf ‘A+B’

5. Latch

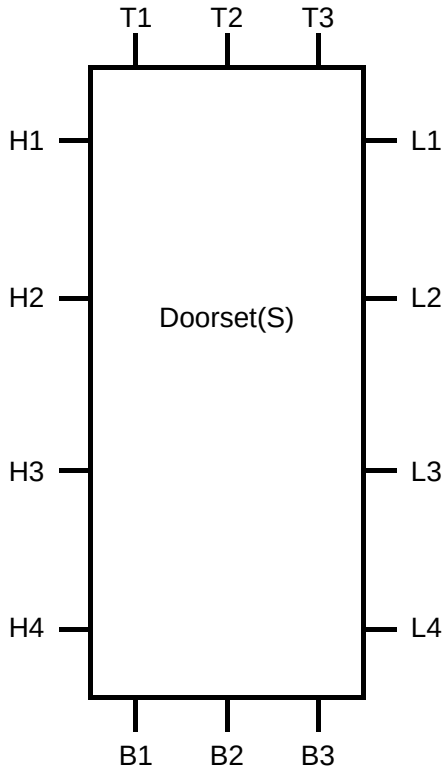
Manufacturer	:	Securefast plc
Reference	:	SEU777/2R
Material		
i. Lock case	:	Steel
ii. Forend plate	:	Steel
iii. Latch bolt	:	Steel
iv. Mini latch bolt	:	Steel
Overall sizes		
i. Lock case	:	155mm long x 75mm wide x 15.5mm deep
ii. Forend plate	:	235mm long x 24mm wide x 3mm thick
iii. Latch bolt	:	32mm long x 12mm wide x 11mm projection
iv. Mini bolt	:	8mm long x 10mm wide & 8mm projection
Fixing Method	:	Screw fixed
Operation of Latch bolt (upper lockset)	:	Engaged
Operation of Latch bolt (lower lockset)	:	Disengaged
Bedding material	:	The lockcase and behind the forend plate was wrapped in 1mm interdens on both doorsets

6. Cylinder

Manufacturer	:	Union Assa Abloy
Reference	:	J-U6PED4555SN Union 6 pin Euro Profile
Primary material	:	Stainless Steel
Overall sizes	:	100mm Long x 45/55 (even split)

Item		Description
7. Strike Plate – Fail Secure		
Manufacturer	:	Gianni Industries Inc
Reference	:	GK361M-ST-1224
Primary material	:	Stainless Steel
Overall sizes	:	201.6mm Long x 43mm Wide x 29.5mm Deep
Bedding material	:	Wrapped in 1mm interdens on both doorsets
8. Strike Plate – Fail Safe		
Manufacturer	:	Gianni Industries Inc
Reference	:	GK450M-ST-1224
Primary material	:	Stainless Steel
Overall sizes	:	123.8mm Long x 31.8 -43.5mm Wide x 29.5mm Deep
Bedding material	:	Wrapped in 1mm interdens on both doorsets
9. Door Loop		
Manufacturer	:	Gianni Industries Inc
Reference	:	DL-500 (White coated paint)
Material	:	Steel
Overall Size	:	292.5mm length x 25mm Width x 19mm Depth
Fixing Method	:	Screw fixed into position
Bedding material	:	Wrapped in 1mm interdens on both doorsets
10. Door Loop		
Manufacturer	:	Gianni Industries Inc
Reference	:	DL-417ST (Stainless Steel)
Material	:	Steel
Overall Size	:	290mm length x 24.4mm Width x 20mm Depth
Fixing Method	:	Screw fixed into position
Bedding material	:	Wrapped in 1mm interdens on both doorsets
11. Hinges		
Manufacturer	:	Royde & Tucker
Reference	:	Hi load 102
Primary material	:	Zinc plated steel.
Overall sizes		
knuckle	:	104mm long by 14mm diameter.
blades	:	100mm long by 35mm wide by 3mm thick.
Fixings		
type	:	Countersunk head wood screws.
material	:	Steel.
size	:	30mm long by 5mm diameter (supplied with hinges)
number off per blade	:	5 off.
max	:	30mm
min	:	20mm
Bedding material	:	Bedded on one layer of 1mm Interdens sheet. On both doorsets

Doorset clearance gaps



Doorset A (mm)					
Hinge Side	Primary	Leaf to Stop	Leading Edge	Primary	Leaf to Stop
H1	2.9	1.0	L1	2.3	0.5
H2	3.1	0.9	L2	2.9	1.7
H3	2.7	0.5	L3	3.2	1.1
H4	2.8	0.3	L4	2.6	0.3
Mean	2.9		Mean	2.8	
Max	3.1		Max	3.2	
Min	2.7		Min	2.3	
Max Permitted	*5.0*		*Max Permitted*	*5.0*	
Top edge	Primary	Leaf to stop	Threshold	Primary	
T1	0.8	2.2	B1	11.1	
T2	0.0	2.4	B2	12.3	
T3	2.0	2.8	B3	13.3	
Mean	0.9		Mean	12.2	
Max	2.0		Max	13.3	
Min	0.0		Min	11.1	
Max Permitted	*3.5*		*Max Permitted*	*14.8*	

Doorset B (mm)					
Hinge Side	Primary	Leaf to Stop	Leading Edge	Primary	Leaf to Stop
H1	3.2	0.4	L1	2.9	2.0
H2	2.8	1.5	L2	3.0	0.9
H3	2.4	0.6	L3	2.9	0.2
H4	4.3	1.6	L4	3.1	1.0
Mean	3.2		Mean	3.0	
Max	4.3		Max	3.1	
Min	2.4		Min	2.9	
Max Permitted	*5.7*		*Max Permitted*	*5.0*	
Top edge	Primary	Leaf to stop	Threshold	Primary	
T1	2.5	3.1	B1	9.9	
T2	2.3	2.5	B2	10.5	
T3	1.9	1.7	B3	9.1	
Mean	2.2		Mean	9.8	
Max	2.5		Max	10.5	
Min	1.9		Min	9.1	
Max Permitted	*4.4*		*Max Permitted*	*12.2*	

Test Observations

All observations are from the unexposed face unless noted otherwise.

Time		
mins	secs	
00	00	**The Test Commences.**
00	30	Steam/smoke release along the jambs and head of the doorsets.
01	51	Discolouration at all of the lockset positions.
03	11	Increased steam/smoke release along the jambs and head of the doorsets, steam/smoke release now issues from all hardware positions across both doorsets. Flicker of flame issues from the base of Door leaf A.
06	52	Dark discolouration at the top and mid hinge positions and around both locksets fitted to Doorset A.
09	00	Moisture is running down face of Door leaves A and B.
13	39	The steam/smoke release has recinded and now is only light, the steam/smoke release is now only issueing from the top and mid hinge positions and around both lockset positions on Doorset A.
21	01	There is continued discolouration at all hardware positions on both doorsets.
23	48	Flicker of flame from bottom lockset on Doorset A.
24	40	Steam/smoke release coming from all of the cylinders and around the roses on both Doorsets.
25	00	Flicker of flame coming from the lower strike plate position on Doorset A.
27	45	Cotton pad applied at the lower lockset on Doorset A, no discolouration of the cotton pad.
28	45	The plastic insert on the escutcheons can be seen to be reacting.
29	13	Flicker of flame at the lower lockset on Doorset A.
30	50	Cotton pad applied at the lower lockset on Doorset A, no discolouration of the cotton pad.
33	28	Flicker of flame at the lower lockset position on Doorset A.
34	29	Door leaf A can be seen to have bowed away from the heating conditions.
35	45	Flickers of flame at the lower lockset on Doorset A.
36	10	No sustained flaming on Doorset A, Doorset A is dampened down with water and blanked off to allow the test to continue.

Time		
mins	secs	
42	14	The cylinders on Doorset B are now discolouring a golden brown colour.
48	07	The plastic insert on the escutcheons is starting to melt.
54	40	Black discolouration at the lockset positions and the top hinge position on Doorset B.
57	55	Flicker of flame at the base of Doorset B. When viewed from the exposed face both handles and escutcheons have come away from the door leaf.
60	00	Continued black discolouration at the top latched and hinged corners and around the locksets on Doorset B.
63	37	**Sustained flaming all along the head of Doorset B. Integrity failure is deemed to have occurred. The flaming is put out with water and sealed with intumescent mastic.**
65	00	Glowing can be seem at the strike plate position of the upper lockset on Doorset B.
66	00	Glowing can be seen at the top hinge position on Doorset B.
68	10	Test discontinued.

Test Photographs

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

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

The unexposed face of the doorsets after a test duration of 10 minutes

The unexposed face of the doorsets after a test duration of 15 minutes

The unexposed face of the doorsets after a test duration of 20 minutes

The unexposed face of the doorsets after a test duration of 25 minutes

The unexposed face of the doorsets after a test duration of 30 minutes

The unexposed face of the doorsets after a test duration of 36 minutes

The unexposed face of Doorset B after a test duration of 40 minutes

The unexposed face of Doorset B after a test duration of 50 minutes

The unexposed face of Doorset B after a test duration of 60 minutes

The unexposed face of Doorset B after a test duration of 63 minutes

The unexposed face of Doorset B after a test duration of 68 minutes

The exposed face of the test assembly shortly after the test

Temperature and Deflection Data

Mean furnace temperature, together with the temperature/time relationship specified in BS EN 1363-1: 2012

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	34
2	445	443
4	544	645
6	603	668
8	646	629
10	678	683
12	706	682
14	728	728
16	748	752
18	766	760
20	781	777
22	796	797
24	809	810
26	820	819
28	832	825
30	842	836
32	852	851
34	860	858
36	869	866
38	877	870
40	885	883
42	892	893
44	899	900
46	906	907
48	912	917
50	918	923
52	924	928
54	930	936
56	935	930
58	940	976
60	945	923
62	950	951
64	955	946
66	960	961
68	964	962

Individual And Mean Temperatures Recorded On The Unexposed Surface Of Doorset A

Time Mins	T/C Number 4 Deg. C	T/C Number 5 Deg. C	T/C Number 6 Deg. C	T/C Number 7 Deg. C	T/C Number 8 Deg. C	Mean Temp Deg. C
0	22	22	21	21	20	21
1	25	28	24	24	22	25
2	23	26	23	24	21	23
3	23	25	23	23	21	23
4	23	25	22	23	21	23
5	23	24	22	22	21	22
6	22	24	22	22	21	22
7	22	24	22	22	21	22
8	22	24	22	22	21	22
9	23	24	23	22	22	23
10	23	25	24	23	22	23
11	24	26	25	24	24	25
12	25	28	26	25	25	26
13	26	30	28	26	27	27
14	27	31	29	27	28	28
15	28	33	31	28	30	30
16	29	35	33	30	32	32
17	31	37	34	31	33	33
18	32	39	36	33	35	35
19	34	40	38	34	37	37
20	35	42	39	36	38	38
21	36	44	41	38	40	40
22	38	46	43	40	42	42
23	40	47	45	41	43	43
24	41	49	46	43	45	45
25	43	51	48	45	47	47
26	44	52	50	47	48	48
27	46	54	51	48	50	50
28	47	55	53	50	51	51
29	49	57	54	51	52	53
30	51	58	56	53	54	54
31	52	59	57	55	55	56
32	54	61	59	56	56	57
33	55	62	60	57	58	58
34	57	63	61	59	59	60
35	58	64	63	60	60	61
36	60	66	64	62	62	63

Individual And Mean Temperatures Recorded On The Unexposed Surface Of Doorset B

Time Mins	T/C Number 9 Deg. C	T/C Number 10 Deg. C	T/C Number 11 Deg. C	T/C Number 12 Deg. C	T/C Number 13 Deg. C	Mean Temp Deg. C
0	21	21	21	20	20	21
2	22	22	22	22	22	22
4	22	22	22	21	21	22
6	21	22	21	21	21	21
8	21	22	21	21	21	21
10	21	21	21	21	21	21
12	22	21	21	21	21	21
14	22	21	21	21	21	21
16	23	22	22	22	22	22
18	25	23	23	23	23	23
20	26	24	24	25	24	25
22	28	25	25	27	26	26
24	30	26	27	28	28	28
26	32	28	29	30	30	30
28	35	29	31	32	32	32
30	37	31	33	34	34	34
32	40	34	35	36	36	36
34	42	36	37	38	38	38
36	44	38	40	39	40	40
38	47	41	42	41	42	43
40	49	44	44	43	44	45
42	52	47	47	44	46	47
44	55	50	49	46	48	50
46	57	52	52	48	51	52
48	59	55	55	50	53	54
50	62	58	57	52	55	57
52	64	62	60	54	57	59
54	66	64	62	56	59	61
56	68	67	65	58	61	64
58	70	70	68	60	63	66
60	73	73	70	62	65	69
62	75	75	72	63	67	70
64	77	77	74	66	70	73
66	79	79	77	67	71	75
68	81	81	78	69	73	76

Individual Temperatures Recorded On The Leaf Of Doorset A 25 mm Away From The Edges

Time Mins	T/C Number 14 Deg. C	T/C Number 15 Deg. C	T/C Number 18 Deg. C	T/C Number 21 Deg. C
0	31	28	22	23
1	84	72	30	38
2	86	65	28	42
3	82	63	27	43
4	83	59	27	43
5	81	56	26	39
6	79	56	27	44
7	78	56	27	49
8	77	56	28	46
9	79	58	29	46
10	82	61	29	47
11	84	64	30	49
12	86	68	32	56
13	89	71	34	60
14	89	72	36	60
15	92	76	38	63
16	93	78	41	65
17	94	81	43	67
18	94	85	45	69
19	92	90	48	70
20	92	96	50	73
21	92	100	52	73
22	93	89	55	73
23	95	86	57	74
24	99	86	59	76
25	102	88	61	77
26	105	89	63	78
27	111	91	64	79
28	113	93	66	81
29	113	94	67	82
30	118	97	68	83
31	124	99	69	84
32	129	101	70	83
33	135	106	71	83
34	141	111	72	83
35	145	117	73	84
36	145	127	74	84

Individual Temperatures Recorded On The Leaf Of Doorset A 100 mm Away From The Edges

Time Mins	T/C Number 16 Deg. C	T/C Number 17 Deg. C	T/C Number 19 Deg. C	T/C Number 20 Deg. C
0	24	24	22	23
1	33	38	25	29
2	30	31	24	26
3	28	31	23	25
4	28	30	23	25
5	27	30	23	25
6	27	30	23	25
7	27	32	23	25
8	27	32	23	25
9	29	32	24	27
10	31	34	24	29
11	34	35	25	31
12	37	38	27	34
13	39	40	28	37
14	42	42	30	40
15	44	44	32	42
16	46	46	33	45
17	48	48	35	47
18	50	49	37	49
19	51	51	39	51
20	52	53	41	53
21	54	54	42	55
22	55	55	44	56
23	56	57	46	58
24	57	58	48	59
25	58	59	50	60
26	59	60	52	61
27	60	61	53	62
28	60	62	55	63
29	61	63	56	64
30	62	64	57	65
31	63	65	59	65
32	64	66	60	66
33	65	67	61	67
34	66	68	62	68
35	67	69	63	68
36	68	70	65	69

Individual Temperatures Recorded On The Leaf Of Doorset B 25 mm Away From The Edges

Time Mins	T/C Number 22 Deg. C	T/C Number 23 Deg. C	T/C Number 26 Deg. C	T/C Number 29 Deg. C
0	19	19	17	23
2	34	34	20	34
4	42	46	19	31
6	39	42	19	28
8	36	37	19	27
10	34	35	19	26
12	34	36	20	26
14	35	38	23	27
16	38	43	26	27
18	41	48	30	29
20	47	51	34	31
22	52	56	38	34
24	55	61	43	37
26	58	64	48	39
28	62	67	52	42
30	63	68	56	44
32	65	69	57	47
34	67	70	60	50
36	68	71	63	53
38	71	73	65	56
40	73	75	67	59
42	75	76	69	62
44	77	76	70	65
46	77	77	72	67
48	77	77	73	69
50	78	79	79	72
52	79	81	83	73
54	80	85	84	74
56	82	91	85	76
58	84	98	87	77
60	87	111	89	78
62	91	124	91	80
64	147	171	93	81
66	124	169	98	83
68	239	110	101	85

Individual Temperatures Recorded On The Leaf Of Doorset B 100 mm Away From The Edges

Time Mins	T/C Number 24 Deg. C	T/C Number 25 Deg. C	T/C Number 27 Deg. C	T/C Number 28 Deg. C
0	18	18	17	11
2	19	20	18	14
4	19	21	18	14
6	18	19	18	13
8	18	19	18	12
10	18	19	18	*
12	19	19	19	*
14	21	20	20	*
16	23	22	22	*
18	26	25	25	21
20	29	28	28	22
22	31	30	31	23
24	34	33	34	24
26	37	35	36	25
28	39	38	39	26
30	42	40	41	28
32	44	42	44	29
34	46	44	46	30
36	47	45	48	32
38	49	47	49	33
40	51	49	51	35
42	53	51	53	36
44	55	53	54	38
46	56	55	56	39
48	58	56	57	41
50	60	58	58	43
52	62	60	60	45
54	64	62	62	47
56	65	64	64	48
58	67	66	65	50
60	69	67	67	51
62	71	69	69	53
64	76	72	71	55
66	73	75	73	57
68	64	76	70	58

*Thermocouple Malfunction

Individual Temperatures Recorded On The Unexposed Surface Of Door Frame A

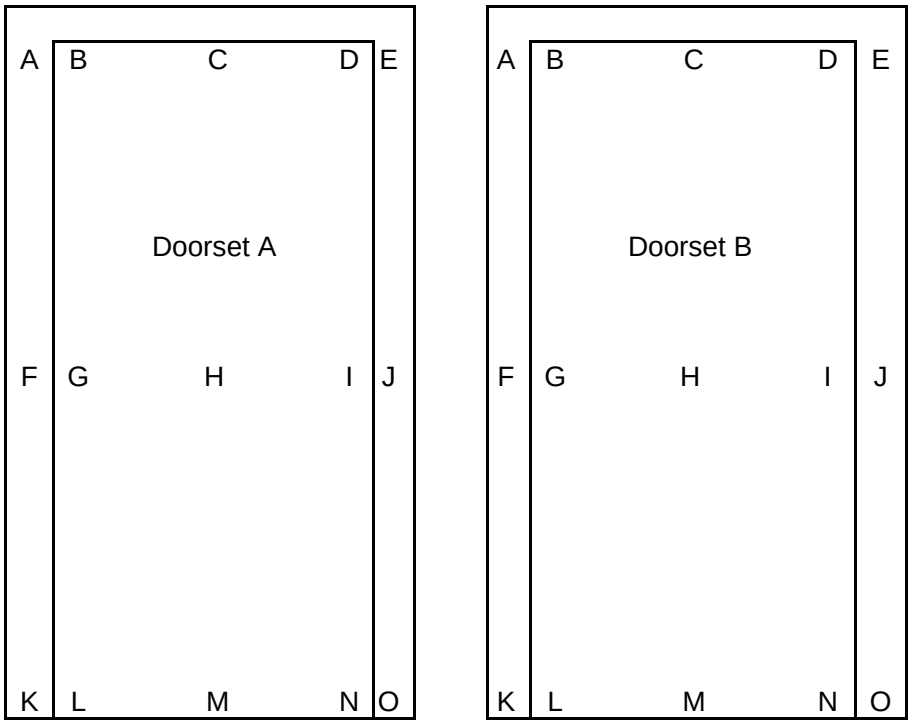
Time Mins	T/C Number 30 Deg. C	T/C Number 31 Deg. C	T/C Number 32 Deg. C	T/C Number 33 Deg. C
0	22	22	21	21
1	30	36	24	23
2	33	39	23	22
3	41	40	22	22
4	46	40	22	21
5	49	39	22	21
6	51	39	22	22
7	49	39	22	22
8	47	38	22	22
9	46	38	22	23
10	44	37	23	23
11	42	36	23	23
12	40	37	23	24
13	41	37	24	25
14	40	37	24	25
15	40	37	25	26
16	39	37	25	26
17	39	39	26	26
18	39	39	26	27
19	40	40	27	27
20	40	42	28	28
21	41	43	28	29
22	41	42	29	29
23	42	43	30	30
24	44	44	30	30
25	45	46	31	31
26	45	48	32	31
27	47	50	33	32
28	49	51	33	33
29	50	52	34	35
30	52	54	35	37
31	52	56	36	39
32	53	58	36	40
33	54	59	37	41
34	54	61	38	42
35	55	63	38	44
36	55	67	39	45

Individual Temperatures Recorded On The Unexposed Surface Of Door Frame B

Time Mins	T/C Number 34 Deg. C	T/C Number 35 Deg. C	T/C Number 36 Deg. C	T/C Number 37 Deg. C
0	22	21	18	16
2	26	29	20	17
4	30	33	19	17
6	29	29	19	17
8	27	27	19	*
10	26	26	19	*
12	25	26	19	*
14	25	26	19	*
16	26	26	19	*
18	26	27	19	*
20	27	28	20	*
22	27	29	20	*
24	28	31	21	*
26	29	32	21	*
28	30	32	21	*
30	31	32	22	*
32	32	32	23	*
34	33	33	23	*
36	34	34	24	*
38	35	35	25	*
40	37	39	25	*
42	38	43	26	*
44	40	44	26	*
46	41	45	27	*
48	42	44	28	*
50	44	44	29	*
52	46	47	30	*
54	48	49	31	*
56	50	53	32	*
58	51	58	33	*
60	54	66	34	*
62	56	73	35	*
64	69	101	35	*
66	94	124	36	*
68	216	110	37	*

*Thermocouple Malfunction

Horizontal Deflections Of The Doorsets

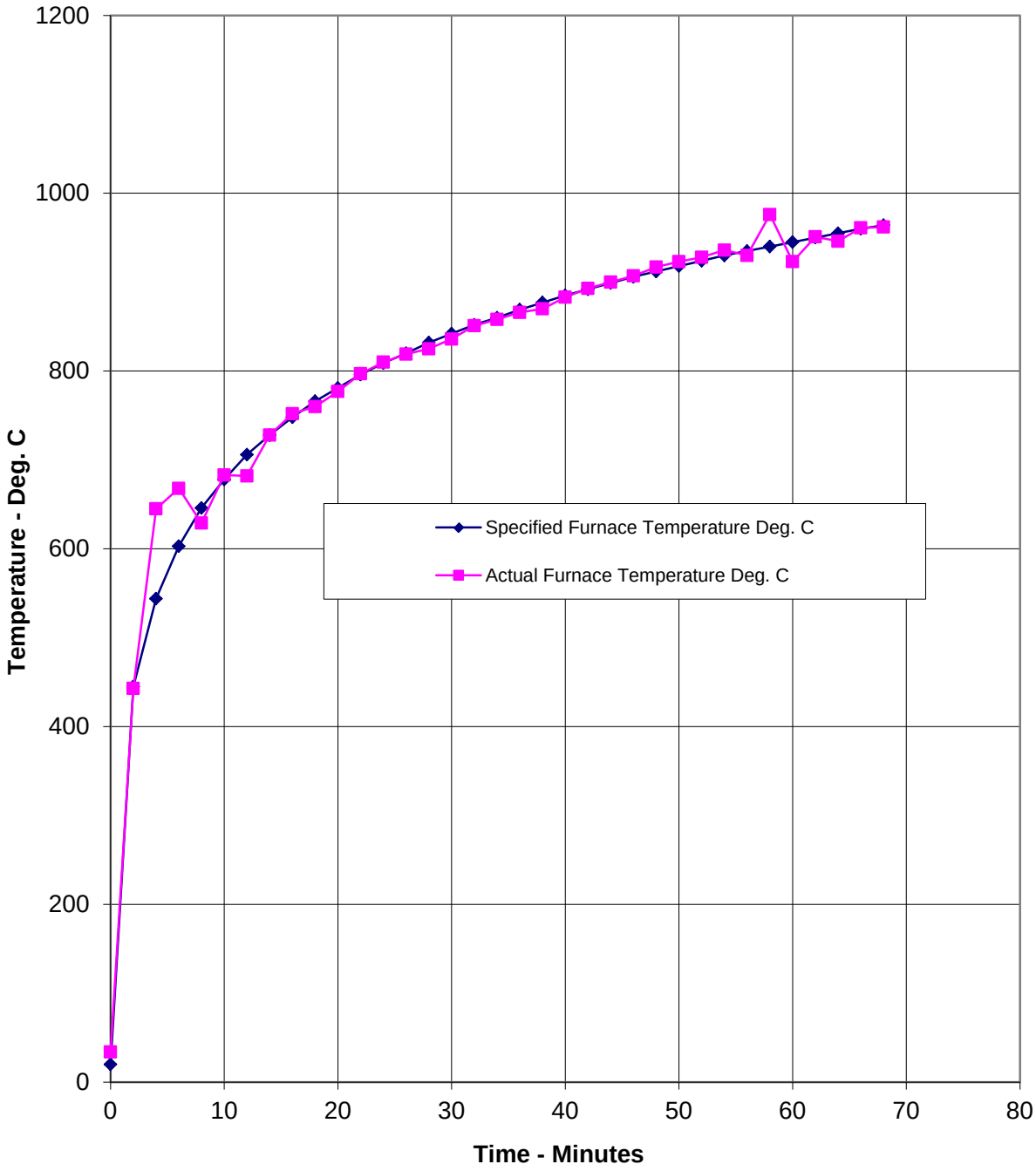


Doorset A															
Deflections – mm															
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4	-3	2	2	2	-1	-7	-6	-3	1	2	2	-2	0	2
10	-1	-4	0	3	0	-2	-5	-8	-6	-1	-1	0	-1	3	9
15	1	2	2	4	4	-2	0	-9	-3	2	1	1	-1	6	2
20	2	-3	3	3	2	-5	-5	-14	-1	0	0	3	0	12	3
25	-2	0	-1	4	3	-1	-2	-18	-4	2	1	6	1	12	5
30	1	-2	4	2	1	-2	-6	-17	-4	-1	1	7	-1	14	4
35	-3	2	-3	2	0	-2	-7	-23	-4	1	3	11	-1	15	4

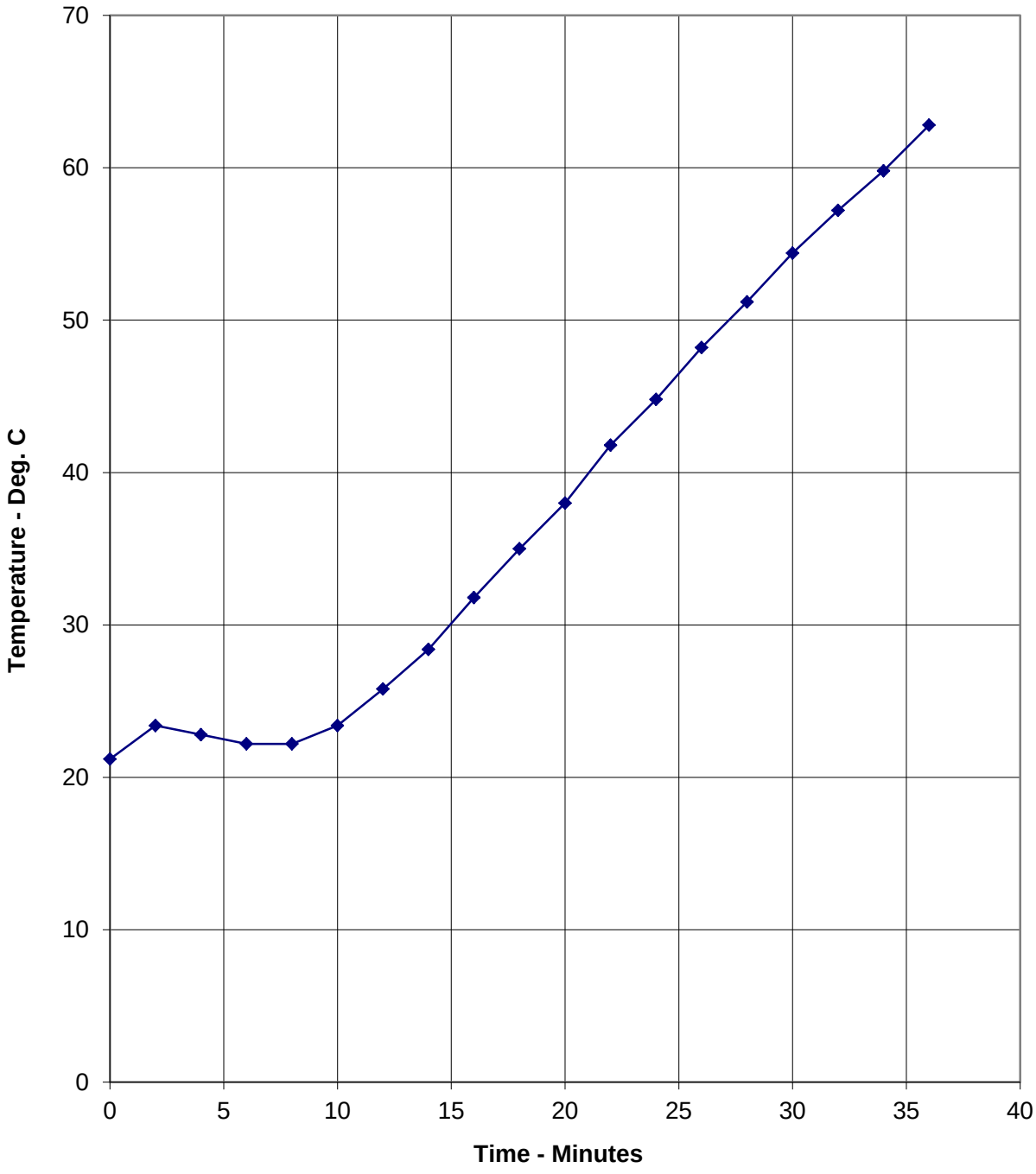
Doorset B															
Deflections – mm															
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1	1	2	-2	-5	-2	-9	-12	2	-5	1	-4	1	2	-2
20	2	-2	-4	0	3	1	-3	-1	1	-7	3	-1	3	-1	-3
30	4	1	-1	0	2	0	-3	-3	-2	1	4	-3	2	0	3
40	-1	4	-1	-6	8	-5	-3	-5	-3	-4	6	-1	-5	5	7
50	1	0	-3	0	6	-4	-7	-14	2	0	5	-2	-5	1	12
60	4	-1	-6	1	8	-3	-9	-24	-5	3	10	0	-8	2	4

Positive values indicate movement towards the furnace

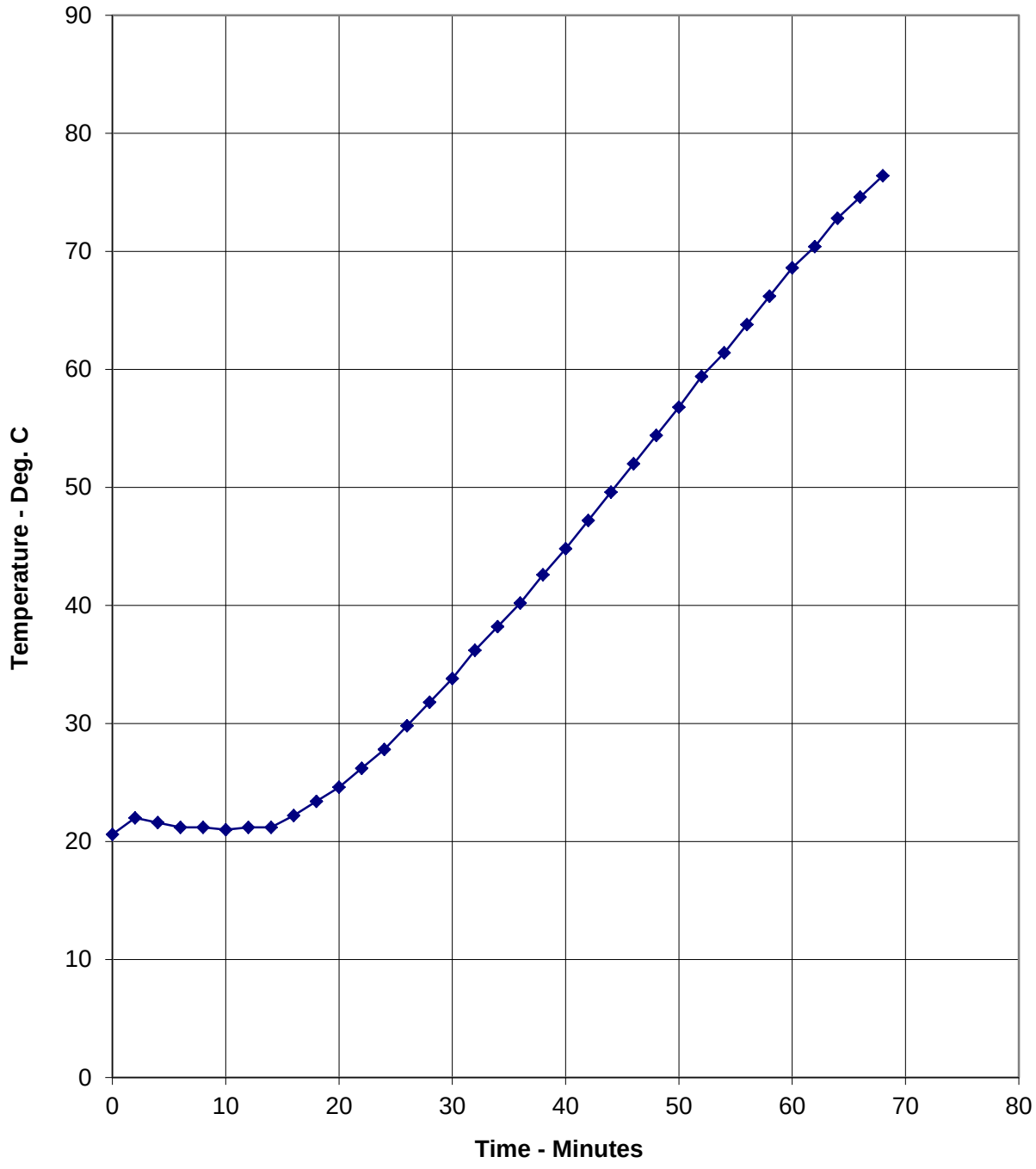
Graph showing mean furnace temperature, together with the temperature/time relationship specified in BS EN 1363-1: 2012



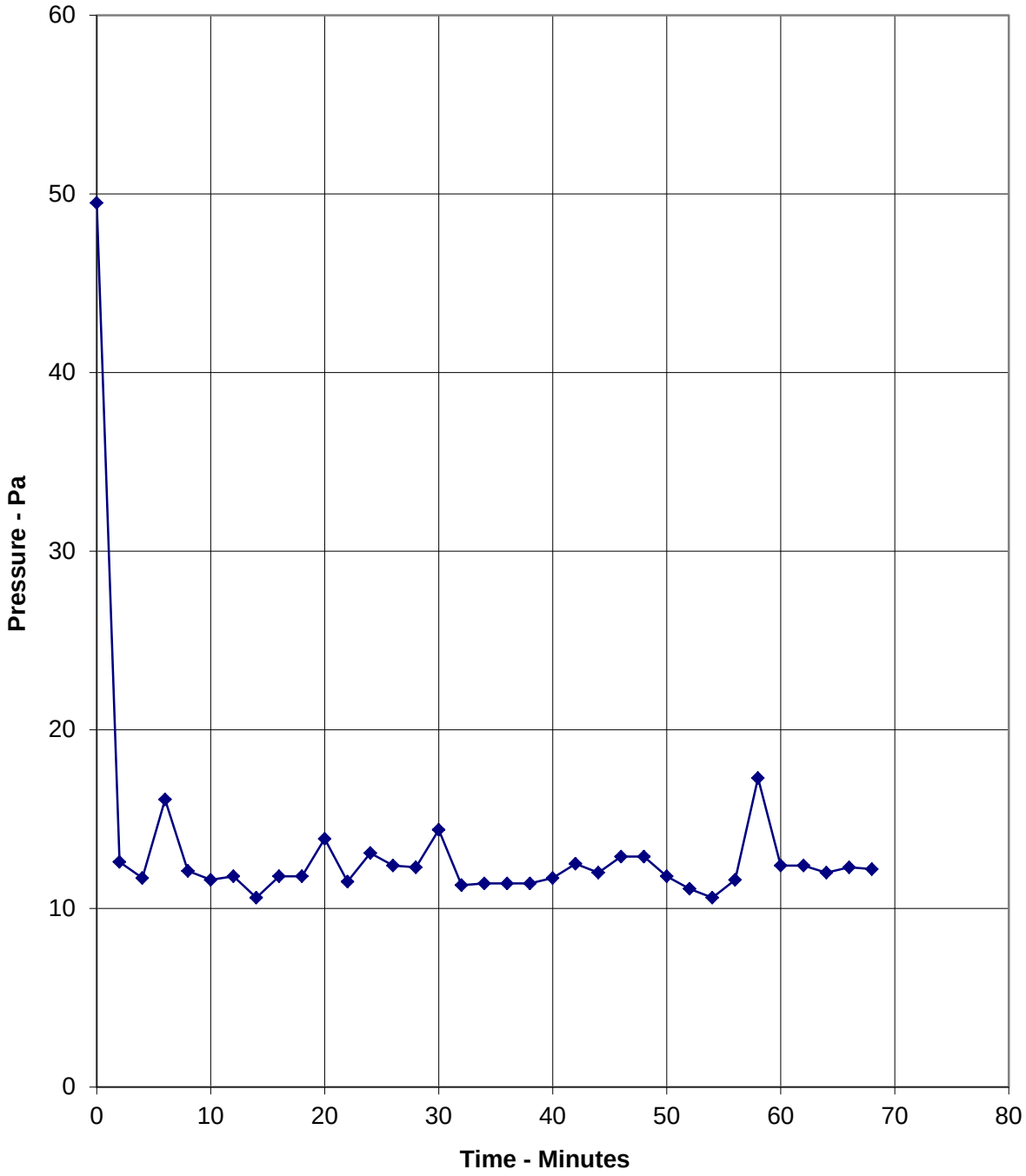
Graph Showing Mean Temperatures Recorded On The Unexposed Surface Of Doorset A



Graph Showing Mean Temperatures Recorded On The Unexposed Surface Of Doorset B



Graph showing recorded furnace pressure at the head of the Doorsets



On-going Implications

Limitations

This report details the method of construction, the test conditions and the results obtained when the specific elements of construction described herein were 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.

EGOLF

Certain aspects of some fire test specifications are open to different interpretations. 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