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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:

19th November 2019

Issue 1:

16th March 2020

WF Report No:

419361

Prepared for:

Frelan Hardware

Unit 10 Mitchum Ind Est
Streatham Road
Mitcham
Surrey
CR4 2AP

UKAS TESTING
0249

Test Specimen

Summary of Tested Specimens

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

Doorset A had overall nominal dimensions of 1000 mm wide by 2080 mm high, incorporating a single door leaf with overall dimensions of 926 mm wide by 2040 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 for the duration of the test. The Doorset was fitted with the following Frelan hardware:

Item No	Description	Reference
13	Hinges	J9400SSS
6	Sashlock	JL1091SSS
5	Lever handles	SAA01
10	Roller ball latch	JL8091SS
8	Tubular latch	JL121NP
7	Door knob	BUR100SN
9	Door chain	J3004SN
12	Door Guard	J3003SC
11	Door viewer	JV944SC

Doorset B had overall nominal dimensions of 1000 mm wide by 2080 mm high, incorporating a single door leaf with overall dimensions of 926 mm wide by 2040 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 for the duration of the test. The lockset fitted to the hinged edge was unlatched for the duration of the test. The Doorset was fitted with the following Frelan hardware:

Item No	Description	Reference
13	Hinges	J9400SSS
15	Cylinder	JL70-OPDPB
14	Sashlock	JL1053SSS
18	Sashlock	JLBSS76PC
5	Lever handles	SAA01
16	Escutcheon	JSS-PSS-17
17	Lever handles	JSS-PSS-134
11	Door viewer	JV945SC
12	Door guard	J3003SC

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

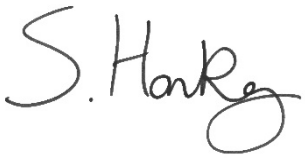
Integrity	It is required that the specimens retain their separating function, without either causing ignition of a cotton pad when applied, or permitting the penetration of a gap gauge as specified in BS EN 1634-1: 2014, or resulting in sustained flaming on the unexposed surface. **These requirements were satisfied for the periods shown below:**			
	Doorset A		**Doorset B**	
Sustained flaming	38 minutes#		61 minutes	
Gap gauge	38 minutes#	Area blanked off	62 minutes	Area extinguished
Cotton pad	38 minutes#		61 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	38 minutes#	Due to integrity failure	61 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).			
	38 minutes#		61 minutes	
	*Test was discontinued after a period of 68 minutes. # The specimen was blanked off allowing the test to continue			

Date of Test 19th November 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: 16th March 2020

Revision History

Issue No:	Re-issue Date:
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 specimen or any of the components.

The results obtained during the test only apply to the test samples as provided by the test sponsor

Installation

The doorsets were received on the 18th November 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 18th November 2019.

Conditioning

The specimens' storage, construction, and test preparation took place in the test laboratory over a total, combined time of 6 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 8.5^{o}C to 18.5^{o}C and 36.5% to 65% respectively.

The test was conducted on the 19th November 2019 at the request of Frelan Hardware, the test sponsor. Mr. A. McMeechan a representative of the test sponsor witnessed the test.

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 10ºC at the start of the test with a maximum variation of -2ºC 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

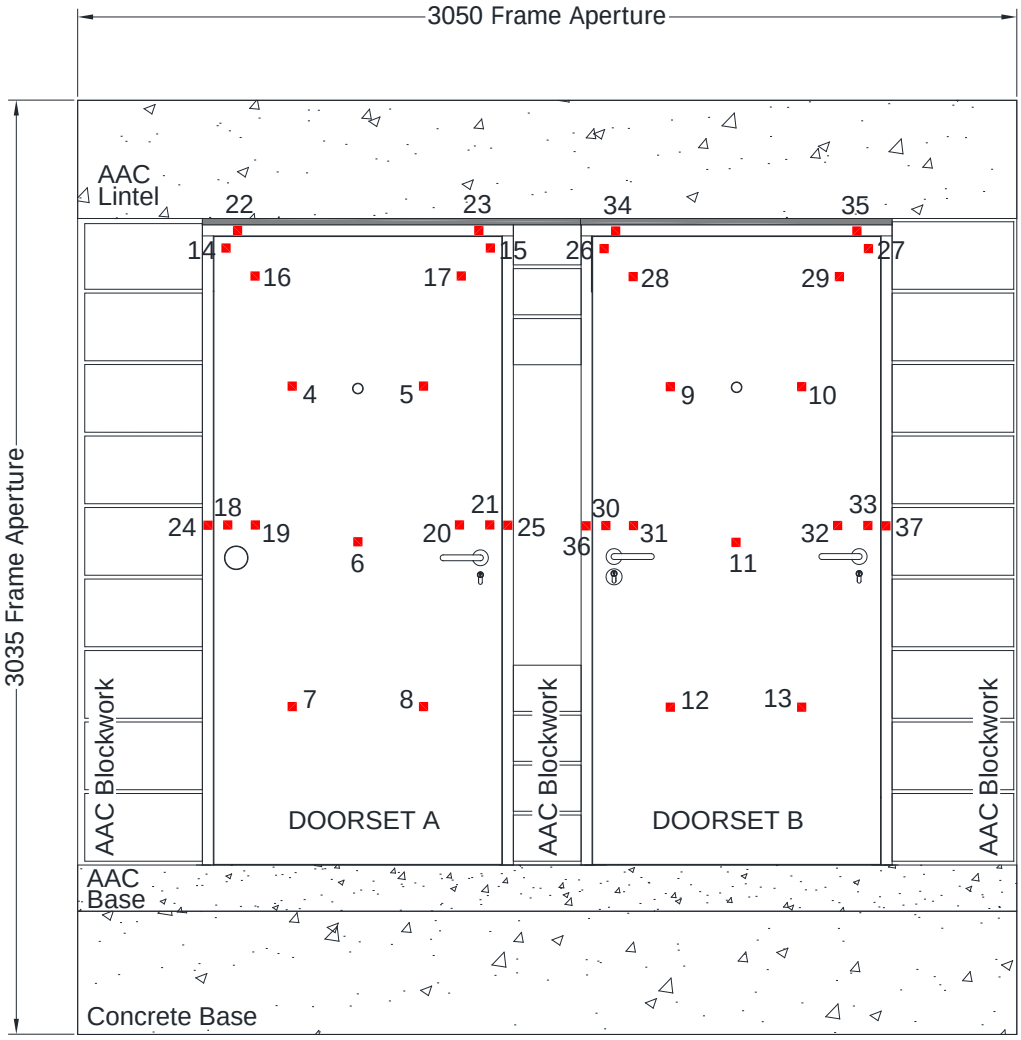
Thermocouples were provided to monitor the unexposed surface of the specimen. The output of all instrumentation was recorded at no less than one minute intervals. The locations and reference numbers of the various unexposed surface thermocouples are shown in Figure 1.

Furnace Pressure

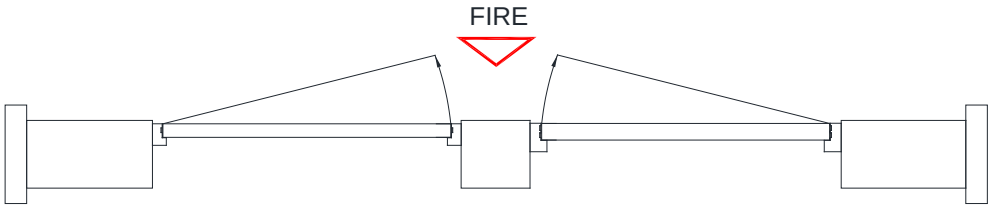
After the first five minutes of testing and for the remainder of the test, the furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 2012, clause 5.2.1 The calculated pressure differential relative to the laboratory atmosphere at the top of the specimens was 13.4 (± 5) Pa between 5 and 10 minutes and 13.4 (± 3) Pa thereafter. During the test, a pressure exceeding the requirements detailed within Clause 5.2 of BS EN 1363-1: 2012 occurred due to temperature adjustments in the furnace. As this represents more onerous test conditions the test results remain valid in line with clause 5.7 of BE EN 1363-1: 2012

Test Specimen

Figure 1- General Elevation of Test Construction



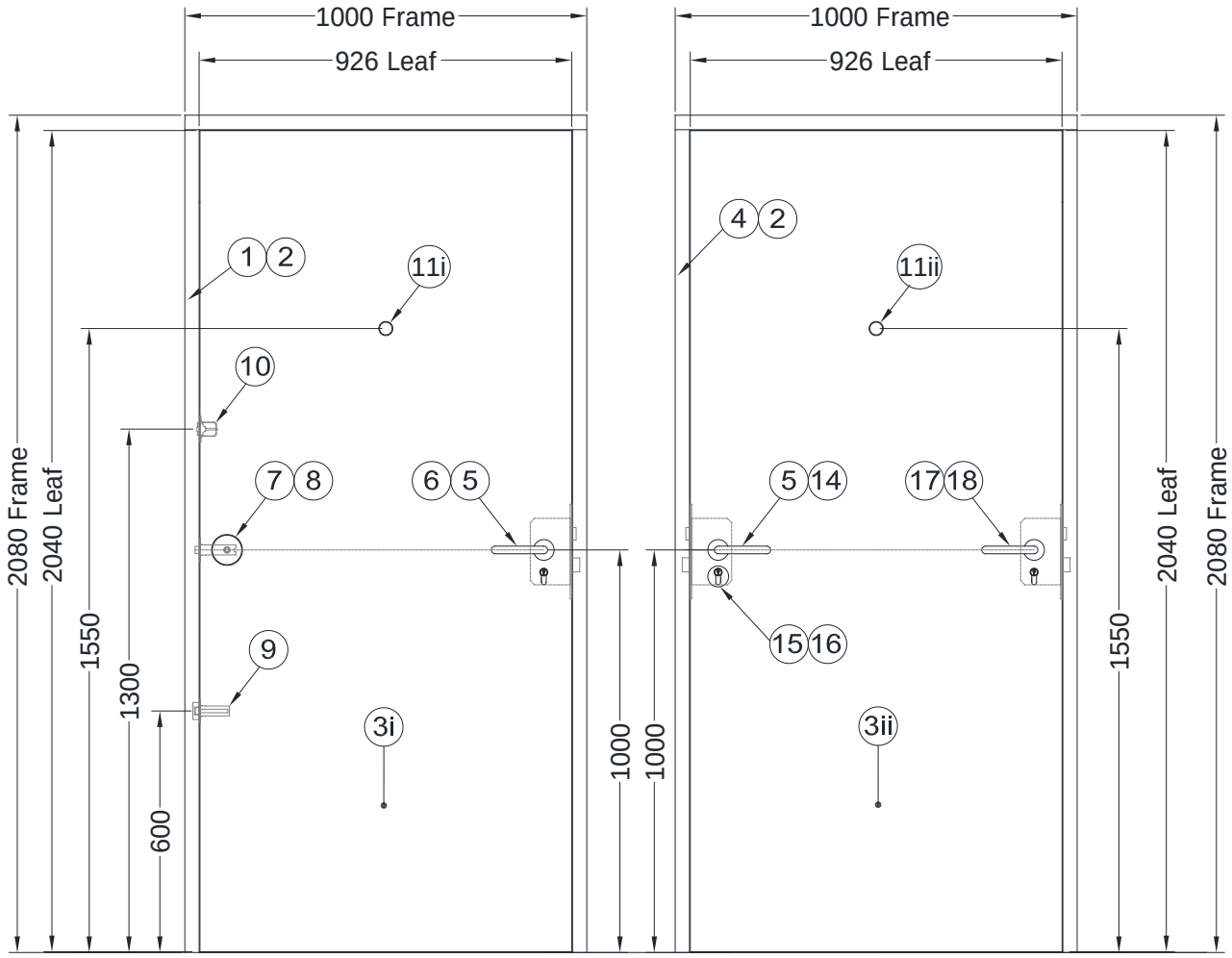
GENERAL ELEVATION OF TEST CONSTRUCTION
UNEXPOSED FACE



HORIZONTAL SECTION THROUGH TEST CONSTRUCTION

Do not scale. All dimensions are in mm

Figure 2 – Details of Doorset

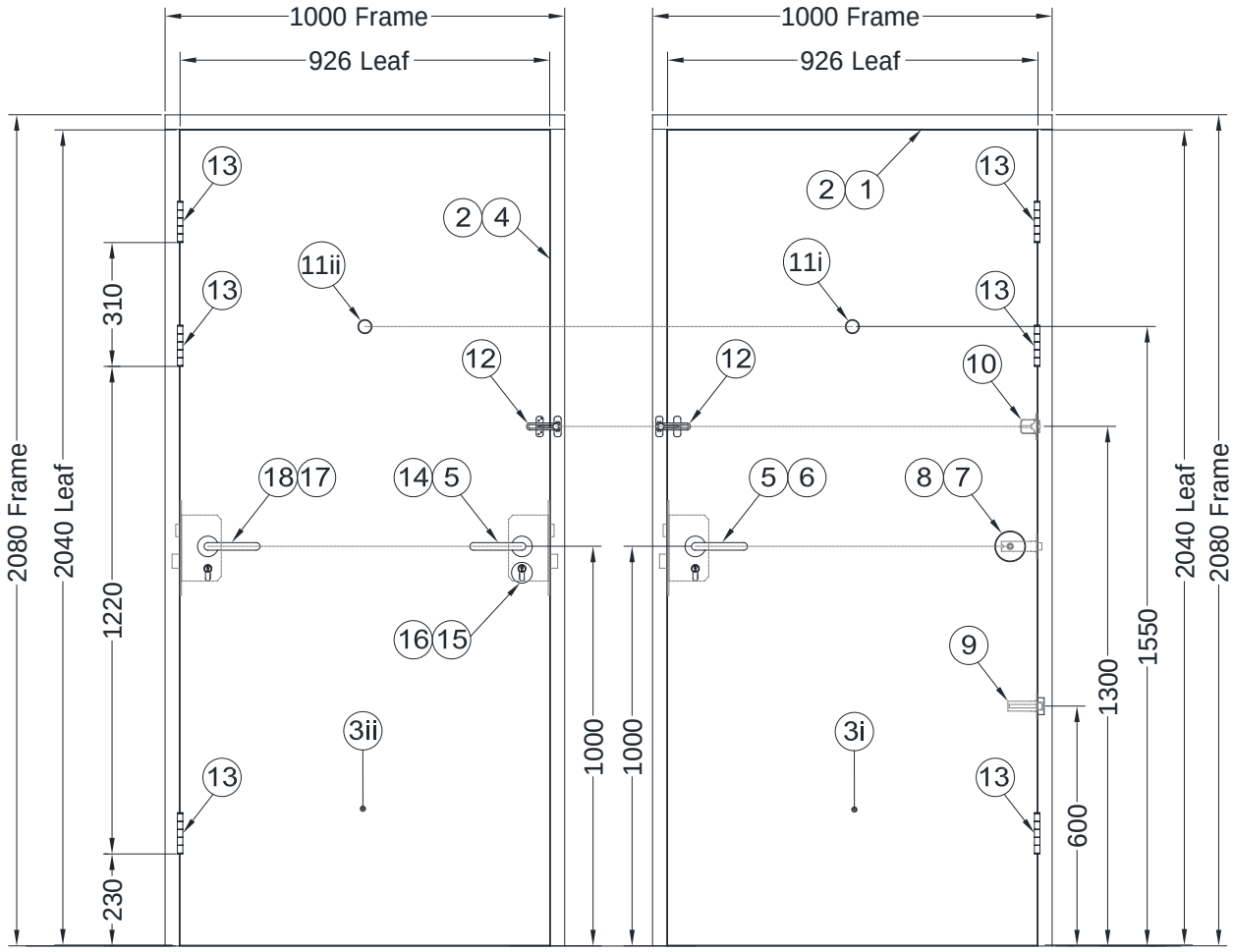


DOORSET A DOORSET B

GENERAL ELEVATION OF TEST CONSTRUCTION
UNEXPOSED FACE

Do not scale. All dimensions are in mm

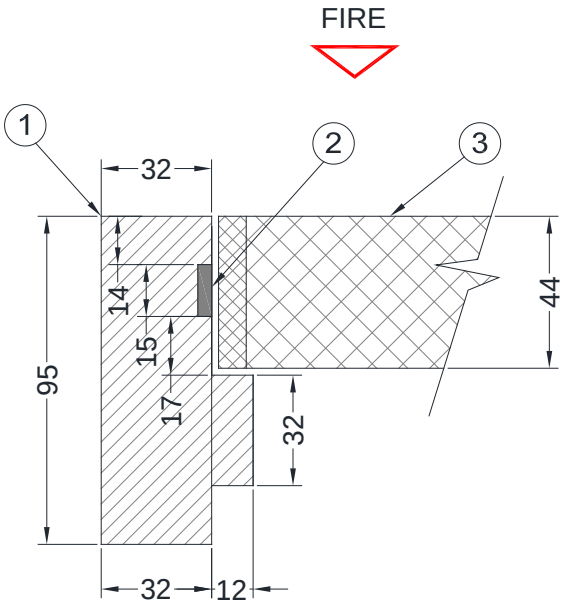
Figure 3 – Details of Doorset



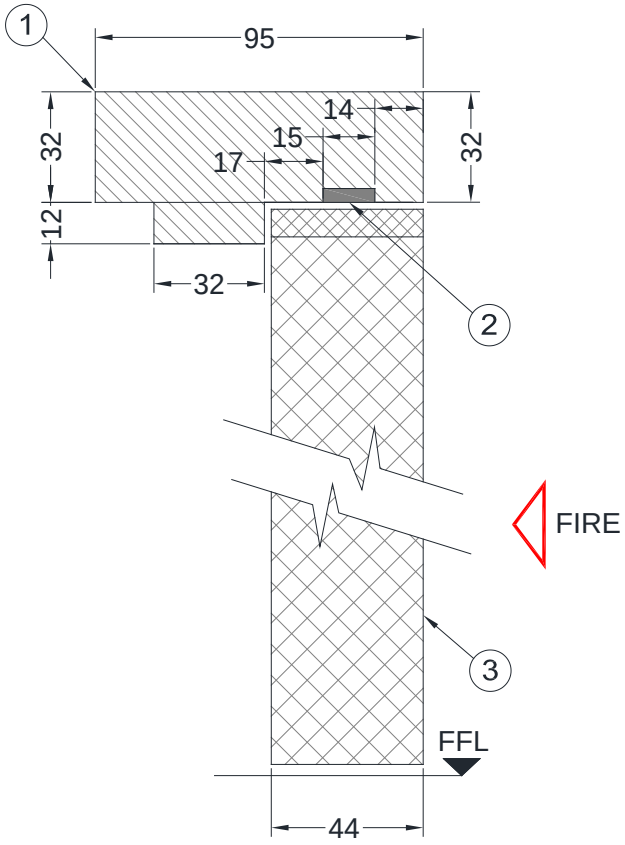
GENERAL ELEVATION OF TEST CONSTRUCTION
EXPOSED FACE

Do not scale. All dimensions are in mm

Figure 4 – Section Through Head and Base of Doorset A



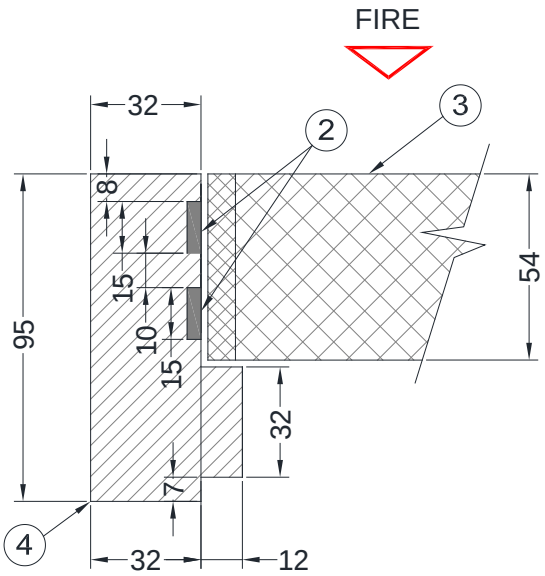
SECTION THROUGH DOOR JAMB:
DOOSET 'A'



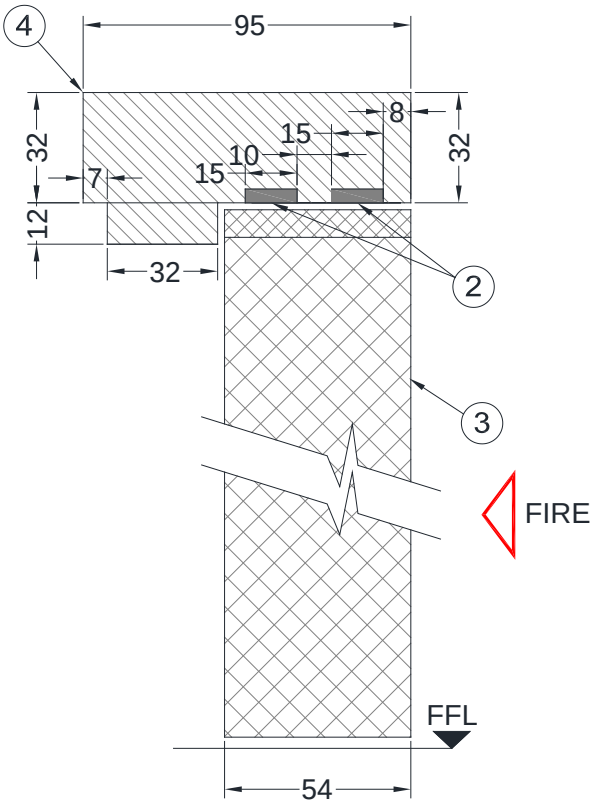
SECTION THROUGH HEAD OF DOOR
FRAME AND BASE OF DOORLEAF 'A'

Do not scale. All dimensions are in mm

Figure 5 – Section Through Head and Base of Doorset B



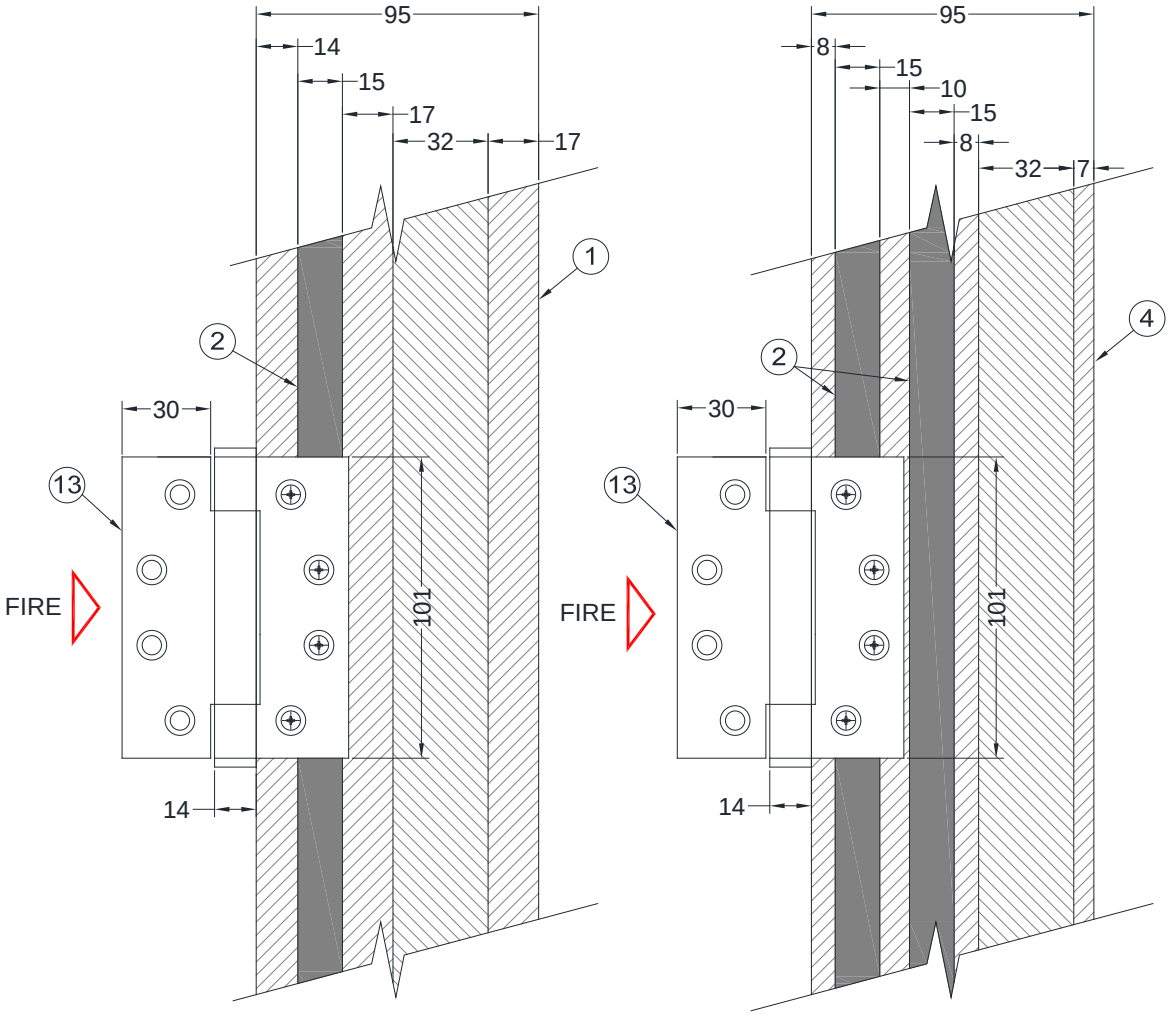
SECTION THROUGH DOOR JAMB:
DOOSET 'B'



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



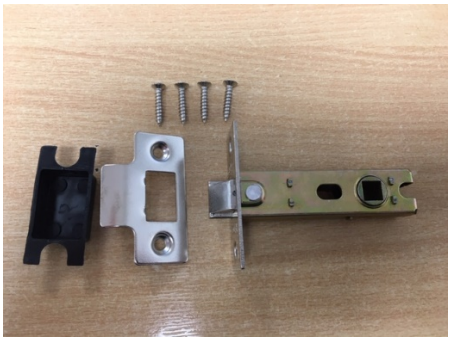
DOORSET 'A' DOORSET 'B'

INTUMESCENT SEAL INTERRUPTION AROUND HINGES

Do not scale. All dimensions are in mm

Figure 7 – Photos of ironmongery	
UNEXPOSED FACE	EXPOSED FACE
	

Item 5	Item 6
	
Lever Handset: SAA01	Mortice Lock: JL1091

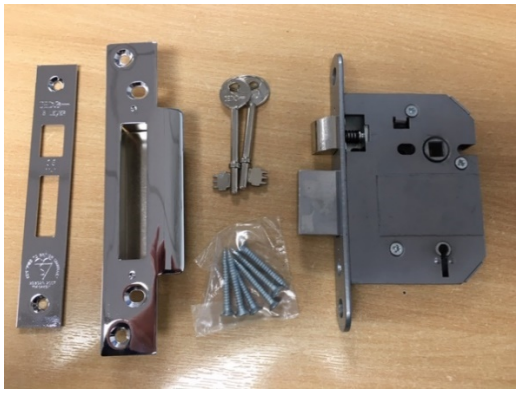
Item 7	Item 8
	
Door Knob: BUR100SN	Tubular Latch: JL121NP

Item 9	Item 10
	
Concealed Door Chain: J3004SN	Roller Ball Latch: JL8091SS

Item 11i & 11ii	Item 12
	
Door Viewer: JV944SC	Door Guard: J3003

Item 13	Item 14
	
Hinges: J9400SSS	Mortice Sash Lock: JL1053SSS

Item 15	Item 16
	
Oval Cylinder: JL70-OPDPB	Escutcheon: JSS-PSS-17

Item 17	Item 18
	
Lever Handset: JSS-PSS-134	Sash Lock: JLBSS76PC

Schedule of Components

(Refer to Figures 1 to 7)
(All values are nominal unless stated otherwise)
(All other details are as stated by the sponsor)

1. Door Frame 'A'

Material	:	Pine Softwood
Density	:	510 ~ 550 kg/m^3 nominal
Average moisture content	:	8.7% (measured with a Protimeter moisture meter by Warringtonfire)
Overall size	:	95mm x 32mm, with 46mm x 12mm 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	:	6 off 90mm above and 90mm below each hinged position. 4 off, 150mm -730mm – 1230mm & 1900mm from ground floor level 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		
i. Doorleaf 'A'	:	1 off x 15mm x 4mm
ii. Doorleaf 'B'	:	2 off 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
Average moisture content		
i. Doorleaf 'A'	:	7.2 %
ii. Doorleaf 'B'	:	7.5 %
Construction		
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

Item		Description
4. Door Frame 'B'		
Material	:	Sapele, hardwood
Density	:	620 ~ 660 kg/m^3, nominal
Average moisture content	:	8.7% (measured with a Protimeter moisture meter by Warringtonfire)
Overall size	:	95mm x 32mm, with 56mm x 12mm 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
ii. material	:	Steel screws with plastics plugs
iii. overall size	:	100mm long by 4.8 diameter
iv. centres	:	6 off 90mm above and 90mm below each hinged position. 4 off, 150mm -730mm – 1230mm & 1900mm from ground floor level along the unhinged jam
5. Handleset – Lever on Rose		
Manufacturer	:	Frelan
Reference	:	SAA01
Material	:	Steel
Overall size	:	141mm Long x 19mm diameter x 63mm Projection Fitted with 52mm x 8mm diameter backplate.
Fixing method	:	Screw fixed into position using wood screws
6. Latch Set 'A'		
Manufacturer	:	Frelan
Reference	:	JL1091SSS
Material		
i. Lock case	:	Steel
ii. Forend plate	:	Steel
iii. Latch bolt	:	Brass
iv. Lock bolt	:	Brass
v Strike plate	:	Steel
vi Dust Box	:	Plastic
Overall sizes		
i. Lock case	:	109.3mm long x 80.7mm wide x 15mm deep
ii. Forend plate	:	162mm long x 26mm wide x 1.2mm thick
iii. Latch bolt	:	20mm long x 14mm wide x 12mm projection
iv. Lock bolt	:	37mm long x 11mm wide x 14mm throw
v. Strike plate	:	168mm long x 29mm wide x 1.5mm thick, with 86mm x 15.5mm lip
vi Dust Box	:	166mm long x 26.5mm wide x 19mm deep
Fixing Method	:	Screw fixed into position
Operation of latch bolt	:	Engaged
Operation of dead bolt	:	Disengaged
Bedding material	:	1 mm interden kit to be fitted around dust box (Sheet Supplied)
7. Door Knob 'A'		
Manufacturer	:	Burlington
Supplier	:	Frelan
Reference	:	BUR100SN
Material	:	Brass
Overall size	:	65mm Diameter x 65mm Projection Fitted with 65mm x 10mm diameter backplate.
Fixing method	:	Screw fixed into position with wood screws

Item		Description
8. Tubular Latch		
Manufacturer	:	Frelan
Reference	:	JL121NP
Material		
i. Latch case	:	Steel
ii. Forend plate	:	Steel
iii. Latch	:	Steel
iv. Strike Plate	:	Steel
v. Dust Box	:	Plastic
Overall sizes		
i. Latch case	:	76mm long x 20mm wide
ii. Forend plate	:	60mm x 25mm x 1mm thick
iii. Latch	:	7.5mm projection
iv. Strike Plate	:	57mm x 37mm
v. Dust Box	:	49.5mm long x 23.5mm wide x 14mm deep
Operation of latch	:	Lathed
Fixing Method	:	Screw fixed into position
9. Concealed Door Chain		
Manufacturer	:	Frelan
Reference	:	J3004SN
Material		
i. Body	:	Plastic
ii. Chain latch	:	Brass
iii. Strike Plate	:	Steel
iv. Forend plate	:	Steel
Overall size		
v. Body	:	91.5mm x 16mm diameter
vi. Chain latch	:	11mm diameter x 6mm protrusion
vii. Strike Plate	:	Plan View: 50mm long x 30mm wide, with 30mm long x 16mm wide rebate. Front Elevation: 41mm high x 50mm long
viii. Forend plate	:	56.5mm x 25mm 2mm thick
Bedding material	:	0.88mm Intumescent kit fitted to hinged edge
Fixing method	:	Screw fixed into position
10. Roller Ball Latch 'A'		
Manufacturer	:	Frelan
Reference	:	JL8091SS
Material		
i. Lock case	:	Steel
ii. Forend plate	:	Steel
iii. Latch bolt	:	Brass
v. Strike plate	:	Steel
Overall sizes		
i. Lock case	:	35mm long x 41mm wide x 12mm deep
ii. Forend plate	:	76mm long x 22mm wide
iii. Latch bolt	:	28mm long x 12-8mm wide x 12mm projection
v. Strike plate	:	63mm long x 22mm wide, with 17.5mm x 30mm lip
Fixing Method	:	Screw fixed into position

Item		Description
11. Door Viewer		
Manufacturer	:	Frelan
i. Reference: A	:	JV944SC
ii. Reference: B	:	JV945SC
Material	:	Steel
Overall size		
i. Body: A	:	35mm – 55mm Range x 14mm Shaft
ii. Body B	:	50mm – 70mm Range x 14mm Shaft
Bedding material		
i. Doorleaf 'A'	:	None
ii. Doorleaf 'B'	:	0.88mm, Kit supplied with viewer
12. Door Guard		
Manufacturer	:	Frelan
Reference	:	J3003SC
Material	:	Zinc Alloy
Overall size		
i. Body of latch	:	67mm long x 22mm wide x 4mm thick
ii. Latch catch	:	82.43mm x 20mm, with 11mm wide slot
iii. Body of catch	:	67mm long x 22mm wide x 4mm thick
iv. Catch	:	39mm x 20mm protrusion (12.5mm diameter ball catch)
Operation of Catch	:	Engaged
Fixing Method	:	Screw fixed into position
13. Hinges		
Manufacturer	:	Frelan
Reference	:	J9400SSS
Primary material	:	Stainless Steel.
Overall sizes		
i. knuckle	:	108mm long by 14mm diameter.
ii. blades	:	101mm long by 30mm wide by 3mm
Fixings		
type	:	Countersunk head wood screws.
material	:	Stainless Steel.
size	:	32mm long by 4.5mm diameter
number off per blade	:	8 off.
Bedding material		
i. Doorleaf 'A'	:	1 off x 0.88mm interdens behind each blade
ii. Doorleaf 'B'	:	2 off x 0.88mm interdens behind each blade
14. Mortice Sash Lock		
Manufacturer	:	Frelan
Reference	:	JL1053SSS
Material		
i. Lock case	:	Steel
ii. Forend plate	:	Steel
iii. Latch bolt	:	Brass
iv. Lock bolt	:	Brass
v. Strike plate	:	Steel
vi. Dust box	:	Plastic
Overall sizes		
i. Lock case	:	109.3mm long x 80.7mm wide x 15mm deep
ii. Forend plate	:	162mm long x 26mm wide x 1.2mm thick
iii. Latch bolt	:	20mm long x 14mm wide x 12mm projection
iv. Lock bolt	:	37mm long x 11mm wide x 14mm throw

Item		Description
v. Strike plate	:	168mm long x 29mm wide x 1.5mm thick, with 86mm x 16.5mm lip
vi Dust Box	:	166mm long x 26.5mm wide x 19mm deep
Fixing Method	:	Screw fixed into position
Operation of latch bolt	:	Engaged
Operation of dead bolt	:	Disengaged
Bedding material	:	1 mm graphite around the body, strike plate and behind the forend.

15. Oval Cylinder

Manufacturer	:	Frelan
Reference	:	JL70-OPDPB
Material	:	Brass cylinder Body
Length	:	70=35-35 (even split)

16. Escustcheon

Manufacturer	:	Frelan
Reference	:	JSS-PSS-17
Material	:	Stainless Steel
Overall sizes	:	Ø52 x 8mm

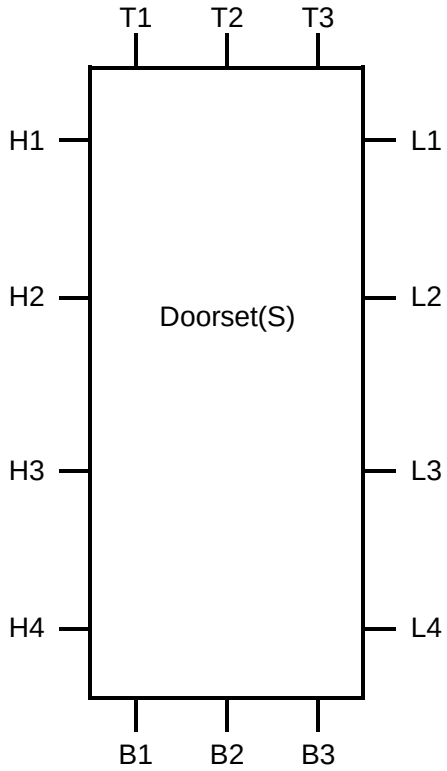
17. Handleset – Lever on Rose

Manufacturer	:	Frelan
Reference	:	JSS-PSS-134
Material	:	Steel
Overall size	:	139mm Long x 19mm diameter Fitted with 52mm x 8mm diameter backplate.
Fixing method	:	Screw fixed into position with bolt through screws

18. Sash lock

Manufacturer	:	Frelan
Reference	:	JLBSS76PC
Material		
i. Lock case	:	Steel
ii. Forend plate	:	Steel
iii. Latch bolt	:	Steel
iv. Lock bolt	:	Steel
v. Strike plate / Dust Box	:	Steel
Overall sizes		
i. Lock case	:	109.5mm long x 81mm wide x 16mm deep
ii. Forend plate	:	178mm long x 25.5mm wide x 1.2mm thick
iii. Latch bolt	:	20mm long x 14mm wide x 12mm projection
iv. Lock bolt	:	37mm long x 11mm wide x 21.5mm throw
v. Strike plate / Dust Box	:	178mm long x 30mm wide x 2.6mm thick, with 96mm x 14.6mm lip
Fixing Method	:	Screw fixed into position
Operation of latch bolt	:	Engaged
Operation of dead bolt	:	Disengaged
Bedding material	:	1mm graphite kit wrapped around body, 2 x 1mm behind strike plate and forend plate. Kit supplied

Doorset Clearance Gaps



Doorset A (mm)						Doorset B (mm)					
Hinge Side	Primary	Leaf to Stop	Leading Edge	Primary	Leaf to Stop	Hinge Side	Primary	Leaf to Stop	Leading Edge	Primary	Leaf to Stop
H1	3.5	0.1	L1	3.1	0.3	H1	3.2	0.1	L1	3.0	0.4
H2	2.8	0.1	L2	2.6	1.9	H2	4.6	0.2	L2	1.6	0.4
H3	2.3	0.1	L3	3.1	4.3	H3	3.7	0.2	L3	2.7	0.1
H4	2.7	0.1	L4	2.2	4.5	H4	4.5	0.4	L4	3.5	0.1
Mean	2.8		Mean	2.8		Mean	4.0		Mean	2.7	
Max	3.5		Max	3.1		Max	4.6		Max	3.5	
Min	2.3		Min	2.2		Min	3.2		Min	1.6	
Max Permitted	*5.2*		*Max Permitted*	*4.9*		*Max Permitted*	*6.3*		*Max Permitted*	*5.1*	
Top edge	Primary	Leaf to stop	Threshold	Primary		Top edge	Primary	Leaf to stop	Threshold	Primary	
T1	2.7	0.1	B1	9.6		T1	3.8	2.6	B1	6.8	
T2	2.6	0.1	B2	10.0		T2	4.2	2.7	B2	9.9	
T3	3.0	0.1	B3	9.9		T3	4.0	2.2	B3	7.1	
Mean	2.8		Mean	9.8		Mean	4.0		Mean	7.9	
Max	3.0		Max	10.0		Max	4.2		Max	9.9	
Min	2.6		Min	9.6		Min	3.8		Min	6.8	
Max Permitted	*4.9*		*Max Permitted*	*11.9*		*Max Permitted*	*6.1*		*Max Permitted*	*10.9*	

Test Observations

All observations are from the unexposed face unless noted otherwise.

Time		
mins	secs	
00	00	**The Test Commences.**
00	37	Steam/smoke release from the perimeter of both door leaves.
02	25	Steam/smoke release from the upper half of both doorsets, discolouration along the latched edge of Doorset A.
03	53	Discolouration at the eye viewer on Doorset B.
04	44	Steam/smoke release through the keyholes and at the lever handles of the locksets fitted to both doorsets.
08	27	Discolouration at the eye viewer on Doorset A.
10	19	Dark black discolouration at the top corners of both doorsets.
12	21	When viewed from the exposed face the handle fitted to the latched edge of Doorset A have burnt away.
18	24	Dark black discolouration along the latched edge of Doorset A, concentrated at the strike plate position.
24	00	Dark black discolouration at the top hinge position of Doorset A. Brown liquid and discolouration on the cylinder and escutcheon fitted to the lockset on Doorset B on the latched edge.
26	16	Doorset B, the hinged edge appears to have dropped.
30	26	Continued discolouration around the perimeter of door leaf A.
38	07	**Doorset A is blanked off to allow the test to continue.**
46	53	The roses of the lever handles fitted to Doorset B have started to discolour black.
55	28	Continued discolouration around the perimeter of door leaf B.
58	40	Flicker of flame at base of door leaf B.
59	30	Small amount of glowing can be seen on the right lockset of Doorset B.
60	19	Flicker of flame at the latched edge of the lockset fitted to Doorset B.
60	52	Glowing at the strike plate position on the right lockset of Doorset B.

Time		
mins	secs	
61	09	**Sustained flaming on the latched edge at the lockset position of Doorset B. Integrity failure is deemed to have occurred. Intermittent flicker of flames at the base of Doorset B.**
62	48	The base of Door Leaf B and the lockset fitted to the latched edge of Doorset B is put out with water to allow the test to continue.
64	29	Glowing can be seen along the hinged jamb along and above the lockset position.
65	07	Sustained flaming at the hinged jamb along and above the lockset position along the hinged jamb.
65	48	Glowing and intermittent flaming at the bottom hinge position on Doorset B.
66	36	Sustained flaming all along the head and hinged jamb of Doorset B.
67	07	Sustained flaming at bottom hinge positions on Doorset B.
68	10	**The test is 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 20 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 38 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 61 minutes. Sustained flaming at the lockset position on the latched edge. Integrity failure is deemed to occur

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

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	27
2	445	643
4	544	681
6	603	582
8	646	651
10	678	695
12	706	694
14	728	713
16	748	742
18	766	755
20	781	788
22	796	800
24	809	806
26	820	818
28	832	825
30	842	834
32	852	846
34	860	855
36	869	862
38	877	870
40	885	881
42	892	893
44	899	903
46	906	910
48	912	918
50	918	927
52	924	932
54	930	934
56	935	960
58	940	967
60	945	993
62	950	1065
64	955	1023
66	960	995
68	964	984

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	17	17	16	16	15	16
1	18	29	18	17	16	20
2	18	25	17	16	15	18
3	17	22	17	16	15	17
4	17	21	17	16	15	17
5	17	21	16	16	15	17
6	17	20	16	16	15	17
7	17	20	16	16	15	17
8	17	20	17	16	15	17
9	18	20	17	17	15	17
10	19	20	18	17	16	18
11	20	21	19	18	17	19
12	22	23	20	20	18	21
13	24	24	21	21	19	22
14	26	26	23	23	21	24
15	27	28	24	25	22	25
16	29	29	26	26	24	27
17	31	31	28	28	25	29
18	33	33	30	30	27	31
19	35	35	32	32	28	32
20	36	37	34	33	30	34
21	38	38	36	35	32	36
22	40	40	37	37	33	37
23	41	42	39	38	35	39
24	43	44	41	40	36	41
25	44	46	43	41	38	42
26	46	47	44	43	40	44
27	47	49	46	45	41	46
28	48	50	47	47	43	47
29	50	52	49	48	44	49
30	51	54	50	49	46	50
31	52	55	52	51	47	51
32	54	57	53	53	49	53
33	55	58	54	54	50	54
34	56	59	56	55	52	56
35	57	61	57	57	53	57
36	58	62	59	58	55	58
37	60	63	60	60	56	60
38	61	65	61	61	58	61

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	16	13	15	15	15	15
2	17	11	16	17	15	15
4	16	*	16	16	15	14
6	16	*	16	15	15	14
8	16	*	16	15	15	13
10	16	*	7	15	15	13
12	16	*	7	15	15	13
14	17	*	16	15	16	15
16	18	*	17	16	17	16
18	19	*	19	18	19	17
20	21	*	20	20	20	19
22	22	*	22	22	22	20
24	24	*	24	23	24	22
26	26	*	27	25	26	24
28	28	*	29	28	28	26
30	30	*	32	30	30	28
32	32	*	34	32	32	30
34	34	*	37	34	35	33
36	37	*	39	37	37	35
38	40	*	42	39	39	37
40	43	*	44	42	42	40
42	46	*	47	44	45	43
44	49	*	50	47	48	45
46	51	*	52	50	50	48
48	54	*	55	53	53	50
50	56	*	57	55	55	52
52	59	*	60	58	58	55
54	61	*	62	61	60	57
56	64	*	64	64	60	59
58	66	*	67	66	62	61
60	68	*	69	68	66	63
62	71	*	72	74	71	72
64	72	*	73	73	74	73
66	74	*	75	74	76	75
68	77	*	77	76	78	77

*Thermocouple malfunction

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	24	23	18	19
1	44	93	19	64
2	43	85	18	52
3	42	80	18	47
4	40	74	18	42
5	40	73	18	43
6	41	70	18	47
7	43	68	19	51
8	45	66	19	56
9	48	63	21	55
10	51	63	24	54
11	54	64	27	55
12	57	66	30	58
13	60	67	34	62
14	63	69	37	67
15	65	71	40	71
16	69	72	43	75
17	72	72	46	80
18	75	73	49	85
19	77	74	51	90
20	79	74	54	94
21	80	75	58	98
22	81	76	60	100
23	82	77	62	101
24	82	78	65	101
25	83	79	67	103
26	83	80	69	103
27	85	82	70	105
28	86	83	71	106
29	88	85	72	108
30	89	87	74	110
31	91	88	75	111
32	92	91	76	114
33	94	93	77	116
34	97	96	78	119
35	103	99	79	122
36	107	102	80	125
37	114	108	81	128
38	124	119	82	134

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	19	20	18	18
1	20	44	19	34
2	20	37	18	27
3	20	32	18	24
4	20	30	18	23
5	20	29	18	22
6	20	28	18	21
7	20	27	18	21
8	20	27	19	21
9	21	27	21	22
10	23	27	23	23
11	25	28	26	26
12	27	30	29	28
13	30	32	32	30
14	32	33	35	33
15	34	35	37	35
16	36	37	40	38
17	38	39	42	40
18	41	40	44	42
19	42	42	46	44
20	44	43	48	45
21	46	45	49	47
22	47	46	51	49
23	49	47	52	50
24	50	49	53	52
25	51	50	55	53
26	53	51	56	54
27	54	52	57	55
28	55	53	58	57
29	56	54	59	58
30	57	55	60	59
31	58	56	61	61
32	59	57	62	62
33	60	58	63	62
34	61	58	64	63
35	62	59	65	64
36	62	60	66	65
37	63	61	66	66
38	64	62	68	67

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

Time Mins	T/C Number 28 Deg. C	T/C Number 29 Deg. C	T/C Number 31 Deg. C	T/C Number 32 Deg. C
0	14	20	17	17
2	15	28	18	17
4	15	24	18	17
6	15	23	17	17
8	15	23	17	17
10	15	22	17	17
12	15	23	18	18
14	17	24	20	20
16	20	27	22	23
18	23	30	25	25
20	26	35	28	28
22	29	36	31	31
24	33	39	34	34
26	36	41	37	37
28	39	44	40	39
30	41	46	43	42
32	44	49	45	44
34	46	51	47	46
36	48	53	49	48
38	50	55	51	51
40	52	56	53	52
42	54	58	54	55
44	55	60	56	56
46	56	61	58	58
48	58	63	60	60
50	59	64	62	63
52	60	66	64	65
54	62	67	66	67
56	63	68	68	69
58	65	70	70	71
60	66	72	72	73
62	74	74	96	76
64	76	77	*	79
66	74	104	*	93
68	79	166	*	113

*Thermocouple malfunction

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

Time Mins	T/C Number 26 Deg. C	T/C Number 27 Deg. C	T/C Number 30 Deg. C	T/C Number 33 Deg. C
0	16	18	18	18
2	29	37	29	18
4	33	37	24	18
6	32	44	24	19
8	33	46	26	22
10	34	45	26	22
12	35	45	26	24
14	37	47	29	27
16	40	51	32	33
18	43	55	35	44
20	48	58	41	46
22	54	60	44	50
24	61	61	48	53
26	66	64	51	58
28	72	65	55	62
30	78	66	59	66
32	80	66	62	68
34	82	66	65	70
36	81	66	69	72
38	80	67	72	74
40	79	67	74	75
42	78	67	76	76
44	78	69	79	77
46	78	69	81	78
48	80	70	84	80
50	80	71	85	82
52	81	73	88	83
54	82	75	92	86
56	86	78	99	92
58	90	81	103	101
60	94	84	106	112
62	96	89	176	132
64	109	97	*	148
66	128	164	*	265
68	229	395	*	422

*Thermocouple malfunction

Individual Temperatures Recorded On The Unexposed Surface Of Door Frame A

Time Mins	T/C Number 22 Deg. C	T/C Number 23 Deg. C	T/C Number 24 Deg. C	T/C Number 25 Deg. C
0	11	11	8	8
1	15	22	*	*
2	18	33	*	*
3	19	35	*	*
4	19	34	*	*
5	21	35	*	*
6	21	33	*	*
7	22	31	*	*
8	22	29	*	*
9	22	26	*	*
10	22	24	*	*
11	22	22	*	*
12	22	21	*	*
13	22	21	*	*
14	22	20	*	*
15	22	20	*	*
16	22	20	*	*
17	23	20	*	*
18	23	20	*	*
19	24	20	*	*
20	25	21	*	*
21	26	21	*	*
22	28	21	*	*
23	28	22	*	*
24	29	22	*	*
25	30	23	*	*
26	30	23	*	*
27	31	24	*	*
28	32	24	*	*
29	33	25	*	*
30	34	26	*	*
31	36	26	*	*
32	37	27	*	*
33	38	28	*	*
34	40	29	*	*
35	42	30	*	*
36	44	31	*	*
37	47	32	*	*
38	51	34	*	*

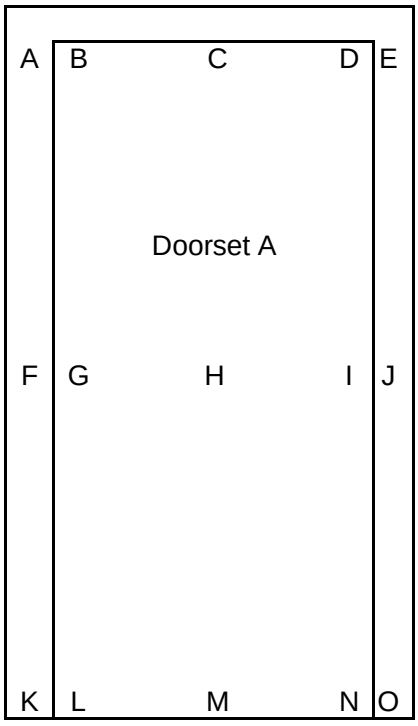
*Thermocouple Malfunction

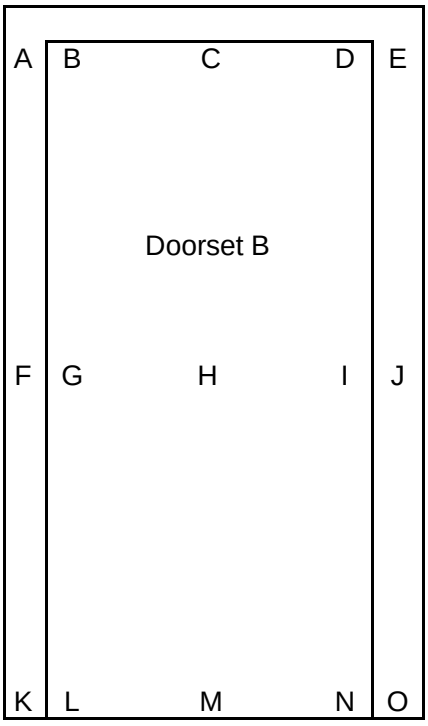
Individual Temperatures Recorded On The Unexposed Surface Of Door Frame B

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	17	17	12	12
2	23	23	13	13
4	28	24	12	12
6	26	28	12	12
8	23	30	12	12
10	23	30	12	12
12	22	30	12	12
14	22	33	13	12
16	21	34	13	13
18	22	32	14	13
20	23	32	16	13
22	27	32	17	14
24	31	32	19	15
26	32	33	22	16
28	33	34	25	17
30	34	36	27	19
32	34	37	29	21
34	34	38	31	23
36	33	40	33	24
38	34	41	34	26
40	36	43	34	28
42	38	43	35	29
44	40	45	36	31
46	42	46	37	32
48	44	47	37	33
50	45	47	38	35
52	47	48	39	36
54	48	49	39	36
56	50	51	40	38
58	53	52	41	39
60	55	54	41	40
62	63	57	45	42
64	68	65	46	43
66	67	125	*	47
68	111	283	*	54

*Thermocouple malfunction

Horizontal Deflections Of The Doorsets



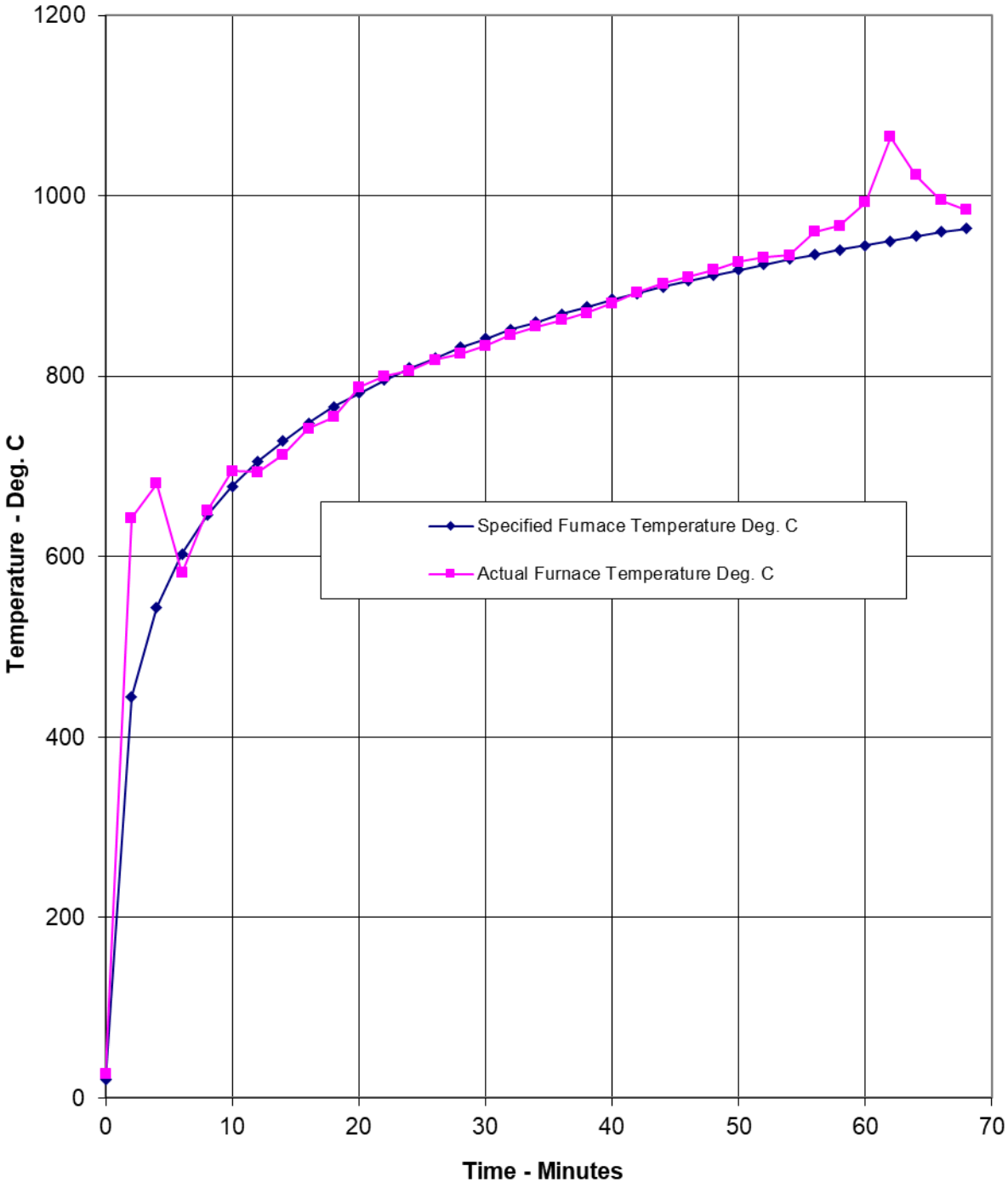


Doorset A															
Deflections – mm															
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	-2	-1	-3	-2	-5	1	-2	-1	2	-4	0	1	1	-1	1
10	-1	2	-1	2	-3	1	-2	-3	-2	-4	1	2	1	0	0
15	1	2	1	3	1	3	-4	-3	-2	0	1	2	4	6	2
20	2	1	3	-4	2	2	-1	-6	1	-2	1	4	4	11	2
25	-1	1	1	-7	-1	1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

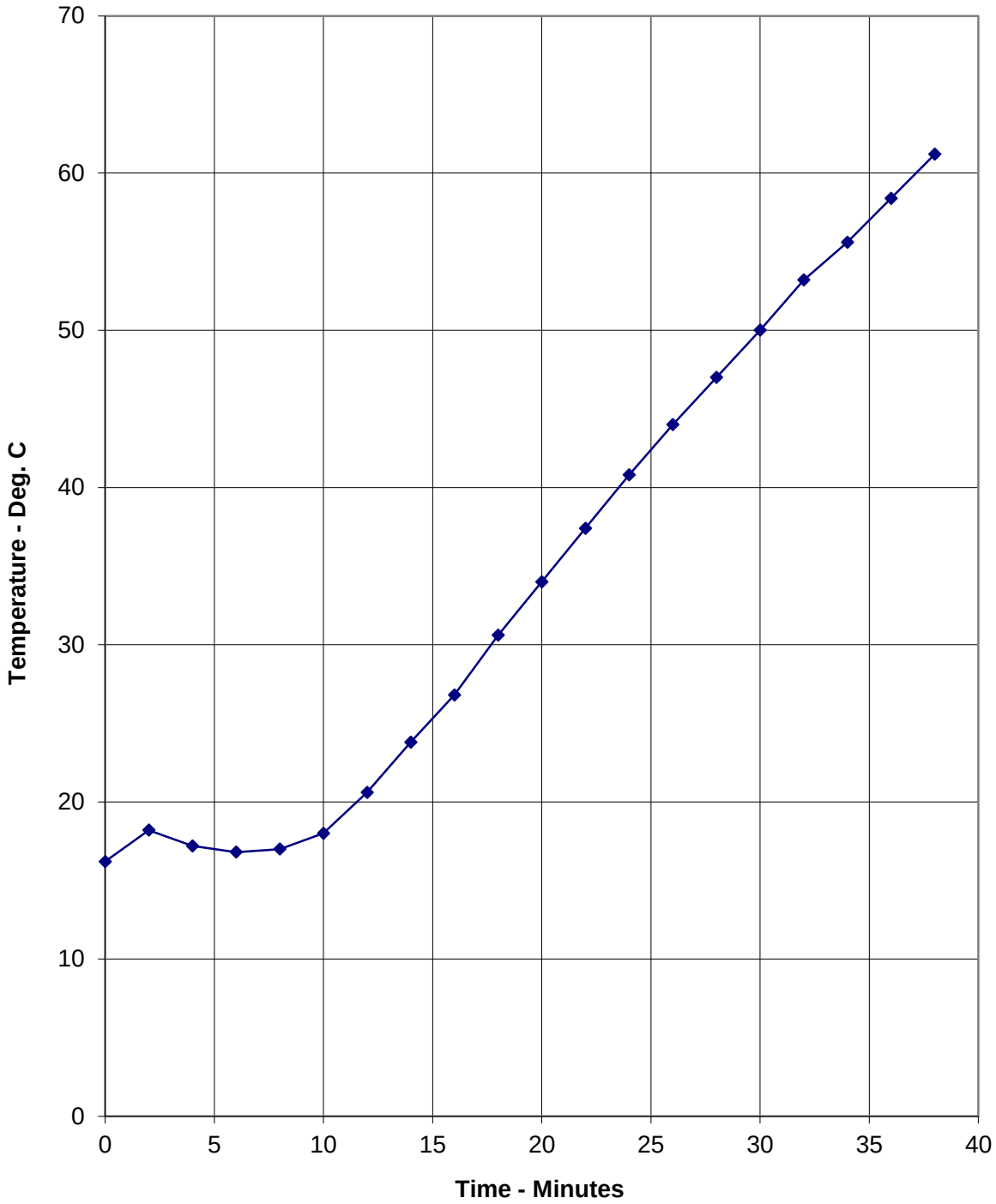
Doorset B															
Deflections – mm															
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1	1	-1	2	8	-1	1	3	2	2	4	-3	-2	7	17
20	0	-3	1	3	2	0	-2	2	1	-5	0	-4	-3	5	3
30	5	1	-3	28	2	-1	-3	-1	-2	0	-3	0	-5	-2	-2
40	-1	2	-1	7	8	-1	-6	-5	4	-8	-1	-4	-5	4	-3
50	3	-1	-2	25	9	-5	-11	-14	1	-12	-4	-3	-9	4	-2
60	3	-3	-4	-4	7	-6	-17	-25	0	-10	-4	-5	-11	4	-4

Positive values indicate movement towards the furnace

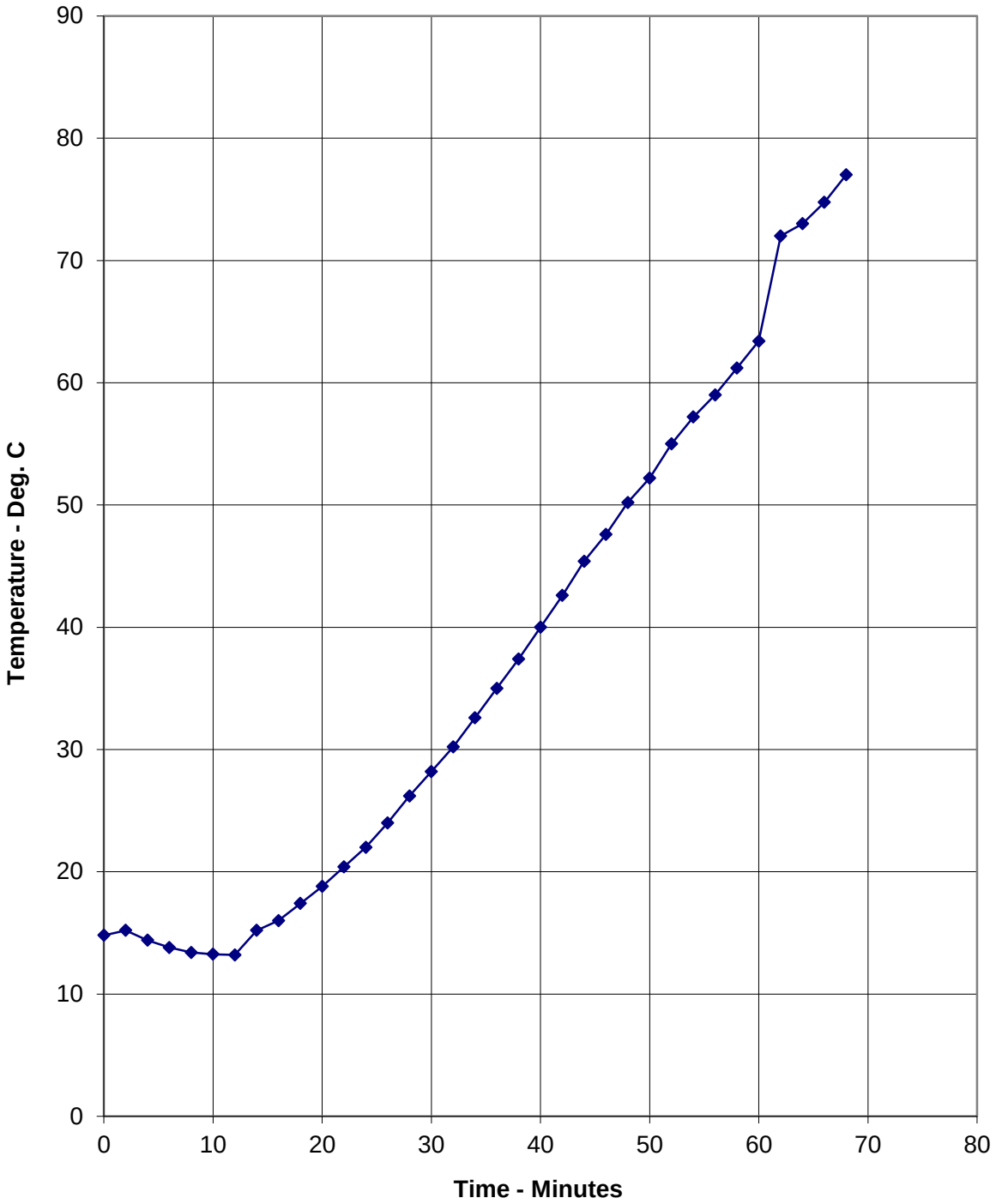
Graph Showing Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In BS EN 1363-1: 2012



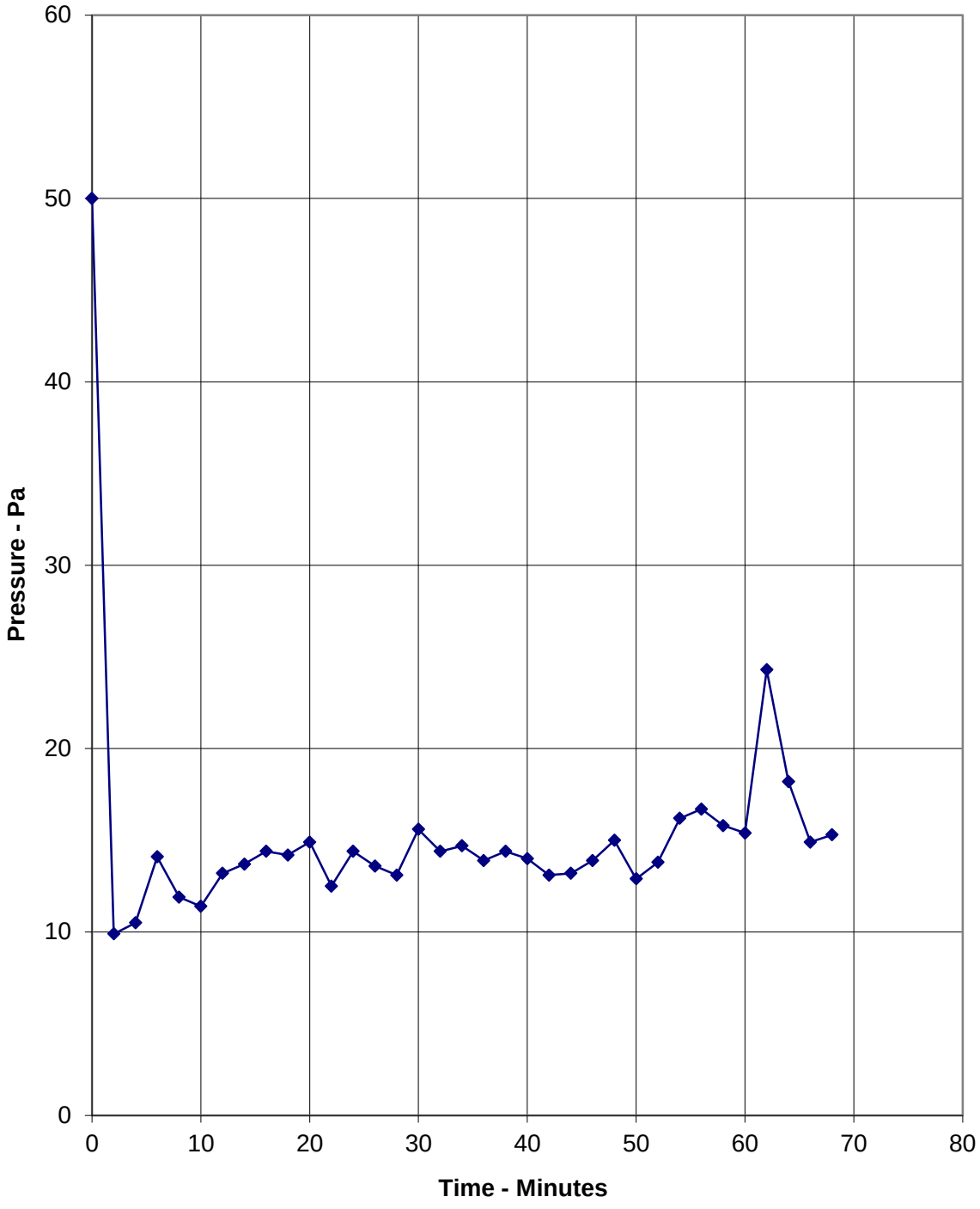
Graph Showing Mean Temperatures Recorded On The Unexposed Surface Of Doorset A



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