

Exova Warringtonfire  
Holmesfield Road  
Warrington  
WA1 2DS  
United Kingdom

T : +44 (0) 1925 655 116  
F : +44 (0) 1925 655 419  
E : warrington@exova.com  
W: [www.exova.com](http://www.exova.com)



Testing. Advising. Assuring.

**Title:**

The fire resistance performance of two specimens of single-acting, single-leaf doorsets incorporating various items of building hardware when tested in accordance with BS EN 1634-1: 2008

**Report No:**

316597



**Prepared for:**

Paxton Access Ltd  
Paxton House  
Home Farm Road  
Brighton  
BN1 9HU  
United Kingdom

**Date:**

19<sup>th</sup> April 2012

**Notified Body No:**

0833



0246

# Summary

**Objective** To determine the fire resistance performance of two specimens of single-acting, single-leaf timber based doorsets, incorporating various items of building hardware mounted within a low-density rigid supporting construction, when tested in accordance with BS EN 1634-1: 2008.

**Test Sponsor** Paxton Access Ltd, Paxton House, Home Farm Road, Brighton, BN1 9HU.

**Summary of Tested Specimens** For the purposes of the test the doorsets were referenced Doorset A and Doorset B.

**Doorset A** had overall dimensions of 1990 mm high by 1000 mm wide and incorporated a door leaf of overall dimensions 1950 mm high by 930 mm wide by 44 mm thick. The door leaf was hung within a softwood door frame on three stainless steel hinges. The door leaf was formed from a graduated density chipboard core with hardwood lippings to the vertical edges. The doorset was fitted with a Paxton Access 'Net 2 PaxLock, battery powered access control unit' and an Assa Abloy mortice escape lock. The doorset was installed so it opened towards the heating conditions of the test and was latched for the duration of the test.

**Doorset B** had overall dimensions of 1990 mm high by 1010 mm wide and incorporated a door leaf of overall dimensions 1945 mm high by 930 mm wide by 54 mm thick. The door leaf was hung within a hardwood door frame on three stainless steel hinges. The door leaf was formed from a graduated density chipboard core with hardwood lippings to the vertical edges. The doorset was fitted with a Paxton Access 'Net 2 PaxLock, battery powered access control unit' and an Assa Abloy mortice escape lock. The doorset was installed so it opened towards the heating conditions of the test and was latched for the duration of the test.

Test Results:		Doorset A	Doorset B
<b>Integrity performance</b>	Sustained flaming	37 minutes	73 minutes
	Gap gauge	37 minutes*	#75 minutes
	Cotton Pad	37 minutes	73 minutes
<b>Insulation performance</b>		37 minutes	73 minutes

\*Doorset blanked off to allow the test to continue.

#The test duration. The test was discontinued after a period of 75 minutes.

**Date of Test** 22<sup>nd</sup> March 2021

**This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of Exova Warringtonfire.**

# Signatories

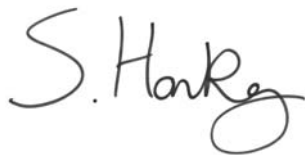
---



Responsible Officer  
**S. Gilfedder\***  
Testing Officer



Approved  
**D. Forshaw\***  
Principal Certification Engineer



Head of Department  
**S. Hankey\***  
Operations Manager

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

Report Issued

**Date:** 19<sup>th</sup> April 2012

<b>CONTENTS</b>	<b>PAGE NO.</b>
<b>SUMMARY</b> .....	<b>2</b>
<b>SIGNATORIES</b> .....	<b>3</b>
<b>TEST PROCEDURE</b> .....	<b>5</b>
<b>TEST SPECIMENS</b> .....	<b>6</b>
<b>SCHEDULE OF COMPONENTS</b> .....	<b>12</b>
<b>INSTRUMENTATION</b> .....	<b>16</b>
<b>TEST OBSERVATIONS</b> .....	<b>17</b>
<b>TEST PHOTOGRAPHS</b> .....	<b>19</b>
<b>TEMPERATURE DATA</b> .....	<b>24</b>
<b>PERFORMANCE CRITERIA AND TEST RESULTS</b> .....	<b>36</b>
<b>ONGOING IMPLICATIONS</b> .....	<b>36</b>
<b>CONCLUSIONS</b> .....	<b>37</b>

# Test Procedure

---

## Introduction

The doorsets are required to provide a fire separating function and were therefore tested in accordance with BS EN 1634-1: 2008 'Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 1: Fire resistance tests for doors, shutters and openable windows'. This test report should be read in conjunction with that Standard and with BS EN 1363-1: 1999, 'Fire resistance tests - Part 1: General requirements' and BS EN 1363-2: 1999, 'Fire resistance tests - Part 2: Alternative and additional procedures'.

The specimens were judged on their ability to comply with the performance criteria for integrity and insulation, as required by BS EN 1634-1: 2008.

The specific purpose of the test was to evaluate the effects of the inclusion of various items of building hardware with a previously tested doorset construction. Because of this, no direct field of application for the doorsets is included in this report.

## Fire Test Study Group/EGOLF

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

## Instruction To test

The test was conducted on the 22<sup>nd</sup> March on behalf of **Paxton Access Ltd**, the sponsor of the test.

## Test Specimen Construction

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

The doorsets' installation and test preparation took place in the test laboratory between the 20<sup>th</sup> March 2012 and the 23<sup>rd</sup> March 2021.

## Installation

The doorsets were mounted into apertures provided within a low-density rigid supporting construction. Representatives of **Exova Warringtonfire** conducted installation on the 21<sup>st</sup> March 2021

## Sampling

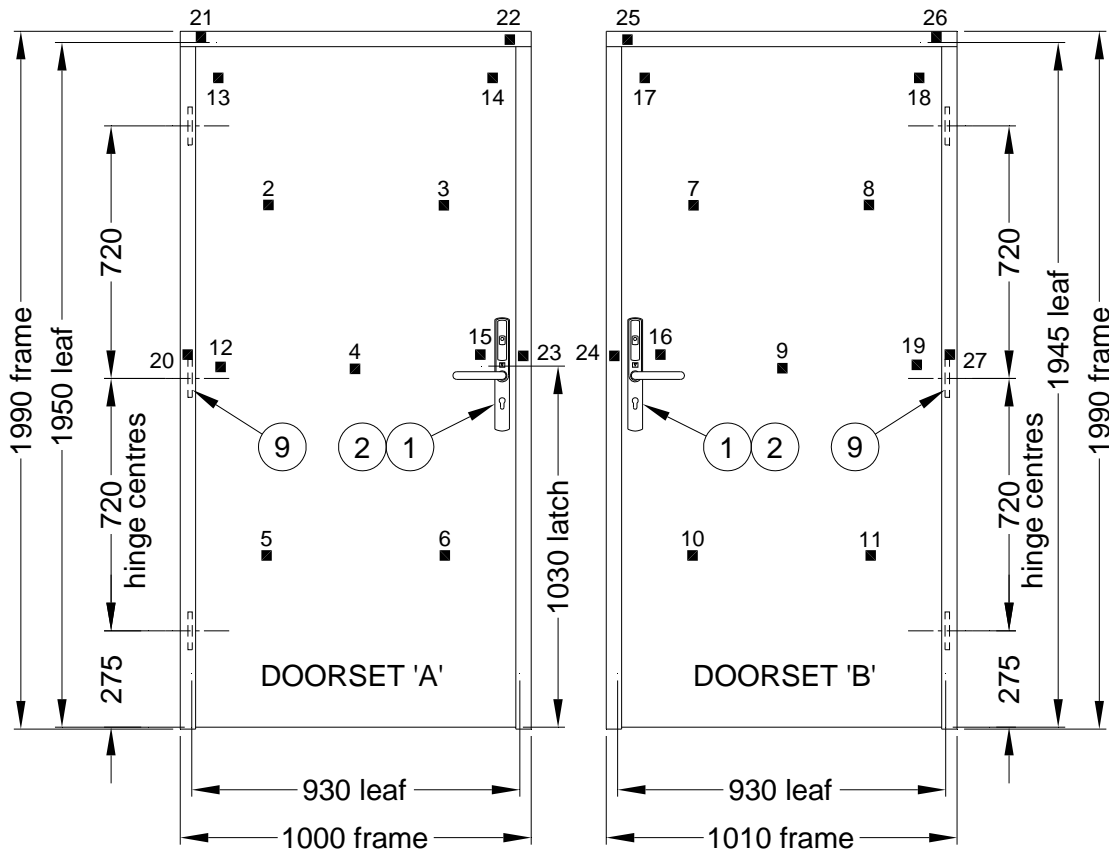
**Exova Warringtonfire** was not involved in any selection or sampling procedures of the specimens or any of their components.

## Conditioning

The specimens' storage, construction, and test preparation took place in the test laboratory over a total, combined time of 3 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 10°C to 17°C and 40% to 69% respectively.

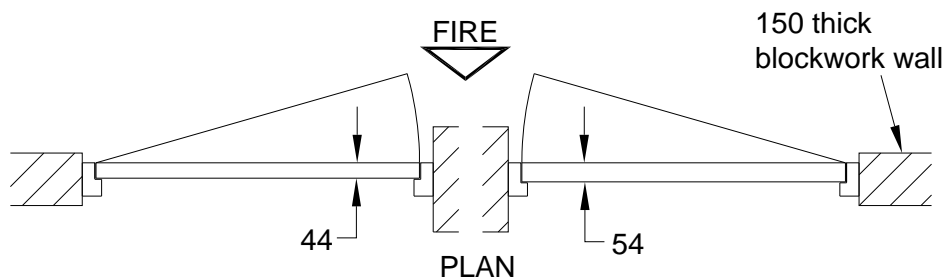
# Test Specimens

**Figure 1- General Elevation of Test Specimens and Unexposed Face Thermocouples**



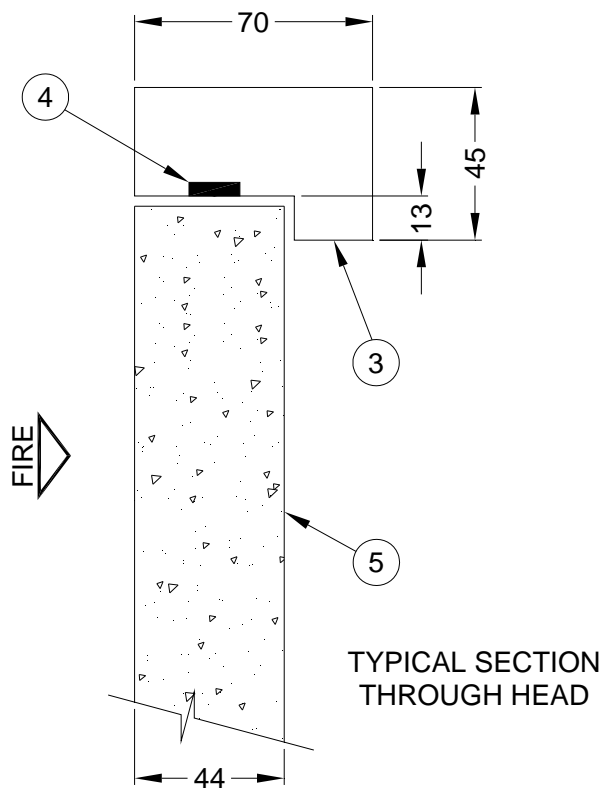
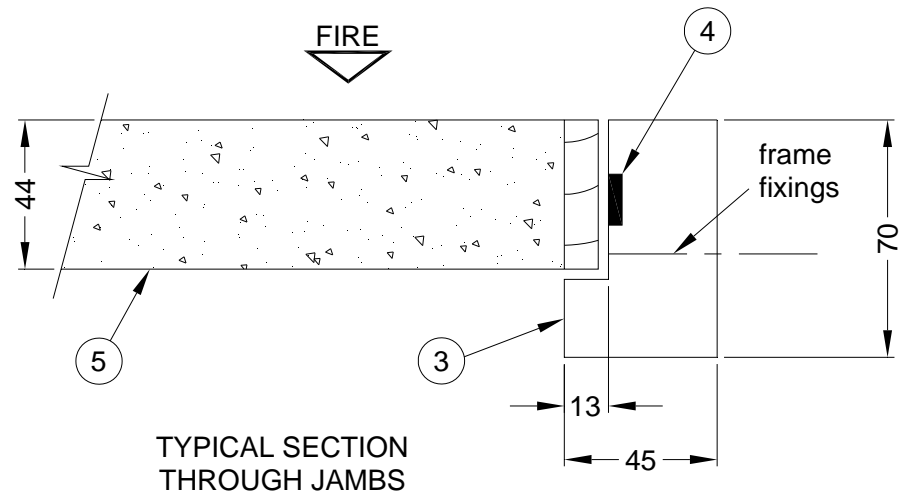
GENERAL ELEVATION OF UNEXPOSED FACE

■ Positions of thermocouples



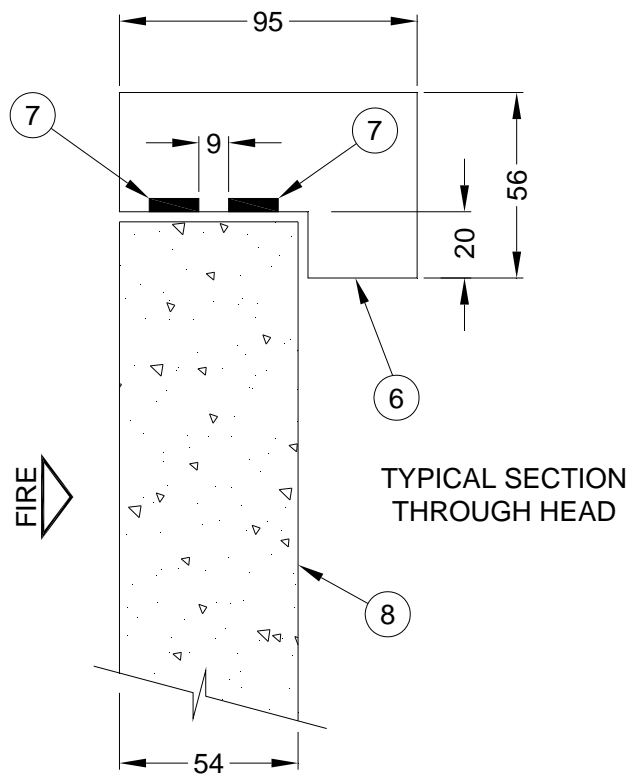
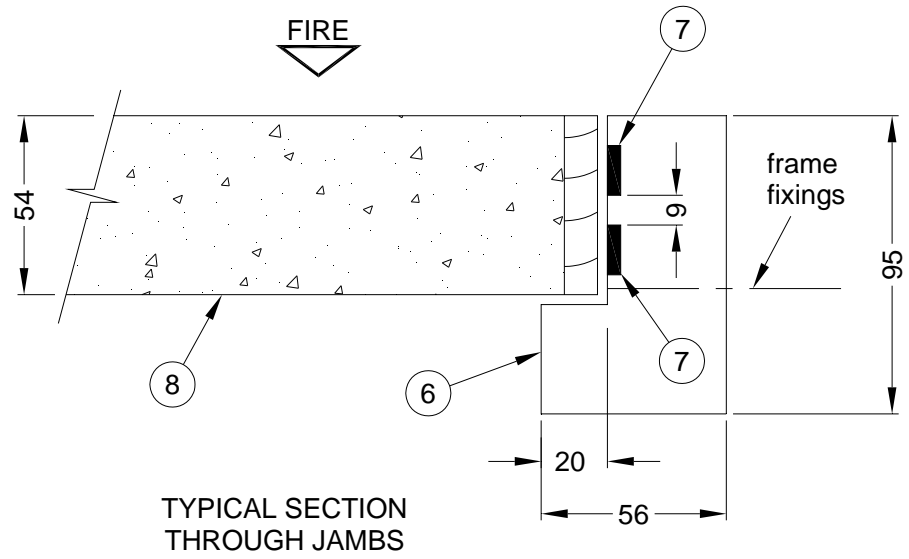
Do not scale. All dimensions are in mm

**Figure 2 – Typical Details of Doorset 'A'**



Do not scale. All dimensions are in mm

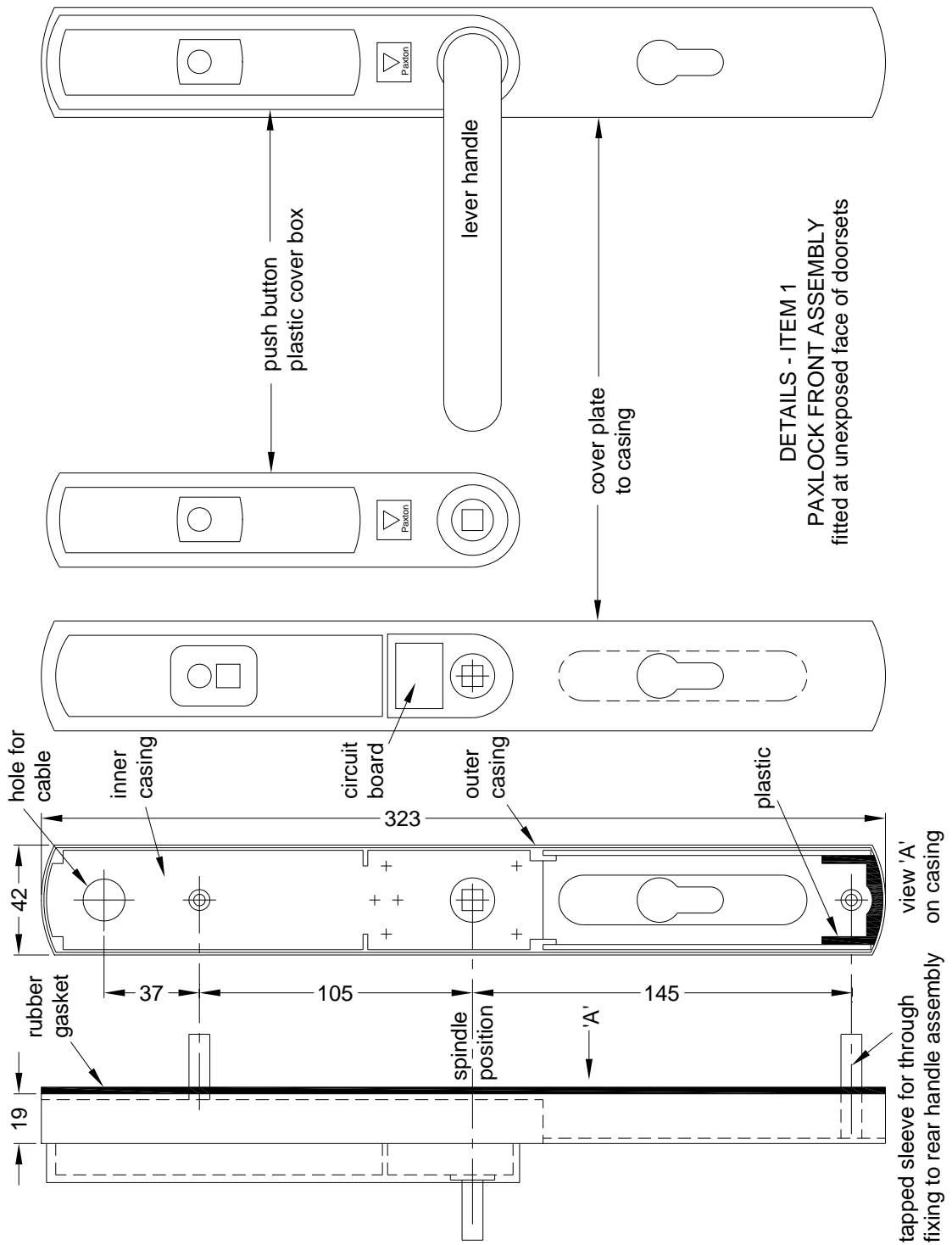
**Figure 3 – Typical Details of Doorset 'B'**



Do not scale. All dimensions are in mm



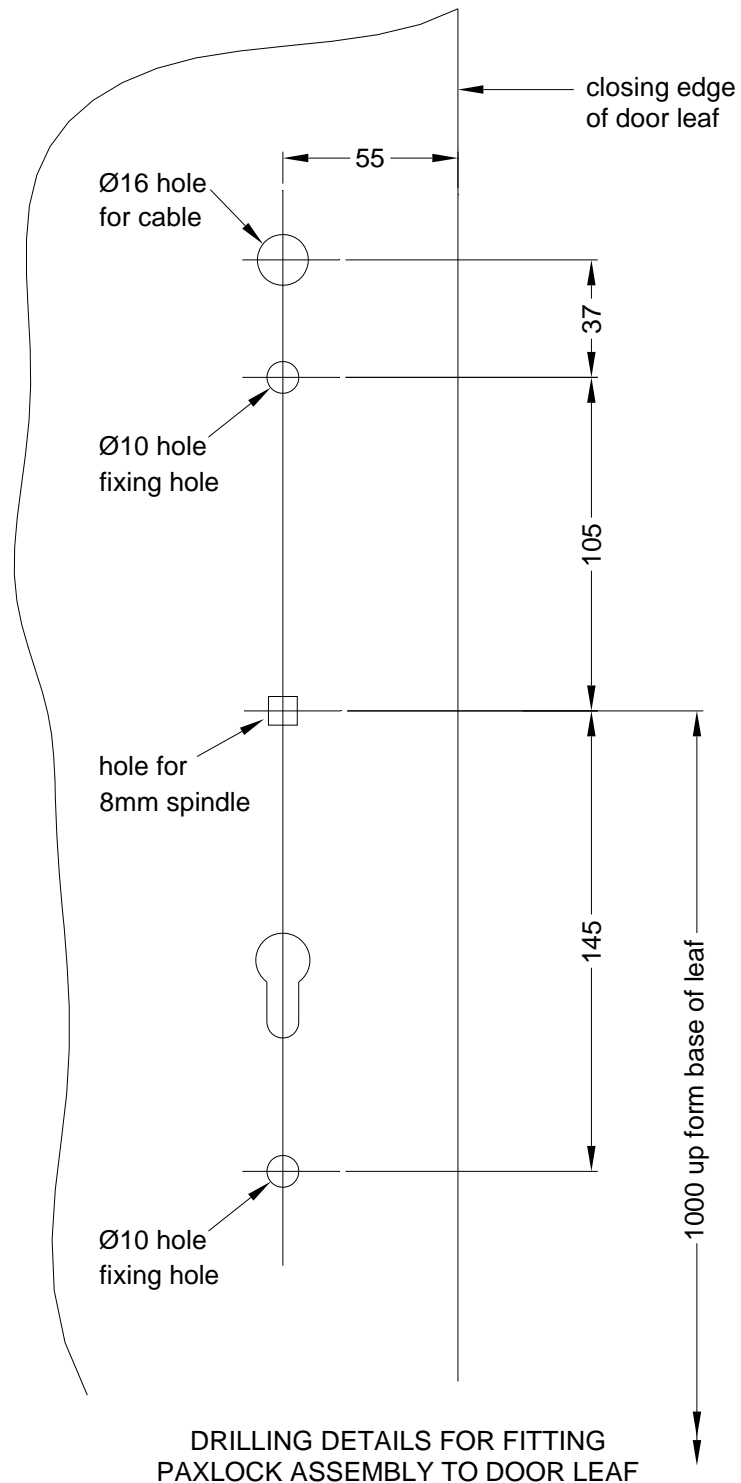
**Figure 4 – Details of PaxLock**



Do not scale. All dimensions are in mm



**Figure 6 – Drilling Details in Door Leaf for PaxLock Installation**



Do not scale. All dimensions are in mm

# Schedule of Components

---

(Refer to Figures 1 to 6)

(All values are nominal unless stated otherwise)

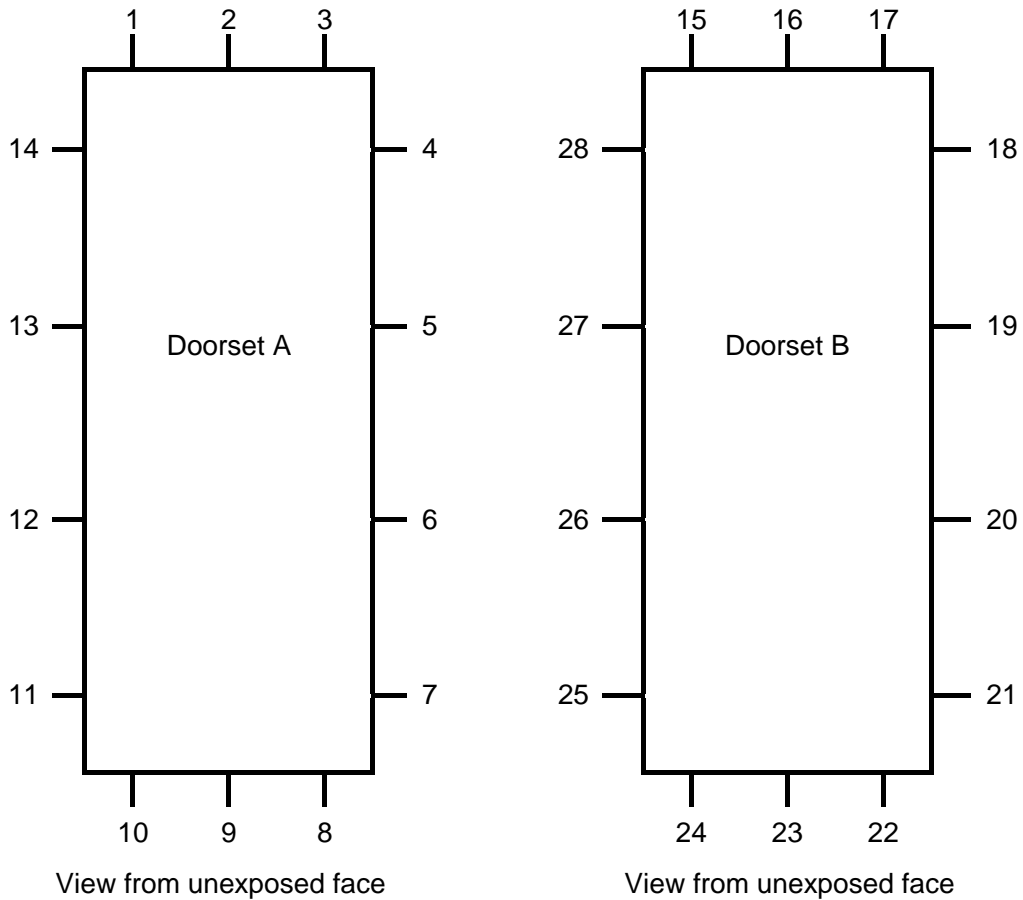
(All other details are as stated by the sponsor)

<u>Item</u>	<u>Description</u>
<b>1. Access Control Unit</b>	
Manufacturer	: Paxton Access
Reference	: PaxLock Net 2 PaxLock-72mm Euro lock case 901-172
Type	: Battery powered access control unit fitted within a slimline door handleset.
Material	
i. inner casing of front assembly	: Steel, 2 mm thick
ii. outer casing of front assembly	: Steel, 1 mm thick
iii. casing of rear assembly	: Steel, 2 mm thick
iv. cover plate to casing	: Steel
v. spindle	: Steel
vi. lever handles	: Stainless steel tube, 22 mm diameter x 130 mm long
Details of Batteries	
i. type	: Alkaline battery
ii. size	: 4 no. AA 1.5v batteries
Details of Bedding material	
i. supplier	: Exova Warringtonfire
ii. material	: Acrylic based Intumescent sealant
iii. application method	: Cartridge gunned into the 16mm diameter through hole.
<b>2. Latch/Lock Case</b>	
Manufacturer	: Assa Abloy
Type	: Cylinder mortise escape lock (2C2)
Reference	
i. lock case	: JL2C26S-SS55
ii. cylinder	: SEU6882 double cylinder 45-45 (for doorset 'A') SEU6992 double cylinder 50-50 (for doorset 'B')
Material	
	: Steel
Overall sizes	
i. latch forend plate	: 235 mm long x 24 mm wide
ii. lock case	: 80 mm deep x 165 mm long
iii. strike plate	: 196 mm long x 29 mm wide
Operation of latch bolt	: Engaged
Operation of lock bolt	: Disengaged
Details of Bedding material	
i. manufacturer	: Lorient Polyproducts Limited (supplied by <b>Exova Warringtonfire</b> ).
ii. reference	: Interdens
iii. thickness	: 2 mm to lockcase and forend plate 1 mm to strike plate
iv. fixing method	: Self adhesive fixed to faces and edges of lock case and also behind forend plate and strike plate.

<u>Item</u>	<u>Description</u>
<b>Timber Doorset 'A' (supplied by Exova Warringtonfire) consisting of items 3 to 5</b>	
<b>3. Door frame Jambs and Head</b>	
Material	: Timber, softwood
Nominal Density	: 510 kg/m <sup>3</sup>
Overall section size	: 45 mm x 70 mm, with a 13 mm deep rebate
Jambs to head jointing method	: Mortise & tenon and screwed
Fixing method to masonry surround	
i. type	: Countersunk head steel screws into plastic plugs through jambs.
ii. size	: 100 mm long x 5.6 mm (No.12) diameter screws
iii. quantity	: 4 no. screws along full height of closing jamb. 6 no. screws along hinged jamb (2 no. screws at 215 mm centres about each hinge position).
<b>4. Door Frame Intumescent seal</b>	
Manufacturer	: Intumescent Seals Limited
Material	: Graphite based intumescent within a polyvinyl chloride (PVC) carrier.
Overall section size	: 15 mm wide x 4 mm deep carrier
Fixing method	: Single seal self-adhesive fixed within a groove along the rebate of the door frame jambs and head. The seal was interrupted at the hinges and latch strike plate.
<b>5. Door Leaf</b>	
Manufacturer	: Halspan
Reference	: 'Optima' door blank
Material	: 3-layer particle board. Door blank fitted with 8 mm thick Sapele hardwood lipping along the vertical edges by <b>Exova Warringtonfire</b> using formaldehyde adhesive.
Thickness	: 44 mm
<b>Timber Doorset 'B' (supplied by Exova Warringtonfire) consisting of items 6 to 8</b>	
<b>6. Door frame Jambs and Head</b>	
Material	: Hardwood, species Sapele
Overall section size	: 56 mm x 95 mm, with a 20 mm deep rebate
Jambs to head jointing method	: Double mortise & tenon and screwed
Fixing method to masonry surround	
i. type	: Countersunk head steel screws into plastic plugs through jambs.
ii. size	: 100 mm long x 5.6 mm (No.12) diameter screws
iii. quantity	: 4 no. screws along full height of closing jamb. 6 no. screws along hinged jamb (2 no. screws at 215 mm centres about each hinge position).
<b>7. Door Frame Intumescent seal</b>	
Manufacturer	: Intumescent Seals Limited
Material	: Graphite based intumescent within a polyvinyl chloride (PVC) carrier.
Overall section size	: 15 mm wide x 4 mm deep carrier
Fixing method	: 2 no. seals self-adhesive fixed within grooves 9 mm apart along the rebate of the door frame jambs and head. The outer seal was interrupted at the hinges and latch strike plate. The inner seal was continuous at the hinges and trimmed around the latch strike plate.

<u>Item</u>	<u>Description</u>
<b>8. Door Leaf</b>	
Manufacturer	: Halspan
Reference	: 'Prima' door blank
Material	: 3-layer particle board. Door blank fitted with 8 mm thick Sapele hardwood lipping along the vertical edges by <b>Exova Warringtonfire</b> using formaldehyde adhesive.
Thickness	: 54 mm
<b>9. Hinges</b>	
Manufacturer	: Royde & Tucker Ltd.
Reference	: Hi-load 102
Primary material	: Steel
Quantity	: 3 no. hinges per doorset
Overall Size	
i. blades	: 100 mm long x 35 mm wide x 3 mm thick
ii. knuckle	: 104 mm long x 14 mm diameter
Details of Fixings	
i. type	: Countersunk head woodscrews
ii. material	: Steel
iii. size	: 30 mm long x 5 mm diameter
iv. number off per blade	: 5 no. screws
Details of Bedding material	
i. manufacturer	: Lorient Polyproducts Limited (supplied by <b>Exova Warringtonfire</b> )
ii. reference	: Interdens
iii. thickness	: 2 mm
iv. location	: Fitted beneath all hinge blades

# Doorset clearance gaps



Door Ref	Gap Dimension in mm at Positions													
A	1	2	3	4	5	6	7	8*	9*	10*	11	12	13	14
	2.5	3.8	3.7	2.4	1.9	2.4	3.3	6	6	6	2.8	2.5	2.8	3.9
B	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
	2.3	2.5	2.5	2.6	2.7	3.3	2.2	6	6	6	3	2.6	2.3	2.2
A	Mean		2.9		Maximum			3.9		Minimum			1.9	
B	Mean		2.6		Maximum			3.3		Minimum			2.2	

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	13	14
	1.1	2.2	3.5	2.7	1.3	0.9	0	n/a	n/a	n/a	0.8	0.8	0.8	0.8
B	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
	0.8	0.8	0.8	1.4	1.4	1.7	0.6	n/a	n/a	n/a	0.6	0.6	1.1	1.1

\* Dimension not included in calculations

# Gap not measured

DO NOT SCALE

ALL DIMENSIONS ARE IN mm

# Instrumentation

---

<b>General</b>	The instrumentation was provided in accordance with the requirements of the Standard.
<b>Furnace</b>	The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 1999 Clause 5.1 using six plate thermometers, distributed over a plane 100 mm from the surface of the test construction.
<b>General</b>	Thermocouples were provided to monitor the unexposed surface of the specimens and the output of all instrumentation was recorded at no less than one minute intervals as follows:
<b>Thermocouples 2 to 6</b>	At five positions on Doorset A, one approximately at the centre and one at the approximate centre of each quarter section of the doorset.
<b>Thermocouples 7 to 11</b>	At five positions on Doorset B, one approximately at the centre and one at the approximate centre of each quarter section of the doorset.
<b>Thermocouples 12 to 15</b>	At four positions on Doorset A, positioned at 100 mm in from the door leaf vertical edges, two at mid-height, and two at 100 mm below the top edge of the leaf.
<b>Thermocouples 16 to 19</b>	At four positions on Doorset A, positioned at 100 mm in from the door leaf vertical edges, two at mid-height, and two at 100 mm below the top edge of the leaf.
<b>Thermocouples 20 to 23</b>	At four positions on Doorset A, at two positions on the top horizontal frame, one positioned approximately 50 mm from each vertical edge and one positioned centrally on each vertical member.
<b>Thermocouples 24 to 27</b>	At four positions on Doorset A, at two positions on the top horizontal frame, one positioned approximately 50 mm from each vertical edge and one positioned centrally on each vertical member.
	The locations and reference numbers of the various unexposed surface thermocouples are shown in Figure 1.
<b>Roving Thermocouple</b>	A roving thermocouple was available to measure temperatures on the unexposed surface of the specimens at any position, which might appear to be hotter than the temperatures indicated by the fixed thermocouples.
<b>Integrity Criteria</b>	Cotton pads and gap gauges were available to evaluate the integrity of the specimens.
<b>Furnace Pressure</b>	The furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 1999. Clause 5.2. The calculated pressure differential relative to the laboratory atmosphere at the top of the specimens was 12.6 ( $\pm 3$ ) Pa.



# Test Observations

Time		All observations are from the unexposed face unless noted otherwise.
mins	secs	The ambient air temperature in the vicinity of the test construction was 17°C at the start of the test with a maximum variation of -1°C during the test.
00	00	<b>The test commences.</b>
01	06	Smoke release commences across the head of both doorsets.
02	30	The exposed faces of both doorsets have ignited.
04	08	Heavy smoke release visible around the top half of both doorsets.
08	36	Smoke release reduces around both doorsets.
10	30	Both exposed handle sets remain attached.
14	32	Slight moisture release visible at the bottom of both handles.
19	12	Faint smoke release visible from both cylinders.
23	17	Both exposed handle sets remain attached, the exposed faces of the doorsets are cracked and charred.
24	38	Smoke release starts to increase from the cylinders on both doorsets.
27	19	The threshold gap of Doorset B had closed on leading edge and the threshold gap of Doorset A has closed on the trailing edge.
31	54	Discolouration increasing across the head of Doorset A.
33	05	The top and bottom leading corners of Doorset A bow in towards the furnace, bowing is less noticeable on Doorset B.
34	00	Faint glowing now visible top leading edge corner of Doorset A, no significant visible change to the handle set.
36	06	Smoke release increasing in the top leading edge corner of Doorset B.
37	00	<b>Sustained flaming visible across the head of Doorset A. Sustained flaming and cotton pad integrity failure is deemed to have occurred. The doorset is blanked off to allow the test to continue.</b>
42	34	No significant visible change to the handle set on Doorset B.
45	37	The exposed handle has fallen / melted away from Doorset B, but the handle case remains attached.

**Time****mins    secs**

<b>44</b>	<b>56</b>	The threshold gap has now completely closed on Doorset B.
<b>48</b>	<b>28</b>	Slight smoke release now visible between the handle body and leaf, level with the cylinder on Doorset B.
<b>52</b>	<b>13</b>	The exposed handle case remains attached.
<b>60</b>	<b>00</b>	Doorset B continues to satisfy the test criteria.
<b>61</b>	<b>18</b>	Smoke release slowly increasing around the handle set. Doorset B is bowing out down its central vertical axis.
<b>64</b>	<b>16</b>	The bottom edge of Doorset B is starting to erode in places.
<b>70</b>	<b>00</b>	Smoke release continues to increase around the top half of the Doorset B.
<b>71</b>	<b>00</b>	The exposed handle case remains attached.
<b>71</b>	<b>51</b>	Slight glowing visible between the frame and leaf at the latch position of Doorset B.
<b>73</b>	<b>25</b>	<b>Sustained flaming visible from the bottom hinge position of Doorset B, Sustained flaming and cotton pad integrity failure is deemed to have occurred.</b>
<b>75</b>	<b>00</b>	<b>Sustained flaming visible across the head of the doorset, the test is discontinued, there has been no failure at the latch / handle position.</b>

# Test Photographs

The exposed face of the doorsets prior to testing



The unexposed face of the doorsets prior to testing



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

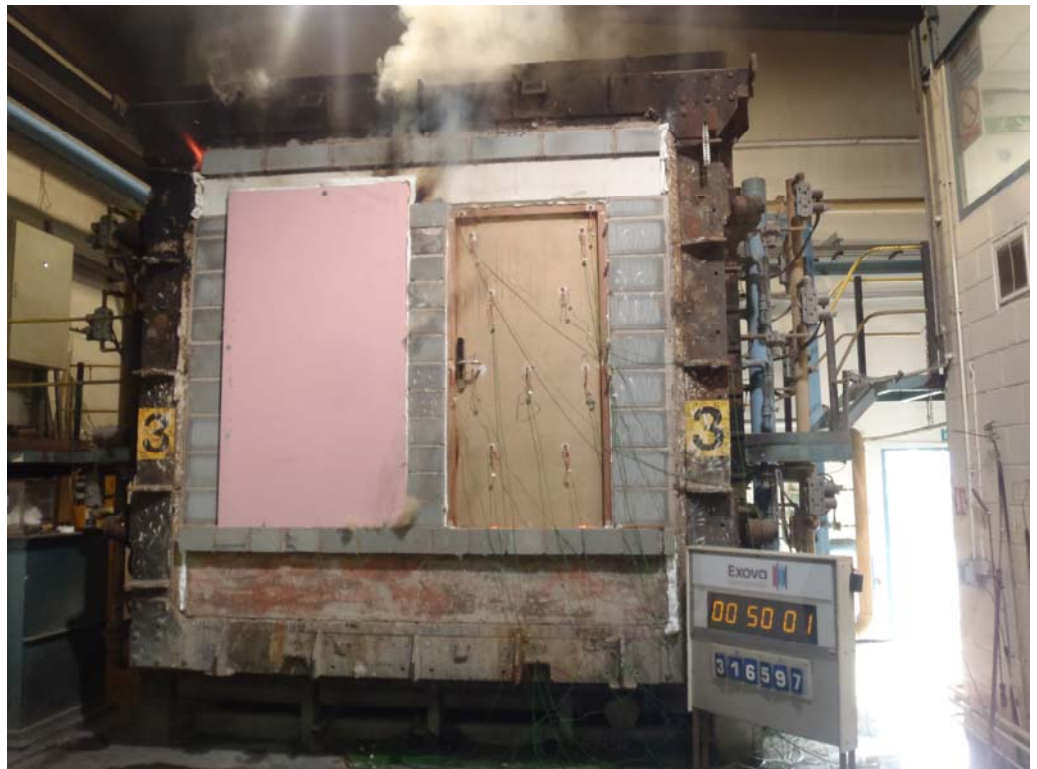




**Flaming seen across the head of Doorset A after a test duration of 37 minutes**



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



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



Flaming seen across the head of Doorset B after a test duration of 75 minutes



**The exposed face of the test assembly immediately after the test**





# Temperature Data

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

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	24
2	445	409
4	544	527
6	603	600
8	646	647
10	678	668
12	706	716
14	728	717
16	748	743
18	766	767
20	781	782
22	796	794
24	809	809
26	820	824
28	832	834
30	842	843
32	852	852
34	860	860
36	869	867
38	877	873
40	885	879
42	892	892
44	899	899
46	906	906
48	912	913
50	918	924
52	924	931
54	930	932
56	935	934
58	940	941
60	945	956
62	950	961
64	955	970
66	960	945
68	964	953
70	968	962
72	973	969
74	977	974
75	979	976



**Individual and mean temperatures recorded on the unexposed surface of Doorset A**

Time Mins	T/C Number 2 Deg. C	T/C Number 3 Deg. C	T/C Number 4 Deg. C	T/C Number 5 Deg. C	T/C Number 6 Deg. C	Mean Temp Deg. C
0	17	18	17	18	18	18
2	17	18	18	18	18	18
4	18	18	18	18	18	18
6	18	18	18	18	18	18
8	18	18	18	18	18	18
10	19	19	19	19	19	19
12	22	22	21	22	22	22
14	26	27	24	26	26	26
16	31	31	28	30	31	30
18	35	36	32	34	36	35
20	39	40	36	39	40	39
22	42	43	40	42	44	42
24	45	46	43	46	47	45
26	49	50	47	49	51	49
28	52	53	50	52	54	52
30	55	55	54	55	57	55
32	58	58	57	58	60	58
34	61	61	60	61	63	61
36	64	64	63	64	66	64
38	*	*	*	*	*	*

\*Doorset Blanked off

**Individual and mean temperatures recorded on the unexposed surface of Doorset B**

Time Mins	T/C Number 7 Deg. C	T/C Number 8 Deg. C	T/C Number 9 Deg. C	T/C Number 10 Deg. C	T/C Number 11 Deg. C	Mean Temp Deg. C
0	18	19	19	19	19	19
2	18	19	19	19	19	19
4	18	19	19	19	19	19
6	18	19	19	19	19	19
8	18	20	19	19	19	19
10	18	20	19	19	19	19
12	19	20	19	19	19	19
14	19	20	20	20	20	20
16	20	21	21	21	20	21
18	22	23	22	22	21	22
20	24	25	24	24	23	24
22	26	27	26	26	24	26
24	29	29	28	28	26	28
26	32	31	30	30	28	30
28	34	34	33	32	30	33
30	36	36	35	35	33	35
32	39	38	38	37	35	37
34	41	40	40	40	38	40
36	44	43	43	42	40	42
38	46	45	46	45	43	45
40	49	47	49	47	46	48
42	51	50	51	50	48	50
44	54	52	54	52	51	53
46	56	54	57	55	54	55
48	58	57	60	57	57	58
50	61	59	62	60	60	60
52	63	62	65	62	63	63
54	65	64	68	65	65	65
56	68	66	70	68	68	68
58	70	69	72	70	70	70
60	72	71	75	72	73	73
62	74	73	76	74	75	74
64	76	75	78	76	77	76
66	78	76	80	78	79	78
68	80	78	82	81	81	80
70	82	80	85	82	83	82
72	84	82	87	84	85	84
74	86	84	89	87	87	87
75	87	85	90	88	88	88

**Individual temperatures recorded on the unexposed surface of Doorset A**

Time Mins	T/C Number 12 Deg. C	T/C Number 13 Deg. C	T/C Number 14 Deg. C	T/C Number 15 Deg. C
0	20	20	20	15
2	20	20	23	15
4	20	22	23	15
6	20	22	22	15
8	20	22	23	16
10	21	24	24	18
12	24	30	29	24
14	27	35	35	31
16	32	41	40	38
18	37	46	45	43
20	41	49	48	48
22	45	52	52	50
24	48	55	55	53
26	52	57	58	55
28	55	60	60	57
30	58	62	63	59
32	61	65	66	61
34	65	67	69	63
36	68	69	73	64
38	*	*	*	*

\*Doorset Blanked off

**Individual temperatures recorded on the unexposed surface of Doorset B**

Time Mins	T/C Number 16 Deg. C	T/C Number 17 Deg. C	T/C Number 18 Deg. C	T/C Number 19 Deg. C
0	15	16	16	16
2	15	16	16	16
4	15	17	17	16
6	15	17	18	16
8	15	17	20	16
10	15	17	20	16
12	16	17	20	16
14	17	18	20	17
16	19	20	21	18
18	23	23	23	19
20	26	26	25	21
22	30	29	27	23
24	33	32	29	25
26	37	35	33	27
28	39	38	35	30
30	43	41	35	32
32	46	43	36	35
34	49	45	37	37
36	52	47	38	40
38	55	50	39	42
40	56	52	40	45
42	58	54	42	48
44	59	56	43	50
46	61	58	44	53
48	62	60	46	56
50	63	62	48	59
52	65	64	50	61
54	66	65	52	64
56	68	67	54	66
58	69	69	57	69
60	71	70	59	71
62	73	72	62	73
64	75	74	64	75
66	76	75	67	77
68	78	77	70	79
70	80	79	74	81
72	81	81	77	83
74	83	84	81	85
75	85	86	83	87

**Individual temperatures recorded on the unexposed frame of Doorset A**

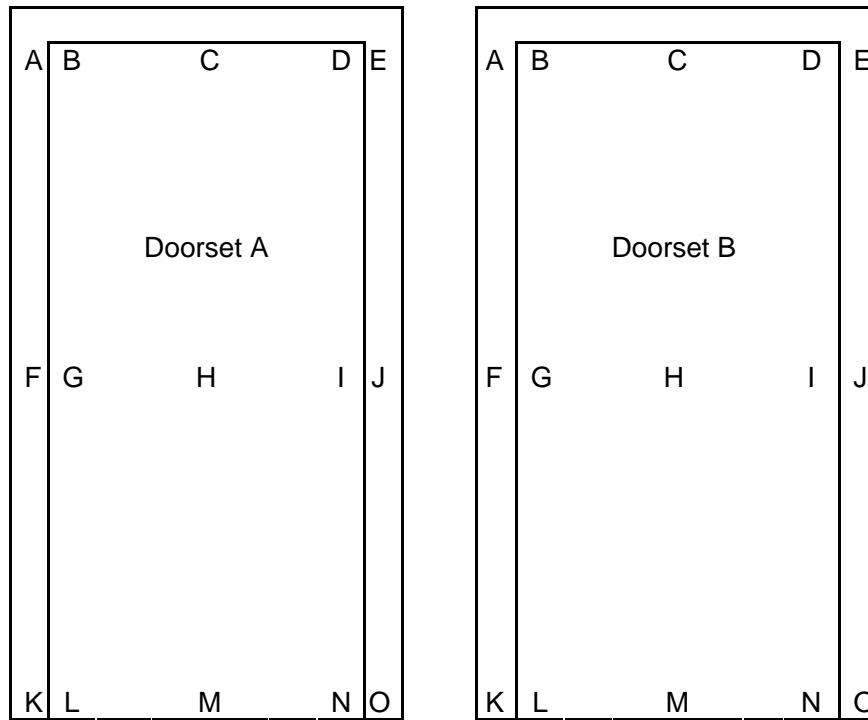
Time Mins	T/C Number 20 Deg. C	T/C Number 21 Deg. C	T/C Number 22 Deg. C	T/C Number 23 Deg. C
0	14	15	17	16
2	14	19	19	16
4	14	38	48	16
6	14	48	66	17
8	15	49	65	17
10	15	48	56	17
12	15	42	45	17
14	16	39	41	18
16	17	36	38	19
18	18	34	37	20
20	20	34	36	21
22	21	34	36	22
24	23	35	36	23
26	25	36	37	24
28	28	37	39	26
30	29	39	41	27
32	31	41	44	29
34	33	43	56	30
36	35	50	76	32
38	*	*	*	*

\*Doorset Blanked off

**Individual temperatures recorded on the unexposed frame of Doorset B**

Time Mins	T/C Number 24 Deg. C	T/C Number 25 Deg. C	T/C Number 26 Deg. C	T/C Number 27 Deg. C
0	16	18	18	17
2	16	18	18	17
4	16	27	25	17
6	16	30	27	18
8	16	31	29	18
10	16	29	28	18
12	16	29	29	18
14	17	28	30	18
16	17	28	31	18
18	17	27	31	18
20	17	27	32	19
22	17	28	32	19
24	18	30	33	20
26	18	30	34	20
28	19	31	33	20
30	20	33	33	21
32	20	32	33	22
34	21	31	32	22
36	22	33	32	23
38	23	32	32	24
40	24	33	33	25
42	25	34	35	26
44	26	34	35	27
46	28	35	36	28
48	29	36	37	30
50	30	38	38	31
52	31	40	39	32
54	32	41	40	33
56	33	42	41	34
58	34	43	43	36
60	35	45	45	37
62	37	47	47	38
64	38	49	50	40
66	39	51	52	41
68	41	53	54	43
70	42	56	57	44
72	44	59	61	46
74	46	64	66	48
75	47	81	70	49

**Deflections Of The Door Leaves And Door Frames During The Test**

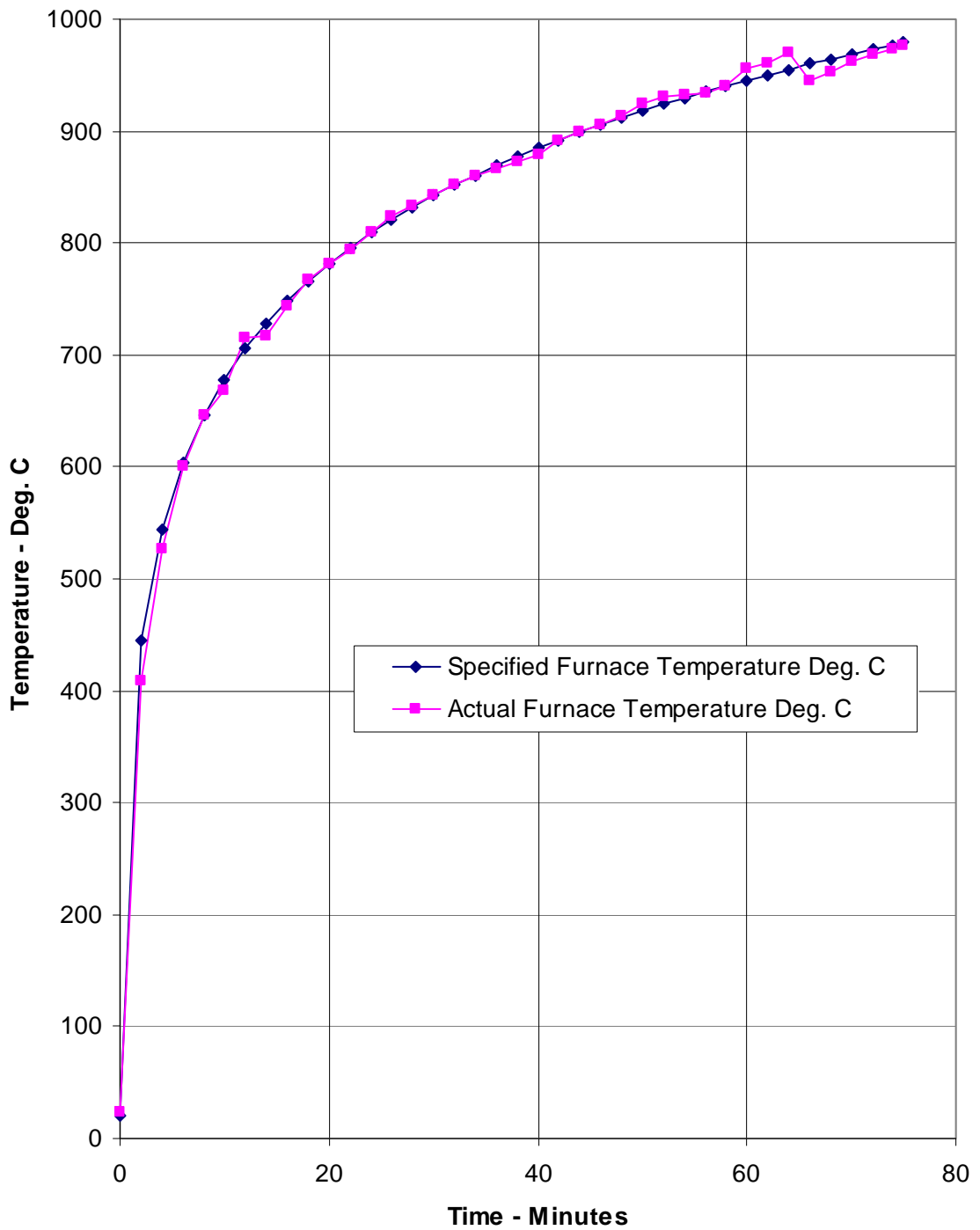


Doorset A															
Deflections – mm															
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	-2	-8	2	0	-3	2	1	-6	-1	0	5	3	1	4	0
20	-2	-2	-1	3	-3	0	-1	-7	-3	6	2	8	6	13	2
30	-11	-7	0	8	-5	-2	-1	-15	-3	3	1	12	5	22	0
40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

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	-7	2	0	-7	-1	3	2	-2	0	-3	2	2	1	-1	1
20	-4	9	2	-8	1	-3	0	-9	-2	3	1	13	2	-5	2
30	-5	7	0	-5	-1	0	0	-11	1	5	2	8	4	4	2
40	-1	8	0	-5	2	-4	-2	-16	-2	2	7	12	2	4	4
50	-6	8	1	-1	2	-2	-7	-22	-1	1	6	15	2	10	4
60	-5	8	-2	-3	3	-2	-9	-21	-5	3	9	20	3	11	1

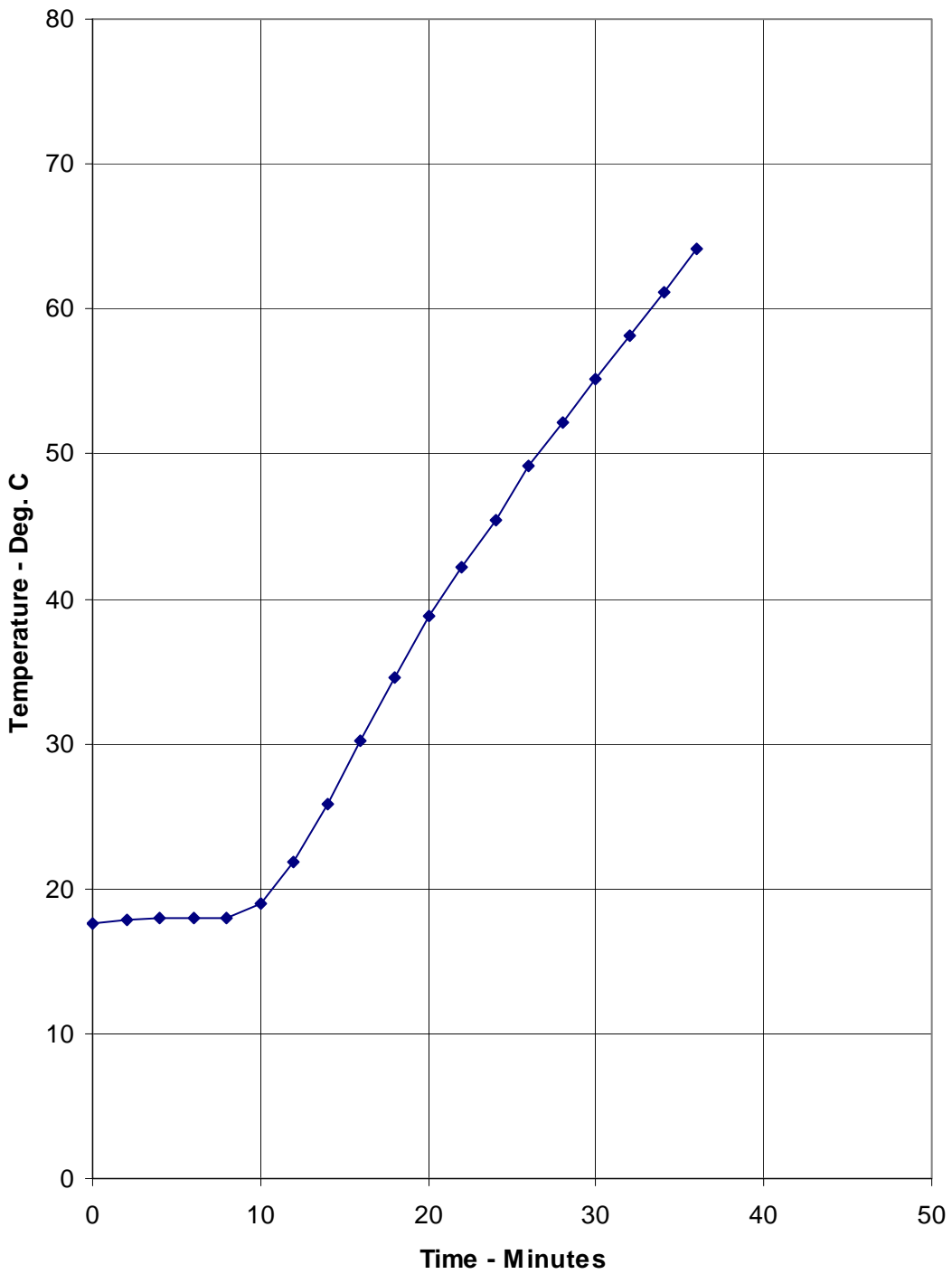
Positive values indicate a deflection towards the heating condition of the test

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

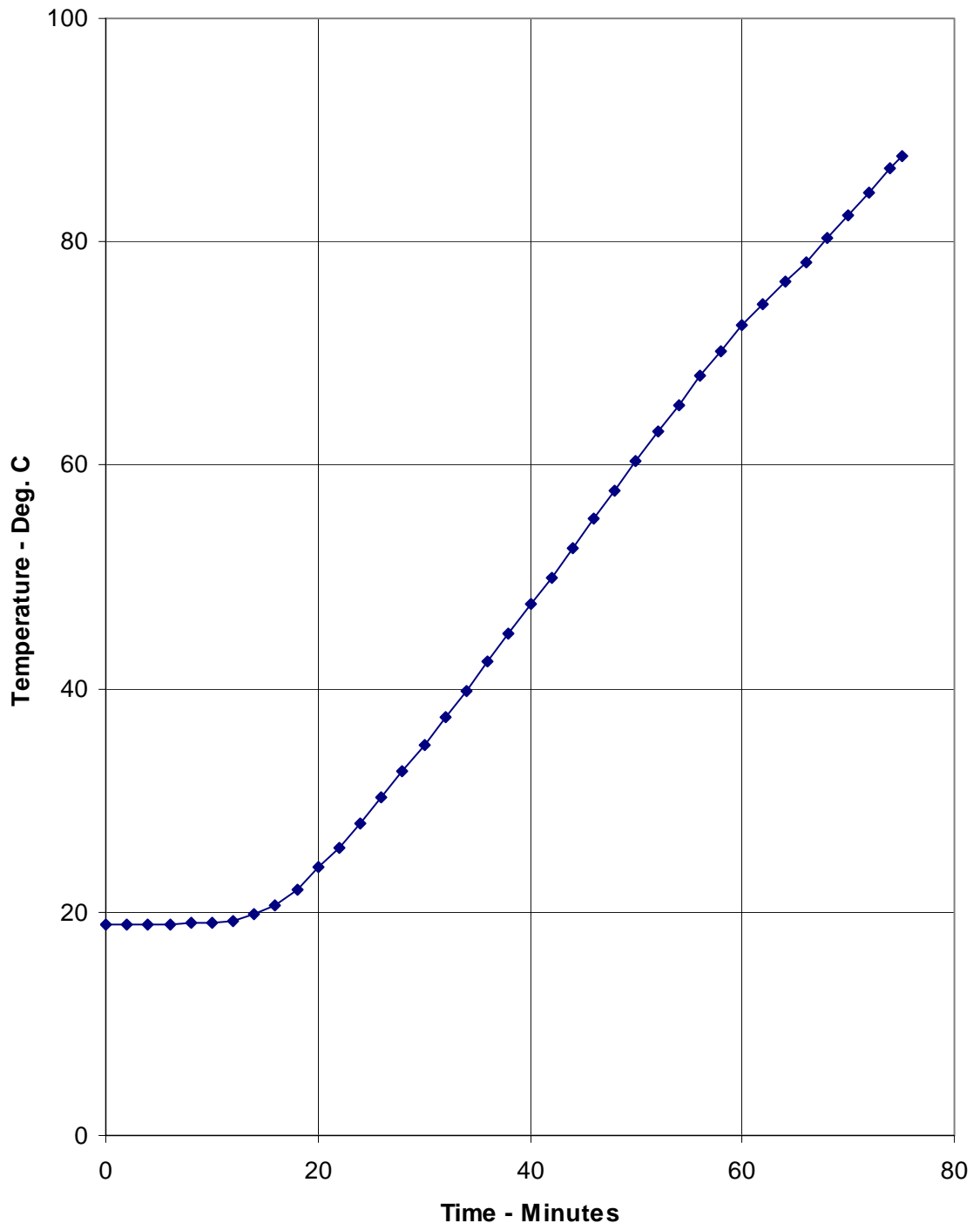




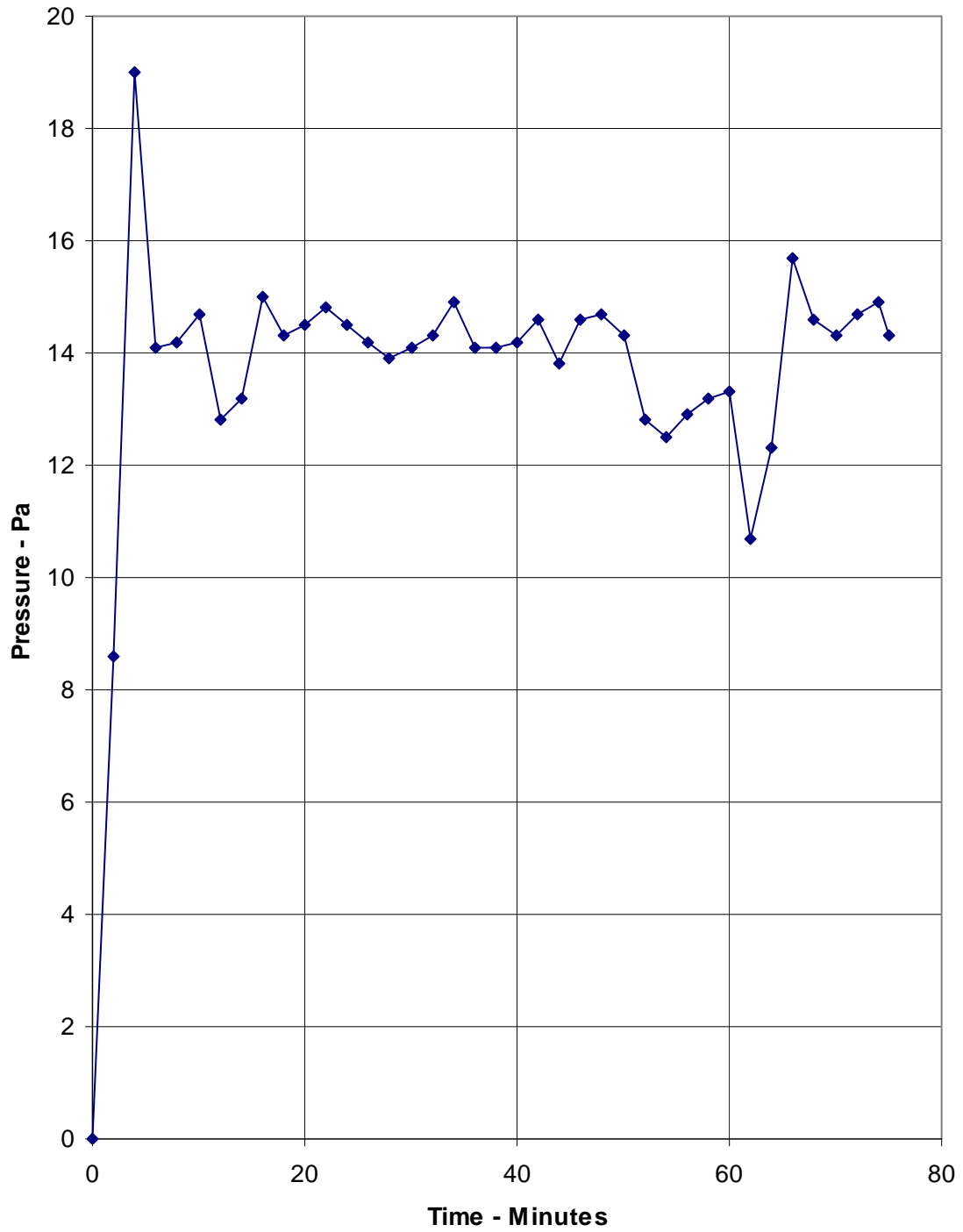
Graph showing mean temperatures recorded on the unexposed surface of Doorset A



Graph showing mean temperatures recorded on the unexposed surface of Doorset B



Graph showing the furnace pressure recorded during the test



## Performance Criteria and Test Results

### Integrity

It is required that the specimen retains its 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: 2008, or resulting in sustained flaming on the unexposed surface.

These requirements were satisfied for the periods shown below:

	Doorset A	Doorset B
Sustained flaming	37 minutes	73 minutes
Gap gauge	37 minutes*	#75 minutes
Cotton pad	37 minutes	73 minutes

### Insulation

The mean temperature rise of the unexposed surface shall not be greater than 140°C and that the maximum temperature rise shall not be greater than 180°C (except on the door frame, where the maximum temperature rise shall not exceed 360°C). Insulation failure also occurs simultaneously with integrity failure as specified in BS EN 1634-1: 2008.

These requirements were satisfied for the periods shown below:

	Doorset A	Doorset B
Insulation	37 minutes	73 minutes

\*Doorset blanked off to allow the test to continue.

#The test duration. The test was discontinued after a period of 75 minutes.

## Ongoing Implications

### Limitations

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in BS EN 1363-1: 1999, 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: 1999, provides guidance information on the application of fire resistance tests and the interpretation of test data.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

# Conclusions

**Evaluation against objective** Two specimens of single-acting, single-leaf timber based doorsets, incorporating various items of building hardware have been subjected to a fire resistance test in accordance with BS EN 1634-1: 2008, Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware, BS EN 1363-1: 1999, General requirements and BS EN 1363-2: 1999, Alternative and additional procedures.

The evaluation of the doorsets against the requirements of BS EN 1634-1: 2008 showed that they satisfied the requirements for the following periods.

<b>Test Results:</b>		<b>Doorset A</b>	<b>Doorset B</b>
<b>Integrity performance</b>	Sustained flaming	37 minutes	73 minutes
	Gap gauge	37 minutes*	#75 minutes
	Cotton Pad	37 minutes	73 minutes
<b>Insulation performance</b>		37 minutes	73 minutes

\*Doorset blanked off to allow the test to continue.

#The test duration. The test was discontinued after a period of 75 minutes.