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

Testing. Advising. Assuring.

Title:

The fire resistance performance of two fully insulated single-acting, single-leaf doorsets when tested in accordance with BS 476: Part 22: 1987, Clause 6.

WF Report No:

344527

Prepared for:

Rohden UK Ltd
Unit 2, Hayleys Manor Farm
Upland Road,
Epping Upland,
Essex,
CM16 6PQ

Date:

9th December 2014

Notified Body No:

0833

UKAS TESTING

0249

Summary

Objective

To determine the fire resistance performance of two fully insulated single-acting, single-leaf doorsets, when tested in accordance with BS 476: Part 22: 1987, Clause 6.

Test Sponsor

Rohden UK Ltd.

Address

Unit 2, Hayleys Manor Farm, Upland Road, Epping Upland, Essex, CM16 6PQ

Summary of Tested Specimen

For the purpose of the test the doorsets were referenced Doorset A and Doorset B.

Doorset A – Client referenced Oxford. Briefly had overall nominal dimensions 2075 mm high by 910 mm wide incorporating a door leaf with overall dimensions 2032 mm high by 838 mm wide by 44 mm thick. The door leaf had laminated particle board stiles and rails, and an inner panel comprising a 10 mm thick Magnesium oxide board with 7.5 mm thick particle board facings, with 16 mm Ash lippings to the vertical edges and was hung within a softwood frame on three Royde and Tucker stainless steel hinges referenced, Hi-Load 102. The doorset incorporated a Magnet tubular mortice latch referenced Br 63 mm and a Ingersoll Rand surface mounted door closer referenced 'Briton 121'.

Doorset B – Client referenced Marlow. Briefly had overall nominal dimensions 2075 mm high by 910 mm wide incorporating a door leaf with overall dimensions 2032 mm high by 838 mm wide by 44 mm thick. The door leaf was had laminated particle board stiles and rails, and an inner panel comprising a 10 mm thick Magnesium oxide board with 7.5 mm thick particle board facings, with 16 mm Ash lippings to the vertical edges and three horizontal 8.5 mm thick by 95 mm wide magnesium oxide board muntin covered in a white Oak veneer. The door leaf was hung within a softwood frame on three Royde and Tucker stainless steel hinges referenced, Hi-Load 102. The doorset incorporated a Magnet tubular mortice latch referenced Br 63 mm and a Ingersoll Rand surface mounted door closer referenced 'Briton 121'.

The doorsets were installed so that they opened towards the heating conditions of the test and were un-latched for the purpose of the test.

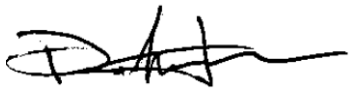
Test Results:	**Doorset A**	**Doorset B**
Integrity	34 minutes	34 minutes
Insulation	34 minutes	34 minutes

The test was discontinued after a period of 34 minutes.

Date of Test

27th September 2014

Signatories



Responsible Officer
D. Fitzsimmons*
Testing Officer

Approved
S. Gillfedder*
Testing Officer

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

Report Issued:

Date : 9th December 2014

CONTENTS **PAGE NO.**

Test Procedure

Introduction

The doorsets were of a fully insulated construction, the test was therefore conducted in accordance with Clause 6 of BS 476: Part 22: 1987 'Methods for determination of the fire resistance of non-loadbearing elements of construction' respectively. This test report should be read in conjunction with that Standard and with BS 476: Part 20: 1987, 'Methods for determination of the fire resistance of elements of construction (general principles)'.

The specimens were judged on their ability to comply with the performance criteria for integrity and insulation as required by BS 476: Part 22: 1987, Clause 6.

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 27th September 2014 at the request of Rohden UK Ltd the test sponsors.

Test Specimen Construction

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

Installation

The specimens were installed into apertures in a masonry wall within a refractory concrete lined steel restraint frame by Exova Warringtonfire on behalf of the test sponsor on the 26th September 2014.

Sampling

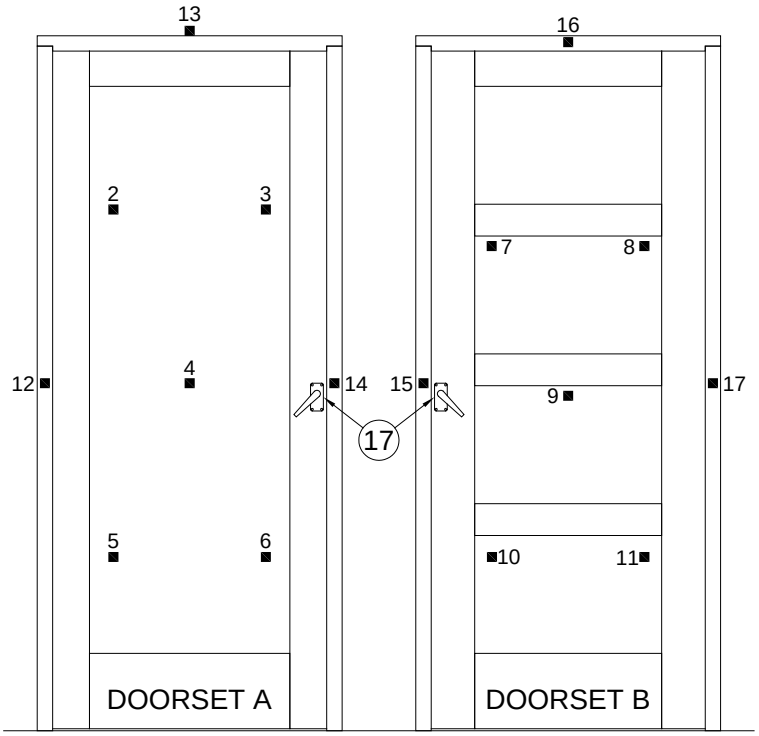
Exova Warringtonfire was not involved in the sampling or selection of the tested specimen or any of the components.

Conditioning

The specimens' storage, construction, and test preparation took place in the test laboratory over a total, combined time of 2 days. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 14°C to 22°C and 50.5% to 76% respectively.

Test Specimen

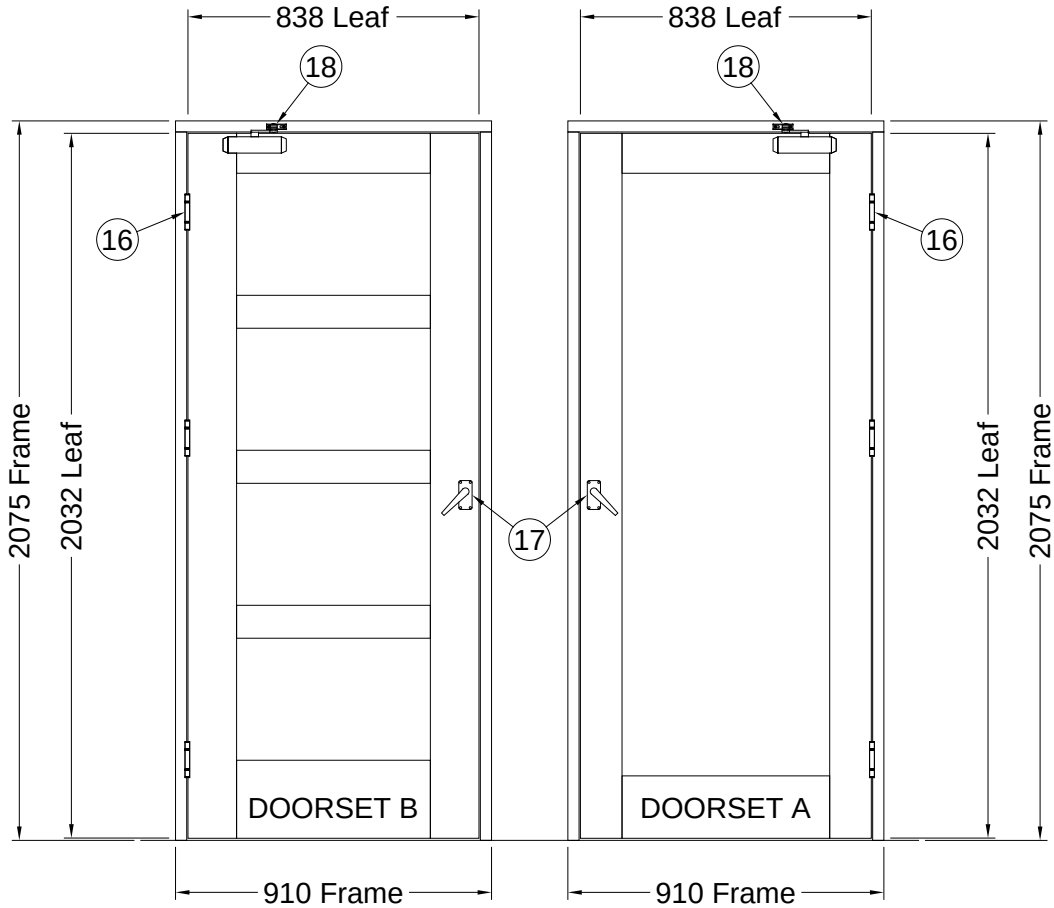
Figure 1- General Elevation of the Unexposed Face of the Test Specimen



■ Positions of thermocouples

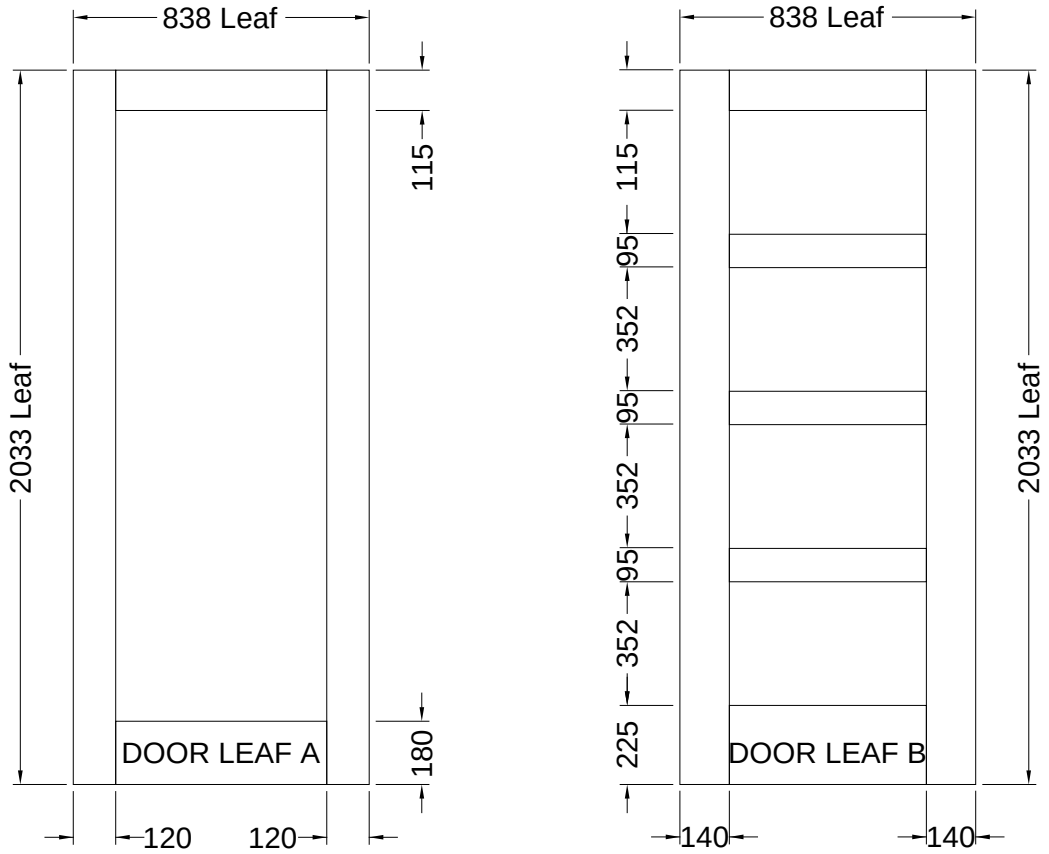
Do not scale. All dimensions are in mm

Figure 2 – General Elevation of the Exposed Face of the Test Specimen



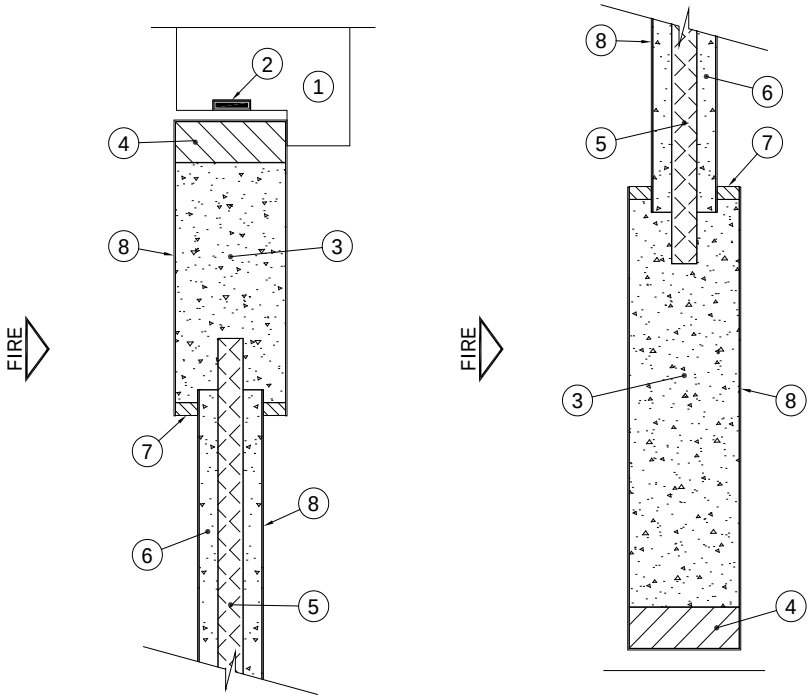
Do not scale. All dimensions are in mm

Figure 3 – Details of Dimensions of Door Leaves



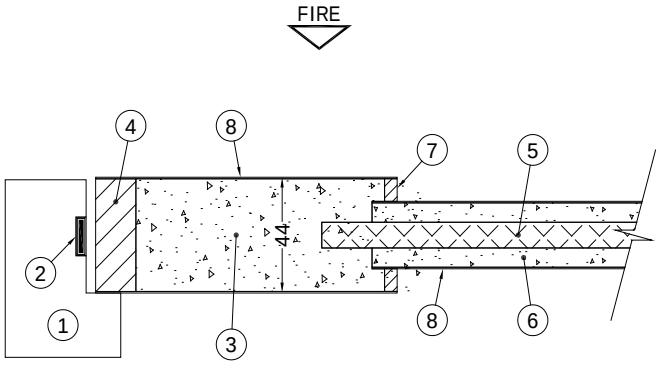
Do not scale. All dimensions are in mm

Figure 4 – Details of Door Leaves



TYPICAL SECTION
THROUGH HEAD
OF DOORSET A

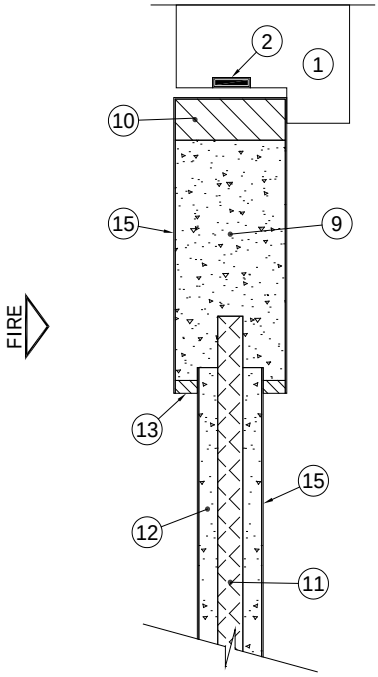
TYPICAL SECTION
THROUGH BASE
OF DOORSET A



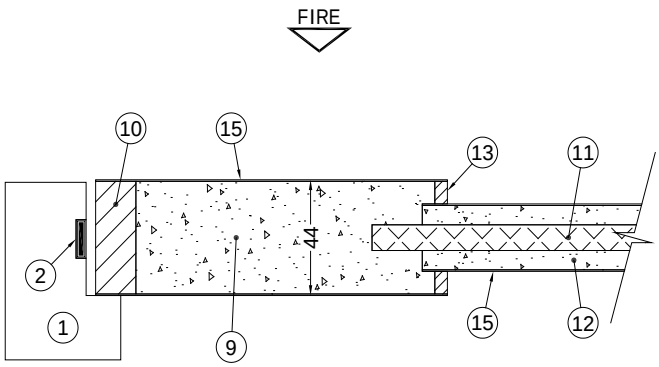
TYPICAL SECTION
THROUGH JAMB
OF DOORSET A

Do not scale. All dimensions are in mm

Figure 5 – Details of Door Leaves



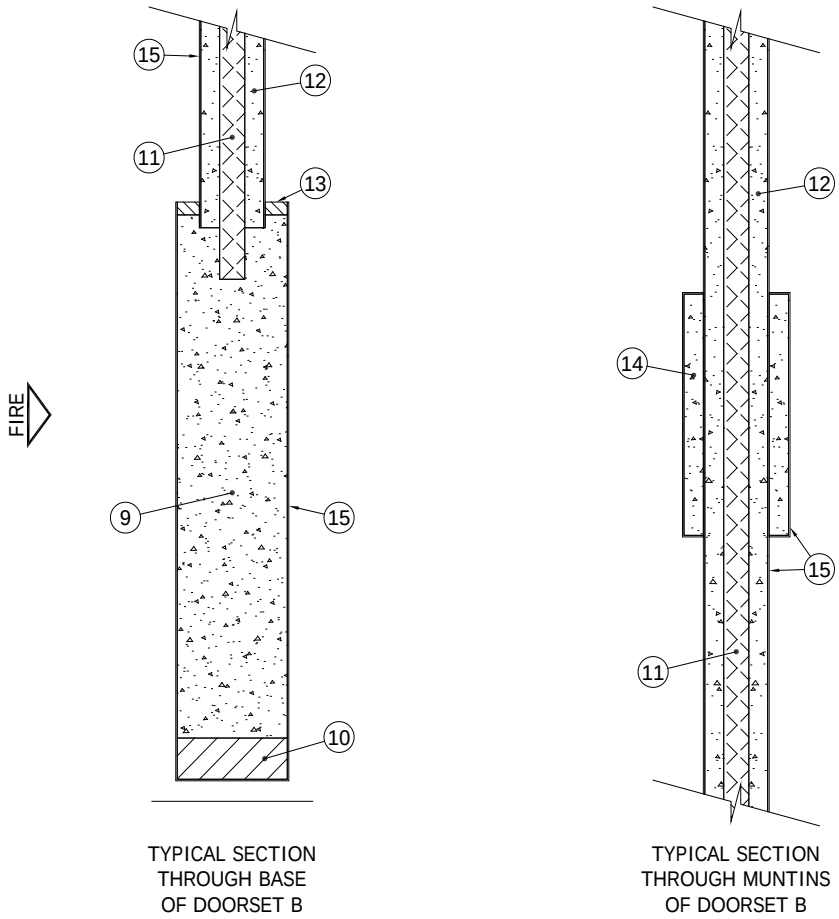
TYPICAL SECTION
THROUGH HEAD
OF DOORSET B



TYPICAL SECTION
THROUGH JAMB
OF DOORSET B

Do not scale. All dimensions are in mm

Figure 6 – Details of Door Leaves



TYPICAL SECTION
THROUGH BASE
OF DOORSET B

TYPICAL SECTION
THROUGH MUNTINS
OF DOORSET B

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)

Item		Description
1. Door Frames		
Material	:	General commercial softwood
Density	:	532 kg/m^3 nominal
Average moisture content		
i. doorset A	:	11.8%
ii. doorset B	:	10.6%
Overall size	:	69.2 mm x 45 mm, with 45.7 mm x 13.1 mm deep rebate
Jambs to head jointing method	:	Stub mortice and screwed
Fixing method	:	Screwed
Fixings		
i. type	:	Countersunk head wood screws
ii. material	:	Steel
iii. overall size	:	100 mm long x 5.8 mm diameter
iv. centres	:	4 off per jamb
2. Intumescent Seal		
Manufacturer	:	Intumescent Seals Ltd
Reference	:	Therm-A-Seal
Material	:	High pressure, high pressure graphite intumescent strip within a polyvinyl chloride, PVC, carrier
Overall size	:	15 mm x 4 mm
Fixing method	:	Self adhered into groove within rebate of frame, item 1, the strips were interrupted at furniture positions
3. Door Leaf A Framework		
Material	:	Fire retardant particle board, stated
Density	:	680 – 700 kg/m^3, stated
Overall size		
i. stiles	:	120 mm x 43 mm
ii. top rail	:	115 mm x 43 mm
iii. bottom rail	:	180 mm x 43 mm
Jointing method	:	Butted with the stiles running the full height of the leaf
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine

Item		Description
4. Door Leaf A Lippings		
Material	:	Ash, stated
Density	:	730 – 750 kg/m^3, stated
Overall size	:	43 mm wide x 16 mm thick
Fixing method	:	Bonded around the perimeter of the framework, sections, item 3
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
5. Door Leaf A Panel Core		
Material	:	Magnesium oxide board, stated
Density	:	880 kg/m^3, stated
Thickness	:	10 mm
Fixing method	:	Bonded to outer facing on both side first, item 6, then fitted into 30 mm deep grooves within the framework sections and bonded again
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
6. Door Leaf A Panel Outer Facing		
Material	:	Fire retardant particle board
Density	:	680 – 700 kg/m^3, stated
Thickness	:	7.5 mm
Fixing method	:	Bonded to each face of panel core, item 5
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
7. Door Leaf A Panel Aperture Lining		
Material	:	Ash, stated
Density	:	680 – 700 kg/m^3, stated
Thickness	:	5 mm
Fixing method	:	Bonded to the inside edges of the framework sections, item 3 around the panel apertures
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine

Item		Description
8. Door Leaf A Facings		
Material	:	White Oak veneer, stated
Thickness	:	0.6 mm
Fixing method	:	Bonded to the framework sections, lippings and panel outer facings, items 3, 4 & 6 respectively
Adhesive		
i. manufacturer	:	Foshan Nanhai Jianguli Maoyuan Adhesive Co. Ltd
ii. reference	:	MY601E
iii. curing method	:	Hot press
iv. application method	:	Applied by hand then pressed by hot press
9. Door Leaf B Framework		
Material	:	Fire retardant particle board, stated
Density	:	680 – 700 kg/m^3, stated
Overall size		
i. stiles	:	140 mm x 43 mm
ii. top rail	:	115 mm x 43 mm
iii. bottom rail	:	225 mm x 43 mm
Jointing method	:	Butted with the stiles running the full height of the leaf
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
10. Door Leaf B Lippings		
Material	:	Ash, stated
Density	:	730 – 750 kg/m^3, stated
Overall size	:	43 mm wide x 16 mm thick
Fixing method	:	Bonded around the perimeter of the framework, sections, item 8
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
11. Door Leaf B Panel Core		
Material	:	Magnesium oxide board, stated
Density	:	880 kg/m^3, stated
Thickness	:	10 mm
Fixing method	:	Bonded to outer facing on both sides first, item 12 , then fitted into 20 mm deep grooves within the framework sections, item 8, and bonded again
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine

Item		Description
12. Door Leaf B Panel Outer Facing		
Material	:	Fire retardant particle board
Density	:	680 – 700 kg/m^3, stated
Thickness	:	7.5 mm
Fixing method	:	Bonded to each face of panel core, item 11
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
13. Door Leaf B Panel Aperture Lining		
Material	:	Ash, stated
Density	:	730 – 750 kg/m^3, stated
Thickness	:	5 mm
Fixing method	:	Bonded to the inside edges of the framework sections, item 9 around the panel apertures
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
14. Door Leaf B Muntin		
Material	:	Fire retardant particle board, stated
Density	:	680 – 700 kg/m^3, stated
Overall size	:	95 mm x 7.5 mm
Fixing method	:	Bonded to each face of panel outer facing, item 12
Adhesive		
i. manufacturer	:	Winsir Chemical
ii. type	:	VS – 798
iii. curing method	:	Cold press
iv. application method	:	Applied by hand then pressed by machine
15. Door Leaf B Facings		
Material	:	White Oak veneer, stated
Thickness	:	0.6 mm
Fixing method	:	Bonded to the framework sections, lippings, panel outer facings & door leaf muntins, items 9, 10, 12 & 13 respectively
Adhesive		
i. manufacturer	:	Foshan Nanhai Jianguli Maoyuan Adhesive Co. Ltd
ii. reference	:	MY601E
iii. curing method	:	Hot press
iv. application method	:	Applied by hand then pressed by hot press
16. Hinges		
Manufacturer	:	Royde & Tucker Ltd
Reference	:	Hi-load 102
Primary material	:	Zinc plated steel
Size		
i. knuckle	:	104 mm long by 13.8 mm diameter
ii. blades	:	100 mm long by 35 mm wide by 3 mm thick
Fixings		
i. type	:	Countersunk head wood screws
ii. material	:	Steel

iii. sizes	:	29 mm long by 5.1 mm diameter
iv. number off per blade	:	5 off
v. maximum distance of fixing screws from face of door leaf	:	26 mm
Bedding material		
i. manufacturer	:	Lorient Polyproducts Ltd
ii. material	:	Interdens sheet
iii. overall size	:	100 mm long by 35 mm wide by 1 mm thick
iv. fixing method	:	Self adhered to the back face of hinge blades

17. Latch

Manufacturer	:	Magnet
Reference	:	Br 63 mm tubular mortice latch
Material	:	Steel
Overall size		
i. fore plate	:	58 mm x 26 mm
ii. strike plate	:	57 mm x 24 mm
iii. casing	:	19 mm x 15 mm x 64 mm long
iv. latch bolt	:	14.5 mm x 10.9 mm with 8 mm throw
Operation of latch	:	Disengaged
Fixing method	:	Screwed
Bedding material		
i. supplier	:	Lorient Polyproducts Ltd
ii. material	:	Interdens sheet
iii. thickness	:	1 mm
iv. fitting method	:	Wrapped around the body, also fitted behind the fore and strike plates

18. Door Closer

Manufacturer	:	Ingersoll Rand Architectural Hardware
Reference	:	Briton 121
Material		
i. body	:	Die cast alloy
ii. closer arm	:	Steel
Overall size		
i. body	:	182 mm long x 47 mm high x 63 mm deep
Fixing method	:	Exposed face
Maximum opening moment		
i. doorset A	:	38.0 Newton metre (Nm)
ii. doorset B	:	39.6 Nm
Maximum closer moment		
i. doorset A	:	21.2 Nm
ii. doorset B	:	21.4 Nm

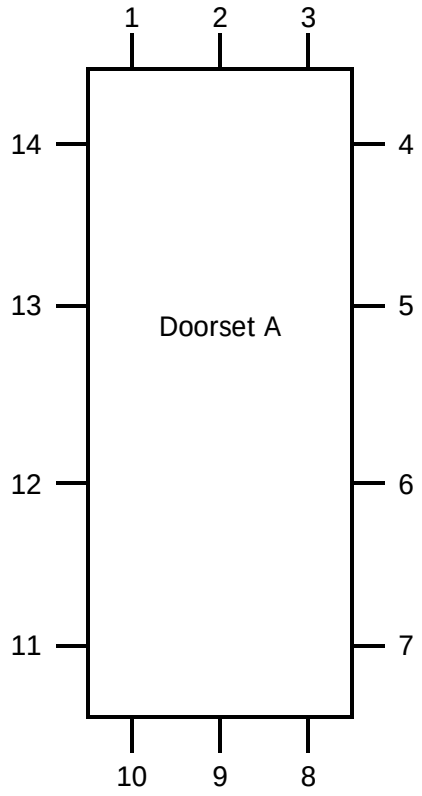
Instrumentation

General

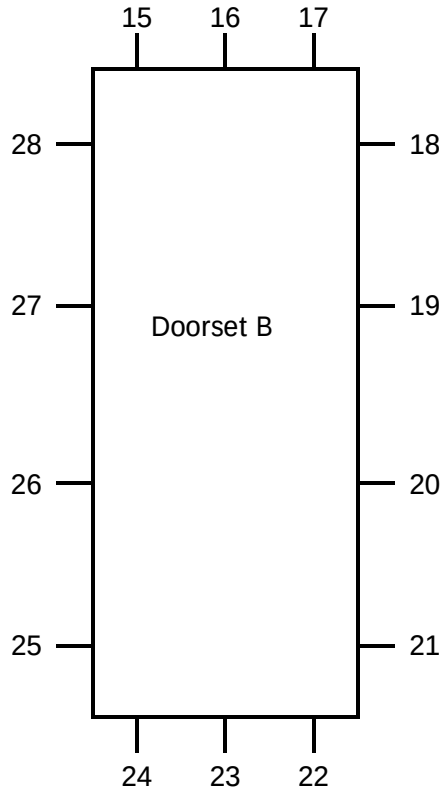
The instrumentation was provided in accordance with the requirements of the Standard.

Furnace	The furnace was controlled so that its mean temperature complied with the requirements of BS 476: Part 20: 1987, Clause 3.1, using six mineral insulated, Type K thermocouples distributed over a plane 100 mm from the surface of the test construction.
Thermocouple Allocation	Thermocouples were provided to monitor the unexposed surface of the specimen and the output of all instrumentation was recorded at no less than one minute intervals.
Thermocouples 2 to 6	At five positions on the unexposed surface of doorset A, one approximately at the centre and one at approximately the centre of each quarter section of the doorset.
Thermocouples 7 to 10	At five positions on the unexposed surface of doorset B, one approximately at the centre and one at approximately the centre of each quarter section of the doorset.
Thermocouples 12 to 14	Placed around the frame of doorset A, one above the centre of the leaf and one either side of the specimen at mid-height.
Thermocouples 15 to 17	Placed around the frame of doorset B, one above the centre of the leaf and one either side of the specimen at mid-height.
Roving Thermocouple	A roving thermocouple was available to measure temperatures on the unexposed surface of the specimen at any position, which might appear to be hotter than the temperatures indicated by the fixed thermocouples.
Integrity criteria	Cotton pads and gap gauges were available to evaluate the impermeability of the specimen to hot gases.
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 476: Part 20: 1987, Clause 3.2.2. The calculated pressure differential relative to the laboratory atmosphere at the top of the doorsets was 9.2 respectively (±2) Pa.

Door Gap Measurements



View from unexposed face



View from unexposed face

Door Ref	Gap Dimension in mm at Positions													
A	1	2	3	4	5	6	7	8*	9*	10*	11	12	13	14
	2.1	2.3	2.7	3.1	3.1	3.6	2.8	7.4	7.2	7.6	2.3	2.6	2.5	2.3
B	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
	2.7	2.7	2.1	1.8	2.6	2.1	1.8	6.9	7.2	7.4	3.8	3.6	3.6	4.5
A	Mean		2.7		Maximum			3.6		Minimum			2.1	
B	Mean		2.8		Maximum			4.5		Minimum			1.8	

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	0.6	0.2	1.0	0.3	0.3	0.8	n/a	n/a	n/a	0.9	1.0	2.0	2.3
B	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
	0.6	0.3	0.6	0.6	1.0	1.5	0.8	n/a	n/a	n/a	2.0	1.1	2.0	1.4

* Dimension not included in calculations
# Gap not measured

DO NOT SCALE
ALL DIMENSIONS ARE IN mm

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 16ºC at the start of the test with a maximum variation of -1ºC during the test.
00	00	**The test commences.**
02	20	Very light steam/smoke release at ¾ height of both doorsets.
03	16	Very light steam/smoke release from the leading edge of both leaves.
04	16	Steam/smoke release from between the leaf and the frame on leaf B
05	14	The top corner of the leading edge of leaf B is now discolouring.
06	26	Smoke release from both doorsets at ¾ height increases.
08	00	The top half of the leading edge of leaf B continues to discolour.
09	00	Slight discolouring can be seen at the head and down the hinge edge of leaf A.
13	00	Smoke release continues from the head and intermittently from the edges on both leaves.
15	17	The discolouring on the top half of the hinge edge of leaf A is now turning a black/brown colour.
18	00	Around the top profile of leaf B is now starting to discolour and release smoke.
20	00	Smoke release from the top corners of the leading edge of both doorsets continues.
23	00	Very light discolouring can be seen on the leading edge of both doorsets where intermittent smoke release is.
25	00	Smoke release from the leading edge next to lock sets increase.
29	00	Smoke release continues from top profile of leaf B as the other panels show signs of splitting.
31	00	Discolouring along the leading edge of leaf B has now spread to the bottom half of Leaf B.
34	00	**Test discontinued**

Test Photographs

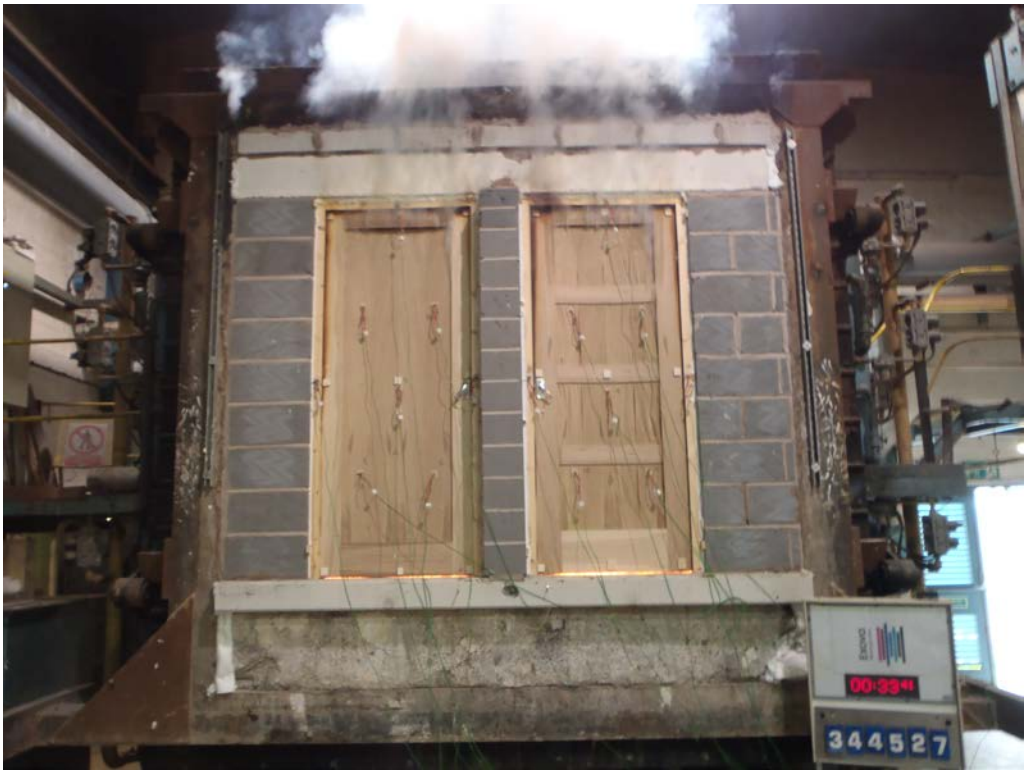
The exposed face of the test specimens prior to testing

The unexposed face of the test specimens after a test duration of 7 minutes

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

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

The unexposed face of the test specimens after a test duration of 33 minutes



The exposed face of the test specimens after the test

Temperature and Deflection Data

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

Time Minutes	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	22
1	349	329
2	445	440
3	502	485
4	544	503
5	576	528
6	603	557
7	626	612
8	646	641
9	663	631
10	678	664
11	693	684
12	706	687
13	717	699
14	728	715
15	739	737
16	748	757
17	757	757
18	766	771
19	774	777
20	781	780
21	789	787
22	796	786
23	802	799
24	809	809
25	815	822
26	820	821
27	826	832
28	832	833
29	837	836
30	842	839
31	847	850
32	852	852
33	856	855
34	860	859

Individual and mean temperatures recorded on the unexposed surface of doorset A

Time Minutes	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	18	18	18	18
1	17	18	18	18	18	18
2	17	18	18	18	18	18
3	17	18	18	18	18	18
4	18	18	18	18	18	18
5	18	18	18	19	19	18
6	19	20	20	20	20	20
7	21	21	21	22	22	21
8	23	24	24	25	24	24
9	26	27	26	28	27	27
10	29	30	29	31	30	30
11	32	33	32	34	34	33
12	35	36	35	38	37	36
13	39	39	38	41	40	39
14	42	43	42	46	44	43
15	46	47	46	51	49	48
16	52	51	51	58	55	53
17	58	55	55	65	63	59
18	67	59	59	72	73	66
19	79	63	63	78	83	73
20	85	66	66	84	89	78
21	87	70	70	86	90	81
22	87	72	72	88	89	82
23	86	75	75	89	89	83
24	85	76	77	89	88	83
25	84	78	78	90	87	83
26	84	80	80	91	87	84
27	84	81	82	91	87	85
28	84	83	85	92	88	86
29	86	85	89	93	89	88
30	88	87	91	94	90	90
31	89	88	93	95	91	91
32	90	89	95	95	92	92
33	92	90	95	96	92	93
34	93	91	96	96	93	93

Individual temperatures recorded on the frame on doorset A

Time Minutes	T/C Number 12 Deg. C	T/C Number 13 Deg. C	T/C Number 14 Deg. C
0	19	18	18
1	19	18	18
2	19	18	18
3	20	18	18
4	20	18	18
5	21	18	18
6	21	18	18
7	20	18	18
8	20	18	19
9	20	18	19
10	21	19	19
11	21	19	19
12	21	19	19
13	22	19	19
14	22	19	19
15	23	20	19
16	23	20	19
17	24	21	19
18	26	21	20
19	27	22	20
20	28	23	21
21	29	23	21
22	30	24	22
23	31	25	23
24	32	26	23
25	33	27	24
26	34	28	25
27	35	29	26
28	36	30	27
29	38	31	28
30	39	33	29
31	41	34	30
32	42	35	31
33	45	36	32
34	50	37	33

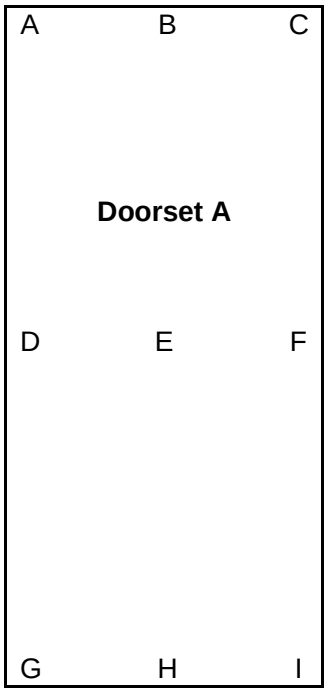
Individual and mean temperatures recorded on the unexposed surface of doorset B

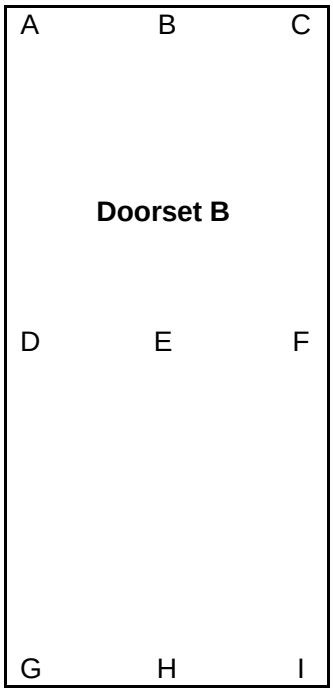
Time Minutes	T/C Number 7 Deg. C	T/C Number 8 Deg. C	T/C Number 9 Deg. C	T/C Number 10 Deg. C	T/C Number 11 Deg. C	Mean Temp Deg. C
0	18	20	20	20	20	20
1	18	20	20	20	20	20
2	18	20	20	19	20	19
3	18	19	19	19	20	19
4	18	20	20	20	20	20
5	19	20	20	20	20	20
6	20	21	22	22	22	21
7	22	23	24	24	24	23
8	25	26	26	27	27	26
9	28	28	29	30	30	29
10	31	31	33	33	33	32
11	34	35	36	37	37	36
12	38	38	40	40	40	39
13	42	41	44	45	45	43
14	47	45	48	50	50	48
15	53	50	53	57	56	54
16	58	56	57	64	61	59
17	63	63	61	71	65	65
18	67	69	65	76	70	69
19	71	74	69	81	74	74
20	74	77	73	84	78	77
21	76	79	76	86	81	80
22	78	81	79	88	84	82
23	80	82	81	90	86	84
24	82	84	83	91	88	86
25	84	85	85	92	89	87
26	86	86	88	93	90	89
27	87	87	92	92	91	90
28	88	88	93	92	92	91
29	89	89	93	92	91	91
30	90	89	93	92	90	91
31	90	89	94	91	89	91
32	90	88	92	90	89	90
33	88	87	87	89	90	88
34	85	86	85	85	90	86

Individual temperatures recorded on the frame on doorset B

Time Minutes	T/C Number 15 Deg. C	T/C Number 16 Deg. C	T/C Number 17 Deg. C
0	15	14	14
1	15	14	14
2	15	14	14
3	16	14	14
4	17	14	14
5	17	14	14
6	17	14	14
7	16	14	14
8	16	14	14
9	16	14	14
10	17	14	14
11	17	14	15
12	17	14	15
13	18	14	15
14	18	14	15
15	20	15	15
16	21	15	15
17	22	15	16
18	24	16	16
19	25	16	16
20	26	17	17
21	28	17	17
22	29	18	18
23	30	18	18
24	32	19	19
25	33	20	20
26	34	20	21
27	36	21	21
28	37	22	23
29	38	22	23
30	39	23	25
31	41	24	26
32	43	25	27
33	45	26	28
34	47	27	29

Horizontal Deflections of the Doorsets During the Test





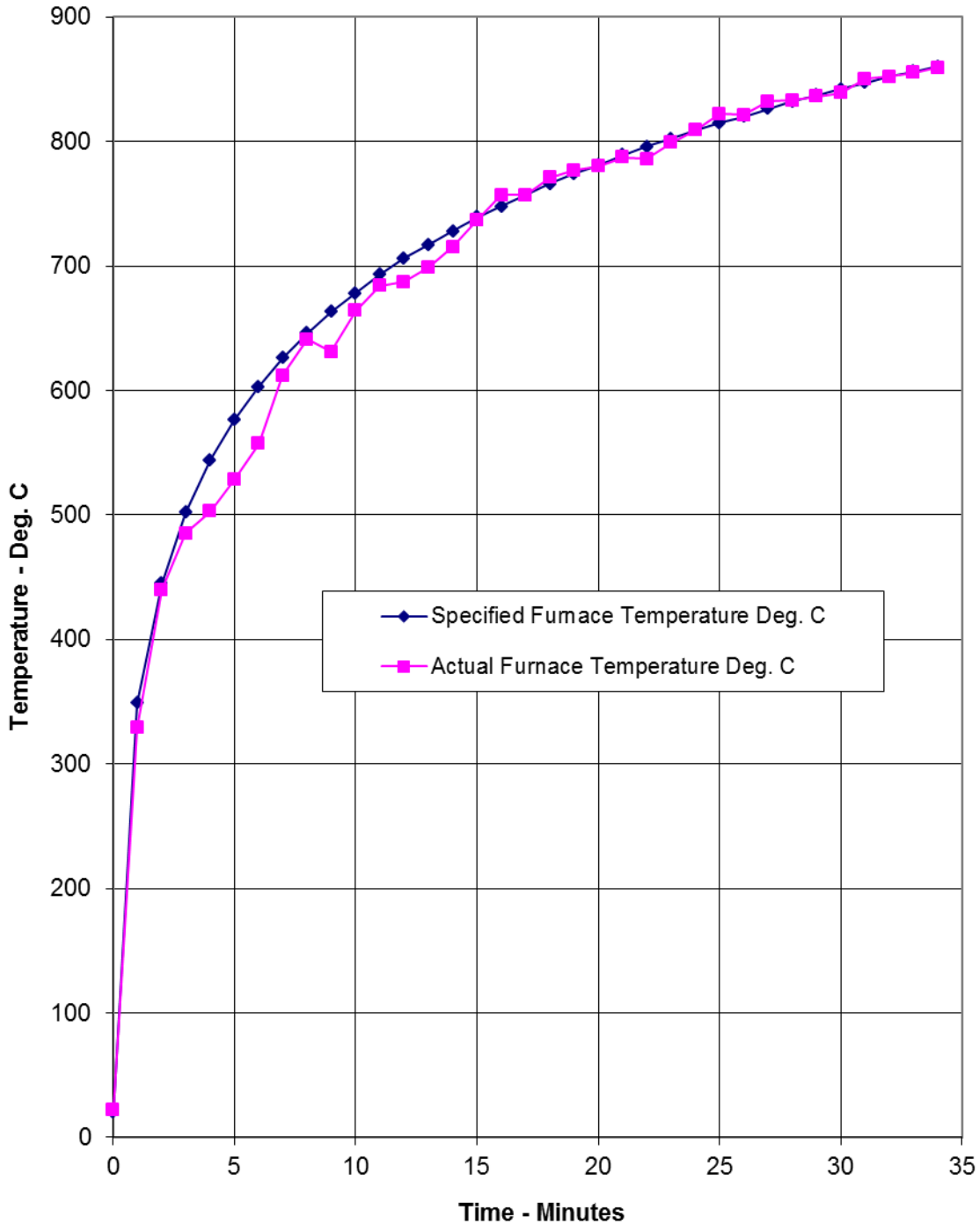
Doorset A									
Deflections – mm									
TIME mins	A	B	C	D	E	F	G	H	I
0	0	0	0	0	0	0	0	0	0
5	-2	1	-5	-3	2	5	-3	0	1
10	0	1	-5	-3	-1	2	2	2	2
15	-2	2	-5	-1	-5	-2	0	0	3
20	-2	2	1	-2	-18	1	0	5	1
25	-3	3	4	-4	-19	13	2	1	1
30	0	5	3	0	21	7	2	3	2

Doorset B									
Deflections – mm									
TIME mins	A	B	C	D	E	F	G	H	I
0	0	0	0	0	0	0	0	0	0
5	-4	5	-3	-3	1	6	1	1	0
10	1	1	0	-4	2	6	3	-4	-1
15	3	1	3	-1	-1	3	5	-4	1
20	1	4	5	-4	0	2	6	-6	1
25	-1	9	6	-1	1	4	3	-6	-2
30	1	14	8	9	*	4	2	-6	0

Positive deflections indicate movement towards the furnace chamber

*unable to take deflection readings

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



Performance Criteria and Test Results

Integrity

It is required that there is no collapse of the specimen, no sustained flaming on the unexposed surface and no loss of impermeability. These requirements were satisfied for 34 minutes on both doorsets at which time the test was discontinued.

Insulation

It is required that 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. These requirements were satisfied for a period of 34 minutes on both doorsets at which time the test was discontinued.

On-going Implications

Limitations

The results relate only to the behaviour of the specimen of the element of construction under the particular conditions of test. They are not intended to be the sole criteria for assessing the potential fire performance of the element in use, nor do they reflect the actual behaviour in fires.

The test results relate only to the specimen tested. Appendix A of BS 476: Part 20: 1987 provides guidance information on the application of fire resistance tests and the interpretation of test data. Application of the results to assemblies of different dimensions or incorporating different components should be the subject of a design appraisal.

Review

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

Conclusions

Evaluation against objective

To determine the fire resistance performance of two fully insulated single-acting, single-leaf doorsets, when tested in accordance with BS 476: Part 22: 1987, Clause 6.

The specimen satisfied the performance requirements specified in the Standard for the periods stated below:

Test Results:	**Doorset A**	**Doorset B**
Integrity	34 minutes	34 Minutes
Insulation	34 minutes	34 minutes

The test was discontinued after a period of 34 minutes.