



Chiltern House Stocking Lane Hughenden Valley
High Wycombe Buckinghamshire HP14 4ND UK

t +44 (0) 1494 569 800 f +44 (0) 1494 564895
e cif@chilternfire.co.uk w www.chilternfire.co.uk

CONFIDENTIAL

Test Report : Chilt/RF06168

**A fire resistance test performed on
a one and a half leaf, single acting doorset with glazing
and a single leaf single acting doorset**

Test conducted in accordance with BS 476 : Part 22 : 1987

Test Date: 20 February 2007

Test for : Deanta Wood
Curraheen
Tralee
Co Kerry
Ireland

Page 1 of 19

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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No. 1762

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1 Introduction

The doorsets were manufactured and supplied for test by the client and delivered during February 2007. Chiltern International Fire Limited (CIFL) conducted further work on the doorsets as follows:

Doorset A: Glazing beads

CIFL constructed a timber stud/plasterboard clad partition and installed the doorsets into the partition.

2 Specification

Details of the specimen are shown in Figures 1 to 4.

2.1 Door leaves

The left doorset was designated doorset A and the right doorset was designated doorset B. The left leaf of doorset A measured 2278mm high x 460mm wide x 44mm thick and the right leaf measured 2278mm high x 912mm wide x 44mm thick. The leaf of doorset B measured 2260mm high x 915mm wide x 44mm thick. All leaves were hung to open in towards the furnace, which is considered to be the most onerous direction based on experience of testing doors of similar construction. It is therefore the opinion of the laboratory that the test results can be applied to doors opening in either direction. The results of this test were obtained from doorsets each fitted with a latch but disengaged.

2.2 Door perimeter gaps

The gaps between the edge of the doors and frame were measured prior to test. A total of 31 readings were taken. The measurements (in mm) are given in Figure 4.

2.3 Closer forces

Measured in accordance with FTSG Resolution No 63.

		Opening force (Nm)	Closing force (Nm)
Doorset A	Left leaf	30	16
	Right leaf	36	14
Doorset B		38	13

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3 Test conditions

- 3.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71, 72 and 78 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 3.2 The ambient temperature of the test area at commencement of test was 15°C.
- 3.3 After the first 5 minutes of the test, the furnace pressure was maintained at 0 ± 2 Pa with respect to atmosphere, at a point 1m from the notional floor level.
- 3.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 20: 1987 as closely as possible, using the average of six thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 4.1.
- 3.5 The temperature of the unexposed face of doorset A was monitored by means of five thermocouples fixed to the surface of the door leaves, and four thermocouples attached to the frame, one at midheight on each jamb and one centrally located above each leaf on the frame head. Two additional thermocouples were fixed to the face of the glass on each aperture.

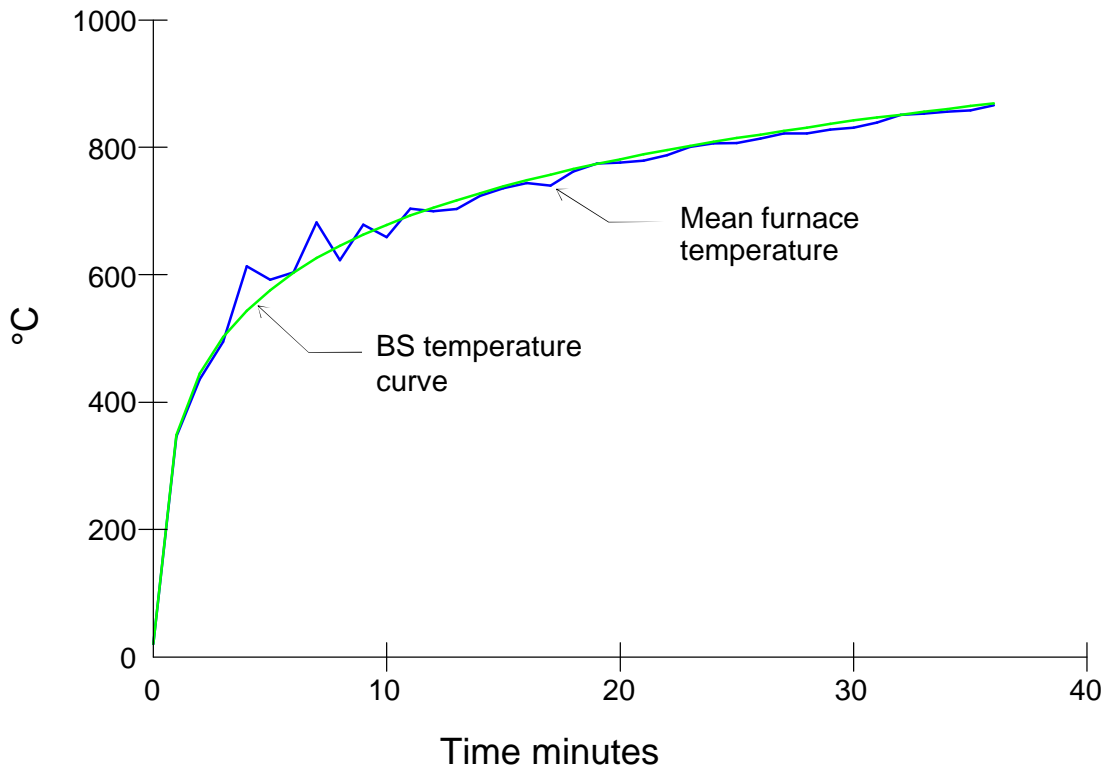
The temperature of the unexposed face of doorset B was monitored by means of five thermocouples fixed to the surface of the door leaf, and three thermocouples attached to the frame, one at midheight on each jamb and one centrally located above the leaf on the frame head

The thermocouple positions are shown in Figure 4. The average temperature of each door leaf and maximum temperature of each doorset are shown graphically in Section 4.2.

4 Test results

The following data and observations were recorded during the test.

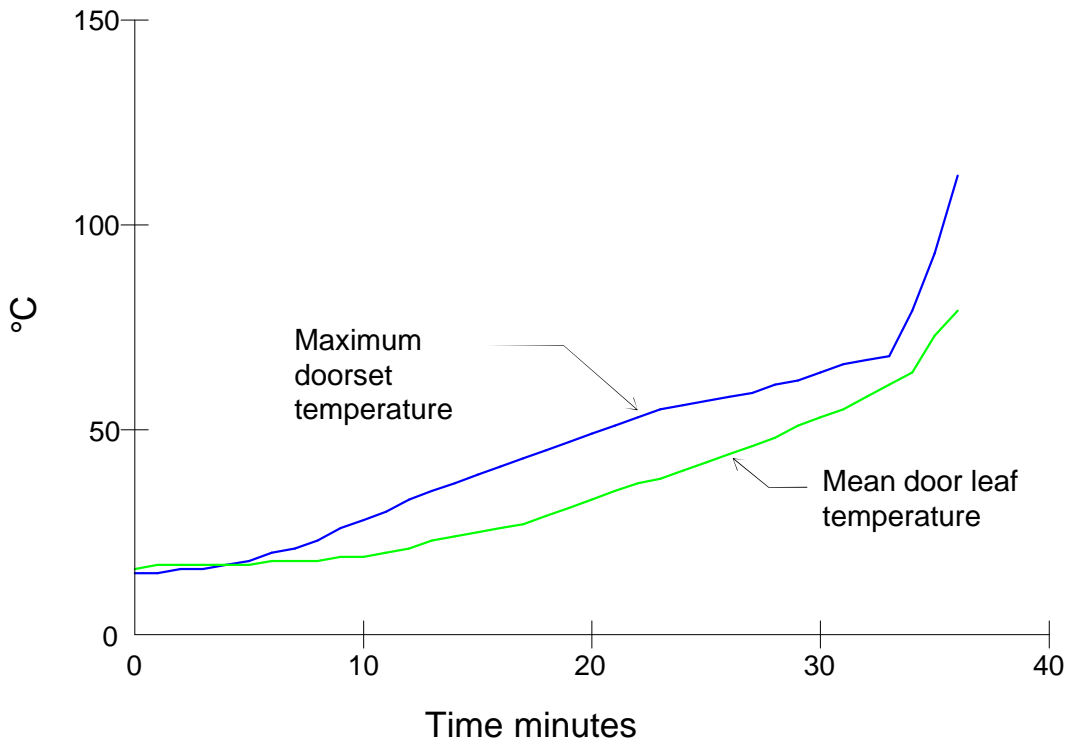
4.1 Furnace temperature curve



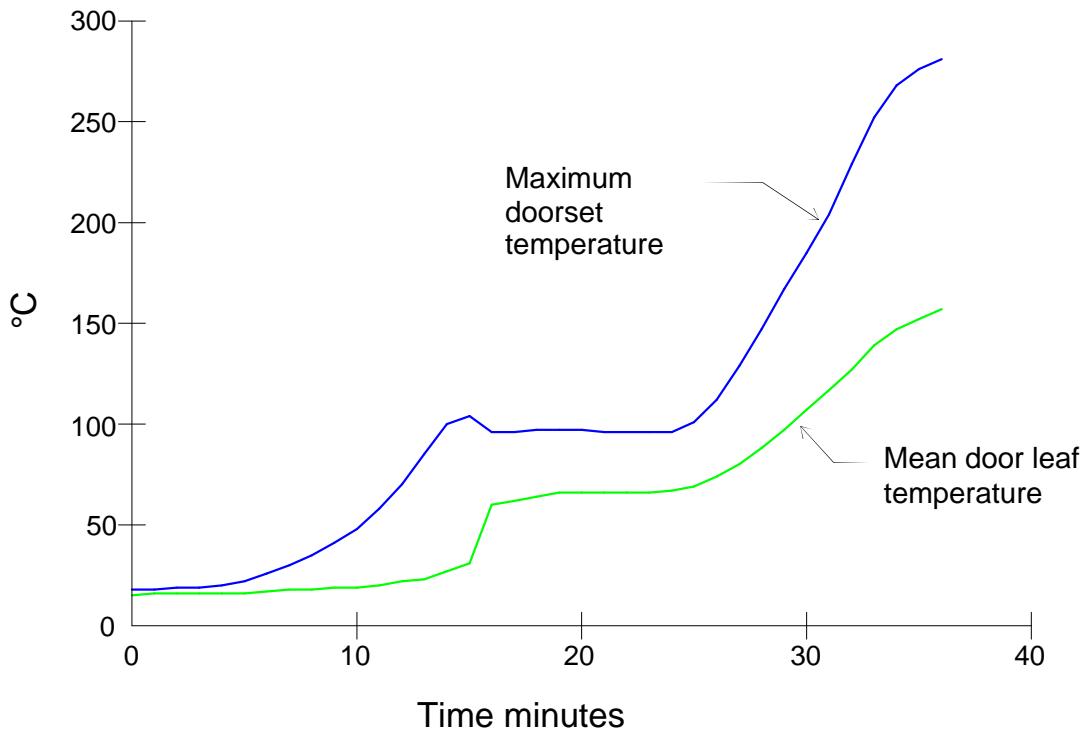
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4.2 Unexposed face temperature curves

Doorset A

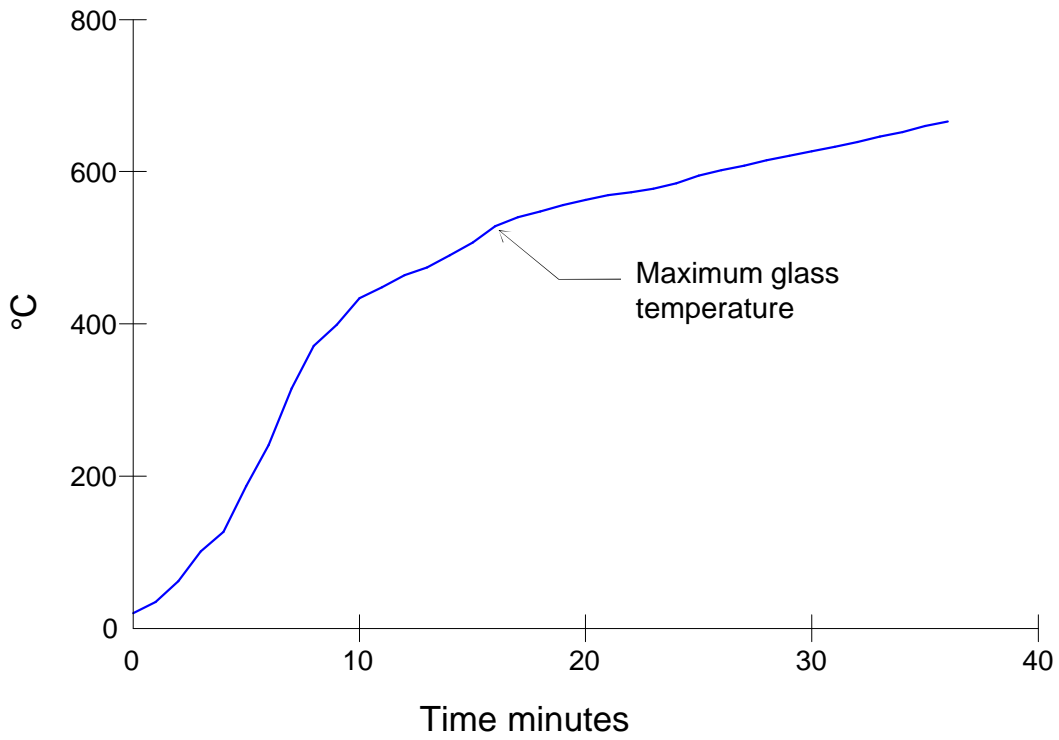


Doorset B



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Glass - doorset A only



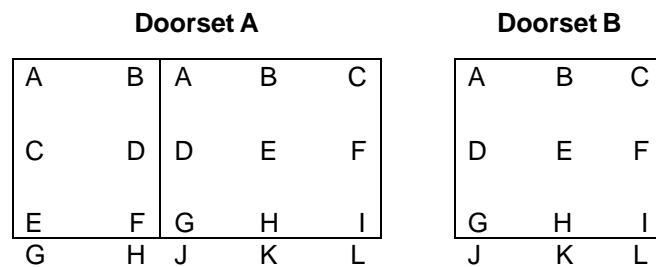
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4.3 Door distortion data

The following tables show the distortion of the doors in mm with an accuracy of ± 1 mm. A positive measurement indicates distortion towards the fire.

A negative measurement indicates distortion away from the fire.

J, K and L give vertical movement of the door, a negative reading indicates that the door has dropped.



Doorset A - left hand leaf (hung on the left and opening in towards the fire)

Time	A	B	C	D	E	F	G	H
10	0.5	0	0	0	-1	0	0	0
20	1.5	1	3	0	2	4	-2	-1

Doorset A - right hand leaf (hung on the right and opening in towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	0.5	0	1	3	4	5	1	2	2	-2	-1	-0.5
20	1	-0.5	3	-1	2	7	1	4	5	-3	-2	-2

Doorset B (hung on the right and opening in towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	4.5	1.5	0	2	-3	1	4	3	1	-2	-1.5	-1
20	8.5	3.5	3	9	-10	1	15	8	7	-4	-3.5	-3

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4.4 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	Comments
00.00	Test started.
01.30	Doorset A, the glass is cracking in both apertures.
02.05	Doorset A, there is smoke issuing from across the head of each leaf.
03.09	Doorset B, there is smoke issuing from across the head of the leaf.
03.31	Doorset A, there is an increase in the level of smoke issuing from the top of the meeting edge of the leaves.
04.05	Doorset A, there is smoke issuing from the upper perimeter of the leaf.
05.50	Doorset B, there is an increase in the level of smoke issuing from the top closing corner of the leaf.
06.19	Doorset A, there is smoke issuing from the latch position.
07.07	Doorset B, there is smoke issuing from the latch position.
08.22	Doorset A, there is discolouration of the top half of the glazed aperture.
08.30	Doorset A, there is discolouration at the top of the meeting edge of the leaves.
09.51	Doorset B, there is discolouration at the top closing corner and top of the closing edge of the leaf.
11.10	Doorset A, right leaf, there is discolouration at the top hanging corner of the leaf. Doorset B, there is discolouration at the top hanging corner of the leaf.
11.20	Doorset B, there is smoke issuing from the joint between the right stile and top right corner of the panel.
13.40	Doorset A, there is intermittent flaming from the latch position.
18.58	Doorset A, a cotton pad integrity test was performed at the latch position which resulted in ignition of the cotton pad thereby constituting integrity failure .
20.17	Doorset B, there is smoke issuing from the top half of the joint between the panel and hanging edge stile.
20.50	Doorset B, there is smoke issuing from the bottom half of the joint between the panel and the hanging edge stile.

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- 22.02 Doorset A, approximately 50% of the exposed face glazing beads on both panels has fallen away.
- 22.40 Doorset B, there is discolouration of the leaf face at the latch position.
- 24.43 Doorset B, there is an increase in the level of smoke issuing from the joints between the centre panel and stiles from the top half of the doorset only.
- 25.53 Doorset B, there is smoke issuing from the centre left of the panel and blistering of its surface.
- 27.08 Doorset A, there is an increase in the level of smoke issuing from the centre left of the middle panel.
- 29.00 Doorset B, a roving thermocouple reading was taken on the panel, a temperature of 41°C was recorded.
- 29.30 Doorset B, a roving thermocouple reading was taken on the panel, a temperature of 103°C was recorded.
- 30.00 Doorset B, a roving thermocouple reading was taken on the panel, a temperature of 63°C was recorded.
- 30.00 Doorset B, there is intermittent flaming from the latch position.
- 31.00 Doorset B, the surface temperature of the panel was recorded as 109°C.
- 31.30 Doorset B, a cotton pad integrity test was performed approximately 50mm above the latch position which resulted in ignition of the cotton pad thereby constituting **integrity failure**.
- 32.50 Doorset A, there is continuous flaming from the top glazing bead of the left aperture thereby constituting further **integrity failure**.
- 34.40 Doorset A, all of the centre panel has blistered and there is an increase in the level of smoke issuing.
- 35.18 Doorset B, there is discolouration of approximately 90% of the centre panel.
- 35.20 Doorset B, there is a glow visible at the bottom of the centre panel joint to bottom rail.
- 36.00 Test terminated.

4.5 Times to failure

Doorset A was tested in accordance with BS 476: Part 22: 1987, Method 8, Determination of fire resistance of uninsulated doorsets and shutter assemblies and doorset B was tested in accordance with BS 476: Part 22: 1987, Method 6, Determination of fire resistance of fully insulated doorsets and shutter assemblies. The requirements of the standard were satisfied for the following periods:

	Doorset A	Doorset B
Integrity	18 (eighteen) minutes	31 (thirty one) minutes
Insulation	0 (zero) minutes *	31 (thirty one) minutes



* In accordance with Section 8.6.1 of BS 476: Part 22: 1987, the specimen has not been evaluated for insulation.

5 Limitations

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

The results of this test were obtained using the door to frame gaps recorded in Figure 4. The fire resistance performance of doors of this design may change if substantially different gaps are employed.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. CIFL 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.

Signature:		
Name:	Mark Cummings	Jonathan Osborn
Title:	Senior Test Engineer	General Manager
Date of issue:	14 June 2007	

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Description of construction (refers to Figures 1 to 4)

Leaves - doorset A

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles		None fitted	-	-	-	-
Rails		None fitted	-	-	-	-
Core *		Fir finger jointed vertical lamels	39 thick x 50 wide x 300 long (each lamel)	550	8.5-9	1
Facings *		Oak veneered plywood	2.5 thick	-	-	2
Adhesive	Lipping	Urea formaldehyde	-	-	-	-
	Facing	Urea formaldehyde	-	-	-	-
	Core	Urea formaldehyde	-	-	-	-
Lippings - vertical edges only		Oak	11-12 thick	900*	8-9	3

* Information provided by the client and could not be verified by CIFL

Leaf - doorset B

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles * #		Fir finger jointed vertical lamels	39 thick x 50 wide x 300 long (each lamel) 200 wide (total stile)	550*	-	4
Rails - top & bottom * #		Fir finger jointed horizontal lamels	29 thick x 50 wide x 300 long (each lamel) 180 wide (total rail)	550*	-	5
Core *		Fir figure jointed horizontal lamels	39 thick x 50 wide x 300 long (each lamel)	550*	8.5-9	6
Panel		12 thick calcium silicate board sandwiched between 4 thick veneered MDF and fixed to the core with 40 long panel pins located 50 from corners at nominally 150 centres at 30° to the face of the panel	Overall 20 thick	-	-	7
Facings		Oak veneered plywood	2.5 thick	-	-	8
Adhesive	Lipping	Urea formaldehyde	-	-	-	-
	Facing	Urea formaldehyde	-	-	-	-
	Core	Urea formaldehyde	-	-	-	-
Lippings - vertical edges only		Oak	10-12 thick	900*	9	9

* Information provided by the client and could not be verified by CIFL

** Nominal density

Stiles and rails fixed together using 2No 15mm ø timber dowel and urea formaldehyde adhesive

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Door frame - doorset A

	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Head & jambs	Red deal	118 deep x 30 thick (excluding stop)	550*	10	10
Head to jamb jointing detail	Rebate joint - screwed	-	-	-	-
Stops	Red deal - planted (pinned)	Overall 9 deep x 44 wide	550*	9.5	11
Frame to supporting construction fire stopping detail	Tightly packed mineral fibre	Nominally 15 thick	-	-	-
Frame to supporting construction fixing detail	3No steel wood screws per jamb	100 long	-	-	-
Architrave	European redwood	18 thick	510**	-	-
Threshold	Non combustible	-	-	-	-

* Stated density not checked by laboratory

** Nominal density

Door frame - doorset B

	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Head & jambs	Red deal	118 deep x 30 thick (excluding stop)	550*	9.2	12
Head to jamb jointing detail	Rebate joint - screwed	-	-	-	-
Stops	Red deal - planted (pinned)	Overall 13 deep x 44 wide	550*	10	13
Frame to supporting construction fire stopping detail	Tightly packed mineral fibre	Nominally 15 thick	-	-	-
Frame to supporting construction fixing detail	3No steel wood screws per jamb	100 long	-	-	-
Architrave	European redwood	18 thick	510**	-	-
Threshold	Non combustible	-	-	-	-

* Stated density not checked by laboratory

** Nominal density

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Intumescent materials - doorset A

		Make/type	Size (mm)	Location	Key to figures	
Door edges	Head & hanging edges	None fitted	-	-	-	
	Meeting edges	Left leaf	Reddiplex Group plc Pyroplex graphite with brush seal	15 x 4	Centrally fitted in the meeting edge	14
		Right leaf	Reddiplex Group plc Pyroplex graphite seal	15 x 4	Centrally fitted in the meeting edge	15
Frame reveal - head & jambs		Reddiplex Group plc Pyroplex graphite with brush seal	15 x 4	Fitted in the frame reveal 10mm from the exposed face	16	
Around hinges		Fully interrupted	-	Hinge blade fully interrupts the intumescent seal	-	
Under hinge blade		None fitted	-	-	-	
Encasing latch body		None fitted	-	-	-	
Under latch forend		None fitted	-	-	-	
Under latch keep		None fitted	-	-	-	
Glazing perimeter - right leaf only		Lorient Polyproducts Ltd System 36/6	As Lorient's specification	Fitted around the perimeter of the glass	17	

Intumescent materials - doorset B

		Make/type	Size (mm)	Location	Key to figures
Door edges		None fitted	-	-	-
Frame reveal - head & jambs		Reddiplex Group plc Pyroplex graphite with brush seal	15 x 4	Fitted in the frame reveal 15mm from the exposed face	18
Around hinges		Fully interrupted	-	Hinge blade fully interrupts the intumescent seal	-
Under hinge blade		None fitted	-	-	-
Encasing latch body		None fitted	-	-	-
Under latch forend		None fitted	-	-	-
Under latch keep		None fitted	-	-	-
Panel perimeter		Reddiplex Group plc Pyroplex intumescent acrylic mastic	2 thick	Fitted at the perimeter of the panel	19

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Ironmongery - both doorsets

	Make/type	Size (mm)	Location	Key to figures
Hinges	3No Proline "Ceri" lift off type hinges per leaf	100 x 20 (blade size)	Located 180, 970 and 1960 from the head of the leaf	20
Closer	Dorma Door Controls Ltd TS73V surface mounted overhead closer	233 x 60 (footprint size)	Fitted to the exposed face as per manufacturer's specification	21
Latch	Basta 505/506 2 lever sash lock - disengaged	150 x 23 (forend size)	Fitted 1255 from the head of the right leaf of doorset A and 1235 from the head of doorset B to the centre of the latch nib	22
Furniture	Brushed aluminium lever handles	-	Fitted appropriate to the latch	23

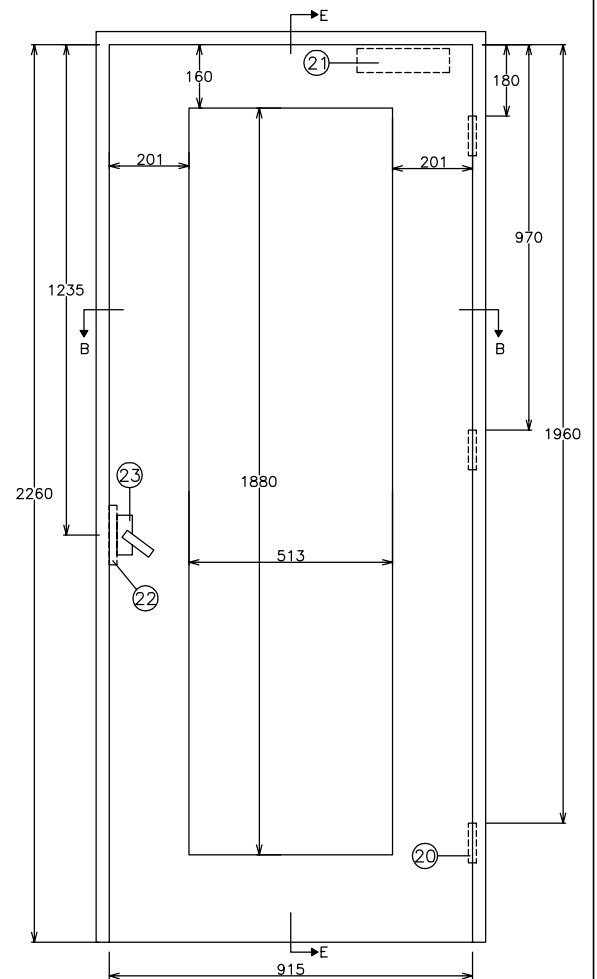
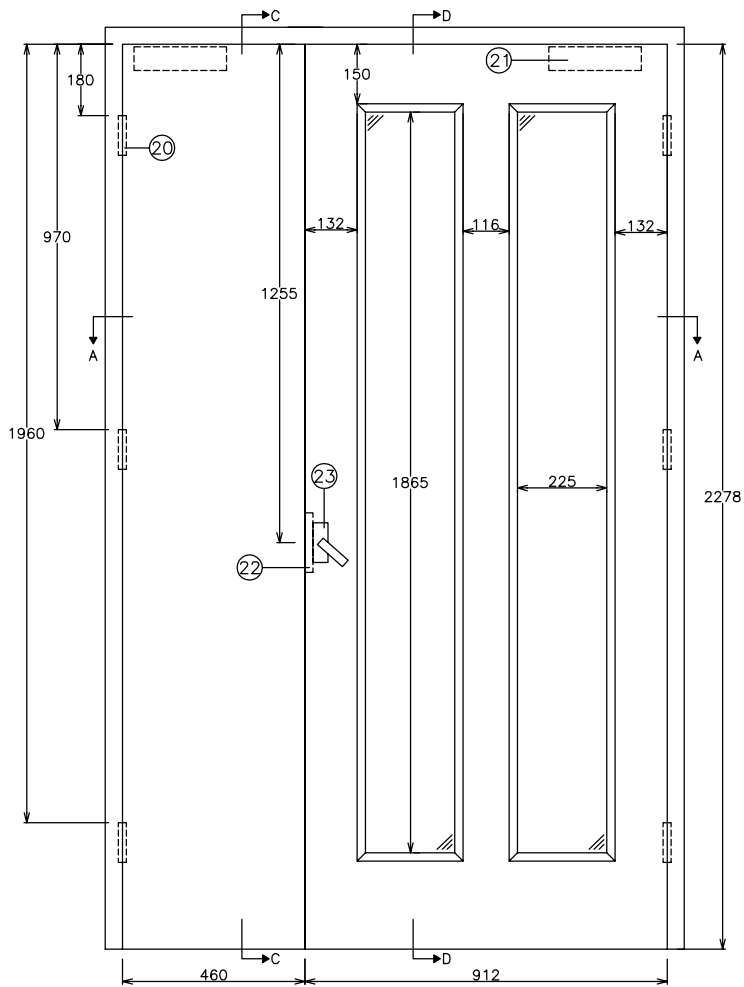
Glazing - right leaf of doorset A only

	Make/type	Size (mm)	Location	Key to figures
Glass type	2No apertures of Pilkington Pyroshield Georgian wired glass	Nominally 6 thick	Fitted centrally in leaf width spaced 116 apart and 150 from the head (see Figure 1)	24
Sight size	-	1865 high x 225 wide	-	-
Overall aperture size	-	1899 high x 259 wide	-	-
Expansion allowance	-	2.5 all edges	-	-
Beading	Sapele (MC 8.5%)	23.5 deep x 21 high including a 6 x 6 bolection return and 14° chamfer	Fitted on both faces around the perimeter of each glazing aperture	25
Beading fixings	Hand fitted steel pins	40 long	Fitted 50 from the corners at 150 centres and 30° to the face of the glass	26

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Doorset A

Doorset B



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Title Unexposed face elevation showing ironmongery positions
 (All dimensions in mm)

Date Drawn 07/03/07

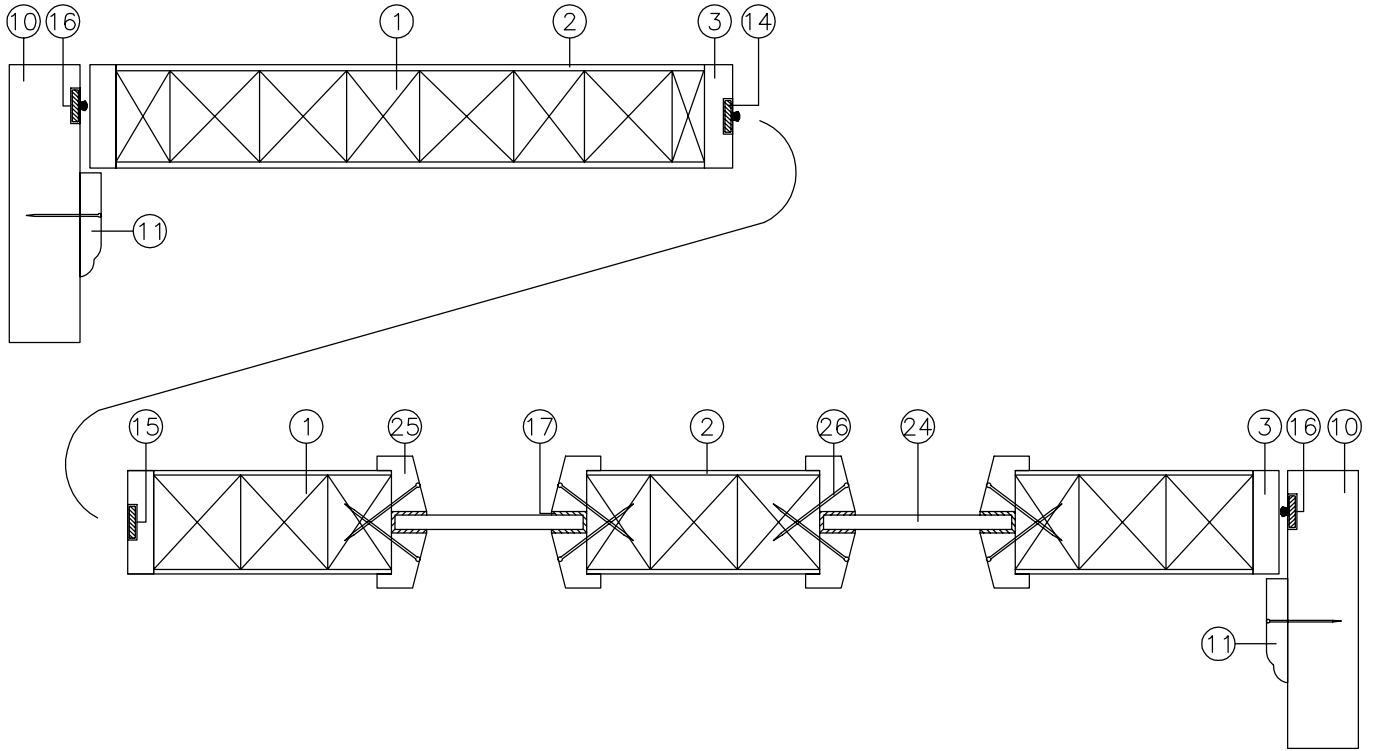
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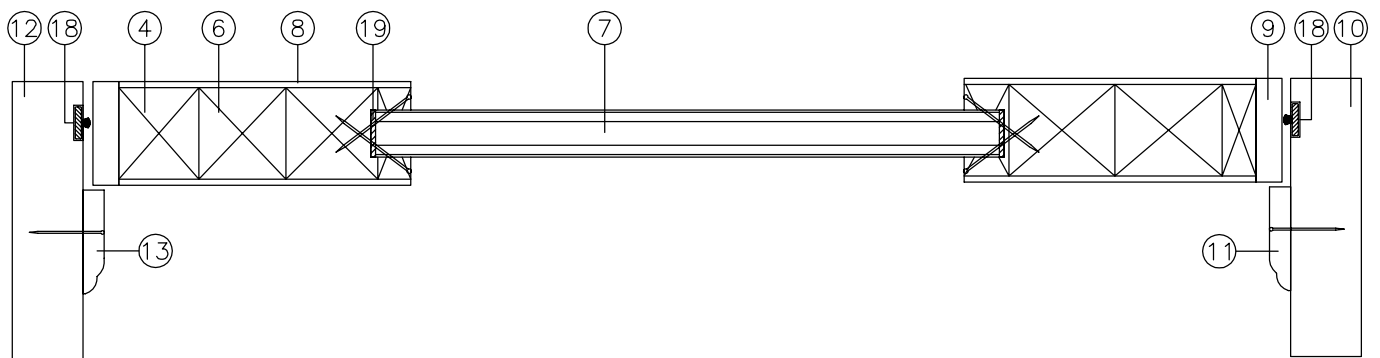
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Section A-A



Section B-B



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Title

Horizontal cross sections

Date Drawn
 07/03/07

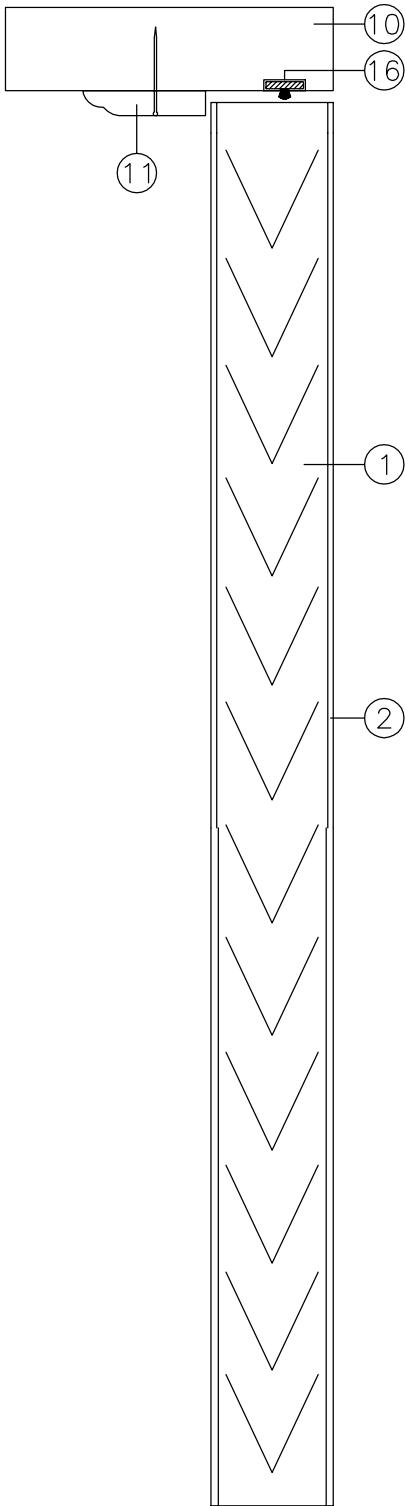
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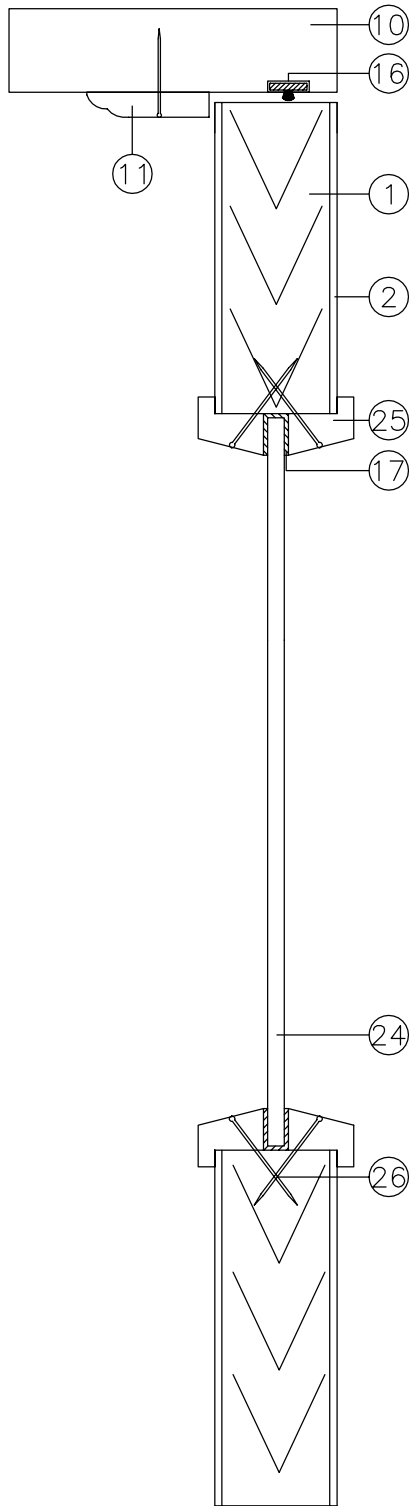
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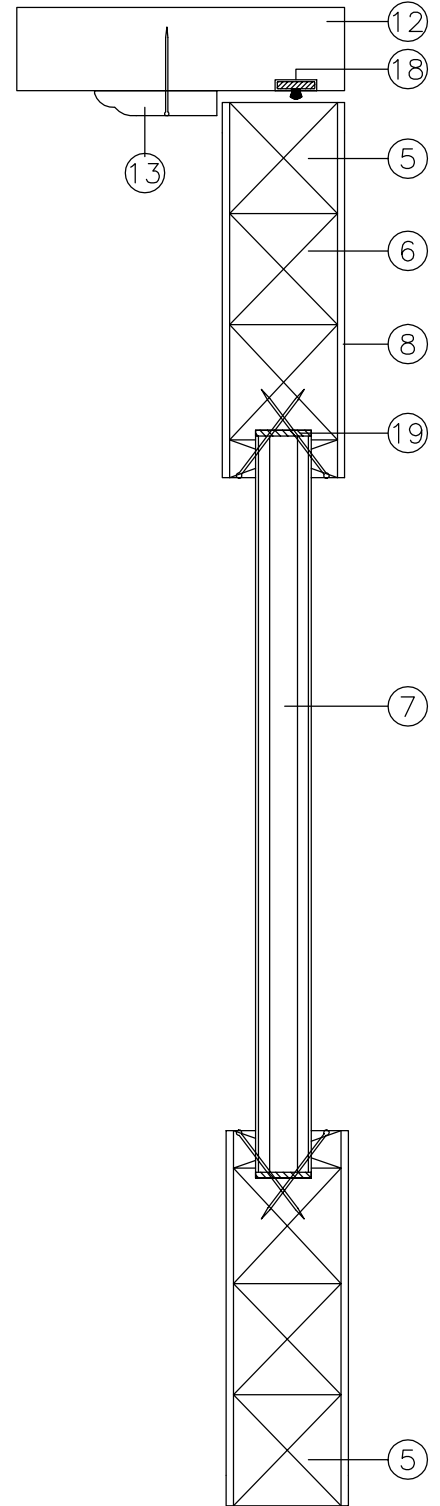
Section C-C



Section D-D



Section E-E



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High Wycombe, Buckinghamshire, HP14 4ND, UK.
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Title

Vertical cross sections

Date Drawn
09/03/07

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Scale
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