

CHILTERN

INTERNATIONAL FIRE

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CONFIDENTIAL

Test Report : RF97023

**A fire resistance test performed on
two single leaf single acting doorsets with glazing,
letterboxes and ventilation grilles**

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

Test Date: 19 March 1997

Test for :
Complete Fire Protection Ltd
1 Queen Victoria Street
St Philips
Bristol
BS2 0QR

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CHILTERN INTERNATIONAL FIRE LIMITED

A member of the TTL Chiltern Group of companies

Registered Office:

*Chiltern House, Stocking Lane, Highbenden Valley,
High Wycombe, Buckinghamshire HP14 4ND, UK*

Registered Number 3125010 ENGLAND



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Tested in accordance with BS 476 : Part 22 : 1987.

1. Introduction

The doorsets were manufactured and supplied for test by the client and delivered on 11 March 1997. Chiltern International Fire Limited (CIFL) constructed a timber stud/plasterboard clad partition and installed the doorsets into the partition.

2. Specification

2.1 Door leaves

The left leaf was designated doorset A and measured 2000mm high x 738mm wide x 53mm thick. The right leaf was designated doorset B and measured 2040mm high x 823mm wide x 44mm thick. Both 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. Doorset A was tested with a disengaged latch and is therefore applicable to both latched and unlatched doorsets. Doorset B was tested with an engaged latch and is therefore only applicable to latched doorsets.

2.1.1 Doorset A

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)
Core		European redwood lamels	30 wide x 45 thick	510**	-
Stiles		None fitted	-	-	-
Rails	Top	None fitted	-	-	-
	Bottom	None fitted	-	-	-
Facings		Far Eastern hardwood ply	4 thick	650**	14
Adhesive	Lipping	Waterproof PVA	-	-	-
	Facing	WBP type	-	-	-
	Core	PVA	-	-	-
Lippings		American white ash - all edges	9 thick	670**	9-10

* Stated density, not checked by laboratory

** Nominal density

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2.1.2 Doorset B

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)
Core		Flaxboard	38 thick	350*	-
Stiles		European redwood	38 thick x 100 wide	510**	-
Rails	Top & bottom	European redwood	38 thick x 100 wide	510**	10
	Mid	European redwood	38 thick x 75 wide	510**	-
Facings		Far Eastern hardwood ply	3 thick	650**	9
Adhesive	Lipping	Waterproof PVA	-	-	-
	Facing	WBP type	-	-	-
	Core	-	-	-	-
Lippings		Durian - vertical edges only	6.5 thick	688**	10

* Stated density, not checked by laboratory

** Nominal density

2.2 Door frame

2.2.1 Doorset A

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)
Head & Jambs		Durian	57 x 95 incl 25 deep stop	688**	9
Stops		Integral	25 deep	688**	9
Architrave		Plasterboard	12.5 thick	-	-
Threshold		Non combustible	-	-	-

* Stated density not checked by laboratory

2.2.2 Doorset B

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)
Head & Jambs		European redwood	125 x 32	510**	10
Stops		European redwood - planted	13.5 deep	510**	9
Architrave		Plasterboard	12.5 thick	-	-
Threshold		Non combustible	-	-	-

* Stated density not checked by laboratory

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2.3 Intumescent materials

2.3.1 Door A

		Make/type	Size (mm)	Location
Door edges	Head	None fitted	-	-
	Vertical edges	None fitted	-	-
Frame reveal	Head & closing edge	Fireplug FPSM/60 comprising FP202 (Fireplug 104) with brush seal	Intumescent strip 20 x 2 Brush 5 x 5	Surface mounted with the brush seal butted up to the doorstop
	Hanging edge	Fireplug FPSM/60 comprising FP201 (Fireplug 102) with brush seal	Intumescent strip 20 x 1 Brush 5 x 5	Surface mounted with the brush seal butted up to the doorstop
Around hinges		Continuous	-	Strip continues over the hinge blade
Under hinge blade		None fitted	-	-
Encasing latch body		Fireplug CFPM membrane paper (Fireplug 104)	0.5 thick	Wrapped around the latch barrel and spindle
Around latch forend		None fitted	-	-
Under latch forend		None fitted	-	-
Under latch keep		None fitted	-	-
Glazing perimeter		Fireplug IF152 (Fireplug 102) Fireplug IF222 (Fireplug 102)	15 x 2 22 x 2	Fitted between the rear face of the beading and the glass Lining the glazing aperture either side of the glass (see Fig 4 & 5)
Within letterbox		Fireplug FLBL/60 letterbox liner (Fireplug 102)	4 thick x 40 wide	Fitted around the inner surface of the letterbox aperture
Within ventilation grille		Fireplug FPG/60 intumescent honeycomb (Fireplug 105)	25 thick	Fitted centrally between the louvered face plates
Structural opening		Fireplug IF254 (Fireplug 102)	25 x 4	Centrally fitted in the rear face of the door frame in a groove

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2.3.2 Door B

		Make/type	Size (mm)	Location
Door edges	Head	None fitted	-	-
	Vertical edges	None fitted	-	-
Frame reveal	Head & closing edge	Fireplug FPSM/30 comprising FP152 (Fireplug 104) with brush seal	Intumescent strip 15 x 2 Brush 5 x 5	Surface mounted with the brush seal butted up to the doorstop
	Hanging edge	Fireplug FPSM/30 comprising FP151 (Fireplug 102) with brush seal	Intumescent strip 15 x 1 Brush 5 x 5	Surface mounted with the brush seal butted up to the doorstop
Around hinges		Continuous	-	Strip continues over the hinge blade
Under hinge blade		None fitted	-	-
Encasing latch body		Fireplug CFPM membrane paper (Fireplug 104)	0.5 thick	Wrapped around the latch barrel and spindle
Around latch forend		None fitted	-	-
Under latch forend		None fitted	-	-
Under latch keep		None fitted	-	-
Glazing perimeter		Fireplug IF102 (Fireplug 102)	10 x 2	Fitted between the rear face of the beading and the glass
Within letterbox		Fireplug FLBL/30 letterbox liner (Fireplug 102)	2 thick x 40 wide	Fitted around the inner surface of the letterbox
Within ventilation grille		Fireplug FPG/30 intumescent honeycomb (Fireplug 105)	15 thick	Fitted centrally between the louvered face plates
Structural opening		Fireplug IF154 (Fireplug 102)	15 x 4	Centrally fitted in the rear face of the door frame in a groove

2.4 Ironmongery

2.4.1 Doorset A

	Make/type	Size (mm)	Location
Hinges	Steel butts	100 x 30	Fitted 180, 920 and 1670 from the leaf head
Closer	Briton 2003	236 x 46	Fitted to the exposed face as per manufacturer's instructions
Latch	Union 3 lever lock and latch	153 x 26	1030 from the leaf head
Furniture	Aluminium lever handle	78 x 40	1048 from the leaf head
Letterplate	FLA letterplate	298 x 70	Fitted 920 from the head and 265 from the closing edge
Ventilation grille	Ventilation grille	336 x 336	Fitted 194 from the closing edge and 134 from the bottom of the leaf

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2.4.2 Doorset B

	Make/type	Size (mm)	Location
Hinges	Monarch steel butts	100 x 30	Fitted 180, 943 and 1708 from the leaf head
Closer	Ryobi No 62	225 x 50	Fitted to the exposed face as per manufacturer's instructions
Latch	Union 2 lever lock and latch	153 x 22	808 from the leaf head
Furniture	Aluminium lever handle	152 x 38	815 from the leaf head
Letterplate	FLA letterplate	298 x 70	Fitted 985 from the head and 303 from the closing edge
Ventilation grille	Ventilation grille	336 x 336	Fitted 242 from the closing edge and 130 from the bottom of the leaf

2.5 Door perimeter gaps

The gaps between the edge of the doors and frame were measured prior to test. A total of 24 readings were taken. The measurements (in mm) are given in Figure 6.

2.6 Closer Forces

Measured in accordance with FTSG Resolution No. 63

	Opening Force (Nm)	Closing Force (Nm)
Left	19	10
Right	39	18

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2.7 Glazing

	Make/type	Size (mm)	Location
Glass type	A - Pilkington Pyroshield - clear	6 thick	A - Fitted 146 from the leaf head and 280 from the closing edge B - Fitted 145 from the leaf head and 236 from the hanging edge
	B - Pilkington Pyroshield - cast	7 thick	
Sight size		A - 585 x 138 B - 368 x 314	-
Overall size	-	A - 625 x 178 B - 405 x 352	-
Beading	West African mahogany with a 10° chamfer and a 5 deep bolection return - nominal density 530kg/m ³ , MC 10%	25 x 17	Fitted around the perimeter of the glass on both sides
Beading fixings	Steel screws	40 long	Fixing beading to the leaf at 280 centres at nominally 30° to the glass
Expansion allowance	-	2-3 all round	-
Aperture framing	None fitted	-	-

3. Test Results

When tested in accordance with BS476: Part 22: 1987, the requirements of the standard were satisfied for the following periods:

	Door A	Door B
Integrity	38 (thirty eight) minutes*	16 (sixteen) minutes**
Insulation	38 (thirty eight) minutes***	16 (sixteen) minutes***
<p>* The initial failure was due to the glazed aperture at 38 minutes with further failure at 49 minutes of the letterbox but no subsequent failure of the leaf perimeter until 62 minutes with failure at the latch position. At the time of test termination at 63 minutes there had been no further failure of the doorset.</p>		
<p>** The initial failure was due to the glazed aperture at 16 minutes with further failure occurring at the leaf perimeter at 22 minutes with failure at the letterbox position at 43 minutes. There had been no failure of the ventilation grille when the doorset was blanked off at 50 minutes.</p>		
<p>*** In accordance with the note to clause 7.6.1.1 of BS 476: Part 22: 1987, the glazing has not been evaluated for insulation.</p>		

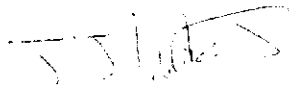
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4. Limitations

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 6. 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.



J J VIBERT
Laboratory Manager



C P A HOUCHEN
Head of Testing

Date of issue: 20/5/81

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5. Observations

Time	Comments
00.00	Test started.
03.04	Doorset B, the closing edge has distorted in towards the furnace by approximately 6mm.
05.43	Doorset B, the closing edge of the leaf has distorted excessively in towards the furnace prompting the latch to be manually engaged in order to continue the test and prevent premature failure. However the intumescent in the closing edge above the latch position has reacted and fallen out of the leaf.
06.42	Doorset B, the intumescent in the letterbox has fully reacted filling the aperture and pushing the letterbox plate open slightly on the unexposed face.
08.22	Doorset A, the closing edge has distorted in towards the furnace by approximately 8-10mm.
09.08	Doorset B, there is smoke issuing from the top closing corner of the leaf.
09.36	Doorset A, the intumescent in the letterbox has reacted thus opening the letter flap slightly. Doorset B, the intumescent has fully reacted in the letterbox and the letter plate is now open at approximately 80° to the face of the leaf.
11.55	Doorset B, there is smoke issuing from the top corners of the glazed aperture. The glass appears to be moving in towards the furnace as the beading has become detached along the top edge on the exposed face. The gap between the glazing and the beading on the unexposed face is approximately 10mm.
13.47	Doorset A, discolouration of the leaf face has occurred directly above the letterbox position.
15.14	Doorset B, the lipping is beginning to fissure approximately 150mm down from the top closing corner.
15.34	Doorset B, the top edge of the glass in the glazed aperture has now distorted in towards the furnace by approximately 30-35mm with respect to the beading on the unexposed face and small glows are beginning to appear between the glass and the beading as the glazing intumescent erodes away.
16.15	Doorset B, there is continuous flaming from around the top of the glazed aperture thereby constituting INTEGRITY FAILURE .

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- 20.30 Doorset B, a cotton pad integrity test was performed at the top closing corner, no failure.
- 22.45 Doorset B, a cotton pad integrity test was performed at the top closing corner of the leaf which resulted in ignition of the cotton pad thereby constituting **INTEGRITY FAILURE**. This was followed by continuous flaming thereby constituting further **INTEGRITY FAILURE**.
- 25.49 Doorset A, the top edge of the glass has distorted in towards the furnace by approximately 10-15mm with respect to the beading on the unexposed face.
- 30.00 Doorset A satisfactory.
- 30.43 Doorset A, the unexposed face beading around the upper half of the glazed aperture is beginning to discolour and fissure.
- 31.01 Doorset B, there is smoke issuing from the top of the ventilation grille.
- 33.30 Doorset B, the letterbox and grille are still in position and have maintained their integrity.
- 37.17 Doorset A, the top section of the beading in the glazed aperture is glowing across its width.
- 38.14 Doorset A, ignition of the beading around the glazed aperture has occurred thereby constituting **INTEGRITY FAILURE**.
- 39.07 Doorset A, the top closing corner of the leaf has distorted in towards the furnace by approximately 10-15mm and the top hanging corner has distorted in towards the furnace by approximately 10mm.
- 39.35 Doorset B, a vertical line of discolouration has occurred approximately 140mm from the closing edge of the leaf extending downwards for approximately two-thirds the height of the door.
- 41.51 Doorset B, the vertical line of discolouration is beginning to fissure.
- 42.01 Doorset B, a fissure has occurred directly above the letterbox position through which a glow is visible.
- 43.17 Doorset B, there is continuous flaming from the letterbox aperture above the letterbox position thereby constituting further **INTEGRITY FAILURE**.
- 44.49 Doorset B, the area of discolouration at the top of the leaf has fissured producing continuous flaming thereby constituting further **INTEGRITY FAILURE**.

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- 46.35 Doorset B, an area of erosion at the middle hinge position has resulted in ignition of the leaf face thereby constituting further **INTEGRITY FAILURE**.
- 47.06 Doorset A, a small glow has appeared above the letterbox between the letterplate and the letterbox aperture.
- 49.55 Doorset A, there is continuous flaming from the letterbox aperture thereby constituting further **INTEGRITY FAILURE**. The glass has now fallen out of the aperture in the leaf.
- 50.00 Doorset B, blanked off
- 51.40 Doorset A, the glazed aperture has now been blanked off with Rockwool.
- 56.51 Doorset A, the top and bottom closing corners have distorted in towards the furnace by approximately 20mm, the top hanging corner has distorted in towards the furnace by approximately 15mm, however the bottom hanging corner remains tight to the stop.
- 57.39 Doorset A, glows are appearing at the bottom closing corner of the leaf.
- 58.37 Doorset A, a glow has appeared at the top hanging corner of the leaf.
- 59.02 Doorset A, a glow has appeared at the top closing corner, which has distorted in towards the furnace by approximately 30-35mm.
- 60.00 Doorset A, the perimeter intumescent sealing has not failed at this time.
- 60.20 Doorset A, the intumescent within the ventilation grille has now fully reacted.
- 62.30 Doorset A, there is continuous flaming from the latch position thereby constituting further **INTEGRITY FAILURE**.
- 63.00 Test terminated.

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