Chiltern
INTERNATIONAL FIRE

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Test Report : RF99141B

A fire resistance test performed on a single leaf single acting doorset

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

Test Date: 23 February 2000

Test for : The Dixon International Group Ltd
Brewery Road
Pampisford
Cambridge
CB2 4HG

CONTENTS

1. Introduction

The doorset was supplied for test by the client and delivered on 4 February 2000. Chiltern International Fire Limited (CIFL) constructed a timber stud/plasterboard clad partition and installed the doorset into the partition.

Two doorsets were tested, only one being the subject of this report, the other doorset is the subject of report RF99141A. The doorset was tested on behalf of Intumescent Seals (A division of the Dixon International Group Ltd).

2. Specification

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

2.1 Door leaves

The leaf was designated doorset B and measured 2050mm high x 900mm wide x 52mm thick. The leaf was 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 a door 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 24 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)
43	20

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.

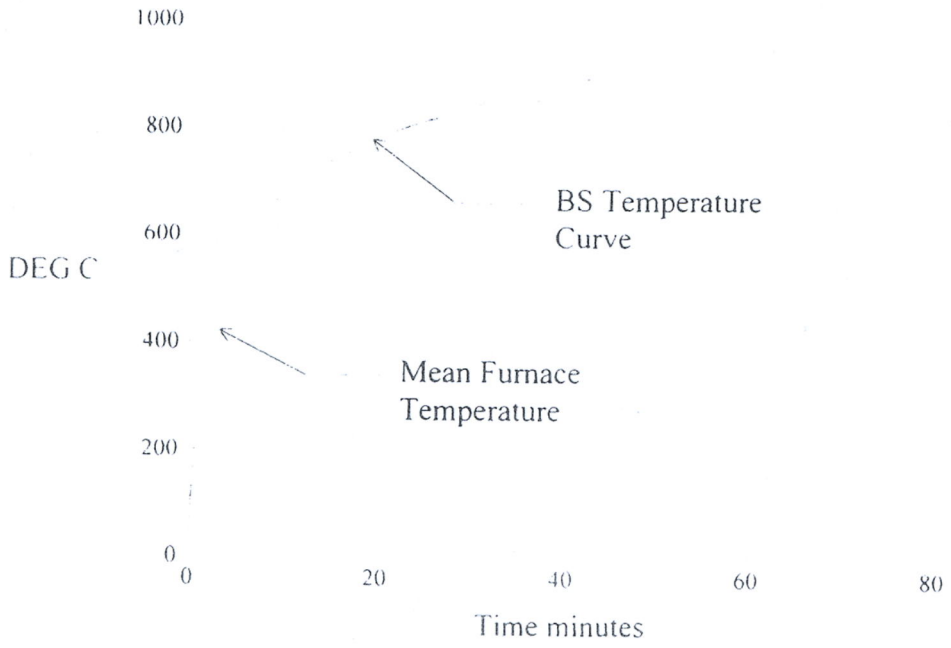
3.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 20: 1987 as closely as possible, using the average of six thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 4.1.

3.5 The temperature of the unexposed face was monitored by means of five thermocouples fixed to the surface of the door leaf, three thermocouples attached to the frame, one at midheight on each jamb and one centrally located above the leaf on the frame head. Further thermocouples were fitted to the centre of each grille and to the letterplate. The thermocouple positions are shown in Figure 4. The average temperature of the door leaf and maximum temperature of the doorset are shown graphically in Section 4.2.

4. Test Results

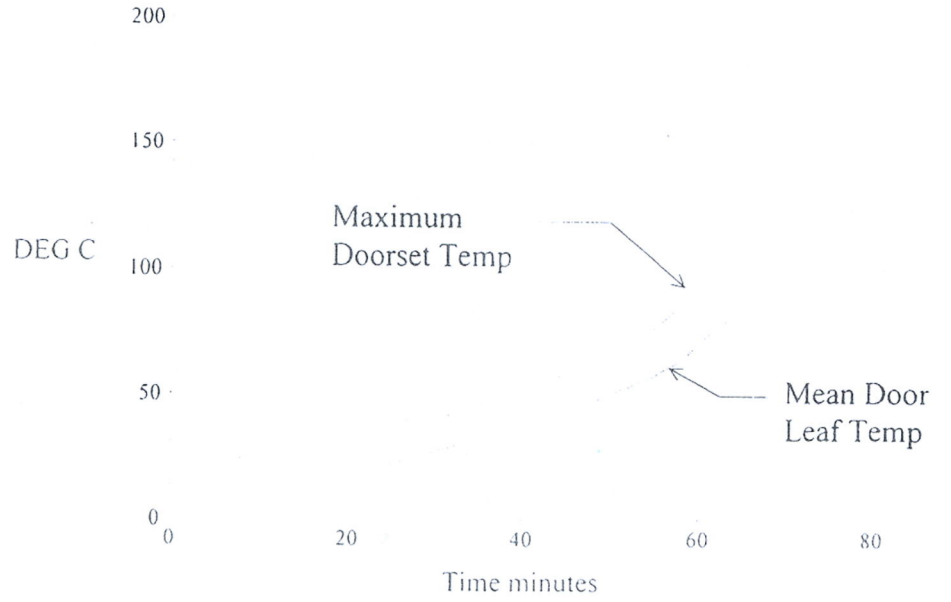
The following data and observations were recorded during the test.

4.1 Furnace temperature curve



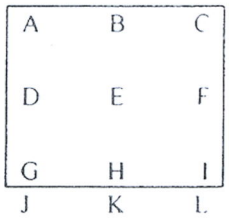
4.2 Unexposed face temperature curves

Doorset B



4.3 Door Distortion Data

The following tables show the distortion of the doors in 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.



Leaf (hung on the left and opening in towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
15	2	2	6	1	-3	4	3	4	7.5	-1.5	-1	-1.5
30	3	2	7	0	-7	0	6	12	15	-1	-2	-1.5
45	-2	4	11	0	-8	2	8	12.5	18	-1	-4.5	-1.5
60	8	6	16	1	-20	2	11	14	25	-4	-6	-4

4.4. Observations

All comments relate to the unexposed face unless otherwise specified.

Time	Comments
00.00	Test started.
02.36	There is smoke issuing from around the letterbox.
03.40	There is smoke issuing from the top grille.
06.00	The intumescent in the top ventilation grille has reacted
22.00	There is flaming within the top air transfer grille along the plastic holders.
23.00	Top ventilation grille. **INSULATION FAILURE**
25.30	The flaming within the air transfer grille has ceased.
36.00	Letter box. **INSULATION FAILURE**
37.00	The letterbox unit is separating from the door leaf across the top edge of the unit.
43.00	The reacted intumescent within the air transfer grille is spilling through the grille on to the unexposed face of the leaf.
50.50	The lower half of the top intumescent grid has reacted.
53.40	There is intermittent flaming from the top left corner of the letterbox.
55.10	There is intermittent flaming from the top left corner of the letterbox.
58.05	A cotton pad integrity test was performed in the area of the letterbox, no failure.
59.18	There is continuous flaming from the bottom closing corner between the frame and the leaf thereby constituting **INTEGRITY FAILURE.**
65.00	There is a glow visible at the top closing corner of the leaf.
66.32	There is continuous flaming from along the top edge of the letterbox thereby constituting further **INTEGRITY FAILURE.**
69.10	There is continuous flaming from the leaf head thereby constituting further **INTEGRITY FAILURE.**

77.00 There is continuous flaming from the top right corner of the top air transfer grille thereby constituting further **INTEGRITY FAILURE**.

78.00 Bottom grille. **INSULATION FAILURE.**

80.00 Test terminated.

4.5 Times to failure

When 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:

Integrity	**59 (fifty nine) minutes**
Insulation	**23 (twenty three) minutes**

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.

M J BULLOCK
Fire Testing Manager

J J OSBORN
Senior Fire Test Engineer

Date of issue: 24/7/00

Description of Construction (refers to Figures 1 to 4)

Leaf (identified as being an F R Shadbolt Ltd Shadmaster 60 leaf)

		Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Stiles		None fitted	-	-	-	-
Rails	Top	Spruce – laminated (6mm horizontal strips)	75 wide x 32 thick	440*	-	1
	Bottom	Spruce – laminated (6mm horizontal strips)	75 wide x 32 thick	440*	-	1
Core		Laminated spruce (6mm vertical strips)	32 thick	440*	-	2
Facings		Pyroex veneered chipboard	10 thick	740*	12	3
Adhesive	Facing	Urea formaldehyde	-	-	-	-
	Core	Urea formaldehyde	-	-	-	-
	Lipping	Urea formaldehyde	-	-	-	-
Lippings		Hardwood - vertical edges only	10 thick	650**	-	4

* Stated density, not checked by laboratory

** Nominal density

Door frame

	Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Head & Jambs	Hardwood - Sapele	90 wide x 40 thick	650**	9	5
Stops	Hardwood - Sapele	30 wide x 15 deep	650**	-	6
Architrave	Hardwood – exposed face only	45 wide x 15 deep	650**	-	-
Threshold	Non combustible	-	-	-	-

** Nominal density

Intumescent materials/Smoke seals

		Make/type	Size (mm)	Location	Key to figures
Door edges	Head	None fitted	-	-	-
	Vertical edges	None fitted	-	-	-
	Bottom	Ventura Seals automatic door bottom seal ref. V411 ARI.	32 wide x 37 deep	Centrally fitted in the bottom of the leaf, fixed with 15mm steel screws	7
Frame reveal	Head	2 No Therm-A-Seal intumescent seals with a Ventura Seals VS88 Elastomeric smoke seal	10 x 4	Centrally fitted in the frame reveal, spaced 14 apart	8 9
	Jambs	2 No Therm-A-Seal intumescent seals with a Ventura Seals VS88 Elastomeric smoke seal	10 x 4	Centrally fitted in the frame reveal, spaced 14 apart	8 9
Around hinges		Partially interrupted	10 x 4	One strip interrupted and one strip continuous past the hinge blade	-
Under hinge blade		Therm-A-Line intumescent pad	2 thick (100 x 30)	Fitted beneath the hinge blade on the leaf and frame	-
Encasing latch body		Therm-A-Flex intumescent pad	1 thick	Latch encased in the intumescent pad (1No. 20x10x1 & 1No. 10x10x1 on either side of the barrel	-
Under latch forend		Therm-A-Flex intumescent pad	1 thick (57 x 25)	Forend bedded on intumescent pad	-
Under latch keep		Therm-A-Flex intumescent pad	1 thick (57 x 20)	Keep bedded on intumescent pad	-
Letterbox		Intumescent Seals Ltd Therm-A-Plate LPTC54 - to suit 120 x 300 cut-out in door	6 thick	Fixed to the top and bottom aperture with steel pins 30mm long and 1.5mm in diameter, 50mm from the ends of the aperture and 10mm from the faces of the leaf	10
Top & bottom ventilation grille		Intumescent Seals Ltd Therm-A-Grille	600 x 600 x 40 thick	Fixed to the aperture with 8 No steel screws	11