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CONFIDENTIAL

Test Report : Chilt/RF07024

**A fire resistance test performed on
a single leaf, single acting doorset with glazing and a
glazed side panel**

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

Test Date: 27 February 2007

Test for :
LB Plastics Ltd
Firs Works
Neather Heage
Derby
DE56 2JJ

Page 1 of 17

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 doorset and side panel were manufactured and supplied for test by the client and delivered during February 2007. Chiltern International Fire Limited (CIFL) constructed a timber stud/plasterboard clad partition and installed the specimen into the partition.

2 Specification

Details of the specimen are shown in Figures 1 and 2 and the Appendix.

2.1 Door leaf

The leaf measured 1955mm high x 768mm wide x 44mm 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 doorset fitted with an engaged latch.

2.2 Side panel

The side panel measured overall 2025mm high x 600mm wide x 70mm thick and included two glazed apertures with sight sizes of 1030mm high x 460mm wide for the top aperture and 785mm high x 460mm wide for the bottom aperture.

2.3 Door perimeter gaps

The gaps between the edge of the doors and frame were measured prior to test. A total of 12 readings were taken. The measurements (in mm) are given in Figure 2.

2.4 Closer forces

Measured in accordance with FTSG Resolution No 63.

Opening force (Nm)	Closing force (Nm)
36	17

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3 Test conditions

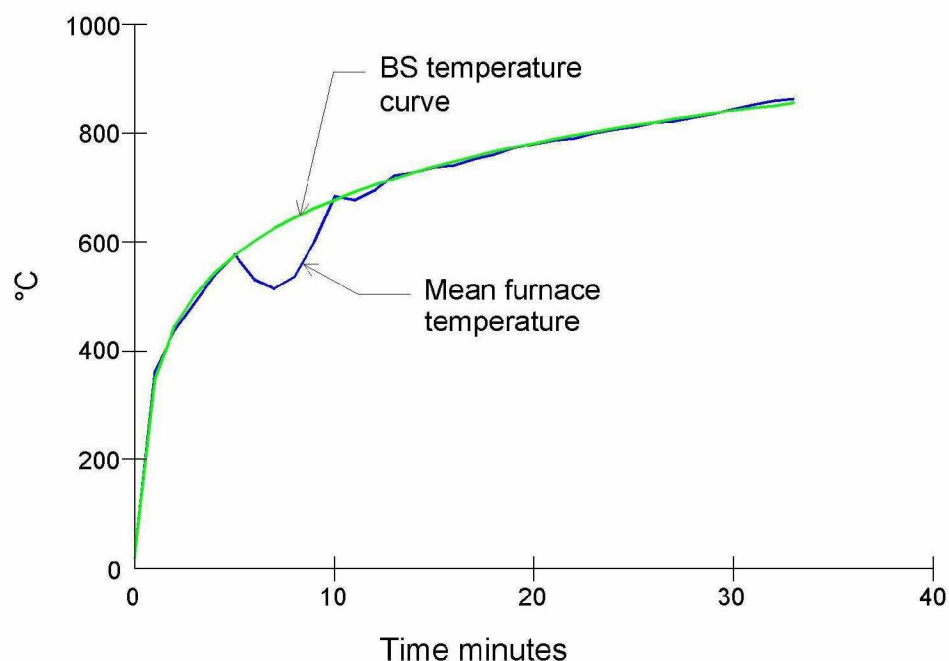
- 3.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71, 72 and 78 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 3.2 The ambient temperature of the test area at commencement of test was 16°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 specimen, and four thermocouples attached to each frame, one at midheight on each jamb and one centrally located above the leaf and side panel on the frame head. Two additional thermocouples were fixed to the glass of each aperture. The thermocouple positions are shown in Figure 2. The average temperature of the door leaf and maximum temperature of the doorset are shown graphically in Section 4.2.

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4 Test results

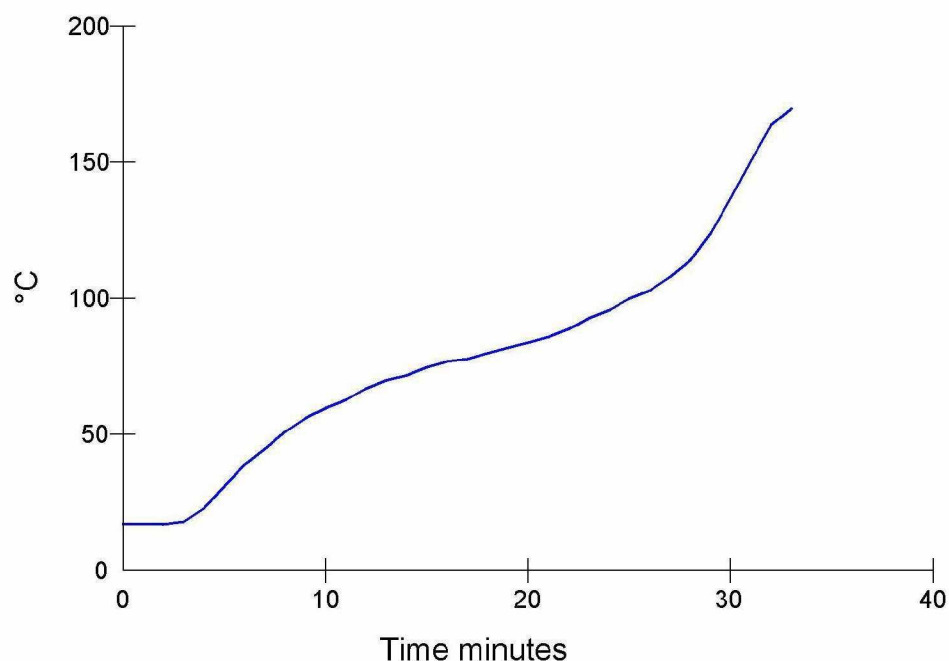
The following data and observations were recorded during the test.

4.1 Furnace temperature curve



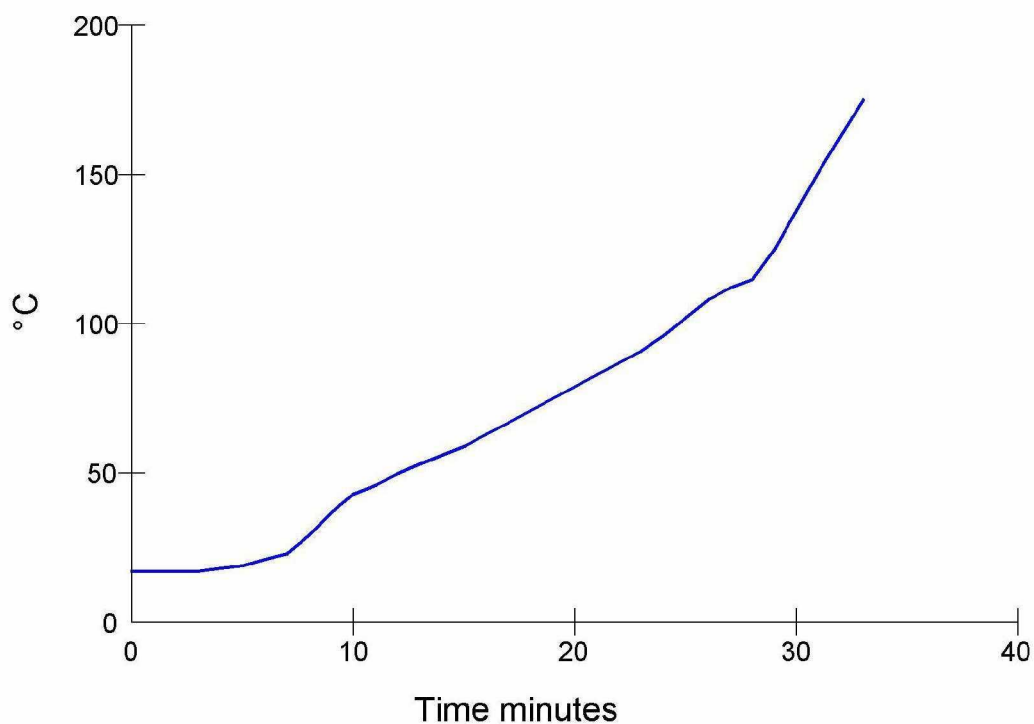
4.2 Unexposed face temperature curves

Mean temperature of leaf

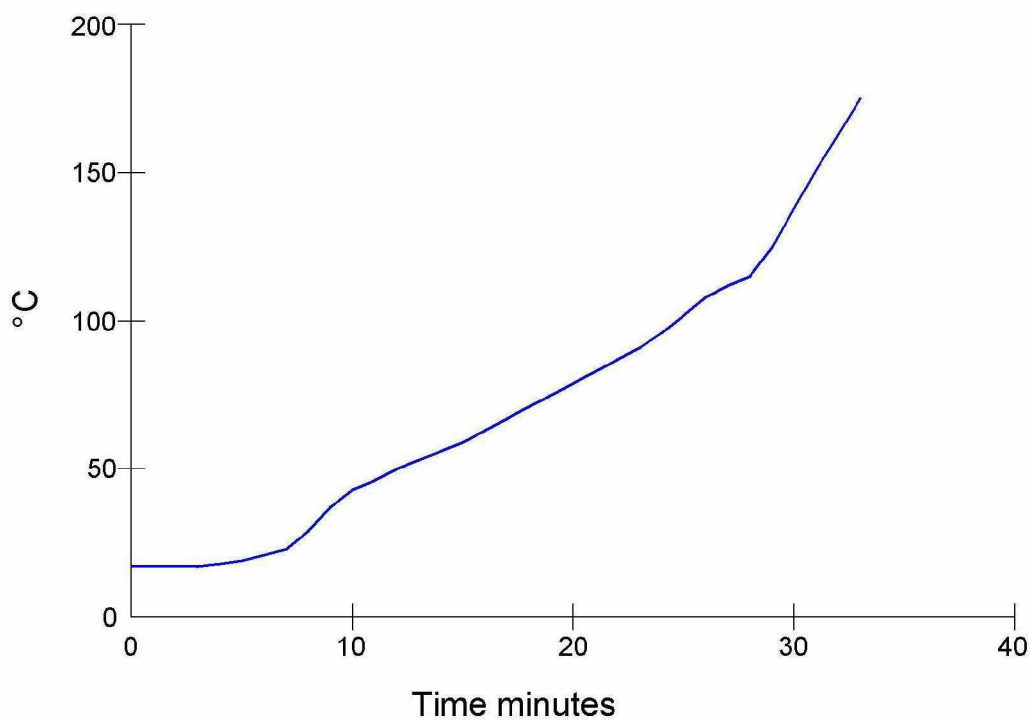


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Mean temperature of glass - leaf

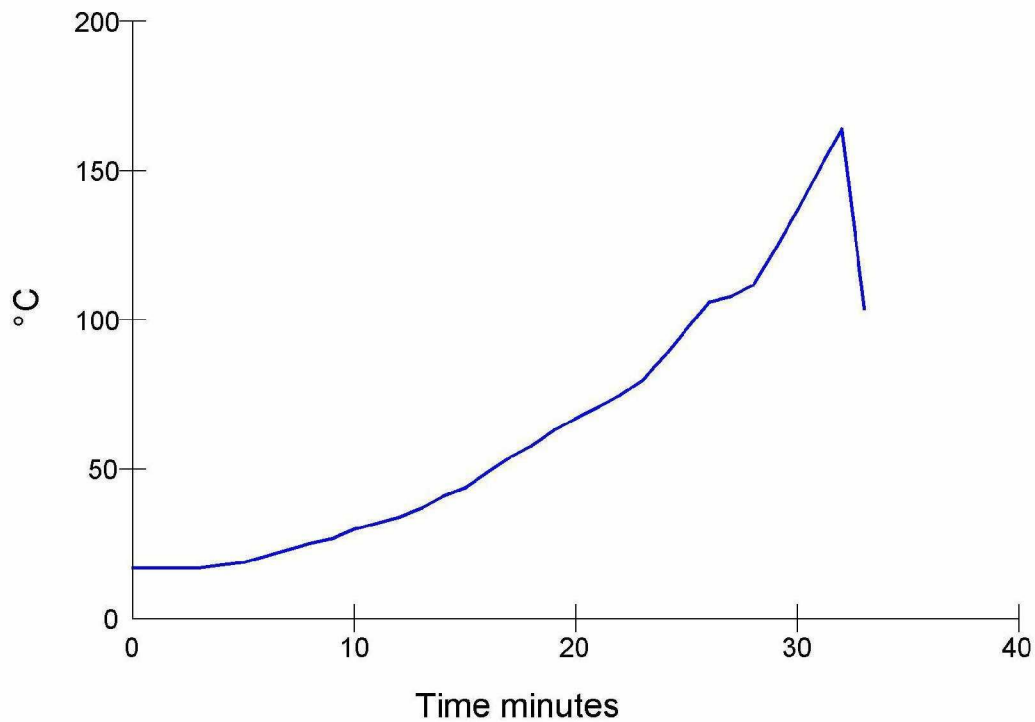


Mean temperature of glass - top aperture of side panel

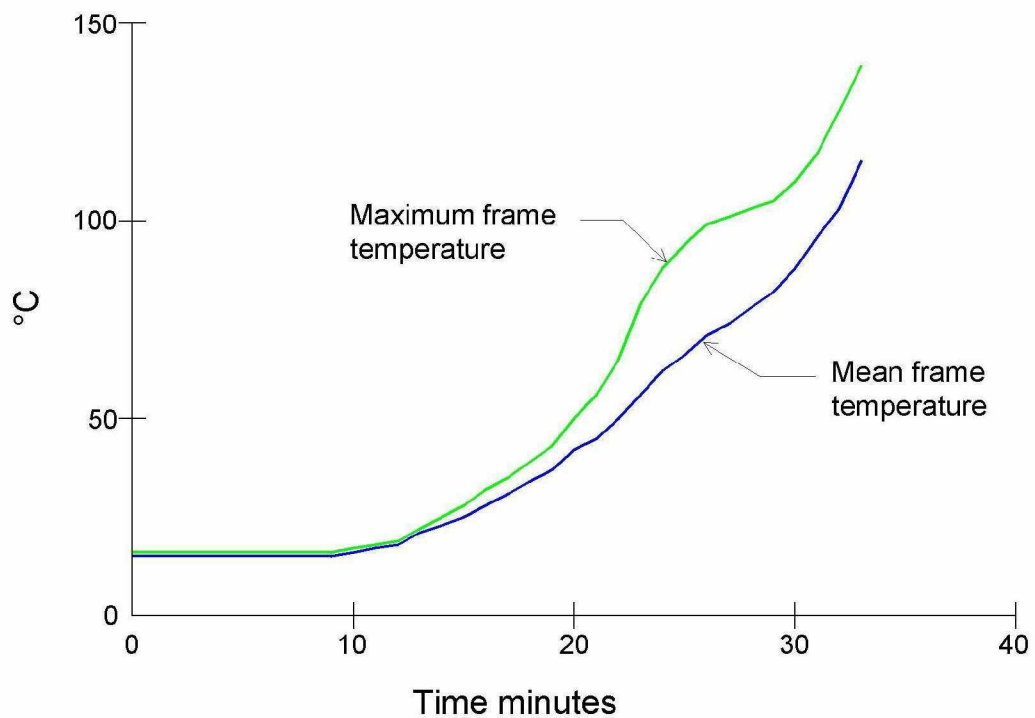


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Mean temperature of glass - bottom aperture of side panel



Mean and maximum temperatures of door frame



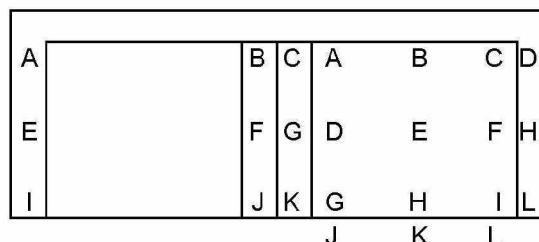
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4.3 Door distortion data

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.



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	-1.5	-1.5	-1.5	0	-	-8.5	0	-0.5	0.5	0.5	0.5	5.5
20	13	2	-4	22.5	-	2.5	5	2	0.5	1	2	7.5
30	-	-	-	22.5	-	3.5	5	2	1.5	1	-	-

Frame

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	-1.5	0.5	-0.5	-3.5	0.5	7.5	8.5	10	-0.5	1	-0.5	0
20	-9.5	-11.5	-1.5	-13.5	-2	-2.5	5	6	-1.5	0	-0.5	-1
30	-20.5	-40.5	16.5	-	-	-	-	-	-	-	-	-

Where a dash (-) applies, a distortion reading could not be taken

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4.4 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	Comments
00.00	Test started.
02.10	Side panel, top glazing aperture, there is smoke issuing from the left side, centre and top. Doorset, the glass has cracked.
02.40	Side panel, the glass in both glazing apertures has cracked.
03.00	Side panel, there is smoke issuing from the mid rail.
03.20	Side panel, the glazing intumescent is reacting.
03.50	Side panel, bottom glazing aperture, there is smoke issuing from the top hanging corner and the intumescent is reacting.
05.00	Doorset, there is smoke issuing from the latch position and top closing corner of the leaf.
06.20	All glass intumescent has reacted.
11.30	Doorset, there is an increase in the level of smoke issuing from the top closing corner of the leaf.
13.22	Doorset, there is discolouration at the top hanging corner of the leaf, latch position, top rail and top of the closing and hanging edges of the leaf.
15.20	Doorset, there is an increase in the level of smoke issuing from the top of the closing edge of the leaf. The joint between the side panel and door is distorting.
17.20	Doorset, the top glazing bead has distorted away from the leaf.
21.30	Side panel, the frame is distorting around both glazing panels.
23.00	There is an increase in the level of smoke issuing from the whole specimen.
25.30	Doorset, there is intermittent flaming from the middle hinge position.
26.15	There is a glow visible through the frame gap.
28.59	Doorset, a cotton pad integrity test was performed at the top hanging corner of the leaf, no failure.
30.00	Specimen satisfactory.

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- 30.10 Doorset, a cotton pad integrity test was performed at the top hanging corner of the leaf which resulted in ignition of the cotton pad thereby constituting **integrity failure**.
- 30.45 Doorset, there is continuous flaming from the top glazing bead ignited from the bottom of the hanging edge of the leaf thereby constituting further **integrity failure**.
- 33.40 Test terminated.

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4.5 Times to failure

When tested in accordance with BS 476: Part 22: 1987, Method 7, Determination of fire resistance of fully insulated doorsets and shutter assemblies, the requirements of the standard were satisfied for the following periods:


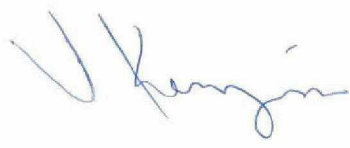
Integrity	30 (thirty) minutes
Insulation	30 (thirty) minutes

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 2. 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	Vincent Kerrigan
Title:	Senior Test Engineer	Deputy Technical Manager
Date of issue:	23 May 2007	23 May 2007

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Description of construction (refers to Figures 1 to 2 and the Appendix)

Door leaf

The door leaf was identified as a Nan Ya FD30 Trimmable doorblank

	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)
Stiles	Sapele	69 wide x 40 thick	640**	-
Rails - top & bottom	Sapele	100 wide x 40 thick	640**	-
Core	Phenolic foam	Maximum 40 thick Minimum 15 thick at the mock panel perimeters	150-180*	-
Facings	SMC (glass reinforced polyester)	2 thick	-	-
Adhesive	Facings	Polyurethane	-	-
Lippings - vertical edges	Sapele	32 wide x 40 thick	640**	-

* Stated density, not checked by laboratory

** Nominal density

Door frame

(see Appendix for construction details and product references)

	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)
Head & jambs	UPVC with steel reinforcement as supplied by Sheerframe SR77950	Overall 69 thick x 70 deep including 18 deep stop	-	-
Head to jamb jointing detail	Mitred fusion welded and mild steel angle	-	-	-
Stops	Integral	18 deep	-	-
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	None fitted	-	-	-
Threshold	Stormguard - Masterguard 15	94 wide x 8.6 (minimum), 15.5 (maximum) deep	-	-

* Stated density not checked by laboratory

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Side panel

		Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)
Stiles		UPVC with steel reinforcement and a 19 wide x 28 deep push fit loose bead fitted to the exposed face	Overall 70 deep x 68 thick	-	-
Rails	Top & bottom	UPVC with steel reinforcement and a 19 wide x 28 deep push fit loose bead fitted to the exposed face	Overall 70 deep x 68 thick	-	-
	Mid	UPVC with steel reinforcement and 2No 20 wide x 28 deep push fit loose beads fixed to the exposed face	Overall 70 deep x 70 thick	-	-
Glass type		2No double glazed apertures comprising 10mm Pilkington Pyrodur (exposed face), 8mm steel spacer and 6.4mm Pilkington Optilam laminated glass (unexposed face)	24.4 thick	-	-
Sight size	Top aperture	-	1030 high x 460 wide	-	-
	Bottom aperture	-	785 high x 460 wide	-	-
Overall aperture size	Top aperture	-	1072 high x 501 wide	-	-
	Bottom aperture	-	827 high x 501 wide	-	-

* Stated density, not checked by laboratory

** Nominal density

Intumescent materials - doorset

		Make/type	Size (mm)	Location
Door edges	Head & hanging edges	None fitted	-	-
	Closing edge	Environmental Seals Ltd Envirograf HP paper	1 thick	Fitted under the aluminium fast fit
Frame reveal - head & jambs		Environmental Seals Ltd Envirograf ES253 vinyl covered adhesive strip	25 x 3	Centrally fitted in the frame reveal
		SW73144 brush seals	-	Fitted either side of the 25 x 3 seal
Around hinges		Fully interrupted	-	Hinge blade fully interrupts the intumescent seal
Under hinge blade		Environmental Seals Ltd Envirograf HP	1 thick	Fitted under the hinge blade on both leaf and frame
Encasing latch body		Environmental Seals Ltd Envirograf LHP	1 thick	Wrapped around the latch body
Under latch forend		Environment Seals Ltd Envirograf LHP	1 thick	Fitted under the latch forend
Under latch keep		Environmental Seals Ltd Envirograf LHP	1 thick	Fitted under the latch keep
Glazing perimeter		Environmental Seals Ltd Envirograf Group 37 Special	3 thick	Fitted around the perimeter of the aperture between glass and beading

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Intumescent materials - side panel

	Make/type	Size (mm)	Location
Panel edges	Environmental Seals Ltd Envirograf ES302	30 x 2	Centrally fitted in the outer edge of the panel
	2No Environmental Seals Ltd Envirograf ES102	10 x 2	Fitted at ead edge of the outer edge of the panel
Glazing perimeter	Environmental Seals Ltd Group 77 Special	3 thick	Fitted around the perimeter of the aperture between glass and beading

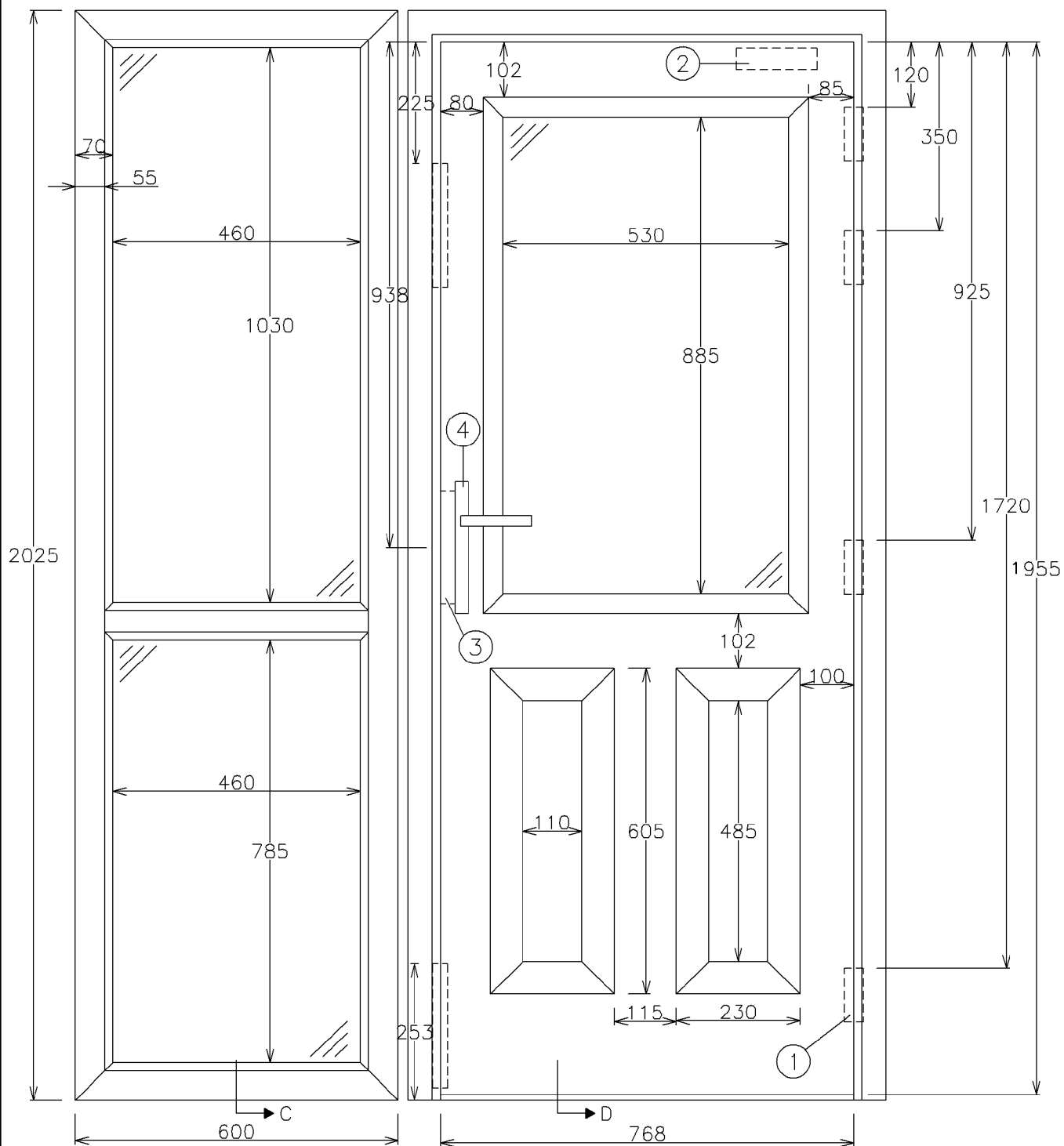
Ironmongery - doorset

	Make/type	Size (mm)	Location	Key to figures
Hinges	4No Seely Engineering Asia Masterdor HNG 133 stainless steel hinges	100 x 35 (blade size)	Fitted 120, 350, 925 and 1720 from the head of the leaf	1
Closer	Laidlaw B2W aluminium and steel surface mounted overhead closer	150 x 40 (footprint size)	Fitted to the exposed face as per manufacturer's specification	2
Latch	Winkhaus STV-F2070 3 point lock - centre point only engaged	1770 x 20 (forend size)	Fitted 938 from the head to the centre of the latch nib	3
Furniture	Hoppe aluminium lever handles	27 x 245 (footprint size)	Fitted appropriate to the latch	4

Glazing - doorset

	Make/type	Size (mm)	Location
Glass type	Double glazed unit comprising 10mm Pilkington Pyrodur (exposed face), 8mm steel spacer and 6.4mm Pilkington Optilam laminated glass (unexposed face)	24.4 thick	Fitted 85 from the hanging edge and 102 from the head of the leaf
Sight size	-	885 high x 530 wide	-
Overall aperture size	-	939 high x 588 wide	-
Expansion allowance	-	2 all round	-
Beading	Nan Ya Plastics ABS glazing cassette snap together fitting	Overall 16 deep x 37 high	Fitted on both faces around the perimeter of the aperture
Beading fixings	Steel 'U' channel	65 long x 35 high x 18 high	Perimeter edge - 3 per edge, equally spaced, fitted as inserts within phenolic foam

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

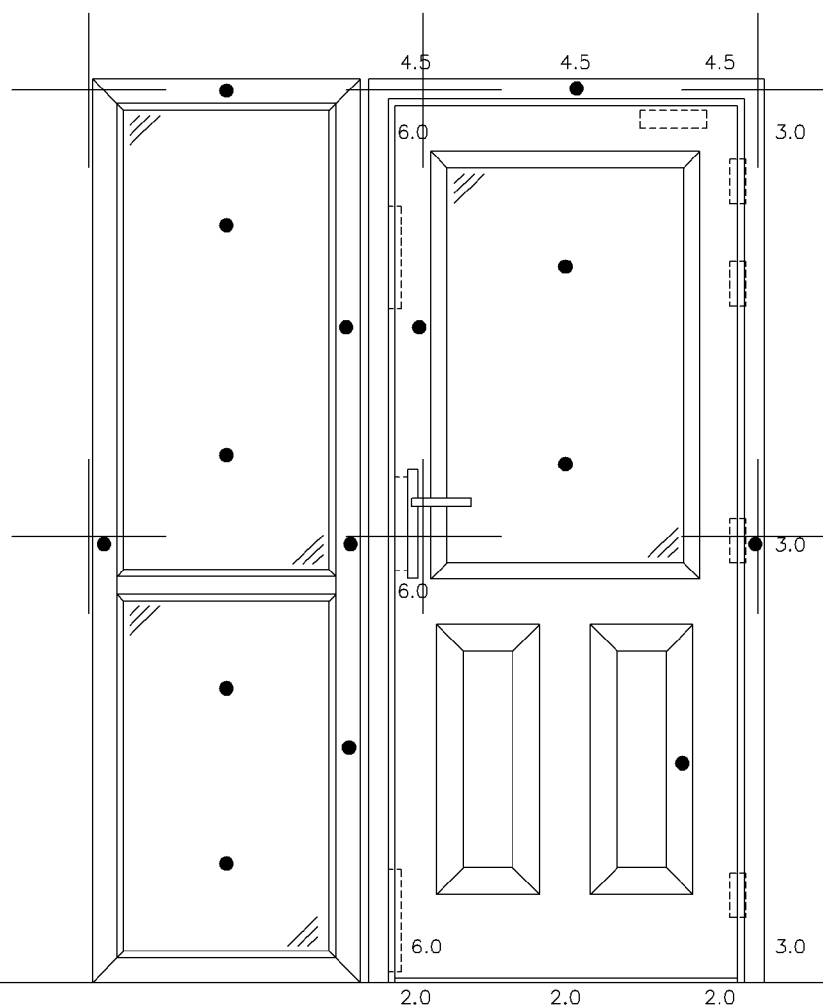
Date Drawn
16/03/07

Drawn By
SP

Scale
NTS

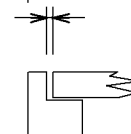
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+ : Furnace Thermocouples
 • : Unexposed Face Thermocouples

Gaps Shown



Viewed From Unexposed Face



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Title Thermocouple positions
 and door gaps
 (All dimensions in mm)

Date Drawn
 19/03/07

Drawn By
 SP

Scale
 NTS

Project No.
 Chilt/RF07024

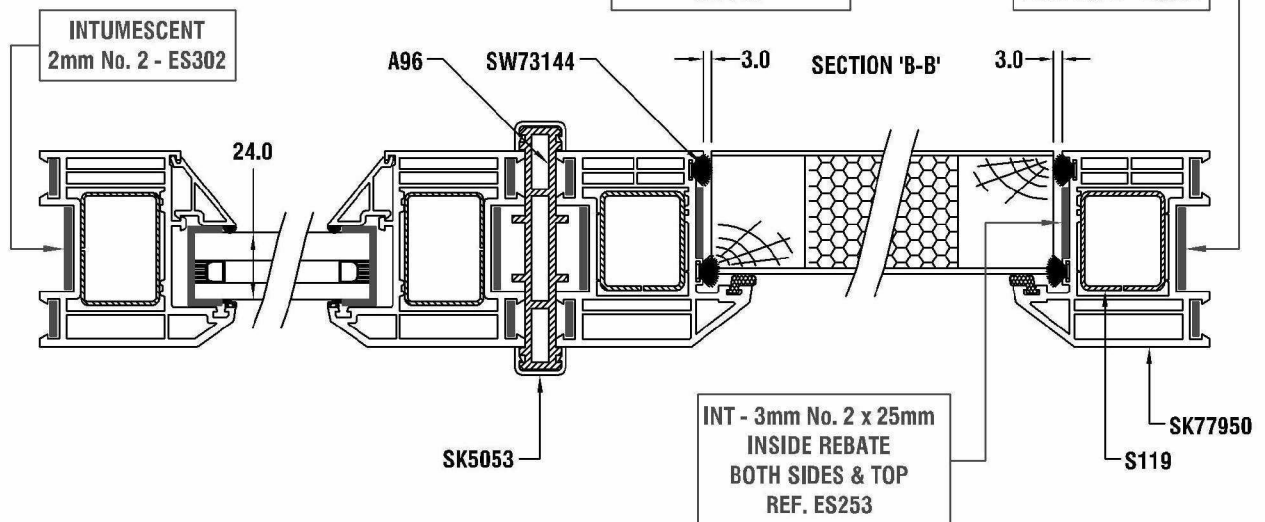
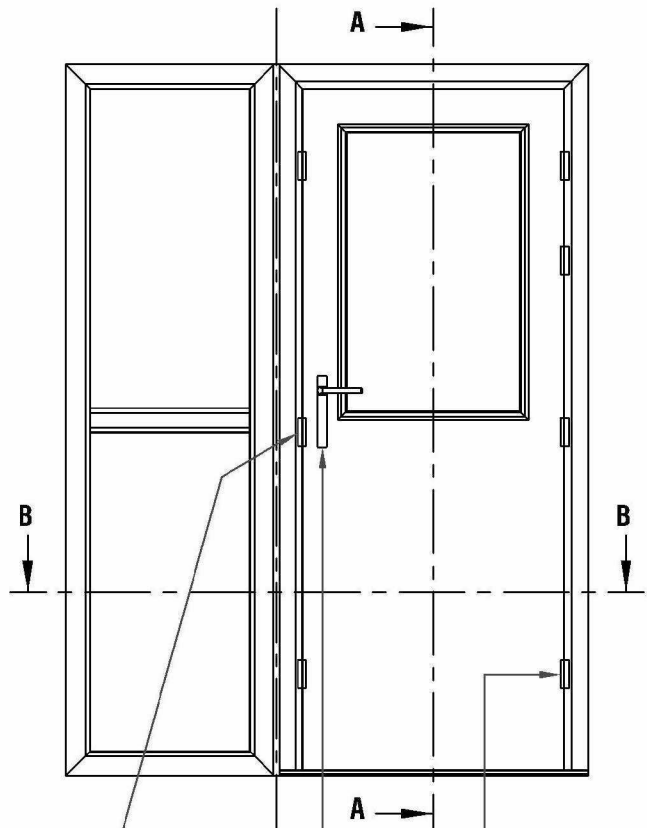
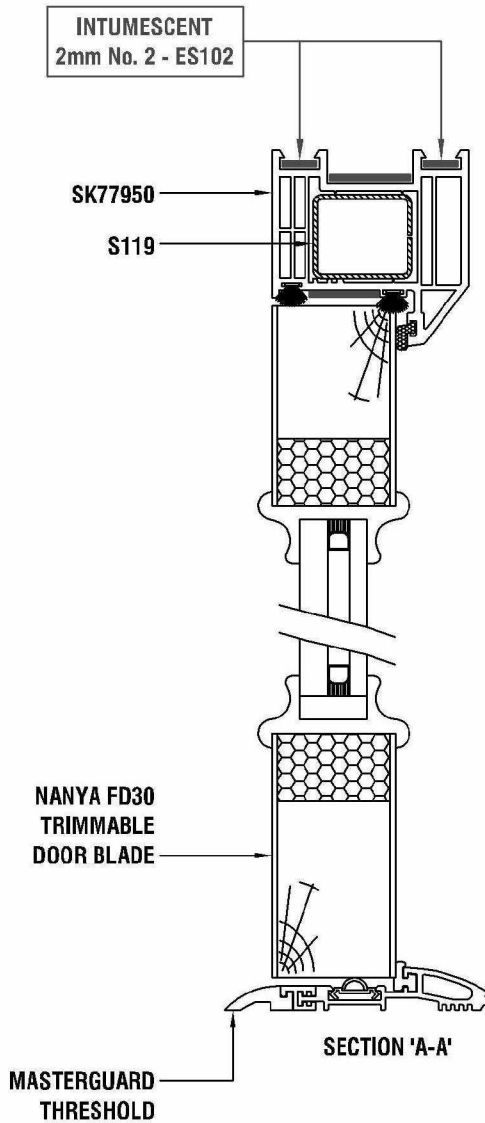
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Appendix

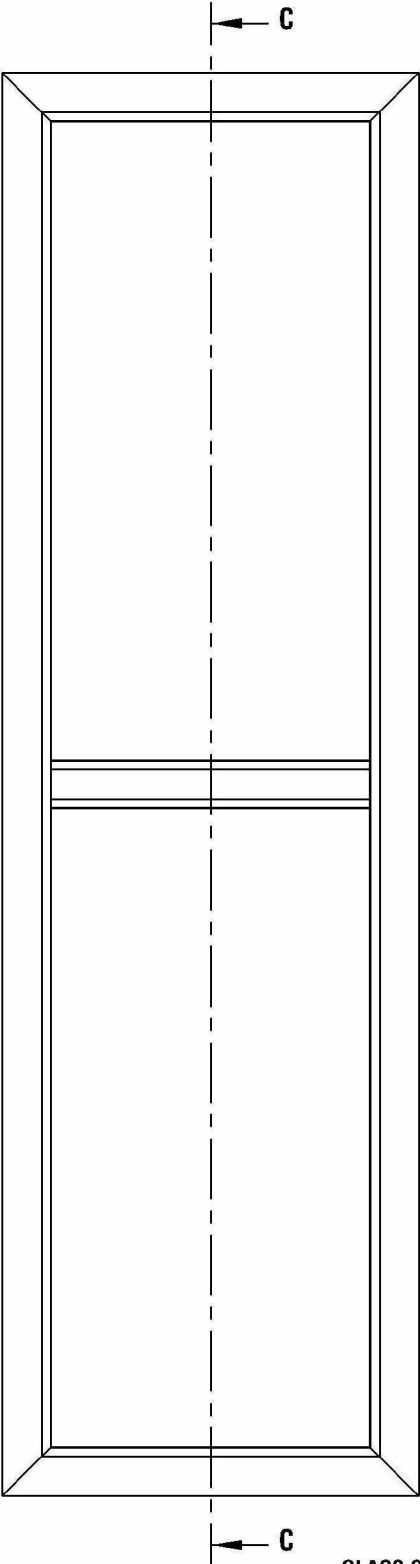
Drawings of specimen provided by LB Plastics Ltd

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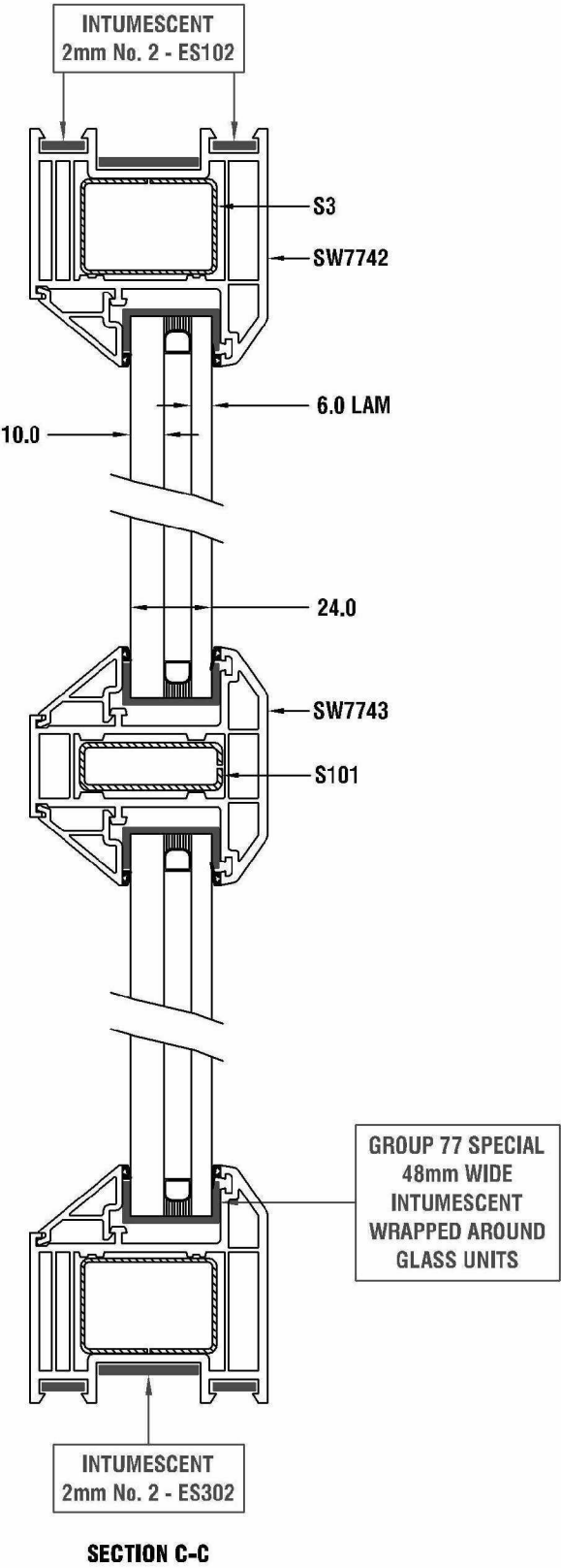
COMPOSITE FIRE DOOR VERTICAL & HORIZONTAL CROSS SECTIONS

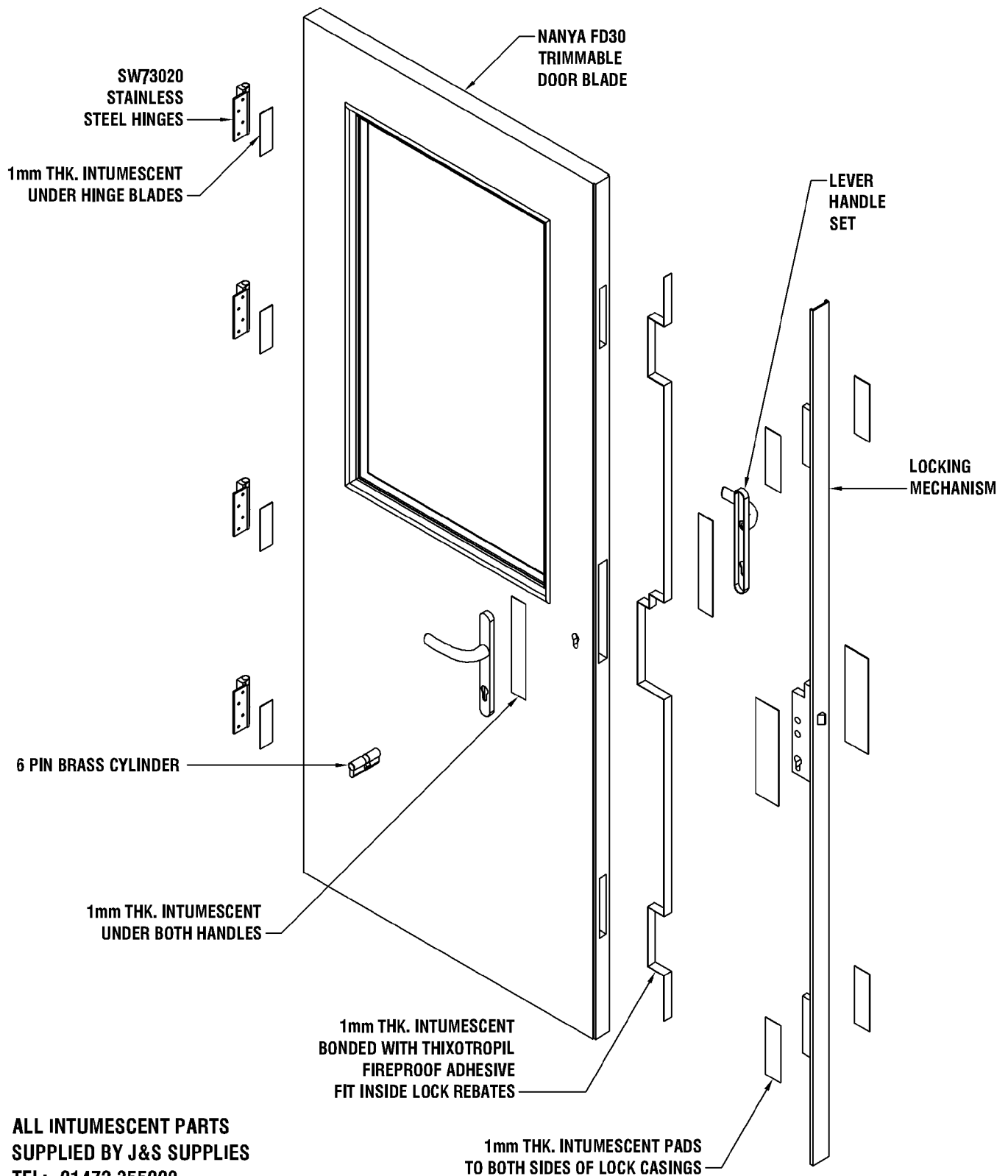


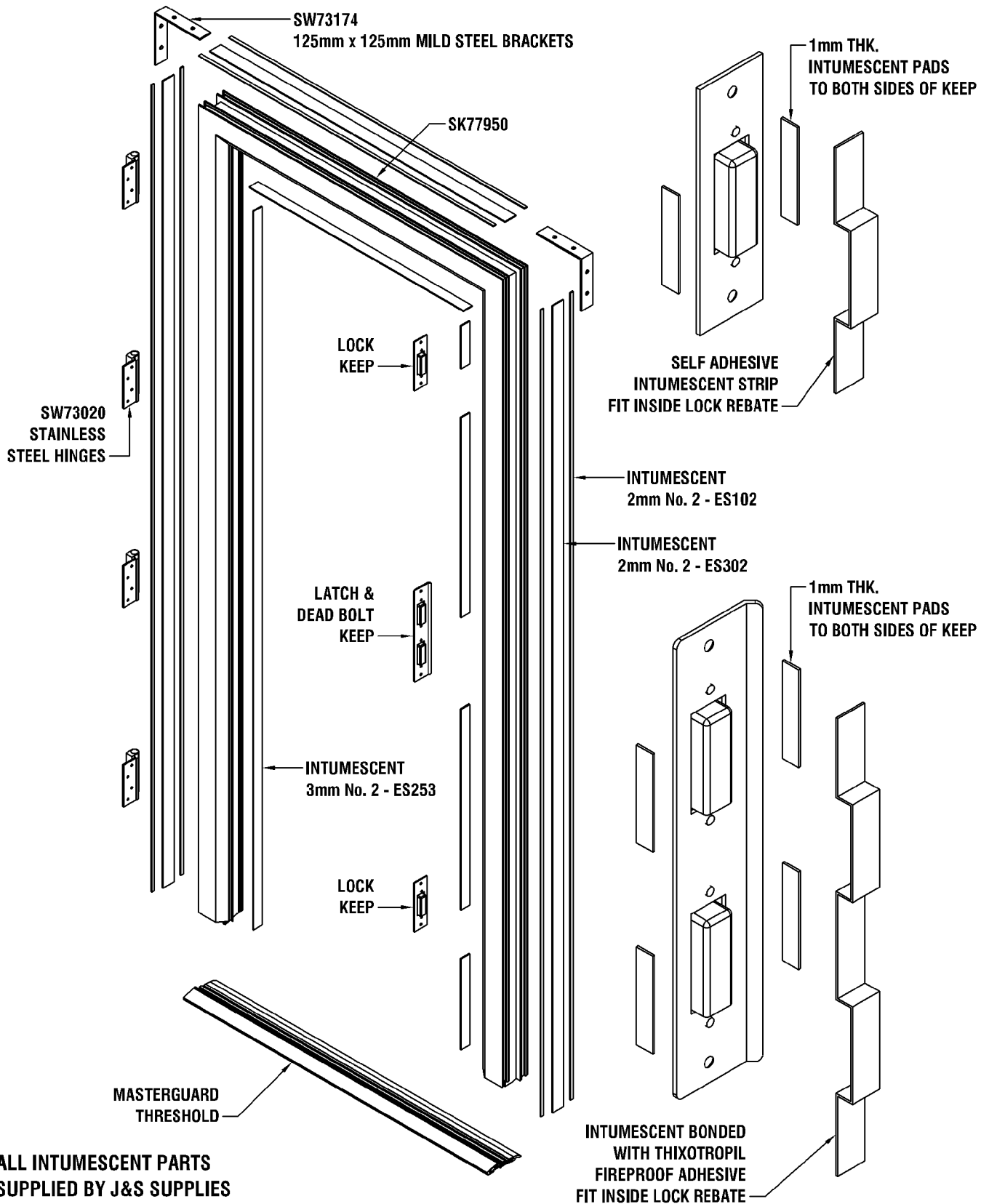
**COMPOSITE FIRE DOOR PANEL
VERTICAL CROSS SECTION**



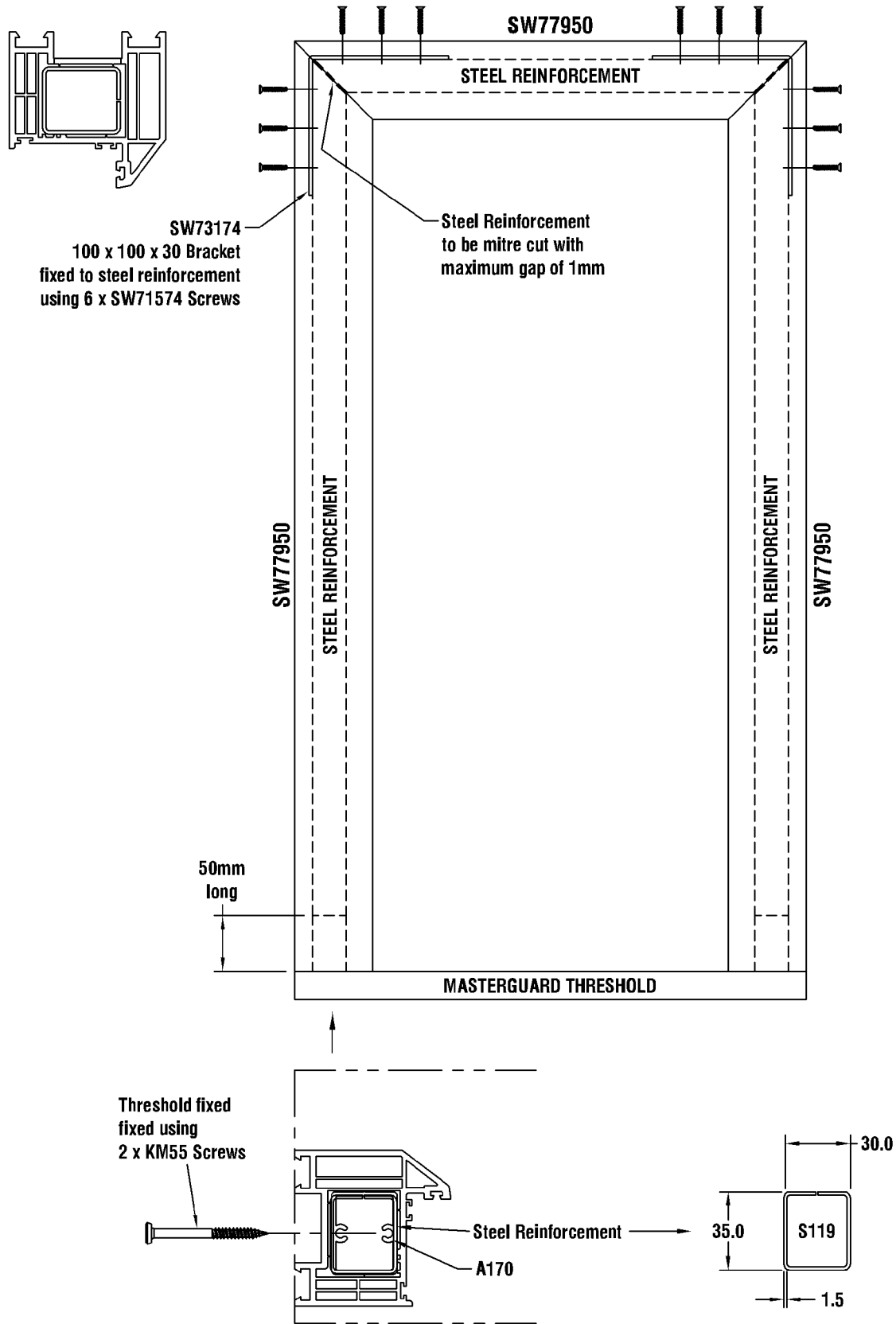
GLASS SPECIFICATION
 6.4mm PILKINGTON 'K' LAMINATED
 8mm STEEL SPACER
 10mm PILKINGTON PYRODUR EW30-201







**COMPOSITE FIRE DOOR
OUTERFRAME GENERAL ASSEMBLY DETAILS**



**COMPOSITE FIRE DOOR
SIDE PANEL SPECIFICATION**

