

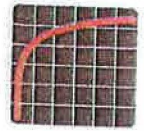


FIRE RESEARCH

4 TEST OBSERVATIONS

Photographs taken during and after the test are shown in Appendix 2.

TEST OBSERVATIONS (E = Exposed face: U = Unexposed face)		
Time (min:sec)	Face	Observation
00:00		Start of the test.
02:00	E	Exposed side glazing pane cracks.
04:26	U	Smoke/steam issuing from letterplate.
04:46	E	Material detaches at top bead of glazing pane.
05:20	U	Smoke/steam issuing from letterplate is increasing.
06:35	U	Smoke/steam visible in cavity between panes.
08:50	U	Smoke/steam issuing from letterplate is increasing.
10:12	U	Flash flame at letterplate.
10:47	U	Smoke/steam at top corners of leaf.
11:17	U	A gap has opened between the letterplate and the leaf face.
12:24	U	Unexposed side glazing pane interlayer activates.
13:00	E	Inner flap of letterbox is missing and intumescent has activated.
13:42	U	Exposed face of unexposed pane cracks.
14:30	U	Smoke/steam issuing from letterplate is decreasing.
14:50	U	Smoke/steam issuing from keyhole.
15:40	U	Moisture is visible at the threshold and on the hanging jamb.
16:36	U	Unexposed face of unexposed pane cracks.
16:50	U	Smoke/steam issuing from top joints in frame.
20:10	E	Handle melting; stiles, rails and core exposed and fissured.
21:26	U	The gap between the letterplate and the face of the leaf is 4mm nominally.
23:24	U	Pops emanate from the specimen.
23:50	U	Further cracks on unexposed face of unexposed glazing pane.
24:33	U	The gap between the letterplate and the face of the leaf is 8mm nominally.
25:30	E	Moisture is visible on leaf at hanging stile/head corner.
27:00	U	The gap between the letterplate and the face of the leaf is 15mm nominally.
27:54	U	The letterplate has detached.
28:14	U	A glow is visible at the letterplate aperture.
28:34	U	A cotton pad is applied to the letterplate aperture (no failure)
31:08	U	Smoke/steam issuing from the letterplate aperture.
31:29	U	Staining is visible on the leaf face above the letterplate aperture.
33:36	U	Flash flaming at the letterplate aperture.
34:06	U	A cotton pad is applied to the letterplate aperture.
34:16	U	INTEGRITY FAILURE due to ignition of the cotton pad at the letterplate aperture.
		INSULATION FAILURE due to integrity failure.
36:00	U	Smoke/steam issuing from keyhole is increasing.



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36:50	U	Smoke/steam increasing from top corners of the frame.
38:42	U	Flash flaming at the letterplate aperture continues.
39:20	U	Glass in the door viewer has melted.
40:05	U	Smoke/steam issuing at head of leaf 100mm to the left of mid width.
41:40	U	Letterplate aperture sealed at the request of the sponsor.
43:00	U	Smoke/steam issuing from the head is increasing.
43:47	U	Flash flame at hanging stile/head corner.
44:23	U	A cotton pad is applied to the hanging stile/head corner (no failure).
44:52	U	A glow is visible at the hanging stile/head corner.
44:57	U	Flash flaming at hanging stile/head corner.
45:08	U	A cotton pad was applied to the hanging stile/head corner.
45:18	U	Further integrity failure due to ignition of the cotton pad at the hanging stile/head corner.
47:05	U	Flaming commences at the hanging stile/head corner.
47:15	U	Further integrity failure due to sustained flaming at the hanging stile/head corner.
47:54		The test is terminated.



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5 LIMITATIONS

1. The test results relate only to the specimen tested. Appendix A of BS476: Part 20: 1987 provides guidance information on the application of fire resistance tests and the interpretation of test data. Application of the results to specimens of different dimensions, orientation or incorporating different components should be the subject of a design appraisal or further testing.
2. 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.
3. The doorset was asymmetrical and was tested such that the door leaf opened towards the heating conditions of the test. The test results may not be appropriate to situations where the door leaf opens away from the heating conditions.
4. The leaf was in accordance with BS476: Part 22:1987 except that the furnace opening was 1.35m wide x 2.4m high.

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Report issued:

21st January 2015



APPENDIX 1 SPECIMEN CONSTRUCTION

The item numbers listed in Appendix 1 Table 1 and shown in the figures in Appendix 1 refer to the components of the specimen construction. Any photo numbers refer to those in Appendix 2.

Please note that unless otherwise indicated the following applies:

- All dimensions and materials of construction were verified by the laboratory.
- Figures are not to scale.
- All dimensions are given in mm.

Appendix 1 Table 1

Item	Component	Information
1	<p>Frame</p> <p>Supplier:</p> <p>Description:</p> <p>Capping:</p> <p>Exposed section:</p> <p>Description:</p> <p>Overall size (h x d):</p> <p>Density (kg/m³):</p> <p>Unexposed Section:</p> <p>Description:</p> <p>Overall size (h x d):</p> <p>Density (kg/m³):</p> <p>Internal reinforcement</p> <p>Description:</p>	<p>LB Plastics</p> <p>A three sided hollow aluminium frame with sapele** capping to exposed and unexposed surfaces and supporting internal reinforcement within the hollow section. The butt joints are affixed with 2 No. Ø5 x 70 steel countersunk The frame profile includes an integral double rebated stop. The frame is fixed to the supporting construction with No 10 x 3" steel woodscrews set at 215, 430, 1040 and 1760 below the head on the hanging stile and 345, 1030 and 1845 below the head on the closing stile.</p> <p>Sapele ** affixed using concealed 16No. horizontal Ø5 x 55 long countersunk steel woodscrews fitted at 360* centres maximum through aluminium section and head covered by unexposed capping. The capping has a recess to retain the pile smoke seal in contact with the door edge.</p> <p>45 x 24 640* **</p> <p>Sapele ** affixed using concealed 16No. horizontal Ø4 x 30 long countersunk steel woodscrews fitted at 350 centres maximum through aluminium section integral stop. The capping has a recess to retain the blade smoke seal in contact with the door edge.</p> <p>71 x 18 640* **</p> <p>Sapele ** affixed using concealed 16No. horizontal Ø5 x 55 long countersunk steel woodscrews fitted at</p>



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Item	Component	Information
	Density (kg/m ³): Threshold Manufacturer: Type: Description: Overall size (h x d): Photo(s):	350 centres maximum through aluminium section and head covered by unexposed capping. 640* ** Stormguard Masterguard** Aluminium threshold fixed to bottom of frame using 2 No. Ø4.5 x 50 countersunk steel woodscrews per jamb at 20 centres oriented with a weather bar to the unexposed side. 13 x 75 2.1.1 to 2.1.6, 2.1.10 to 2.1.12, 2.1.14 and 2.1.15
2	Leaf weather board Supplier: Description: Size (w x h x d): Photo(s):	LB Plastics A wood composite profile** (WCP) weather board at the bottom of the unexposed face of the leaf adhered with D4 PVA (WBP) adhesive** and 2No. dowels at 15 from each end. 706 x 44 x 22 2.1.8
3	Leaf Supplier: Description: Overall size (h x w x t): Weight (kg): Sub-components: Core: Description: Overall size (t): Density (kg/m ³): Lipping: Description: Overall size (w x d): Density (kg/m ³): Facing: Description: Overall size (t): Density (kg/m ³): Glazing aperture: Description:	LB Plastics A laminated veneered lumber core with Tricoya Extreme MDF facings and Sapele lippings 1977 x 754 x 54 65 A laminated timber core. 42 450* ** Sapele** lippings affixed to the core with a tenon joint, adhered using D4 PVA wood adhesive (WBP grade) **. 60 x 42 640* ** A Tricoya Extreme Density ** facing adhered to both faces and oversailing the lippings using D4 PVA wood adhesive (WBP grade)**. 6 450 A glazing aperture 612 high x 462 wide positioned 131 below the head of the leaf and 131 in from the hanging stile containing a double glazed unit with 6 thick sapele** liner** to the internal faces of the



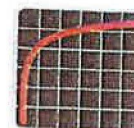
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Item	Component	Information
	Photo(s):	aperture, affixed using D4 PVA wood adhesive (WBP grade) **. 2.1.1, 2.1.2, 2.1.7 to 2.1.15
4	Glazing pane exposed Supplier: Reference: Description: Overall size (h x w x t): Sight size (h x w): Photo(s):	LB Plastics Masterdoor Sheerlam obscure** An obscure laminated glass pane** fitted within the aperture and separated from the unexposed pane with a 10mm spacer**. 600 ** x 450 ** x 6.8 **. 575 x 427 2.1.12 and 2.1.15
5	Glazing pane unexposed Supplier: Reference: Description: Overall size (h x w x t): Sight size (h x w):	LB Plastics Pyrobel FRG E60/EI30 16 ** A. clear multi-layer insulating glass pane with clear intumescent interlayer fitted within the aperture of the leaf and separated from the exposed pane with a 10mm spacer. 600 ** x 450 ** x 16 **. 575 x 427
6	Glazing bead exposed Supplier: Description: Overall size (h x d): Density (kg/m3): Photo(s):	LB Plastics Sapele** moulded section bolected beads as shown in Figure 3 affixed using Ø4 x 50 steel woodscrews at 150 * centres maximum set perpendicular to the leaf face through the bolection. 38.5 x 18 to leaf and 27 to pane 640* **. 2.1.12 and 2.1.15
7	Glazing bead – unexposed Supplier: Description: Overall size (h x d): Density (kg/m3):	LB Plastics Sapele** moulded section bolected beads as shown in Figure 3 affixed using PUR hot melt adhesive**. 28.4 x 8.7 to leaf and 15.3 to pane 640* **
8	Hinges Supplier: Type: Description: Blade size (h x w x t): Knuckle size (Ø):	Masterdoor Butt hinge 4No. stainless steel butt hinges set at 156, 368, 986 and 1703 from the top of the leaf to the top of the blade, all affixed using 4No. Ø4 x 25 long self drilling screws to frame plus 1No. frame fixing and 4No. Ø3.9 x 40 long countersunk steel woodscrews per blade to leaf. 100 x 32 x 1.5



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Item	Component	Information
	Photo(s):	12 2.1.2, 2.1.12, 2.1.14 and 2.1.15
9	Closer Manufacturer: Reference: Description: Overall size: Face plate (h x w x d): Photo(s):	Barymatic Concealed hydraulic jamb closer A hidden closer set in hanging jamb and stile is affixed to the leaf using 4No. Ø3.9 x 40 countersunk steel woodscrews, and to the frame using 4No. Ø4 x 25 long self drilling steel screws. 123 x 25 x 5 2.1.1
10	Latch/lock Manufacturer: Lock: Description: Overall size: Body (h x d x w): Forend (h x w x t): Strike (h x w): Hook box (h x w): Photo(s):	Wink Haus SKG multipoint Pyro Lock with S-Tech eurocylinder A multipoint latch with eurocylinder lock such that the centre line of the spindle was 1000 above the threshold and affixed using 10No. Ø3.9 x 40 long countersunk steel woodscrews. Security hooks were 240 up and down from the ends of the forend of the lock. A stainless steel strike was fitted to the frame to suit the position of the latch and affixed using 2No. Ø4 x 25 long self drilling steel screws and 1No. frame fixing. Hook boxes were fitted to the frame to suit the position of the security hooks using 4No. Ø4 x 25 long self drilling steel screws and 1No. frame fixing. The eurocylinder was fitted with key hole to the unexposed side and the thumbwheel to the exposed side. 185 ± x 16 ± x 70 ± 1760 x 20 x 3 125 x 42 including a tongue of 62 (h) x 15 (w) 230 x 28 2.1.3, 2.1.4, 2.1.7, 2.1.11 and 2.1.15
11	Handleset Supplier: Reference: Description: Overall size: Handle (Ø x l): Backplate (h x w x d): Photo(s):	S-Tech SLD-XS lever handle An aluminium handle set to suit the position of the latch spindle using 3No. M5 x 70 long countersunk steel machine screws per side. 24 to 19 x 150 240 x 32 x 12 2.1.11 and 2.1.15
12	Letterplate Manufacturer:	UAP**



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Item	Component	Information
	Reference: Description: Overall size: Aperture (h x w): Faceplate (h x d x w): Photo(s):	Framemaster 12 inch A plastic unit incorporating intumescent protection and an aluminium flap on both faces and affixed to the leaf using 4No. Ø4.8 x 36 long machine steel screws through alloy fixing plates and threaded lugs. The aperture for the letterplate was located with the bottom of the aperture 775 up from the bottom of the leaf. 49.5 x 258 67 x 19 x 305 2.1.13 and 2.1.15
13	Door viewer Supplier: Reference: Description: Overall size (Ø x d): Photo(s):	UAP VWR 0921 Stainless steel and brass door viewer consisting of two threaded tubes fitted from each side of the door. The viewer was set 65mm from the closing stile and 525mm down from the top of the leaf on the exposed face in a Ø13 hole in the leaf. The tube incorporating the lens was on the unexposed face. 9.7/12/27 x 54 2.1.12 and 2.1.15
14	Intumescent – frame 1 Manufacturer: Reference: Description: Overall size:	Sealed Tight Solutions Ltd** ST30 x 2.5** A graphite** based intumescent compound with self-adhesive tape affixed to the outer perimeter of the aluminium frame. 30 x 2.5
15	Intumescent – frame 2 Manufacturer: Reference: Description: Overall size: Photo(s):	Sealed Tight Solutions Ltd** ST25 x 2.5** A graphite** based intumescent compound with self-adhesive tape affixed to the reveal of the aluminium frame. 25 x 2.5 2.1.1, 2.1.2, 2.1.4 and 2.1.5
16	Intumescent - hinges Supplier: Description: Overall size (h x w x t):	Sealed Tight Solutions Ltd** A graphite** based intumescent compound with self-adhesive tape on one side fitted under all hinge blades attached to the door edge. 100 x 30 x 1
17	Intumescent – strike and forend Supplier:	Sealed Tight Solutions Ltd**



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Item	Component	Information
	Description:	A layer of intumescent material fitted behind the strike and forend of the lock.
	Overall size (t):	1
18	Intumescent – latch/lock Supplier: Description:	Sealed Tight Solutions Ltd** An intumescent self-adhesive pad fitted to both faces of lock case**
	Overall size (h x d x t):	140 x 50 x 1
19	Intumescent – hook box Supplier: Description:	Sealed Tight Solutions Ltd** An intumescent self-adhesive pad fitted to both faces of hook box
	Overall size (h x d x t):	10 x 30 x 1
20	Intumescent - closer Supplier: Reference: Description:	Sealed Tight Solutions Ltd** ST140 x 70 An intumescent self-adhesive pad affixed to either side of the closer barrels within the door**.
	Overall size (h x w x t):	70 x 140 x 1
21	Intumescent - letterplate Supplier: Description:	UAP** A layer of graphite based intumescent reinforced with glass fibre was wrapped around outer surface of the body within door thickness and adhered with self-adhesive on the intumescent material.
	Overall size (d x t):	40 x 2
22	Intumescent – door viewer Supplier: Description:	Sealed Tight Solutions Ltd** A graphite based intumescent forming a hollow cylinder within the barrel of the viewer on the exposed face and also within the aperture through the door to accommodate the viewer set 25mm from the exposed face.
	Overall size (d x t):	23 x 1 inner seal 22 x 1 outer seal
23	Intumescent – glazing 1 Supplier: Reference: Description:	Sealed Tight Solutions Ltd** ST105GT 10 x 5** An intumescent compound with self-adhesive tape** on each side of the double glazed unit set between the glazing pane and the bead.
	Overall size (w x t):	10 ** x 5 **
24	Intumescent – glazing 2 Supplier: Reference: Description:	Sealed Tight Solutions Ltd** ST302 30 x 2** An intumescent glazing liner** with self-adhesive



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Item	Component	Information
	Overall size (w x t):	tape around the perimeter of the glazing aperture. 30 ** x 2 **
25	Smoke seal 1 Supplier: Description: Photo(s):	Linear Ltd** 10mm pile seal fitted around inside of frame to contact door edge set 7.5mm from the exposed face as shown in Figures 2 and 4. 2.1.1 to 2.1.5
26	Smoke seal 2 Supplier: Type: Description: Photo(s):	Schlegel** Q-LON angled blade** A foam seal with polyurethane coating to form smooth impermeable outer surface fitted to frame to contact inner door edge rebate set 33 from unexposed face of leaf as shown in Figures 2 and 4. 2.1.1 to 2.1.5
27	Smoke seal 3 Supplier: Type: Description: Photo(s):	Schlegel** Q-LON bulb seal** A foam seal with polyurethane coating to form smooth impermeable outer surface fitted to capping to contact outer door edge rebate set 24 from unexposed face of leaf as shown in Figures 2 and 4. 2.1.1 to 2.1.5
28	Threshold seal Supplier: Type: Description:	Schlegel** Q-LON bulb seal** A foam seal with polyurethane coating to form smooth impermeable outer surface fitted to the aluminium threshold as shown in Figure 5.
29	Fire stopping detail Description: Photo(s):	Gaps between the frame and the associated construction were packed with Unifrax Insulfrax S blanket and capped with Intumescent & Acoustic Acrylic Sealant on both sides. 2.1.1, 2.1.2, 2.1.6, 2.1.10 to 2.1.12, 2.1.14 and 2.1.15

Key:

* Nominal value

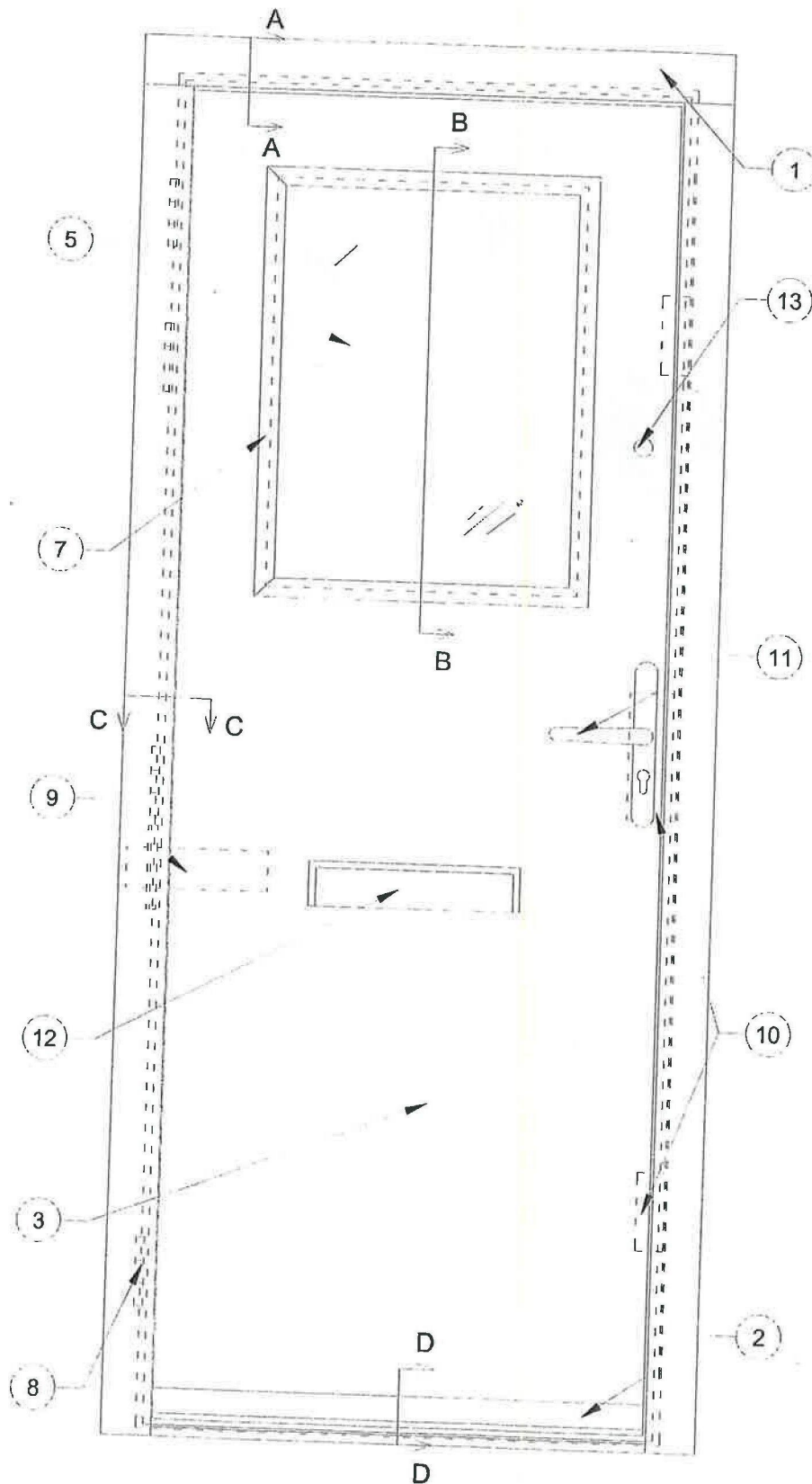
** Sponsor declared value or detail, not verified by laboratory

‡ Identified post test from remains of specimen



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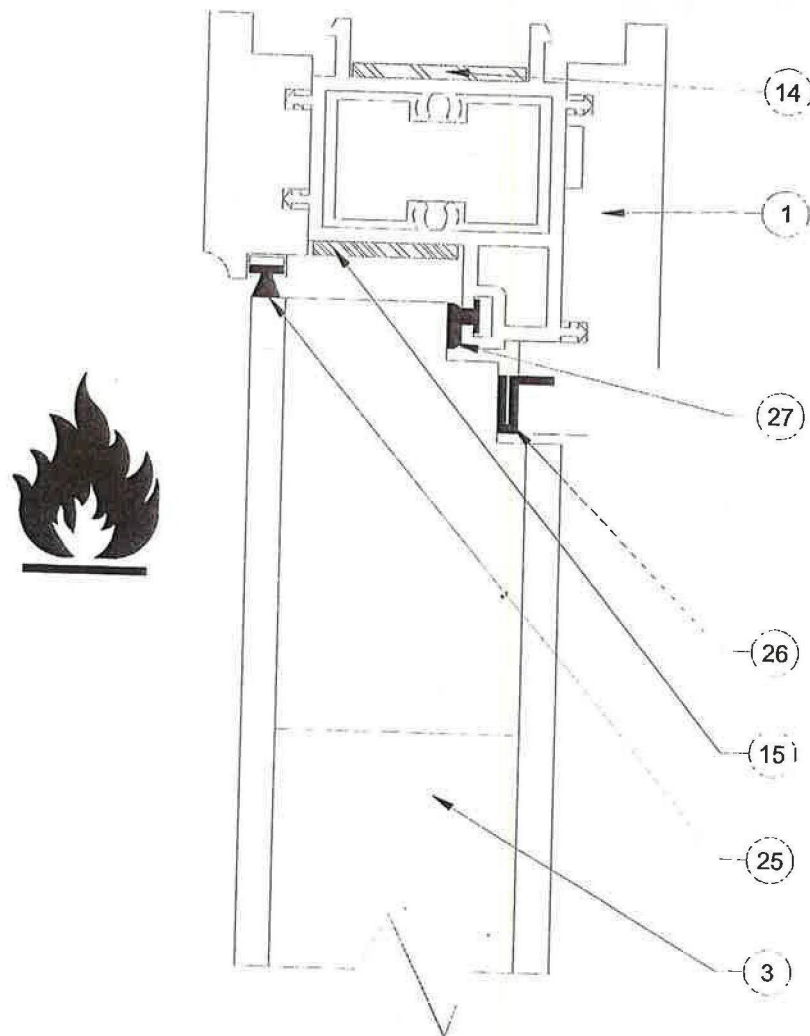
Appendix 1 Figure 1 – Elevation viewed from the unexposed side including hidden detail





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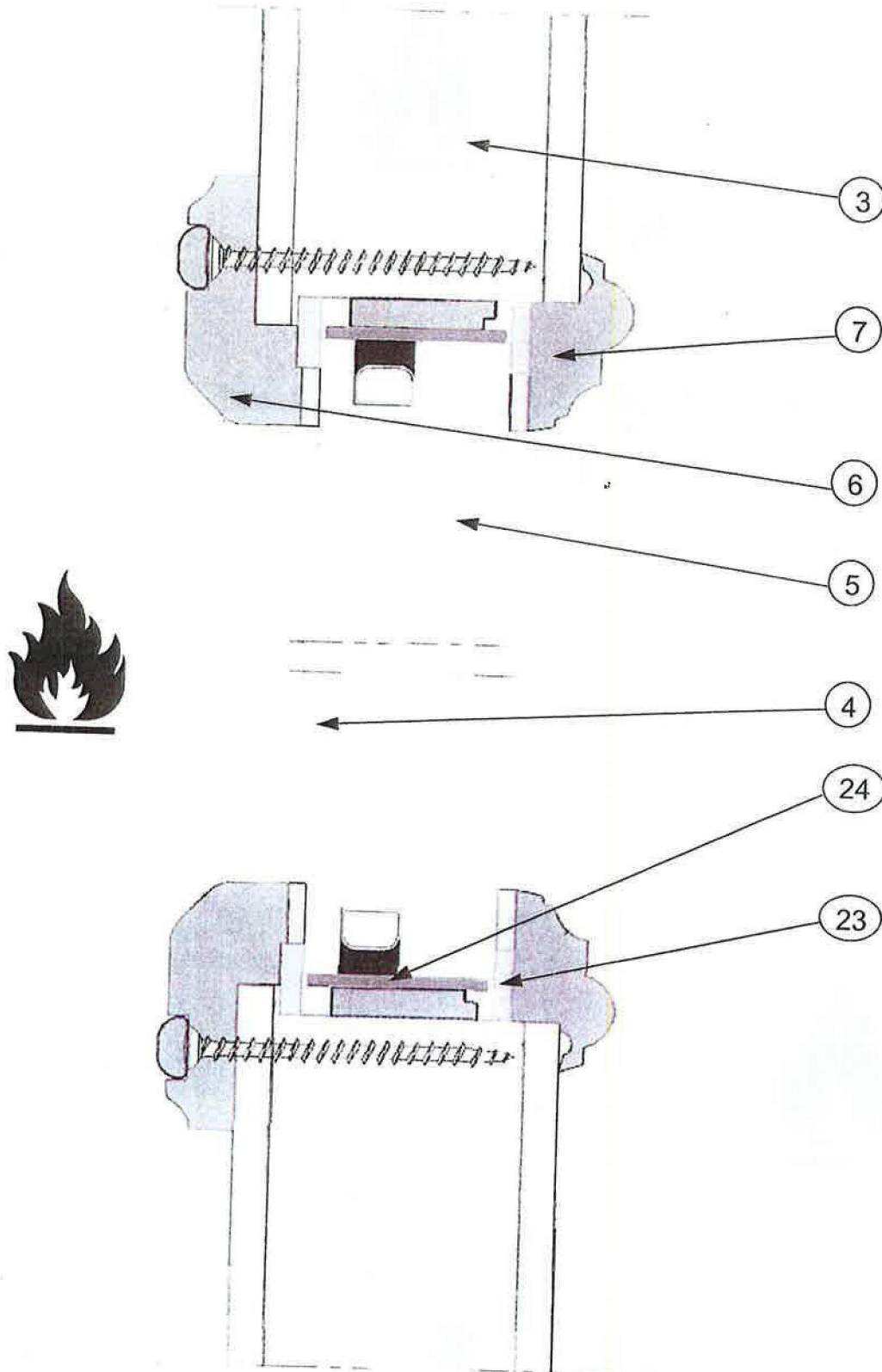
Appendix 1 Figure 2 – Section A – A





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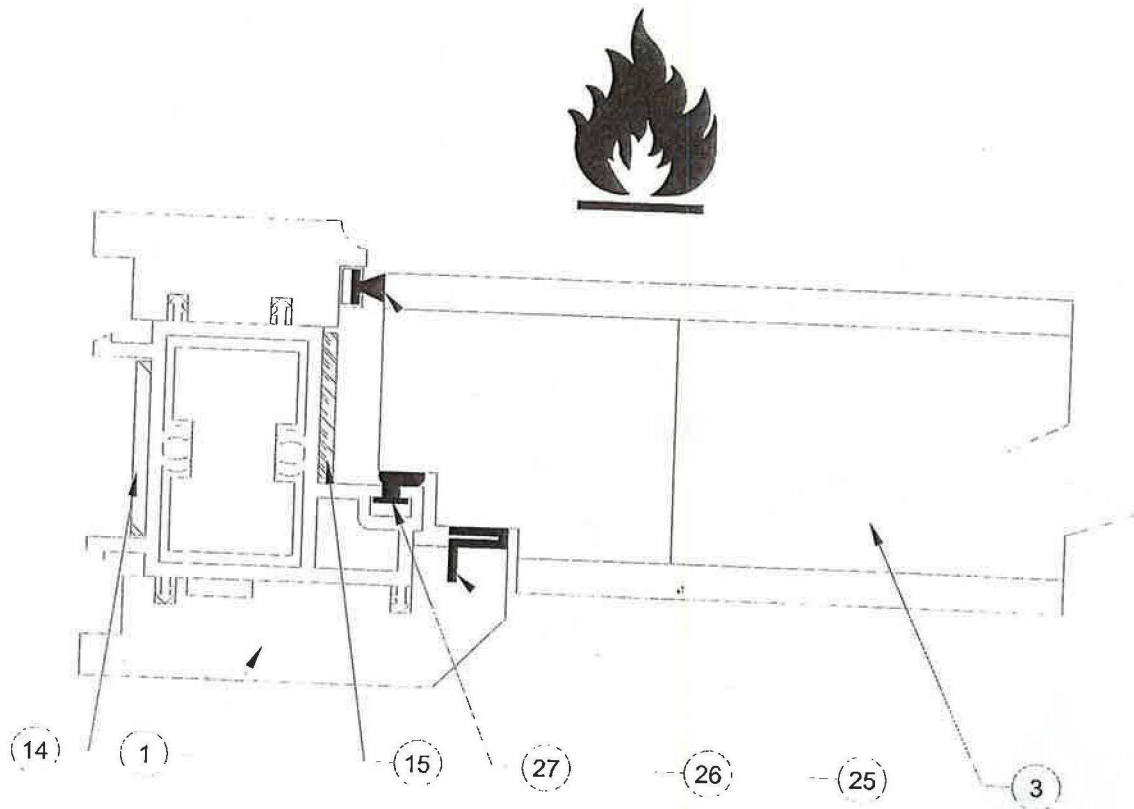
Appendix 1 Figure 3 – Section B – B



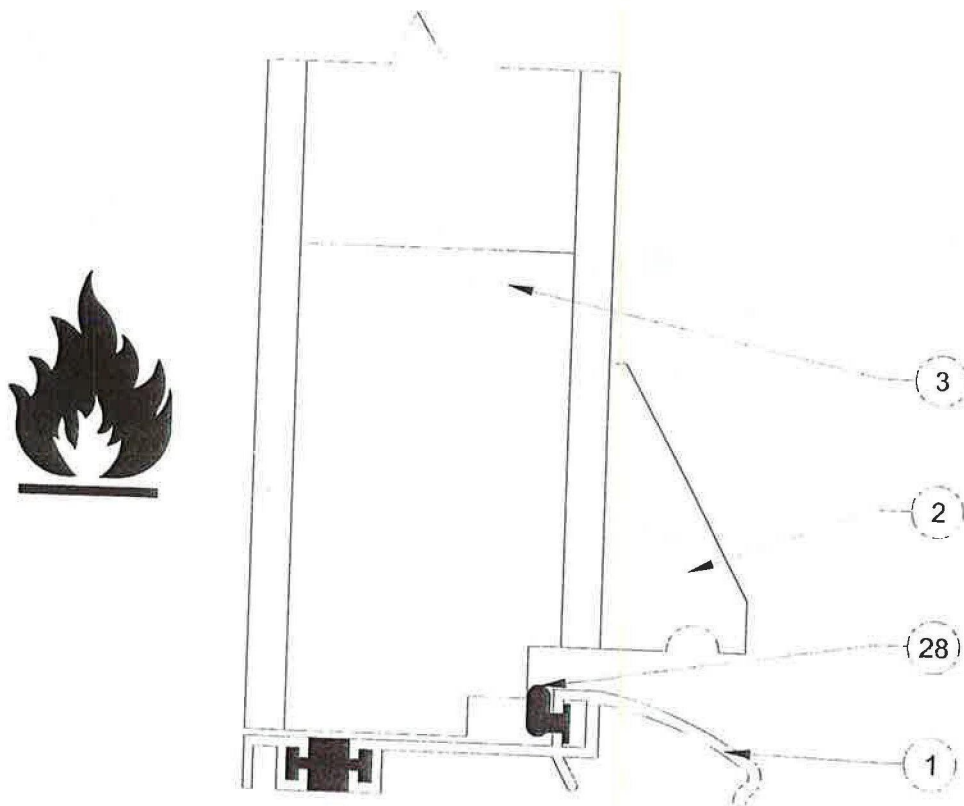


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Appendix 1 Figure 4 – Section C – C



Appendix 1 Figure 5 – Section D – D





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APPENDIX 2 PHOTOGRAPHS

Appendix 2.1 Pre-test photos

Photo 2.1.1

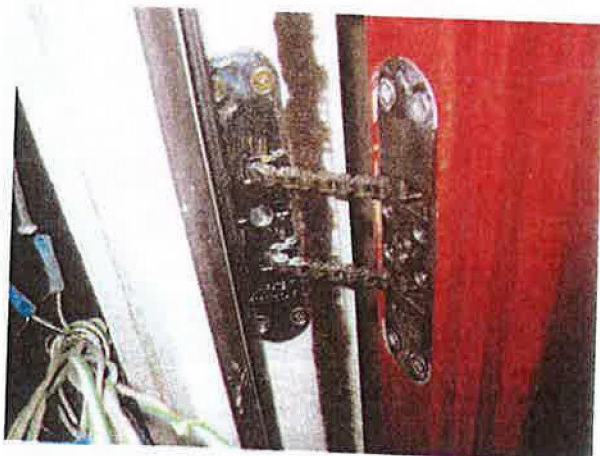


Photo 2.1.2



Photo 2.1.3

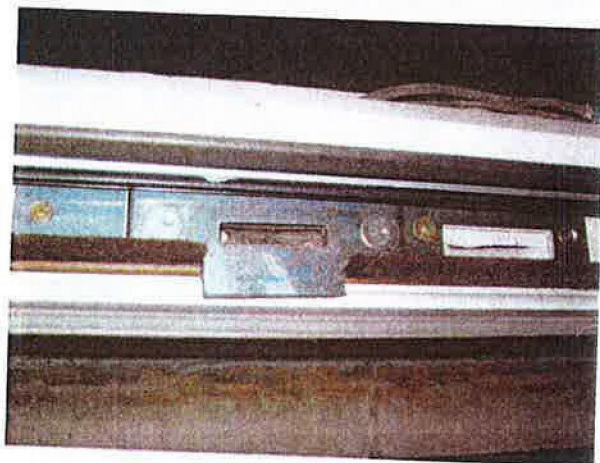


Photo 2.1.4

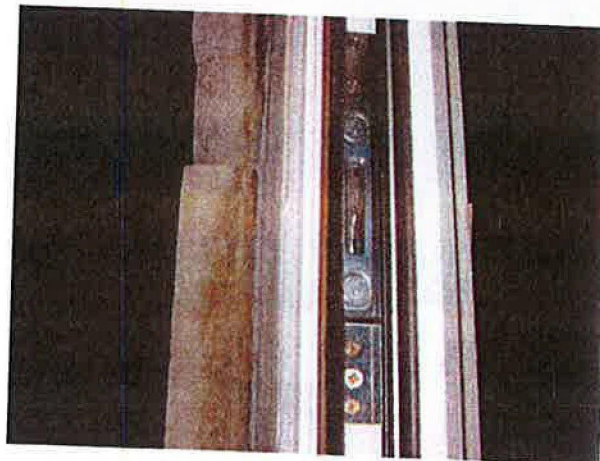
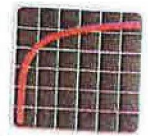


Photo 2.1.5



Photo 2.1.6





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Photo 2.1.7



Photo 2.1.8



Photo 2.1.9

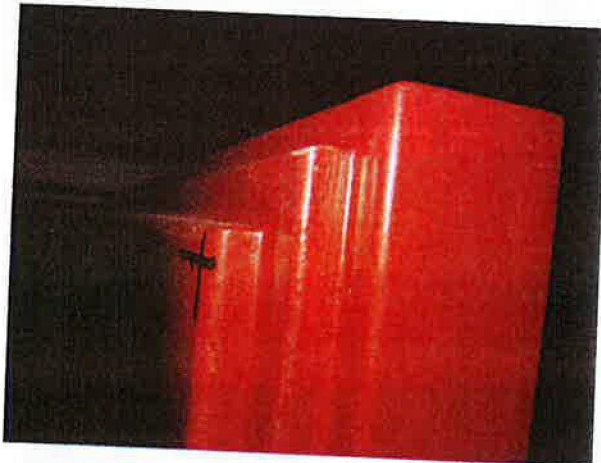


Photo 2.1.10



Photo 2.1.11



Photo 2.1.12





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Photo 2.1.13

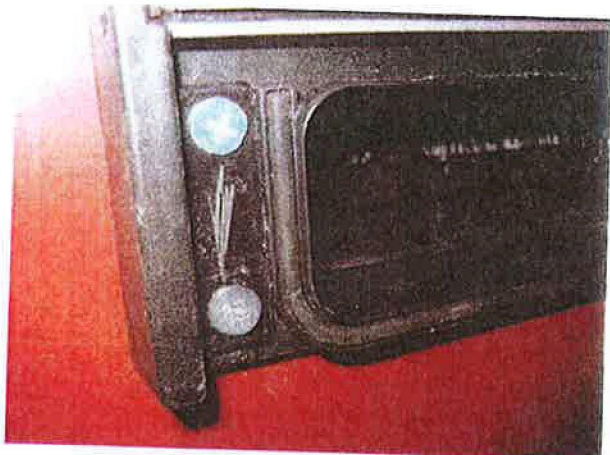
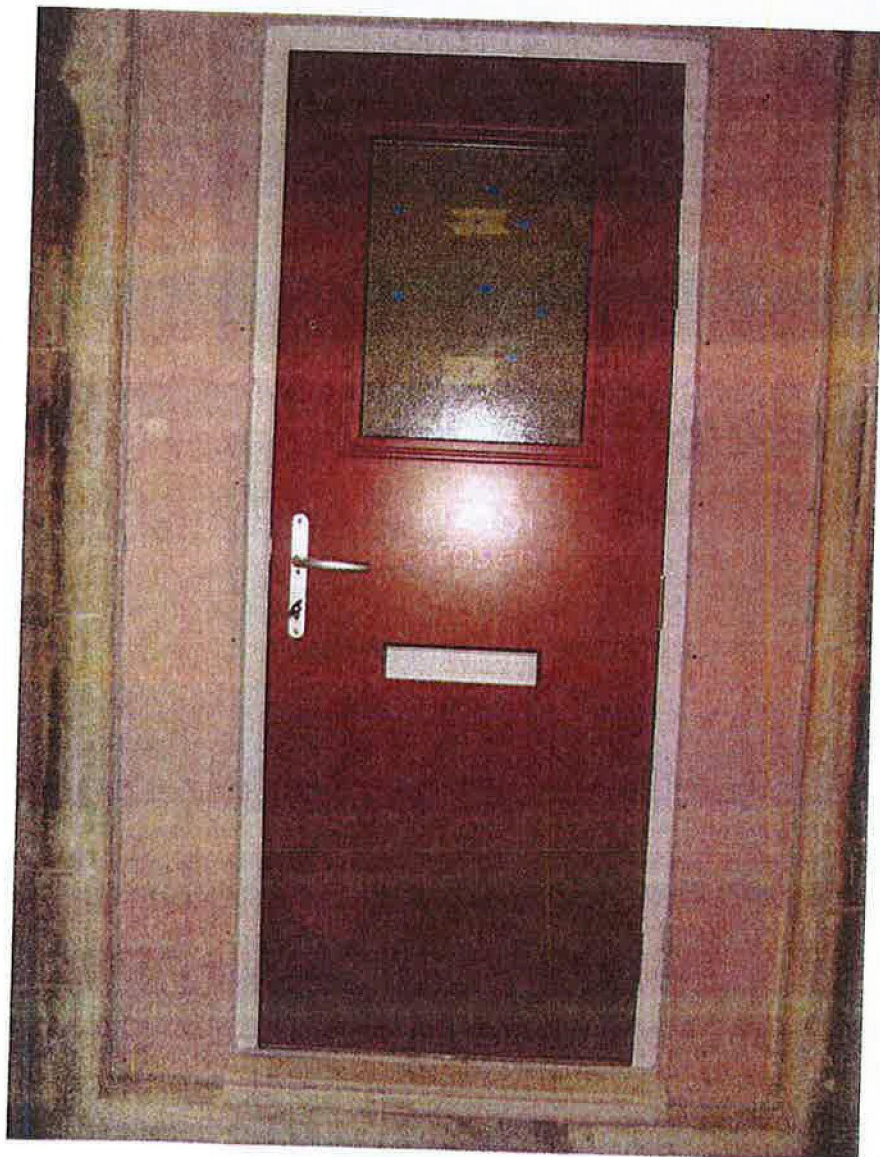
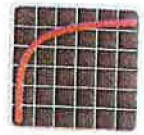


Photo 2.1.14



Photo 2.1.15





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Appendix 2.2 During test photos

Photo 2.2.1

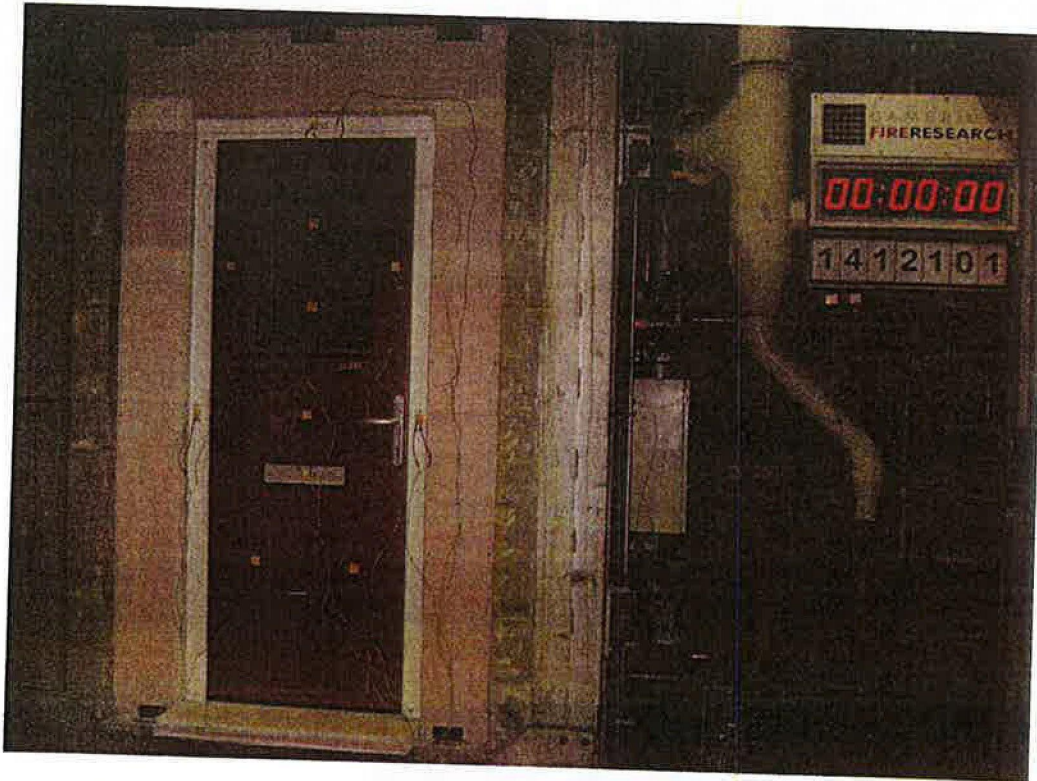


Photo 2.2.2





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Photo 2.2.3

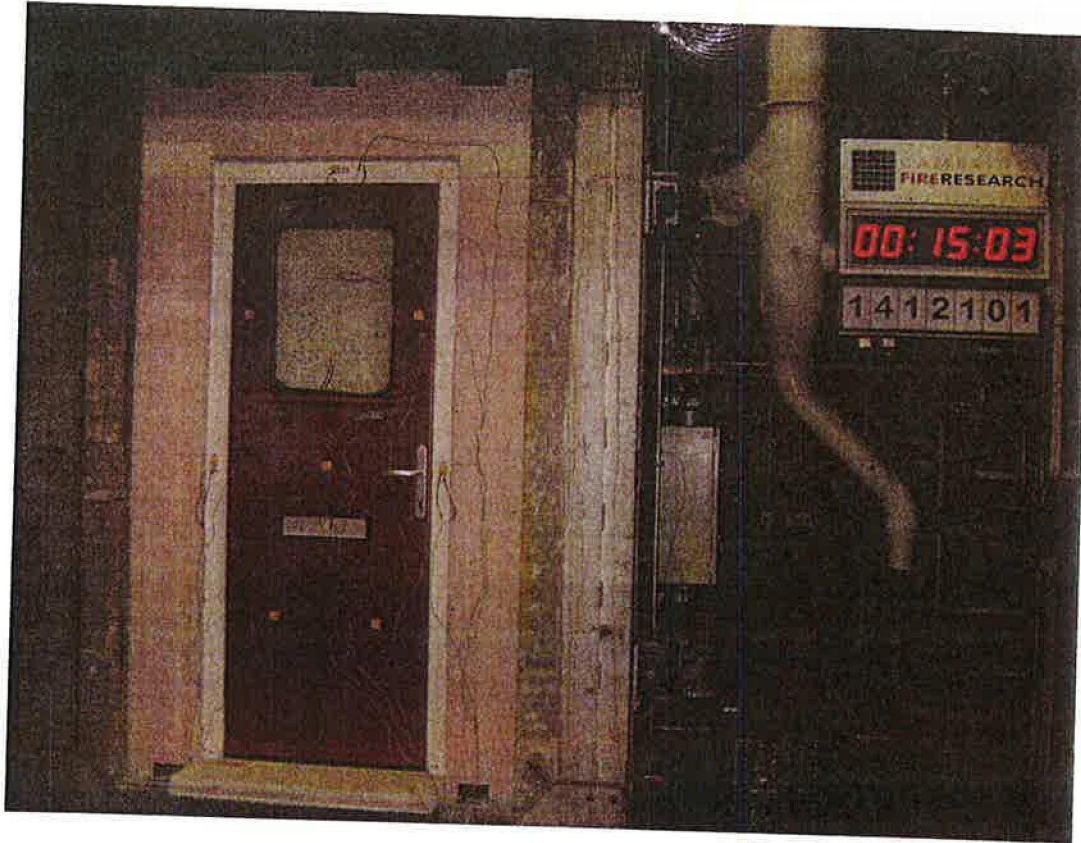
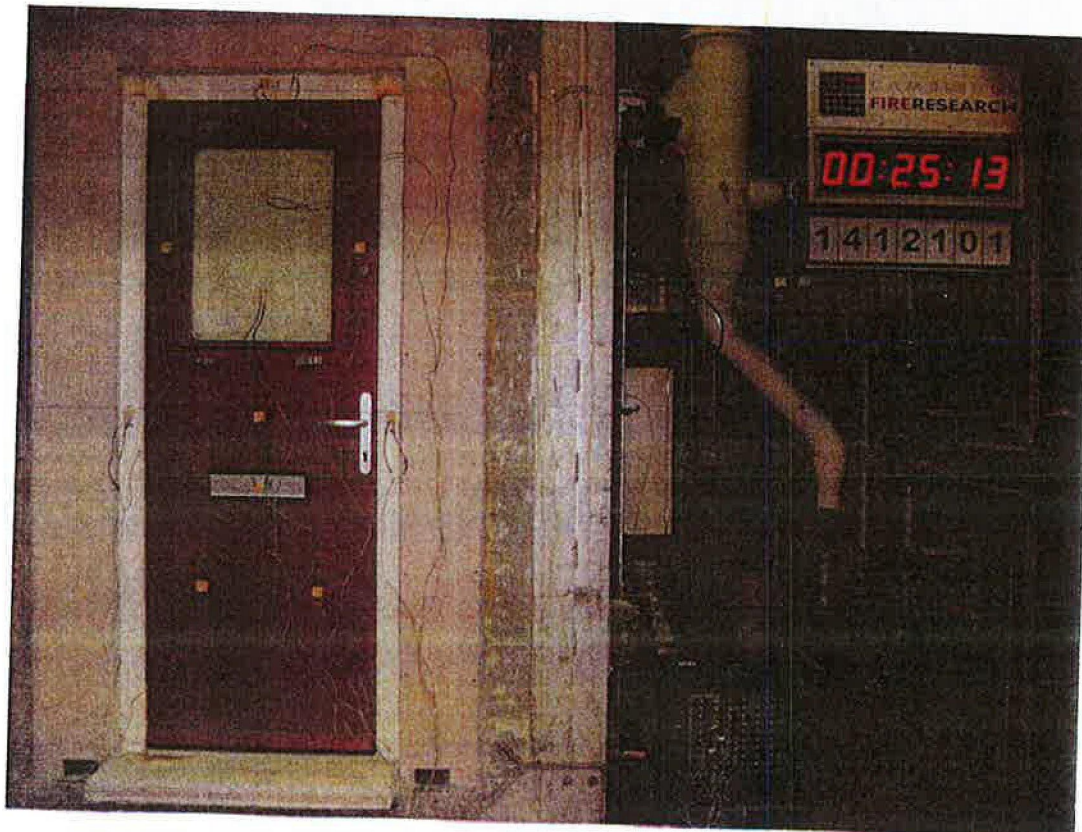


Photo 2.2.4



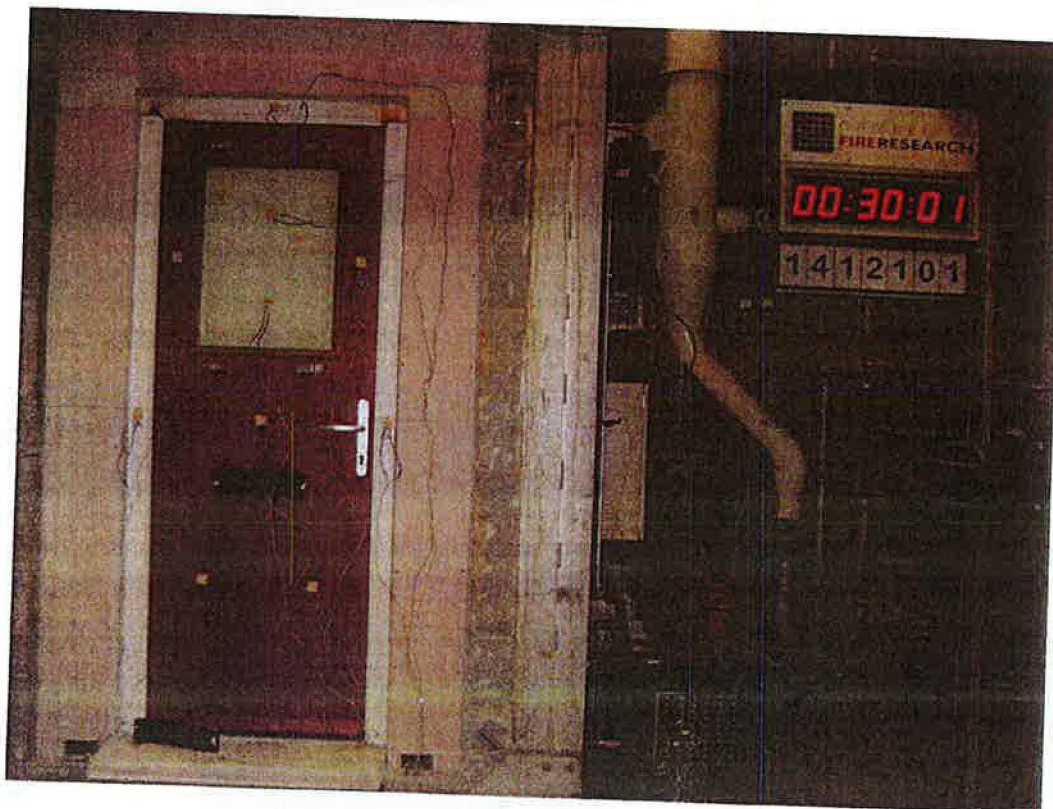


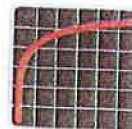
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Photo 2.2.5 – after 27 minutes



Photo 2.2.6





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Photo 2.2.7 – after 32 minutes

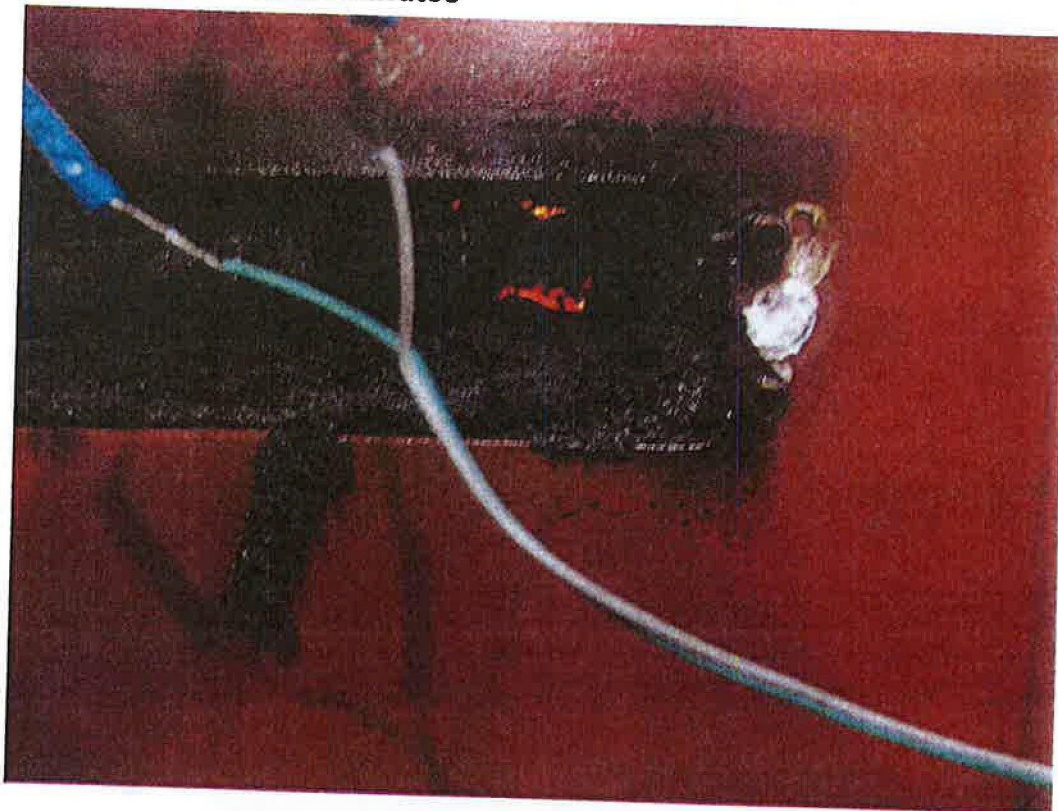
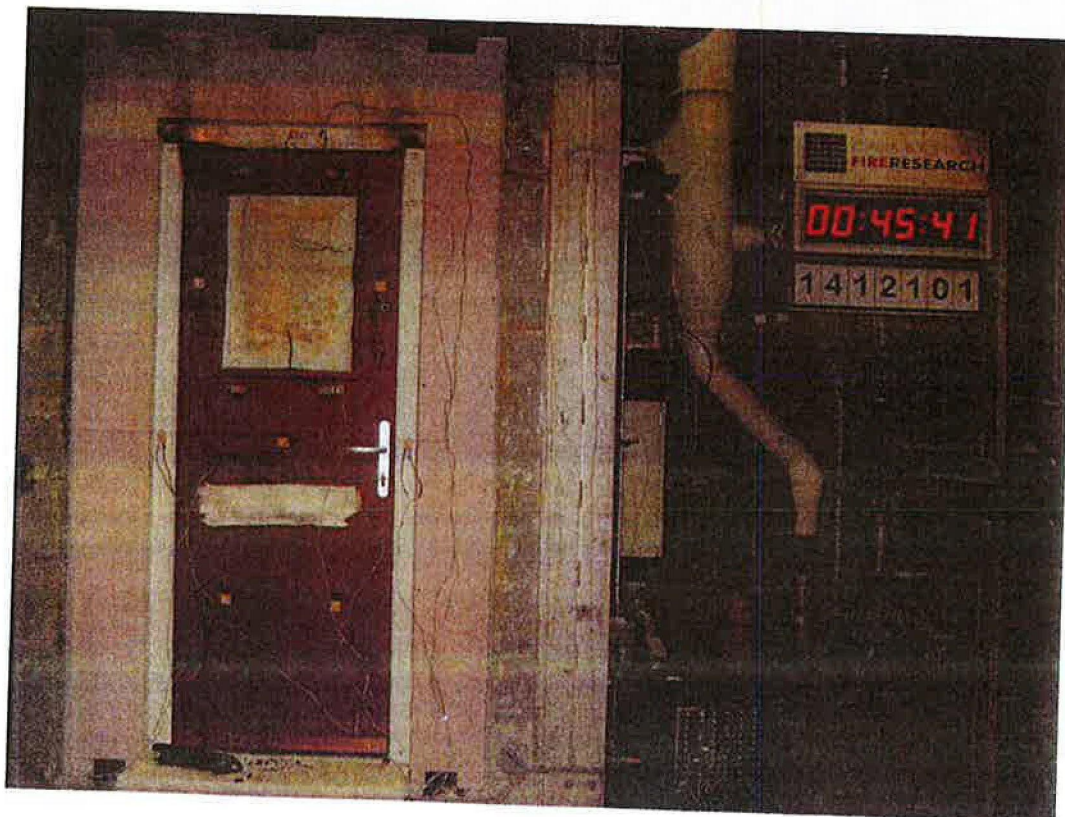


Photo 2.2.8

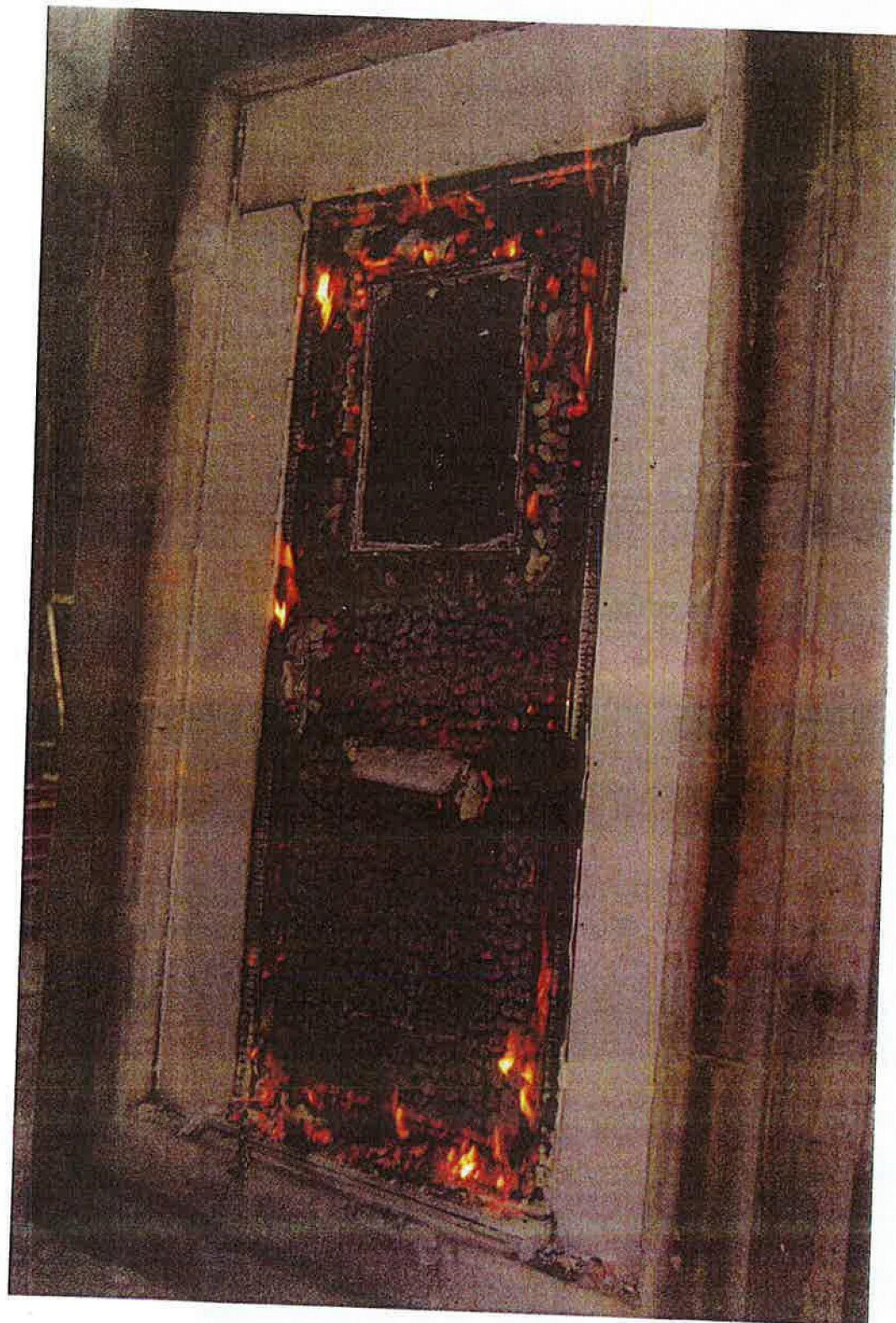




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Appendix 2.3 Post-test photo

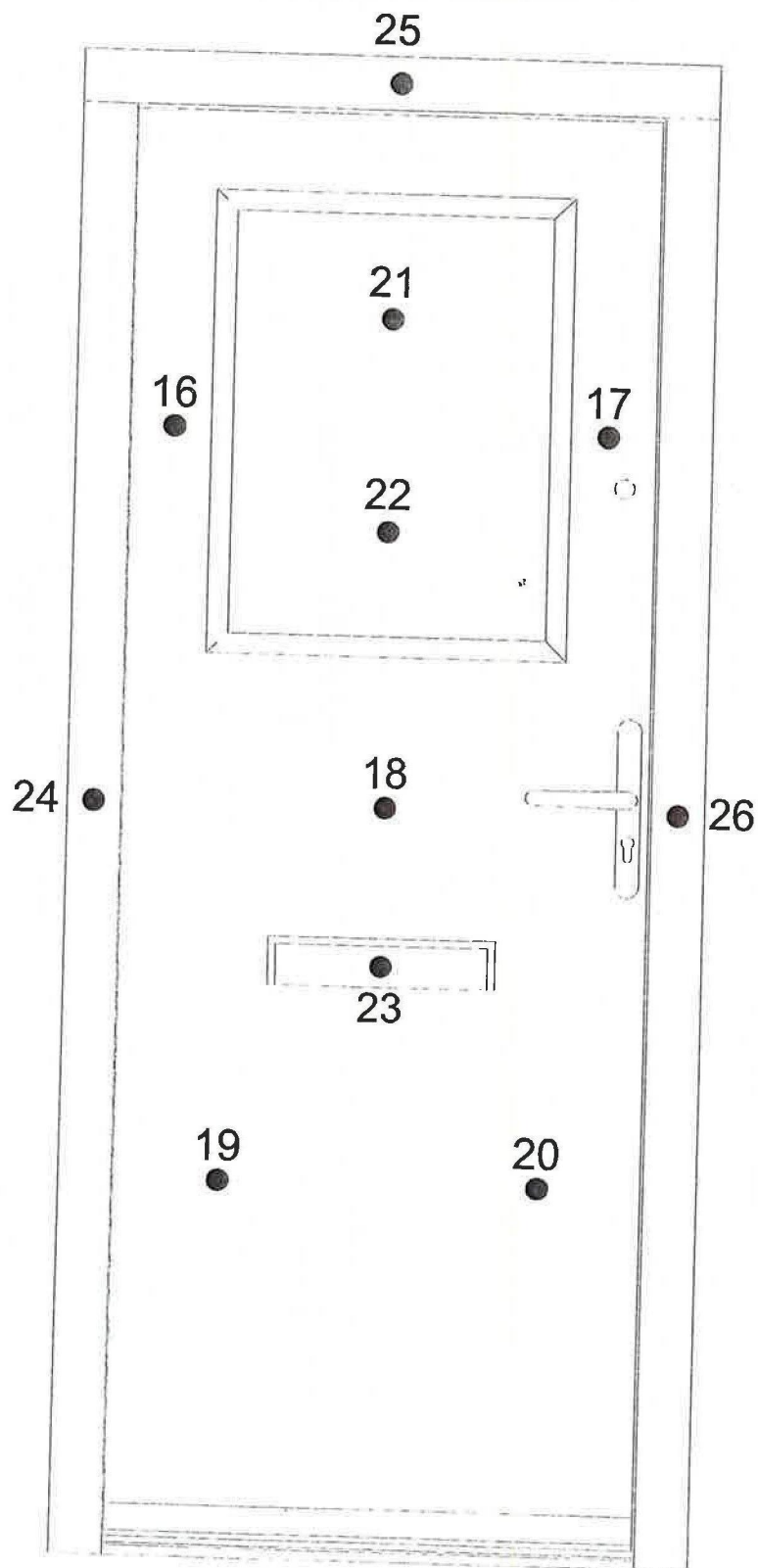
Photo 2.3.1





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APPENDIX 3 POSITIONING OF INSTRUMENTATION



● Unexposed face specimen thermocouple



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APPENDIX 4 RECORDED THERMOCOUPLE DATA

Time min	Chan 16 °C	Chan 17 °C	Chan 18 °C	Chan 19 °C	Chan 20 °C	Chan 21 °C	Chan 22 °C	Chan 23 °C	Chan 24 °C	Chan 25 °C	Chan 26 °C
0	12	12	12	12	12	12	12	12	12	12	12
1	12	12	12	12	11	12	12	12	12	12	12
2	12	12	12	12	12	12	12	13	12	12	12
3	12	12	12	12	12	12	12	13	12	12	12
4	12	12	12	12	12	12	12	13	12	12	12
5	12	12	12	12	12	13	13	13	12	12	12
6	12	12	12	12	12	14	14	14	12	12	12
7	12	12	12	12	12	16	15	45	12	12	12
8	12	12	12	12	12	19	18	62	12	13	12
9	12	13	15	12	12	22	21	70	12	13	12
10	12	13	14	12	12	27	25	109	13	14	13
11	12	13	14	12	12	33	30	93	14	15	13
12	12	14	13	12	12	39	36	77	14	16	14
13	12	14	13	12	12	48	43	65	15	18	14
14	12	15	13	12	12	59	51	59	16	19	15
15	12	15	13	12	12	71	62	55	17	21	17
16	12	15	13	12	12	83	74	50	18	23	18
17	12	16	13	12	12	90	82	46	19	25	20
18	12	16	13	12	12	95	87	44	21	27	22
19	13	17	13	12	12	99	91	42	22	29	23
20	13	17	14	12	12	103	95	42	24	32	25
21	13	18	14	12	12	107	98	42	26	34	27
22	13	19	14	13	13	111	101	41	28	36	29
23	13	20	15	13	13	115	104	41	30	38	31
24	14	21	15	13	13	118	106	42	32	40	33
25	14	21	15	13	13	113	108	42	34	42	35
26	15	22	16	14	14	109	104	43	36	44	37
27	15	23	17	14	14	107	102	43	38	46	39
28	16	24	18	15	14	106	101	43	40	48	40
29	16	25	20	15	15	106	101	43	42	49	42
30	17	26	22	16	16	106	100	45	44	51	44
31	18	27	23	16	16	106	100	45	46	52	46
32	18	28	24	17	17	107	100	44	48	54	48
33	19	29	24	18	18	108	100	43	50	56	49
34	20	30	26	19	19	109	100	42	52	57	51
35	21	31	28	20	20	111	100	41	54	60	53
36	22	32	28	21	21	113	101	40	56	61	54
37	23	34	29	22	22	116	101	39	58	63	56
38	24	35	31	23	23	119	102	38	59	65	57
39	25	37	34	24	24	122	103	37	62	67	59
40	26	38	34	26	25	126	104	36	63	68	61
41	27	40	37	27	27	131	106	34	65	70	62
42	29	42	39	28	28	136	108	32	67	72	64
43	30	43	38	30	30	141	112	31	69	74	65
44	31	45	38	32	32	146	116	31	71	76	67
45	32	47	38	34	34	152	121	30	73	78	69
46	35	48	40	36	36	158	125	29	75	80	71
47	36	50	41	38	38	163	132	29	76	82	74
						168	137	29	78	84	76



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IFC FIELD OF APPLICATION REPORT

PAR/14173/01

Field of Application of the Fire Resistance of Minimum 44mm Thick FD60 Nan Ya Composite Door Leaves Installed in LB Plastics Frames

Prepared on behalf of:

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Fire Works
Nether Heage
Derby
DE56 2JJ

NOTE: *This report should not be manipulated, abridged or otherwise presented without the written consent of International Fire Consultants Ltd*

Issued – August 2014
Valid Until – August 2019

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ISSUE RECORD

Issue	Date	Recipient	Comments
Draft	06/08/14	LB Plastics Ltd	In electronic (pdf) format
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AMENDMENT RECORD

Date	Paragraph	Amendment

Revision	PAR/14173/01				
Author	PP				
Reviewer	DC				

Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

Prepared for: LB Plastics Ltd

IFC Field of Application Report
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MET00040108/26

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Field of Application of 44mm thick FD60 Nan Ya
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MET00040108/27

1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC) to define the Field of Application for minimum 44mm thick Nan Ya composite door leaves installed in LB Plastics frames, that are required to provide 60 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

The methodologies used in preparing this document are based upon the guidance in BS ISO/TR 12470: 1998; *'Fire resistance tests - Guidance on the application and extension of results'*.

It is proposed that variations to the tested specifications, as described in the following sections, may be accommodated into assemblies, without reducing their potential to achieve a 60 minute integrity rating, if tested in accordance with the method and criteria of BS476: Part 22: 1987. The omission of information on any components or manufacturing methods does not imply a lack of approval of those details but these would need to be the subject of a separate analysis. Only variations specifically mentioned are supported by this assessment document, and all other aspects must otherwise be as tested.


2. TEST EVIDENCE

The test evidence used to support this assessment is summarised in Appendix E of this report.

3. SCOPE OF APPROVAL

3.1 Doorset Configuration

The following doorset configurations are approved within the scope of this report:

Configuration	Envelope of Approved Leaf Size
 <ul style="list-style-type: none">• Latched• Single Acting• Single Door• Without Overpanel	Figure PAR/14173/01:C01 in Appendix C

Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

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3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each mode and configuration covered by this field of application report are given in Appendix C, based upon use of the intumescent seal specification shown in Appendix B.

3.3 Door Leaf Specification

A detailed constructional specification of the basic door construction is given below. This is based upon the test evidence detailed in Appendix E, (and is, therefore, limited to the information available from that test report), but also defines variations and tolerances, where it is considered that these will not adversely affect overall fire resistance.

Component		Species/ Material	Dimensions	Minimum Density
Core		Phenolic foam	41mm thick reducing to 26mm at fielded areas	90kg/m ³ <i>Note 1</i>
Stiles	Inner	Mixed timber finger-jointed lamels <i>Note 2</i>	30mm wide x 40mm thick	490-600kg/m ³ <i>Note 1</i>
	Outer		60mm wide x 40mm thick	
Rails	Inner	Mixed timber finger-jointed lamels <i>Note 2</i>	30mm wide x 40mm thick	490-600kg/m ³ <i>Note 1</i>
	Outer		60mm wide x 40mm thick	
Facings		Interlocking GRP (9mm wide interlocking detail)	2mm thick	—
Adhesives	Stiles and rails	Polyurethane	—	—
Minimum leaf thickness		—	44mm	—
Optional additional decorative finish		Paint	Maximum 1mm thick	—

Note 1 Nominal stated density.

Note 2 Mixed timber consisting of Pine, Acacia and Styrax. Timber must be of appropriate quality in accordance with BS EN 942: 1996. Moisture content shall be 10 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries).

Field of Application of 44mm thick FD60 Nan Ya Composite Door Leaves Installed in LB Plastics Frames

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A detailed drawing of the proposed door leaf construction is given in **Figure PAR/14173/01:A01 and A02** in Appendix A.

3.4 Door Frames

Composite frames, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendix C, utilising the intumescent seal specification outlined in Appendix B.

Product References	Product Description	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth	Minimum Stop Height
LB Plastics SK77950 and S119	Extruded PVC section reinforced with a 30mm x 35mm x 1.5mm steel box section	70mm	70mm	22mm	20mm

Frame corner joint : Mitred joint with 125 x 125mm bracket (reference LB Plastics SW73174) screw fixed in each corner.

Frame extension : A 25mm wide x 70mm deep extruded PVC section including a ST 30 x 2.5 intumescent seal (reference LB Plastics SK70131) can be include at the perimeter.

3.5 Glazed Apertures

3.5.1 Glass types

The following glass type is approved for use in the Nan Ya door leaves considered herein, which are compatible with the identified approved glazing systems given in Section 3.5.2, although some restrictions on size may be given in subsequent sections.

- 24mm thick double glazed unit including 7mm thick Pyroguard glass on the unexposed/external side of the door, a 10mm thick steel spacer and a 6.4mm thick laminated clear glass on the exposed/internal side

Expansion allowance shall be as recommended by the glass manufacturer.

Field of Application of 44mm thick FD60 Nan Ya Composite Door Leaves Installed in LB Plastics Frames

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3.5.2 Bead profiles, glass retention and installation

The double glazed unit is retained in the aperture by means of the Nan Ya two part steel retaining clips and a glazing cassette. The base section of the retaining clip is fixed with 2no No4 x 25mm long steel screws into the door core centrally at the top and bottom of the aperture. The locking clip slides over the screw fixings to retain the double glazed unit in place. The Nan Ya 9S twin top ABS snap fit glazing cassette is fixed in place around the glass and glazing clips and fixed with cassette fixing screws.

The glazing materials are a 1mm thick Interdens liner at the base of the aperture with a Pyroplex 30 x 2.5mm flexible graphite aperture liner and Alonsons 1101 hybrid polymer clear sealant applied to the perimeter of the glazing cassette.

The approved bead size and profile, intumescent material and relevant fixing details, are shown on **Figure PAR/14173/01:A01** in Appendix A.

3.5.3 Assessed aperture sizes

Based upon the size of apertures tested, it the opinion of IFC that the following limitations apply where glazed apertures are included in the Nan Ya door leaf construction considered herein;

Maximum area of aperture	=	0.023m ²
Maximum glass height	=	205mm
Maximum glass width	=	160mm
Minimum margin from leaf head	=	130mm
Minimum margin from leaf edge	=	120mm
Minimum margin between apertures	=	90mm

3.6 Intumescent Seals

The intumescent seal specifications, widths, and positions are shown in Appendix B, based upon details tested.

3.7 Ambient Temperature Smoke Seals

Smoke seals, or combined intumescent/smoke seals (using the intumescent products approved in Appendix B), that have been tested to BS476: Part 31: Section 31.1: 1983 and shown not to leak by more than 3m³/m/hr at 25Pa may be used in conjunction with the proposed doorsets to provide smoke control.

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The orientation of the seals, door edge gaps, degree of building hardware interruption, and leaf configuration, will need to be as tested to BS476: Part 31: Section 31.1: 1983 to achieve the desired level of smoke control, unless these conflict with the intumescent seal widths and positions as shown in Appendix B, in which case, the latter shall take precedence.

Test evidence to BS476: Part 22: 1987 shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber doorsets, when fitted in the proposed arrangements.

3.8 Hardware

Some of the various items of hardware to be used with the proposed doorsets will have a positive contribution to the overall performance ('essential hardware') and others are classed as 'non-essential'. However, in all cases it must be ensured that choice of items, or their installation within the assemblies, does not have a detrimental effect upon their achievement of the required period of fire resistance.

All hardware beyond the scope of the general guidance given below must have been subjected to fire resistance testing, and/or assessed by a notified body, to support its use in doors of a similar construction to that proposed, or third party certification shall be available to support its use on doorsets of the proposed type.

General guidance for all items of hardware is outlined in Appendix D, based upon the range of items tested.

3.9 Installation, Supporting Construction, and Door Edge Gaps

The frames must be fixed back to the supporting construction with steel fixings at centres not exceeding 600mm; this applies to jambs and head. Screws shall be of sufficient length to penetrate the wall by at least 40mm, and shall be positioned such that they are not exploited by charring of the frame, irrespective of the direction of test exposure; (this may necessitate a twin line of screws). Packers shall be used at all fixing positions, although if combustible packers are employed, these must be protected by a layer of firestopping (see below), aligned near to each face of the door frame.

The supporting construction may be either timber or steel stud plasterboard clad partition, blockwork, brickwork or concrete walls, but shall be of a type that has been tested or assessed to provide in excess of 60 minutes fire resistance at the required size when incorporating doorset openings. If fitted into timber or steel stud partitions, the method of forming the doorset aperture must be as tested by the partition and/or doorset manufacturer.

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Note 3 Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers – this report does not approve use of the proposed doorsets in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and doorsets therein.

No part of the rear of the frame section shall be exposed once installed, (except for integral architraves) and the leaf must be flush with the face of the wall. There shall be no feature rebates or shadow gaps at the junction of the frame and wall.

The fire stopping between the supporting construction and timber frames should follow the recommendations of Table 3 in BS8214: 2008, "Code of practice for fire door assemblies", using a product proven in such applications, and with reference to the correct depth of seal to suit the width of gap between wall and frame. The firestopping shall be positioned on the plane of the door leaf; (unless combustible packers are employed).

The gap between the door and the frame should be 2–5mm. Gaps under the door(s) should not exceed 6mm for fire performance, although, if smoke control is also required, these gaps should only be 3mm, or smoke seals should be included (see also Section 3.7 regarding suitability of smoke seals).

The doorset design should be such that the leaves are fully flush within the frame when in the closed position. They may however be set back from the exposed face of the frame if required.

4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that, if the proposed minimum 44mm thick Nan Ya composite door leaves installed in LB Plastics frames, were manufactured and installed within the limitations of this assessment, and tested for fire resistance, they would satisfy the integrity criteria of BS476: Part 22: 1987 for 60 minutes.

5. LIMITATIONS

This assessment addresses itself solely to the ability of the proposed assemblies described to satisfy the criteria of the fire resistance test and does not imply any suitability for use with respect to other unspecified criteria.

This document only considers the doorset constructions described herein, and assumes that the surrounding construction will provide no less restraint than the tested assembly, and that it will remain in place and be substantially intact for the full fire resistance period.

Field of Application of 44mm thick FD60 Nan Ya
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Where the constructional information in this report is taken from details provided to IFC and/or fire resistance test reports referenced herein, it is therefore limited to the information given in those documents. It is necessarily dependent upon the accuracy and completeness of that information. Where constructional or manufacturing details are not specified, or discussed herein, it should not, therefore, be taken to infer approval of variation in such details from those tested or otherwise approved.

Where the assessed constructions have not been subject to an on-site audit by IFC, it is the responsibility of anyone using this report to confirm that all aspects of the assemblies fully comply with the descriptions and limitations herein.

Any materials specified in this report have been selected and judged primarily on their fire performance. IFC do not claim expertise in areas other than fire safety. Whilst observing all possible care in the specification of solutions, we would draw the reader's attention to the fact that during the construction and procurement process, the materials used should be subjected to more general examination regarding the wider Health and Safety, and CoSHH Regulations.

This Report is provided to the sponsor on the basis that it is a professional independent engineering opinion as to what the fire performance of the construction/system would be should it be tested to the named standard. It is IFC's experience that such an opinion is normally acceptable in support of an application for building approvals, certainly throughout the UK and in many parts of Europe and the rest of the world.

However, unless IFC have been commissioned to liaise with the Authorities that have jurisdiction for the building in question for the purpose of obtaining the necessary approvals, IFC cannot assure that the document will satisfy the requirements of the particular building regulations for any building being constructed.

It is, therefore, the responsibility of the sponsor to establish whether this evidence is appropriate for the application for which it is being supplied and IFC cannot take responsibility for any costs incurred as a result of any rejection of the document for reasons outside of our control. Early submittal of the Report to the Authorities will minimise any risks in this respect.

Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

Prepared for: LB Plastics Ltd

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6. VALIDITY

This assessment has been prepared based on International Fire Consultants Ltd's present knowledge of the products described, the stated testing regime and the submitted test evidence. For this reason anyone using this document after August 2019 should confirm its ongoing validity.

Prepared by:



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BSc (Hons) PhD MIFireE

Fire Safety Engineer

International Fire Consultants Ltd. (IFC)

Checked by:



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Senior Fire Safety Engineer

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Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

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APPENDIX A

Nan Ya Door Leaf Details

Figure PAR/14173/01:A01 and A02

*The figures in this Appendix are not included
in the sequential page numbering of this report*

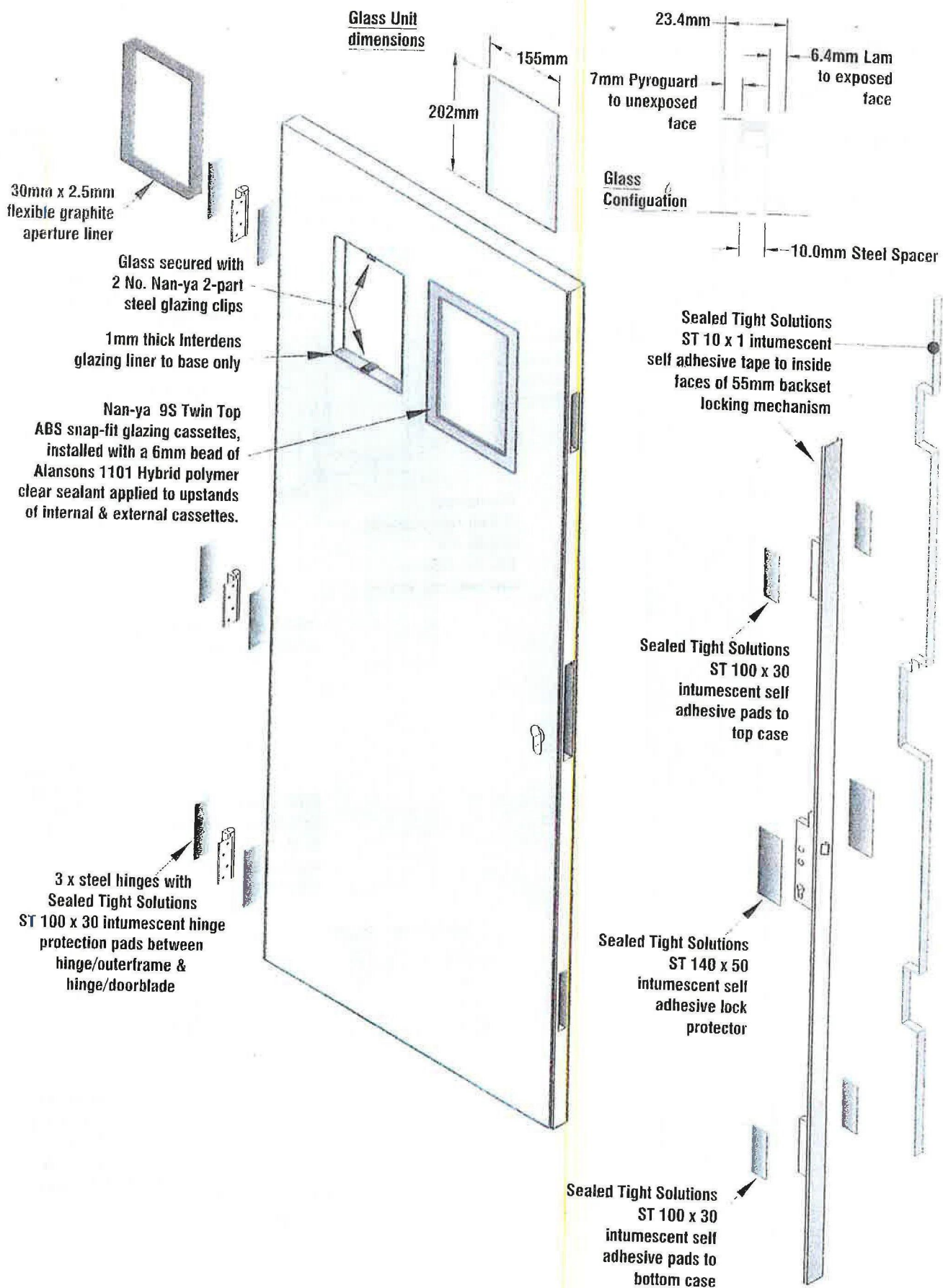
Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

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Field of Application Report PAR/14173/01
LB Plastics Ltd
Minimum 44mm Thick FD60 Nan
Ya Composite Door Leaves
Installed in LB Plastics Frames

Nan-ya 44mm FD60
Intumescent Positioning Details

Job number: 14173

Drawn by: CSP

Checked by: PP

Not To Scale

Drawn: Jun 2014

PAR/14173/01:AO1

Intumescent
Sealed Tight Solutions
ST 30 x 2.5
(30mm x 2.5mm)

Intumescent
Sealed Tight Solutions
ST 25 x 2.5
(25mm x 2.5mm)

SK77950 PVCu
Outerframe
S119 Reinforcing

Intumescent
Sealed Tight
Solutions ST 1
(1mm frame
protection)

6.0mm

70mm

30mm

5.0mm

Intumescent 2off
25mm x 2.5mm
(Head of door
blade only)

3.0mm

VERTICAL SECTION 'XX'

SK77950 PVCu
Outerframe

Intumescent
Sealed Tight Solutions
ST 30 x 2.5
(30mm x 2.5mm)

Intumescent Sealed Tight Solutions
ST 10 x 1 (10mm x 1mm continuous
to hinge side jamb)

3.5mm

Intumescent
Sealed Tight Solutions
ST 25 x 2.5
(25mm x 2.5mm,
interrupted by hinges)

HORIZONTAL SECTION THRO'
HINGE SIDE JAMB

Intumescent
Sealed Tight Solutions
ST 30 x 2.5
(30mm x 2.5mm)

Intumescent
Sealed Tight Solutions
ST 10 x 1 (10mm x 1mm
continuous to lock
side jamb)

9mm

30mm

Nom. 60mm

Intumescent
Sealed Tight Solutions
ST 25 x 2.5
(25mm x 2.5mm,
interrupted by keeps)

HORIZONTAL SECTION THRO'
LOCK SIDE JAMB

2mm GRP Skin
& Interlock

Phonelic Foam
Insulation
40mm thick,
26mm thick at
fielded areas

Mixed wood
40mm thick

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Field of Application Report PAR/14173/01
LB Plastics Ltd
Minimum 44mm Thick FD60 Nan
Ya Composite Door Leaves
Installed in LB Plastics Frames

Nan-ya 44mm FD60
Horizontal & Vertical Sections

Job number: 14173

Drawn by: CSP

Checked by: FP

Not To Scale

Drawn: Jun 2014

PAR/14173/01

MET00040108/38

APPENDIX B

Assessed Intumescent Seal Specifications

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Composite Door Leaves Installed in LB Plastics Frames

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Intumescent Seal Specifications

Location		Size and Position
Door frame head	Frame reveal	1no Sealed Tight Solutions ST 25 x 2.5 seal centrally fitted in the frame reveal and 1no Sealed Tight Solutions ST 10 x 2 fitted in the upstand of the stop
	Leaf edge	2no Sealed Tight Solutions ST 25 x 2.5 seals fitted 'back to back' in a 5mm groove set 6mm from the stop face of the leaf
	Frame	1no Sealed Tight Solutions ST 30 x 2.5 seal fitted in the back of the frame and 1mm Sealed Tight Solutions ST flexible graphite fitted to the outer faces of the frame reinforcement
Door frame stiles/jambs	Frame reveal	1no Sealed Tight Solutions ST 25 x 2.5 seal centrally fitted in the frame reveal and 1no Sealed Tight Solutions ST 10 x 2 fitted in the upstand of the stop
	Back of frame	1no Sealed Tight Solutions ST 30 x 2.5 seal fitted in the back of the frame and 1mm Sealed Tight Solutions ST flexible graphite fitted to the outer faces of the frame reinforcement

All intumescent seals to be Sealed Tight Solutions graphite-based material.

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APPENDIX C

Assessed Leaf Size Envelope

Figures PAR/14173/01:C01

The figure in this Appendix is not included in the sequential page numbering of this report

Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

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	A	B
Width	654	888
Height	2289	1819

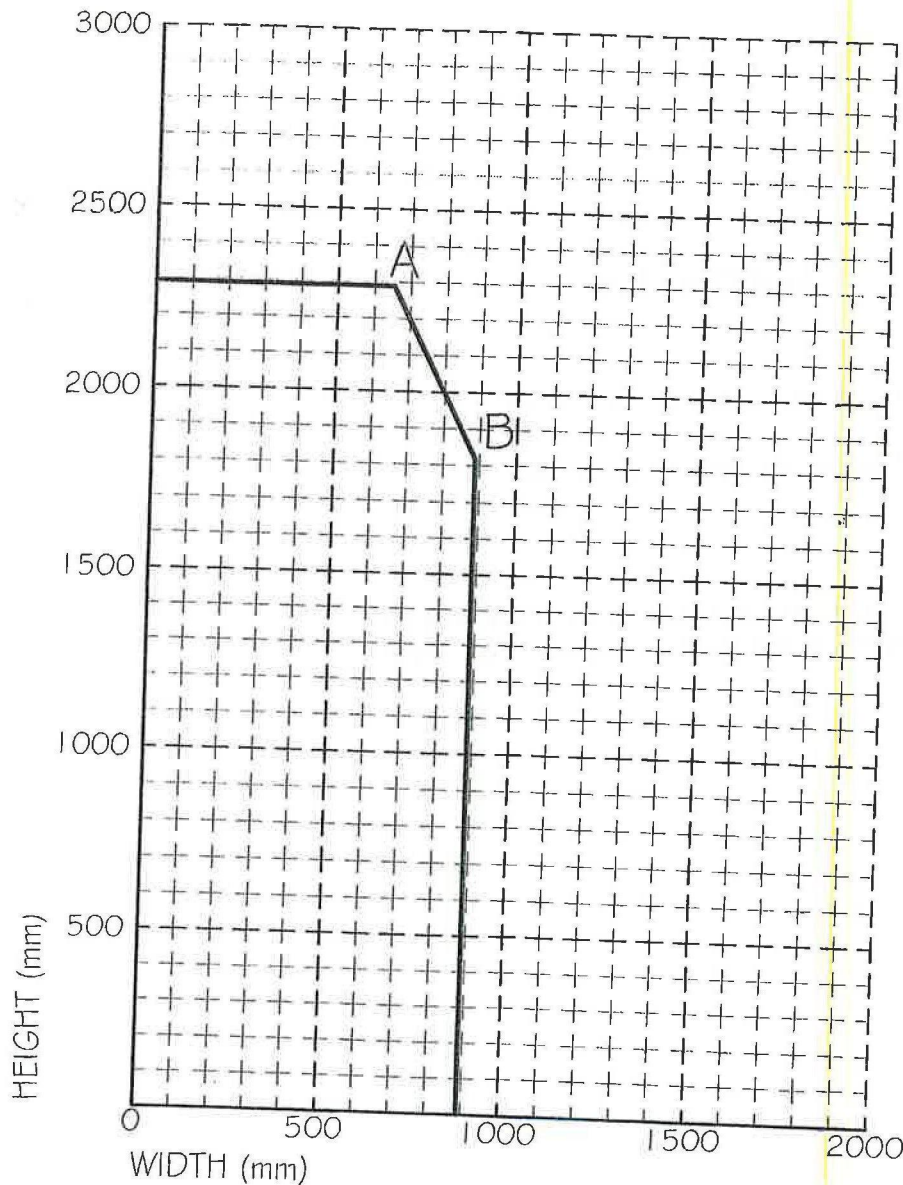
LEAF SIZE ENVELOPE POINTS

Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
WITHOUT
OVERPANEL

REQUIRED INTEGRITY : 60 Minutes



This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/14173/01, which contains full details of the assessed doorset construction.

This drawing is Copyright©
Contractors must check all dimensions.
Any discrepancies must be reported before
work proceeds.
Only work to dimensions stated on drawing.

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Field of Application Report PAR/14173/01
LB Plastics Ltd
Minimum 44mm Thick FD60 Nan
Ya Composite Door Leaves
Installed in LB Plastics Frames

Envelope of Approved
Door Leaf Sizes
LSASD
In Composite Frames

Job number: 14173

Drawn by: CSP Checked by: PP
Not To Scale Drawn: Jun 2014

PAR/14173/01:CO1

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.
Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph above are approved.
POINT A represents the maximum leaf height and its associated width.
POINT B represents the maximum leaf width and its associated height.

APPENDIX D

General Guidance on Installation of Hardware

Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

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General Guidance on Installation of Hardware

D.1 Hinges

The doorsets have been tested utilising the following steel butt hinges;

- Masterdor Type HNG1333

These hinges can be utilised and will make a positive contribution to the required 60 minutes integrity performance providing they comply with the following specification:

- Minimum number : 3no per leaf.
- Positions : The top hinge must be positioned 150mm down from the head of the leaf to the top of the hinge and the bottom hinge positioned 225mm up from the foot of the leaf to the bottom of the hinge. Central hinge to be equispaced between the top and bottom hinges. (All positions $\pm 25\text{mm}$).
- Fixings : Steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) x 30mm long, and having thread for the full length. Position of screws (in relation to the door face) in blades of alternative hinge types shall be similar to hinges tested with the proposed door type.
- Hinge materials : Brass, Phosphor Bronze, Steel or Stainless Steel. (Aluminium, Nylon or 'Mazac' are not permitted). No combustible or thermally softening materials to be included.
- Additional protection : Hinge blades to be bedded on 1mm thick Sealed Tight Solutions ST flexible graphite intumescent material between blade and leaf and blade and frame.

Rising butt, non-cranked butts and spring hinges (single or double action) are not suitable for use on doors approved within the scope of this generic assessment, although may be suitable to form the subject of an individual and specific evaluation.

D.2 Mortice Latches/Locks

The assessed doorsets include the Winkhaus MDS301 multi-point locking system which includes up to 3no. lock/latch cases morticed into the door leaf, a forend plate in excess of 1000mm long and individual keep plates at each lock/latch position. This system must be included in the assessed doorsets and, as testing was carried out with all of the multi-point locking points engaged, doorsets must include engaged multi-point locks.

A bespoke configuration of intumescent seals (see Appendix B and below) is included to compensate against the potential for integrity failure introduced by the installation of these components.

The main body of the latch, top case and bottom case shall be lined on both faces with 1mm thick ST flexible graphite intumescent material.

The inner face of the backset locking mechanism must be lined with 10 x 1mm Sealed Tight Solutions ST flexible graphite intumescent material.

The latch keeps and inside the hook bolt pockets must be lined with 1mm thick Sealed Tight Solutions ST flexible graphite intumescent material.

Holes bored through the door for handles must be as small as possible to suit the penetrating item.

D.3 Door Closers

Where required by regulatory guidance, each hinged door leaf must be fitted with a self-closing device unless they are normally kept locked shut and labelled as such with an appropriate sign which complies with BS5499: Part 1: 1990.

Doorsets have been tested with Rutland TS3204 overhead type closer. These closers and other face-fixed overhead door closers (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on latched FD60 cellulosic door leaves may be used. Any accessory that is located within the door reveal must have appropriate test or assessment evidence.

Transom mounted or concealed overhead closers must not be incorporated into any of the doorsets within the scope of this generic scope of this report.

It is essential that all closers are of the correct power rating for the width and weight of the doorsets. They must be fitted according to the manufacturer's instructions, and be adjusted so that they are capable of fully closing the door leaf, against any friction imposed by the latch, (and smoke seals, if fitted), from any position of opening.

Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

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D.4 Non-Essential Hardware Items

Security Viewers

These may be fixed into the proposed doors, subject to the following limitations, unless specific fire test evidence exists to the contrary;

- Viewers must not exceed 13mm outer diameter, and be made from brass or steel.
- Holes bored through the door must be no greater than 1mm larger than the bore of the viewer.
- The viewer must include an effective shutter/cover plate.
- The viewer must not be less than 35mm away from the leaf edge, or any other aperture or panel detail.
- The viewer cut out must be lined with 1mm thick Sealed Tight Solutions ST flexible graphite intumescent material.

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Summary of Fire Test Evidence

Test Report	Configuration Tested	Leaf Size	Test Standard	Integrity
BMT/FEP/ F13274	LSASD	2015 x 790 x 44mm	BS476: Part 22: 1987	29 minutes*
BMT/FEI/ IF14030	LSASD	1200 x 785 x 44mm	BS476: Part 22: 1987	57 minutes**

LSASD = Latched, Single Acting, Single leaf Doorset

* Failure occurred at the top hanging corner. The analysis of this report has included additional intumescent protection mitigating against the premature failure. Further failure occurred at this position at 35 minutes. There were no further failures prior to 60 minutes.

** Failure occurred at the top hanging corner. The analysis of this report has included additional intumescent protection mitigating against the premature failure. There were no further failures prior to 60 minutes.

Field of Application of 44mm thick FD60 Nan Ya
Composite Door Leaves Installed in LB Plastics Frames

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IFC FIELD OF APPLICATION REPORT**PAR/13981/01**

**Field of Application of FD30 LB Plastics
Capstone and Nanya Composite Door Leaves
Installed in LB Plastics Composite Frames,
with Optional Overpanels and Side Lights**

Prepared on behalf of:

LB Plastics Ltd
Firs Works
Nether Heage
Derbyshire
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NOTE: *This report should not be manipulated, abridged or otherwise presented without the written consent of International Fire Consultants Ltd*

Issued – March 2014
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ISSUE RECORD

Issue	Date	Recipient	Comments
Original	13/03/14	LB Plastics Ltd	In electronic (pdf) format

AMENDMENT RECORD

Date	Paragraph	Amendment

Revision	PAR/13981/01				
Author	PP				
Reviewer	DC				

Field of Application of FD30 LB Plastics Capstone and Nanya Composite Door Leaves Installed in LB Plastics Composite Frames, with Optional Side Lights and Overpanels

Prepared for: LB Plastics Ltd

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Frames, with Optional Side Lights and Overpanels

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1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC) to define the Field of Application for FD30 LB Plastics Capstone and Nanya composite door leaves installed in LB Plastics composite frames composite frames that are required to provide 30 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

The methodologies used in preparing this document are based upon the guidance in BS ISO/TR 12470: 1998; 'Fire resistance tests - Guidance on the application and extension of results'.

It is proposed that variations to the tested specifications, as described in the following sections, may be accommodated into assemblies, without reducing their potential to achieve a 30 minute integrity rating, if tested in accordance with the method and criteria of BS476: Part 22: 1987. The omission of information on any components or manufacturing methods does not imply a lack of approval of those details but these would need to be the subject of a separate analysis. Only variations specifically mentioned are supported by this assessment document, and all other aspects must otherwise be as tested.

2. TEST EVIDENCE


The test evidence used to support this assessment is summarised in Appendix E of this report.

3. SCOPE OF APPROVAL

3.1 Doorset Configuration

The following doorset configurations are approved within the scope of this report:

Capstone

Configuration	Envelope of Approved Leaf Size
 <ul style="list-style-type: none">• Latched• Single Acting• Single Door• Without Overpanel	Figure PAR/13981/01:C01 in Appendix C

Field of Application of FD30 LB Plastics Capstone and Nanya Composite Door Leaves Installed in LB Plastics Composite Frames, with Optional Side Lights and Overpanels

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Nanya

Configuration	Envelope of Approved Leaf Size
 <ul style="list-style-type: none"> • Latched • Single Acting • Single Door • Without Overpanel 	Figure PAR/13981/01:C02 in Appendix C

3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each door configuration covered by this Field of Application Report are given in Appendix C, based upon use of the intumescent seal specifications outlined in Appendix B.

3.3 Door Leaf Specification

Detailed constructional specifications of the basic door constructions are given below. These are based upon the test evidence detailed in Appendix E, (and are, therefore, limited to the information available from test reports), but also defines variations and tolerances, where it is considered that these will not adversely affect overall fire resistance.

Capstone

Component		Species	Dimensions	Minimum Density
Stiles	Inner	Laminated veneer lumber	111 – 30.5mm wide x 40mm thick	570kg/m ³ <i>Note 1</i>
	Outer	Engineering timber	47 – 25.5mm wide x 40mm thick	530kg/m ³ <i>Note 1</i>
Top rail	Inner	Laminated veneer lumber	30.5 – 30mm wide x 40mm thick	570kg/m ³ <i>Note 1</i>
	Outer	Engineering timber	96.8(2no 48.4) – 15.5mm wide x 40mm thick	530kg/m ³ <i>Note 1</i>
Bottom rail		Engineering timber	26.8mm wide x 40mm thick	530kg/m ³ <i>Note 1</i>
Core		Phenolic foam	40mm thick reducing to nominally 16mm at fielded areas	50kg/m ³ <i>Note 1</i>

Field of Application of FD30 LB Plastics Capstone and Nanya Composite Door Leaves Installed in LB Plastics Composite Frames, with Optional Side Lights and Overpanels

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Component	Species	Dimensions	Minimum Density
Facings	Moulded GRP	2mm thick	N/A
Optional lippings – vertical edges only	Profiled steel	1.5mm thick	N/A
Adhesives and jointing methods	As tested	–	–
Minimum leaf thickness	–	44mm	–
Optional additional decorative finishes	Timber veneer, decorative plastic based laminate, PVC or paint	Maximum 2mm thick	–

Note 1 Nominal stated density.

Door leaves can be flush or include the effect of four raised and fielded panels. Alternatively the top two half of the door can include two glazed apertures or one larger glazed aperture (see Section 4.5).

Nanya

Component		Species	Dimensions	Minimum Density
Stiles	Inner	Mixed timber finger jointed lamels	70 – 38mm wide x 40mm thick	490kg/m ³ <i>Note 2</i>
	Outer		30mm wide x 40mm thick	
Rails	Inner	Mixed timber lamels	70mm wide x 40mm thick	490kg/m ³ <i>Note 2</i>
	Outer		30mm wide x 40mm thick	
Core		Phenolic foam	41mm thick	75kg/m ³ <i>Note 2</i>
Facings		Moulded GRP	2mm thick	N/A
Lippings – vertical edges only		Profiled steel	2mm thick	N/A

Field of Application of FD30 LB Plastics Capstone and Nanya Composite Door Leaves Installed in LB Plastics Composite Frames, with Optional Side Lights and Overpanels

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Component	Species	Dimensions	Minimum Density
Adhesives and jointing methods	As tested	—	—
Minimum leaf thickness	—	44mm	—
Optional additional decorative finishes	Timber veneer, decorative plastic based laminate, PVC or paint	Maximum 2mm thick	—

Note 2 Nominal stated density.

Door leaves have a flush appearance.

3.4 Frames

Composite frames, to any of the specifications given, below, may be used as the perimeter framing for all doorsets in the range of approved sizes and configurations outlined in Appendix C, utilising the intumescent seal specifications outlined in Appendix B.

Product References	Product Description	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth	Minimum Stop Height
LB Plastics SK77950 and S119	Extruded PVC section reinforced with a 30mm x 35mm x 1.5mm steel box section	52mm	70mm	23mm	20mm
LB Plastics SK77960 and S960	Extruded PVC section reinforced with a 15mm x 35mm x 1.5mm steel box section	34mm	70mm	23mm	20mm

Frame extension : A 25mm wide x 68mm deep extruded PVC section including a 30 x 2.5mm graphite-based intumescent seal (e.g. Norsound NOR 940) (reference LB Plastics SK70131) can be include at the perimeter of both of the LB Plastics frame profiles outlined above.

Frame corner joint : Mitred joint with 125 x 125mm bracket (reference LB Plastics SW73174) screw fixed in each corner.

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- Threshold : The following thresholds can be included within the assembly;
- 75mm wide x 28mm high extruded aluminium Masterguard 51 low mobility threshold
 - 115mm wide x 25mm high extruded aluminium Exitex MDS threshold
- Mullions and transom members : When mullions and transom members are used between door leaves and side lights and overpanels, the member shall consist of LB Plastics SK7742 and S3 members jointed utilising A204 profiled aluminium couplers and SK70981 aluminium coupler cover trim.
- Side light transom : 70mm wide x 70mm high extruded PVC section, reference LB Plastics SW7743, reinforced with 1.5mm thick steel box section, reference LB Plastics S101, with integral 14mm high x 15mm integral beads to top and bottom.

3.5 Glazed Apertures

Glazed apertures can be included in Capstone door leaves only.

3.5.1 Glass Types

The following glass type is approved for use in the Capstone door leaves considered herein, which are compatible with the identified approved glazing systems given in Section 3.5.2, although some restrictions on size may be given in subsequent sections.

- 26mm thick double glazed unit including 7mm thick Pyroshield 2 glass on the unexposed/external side of the door, a 12mm thick steel spacer and a 6.8–7mm thick laminated clear glass on the exposed/internal side

Expansion allowance shall be as recommended by the glass manufacturer.

3.5.2 Bead Profiles, Glass Retention and Installation

The double glazed unit is retained in the aperture by means of two part steel retaining clips and a glazing cassette. The base section of the retaining clip is fixed with 2no No4 x 25mm long steel screws. The locking clip slides over the screw fixings to retain the double glazed unit in place. The glazing cassette is fixed in place around the glass and glazing clips and fixed with cassette fixing screws. The clips are positioned at maximum 50mm from corners and maximum 450mm centres.

The approved bead size and profile, intumescent material and relevant fixing details, are shown on **Figure PAR/13981/01:A01** in Appendix A.

3.5.3 Assessed Aperture Sizes

Based upon the size of apertures tested, it is the opinion of IFC that the following limitations apply where glazed apertures are included in the Capstone door leaf construction considered herein;

One Glazed Aperture

Maximum area of glazed aperture	-	0.56m ²
Maximum aperture height	-	1000mm
Maximum aperture width	-	615mm
Minimum margin from leaf head	-	120mm
Minimum margin from leaf edge	-	120mm

Two Glazed Apertures

Maximum area of each glazed aperture	-	0.19m ²
Maximum aperture height	-	920mm
Maximum aperture width	-	210mm
Minimum margin from leaf head	-	120mm
Minimum margin from leaf edge	-	70mm
Minimum distance between apertures	-	90mm

3.6 Intumescent Seals

The intumescent seal specifications, widths, and positions are shown in Appendix B, based upon details tested.

3.7 Ambient Temperature Smoke Seals

Smoke seals, or combined intumescent/smoke seals (using the intumescent products approved in Section 3.6), that have been tested to BS476: Part 31: Section 31.1: 1983 and shown not to leak by more than 3m³/m/hr at 25Pa may be used in conjunction with the proposed doorsets to provide smoke control.

The orientation of the seals, door edge gaps, degree of building hardware interruption, and leaf configuration, will need to be as tested to BS476: Part 31: Section 31.1: 1983 to achieve the desired level of smoke control, unless these conflict with the intumescent seal widths and positions as shown in Section 3.6, in which case, the latter shall take precedence.

Test evidence to BS476: Part 22: 1987 shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber doorsets, when fitted in the proposed arrangements.

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3.8 Hardware

Some of the various items of hardware to be used with the proposed doorsets will have a positive contribution to the overall performance ('essential hardware') and others are classed as 'non-essential'. However, in all cases it must be ensured that choice of items, or their installation within the assemblies, does not have a detrimental effect upon their achievement of the required period of fire resistance.

All hardware beyond the scope of the general guidance given below must have been subjected to fire resistance testing, and/or assessed by a notified body, to support its use in doors of a similar construction to that proposed, or third party certification shall be available to support its use on doorsets of the proposed type.

General guidance for all items of hardware is outlined in Appendix D, based upon the range of items tested.

3.9 Overpanel and Side Lights

Doorsets can include an overpanel, on the other side of a transom member and/or sidelights on the other side of mullions. Sidelights may be positioned with one on either side of the doorset or with two on one side of the door leaf, separated by a mullion. For transom and mullion specifications see Section 3.4.

The overpanels and side light can be glazed using the following;

- 24mm thick double glazed unit including 7mm thick Pyroshield 2 glass on the unexposed/external side of the door, a 10mm thick steel spacer and a 6.8–7mm thick laminated clear glass on the exposed/internal side. Expansion allowance shall be as recommended by the glass manufacturer.

The overpanels and side light can be solid using the following;

- 24mm thick with a core of 18mm thick graduated density chipboard (density 639kg/m³), with an inner facing of 1mm thick Norsound NOR 910 graphite based intumescent sheet and outer facing of 1.6mm thick moulded GRP.

The approved bead size and profile, and relevant fixing details, shown with glazing, are shown on **Figure PAR/13981/01:A02** in Appendix A.

Based upon the size of overpanels tested, it the opinion of IFC that the following limitations apply to the apertures considered herein;

Maximum area of individual aperture	≤	0.30m ²
Maximum aperture height	-	400mm
Maximum aperture width	-	1010mm

Based upon the size of the glass in the two pane side light tested, it the opinion of IFC that the following limitations apply to each individual glazed or solid aperture considered herein;

Maximum area of individual aperture	-	0.52m ²
Maximum aperture height	-	1785mm
Maximum aperture width	-	400mm

More than one glazed or solid aperture will be required for the majority of door leaf heights especially as side lights extend the full height of the door and overpanel, if included. The side light apertures should be separated by side light transom members (see Section 3.4).

3.10 Installation, Supporting Construction, and Door Edge Gaps

The frames must be fixed back to the supporting construction with steel fixings at centres not exceeding 600mm; this applies to jambs and head. Screws shall be of sufficient length to penetrate the wall by at least 40mm, and shall be positioned such that they are not exploited by charring of the frame, irrespective of the direction of test exposure; (this may necessitate a twin line of screws). Packers shall be used at all fixing positions, although if combustible packers are employed, these must be protected by a layer of firestopping (see below), aligned near to each face of the door frame.

The supporting construction may be either timber or steel stud plasterboard clad partition, blockwork, brickwork or concrete walls, but shall be of a type that has been tested or assessed to provide in excess of 30 minutes fire resistance at the required size when incorporating doorset openings. If fitted into timber or steel stud partitions, the method of forming the doorset aperture must be as tested by the partition and/or doorset manufacturer.

Note 3 Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers – this report does not approve use of the proposed doorsets in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and doorsets therein.

No part of the rear of the frame section shall be exposed once installed, (except for integral architraves) and the leaf must be flush with the face of the wall. There shall be no feature rebates or shadow gaps at the junction of the frame and wall.

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The fire stopping between the supporting construction and timber frames should follow the recommendations of Table 2 in BS8214: 2008, "*Code of practice for fire door assemblies*", using a product proven in such timber applications, and with reference to the correct depth of seal to suit the width of gap between wall and frame. The firestopping shall be positioned on the plane of the door leaf; (unless combustible packers are employed).

The gap between the door and the frame should be 2–4mm. Gaps under the door(s) should not exceed 6mm for fire performance, although, if smoke control is also required, these gaps should only be 3mm, or smoke seals should be included in accordance with BS8214 (see also Section 3.7 regarding suitability of smoke seals).

The doorset design should be such that the leaves are fully flush within the frame when in the closed position. They may however be set back from the exposed face of the frame if required.

4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that, if the proposed FD30 LB Plastics Capstone and Nanya composite core door leaves installed in LB Plastics composite frames, with optional side lights and overpanels, were manufactured and installed within the limitations of this assessment, and tested for fire resistance, they would satisfy the integrity criteria of BS476: Part 22: 1987 for 30 minutes.

5. LIMITATIONS

This assessment addresses itself solely to the ability of the proposed assemblies described to satisfy the criteria of the fire resistance test and does not imply any suitability for use with respect to other unspecified criteria.

This document only considers the doorset constructions described herein, and assumes that the surrounding construction will provide no less restraint than the tested assembly, and that it will remain in place and be substantially intact for the full fire resistance period.

Where the constructional information in this report is taken from details provided to IFC and/or fire resistance test reports referenced herein, it is therefore limited to the information given in those documents. It is necessarily dependent upon the accuracy and completeness of that information. Where constructional or manufacturing details are not specified, or discussed herein, it should not, therefore, be taken to infer approval of variation in such details from those tested or otherwise approved.

Where the assessed constructions have not been subject to an on-site audit by IFC, it is the responsibility of anyone using this report to confirm that all aspects of the assemblies fully comply with the descriptions and limitations herein.

Any materials specified in this report have been selected and judged primarily on their fire performance. IFC do not claim expertise in areas other than fire safety. Whilst observing all possible care in the specification of solutions, we would draw the reader's attention to the fact that during the construction and procurement process, the materials used should be subjected to more general examination regarding the wider Health and Safety, and CoSHH Regulations.

This Report is provided to the sponsor on the basis that it is a professional independent engineering opinion as to what the fire performance of the construction/system would be should it be tested to the named standard. It is IFC's experience that such an opinion is normally acceptable in support of an application for building approvals, certainly throughout the UK and in many parts of Europe and the rest of the world.

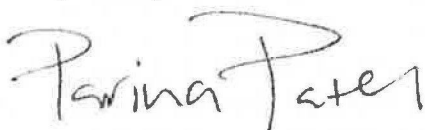
However, unless IFC have been commissioned to liaise with the Authorities that have jurisdiction for the building in question for the purpose of obtaining the necessary approvals, IFC cannot assure that the document will satisfy the requirements of the particular building regulations for any building being constructed.

It is, therefore, the responsibility of the sponsor to establish whether this evidence is appropriate for the application for which it is being supplied and IFC cannot take responsibility for any costs incurred as a result of any rejection of the document for reasons outside of our control. Early submittal of the Report to the Authorities will minimise any risks in this respect.

6. VALIDITY

This assessment has been prepared based on International Fire Consultants Ltd's present knowledge of the products described, the stated testing regime and the submitted test evidence. For this reason anyone using this document after November 2018 should confirm its ongoing validity.

Prepared by:



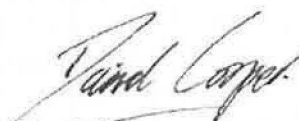
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Field of Application of FD30 LB Plastics Capstone and Nanya
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APPENDIX A

Glazing Details

Figures PAR/13981/01:A01 and A02

The figures in this Appendix are not included in the sequential page numbering of this report

APPENDIX B

Assessed Intumescent Seal Specifications

Field of Application of FD30 LB Plastics Capstone and Nanya
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Frames, with Optional Side Lights and Overpanels

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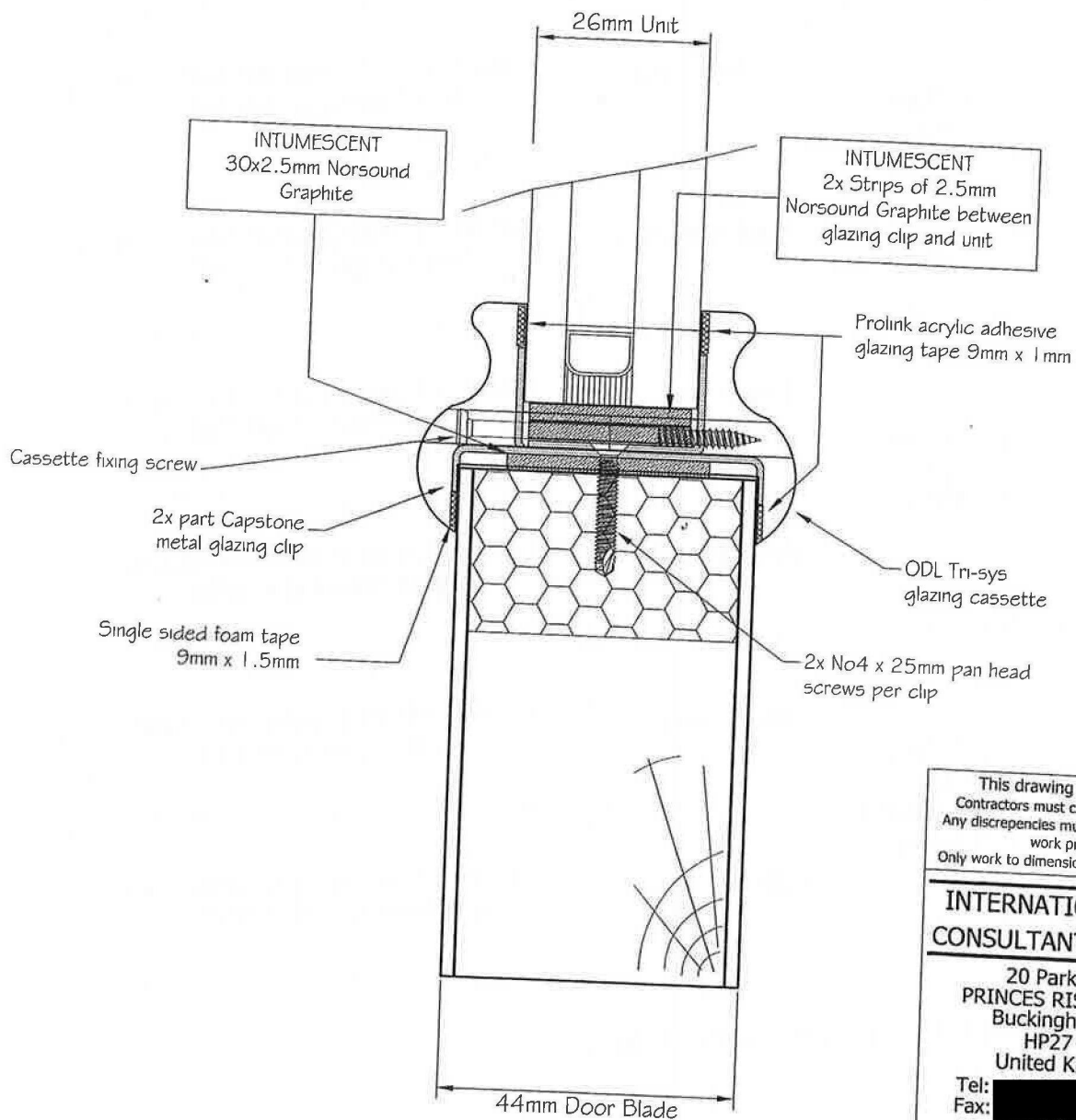
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Intumescent Seal Specifications

Location		Size and Position
Door frame stiles/ jambs	Frame reveal	1no 25 x 2.5mm graphite-based seal (e.g. Norsound NOR 930)
	Back of frame	1no 30 x 2.5mm graphite-based seal (e.g. Norsound NOR 940)
Door frame head	Frame reveal	1no 25 x 2.5mm graphite-based seal (e.g. Norsound NOR 930)
	Back of frame	1no 30 x 2.5mm graphite-based seal (e.g. Norsound NOR 940)
Side light and overpanel framing	Frame reveal	1no 25 x 2.5mm graphite-based seal (e.g. Norsound NOR 930)
	Back of frame	1no 30 x 2.5mm graphite-based seal (e.g. Norsound NOR 940)

Intumescent seals to be obtained from Norsound Ltd.



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Contractors must check all dimensions.
Any discrepancies must be reported before
work proceeds.
Only work to dimensions stated on drawing.

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Field of Application Report PAR/13981/01
LB Plastics Limited
FD30 LB Plastics Capstone and Nanya
Composite Door Leaves Installed in LB
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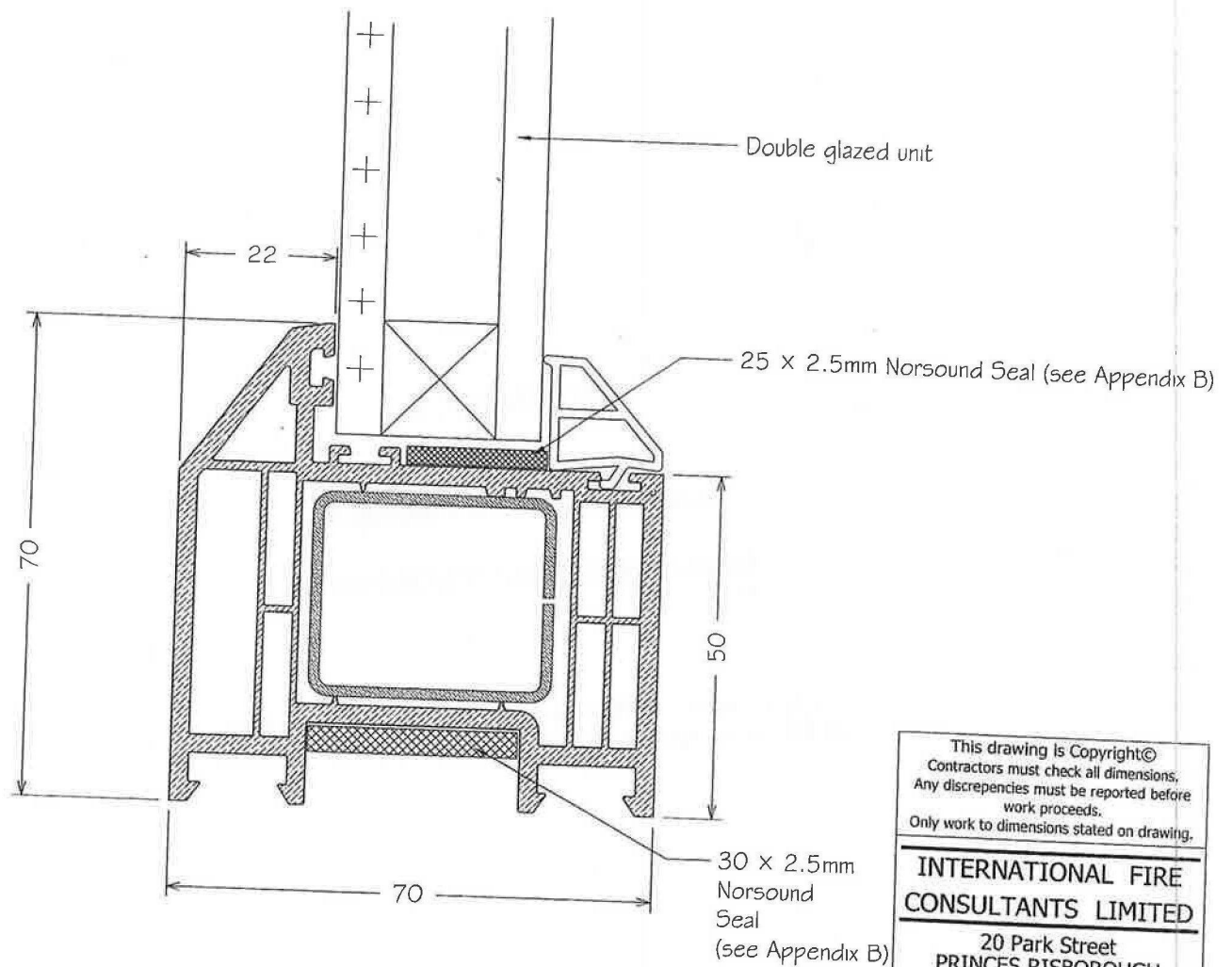
Glazing Detail

Job number: 13981

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Feb 2014

PAR/13981/C

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LB Plastics Limited
FD30 LB Plastics Capstone and Nanya
Composite Door Leaves Installed in LB
Plastics Composite Frames, with Optional
Side Lights and Overpanels

Optional Sidelight &
Overpanel Details

Job number: 13981

Drawn by: CSP	Checked by: PP
Not To Scale	Drawn: Feb 2014

PAR/13981/01:A02

APPENDIX C

Assessed Leaf Size Envelopes

Figures PAR/13981/01:C01 to C02

*The figures in this Appendix are not included
in the sequential page numbering of this report*

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	A	B
Width	753	981
Height	2421	1963

LEAF SIZE ENVELOPE POINTS

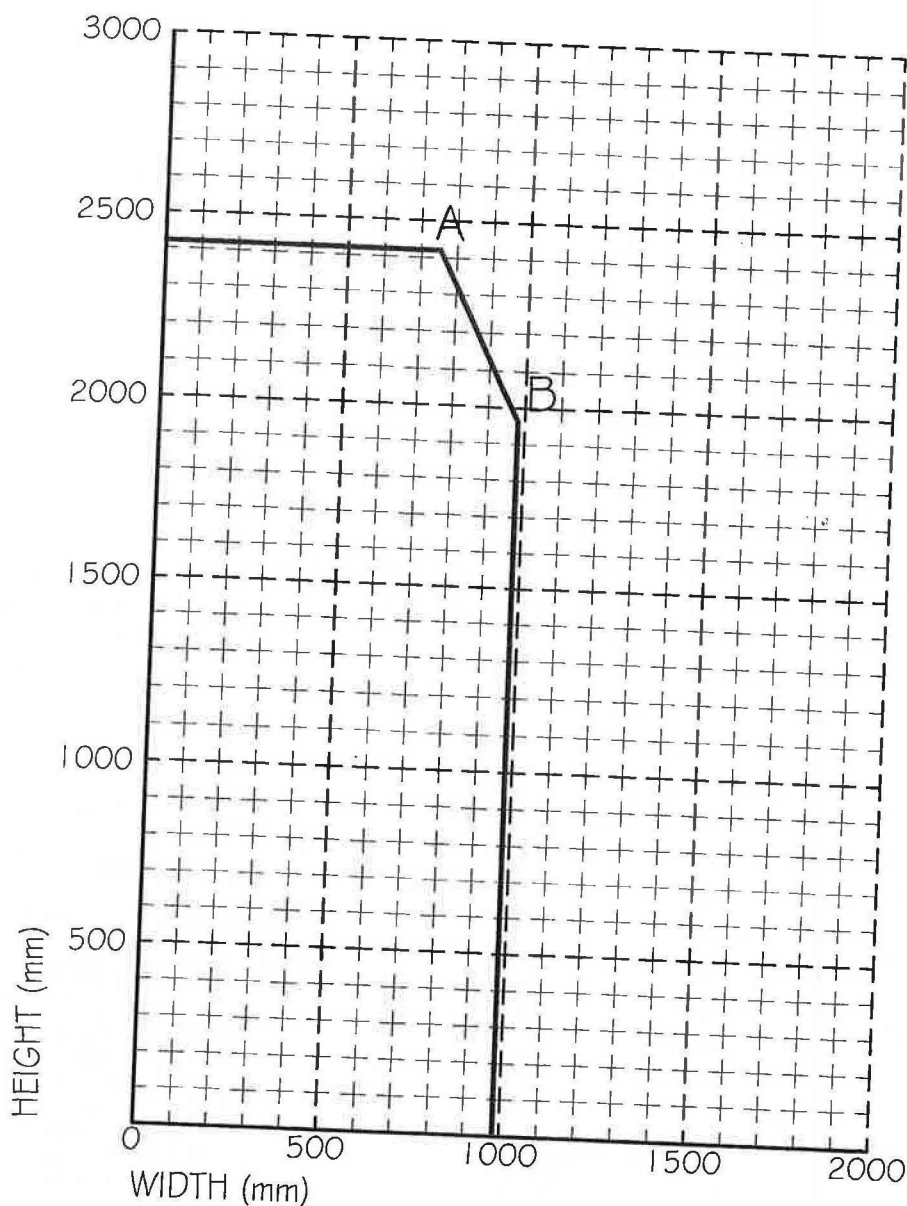
Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF

CAPSTONE

REQUIRED INTEGRITY : 30 Minutes



This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/13981/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.

Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph above are approved.

POINT A represents the maximum leaf height and its associated width.

POINT B represents the maximum leaf width and its associated height.

This drawing is Copyright©
Contractors must check all dimensions.
Any discrepancies must be reported before
work proceeds.
Only work to dimensions stated on drawing.

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Field of Application Report PAR/13981/01
LB Plastics Limited
FD30 LB Plastics Capstone and Nanya
Composite Door Leaves Installed in LB
Plastics Composite Frames, with Optional
Side Lights and Overpanels

Envelope of Approved
Door Leaf Sizes
LSASD Capstone
In Composite Frames

Job number: 13981

Drawn by: CSP Checked by: DJC

Not To Scale Drawn: Feb 2014

PAR/13981/01:CO1

	A	B
Width	658	894
Height	2262	1789

LEAF SIZE ENVELOPE POINTS

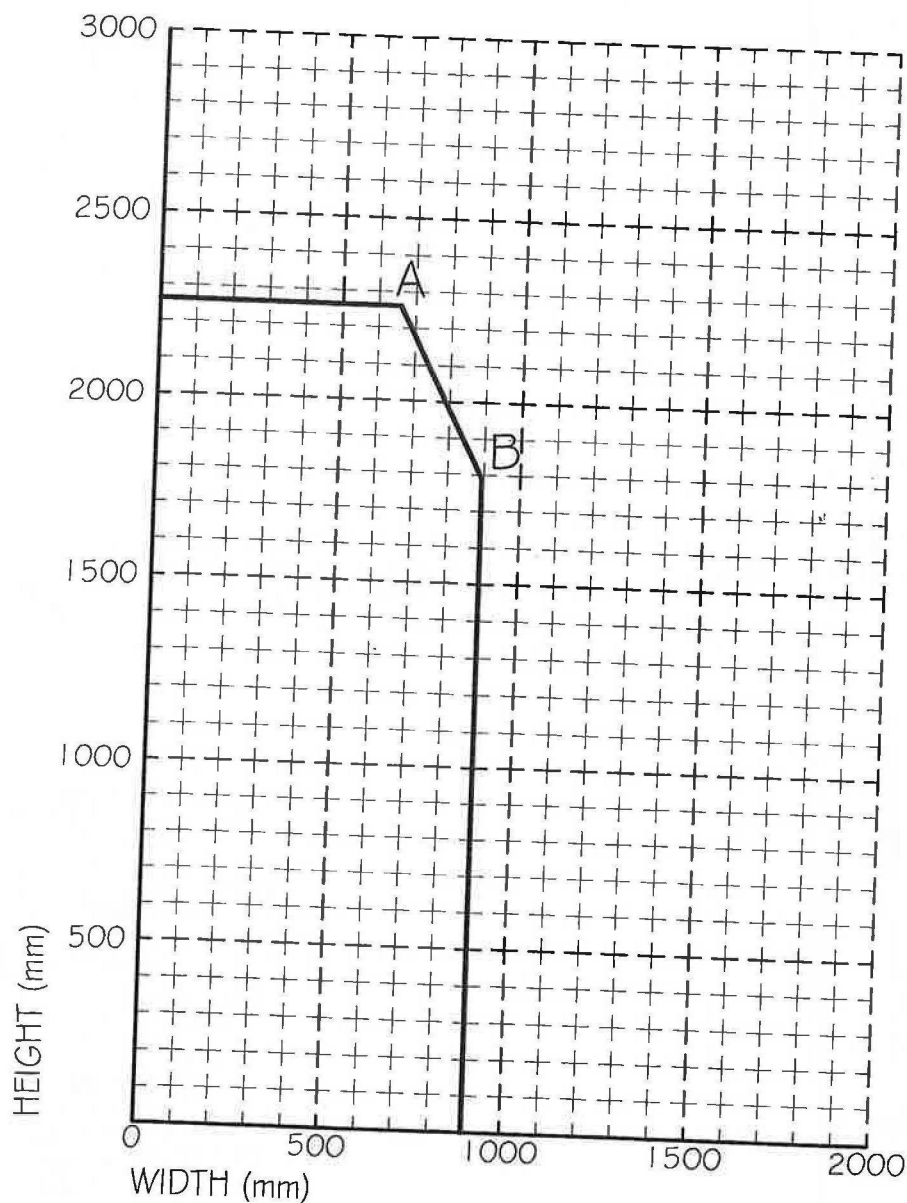
Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF

NANYA

REQUIRED INTEGRITY : 30 Minutes



This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/13981/01, which contains full details of the assessed doorset construction.

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PAR/13981/01

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.

Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph above are approved.

POINT A represents the maximum leaf height and its associated width.

POINT B represents the maximum leaf width and its associated height.

APPENDIX D

General Guidance on Installation of Hardware

Field of Application of FD30 LB Plastics Capstone and Nanya
Composite Door Leaves Installed in LB Plastics Composite
Frames, with Optional Side Lights and Overpanels

Prepared for: LB Plastics Ltd

IFC Field of Application Report
PAR/13981/01

Page 18 of 23

International Fire Consultants Ltd

General Guidance on Installation of Hardware

D.1 Hinges

The doorsets have been tested utilising the following steel butt hinges;

- Masterdor Type HNG1333
- Norsound NOR 330

These hinges can be utilised and will make a positive contribution to the required 30 minutes integrity performance providing they comply with the following specification:

- Minimum number : 3no per leaf.
- Positions : The top hinge must be positioned 150mm down from the head of the leaf to the top of the hinge and the bottom hinge positioned 225mm up from the foot of the leaf to the bottom of the hinge. Central hinges, where installed, to be equispaced between the top and bottom hinges. (All positions $\pm 25\text{mm}$).
- Fixings : Steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) x 30mm long, and having thread for the full length. Position of screws (in relation to the door face) in blades of alternative hinge types shall be similar to hinges tested with the proposed door type.
- Hinge materials : Brass, Phosphor Bronze, Steel or Stainless Steel. (Aluminium, Nylon or 'Mazac' are not permitted.) No combustible or thermally softening materials to be included.
- Additional protection : Hinge blades to be bedded on 1mm thick graphite-based intumescent material (e.g. Norsound NOR 910).

Rising butt, non-cranked butts and spring hinges (single or double action) are not suitable for use on doors approved within the scope of this generic assessment, although may be suitable to form the subject of an individual and specific evaluation.

D.2 Mortice Latches/Locks

The assessed doorsets include the Winkhaus AV2 multi-point locking system which includes up to 5no. lock/latch cases morticed into the door leaf, a forend plate in excess of 1700mm long and individual keep plates at each lock/latch position. This system must be included in the assessed doorsets but as testing was carried out with all of the multi-point locking points engaged and so all doorsets must include engaged multi-point locks.

A bespoke configuration of intumescent seals (see Appendix B) is included to compensate against the potential for integrity failure introduced by the installation of these components.

The main body of the latch shall be encased in minimum 0.5mm thick graphite-based intumescent material (e.g. Norsound NOR 910).

Holes bored through the door for handles must be as small as possible to suit the penetrating item.

D.3 Door Closers

Where required by regulatory guidance, each hinged door leaf must be fitted with a self-closing device unless they are normally kept locked shut and labelled as such with an appropriate sign which complies with BS5499: Part 1: 1990.

Doorsets have been tested with Rutland TS3204 overhead type and Perko 85R6 leaf edge concealed closers. These closers and other face-fixed overhead door closers (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on unlatched FD30 cellulosic door leaves, may be used. Any accessory that is located within the door reveal must have appropriate test or assessment evidence.

Transom mounted or concealed overhead closers must not be incorporated into any of the doorsets within the scope of this generic scope of this report.

It is essential that all closers are of the correct power rating for the width and weight of the doorsets. They must be fitted according to the manufacturer's instructions, and be adjusted so that they are capable of fully closing the door leaf, against any friction imposed by the latch, (and smoke seals, if fitted), from any position of opening.

D.4 Non-Essential Hardware Items

Letter Plates

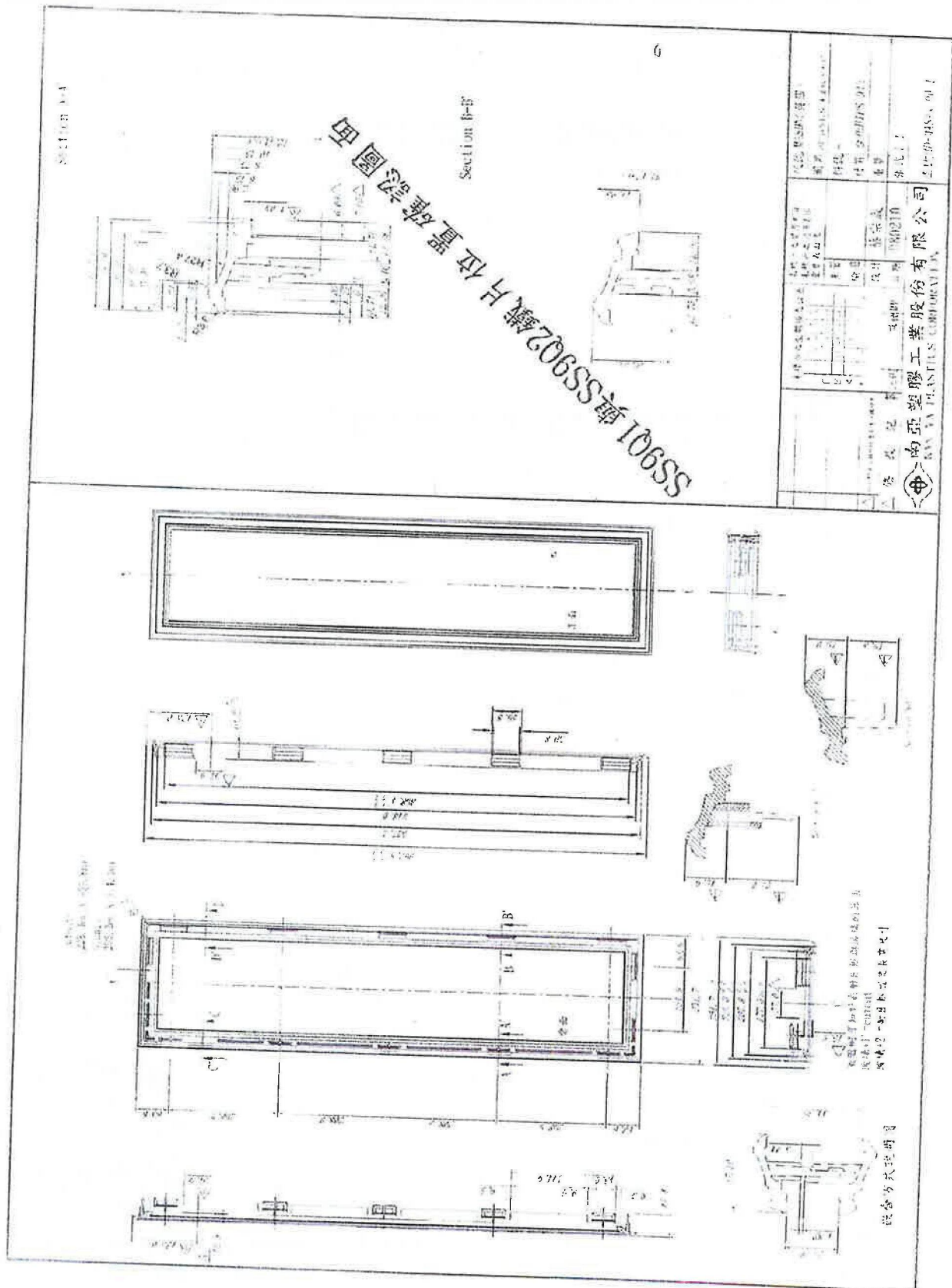
Norsound NOR400(e) letter plates of maximum size 310mm wide x 75mm high may be included. Plates must not be less than 100mm away from the leaf edge, or any other aperture or panel detail. The letter plate aperture must be lined with 2.5mm thick flexible graphite liner.

Security Viewers

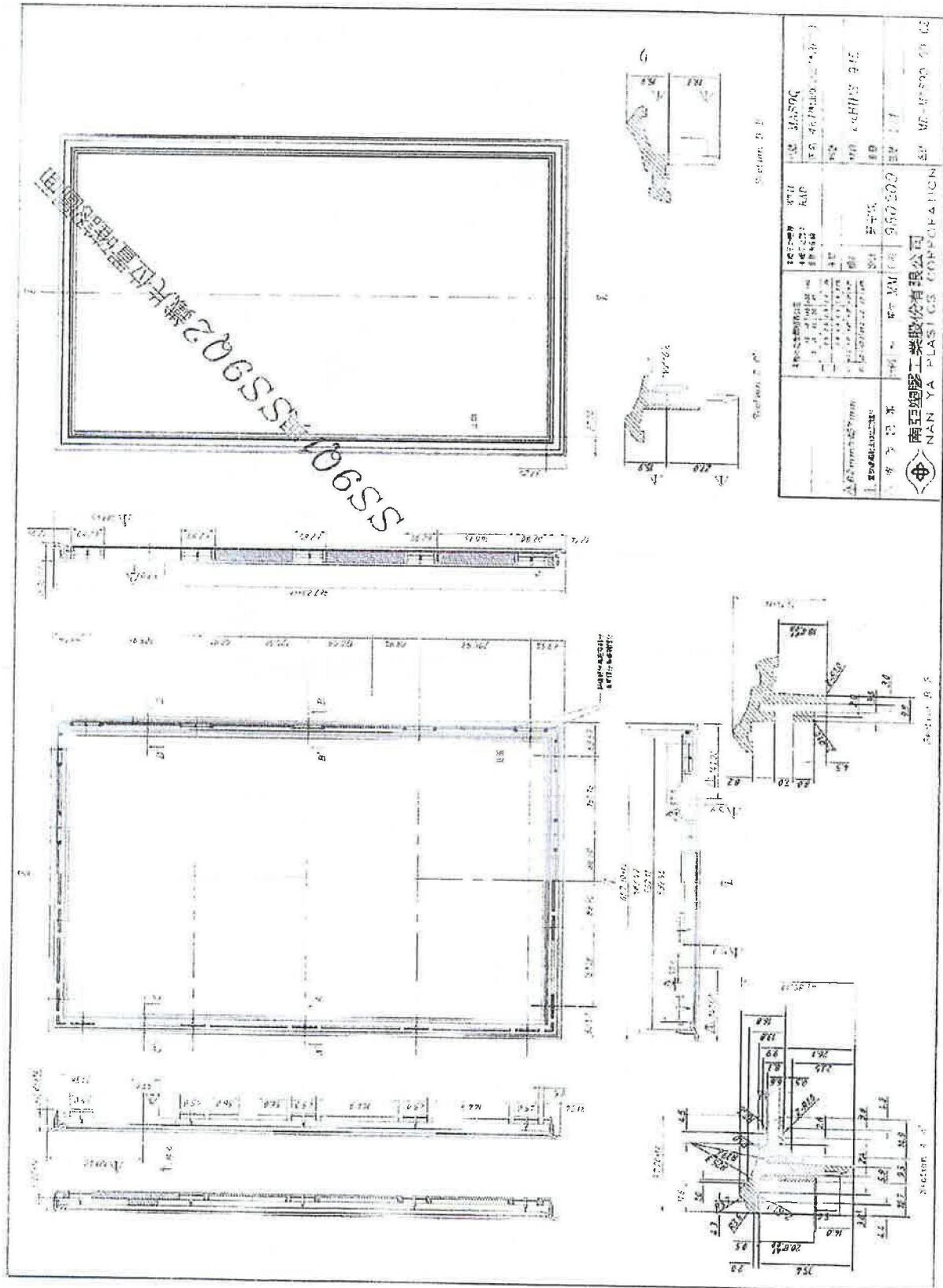
These may be fixed into the proposed doors, subject to the following limitations, unless specific fire test evidence exists to the contrary;

- Viewers must not exceed 13mm outer diameter, and be made from brass or steel.
- Holes bored through the door must be no greater than 1mm larger than the bore of the viewer.
- The viewer must include an effective shutter/cover plate.
- The viewer must not be less than 35mm away from the leaf edge, or any other aperture or panel detail.
- The viewer cut out must be lined with 1mm thick flexible graphite type intumescent material.

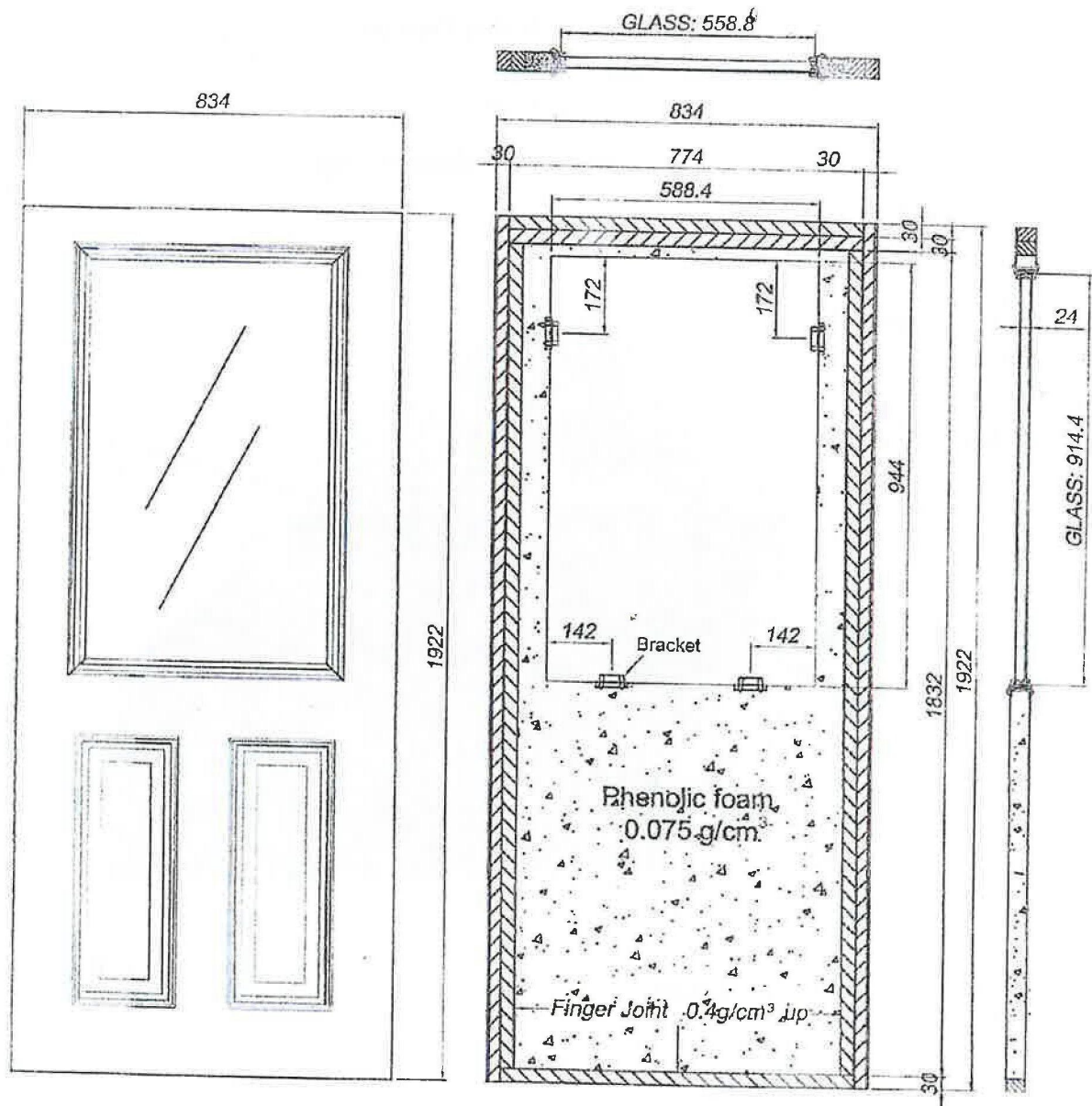
Twin Glazed Apertures



Single Glazed Aperture



Diagrams Showing Glazing Clip Positions



Appendix B

Glazing Details

Details of Glazing Clip

Slots to locate
secondary
section of clip
into main
section

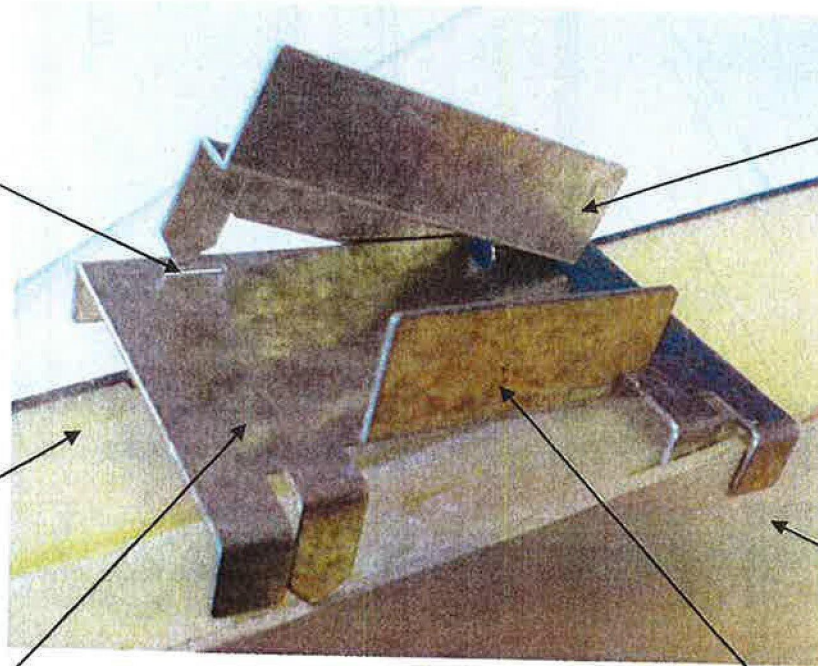
Secondary section
of glazing clip with
15mm high
upstand fitted on
exposed face
(fire side)

Foam
core

Facing

Main body of glazing clip fitted
across aperture

15mm high upstand of main clip
body (non fire side)



Based on the integrity performance demonstrated during testing, both 838mm and 914mm wide door leaves are assessed for the stiles and top rail to be either untrimmed or trimmed to a maximum of 40mm, ensuring internal framing is never less than the 60mm minimum width tested.

However, the construction of moulded 762mm wide door leaves, which are covered by this assessment, comprises stiles of a combined width of only 80mm (30 +50mm). Therefore, in order to maintain the stile at the minimum 60mm width tested, a maximum of only 20mm may be trimmed from each stile of a 762mm wide doorset (as specified in Section 6.3 of this assessment).

Flush doorsets supplied as 762mm wide must be assumed to be of the same construction as the moulded design and therefore the same trimming restriction will apply. The manufactured untrimmed width of stiles and rails of smaller sizes of flush leaves must be confirmed with the manufacturer or supplier and trimmed within the parameters specified above.

3. U/LSASD = Unlatched/Latched single action single door; DGU = Double Glazed Unit.
4. Door leaf (overall size, including fanlight and side light: 2500 x 1350 x 70). Insulation values shown for doorsets A and B are for the door leaves.
5. Justification for use of the Sealed Tight Solutions (STS) dry graphite glazing system in this assessment is based on test PF14114 doorset A and test PF15142 doorset A. Both doorsets were glazed using the STS dry graphite glazing system.

Doorset A in test PF14114 utilised a 3 point lock, engaged at the centre only, a Sapele frame, and was glazed with twin vertical apertures, achieving 35 minutes performance before the glazing panel failed.

Doorset A in 15142 utilised a 3 point lock, engaged at the top centre and bottom; installed within a side screen utilising a Sheerframe profile. The doorset was glazed with a single pane and achieved 36 minutes integrity performance.

Primary Data Continued

Report No	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
RF13209	A: LSASD	2010 905 45	BS EN 1634-1:2008 and BS EN 1363-1:1999	Integrity: 36 Insulation: 36
	B: LSASD	2014 908 45		Integrity: 33 Insulation: 33
RF07024 (Leaf glazed 10mm Pyrodur 30-201)	LSASD & fanlight + sidescreen	1955 768 44	BS 476 Part 22:1987	Integrity: 30 Insulation: 30
PF15142 (owned by Masterdor)	A: LSASD & fanlight + sidescreen	2010 780 44	BS 476 Part 22:1987	Integrity: 36 Insulation: 0

Supplementary Data

Report No	Configuration	Leaf Size (mm)	Standard	Performance (mins)
RF09038 (Nan Ya interlocking frames and 25.8mm core)	A: LSASD	2014 913 46	BS 476 Part 22: 1987	Integrity: 55 Insulation: 55
	B: LSASD	1938 838 46		Integrity: 50 Insulation: 50
PF14114 ⁵ (Sealed Tight Solutions Ltd)	A: LSASD (Sealed Tight graphite glazing system)	1975 914 44	BS 476 Part 22:1987	Integrity: 35 Insulation: 35
IF12041 AR1 (Astra Door Controls Ltd)	LSASD (Astra 3000 series 3003 concealed closer)	981 911 44	BS 476 Part 20:1987 to conditions of: BS 476 Part 22:1987	Integrity: 33

Notes:

1. Test RF09038 is used to justify the interlocking frame detail as a construction option for the 30 minute designs detailed in the primary data. The interlocking detail is depicted in appendix E.
2. The primary testing of this design utilised moulded door leaf samples which were either 914mm wide and tested with untrimmed internal leaf framing stiles and top rail, each having a combined width of 100mm (inner 30mm + outer 70mm), or 838mm wide leaves with the internal leaf framing stiles and top rail tested trimmed to a combined width of 60mm.

Appendix A

Performance Data

Primary Data

Report No	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
RF08171 (Nan Ya)	A: LSASD (glazed: DGU)	1915 838 44	BS 476: Part 22: 1987	Integrity: 50 Insulation: 0
	B: LSASD (glazed: DGU)	2012 914 44		Integrity: 47 Insulation: 0
RF09037 (Nan Ya)	B: LSASD (glazed: 7mm Pyrobelite)	2015 914 44	BS 476: Part 22: 1987	Integrity: 49 Insulation: 0
RF10172	A: LSASD (glazed sidescreen Pyrodur DGU)	2015 914 44	BS 476: Part 22: 1987	Integrity: 49 Insulation: 0
RF11186	A: LSASD	2013 895 44	BS 476: Part 22:1987	Integrity: 38 Insulation:38
	B: LSASD	2015 914 44		Integrity: 41 Insulation:41
RF12103	A: LSASD	2010 890 44	BS 476 Part 22:1987	Integrity: 36 Insulation:36
	B: LSASD	2010 890 44		Integrity: 40 Insulation:40
RF12120	A: LSASD	2014 912 45	BS EN 1634-1:2008 BS EN 1363-1:1999	Integrity: 31 Insulation:31
	B: ULSASD	1950 800 44		Integrity: 33 Insulation:33
RF13170	A: LSASD	1950 800 44	BS EN 1634-1:2008 BS EN 1363-1:1999	Integrity: 31 Insulation:31




23 Limitations

The following limitations apply to this assessment:

1. This assessment addresses itself solely to the elements and subjects discussed and does not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.
2. This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available, Exova Warringtonfire reserves the right to withdraw the assessment unconditionally but not retrospectively.
3. This assessment has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
4. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
5. This assessment relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this assessment, the element is suitable for its intended purpose.

24 Validity

1. The assessment is valid for 5 years from the date of issue, after which time it must be submitted to Exova Warringtonfire for technical review.
2. This assessment report is not valid unless it incorporates the declaration given in Section 22 duly signed by the applicant.

Signature:			
Name:	A M Winning	S Bailey	P N Barker
Title:	Senior Product Assessor	Product Assessor	Principal Technical Officer

21 Conclusion

If the Masterdor Ltd doorset design constructed in accordance with the specifications documented in this global assessment, were to be tested in the appropriate configuration in accordance with BS 476: Part 22: 1987, it is our opinion that it would provide a minimum of 30 minutes integrity and insulation (subject to section 20).

22 Declaration by the Applicant

1. We the undersigned confirm that we have read and comply with obligations placed on us by FTSG Resolution No. 82: 2001.
2. We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which this assessment is being made.
3. We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.
4. We are not aware of any information that could adversely affect the conclusions of this assessment.
5. If we subsequently become aware of any such information we agree to ask the assessing authority to withdraw the assessment.

Signed:

Name:

For and on behalf of: **Masterdor Ltd**

19 Smoke Control

19.1 General

If the doorset design is required to provide a smoke control function to comply with Building Regulations, in the absence of a suitable pressurisation system, the doorset must meet one of the following criteria:

- (a) have a leakage rate not exceeding $3\text{m}^3/\text{m}/\text{hour}$ (head and jambs only) when tested at 25Pa under BS 476 *Fire tests on building materials and structures*, Section 31.1 - *Methods for measuring smoke penetration through doorsets and shutter assemblies, Method of measurement under ambient temperature conditions*; or
- (b) meet the additional classification requirement of Sa when tested to BS EN 1634-3: 2004 - *Fire resistance tests for door and shutter assemblies*, Part 3 – *Smoke control doors*.

Smoke seals or combined intumescent/smoke seals that are fitted to the door to achieve the performance requirements specified above, must have been tested in accordance with the associated test method. Providing the smoke seals, any interruptions, door gaps, and the type/configuration of the doorset are consistent with the detail tested, the doorset will comply with current smoke control legislation under approved document B; and a suffix 'S' or 'Sa', as appropriate, may be added to the designation. Any other components installed where smoke leakage may occur must also be taken into account.

Note: The incorrect specification and fitting of smoke seals may impair the operation of a doorset and therefore compromise the fire resistance performance. Advice should be sought from the seal manufacturers regarding the correct specification and installation of smoke seals or combined smoke and intumescent seals.

19.2 Further Considerations

Other guidance is available, including BS EN 9999-2008 - *Code of practice for fire safety in the design, management and use of buildings*, which may impose different or additional requirements. It is the responsibility of the relevant parties to stipulate the precise smoke control specification, prior to commencing manufacture and/or installation.

20 Insulation

Insulation performance may be claimed for a doorset to this design meeting the following.

Type	Details
Partially insulating	Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Unglazed doorsets

18 Sealing to Structural Opening

The door frame to structural opening gap must be protected using one of the methods shown in the table below.

For Extruded Door Frames.

1. Intimate frame to surround junctions may be sealed using 2 No. 20 x 2mm raw strips of intumescent, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1, and fixed to the back of the frame
2. Gaps up to 10mm must be sealed on both sides with a 10 - 15mm depth of intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional
3. Gaps between 10mm and 20mm must be tightly packed with mineral fibre or fire rated expanding PU foam, capped on both sides with a 10mm depth of intumescent mastic. The PU foam and intumescent mastic must have been fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional
4. Gaps up to 20mm filled with proprietary fire stopping product (e.g. expanding PU foam or preformed compressible intumescent foam). Products must be tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick timber architraves (softwood, hardwood or MDF min density 510kg/m ³) overlapping at least 15mm each side
5. Gaps up to 50mm wide may be filled with a timber based (softwood, hardwood or MDF min density 510kg/m ³) or non-combustible subframe up to 50mm thick, for the full depth of the frame, with no gaps between the components. Joint must be fitted with 15mm thick architraves (softwood, hardwood or MDF min density 510kg/m ³) overlapping at least 15mm each side
6. Gaps up to 50mm wide may be filled with a timber based (softwood, hardwood or MDF min density 510kg/m ³) or non-combustible subframe up to 50mm thick, for the full depth of the frame, with gaps up to 10mm between the components filled on both sides with 10mm depth of intumescent mastic or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves (softwood, hardwood or MDF min density 510kg/m ³) overlapping at least 15mm each side.

14.4 Push Plates/Kick Plates

Steel, stainless steel or brass, face-fixed ironmongery (such as push plates and kick plates) may be fitted to the doorsets providing they do not exceed 10% of the door leaf area and are fitted to the nominal 'stile' and 'rail' sections of the facing.

14.5 Environmental Seals

Silicon based flame retardant acoustic, weather and dust seals may be fitted to this doorset design without compromising the performance, providing fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

14.6 Letter Plates

Letter boxes/plates may be fitted providing the product has demonstrated contribution to the required integrity performance of this type of doorset design, when tested to BS 476: Part 22: 1987 or BS EN 1634-1, when installed in a Nan-Ya door blank. Products must be fitted through a full thickness section of the leaf and no closer to the leaf edge than tested.

15 Door Gaps

For fire resistance applications, door gaps and alignment tolerances must fall within the following range.

Location	Tolerances
Door edge gaps	Representative of the tested gaps but as a guideline - 4mm +/- 2mm
Alignment tolerances	Leaves must not be proud from the door frame by more than 3 mm
Threshold gaps	A maximum of 10mm between the bottom of the leaf and top of floor covering ¹

¹ **Note:** Tested or assessed proprietary fitted thresholds will each have their own specified gaps between the leaf and the body of the threshold. Refer to the fitting instructions of the chosen manufacturer.

16 Fixings

The frame jambs are to be fixed to the supporting construction using steel fixings at 450mm maximum centres. The steel brackets (SW7050) detailed in section 7 may be used or fixings through the leaf rebate section of the frame which must additionally be of an appropriate type for the supporting construction and must penetrate to a minimum depth of 40mm. It is not necessary to fix the frame head, although packers must be inserted.

17 Supporting Construction

The supporting construction must provide the required level of fire resistance designated for the doorset design and be a suitable medium to permit adequate fixity.

14 Additional & Alternative Hardware

The following sections detail the permitted scope and constraints for fitting additional and alternative hardware to the door design.

The following items of hardware must also bear the CE mark:

Locks and latches: test standard EN 12209

Electro mechanically operated locks: test standard EN 14846

Single axis hinges: test standard EN 1935

Controlled door closing devices: test standard EN 1154

Electrically powered hold open devices: test standard EN 1155

Door co-ordinators: test standard EN 1158

Emergency exit hardware: test standard EN 179

Panic exit hardware: test standard EN 1125.

Note: Test standard EN 15685 for multipoint latches & locks is currently in draft and therefore not available for CE marking purposes. When EN 15685 becomes available, multipoint locks will have to be CE marked in compliance with this standard.

14.1 Automatic Closing

Automatic closing devices, must either be as tested or components of equal specification that have demonstrated a contribution to the required integrity performance of this type of doorset design, when tested to BS 476: Part 22: 1987, BS EN 1634-1, or BS EN 1634-2.

14.2 Hinges

A minimum of 3 hinges must be used with this doorset design. Alternative hinges to those tested must meet the following specification.

Element	Specification
Blade height:	90 - 120mm
Blade width (excluding knuckle):	32 - 40mm
Blade thickness	2.5 - 4mm
Fixings:	Equal number and nominally same pattern as tested
Materials:	Steel or stainless steel
Hinge positions:	Nominally as defined in section 13.1
Intumescent protection:	As tested - see section 7.1

14.3 Latches & Locks

The door design covered by this assessment must use one of the multipoint locks tested and detailed in section 13.2, utilising either a 35mm or 45mm backset.

It is permitted to utilise the Winkhaus AV2E lockset, provided the additional cut-out required is fully lined with 1mm thick STS graphite sheet encasing the mechanism as tested in PF15142 around the latch mechanisms.

13.2 Latches and Locks

The following latches and locks have been tested with this design.

Product	Details	Dimensions (mm) ²	Tested Locations (mm)
Fullex Crimebeater	Fullex Crimebeater multi point + CRB 0002 back/set and lock cylinder: 25603 ¹	1720 x 20 (forend size) with 35mm radius ends	Centre latch 1000-1065mm from the head of the leaf
	Fullex hook bolt keep set ref. CRD 0002	180 x 30 (keep size)	Fitted 750 (top) and 650 (bottom) from centre latch
Paddock Lockmaster	Paddock Lockmaster multi point with Eurocylinder ¹	2014 x 20 (forend size)	Centre latch fitted 1080 from the threshold
	Top and bottom keeps	130 x 20	Fitted 240 and 1730 from head
Avantis multi-point	Avantis 3-point multi point: DLC1-751-MS ¹	1785 x 20 (forend size)	Centre latch fitted 1000-1065mm from the head of the leaf
	Top and bottom hook bolt keep	142 x 25 (keep size)	Fitted 930mm (top) and 995mm (bottom) from centre latch
Winkhaus AV2	Winkhaus AV2 3-point ref: 4929140 (RH and LH) with Eurocylinder ¹	1770 x 20 (forend size)	Centre latch fitted 935mm from the head of the leaf
	Winkhaus AV2 F24-908 centre keep F24-908 hook keep	178x 25 (keep size)	Fitted 225mm and 1715mm from head of the leaf
Winkhaus Trulock Multi Point Latch	Forend with Eurocylinder ¹	1770 x 20 (forend size)	Centre latch fitted 1015mm from the head of the leaf
	Top & Bottom hook keep	175x 24 (keep size)	Fitted 155mm and 1687mm from head of the leaf
Gretsch Unitas	GU Secury Automatic multi point lock/latch -	1892 x 16 (forend size) 210 x 25 (centre keep)	Centre lock/latch fitted 1005mm - 1185mm - from the leaf threshold
		120 x 20 (top and bottom keep)	Fitted 140 - 145mm (top) and 1630mm (bottom) from leaf head

¹ Alternative cylinder locks matching the dimensions of the tested Eurocylinder locks above, and utilising similar metallic mechanism materials, may be substituted for the tested cylinder locks, when used in conjunction with the above multipoint locks

² Refer to appendix D for permitted spindle/cylinder machining tolerances.

Element	Product	Dimensions (mm)	Location
Furniture	Hoppe Winkhaus Palladio aluminium lever handle	260 x 35 (footprint size)	Fitted appropriate to the latch
	Hoppe Atlanta aluminium lever handle	240 x 26 (footprint size)	
	Hoppe Tokyo lever handle Ref. CRBHAN 008	245 x 30 (footprint size)	
	Yale YS17 Mk 2 lever handle	250 x 28 (footprint size)	
Threshold Seals	Exitex MXS 15 profiled aluminium extrusion	15 high x 71 wide overall	-
	Exitex MWK 27 extruded aluminium threshold and rain deflector	68 wide x 15 high overall	-
	Masterguard 25	75 wide x 25 high	-
	Stormguard AM3 threshold	25 high x 114 wide overall	
Weather Seals ¹	Schlegel Qlon Aquamac 21	9 high x 6 wide	Fitted in stop upstand on the unexposed face. (supplied pre-fitted to frame)
	Schlegel Qlon 9154 buffer seal	8 high x 8 wide	Fitted in the upstand of the stop. Supplied pre fitted to the frame
	Schlegel Qlon 5473045 buffer seal	10 high x 5 wide	Fitted in the upstand of the stop. Supplied pre fitted to the frame
	Schlegel 5W1248 Brush seal	10 high x 8 wide	Fitted in the profile of the frame reveal. Supplied pre fitted to the frame
Security viewer	U. A. P. viewer	12Ø barrel 25Ø outer	Fitted centrally in leaf bedded on 1mm thick Environmental Seals No.1 HP intumescent
Letterplate	Paddock Firemaster P207	305 x 70 (footprint size)	Fitted centrally in the leaf width, 860mm from the threshold

Note: ¹ Extruded frames may also include integral extruded seals.

13 Tested Hardware

The following hardware has been successfully incorporated in the tests referred to in this assessment.

13.1 Hinges, Closers and Furniture

Element	Product	Dimensions(mm)	Location
Hinges	3No Royde and Tucker H101 lift off type hinges	101 x 35 (blade size)	Fitted 152mm, 890mm and 1640mm from the head of the leaf
	3No Nico butt type steel hinges	102 x 40 (blade size)	Fitted 120mm, 635mm and 1790mm from the head of the leaf
	3 No. Fullex bearing butt type hinges	100 x 36 (blade size)	Fitted 100mm, 955mm and 1760mm from the head of the leaf
	3No Paddock H101 lift off type hinges	101 x 35 (blade size)	Fitted 152mm, 890mm and 1640mm from the head of the leaf
	3 No. Paddock Mk 4 bearing butt type hinges	101 x 38 (blade size)	Fitted 95mm, 950mm and 1705mm from leaf head
	3No Masterdor Butt type ref: HNG1333	102 x 30 (blade size)	Fitted 150mm, 955mm and 1755mm from the head of the leaf
Closers	Dorma UK Ltd TS71 overhead type closer	232 x 68 (footprint size)	Fitted as per the manufacturer's instructions
	Dorma UK Ltd TS68 overhead type closer	232 x 68 (footprint size)	
	Dorma UK Ltd TS83 overhead type closer	293 x 60 (footprint size)	
	Rutland TS3204 overhead type closer	220 x 59 (footprint size)	
	Astra 3003 concealed jamb mounted closer	36 x 92 (forend size)	

10.3 Assessed Glazed Apertures

The tests conducted, evaluated the performance of a single rectangular glazing system as detailed in drawing MAS9Q, and twin top apertures as detailed in drawing MAS9S, contained in appendix B. Based on the performance of the largest area of glass and the tested twin apertures, alternative glazed options with a reduced area of glass have been deemed acceptable.

The additional glazed options are depicted in drawings MAS9N, MAS9W, MAS9S and MAS7L contained in appendix B.

Glazing clips must be fitted in accordance with the following table.

Glazed Aperture Options ¹	Number of Clips	Clip Location
9Q - Half glazed	4	1 at the top of each vertical edge and 2 at the bottom edge
9N - Twin glazed apertures	3	1 at the top of each vertical edge and 1 at the centre of the bottom edge
9W - Half moon	4	2 at the top of the arched edge and 2 at the bottom edge
9S - Twin top apertures	2	1 at the centre of the top edge and 1 at the centre of the bottom edge
7L - Twin mid apertures	3	1 at the top of each vertical edge and 1 at the centre of the bottom edge
9N – Single offset glazed aperture	3	1 at the top of each vertical edge and 1 at the centre of the bottom edge
9N – Single central glazed aperture	3	1 at the top of each vertical edge and 1 at the centre of the bottom edge

¹ Drawings for referenced aperture options are contained in appendix B.

11 Intumescent Materials

The test evidence generated for this doorset design in test PF15142 permits the use of the combination of intumescent system and door frame materials shown in section 7.1.

Other intumescent system and frame combinations are not permitted.

12 Adhesives

The following adhesives have been tested for use with this doorset design.

Element	Product
Facings	Polyurethane adhesive resin (core)

10.2.1.1 Glazing System Notes

1. Where Pyroshield or Pyroshield II is utilised in place of the Pyrodur Plus 30-104 as shown above, the resulting DGU may be oriented in either direction with respect to the fire risk
2. AGC Pyrobelite 7 glass must only be used with 6.8mm laminated glass
3. 6.4mm thick Pilkington Stippolyte laminated glass may be used on the non fire risk side of double glazed units when using Pyrodur Plus 30-104
4. All glass products must be used in accordance with the manufacturers' installation requirements, particularly with respect to expansion tolerances
5. Glazed apertures must not be nearer than 68mm to any leaf edge
6. Single, double, and half moon apertures are permitted (see section 5, section 10.3 and appendix B)
7. Surface applied glazing beads are not permitted for the Masterdor design
8. Justification for use of STS glazing system based on tests PF14114 & PF15142 in appendix A.

10.2.2 ODL Glazing Cassette Option

Element	Product	Dimensions (mm)	Location
Glass type	Nominally 24 thick double glazed unit	6.8 thick clear laminate	Fitted on the non fire risk side
		6 - 7mm Pyroshield or Pyroshield II	Fitted on the fire risk side
		12 thick stainless steel spacer	Fitted between the glass layers
Expansion allowance	-	2 - 3 all round	-
Glazing Beading	ODL cassette beads	43 high x 18 deep	Fitted around glazed aperture on both faces
Beading fixings	Steel Screws	28 long	Joining cassette beads
Intumescent protection	Sealed Tight Solutions ST30/2.5 dry graphite strip (see appendix C)	30 wide x 2.5 thick	Fitted around the glazing aperture
Glazing clips	0.9mm thick two part profiled galvanised steel (see section 10.3 and appendix B)	70 wide x 46.5 high	See section 10.3 and appendix B

Notes:

1. All glass products must be used in accordance with the manufacturers' installation requirements, particularly with respect to expansion tolerances
2. Glazed apertures must not be nearer than 68mm to any leaf edge
3. Single, double, and half moon apertures are permitted (see section 5, section 10.3 and appendix B)
4. Surface applied glazing beads are not permitted for the Masterdor design.

10 Door Leaf Glazing

10.1 General

The testing conducted demonstrated that the design is capable of including double glazed units.

Glazing is acceptable in single or multiple apertures as depicted in section 5, up to a total maximum area of 0.55m².

10.2 Glazing Systems

The glazing system must be one of those described in the following sections and depicted in appendix C.

10.2.1 Sealed Tight Solutions ST30/2.5 Dry Graphite Glazing System

Element	Product	Dimensions (mm)	Location
Glass type	Nominally 24 thick double glazed unit	6.8 thick clear laminate	Fitted on the non fire risk side
		7 thick Pilkington Pyrodur Plus 30-104	Fitted on the fire risk side
		10 thick stainless steel spacer	Fitted between the glass layers
Expansion allowance	-	3 all round	-
Glazing Beading	Nan Ya ABS cassette	37-38 high x 16 deep	Fitted around the glazing aperture on both faces
Beading fixings	Snap fit interlocking beads (see appendix C)	-	-
Cassette fixing to perimeter	Alansons 1101 clear adhesive	-	-
Intumescent protection	Sealed Tight Solutions ST30/2.5 dry graphite strip (see appendix C)	30 wide x 2.5 thick	Fitted around the glazing aperture
Glazing clips	0.9mm thick two part profiled galvanised steel (see section 10.3 and appendix B)	70 wide x 46.5 high	See section 10.3 and appendix B

Pyrodur Plus 30-104, in DGU above, may be replaced by the following glass types:

Glass Type	Manufacturer
6 - 7mm Pyroshield or Pyroshield II	Pilkington Glass Ltd
Pyrobelite 7	AGC Flat Glass
10 thick Pilkington Pyrodur 30-201	Pilkington Glass Ltd

9.1.2 Glazing

Fanlights and sidelights must be glazed with a DGU, constructed as detailed in the table below.

Element	Product	Dimensions (mm)	Location
Double Glazed Unit	Pilkington Pyroshield or Pyroshield 2	7 thick	Fitted on the fire risk face
	Laminated glass	6.8 thick	Fitted on the non-fire risk face
	Stainless steel spacer	12 thick	Fitted between the glass layers
Expansion allowance	-	2 – 3 on all edges	-
Beading including bead cover	Sheerframe Clip In Glazing Bead ref: CS8810	25mm wide x 28mm high	Fitted on the exposed face
Beading location	-	-	Fitted around the perimeter of the glazing on the exposed face
Beading fixing	-	-	-
Intumescent protection	STS ST30 x 2.5	30 wide x 2.5 thick	Fitted around the glazing aperture ¹

¹ See diagram in section 7.1.

9.2 Solid Panels

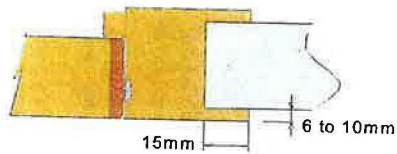
Based on the testing conducted in PF15142, solid panels in fanlights and sidelights must be manufactured to the following specification. Solid panels may replace the DGU as detailed in section 9.1.2. All other details of the installation must remain as required for glazed panels.

Element	Maximum Height (mm)	Thickness (mm)
Core	Calcium Silicate Board	25
Facings	uPVC	1.5

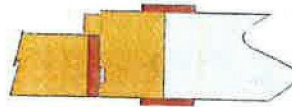
7.2 Door Frame Installation

The following diagrams indicate acceptable and unacceptable door frame installations:

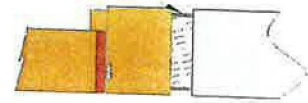
Max 10 x 10mm shadow gap with 2mm
 intumescent mastic capping or
 10 x 4mm PVC encased intumescent seal



Permitted



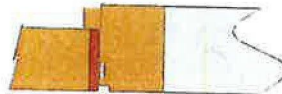
Permitted



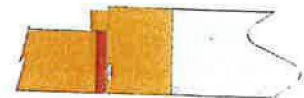
Permitted



Not Permitted



Not Permitted



Permitted

Notes:

1. Drawing is representative of door frame installation; actual installation must be as this document specifies. See section 18 for sealing to structural opening specification
2. For shadow detail depicted (top right) the sub-frame material must be the same material as approved for the door frame, or a non-combustible board, tightly fitted with no gaps.

8 Leaf Facing Materials

1. This design must be manufactured with 2 - 4mm thick GRP facings, as tested
2. 3 - 4mm thick GRP facings are only permitted in doorsets utilising a latched configuration
3. Other than kick plates and push plates, metallic additions to the facings are not permitted.

9 Fanlights & Sidelights

Fanlights and sidelights may be fitted using either the SK77950 or SK77960 frame sections as detailed in section 7. Panels fitted within fanlights and sidelights may be of glazed or solid construction meeting the specifications in this section.

Sidelights must consist of two panels separated by a transom, as tested, and with a maximum assessed panel size of 1150mm high x 760mm wide.

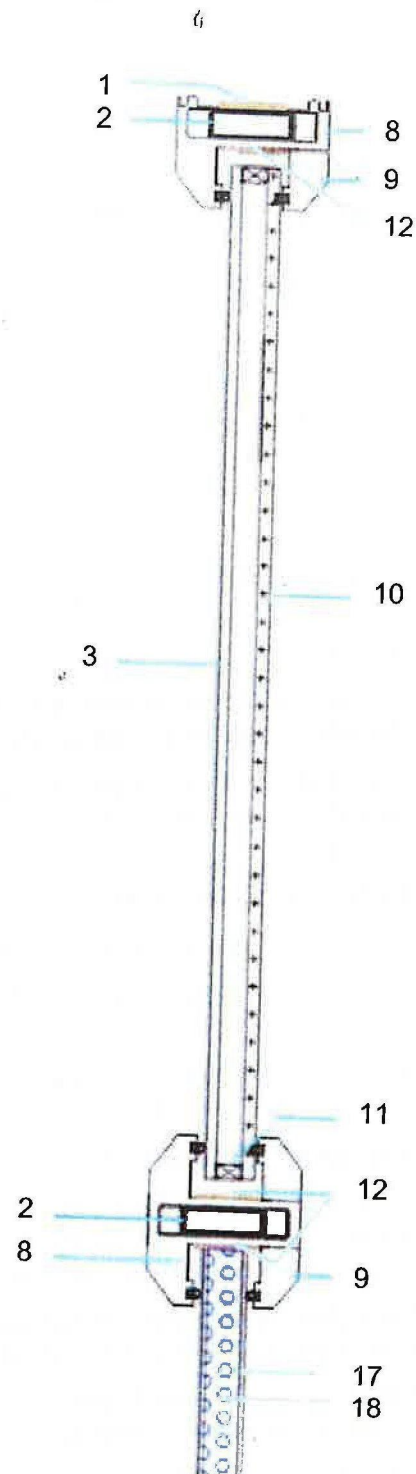
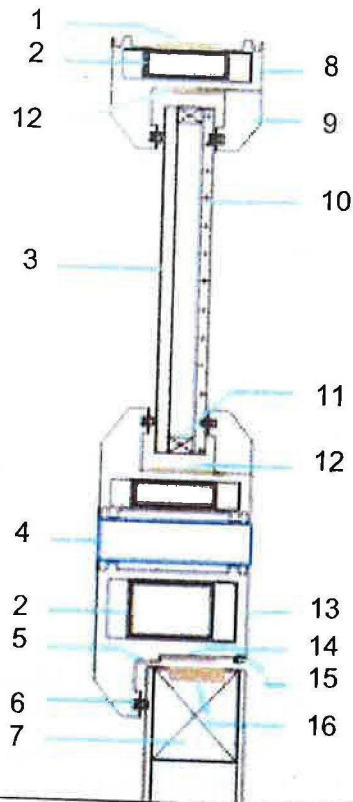
Fanlights must consist of two panels separated by a mullion, as tested, and with a maximum assessed panel size of 360mm high x 760mm wide.

Glazing and solid panels must be retained in position against the framing members (CS8802) with the Sheerframe Clip In Glazing Bead ref: CS8810 as shown as item 9 in section 7.1.

9.1.1 Framing

See details in section 7.

7.1 Extruded Door Frame and Intumescent Details



Key

1. STS ST30x2.5 seal
2. Frame Reinforcement SK5128
3. Laminated Glass
4. Frame Coupler ref: A204
5. STS ST10x2.5 seal
6. Schlegel Q-Lon5473045 Weather Seal
7. Leaf Head Rail
8. PVC Frame extrusion ref: CS8802
9. Sheerframe Clip In Glazing Bead CS8810
10. Fire resisting Glass
11. Stainless Steel Spacer
12. STS 30x2.5 seal
13. Sheerframe Extrusion ref: SK77950
14. STS ST25x2.5 seal
15. Schlegel 5W1248 Brush Weather Seal
16. 2No STS25x2.5 seals
17. 1.5mm uPVC
18. 25mm Corex Calcium Silicate Board

7 Door Frames

Based on the testing conducted on this design, the following extruded PVC frames are assessed in combination with the specified intumescent.

Element		Material	Dimensions (mm)
Head and jambs		Sheerframe PVC extrusion Ref: SK77950	70 deep x 70 wide including a 22 high integral stop
Fanlight/over panel – both doorsets and side screen		Sheerframe PVC extrusion Ref: CS8802	70 deep x 70 wide
Frame reinforcement		Steel box section Ref. SK5128	30 deep x 30 wide x 1.5 thick
Side screen transom		Sheerframe PVC extrusion Ref: CS8802	70 deep x 70 wide
Frame jointing detail		Mitred – fully fusion welded	-
Coupling between fanlight and door frame & between sidescreen and door frame/fanlight		Sheerframe Ref. A204	70 deep x 10 wide
Frame to supporting construction fixing detail	Along edges of sidescreen and fanlight	15mm wide profiled steel brackets SW7050 steel bracket screwed to back of frame using 40mm long steel screws and to the supporting construction using 70mm steel screws	1No. fitted at 450mm centres
	Along frame jambs	Steel wood screws	80 long fitted at 450mm centres

Notes:

1. The frame head and jamb extrusion reference SK77950 may be substituted with SK77960 which is of the same width of 70mm x 51.8mm deep
2. Details of the intumescent materials and their required locations are shown in the diagram in section 7.1
3. Relevant leaf illustrations are shown in appendix D; for full construction details refer to Masterdor Ltd.

6 Leaf Sizes

6.1 Moulded and Flush Door Blanks

Nan Ya moulded and flush door blanks are supplied in the following sizes which are covered by this assessment.

Max height (mm)	Max width (mm)
2013	762
2013	838
2013	914

Doorsets containing leaves with smaller dimensions than those stated are deemed to be less onerous and are therefore automatically covered. Smaller doorsets may be created by trimming the above manufactured sizes within the limits stated in section 6.3 below.

6.2 Smaller Flush Door Blanks

Nan Ya flush door blanks may also be manufactured and supplied in smaller sizes down to an untrimmed height of 1800mm and untrimmed width of 430mm. Providing the leaves are manufactured with full size untrimmed inner and outer stiles and rails, as detailed in section 2, the manufactured size may be trimmed, within the limits stated in section 6.3 below, to produce smaller leaves.

6.3 Leaf Size Adjustment

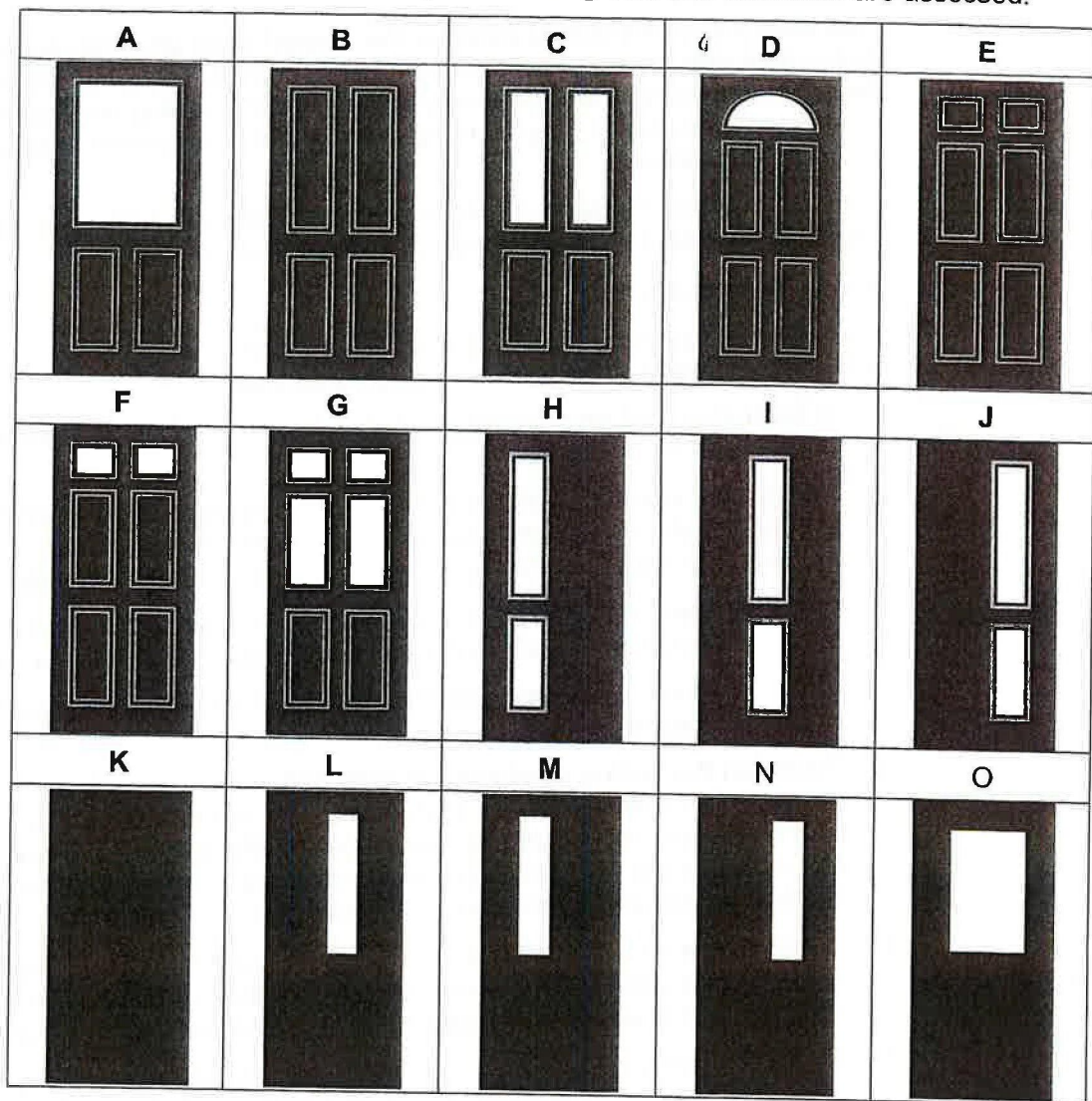
The manufactured door leaf sizes to this design, may be altered as follows.

Manufactured Leaf Size (mm)	Leaf Type	Permitted Reduction (mm)
2013 high x 762 wide	Moulded and Flush	Door leaves may be reduced in size by a maximum of 20 from each side, a maximum of 40 from the top, and a maximum of 70 from the bottom, so that the stiles and rails remain within the range defined in section 2. (See note 2 in appendix A)
2013 high x 838 wide 2013 high x 914 wide	Moulded and Flush	Door leaves may be reduced in size by a maximum of 40 from each side, a maximum of 40 from the top, and a maximum of 70 from the bottom, so that the stiles and rails remain within the range defined in section 2.
Sizes less than 2013 high and less than 762 wide	Flush	Providing they have been manufactured with full width stiles and rails (100 wide), door leaves may be reduced in size by a maximum of 40 from each side, a maximum of 40 from the top, and a maximum of 70 from the bottom, so that the stiles and rails remain within the range defined in section 2.

Note: See appendix E for leaf adjustment options when using the interlocking design.

5 Assessed Door Leaf Styles

Based on the available test data, the following door leaf variations are assessed.



Notes:

1. Styles H, I and J, must have a minimum of 165mm width of core between the glazed apertures
2. Styles C, F and G, must have a minimum of 114mm width of core between the glazed apertures.

3.1 Orientation to Fire Risk

The primary fire resistance tests for this design were all conducted with the doorset hung such that the door leaf opened towards the fire, the most onerous orientation in terms of fire resistance performance. Based on this testing, assessment is made that doorsets to this design may be hung to open either away from or towards the fire risk side of the doorset.

Note: This does not apply to elements within the door leaf, such as glazing, which must be orientated as specified within this assessment report.

4 Variations to Construction

Based on the testing conducted, which is detailed in appendix A, assessment of the following variations to the construction are permitted:

1. A flush door and leaves incorporating a maximum of up to 6 depression moulded panels may be produced
2. Part glazed and part panelled versions of the design have been tested. Therefore, the ratio of glazing with depression moulded panels may be varied as required, up to the stated limits for glazing and panels. (See section 5 for style options.)
3. Flush doorsets may be glazed using the tested and assessed glazing systems described in section 10 and within the parameters detailed in section 10.2
4. The depression moulding detail may be altered providing the moulding is no wider or deeper than tested
5. Based on the testing conducted in RF09038, doors may either be constructed as tested in the primary data or alternatively the interlocking method of assembly is also assessed. Note: trimming parameters for the interlocking design are different and must comply with the requirements detailed in appendix E. (A diagram of the interlocking system is contained in appendix E)
6. Based on the testing conducted in RF12103, outer stiles may also be constructed from either a single 40mm thick piece of softwood or 2 No. 20mm thick lamels, each lamel of finger jointed mixed wood timber, of minimum density 400kg/m³
7. Based on the testing conducted in RF12120, when utilising a latched configuration, outer stiles and rails may also be constructed from Polymer of the same material composition and density as tested. Sidelights are not permitted for doorsets utilising Polymer stiles and rails
8. Based on the testing conducted in RF13209, when utilising a latched configuration, door leaves may be constructed from either 2, 3, or 4mm thick GRP facings, but when using an unlatched configuration, only with 2mm thick GRP facings
9. Based on the testing conducted in RF13209, 2mm thick PVCu edge band lippings, manufactured from the same material as tested, may be utilised on the vertical edges of door leaves to this design.

1 Introduction

This document constitutes a global assessment to collate the fire resistance test evidence relating to 30 minute composite GRP and foam core fire resisting doorsets, for Masterdor Ltd. The assessment uses established extrapolation and interpretation techniques in order to extend the scope of application by determining the limits for the design, based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance, if the elements were to be tested in accordance with BS 476: Part 22: 1987.

2 General Description of Construction

The construction of door leaves are identified as Nan Ya 30 minute door blanks, which are constructed to the following specification.

Element		Material	Dimensions (mm)	Density (kg/m ³)
Stiles	Inner	Mixed wood # finger jointed lamels	30 wide x 40 thick	400-600*
	Outer	Mixed wood # finger jointed lamels	70 - 30 wide x 40 thick	400-600*
Rails	Top	Inner	Mixed wood#	30 wide x 40 thick
		Outer	Mixed wood#	70 - 30 wide x 40 thick
	Bottom	Inner	Mixed wood#	30 wide x 40 thick
		Outer	Mixed wood#	70 - 0 wide x 40 thick
Core	Standard	Phenolic foam	40 thick reducing to 15 thick at fielded areas	75*
	Interlocking facings ¹	Phenolic foam	40 thick reducing to 28 thick at fielded areas	75*
Facings		Moulded GRP	2 thick	-

* Stated by client, not checked by laboratory

mixed wood consisting of pine, acacia and styrax

¹ Construction using interlocking facings combined with minimum 28 thick fielded leaf areas is normally utilised for 60 minutes performance doorsets but where required may also be used for 30 minutes performance – see section 4: note 5 and appendix E for limitations and application.

3 Configurations

Based on the tests listed in Appendix A, the following doorset configurations are permitted.

Abbreviation	Description
LSASD	Latched, single acting, single doorset
ULSASD	Unlatched, single acting, single doorset

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Exova Warringtonfire – the new name for BM TRADA

On December 1st 2015, Chiltern International Fire Limited (trading as BM TRADA) commenced trading under the name Exova Warringtonfire.

To coincide with this change, our Technical Reports, Test Reports, Product Assessments, company stationery and marketing collateral have been updated to reflect the Exova Warringtonfire branding.

The validity of all documents previously issued by Chiltern International Fire Limited including certificates, test reports and product assessments is unaffected by this change. A letter to this effect is available upon request by e-mailing globalfire@exova.com

About Exova Warringtonfire

Exova Warringtonfire is part of the Exova Group one of the world's leading laboratory-based testing groups, trusted by organisations to test and advise on the safety, quality and performance of their products and operations. Headquartered in Edinburgh, UK, Exova operates 143 laboratories and offices in 32 countries and employs around 4,500 people throughout Europe, the Americas, the Middle East and Asia/Asia Pacific. With over 90 years' experience, Exova specialises in testing across a number of key sectors from health sciences to aerospace, transportation, oil and gas, fire and construction.

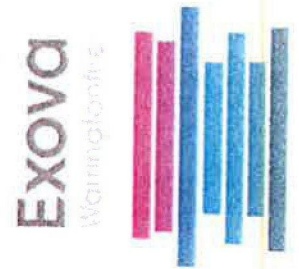
Be assured that whilst the name will change, your service provision and primary contacts have not. What will be available to you is a wider team of testing experts and an extended range of testing capabilities including structural steelwork testing, ventilation duct and damper testing, ASTM testing, water mist system testing and smoke toxicity testing and covering additionally both the rail and marine sectors.

If you have any questions, please do not hesitate to contact a member of the team and we will do our best to answer them. We appreciate your business to date and we look forward to working with you in the future.

Kind regards

Exova Warringtonfire

T: [REDACTED]
E: globalfire@exova.com



Title:

Global Fire Resistance
Assessment of Masterdoor Ltd
Composite GRP 30 Minutes
Fire Resisting Doorsets

Valid from: 9 March 2016

Valid until: 9 March 2021

WF Report No:

BMT/CNA/F16024

Prepared for:

Masterdor Ltd
Firs Works
Spanker Lane
Nether Heage
Derbyshire
DE56 2JJ

Summary of Fire Test Evidence

Test Report	Configuration Tested	Leaf Size	Test Standard	Integrity
RF13081 Revision A	LSASD	2015 x 910 x 44mm	BS EN 1634-1: 2008	25 minutes *
		1900 x 725 x 44mm		25 minutes **
RF13170 Doorset A	LSASD	1950 x 800 x 44mm	BS EN 1634-1: 2008	31 minutes
IFI13067 Revision A	LSASD	1263 x 915 x 44mm	BS EN 1634-1: 2008	25 minutes ***
RF10194	LSASD	1925 x 794 x 44mm	BS476: Part 20: 1987	33 minutes

LSASD = Latched, Single Acting, Single leaf Doorset

* Failure occurred at hardware positions, which did not include intumescent protection. The analysis of this report has included intumescent protection at the hardware positions mitigating against the premature failure. Further failure occurred at the glazing apertures the perimeter detailing of these has been amended mitigating against the premature failure.

** Failure occurred due to the failure of the adjacent doorset. Once the flaming was extinguished there were no other failures prior to test termination at 33 minutes.

*** Failure occurred at the glazing apertures the perimeter detailing of these has been amended mitigating against the premature failure.

Field of Application of FD30 LB Plastics Capstone and Nanya Composite Door Leaves Installed in LB Plastics Composite Frames, with Optional Side Lights and Overpanels

Prepared for: LB Plastics Ltd

IFC Field of Application Report
PAR/13981/01

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International Fire Consultants Ltd

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APPENDIX E

Summary of Fire Test Evidence

Field of Application of FD30 LB Plastics Capstone and Nanya
Composite Door Leaves Installed in LB Plastics Composite
Frames, with Optional Side Lights and Overpanels

Prepared for: LB Plastics Ltd

IFC Field of Application Report
PAR/13981/01

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