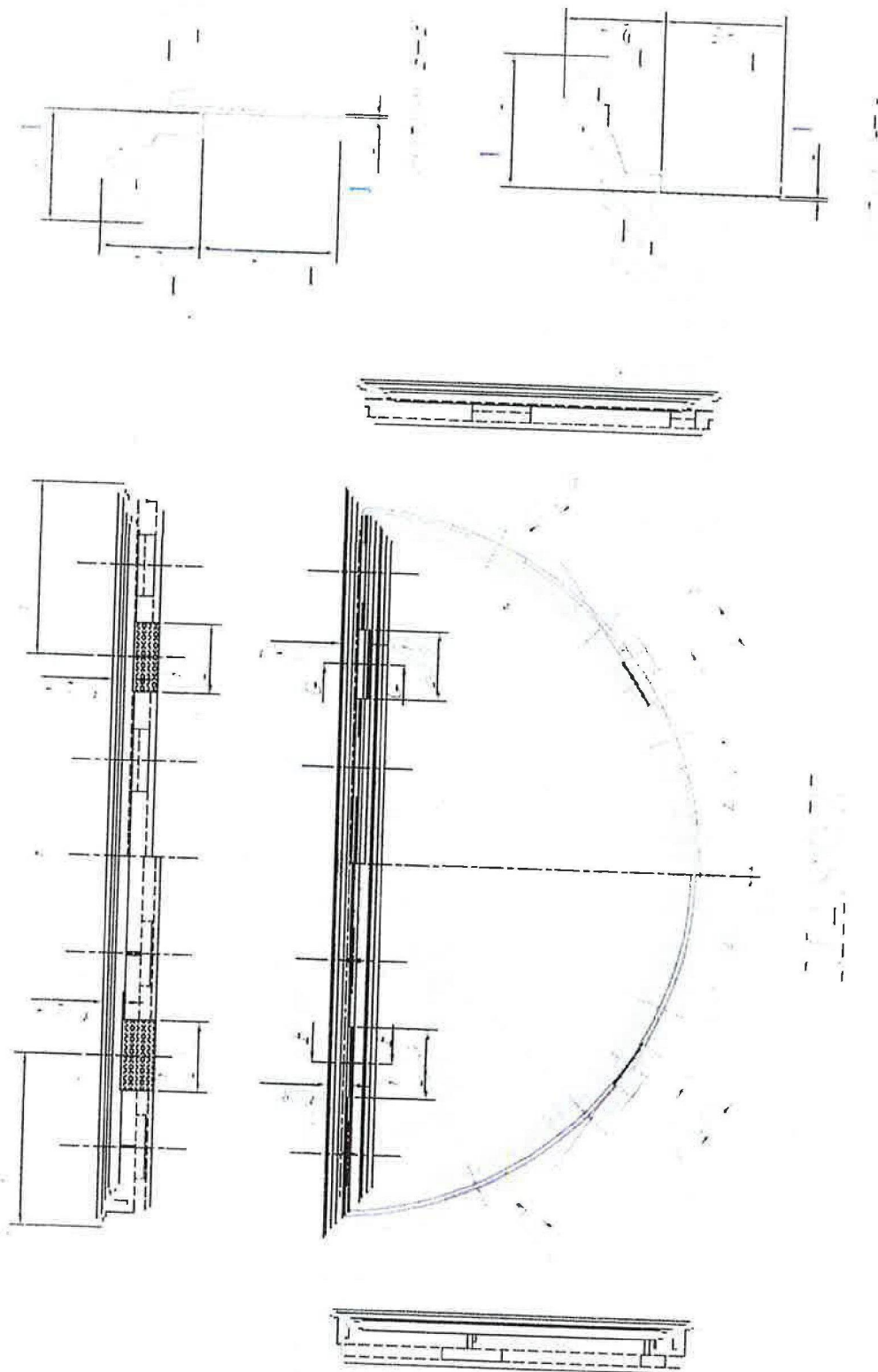
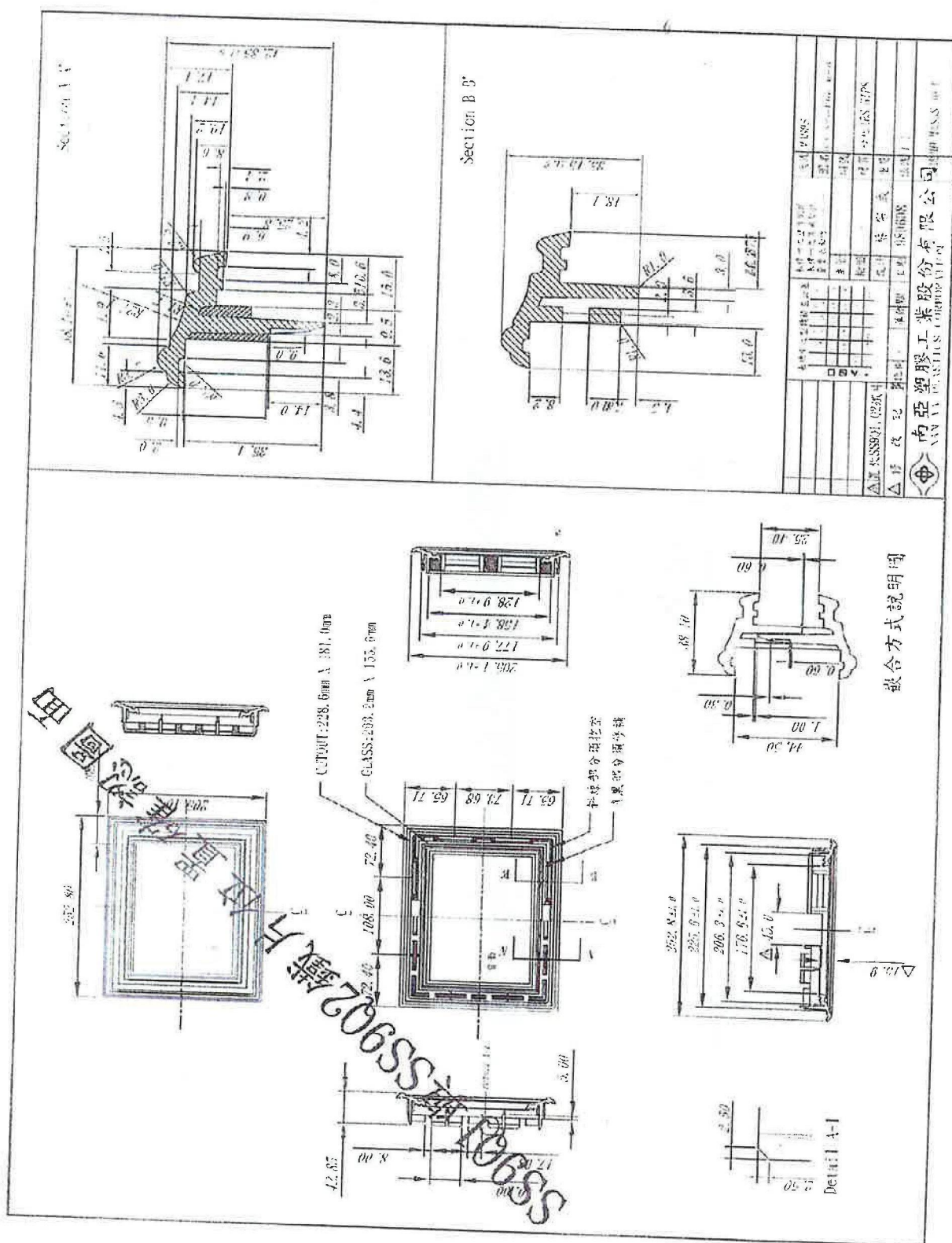


Half Moon Glazed Aperture



Twin Top Glazed Aperture

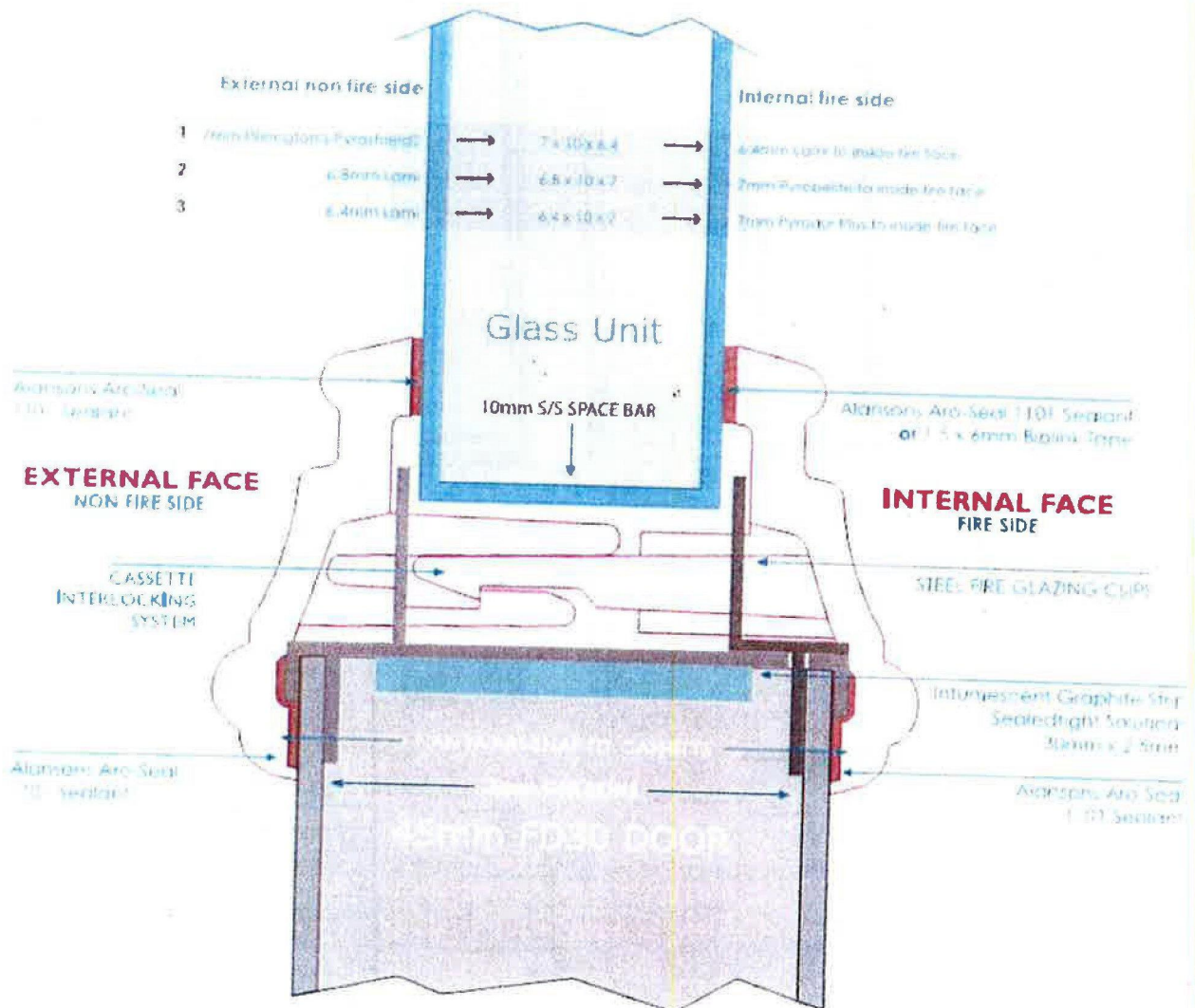


[illegible]

Appendix C

Glazing Cassette Installation

1. Incorporating the Nan-Ya cassette system



FD30 (30 Minute) Nan Ya Fire Door Glazing Guide

Dry Graphite Step by Step Glazing guide

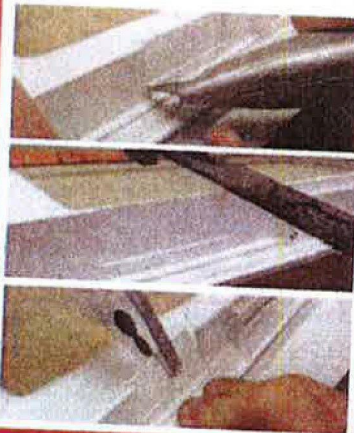
Step 1

Remove the dry graphite from the door frame. The dry graphite from the door frame should be removed for the perfect fit and to avoid the dry graphite from the door frame. The dry graphite from the door frame should be removed for the perfect fit and to avoid the dry graphite from the door frame.



Step 2

Begin by removing the previous flanges from both the inner and outer cassettes to accommodate the 2 part Steel fire glass reference glass. This is done using a Stanley hand saw along the horizontal line. Take care to make a straight cut without damaging the door frame or the back of the glass reference glass.



Step 3

Once one of the cassettes is in the aperture cut out ensure it is square. A square and mark off the top position into the frame.



Remove the cassette from the aperture and position the base clip, ensuring over the marks with the clip start position over the external type skin and pilot holes for the internal clip feet if required. Push the clip a small distance into the aperture feet and the clip should be seated positively. Then insert the secondary clips with the internal feet passing through the slots in the base clip and the long external feet located on the outside of the internal skin.



Step 4

Check the fit and ensure the regulation of the regulation is correct. Make sure the fit is correct and the regulation is correct. Make sure the fit is correct and the regulation is correct. Make sure the fit is correct and the regulation is correct.



Step 5

Position the top clip over the top of the internal feet, ensuring that the external feet are to the outside of the internal and external skins and it is held firmly.



Step 6

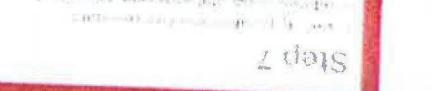
Check thoroughly the inner and outer glass reference channels of both cassettes using industrial type paper and clip off using industrial type paper ensuring they are dust free. Take the external glazing cassette and apply a 6-8mm bead of adhesive over the top of the inner and outer rebate legs where it meets with the glass and GFR skin. With the external cassette positioned on a solid surface place the glass over the cassette and clip off external face down. Check the final position and ensure the cassette is central within the door aperture.




FD30 (30 Minute) Nan Ya Fire Door Glazing Guide

Dry Grabbie Step by Step Glazing guide


Step 7




Remove the top glass panel from the frame. The panel is held in place by a top rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



Remove the bottom glass panel from the frame. The panel is held in place by a bottom rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



Remove the side glass panel from the frame. The panel is held in place by a side rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



Remove the top glass panel from the frame. The panel is held in place by a top rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.

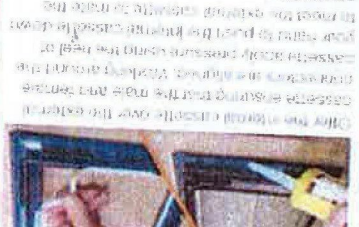
Step 8



Remove the top glass panel from the frame. The panel is held in place by a top rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



Remove the bottom glass panel from the frame. The panel is held in place by a bottom rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



Remove the side glass panel from the frame. The panel is held in place by a side rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



Remove the top glass panel from the frame. The panel is held in place by a top rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.

Step 9



Remove the top glass panel from the frame. The panel is held in place by a top rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



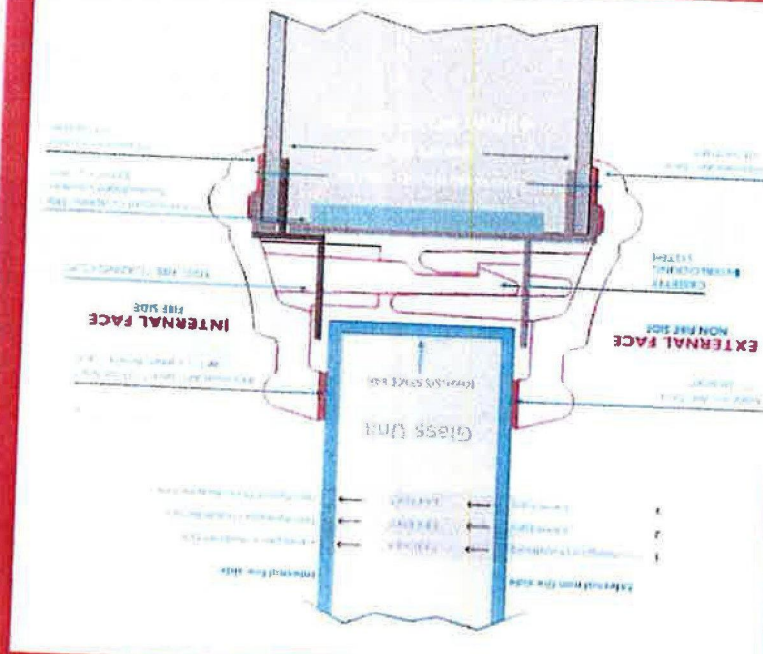
Remove the bottom glass panel from the frame. The panel is held in place by a bottom rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



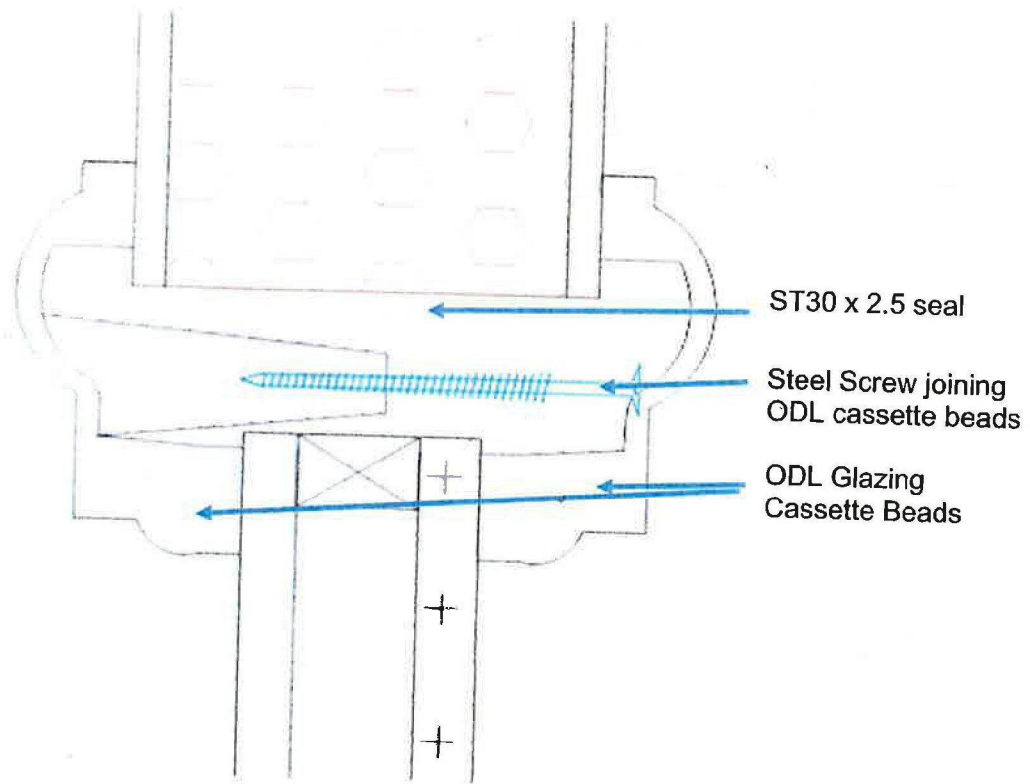
Remove the side glass panel from the frame. The panel is held in place by a side rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



Remove the top glass panel from the frame. The panel is held in place by a top rail. To remove it, lift the panel upwards and outwards, away from the frame. The panel is then placed on a clean, flat surface.



2. Incorporating the ODL cassette system

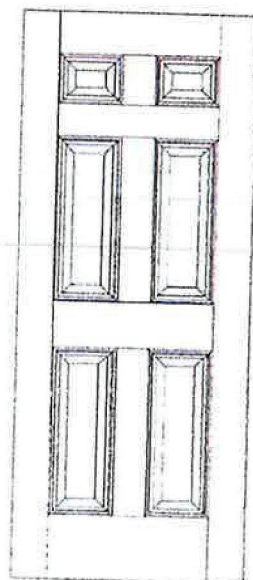


Appendix D

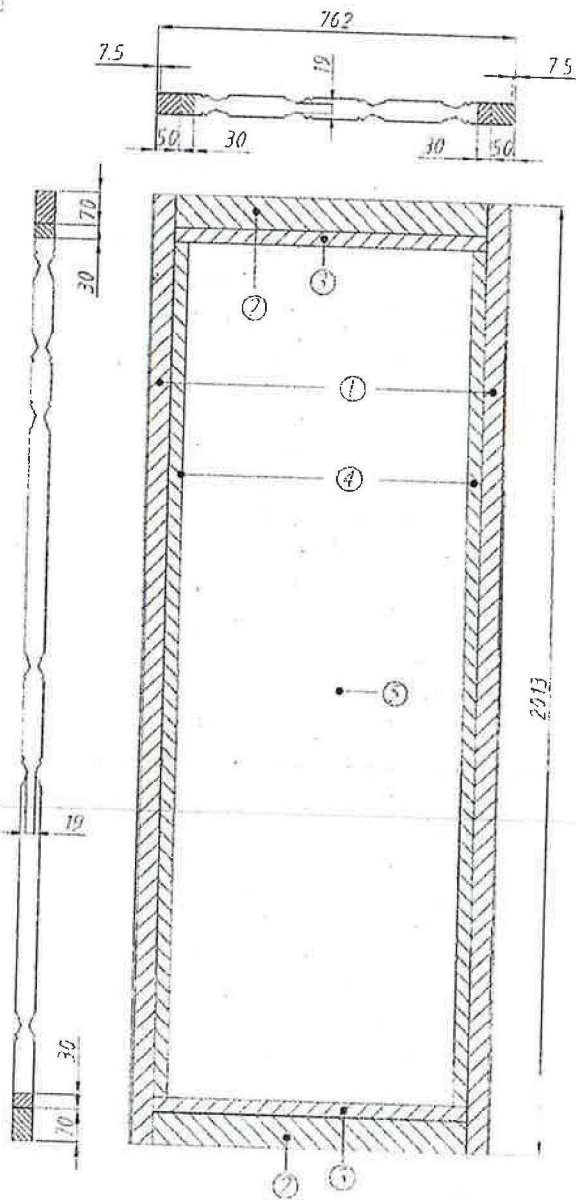
Door Construction Diagrams

ESTABLISH : 2006 08 15	Structure for Trimmable Fire-rated Door	NUMBER : NYB R ALAG
MODIFY : 2009 10 06	PHENOLIC ALDEHYDE FIRE RATING DOOR FOR 30 MINUTE TRIMMABLE (For Door Width 762mm)	PAGE : 1
VERSION : 2.1		

NO.	ITEM	DENSITY
①	Wood Stile	400-600 g/s
②	Top & Bottom Rail	100-600 g/s
③	Top & Bottom Rail	400-600 g/s
④	Reinforced Stile	400-600 g/s
⑤	Phenolic Foam	0.075 g/cm ³



Panel Door



ESTABLISH : 2006.08.15

MODIFY : 2009.10.06

VERSION: 2.1

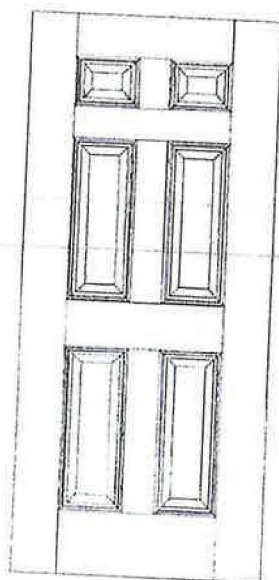
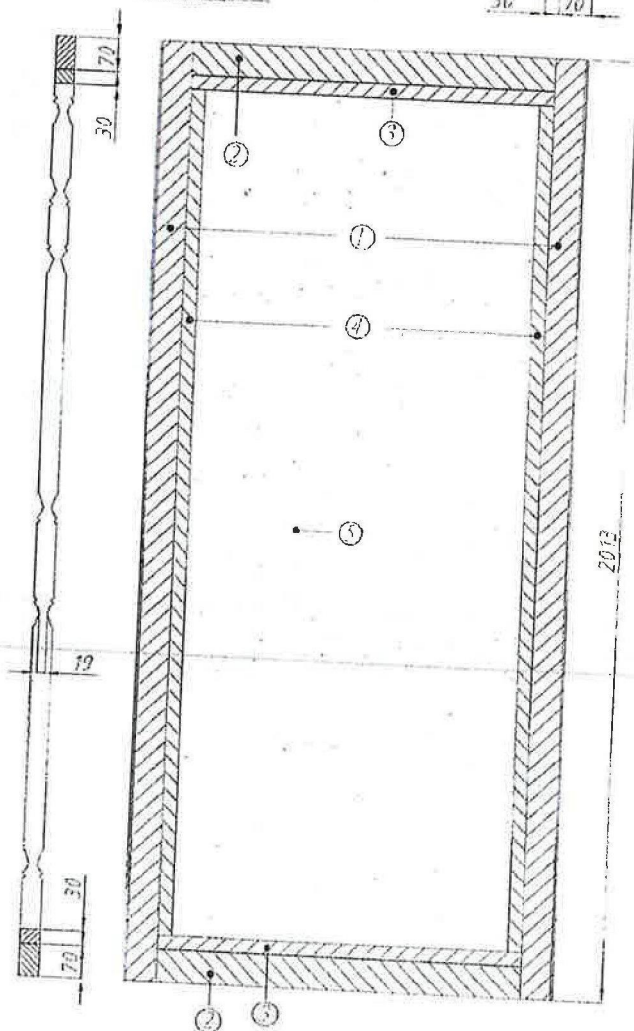
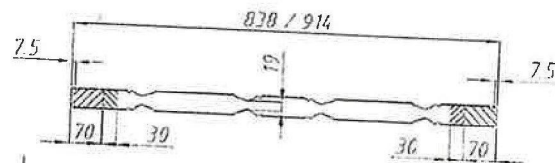
Structure for Trimable Fire-rated Door

PHENOLIC ALDEHYDE FIRE RATING DOOR FOR 30 MINUTE TRIMABLE
(For Door Width: 838mm & 914mm)

NUMBER : KYB-R ALAG

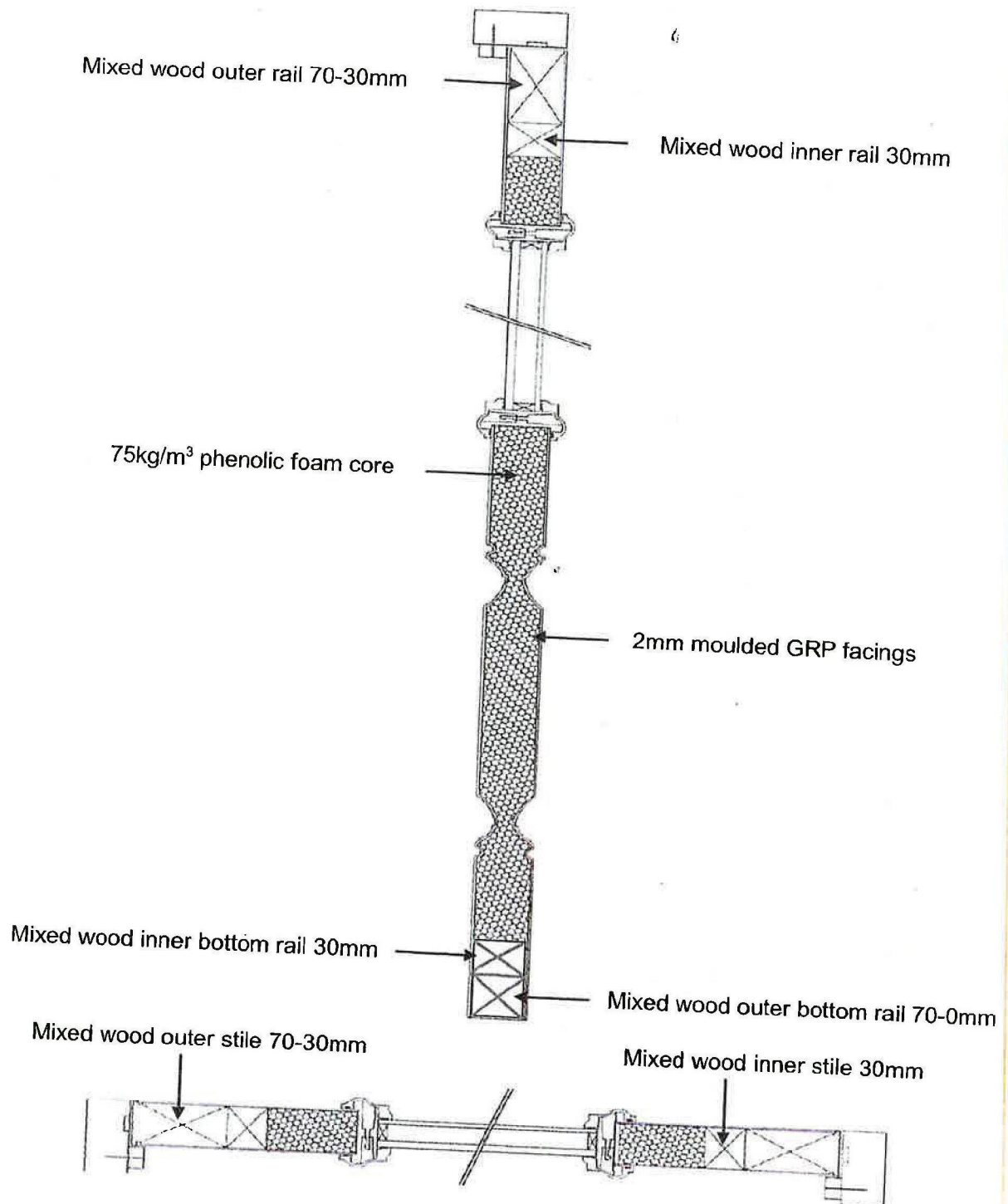
PAGE : 2

NO.	ITEM	DENSITY
①	Head Stile	400-600 g/m
②	Top & Bottom Rail	400-600 g/m
③	Top & Bottom Rail	400-600 g/m
④	Reinforced Board	100-600 g/m
⑤	Phenolic Foam	0.075 g/cm ³



Panel Door

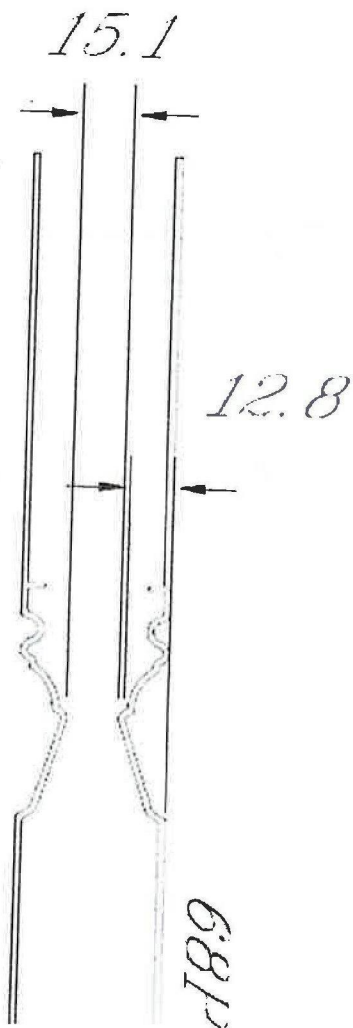
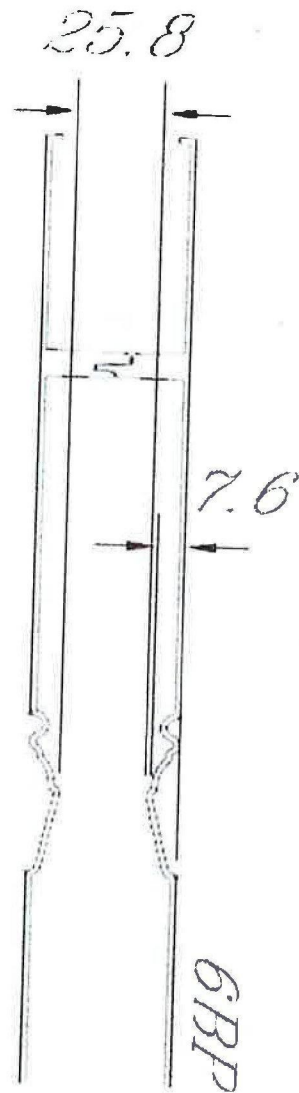
2012



Assessed Core thicknesses⁶

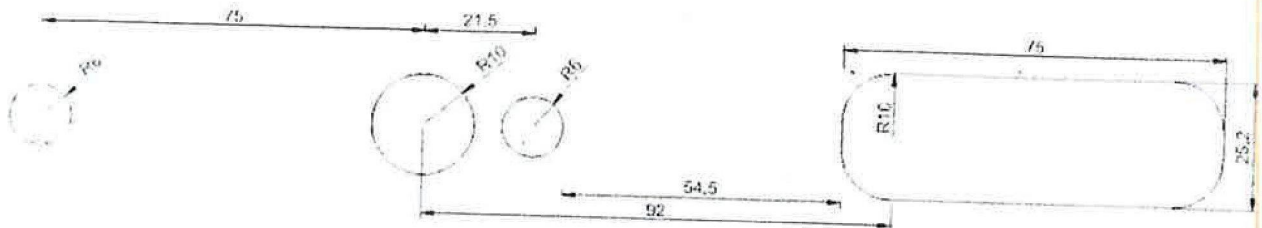
Interlocking (FD60)

Standard (FD30)

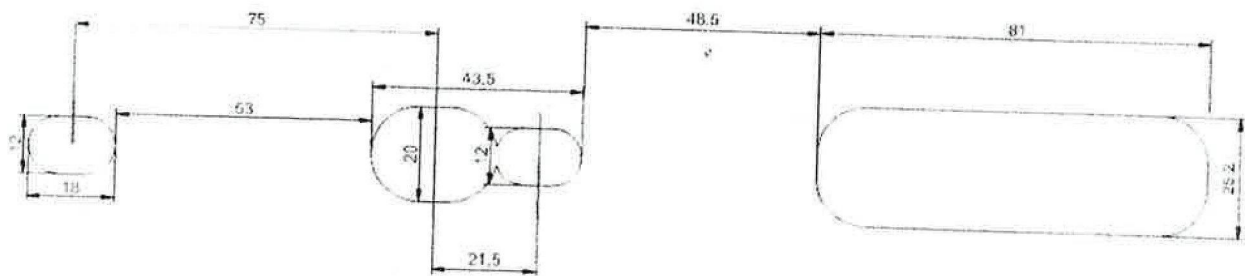


Assessed Machining Tolerance for Hardware

Required spindle/cylinder facing apertures for handles/locks/latches

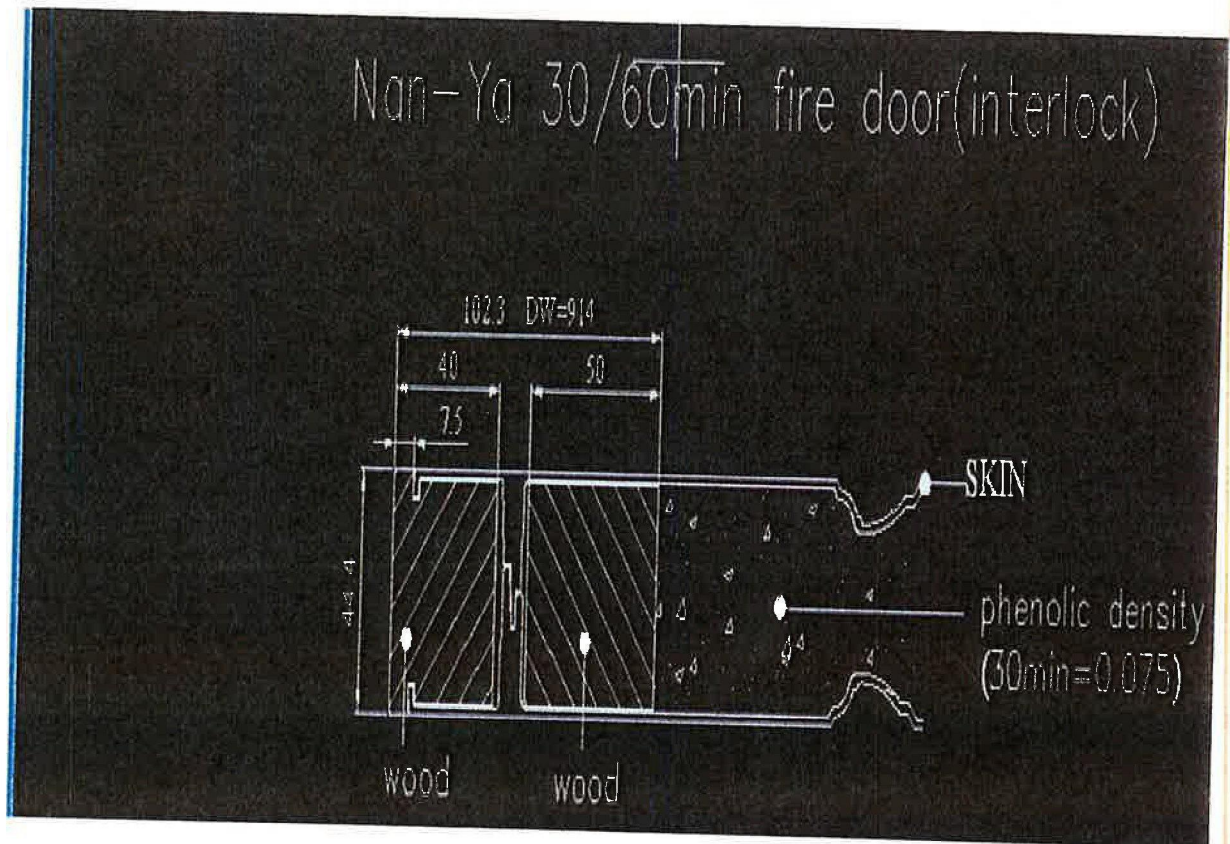


Machining tolerance for spindle/cylinder facing apertures for handles/locks/latches



Appendix E

Interlocking Stile Construction



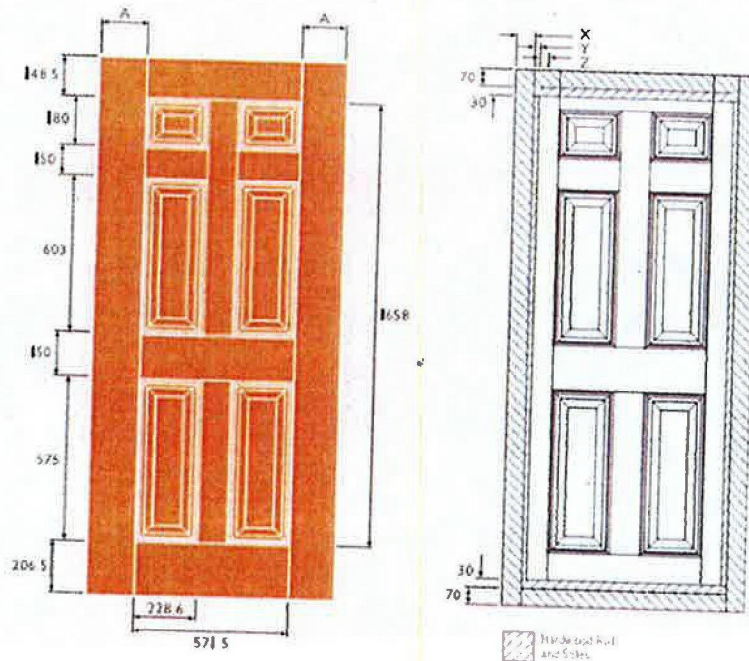
The diagram above illustrates the interlocking stile construction used in conjunction with the 25.8mm minimum core thickness for the Nan Ya FD60 fire door design. However, where necessary this construction may also be utilised for an FD30 performance.

Subject only to the leaf size adjustment (trimability) limitations shown in the illustration below, the interlocking construction is assessed as an acceptable construction variation for use with the full scope of application within this report.

fd60 6 panel door blank

CLASSICAL RANGE OF DOOR STYLES

DOOR SPECIFICATIONS



STRUCTURAL DIMENSIONS					TRIMABILITY		
Blank Size	A	X	Y	Z	Top	Sides (each)	Bottom
780 x 2013mm	104.25mm	41mm	10mm	50mm	40mm	10mm	20mm
838 x 2013mm	133.4mm	41mm	10mm	50mm	40mm	10mm	20mm
914 x 2013mm	171.4mm	41mm	10mm	50mm	40mm	10mm	20mm

Please Note:

- All trimmed edges must be treated with either paint or a clear sealant for protection purposes.
- All full height and entrance doors should be fitted with a self-closing device, as per Building Regulations Approved Document B (Fire Safety) Volume 2 Appendix.
- Surface mounted, overhead track and pivot type hinges are recommended on all fire rated doors as tested.
- Composite self-closing devices are not recommended unless they are tested for the fire rating.
 - Test evidence of approval must be provided.
 - Absolute protection treatment must be applied to the surface of the door to prevent damage from the fire rating.
 - Hardware and door frame should be tested and approved for the performance needed to meet the fire rating.
- All hardware and fittings that may come in contact with the fire door must have adequate safety protection against corrosion in 5531m by fire resistant products.

Appendix F

Revisions

Revision	Exova Warringtonfire Reference	Date	Description

BM TRADA

Fire Resistance Testing

Sponsor:
Masterdor Ltd
Firs Works
Nether Heage
Derby
DE56 2JJ

CONFIDENTIAL

Report: BMT/FEP/F15137C

A fire resistance test performed on a single leaf single acting doorset
Test conducted in accordance with BS 476: Part 20/22: 1987

Test date: 15th May 2015



1762

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...WHEN EXPERIENCE MATTERS

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3 Specification.....	4
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3.3 Closer forces.....	4
4 Description of construction	5
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6.5 Times to failure	13
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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

1 Summary of performance

The following performance was achieved from the specimen tested. Full details of the testing and specimen construction are described in the report.

Results: Fire resistance test in accordance with BS476: Part 20/22: 1987	Times to failure: <table border="1" data-bbox="678 459 1300 593"> <tr> <th data-bbox="678 459 981 504">Integrity</th><th data-bbox="981 459 1300 504">Insulation</th></tr> <tr> <td data-bbox="678 504 981 593">63 (sixty three) minutes</td><td data-bbox="981 504 1300 593">63 (sixty three) minutes</td></tr> </table>	Integrity	Insulation	63 (sixty three) minutes	63 (sixty three) minutes
Integrity	Insulation				
63 (sixty three) minutes	63 (sixty three) minutes				

Summary of specimens:

A latched single leaf single acting doorset

Leaf size: - 1995mm high x 820 wide x 44mm thick



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Report for: Masterdor Ltd
 Ref: BMT/FEP/F15137C

2 Introduction

Three doorsets were supplied for test, the right doorset only is subject to this report. The doorset was manufactured and supplied for test by the client and delivered on 20th May 2015.

BM TRADA plasterboard clad timber stud supporting partition and installed the doorset into the wall.

3 Specification

Details of the specimen are shown in the Appendix.

3.1 Door leaf

The leaf measured 1995mm high x 820mm wide x 44mm thick. The doorset was hung to open in towards the furnace. The results of this test were obtained from a doorset fitted with a multi point lock/latch engaged at the centre latch only.

3.2 Door perimeter gaps

The gaps between the edge of the leaf and frames were measured prior to test. A total of 12 readings were recorded. The measurements (in mm) are detailed in Figure 4 of the Appendix.

3.3 Closer forces

Measured in accordance with FTSG Resolution No 63.

Opening force (Nm)	Closing force (Nm)
26	11

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4 Description of construction (refers to Figures 1 to 4 of the appendix)

Leaf – (identified as a Nan Ya FD60 door blank)

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles	Outer	Mixed wood [#] finger jointed lamels	32 wide x 40 thick	490-600*	12	1
	Inner	Mixed wood [#] finger jointed lamels	56 wide x 40 thick	490-600*	-	2
Rails – top and bottom		Mixed wood [#] finger jointed lamels	100 wide x 40 thick	490-600*	12	3
Core		Phenolic foam	40 thick reducing to 28 thick at fielded areas	75*	-	4
Facings		GRP	2 thick	-	-	5
Sub facings		Glass fibre matting	2No. layers fitted between the core and facing	-	-	6
Adhesive	Facing to stiles and rails only	Polyurethane adhesive	-	-	-	-
Facing to facing interlocking connector		GRP (see figure 2)	8 thick (between inner and outer stiles)	-	-	7
Leaf head insert		Sapele grooved into the leaf head	22 wide x 6 thick	640**	-	8

Mixed wood consisting of pine, acacia and styrax
 ** Nominal density

* Manufacturers stated density, not checked by laboratory

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Frame

	Material	Dimensions (mm)	Density (kg/m ³)	Key to figures
Head and jambs	PVC extrusion Ref. SK 77960	70 deep x 50 wide including a 27 high integral stop	-	9
Frame reinforcement	Steel box section	35 deep x 15 wide x 1.5 thick	-	10
Frame jointing detail	Mitred – fully fusion welded	-	-	-
Frame to supporting construction fire stopping detail	Tightly packed rock mineral fibre capped with intumescent mastic	Nominally 5 wide x 10-15mm deep	-	-
Frame to supporting construction fixing detail	Steel wood screws	100 long fitted at not more than 150mm from corners at 600mm centres (max)	-	-
Architrave	None fitted	-	-	-
Threshold	Masterguard 25 extruded aluminium	75 wide x 25 high	-	11

Intumescent materials

	Make/type	Size (mm)	Location	Key to figures
Leaf edges	None fitted	-	-	-
Frame reveal – head and jambs	Sealed Tight Solutions ST25 x 2.5	25 x 2.5	Fitted in the frame reveal 13mm from the exposed face	12
	Sealed Tight Solutions ST25 x 2.5	25 x 2.5	Fitted in the frame reveal 13mm from the exposed face	13
Rear of frame	Sealed Tight Solutions ST30 x 2.5	30 x 2.5	Fitted at the rear of the frame	14
Weather seal	Schlegel Q-Ion Ref: SW73045	10 high x 5 wide	Fitted in the upstand groove of the stop	15
	Schlegel 5W1248 brush seal	10 high x 8 wide	Fitted in the profile of the frame reveal	16

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

Interruptions and hardware protection

	Make/type	Size (mm)	Location
Around hinges	Partially interrupted	-	Hinge blade fully interrupts 1 st seal in frame reveal leaving 2 nd seal continuous
Under hinge blade	STS graphite	1 thick x 100 x 30	Fitted under hinge blade on frame and leaf
Encasing latch body	STS graphite	1 thick x 140 x 50	Fitted on both faces of all latch bodies
Under latch forend	None fitted	-	-
Around latch keeps	Partially interrupted	-	Latch keeps fully interrupts 1 st seal in frame reveal leaving 2 nd seal continuous
Under latch keeps	STS graphite	1 thick	Fitted under top, centre and bottom keeps

Hardware

	Make/type	Size (mm)	Location	Key to figures
Hinges	3 No. Masterdor stepped butt type hinge	100 x 35 x 3 (blade size)	Fitted 175mm, 945mm, 1740mm and 1730mm from the leaf threshold	17
Closer	Rutland TS3204 overhead type closer	220 x 59 (footprint size)	Fitted on the exposed face as per the manufacturer's instructions	18
Lock/latch - engaged at the centre point only	Winkhaus Trulock multi point lock/latch	1770 x 20 (forend size)	Centre lock/latch fitted 1015mm from the threshold of the leaf	19
		235 x 25 (centre keep size)		
		175 x 24 (top and bottom keep size)	Top keep fitted 155mm from the leaf head Bottom keep fitted 130mm from the leaf threshold	20
Furniture	Aluminium lever type handle Ref: SDL-SX	215 x 24 (footprint size)	Fitted appropriate to the centre lock/latch	21

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

5 Test conditions

- 5.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71, 72 and 78 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 5.2 The ambient temperature of the test area at commencement of test was 16°C.
- 5.3 After the first 5 minutes of the test, the furnace pressure was maintained at -4.25 ± 3 Pa with respect to atmosphere, at a point 0.5m from the notional floor level, equating to 0Pa at a point 1m above the notional floor level.
- 5.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 22: 1987 as closely as possible, using the average of nine thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 6.1.
- 5.5 The temperature of the unexposed face was monitored by means of five thermocouples fixed to the surface of the door leaf and three thermocouples attached to the frame, one at mid-height on each jamb, and one centrally located above the leaf on the frame head.

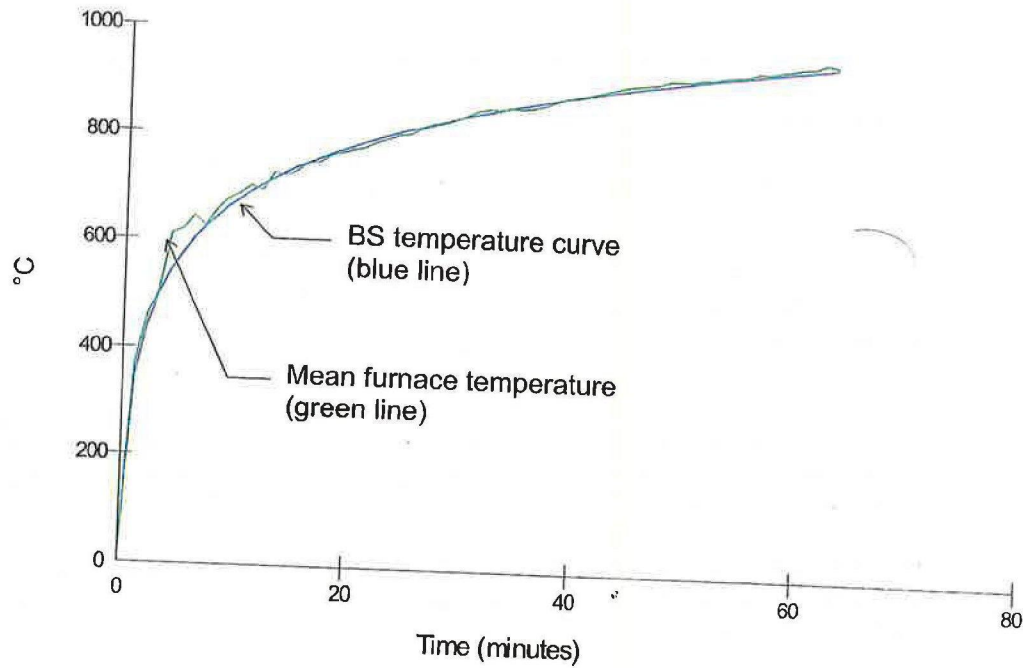
The thermocouple positions are shown in Figure 4 of the appendix. The average temperature of the door leaf and maximum temperature of the doorset are shown graphically in Section 6.2.

The legal validity of this report can only be claimed on presentation of the complete report.

6 Test results

The following data and observations were recorded during the test.

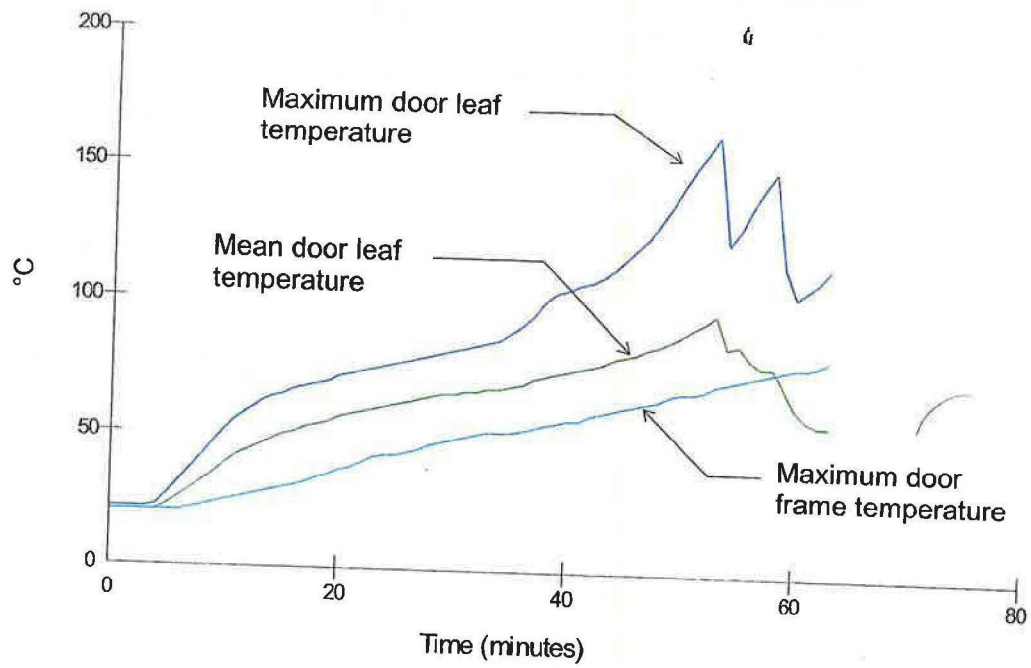
6.1 Furnace temperature curve



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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

6.2 Unexposed face temperature curves



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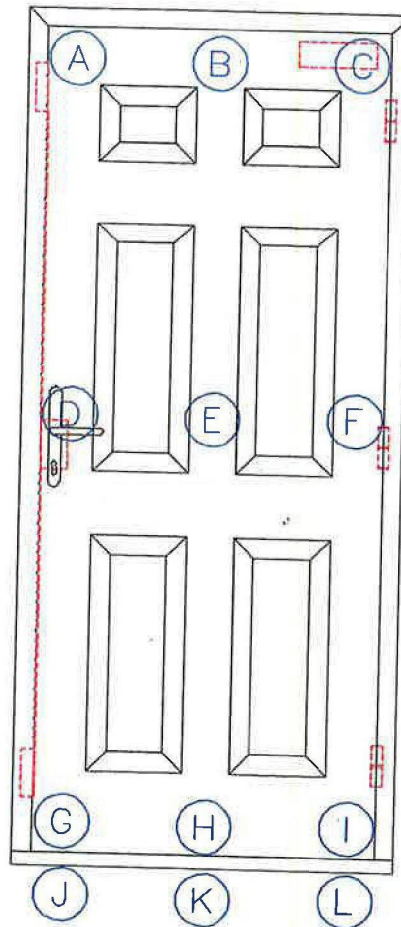
Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

6.3 Door distortion data

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

A negative measurement indicates distortion away from the furnace.

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



Leaf (hung on the right and opening in towards the furnace)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	8	2	4	-4	-19	-6	6	2	-1	-3	-2	-1
20	15	-1	-7	-5	-28	-6	3	10	22	-3	-3	-2
30	8	-7	0	1	-24	-1	5	1	3	-3	-4	-2
40	6	-15	6	-7	-44	-3	6	-7	3	-6	-7	-6
50	9	-18	9	-12	-41	-5	-1	-5	9	-7	-8	-9
60	12	-23	2	-15	-51	-7	0	-9	7	-8	-10	-9

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

6.4 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	Comments
00.00	Test started.
05.48	There is discolouration and smoke issuing from the top closing corner of the leaf.
06.40	There is smoke issuing from the bottom security latch/keep position.
09.14	There is an increase in discolouration and smoke issuing from the top closing corner of the leaf.
21.07	The seal is falling out at the top closing corner of the leaf.
58.35	There is a glow at the top closing corner of the leaf.
59.03	A cotton pad integrity test was performed at the top closing corner of the leaf, no failure.
61.45	A cotton pad integrity test was performed at the top closing corner of the leaf, no failure.
63.09	A cotton pad integrity test was performed at the top closing corner of the leaf, no failure.
63.30	Test terminated.

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

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MET00040107/27
METOC

6.5 Times to failure

When tested in accordance with BS 476: Part 22: 1987, Method 6, determination of fire resistance of insulated doors and shutter assemblies, the requirements of the standards were satisfied for the following periods:

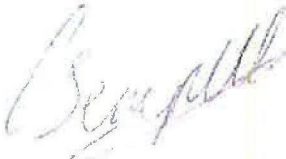

Integrity	Insulation
63 (sixty three) minutes	63 (sixty three) minutes

7 Limitations

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

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

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. BM TRADA will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

	Written and Checked by:	Authorised by:
Signature:		
Name:	Callum Sempill	Robert Axe
Title:	Technical Officer	Lead Technical Officer
Date of issue:	19 th June 2015	19 th June 2015

The legal validity of this report can only be claimed on presentation of the complete report.

Photographs

At start of test



After 15 minutes



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Ref: BMT/FEP/F15137C

At 30 minutes



After 45 minutes



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At 60 minutes



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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

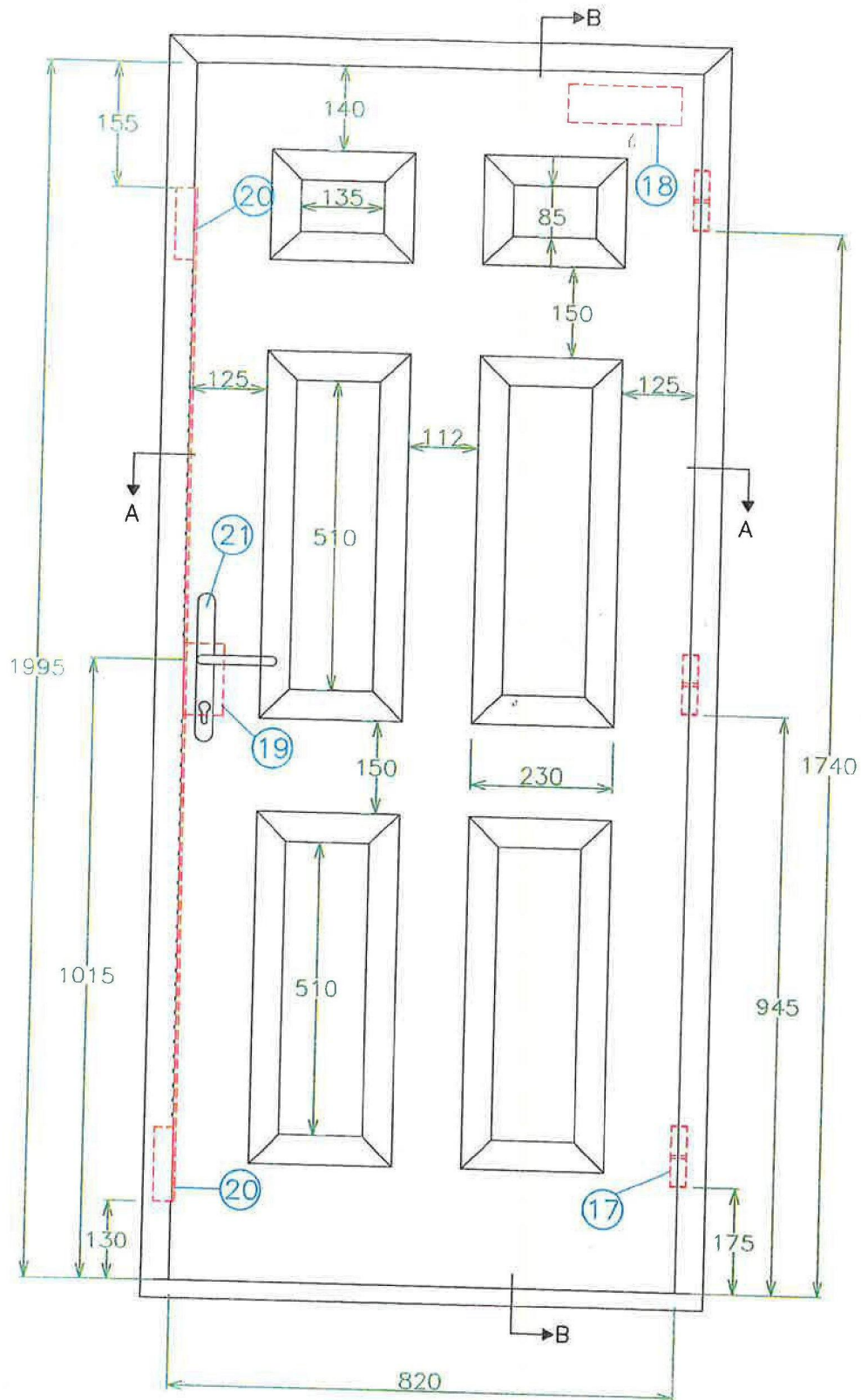
Appendix – figures 1 to 4

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15137C

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MET00040107/32
METOC



BM TRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: [REDACTED] Fax: [REDACTED]

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

Date Drawn 01/06/15

Drawn By ARD

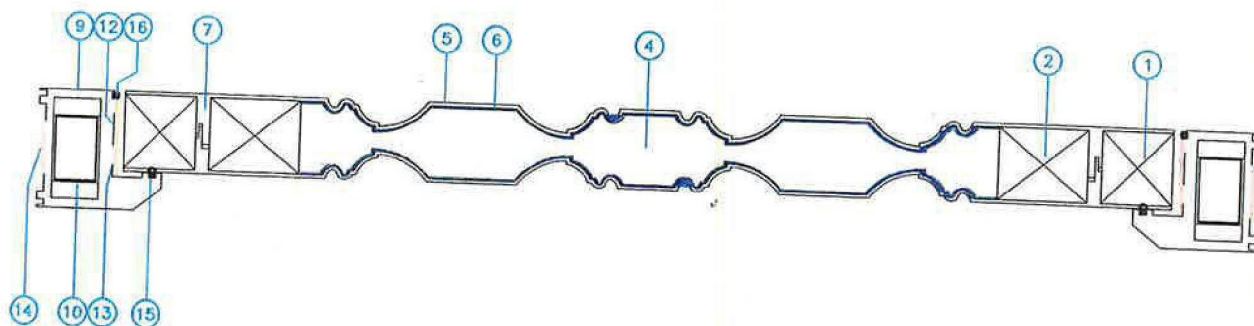
Scale NTS

Project No.

BMT/FEP/F15137C

Appendix

Section A-A

**BMTRADA**

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

Tel: [REDACTED]

Fax: [REDACTED]

Title

Horizontal cross-sections

(All dimensions in mm)

Date Drawn

01/06/15

Drawn By

ARD

Scale

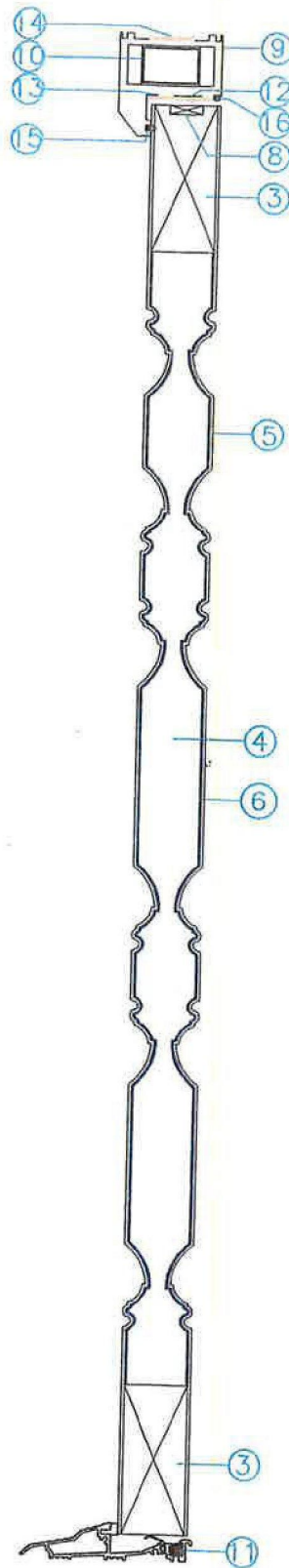
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Project No.

BMT/FEP/F15137C

Appendix

Section B-B



BM TRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: [REDACTED] Fax: [REDACTED]

Title

Vertical cross-sections

(All dimensions in mm)

Date Drawn

01/06/15

Drawn By

ARD

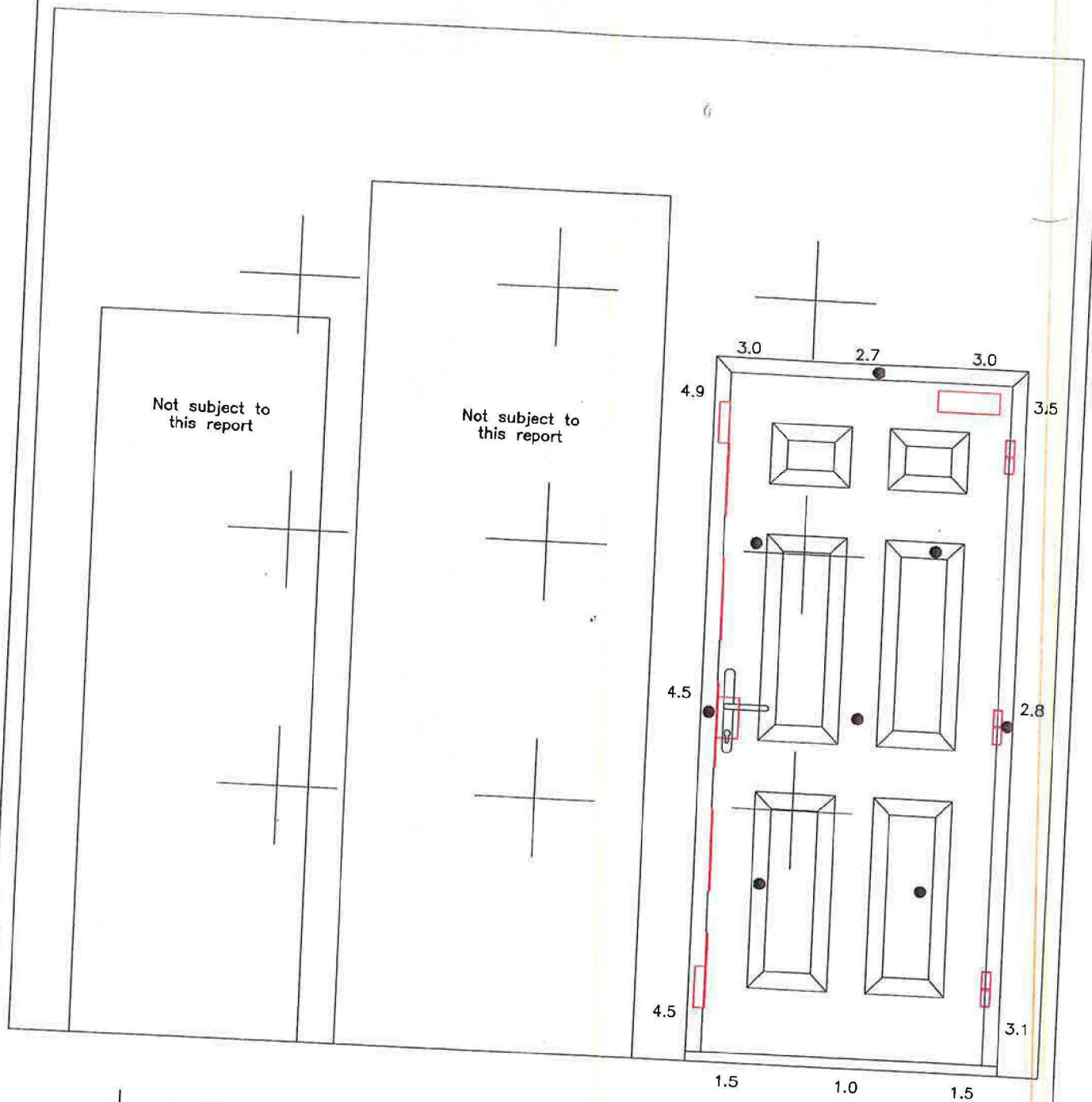
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Project No.

BMT/FEP/F15137C

Appendix



+ : Furnace Thermocouples
 • : Unexposed Face Thermocouples

Viewed From Unexposed Face

BMTRADA

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

Tel: [REDACTED]

Fax: [REDACTED]

Title

Thermocouple positions and
leaf/frame gaps
(All dimensions in mm)

Date Drawn

01/06/15

Drawn By

ARD

Scale

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Project No.

BMT/FEP/F15137C

Appendix

BM TRADA

BM TRADA provides independent certification, testing, inspection, training and technical services around the world. We help customers large and small to prove their business and product credentials and to improve performance and compliance. With an international presence across many industry sectors, we offer a special focus and long history of technical excellence in supply chain certification, product certification and testing, and technical services to the timber, building, fire and furniture industries.



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CHILTERN INTERNATIONAL FIRE LTD CHILTERN HOUSE, STOCKING LANE, HUGHENDEN VALLEY, HIGH WYCOMBE, BUCKS, HP14 4ND, UK

REGISTERED IN ENGLAND NO. 3125010

MET00040107/37
METOC

BMTRADA

Fire Resistance Test Report

Sponsor:
Masterdor Ltd
Firs Works
Nether Heage
Derby
DE56 2JJ

CONFIDENTIAL

Report: BMT/FEP/F15142

A fire resistance test performed on a glazed single leaf single acting doorset with fanlight and side screen and a glazed single leaf single acting doorset with over panel

Test conducted in accordance with BS 476: Part 20/22: 1987

Test date: 17th October 2015

Page 1 of 22



1762

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This document is confidential and remains the property of Chiltern International Fire Ltd. The legal validity of this report can only be claimed on the presentation of the complete report.



...WHEN EXPERIENCE MATTERS

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

2 Introduction

The doorsets were manufactured and supplied for test by the client and delivered during October 2015. BM TRADA plasterboard clad timber stud supporting partition and installed the doorsets into the wall.

3 Specification

Details of the specimens are shown in the Appendix.

3.1 Door leaf

The left doorset was designated doorset A and the leaf measured 2010mm high x 780mm wide x 44mm thick. The right doorset was designated doorset B and the leaf measured 2020mm high x 780mm wide x 44mm thick. Both doorsets were hung to open in towards the furnace. The results of this test were obtained from doorsets fitted with a multi point lock/latch engaged at the centre latch only.

3.2 Door perimeter gaps

The gaps between the edge of the leaf and frames were measured prior to test. A total of 24 readings were recorded. The measurements (in mm) are detailed in Figure 4 of the Appendix.

3.3 Closer forces

Measured in accordance with FTSG Resolution No 63.

	Opening force (Nm)	Closing force (Nm)
Doorset A	46	24
Doorset B	51	32

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4 Description of construction (refers to Figures 1 to 4 of the appendix)

Leaf – doorset A (Identified as a Nan-Ya FD30 Door slab)

	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles	Mixed wood [#] finger jointed lamels	41 wide x 38 thick	640*	10.1	1
Rails	Mixed wood [#] finger jointed lamels	41 wide x 38 thick	640*	10.6	2
Core	Phenolic foam	38 thick reducing to 15 thick at fielded areas	75*	-	3
Facings	Moulded GRP	3 thick	-	-	4
Lippings	None fitted	-	-	-	-

Mixed wood consisting of pine, acacia and styrax

* Stated by client, not verified by the laboratory

Leaf – doorset B

	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles	Profiled Sapele	95 wide x 32 thick	640*	10.1	5
Rails	Profiled Sapele	95 wide x 32 thick	640*	10.6	6
Core	Corex calcium silicate	32 thick	320*	-	7
Facings	MDF	6 thick	700*	-	8
Lippings	None fitted	-	-	-	-
Timber insert	Sapele fitted in all edges of the leaf on the unexposed face	10 wide x 8 deep	640*	-	9
Adhesive	Lippings	D4 PVA	-	-	-
	Facings	D4 PVA	-	-	-

* Stated by client, not verified by the laboratory

Side screen lower panel - doorset A and over panel – doorset B

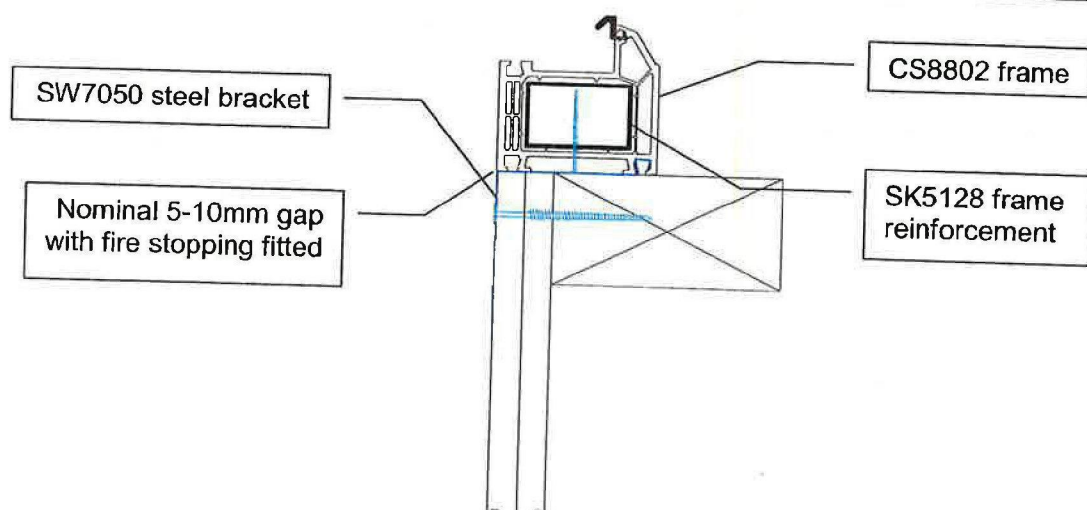
	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Core	Corex calcium silicate	25 thick	320*	-	10
Facings	UPVC	1.5 thick	-	-	11

* Stated by client, not verified by the laboratory

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Frame – both doorsets

	Material	Dimensions (mm)	Density (kg/m³)	Key to figures
Head and jambs	PVC extrusion Sheerframe Ref: SR77950	70 deep x 70 wide including a 22 high integral stop	-	12
Fanlight/over panel – both doorsets and side screen – doorset A	PVC extrusion Sheerframe Ref: CS8802	70 deep x 70 wide	-	13
Frame reinforcement	Steel box section Ref. SK5128	30 deep x 30 wide x 1.5 thick	-	14
Doorset A side screen transom	PVC extrusion Sheerframe Ref: CS8802	70 deep x 70 wide	-	15
Frame jointing detail	Mitred – fully fusion welded	-	-	-
Coupling – doorset A fanlight to door frame/sidescreen to door frame/fanlight Doorset B over panel to door frame	Sheerframe Ref. A204	70 deep x 10 wide	-	16
Frame to supporting construction fire stopping detail	Tightly packed rock mineral fibre capped with intumescent mastic	Nominally 5-10 wide x depth of frame	-	-
Frame to supporting construction fixing detail	Along edges of sidescreen and fanlight	15mm wide profiled steel brackets screwed to back of frame using 40mm long steel screws and to the supporting construction using 70mm steel screws (see below and Photographs)	1No. fitted at 450mm centres	-
	Along frame jambs	Steel wood screws	80 long fitted at 450mm centres	-
Architrave	None fitted	-	-	-
Threshold	Masterguard 25 extruded aluminium	75 wide x 25 high	-	17



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Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

Intumescent materials – both doorsets

	Make/type	Size (mm)	Location	Key to figures
Leaf edges – head only	2No. Sealed Tight Solutions ST25 x 2.5	25 x 2.5	Fitted one on top of the other in the leaf head	18
Frame reveal – head and jambs	Sealed Tight Solutions ST25 x 2.5	25 x 2.5	Fitted in the frame reveal 13mm from the exposed face	19
	Sealed Tight Solutions ST10 x 2.5	10 x 2.5	Fitted in the frame reveal 39mm from the exposed face	20
Rear of frame	Sealed Tight Solutions ST30 x 2.5	30 x 2.5	Fitted at the rear of the frame	21
Weather seal	Schlegel Q-Ion Ref: 5473045	10 high x 5 wide	Fitted in the upstand groove of the stop	22
	Schlegel 5W1248 brush seal	10 high x 8 wide	Fitted in the profile of the frame reveal	23
Glazing perimeter – leaf	Sealed Tight Solutions ST30 x 2.5	30 x 2.5	Fitted around the glazing aperture in the leaf	24
Fanlight/over panel and sidescreen apertures	Sealed Tight Solutions ST30 x 2.5	30 x 2.5	Fitted around the glazing and panel apertures	25

Interruptions and hardware protection

	Make/type	Size (mm)	Location
Around hinges	Continuous	-	Hinge blade planted on 1 st seal in frame reveal leaving 2 nd seal continuous
Under hinge blade	None fitted	-	-
Encasing latch body	STS graphite sheet	1 thick	Fitted around the body of the latch
Under latch forend	STS graphite sheet	1 thick	Fitted under the latch forend
Around latch keeps	Partially interrupted	-	Latch keeps planted on 1 st seal in frame reveal leaving 2 nd seal continuous
Under latch keeps	STS graphite sheet	1 thick	Fitted under top, centre and bottom keeps

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Hardware

		Make/type	Size (mm)	Location	Key to figures
Hinges	Doorset A	3 No. Masterdor butt type hinges Ref. HNG1333	102 x 30 x 2 (blade size)	Fitted 150mm, 955mm and 1755mm from the leaf head	26
	Doorset B	4 No. SEA butt type hinge	100 x 40 x 1 (blade size)	Fitted 150mm, 365mm, 1020mm and 1745mm from the leaf head	27
Closer		Rutland TS3204 overhead type closer	220 x 59 (footprint size)	Fitted on the exposed face as per the manufacturer's instructions	28
Lock/latch - engaged at all points		Winkhaus AV2 multi point lock/latch with S-tech Eurocylinder	1768 x 20 (forend size) 230 x 26 (centre keep size)	Centre lock/latch fitted 1000mm from the threshold of the leaf	29
			175 x 24 (top and bottom keep size)	Fitted 1730mm and 285mm from the leaf threshold	30
Furniture		Chrome lever type handle Ref: SDL-SX	215 x 30 (footprint size)	Fitted appropriate to the centre lock/latch	31

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

Glazing – both doorsets

		Make/type		Dimension (mm)	Key to figures
Glass type	Synseal Global double glazed unit	Pilkington Pyroshield glass fitted on the exposed face		7 thick	32
		Laminated glass fitted on the unexposed face		6 thick	33
		Stainless steel spacer		12 thick	34
		Overall aperture size (mm)	Glass size (mm)	Sight size (mm)	-
Doorset A - leaf		922 high x 568 wide	912 high x 558 wide	885 high x 530 wide	-
Fanlight		303 high x 796 wide	293 high x 786 wide	255 high x 755 wide	-
Side screen		1188 high x 796 wide	1178 high x 786 wide	1145 high x 755 wide	-
Doorset B - leaf		920 high x 554 wide	910 high x 544 wide	875 high x 510 wide	-
Expansion allowance		2-3mm on all edges			-
Glazing bead – doorset A	Leaf	ODL glazing cassette 43mm high x 18mm deep Ref: ½ glazed			35
	Fanlight and sidescreen glazing and panel	Sheerframe clip in Ref. CS8810 25mm wide x 28mm high fitted on the exposed face			36
Beading fixings - doorset A	Leaf	Steel screws at manufacturers pre determined positions fitted from the exposed face to the unexposed face			37
Glazing bead – doorset B	Leaf	Masterdor timber glazing cassette 45mm wide x 24mm deep			38
	Fanlight panel	Sheerframe clip in Ref. CS8810 25mm wide x 28mm high fitted on the exposed face			39
Beading fixings – doorset B	Leaf	Steel wood screws 38mm long fitted 60mm from corners at 120mm centres at 90° to the face of the glass			40
Glazing clips – leaf		None fitted*			-
Glazing clips – fanlight and sidescreen		Steel angle sections 1.9mm thick x 50mm long x 15mm wide x 15mm high. 1No fitted centrally to each side			-

* Information provided by the client, verified as much as possible by the laboratory post test

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Ref: BMT/FEP/F15142

5 Test conditions

- 5.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71, 72 and 78 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 5.2 The ambient temperature of the test area at commencement of test was 13°C.
- 5.3 After the first 5 minutes of the test, the furnace pressure was maintained at -4.25 ± 3 Pa with respect to atmosphere, at a point 0.5m from the notional floor level, equating to 0Pa at a point 1m above the notional floor level.
- 5.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 22: 1987 as closely as possible, using the average of nine thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 6.1.
- 5.5 The temperature of the unexposed face of doorset A was monitored by means of five thermocouples fixed to the surface of the door leaf and seven thermocouples attached to the frame, one at mid-height on each jamb, one centrally located above the leaf on the frame head, one centrally located above the fanlight and one centrally located above the side screen. Six thermocouples were fixed to the glass and two thermocouples were fixed to the side screen lower panel.

The temperature of the unexposed face of doorset B was monitored by means of five thermocouples fixed to the surface of the door leaf and four thermocouples attached to the frame, one at mid-height on each jamb, one centrally located above the leaf on the frame head, one centrally located above the fanlight. Two thermocouples were fixed to the glass and two thermocouples were fixed to the over panel.

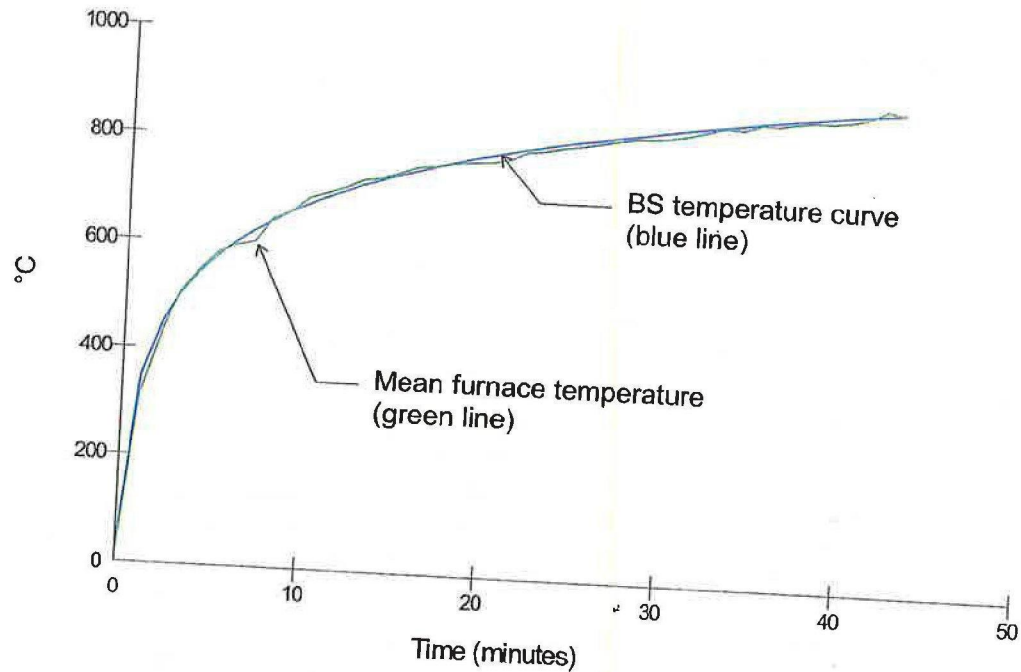
The thermocouple positions are shown in Figure 4 of the appendix. The average temperature of the door leaves and maximum temperature of the doorsets are shown graphically in Section 6.2.

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6 Test results

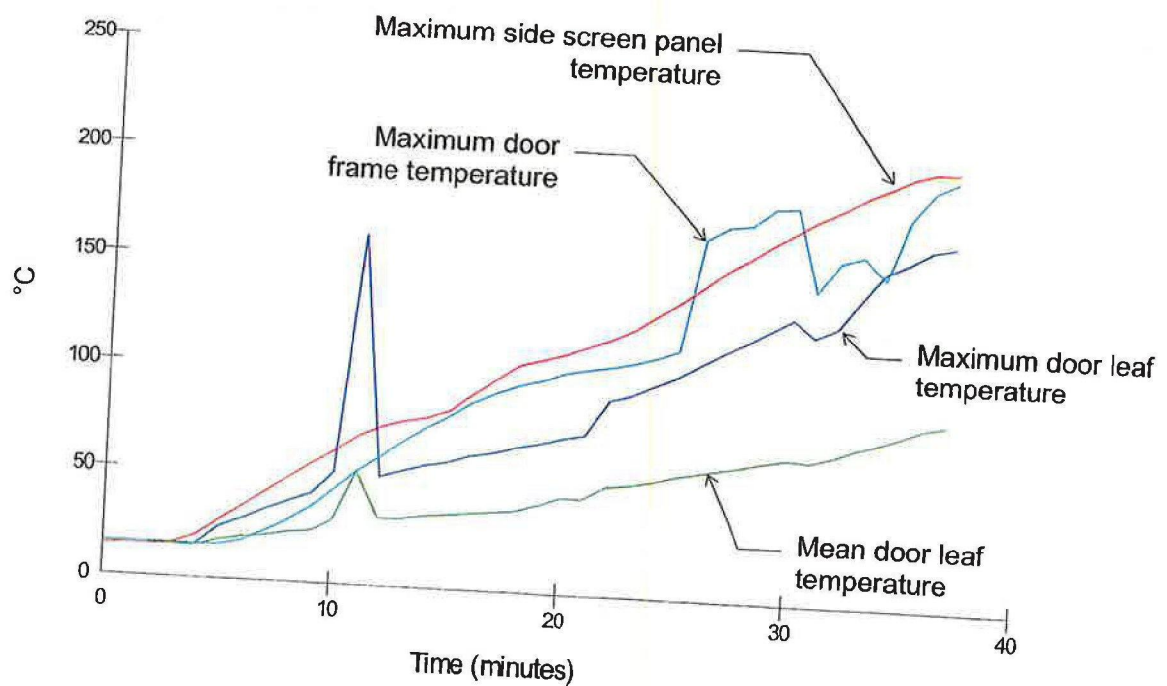
The following data and observations were recorded during the test.

6.1 Furnace temperature curve

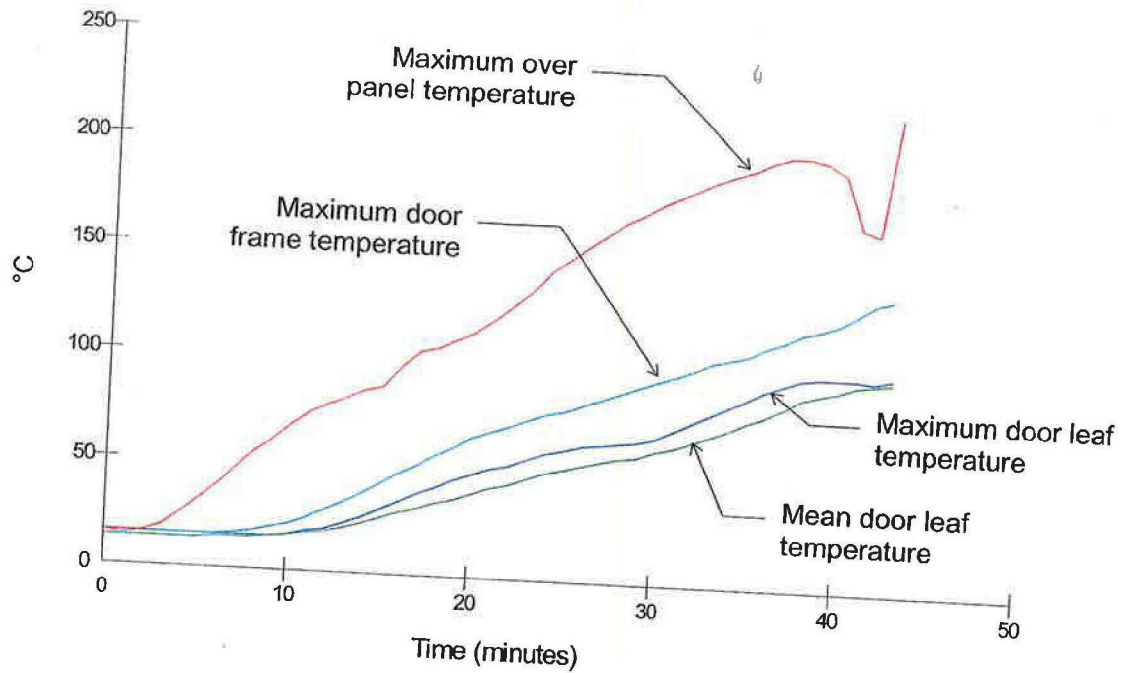


6.2 Unexposed face temperature curves

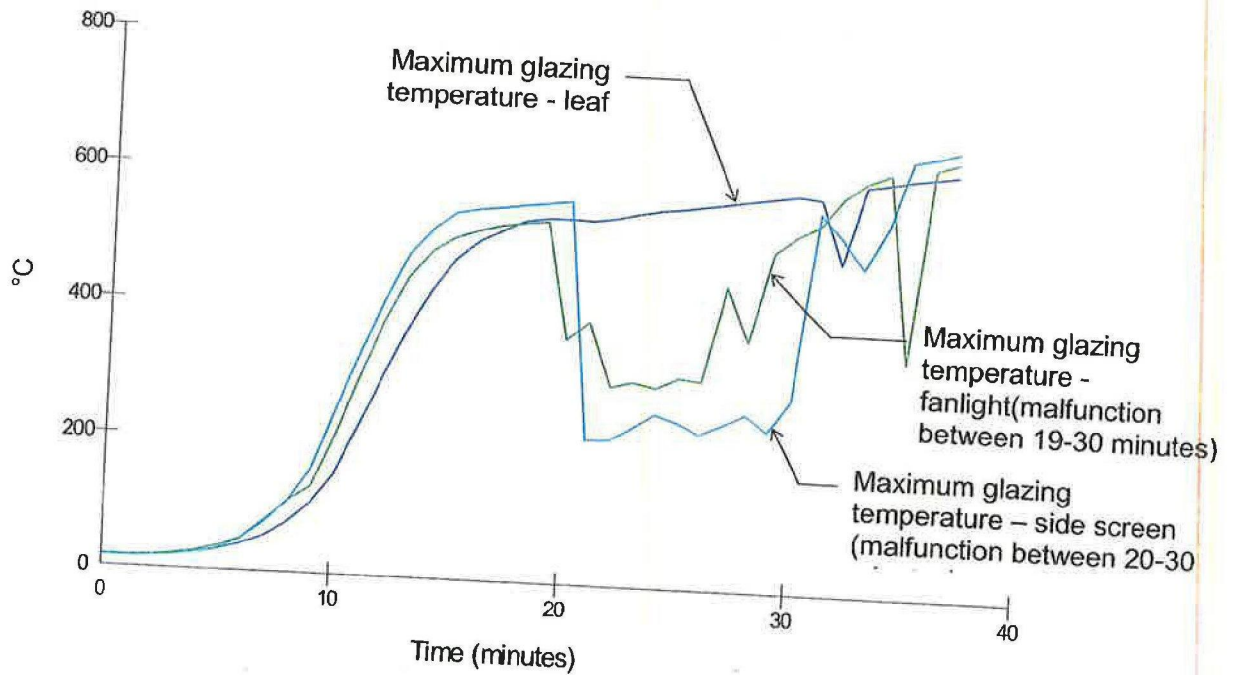
Doorset A

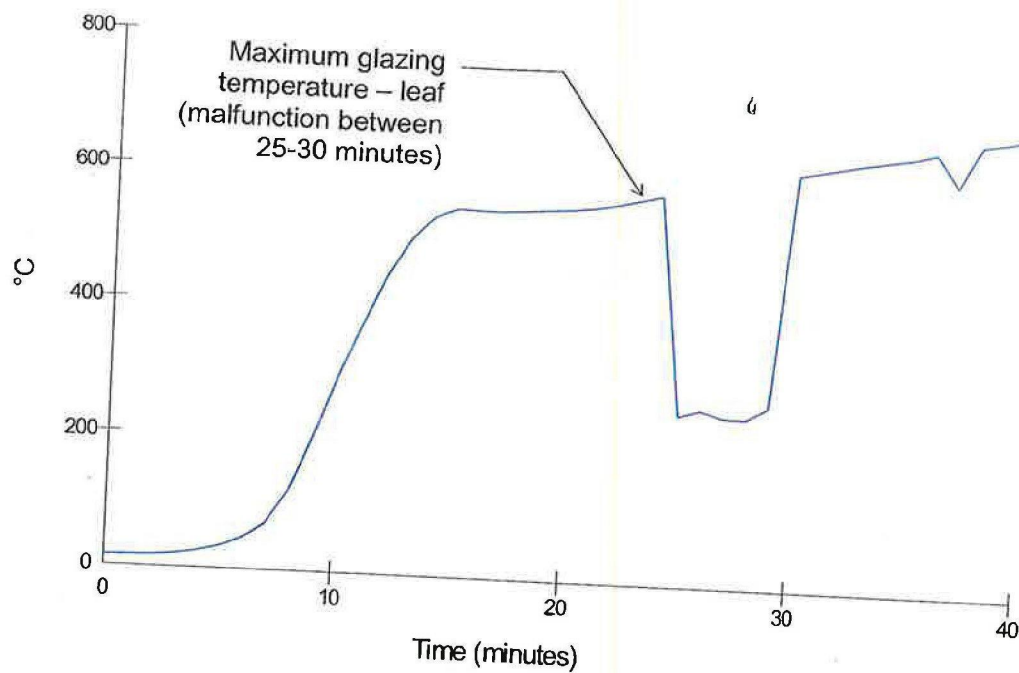


Doorset B

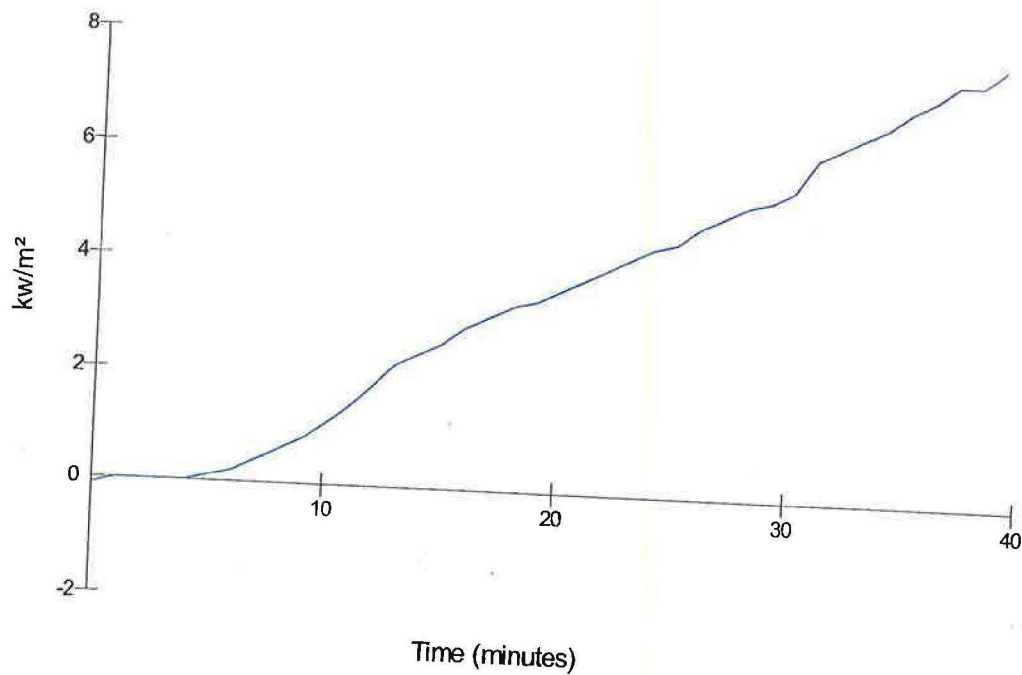


Glazing – doorset A



Glazing – doorset B**Radiation – doorset A**

A radiometer was used to measure the radiation 1m away from the specimen. The results of the radiometer are shown graphically below:



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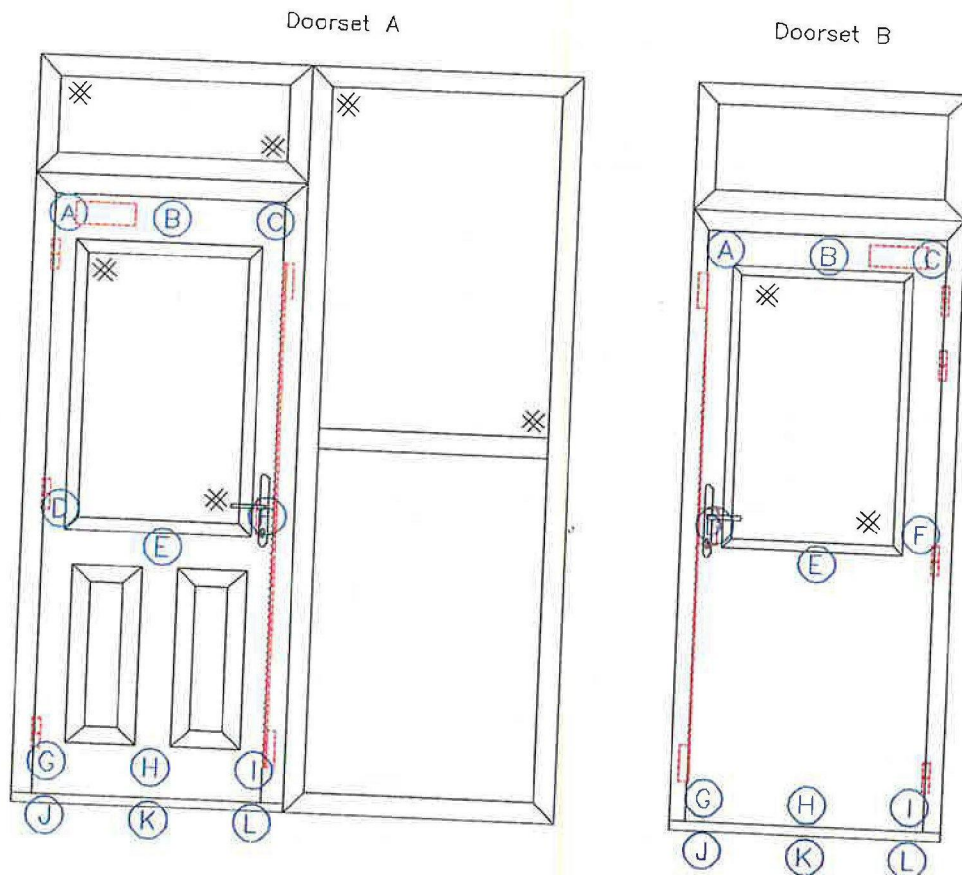
Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

6.3 Door distortion data

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

A negative measurement indicates distortion away from the furnace.

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



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

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	1	5	14	1	2	8	2	3	5	0	-1	-1
20	5	8	22	1	-3	3	6	6	10	-1	-2	-3
30	4	14	31	6	0	12	8	7	13	-3	-4	-5

Doorset B - leaf (hung on the right and opening in towards the furnace)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	4	1	0	4	0	0	3	0	-1	0	0	0
20	7	3	3	5	1	1	5	3	4	-1	-1	-1
30	10	5	7	5	5	4	5	3	7	-2	-1	-1

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Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

6.4 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	
02.40	Both doorsets, the glazing is cracking.
03.00	Both doorsets, there is smoke issuing from the over panel.
04.00	A, the glazing bead is melting.
05.00	A, there is smoke issuing from the side panel.
05.40	Both doorsets, the exposed face glazing has fallen away.
06.00	B, there is discolouration to the top half of the closing edge.
07.00	A, there is smoke issuing from the top closing and hanging corners.
08.00	Both doorsets, the glazing panels are further cracking.
09.00	A, there is an increase in smoke issuing from the over panel and the bottom of the glazing on the side panel.
10.07	A, there is discolouration at the top closing and hanging corners and the frame of the over panel.
11.20	A, there is smoke issuing from the top left corner of the bottom panel of the side screen.
12.20	A, there is smoke issuing across the head.
14.00	A, the bottom panel of the side panels is blistering.
17.00	B, there is smoke issuing from between the over panel and door frame head.
18.50	A, the graphite at the top of the over panel is falling away.
22.00	B, the frame head is slumping.
23.00	A, the seal at the head is dropping from the frame and the head is slumping. B, the seal at the head is dropping.
24.00	A, the frame of the side panel is sagging.
25.00	A, the glazing bead is melting.
29.40	A, the frame of the over panel is falling away.
30.15	A, the frame of the side panel is falling away.
31.05	A, the outer layer of the bottom panel of the side panel is flaking away.

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- 33.39 A, a cotton pad integrity test was performed at the side panel which failed to ignite the cotton pad. No failure.
- 35.00 A, the middle of the bottom panel of the side panel has split.
- 35.53 A, a cotton pad integrity test was performed at the split in the bottom panel of the side panel which failed to ignite the cotton pad. No failure.
- 36.50 A, there is continuous flaming at the bottom of the over panel, thereby constituting **integrity failure**.
- 38.52 A, a cotton pad integrity test was performed at the side panel which failed to ignite the cotton pad. No failure.
- 42.50 B, there is continuous flaming at the over panel, thereby constituting **integrity failure**.
- Test terminated

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6.5 Times to failure

When doorset A was tested in accordance with BS 476: Part 22: 1987, Method 8, determination of fire resistance of uninsulated doors and shutter assemblies, and doorset B was tested in accordance with BS 476: Part 22: 1987, Method 7, determination of fire resistance of partially insulated doorsets and shutter assemblies, the requirements of the standards were satisfied for the following periods:

	Doorset A	Doorset B
Integrity	36 (thirty six) minutes	42 (forty two) minutes
Insulation	0 (zero) minutes*	36 (thirty six) minutes**
Radiation	42 (forty two) minutes***	N/A

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

** In accordance with the note to clause 7.6.1.1 of BS 476: Part 22: 1987, the glazing has not been evaluated for insulated

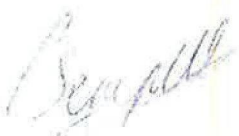

*** No failure of the test criterion at termination of the test

7 Limitations

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

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

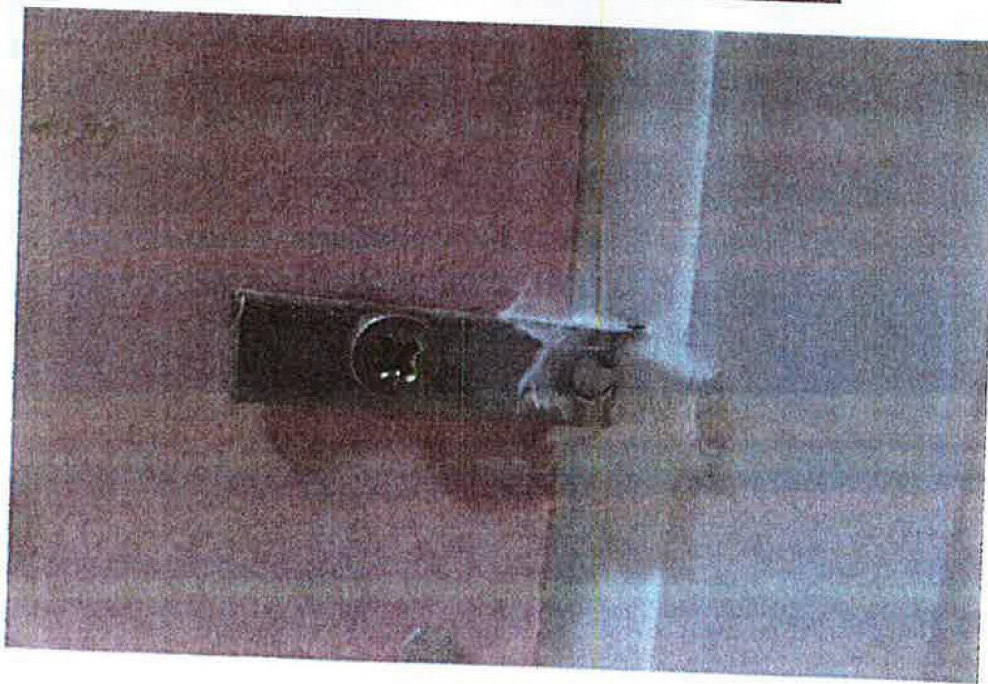
The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. BM TRADA will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

	Written and Checked by:	Authorised by:
Signature:		
Name:	Callum Sempill	Robert Axe
Title:	Technical Officer	Lead Technical Officer
Date of issue:	13 th November 2015	13 th November 2015

The legal validity of this report can only be claimed on presentation of the complete report.

Photographs

Frame fixings to sidescreen and fanlight



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Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

At start of test



At 10 minutes



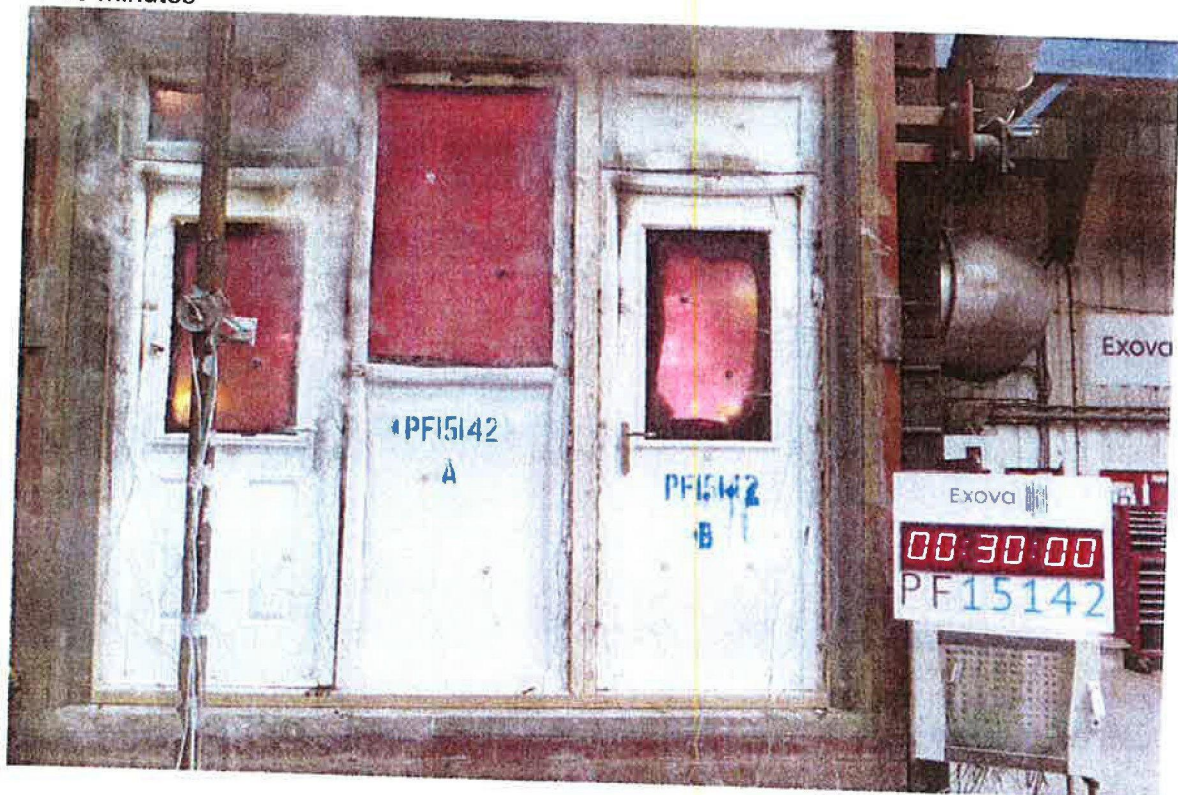
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Ref: BMT/FEP/F15142

At 20 minutes



At 30 minutes



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Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

Exposed face – post test



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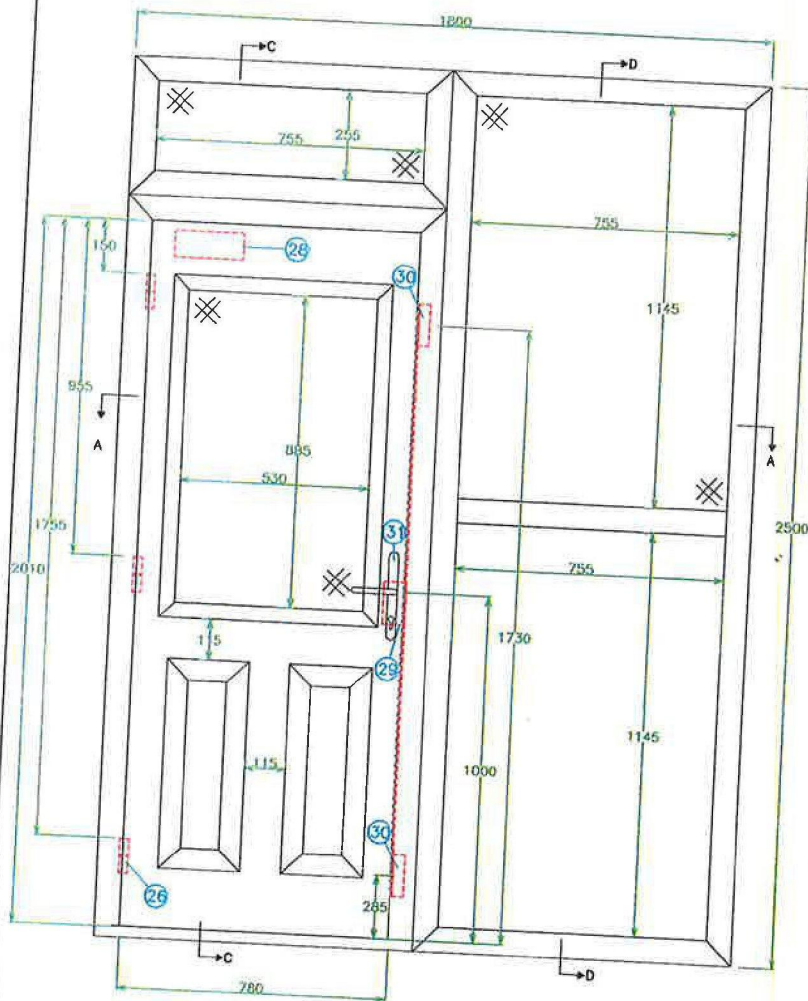
Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

Appendix – figures 1 to 4

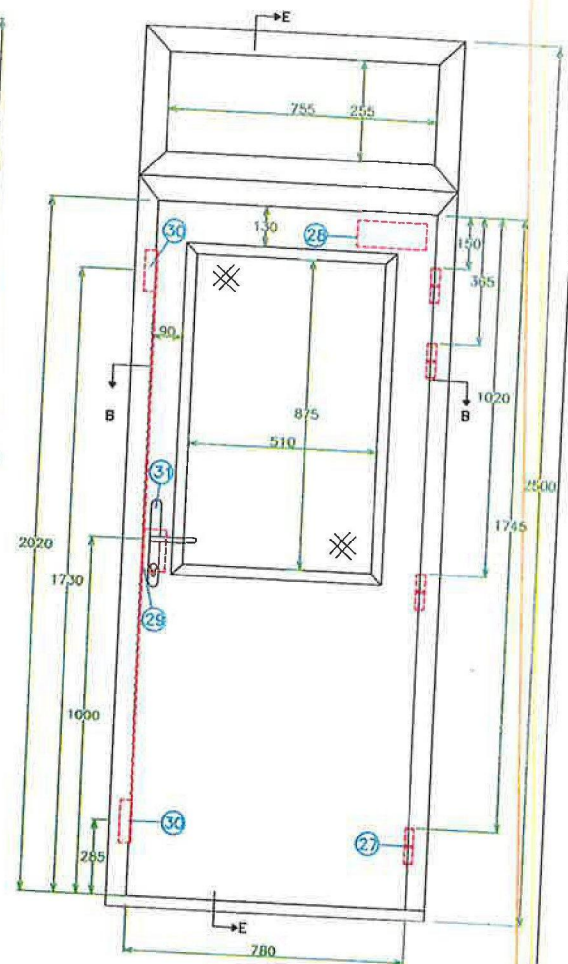
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Report for: Masterdor Ltd
Ref: BMT/FEP/F15142

Doorset A



Doorset B



BM TRADA

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

Tel: [REDACTED] Fax: [REDACTED]

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

Date Drawn
22/10/15

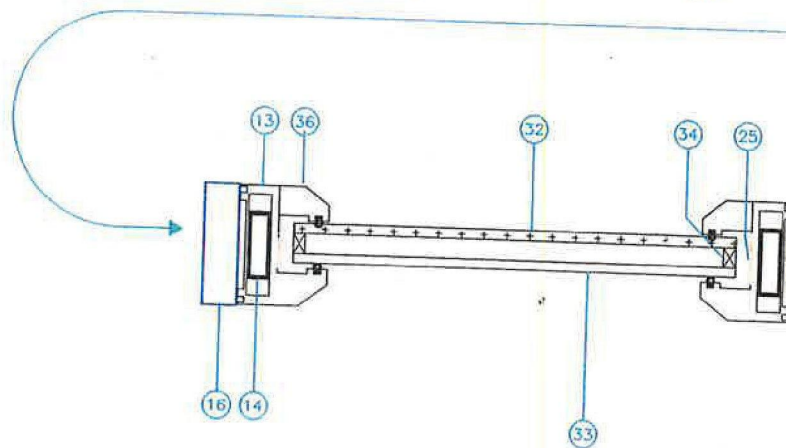
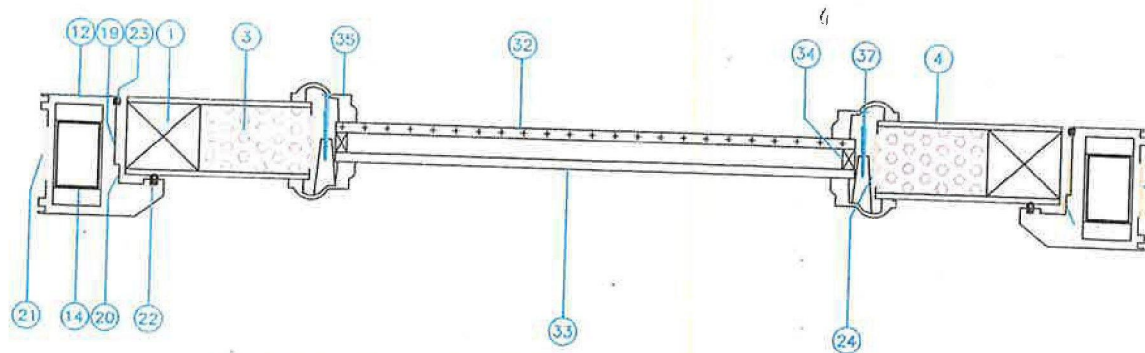
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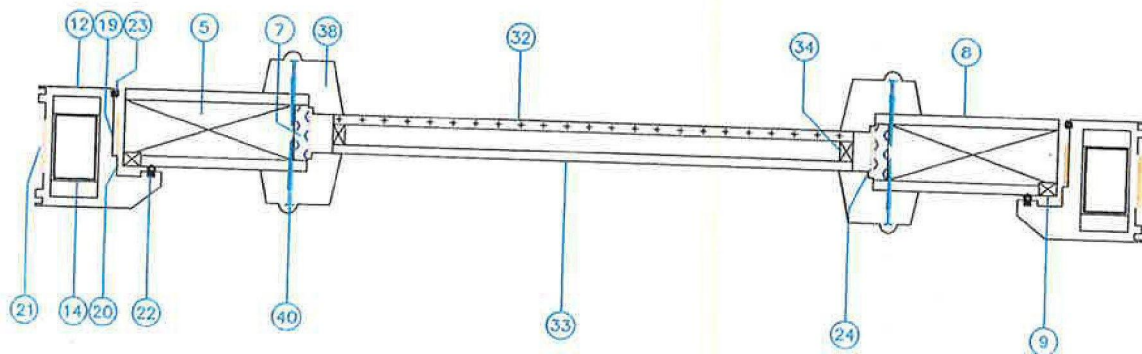
Project No.
BMT/FEP/F15142

Appendix

Section A-A



Section B-B



BM TRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: [REDACTED] Fax: [REDACTED]

Title

Horizontal cross-sections

(All dimensions in mm)

Date Drawn

22/10/15

Drawn By

ARD

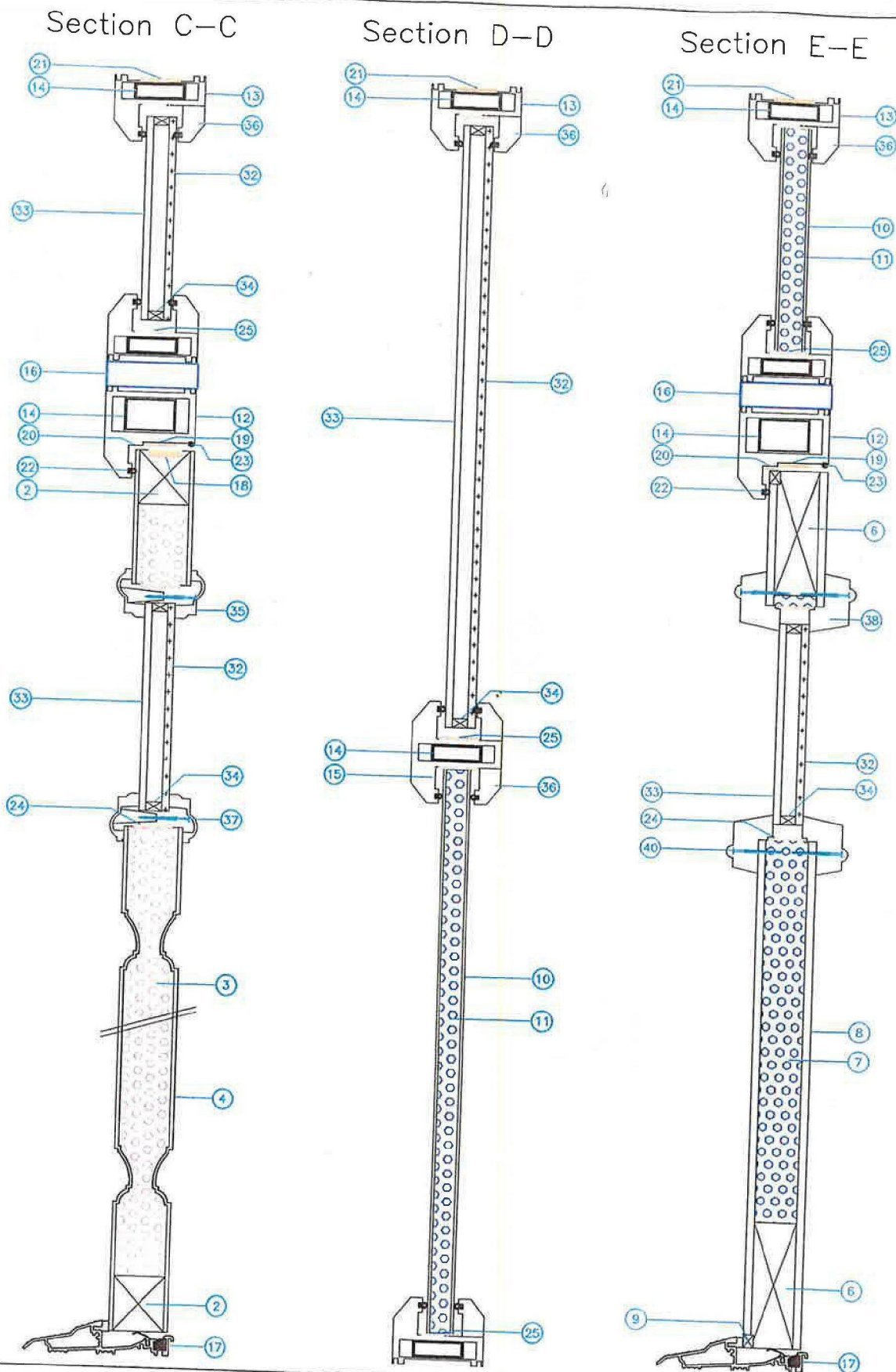
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Project No.

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Appendix



BM TRADA

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Title

Vertical cross-sections
(All dimensions in mm)

Date Drawn

22/10/15

Drawn By

ARD

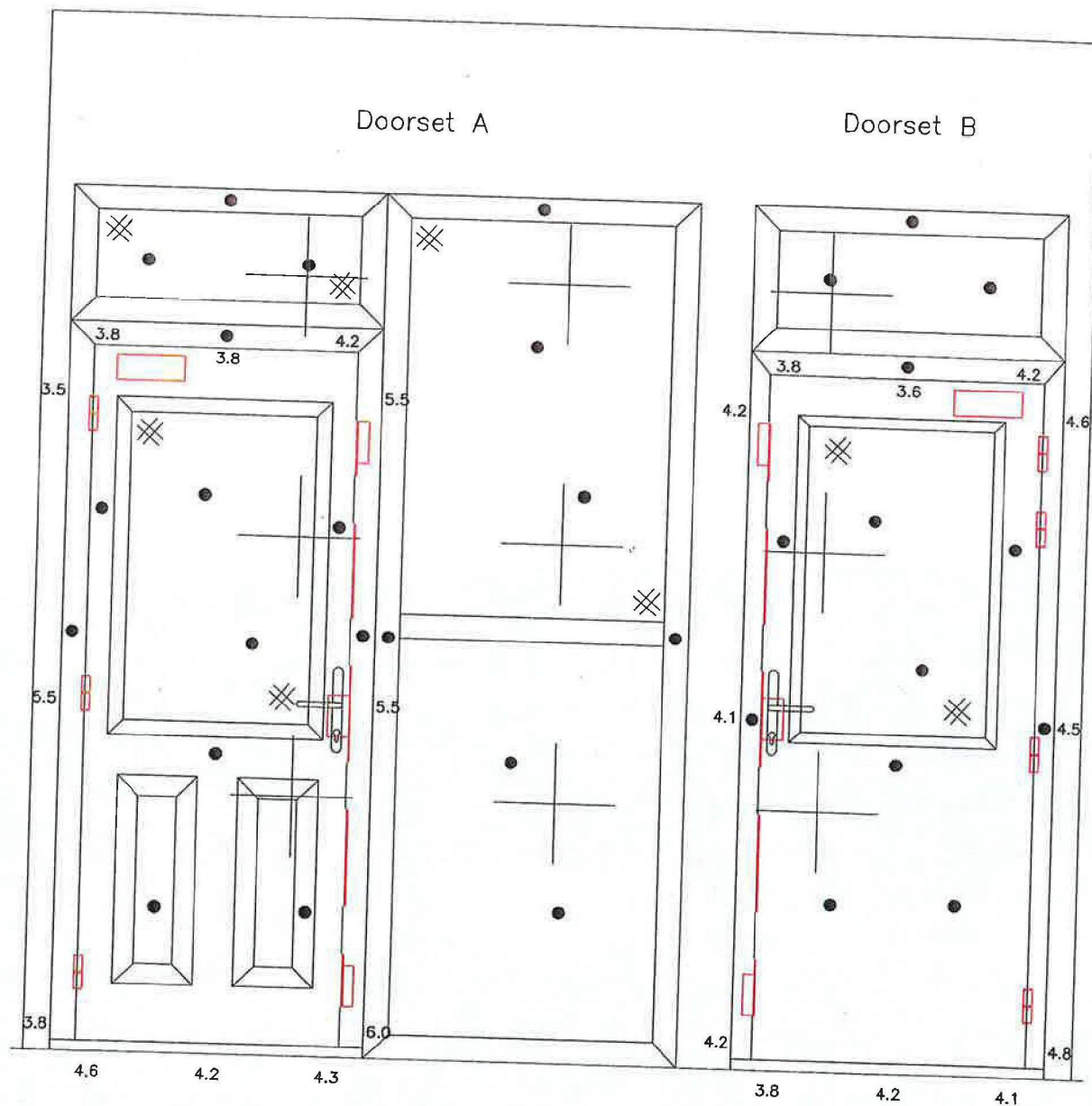
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Project No.

BMT/FEP/F15142

Appendix



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Title

Thermocouple positions and
leaf/frame gaps
(All dimensions in mm)

Date Drawn

22/10/15

Drawn By

ARD

Scale

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Project No.

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Appendix

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INTERNATIONAL FIRE
CONSULTANTS LIMITED

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IFC FIELD OF APPLICATION REPORT

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

Fire Resistance Standard: BS476: Part 22: 1987

IFC Report PAR/13981/01 Revision A

Prepared on behalf of:

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

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ISSUE AND AMENDMENT RECORD

Rev	Date	Author	Review	Section	Amendments
-	March 2014	PP	DC		-
Revision A Draft	September 2017	WL/RA	DC	Various	Update to product name. Incorporation of new test evidence
Revision A	October 2017	WL/RA	DC	Various	Update to product name. Incorporation of new test evidence

Field of Application of FD30 Capstone, Nanya and Masterdor Composite Door Leaves Installed in Sheerframe Composite 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 Capstone, Nanya and Masterdor Blade composite door leaves installed in Sheerframe 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; '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 Leaf Configuration

The following door leaf 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	Figure PAR/13981/01A:C01 in Appendix C

Field of Application of FD30 Capstone, Nanya and Masterdor Composite Door Leaves Installed in Sheerframe 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	Figure PAR/13981/01A:C02 in Appendix C

Masterdor Blade

Configuration	Envelope of Approved Leaf Size
 <ul style="list-style-type: none">• Latched• Single Acting• Single Door	Figure PAR/13981/01A:C03 in Appendix C

There is no restriction with respect to the installation of the doors in terms of orientation relative to the fire attack side. However, specific rules apply where glazing is installed as part of the door assembly; see Section 3.5.1.

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.

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Capstone

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 3.5).

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>
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.

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Nanya

The door leaf can be flush, or can include 'mock' raised and fielded panels. The panel design must include minimum 100mm margins to the vertical leaf edges, head and vertically between panels, minimum 150mm horizontally between panels and minimum 200mm bottom margin. The panel design must include an effective mid-rail and so can include 4, 5 or 6 panels.

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		20 – 30mm wide x 40mm thick	
Rails	Inner	Mixed timber lamels	70mm wide x 40mm thick	490kg/m ³ <i>Note 2</i>
	Outer		20 – 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
Adhesives and jointing methods		As tested	–	–
Minimum leaf thickness		–	44mm overall, but at fielded areas, 15mm thick	–
Optional additional decorative finishes		Timber veneer, decorative plastic based laminate, PVC or paint	Maximum 2mm thick	–

Note 2 Nominal stated density.

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Masterdor Blade

Door leaves can be fully flush or include one or two glazed apertures, full parameters of which are included in Section 3.5, herein.

Component		Species	Dimensions	Minimum Density
Stiles		Profiled Sapele	95mm wide x 32mm thick	640kg/m ³ <i>Note 3</i>
Rails		Profiled Sapele	95mm wide x 32mm thick	640kg/m ³ <i>Note 3</i>
Core		Corex calcium silicate	32mm thick	320kg/m ³ <i>Note 3</i>
Facings		MDF	6mm thick	700kg/m ³ <i>Note 3</i>
Timber insert	Fitted in all edges of the leaf on unexposed face	Sapele	10mm wide x 8mm deep	640kg/m ³ <i>Note 3</i>
Adhesive	Facings	D4 PVA	—	—

Note 3 Nominal stated density.

3.4 Frames

3.4.1 Door frames

Composite frames, to either of the specifications given, below, may be used as the perimeter framing for all door assemblies 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
Sheerframe SK77950 and S119	Extruded PVC section reinforced with a 30mm x 35mm x 1.5mm steel box section	52mm	70mm	23mm	20mm

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Product References	Product Description	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth	Minimum Stop Height
Sheerframe 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 (reference Sheerframe SK70131) including a 30 x 2.5mm graphite-based intumescent seal (e.g. Norsound NOR 940 or STS ST30) can be included at the perimeter of both of the Sheerframe frame profiles outlined above.

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

Threshold : The following thresholds can be included within the assembly;

- 75mm wide x 25mm high extruded aluminium Masterguard 25 threshold
- 75mm wide x 28mm high extruded aluminium Masterguard 51 low mobility threshold
- 115mm wide x 25mm high extruded aluminium Exitex MDS threshold

The approved frame profiles are shown on **Figure PAR/13981/01A:A05** in Appendix A.

3.4.2 Sidelight & Overpanel frames

Composite frames, to the specifications given, below, may be used as the framing for sidelight and/or overpanel assemblies in the range of approved sizes and configurations outlined in Section 3.9, utilising the intumescent seal specifications outlined in Appendix B.

Location	Product References	Product Description	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth	Minimum Stop Height
Frame Perimeter	Sheerframe CS8802 and SK5128	Extruded PVC section reinforced with a 30mm x 30mm x 1.5mm steel box section	49mm	70mm	15mm	24mm

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Location	Product References	Product Description	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth	Minimum Stop Height
Intermediate transom	Sheerframe CS8803 and S128	Extruded PVC section reinforced with a 15mm x 30mm x 1.5mm steel box section	28mm	70mm	15mm	24mm

Coupler fitted between door frames and sidelight / overpanel frames

: Where sidelights or overpanels butt up against the door frame, the frame profiles must be jointed utilising Sheerframe A204 profiled aluminium couplers and Sheerframe SK70981 aluminium coupler cover trim.

Drainage Slots

: Where sidelights and/or overpanels are incorporated into the door assembly, drainage slots may be installed into the frame. Drainage slots are made up of pairs of holes, in the outer chamber of the bottom frame member. One hole is located in the head of the outer chamber and the other in the exposed face of the outer chamber. Slots are 5mm wide x 30mm long, and are staggered at a minimum distance of 50mm apart.

The approved frame profiles are shown on **Figure PAR/13981/01A:A05** in Appendix A.

3.5 Glazed Apertures within leaves

Glazed apertures can be included in Capstone, Nanya and Masterdor Blade door leaves.

3.5.1 Glass Types

The following glass type is approved for use in the 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 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 double glazed unit must be fitted with the Pyroshield glass layer orientated to the non-fire attack face.

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3.5.2 Bead Profiles, Glass Retention and Installation

ODL Tri-sys Glazing Cassette - Capstone and Nanya leaves only

The double glazed unit is retained in the aperture by means of two part steel retaining clips and an ODL Tri-sys 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.

Nanya Glazing Cassette - Nanya leaves only - two glazed 'twin top' apertures only

Each double glazed unit is retained in the aperture by means of two part steel retaining clips and the Nanya 2 part 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 100mm from the top corner, along the vertical edges and at the centre of the bottom edge.

Masterdor Glazing cassette - Masterdor leaves only

The double glazed unit is retained in the aperture by means of the 2 part Masterdor timber glazing cassette. The cassette is constructed from minimum 640Kg/m³ hardwood. The overall size of each part is 45mm wide x 24mm deep and each are fixed to the leaf with minimum 38mm long steel screws fitted at maximum 60mm from the corners and at maximum 120mm centres.

The approved bead size and profiles, intumescent material options and relevant fixing detail for all bead profiles above, are shown on **Figures PAR/13981/01A:A01 to A04** 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 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

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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

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 door assemblies 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 door assemblies, when fitted in the proposed arrangements.

3.8 Hardware

Some of the various items of hardware to be used with the proposed door assemblies 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 door assemblies of the proposed type.

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

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Overpanel and Side Lights

Door assemblies 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 door assembly 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;

- 28mm thick double glazed unit including 7mm thick Pyroshield 2 glass on the unexposed/external side of the door, a 14mm 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. Steel angle sections 1.9mm thick x 50mm long x 15mm wide x 15mm high are fitted centrally to each edge of the glazing.

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

- 25mm thick Corex calcium silicate board (density 320kg/m³) complete with 1.5mm thick UPVC facings. Steel angle sections 1.9mm thick x 50mm long x 15mm wide x 15mm high are fitted centrally to each edge of the panel.

The approved bead size and profile, and relevant fixing details, shown with glazing, are shown on **Figure PAR/13981/01A:A05** 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 x associated width	-	400mm x 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 aperture height x associated maximum width	-	1785mm x 400mm
Maximum aperture width x associated maximum height	-	755mm x 1145mm

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.

An alternative fixing method is acceptable whereby a side screen or overpanel is fitted to the supporting construction. A 15mm wide profiled steel bracket (reference SW7050) is used. The bracket overlaps the supporting constructions exposed face and runs behind the framing member of the side screen or overpanel. This is fixed back to the frame using 40mm long steel screws and to the supporting construction using 70mm steel screws. These are to be fitted at maximum centres of 450mm.

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 door assembly openings. If fitted into timber or steel stud partitions, the method of forming the door assembly aperture must be as tested by the partition and/or door assembly manufacturer.

Note 4 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 door assemblies in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and door assemblies 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 composite frames should be as tested, 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 tests referenced herein utilised a mineral fibre to fill the void, 5-10mm wide, of which was capped on both faces with intumescent acrylic. The intumescent acrylic was to a depth of 20-30mm.

The gap between the door and the frame should be 2-6mm. 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).

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The door assembly 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 Capstone, Nanya and Masterdor composite door leaves installed in Sheerframe composite frames, with optional side lights and overpanels where applicable, 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. DECLARATION BY THE APPLICANT

We the undersigned, confirm that, except for that information declared to International Fire Consultants Ltd previously during the original engineering evaluation process, the components, products, and/or assemblies evaluated within IFC Field of Application Report PAR/13981/01 Revision A have not been altered in any way; and have not subsequently, to our knowledge, been included in a fire test to the standard BS 476: Part 22: 1987 in the form and/or configurations proposed.

We also confirm that we have supplied all information and assurances requested of us, for the purpose of writing this Field of Application Report, and are not aware of any other information that would adversely influence or affect the conclusions of this report.

We agree that if fire test evidence or other information subsequently becomes available, to supply this to IFC in full and seek immediate review of the continuing validity of the original report from IFC. If after review IFC conclude that the original evaluation and report is no longer appropriate, we agree to withdraw it and any references to it from circulation and advise clients and agents accordingly.

Signature:

Position:

Company:

Masterdor Ltd

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6. 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 door assemblies 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.

This report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available, IFC reserves the right to withdraw the report unconditionally but not retrospectively.

Where the constructional information in this report is taken from details provided to International Fire Consultants (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.

The analysis and conclusions within this report are based upon the likely fire resisting performance of a complete door assembly that is manufactured and installed in accordance with this document, and offered for fire resistance testing in 'perfect' condition. In practice, management procedures must be in place in any building where the door assemblies are installed, to ensure that no parts of the assembly are damaged or faulty. Further, the doors must open and close without the use of undue force. The edge gaps/alignment of door leaves must be in accordance with the tolerances defined, herein, when the doors are closed. Any such shortfalls in respect to the condition of the assemblies will invalidate the approval by IFC, and may seriously affect the ability of the assemblies to provide the required level of fire resistance performance. Determination of what constitutes wear or damage, and any corrective actions in order to return assemblies to the required condition, should only be carried out following consultation with the manufacturer and IFC.

This report applies to fire door assemblies that are evaluated to BS476: Part 22: 1987; which is an applicable test method currently referenced within guidance to Building Regulations in the United Kingdom, and in building codes in some other countries. However, IFC have a duty of care to advise that introduction of CE Marking may become compulsory for fire doorsets marketed in the EU, during the validity period of this report; in which case, users should contact IFC for further details/advice.

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

IFC Field of Application Report
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Where the assessed constructions have not been subject to an on-site audit by International Fire Consultants Ltd, 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. Designers, manufacturers and installers are reminded of their responsibilities under the CDM Regulations; but particularly with regard to installation and maintenance of heavy or inaccessible items.

This assessment considers the fire resistance performance of the door assemblies when tested with the leaves in the closed position, within the frame reveal; either retained by the latch, or self-closing device, or locked shut, as applicable. The door assemblies will only provide the assessed fire performance when in a similar configuration; and it is the responsibility of the building occupants/owner to ensure that this is the case.

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 FD30 Capstone, Nanya and Masterdor
Composite Door Leaves Installed in Sheerframe Composite
Frames, with Optional Side Lights and Overpanels

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7. 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 October 2018 should confirm its ongoing validity.

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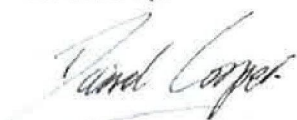
Will Lightfoot BEng (Hons) AIFireE
Fire Safety Engineer
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and:



Rob Axe
Senior Fire Safety Engineer
International Fire Consultants Ltd. (IFC)

Checked by:



David Cooper BEng (Hons) AIMMM AIFireE
Fire Safety Engineering Manager
International Fire Consultants Ltd. (IFC)

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

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APPENDIX A

Frame Profile Sections and Glazing Details

Figures PAR/13981/01A:A01 to A05

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

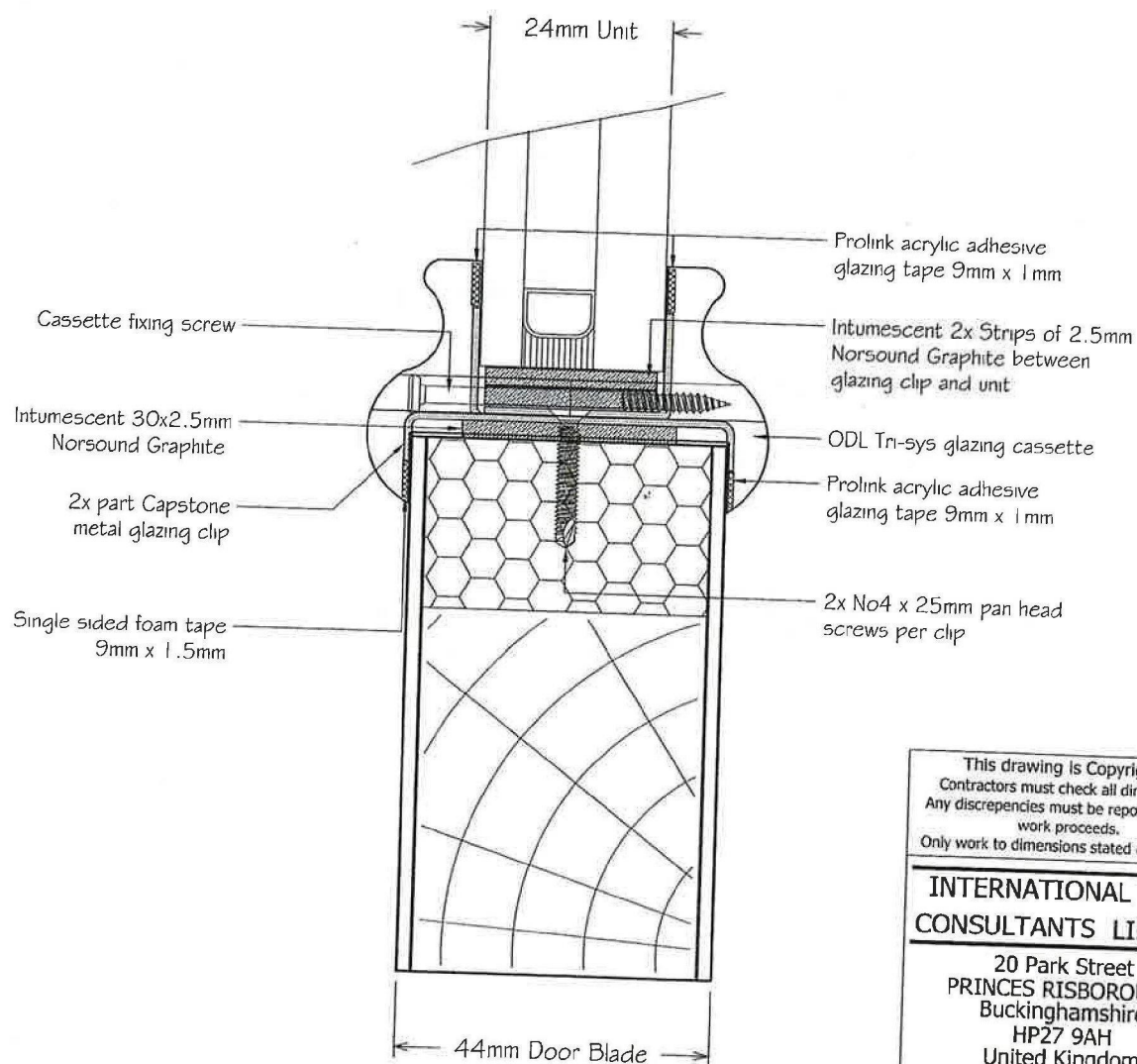
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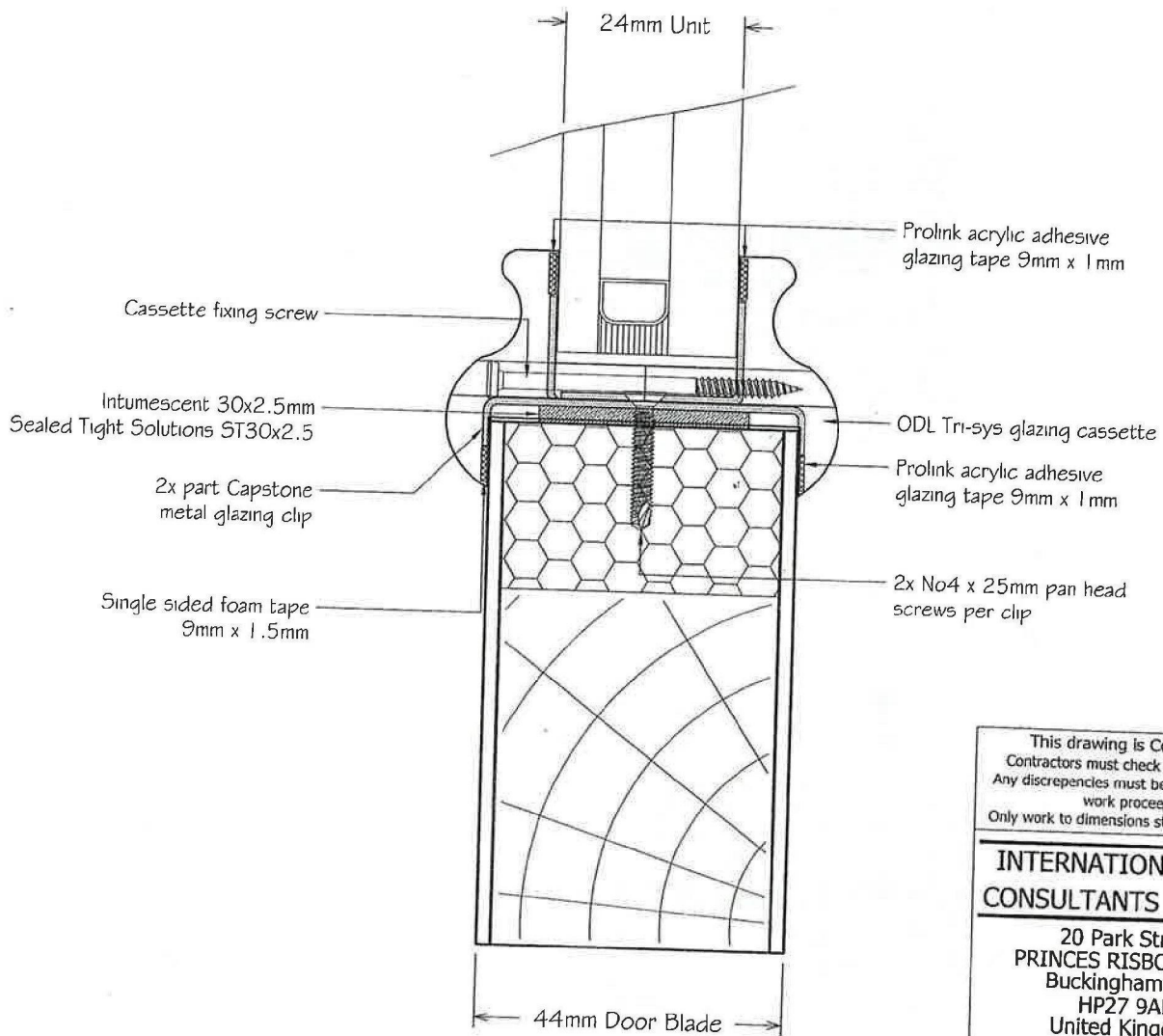
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PAR/13981/01 Revision A
Masterdor Ltd
FD30 Capstone, Nanya & Masterdor Blade
Composite Door Leaves Installed in
Sheerframe Composite Frames,
with Optional Side Lights and Overpanels

Glazing Detail
ODL - Option 1A

Job number: 17342

Drawn by: CSP	Checked by: DJC
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Field of Application Report

PAR/13981/01 Revision A

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FD30 Capstone, Nanya & Masterdor Blade
Composite Door Leaves Installed in
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with Optional Side Lights and Overpanels

Glazing Detail
ODL - Option 1B

Job number: 17342

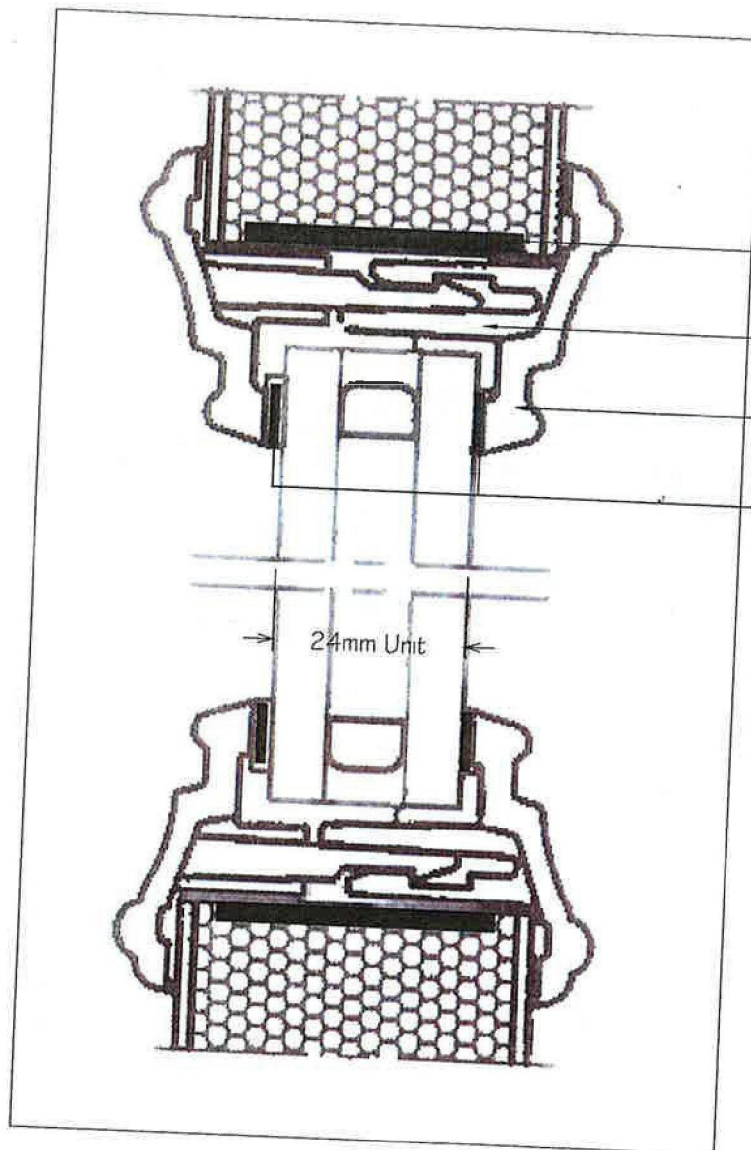
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Drawn: Aug 2017

PAR/13981/01A:AO2



- Intumescent 30 x 2.5mm
Sealed Tight Solutions
ST30x2.5
- Glazing clips fitted but omitted
from drawing for clarity
- Nanya 2 part snap fit
glazing cassette
- Intumescent 6mm bead
Sealed Tight Solutions
ST Mastic

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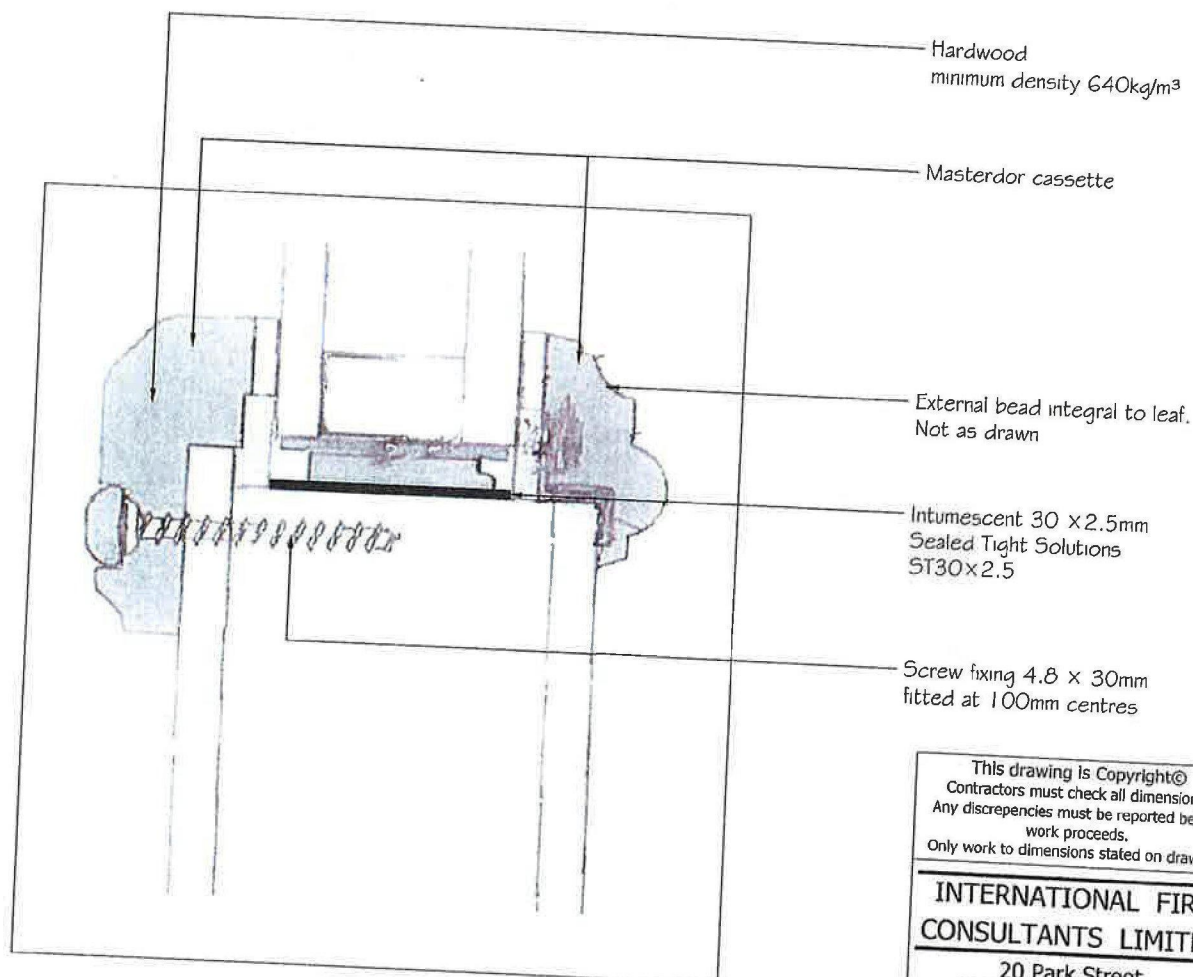
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Glazing Detail
Option 2 - Nanya

Job number: 17342

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FD30 Capstone, Nanya & Masterdor Blade
Composite Door Leaves Installed in
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Glazing Detail
Option 3 - Masterdor Cassette

Job number: 17342

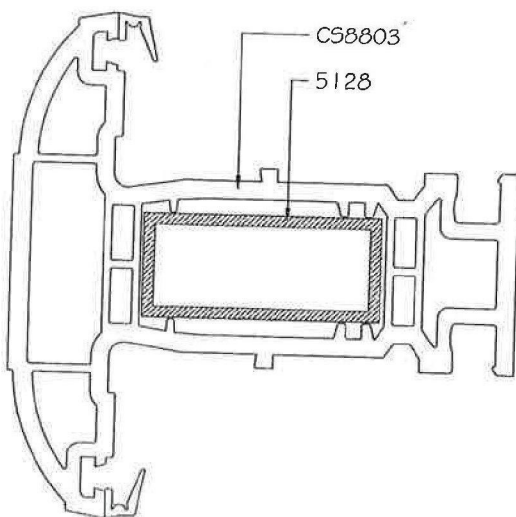
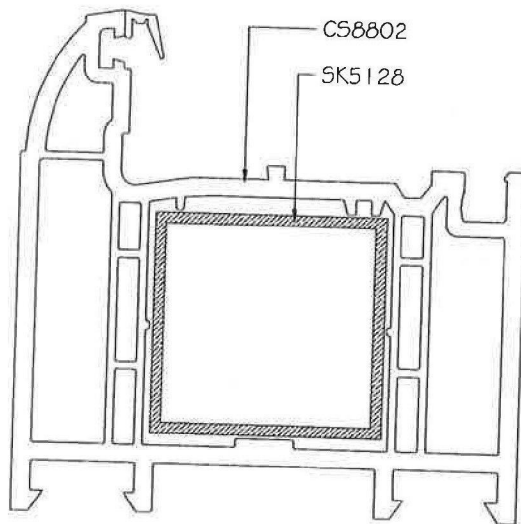
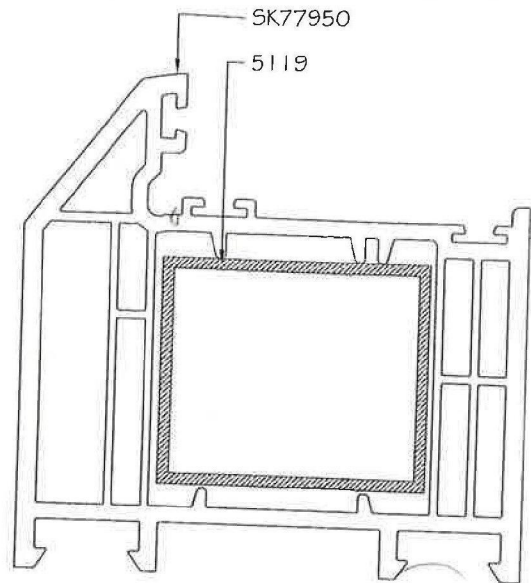
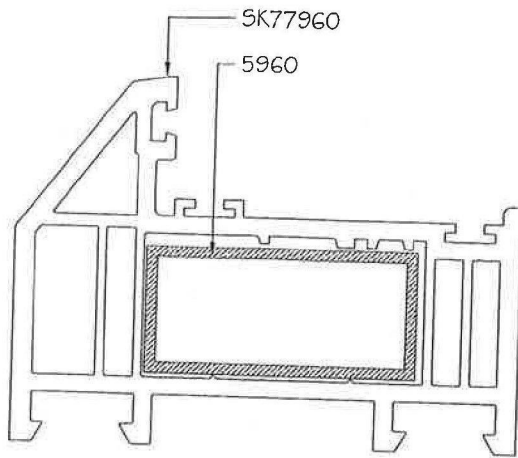
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FD30 Capstone, Nanya & Masterdor Blade
Composite Door Leaves installed in
Sheerframe Composite Frames,
with Optional Side Lights and Overpanels

Profile Details

Job number: 17342

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PAR/13981/01A:A05

APPENDIX B

Assessed Intumescent Seal Specifications

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

Prepared for: Masterdor Ltd

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PAR/13981/01 Revision A

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Assessed Intumescent Seal Specifications

Location		Size and Position	
		Norsound option	Sealed Tight Solutions option
Stiles/ jambs	Door frame reveal	1no 25 x 2.5mm graphite-based seal Norsound NOR 930	1no 25 x 2.5mm (ST25 x 2.5) fitted into main recess and 1no 10 x 2.5mm (ST10 x 2.5) fitted up against the upstand of the stop
	Back of door frame	1no 30 x 2.5mm graphite-based seal Norsound NOR 940	1no 30 x 2.5mm (ST30 x 2.5)
	Leaf edge	-	-
Head	Door frame reveal	1no 25 x 2.5mm graphite-based seal Norsound NOR 930	1no 25 x 2.5mm (ST25 x 2.5) fitted into main recess and 1no 10 x 2.5mm (ST10 x 2.5) fitted up against the upstand of the stop
	Back of door frame	1no 30 x 2.5mm graphite-based seal Norsound NOR 940	1no 30 x 2.5mm (ST30 x 2.5)
	Leaf edge	-	2No. 25 x 2.5mm (ST25 x 2.5) Fitted one on top of the other
Side light and overpanel framing	Frame reveal	1no 25 x 2.5mm graphite-based seal Norsound NOR 930	1no 30 x 2.5mm (ST30 x 2.5mm)
	Back of frame	1no 30 x 2.5mm graphite-based seal Norsound NOR 940	1no 30 x 2.5mm (ST30 x 2.5mm)

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

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MET00040107/89
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APPENDIX C

Assessed Leaf Size Envelopes

Figures PAR/13981/01A:C01 to C03

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Composite Door Leaves Installed in Sheerframe Composite
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	A	B
Width	753	981
Height	2421	1963

LEAF SIZE ENVELOPE POINTS

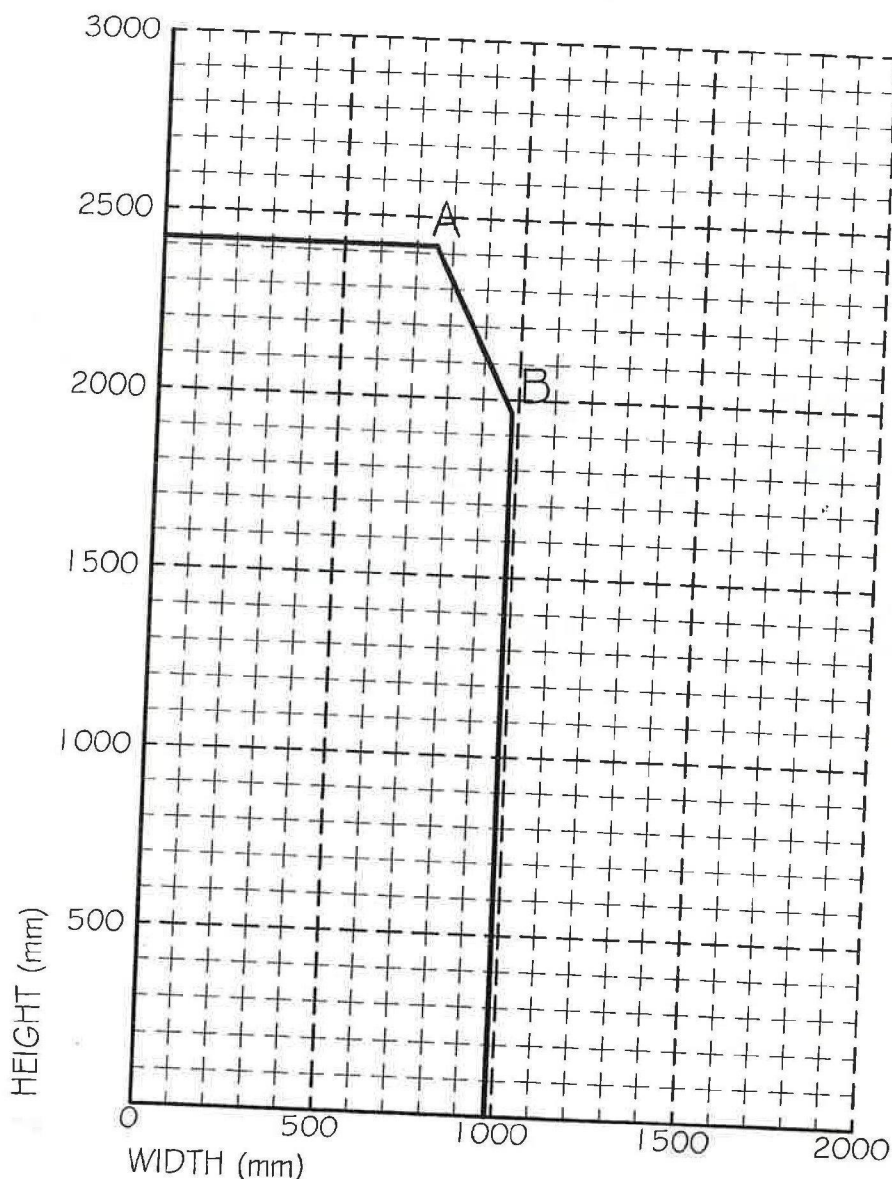
Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF

CAPSTONE⁶

REQUIRED INTEGRITY : 30 Minutes



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Composite Door Leaves Installed in
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Envelope of Approved
Door Leaf Sizes
LSASD
Capstone
In Composite Frames

Job number: 17342

Drawn by: C5P Checked by: DJC
Not To Scale Drawn: Aug 2017

PAR/13981/01A: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.

	A	B
Width	679	916
Height	2377	1903

LEAF SIZE ENVELOPE POINTS

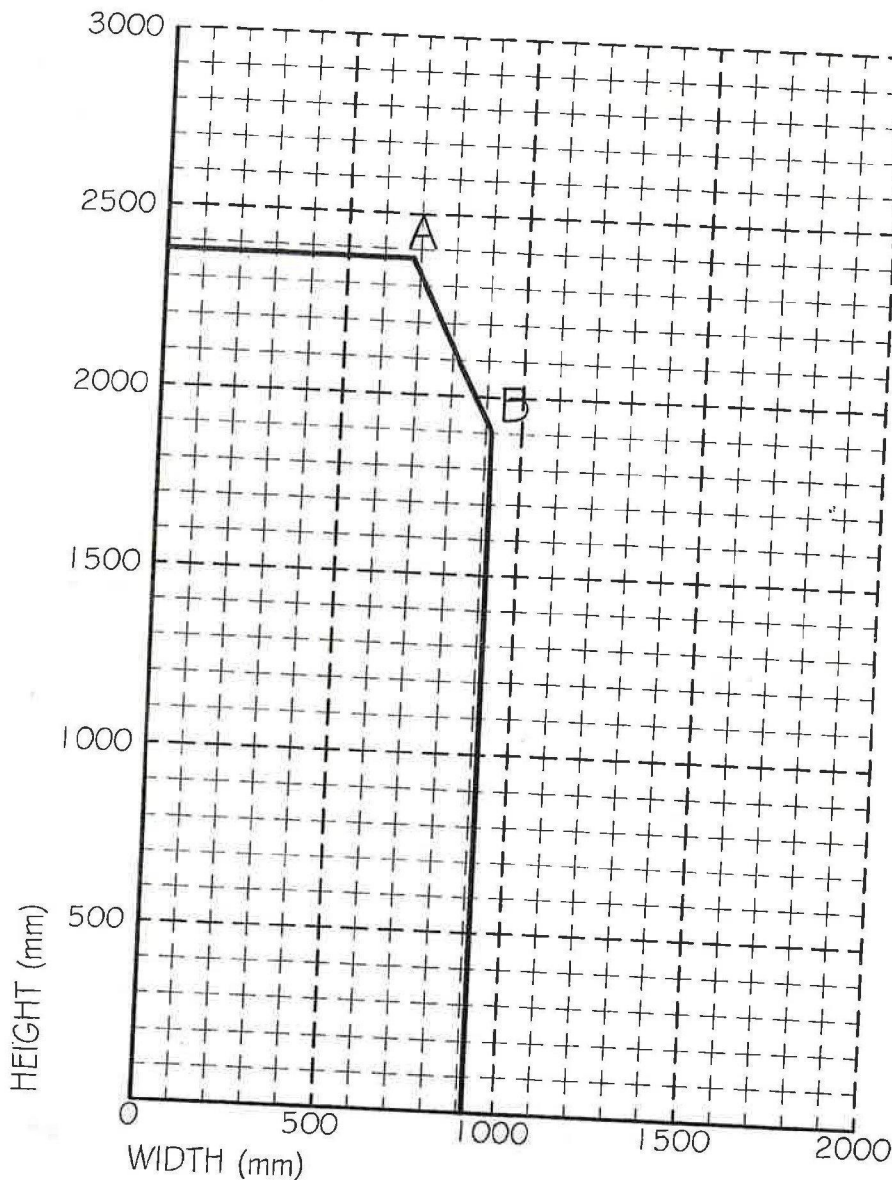
Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF

NANYA

REQUIRED INTEGRITY : 30 Minutes



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Composite Door Leaves Installed in
Sheerframe Composite Frames,
with Optional Side Lights and Overpanels

Envelope of Approved
Door Leaf Sizes
LSASD
Nanya
In Composite Frames

Job number: 17342

Drawn by: CSP

Checked by: DJC

Not To Scale

Drawn: Aug 2017

PAR/13981/01A:CO2

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.

	A	B
Width	708	952
Height	2478	1989

LEAF SIZE ENVELOPE POINTS

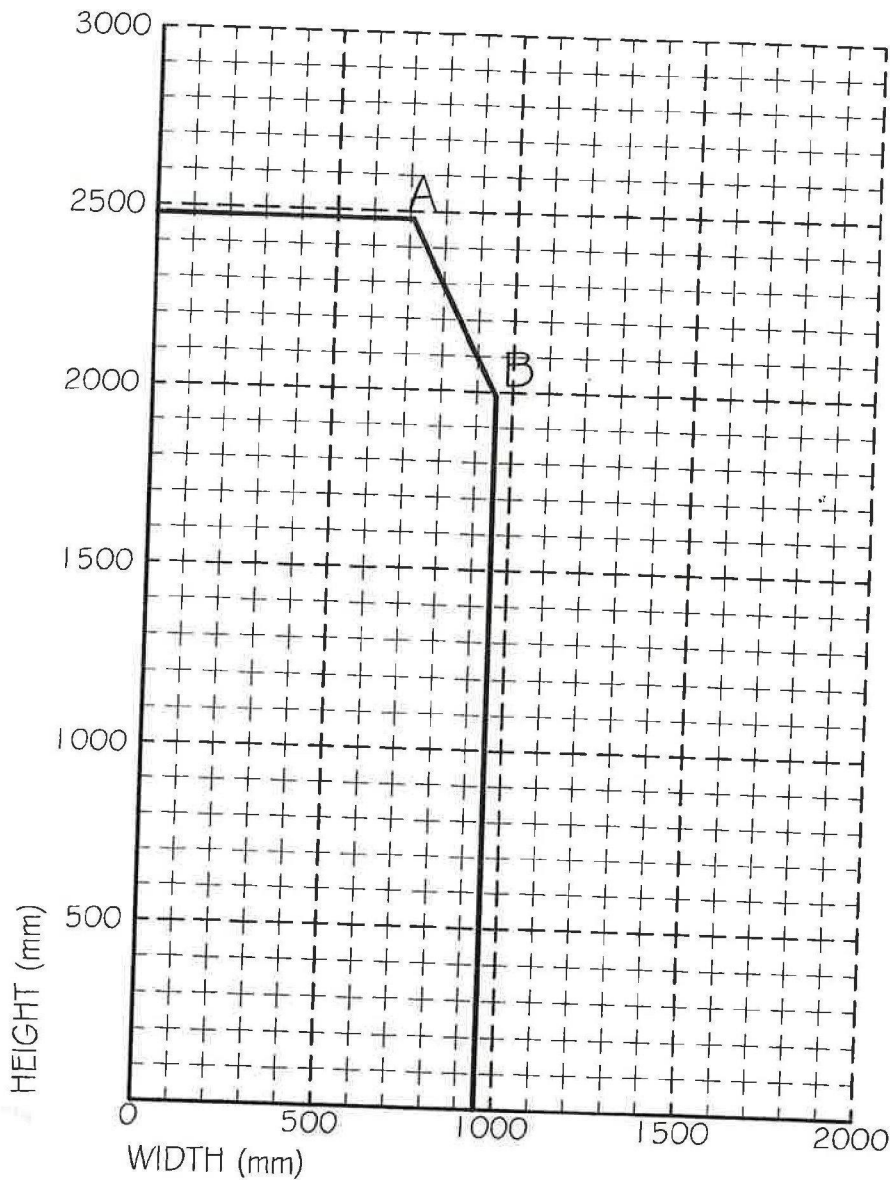
Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF

MASTERDOR BLADE

REQUIRED INTEGRITY : 30 Minutes



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Sheerframe Composite Frames,
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Envelope of Approved
Door Leaf Sizes
LSAD
Masterdor Blade
In Composite Frames

Job number: 17342

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PAR/13981/01A:CO3

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

D.1 Hinges

The doors assemblies have been tested utilising the following steel butt hinges;

- Masterdor Type HNG1333
- Norsound NOR 330
- SEA butt type hinge (100mm x 40mm blade size)

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 : 3no per leaf.
number

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 and STS graphite sheet).

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.

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

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D.2 Mortice Latches/Locks

The assessed door assemblies 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 door assemblies with all of the multi-point locks engaged when the door is fully closed into the frame reveal.

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 or STS 1mm thick graphite sheet).

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.

Door assemblies have been tested with Rutland TS3204 overhead type closers, and Perko 85R6 and Astra Door Controls 3003 leaf edge mounted 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 door assemblies within the scope of this report.

It is essential that all closers are of the correct power rating for the width and weight of the door assemblies. 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.

Note D1 The installation of such items in a door leaf may compromise its performance as a smoke control door assembly.

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.

APPENDIX E

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
BMT FEP F15142	LSASD	2010 x 780 x 44mm	BS476: Part 22: 1987	36 minutes
	LSASD	2020 x 780 x 44mm		42 minutes
BMT FEP F14114	LSASD	1975 x 916 x 44mm	BS476: Part 22: 1987	35 minutes
		2010 x 840 x 44mm		24 minutes ****
IF12041 AR1	ULSASD	981 x 911 x 44mm	BS476: Part 22: 1987	35 minutes

LSASD = Latched, Single Acting, Single leaf Door assembly
ULSASD = Unlatched, Single Acting, Single leaf Door assembly

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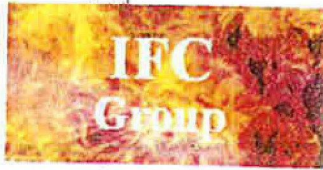
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ASSESSMENT REPORT IFCA/07061

**Field of Application of the fire resistance
of 44mm thick Moralt Lamincore FD30 door
leaves hung in timber door frames**

Prepared on behalf of:

Moralt Tischlerplatten GmbH & Co. KG
Lenggrieser Straße 52
D-83646 Bad Tölz
Germany

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

Ref: X/Assess/2007/07061/#7984

April 2007

International Fire Consultants Ltd

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Tel: [REDACTED] Fax: [REDACTED] e-mail: ifc@intfire.com

Registered No: 2194010 England

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- * 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 door assembly. 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.
- **** Failure occurred at the top closing corner of the leaf where the frame had fallen away.

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

IFC Field of Application Report
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SUMMARY OF FIRE TEST EVIDENCE	

1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC) to define the Field of Application for 44mm thick Moralt Lamincore FD30 door leaves hung in timber door frames, that are required to provide 30 minutes fire resistance performance, when adjudged against BS 476: 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 proven in tests summarised herein.

2. TEST EVIDENCE

The test evidence used to support this Field of Application Report is summarised in Appendix D of this report.

3. SCOPE OF APPROVAL

3.1 Doorset configuration

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

Unlatched, single acting, single leaf doorset	ULSASD
Double acting, single leaf doorset	DASD
Latched, single acting, single leaf doorset	LSASD
Unlatched, single acting, double leaf doorset	ULSADD
Double acting, double leaf doorset	DADD
Latched, single acting, double leaf doorset	LSADD

Note 1 Overpanels above doorsets may be used providing they are fitted above a transom member of similar specification to the door frame.

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.

Leaves in double door assemblies may each be of the same width, up to the maximum width indicated in Appendix C. If leaves are both unlatched/unbolted and of unequal width, the smaller leaf must not be more than 250mm narrower than the larger leaf. This is to reduce the level of differential deflection that may otherwise occur with the varying of leaf widths. If the smaller leaf is bolted, then there is no limit on the ratio of leaf widths, (although the large leaf must still be within the limitations in Appendix C), since the bolts will restrict deflection irrespective of the leaf width. In any case, the width of the small leaf shall not be less than 300mm, since this will affect its vertical stability relative to that of the larger leaf.

3.3 Transomed overpanels

Intumescent seals at the panel/frame interface shall be as defined in Appendix B. Transom members shall be in accordance with Section 3.5, glazing shall be in accordance with Section 3.6 and installation shall be as defined in Section 3.8.

The size of overpanels is limited to the full width of the leaf/leaves contained within the doorset and the following maximum height:

Single leaves:	2000mm high
Double leaves:	1500mm high

In all cases, the overpanel must be a single piece panel across the frame width; i.e. a "double door" overpanel shall not be used above double door leaves. Approval of an overpanel size by IFC does not indicate that such a size can be fabricated. (Check with manufacturer) and will be subject to the ability of the supporting construction providing adequate restraint/support.

3.4 Door leaf and overpanel specification

The Moralt Lamincore FD30 door and overpanel construction comprises a core constructed from spruce ply veneers orientated perpendicular to the leaf faces which have been faced on either side with a hardwood cross-grained veneer. No stiles or rails are incorporated in the door leaf design with all four edges lipped with hardwood. A detailed constructional specification is given below. This is based upon the test evidence detailed in Appendix D, (and is, therefore, limited to the information available from those test reports), but also defines variations and tolerances, where it is considered that these will not adversely affect overall fire resistance.

Component		Species/Type	Dimensions (mm)	Minimum Density (kg/m ³)
Core		Spruce ply veneers	4.6 wide x 40.5 thick	450*
Stiles and rails		None fitted	-	-
Facing		Cross grained hardwood veneer (Ilomba)	1.5-2 thick	500*
Adhesives	Core	Miracol 13F2 (PVAc)	-	-
	Facings	Urea formaldehyde	-	-
	Lippings	Urea formaldehyde	-	-
Lippings – all edges		Hardwood	9 thick	650*

* Stated density

Minimum overall leaf thickness: 43.5mm (excluding any decorative facings)

3.4.1 Leaf facing materials

The primary facing material for this door leaf design is 1.5-2mm thick cross-grained hardwood veneer (stated density 500kg/m³). Facings which are less than 4mm thick can be considered as not having a significant structural effect on the intended fire resistance performance of the leaf, and therefore, alternative facings can be considered. The following is a list of alternative facings that could be used in lieu of the tested hardwood veneer:

- Maximum 3.8mm thick plywood (minimum density 550kg/m³);
- Maximum 3.8mm thick MDF (minimum density 750kg/m³);
- Maximum 3.8mm thick chipboard (minimum density 700kg/m³).

Regardless of the facing material used, the minimum thickness of the door leaf must remain at 43.5mm. Adjustments may be made to the core thickness to account for any thickness variations in alternative facing materials. The adhesive used for adhering any type of facing material must remain as tested.

3.4.2 Decorative finishes

The leaves and overpanels may have timber veneers, or decorative plastic based laminates applied (maximum thickness 2mm) to the leaf faces only as they must not wrap around the leaf edges. The leaf must not be reduced in thickness to accommodate the finishes. Paint or varnish may be applied.