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**Title:** Field of Application Report Vistamatic VS Pyro 60 Vision Panel

Fire Resisting Timber Doorset Assemblies

30 and 60 Minutes Fire Resistance

Report No: WF409531

Valid From: 12<sup>th</sup> March 2019 Valid Until: 12<sup>th</sup> March 2024

Prepared for: Vistamatic Ltd 51 – 55 Fowler Road Hainault Industrial Estate Hainault Essex IG6 3XE

# Contents

1	Fore	eward	3	
2	2 Proposal			
3	Tes	st Data	4	
3	8.1	Test report IF13037	4	
З	8.2	Test report IF12021	5	
4	Tec	chnical Specification	6	
4	l.1	General	6	
4	.2	Intended use	6	
4	1.3	Description of Constructions	6	
5	Sco	ope of Application for Vistamatic VS Pyro 60	9	
5	5.1	Proprietary fire resisting doors	9	
5	5.2	Non-proprietary timber based fire resisting doors	9	
5	5.3	Glass Combinations for 30 and 60 Minutes Integrity Performance	.11	
6	Data	a Sheets	.12	
6	6.1	General	.12	
6	6.2	Falcon Panel Products – Strebord 54	.12	
6	6.3	Halspan Ltd – Optima 60	.12	
6	6.4	Halspan Ltd – Prima 60	.12	
6	6.5	Pacific Rim Wood Ltd – Flamebreak 60	.13	
6	6.6	Blankfort Inc – Blankfort 60 and 60+	.13	
6	6.7	Egger (UK) Ltd – Eurospan 60	.13	
7	Add	ditional Installation Requirements	.14	
8	Cor	nclusion	.14	
9	Dec	claration by the Applicant	.15	
10	Lim	litations	.16	
11	Vali	idity	.17	
۸	Anne and the A. Deufermannes Data			
Ap	vendi		. 10	
Ap				
Ар	Appendix C Revisions			

#### 1 Foreword

This field of application report has been commissioned by Vistamatic Ltd and relates to the Vistamatic VS Pyro 60 vision panel system for 30 and 60 minute fire resisting doorset installations.

This field of application report is for National Application and has been written in accordance with the general principles outlined in BS EN 15725: 2010; *Extended application reports on the fire performance of construction products and building elements*, as appropriate.

This field of application (scope) uses established empirical methods of extrapolation and experience of fire testing similar door assemblies, in order to extend the scope of application by determining the limits for the designs based on the tested constructions and performances obtained. The scope is an evaluation of the potential fire resistance performance, if the variations specified herein were to be tested in accordance with BS 476: Part 22: 1987 and therefore can neither be considered for a CE marking application nor can the conclusion be used to establish a formal classification against EN13501-2.

This field of application has been written using appropriate test evidence generated at a UKAS accredited laboratory to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturers stated door design and is summarised in section 3 and appendix A.

The scope presented in this report relates to the behaviour of the proposed door design variations under the particular conditions of the test; they are not intended to be the sole criterion for considering the potential fire hazard of the door assembly in use.

This field of application has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the Passive Fire Protection Federation (PFPF) guidelines to undertaking assessments. The aim of the PFPF guidelines is to give confidence to end-users that assessments that exist in the UK are of a satisfactory standard to be used for building control and other purposes.

The PFPF guidelines are produced by the UK Fire Test Study Group (FTSG) an association of the major fire testing laboratories in the UK and are published by the PFPF, the representative body for the passive fire protection industry in the UK.

### 2 Proposal

It is proposed to consider the fire resistance performance of the vision panel designs described in the technical specification in section 4 of this report, for 30 and 60 minutes fire resistance, if the doorsets, glazed sidescreens, and fanlights into which they are fitted were to be tested to the requirements of BS 476: Part 22: 1987, *Fire tests on building materials and structures – Part 22: Method for determination of the fire resistance of non-load bearing elements of construction.* 

The field of application defined in this report is based on the fire resistance test evidence for the vision panel design, which is summarised in section 3. Analysis of specific construction details that require assessment are given within this report against the relevant element of construction, as appropriate

### 3 Test Data

The test evidence summarised below has been generated to support the fire resistance performance of the VS vision panel designs that are the subject of this field of application.

#### 3.1 Test report IF13037

The referenced test report, the essential details of which are summarised below, is primary data for the vision panel designs being considered for assessment in this report.

Date of test	4 <sup>th</sup> April 2013
Identification of test body:	Chiltern International Fire Ltd. (Now Warringtonfire Testing and Certification Ltd)
Sponsor:	Vistamatic Ltd
Tested Product:	A single leaf, single acting, timber based, flush door leaf fitted with Vistamatic VS secure vision panels
Summary of test specimen:	A graduated density particleboard core leaf with the vertical edges lipped with 6mm thick sapele of nominal density 640kg/m <sup>3</sup> .
	The leaf was 1250mm (h) x 1230mm (w) x 54mm (t) and hung in a sapele hardwood frame using 2No. lift off type steel hinges. No closer or latch was fitted.
	The leaf incorporated two 800mm high x 400mm wide VS vision panels comprising 19mm thick Pyro- EX toughened glass to the exposed face, 6mm Pyro- EX toughened glass to the unexposed face, and 4mm thick annealed glass between the outer glass panes in the top half of the right panel. One panel utilised profiled stainless steel beading, one utilised sapele hardwood beading of nominal density 640kg/m <sup>3</sup> . Both panels were fitted with an actuator lever.
	2No. 15 x 4 Pyroplex Rigid Box seal perimeter intumescents were fitted in the frame reveal of the head and jambs. Hinges were protected with graphite intumescent gaskets. The vision panels were protected with 54 x 2mm Norsound Vision 60 perimeter aperture liners. Sealmaster Fireglaze compound was fitted between the glass and sapele glazing beads on both faces; autostic adhesive was fitted between the glass and the steel glazing beads on both faces. The door was oriented to open in towards the
	furnace of the test.
Test Standard:	Temperature and pressure conditions of BS 476: Parts 20 and 22: 1987
Performance	Integrity: - 65 minutes - timber glazing beads. Integrity: - 72 minutes* - steel glazing beads (*no failure when test terminated at 72 minutes)

#### 3.2 Test report IF12021

The referenced test report, the essential details of which are summarised below, is primary data for the vision panel designs being considered for assessment in this report.

Date of test	3 <sup>rd</sup> April 2012
Identification of test body:	Chiltern International Fire Ltd. (Now Warringtonfire Testing and Certification Ltd.)
Sponsor:	Vistamatic Ltd
Tested Product:	A single leaf, single acting, timber based, flush door leaf fitted with a Vistamatic VS secure vision panels
Summary of test specimen:	A graduated density particleboard core leaf with the vertical edges lipped with 6mm thick sapele of nominal density 640kg/m <sup>3</sup> . The leaf was 1005mm (h) x 928mm (w) x 44mm (t) and hung in a softwood frame using 2No. lift off type steel hinges. No closer or latch was fitted.
	The leaf incorporated a 800mm high x 400mm wide VS vision panels comprising 10mm thick toughened glass to the exposed face, 6mm toughened glass to the unexposed face, and 4mm thick annealed glass between the outer glass panes. The panel utilised sapele hardwood glazing beads of nominal density 640kg/m <sup>3</sup> . The panel was fitted with an obscuror lever to operate the central pane.
	1No. 15 x 4 Lorient Polyproducts Ltd Type 617 perimeter intumescent seal was fitted in the frame reveal of the head and jambs. Hinges were protected with Interdens intumescent gaskets. The vision panels were protected with Norseal intumescent mastic around the perimeter of the glass. 10 x 4 Mann McGowan Pyroglaze 30 intumescent strips were fitted between the glass and sapele glazing beads on both faces.
	The door was oriented to open in towards the furnace of the test.
Test Standard:	Temperature and pressure conditions of BS EN 1634-1:2008
Performance	Integrity: - 44 minutes.

**Note:** Primary test data for the VS vision panels is based on fire resistance performance to both the BS 476 Part 22:1987 and BS EN 1634-1 test standards. However, because the BS 476 Part 22:1987 test standard is less onerous than the BS EN 1634-1 test standard it is the opinion of Warringtonfire that the BS EN test data can be used to support performance of the vision panels for 30 and 60 minutes fire resistance integrity, if they were to be tested in accordance with BS 476 Part 22:1987.

#### 4 Technical Specification

#### 4.1 General

The technical specification for the proposed vision panels is given in the following sections and is based on the test evidence for the panels, summarised in section 3.

#### 4.2 Intended use

The intended use of the proposed vision panels is summarised below:

Incorporation into specified proprietary pedestrian doorset designs including specified frames, door leaves, fanlights and sidelights, as applicable, which are provided to give a fire resisting capability when used for the closing of permanent openings in fire resisting separating elements, which , together with the building hardware and any seals (whether provided for the purpose of fire resistance or smoke control or for other purposes such as draught or acoustics) form the assembly.

#### 4.3 Description of Constructions

#### 4.3.1 General Vistamatic VS Pyro 60

The Vistamatic VS Pyro 60 vision panel comprises a double glazed unit with an additional, movable, centre layer of obscure glass.

The drawing below shows the essential elements of the double glazed unit. The 19mm thick toughened glass must be oriented to the fire risk side of the doorset.



The vision panel is retained within the door leaf or screen element with either timber or steel beads, which must meet the specifications in sections 4.3.2 and 4.3.3 below.

Based on the testing conducted in IF13037 the maximum individual pane size assessed for the VS Pyro 60 vision panels is 0.35m<sup>2</sup>.

# 4.3.2 Timber Beads Design

Timber beads for the VS Pyro 60 vision panel must be as specified in the table below:

Element	Specification
Timber Bead material <sup>2</sup>	Hardwood (min density 640kg/m <sup>3</sup> ) excluding beech ( <i>Fagus sylvatica</i> and related species).
Timber Bead dimensions <sup>2</sup>	25mm high x 13mm deep including an 8mm high x 5mm wide bolection return. The bead must be chamfered to a 45° angle.
Glazing System <sup>4</sup>	4mm thick Sealmaster Fireglaze compound fitted between the glass and bead on both faces
Aperture liner <sup>1</sup>	54 x 2mm thick Vision 60 glazing liner - Norsound Ltd
Bead fixings <sup>3</sup>	50mm long no. 6-8 steel screws or 50mm long x 2mm diameter steel pins fitted at maximum 100mm centres and 50mm from each corner. Fixings must be inserted at 45° to the vertical.
Assembly Brackets (Not shown in diagram below)	6No.1.2mm thick x 52mm wide x 11.2mm high steel glazing clips (brackets). Fitted 174mm from each corner and at 452mm centres, with 2No. M8 x 40mm long steel screws. See appendix B for client diagrams.
Additional information	See section 7

The superscript note references in the table above refer to the drawing below:



Fire risk (exposed) side

# 4.3.3 Steel Beads Design

Timber beads for the VS Pyro 60 vision panel must be as specified in the table below:

Element		Specification		
Bead material		2mm thick stainless steel		
Bead	Exposed Face <sup>4</sup>	54mm high x 2mm thick, fitted around the glazing aperture on the exposed face		
Profile	Unexposed Face <sup>2</sup>	54mm high x 22 mm deep x 2mm thick, fitted around the glazing aperture on the unexposed face		
Glazing System <sup>3</sup>		1mm thick Autostic adhesive fitted between the glass and bead on both faces		
Aperture liner <sup>5</sup>		54 x 2mm thick Vision 60 glazing liner - Norsound Ltd		
Bead fixings <sup>1</sup>		M6 x 40mm long machine security screws fixed from the exposed face to threaded studs welded to the unexposed face beads. Fixings located at maximum 200mm centres and 30mm from each corner.		
Additional information:		See section 7		

The superscript note references in the table above refer to the drawing below:



# 5 Scope of Application for Vistamatic VS Pyro 60

#### 5.1 Proprietary fire resisting doors

It has been proposed to summarise the use of the Vistamatic VS Pyro 60 with the following proprietary fire resisting doorset designs.

This report will only consider the aperture size relevant to each doorset design for use with the Vistamatic VS Pyro 60. For all other details, the full construction requirements in the assessment documentation relevant to the chosen doorset must be referred to.

Manufacturer	Product	Integrity Rating	General Description
Falcon Panel Products	Strebord 54	60	Graduated density particle board
Halanan <sup>®</sup>	Halspan <sup>®</sup> 60 <b>Optima</b>	60	Tri layer particle board
naispair	Halspan <sup>®</sup> 60 <b>Prima</b>	60	Tri layer particle board
Pacific Rim Wood	Flamebreak 60	60	Lamel 3-layer core door with various facing coverings
Blankfort Inc	Blankfort 60 & 60+	60	Lamella core door with various facing coverings
Egger (UK) Ltd	Eurospan	60	Graduated density chipboard

The above designs have been tested and proven to BS 476: Part 22: 1987 and/or BS EN 1634-1. The global assessment documentation relevant to each door type is referenced before the data sheet for each proprietary door type - contained in section 6 below.

#### 5.2 Non-proprietary timber based fire resisting doors

The Vistamatic VS Pyro 60 vision panel has been successfully subjected to testing for 60 minutes fire resistance to the principles of BS 476 Part 20:1987 and BS 476 Part 22:1987 and is therefore approved for use with different types of timber door construction, subject to the provisos contained in this report. In addition to the assessed proprietary door designs above, the Vistamatic VS Pyro 60 is assessed for use with the following timber based generic types of fire resisting doorsets:

- Graduated density chipboard and three layered particleboard door blanks.
- Softwood or hardwood laminated door constructions with tested or assessed cellulosic facings.
- Stile and rail constructions with flax, chipboard or timber based cores.
- Stile and rail constructions with non-combustible sub-facings.

Assessment of these generic design types is subject to the following four provisos:

1. This report will only consider the aperture size relevant to each doorset design for the Vistamatic VS Pyro 60.

- 2. The maximum glazed area assessed for Vistamatic VS Pyro 60 installations within timber based door designs not specifically mentioned in the data sheets in section 5 is 0.32m<sup>2</sup>.
- 3. The door blank must have been previously successfully tested for 60 minutes fire resisting integrity performance with installed glazing at a UKAS accredited laboratory to either BS 476 Part 22:1987 or BS EN 1634-1 or assessed for use with glazing by Warringtonfire. The glazed area stated herein is the maximum that may be installed within any selected blank. If the permitted area within the selected blank's supporting documentation is smaller, then the smaller area must take precedence.
- 4. The door blank must be a minimum of 54mm thick.
- 5. For all other details, the full construction requirements in the relevant door blank manufacturer's test evidence or assessment documentation must be complied with, including the margins specified within the relevant test or global assessment between glazed apertures and leaf edges and between multiple glazed apertures.
- 6. It is the responsibility of the user of this document to ensure the most recent revisions of applicable doorsets are utilised. See section 6.1.

#### 5.3 Glass Combinations for 30 and 60 Minutes Integrity Performance

Based on the integrity performance achieved in test Chilt/IF12021 which utilised 10mm Pyro-Ex on the exposed face, the options below are assessed as acceptable

These applications may only be utilised with 54mm thick door leaves, as specified in section 5, irrespective of the required integrity performance.

	Integrity	Permitted Bead Type	
Glass Thickness Combinations (mm)	Performance (minutes)	<b>Timber</b> (section 4.3.2)	Steel (section 4.3.3)
Option 1: Fire risk from one side 6 thick – non fire risk side 19 thick – fire risk side <sup>1, 2, 3, 5</sup>	60	~	✓
Option 2: Fire risk from one side 10 thick – non fire risk side 19 thick – fire risk side <sup>1, 2, 3, 4, 5, 6, 8</sup>	60	$\checkmark$	~
Option 3: Fire risk from both sides 10 thick – one side 19 thick – opposite side <sup>4, 5, 6, 7, 8</sup>	30	$\checkmark$	$\checkmark$

- 1. For 60 minutes integrity performance the glass combination must have the 19mm glass oriented to the fire risk (exposed) side. The 6mm or 10mm glass elements must NOT be oriented to the fire risk side.
- 2. Where 6mm or 10mm glass is used on the unexposed, non-fire risk side, the vision panel will be uni-directional with respect to a fire risk requiring 60 minutes fire performance integrity. Care must be taken to ensure the unit is installed the correct way round or the fire resistance performance will be compromised.
- 3. When specifying panels, the required orientation of the operating handle for the central pane must be considered in relation to the fire risk side.
- 4. The bead profiles shown as item 2 in sections 4.3.2 and 4.3.3 may be adjusted in depth only, to suit the specified glazing thickness. The heights of the glazing beads must remain as tested.
- 5. Outside glass (19mm, 10mm and 6mm), must be Pyro-EX Toughened Glass.
- 6. Other than the glass thickness, as shown in the table above, all installation provisions must remain as shown in sections 4.3.2, 4.3.3 and appendix B. In particular, the edge cover of the toughened fire rated glass must remain as tested.
- 7. When utilising Option 3 to provide 30 minutes fire resistance integrity performance with the fire risk from either side of the doorset, timber glazing beads for the 10mm glass must be 19mm high as tested in IF12021. All other installation details must be as for 60 minutes fire resistance.
- 8. When utilising 10mm thick glass combined with 19mm thick glass a wider steel glazing bracket must be used, designed to accommodate the 35mm thick vision panel. This bracket must be secured using No. 8 screws positioned such that the centre line of each screw remains 6mm from the door leaf edge, as tested.

# 6 Data Sheets

#### 6.1 General

The maximum glazed area shown for the supporting assessments below may be comprised of multiple apertures, subject to the minimum framing dimensions stipulated within the appropriate supporting global assessment, and are valid at the date of issue of this assessment report.

However, all the supporting assessments are subject to revalidation every five years and revisions from time to time in-between. It is the responsibility of the user of this document to obtain up to date assessments as they become available and check that the key factors relating to glazing installation are unchanged. If any relevant details change in the assessment then that door construction cannot be used without a review from Warringtonfire.

#### 6.2 Falcon Panel Products – Strebord 54

Door manufacturer:		Falcon Panel Products Ltd
Door core reference:		Strebord 54
Global assessment re	port reference:	Chilt/A02067 Revision H
Description:		Graduated density chipboard blank
Maximum permitted	Single Aperture	0.32
glazed area (m <sup>2</sup> )	Multiple Apertures	1.50

#### 6.3 Halspan Ltd – Optima 60

Door manufacturer:		Halspan Ltd
Door core reference:		Halspan <sup>®</sup> 60 <b>Optima</b>
Global assessment re	port reference:	FEA/F01205 Revision F
Description:		Tri-layer particle board
Maximum permitted	Single Aperture	0.32
glazed area (m <sup>2</sup> )	Multiple Apertures	0.82

#### 6.4 Halspan Ltd – Prima 60

Door manufacturer:		Halspan Ltd
Door core reference:		Halspan <sup>®</sup> 60 <b>Prima</b>
Global assessment re	port reference:	FEA/F96103 Revision N
Description:		Tri-layer particle board
Maximum permitted	Single Aperture	0.32
glazed area (m <sup>2</sup> )	Multiple Apertures	0.82

#### 6.5 Pacific Rim Wood Ltd – Flamebreak 60

Door manufacturer:		Pacific Rim Wood Ltd
Door core reference:		Flamebreak 60
Global assessment re	port reference:	FEA/F02141 Revision J
Description:		Lamella core door with various facing coverings
Maximum permitted	Single Aperture	0.32
glazed area (m <sup>2</sup> )	Multiple Apertures	0.72

#### 6.6 Blankfort Inc – Blankfort 60 and 60+

Door manufacturer:		Blankfort Inc
Door core reference:		Blankfort 60 & 60+
Global assessment re	port reference:	Chilt/A12152 Revision E
Description:		Lamella core door with various facing coverings
Maximum permitted	Single Aperture	0.32
glazed area (m <sup>2</sup> )	Multiple Apertures	0.72

# 6.7 Egger (UK) Ltd – Eurospan 60

Door manufacturer:		Egger (UK) Ltd	
Door core reference:		Eurospan 60	
Global assessment report reference:		Chilt/A10187 Revision D	
Description:		Graduated density chipboard blank	
Maximum permitted glazed area (m <sup>2</sup> )	Single Aperture	0.32	
	Multiple Apertures	0.85	

WF Assessment Report WF409531 Page 14 of 22

#### 7 Additional Installation Requirements

In addition to the provisos above, the following points must be complied with when glazing fire resisting doorsets using the Vistamatic VS1 vision panel.

- 1. Gaps between glass and framing, to permit expansion, should be set at 3mm on all edges, using non-combustible or hardwood setting blocks at the bottom edge.
- 2. Timber for glazing beads must be straight grained joinery quality hardwood, free from knots, splits and checks.
- 3. Pneumatically (gun) fired steel pins are acceptable providing the pins meet the specifications shown below, are a minimum of 60mm long, and for rectangular or oval pins are orientated perpendicularly to the glass where possible.

Round pin diameter (mm) = minimum 1.6mm:



Oval/rectangular pin minimum linear dimensions = 1.6mm x 1.4mm:



4. The spindle for the centre glass actuator, which passes through the outer glass layers, must be wrapped in 2No. 2.5mm thick Norseal Graphite Intumescent layers (5mm overall), Ref: 2.5 – 390 x 10/SA, to line the glass layer apertures.

#### 8 Conclusion

If Vistamatic VS Pyro 60 vision panels were to be used for glazing fire resisting doors, in accordance with the specification documented in this report, and were to be tested in the appropriate configuration in accordance with BS 476 Part 22:1987, it is the opinion of Warringtonfire that the glazing installation would achieve a minimum of 30 or 60 minutes fire resistance integrity, as applicable.

WF Assessment Report WF409531 Page 15 of 22

#### 9 Declaration by the Applicant

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

Signed: .....

Name: MACK NASH 

For and on behalf of Vistamatic Ltd.

### 10 Limitations

The following limitations apply to this assessment:

- 1) This assessment addresses itself solely to the elements and subjects discussed and does not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.
- 2) This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available, Warringtonfire reserves the right to withdraw the assessment unconditionally but not retrospectively.
- 3) This assessment has been carried out in accordance with Fire Test Study Group Resolution No 82: 2001.
- 4) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
- 5) This assessment relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this assessment, the element is suitable for its intended purpose.
- 6) This assessment represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476 Part 22:1987, on the basis of the evidence referred to herein. We express no opinion as to whether that evidence, and/or this assessment, would be regarded by any Building Control authority as sufficient for that or any other purpose. This assessment is provided to the client for its own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.
- 7) This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of Warringtonfire. All work and services carried out by Warringtonfire Testing and Certification Limited are subject to, and conducted in accordance with, the Standard Terms and Conditions of Warringtonfire Testing and Certification Limited, which are available at <u>https://www.element.com/terms/terms-and-conditions</u> or upon request.

WF Assessment Report WF409531 Page 17 of 22

# 11 Validity

- 1) The assessment is initially valid for five years after which time it must be submitted to Warringtonfire for technical review and revalidation.
- 2) This assessment report is not valid unless it incorporates the declaration given in Section 9 duly signed by the applicant.

Signature:	Siha Bailey	Mala
Name:	Simon Bailey	A M Winning
Title:	Senior Product Assessor	Senior Product Assessor

WF Assessment Report WF409531 Page 18 of 22

# Appendix A

# **Performance Data**

# **Primary Test Data**

Report No	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
IF13037 (Particleboard blank)	LSASD (timber and steel glazing beads)	A & B 1250 1230 54	Principles of BS 476 Parts 20/22 1987	Integrity: 65 (timber beads) Integrity: 72 (steel beads)
IF12021 (Particleboard Blank)	LSASD (timber glazing beads)	A & B 1005 928 44	Principles of BS EN 1634-1: 2008	Integrity: 44

#### **Assessed Proprietary Doorsets**

Report No	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
Chilt/A02067 Revision H Strebord 54 Falcon Panel Products	Various	Various	BS 476: Part 22: 1987	60
FEA/F96103 Revision N Halspan <sup>®</sup> 60 <b>Prima</b> Halspan Ltd	Various	Various	BS 476: Part 22: 1987	60
FEA/F01205 Revision F Halspan <sup>®</sup> 60 <b>Optima</b> Halspan Ltd	Various	Various	BS 476: Part 22: 1987	60
FEA/F02141 Revision J Flamebreak 60 Pacific Rim Wood Ltd	Various	Various	BS 476: Part 22: 1987	60
Chilt/A12152 Revision E Blankfort 60 & 60+ Blankfort Inc.	Various	Various	BS 476: Part 22: 1987	60
Chilt/A10187 Revision D Eurospan 60 Egger (UK) Ltd	Various	Various	BS 476: Part 22: 1987	60

**Note:** Proprietary doorsets referenced in the above table are listed with the revision current at the time of issue of this report. Please refer to section 6.1 for the responsibilities of users of these reports to utilise the most recent revisions.

WF Assessment Report WF409531 Page 19 of 22

# Appendix B

# **Client Installation Diagrams**

# 1. Installation with Timber Glazing Beads



#### 2. Steel Glazing Brackets (timber glazing beads)

**Note:** when using 19mm thick glass combined with 10mm thick glass, a modified wider bracket design will be required.



WF Assessment Report WF409531 Page 21 of 22

# 3. Installation with Steel Glazing Beads

**Note:** when using 19mm thick glass combined with 10mm thick glass, a narrower profile steel glazing bead will be required on the 19mm glass face.



WF Assessment Report WF409531 Page 22 of 22

# Appendix C

# Revisions

Revision	Warringtonfire Reference	Date	Description