Exova Warringtonfire
Chiltern House
Stocking Lane
Hughenden Valley
High Wycombe
Buckinghamshire
HP14 4ND

T: +44 (0) 1494 569 800
F: +44 (0) 1494 564 895
E: globalfire@exova.com
W: www.exova.com

Testing, calibrating, advising.

Title:
Global Fire Resistance Assessment of:

Strebord© 35+ &
Strebord© 38+ doorsets

for:

30 Minutes Fire Resistance

Valid From: 24th February 2017

Valid Until: 20th February 2022

WF Report No:
WF380559

Prepared for:
Falcon Panel Products Ltd.

Clock House
Station Approach
Shepperton
Middlesex
TW17 8AN

Contents

1 Introduction

This document constitutes a fire resistance assessment relating to Strebord© 35+ & Strebord© 38+, 30 minute fire resisting doorsets, for Falcon Panel Products Ltd. The assessment uses established extrapolation and interpretation techniques in order to extend the scope of application by determining the limits for the designs, based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance, if the elements were to be tested in accordance with BS 476: Part 22: 1987.

2 General Description of Construction

2.1 General

It is permissible for the doorset manufacturer to fit 35mm thick by 40mm wide softwood (minimum density 430kg/m³) stiles and rails to the perimeter of either of the door core types below. Stiles and rails must be spot bonded with PVA before bonding the faces. If using stiles and rails, leaf size limitations will apply (see relevant data sheets contained in Appendix D). The stiles and rails may be reduced by a maximum of 3mm in width for final sizing and squaring before lipping.

The applied facings for these designs may butt up to or conceal the lipping and must be adhered by fully bonding using a PVA adhesive (see section 13).

It is the opinion of Exova Warringtonfire that, based on the test evidence listed in Appendix A, the construction options available for each door leaf design can be applied to either of the door leaf designs below, unless otherwise specifically stated herein.

2.2 Strebord© 35+

The primary construction for door leaves of this design comprises the following:

- A core of 35mm thick Strebord© particleboard (minimum density 560kg/m^3) with 4mm thick MDF facings to both faces of the leaf. Where required, the leaves are to be lipped with hardwood. The faces are to be bonded by the doorset manufacturer in accordance with this assessment.

2.3 Strebord© 38+

The primary construction for door leaves of this design comprises the following:

A homogenous solid sheet of 38mm thick Strebord© particleboard (minimum density 590kg/m^3) with 4mm thick chipboard facings. Where required, the leaves are to be lipped with hardwood. The faces are to be bonded by the doorset manufacturer in accordance with this assessment.

3 Leaf Sizes

The approval for increased leaf dimensions is based on the tests listed in Appendix A and takes into account the margin of over-performance above 30 minutes integrity for the design and the characteristics exhibited during test. Data sheets specifying the maximum approved leaf sizes and graphs showing the permitted gradient between maximum height and width are contained in Appendix D.

Doorsets with reduced dimensions are deemed to be less onerous. Therefore, doors with dimensions that are less than those tested and stated in Appendix D may be manufactured.

4 Configurations

Based on the test evidence listed in Appendix A, this assessment covers the following doorset configurations.

Abbreviation	Description
LSASD & ULSASD	Latched & unlatched, single acting, single doorsets
DASD	Double acting, single doorsets
LSADD & ULSADD	Latched & unlatched, single acting, double doorsets
DADD	Double acting, double doorsets

Unequal leaf double doorsets are covered by this assessment with no restriction on the smaller leaf dimension.

5 Leaf Size Adjustment

The Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ door leaf designs referred to in section 2 of this assessment may be altered as follows.

Element		Reduction
Leaf	Without stiles & rails	The manufactured size of the leaf may be reduced in height or width without restriction.
	Stiles & rails	The manufactured dimensions of Strebord© 35+ and 38+ fitted with stiles and rails cannot be reduced post manufacture, i.e. factory finished door.
Lipping		Lippings may be adjusted by a maximum of 3mm post-manufacture for on-site fitting purposes, providing a minimum thickness of 6mm of lipping is maintained.

6 Glazing

The testing conducted on the Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ has demonstrated that the designs are capable of tolerating glazed apertures, whilst providing a margin of over-performance. Glazing is therefore acceptable within the following parameters:

The maximum assessed glazed area for all configurations is 1.9m².

6.1 Assessed Glazing Systems

The glazing system must be one of the following tested proprietary systems.

Glazing System	Manufacturer	Max. Area (m^2)
1. Fireglaze 30	Sealmaster Ltd.	1.9
2. Therm-A-Strip 30	Intumescent Seals Ltd.	1.9
3. Firestrip 30	Hodgsons Sealants Ltd.	1.9
4. Pyroglaze 30	Mann McGowan Ltd.	1.33
5. Norsound Vision 30 (see section 6.8)	Norsound Ltd.	1.33
6. System 36 Plus	Lorient Polyproducts Ltd.	1.33
7. Flexible Figure 1	Lorient Polyproducts Ltd.	1.33
8. R8193	Pyroplex Ltd.	1.33
9. 30049	Pyroplex Ltd.	1.33
10. 30054	Pyroplex Ltd.	0.72
11. Therm-A-Bead	Intumescent Seals Ltd.	0.96
12. ST105GT (see section 6.6)	Sealed Tight Solutions Ltd.	1.24
13. Intumescent Foam Tape System (see section 6.12)	Sealmaster	1.24

Intumescent Seals Ltd. Therm-A-Bead glazing system must only be used with glass types 9 – 19 from the table in section 6.2 below.

6.2 Assessed Glass Products

Assessed glass types are as follows.

Glass Type	Manufacturer	Thickness (mm)	Max. Area (m^2)
1 Pyroshield	Pilkington Group Ltd.	6 & 7	1.9
2 Pyroshield 2	Pilkington Group Ltd.	6 & 7	1.9
3 Pyran S	Schott UK Ltd.	6	1.9
4 Pyrostem	CGI Ltd.	6	1.25
5 Pyroswiss[1]	Vetrotech Saint Gobain	6	0.8
6 ESG Pyrotech 630[2]	Essex Safety Glass Ltd.	6	0.8
7 Pyrocet XPT[3]	C3S Ltd.	6	1.9
8 Pyroclear 30-001[4]	Pilkington Group Ltd.	6	1.2
9 Pyroguard EW 30	CGI Ltd.	7	1.14
10 Pyrobelite 7	AGC Flat Glass UK	7	1.9
11 Pyrodur 30-104	Pilkington Group Ltd.	7	1.9
12 Pyrodur 60-10	Pilkington Group Ltd.	10	1.9
13 Pyroguard EW MAXI	CGI Ltd.	11	0.87
14 Pyranova 15-S2.0	Schott UK Ltd.	11	1.9
15 Pyrobelite 12	AGC Flat Glass UK	12	1.9
16 Pyrodur 60-20	Pilkington Group Ltd.	13	1.9
17 Pyroguard EI 30	CGI Ltd.	15	1.9
18 Pyrostop 30-10	Pilkington Group Ltd.	15	1.9
19 Pyrobel 16	AGC Flat Glass UK	16	1.9

1. Pyroswiss product limited to 0.8m^2 and glazing system 3 as defined in section 6.1
2. ESG Pyrotech 630 glass is limited to 0.8m^2 and may only be used with the tested glazing system depicted in Appendix C
3. C3S Pyrocet XPT may only be utilised with the tested glazing system as described in section 6.4 below
4. Pilkington Pyroclear is limited to 1.2m^2 and may only be utilised with the tested glazing system as described in section 6.5 below
5. Glass types 17 - 19 are fully insulating for 30 minutes in terms of the criteria set out in BS 476: Part 20: 1987
6. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance.

6.3 Glazing Beads & Installations

Glazing beads must be as specified in the following table.

Material	Profile	Min. Density (kg/m^3)	Application
Hardwood	Splayed	640	All proprietary systems detailed in 6.1 and Appendix C
Hardwood	Splayed & Flush	640	Proprietary systems 1 & 2 as specified in 6.1 and all glass types specified in 6.2 (see Appendix C for further details)
Hardwood	Square	640	Proprietary systems 1, 2 & 3 as specified in 6.1 and glass types 9 - 19 as specified in 6.2

1. Glazing beads must be retained in position with 40mm long steel pins or 40mm long No. 6-8 screws, inserted at 35 - 40° to the vertical, at 150mm maximum centres and no more than 50mm from each corner, or see section 6.3.1 below for bead fixings using gun (pneumatically) fired applications
2. Alternatively, the following pin specification has been tested and assessed for steel round, oval and rectangular shaped gun fired pins

3. Pins with dimensions less than those stated above are not covered by this assessment
4. See Appendix C for square and splayed bead profile options. A 6 - 10mm thick square aperture liner is permitted for use with square beads providing it is constructed from hardwood of minimum density $640kg/m^3$ and glued in position using a UF, PVA or PU type adhesive
5. Glazed opening must not be less than 100mm from any leaf edge. Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 80mm between apertures
6. Aperture shape is not restricted, providing the glazing system and beads can effectively accommodate the required profile
7. False timber beads may be applied to glass types 9 - 19 using one of the following intumescent glazing products.

Glazing System	Manufacturer
1. Therm-A-Strip 30	Intumescent Seals Ltd
2. Fireglaze 30	Sealmaster Ltd
3. Firestrip 30	Hodgson Sealants Ltd
4. Envirograf Product 77 - G10/10	Intumescent Systems Ltd
5. Intumescent mastic or silicone tested for glazing applications to BS 476: Part 22: 1987 or BS EN 1634-1	Various

All seals must be a minimum of 10mm wide x 0.5 - 3mm thick. Preformed strip systems 1 - 4 may be self-adhesive and grooved into the rear of the glazing bars.

8. Timber for glazing beads must be straight grained, joinery quality, free from knots, splits and checks
9. For alternative glazing bead material specifications, see section 6.10 for Streframe glazing beads and section 6.11 for Morland Quickfix glazing beads.

6.4 Pyrocet XPT Glazing System

The following system must be used with the Pyrocet XPT glass type listed in section 6.2.

1. Hardwood (minimum density 640kg/m³) glazing beads 26mm high x 22mm wide with an 18° chamfer and a 5mm x 5mm bolection return
2. Beads must be retained in position with 50mm long steel pins or 50mm long No. 6 - 8 screws, inserted at 35 - 40° to the vertical at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above
3. 10mm x 2mm Ceramic fibre tape must be installed between the bead and face of the glass on both glass faces. The tape must finish flush with the top of the bead
4. The glass must be fitted with maximum 8mm edge cover and allowing for 13mm expansion on all edges
5. An 8mm thick hardwood aperture liner is to be fitted using PVA or PU adhesive
6. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
7. Timber for glazing beads must be hardwood, straight grained, joinery quality, free from knots, splits and checks
8. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
9. Multiple apertures are permitted, subject to point 8 above.

6.5 Pilkington Pyroclear Glazing System

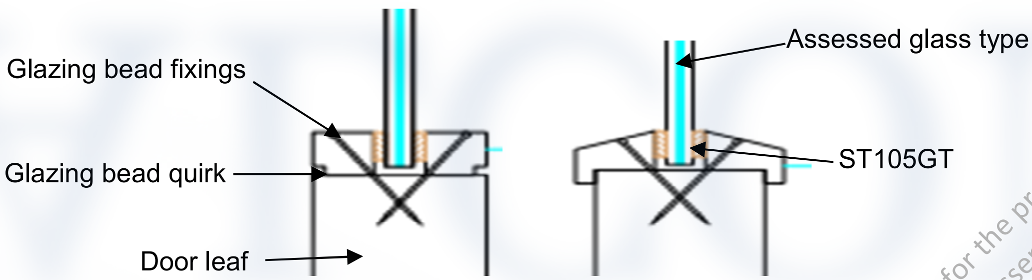
The following system must be used with the Pilkington Pyroclear glass type listed in section 6.2.

1. Hardwood (minimum density 640kg/m³) glazing beads 25mm high x 22mm deep with a 22° chamfer and a 5mm x 5mm bolection return
2. Beads must be retained in position with 50mm long steel pins or 50mm long No. 6 - 8 steel screws, inserted at 45° to the vertical, at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above
3. 15mm x 5mm Fibrefrax ceramic tape must be installed between the bead and face of the glass on both glass faces. The tape must finish flush with the top of the bead
4. 10mm x 2mm Dufaylite Interdens must be fitted lining the glazing aperture
5. The glass must be fitted with maximum 10mm edge cover and allowing for 10mm expansion on all edges
6. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
7. Timber for glazing beads must be hardwood, straight grained, joinery quality, free from knots, splits and check
8. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
9. Multiple apertures are permitted, subject to point 8 above.

6.6 STS Glazing System

The following specification must be followed when using the STS glazing system tested in PF15034.

The STS glazing system referenced ST105GT is illustrated below.



Square bead **Chamfered bead**

1. It is permitted to use square or chamfered glazing beads providing the beads are constructed in accordance with point 2 or 3 below
2. Square glazing beads must be constructed from hardwood (minimum density 640kg/m³) and must be a minimum of 15mm high by a depth to suit the glass thickness, including a 3mm x 3mm quirk
3. Chamfered glazing beads must be constructed from hardwood (minimum density 640kg/m³) and must be a minimum of 20mm high by a depth to suit the glass thickness, including a 5mm x 5mm bolection return and a 19° chamfer
4. Glazing beads must be retained in position with 38mm long steel pins or 40mm long No.6 - 8 steel screws, inserted at 35° to the vertical, at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above

5. ST105GT may be supplied as 10mm x 5mm or 9mm x 3mm strips which must be installed between the bead and the glass on both faces, the two seal sizes may be freely interchanged, subject to restrictions in the table below

ST105GT seal dimensions (mm)	**Permitted Glass types** (see section 6.2)	**Maximum Permitted Area** (m^2)
9 x 3	9 - 19	0.68
10 x 5	1 - 19	1.24

6. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
7. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
8. Timber for glazing beads must be straight grained, joinery quality hardwood, free from knots, splits and checks
9. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
10. Multiple apertures are permitted, subject to point 10 above.

6.7 Improved Security Bead

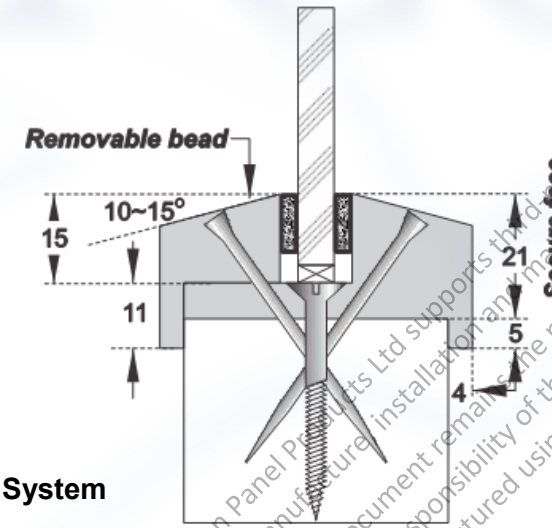
A combined bead and aperture lining can be used to deny access to fixings from one side of the door leaf to improve security.

All glazing details are to meet the specification given in sections 6.1, 6.2, 6.3, 6.4 and 6.5 unless otherwise stated below.

The aperture in the door must be lined using minimum 26mm thickness combined bead and lining in hardwood of minimum 640kg/m^3 density.

The combined bead and lining is bonded to the aperture in the door using the adhesive types approved for lippings (see section 13) and reinforced using No. 6 - 8 50mm long screw fixings located centre thickness of the door at 200mm centres.

The beads must be retained in position with 50mm long steel pins or 50mm long No. 6 - 8 screws, inserted at 35 - 40º to the vertical. Fixings must be at 150mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above. The bead profile must be appropriate for the glazing system selected.

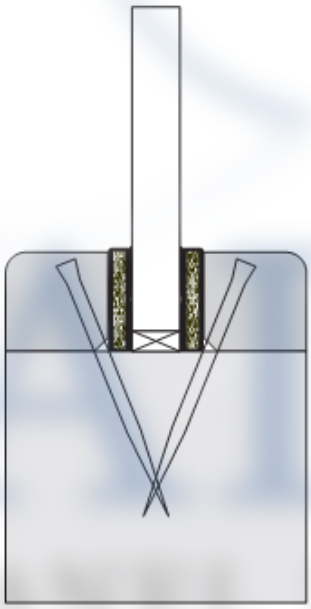


Security Bead System

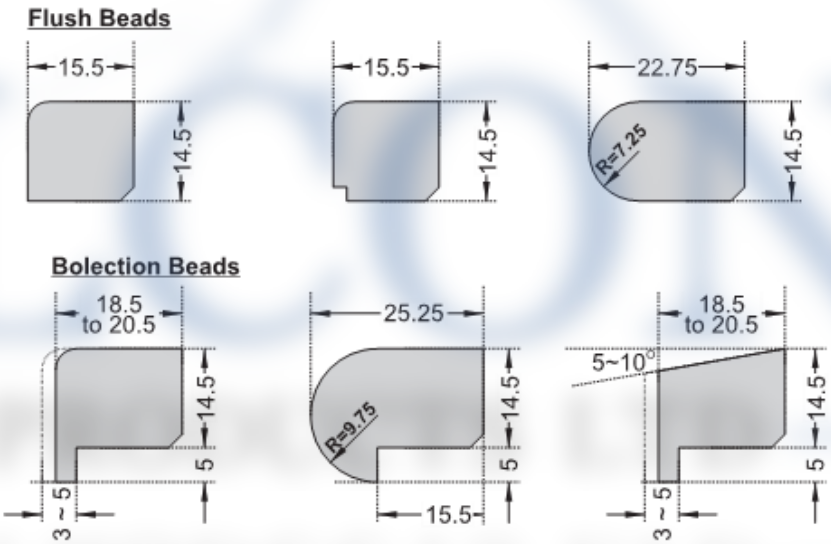
6.8 Norsound Ltd. – Norsound Vision 30B & 30T

The Norsound Ltd. glazing system tested in IF12011 has the following scope of application in addition to that described in sections 6.1 - 6.3 and 6.7.

The Norsound Vision 30B is illustrated below:

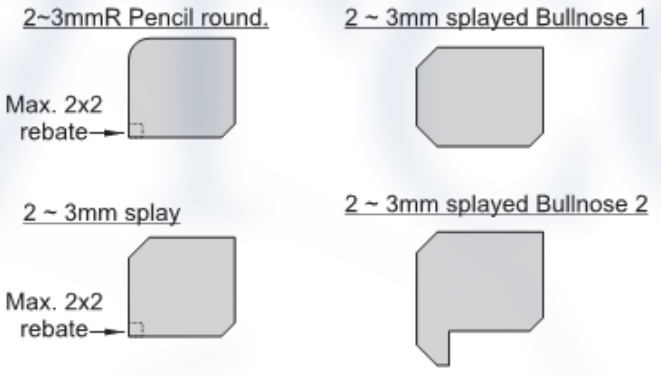


Norsound Vision 30B and 30T



Norsound Vision 30B Bead Profiles

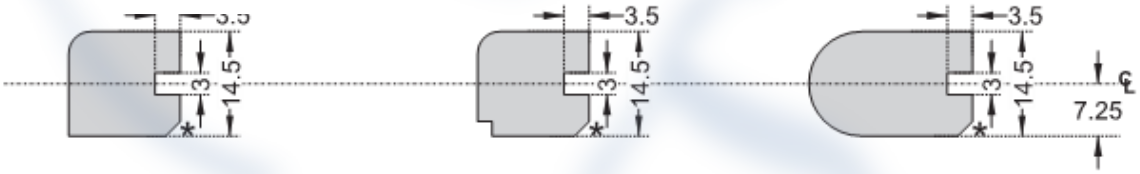
NOTE: When used with flush beads the maximum approved glass thickness for use in 44mm thickness doors is 12mm.



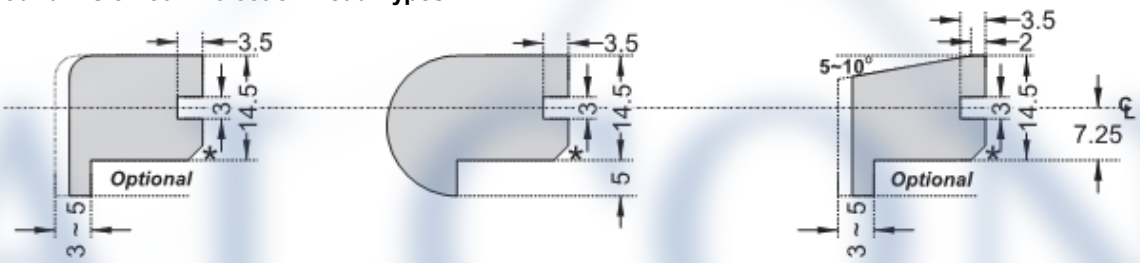
The Norsound Vision 30T may utilise the same range of bead shapes and are illusatrated below.

Norsound Vision 30T Flush Bead Types

NOTE 1: ⋆ = 2mm Splay applies to all bead profile types.



Norsound Vision 30T Bolection Bead Types



1. Bead height must be nominally 14.5mm
2. The intumescent seal component of Norsound Vision 30B and 30T is 15mm high and is required to project 0.5mm above the sightline of the bead
3. The position of the groove in the rear of the bead is therefore critical for installation of Norsound Vision 30T
4. Bolection returns should be a minimum of 5mm high, and a minimum of 3mm thick (projecting from the leaf face)
5. Glazing beads must be retained in position with, minimum, 40mm long steel pins or, minimum, 40mm long No. 6-8 screws, inserted at 35-40º to the vertical at no more than 40mm from each corner and at 150mm maximum centres
6. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3.1 above.

The bead material must meet the following specification and may be used with glass types 1 - 4 and 9 - 19 listed in section 6.2:

Material	**Min. Density** (kg/m³)
Straight grained joinery quality softwood, free from knots, splits & checks	510
Straight grained joinery quality hardwood, free from knots, splits & checks	510
MDF	700

6.9 Streframe Glazing Beads

The Falcon Panel Products Ltd. Streframe glazing beads have the following scope of application based on the testing conducted in PF14029.

1. Streframe glazing beads must be a minimum of 37mm high by a depth to suit the glass thickness, including a 7mm x 13mm bolection return and a 25º chamfer
2. Streframe glazing beads must be retained in position with 60mm long steel pins, inserted at 45º to the vertical, at no more than 50mm from each corner and at 120mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above
3. 25mm x 4mm Intumescent Seals Ltd. Therm-A-Bead is to be fitted between the bead and the glass on both faces
4. 54mm x 2mm Intumescent Seals Ltd. Therm-A-Line must be fitted lining the glazing aperture
5. Permitted glass types for use with the Streframe glazing beads are restricted to glass types 9 – 19 given in the table in section 6.2 above
6. The maximum glazed aperture area when using Streframe glazing beads will be dictated by the maximum area permitted for the glass type in use
7. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
8. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
9. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
10. Multiple apertures are permitted, subject to point 9 above.

6.10 Morland Quickfix Glazing Beads

The Morland Quickfix MDF glazing beads have the following scope of application based on the testing conducted in WF341550 and WF342584.

1. The maximum glazed aperture area permitted when using the Morland Quickfix glazing beads is 0.48m^2
2. Permitted glass types for use with the Morland Quickfix MDF glazing beads are restricted to glass types 1 – 4 and 9 - 11 given in the table in section 6.2 above
3. Morland Quickfix glazing bead dimensions are held in confidence on file by Exova Warringtonfire
4. Morland Quickfix MDF glazing beads must be retained in position with 50mm long steel pins, inserted at 30° to the vertical, at maximum 150mm centres on the vertical beads and maximum 230mm centres on the horizontal beads. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above
5. When using glass type 9 from the table in section 6.2 above, a 6mm deep bead of Lorient Polyproducts Ltd. 4 hour fire-rated intumescent mastic must be applied around the perimeter of the glass
6. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
7. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
8. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures.
9. Multiple apertures are permitted, subject to point 8 above.

6.11 Vistamatic VS2 Secure Vision Panel

The following specification must be followed when using the Vistamatic VS2 secure vision panel tested in Chilt/RF12065 Revision B.

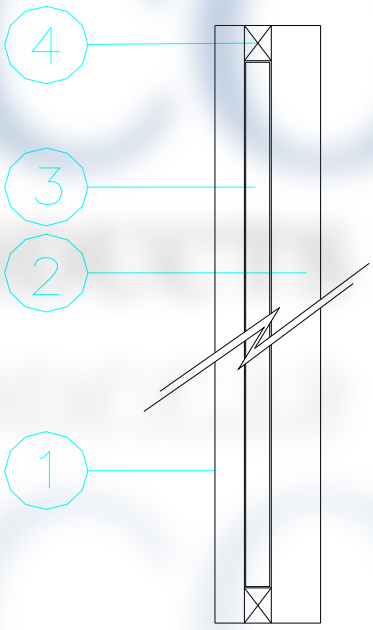
The Vistamatic VS2 vision panel comprises a double glazed unit with an additional, movable centre layer of obscure glass. The 10mm thick toughened glass must be oriented to the fire risk side of the doorset.

The unit must be fitted in accordance with Vistamatics tested details/installation requirements, particularly with respect to edge cover and expansion allowance.

Aperture shape must be rectilinear. Glazed openings must not be less than 100mm from any edge, with a minimum of 80mm between apertures. Multiple apertures are permitted subject to the spacing requirements listed above, with individual panes not exceeding 0.6m^2 and total glazed area within a leaf not exceeding 1.9m^2.

The drawing below shows the essential elements of the double glazed unit.

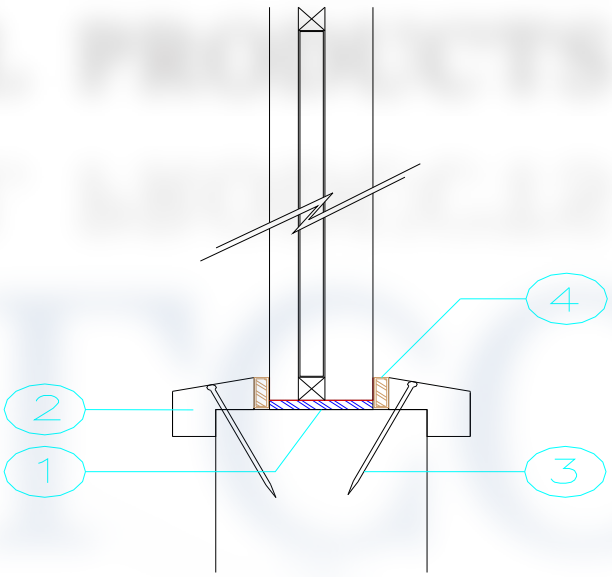
Key:
1. 6mm thick Pyro-EX Toughened Glass
2. 10mm thick Pyro-EX Toughened Glass
3. 4mm thick Annealed Glass
4. 5.5mm thick Stainless Steel Spacer



The vision panel is retained within the door leaf with either timber or steel beads, which must meet the specifications in the relevant section below.

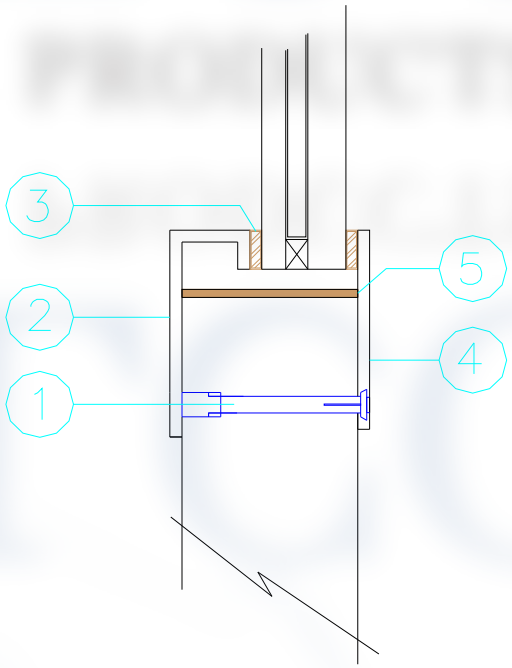
6.11.1 Timber Beads

Element	Specification
Timber bead material[2]	Hardwood of minimum density 640kg/m^3
Glazing system[4]	10mm high x 3mm thick Pyroglaze 30 – Mann McGowan Ltd.
Aperture liner[1]	3mm thick Firewizard acrylic intumescent mastic – Norsound Ltd.
Around centre glass actuator spindle	5mm thick graphite sheet; Ref: 2.5-390 x 10/SA – Norsound Ltd.
Bead fixings[3]	40mm long No. 6 - 8 steel screws or 40mm long steel pins located at minimum 150mm centres and 50mm from each corner. Fixings must be inserted at 35 - 40^o to the vertical and located to 'cradle' the vision panel.
Minimum required bead size	20mm (h) x 17mm (w) including a 9mm x 9mm bolection return and a 15^o chamfer.
Maximum glazed area (m^2)	0.6



6.11.2 Steel Beads

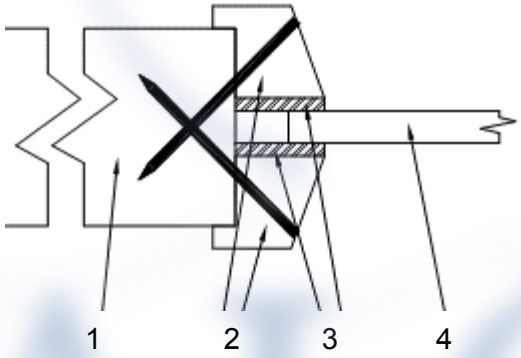
Element		Specification
Bead material		2mm thick stainless steel
Glazing system[3]		10mm high x 2.5mm thick Raw Graphite; Ref: 2.5-390 x 10/SA – Norsound Ltd.
Aperture liner[5]		Intumescent Liner; Ref: 1.8-408 x 53/SA – Norsound Ltd.
Around centre glass actuator spindle		2No. 5mm thick (overall) graphite sheet; Ref: 2.5-390 x 10/SA – Norsound Ltd.
Bead fixings[1]		40mm long M5 machine steel screws fixed from the exposed face to threaded studs welded to the unexposed face. Beads located at minimum 170mm centres and 20mm from each corner.
Bead profile	Exposed face[4]	50mm high x 2mm thick
	Unexposed face[2]	50mm high x 20 mm deep x 2mm thick
Maximum glazed area (m^2)		0.6



6.12 Sealmaster Intumescent Foam Glazing Tape

The following specification must be followed when using the Sealmaster Intumescent Foam Glazing Tape glazing system based on the testing cited in appendix C.

Sealmaster Intumescent Foam Glazing Tape is illustrated below.



Key:
1. Door Leaf
2. Glazing Beads
3. Sealmaster Intumescent Foam Glazing Tape
4. Assessed Glass Type

1. It is permitted to use square or chamfered glazing beads providing the beads are constructed in accordance with points 2 or 3 below
2. Square glazing beads must be constructed from hardwood (minimum density 640kg/m³) and must be a minimum of 20mm high by a depth to suit the glass thickness, including a 3mm x 3mm quirk
3. Chamfered glazing beads may be constructed from mdf, softwood or hardwood, subject to the restrictions in point 6, and must be a minimum of 25mm high by a depth to suit the glass thickness, including a 5mm x 5mm bolection return and a 15 - 20° chamfer
4. Glazing beads must be retained in position with 38mm long steel pins or 40mm long No.6 - 8 steel screws, inserted at 45º to the vertical, at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above
5. Sealmaster Intumescent Foam Glazing Tape is 20mm x 5mm (uncompressed) and must be used between the bead and the glass on both faces
6. Permitted glass types for use when utilising mdf or softwood glazing beads are restricted to glass types 1 – 11 given in the table in section 6.2 above
7. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
8. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
9. Timber for glazing beads must be straight grained, joinery quality timber, free from knots, splits and checks
10. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
11. Multiple apertures are permitted, subject to point 10 above.

7 Overpanels

7.1 Solid

Overpanels of the same construction as the door leaves may be used either flush with the leaf heads or when separated by a transom. In either case the overpanel must be fully contained within the door frame (see following diagram).

If a transom is required to separate the leaf heads from the overpanel, it must be to the same specification as the door frame (see the note under the table in section 9.1).

Door frame joints must be either mortice and tenon joints or butt joints (see section 9.2).

All methods require joints to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Butt joints must be additionally bonded with urea formaldehyde or equivalent.

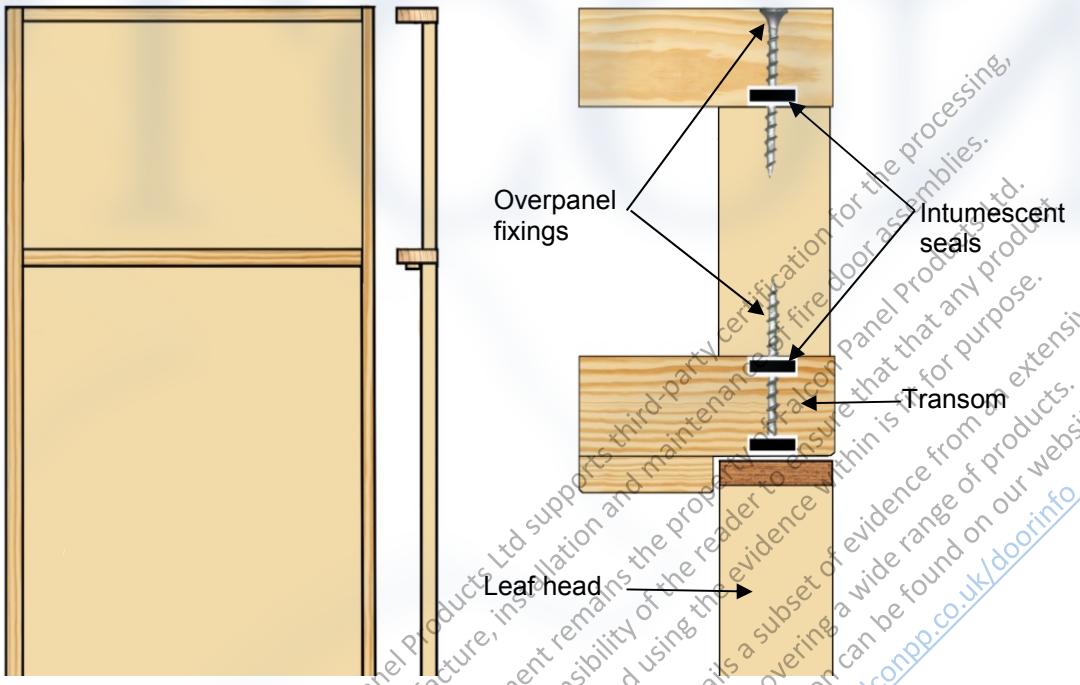
The overpanels must be fixed by screwing through the rear of the frame with steel screws passing at least 30mm into the centre line of the overpanel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.

The intumescent seals specified for the jambs in Appendix D, must also be fitted to all concealed edges of the overpanel. The seals may be fitted in the overpanel edges or alternatively in the frame reveal. A maximum 2mm gap is permitted between the edge of the overpanel and the frame reveal.

It is permitted to include a glazed aperture within the overpanel providing the glazing is within the parameters given in section 6 and the overpanel is fitted with a transom.

Maximum overpanel heights are as follows:

Configuration	Max. Overpanel Height (mm)
Single doorsets	2000
Double doorsets	1500



8 Fanlights & Side Screens

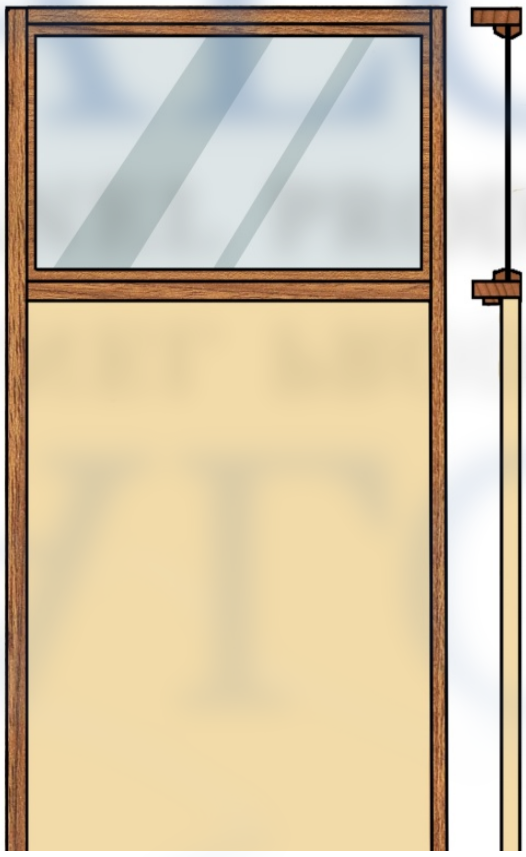
8.1 Glazed Fanlights

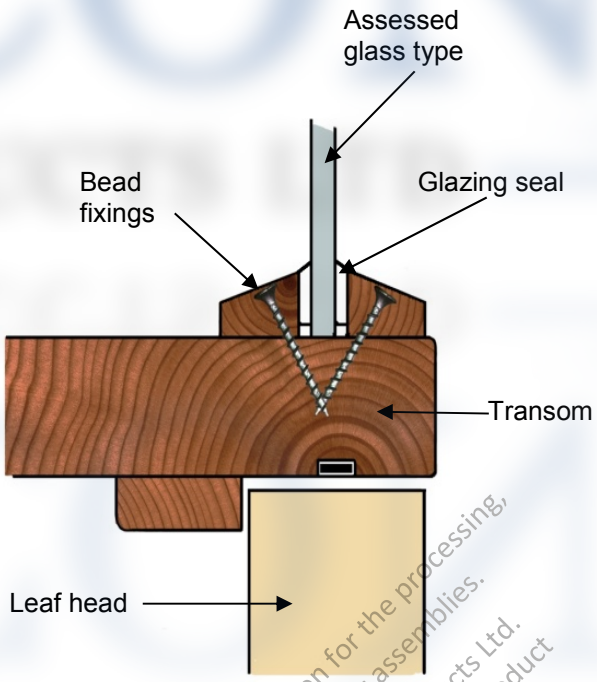
Timber frame doorsets including a transom may include a glazed fanlight. The timber frame and glazing beads must be hardwood with a minimum density of 640kg/m³, whilst the frame section for the transom must be a minimum of 70mm x 44mm. Timber door frame and transom construction must comply with the specification contained in section 9.

The maximum assessed fanlight dimensions are detailed in the table below, subject to the following restriction:

- The glazing system and glass must be able to demonstrate adequate performance when tested as a window or screen in accordance with BS 476: Part 22: 1987, or BS EN 1634-1, at the pane dimensions to be installed.

Configuration	**Height** (mm)	**Width** (mm)
Single & double doorsets	≤600	Overall door width





MDF frame doorsets are not assessed for glazed fanlights.

8.2 Fanlights & Side Screens - Norsound Vision Glazing Systems

8.2.1 General

Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ doorsets installed within timber frames may include glazed fanlights and/or side screens only installed utilising the Norsound Ltd Vision glazing system described in the following section.

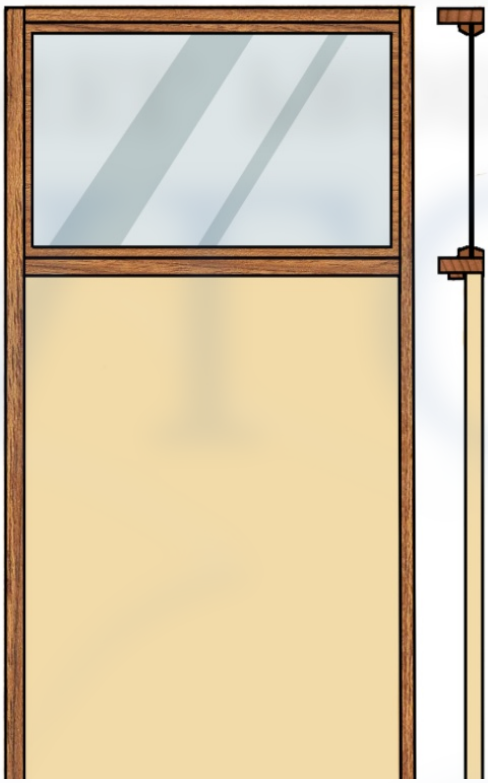
The glazing system and beads must meet the specification shown in section 8.2.4.

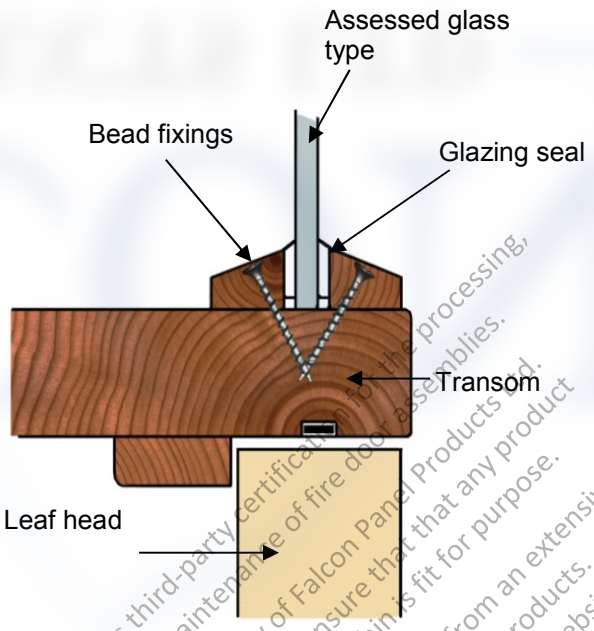
The door frame and screen framing construction must comply with the specification shown in section 8.2.5.

The maximum assessed fanlight and side screen dimensions are detailed in the table below, subject to the following restriction:

- The glass must be able to demonstrate adequate performance when tested as a window or screen in accordance with BS 476: Part 22: 1987 or BS EN 1634-1, at the pane dimensions to be installed.

Screen Element	**Configuration**	**Height** (mm)	**Width** (mm)
Fanlight	Single & double doorsets	≤600	Overall door width
Side screen	Single & double doorsets	Overall door height	≤600

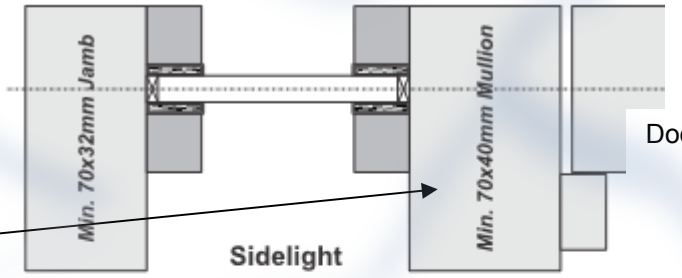




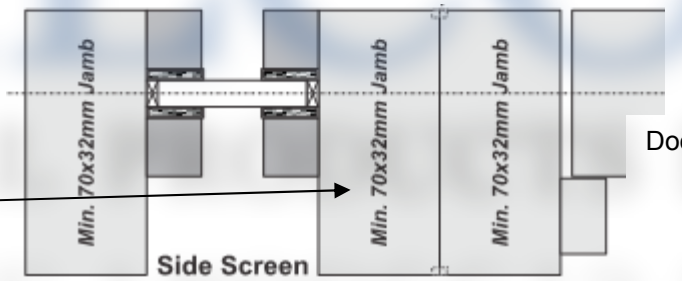
8.2.2 Common Frame Sections

The following drawings depict possible constructions of common frame sections for screens and door frame jambs:

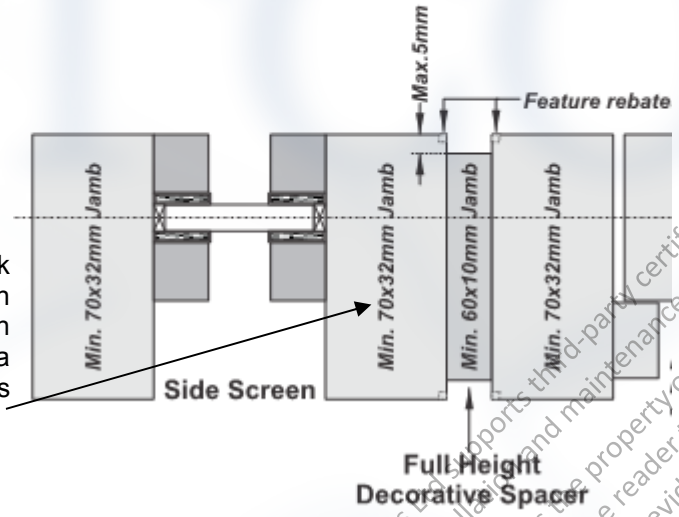
Option 1 - One frame section.



Option 2 - Back to back frame section.



Option 3 - Back to back frame section with separating post, which may be rebated a maximum of 5mm as shown.



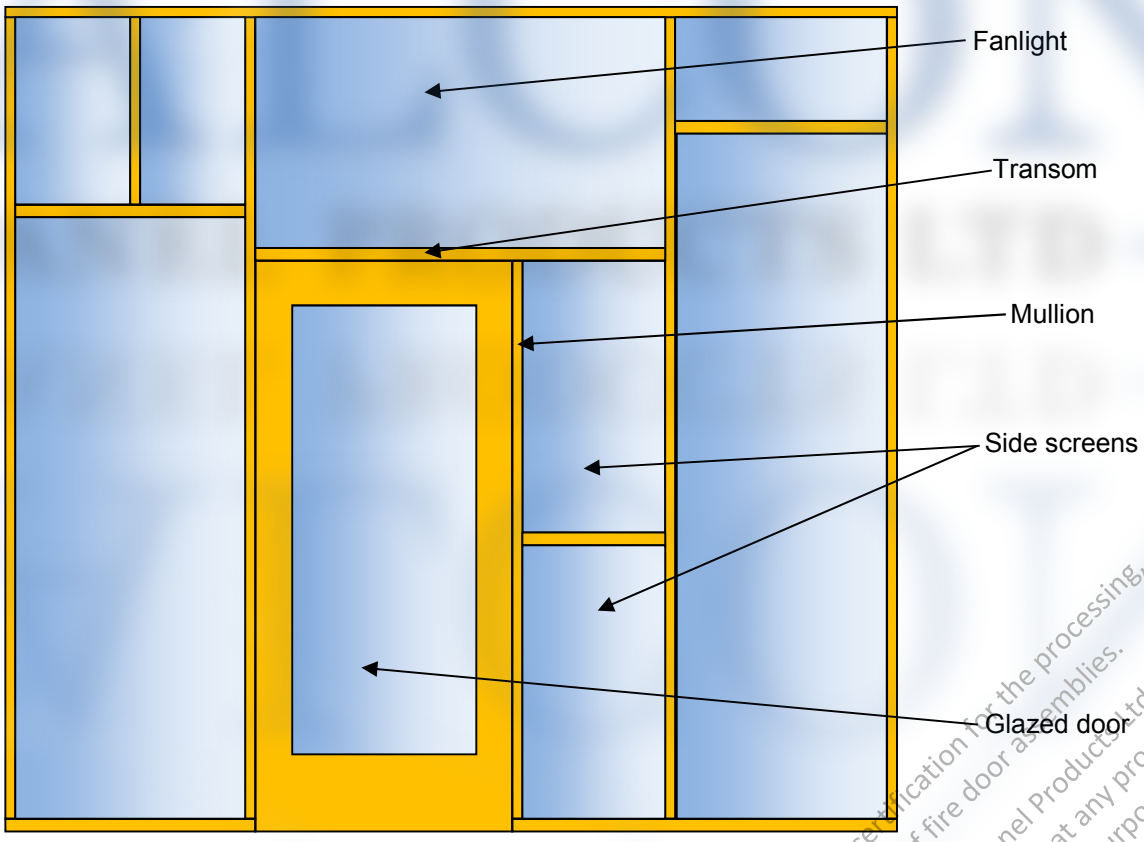
When using separate sections of timber, as shown above (options 2 & 3), each section must be suitably fixed to one-another using appropriate steel screw fixings and glued using Urea Formaldehyde or polyurethane. Screws must be fixed at 600mm centres and locate to approx 2/3 depth of the adjacent timber section. The overall frame section and material must match that given in this assessment for each glass type and glazing specification. Joints must be tight with no gaps.

It is permitted to include maximum 3mm (w) x 3mm (d) quirks/pencil rounds at the junction of each timber section for options 2 & 3.

Drawings are representative of each type of common frame section makeup; actual construction in terms of intumescent seal location and material, etc. must be as the text within this document specifies.

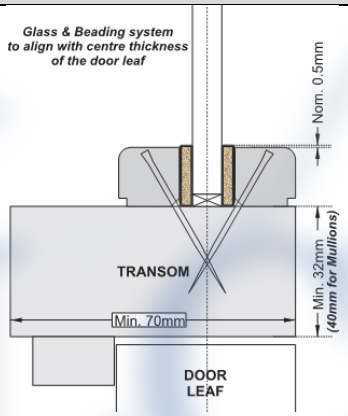
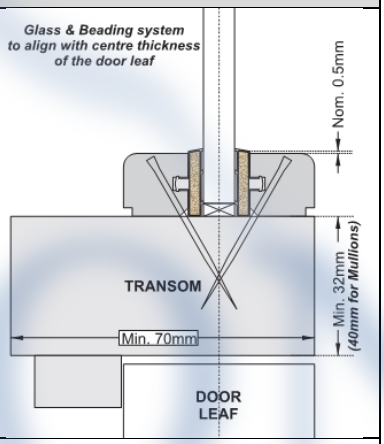
8.2.3 Screen Elevation

The following drawing depicts a possible door and glazed screen configuration. The diagram is for information only. All construction details to remain as specified herein.



8.2.4 Glazing Beads & Installation

Glazing beads and intumescent materials must be installed meeting the following sections.

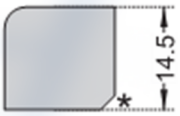
System Name		Norsound Vision 30B	Norsound Vision 30T
Typical Installation			
Sizes	Bead Height	Nominally 14.5	Nominally 14.5
	Intumescent Seal(s)	15 high x 3 thick	15 high x 3 thick plus 'plug'
Aperture Liner		Not required	

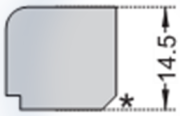
8.2.5 Norsound Vision 30B & 30T Applications

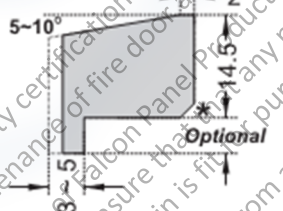
The following bead designs are assessed as acceptable:

Norsound Vision Flush Bead Types

NOTE 1: ⁎ = 2mm Splay applies to all bead profile types.



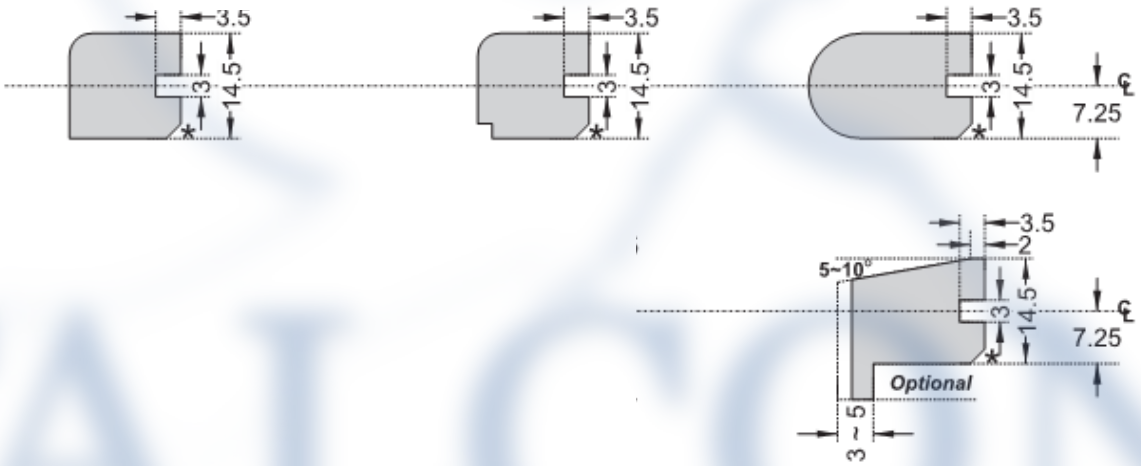




Norsound Vision 30T may utilise the same range of bead shapes.

Norsound Vision Flush Bead Types

NOTE 1: ⁎ = 2mm Splay applies to all bead profile types.



1. Bead height must be nominally 14.5mm
2. The intumescent seal component of Norsound Vision 30B and 30T is 15mm high and is required to project 0.5mm above the sightline of the bead
3. The position of the groove in the rear of the bead is therefore critical for installation of Norsound Vision 30T
4. Glazing beads must be retained in position with, minimum, 40mm long steel pins or, minimum, 40mm long No. 6 - 8 screws, inserted at 35 - 40º to the vertical at no more than 40mm from each corner and at 150mm maximum centres
5. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3 above.

8.2.6 Glazing Bead Material

All timber for glazing beads must be straight grained, joinery quality (MDF, softwood or hardwood as specified in the table below), free from knots, splits and checks.

Bead Profile	Material	Min. Density (kg/m^3)
All in section 8.2.5	Softwood	510
	Hardwood	
	MDF	700

8.2.7 Timber Screen Framing

Timber used for constructing framing elements comprising screen assemblies as illustrated in section 8.2 must meet the following specification.

Door frame jambs and transoms must meet the requirements stipulated within the supporting documentation for the relevant door leaf as specified.

Material	Minimum Section Size[2] (mm)	Min. Density (kg/m^3)
Softwood	70 x 32	510
Hardwood		

1. These timber sections may be used for the perimeter framing of the screen and the transoms separating individual panes of glass within the fanlights and side screens
2. Mullions must be minimum 40mm thick
3. The fanlights and side screens may comprise multiple panes of glass providing the total doorset and screen assembly does not exceed 2950mm high and the transom/mullion restrictions above are complied with
4. Gaps between glass and framing to permit expansion should be set according to the glass manufacturer's information, using non-combustible or hardwood setting blocks at the bottom edge.

9 Door Frames

9.1 Timber Based Door Frame Construction

Timber based door frames for the door leaf designs referred to in sections 2.2 & 2.3 of this assessment must be constructed to meet the following specification.

Material	Section Size* (mm)	Min. Density (kg/m^3)
Softwood or hardwood	70 x 25 (excluding the stop)	450
MDF	70 x 25 (excluding the stop)	700

*If the doorset features a transomed overpanel, the door frame must be softwood or hardwood with a minimum section of 70mm x 30mm (excluding the stop).

All door frame timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects).

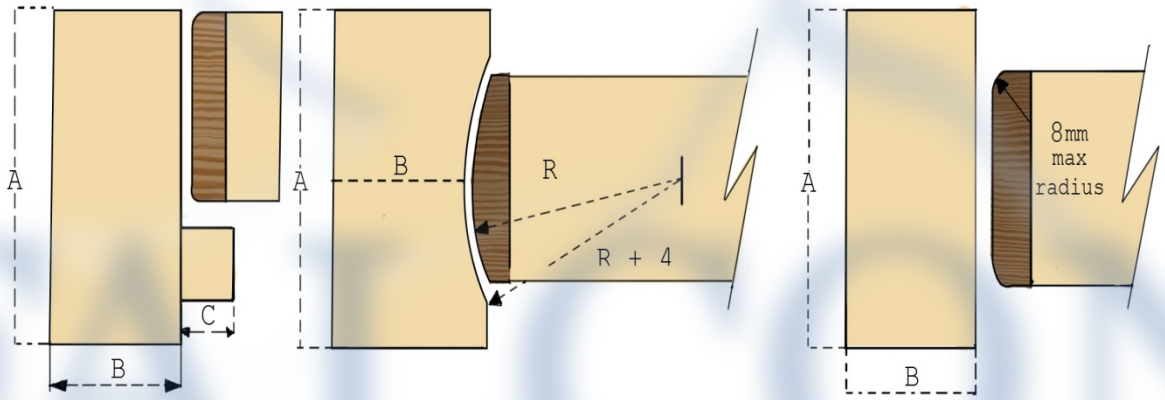
A 12mm deep planted stop is adequate for single acting frames whilst double acting frames may be scalloped or square (see diagram below).

Frame joints may be mortice and tenoned, mitred, half lapped or butted and with no gaps (see section 8.2). All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws.

Door frames utilising engineered timber sections may be used provided the specified door frame can demonstrate suitable, successful, test data and is assessed as suitable for use with Falcon Strebord© 35+ & Strebord© 38+ door blanks. BS EN 942: 2007 provides guidance on the specification of engineered timber.

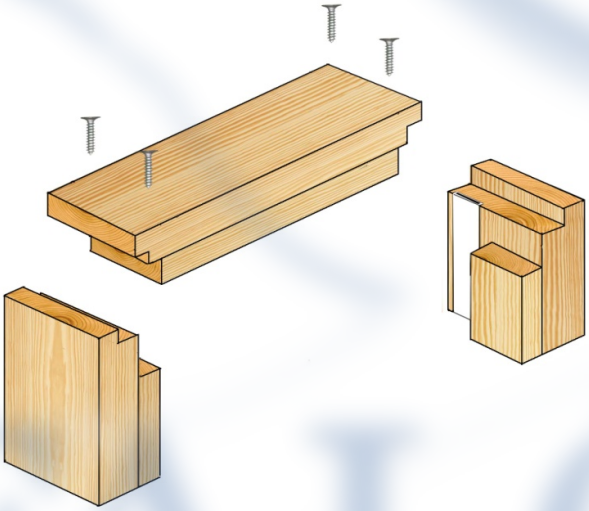
The following diagram depicts the assessed frame profiles and dimensions:

A = Min. 70mm B = Min. 25mm (see table above) C = Min. 12mm
R = Radius from floor spring 8mm radius to create maximum 2mm edge profiling

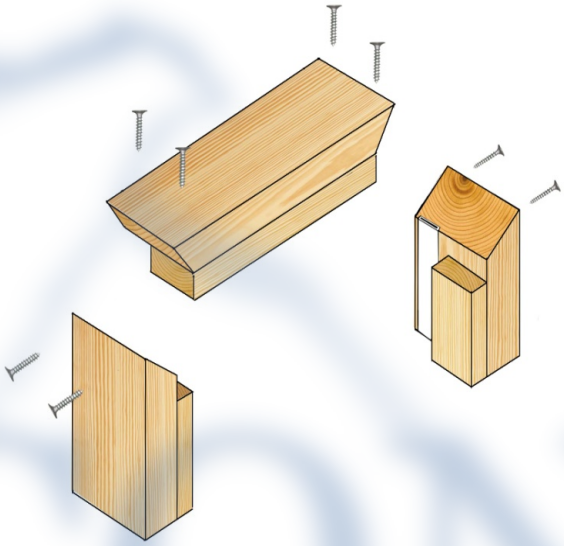


Standard **Scalloped** **Profiled Edges**

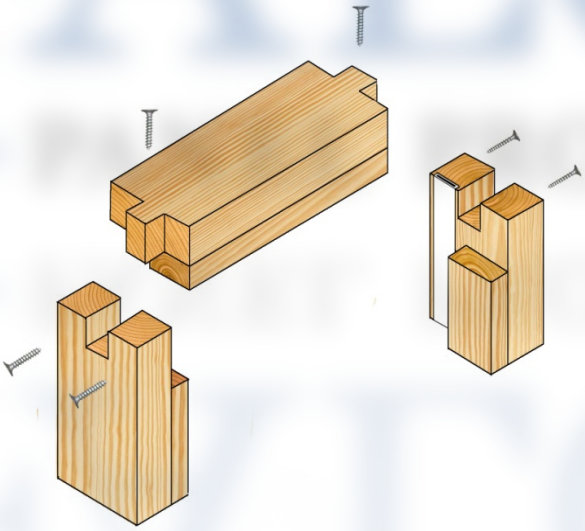
9.2 Door Frame Joints



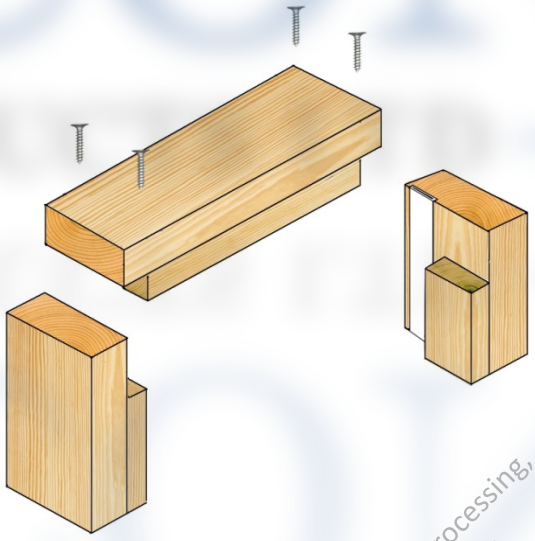
Half Lapped Joint



Mitre Joint



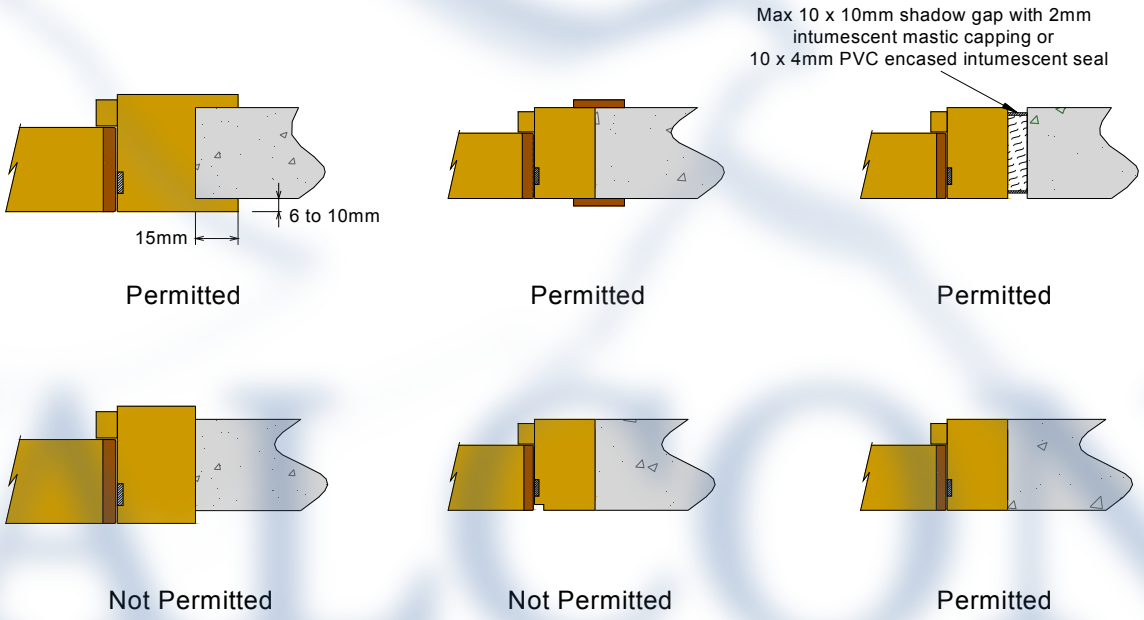
Mortice & Tenon Joint



Butt Joint

9.3 Door Frame Installation

The following diagrams indicate acceptable and unacceptable door frame installations:



1. See section 19 for sealing to structural opening specification
2. For the shadow detail depicted above (top right), the sub-frame material must be manufactured from one of the following materials, tightly fitted and with no gaps:
   - Timber with a density ≥450kg/m^3
   - Plywood with a density ≥600kg/m^3
   - MDF with a density ≥700kg/m^3
   - Particleboard with a density ≥600kg/m^3
   - Non-combustible board.

10 Facings

10.1 General

The facings for Strebord© 35+ & Strebord© 38+ are integral with the core construction and therefore alternative materials are not required or permitted.

10.2 Decorative & Protective Facings

The following additional facing materials are permitted for this door design since they would degrade rapidly under test conditions without significant effect.

Facing Materials	Maximum Permitted Thickness (mm)
Paint	0.5
Timber veneers	2
PVC/Plastic laminates	2
Decorative paper/non-metallic foil	0.5

1. Metallic facings are not permitted except for push plates and kick plates
2. The door leaf thickness may be reduced by a total maximum of 0.6mm to each face (a maximum of 1.2mm in total) for calibration purposes, only in order to accommodate one of the additional facings shown in the table above
3. Materials must not conceal intumescent strips
4. PVC/Plastic laminates may only be applied to leaf edges meeting the specification given in section 12.2.

10.3 Decorative Grooves

The Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ may be grooved to the following specification.

10.3.1 Groove Option 1

Element	Details	
Max. groove size (mm)	10 wide x 4 deep	
Proximity to door edges (mm)	Horizontal grooves	≥ 100 from top & bottom
	Vertical grooves	≥ 100 from sides
Groove spacing (mm)	≥ 100	
Orientation	Vertical or horizontal	
Configuration	Latched & unlatched, single & double acting, single & double leaf doorsets	
Leaf size range (mm)	2150 high x 926 wide	
Intumescent seal dimensions (mm)	≥ to 15 x 4	

A maximum of 4No. vertical and 4No. horizontal grooves are permitted perpendicular to one another, providing all other details meet the specification given in the table above.

10.3.2 Groove Option 2

For further Strebord© grooved and panelled options refer to the latest revision of Falcon Panel Products global assessment referenced Chilt/A09104.

11 Intumescent Materials

The intumescent materials tested and assessed for these doorset designs are as follows.

Application	Location	Product/Manufacturer
Edge seals	Fitted in the frame jambs or leaf edges	1. PVC encapsulated Palusol 100 – Mann McGowan Fabrications Ltd. or Lorient Polyproducts Ltd. 2. Therm-A-Seal – Intumescent Seals Ltd. 3. Pyroplex - Pyroplex Ltd. 4. Type 617 - Lorient Polyproducts Ltd. 5. STS Fire – Sealed Tight Solutions Ltd. 6. FO154 – Exitex Ltd[2]
	Fitted in the frame reveal (not approved as a seal for overpanel edges)	1. Norfast – Norsound Ltd.
Hinges	Under all hinge blades for doorsets greater than 2670mm high[2]	1. 1mm Interdens – Dufaylite Developments Ltd. 2. 1mm MAP paper – Lorient Polyproducts Ltd. 3. 1mm Pyrostrip 300 – Mann McGowan Fabrications Ltd. 4. 1mm Therm-A-Strip – Intumescent Seals Ltd. 5. 1mm NOR910 – Norsound Ltd. 6. 1mm STS Graphite – Sealed Tight Solutions Ltd. 7. 1mm Exi-Fire - Exitex Ltd
Lock/latches	Under forend & keep for double doorsets only[3]	
Top pivots & flush bolts	Lining all sides of the mortices	1. 2mm Interdens – Dufaylite Developments Ltd. 2. 2mm MAP paper – Lorient Polyproducts Ltd. 3. 2mm Therm-A-Strip –Intumescent Seals Ltd. 4. 2mm Therm-A-Flex – Intumescent Seals Ltd. 5. 2mm NOR920 – Norsound Ltd. 6. 1mm STS Graphite – Sealed Tight Solutions Ltd. (for use with flush bolts only, i.e. must not be used to protect top pivots)
Tuscan flush pull handle	Fitted on the back face of the pull handle	1mm Therm-A-Line – Intumescent Seals Ltd.
	Fitted encasing the sides of the pull handle	1mm Therm-A-Flex – Intumescent Seals Ltd.
	Fitted inside the body of the handle	
Concealed Closer	See section 15.1.1 and data sheet in appendix D for full intumescent specification required when installing concealed overhead closer	

1. The seal specification for each doorset configuration is contained in Appendix D
2. Where Exitex leaf edge seals are utilised, Exitex hinge and latch protection must also be installed for all leaf sizes and configurations
3. Where Exitex leaf edge seals are utilised, Exi-Fire graphite gasket must also be wrapped around the body of the latch.

12 Lippings

12.1 Timber Lippings

Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ doorsets must be lipped in accordance with the following specification.

Material	**Size** (mm)	**Min. Density** (kg/m^3)
Timber must be straight grained, joinery quality hardwood, free from knots, splits and checks	1. Flat = 6 – 19 thick with a maximum of 2mm profiling permitted at corners of lipping (see section 9.1). 2. Rounded = 8 –19 thick with a radius matching the distance between leaf edge and floor pivot (see section 9.1). 3. Rebated = 20 – 25 thick with a 12mm deep equal rebate.	530 (see note 6)

1. Single and double doorsets without overpanels only require lipping on the vertical edges but may be additionally lipped on the top and bottom edges if required
2. Doorsets with overpanels must be lipped on the vertical edges and additionally at the bottom edge of the overpanel and top edge of the doors
3. Double doorsets without flush overpanels may use square or rebated meeting edges
4. Double doorsets with flush overpanels may use a square or rebated overpanel junction but only in conjunction with square meeting edges
5. A 2.5^0 chamfer is permitted to the lipping at the leading edge of leaves providing the door gaps meet the requirements of section 16
6. All rebated lippings and flat and rounded lippings thicker than 13mm must be constructed from hardwood timber of minimum 640kg/m^3 density
7. On-site adjustment of the lippings by a maximum of 3mm for fitting purposes is permitted, providing the minimum dimensions stated above are maintained
8. Over-rebated lippings are permitted for use on single leaf doorsets only, see section 12.5 below for further details.

12.2 PVC Edge Protectors

12.2.1 General

It is possible to fit proprietary edge protectors to these Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ doorset designs providing they have suitable supporting test evidence to BS 476: Part 22: 1987 or BS EN 1634-1, when fitted to timber doorsets of similar construction to these designs. The end user must satisfy themselves that the test evidence supports the proposed end use application.

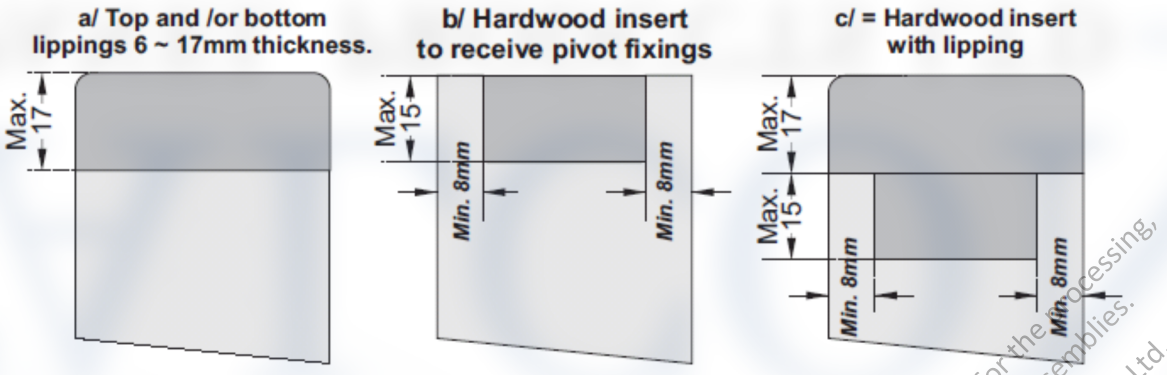
12.2.2 CS Group Edge Protectors

The Falcon Strebord© designs have been assessed for use with CS Group edge protectors. CS Group edge protectors are supplied pre-formed with the approved intumescent material. The CS Group edge protectors must be used as part of a complete intumescent system and the required intumescent specification and leaf sizes are given in the relevant data sheets in Appendix D. CS Group must be contacted for precise installation and fixing details (www.c-sgroup.co.uk).

12.3 Hardwood Blocking for Pivots

The following leaf edge option is permitted for lipping the top and bottom of doors that are to receive pivot fixings and are to be used in severe duty locations.

The hardwood insert must be a size (length) suited to the particular item of hardware plus a maximum of 50mm (but not be full door width) and must be securely adhered to the door core. The hardwood insert should not be greater than 15mm in depth and when fitted should provide for a minimum margin of 8mm to either face of the leaf. The inserted blocks must be bonded on all contact faces using adhesives approved for the application of lippings (see section 13). The hardwood insert must meet the minimum density requirements as given in the table in section 12.1.



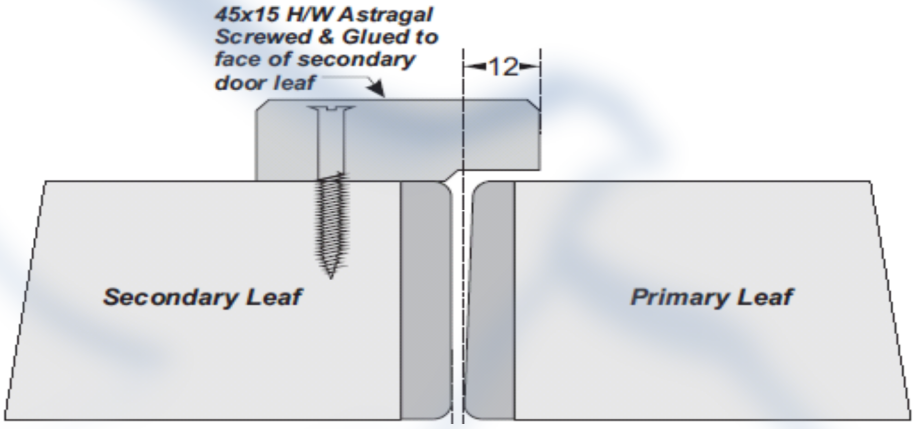
12.4 Meeting Stile Astragals

Generally fire doors should be able to open simultaneously. However, where additional performances are required (e.g. acoustic performances) it may be necessary to provide for sequential opening.

An astragal detail may be used where these conditions apply, without adverse influence on existing fire test/assessment data.

Astragals can be applied to both door leaves provided a suitable door selector is fitted and may be profiled for aesthetic effect providing they meet the minimum specification given below.

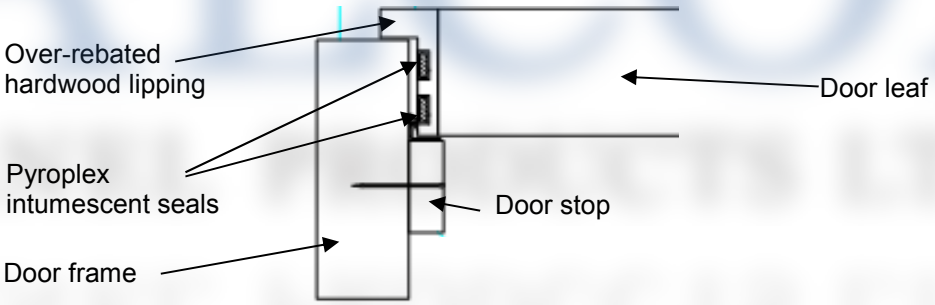
The hardwood for the astragal must be hardwood of the same minimum density being used for the lipping material. See following diagram:



12.5 Over-Rebated Leaf Edges

It is possible to fit over-rebated hardwood lippings to the leaf head and vertical edges of the Falcon door designs covered by this assessment, subject to the provisos below.

The over-rebated lippings are illustrated below.



The over-rebated lippings must meet the following specification.

1. Over rebated lipping as illustrated may be fitted to the top and vertical edges of single acting, single leaf doorsets only
2. Lippings must be 20mm thick hardwood of minimum density 640kg/m^3, including a 34mm wide by 13mm high rebate
3. See the relevant data sheet in Appendix D for the maximum assessed leaf dimensions permitted when using over-rebated lippings
4. The leaf may be installed opening in either direction, i.e. opening away from or in towards the direction of fire-risk
5. The lipping must be adhered to the core using a PU adhesive
6. 2No. 10 x 4mm Pyroplex Rigid Box Seals must be fitted 5.5mm apart and 4mm from the unexposed face in the leaf head and vertical edges (as shown above)
7. The leaf must be fitted with a minimum of 2No. Eclipse cranked bearing butt type hinges. The top hinge must be fitted 200mm from the top of the hinge blade to the top of the leaf, and the bottom hinge must be fitted 203mm from the bottom of the hinge blade to the bottom of the door leaf. The hinges must be fixed with 4No. M5 x 30mm long wood screws per blade.

13 Adhesives

The adhesives used in construction are as follows.

Element	Product
Core	Manufacturers specification
Lipping	Urea formaldehyde, polyurethane or PVA

14 Tested Hardware

The following hardware has been successfully incorporated in the tests on Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ doorsets.

Element	Manufacturer & Product Reference
Hinges	1. Royde & Tucker H101 lift-off type hinges 2. Royde & Tucker H102 lift-off type hinges 3. Royde & Tucker H105 lift-off type hinges 4. Eclipse cranked bearing butt type hinges – see note 1 5. Tectus TE 340 3D FR concealed hinges – see note 4 6. Tectus TE 640 3D A8 FR concealed hinges – see note 4
Closers	1. Dorma TS73V overhead closer 2. Dorma TS71 overhead closer 3. Briton 1110 overhead closer 4. Rutland TS3204 overhead closer 5. Turentek TSS 225 overhead closer 6. Hoppe AR7383 concealed closer – see note 5
Locks & latches	1. Henderson Hardware mortice latch 2. E*S Standard tubular mortice latch 3. Arrone 3 Lever mortice latch 4. Union/ASSA Abloy steel mortice latch
Furniture	1. Aluminium lever handles 2. Stainless steel lever handles 3. Tuscan Hardware flush pull handle – see note 2

1. See note 7 under section 12.5 for the Eclipse cranked bearing butt hinge fixing specification
2. The Tuscan Hardware flush pull handle can only be installed with the manufacturer's tested intumescent pack, as detailed in section 11
3. See section 15.5 below for the installation and intumescent protection details which must be followed when using Tectus concealed hinges
4. See section 15.1.1 and data sheet in appendix D for full intumescent specification required when installing concealed overhead closers.

15 Additional & Alternative Hardware

The following section details the permitted scope and constraints for fitting hardware to this door design.

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

- Latches & Locks: Test Standard EN 12209
- Single Axis Hinges: Test Standard EN 1935
- Controlled Door Closing Devices: Test Standard EN 1154
- Door Co-ordinators: Test Standard EN 1158
- Electro-Mechanically Operated Locks: Test Standard EN 14846.

Where alternative hardware to that tested is permitted in the following sections, Certifire approved hardware may be incorporated subject to the design, material and dimensional limitations identified within this assessment report and identified on the relevant Certifire certificate. This route cannot be used where only specific hardware options are permitted (e.g. the use of a specific concealed closer as in section 15.1.1 below).

15.1 Automatic Closing

Automatic closing devices must either be as tested or components of equal specification that have demonstrated contribution to the required performance of these types of 30 minute doorset designs, when tested to BS 476: Part 22: 1987 or BS EN 1634-1 or BS EN 1634-2.

Note: The top pivots to floorspring assemblies must be protected with 2mm thick intumescent gasket (see section 11) or alternatively the manufacturers tested intumescent pack.

15.1.1 Hoppe AR7383 Concealed Closer

Test FEB/F16012 demonstrates that the Hoppe AR7383 concealed overhead closer may be successfully installed within the Strebord 54 leaf design.

See the data sheet in appendix D for permitted leaf sizes when utilising the Hoppe AR7383 concealed overhead closer.

The following restrictions must be complied with where the Hoppe AR7383 concealed overhead closer is required.

1. The door leaf must be the Strebord© 54, 54mm thick design
2. Permitted doorset configurations are restricted to latched, single action, single and double leaf doorsets. Flush overpanel configurations are not permitted
3. The required leaf edge intumescent specification is given in the data sheet in appendix D
4. The rebate in the head of the leaf must be lined with 2mm thick Interdens from Dufaylite Developments Ltd and the mortice must be as tight to the mechanism as is compatible with its operation
5. Where the electronic handset controller is installed, the perimeter of the routed area for the electronics must be lined with 2mm thick Interdens from Dufaylite Developments Ltd

15.2 Latches & Locks

Latches and locks must either be as tested, or alternatively components with the following specification are acceptable.

Element	Specification
Maximum forend & strike plate dimensions	235mm high by 25mm wide by 4mm thick
Maximum body dimensions	165mm high by 100mm wide by 18mm thick
Intumescent protection	See section 11
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass (melting point ≥800°C)
Location	Between 750mm and 1200mm from the threshold

15.3 Hinges

Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ must be hung on a minimum of 3 hinges. Leaves over 2400mm high must fit 4 hinges. Hinges with the following specification are acceptable.

Element		Specification	
Blade height		90 - 120mm	
Blade width (excluding knuckle)		30 - 35mm	
Blade thickness		2.5 - 4mm	
Fixings		Minimum of 4No. 38mm long fully threaded 'twinfast' or chipboard screws per blade	
Materials		Steel, stainless steel or brass (melting point ≥800°C)	
Hinge positions	Leaf dimensions <2400mm	Top	150 -180mm from the head of the leaf to the top of the hinge
		2nd	Minimum 200mm from top hinge to central between top and bottom hinge
		Bottom	180 - 250mm from the foot of the leaf to the bottom of the hinge
	Leaf dimensions >2400mm	Top	150 - 180mm from the head of the leaf to the top of the hinge
		2nd & 3rd	Equispaced between top and bottom
		Bottom	180 - 250mm from the foot of the leaf to the bottom of the hinge
Intumescent protection		See section 11	

It is also permitted to use screw fixings as tested and supplied with the hinges approved for the Strebord© design at 30 minutes fire resistance.

15.4 Safehinge™

It is possible to fit the Safehinge™ product to the Falcon Strebord© designs. The end user must satisfy themselves that the test evidence supports the proposed end use application. Distributors of the Safehinge™ product can provide supporting test evidence for this doorset design and must be contacted to confirm exact requirements.

15.5 Tectus Concealed Hinges

It is permitted to fit the following Tectus concealed hinges to the Falcon Strebord© designs based on fire test referenced WF316349:

- TECTUS TE 340 3D FR
- TECTUS TE 640 3D A8 FR.

The frame profile for the hanging jamb of the doorframe (i.e. the jamb which will be rebated to accept the Tectus hinge) must be a minimum of 44mm thick, not including the doorstop. Door frame materials and dimensions must otherwise remain as specified in section 9. Therefore the hanging jamb and the closing jamb may be of different dimensions.

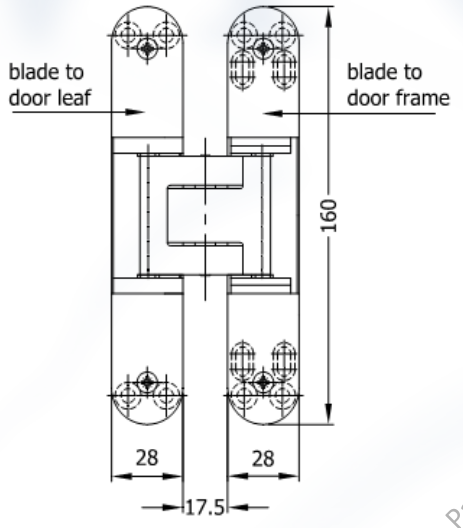
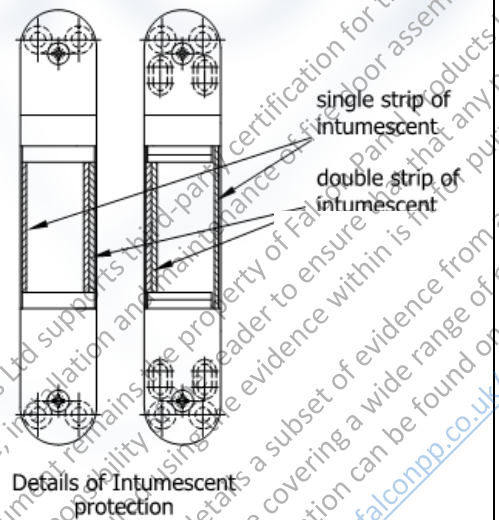
The material of the Tectus hinges must remain as tested; die cast zinc hinge body parts with aluminium knuckle components.

The mortice must be as tight to the hinge body as is compatible with its operation.

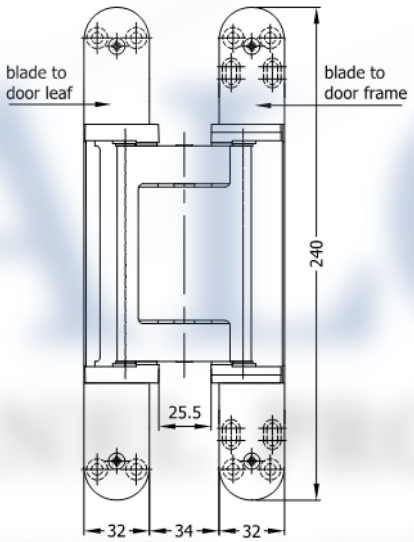
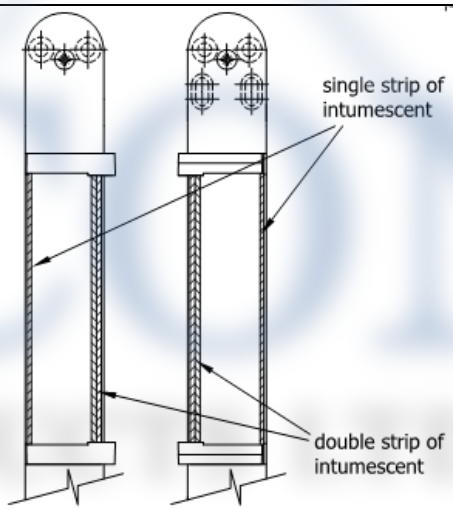
Fixings for the hinges must be stainless steel counter sunk head wood screws; 4No. per hinge blade and 40mm long by 5.2mm diameter.

The following tables define the permitted intumescent protection and installation details required for use with the tested Tectus hinges.

15.5.1 TECTUS TE 340 3D FR

Element	Product & Manufacturer	Location (mm)
TECTUS TE 340 3D FR	ROKU strip M130 – Rolf Kuhn GmbH	Self-adhesive graphite strips fitted as illustrated below: Single strip–1 thick x 27 wide x 47 or 59 long. Double strip–Each 2 thick x 17 wide x 47 long.
		

15.5.2 TECTUS TE 640 3D A8 FR

Element	Product & Manufacturer	Location (mm)
TECTUS TE 640 3D A8 FR	ROKU strip M130 – Rolf Kuhn GmbH	Self-adhesive graphite strips fitted as illustrated below: Single strip–1 thick x 36 wide x 115 long. Double strip–Each 2 thick x 22 wide x 115 long
		

15.6 Pull Handles

Handles may be fixed or bolted through the door leaf, providing they are steel or brass and the length is limited to 1200mm between the fixing points. If through-fixed, there must be no more than 1mm clearance between the hole and stud.

15.7 Push Plates/Kick Plates

Steel, stainless steel or brass plates are permitted up to a maximum of 20% of the door leaf area if mechanically fixed and a maximum of 30% if bonded with a contact or other thermally softening adhesive. Plates must not return around the door edges.

Kick plates (to a maximum size of 250mm high x 2mm thick) and finger plates (to a maximum size of 300mm high x 160mm wide x 2mm thick) may be recessed flush with the face and fitted on one or both sides of the leaf.

15.8 Door Selectors

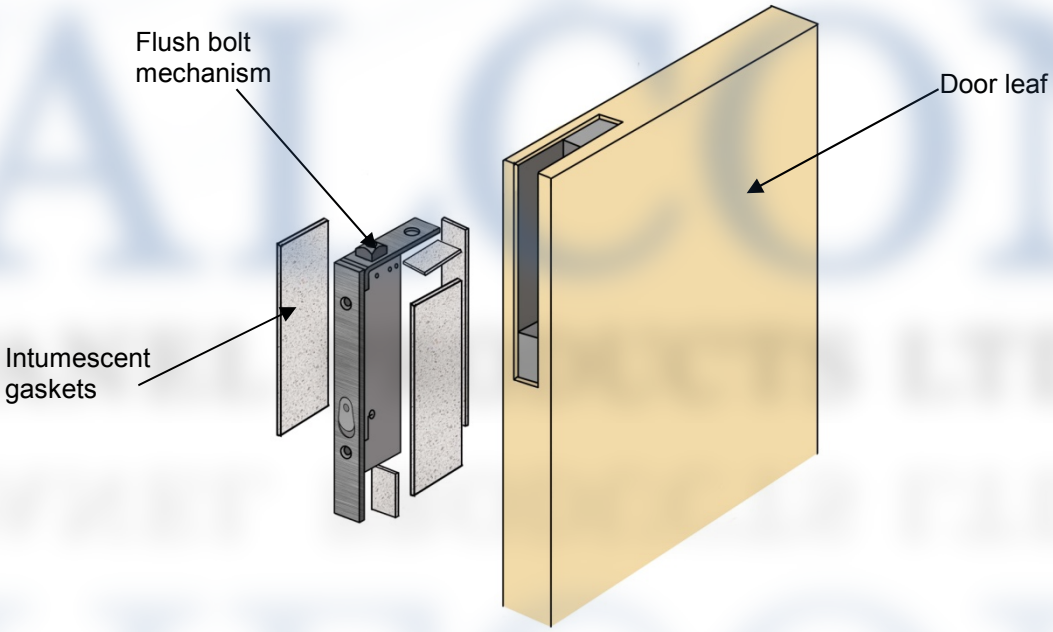
These may be freely applied, provided that they are not invasive in the leaf edges or door frames and they do not interfere with the self-closing action of the door leaf. Products that are invasive will require fire resistance test/assessment evidence to support their use.

15.9 Flush Bolts

Flush bolts may be incorporated centrally into the top and bottom of one meeting edge, providing the following maximum dimensions are not exceeded and the components are fitted opposite the edge fitted with intumescent strips:

- 200mm long x 20mm deep x 20mm wide

Flush bolts must be steel or brass and the mortice must be as tight to the mechanism as is compatible with its operation. All edges of the mortice must be protected with intumescent gaskets as specified in section 11. Alternatively, the hardware manufacturers tested gaskets may be used. See diagram below for example of intumescent protection to flush bolt:



15.10 Door Security Viewers

Door security viewers with brass or steel bodies of a diameter less than or equal to 15mm may be used provided that the through-hole is bored tight to the case of the viewer (maximum tolerance +1mm). Lenses must be glass and the item must be bedded into a tested intumescent mastic.

15.11 Panic Hardware

Panic hardware may be fitted, provided that its installation does not require the removal of any timber from the leaf, stop or frame reveal and it in no way interferes with the self-closing action of the door leaf.

15.12 Air Transfer Grilles

15.12.1 General

Air transfer grilles may be fitted providing the product has suitable test evidence to BS 476: Part 22: 1987 or BS EN 1634-1, that demonstrates a minimum 30 minutes integrity performance when installed within a timber based doorset of comparable thickness. Margins to the leaf edges will remain as detailed for glazing and the position of the unit will be dictated by the pressure regime tested in the proving evidence (normally below mid-height). The area occupied by the air transfer grille must not exceed 0.2m^2 and must be deducted from the area of glazing, if both elements are fitted.

15.12.2 Pyroplex Air Transfer Grilles

The following Pyroplex air transfer grilles have been assessed as acceptable for use with the door leaf designs referred to in sections 2.2 - 2.3 of this assessment.

The grilles must be fitted 100mm from the edge of the door leaf and 80mm apart if more than one grille is to be fitted. The area occupied by the air transfer grille(s) must be deducted from the percentage of glazing, if both elements are fitted. The grilles may be fitted up to a maximum height of 2200mm from the threshold.

Part No.	**Dimensions** (mm)	**Air Flow** (sq. cm)	**Compatible Faceplates**
ATG 1500	150 x 150	153	FP1500
ATG 1503	150 x 300	307	FP1503
ATG 1300	300 x 300	614	FP1300
ATG 2251	112 x 225	161	FP2251
ATG 2250	225 x 225	323	FP2250

The Pyroplex air transfer grilles must be installed in accordance with the manufacturer's installation details, which include a 6mm thick hardwood aperture liner and Pyroplex intumescent mastic applied around the perimeter of the grille. Full details can be obtained from Pyroplex Ltd.

15.13 Environmental Seals

Silicon based flame retardant acoustic, weather and dust seals (e.g. Lorient IS1212, IS1511, IS7025, IS7060 or Sealed Tight Solutions Ltd. ST1009) may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

15.14 Threshold Seals

The following types of automatic threshold drop seals may be recessed in to the bottom rail of leaves to this design without compromising the performance.

Manufacturer	Product Reference
Norsound Ltd.	NOR810, NOR810S & NOR810dB+
Lorient Polyproducts Ltd.	IS8010s
Raven Products Ltd.	RP8Si
Athmer	Schall-Ex Duo L-15

15.15 Cable-Way

Based on the integrity performance of the doorset construction, with no burn-through of the core material, we consider it acceptable to allow the provision for a concealed cable-way to facilitate electro-magnetic closing/latching mechanisms. The cable-way must be concealed in the following way:

1. A hole drilled centrally through the leaf of maximum 10mm diameter
2. The cable for the electronic closing/latching mechanisms must be no more than 2mm smaller in diameter than the hole through the leaf
3. The cable for the electronic closing/latching mechanism must be PVC encased
4. Cable ways are only permitted for use with latched, single leaf, single acting doorsets with maximum leaf dimensions of 2100mm (h) x 900mm (w)
5. The hole must be located below 1500mm from the threshold and must be spaced a minimum of 90mm from any apertures within the leaf, e.g. glazing, air transfer grilles or letter plates, etc.

This approval is subject to the hardware manufacturer having the appropriate test evidence for the product for use with this type of 30 minute construction. Test evidence generated in steel doorsets is not acceptable. Any tested intumescent gaskets for the lockset, closing mechanism, receiver plate, cable loops, etc. must be replicated.

15.16 Letter Boxes/Plates

Letter boxes/plates may be fitted providing the product has demonstrated contribution to the required integrity performance of these types of doorset designs, when tested to BS 476: Part 22: 1987 or BS EN 1634-1, when installed in a timber based doorset of comparable thickness. Products may be fitted up to 1200mm from floor level and not closer than 100mm to any leaf edge.

15.17 Identification Plates

Plastic or metal fire safety signs may be glued or screwed to the face of the door leaves. The signage must comply with BS 5499-5: 2002 according to whether the door is:

a) To be kept closed when not in use (Fire Door Keep Shut)

b) To be kept locked shut when not in use (Fire Door Keep Locked Shut)

c) Held open by an automatic release mechanism or free swing device (Automatic Fire Door Keep Clear).

It is also permitted to fit aluminium (max. thickness 2mm) or PVC (max. thickness 3mm) identification plates, complying with HTM 58 – Internal Doorsets, HTM Building Component Series, NHS Estates. The signage must not exceed 45mm diameter and can be fitted flush with the leaf face, a minimum of 50mm from any edge.

16 Door Gaps

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

Location	Dimensions
Door edge gaps	Representative of those tested but as a guideline, a minimum of 2mm and a maximum of 4mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm
Threshold	10mm between bottom of leaf and top of floor covering

17 Structural Opening

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

18 Fixings

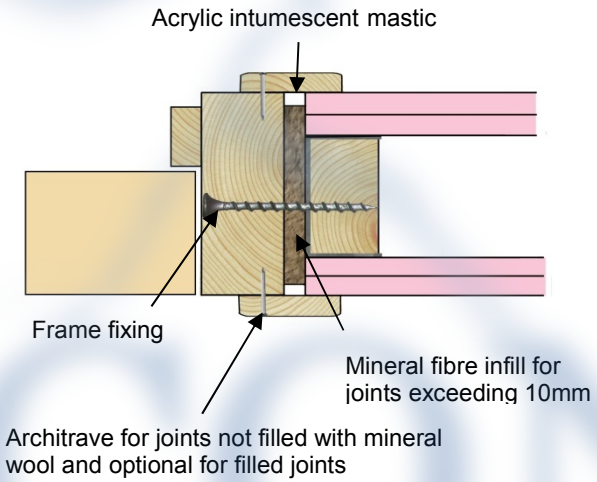
The frame jambs are to be fixed to the supporting construction using steel fixings at 600mm maximum centres. The fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 40mm. It is not necessary to fix the frame head, although packers must be inserted, Craylon Ltd Craylon Blue 60 packers have been successfully tested for this application.

19 Sealing to Structural Opening

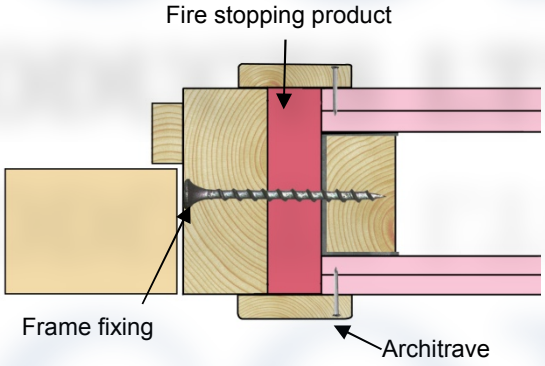
The door frame to structural opening gap must be protected using one of the following methods.

1. Gaps up to 10mm must be sealed on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.

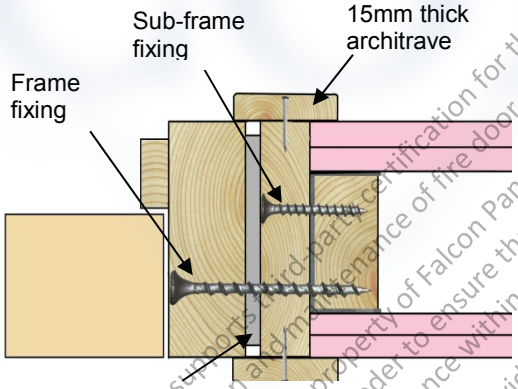
2. Gaps between 10mm and 20mm must be tightly packed with mineral fibre, capped on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional.



3. Gaps up to 20mm filled with proprietary fire stopping product (e.g. expanding PU foam or preformed compressible intumescent foam). Products must be tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side. Craylon Ltd Blue60 expanding foam has been successfully tested for this application.



4. Timber based or non-combustible sub-frame up to 50mm thick, with gaps up to 10mm between the components filled on both sides with 10mm depth of acrylic intumescent mastic or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.



Guidance for various methods of sealing the frame to structural opening gap is also given in BS 8214: 2016, “Code of practice for fire door assemblies”, which may be referred to where appropriate.

20 Insulation

Insulation performance may be claimed for Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ doorset designs meeting the following criteria.

Type	Details
Partially insulating	Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Unglazed or doorsets including 30 minute insulating glazing (see section 6.2)

21 Smoke Control

21.1 General

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

(a) have a leakage rate not exceeding $3m^3/m/hour$ (head and jambs only) when tested at 25Pa under BS 476 *Fire tests on building materials and structures*, Section 31.1 - *Methods for measuring smoke penetration through doorsets and shutter assemblies, Method of measurement under ambient temperature conditions*; or

(b) meet the additional classification requirement of Sa when tested to BS EN 1634-3: 2004 - *Fire resistance tests for door and shutter assemblies*, Part 3 – *Smoke control doors*.

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

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

21.2 Further Considerations

Note that there is other guidance available, including BS EN 9999-2008 - *Code of practice for fire safety in the design, management and use of buildings*, which may impose different or additional requirements, such as consideration of the gap between door leaf and threshold.

Responsibility for the appropriate smoke sealing specification and performance of the doors should be agreed between the relevant parties (i.e. specifier, manufacturer, contractor) prior to commencing manufacture and/or installation.

22 Conclusion

If the Falcon Panel Products Ltd. Strebord© 35+ & Strebord© 38+ door leaf designs, constructed in accordance with the specifications documented in this global assessment, were to be tested in the appropriate configuration in accordance with BS 476: Part 22: 1987, it is our opinion that they would provide a minimum of 30 minutes integrity and insulation, subject to section 20.

23 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: Neil Harrison

For and on behalf of: FALCON PANEL PRODUCTS LTD.

FALCON
PANEL PRODUCTS LTD

24 Limitations

The following limitations apply to this assessment:

1) This assessment addresses itself solely to the elements and subjects discussed and does not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.

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

3) This assessment has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.

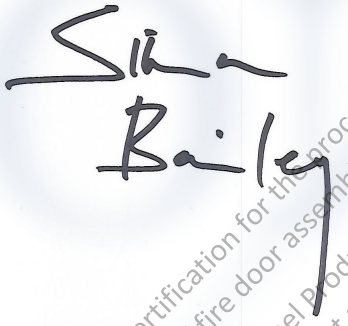
4) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

5) This assessment relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this assessment, the element is suitable for its intended purpose.

25 Validity

1) The assessment is initially valid for five years from the date of issue, after which time it must be submitted to Exova Warringtonfire for re-appraisal

2) This assessment report is not valid unless it incorporates the declaration given in Section 23, duly signed by the applicant.

Signature:		
Name:	**A M Winning**	**S Bailey**
Title:	Lead Product Assessor	Senior Product Assessor

Appendix A

Performance Data

Primary Data

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
RF98048	ULSADD	2100 x 902 x 44	BS 476: Pt 22: 1987	42
RF98137	ULSADD	2100 x 902 x 44	BS 476: Pt 22: 1987	32 (glazing) 41
RF99050	ULSADD + OP	2100 x 900 x 44	BS 476: Pt 22: 1987	36
RF01030	ULSADD	2100 x 902 x 44	BS 476: Pt 22: 1987	32
RF02109	A: ULSASD	A: 2136 x 936 x 44	BS 476: Pt 22: 1987	A: 34
	B: LSASD	B: 2700 x 1072 x 44		B: 35
Warres 144699	ULSADD	2100 x 901 x 44	BS 476: Pt 22: 1987	38
Warres 141445	ULSADD	2100 x 902 x 44	BS 476: Pt 22: 1987	40
Chilt/A05134 (Tall doors)	A: ULSASD	A: 2040 x 915 x 44	BS 476: Pt 22: 1987	A: 37
	B: ULSASD	B: 2800 x 915 x 44		B: 38
RF11161 (70 x 25mm softwood door frames)	ULSADD	2135 x 915 x 35	BS 476: Pt 20/22: 1987	32
Chilt/RF06083 (Lower density lippings)	ULSASD	2700 x 900 x 45	BS 476: Pt 22: 1987	34
Warres137590	A: ULSASD	2044 x 942 x 44	BS 476: Pt 22: 1987	A: 38
	B:ULSASD			B: 30
Chilt/RF07109	ULSADD	2100 x 902 x 44	BS 476: Pt 22: 1987	36
Warres 141445	ULSADD	2100 x 902 x 44	BS 476: Pt 22: 1987	40
Chilt/RF08088 (Pyroplex door edge seals)	ULSADD	2440 x 915 x 44	BS 476: Pt 22: 1987	44
Chilt/RF08125 (MDF door frames)	ULSADD	2442 x 915 x 44	BS 476: Pt 22: 1987	49
WF153130 (Pyroplex door edge seals)	ULSASD	2040 x 926 x 45	BS 476: Pt 22: 1987	A: 32
				B: 36

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)	
RF10011 (Norfast perimeter sealing system)	A: ULSASD	2740 x 926 x 44	BS 476: Pt 22: 1987	Integrity	51
				Insulation	51
RF11160 (Expanded decorative groove scope)	ULSASD	2131 x 928 x 44	BS 476: Pt 22: 1987	Integrity	33
				Insulation	33
RF11172 (25mm thick MDF door frames)	ULSADD	2135 x 915 x 43	BS 476: Pt 20/22: 1987	Integrity	39
				Insulation	39
RF11059 (Construction Specialities – Acrovyn edge protectors)	A: ULSADD	2100 x 900/300 x 44	BS 476: Pt 20/22: 1987	Integrity	43
				Insulation	45
	B: ULSADD	2100 x 900/300 x 44		Integrity	39
				Insulation	39
CFR1603041 (Exitex Seals)	ULSADD	2400 x 1000/1000 x 44	BS EN 1634-1: 2014	Integrity	34
				Insulation	34
CFR1604291(Exitex Seals)	A: ULSASD	2040 x 926 x 44		Integrity	44
				Insulation	44
	B: ULSASD	2040 x 926 x 44		Integrity	39
				Insulation	36

Supplementary Data

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
RF02075	A: ULSADD	2100 x 904/300 x 44	BS EN 1634-1: 2000	A: 26
	B: ULSASD	2099 x 903 x 44		B: 31
RF02110 (Pyroswiss)	A: LSASD	2044 x 825 x 44	BS EN 1634–1: 2000	A: 38
WF146520 (Pyroplex air transfer grilles)	Indicative	990 x 900 x 44	Principles of BS 476: Pt 20: 1987	41
WF137714 (Pyroplex glazing system 30054)	Indicative	990 x 900 x 44	Principles of BS 476: Pt 20: 1987	41
IF09145 (Grooves)	A: ULSASD	1010 x 926 x 44	Principles of BS 476: Pt 20: 1987	A: 40
	B: ULSASD			B: 43
FEI08011 (ESG Pyrotech 630 toughened glass)	ULSASD	1020 x 840 x 44	Principles of BS 476: Pt 20: 1987	35
A07051 Rev B (Lorient Palusol & Type 617)	Various	Various	BS 476: Pt 22: 1987	30 & 60
IF12011 (Norsound Vision – softwood beads & square beads with non-insulating glass)	Swinging sample (ULSASD)	1052 x 1020 x 44	Temperature & pressure conditions of BS 476: Pt 20: 1987 & principles of BS 476: Pt 22: 1987	Integrity: 38
RF11177 (Pilkington Pyroclear)	ULSASD in a glazed screen	2070 x 930 x 44	BS EN 1634-1: 2008	Integrity: 32
IF13014 (Norsound hardware gaskets)	A: LSADD	1268 x 279 x 44	BS 476: Part 20/22: 1987	A: 48
	B: LSADD	1262 x 279 x 54		B: 69
IF13061 (Norsound Universal glazing system)	ULSASD	1052 x 900 x 64	Temperature & pressure conditions of BS 476: Pt 20: 1987 & principles of BS 476: Pt 22: 1987	Integrity: 96
PF14168 Rev. A (Tuscan flush pull handle)	LSASD	2040 x 926 x 46	BS EN 1634-1: 2014 & BS EN 1363-1: 2012	Integrity: 48
PF14029 (Streframe glazing beads)	A: ULSASD	2040 x 926 x 56	BS 476: Part 20/22: 1987	Integrity: 53 Insulation: 53
PF15034 (STS scope)	ULSADD	2900 x 1000/1000 x 44	BS 476: Part 20/22: 1987	Integrity: 33
RF13263 (Over-rebated leaves)	A: ULSASD	2155 x 955 x 44	BS EN 1634-1: 2008 & BS EN 1363-1: 2012	Integrity: 41 Insulation: 38
	B: ULSASD			Integrity: 32 Insulation: 32

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
CFR1403122 (Therm-A-Seal with large leaves & Therm-A-Bead glazing system)	ULSADD	2440 x 931/931 x 44	BS EN 1634-1: 2014	Integrity: 34
WF341550 (Morland Quickfix glazing beads)	Indicative sample	1380 x 608 x 44	BS 476: Pt 20: 1987	A: 35
WF342584 (Morland Quickfix glazing beads)	Indicative sample	1380 x 608 x 44	BS 476: Pt 20: 1987	A: 35
WF316349 (Tectus concealed hinges)	A: ULSASD	1980 x 933 x 44	BS EN 1634-1:	A: 34
	B: ULSASD	1980 x 933 x 44		B: 34
RF12065 Rev. B (Vistamatic privacy glass)	A: LSASD	2100 x 1140 x 44	BS EN 1634-: 2008 & BS EN 1363-1: 1999	A: 30
	B: LSASD	2100 x 1140 x 44		B: 34
CFR1603041 (Blue60 fire-stopping foam and packers)	LSADD	2400 1000/1000 44	BS EN 1634-1: 2014	Integrity: 64
FEB/F16012[7] (Hoppe Concealed closer)	LSASD	2042 925 5	BS 476: Pt 22: 1987	Integrity: 66

1. Test RF02075 is used to justify 8mm thick lippings. Although the double leaf failed at 26 minutes, the result of the single leaf and the known relative severity of the European test standard compared to the BS test standard permits us to assess the thinner lippings across the range of assessed doorsets
2. The Pyroplex air transfer grilles in test WF146520 were tested under positive pressure for 30 minutes fire resistance in a section of 44mm thick particleboard door. It has been deemed acceptable for the same products to be fitted at positive and negative pressure locations based on the comparative data generated for 60 minutes fire resistance contained in test WF148053
3. The doorsets tested in IF09145 were positioned in the furnace to simulate both the top and bottom half of a standard size doorset
4. The tested specification of the Norfast sealing system is contained in test report RF10011 and is held in confidence. The tested direction of the seal, with respect to fire exposure, was asymmetric. However, based on the performance of the seal in RF10011 and the leaf size scope given in the relevant data sheet in Appendix D, it has been assessed as being acceptable for use with doorsets that open in either direction
5. For test RF11170, a core density of 520kg/m^3 was measured by Exova Warringtonfire prior to the test commencing. Based on comparison of the distortion figures between test RF11170 and RF09060 and RF07109 it is our assessment the core density range assessed in section 2 is acceptable
6. Test PF14029 has been used to justify Streframe glazing beads. The test was conducted using a 60 minute glazing system and due to the lower density of the timber compared to that normally used for glazing applications, it has been necessary to specify the tested 60 minute glazing system for 30 minute applications. See the main assessment for details
7. Test FEB/F16012 has been used to justify the use of Hoppe concealed overhead closers, see section 15.1.1. for full required installation details.

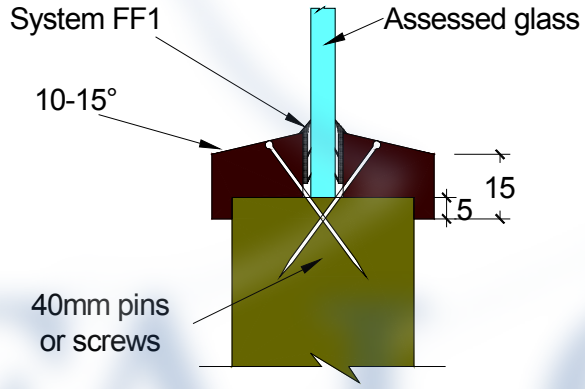
Appendix B

Revisions

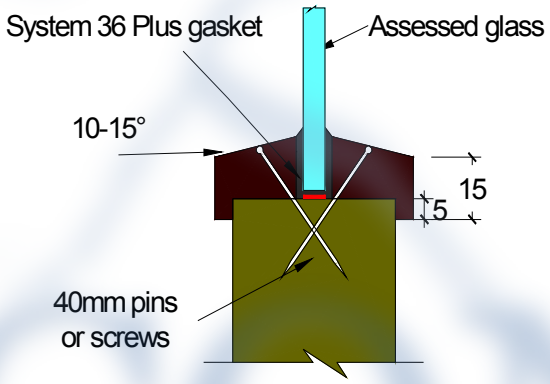
Revision	Exova Warringtonfire Ref.	Date	Description

Appendix C

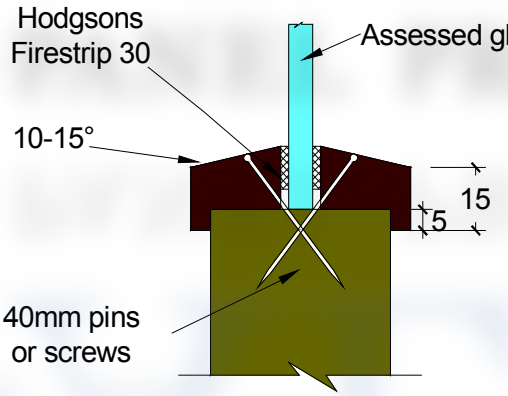
Proprietary 30 Minute Glazing Systems



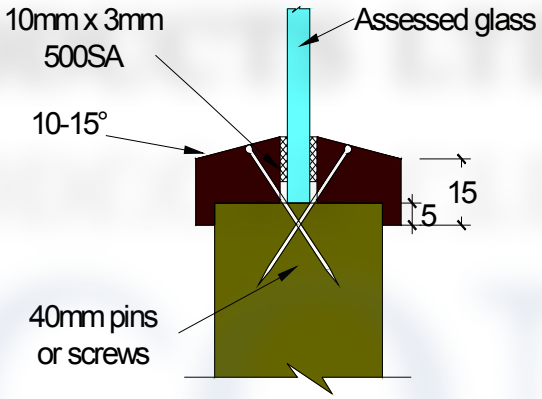
System FF1
Lorient Polyproducts Ltd



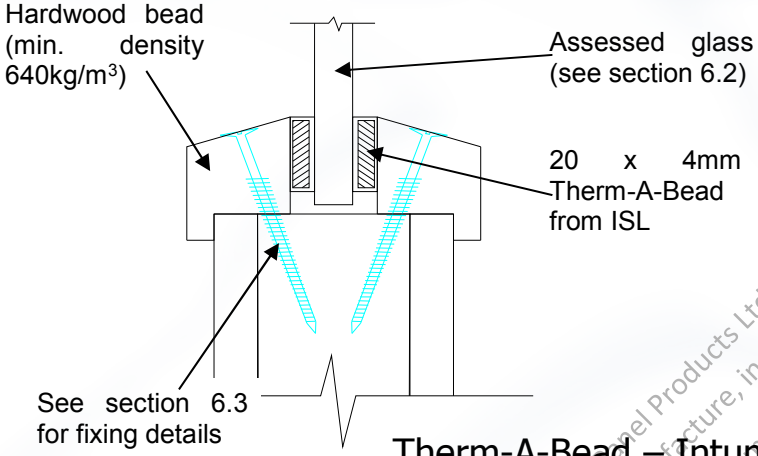
System 36 Plus
Lorient Polyproducts Ltd



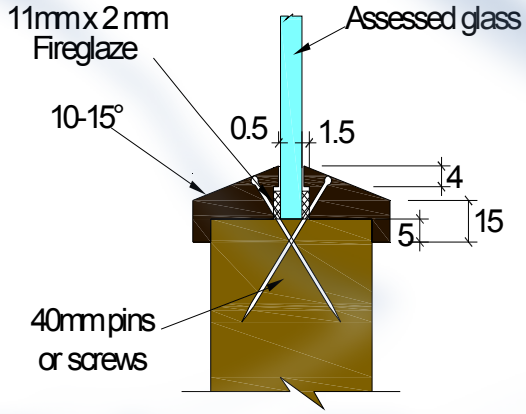
Firestrip 30
Hodgsons Sealants Ltd



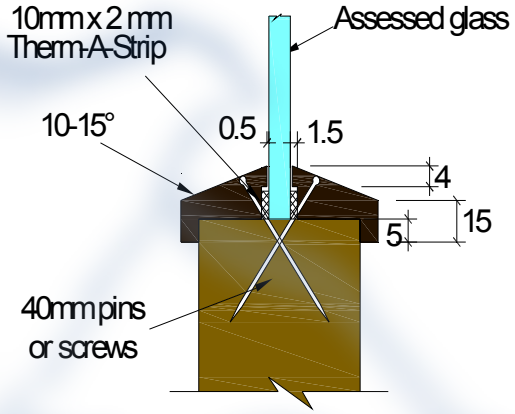
Pyroglaze 30
Mann McGowan Ltd



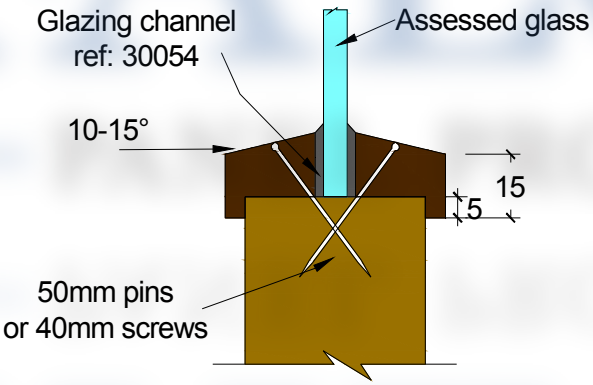
Therm-A-Bead – Intumescent Seals Ltd.



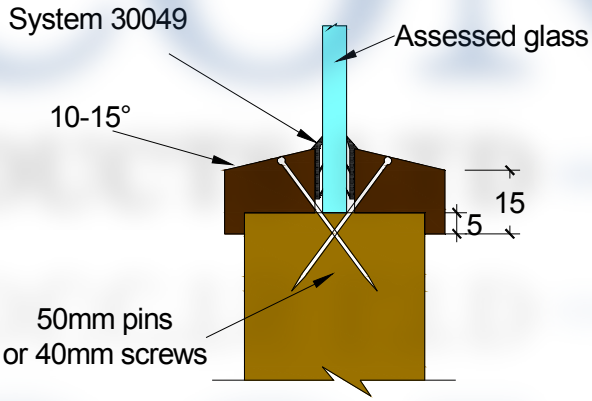
Fireglaze
Sealmaster Ltd



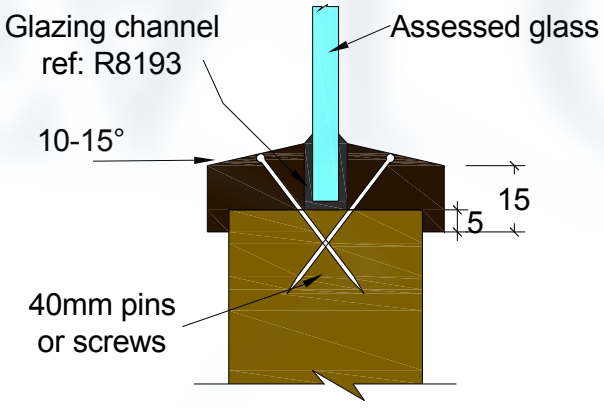
Therm-A-Strip
Intumescent Seals Ltd



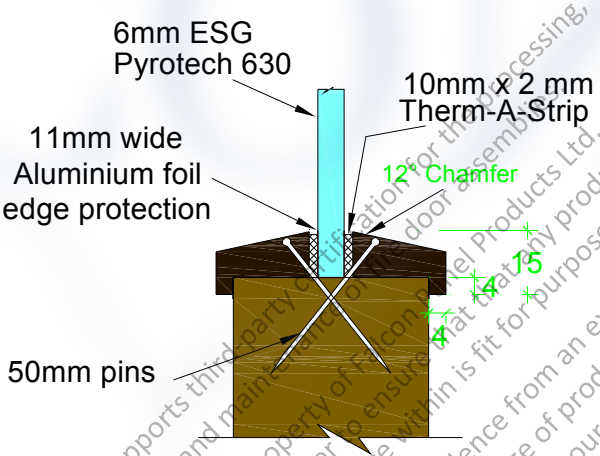
Pyroplex Ltd



Pyroplex Ltd



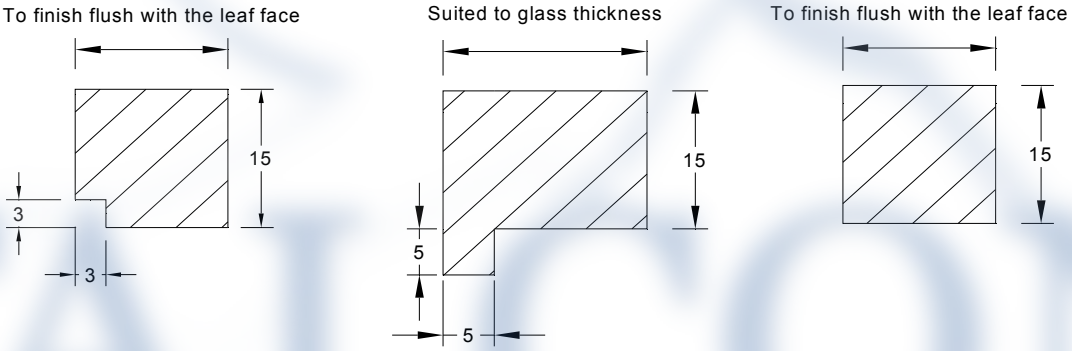
Pyroplex Ltd



Glazing system required for use with ESG Pyrotech 630 Glass

Assessed Square Glazing Bead Profiles

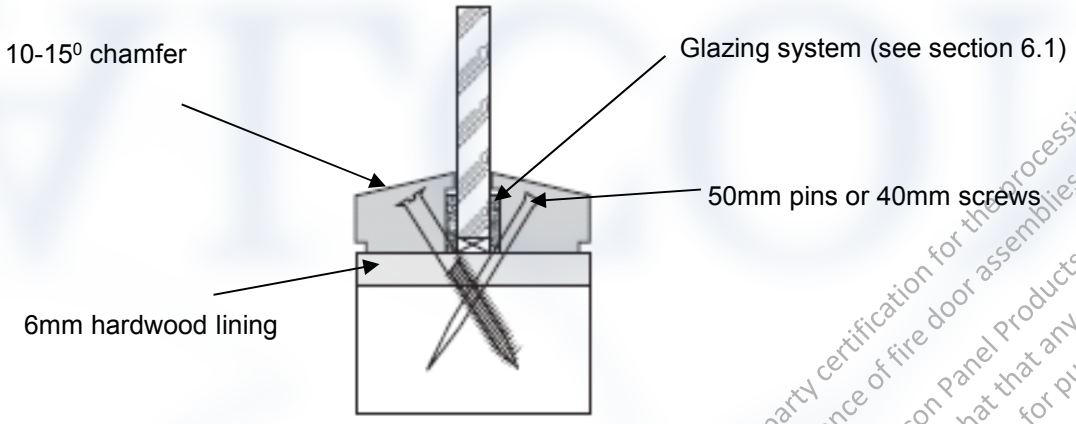
The following square bead profiled may be used as an alternative to the splayed beads detailed above in the glazing system diagrams above - refer to section 6 for glazing system and glass restrictions.



Splayed Flush Bead Option

A splayed, flush, bead may be used with glazing systems approved for use with square beads in section 6 subject to the following:

1. The aperture must be lined using ≥6mm thickness of hardwood of ≥640kg/m^3 density
2. The bead must be ≥ to 15mm high, with a 10 - 15^0 chamfer
3. A rebate not exceeding 2 x 2mm may be used to the bead or lining to accommodate door thickness tolerances
4. The diagram below depicts the assessed system:



Exova Warringtonfire
Chiltern House
Stocking Lane
Hughenden Valley
High Wycombe
Buckinghamshire
HP14 4ND

T: +44 (0) 1494 569 800
F: +44 (0) 1494 564 895
E: globalfire@exova.com
W: www.exova.com

Testing, calibrating, advising.

Appendix D

Data Sheets for:

Falcon Panel Products Ltd.

Strebord© 35+ & Strebord© 38+
30 Minute Fire Resisting Doorsets

Falcon Panel Products – Strebord© 35+/38+ - With Softwood Stiles & Rails Only

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 01	Configuration		Height (mm)		Width (mm)
Leaf Sizes	ULSASD & DASD	From:	2138	x	1020
		To:	2366	x	916
	LSASD	From:	2138	x	1045
		To:	2416	x	916
Maximum Overpanel Height (mm)		Transomed	2000		

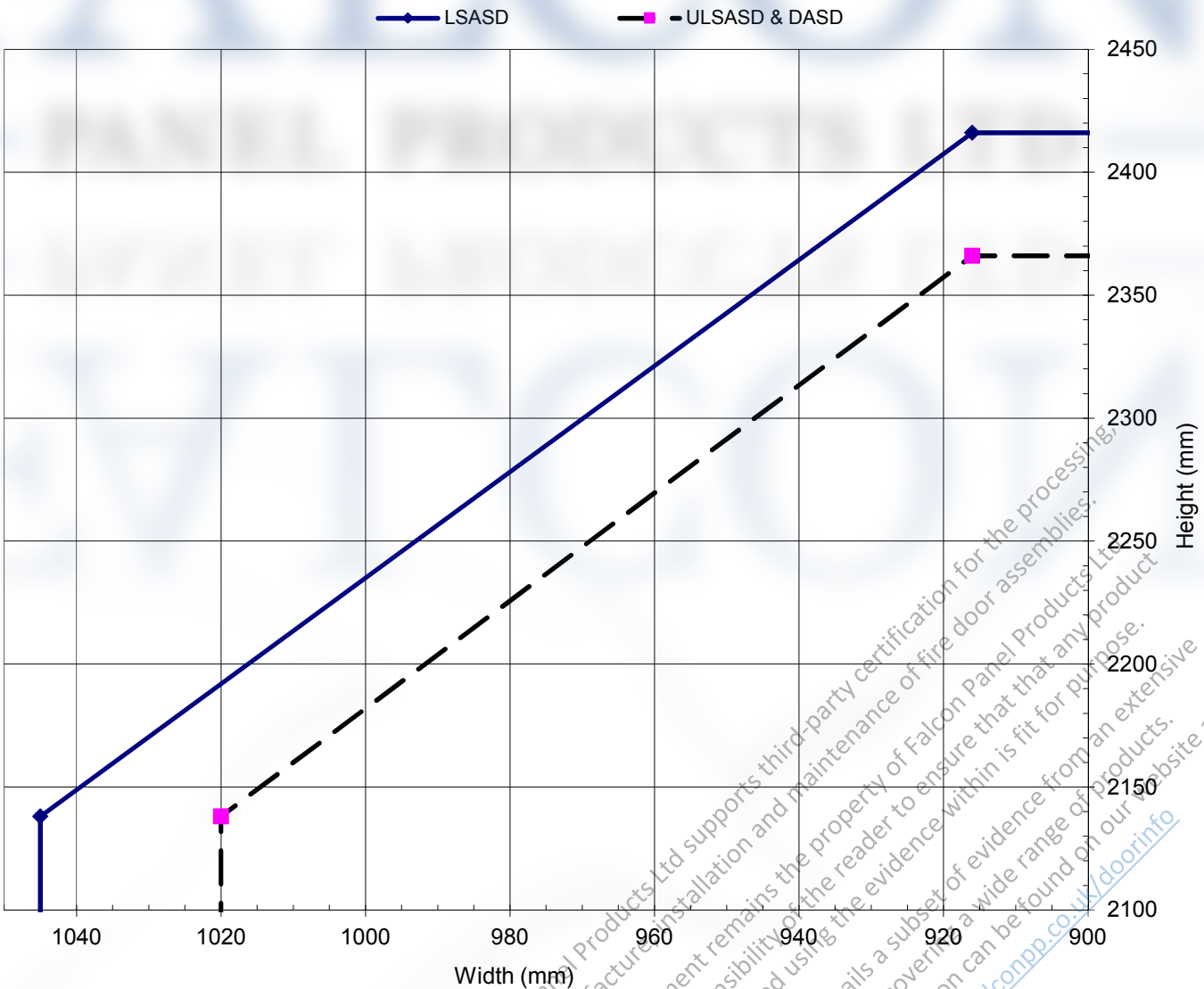
Intumescent Materials: Mann McGowan Ltd. Pyrostrip 100P

Head: 1No. 10x4mm fitted centrally in the leaf edge or frame reveal.

Jambs: 1No. 10x4mm fitted centrally in the leaf edge or frame reveal.

Hardware Protection: See section 11.

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+/38+ - With Softwood Stiles & Rails Only

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 02	Configuration		Height (mm)		Width (mm)
Leaf Sizes	ULSADD & DADD	From:	2138	x	970
		To:	2266	x	916
	LSADD	From:	2138	x	995
		To:	2316	x	916
Maximum Overpanel Height (mm)		Transomed	1500		

Intumescent Materials: Mann McGowan Ltd. Pyrostrip 100P

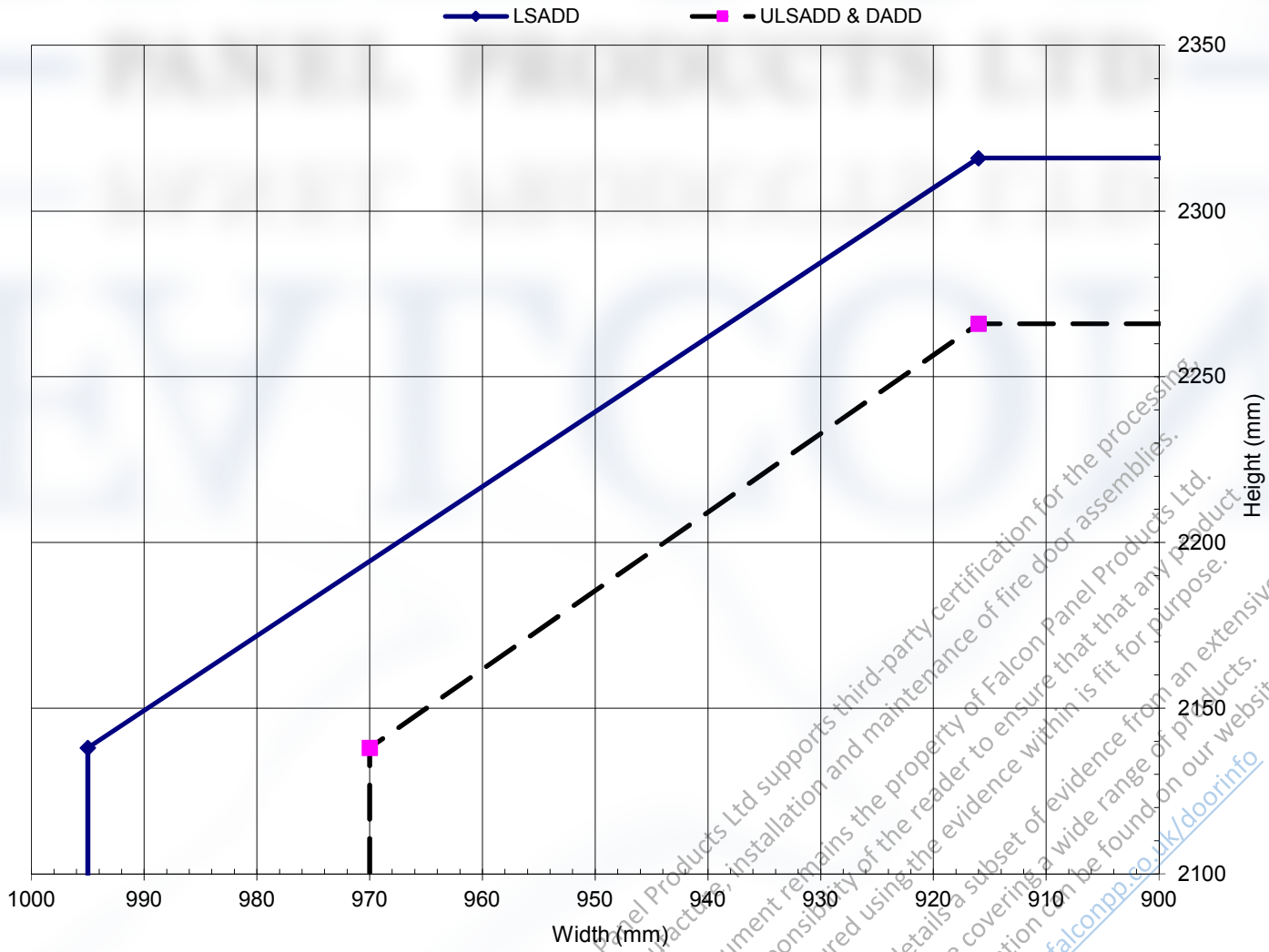
Head: Square: 10x4mm exposed and centrally fitted in the leaf or frame head.

Meeting Edges:
Square: 2No. 10x4mm spaced 10mm apart and centrally fitted in one leaf edge.

Jambs & Overpanels: 1No. 10x4mm exposed and centrally fitted in the leaf or frame.

Hardware Protection: See section 11.

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+ - Over-Rebated Lippings

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 03	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2155	x	1009
		To:	2270	x	955
	ULSASD	From:	2155	x	984
		To:	2220	x	955
Maximum Overpanel Height (mm)		Transomed	2000		

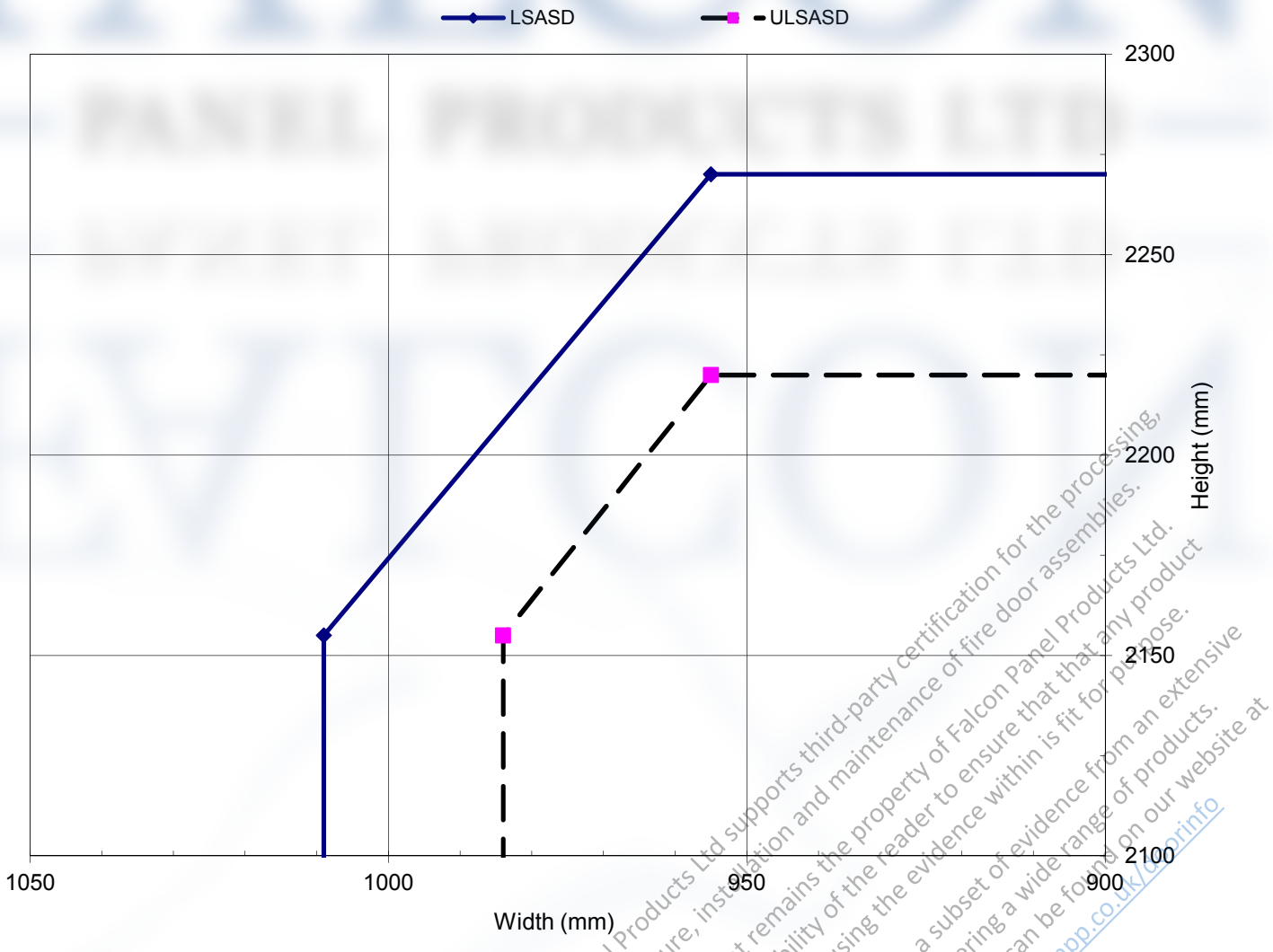
INTUMESCENT MATERIALS: Pyroplex

HEAD: 2No. 10x4mm strips fitted 5.5mm apart and 4mm from the unexposed face in the leaf head

JAMBS & OVERPANEL: 2No. 10x4mm strips fitted 5.5mm apart and 4mm from the unexposed face in the leaf edges

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 04	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2900	x	1125
		To:	3195	x	1000
	ULSASD & DASD	From:	2900	x	1100
		To:	3145	x	1000
Maximum Overpanel Height (mm)		Transomed	2000		

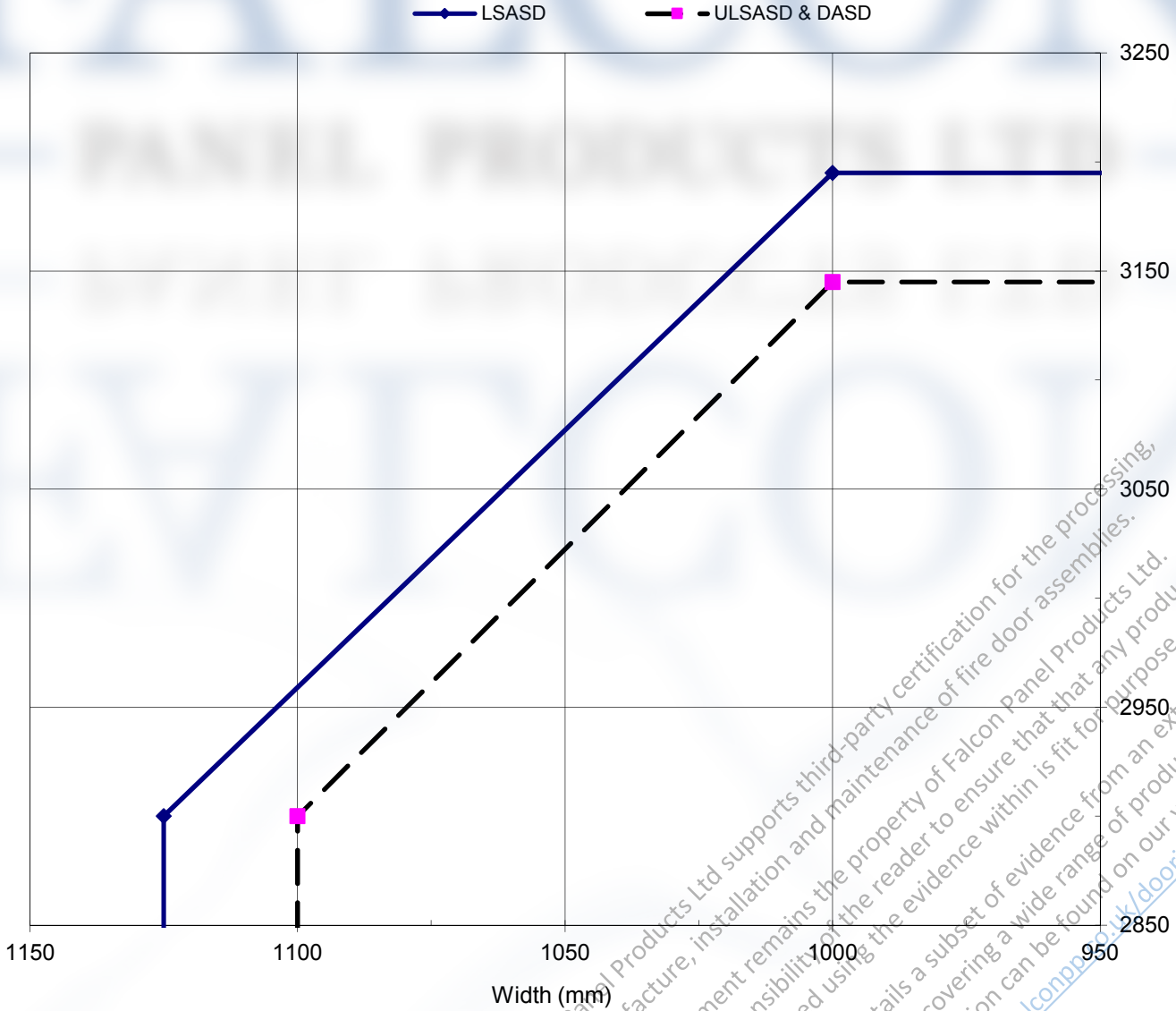
INTUMESCENT MATERIALS: STS Fire – Sealed Tight Solutions Ltd.

HEAD: 1No. 15x4mm strip centrally fitted in the head of the frame reveal

JAMBS & OVERPANEL: 1No. 15x4mm strip centrally fitted in the jambs of the frame reveal

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 05	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2740	x	951
		To:	2790	x	926
	ULSASD & DASD	From:	2740	x	926
		To:	2740	x	926
Maximum Overpanel Height (mm)		Transomed	2000		

INTUMESCENT MATERIALS: Norfast Perimeter Seal

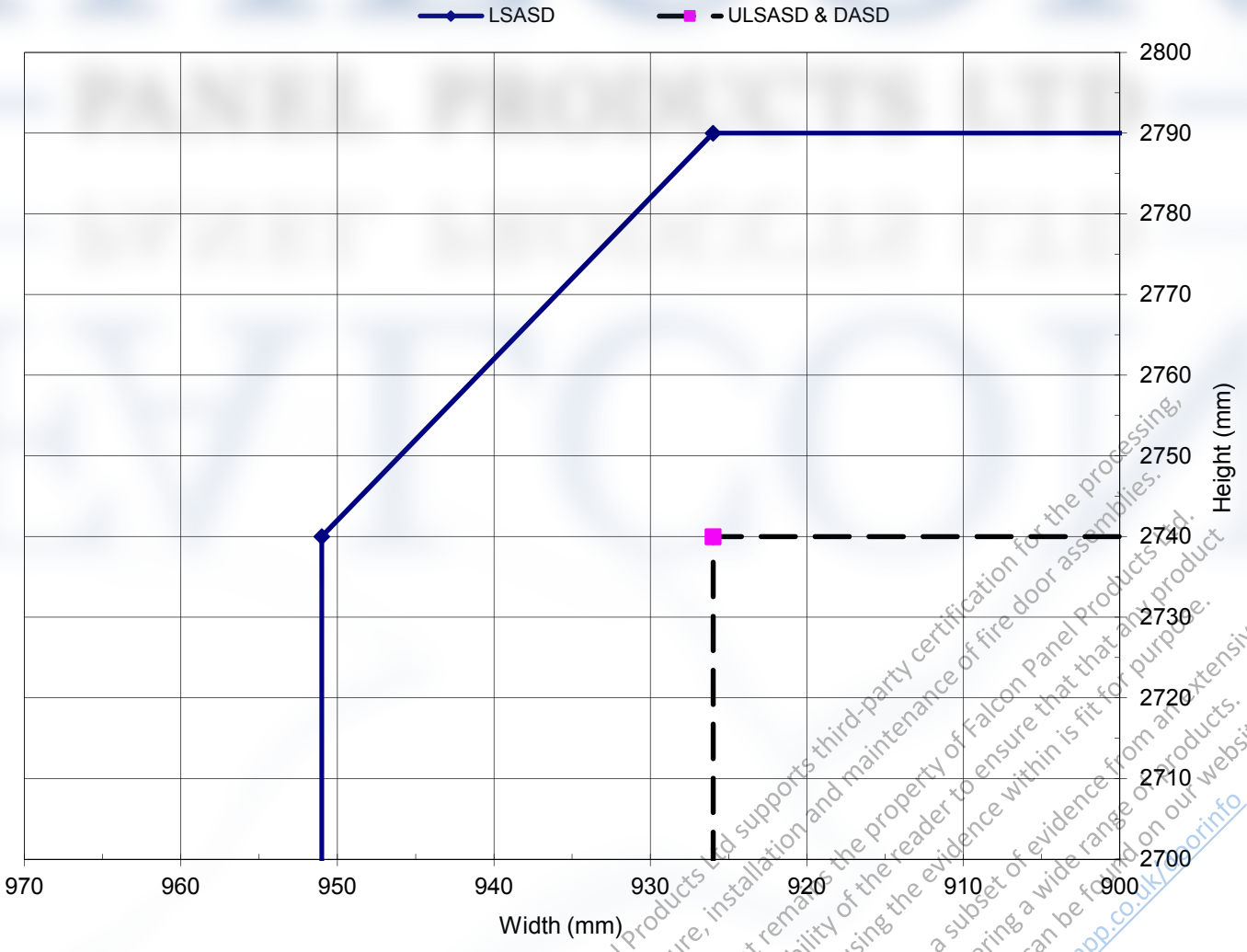
HEAD: 1No. Norfast seal surface fixed in the frame reveal butted up against the upstand of the door stop

JAMBS: 1No. Norfast seal surface fixed in the frame reveal butted up against the upstand of the door stop

OVERPANEL: 1No. 10x4mm intumescent seal (see approved edge seal types in section 11) centrally fitted in the edges of the overpanel or frame reveal

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 06	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2100	x	1067
		To:	2460	x	902
	ULSASD & DASD	From:	2100	x	1042
		To:	2410	x	902
Maximum Overpanel Height (mm)		Transomed	2000		

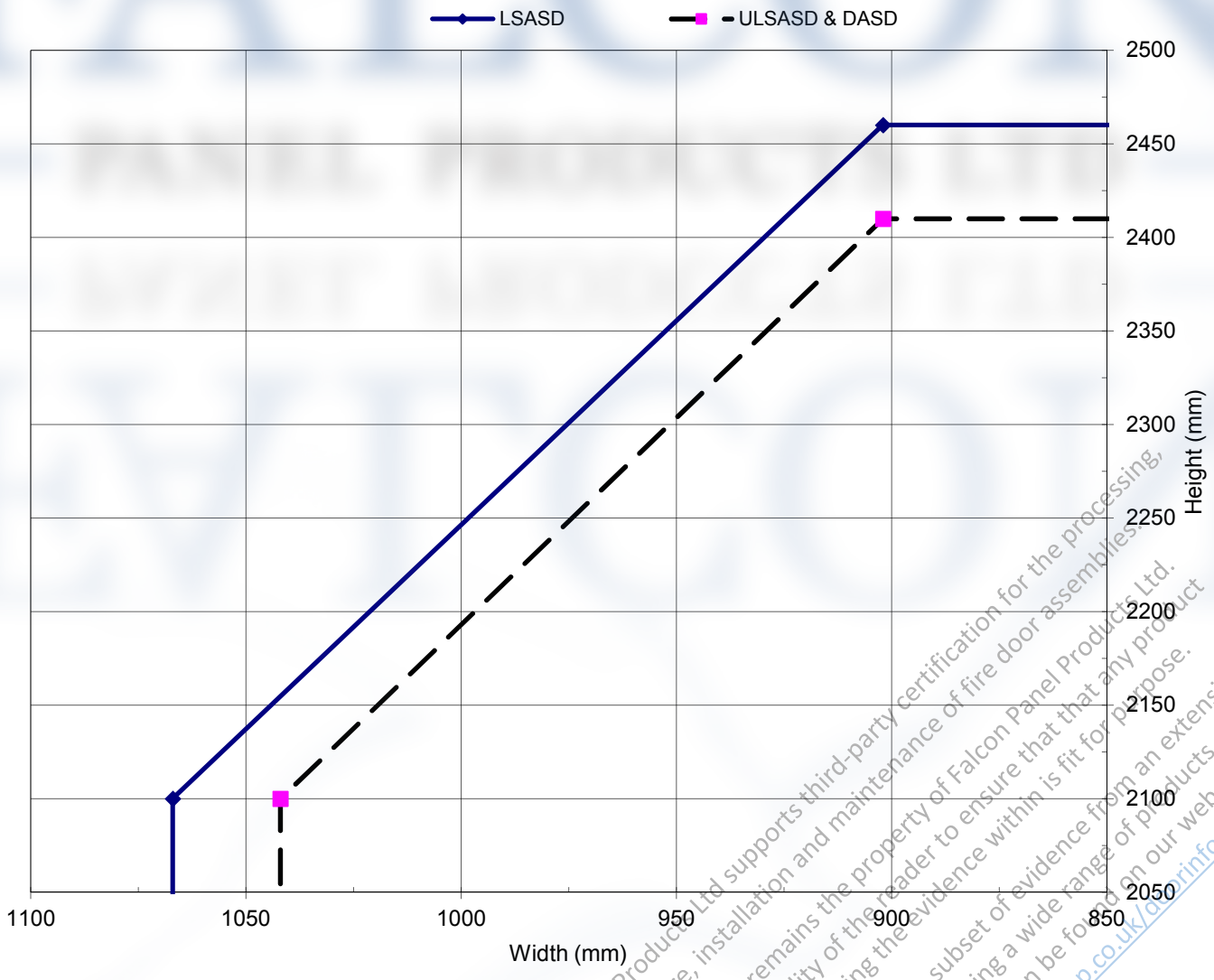
INTUMESCENT MATERIALS: PVC encased Palusol or Type 617

HEAD: 1No. 10x4mm exposed and centrally fitted in the leaf or frame head

JAMBS & OVERPANEL: 1No. 10x4mm exposed and centrally fitted in the leaf/overpanel or frame

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 07	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2040	x	951
		To:	2090	x	926
	ULSASD & DASD	From:	2040	x	926
		To:	2040	x	926
Maximum Overpanel Height (mm)		Transomed	2000		

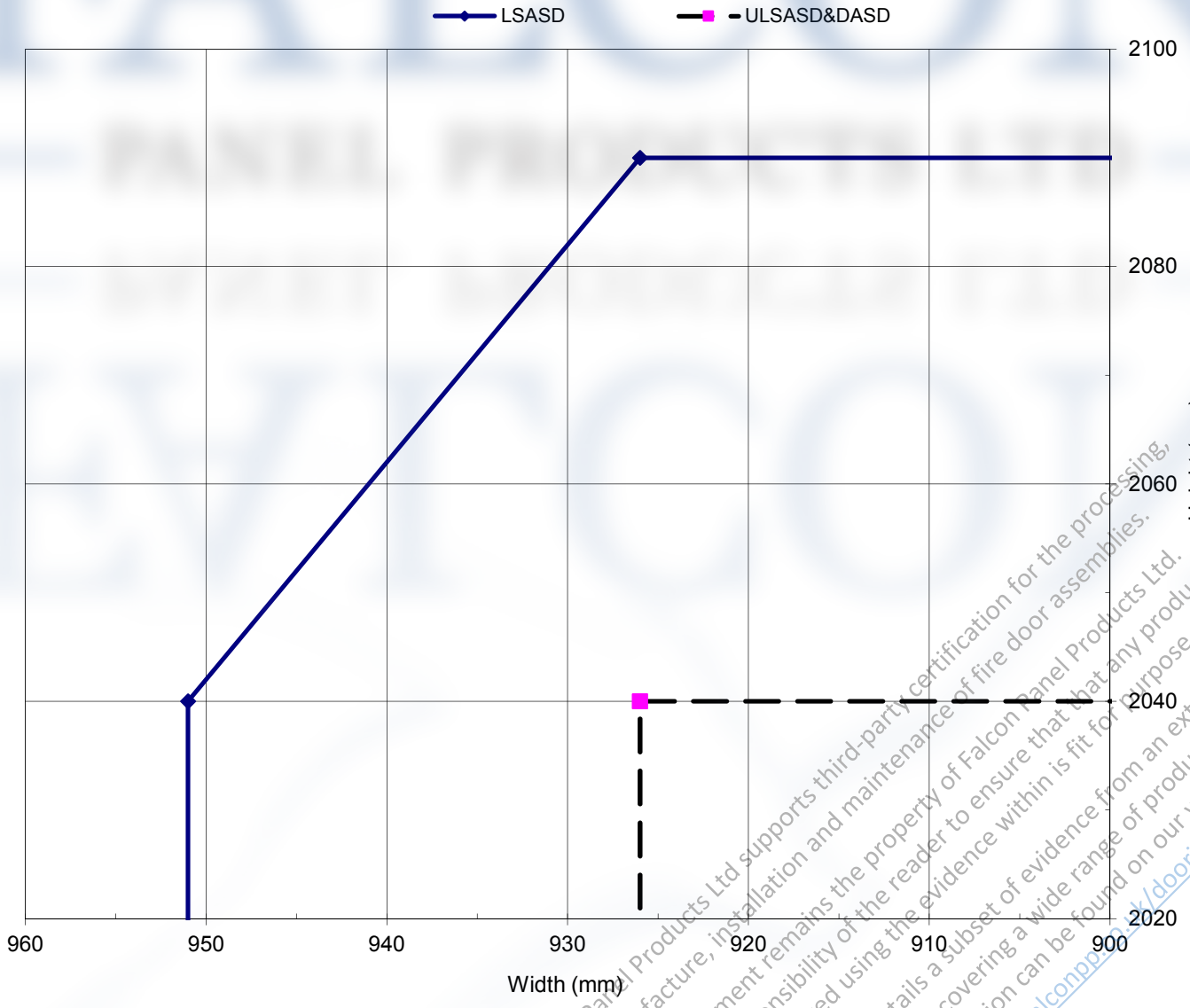
INTUMESCENT MATERIALS: Pyroplex

HEAD: 1No. 10x4mm exposed and centrally fitted in the leaf or frame head

JAMBS & OVERPANEL: 1No. 10x4mm exposed and centrally fitted in the leaf/overpanel or frame

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 08	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2700	x	1161
		To:	2925	x	1072
	ULSASD & DASD	From:	2100	x	1140
		To:	2620	x	915
Maximum Overpanel Height (mm)		Transomed	2000		

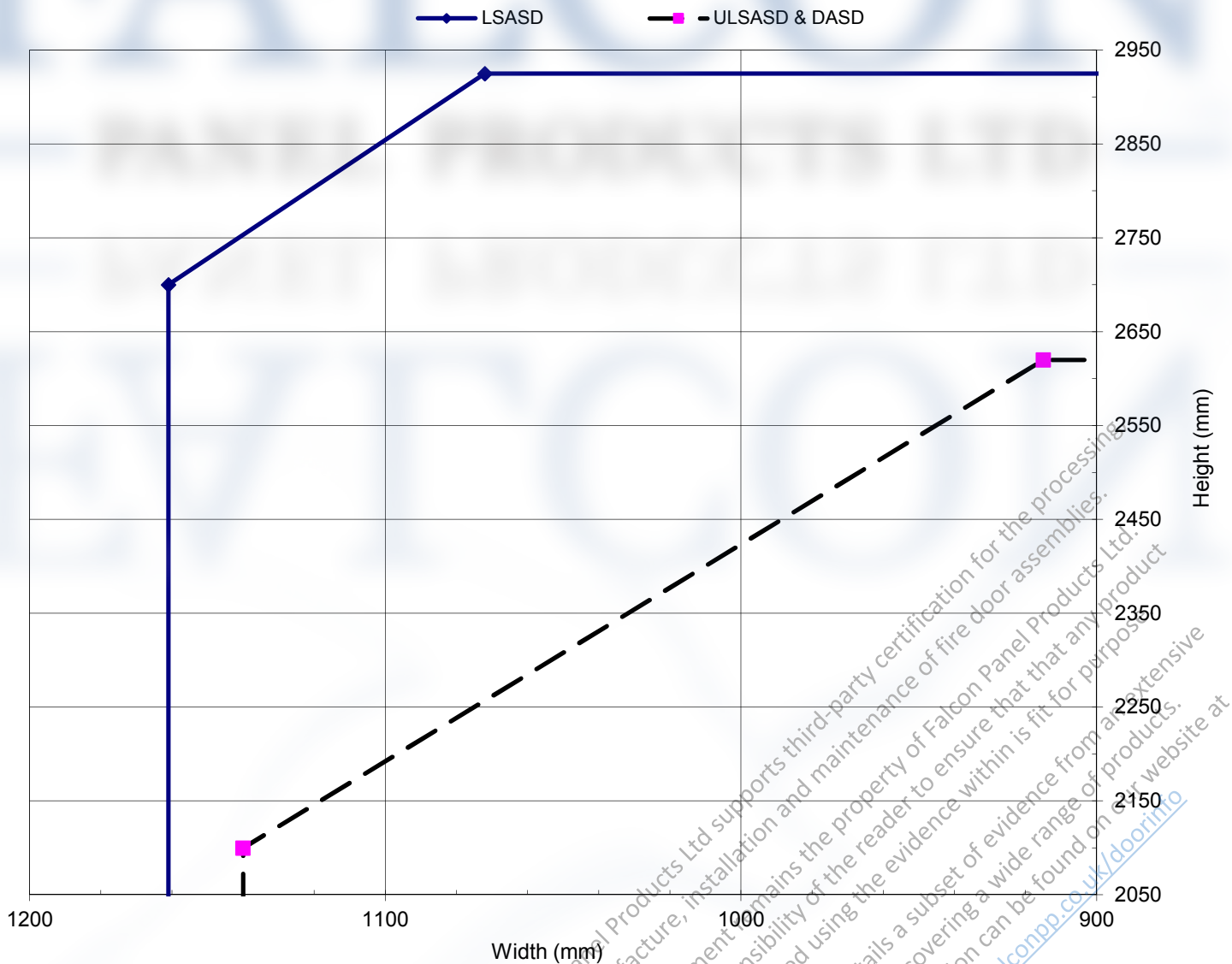
INTUMESCENT MATERIALS: PVC encased Palusol 100 or Type 617

HEAD: 1No. 15x4mm exposed and centrally fitted in the leaf or frame head

JAMBS & OVERPANEL: 1No. 15x4mm exposed and centrally fitted in the leaf or frame

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 09	Configuration		eight (mm)		Width (mm)
Leaf Sizes	LSASD	From: To:	2800 3159	x x	1203 1100
	ULSASD & DASD	From: To:	2800 3109	x x	1178 1100
Maximum Overpanel Height (mm)		Transomed	2000		

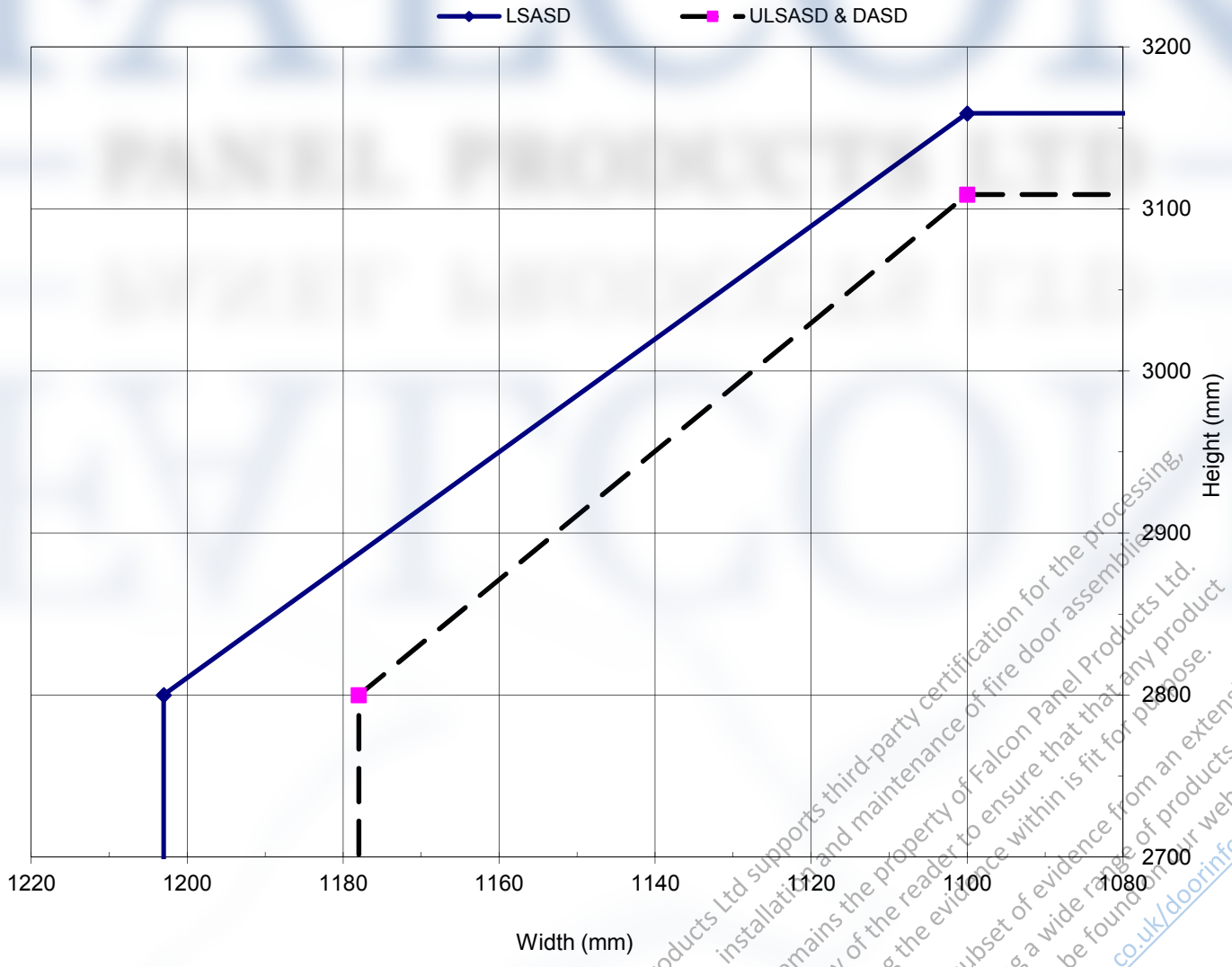
INTUMESCENT MATERIALS: Pyroplex Rigid Box Seals FO8700

HEAD: 1No. 15x4mm strip exposed and fitted centrally in the leaf edge or frame reveal. Increase seal to 20x4mm on doorsets over 2300mm high

JAMBS: 1No. 15x4mm strip exposed and fitted centrally in the leaf edge or frame reveal. Increase seal to 20x4mm on doorsets over 1075mm wide

HARDWARE PROTECTION: See section 11.

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 10	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	3000	x	965
		To:	3223	x	915
	ULSASD & DASD	From:	3000	x	940
		To:	3173	x	915
Maximum Overpanel Height (mm)		Transomed	2000		

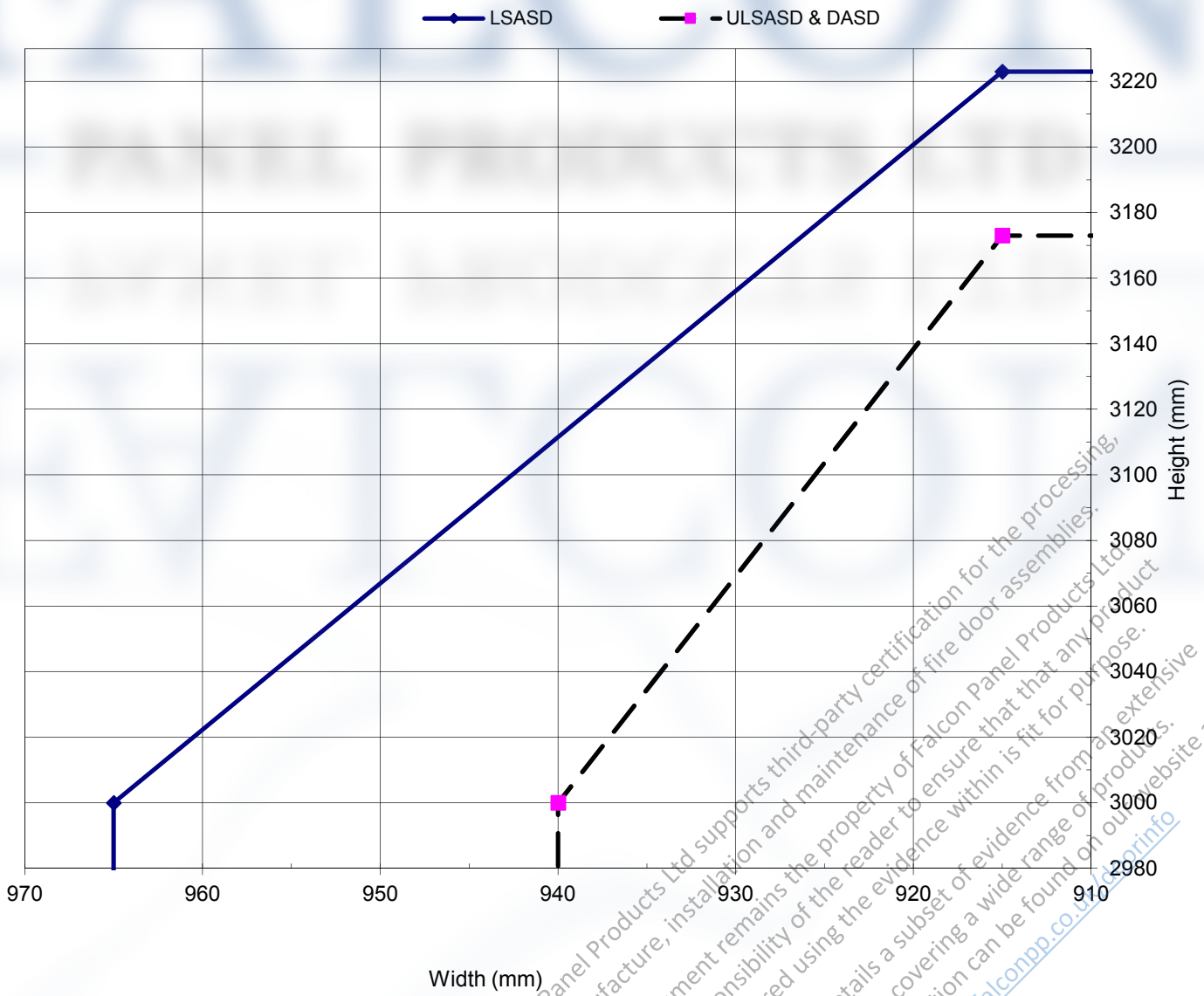
INTUMESCENT MATERIALS: PVC encased Palusol 100 or Type 617

HEAD: 20x4mm exposed and centrally fitted in the leaf or frame head. Increase seal to 25x4mm on doorsets over 3000mm high

JAMBS & OVERPANEL: 20x4mm exposed and centrally fitted in the leaf or frame.

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 11	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2440	x	1061
		To:	2736	x	931
	ULSASD & DASD	From:	2440	x	1036
		To:	2686	x	931
Maximum Overpanel Height (mm)		Transomed	2000		

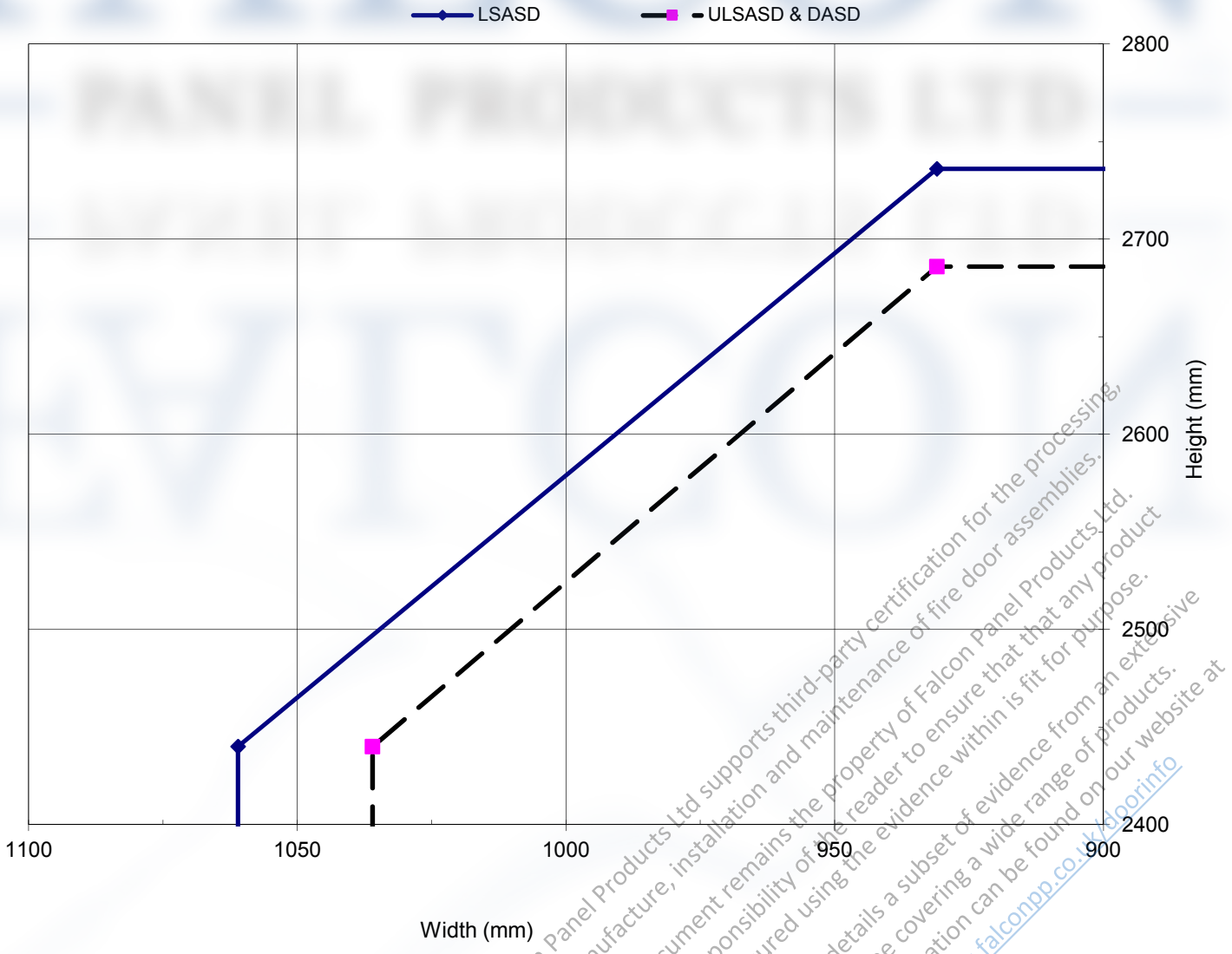
INTUMESCENT MATERIALS: Therm-A-Seal – Intumescent Seals Ltd.

HEAD: 1No. 15x4mm exposed and centrally fitted in the leaf or frame head

JAMBS & OVERPANEL: 1No. 15x4mm exposed and centrally fitted in the leaf/overpanel or frame

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Single Doorsets

Sheet 12	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2040	x	1275
		To:	2804	x	926
	ULSASD & DASD	From:	2040	x	1250
		To:	2754	x	926
Maximum Overpanel Height (mm)		Transomed	2000		

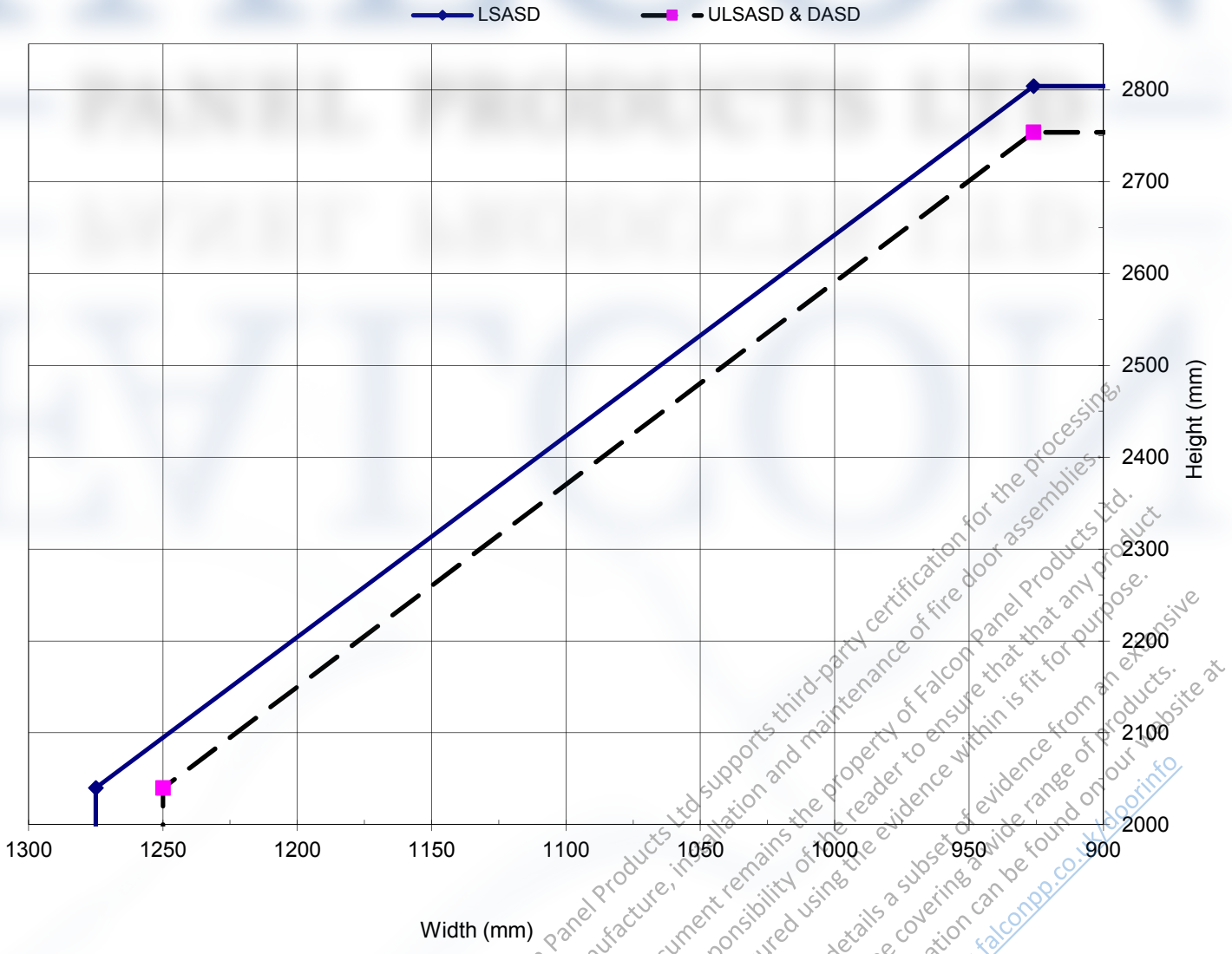
INTUMESCENT MATERIALS: PVC encased FO154 – Exitex Ltd

HEAD: 1No. 15x4mm exposed and centrally fitted in the leaf or frame head, for leaves over 2500mm high increase to 1No 20x4mm seal.

JAMBS & OVERPANEL: 1No. 15x4mm exposed and centrally fitted in the leaf/overpanel or frame reveal, for leaves over 1100mm wide increase to 1No 20x4mm seal.

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 13	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2900	x	1075
		To:	3095	x	1000
	ULSADD & DADD	From:	2900	x	1050
		To:	3045	x	1000
Maximum Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: STS Fire – Sealed Tight Solutions Ltd.

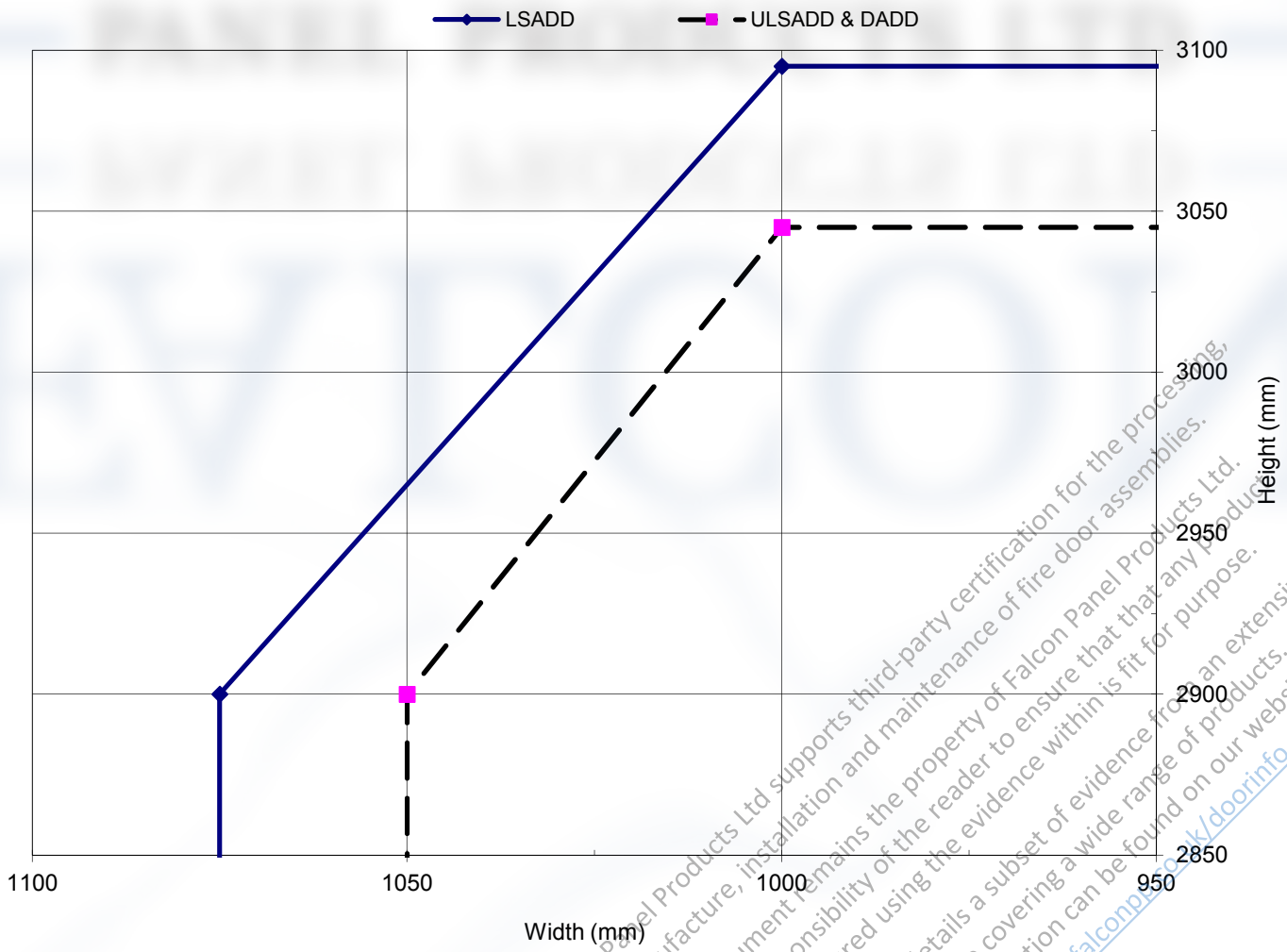
HEAD: 1No. 15x4mm strip exposed and fitted centrally in the frame head

MEETING EDGES:
Square: 2No. 10x4mm strips spaced 10mm apart and fitted 7mm from the exposed face in one leaf edge only
Rebated: Not permitted

JAMBS & OVERPANEL: 1No. 15x4mm strip exposed and centrally fitted in the frame jambs

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 14	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2100	x	1017
		To:	2360	x	902
	ULSADD & DADD	From:	2100	x	992
		To:	2310	x	902
Maximum Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: PVC encased Palusol 100 or Type 617

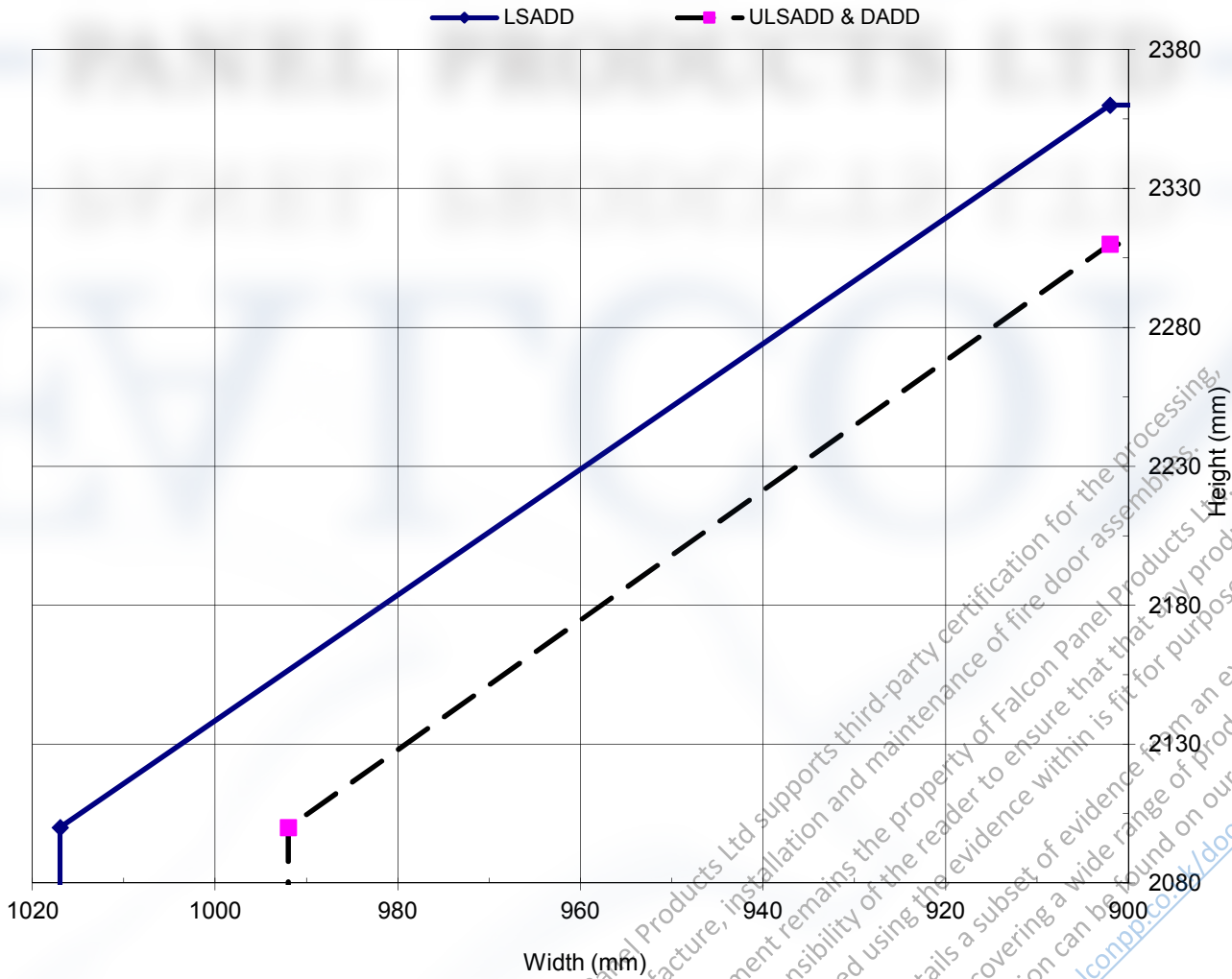
HEAD: 10x4mm exposed and fitted centrally in the leaf or frame head

MEETING EDGES:
Square: 2No. 10x4mm spaced 12mm apart and centrally fitted in one leaf edge
Rebated: Not permitted

JAMBS & OVERPANEL: 10x4mm exposed and centrally fitted in the leaf or frame

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 15	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2440	x	1011
		To:	2636	x	931
	ULSADD & DADD	From:	2440	x	986
		To:	2586	x	931
Maximum Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: Therm-A-Seal – Intumescent Seals Ltd.

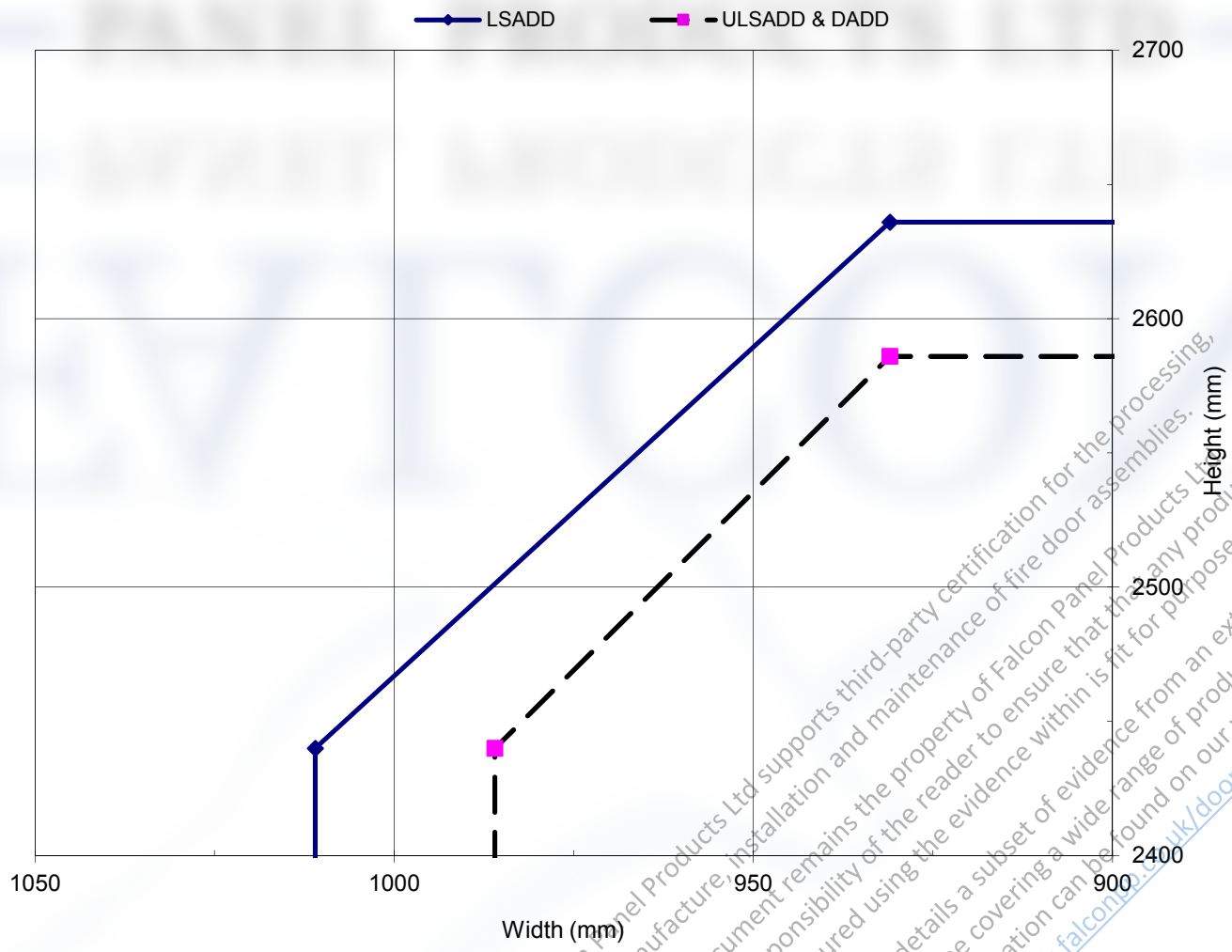
HEAD:
Square: 1No. 15x4mm exposed and fitted centrally in the leaf or frame head

MEETING EDGES:
Square: 2No. 10x4mm spaced 12mm apart and centrally fitted in one leaf edge.
Rebated: 2No. 10x4mm strips, with 1No. fitted centrally in each rebate

JAMBS & OVERPANEL: 1No. 15x4mm exposed and centrally fitted in the leaf or frame

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 16	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2100	x	1065
		To:	2350	x	915
	ULSADD & DADD	From:	2100	x	1040
		To:	2350	x	915
Maximum Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: PVC encased Palusol 100 or Type 617

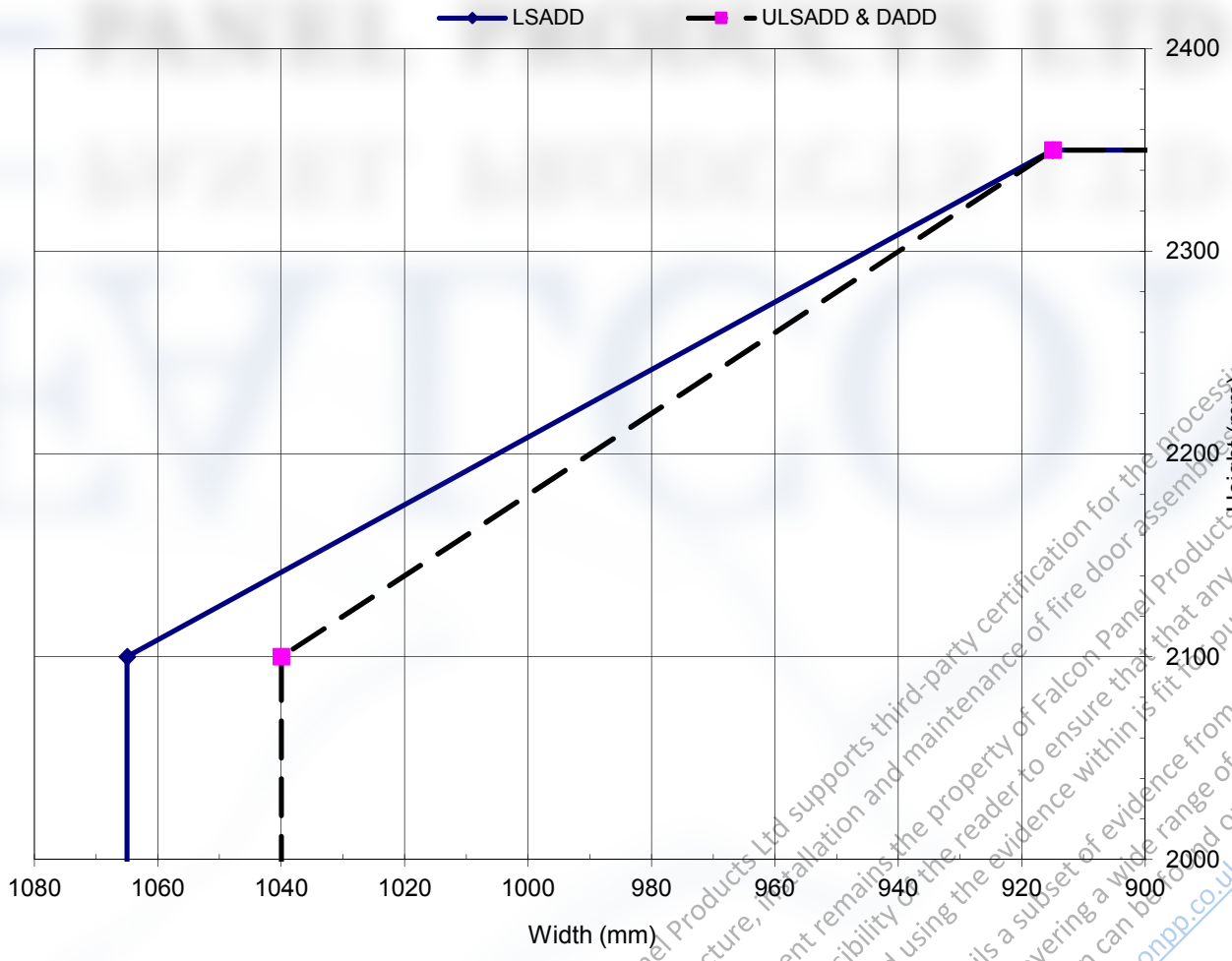
HEAD:
Square: 15x4mm exposed and fitted centrally in the leaf or frame head

MEETING EDGES:
Square: 2No. 10x4mm spaced 12mm apart and centrally fitted in one leaf edge
Rebated: 2No. 10x4mm one strip fitted centrally in each rebate

JAMBS & OVERPANEL: 15x4mm exposed and centrally fitted in the leaf or frame

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 17	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2800	x	1153
		To:	3059	x	1100
	ULSADD & DADD	From:	2800	x	1128
		To:	3009	x	1100
Maximum Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: Pyroplex

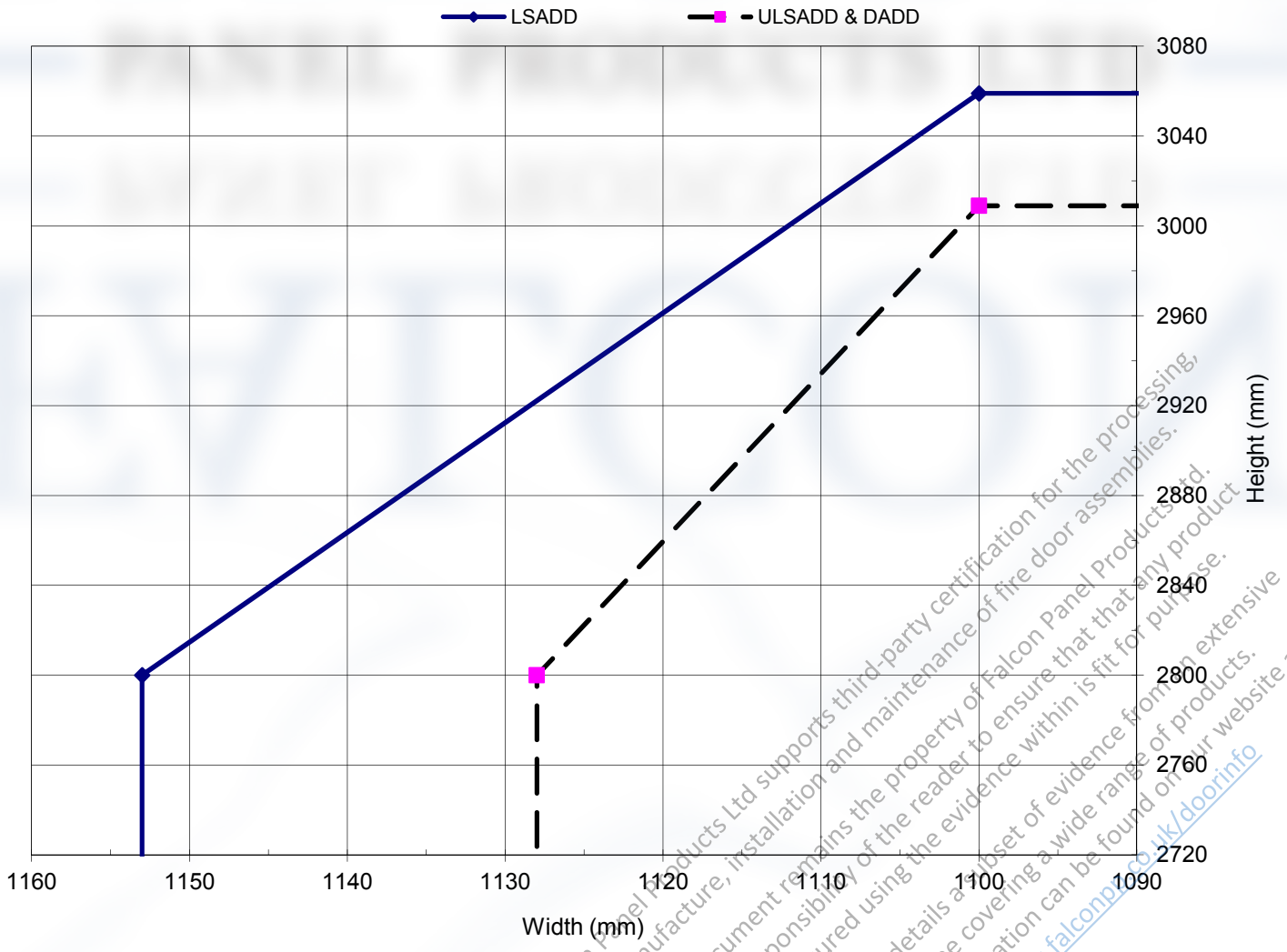
HEAD:
Square: 15x4mm exposed and fitted centrally in the leaf or frame head. Increase seal to 20x4mm on doorsets over 2800mm high.

MEETING EDGES:
Square: 2No. 10x4mm spaced 10mm apart and centrally fitted in one leaf edge

JAMBS & OVERPANEL: 15x4mm exposed and centrally fitted in the leaf or frame. Increase seal to 20x4mm on doorsets over 1100mm wide.

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 18	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From: To:	2350 2470	x x	1065 915
	ULSADD & DADD	From: To:	2350 2420	x x	1040 915
Maximum Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: PVC encased Palusol 100 or Type 617

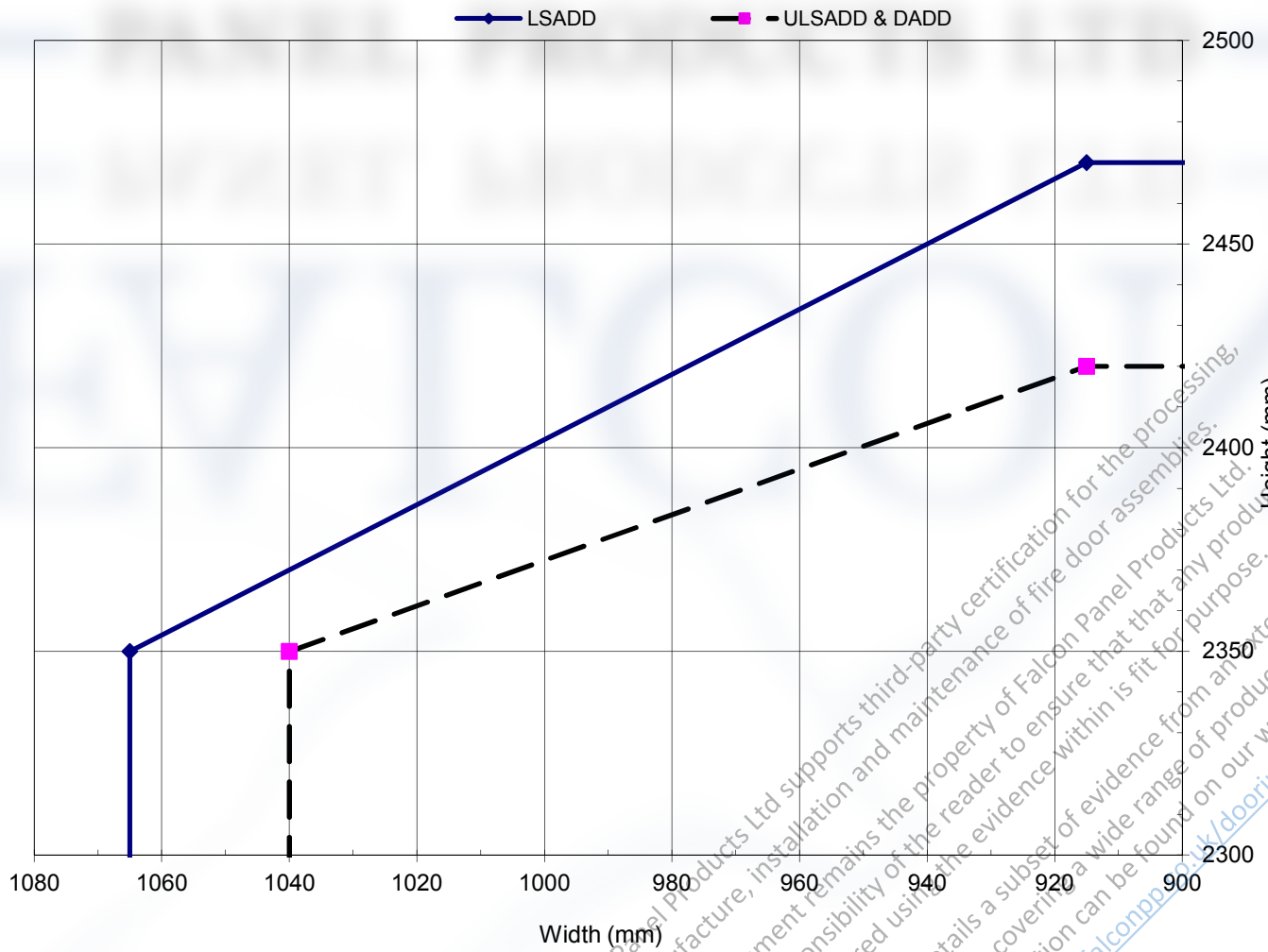
HEAD:
Square: 20x4mm exposed and fitted centrally in the leaf or frame head, 25x4mm seals may be used if preferred.

MEETING EDGES:
Square: 2No. 10x4mm spaced 12mm apart and centrally fitted in one leaf edge
Rebated: 2No. 10x4mm one strip fitted centrally in each rebate

JAMBS & OVERPANEL: 20x4mm exposed and centrally fitted in the leaf or frame, 25x4mm seals may be used if preferred.

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – Strebord© 35+ & Strebord© 38+

Latched & Unlatched, Single & Double Acting, Double Doorsets

Sheet 19	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2400	x	1091
		To:	2610	x	1000
	ULSADD & DADD	From:	2400	x	1066
		To:	2560	x	1000
Maximum Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: PVC encased FO154 – Exitex Ltd

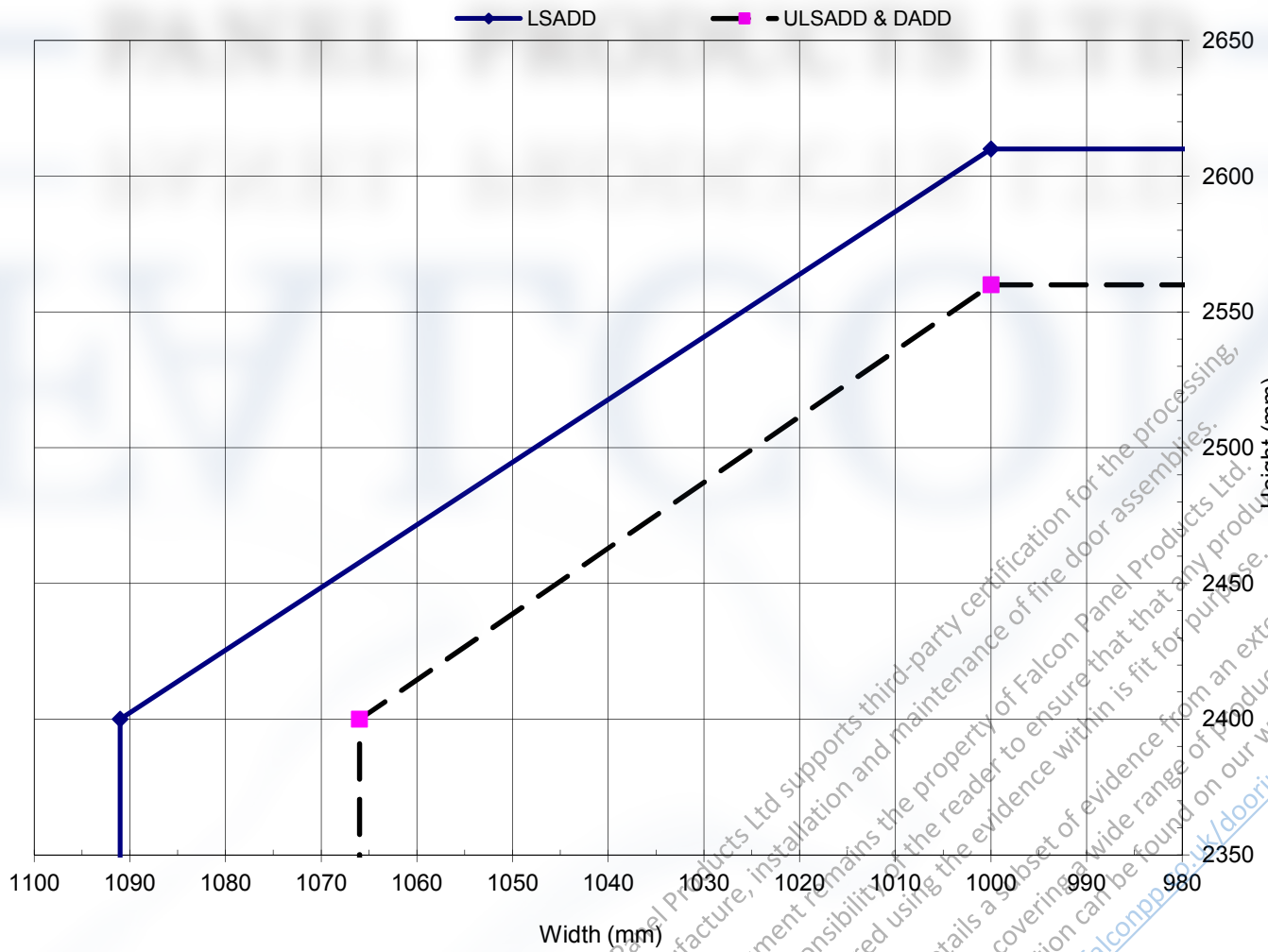
HEAD:
Square: 15x4mm exposed and fitted centrally in the leaf or frame head

MEETING EDGES:
Square: 1No. 15x4mm centrally fitted in one leaf edge.

JAMBS & OVERPANEL: 15x4mm exposed and centrally fitted in the leaf or frame reveals.

HARDWARE PROTECTION: See section 11

Maximum Door Leaf Size



Falcon Panel Products – CS Edge Protectors

Latched & Unlatched, Single & Double Acting, Single & Double Doorsets

Sheet 20	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD, ULSASD & DASD	From:	2100	x	1225
		To:	2850	x	900
	LSADD, ULSADD & DADD	From:	2100	x	1200
		To:	2800	x	900
Maximum Overpanel Height (mm)		Transomed	Single Leaves – 2000 Double Leaves - 1500		

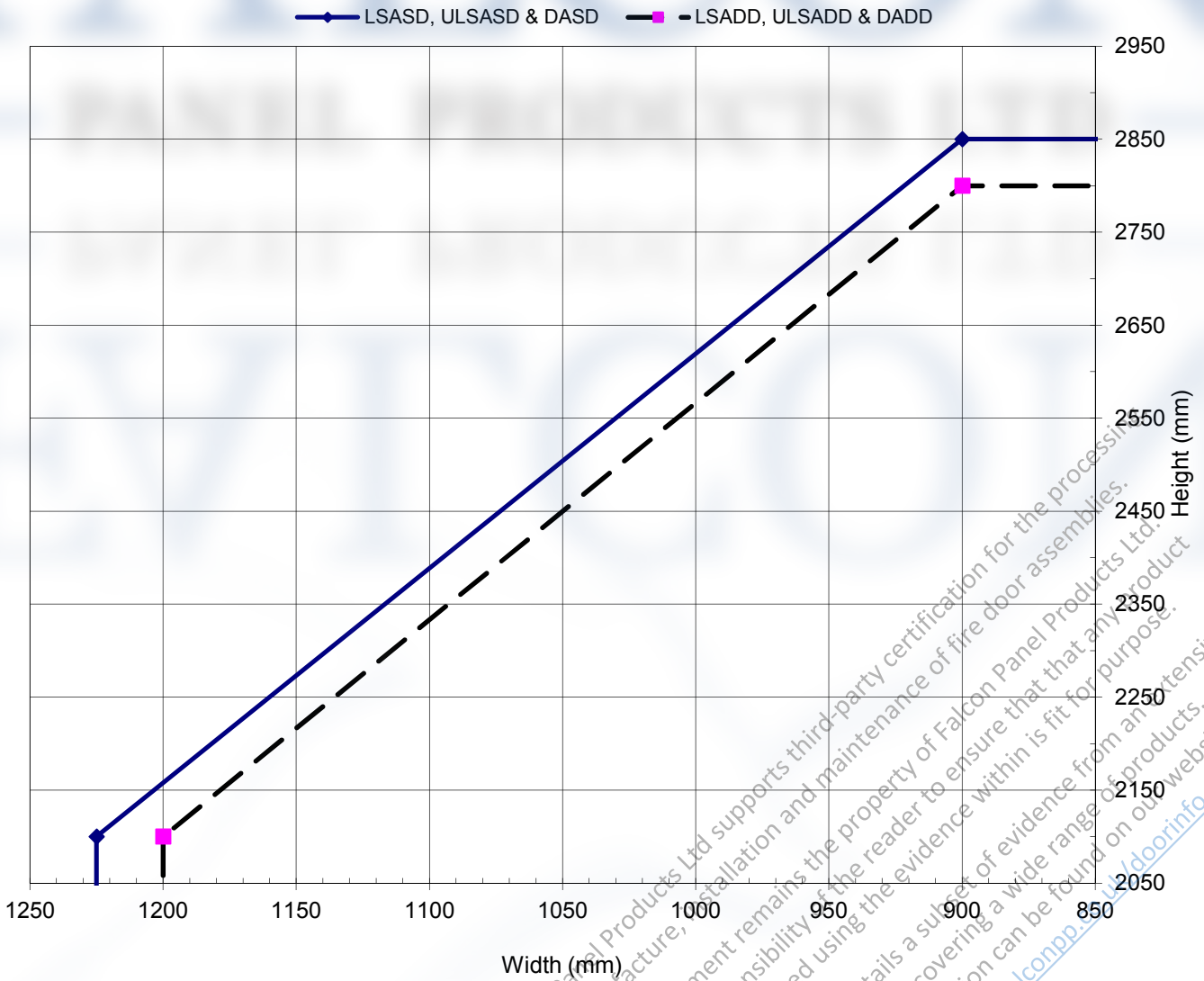
INTUMESCENT MATERIALS: Type 617 – Lorient Polyproducts Ltd. & see section 12.2

HEAD:
Square: 1No. 15x4mm fitted centrally in the leaf head or frame reveal.

JAMBS & OVERPANELS: 1No. 15x4mm fitted centrally in the leaf edge.

HARDWARE PROTECTION: See section 11.

Maximum Door Leaf Size



Falcon Panel Products – Concealed Overhead Closer

Latched, Single Acting, Single & Double Doorsets

Sheet 21	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD & LSADD	From: To:	2100 2605	x x	1120 900
Door Frame	See section 9		Hardwood – minimum density 640kg/m^3		
Maximum Overpanel Height (mm)		Transomed	Single Leaves – 2000 Double Leaves - 1500		

INTUMESCENT MATERIALS: Pyroplex Ltd – PVC encased FO8700

HEAD:
Square: 2No. 15x4mm seals centrally fitted 10mm apart in the frame reveal. 7mm of each seal must run uninterrupted past the closer slide arm.

MEETING EDGES:
Square: 2No. 10x4mm spaced 12mm apart and centrally fitted in one leaf edge.

JAMBS & OVERPANELS: 2No. 15x4mm seals centrally fitted 10mm apart in the frame reveal.

HARDWARE PROTECTION: See section 11 & 15.1.1

Maximum Door Leaf Size