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Testing, calibrating, advising.

Title:
Fire Resistance
Assessment for:

Halspan® 60 Optima
Doorsets
60 Minute Timber Based
Fire Resisting Doorsets

WF Report No:

BMT/CAN/F16083

Sponsor:

Greenlam Industries Ltd.
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Exova Warringtonfire – the new name for BM TRADA

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

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

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

About Exova Warringtonfire

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

Kind regards

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1 Introduction

This document constitutes a global assessment relating to Halspan® 60 Optima fire resisting doorsets, manufactured by Greenlam Industries Ltd. The assessment uses established extrapolation and interpretation techniques in order to extend the scope of application by determining the limits for the design based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance, if the elements were to be tested in accordance with BS 476: Part 22: 1987.

2 General Description of Construction

The construction for door leaves of this design comprises a solid sheet of 54mm thick three layered particleboard (nominal density 620kg/m³ +/- 10%). Where specified, the leaves are lipped with hardwood.

3 Leaf Sizes

The approval for increased leaf dimensions is based on the tests listed in appendix H and takes into account the margin of over performance above 60 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 B.

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

4 Configurations

Based on the test evidence listed in appendix H this assessment covers the following doorset configurations.

Abbreviation	Description
LSASD & ULSASD	Latched & unlatched, single acting, single doorset
DASD	Double acting, single doorset
LSASD+OP & ULSASD+OP	Latched & unlatched, single acting, single doorset + overpanel
DASD + OP	Double acting, single doorset + overpanel
LSADD & ULSADD	Latched & unlatched, single acting, double doorset
DADD	Double acting, double doorset
LSADD+OP & ULSADD+OP	Latched & unlatched, single acting, double doorset + overpanel
DADD + OP	Double acting, double doorset + overpanel

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

5 Leaf Size Adjustment

Halspan® 60 Optima door leaves may be altered as follows.

Element	Reduction
Leaf	The manufactured size of the leaf may be reduced in height or width without restriction, lippings meeting the requirements in section 8 must be applied
Lipping	Where fitted the dimensions stated in section 8.1 may be reduced by 20% for fitting purposes

6 Overpanels

6.1 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 notes under the table in section 10.1).

Door frame joints must utilise either mortise and tenon or butt joints (see section 10.2).

Either method requires 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.

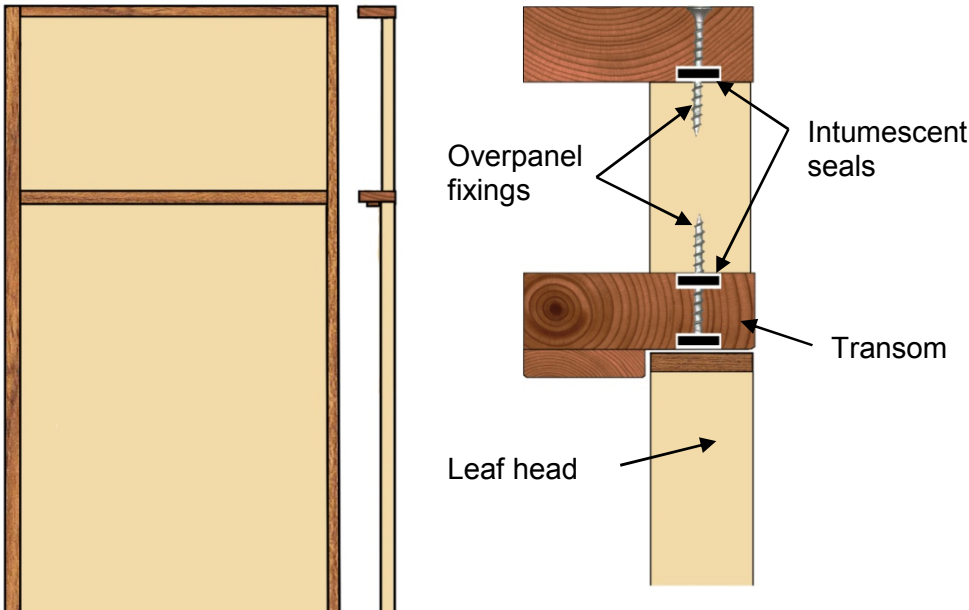
Overpanels must be fixed by either:

- 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
- using 75mm long x 8mm diameter steel dowels fitted centrally in the frame reveal across the head of the overpanel no closer than 150mm from each corner of the overpanel and equispaced between at a maximum of 450mm centres. A minimum of four dowels must be used. A further 75mm long screw fixing is required to be inserted at an angle through the bottom corners of the overpanel into the door frame.

The intumescent seals specified for the jambs in appendix B, may be fitted to all edges of the overpanel if required for the manufacturing process. The seals may be fitted in either the overpanel edges or frame reveal; in either case the frame to overpanel junction is permitted to have a maximum 2mm gap tolerance.

Maximum overpanel heights are as follows.

Configuration	Height (mm)	Width (mm)
Single doorsets	2000	Overall door width
Double doorsets	1500	Overall door width



6.2 Fanlights

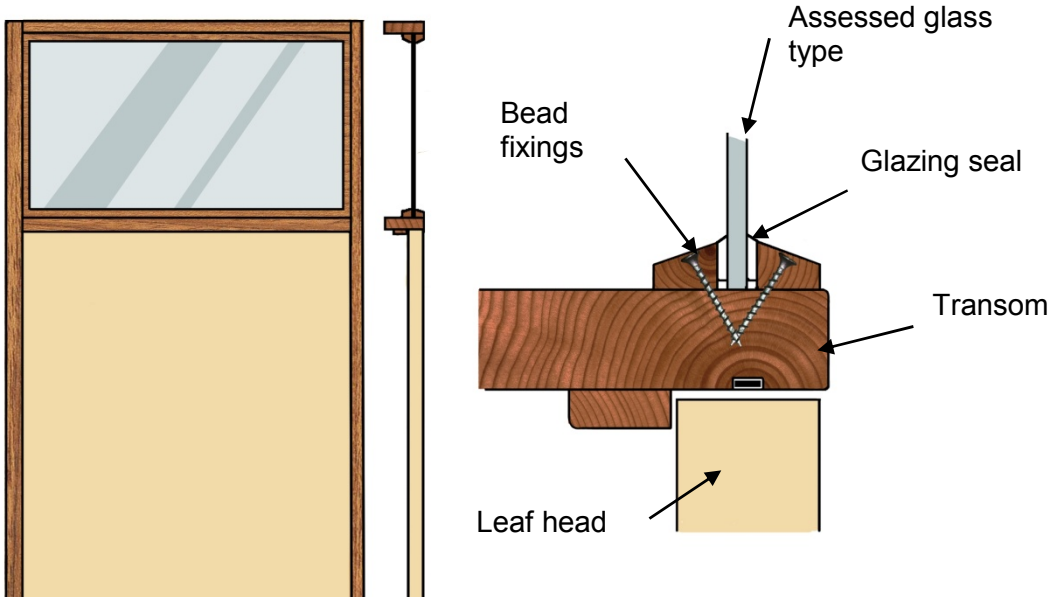
Timber frame doorsets including a transom may include a glazed fanlight. The timber frame and glazing beads must be hardwood (the use of Beech (*Fagus Sylvatica*) is not permitted) with a minimum density of 640 kg/m³, whilst the frame section must be a minimum of 70mm x 44mm. Timber door frame and transom construction must comply with the specification contained in section 10.

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

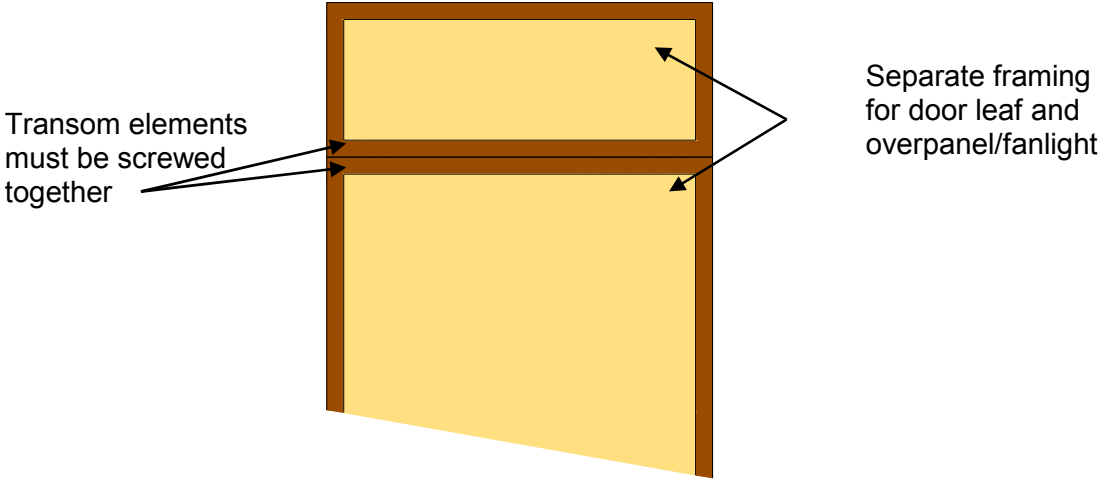
Steel or MDF framed doorsets are not assessed for glazed fanlights.



Note: Drawing is representative of doorset construction only; actual construction must be as the text within this document specifies.

6.3 Split Transom

Separate frames for the door leaf and overpanel are acceptable; both transom elements must be to the same specification as the door frame (see the note under the table in section 10.1). The two transom elements must be screwed together at maximum 200mm centres and the joint between the two must be tight with no gaps.



7 Glazing

7.1 General

The testing conducted on Greenlam Industries Ltd Halspan® 60 Optima has demonstrated that the design is 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 0.82m².

7.2 Assessed Glass Products

Assessed glass types are as follows.

Glass Type	Manufacturer	Thickness (mm)	Maximum Area (m ²)	Minimum Edge Distance (mm)
1. Pyroshield	Pilkington Group Ltd.	6 & 7	0.82	100
2. Pyroshield 2	Pilkington Group Ltd.	6 & 7	See section 7.5	100
3. Sureglaze Wired	Halspan Ltd.	6	0.82	100
4. Pyran S	Schott Glass Ltd.	6	0.82	100
5. Pyrostem	Pyroguard UK Ltd	6	0.6	100
6. Pyrodur 60-10	Pilkington Group Ltd.	10	0.82	100
7. Pyroguard EW Maxi	Pyroguard UK Ltd	11	0.52	100
8. Pyrobelite 12	AGC Flat Glass UK	12	0.82	100
9. Pyrodur 60-20	Pilkington Group Ltd.	13	0.82	100
10. Pyroguard EI30	Pyroguard UK Ltd	15	0.82	100
11. Contraflam 16	Vetrotech Saint Gobain	16	0.82	100
12. Pyrostop 30-10	Pilkington Group Ltd.	15	0.82	100
13. Pyrobel 16	AGC Flat Glass UK	16	0.82	100
14. Pyrosec ²	C3S Projects Ltd.	19	0.63 multiple apertures	100
			0.4 single pane	100
15. Pyroguard EI60	Pyroguard UK Ltd	23	0.52	100

Notes:

- All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion tolerances.
- 19mm Pyrosec must be installed as tested in CFR0607172 and illustrated in appendix A, which also details option for its installation in PVC clad doorsets.

7.3 Assessed Glazing Systems

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

Glazing System	Manufacturer	Maximum Area (m ²)
1. Therm-A-Glaze 60	Intumescent Seals Ltd.	0.82
2. System 36 Plus	Lorient Polyproducts Ltd.	0.5
3. Fireglaze 60	Sealmaster Ltd.	0.82
4. System 63 (circular apertures only)	Lorient Polyproducts Ltd.	0.5
5. Pyroglaze 60	Mann McGowan Ltd.	0.5
6. System 90+	Lorient Polyproducts Ltd.	0.5
7. Halspan 60	Halspan Ltd.	0.5
8. Halspan Slimglaze 60	Halspan Ltd.	0.5

Notes:

1. Pyroglaze 60 and Halspan 60 must be used with 60mm long steel screw fixings only
2. Halspan Slimglaze 60 must be installed exactly as depicted in appendix A.

7.4 Glazing Beads & Installation

Glazing beads must be from hardwood as specified in the following table.

Profile	Min. Density (kg/m ³)	Application	Maximum Permitted Aperture (m ²)
Splayed	640	All proprietary systems detailed in 7.3 and appendix A	0.82
Square	640	Proprietary system 3 with aperture lined using 33 x 2mm Therm-A-Line in lieu of GL60 liner with glass types 1 – 4 as specified in 7.2	0.2
Square	640	Proprietary systems 1 and 3 as specified in 7.3 and glass types 9-13 and 15 as specified in 7.2	0.82

1. All timber for glazing beads must be hardwood of straight grained, joinery quality, free from knots, splits and checks. The use of Beech (*Fagus Sylvatica*) is not permitted
2. A square bead profile may be used as an alternative to the splayed beads subject to the restricted glass types and glazing systems specified in the table above. See appendix A for square bead options. A 6 – 10mm thick square aperture liner is permitted for use with square beads (if desired) providing it is constructed from hardwood of minimum density 640kg/m³ and glued in position using a UF type adhesive
3. Glazing beads must be retained in position with 50mm long 2mm diameter steel pins or 50mm long No. 6 - 8 screws, inserted at 35 - 40° to the plane of the glass

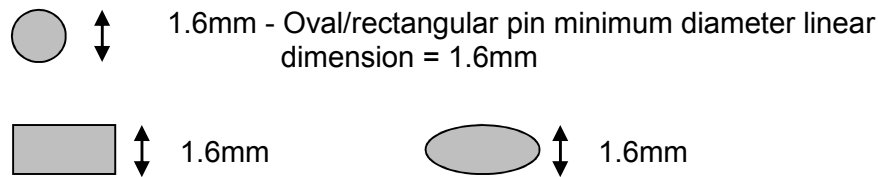
(or perpendicular to the bead splay) at no more than 50mm from each corner and at 150mm maximum centres. Fixings required for the Pyroglaze and Halspan 60 glazing systems must meet the same details, note 60mm long screws are required.

4. The following minimum pin specification is permitted and is considered suitable for gun (pneumatically) fired applications:

4.1 Option 1 – Round, Oval and Rectangular shaped pins:

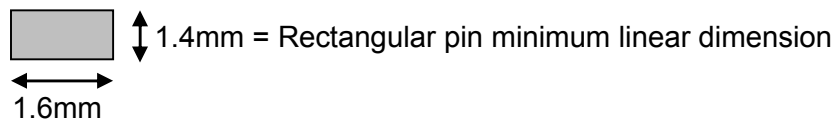
- Minimum Standard Wire Gauge (SWG) 16
- Minimum cross section area of 2.03mm²
- Minimum linear dimension 1.6mm in any direction

Round pin diameter (mm) = minimum 1.6mm



4.2 Option 2 – Rectangular shaped pins:

- Minimum Standard Wire Gauge (SWG) 16
- Minimum cross section area of 2.24mm²
- Minimum linear dimension 1.4mm in any direction



Note:

There are many pins/brads on the market which are sold as SWG 16 but are often below the minimum dimensions stated above. The use of these pins is not covered by the scope of this assessment.

5. Glazed openings must not be less than 100mm from any door edge. Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 80mm of Halspan® 60 Optima core between apertures. Alternatively, the dimension may be reduced to 38mm using the Halspan® 60 multipane glazing system and inserting solid 54mm x 38mm hardwood transoms/mullions dividing the apertures (see appendix A for details)
6. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape.

7.5 Pyroshield 2

The following table details the maximum pane sizes and approved glazing systems permitted for Pyroshield 2 in the Halspan® 60 Optima doorset design.

Glass Type	Glazing System (section 7.2)	Maximum Pane Size* (height x width – mm)	Maximum Area (m ²)
Pyroshield 2	1	1300 x 550	0.715
	6	1300 x 310	0.4

*The heights and widths listed are the maximum single dimension allowable for an individual pane utilising the relevant glazing system; maximum dimensions may not be increased even if the other dimension for the pane is reduced.

All other installation details must remain as shown in section 7.4.

7.6 Visicom Glazing Systems

7.6.1 General

As an alternative to the single glazed systems above, Visicom panels may be installed within Halspan® 60 Optima door designs to the specifications within this assessment.

All installation and intumescent details for the Visicom panels must remain as detailed in the test reports unless specified below; further options and information relating to Visicom installations may be found in Chilt/A05064 Revision B (it is the responsibility of the user of this document to ensure that they have the latest revision - liaise with Greenlam Industries Ltd).

Glass types used must remain as tested and detailed in the tables below.

Apertures must be no closer than 150mm from any leaf edge with a minimum of 80mm of Halspan® 60 Optima core between apertures.

7.6.2 Pyran S

The maximum assessed glazed area for all orientations using Pyran S is 0.65m² (which may be distributed using multiple panes); glazing must meet the following specification:

Location	Glass Description (mm)*
Exposed Face	6 Pyran S or 6 Toughened
Centre Pane	4 Toughened or 4 Float
Unexposed Face	6 Pyran S or 6 Toughened

* The glazing system must utilise Pyran S as either an exposed or unexposed face glass.

7.6.3 Hansens Products Fortplus Toughened Option

Based on the results of test FEX10003 the following alternative glazing specification is acceptable for 60 minute applications; the maximum single pane area is 0.175m²:

Location	Glass Configuration (mm)
Exposed	10 or 15 Modified Toughened
Centre	4 Toughened
Unexposed	10 or 15 Modified Toughened

Assessed product for this option is Hansens Products Fortplus Toughened glass

Note: The Visicom unit must, as a minimum, use 15mm thick glass in one of either the exposed or unexposed faces.

7.6.4 **Visicom Plus**

The construction of the Visicom Plus design is identical to the standard, except that (where fitted) the single centre pane of glass is replaced with 2 thinner panes. The extra pane in conjunction with a modified operating shaft shape allows lower operating forces and increases the viewable area of the system when open.

It is our assessment that where a 4mm thick pane is required in the centre of the Visicom designs as detailed in section 7.6.2, the single pane may be replaced with two as described.

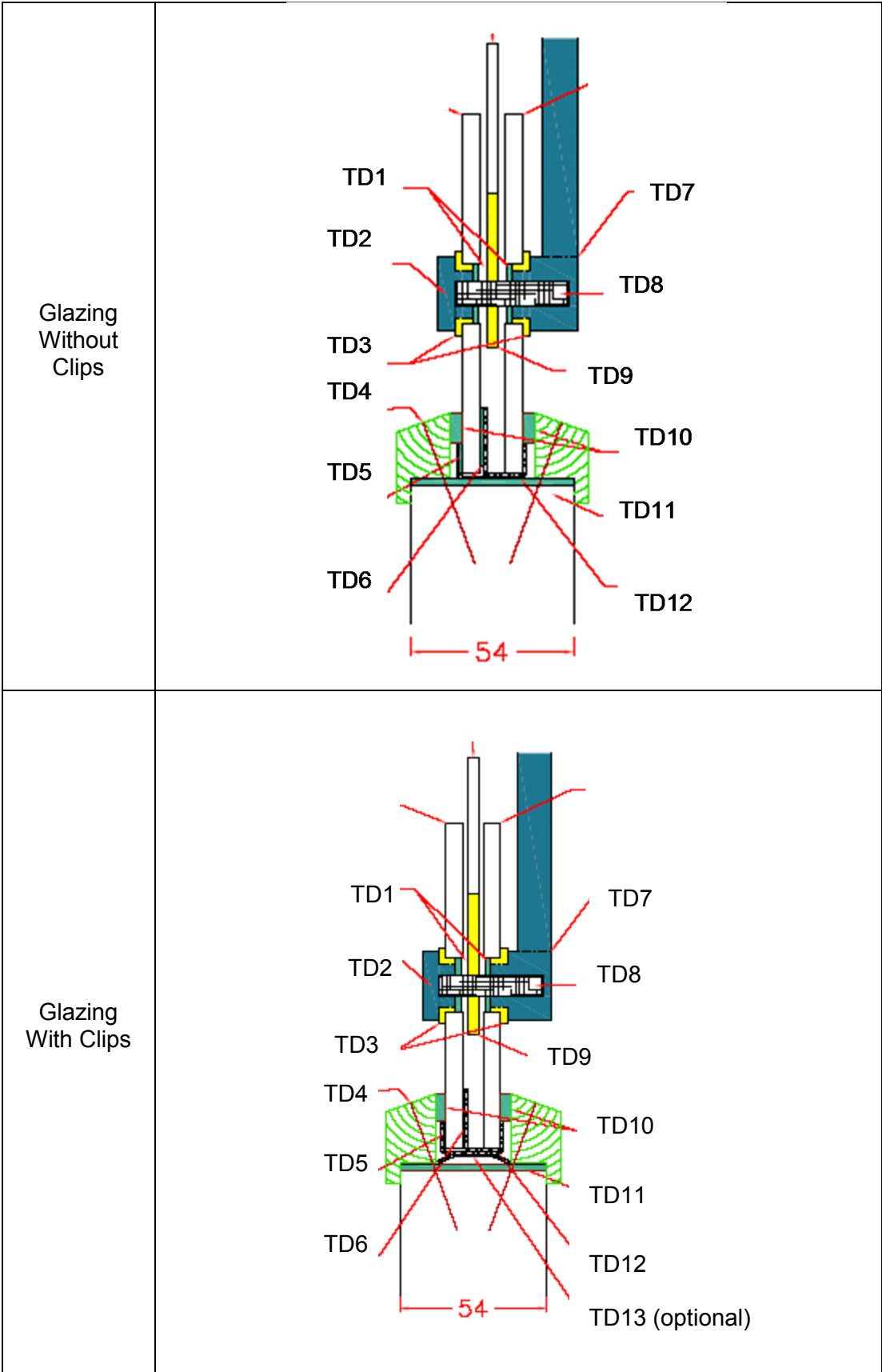
7.6.5 **Installation**

The installation method for the specified Greenlam Industries Ltd Visicom unit must remain as tested; the relevant test reports and sectional drawings are held in confidence at Exova Warringtonfire. Visicom units may be installed either with or without steel clips (as appropriate – see relevant test evidence) and may incorporate an aluminium or steel lever handle (to operate the middle pane) which may be orientated on either the exposed or unexposed face.

Hardwood beads (the use of Beech (*Fagus Sylvatica*) is not permitted) having a minimum density of 640kg/m³ must be retained in position with 39mm long x No 6 to No 8 steel screws or 50mm long x 2mm diameter steel pins inserted at nominally 150mm to 180mm centres. Timber for glazing beads must be straight grained joinery quality, free from knots, splits and checks.

7.6.6 Visicom Glazing Sections – using Pyran S

(TD references are held in confidence on file at Exova Warringtonfire)



8 Lipping Materials

8.1 Timber Lippings

Halspan® 60 Optima must be lipped in accordance with the following specification. The lipping specifications for steel frame doorsets are contained in appendix C.

Material	Size (mm)	Min. Density (kg/m ³)
Hardwood ¹ which must be straight grained, joinery quality, free from knots, splits and checks	<ol style="list-style-type: none"> 1. Flat = 6 – 18 thick with a maximum of 2mm profiling permitted at corners of lipping (see section 10.1) 2. Rounded = 8 – 18 thick with a radius matching the distance between leaf edge and floor pivot (see section 10.1) 3. Rebated = 20 – 30 thick with a 13mm deep equal rebate 	640

Notes:

1. The use of Beech (Fagus Sylvatica) is not permitted
2. Overpanels separated from the leaf heads with a transom do not need to be lipped
3. Overpanels flush with the leaf heads must be lipped on the bottom edge and may additionally be lipped on all edges if required
4. 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
5. Leaves to doorsets with flush overpanels must be lipped on the vertical edges and additionally at the bottom edge of the overpanel and top edge of the doors
6. Double doorsets without flush overpanels may use square or rebated meeting edges
7. Double doorsets with flush overpanels may use a rebated overpanel junction and rebated meeting edge junction concurrently
8. A 2.5° chamfer is permitted to the lipping at the leading edge of leaves providing the door gaps meet the requirements of section 14.

8.2 PVC Lippings

Halspan® 60 Optima may be lipped with PVC in accordance with the following specification; lippings may be applied to all edges as required:

Material	Size (mm)	Min. Density (kg/m ³)
PVC	2 thick	-

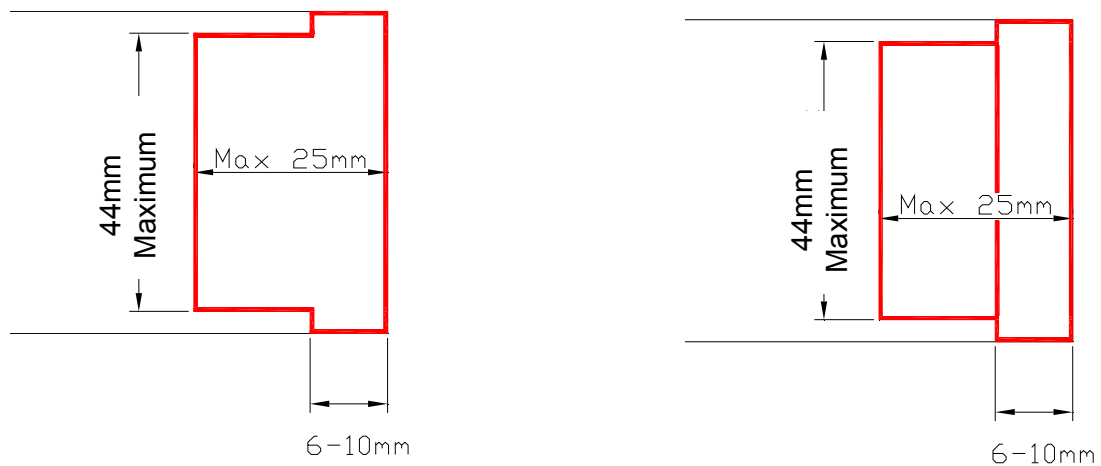
PVC lippings as above may be fitted direct to Halspan® 60 Optima core or onto hardwood lippings as detailed in section 8.1.

8.3 DDA Compliant Contrast Strips

In certain circumstances, edging to the door leaf may be required to provide visible contrast to comply with DDA regulations; it will be permissible to fit solid 2mm x 15mm wide PVC strips into a groove machined in the edge of the leaf, provided the installation does not interfere with any installed intumescent system.

8.4 'T' Section Lippings

In certain circumstances, a 'T' section lipping may be required which will be bonded into a groove machined in the edge of the leaf. This option is acceptable providing the tongue is a maximum of 44mm wide and otherwise meets the specification given in section 8.1. The 'T' section lipping may be in two sections with the exposed lipping being within the range of 6–10mm thick. T-section lippings may not be used in combination with the facings options shown in section 9.2. All glue lines must be as stated in section 12. See drawings below:



9 Leaf Facing Materials

9.1 General

The basic 54mm thick Halspan® 60 Optima leaf construction has integral facings and

9.2 Grooves

Both sides of Halspan® 60 Optima door leaves may be grooved to the following specification: Grooves may coincide with the top and bottom edges of glazed apertures if desired.

Element	Details	
Max. groove size (mm)	5 wide x 4 deep	
Proximity to door edges (mm)	Horizontal Grooves	≥ 150 from top and bottom
	Vertical Grooves	≥ 150 from sides
Groove spacing (mm)	Max. 6No. grooves divided between horizontal and vertical orientations as required	
Orientation	Vertical or horizontal	
Configuration	Latched and unlatched, single and double acting, single and double leaf doorsets	
Leaf size range (mm)	All	

9.3 Decorative and 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 Material	Maximum Permitted Thickness (mm)
Paint	0.5
Timber veneers	2
Plastic laminates	2
PVC	2
Decorative paper / non-metallic foil	0.4

Notes:

1. Metallic facings are not permitted except for push plates and kick plates
2. The door leaf thickness may be reduced by a 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. The finished leaf thickness must be a minimum of 54mm
3. The PVC may be post-formed over the vertical and horizontal edges provided that the required intumescent specification detailed in appendix B is maintained. The maximum radius at the corners of the leaf for post formed doors is 8mm, see diagram in section 10.1 for details
4. Other than PVC as in note 3, materials must not conceal intumescent strips.

9.4 PVC Edge Protectors and Post-Formed CS Group Acrovyn

9.4.1 General

It is possible to fit proprietary edge protectors to this doorset design 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 this design. The end user must satisfy themselves that the test evidence supports the proposed end use application.

9.4.2 CS Group Edge Protectors

The Halspan® 60 Optima designs have been tested and assessed for use with CS Group edge protectors. CS Group edge protectors for fitting at the meeting edges of double doors are supplied pre-formed with the approved intumescent material. The CS Group edge protectors for fitting at the hanging edges (and closing edges of single doors) are supplied without intumescents and require intumescents to be fitted in the frame reveal. 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 datasheets in appendix B. CS Group must be contacted for precise installation and fixing details (www.c-sgroup.co.uk).

9.4.3 Post-Formed CS Group Acrovyn

It is possible to encapsulate the Halspan® 60 Optima design by post-forming the leaf in CS Group Acrovyn, based on the supporting test evidence in Chilt/RF11061 and the following specification.

1. CS Group Acrovyn must be wrapped around the vertical edges of the leaf only, i.e. the top and bottom of the leaf must remain exposed
2. The vertical edge detail prior to post-forming must either be lipped with hardwood as detailed in section 8 of this assessment
3. The maximum radius of the lipping at the corners of the vertical edges before post-forming must be 9mm, which provides for 11mm external radius after the CS Group Acrovyn has been applied
4. The intumescent detail as specified in section 11 and the relevant (CS Group headed) datasheets contained in appendix B of this assessment must be replicated
5. CS Group Acrovyn must be bonded to the leaf using 3M Scotch-Grip cement 10 contact adhesive, or equivalent
6. See relevant (CS Group headed) datasheets in appendix B of this assessment for maximum permitted leaf sizes;
7. The maximum thickness of CS Group Acrovyn used must be 2mm, as per test evidence
8. The CS Group Acrovyn can be provided as pre-formed trays with dimensions to suit the proposed leaf sizes, as well as sheets for post-forming by the door manufacturer.

10 Door Frames

10.1 Door Frame Construction

Timber based door frames for Halspan® 60 Optima must be constructed to meet the following specification (for steel door frame options see appendix C).

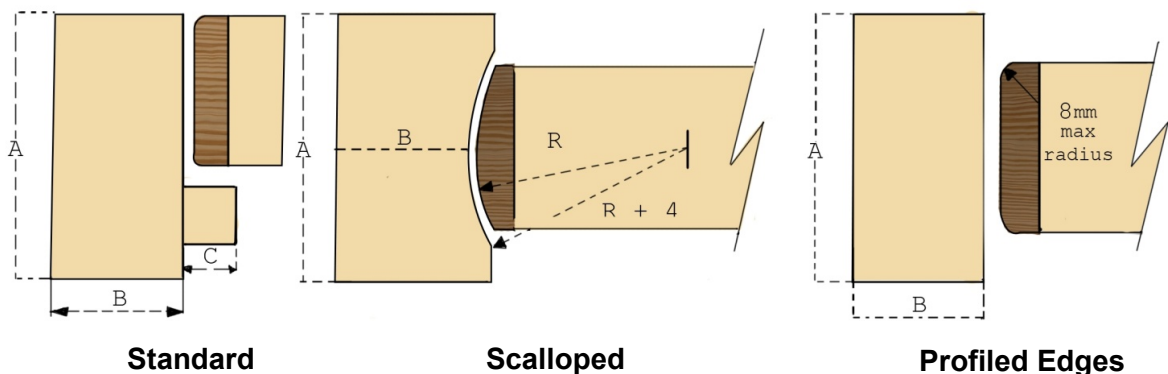
Material	Min. Section Size (mm)	Min. Density (kg/m ³)	Permitted Configuration	Max. Leaf Dimensions
Hardwood ¹	70 x 32*	640	All	All
Hardwood ¹	70 x 32	530	LSASD & ULSASD	2100mm (h) x 900mm (w)
Hardwood ¹	70 x 44	530	All	All
MDF	70 x 30*	700	All	2440 (h) and not restricted in width

Notes:

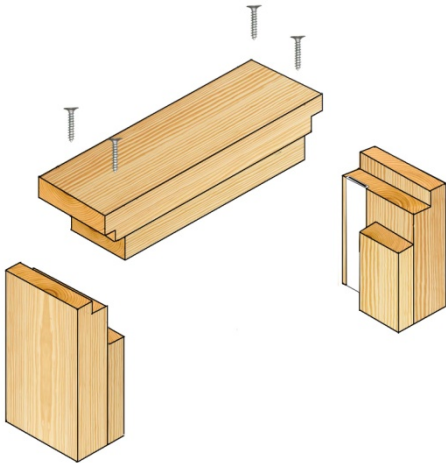
1. The use of Beech (*Fagus Sylvatica*) is not permitted
2. If the doorset features a transomed overpanel, the door frame must be hardwood with a minimum density of 640kg/m³ and with a minimum section of 70mm x 32mm
3. All door frame timber must be joinery quality, free from knots, splits and checks
4. A 12mm deep planted or integral stop is adequate for single acting frames whilst double acting frames may be scalloped or square (see diagram below). However, a 14mm deep stop is required when using the Dorma ITS 96 concealed closer mounted in the leaf head – see section 13 for details
5. Frame joints may be mortice and tenoned, mitred, half lapped or butted and with no gaps. All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws
6. Hinge fixings must be fit for purpose and if they penetrate through the rear of the frame, a sub frame of the same hardwood will be required. The entire screw length must be within a timber substrate
7. The door frame (MDF or timber based) may be entirely clad in 2mm thick PVC sheeting for use with leaves either with or without 2mm thick PVC edge protectors (see section 8) and facing material (see section 9)
8. Steel and MDF framed doorsets are not assessed for glazed fanlights.

The following diagram depicts the assessed frame profiles and dimensions:

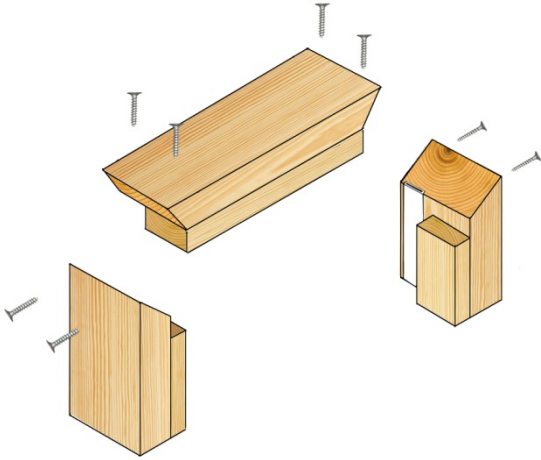
A = min 70mm
B = min 30 - 44mm (see table above)
C = min 12mm
R = radius from floor spring
8mm max radius to create a maximum 2mm edge profiling



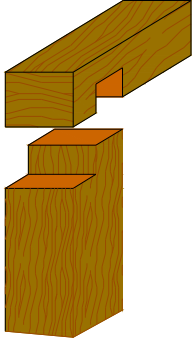
10.2 Door Frame Joints



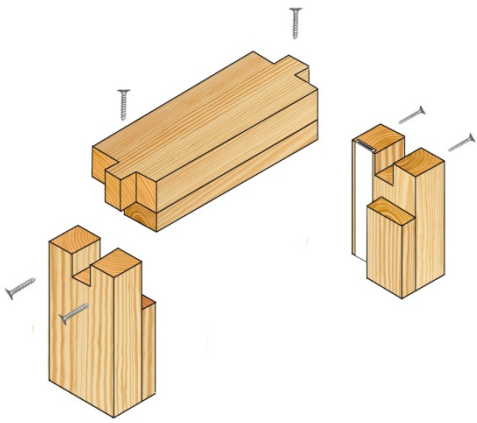
Half Lapped Joint



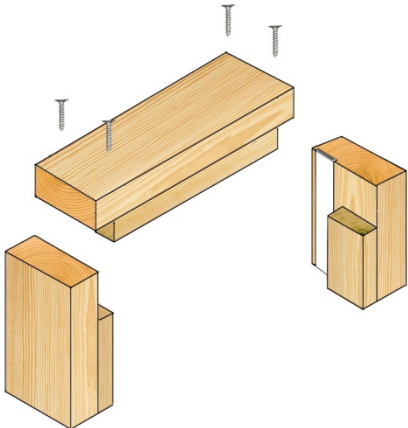
Mitre Joint



Half Lapped Joint - variation



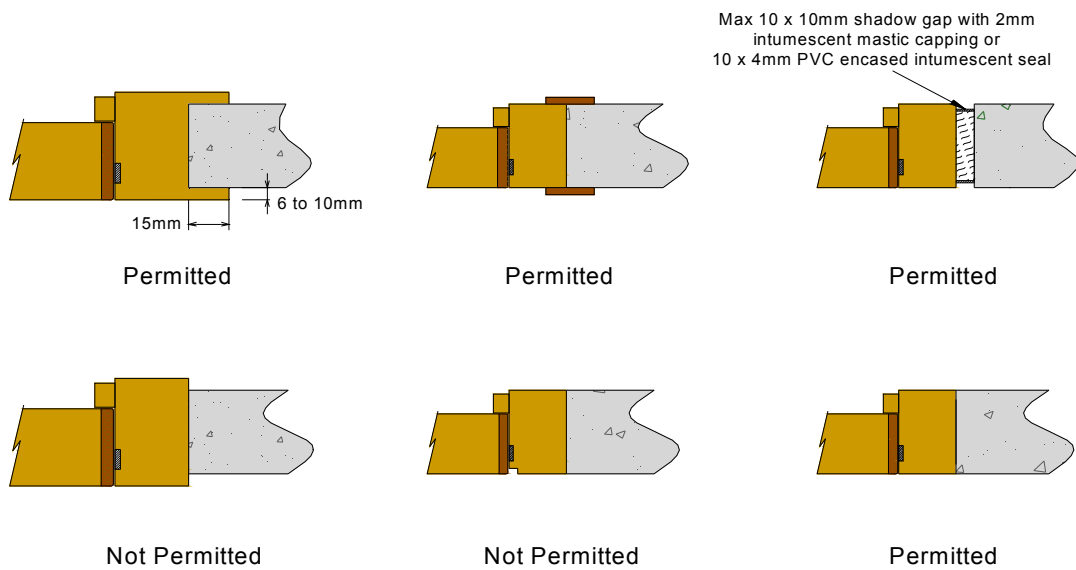
Mortice and Tenon Joint



Butt Joint

10.3 Door Frame Installation

The following diagrams indicate acceptable and unacceptable door frame installations:

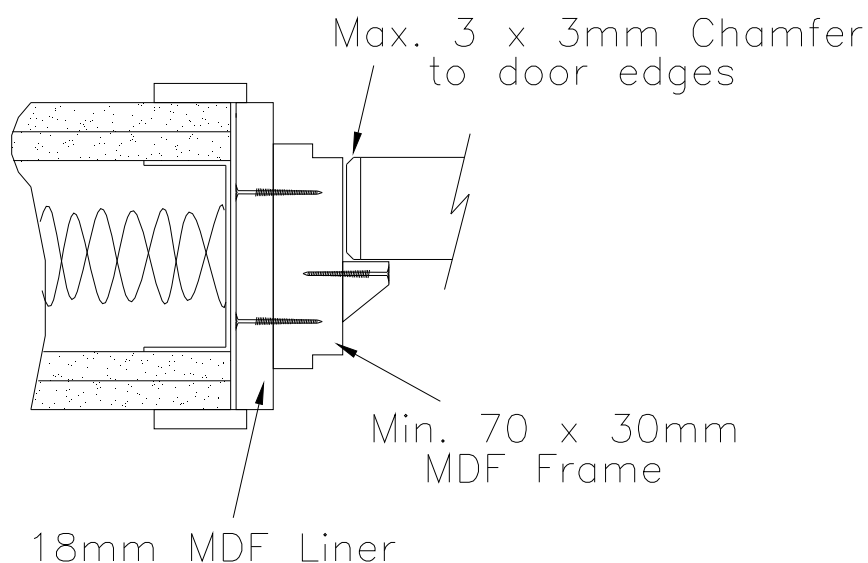


Note:

1. For the shadow detail depicted (top right), the sub-frame material must be the same material as is approved for the door frame or a non-combustible board tightly fitted to the rear of the frame with no gaps, gaps between the subframe and supporting construction must be appropriately fire-stopped in accordance with the requirements of section 17.

10.3.1 MDF Frame Installation Option

The installation detail shown below is allowable provided the door frame and liner are screwed and additionally glued together using Urea or Phenol Formaldehyde, PVA, PVAC or PU gluelines; the door frame joints must be mitre type, tight with no gaps. All other details must as specified in section 10.1 and datasheets in appendix B.



10.3.2 Additional Permitted Frame Installation Details

The following variation to the standard installation details is additionally permitted for solid timber frames (MDF frames are not permitted).

Based on the testing conducted for this design and Exova Warringtonfires' general experience of testing both door frames and glazed screens (where the char rate of the timber increases as a result of charring from two faces simultaneously), solid timber frames may project a maximum of 18mm from the structural surround, providing one of the two frame material specifications below is met:

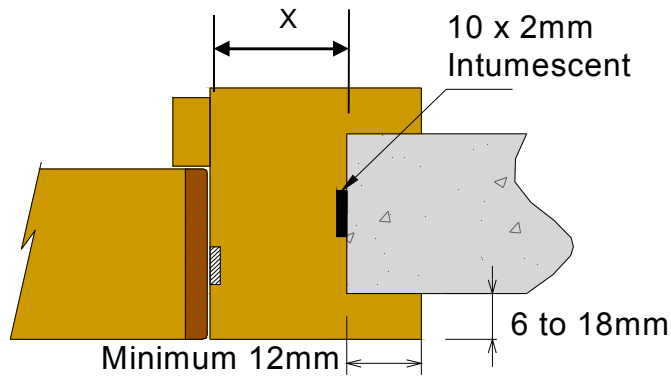
Material	Minimum Section Size ¹ (mm)	Minimum Density (kg/m ³)
Hardwood ⁴	70 x 32	640
Hardwood ⁴	70 x 40	530

Notes:

1. Excluding both the stop and any bolection around the structural surround
2. The integral frame bolection must overlap the structural surround by a minimum of 12mm (reduced from the 15mm shown in section 10.3); providing the frame section meets the requirements shown in the table above
3. A 2mm thick intumescent gasket of one of the types shown for top pivots & flush bolts in section 11.1 must be rebated in to the rear of the frame as shown below
4. The use of Beech (Fagus Sylvatica) is not permitted.

The following diagram illustrates the principles described:

$X = \text{min } 32 - 40\text{mm}$ (see table above)



11 Intumescent Materials

11.1 General

The intumescent materials tested and assessed for this doorset design are as follows.

Application	Location	Product/Manufacturer
Edge seals	Fitted in the frame jambs or leaf edges	<ol style="list-style-type: none"> 1. PVC encased Therm-A-Seal – Intumescent Seals Ltd. 2. PVC encased Type SLS – Halspan Ltd. 3. PVC encased 500P – Mann McGowan Ltd. 4. PVC encased Palsuol 100 – Lorient Polyproducts Ltd/Mann McGowan Ltd. 5. PVC encased Type 617 – Lorient Polyproducts Ltd. 6. PVC encased Pyroplex – Pyroplex Ltd.
Hinges	Underneath both hinge blades	<ol style="list-style-type: none"> 1. 1mm Interdens - Dufaylite Developments Ltd. 2. 1mm MAP paper - Lorient Polyproducts Ltd. 3. 1mm Pyrostrip 300 - Mann McGowan. 4. 1mm Therm-A-Strip - Intumescent Seals Ltd. 5. 1mm SLS-PAD-106 – Halspan Ltd.
Lock/latches	Under forend & keep	<ol style="list-style-type: none"> 1. 1mm Interdens - Dufaylite Developments Ltd. 2. 1mm MAP paper - Lorient Polyproducts Ltd. 3. 1mm Pyrostrip 300 - Mann McGowan. 4. 1mm Therm-A-Strip - Intumescent Seals Ltd. 5. 1mm SLS-PAD-106 – Halspan Ltd.
Top pivots & flush bolts	Lining all sides of the mortices	<ol style="list-style-type: none"> 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 SLS-PAD-107 – Halspan Ltd.

The seal specification for each doorset configuration is contained in appendix B.

Encapsulated intumescent seals may be over-painted with conventional paints or varnishes, in normal thicknesses without detrimental effect, see BS 8214-2008 section 14 for details.

11.2 Anti-Ligature Installations

To help maintain the anti-ligature status of fire resisting doorsets installed within mental health facilities it is necessary to provide for the option of fitting perimeter intumescent seals in short lengths (minimum 200mm).

Investigative testing carried out by BM TRADA has shown that the fitting of perimeter intumescent seals as short lengths is acceptable subject to the following specification.

Element	Details
Leaf Configurations	Latched, single acting, single doorsets and latched, single acting, double doorsets
Leaf Dimensions (mm)	Maximum 2100 (h) x 1000 (w), but note that smaller leaf sizes within the envelopes in appendix B take precedence
Door Frame Dimensions (mm)	Minimum 70 x 32 thick
Door Frame Material	Hardwood ³ with a minimum density of 640kg/m ³ , door frame timber must be joinery quality, free from knots, splits and checks.
Intumescent Strip	1. Lorient Polyproducts Type 617 2. Graphite based seals as detailed in appendix B
Intumescent Fixing	Each strip must be pinned with fine gauge, 20mm long steel pins 25mm from each end

Notes:

1. The joints between intumescent sections must be tightly butted to each other with no gaps
2. It must be ensured that the intumescent material is present and unbroken for the full length of its PVC casement for each strip
3. The use of Beech (*Fagus Sylvatica*) is not permitted
4. All other details must remain as specified in the relevant sections of this document.

12 Adhesives

The following adhesives must be used in construction:

Element	Product/Manufacturer
MDF or plywood facings	Urea formaldehyde (UF), Phenol Formaldehyde (PF) or PVA
Timber lippings	UF, PF, PVA, EVA, PVAC or PU
PVC lippings	Contact adhesive

13 Hardware

13.1 General

The following sections detail the scope and constraints for fitting hardware to the 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
- Panic exit hardware: Test Standard EN 1125.

13.2 Tested Hardware

The following hardware has been successfully incorporated in the tests on Halspan® 60 Optima doorsets:

Element	Manufacturer and Product Reference
Hinges	<ol style="list-style-type: none"> 1. 100 x 30mm standard steel butt hinges 2. 101 x 30mm Fireblock stainless steel hinges 3. Royde & Tucker H105 lift off hinges 4. Royde & Tucker H101 lift off hinges 5. Cairney Hardware SOSS type hinges 6. Allgoods steel butt hinges Ref: SS8066RCB 7. Allgoods Ref: MA9171S 8. 114 x 30mm ASSA lift off type butt hinge Ref: 3244 9. 101 x 30mm Halspan R60 butt hinge Ref: BOM-HIN-200/1
Closers	<ol style="list-style-type: none"> 1. Dorma TS83 face fixed overhead closer 2. Geze TS200 VW face fixed overhead closer 3. Halspan R60 Eco closer ref: CLR-AGN-101 4. Halspan R60 power closer ref: CLR-BSS-101 5. Cairney Hardware Ltd Mitron C2300 concealed overhead closer 6. ITS 96 concealed overhead closer 7. Briton BTS75V floorsprings 8. Dorma Door Controls Ltd 7475AX floorsprings/7421 bottom strap 9. Dorma Door Controls Ltd 8066 top pivot/top centre 10. Dorma Door Controls Ltd EMF guide channel 11. Allgood 9171 face fixed overhead closer
Locks & Latches	<ol style="list-style-type: none"> 1. Standard tubular mortice latch 2. GU Ferco multi point lock/latch 3. Halspan R60 latch/lock Ref: BOM-LCK-104 4. Cairney Architectural Hardware – C4100 Shearmag lock 5. Allgoods mortice cylinder lock Ref: SS7279F60 6. Abloy – latch body Ref 251RRKKRR mounted in frame head 7. Head Mounted Roller Latch
Threshold seals	<ol style="list-style-type: none"> 1. Halspan threshold drop seal Ref: SAC PA 08935, Ref: SLS-DRP-100 range 2. Norsound threshold drop seal Ref: 810

Notes:

1. The GU Ferco 3 point Deadbolt requires a 25 x 4mm thick intumescent strip in the closing edge frame reveal in lieu of the specification shown in appendix B and can only be used on single leaf doorsets of maximum leaf height 2231mm, when used in a hardwood (640kg/m³) door frame
2. The Cairney Hardware Shearmag lock must be used in conjunction with a twin strip perimeter intumescent specification at the head of the door in conjunction with the supplied Halspan intumescent protection pack fitted around the body of the lock
3. The Cairney Hardware Mitron C2300 concealed overhead closer must be used in conjunction with a twin strip perimeter intumescent specification at the head of the door in conjunction with the supplied Halspan intumescent protection pack fitted around the body of the closer
4. The Dorma ITS 96 concealed overhead closer (with associated smoke shroud) may be used with a single strip perimeter intumescent specification providing the strip is $\geq 25 \times 4\text{mm}$ and centrally fitted. The closer may also be used with a twin strip perimeter intumescent specification at the head of the door providing the seals are $\geq 15 \times 4\text{mm}$. The closer must always be used in conjunction with the tested proprietary intumescent pack to be provided by the supplier of the closer. Timber door stops will need to be a minimum depth of 14mm to accommodate the closer
5. The Geze Boxer concealed overhead closer may be used in lieu of the ITS96, subject to the same installation requirements shown in point 4. Assessment is made on the basis of the close similarity in rebate sizes required and material specifications of the two closers
6. Locksets with forends/keeps $\geq 150\text{mm}$ high must either be used with a twin strip perimeter intumescent specification or if a single strip system is to be used an additional seal must be fitted to run along-side the forend/keep
7. Abloy latch body Ref. 251RRKKRR must only be fitted to doorsets that are specified with a twin strip perimeter intumescent specification at the head of the door, the seals must be $\geq 15 \times 4\text{mm}$.

13.3 Additional & Alternative Hardware

13.3.1 Latches & Locks

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

Element	Specification
Maximum forend and strike plate dimensions	235mm high by 25mm wide by 4mm thick
Maximum body dimensions	18mm thick by 100mm wide by 170mm high
Intumescent protection	Required - see section 11
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel
Location	750 – 1200mm from the threshold

13.3.2 Automatic Closing

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

Perkomatic jamb mounted closers may be fitted provided the inactive leaf of any associated double doorset is bolted closed; a minimum of 80mm of core material remains from the end of the rebate required by the Perkomatic to the closing or meeting edge of the door leaf and manufacturers installation instructions are followed.

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

13.3.3 Hinges

Halspan® 60 Optima leaves must be hung on minimum 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 4 No. 30mm long No. 8 or No.10 steel wood screws per blade	
Materials		Steel or stainless steel	
Hinge positions	If 3 hinges are required	Top	100 –180mm from the head to top of hinge
		2 nd	Minimum 200mm from bottom of top hinge to top of 2 nd hinge or centrally fitted between top and bottom hinges
		Bottom	150 – 250mm from the foot of leaf to bottom of hinge
	If 4 hinges are required	Top	100-180mm from the head to top of hinge
		2 nd & 3 rd	Equispaced between top and bottom or minimum 200mm from bottom of top hinge to top of 2 nd hinge and 3 rd hinge equally spaced between 2 nd and bottom hinges
		Bottom	150 – 250mm from the foot of leaf to bottom of hinge
Intumescent protection		Required - see section 11	

13.3.4 Pull Handles

Handles may be surface-fixed or bolted through the door leaf and must be stainless steel, steel, bronze or brass; the length is limited to 1200 mm between the fixing points. If through fixed, bolts or studs must be steel and there must be no more than 1mm clearance between the hole and bolt/stud.

13.3.5 Push Plates & Kick Plates

Stainless steel, steel, bronze or brass push plates and kick plates may be fitted to the doorsets provided that their fitting requires the removal of no part of the door leaf. These items of hardware 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.

13.3.6 Head Mounted Roller Latch

Roller catches may be used with this door design but only in conjunction with a self closing device, the roller catch must be steel and must meet the specification given below.

Element		Maximum Dimensions (mm)	Position
Latch Body Forend		45 x 22	Frame Head –opposite centreline of leaf
Roller Latch Keep		-	Appropriate to forend above on top of intumescent strip
Intumescent Strips – Intumescent Seals Ltd.	Therm-A-Flex	25 x 2	Fitted centrally in leaf head
	Therm-A-Blade	2No. 10 x 4	Fitted either side of the door closer guide channel

Forend must be fitted 60mm from the meeting edge.

13.3.7 Panic Hardware

Panic hardware may be fitted, providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and it does not interfere with the self-closing action of the door leaf.

13.3.8 Door Selectors

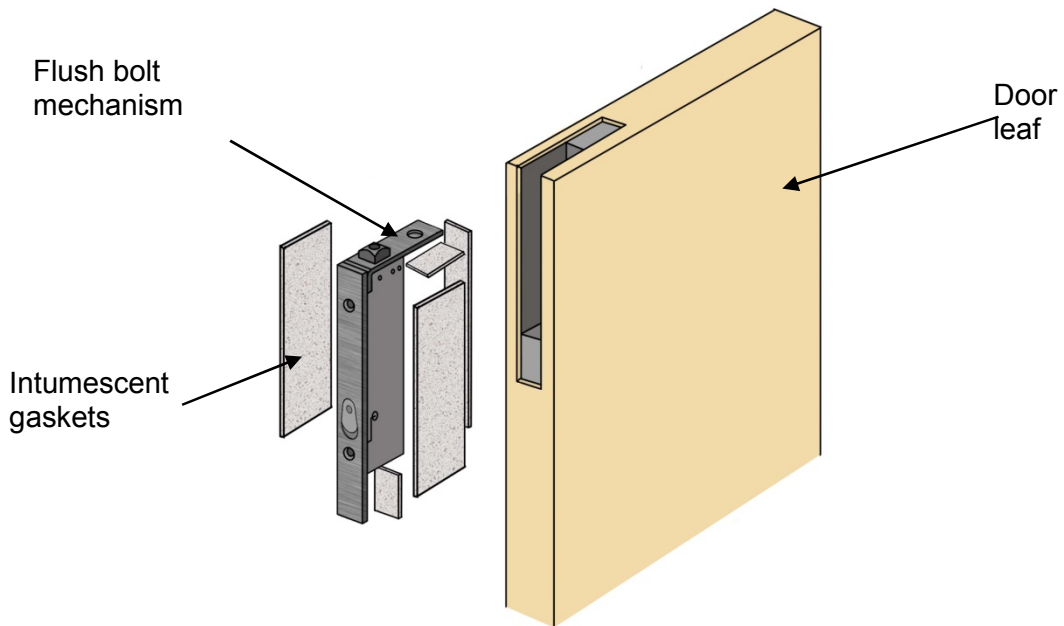
Selectors may be fitted providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and they do not interfere with the self-closing action of the door leaf.

13.3.9 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 leaf edge fitted with intumescent strips:

- 900mm long x 20mm deep x 20mm wide

Flush bolts must be stainless steel or steel and the mortice must be as tight to the mechanism as is compatible with its operation. All edges of the mortice for both top and bottom bolts, as fitted, must be protected with intumescent gaskets as specified in section 11. Alternatively the hardware manufacturers tested gaskets may be used.



13.3.10 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
• Halspan	SLS-DRP-100 range
• Lorient Polyproducts	IS8010si
• Raven	RP8Si
• Athmer	Schall-Ex Duo L-15
• Norsound	NOR810

13.3.11 Environmental Seals

Silicon based flame retardant acoustic, weather and dust seals (e.g. Halspan Triple Fin Ref: SLS-TRI-100 range, Norsound 710, Lorient IS1212, IS1511, IS7025, IS7060) 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.

13.3.12 Sportshall Brackets

Door stop functionality may be provided to double acting doorsets using 3mm thick stainless steel brackets as detailed below.

Installation of the brackets must not involve removal of material from the door leaf.

Brackets may be mounted to either face of a doorset, including opposite sides of double leaf doorsets where leaves are arranged to open asymmetrically.

Element		Dimensions (mm)	Location
Bracket		40 x 35 x 25 with 3 mounting holes for minimum 25mm long steel screws	1No. per leaf in frame head – 100mm from closing edge
Intumescent protection	Leaf Edge Seals	2No. 15 x 4 Lorient Palusol 100P or Type 617	Fitted 5mm either side of the centre line of the leaf hanging edges and head
	Hinge Blades	1mm thick Interdens	Under both blades
	Bracket	2mm thick Interdens	Fitted under the bracket where fixed to the frame
Lipping		6–18 thick Hardwood min. density 640kg/m ³	All leaf edges

See below for drawing detailing the brackets.

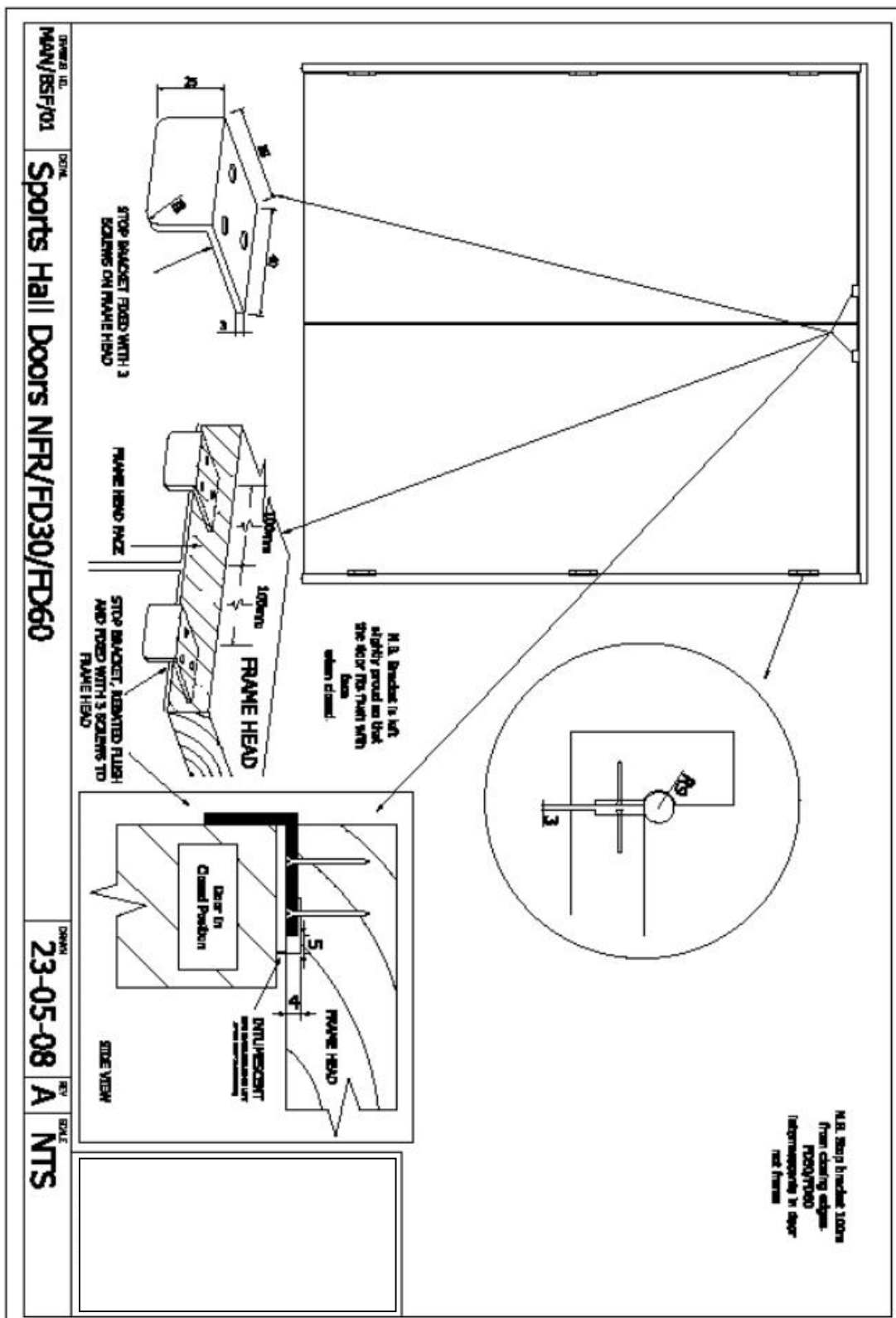
Adhesives for lippings where these steel brackets are utilised must be either Urea formaldehyde (UF) or Phenol Formaldehyde (PF).

Door frames for use with these brackets must meet the following specifications.

Material	Minimum Dimensions (mm)	Density (kg/m ³)
Hardwood*	90 x 32	640
MDF	90 x 30	750

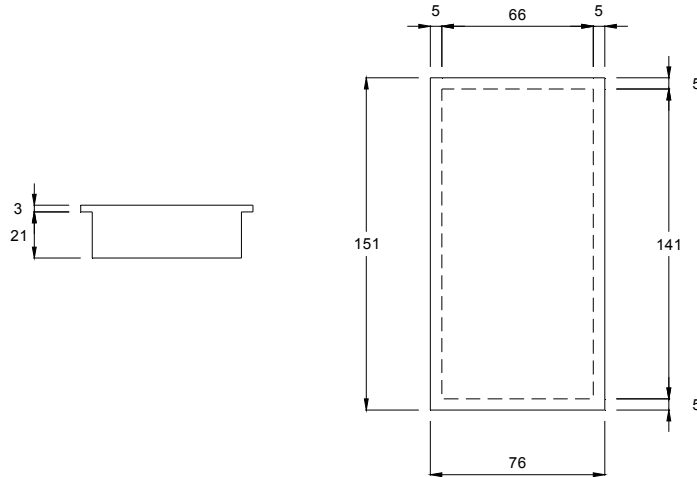
* The use of Beech (Fagus Sylvatica) is not permitted.

Doorsets must be fitted with an automatic face fixed self-closing device which complies with the requirements in section 13.3.2.



13.3.13 Flush Door Handles

The evidence cited in test DFR0511252 demonstrates that rectangular shaped steel flush handles with a maximum linear dimension of 141mm and an area of 0.01m² may be fitted on both faces of Halspan® 60 Optima door leaves provided the required rebates are offset from each other by a minimum of 100mm and fitted no closer than 100mm from the leaf edge and may be fitted up to 1200mm from the foot of the leaf. The diagram below illustrates the tested handle:



Provided the rebate for the 'tray' is tight, no additional intumescent material is required.

13.3.14 Letter Boxes/Plates

Letter boxes/plates may be fitted providing the product has demonstrated contribution to the required integrity performance of this type of doorset design, when tested to BS 476: Part 22: 1987, BS EN 1634-1 or EN 1634-2, when installed in a timber based doorset of comparable thickness. Products may be fitted up to 1200mm from floor level and no closer than 100mm to any leaf edge.

13.3.15 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 +1 mm). Lenses must be glass and the item must be bedded into a tested intumescent mastic.

13.3.16 Air Transfer Grilles

Air transfer grilles may be fitted providing the product has suitable test evidence to BS 476: Part 22: 1987, BS EN 1634-1 or EN 1634-2 that demonstrates a minimum 60 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 that proven by the supporting fire test for the specific type of grille being used, and must be deducted from the area assessed for glazing, if both elements are fitted.

13.3.17.1 Smoke Control

Except where the installed grille or louvre is linked to a smoke detection system such that it will be closed in the event of smoke being detected, smoke control as defined by the performance criteria set out in BS 476: Part 31: Section 31.1 cannot be claimed for a doorset fitted with an air transfer grille(s).

13.3.17 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 60 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.

14 Door Gaps

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

Location	Dimension
Door edge gaps	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

15 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.

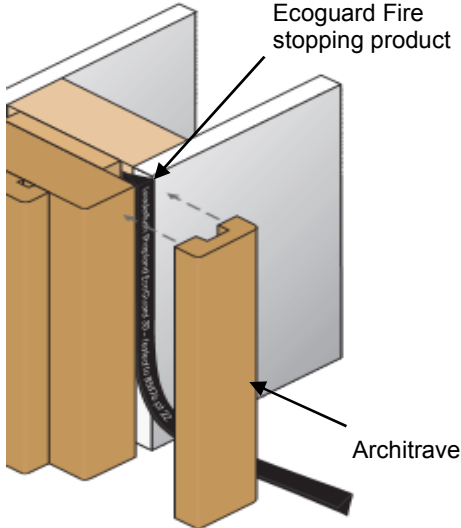
16 Fixings

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 50mm. It is not necessary to fix the frame head, although packers must be inserted. Packers may be from PVC; all framing must be sealed to the structural opening in line with the details in section 17.

17 Sealing to Structural Opening

The door frame to structural opening gap must be appropriately protected; guidance for various methods of sealing the frame to structural opening gap is given in BS 8214: 2008, Code of practice for timber fire doors, which may be referred to where appropriate.

Alternatively the Greenlam Industries Ltd Ecoguard Fire stopping product may be utilised as illustrated below.

<p>Gaps between 6 and 14mm may be sealed on both faces with Greenlam Industries Ltd Ecoguard – as illustrated. Ecoguard must be fully inserted with its' wider edge flush with the supporting construction.</p> <p>Infilling between the 2 Ecoguards is optional.</p> <p>Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.</p> <p>Full details are available from Greenlam Industries Ltd.</p>	
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18 Insulation

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

Type		Details
Partially insulating		Doorsets incorporating up to 20% of non-insulating or partially insulating glazing
Fully insulating	Timber frames	Unglazed doorsets
	Steel frames back filled with mortar/concrete	

19 Smoke Control

19.1 General

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

(a) have a leakage rate not exceeding 3m³/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.

19.2 Further Considerations

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

The following products can be used for smoke control purposes:

- Halspan Triple Fin (Ref: SLS-TRI-100/2) – fitted in the frame reveal against the upstand of the stop
- Halspan Trident Seal (Ref: SLS-TRI-103/5)
- Halspan threshold drop seal (Ref: SLS-DRP-100 range) – fitted in the bottom edge of the leaf
- Norsound 810 drop seal – fitted in the bottom edge of the leaf
- Norsound 710 perimeter seal – fitted in the frame reveal against the upstand of the doorstep
- Greenlam Industries Ltd PS01 perimeter seals – fitted in the leaf edge or frame reveal
- Norsound 720 and 710 perimeter seals – fitted in the leaf edge or frame reveal
- Lorient Batwing range – fitted in the frame reveal against the upstand of the stop
- Lorient DS range of combined intumescent, smoke and sound control seals.

Note:

The incorrect specification and fitting of smoke seals may impair the operation of a fire resisting doorset assembly such that integrity is reduced, or in the extreme case completely diminished.

20 Conclusion

If the Greenlam Industries Ltd Halspan® 60 Optima doorset design, constructed in accordance with the specification documented in this global assessment, were to be tested in accordance with BS 476: Part 22: 1987, it is our opinion that they would provide a minimum of 60 minutes integrity and insulation (subject to section 18).

21 Declaration by the Applicant

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

Signed:

Name:

For and on behalf of: **Greenlam Industries Ltd.**



22 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.

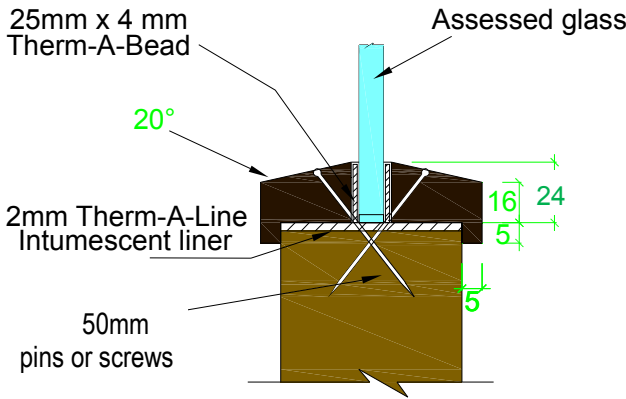
23 Validity

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 technical review and revalidation
2. This assessment report is not valid unless it incorporates the declaration given in Section 21 duly signed by the applicant.

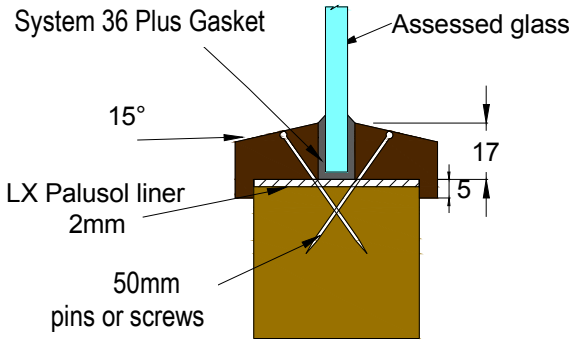
Signature:		
Name:	A M Winning	J P Mullett
Title:	Senior Product Assessor	Principal Consultant

Appendix A

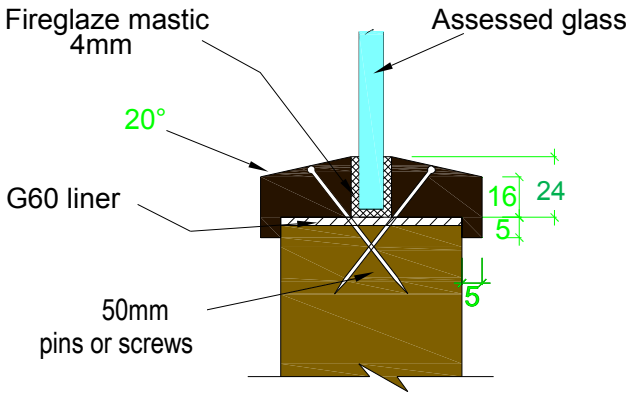
Proprietary Glazing Systems



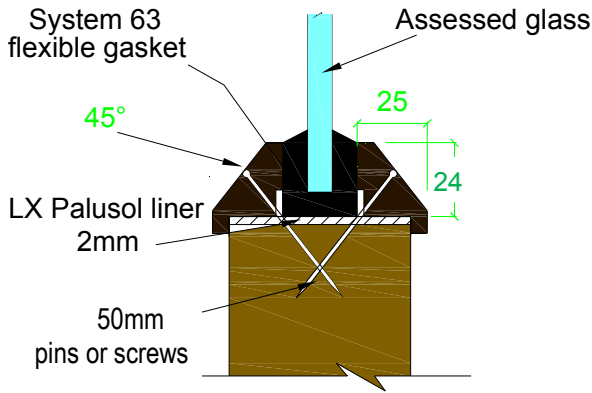
Therm-A-Glaze 60
Intumescent Seals Ltd
Glazing system 1



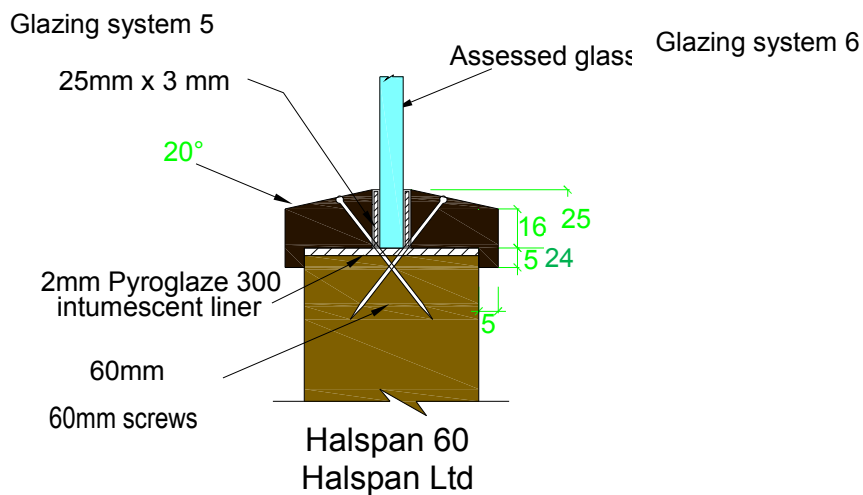
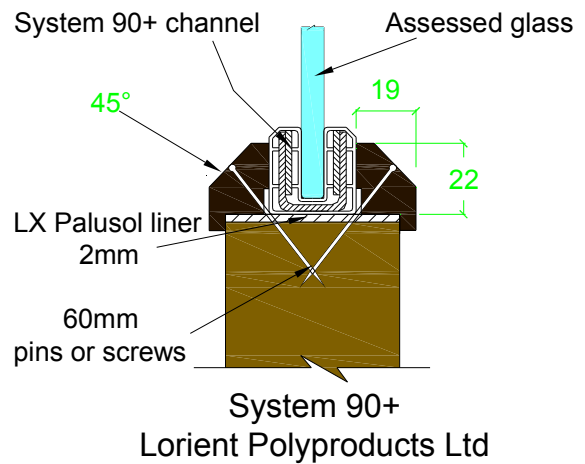
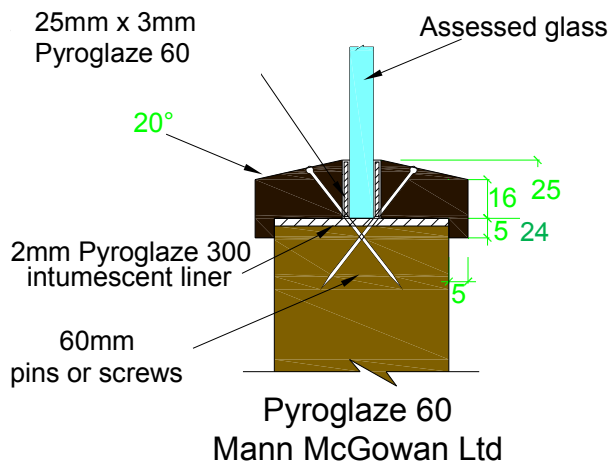
System 36 Plus
Lorient Polyproducts Ltd
Glazing system 2



Fireglaze Mastic
Sealmaster Ltd
Glazing system 3

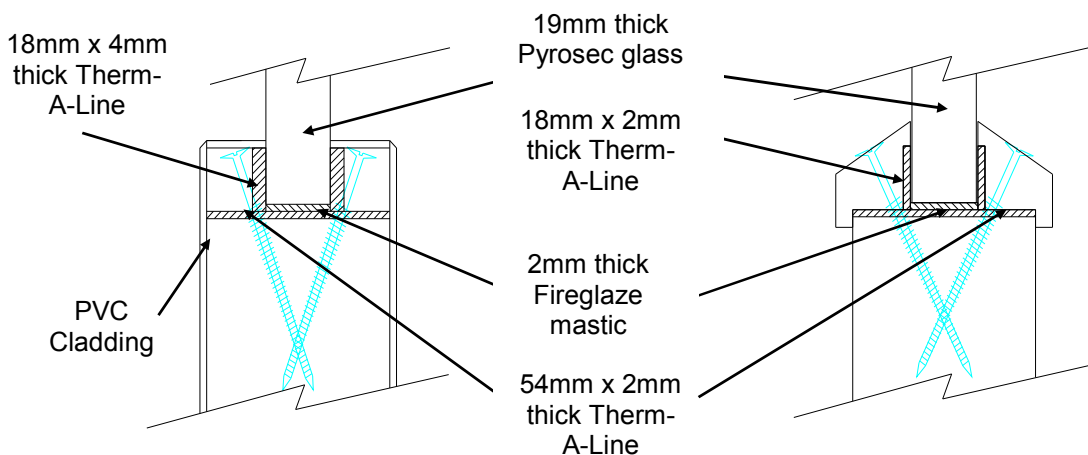


System 63
Lorient Polyproducts Ltd
Glazing system 4



Glazing system 7

19mm Pyrosec Installation



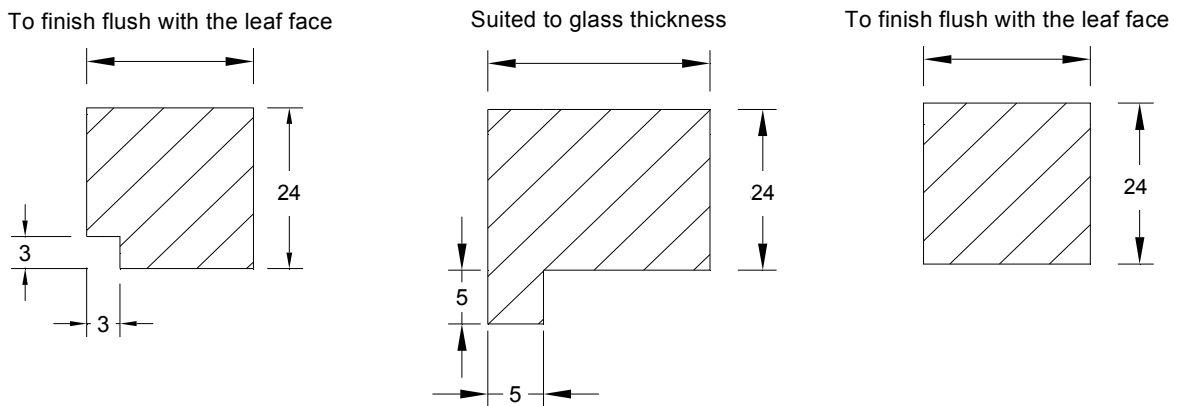
60mm long steel screws at 100mm centres and 30° to the plane of the glass.
 Hardwood Beads - 640kg/m³.
 PVC Cladding is optional.

Summary of Glazing Restrictions

Glazing System	Maximum Area (m ²)	Glazing systems 1 – 8 may be used with any of the assessed glasses shown on the right. Further restrictions apply beyond the limits given for area (area for glazing system takes precedence over area for glass) – see section 7 for full details.	Assessed Glass	Maximum Area (m ²)
1. Therm-A-Glaze 60	0.82		6 & 7mm Pyroshield 2	0.82
2. System 36 Plus	0.5		Sureglaze Wired	0.82
3. Fireglaze 60	0.82		Pyran S	0.82
4. System 63 (circular apertures only)	0.5		Pyrostem	0.6
5. Pyroglaze 60	0.5		Pyrodur 60-10	0.82
6. System 90+	0.5		Pyroguard EW Maxi	0.52
7. Halspan 60	0.5		Pyrobelite 12	0.82
8. Halspan Slimglaze60	0.5		Pyrodur 60-20	0.82
		Pyroguard EI30	0.82	
		Contraflam 16	0.82	
		Pyrostop 30-10	0.82	
		Pyrobel 16	0.82	
		Pyroguard EI60	0.52	

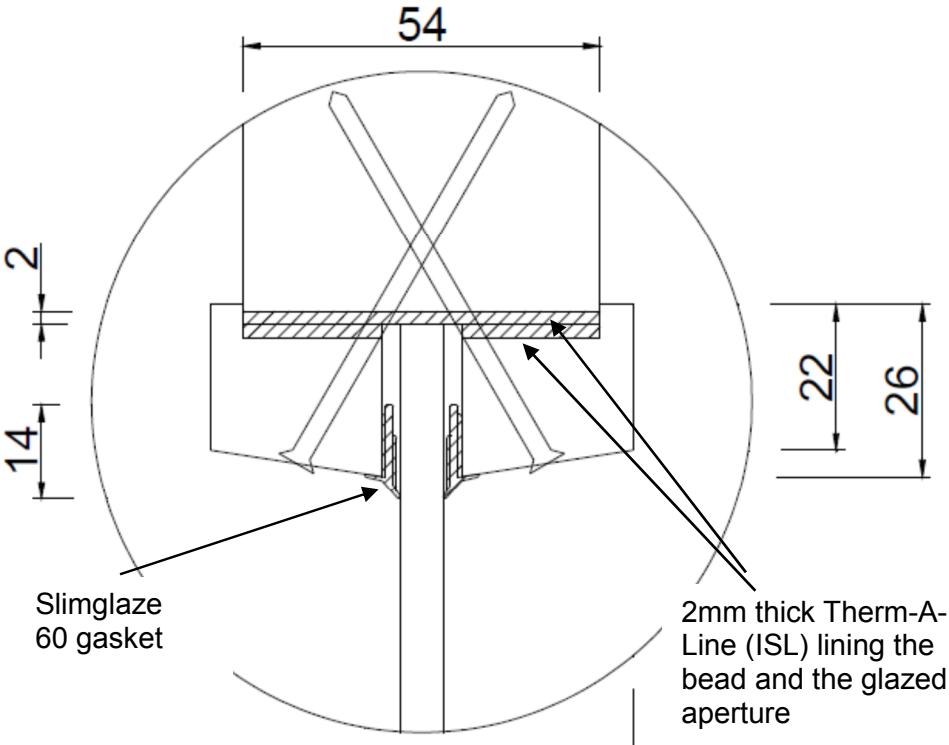
Assessed Square Glazing Bead Profiles

The following square bead profiles may be used as an alternative to splayed beads – refer to section 7 for full details of glazing system and glass restrictions

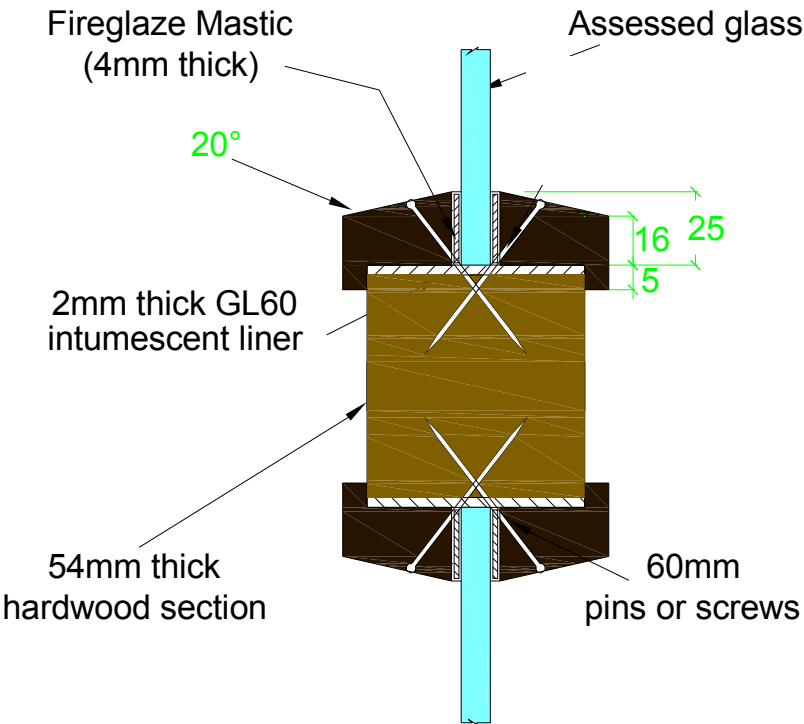


Assessed Square Bead Installations	Glazing System	Assessed Glass	Maximum Area (m ²)
	Therm-A-Glaze 60	6 & 7mm Pyroshield 2	0.82
		6mm Sureglaze Wired	
	1. Therm-A-Glaze 60 2. Fireglaze 60	Pyrodur 60-20	
		Pyroguard EI30	
		Contraflam 16	
		Pyrostop 30-10	
		Pyrobel 16	
Fireswiss Foam 60/60			

Halspan Slimglaze 60 System – Glazing System 8



Halspan® 60 Multipane Glazing System



Appendix B

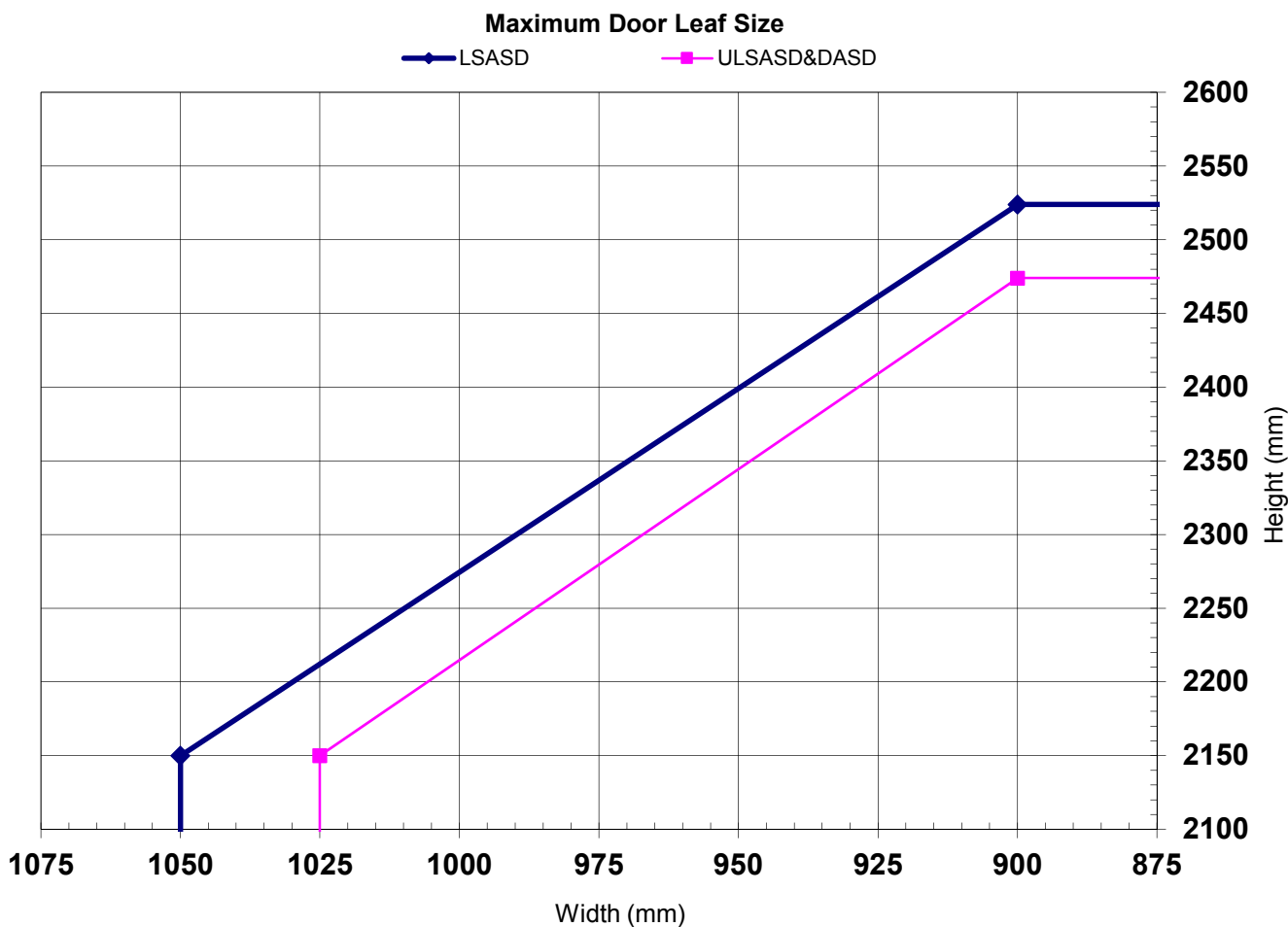
Data Sheets for Greenlam Industries Ltd.

Halspan® 60 Optima Doorset

60 Minute Fire Resisting Doorset

Halspan® 60 Optima Doorset – 60 Minutes Fire Resistance Latched & Unlatched, Single & Double Acting, Single Doorset

Fig: G1	Configuration	Height (mm)		Width (mm)	
Leaf Sizes	LSASD	From:	2150	x	1050
		To:	2524	x	900
	ULSASD & DASD	From:	2150	x	1025
		To:	2474	x	900
Maximum Overpanel Height (mm)		Transomed	2000		
Glazing		Maximum Glazed Area	0.82m ² (see section 7 for details)		
		Approved Systems	See section 7 and appendix A		
Frame Specification (see section 10 for details)		Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)	
		Min. Section (mm)	70 x 22	70 x 30	
		Min. Density (kg/m ³)	640	700	
Intumescent Materials: PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS Head: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head. Jamb: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. Hardware Protection: See section 11.					



Halspan® 60 Optima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Single Doorset - Transom Optional

Fig: G2	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD+OP	From:	2150	x	1025
		To:	2424	x	900
	ULSASD+OP & DASD+OP	From:	2150	x	1000
		To:	2374	x	900
Maximum Overpanel Height (mm)		No Transom Required	2000		
Glazing		Maximum Glazed Area	0.82m ² (see section 7 for details)		
		Approved Systems	See section 7 and appendix A		
Frame Specification (see section 10 for details)		Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)	
		Min. Section (mm)	70 x 22	70 x 30	
		Min. Density(kg/m ³)	640	700	

Intumescent Materials: PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS

Head (junction of leaf heads and overpanel):

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of overpanel; optionally 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf heads and 1No. 15x4mm fitted centrally in the bottom of overpanel.

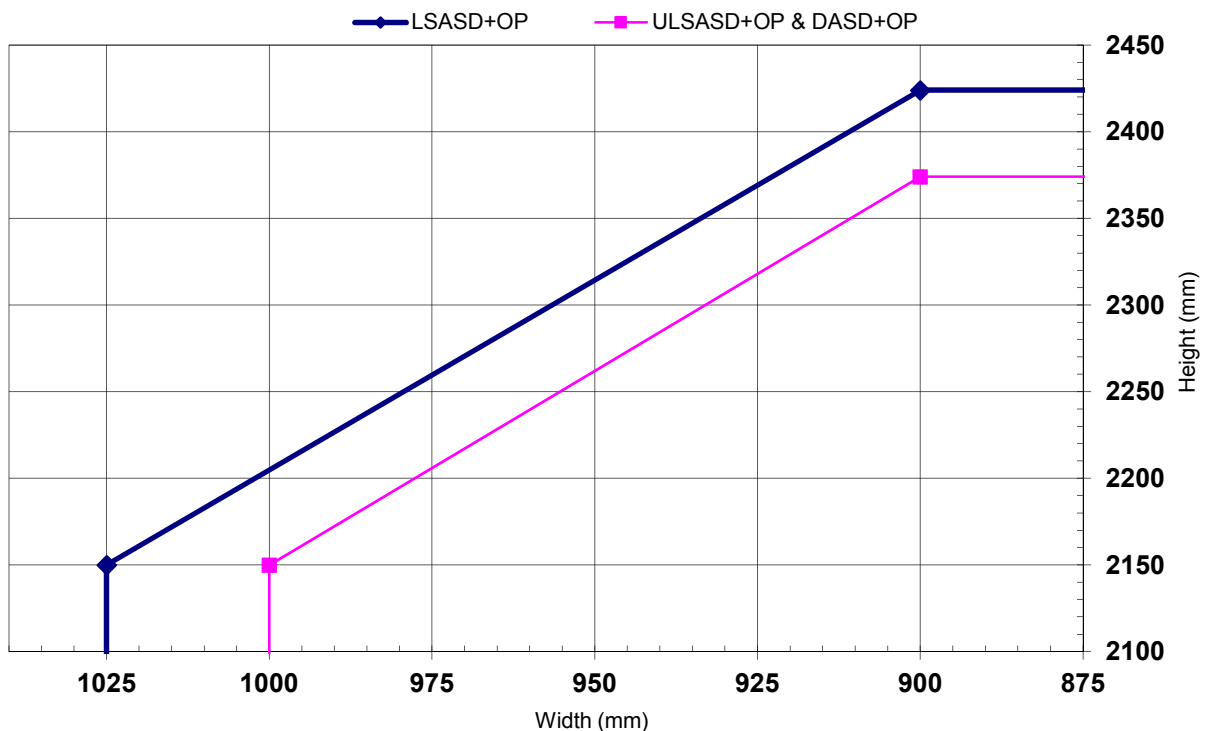
Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates (maximum leaf height with rebates is 2200mm).

Jambs & Overpanel:

2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. It is permitted to increase the intumescent specification to match that given for the leaf head if required.

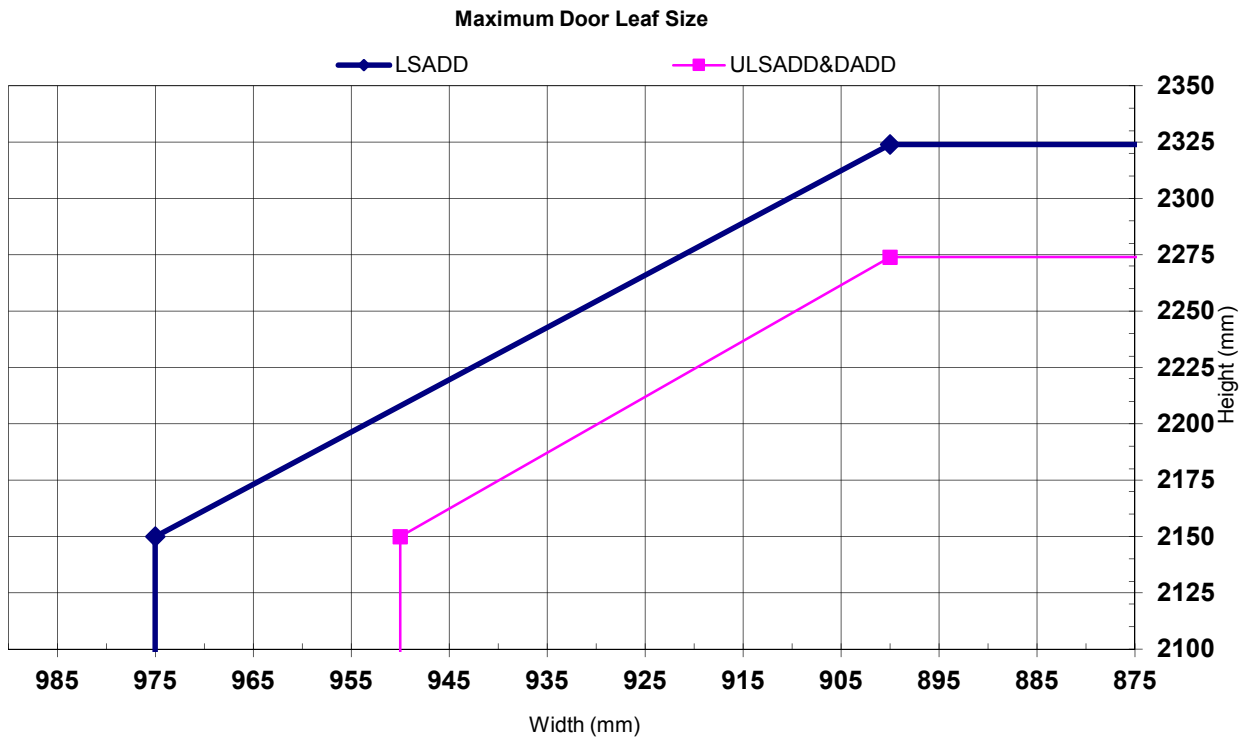
Hardware Protection: See section 11.

Maximum Door Leaf Size



Halspan® 60 Optima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Double Doorset

Fig: G3	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD	From:	2150	x 975
		To:	2324	x 900
	ULSADD & DADD	From:	2150	x 950
		To:	2274	x 900
Maximum Overpanel Height (mm)		Transomed	1500	
Glazing		Maximum Glazed Area	0.82m ² (see section 7 for details)	
		Approved Systems	See section 7 and appendix A	
Frame Specification (see section 10 for details)		Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)
		Min. Section (mm)	70 x 22	70 x 30
		Min. Density(kg/m ³)	640	700
Intumescent Materials: PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS Head: Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head. Meeting Edges: Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in one leaf edge only. Rebated: 2No. 15x4mm exposed with each seal fitted centrally in the rebate of each leaf. Jambs: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. Hardware Protection: See section 11.				



Halspan® 60 Optima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Double Doorset - Transom Optional

Fig: G4	Configuration		Height (mm)	Width (mm)	
Leaf Sizes	LSADD+OP	From:	2150	x	925
		To:	2224	x	900
	ULSADD+OP & DADD+OP	Max:	2150	x	910
			2174	x	900
Maximum Overpanel Height (mm)	No Transom Required	1500			
Glazing	Maximum Glazed Area	0.82m ² (see section 7 for details)			
	Approved Systems	See section 7 and appendix A			
Frame Specification (see section 10 for details)	Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)		
	Min. Section (mm)	70 x 22	70 x 30		
	Min. Density(kg/m ³)	640	700		

Intumescent Materials:
PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS

Head (junction of leaf heads and overpanel):

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of overpanel; optionally 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf heads and 1No. 15x4mm fitted centrally in the bottom of overpanel.

Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates (maximum leaf height with rebates is 2200mm).

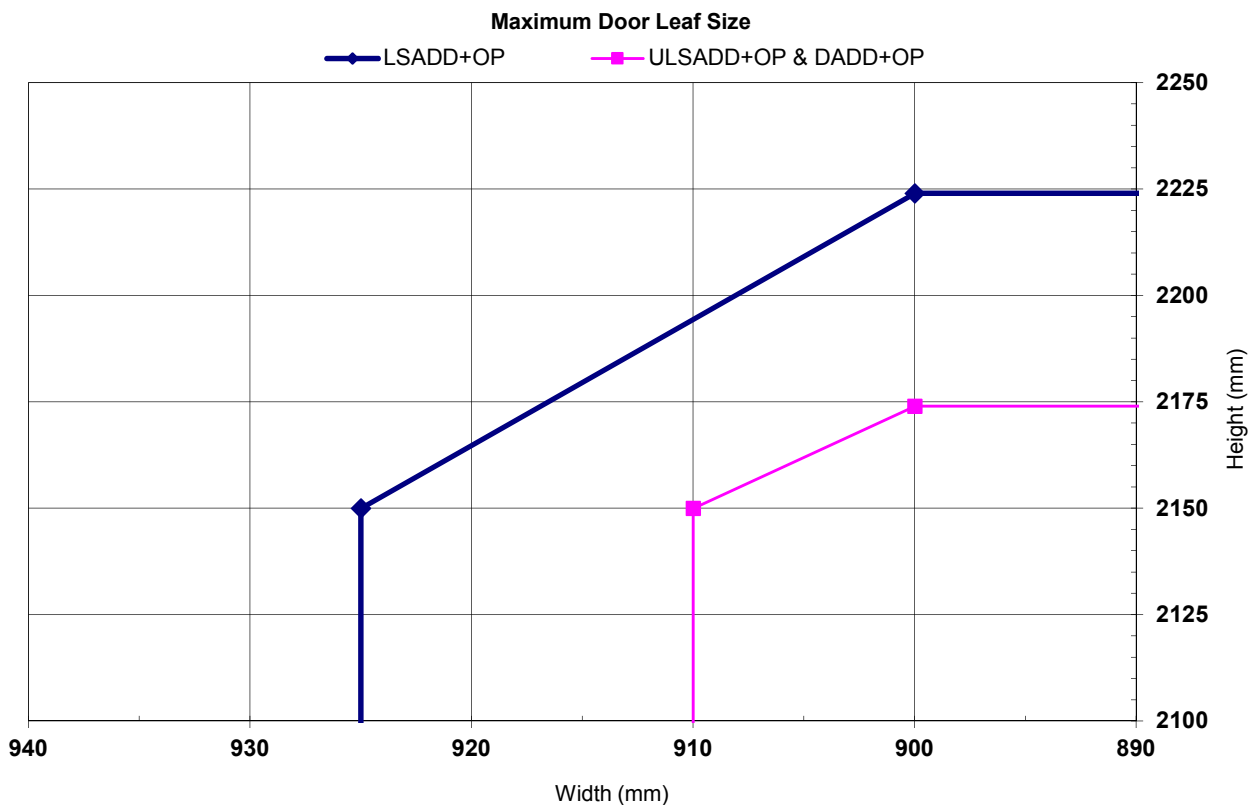
Meeting Edges:

Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in one leaf edge, and 1No. 15x4mm fitted centrally in the opposite leaf.

Jambs & Overpanel:

2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. It is permitted to increase the intumescent specification to match that given for the leaf head if required.

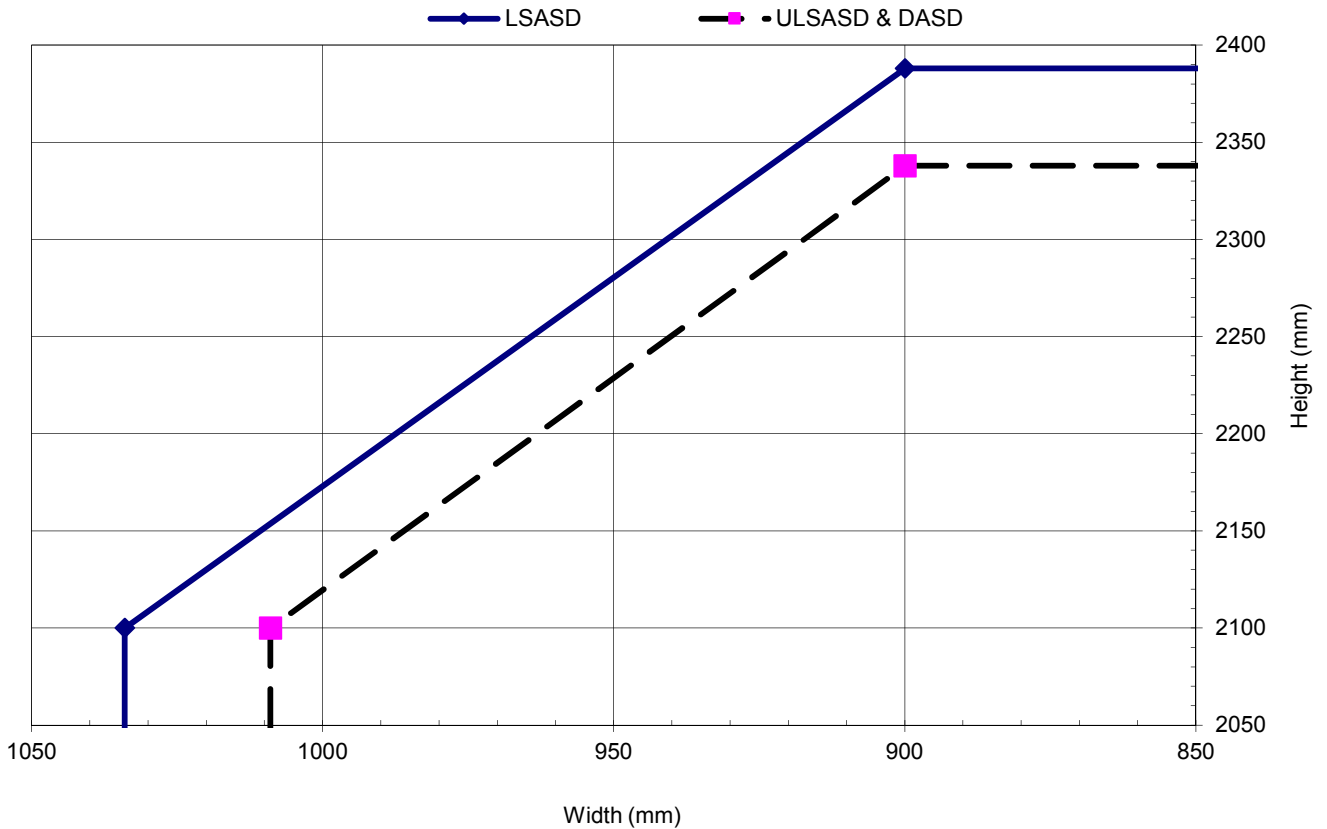
Hardware Protection: See section 11.



Halspan® 60 Optima - CS Edge Protectors/Acrovyn Wrap
Latched & Unlatched Single & Double Acting Single Doorsets

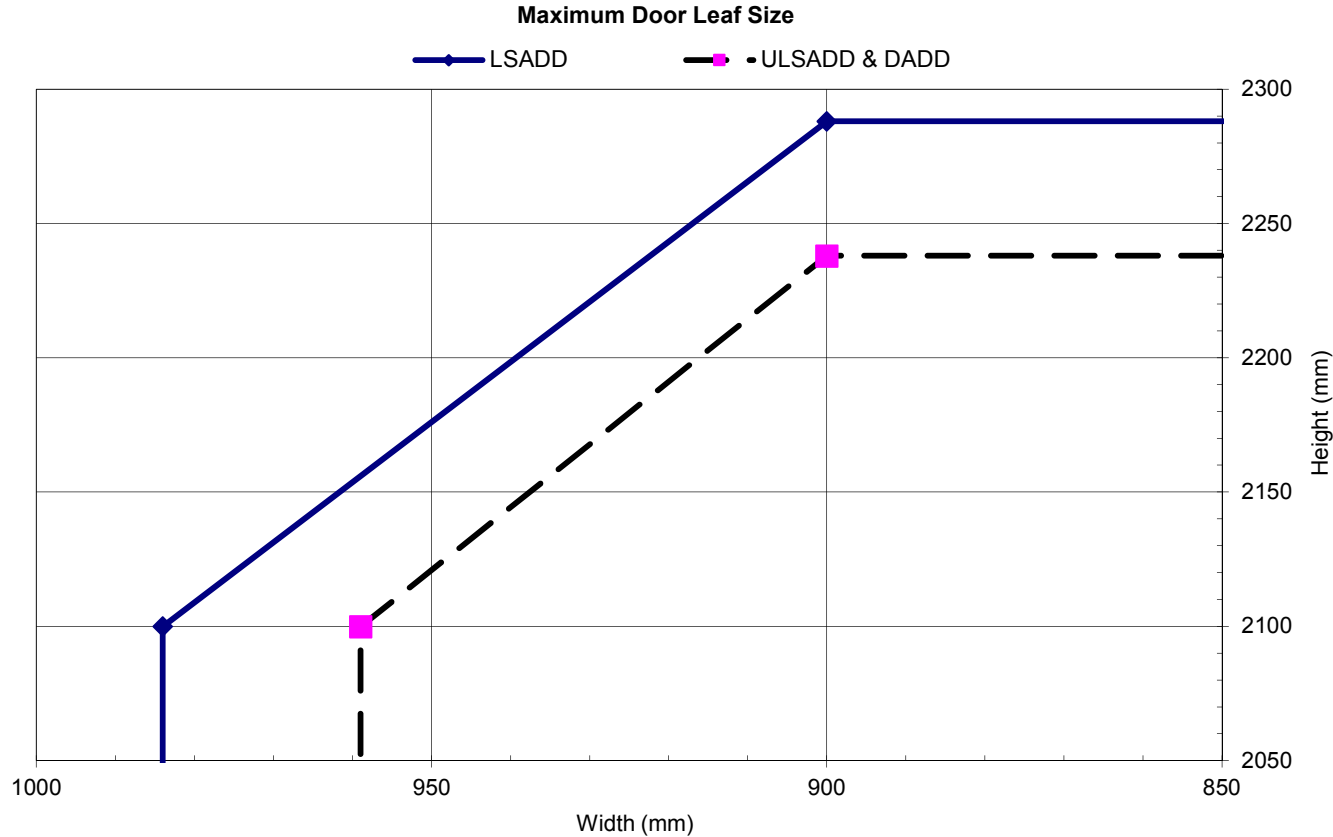
Fig: G5	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2100	x	1034
		To:	2388	x	900
	ULSASD & DASD	From:	2100	x	1009
		To:	2338	x	900
Maximum Overpanel Height (mm)	Transomed	2000			
Glazing	Maximum Glazed Area:	0.82m ²			
	Approved Systems:	See section 7 and appendix A			
Frame Specification (see section 10)	Min. Section (mm):	70 x 32	70 x 30		
	Material:	Hardwood	MDF		
	Min. Density (kg/m ³):	640	700		
Intumescent Materials: Type 617 – Lorient Polyproducts Ltd.					
Head:					
Square: 2No. 15x4mm fitted 5mm either side of the centreline in the frame reveal.					
Jambs & Overpanels: 2No. 15x4mm fitted 5mm either side of the centreline in the frame reveal.					
Hardware Protection: See section 11.					

Maximum Door Leaf Size



**Halspan® 60 Optima - CS Edge Protectors/Acrovyn Wrap
 Latched & Unlatched Single & Double Acting Double Doorsets**

Fig: G6	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD	From:	2100	x 984
		To:	2288	x 900
	ULSADD & DADD	From:	2100	x 959
		To:	2238	x 900
Maximum Overpanel Height (mm)	Transomed	1500		
Glazing	Maximum Glazed Area:	0.82m ²		
	Approved Systems:	See section 7 and appendix A		
Frame Specification (see section 10)	Min. Section (mm):	70 x 32	70 x 30	
	Material:	Hardwood	MDF	
	Min. Density (kg/m ³):	640	700	
Intumescent Materials: Type 617 – Lorient Polyproducts Ltd.				
Head: Square: 2No. 15x4mm fitted 5mm either side of the centreline in the frame reveal.				
Meeting Edges: Square: 1No. 15x4mm fitted centrally in the meeting edge of both leaves.				
Jams & Overpanels: 2No. 15x4mm fitted 5mm either side of the centreline in the frame reveal.				
Hardware Protection: See section 11.				



Appendix C

Greenlam Industries Ltd. Halspan® 60 Optima Steel Frame Doorsets

1. Introduction

This appendix contains the information relating to Halspan® 60 Optima doorsets utilising steel door frames. The assessment uses the same extrapolation and interpretation techniques applied for the main assessment and 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 Specification of Construction

The door leaves for Halspan® 60 Optima steel framed doorsets are manufactured in accordance with the design as specified in section 2 of BMT/CNA/F16083. All other aspects of the construction specification are identical to that detailed in the main assessment except where specifically discussed in the following paragraphs.

3. Leaf Sizes and Configurations

The assessed leaf sizes and configurations are based on the constructions and performances obtained from the specimens tested in Warres 111201, RF01073 and RF01074. Data sheets specifying the maximum approved leaf sizes and graphs detailing the permitted gradient between height and width are contained in the data sheets in appendix D.

The maximum assessed overpanel height for steel framed doorsets is 500mm. Doorsets must use a flush overpanel to leaf head junction. Steel transomed assemblies are not permitted.

4. Lippings

Steel framed Halspan® 60 Optima must be lipped on all edges in accordance with the following specification.

Material	Size (mm)	Min. Density (kg/m ³)
Hardwood* which must be straight grained, joinery quality, free from knots, splits and checks	1. Flat = 6–13 thick with a maximum of 2mm profiling permitted at corners of lipping (see section 10.1) 2. Not permitted	640

* The use of Beech (Fagus Sylvatica) is not permitted.

5. Door Frames

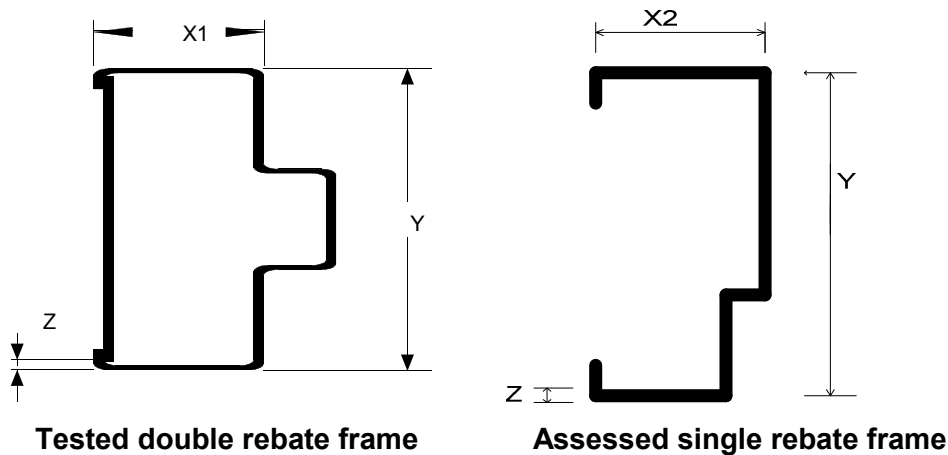
The tested frame specification for doorsets to this design comprised the following:

- Material: 1.5mm thick rolled mild steel.
- Section: 151mm wide x 62mm thick excluding a 13mm deep x 48mm wide integral stop
- Head to jamb joints may be folded and tack welded tabs or mitred and welded.

The door frames must be manufactured from mild steel as tested or alternatively stainless steel of the appropriate grade, e.g. 304 or 316 may be used.

The frame profile may be either single or double rebated of the size tested i.e. X1 = 62 X2 = 75mm, Y = 151 mm, and Z = 1.5mm.

The following diagram depicts the X, Y and Z dimensions along with the percentage increases and decreases that are acceptable.



X = $\pm 30\%$

Y = - 50% + Unlimited providing the frame reveal dimensions are maintained

Z = + 100% only, no reduction

The frame may be hollow or back filled with mortar or concrete.

Plasterboard, mineral fibre, glass fibre polyurethane expanding foam and ceramic wool must not be used.

Data sheets detailing the different leaf size scopes and intumescent specifications for hollow and backfilled frame constructions are in appendix D.

6. Fixings

Fixings must be of the appropriate type and length for the structural opening medium and must include a minimum of 1No. fixing per 600mm of vertical edge, with a fixing no more than 350mm from the top and bottom corners and two across the head. Fixing locations through the frame may be capped with steel or plastic grommets without compromising the integrity.

7. Sealing to Structural Opening

Gaps between door frames and structural openings must be protected with proprietary materials that have been successfully tested for this application.

8. Structural Openings

Halspan® 60 Optima steel framed doorsets may be fitted into the following types of structural opening:

- Cast dense concrete;
- Dense concrete blocks or brickwork;
- Masonry;
- Lightweight concrete;
- Lightweight aerated concrete;
- Timber stud partition;
- Steel stud partition (apertures must be framed by steel studs, which have a minimum of 45 x 45mm softwood stiffeners to the vertical edges).

Appendix D

Data Sheets for Greenlam Industries Ltd.

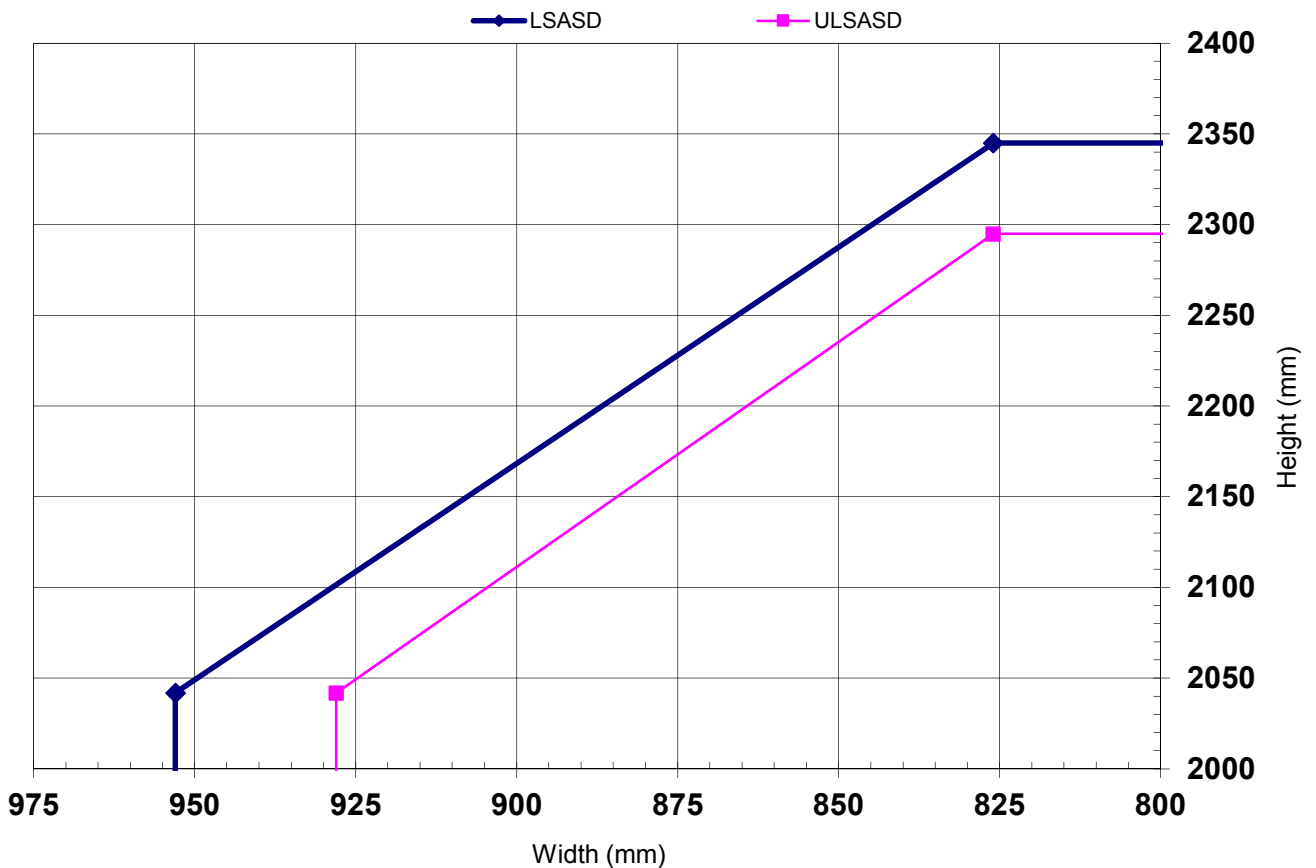
Halspan® 60 Optima Steel Frame Doorset

60 Minute Fire Resisting Doorset

Halspan® 60 Optima Hollow Steel Frame Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single Acting, Single Doorset

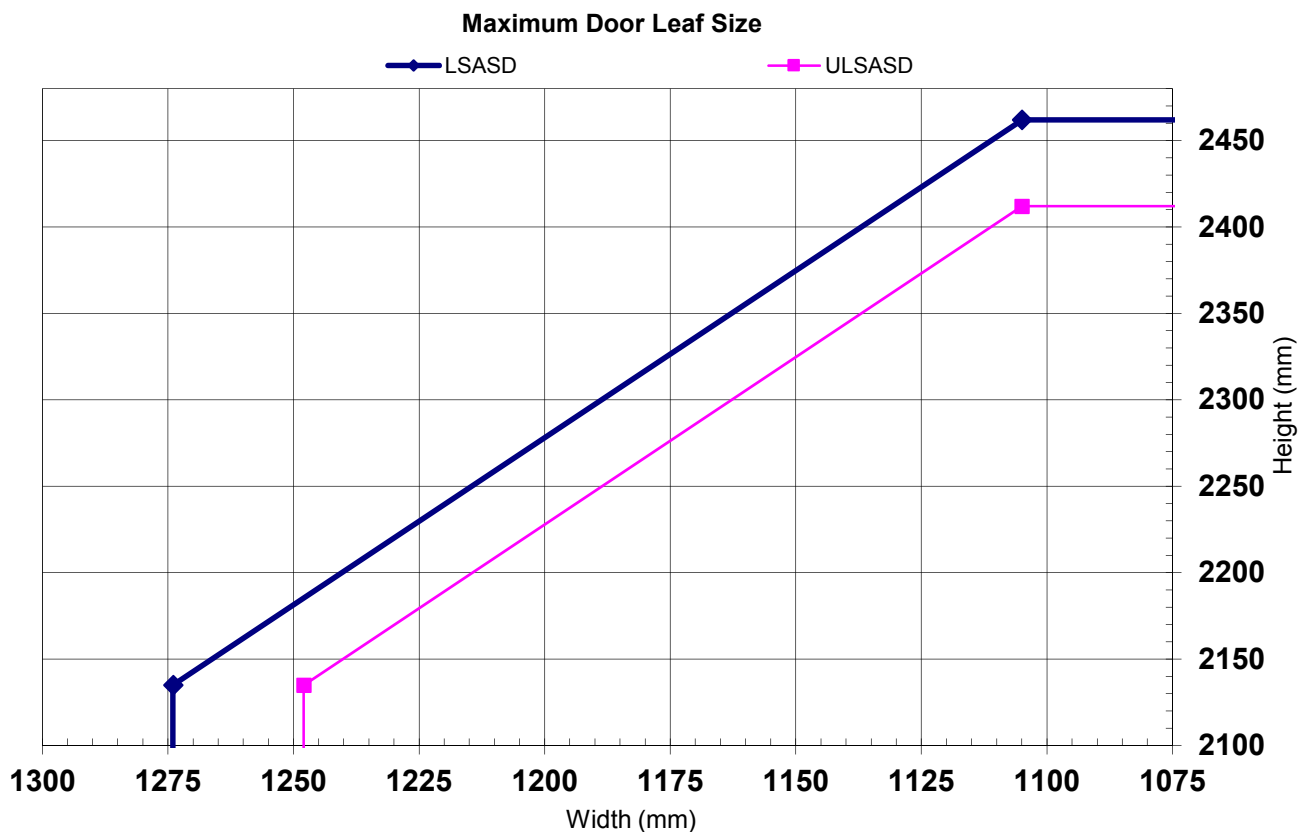
Fig: G7	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2042	x	953
		To:	2345	x	826
	ULSASD	From:	2042	x	928
		To:	2295	x	826
Maximum Overpanel Height (mm)		N/A	N/A		
Glazing	Maximum Glazed Area	0.82m ² (see section 7 for details)			
	Approved Systems	See section 7 and appendix A			
Frame Specification	Material	Mild or stainless steel – See appendix C			
	Min. Section (mm)	100 x 20			
Intumescent Materials:					
Head: H60 (details in confidence on file at Exova Warringtonfire)					
Jams: H60 (details in confidence on file at Exova Warringtonfire)					
Hardware Protection: See section 11.					

Maximum Door Leaf Size



Halspan® 60 Optima Backfilled Steel Frame Doorset – 60 Minutes Fire Resistance Latched & Unlatched, Single Acting, Single Doorset

Fig: G8	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD	From:	2135	x 1277
		To:	2469	x 1105
	ULSASD	From:	2135	x 1252
		To:	2419	x 1105
Maximum Overpanel Height (mm)	N/A	N/A		
Glazing	Maximum Glazed Area	0.82m ² (see section 7 for details)		
	Approved Systems	See section 7 and appendix A		
Frame Specification	Material	Mild or stainless steel – see appendix C		
	Backfilling	Concrete or mortar		
	Min. Section (mm)	100 x 20		
Intumescent Materials: Therm-A-Seal				
Head:				
Square: 1No. 38x4mm exposed and fitted centrally in the leaf or frame head.				
Jamb: 1No. 38x4mm exposed and fitted centrally in the leaf edge or frame reveal.				
Hardware Protection: See section 11.				



Halspan® 60 Optima Hollow Steel Frame Doorset – 60 Minutes Fire Resistance Latched & Unlatched, Single Acting, Double Doorset

Fig: G9	Configuration		Height (mm)	Width (mm)	
Leaf Sizes	LSADD	From:	2042	x	913
		To:	2245	x	826
	ULSADD	From:	2042	x	888
		To:	2195	x	826
Maximum Overpanel Height (mm)		N/A	N/A		
Glazing	Maximum Glazed Area	0.82m ² (see section 7 for details)			
	Approved Systems	See section 7 and appendix A			
Frame Specification	Material	Mild or stainless steel – see appendix C			
	Min. Section (mm)	100 x 20			

Intumescent Materials: Therm-A-Seal

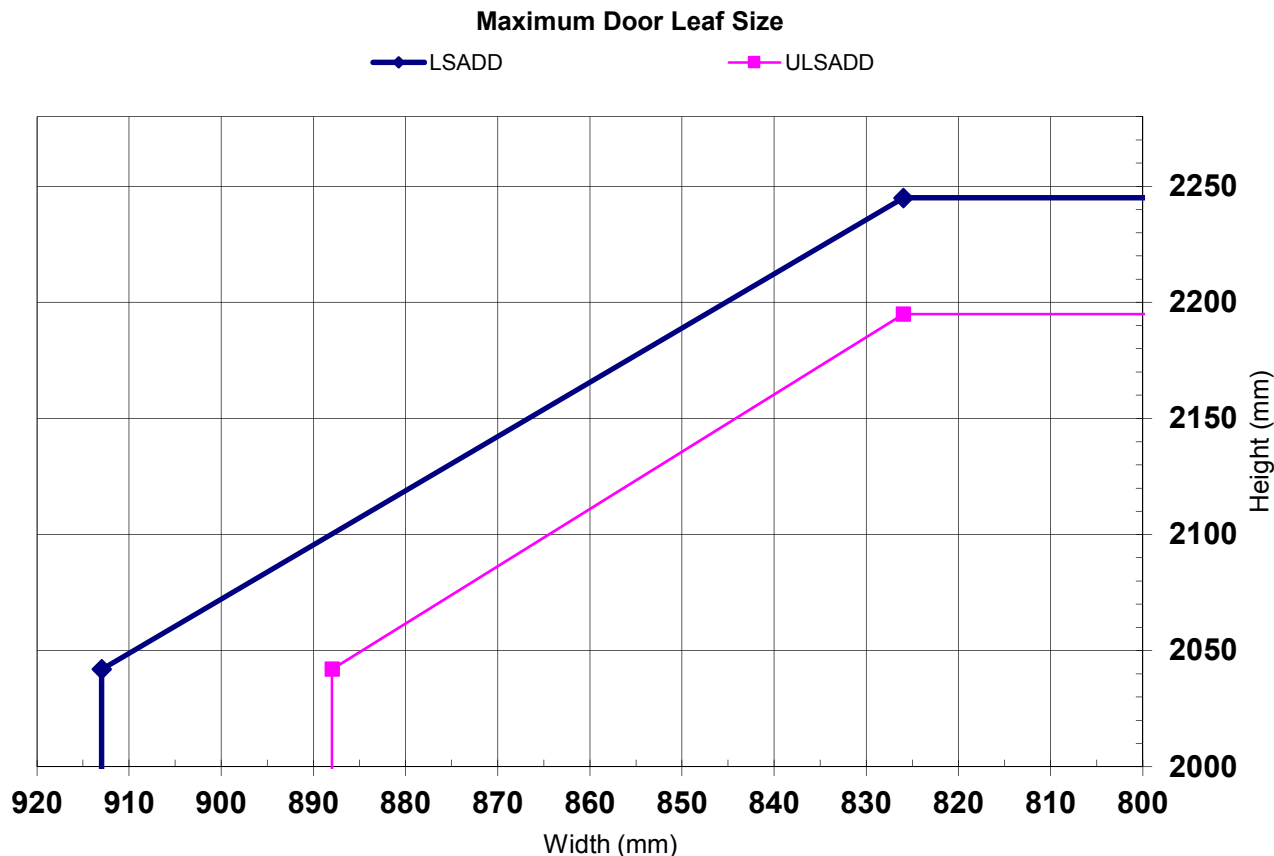
Head: H60 (details in confidence on file at Exova Warringtonfire).

Meeting Edges:

Square: 2No. 10x4mm exposed and fitted 5mm either side of the centreline in one leaf edge and 1No. 10x4mm fitted centrally in the opposite leaf.

Jambs: H60 (details in confidence on file at Exova Warringtonfire).

Hardware Protection: See section 11.



Halspan® 60 Optima Backfilled Steel Frame Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single Acting, Double Doorset

Fig: G10	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD	From:	2135	x 945
		To:	2505	x 800
	ULSADD	From:	2135	x 920
		To:	2455	x 800
Maximum Overpanel Height (mm)		N/A	N/A	
Glazing	Maximum Glazed Area		0.82m ² (see section 7 for details)	
	Approved Systems		See section 7 and appendix A	
Frame Specification	Material		Mild or stainless steel – see appendix C	
	Backfilling		Concrete or mortar	
	Min. Section (mm)		100 x 20	

Intumescent Materials: Therm-A-Seal

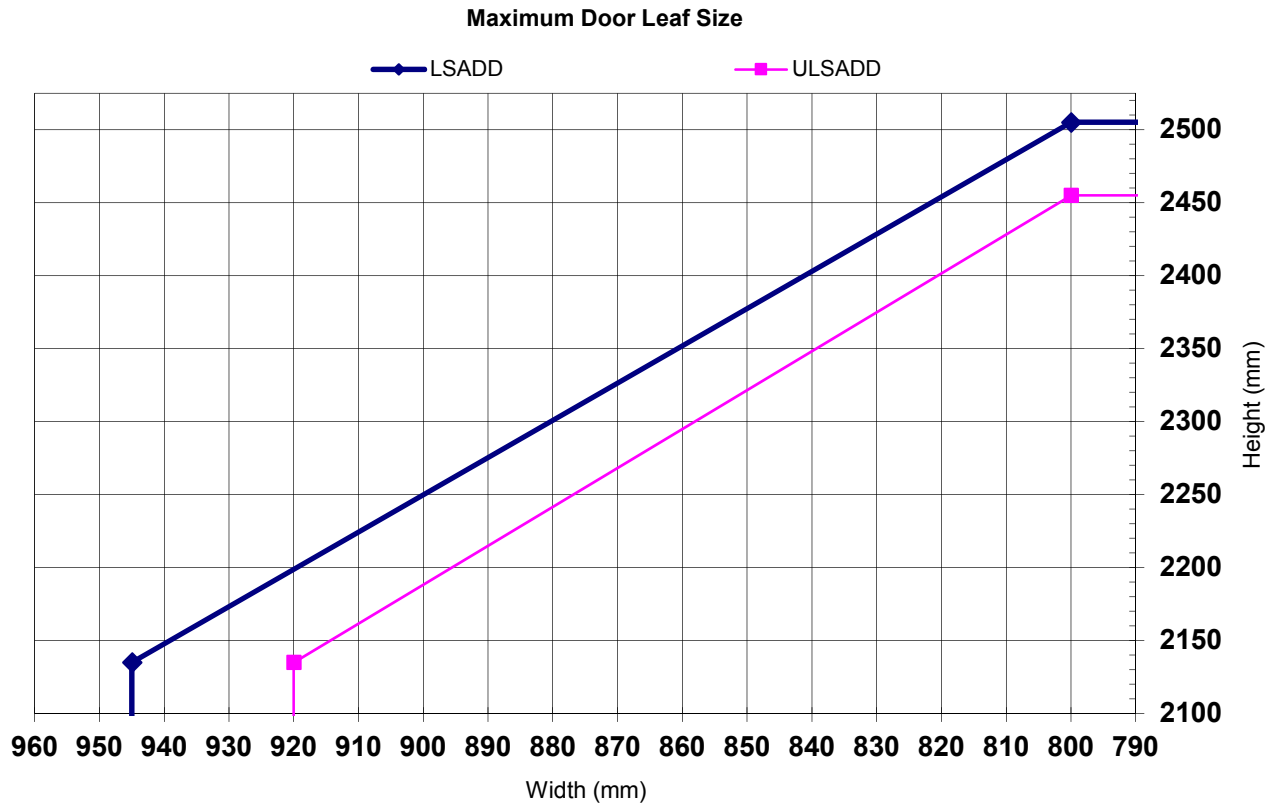
Head: 1No. 38x4mm exposed and fitted centrally in the leaf or frame head.

Meeting Edges:

Square: 2No. 10x4mm exposed and fitted 5mm either side of the centreline in one leaf edge and 1No. 10x4mm fitted centrally in the opposite leaf.

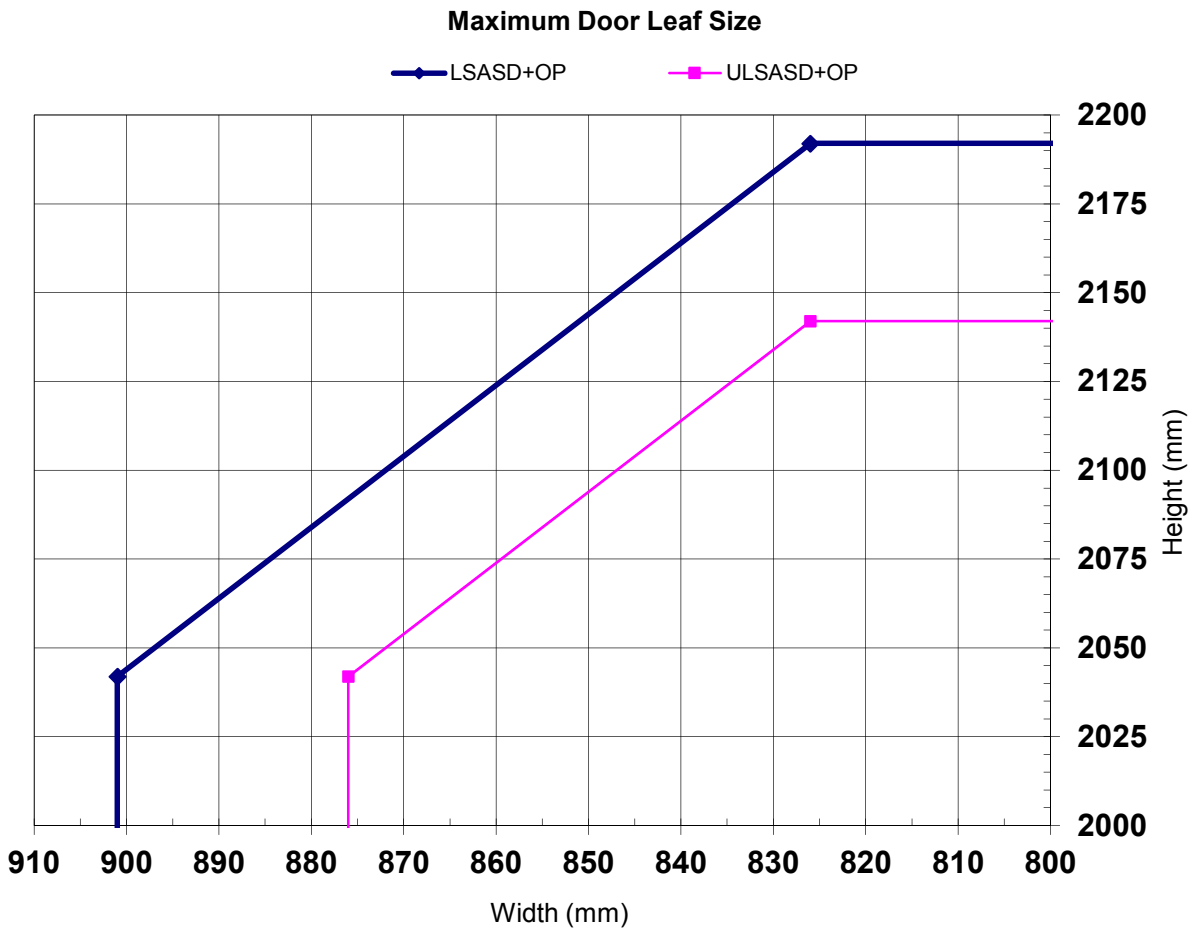
Jamb: 1No. 38x4mm exposed and fitted centrally in the leaf edge or frame reveal.

Hardware Protection: See section 11.



Halspan® 60 Optima Hollow Steel Frame Doorset – 60 Minutes Fire Resistance Latched & Unlatched, Single Acting, Single Doorset + Overpanel

Fig: G11	Configuration		Height (mm)	Width (mm)	
Leaf Sizes	LSASD+OP	From:	2042	x	901
		To:	2192	x	826
	ULSASD+OP	From:	2042	x	876
		To:	2142	x	826
Maximum Overpanel Height (mm)	No Transom Required	500			
Glazing	Maximum Glazed Area	0.82m ² (see section 7 for details)			
	Approved Systems	See section 7 and appendix A			
Frame Specification	Material	Mild or stainless steel – see appendix C			
	Min. Section (mm)	100 x 20			
Intumescent Materials: Therm-A-Seal					
Head:					
Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of the overpanel.					
Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates.					
Jambs & Overpanel: H60 (details in confidence on file at Exova Warringtonfire).					
Hardware Protection: See section 11.					



Halspan® 60 Optima Backfilled Steel Frame Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single Acting, Single Doorset + Overpanel

Fig: G12	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD+OP	From:	2135	x 875
		To:	2285	x 800
	ULSASD+OP	From:	2135	x 850
		To:	2235	x 800
Maximum Overpanel Height (mm)	No Transom Required	500		
Glazing	Maximum Glazed Area	0.82m ² (see section 7 of the main assessment for details)		
	Approved Systems	See section 7 and appendix A		
Frame Specification	Material	Mild or stainless steel – see appendix C		
	Backfilling	Concrete or mortar		
	Min. Section (mm)	100 x 20		

Intumescent Materials: Therm-A-Seal

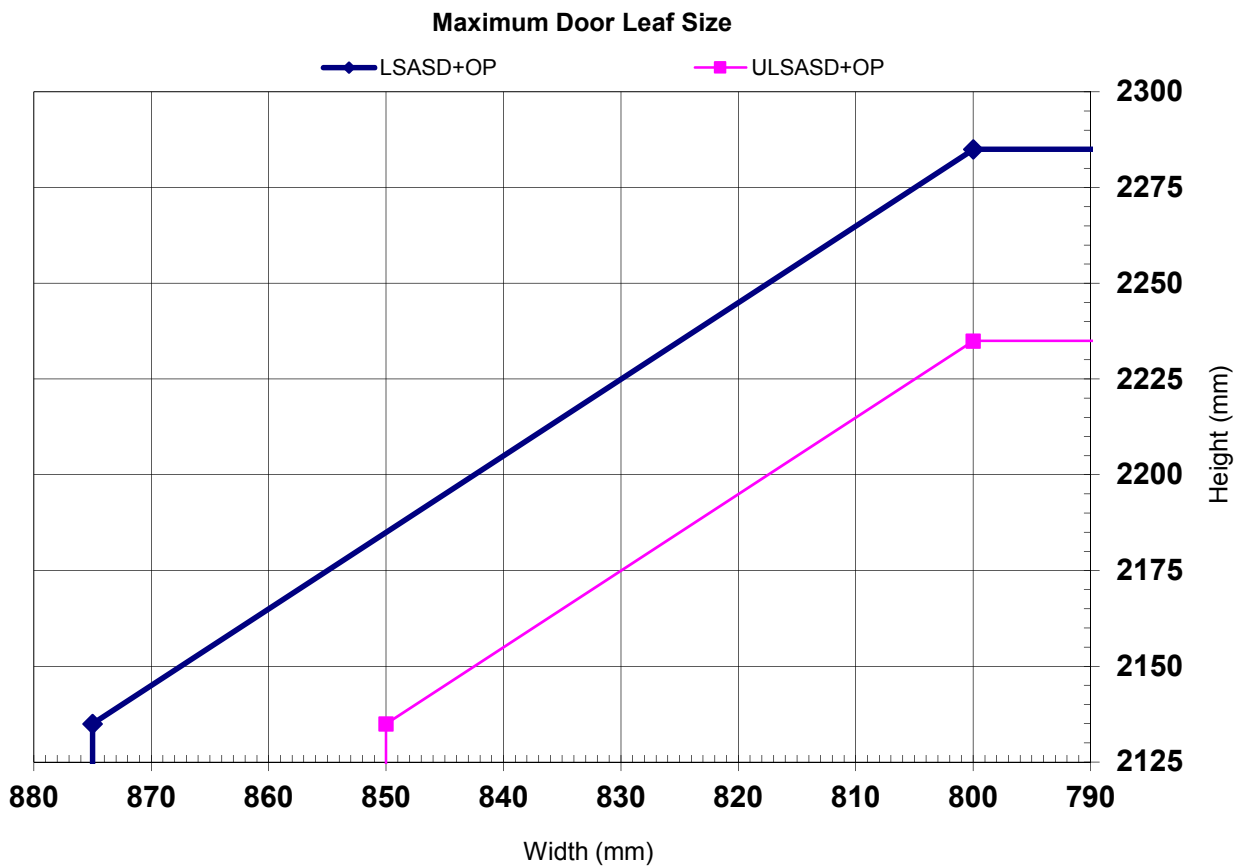
Head:

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of the overpanel.

Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates.

Jamb & Overpanel: 1No. 38x4mm exposed and fitted centrally in the leaf edge or frame reveal.

Hardware Protection: See section 11.



Halspan® 60 Optima Hollow Steel Frame Doorset – 60 Minutes Fire Resistance Latched & Unlatched, Single Acting, Double Doorset + Overpanel

Fig: G13	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD+OP	From:	2042	x 851
		To:	2092	x 826
	ULSADD+OP	Max:	2042	x 826
Maximum Overpanel Height (mm)	No Transom Required		500	
Glazing	Maximum Glazed Area		0.82m ² (see section 7 of the main assessment for details)	
	Approved Systems		See section 7 and appendix A	
Frame Specification	Material		Mild or stainless steel – see appendix C	
	Min. Section (mm)		100 x 20	

Intumescent Materials: Therm-A-Seal

Head:

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of the overpanel.

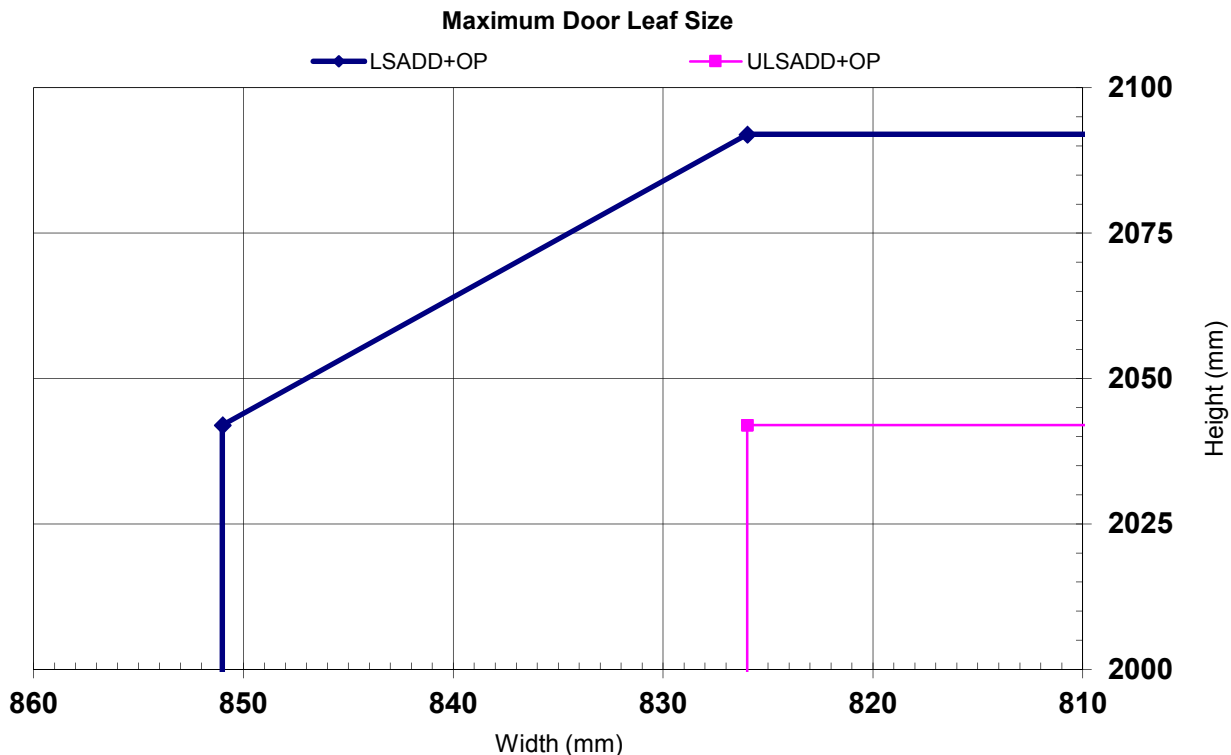
Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates.

Meeting Edges:

Square: 2No. 10x4mm exposed and fitted 5mm either side of the centreline in one leaf edge and 1No. 10x4mm fitted centrally in the opposite leaf.

Jambs & Overpanel: H60 (details in confidence on file at Exova Warringtonfire).

Hardware Protection: See section 11.



Halspan® 60 Optima Backfilled Steel Frame Doorset – 60 Minutes Fire Resistance Latched & Unlatched, Single Acting, Double Doorset + Overpanel

Fig: G14	Configuration		Height (mm)	Width (mm)	
Leaf Sizes	LSADD+OP	From:	2135	x	825
		To:	2185	x	800
	ULSADD+OP	Max:	2135	x	800
Maximum Overpanel Height (mm)	No Transom Required		500		
Glazing	Maximum Glazed Area	0.82m ² (see section 7 of the main assessment for details)			
	Approved Systems	See section 7 and appendix A			
Frame Specification	Material	Mild or stainless steel – see appendix C			
	Backfilling	Concrete or mortar			
	Min. Section (mm)	100 x 20			

Intumescent Materials: Therm-A-Seal

Head:

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of the overpanel.

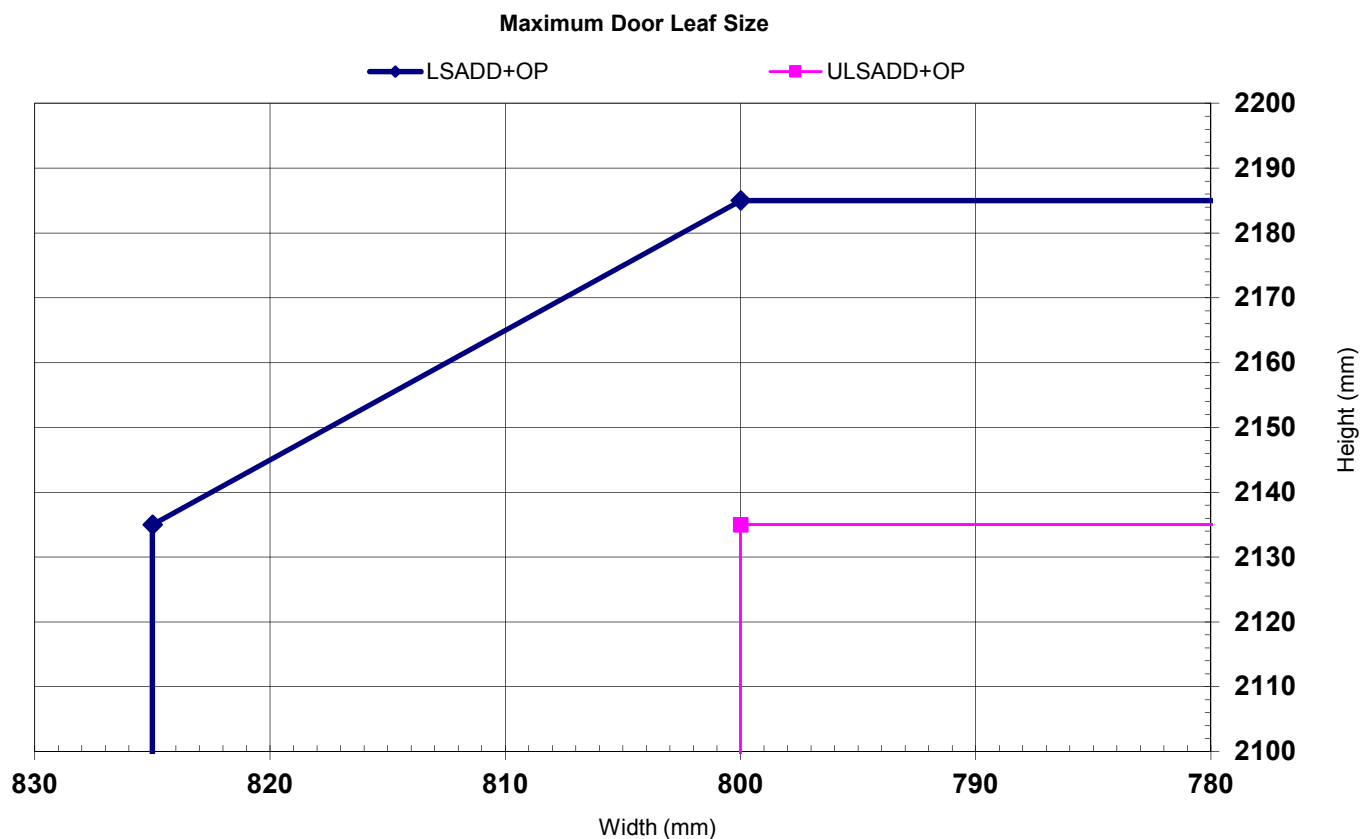
Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates.

Meeting Edges:

Square: 2No. 10x4mm exposed and fitted 5mm either side of the centreline in one leaf edge and 1No. 10x4mm fitted centrally in the opposite leaf.

Jams & Overpanel: 1No. 38x4mm exposed and fitted centrally in the leaf/overpanel edge or frame reveal.

Hardware Protection: See section 11.



Appendix E

Duraguard Edge Protectors

1. General

Door leaves for Greenlam Industries Ltd Halspan® 60 Optima doorsets using Duraguard aluminium edge protectors are manufactured in accordance with the design as specified in section 2 of BMT/CNA/F16083. All aspects of the construction specification must remain as detailed in the main assessment except where specifically discussed in the following paragraphs. Duraguards may be fitted to both hanging and closing edges of single doors and the hanging and meeting edges of double doors; Duraguards must be fitted to both meeting edges.

2. Lippings

Where Duraguard edge protectors are fitted to the leaf edges, timber lippings meeting the specification below must still be fitted with the Duraguard profile added on top.

Material	Size (mm)	Min Density (kg/m ³)
Hardwood ¹ which must be straight grained, joinery quality, free from knots, splits and checks	1. Flat = 6 – 11 thick 2. Rounded = not permitted 3. Rebated = not permitted	640

Notes:

- The use of Beech (*Fagus Sylvatica*) is not permitted
- The meeting edges of double doorsets do not require lipping under the Duraguard profile.

3. Intumescent Materials

3.1 General

The Duraguard edge protectors must only be used on the vertical edges of door leaves. Specified perimeter edge intumescent seals must be fitted in the frame reveals as opposed to leaf edges and be used in addition to that contained within the Duraguard edge protectors.

Door leaves for use with Duraguards must be assessed to utilise the perimeter edge intumescent specification below:

Frame Reveal – Head and Jamb	Intumescent Seal Type
2No 15 x 4mm thick seals spaced 5mm either side of the centre line	Therm-A-Seal

3.2 Single Leaf Doorsets

For single leaf doorsets, the required intumescent specification for either or both hanging and closing jambs is:

Location	Details (mm)
Concealed – fitted between the rear of the Duraguard and leaf edge	54x2 thick Therm-A-Strip on top of 54x1 thick Therm-A-Flex
Exposed - and within the Duraguard edge	10x4 Therm-A-Seal centrally fitted plus a Therm-A-Blade smoke seal

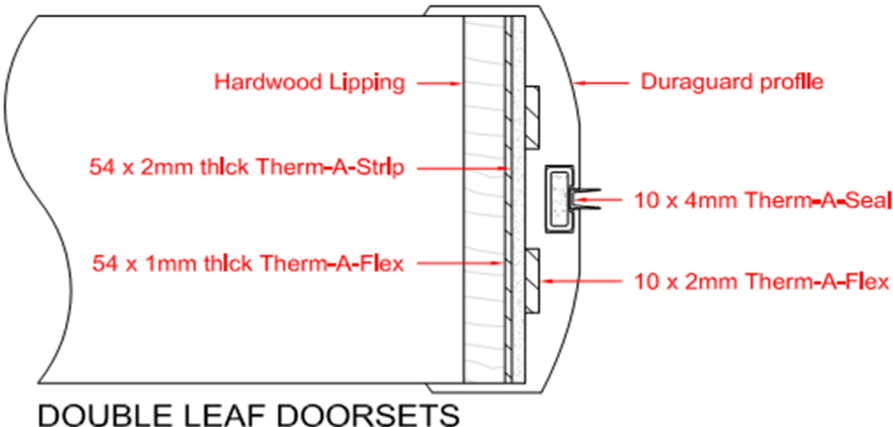
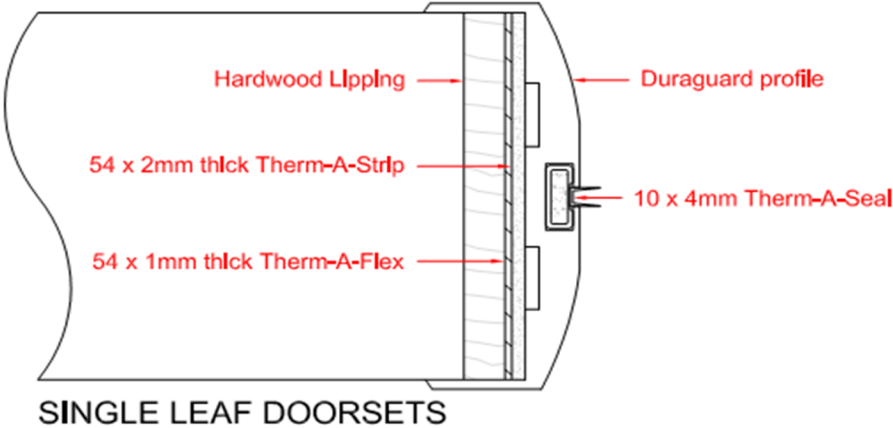
All intumescent materials detailed must be fitted.

3.3 Double Leaf Doorsets

For double leaf doorsets, the intumescent requirement for the hanging edges (where Duraguards are fitted) must remain as shown in section 3.1 above.

The meeting edge intumescent specification for double leaf doorsets is:

Location	Details (mm)
Concealed – fitted between the rear of the Duraguard and leaf edge	2No. 10x2mm thick Therm-A-Flex in the rebates in the rear of the Aluminium profile on top of 54x2 thick Therm-A-Strip on top of 54x1 thick Therm-A-Flex
Exposed - and within the Duraguard edge	10x4 Therm-A-Seal centrally fitted plus a Therm-A-Blade smoke seal



3.4 Hardware

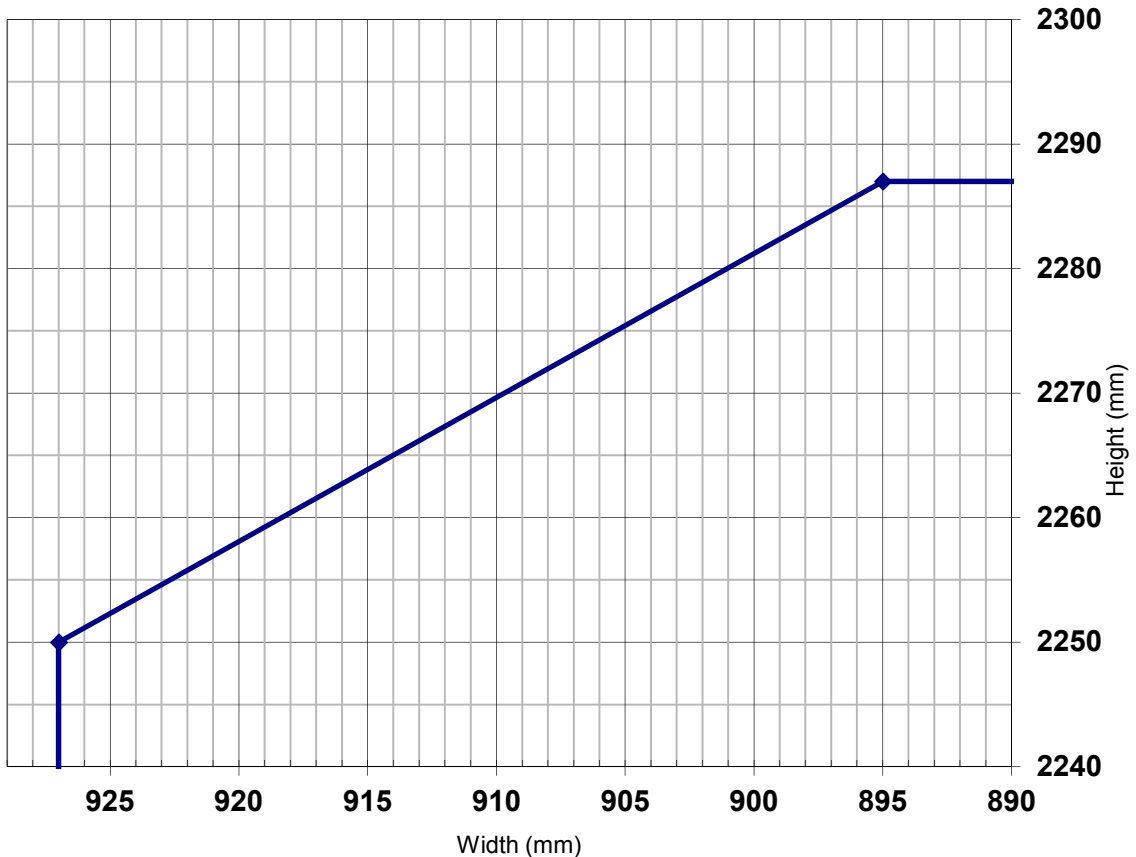
The following items of hardware are directly affected by the installation of Duraguard edge protectors and must be installed with the following protection. Intumescent protection for all other hardware will remain as specified in section 11 of the main assessment:

Item	Specification	Required Intumescent Protection
Hinges	As per section 13.3.3	2mm thick Therm-A-Strip
Locks and latches	As per section 13..3.1	2mm Therm-A-Strip under the forend and keeps at all sizes
Flushbolts	Maximum 200mm long	<ol style="list-style-type: none"> 2mm Interdens - Dufaylite Developments Ltd. 2mm MAP paper - Loriant Polyproducts Ltd. 2mm Therm-A-Strip - Intumescent Seals Ltd.

4. Leaf Sizes

Test data has been generated on double leaf doorsets (which are generally considered a more onerous configuration); it is therefore our assessment that Duraguard edge protectors may be used on both double and single leaf configurations. The maximum leaf dimensions for doorsets that the Duraguard edge protectors may be applied to must fall below the graph line shown below; however if the dimensions given for the relevant doorset configuration in appendix B are smaller, then those dimensions take precedence:

Maximum Door Leaf Size (Fig: G13)



5. Frame Fixings

The fixings for hinges on doorsets using Duraguard edge protectors must be of sufficient length to penetrate the timber door leaf by a minimum of 24mm.

6. Plastic Facings

If plastic type face materials are to be applied, the plastic must be cut back to finish flush with the edge of the Duraguard edge protector.

7. Duraguard Installation

The Duraguard edge protectors are to be cut 3mm short in order to allow for expansion under fire conditions.

Appendix F

Greenlam Industries Ltd. Plasdor Doorset

1. General

Door leaves for Greenlam Industries Ltd Plasdor doorsets are manufactured in accordance with the design as specified in section 2 of BMT/CNA/F16083 for Halspan® 60 Optima doorsets; modified with PVC facings, lippings and alternative glazing details. All aspects of the construction specification are identical to that detailed in the main assessment except where specifically discussed in the following paragraphs.

2. Test Evidence

The test data that has been submitted in support of this assessment of Plasdor doorsets is contained within the reports listed in appendix H. Full details are held in confidence at Exova Warringtonfire. This evidence provides confidence regarding burn through issues and also distortion characteristics of the individual constructions discussed below.

3. Leaf Sizes

The maximum leaf dimensions for the Plasdor range are shown in the data sheets at the end of this appendix.

Note: On-site leaf size adjustment is not permitted.

4. Configurations

All doorset configurations shown in section 4 of BMT/CNA/F16083 may be modified to the Plasdor specification, however doorsets with overpanels must use a transom to the specification in section 6.1 of BMT/CNA/F16083.

5. Facing Materials

The doorset constructions detailed in section 2 of BMT/CNA/F16083 for Halspan® 60 Optima are to be clad with 2mm thick PVC – facings, lippings and alternative glazing details.

This forms the basis of the Plasdor range and alternative materials must not be used.

The PVC faces may be post-formed around the leaf edges provided that the edges are lipped with the required lipping specification given in section 6 below.

6. Lippings

The doorset constructions detailed in section 2 of BMT/CNA/F16083 for Halspan® 60 Optima and modified as above must be lipped on all edges with one of the following:

1. 2 – 8mm thick PVC in lieu of the hardwood which is specified in the relevant section of BMT/CNA/F16083
2. 6 – 10mm thick hardwood with a minimum density of 640kg/m³ which may then be clad with 2mm thick PVC. The use of Beech (*Fagus Sylvatica*) is not permitted).

The lippings may be rounded by a maximum of 8mm provided that a 10mm thick lipping is used.

The lippings are to be bonded to the leaf edges with a PU adhesive.

7. Intumescent Materials

Leaf edge seals for the Plasdor doorset designs must be as shown in the table below; all other intumescent materials assessed for these Plasdor doorset designs must be as detailed in section 11 of BMT/CNA/F16083 for Halspan® 60 Optima doorsets.

Application	Location	Product/Manufacturer
Edge seals	Fitted in the frame jambs or leaf edges	PVC encased Therm-A-Seal – Intumescent Seals Ltd.

The seal specification for each doorset configuration is contained in the data sheets at the end of this appendix.

8. Door Frames

Door frames for the Plasdor range must be as specified in section 10 of BMT/CNA/F16083 for Halspan® 60 Optima doorsets; if Viscount Super is used the frame material is limited to either hardwood (the use of Beech (*Fagus Sylvatica*) is not permitted) with a minimum density of 640kg/m³ or MDF with a minimum density of 700kg/m³.

9. Glazing

9.1 General

The testing conducted on Halspan® 60 Optima has demonstrated that the design is capable of tolerating glazed apertures, whilst providing a margin of over performance. The testing conducted on doorsets modified with the Plasdor materials permits the use of the following glazing installations.

Details of the tested glazing systems for the Plasdor range of doorsets incorporating PVC facings and flush glazing details are shown in sections 9.2, 9.3 & 9.4 below.

Glazing is therefore acceptable within the following parameters:

9.2 Tested Glazing Systems

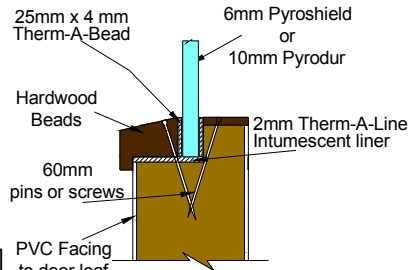
Glazing System	Manufacturer	Maximum Area (m ²)
1. Duoglaze	Proprietary to Greenlam Industries Ltd Plasdor	0.60
2. Flushglaze		
3. Trueglaze option A		
4. Trueglaze option B		

9.3 Assessed Glass Products

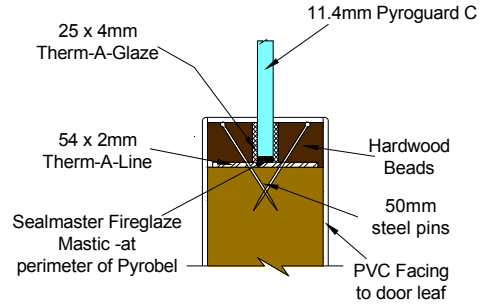
Assessed glass types are contained in drawings below:



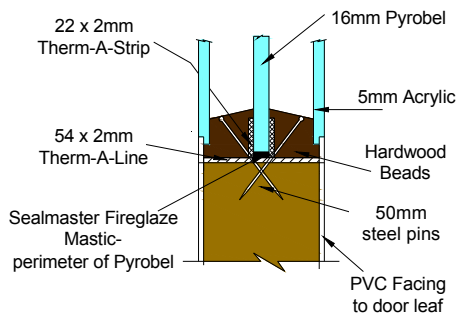
Approved fire risk direction for Trueglaze Option A



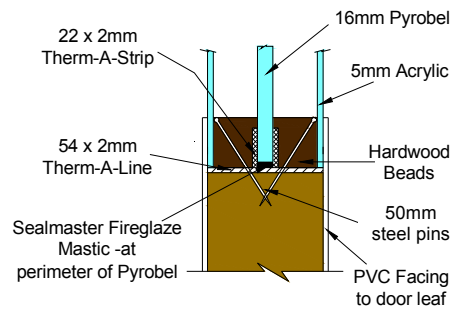
Trueglaze 60 Option A



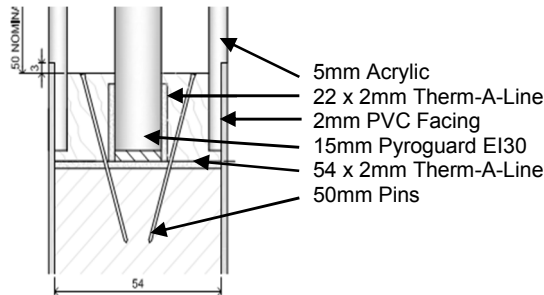
Trueglaze 60 Option B



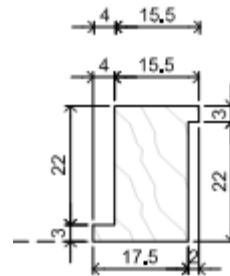
Flushglaze 60



Duoglaze 60



FlushGlaze 60 with square beads



Square Bead details

Notes:

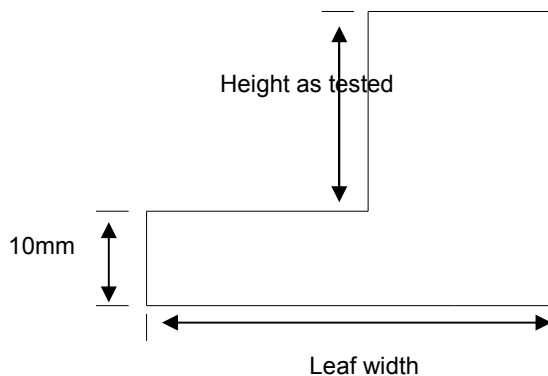
1. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion tolerances
2. 5mm thick acrylic as shown above may be replaced with 6mm thick acrylic as required
3. 16mm thick Pyrobel16 as shown above may be replaced with 15mm thick Pyrostop 30-10 or 15mm thick Pyroguard EI30 as required
4. Flushglaze 60 and Duoglaze 60 may use hardwood or non-combustible setting blocks in place of the Sealmaster Fireglaze mastic shown at the edge of the glass above the Therm-A-Line material as illustrated above.

9.4 Glazing Beads & Installation

Glazing beads must be from hardwood as specified within section 7 of BMT/CNA/F16083 for Halspan® 60 Optima doorsets.

Glazed openings must not be less than 100mm from any door edge. Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 80mm of Halspan® 60 Optima core between apertures.

If the integral upstand system is to be used, the aperture must be lined out with hardwood (minimum density 640kg/m³, (the use of Beech (*Fagus Sylvatica*) is not permitted)) glued in position with a urea formaldehyde adhesive. The upstand must provide the minimum edge cover as specified in the drawings in appendix A and have a minimum thickness of 10mm as shown below:



Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape.

10. Duraguard

It will be acceptable to use the Duraguard edge protectors as per specifications in appendix E (up to the maximum leaf size specified therein) provided that the leaf edges under the Duraguard are lipped with hardwood and that the Plasdor PVC facing material is cut such that it does not extend under the aluminium profile.

11. Data Sheets

The data sheets below detail the intumescent requirements for 60 minutes fire resistance performance when Halspan® 60 Optima doorsets are modified with Plasdor materials. Details specified below take precedence over those in the main body of this assessment – BMT/CNA/F16083.

Appendix G

Data Sheets for Greenlam Industries Ltd.

Halspan® 60 Optima Plasdor Doorset

60 Minute Fire Resisting Doorset

Halspan® 60 Optima Plasdor Doorset– 60 Minutes Fire Resistance Latched & Unlatched, Single & Double Acting, Single Doorset

Fig: G15	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD	From:	2055	x 1025
		To:	2205	x 950
	ULSASD & DASD	From:	2055	x 1000
		To:	2155	x 950
Maximum Overpanel Height (mm)		Transomed	2000	
Glazing		Maximum Glazed Area	0.60m ² (see section 9 of this appendix for details)	
		Approved Systems	See section 9 of appendix F	
Frame Specification (see section 10 of main assessment)		Material	Hardwood or MDF	
		Min. Section (mm)	70 x 32	
		Min. Density(kg/m ³)	640 (hardwood) / 700 (MDF)	

Intumescent Materials: Intumescent Seals Ltd. – Therm-A-Strip

Head: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of the leaf edge.

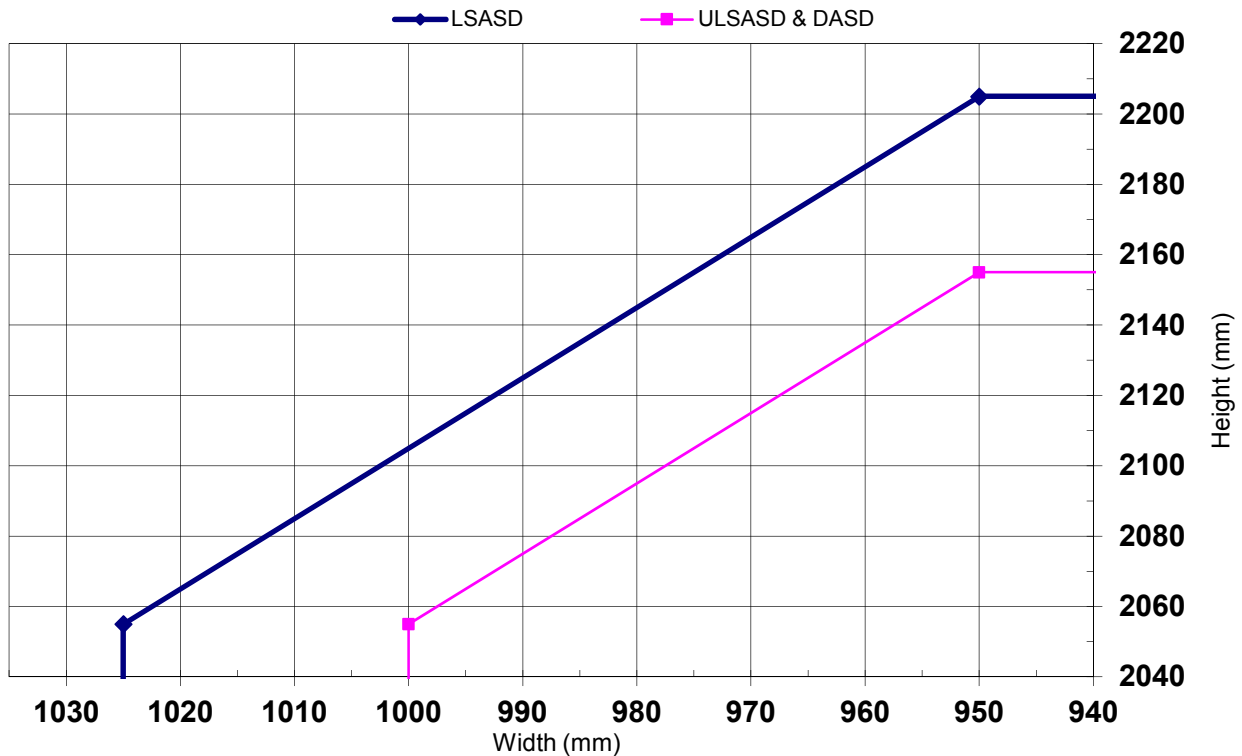
Meeting Edges: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of one leaf edge plus 1No. 15x4mm strip exposed and fitted centrally in the opposing leaf edge.

Jambs: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of the leaf edge.

Overpanel: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of the overpanel edge or frame reveal.

Hardware Protection: See section 11 of main assessment.

Maximum Door Leaf Size

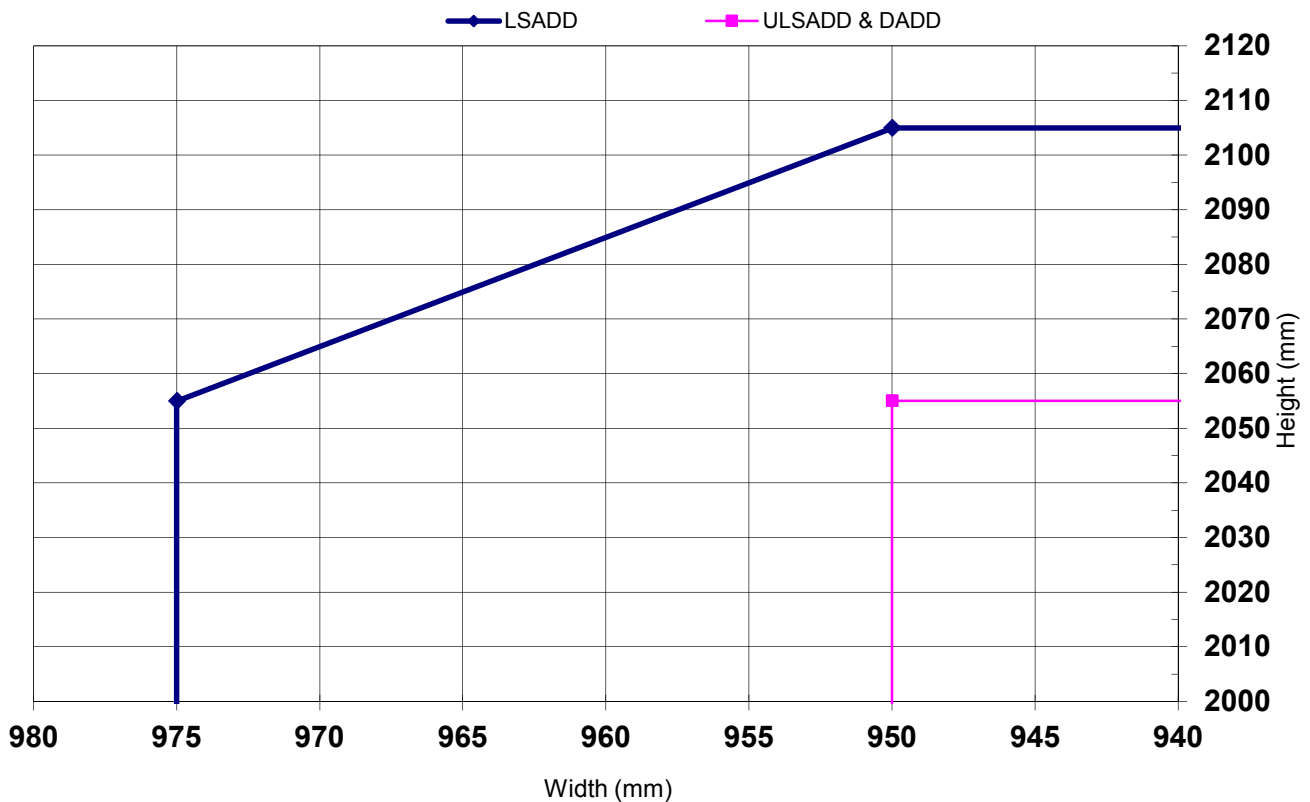


Halspan® 60 Optima Plasdor Doorset – 60 Minutes Fire Resistance

Latched & Unlatched, Single & Double Acting, Double Doorset

Fig: G16	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD	From:	2055	x 975
		To:	2105	x 950
	ULSADD & DADD	From:	2055	x 950
		To:	2055	x 950
Maximum Overpanel Height (mm)	Transomed	1500		
Glazing	Maximum Glazed Area	0.60m ² (see section 9 of this appendix for details)		
	Approved Systems	See section 9 of appendix F		
Frame Specification (see section 10 of main assessment)	Material	Hardwood or MDF		
	Min. Section (mm)	70 x 32		
	Min. Density(kg/m ³)	640 (hardwood) / 700 (MDF)		
Intumescent Materials: Intumescent Seals Ltd – Therm-A-Strip				
Head: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of the leaf edge.				
Meeting Edges: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of one leaf edge plus 1No. 15x4mm strip exposed and fitted centrally in the opposing leaf edge.				
Jamb: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of the leaf edge.				
Overpanel: 2No. 15x4mm exposed and fitted 5mm either side of the centre line of the overpanel edge or frame reveal.				
Hardware Protection: See section 11 of main assessment.				

Maximum Door Leaf Size



Appendix H

Performance Data

Primary Data

Test/ Assessment No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins) ¹
RF96061 (bond up ply)	ULSADD	2040 830 52.5	BS 476: Part 22: 1987	55
RF96062 (bond up MDF)	DADD	2040 826 54	BS 476: Part 22: 1987	64
RF98051	ULSADD+OP	2150 900 54	BS 476: Part 22: 1987	64
Warres 111202 (hollow steel frames)	ULSADD	2042 826 54	BS 476: Part 22: 1987	69
RF00006A (glazing)	ULSASD	2100 900 54	BS 476: Part 22: 1987	60
RF01056 (glazing & grooves)	ULSASD	2040 825 54	BS 476: Part 22: 1987	61
RF01073 (backfilled steel frame)	ULSASD	2135 1105 54	BS 476: Part 22: 1987	76
RF01074** (backfilled steel frame)	ULSADD	2145 795 +300 59	BS 476: Part 22: 1987	78
RF02018 (Pyroplex)	DADD	2040 826 54	BS 476: Part 22: 1987	72
RF02083	ULSADD	2040 828 54	BS 476: Part 22: 1987	A = 60 B = 67
RF02125 (tall double doorsets, MDF frames and 500P)	ULSADD + OP (Halspan® 60 Prima)	2700 + 250 825 54	BS 476: Part 22: 1987	59

¹Integrity only.

Test/ Assessment No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
RF03041 (reduced intumescent)	ULSADD & ULSASD	A: 2135 826 + 300 54 B: 2135 915 54	BS 476: Part 22: 1987	A: 61 B: 61
RF04074 (bond up ply)	LSASD	2040 923 54	BS 476: Part 22: 1987	67
RF06005 (Halspan® 60 Prima)	A: ULSASD B: ULSASD	2125 915 54	BS 476: Part 22: 1987	A: 75 B: 75
RF07032 (Type 617 intumescent seals)	A: ULSADD	Both: 2040 827/303 54	BS 476: Part 22: 1987	71
	B: ULSADD			60
RF07128 (Type 617 and 100P and P.U foam fire stopping detail)	A: ULSASD	2441 1236 54	BS 476: Part 22: 1987	72
	B: ULSASD	2441 1236 54	BS 476: Part 22: 1987	67
RF08035 (Halspan intumescent seals, additional hardware – closer and latch)	ULSADD	2054 910/413 54	BS 476: Part 22: 1987	64
RF08093 (EVA glueline – lippings)	ULSADD	2040 826/300 54	BS 476: Part 22: 1987	67
RF10128 (PVA facings glueline, long flush bolts)	B: ULSADD	2696 950/446 54	BS 476: Part 22: 1987	65
RF13022	A: ULSASD (Ecoguard & 24mm high glazing beads)	2250 895 54	BS 476: Part 22: 1987	66
	B: ULSADD (Duraguard & Pyroplex Seals)	2250 1236 54		50 ²
A06128 ³	Pyrosec Glazing	Various	BS 476: Part 22: 1987	Various

² Failure was attributed to continuous flaming at the bottom hinge position; no failures were attributed to the Duraguard edge protectors prior to 63 minutes

³Assessment Chilt/A06128 provides justification for the use of 19mm Pyrosec within Blankfort 60 and 60+ designs; it is our assessment, given the relative performances, that Halspan® 60 Prima door leaves may be used in lieu of the assessed Blankfort blank.

Supplementary Test Evidence

Test/Assessment No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
RF00069 (PU Glueline)	A: ULSASD	2100 824 54	BS EN 1634-1: 2000 & BS EN 1363-1: 1999	A: 66
RF00006B (glazing)	Indicative panel	1000 x 700	Principles of BS476: Part 22: 1987	80
Warres 117483	Fixed indicative panel	990 990 54		72
Warres 117744 (50mm glazing pins)	Fixed indicative panel	990 990 54		61
RF02098 (wireway & glazing)	Fixed indicative panel	2100 600 54		62
Warres 170821 (Halspan intumescent, PVC lippings, Halspan hardware)	A: LSADD B: ULSASD	A: 2055 910/413 54 B: 2040 926 54	BS EN 1634-1: 2000 & BS EN 1363-1: 1999	A: 58 B: 62
A07051 Rev B (Lorient Palusol and Type 617 seals)	Various	Various	BS 476: Part 22: 1987	30 and 60
RF08127 (additional hardware)	ULSADD + OP	2135 916 44 + 400 OP	BS 476: Part 22: 1987	38
RF09010 (additional hardware, PVC lippings, Halspan drop down seal and triple fin smoke seal)	ULSASD	2045 904 46	BS 476: Part 22: 1987	56
RF09029 (Halspan intumescent mastic and PU foam fire stopping detail)	A: LSASD	2132 912 78	BS 476: Part 22: 1987	114
	B: LSASD	2132 912 78	BS 476: Part 22: 1987	116
CFR0909211 (Visicom & Duraglass)	Fixed indicative panel	A - 440 x 440 B - 1200 x 650	Principles of BS 476: Part 22: 1987	62
Chilt/RF11061 (post-formed Acrovyn)	B: ULSADD	2100 900/300 54	BS 476: Part 22: 1987	68

Test/Assessment No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)	
Warres 170821 (Halspan intumescent seals and additional hardware)	A: LSADD	2055 910/413 54	BS EN 1634-1: 2000 & BS EN 1363-1: 1999	58 (integrity failure at latch)	
	B: ULSASD	2040 926 54	BS EN 1634-1: 2000 & BS EN 1363-1: 1999	62	
Warres 191350 (Pyrostem)	Fixed sample	1495 926 54	Principles of BS 476: Part 20: 1987	62	
IF09028 (200mm lengths of intumescent)	2No. ULSASD	-	Principles of BS 476: Part 22: 1987	Comparative only	
DFR0410131 (Visicom)	Fixed sample	1955 1150 54	Principles of BS 476: Part 22: 1987	System Ref 7 - 69	
DFR0502251 (Visicom)	Fixed sample	1955 1180 54	Principles of BS 476: Part 22: 1987	System Ref 5 - 74	
				System Ref 6 - 69	
DFR0410132 (Duraguard)	SADD	1834 537 54	Principles of BS 476: Part 22: 1987	61	
DFR0502281 (Duraguard)	SA + DASD	1830 530 54	Principles of BS 476: Part 22: 1987	46 ⁴	
DFR0409232 (Plasdor ^{**})	ULSADD	1808 693/343 58	BS 476: Part 22: 1987	68 ⁵	
DFR0501312 (Plasdor ⁵)	Fixed sample	1900 1100 58	BS 476: Part 22: 1987	72	
DFR0511252 (Flush Handles)	Fixed leaf with 4 handles	1900 575 54	Principles of BS 476: Part 22: 1987	A	76
				B	71
				C	75
				D	76
CFR1011171 (23mm Fireswiss Foam)	ULSADD (1200 x 200mm glazing aperture)	2100 826/339 54	BS 476: Part 22: 1987	60 - latch	
CFR0607172	Fixed sample with six glazed apertures	1850 1150 54	Principles of BS 476: Part 22: 1987	Lined Apertures – Integrity 65	

⁴ Initial failure at 46 minutes was at the meeting edges, the glazing detail failed at 68 minutes due to continuous flaming tracking from the centre of the door leaf.

⁵ Plasdor glazing systems have been renamed Flushglaze and Duoglaze from the tested Smoothglaze and Surfaceglaze respectively, no material changes made to the design.

Appendix J

Greenlam Industries Ltd. Halspan® 60 Prima Doorset

1. Introduction

This appendix contains the information relating to Halspan® 60 Prima doorsets. The assessment uses the same extrapolation and interpretation techniques applied for the main assessment and 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 Specification of Construction

The door leaves for Halspan® 60 Prima doorsets are manufactured in accordance with the design as specified in section 2 of BMT/CNA/F16083 utilising the Halspan® 60 Prima blank (nominal density 630kg/m³ +/- 10%) in place of the Halspan® 60 Optima. All other aspects of the construction specification are identical to that detailed in the main assessment except where specifically discussed in the following paragraphs detailing options not available with the Halspan® 60 Optima door blank.

3. Leaf Sizes and Configurations

The assessed leaf sizes and configurations are based on the constructions and performances obtained from the range of tests utilising the Halspan® 60 Prima door blank. Data sheets specifying the maximum approved leaf sizes and graphs detailing the permitted gradient between height and width are contained in the data sheets in appendix K.

4. Door Frames

4.1 Door Frame Construction

Timber based door frames for Halspan® 60 Prima must be constructed to meet the following specification (for steel door frame options see appendix C of the main assessment):

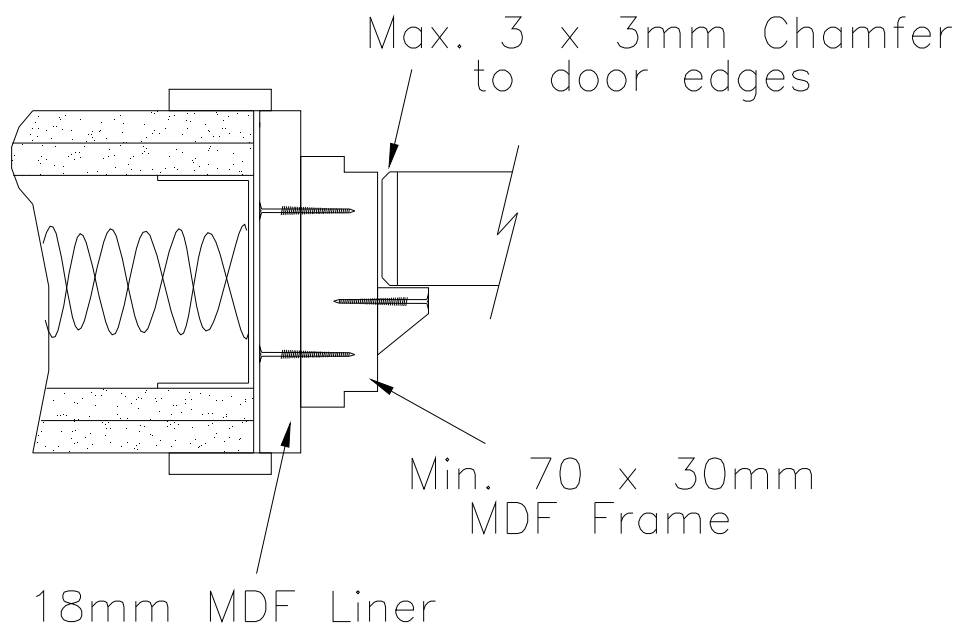
Material ¹	Min. Section Size (mm)	Min. Density (kg/m ³)	Permitted Configuration	Max Leaf Dimensions (mm)
Hardwood (for use with reduced intumescent)	70 x 32	640	LSASD, ULSASD & DASD, LSADD, ULSADD & DADD	See relevant data sheet in appendix B
Hardwood ²	70 x 32	530	LSASD & ULSASD	2100 (h) x 900 (w)
Hardwood ²	70 x 44	530	All	All
Hardwood ²	70 x 22	640	All	All
MDF ²	70 x 30	700	All	2440 (h) and not restricted in width

Notes:

1. Where hardwood is specified the use of Beech (*Fagus Sylvatica*) is not permitted
2. Not permitted for use with reduced intumescent specification
3. If the doorset features a transomed overpanel, the door frame must be hardwood with a minimum density of 640kg/m^3 and with a minimum section of $70\text{mm} \times 32\text{mm}$
4. All door frame timber must be joinery quality, free from knots, splits and checks
5. A 12mm deep planted or integral stop is adequate for single acting frames whilst double acting frames may be scalloped or square (see section 10 of main assessment). A 14mm deep stop is required when using the Dorma ITS 96 concealed closer mounted in the leaf head – see section 13 for details
6. Frame joints may be mortice and tenoned, mitred, half lapped or butted and with no gaps. All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws
7. Hinge fixings must be fit for purpose and if they penetrate through the rear of the frame, a sub frame of the same hardwood will be required. The entire screw length must be within a timber substrate
8. The door frame (MDF or timber based) may be entirely clad in 2mm thick PVC sheeting for use with leaves either with or without 2mm thick PVC edge protectors (see section 8 of main assessment) and facing material (see section 9 of main assessment)
9. See section 10 for diagrams depicting the assessed frame profiles and dimensions
10. See section 16 for details of required frame fixings, and section 17 for details of sealing to the structural opening
11. Steel and MDF frame doorsets are not assessed for glazed fanlights.

4.2 MDF Frame Option

The installation detail illustrated below is permitted provided the door frame and liner are screwed and additionally glued together using Urea or Phenol Formaldehyde, PVA, PVAC or PU gluelines, frame joints must be mitre type, tight with no gaps. All other details must as specified in section 4.1 above and datasheets for Halspan® 60 Prima doorsets.



5. Zeroplus Slimport Glazing System

Additional test data Ref: Warres 117483 is suitable evidence to allow the use of two alternative glazing methods if the Halspan® 60 Prima door blank is used; i.e. Zeroplus Slimport SP250 or SP450 for use with Pyroacet glass only. Installation must be as per the test data. Zero Seal Systems Ltd. must be contacted for details on glazing materials and installation.

Glass Type	Glazing System	Manufacturer	Maximum Area (m²)
6mm Pyroacet	Zeroplus Slimport SP250	Securiglass Co. Ltd.	Limited by glazing system (see test 117483)
	Zeroplus Slimport SP450		

Appendix K

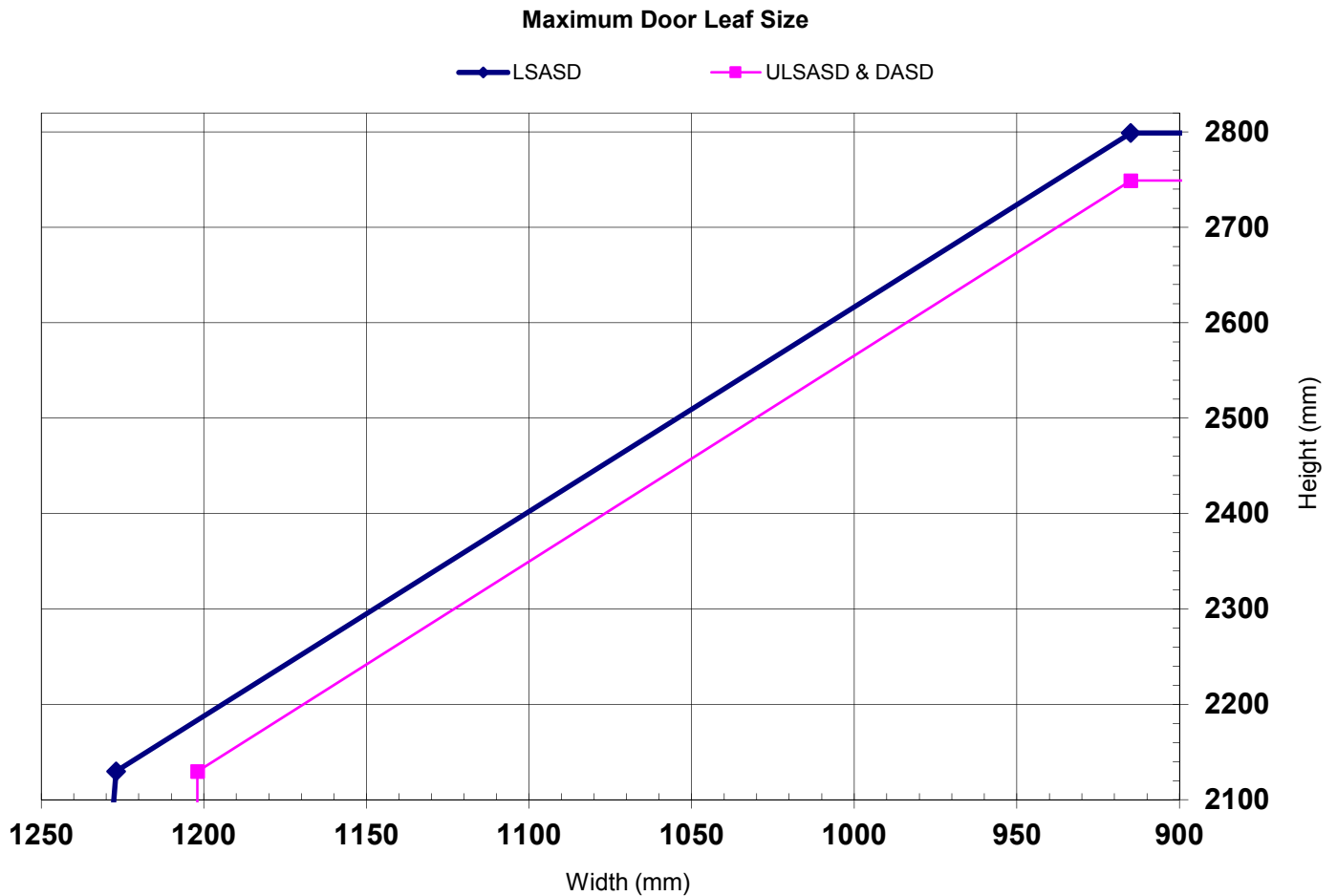
Data Sheets for Greenlam Industries Ltd.

Halspan[®] 60 Prima Doorset

60 Minute Fire Resisting Doorset

Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Single Doorset - Extended Width

Fig: G17	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD	From:	2130	x 1227
		To:	2799	x 915
	ULSASD & DASD	From:	2130	x 1202
		To:	2749	x 915
Maximum Overpanel Height (mm)		Transomed	2000	
Frame Specification (see section 10 of main assessment for details)		Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)
		Min. Section (mm)	70 x 22 (32 if transom fitted)	70 x 30
		Min. Density(kg/m ³)	640	700
Intumescent Materials: PVC encapsulated Palusol 100, Type 617, Pyroplex, 500P or Halspan® Type SLS				
Head: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head.				
Jamb: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal.				
Hardware Protection: See section 11 of main assessment.				

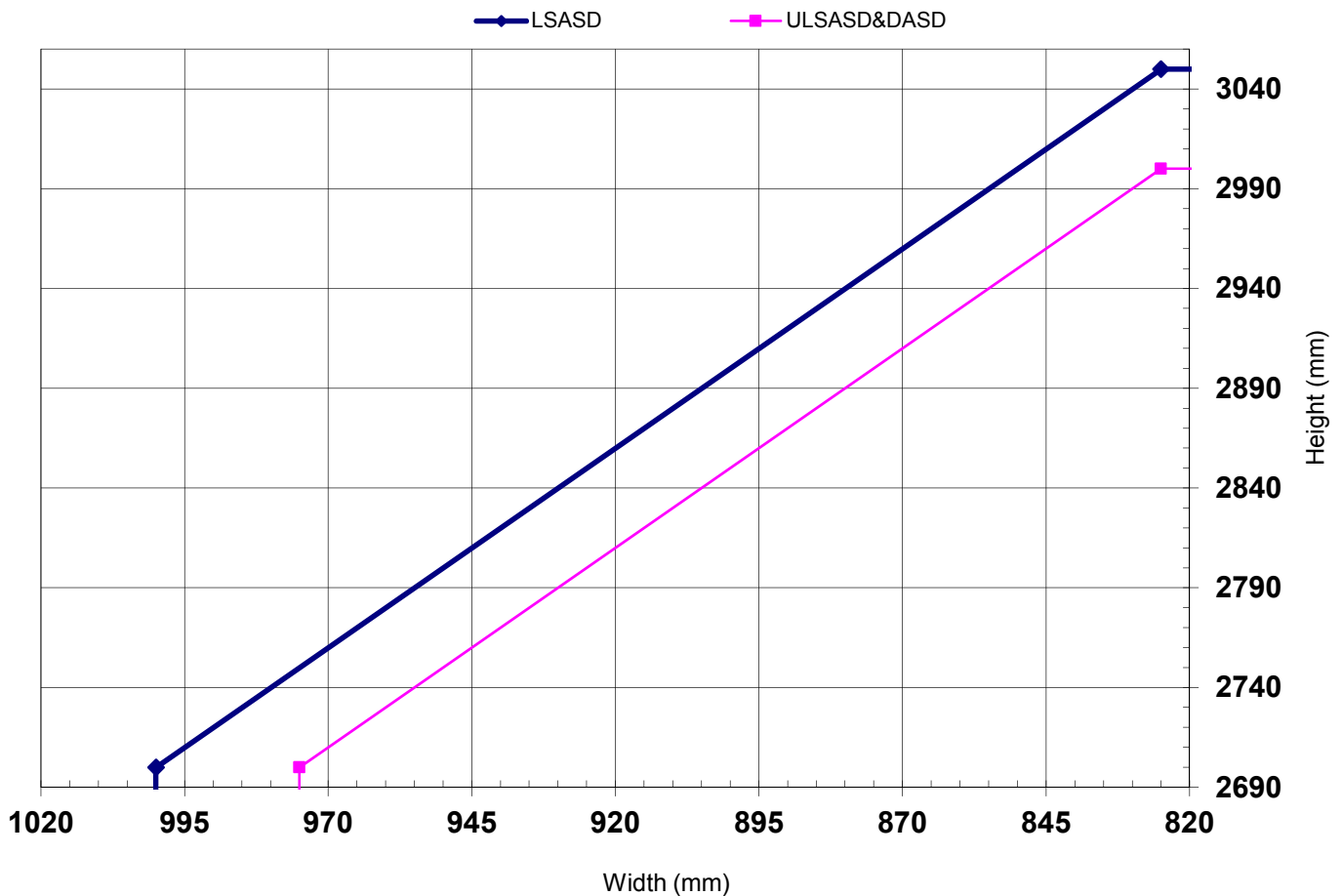


Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance

Latched & Unlatched, Single & Double Acting, Single Doorset – Extended Height

Fig: G18	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD	From:	2700	x 1000
		To:	3050	x 825
	ULSASD & DASD	From:	2700	x 975
		To:	3000	x 825
Maximum Overpanel Height (mm)	Transomed	2000		
Frame Specification (see section 10 of main assessment for details)	Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)	
	Min. Section (mm)	70 x 22 (32 if transom fitted)	70 x 30	
	Min. Density (kg/m ³)	640	700	
Intumescent Materials: PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS				
Head: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head.				
Jamb: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal.				
Hardware Protection: See section 11 of main assessment.				

Maximum Door Leaf Size



Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Single Doorset - Extended Width - Transom optional

Fig: G19	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD+OP	From:	2130	x	1177
		To:	2699	x	915
	ULSASD+OP & DASD+OP	From:	2130	x	1152
		To:	2649	x	915
Maximum Overpanel Height (mm)	No Transom Required	2000			
Frame Specification (see section 10 of main assessment for details)	Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)		
	Min. Section (mm)	70 x 22	70 x 30		
	Min. Density(kg/m ³)	640	700		

Intumescent Materials:

PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS

Head (junction of leaf heads and overpanel):

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of overpanel; optionally 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf head and 1No. 15x4mm fitted centrally in the bottom of overpanel.

Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates (maximum leaf height with rebates is 2200mm).

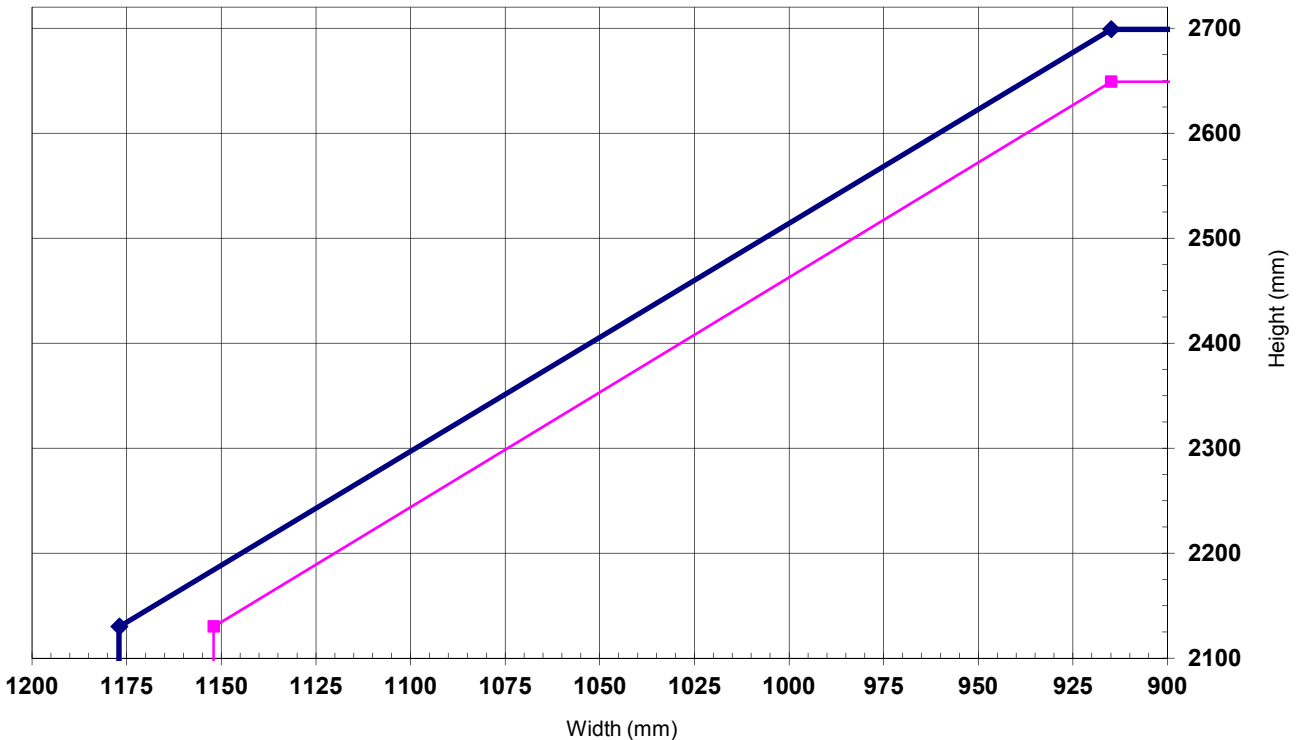
Jams & Overpanel:

2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. It is permitted to increase the intumescent specification to match that given for the leaf head if required.

Hardware Protection: See section 11 of main assessment.

Maximum Door Leaf Size

—◆— LSASD+OP —■— ULSASD+OP & DASD+OP



Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Single Doorset - Extended Height - Transom optional

Fig: G20	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD+OP	From:	2700	x	950
		To:	2950	x	825
	ULSASD+OP & DASD+OP	From:	2700	x	925
		To:	2900	x	825
Maximum Overpanel Height (mm)		No Transom Required	2000		
Frame Specification (see section 10 of main assessment for details)		Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)	
		Min. Section (mm)	70 x 22 (32 if transom fitted)	70 x 30	
		Min. Density(kg/m ³)	640	700	

Intumescent Materials:

PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS

Head (junction of leaf heads and overpanel):

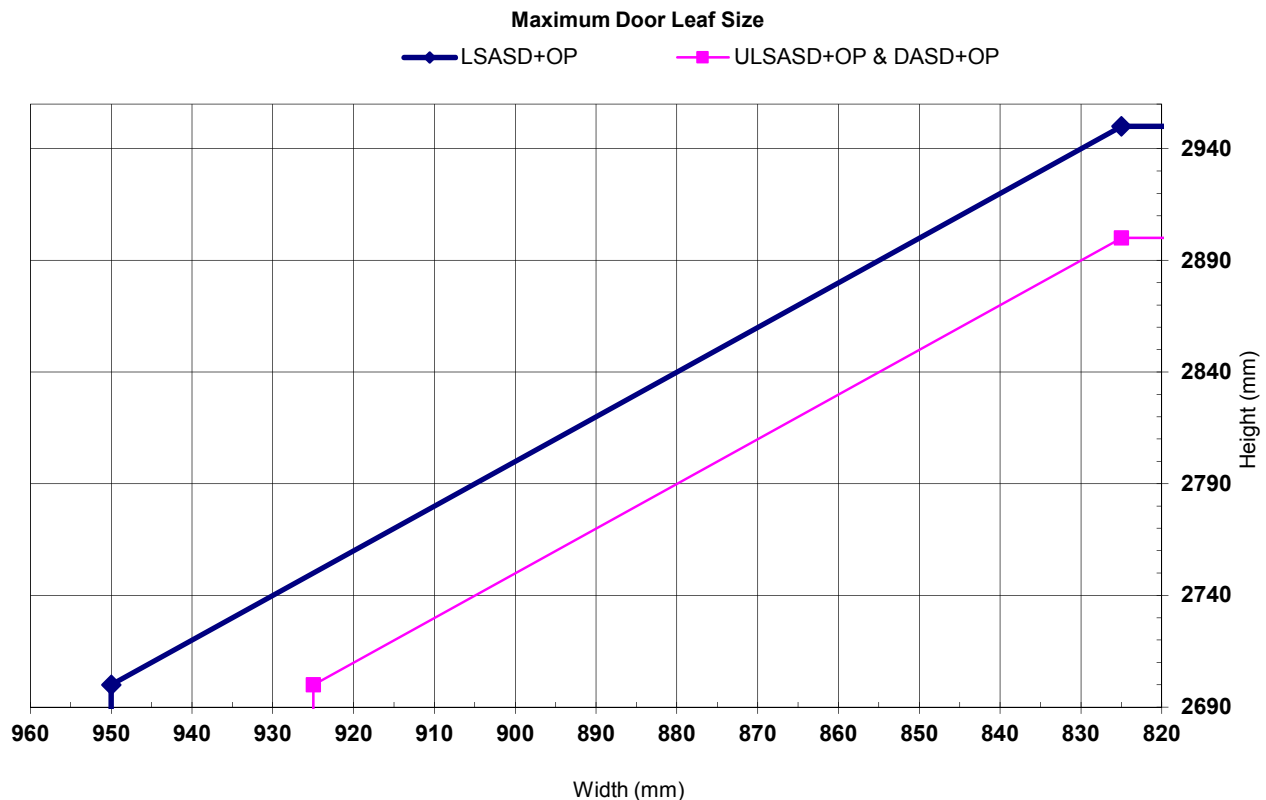
Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of overpanel; optionally 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf head and 1No. 15x4mm fitted centrally in the bottom of overpanel.

Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates (maximum leaf height with rebates is 2200mm).

Jambs & Overpanel:

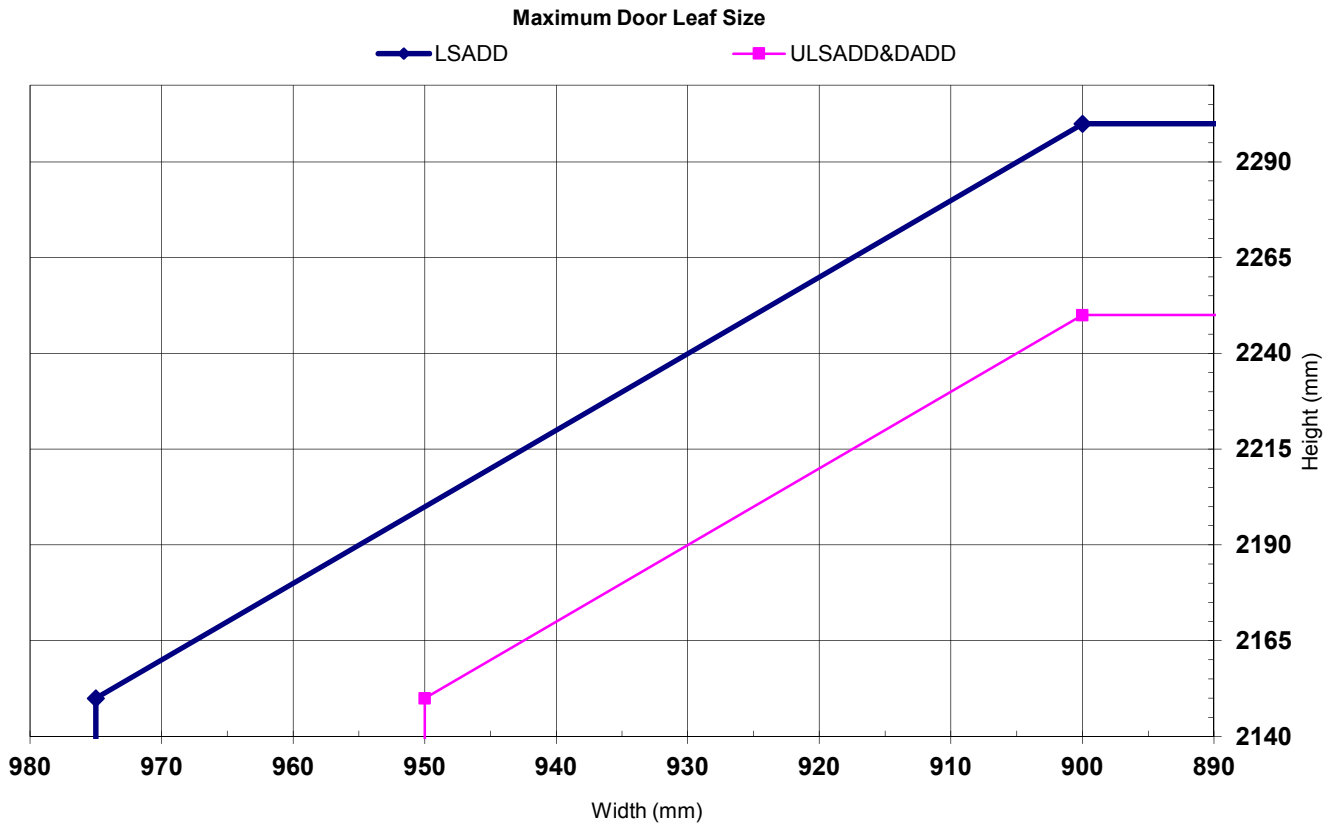
2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. It is permitted to increase the intumescent specification to match that given for the leaf head if required.

Hardware Protection: See section 11 of main assessment.



Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Double Doorset - Extended Width

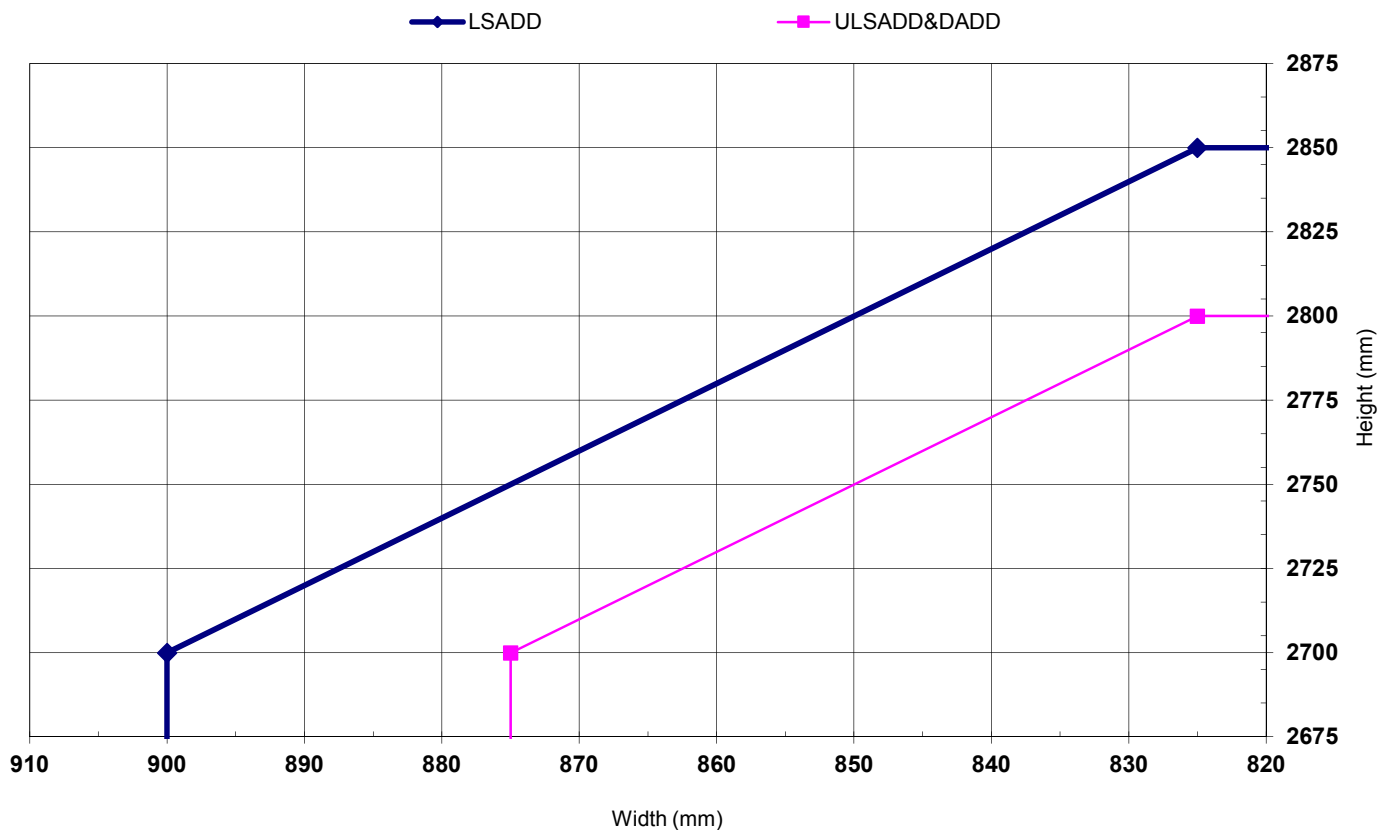
Fig: G21	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD	From:	2150	x 975
		To:	2300	x 900
	ULSADD & DADD	From:	2150	x 950
		To:	2250	x 900
Maximum Overpanel Height (mm)	Transomed	1500		
Frame Specification (see section 10 of main assessment for details)	Material	Hardwood		MDF – (not permitted with transoms or leaves ≥ 2440 high)
	Min. Section (mm)	70 x 22 (32 if transom fitted)		70 x 30
	Min. Density(kg/m ³)	640		700
Intumescent Materials: PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS				
Head: Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head.				
Meeting Edges: Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in one leaf edge only. Rebated: 2No. 15x4mm exposed with each seal fitted centrally in the rebate of each leaf.				
Jambs: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal.				
Hardware Protection: See section 11 of main assessment.				



Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Double Doorset - Extended Height

Fig: G22	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD	From:	2700	x 900
		To:	2850	x 825
	ULSADD & DADD	From:	2700	x 875
		To:	2800	x 825
Maximum Overpanel Height (mm)		Transomed	1500	
Frame Specification (see section 10 of main assessment for details)		Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)
		Min. Section (mm)	70 x 22 (32 if transom fitted)	70 x 30
		Min. Density(kg/m ³)	640	700
Intumescent Materials: PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS				
Head: Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head.				
Meeting Edges: Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in one leaf edge only. Rebated: 2No. 15x4mm exposed with each seal fitted centrally in the rebate of each leaf.				
Jamb: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal.				
Hardware Protection: See section 11 of main assessment.				

Maximum Door Leaf Size



Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Double Doorset - Extended Width - Transom Optional

Fig: G23	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD+OP	From:	2150	x	925
		To:	2200	x	900
	ULSADD+OP & DADD+OP	Max:	2150	x	900
Maximum Overpanel Height (mm)		No Transom Required	1500		
Frame Specification (see section 10 of main assessment for details)	Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)		
	Min. Section (mm)	70 x 22 (32 if transom fitted)	70 x 30		
	Min. Density(kg/m ³)	640	700		

Intumescent Materials:

PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS

Head (junction of leaf heads and overpanel):

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of overpanel; optionally 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf heads and 1No. 15x4mm fitted centrally in the bottom of overpanel.

Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates (maximum leaf height with rebates is 2200mm).

Meeting Edges:

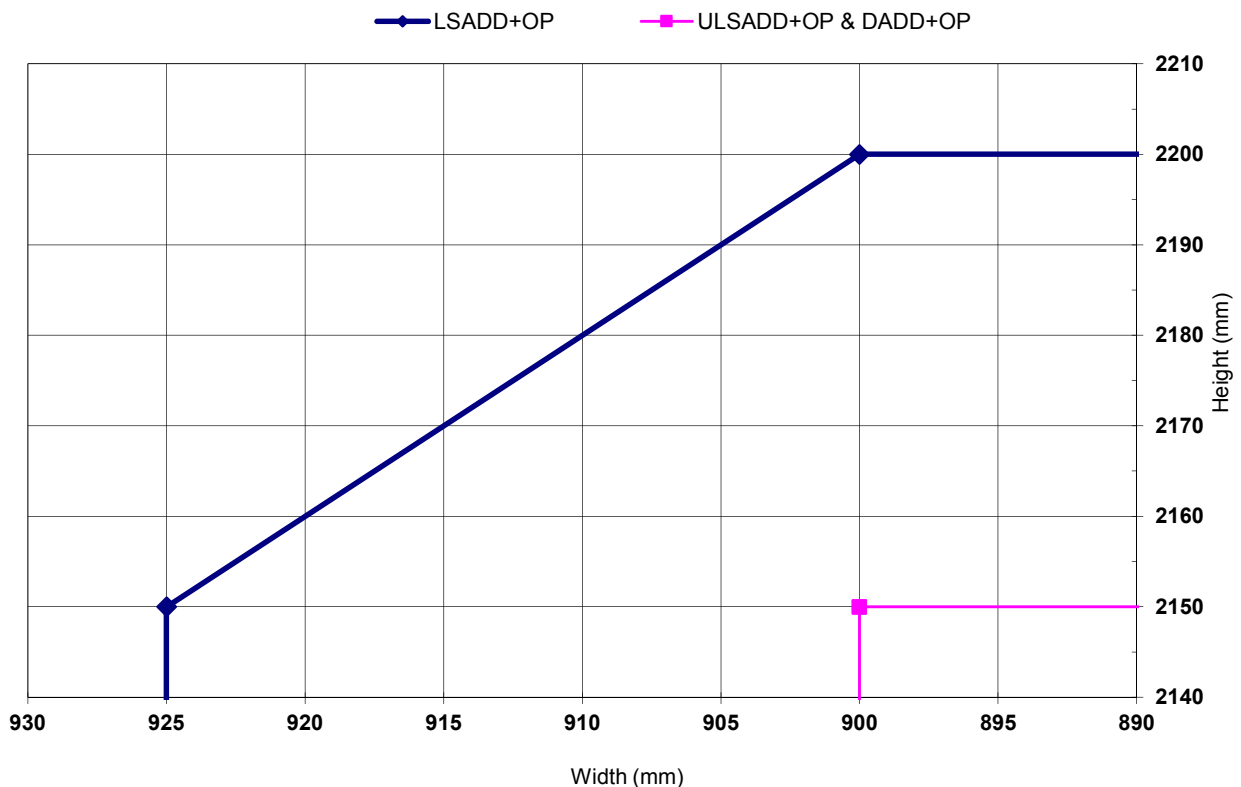
Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in one leaf edge, and 1No. 15x4mm fitted centrally in the opposite leaf.

Jams & Overpanel:

2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. It is permitted to increase the intumescent specification to match that given for the leaf head if required.

Hardware Protection: See section 11 of main assessment.

Maximum Door Leaf Size



Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance

Latched & Unlatched, Single & Double Acting, Double Doorset - Extended Height - Transom Optional

Fig: G24	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSADD+OP	From:	2700	x 850
		To:	2750	x 825
	ULSADD+OP & DADD+OP	Max:	2700	x 825
Maximum Overpanel Height (mm)	No Transom Required		1500	
Frame Specification (see section 10 of main assessment for details)	Material	Hardwood		MDF – (not permitted with transoms or leaves ≥ 2440 high)
	Min. Section (mm)	70 x 22 (32 if transom fitted)		70 x 30
	Min. Density(kg/m ³)	640		700

Intumescent Materials:

PVC Encapsulated Palusol 100, Type 617, Therm-A-Seal, Pyroplex, 500P or Halspan® Type SLS

Head (junction of leaf heads and overpanel):

Square: 1No. 38x4mm exposed and fitted centrally in the leaf or bottom of overpanel; optionally 2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf heads and 1No. 15x4mm fitted centrally in the bottom of overpanel.

Rebated: 2No. 15x4mm exposed and fitted centrally with one seal in the rebate and one seal in the upstand of the overpanel plus 1No. 10x4mm in the corner of the leaf head rebates (maximum leaf height with rebates is 2200mm).

Meeting Edges:

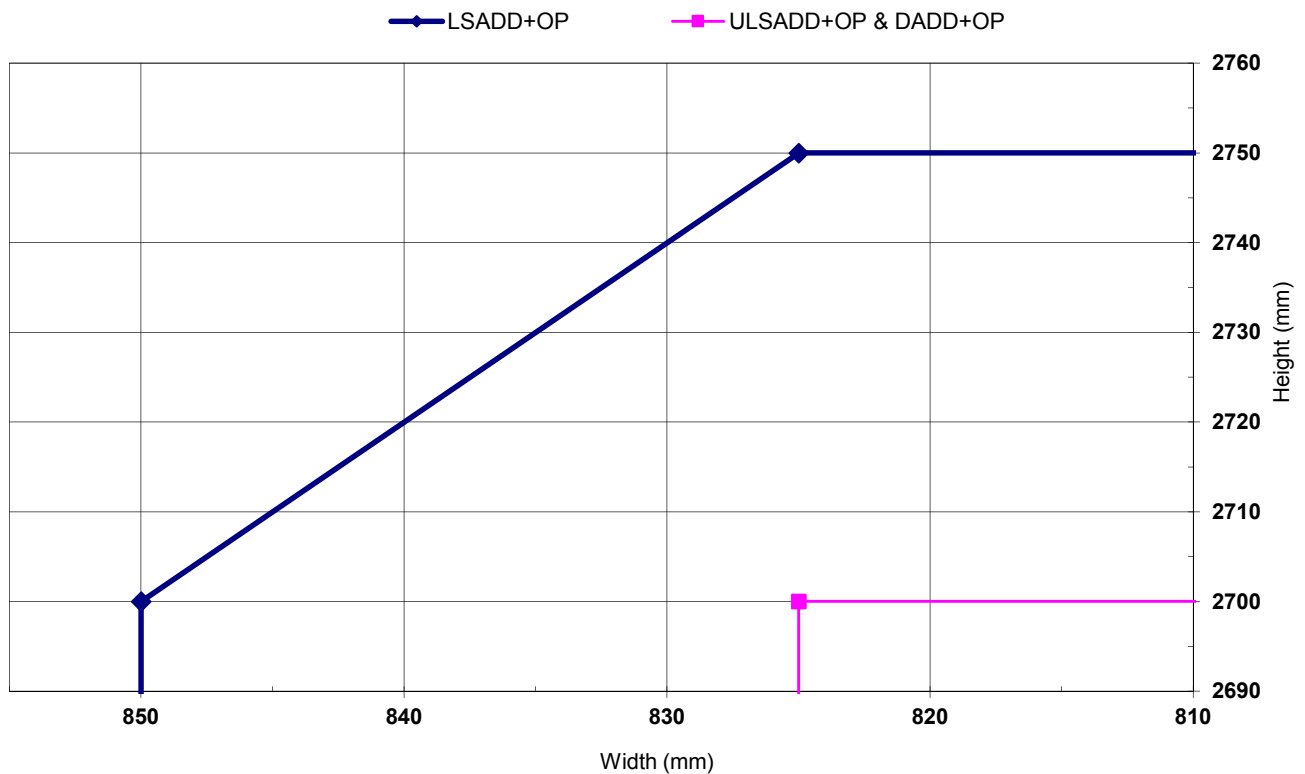
Square: 2No. 15x4mm exposed and fitted 5mm either side of the centreline in one leaf edge, and 1No. 15x4mm fitted centrally in the opposite leaf.

Jambs & Overpanel:

2No. 15x4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal. It is permitted to increase the intumescent specification to match that given for the leaf head if required.

Hardware Protection: See section 11 of main assessment.

Maximum Door Leaf Size

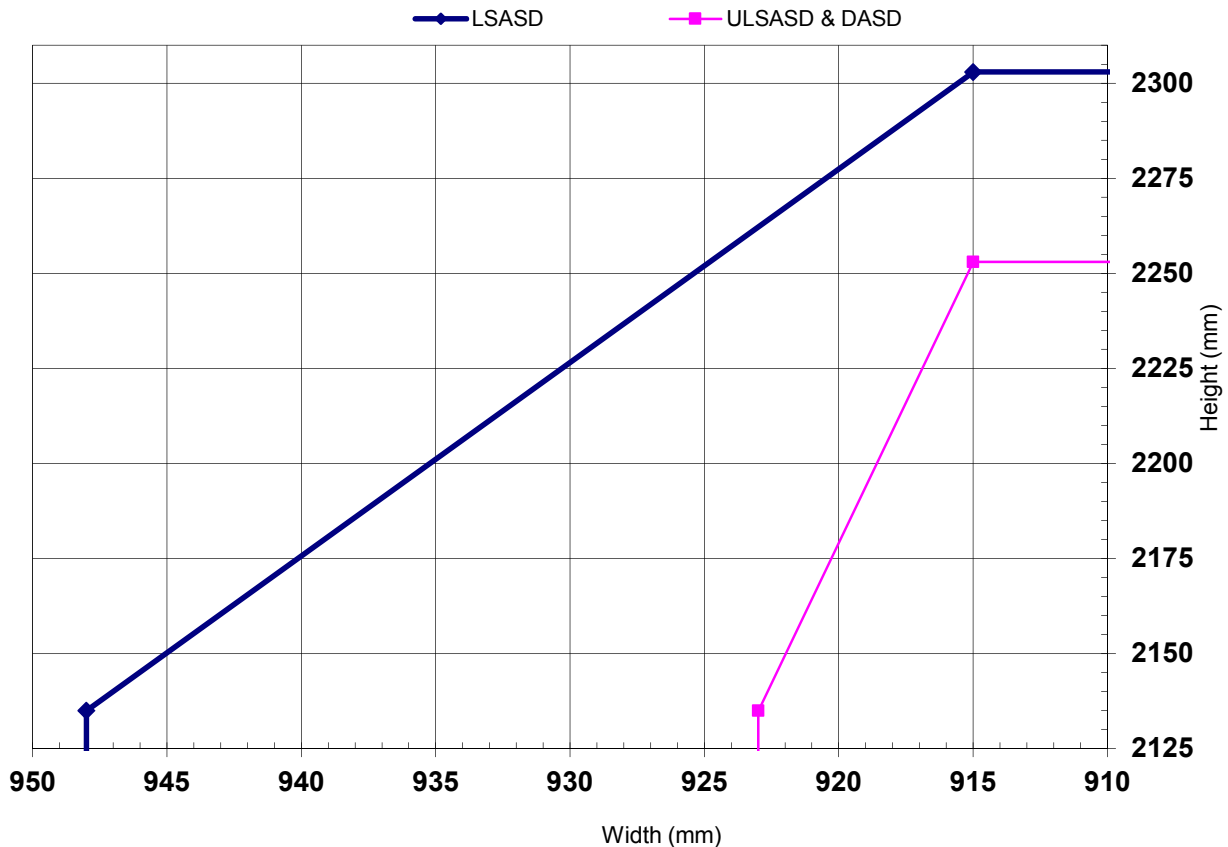


Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance

Latched & Unlatched, Single & Double Acting, Single Doorset - Reduced Intumescent

Fig: G25	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD	From:	2135	x 948
		To:	2303	x 915
	ULSASD & DASD	From:	2135	x 923
		To:	2253	x 915
Maximum Overpanel Height (mm)	Transomed	2000		
Frame Specification (see section 10 of main assessment)	Material	Hardwood	MDF – (not permitted with transoms or leaves ≥ 2440 high)	
	Min. Section (mm)	70 x 32 (32 if transom fitted)	70 x 30	
	Min. Density(kg/m ³)	640	700	
Intumescent Materials: PVC encapsulated Palusol 100 or Type 617				
Head: 1No. 20x4mm exposed and centrally fitted in the frame reveal.				
Jambs: 1No. 20x4mm exposed and centrally fitted in the frame reveal.				
Hardware Protection: See section 11 of main assessment.				

Maximum Door Leaf Size



Halspan® 60 Prima Doorset – 60 Minutes Fire Resistance
Latched & Unlatched, Single & Double Acting, Double Doorset - Reduced Intumescent

Fig: G26	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2135	x	858
		To:	2203	x	826
	ULSADD & DADD	From:	2135	x	833
		To:	2153	x	826
Maximum Overpanel Height (mm)	Transomed	1500			
Frame Specification (see section 10 of main assessment for details)	Material	Hardwood			MDF – (not permitted with transoms or leaves ≥ 2440 high)
	Min. Section (mm)	70 x 32 (32 if transom fitted)			70 x 30
	Min. Density(kg/m ³)	640			700
Intumescent Materials: PVC Encapsulated Palusol 100 or Type 617					
Head: 1No. 25x4mm exposed and fitted centrally in the frame reveal.					
Meeting Edges:					
Square: 1No. 25x4mm exposed and fitted centrally in one leaf edge only.					
Rebated: 1No. 15x4mm exposed and fitted centrally in the rebate of both leaf edges.					
Jambs: 1No. 25x4mm exposed and fitted centrally in the frame reveal.					
Hardware Protection: See section 11 of main assessment.					

