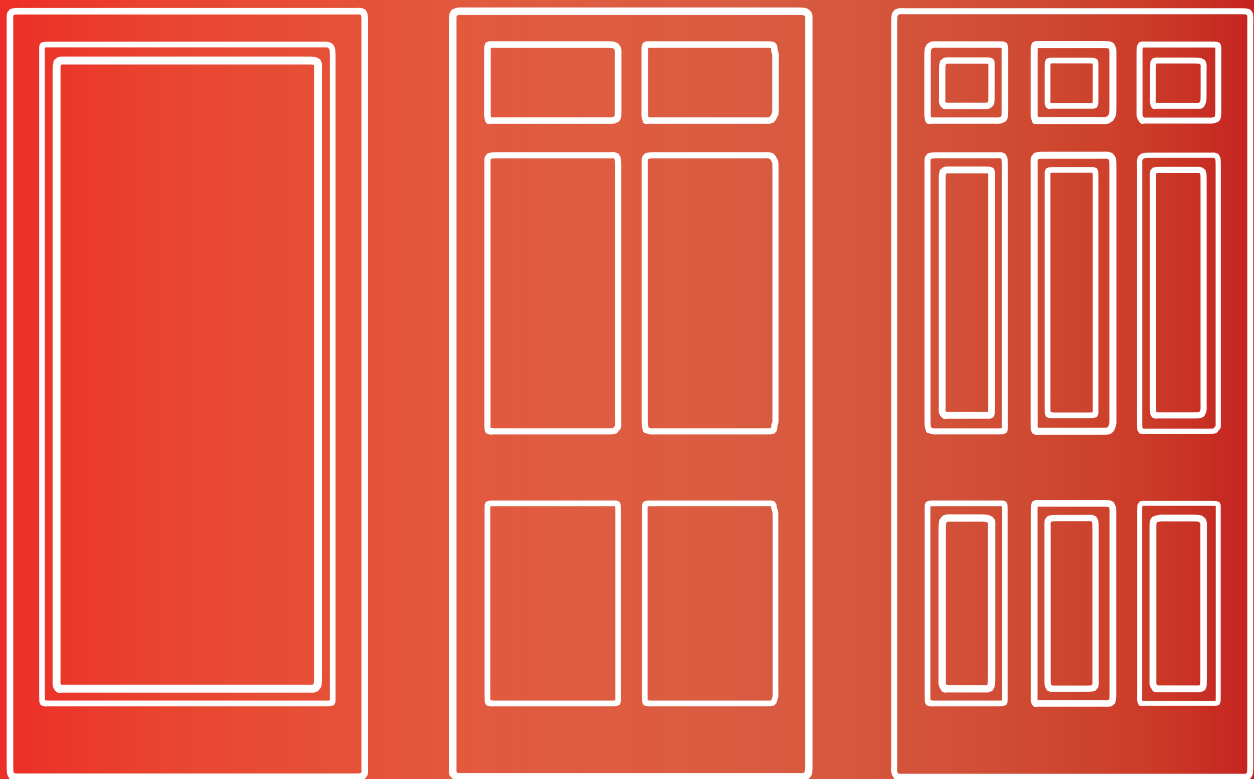
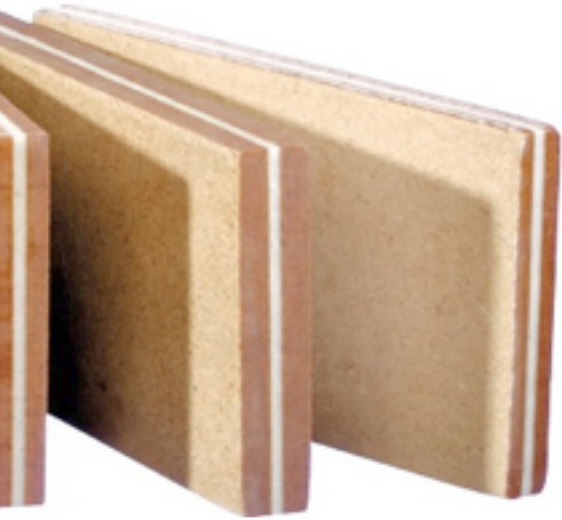


Palusol® SW Door Cores Technical Manual



MANN **Mc GOWAN**
Advanced Intumescent Technology

The New Innovation in Door Core Technology



Introducing Palusol® SW

Palusol® SW is a ready made laminated board material that can be used to manufacture both flat and raised and fielded – fire resisting panelled doors.

In a joint development between Mann McGowan® and BASF SE, fire resistance tests have been successfully conducted on both 30 and 60 minute door constructions.

These tests carried out at Chiltern International Fire in accordance with BS 476 Part 22: 1987 has culminated in two global assessments Chiltern/A 09136 and A0 9165.

This Technical Manual provides details of all of the products required to manufacture fire resisting doors without the joinery manufacturer having to go to the expense of fire testing.

The Palusol® SW Boards and all the intumescent materials should be obtained direct from Mann McGowan to ensure the fire test evidence is complied with.

Benefits

By using Palusol® SW boards manufactured by BASF SE and distributed by Mann McGowan®, specialist joinery producers and OEM's can manufacture flat and raised and fielded panelled fire resisting door-sets. As the boards are pre-manufactured and pressed-this provides savings on production time and negates the need for R + D on the part of the manufacturer.

These tangible benefits equates to lower production costs as well as allowing the producer to tender for a work in this increasing market sector.

Other benefits include;

- Global Fire Assessments from Chiltern International Fire
- 10mm thick panels can be used on FD 30 and FD30(S) constructions
- A double layer of 10mm thick panels can be used on FD 60 and FD60(S) constructions
- Customised raised and fielded decorative panels can be utilised
- Commercially available wood adhesives can be used
- Up to 10 panels per door leaf can be accommodated
- Glazing apertures can be incorporated

Quality Assurance

Mann McGowan and BASF SE are a quality assured companies in accordance with ISO 9001:2008

BASF SE Implements and maintains an environmental system in accordance with ISO 14001: 2004



Palusol® SW4 Boards

Product Code	Standard Dimensions	Weight Per Sheet
Palusol® SW4	2160mm x 1110mm x 10mm*	27kg per sheet

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Advanced Intumescent Technology

Cutting and Working

*The raw edges of the board should be trimmed 5mm all around.

Palusol® SW can be cut and processed using standard woodworking machinery. Carbide tipped cutting tools is recommended for longer usage.

Cut edges which arise during processing must be coated and adequately protected

Safety Precautions during Processing

Sodium silicate dust is created during the cutting, drilling or milling of Palusol® SW. It must not get into the eyes or respiratory passages and the use of appropriate extraction facilities and wearing of safety glasses and dust masks are strongly advised.

Storage and Transport

Palusol® SW should be protected from water, high atmospheric humidity and sustained temperatures above 40° C. The boards should be stored horizontally and supported over their entire area. Protective gloves should be worn.

Construction FD 30 + FD30(S)

Design A Raised and Fielded Panels

Element		Species/type	Dims mm	Density kg/m ³
Head Rails + Stiles		Softwood or Hardwood	95 mm wide x 44mm thick with 18mm wide x 30mm deep groove	510
Rails	Middle	Softwood or Hardwood	95 mm wide x 44mm thick with 18mm wide x 30mm deep groove	510
Rails	Bottom		190 mm wide x 44mm thick with 18mm wide x 30mm deep groove	
Panel	Core	Palusol® SW HDF Laminated Board	10mm thick	1000kg/m ³
Panel	Facing	MDF Chipboard Plywood Timber	12mm thick reducing to 4mm thick at fielded areas	600 kg/m ³ 600 kg/m ³ 600 kg/m ³ 500kg/m ³

Design B Flat Panels

Element		Species/type	Dims mm	Density kg/m ³
Head Rails + Stiles		Softwood or Hardwood	95 mm wide x 44mm thick with 10mm wide x 30mm deep groove	510
Rails	Middle	Softwood or Hardwood	190 mm wide x 44mm thick with 10mm wide x 30mm deep groove	510
Rails	Bottom		190 mm wide x 44mm thick with 10mm wide x 30mm deep groove	
Panel	Core	Palusol® SW HDF Laminated Board	10mm thick	1000kg/m ³

Notes

Flat panels do not require facings, however the materials specified in Design A above can be used if required

Additional mouldings/beads may be applied if required

A minimum of 1 and maximum of 10 panels can be used

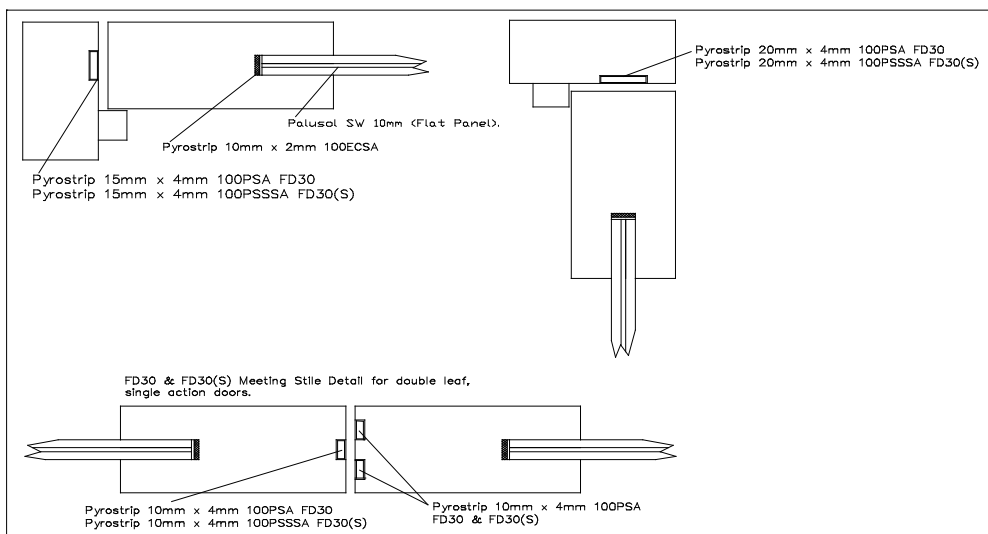
Veneering

Timber veneers, foils and plastic laminates up to 2mm thick can be used on Palusol® SW Laminated boards.

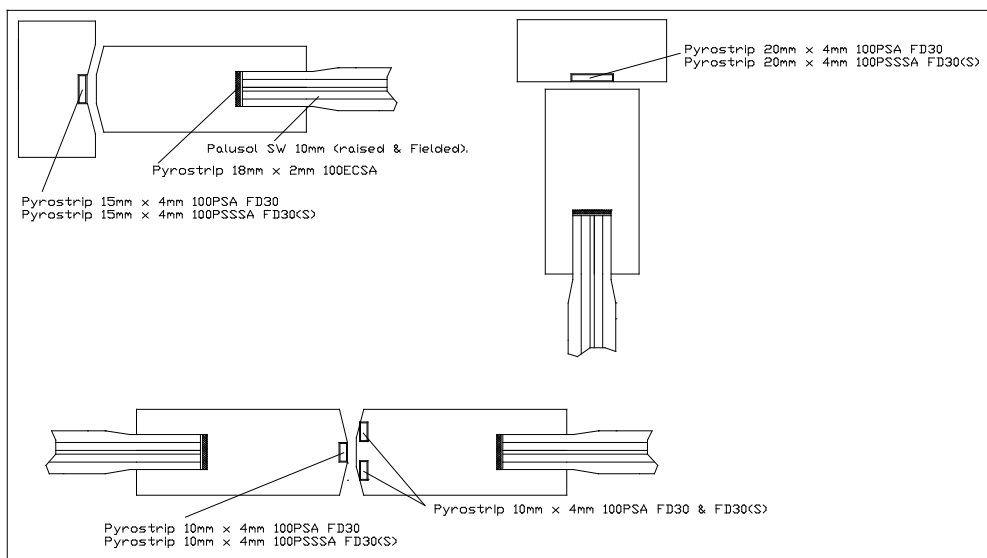
Palusol® SW Doorset Configurations

Intumescent Detail for both Raised & Fielded Doorsets and Flat Panelled Doorsets

LSASD + ULSASD + LSADD + ULSADD



DASD + DADD

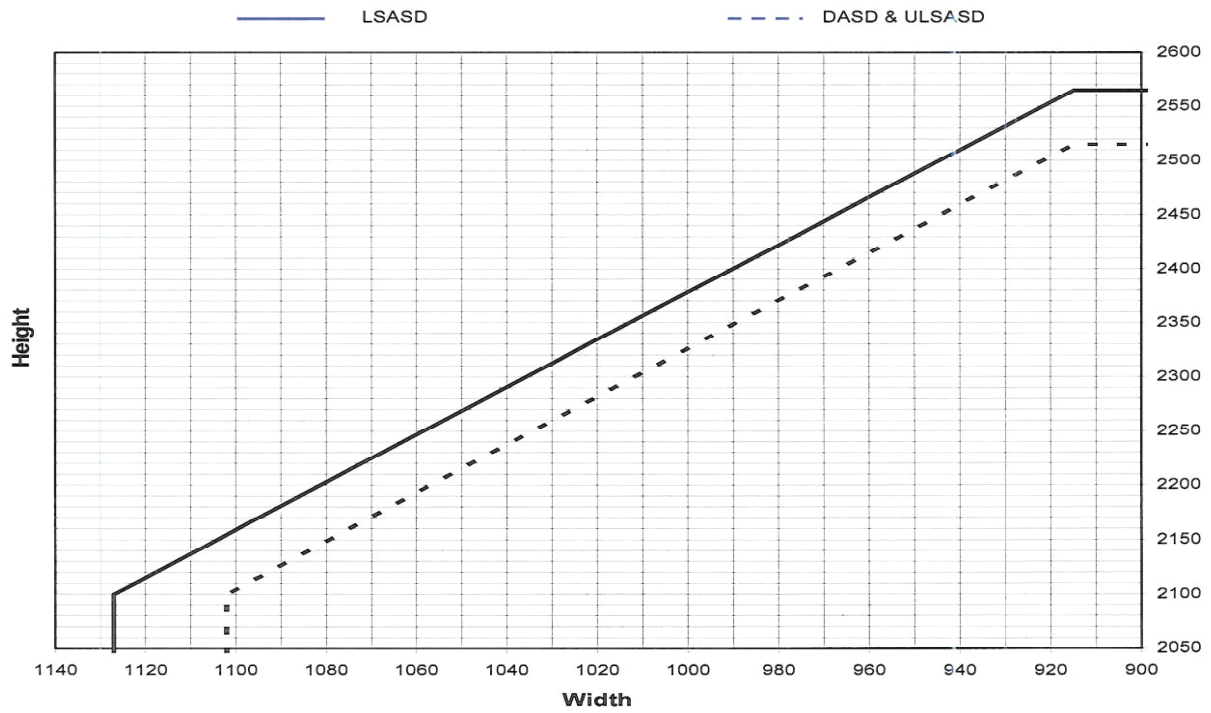


Maximum Door-leaf Dimensions

Raised & Fielded Panelled Doorsets

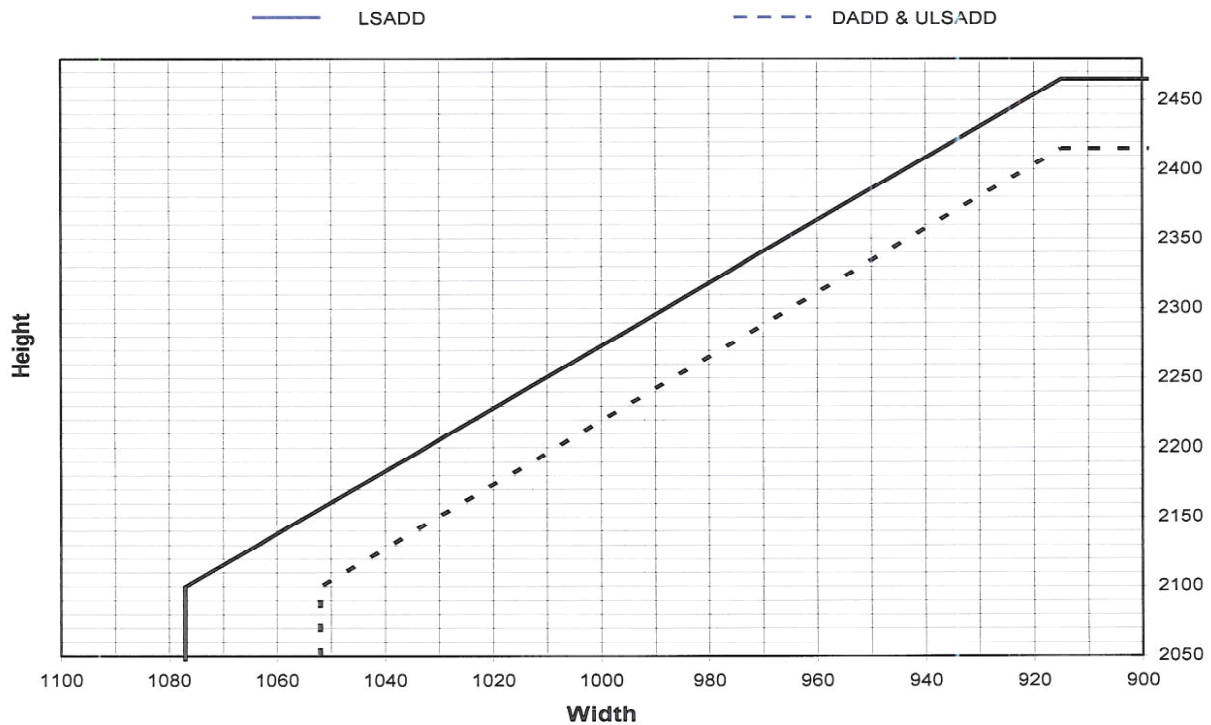
Latched & Unlatched Single & Double Acting Single Doorset

Leaves over 2350mm high increase the head Intumescent Seal to 25mm x 4mm



Latched & Unlatched Single & Double Acting Double Doorset

Leaves over 2350mm high increase the head Intumescent Seal to 25mm x 4mm

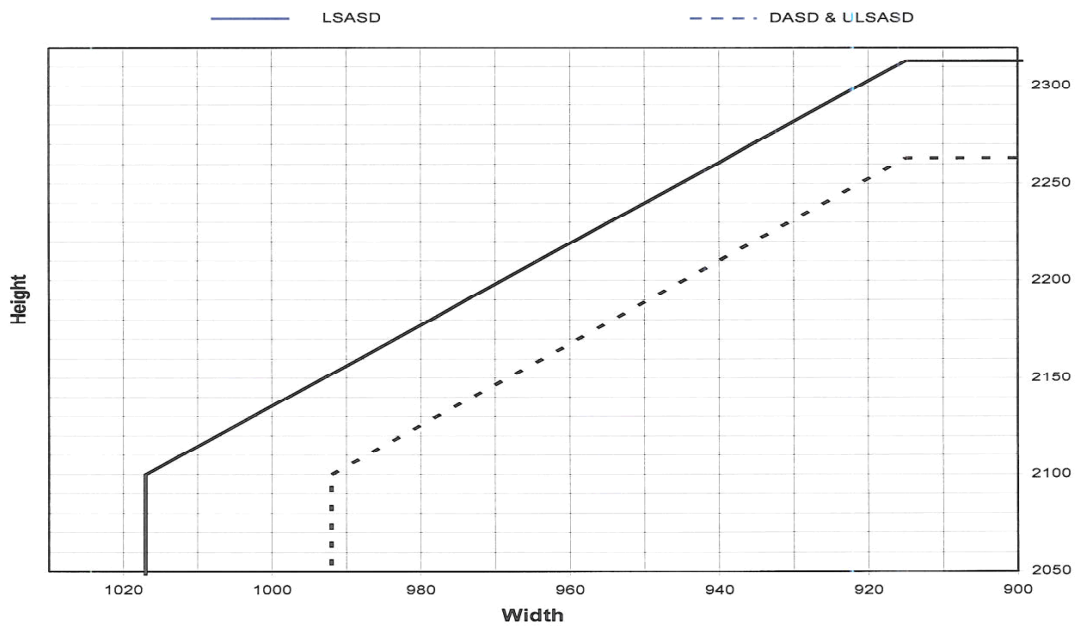


The New Innovation in Door Core Technology

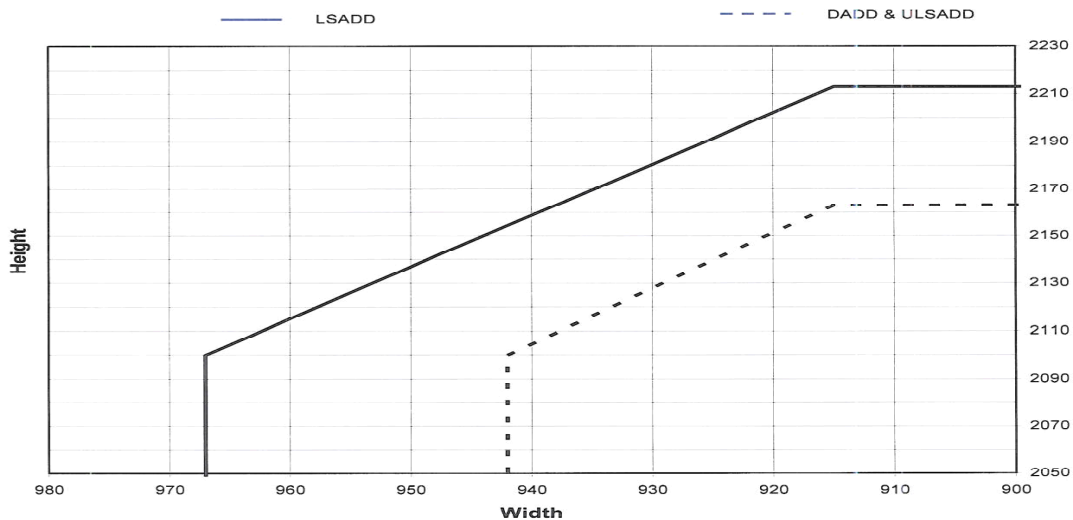
Maximum Doorleaf Dimensions

Flat Panelled Doorsets

Latched & Unlatched Single & Double Acting Single Doorset



Latched & Unlatched Single & Double Acting Double Doorset



Door Frames

Door frames can be manufactured from timbers with a minimum density of 510kg/m³

Frame jambs are to be fixed to the supporting structure using steel fixings at 500mm ϕ . They must be compatible with the supporting structure and penetrate to a minimum depth of 50mm. Packers must be used at the frame head but no fixings are necessary.

Sealing to Structural Openings

Gaps < 20mm

1. Mineral Fibre capped with 10mm depth Pyromas® A both sides
2. Pyrospan® intumescent foam

Smoke Control

If the door-set is to provide smoke resistance in accordance with BS 476 Part 31 the following seals should be fitted.

1. Pyrostrip® Flexifin Twin
2. Pyrostrip ® 100PSSSA
3. Enviroseal® ACS-1 and TD 5

Glazing

The maximum glazed area is 0.2m² and must meet the following criteria.

Glazing System Pyroglaze 30 as manufactured by Mann McGowan

Glass Products

6 + 7mm	Pyroshield
6mm	Pyran S
7mm	Pyroguard
7mm	Pyrobelite
7mm	Pyrodur
10mm	Pyrodur
11mm	Pyroguard
12mm	Pyrobelite
15mm	Pyrostop
16mm	Pyrobel

Glazing Beads Manufactured from timber with a minimum density of 640kg/m³

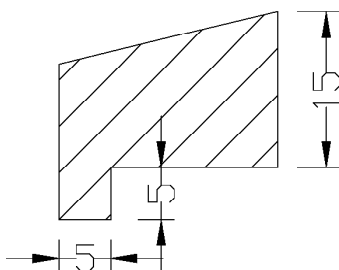
Splayed (chamfered) glazing beads must be used when glazing with the following glass types: -

6 + 7mm	Pyroshield
6mm	Pyran S
7mm	Pyroguard

Typical bead dimensions are shown in the following drawings.

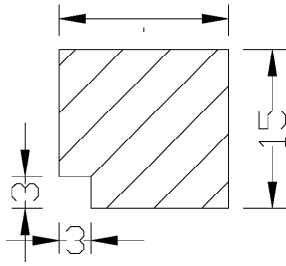
Glazing Bead Profiles.

Splayed (chamfered) Beads

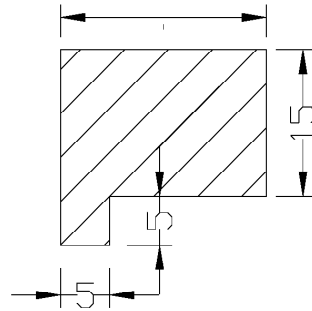


Square edged Beads

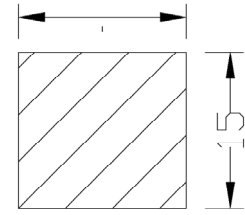
To finish flush with leaf face



Suited to glass thickness



To finish flush with leaf face



Glazing Bead Fixings

40mm x 2mm diameter steel pins or 40mm-No.8 woodscrews inserted at 35-40° to the vertical no more than 50mm from each corner and @ 150mm centres

False Timber Beads

False timber beads may be bonded to the glass face with Pyromas® A or a fire rated silicone or a 2mm thick Pyrostrip® 300 I SA self adhesive intumescent strip

Intumescent Materials

It is important that the type, size and fitting detail for the Intumescent seals remains as tested. These products often exhibit significantly different characteristics, which could alter the performance obtained during test, and therefore they must not be considered interchangeable, irrespective of whether the product has been tested and the seal dimensions are maintained.

The following Mann McGowan Fabrications Ltd, Intumescent materials were tested for this door-set design.

Element	Product	Size (mm)	Location
Door frame head	Pyrostrip 100PSA (2mm PVC cased Palusol 100)	20 x 4	Fitted centrally in the frame reveal
Door frame Jamb	Pyrostrip 100PSA (2mm PVC cased Palusol 100)	15 x 4	Fitted centrally in the frame reveal
Double doorsets	one meeting edge	2No Pyrostrip 100 PSSA (2mm PVC cased Palusol 100)	Fitted 8mm apart, 8mm from the exposed face
	opposite meeting edge	1No Pyrostrip 100 PSA (2mm PVC cased Palusol 100)	Centrally fitted in the meeting edge of the leaf
Around hinges	Fully interrupted	-	Hinge blade fully interrupts seal on frame jamb
Under hinge blade	None fitted	-	-
Encasing latch body	None fitted	-	-
Around latch forend	Fully interrupted	-	Latch forend fully interrupts seal on leaf edge
Under latch forend	None fitted	-	-
Around latch keep	None fitted	-	Latch keep fitted over seal
Under latch keep	Fully interrupted	-	Latch forend fully interrupts seal on leaf edge
Panel perimeter	Flat	Pyrostrip 100ECSA (2mm edge coated Palusol 100)	Fitted around the panel perimeter
	Raised & Fielded	Pyrostrip 100ECSA (2mm edge coated Palusol 100)	Fitted around the panel perimeter

Overpanels

Solid

Overpanels of the same construction as the door leaves may be used. A transom of the same section and material as used for the door frames must separate the leaf heads from the overpanel. They must be mortice housed jointed with no gaps or butt jointed, screwed to the jambs and bonded with urea formaldehyde.

Overpanels must be fixed by steel screws through the rear of the frame penetrating at least 30mm centrally into all edges of the overpanel. Fixing must be no more than 100mm in from each corner and at a maximum ϕ of 250mm. Please refer to the table below for the specification of intumescent materials. The seals may be fitted in the overpanel edges or alternatively in the frame reveal. Maximum overpanel heights are as follows:

- Single doorsets-800mm
- Double doorsets-500mm

Glazed Overpanels

Timber frame door-sets including a transom may have the overpanel section glazed in lieu of a section of door. 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: 2000. The timber frame must have a density of 640kg/m³ and the frame section must be 70mm x 44mm.

The glazing system employed must be Mann McGowan Pyroglaze® 30.

Please consult our technical department for maximum sizes permissible.

Adhesives

Panel facings and leaf framings require PVA adhesives to be used

Ironmongery and Hardware

Hinges

Door leaf <2299mm high	3 hinges must be used
Door leaf >2300mm high	4 hinges must be used
Blade height	90-120mm
Blade width (excl. knuckle)	30-35mm
Fixings	Minimum of 4No- 30mm long-No 8 steel woodscrews per blade
Materials	Steel, stainless steel or brass
Hinge Positions (to top of blade)	Top: 120-150mm from the head Bottom: 180mm-200mm from the foot 3rd and 4th; Equally spaced between the top and bottom
Intumescent	Pyrohinge® gaskets

Latches and Locks

Latches and locks must either be Eurospec tubular mortice latch (57mm high x 26mm wide) or alternatively components with the following specification are acceptable:

Maximum forends and strike plates	200mm high x 28mm wide x 4mm thick
Maximum body dimensions	18mm thick x 100mm wide x 160mm high
Intumescent Protection	Locks with face plates over 60 x 25mm must have the forend and keep fitted on to 1mm thick Pyrohinge® 300 I SA gaskets
Materials	All parts essential to the locking/latching action to be steel or stainless steel
Automatic Closing	Automatic closing devices must demonstrate contribution to the required integrity performance to this type of door-set design when tested to BS 476: Part 22: 1987 or BSEN 1634-1: 2000 NB Concealed head mounted closers are not acceptable with Palusol® SW Panel door-sets.
Intumescent Protection	The top pivots to floor-springs assemblies must be protected by lining all sides with 1mm thick Pyrohinge® 300 I SA gaskets.
Flush Bolts	Flush bolts may be incorporated into the top and bottom of the meeting edge of the inactive leaf of a double doorset provided the following maximum dimensions are not exceeded; 200mm long x 20mm deep x 20mm wide.
Intumescent Protection	Pyrohinge® 300 I
Pull Handles	These may be surface-fixed to the door leaf provided that they are steel or brass and length is limited to 1200mm between fixing points.
Push Plates/Kick Plates	These may be fitted to Palusol® SW Panelled doors provided that their fitting does not remove any part of the door leaf. Maximum area per door leaf 10%
Door Selectors	These may be freely used provided that they are not invasive in the leaf edges or door frames.
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. Lenses must be bedded in Pyromas® A intumescent sealant. The viewers must be fitted through solid framing members.

Acoustic Weather and Dust Seals

Mann McGowan Enviroseal® ACS 1
 Mann McGowan Enviroseal® Flexifin Twin
 Mann McGowan Pyrostrip® Flexifin Twin

Threshold Seals

Mann McGowan Enviroseal® DD1

Letter Boxes/Plates

Mann McGowan Pyrostrip fitted through a 200mm wide mid rail and the margin of the leaf edges must be a minimum of 150mm.
 Alternatively Pyrostrip® Letter plate liner kits can be used with suitable letter plate flaps

Construction FD 60 + FD60(S)

Raised and Fielded Panels

Element		Species/type	Dims mm	Density kg/m ³
Stiles		Softwood or Hardwood	95 mm wide x 54mm thick with 28mm wide x 34mm deep groove	510
Rails	Top	Softwood or Hardwood	95 mm wide x 54mm thick with 28mm wide x 34mm deep groove	510
Rails	Middle Bottom		190 mm wide x 54mm thick with 10mm wide x 30mm deep groove	
	Intermediate		80mm x 54mm	
Panel	Core	2no. Palusol® SW HDF Laminated Boards glued together with PVA	20mm thick	1000kg/m ³
	Facings	MDF Chipboard Plywood Timber	12mm thick reducing to 4mm thick at fielded areas	750kg 700kg 600kg 600kg
Adhesive	Panel Facing	PVA	-	-
Panel Fixings		50mm steel pins fitted 35-40° to the vertical fitted 40mm from corners + 145mm ϕ	50mm long	-

Flat Panels

Element		Species/type	Dims mm	Density kg/m ³
Stiles		Softwood or Hardwood	95 mm wide x 54mm thick with 28mm wide x 34mm deep groove	510
Rails	Top	Softwood or Hardwood	95 mm wide x 54mm thick with 88mm wide x 34mm deep groove	510
Rails	Bottom		190 mm wide x 54mm thick with 18mm wide x 30mm deep groove	
	Intermediate		80mm x 54mm	
Panel	Core	2No.Palusol ® SW HDF Laminated Boards glued together with PVA	20mm thick	1000kg/m ³

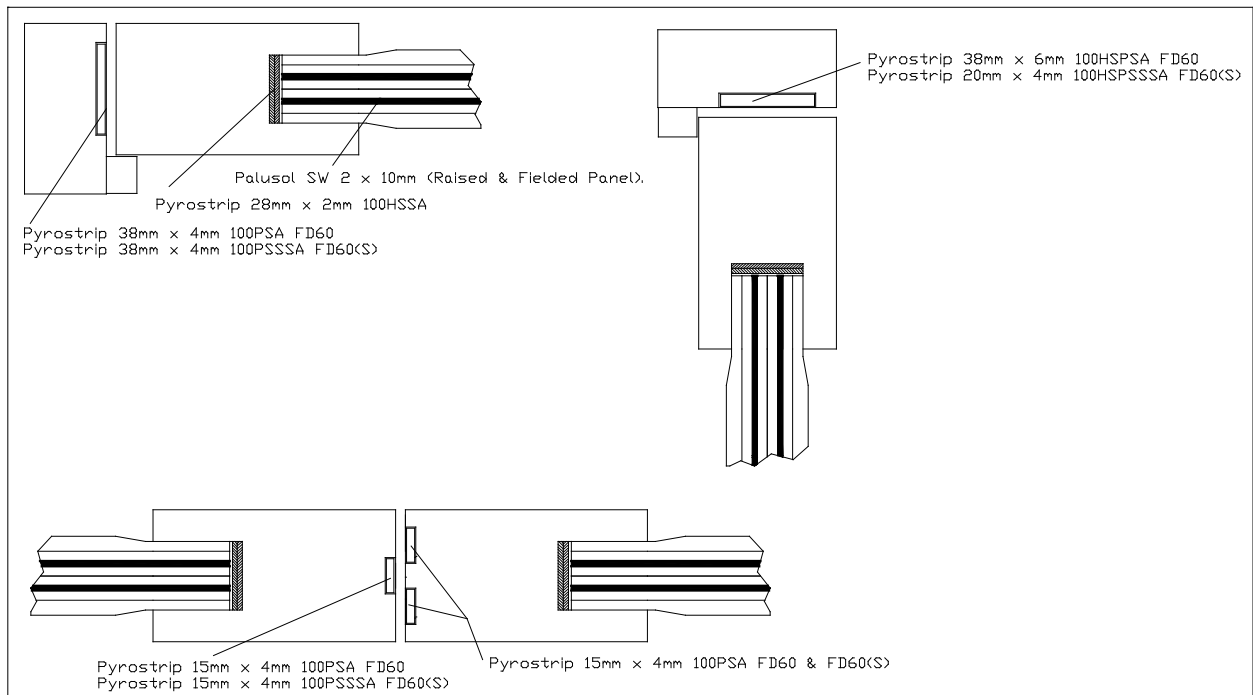
Panel	Facing	MDF Chipboard Plywood Timber	4mm thick on both faces	750kg 700kg 600kg 600kg
Adhesive	Panel Facing	PVA	-	-
Panel Fixings		50mm steel pins fitted 35-40° to the vertical fitted 40mm from corners + 145mm	50mm long	-

Notes

1. Flat panels: - A minimum of 4 and maximum of 10 panels may be used.
2. R and F panels: - A minimum of 1 and maximum of 10 panels may be used.
3. Panels must be fixed with 50mm long steel pins inserted at 35-40° to the vertical, fitted 40mm from the corners and at 145mm centres.

Veneering

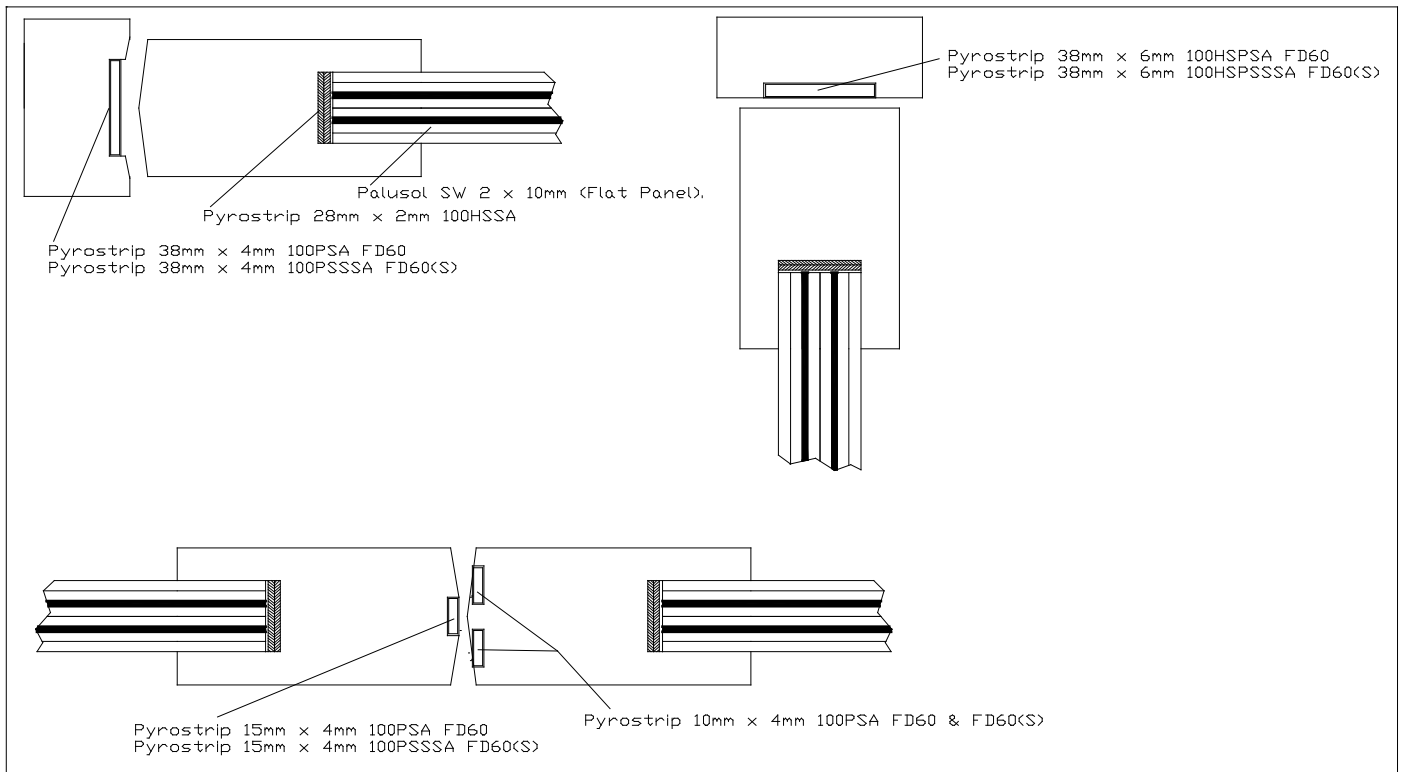
Timber veneers, foils and plastic laminates up to 2mm thick can be used on Palusol® SW Laminated boards.



SW Doorset Configurations

Intumescent Detail for both Raised & Fielded Doorsets and Flat Panelled Doorsets
LSASD + ULSASD + LSADD + ULSADD

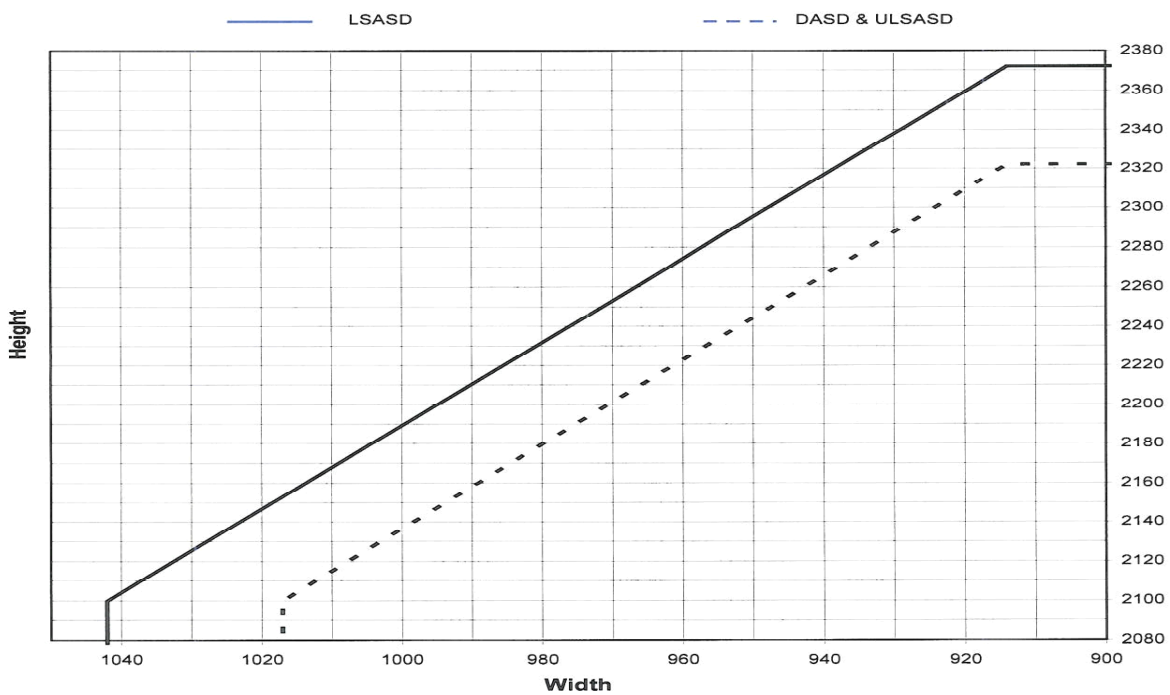
DASD + DADD



Maximum Door-leaf Dimensions

Raised & Fielded and Flat Panelled Doorsets

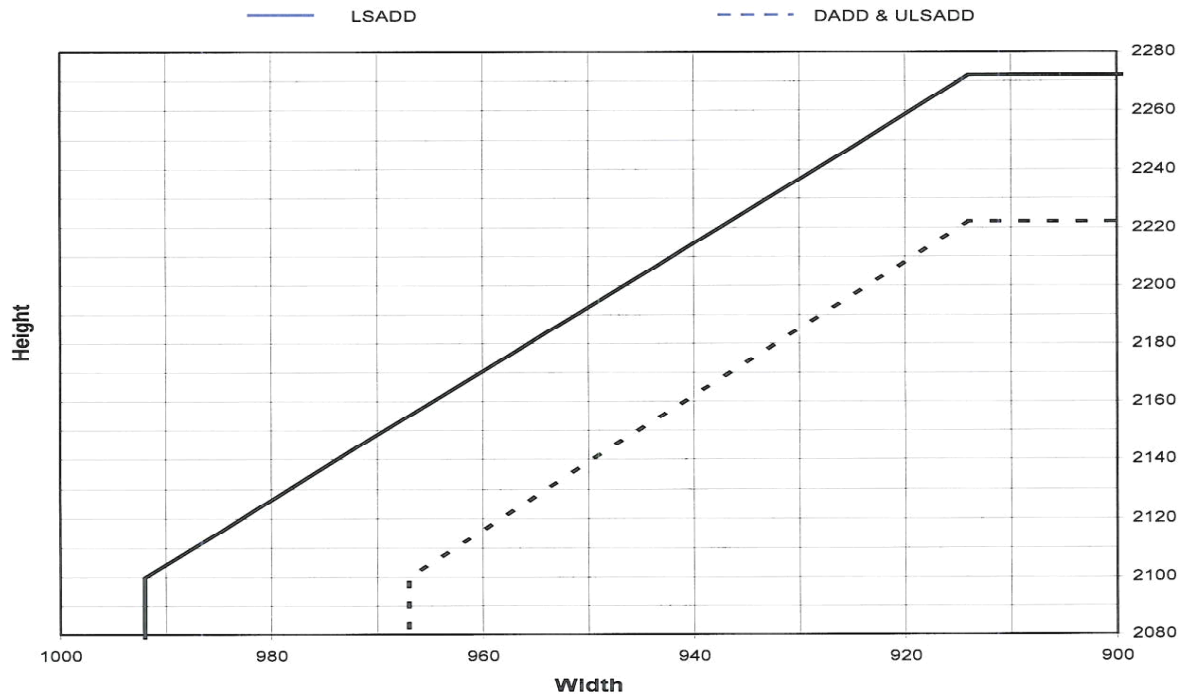
Latched & Unlatched Single & Double Acting Single Doorset



The New Innovation in Door Core Technology

Raised & Fielded and Flat Panelled Doorsets

Latched & Unlatched Single & Double Acting Double Doorsets



Door Frames

Door-frames can be manufactured from timbers with a minimum density of 510kg/m³

Frame jambs are to be fixed to the supporting structure using steel fixings at 500mm ϕ . They must be compatible with the supporting structure and penetrate to a minimum depth of 50mm. Packers must be used at the frame head but no fixings are necessary.

Sealing to Structural Openings

Gaps < 20mm

- 1.Mineral Fibre capped with 10mm depth Pyromas® A to both sides
- 2.Pyrospan® intumescent foam

Smoke Control

If the door-set is to provide smoke resistance in accordance with BS 476 Part 31 the following seals should be fitted.

- 1.Pyrostrip® Flexifin Twin
- 2.Pyrostrip ® 100PSSSA
- 3.Enviroseal® ACS-1 and TD 5

Glazing

The maximum glazed area is 0.10 and must meet the following criteria.

The maximum glazed area is 0.10m and must meet the following criteria.

Glazing System Pyroglaze 60 as manufactured by Mann McGowan

Glass Products

6 + 7mm	Pyroshield
6mm	Pyran S
11mm	Pyroguard
12mm	Pyrobelite
15mm	Pyrostop
16mm	Pyrobel

Glazing Beads Manufactured from timber with a minimum density of 640kg/m³

Glazing Bead Profile

Splayed (chamfered) glazing beads must be used when glazing with the following glass types: -

6 + 7mm	Pyroshield
6mm	Pyran S
11mm	Pyroguard
12mm	Pyrobelite

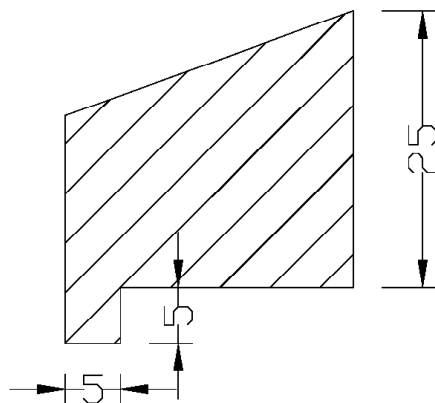
Splayed (chamfered) or Square edged glazing beads can be used if required with the following glass types only: -

14mm	Swissflam Lite
15mm	Pyrostop
16mm	Pyrobel

Typical bead dimensions are shown in the following drawings.

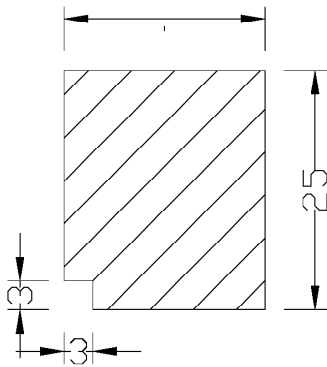
Glazing Bead Profiles

Splayed (chamfered) Beads

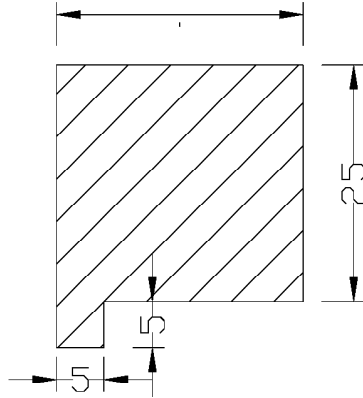


Square edged Beads

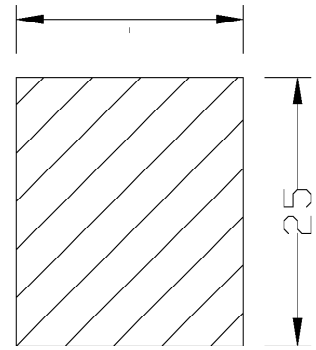
To finish flush with leaf face



Suited to glass thickness



To finish flush with leaf face



Glazing Bead Fixings

60mm long steel screws inserted at 35-40° to the vertical at no more than 50mm in from each corner and at 150mm ϕ

Overpanels

Solid

Overpanels of the same construction as the door leaves may be used. A transom of the same section and material as used for the door frames must separate the leaf heads from the Overpanel. They must be mortice housed jointed with no gaps or butt jointed, screwed to the jambs and bonded with urea formaldehyde.

Overpanels must be fixed by steel screws through the rear of the frame penetrating at least 30mm centrally into all edges of the Overpanel. Fixing must be no more than 100mm in from each corner and at a maximum ϕ of 250mm. Please refer to the table below for the specification of intumescent materials. The seals may be fitted in the overpanel edges or alternatively in the frame reveal. Maximum overpanel heights are as follows:

- Single doorsets-800mm
- Double doorsets-500mm

Glazed Overpanels

Timber frame door-sets including a transom may have the overpanel section glazed in lieu of a section of door. 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: 2000. The timber frame must have a density of 640kg/m³ and the frame section must be 70mm x 44mm.

The glazing system employed must be Mann McGowan Pyroglaze® 60.

Please consult our technical department for maximum sizes permissible.

Intumescent Materials

It is important that the type, size and fitting detail for the Intumescent seals remains as tested. These products often exhibit significantly different characteristics, which could alter the performance obtained during test, and therefore they must not be considered interchangeable, irrespective of whether the product has been tested and the seal dimensions are maintained.

The following Mann McGowan Fabrications Ltd, Intumescent materials were tested for this doorset design.

Element		Product	Size (mm)	Location
Door frame head		Pyrostrip 100HSPSA (PVC cased combistrip comprising 2mm Palusol 100 & 2mm Interdens Heatseal)	38 x 6	Centrally fitted in the frame reveal
Door frame Jambs		Pyrostrip 100PSA (2mm PVC cased Palusol 100)	38 x 4	Centrally fitted in the frame reveal
Double doorsets	one meeting edge	2No Pyrostrip 100PSA (2mm PVC cased Palusol 100)	15 x 4	Centrally fitted 10mm apart in the meeting edge of the left leaf
	opposite meeting edge	Pyrostrip 100PSA (2mm PVC cased Palusol 100)	15 x 4	Centrally fitted in the meeting edge of the right leaf
Around hinges		Partially interrupted	-	Hinge blade partially interrupts seal on frame with 12mm left continuous
Under hinge blade		Pyrostrip 300ISA	1 thick	Fitted under the hinge blade on frame and jamb
Encasing latch body		Pyrostrip 300ISA	1 thick	Fitted around the body of the latch
Around latch forend		Fully interrupted	-	Latch forend fully interrupts seal on edge of right leaf
Under latch forend		Pyrostrip 300ISA	1 thick	Fitted under the latch forend
Around latch keep		Partially interrupted	-	Latch keep fully interrupts first seal and leaves 7mm of second seal continuous
Under latch keep		Pyrostrip 300ISA	1 thick	Fitted under the latch keep
Panel perimeter		Pyrostrip 100HSSA (combistrip comprising 2mm Palusol 100 & 2mm Interdens Heatseal)	28 x 4	Fitted around the perimeter of the panels

Adhesives

Panel facings and leaf framing requires PVA adhesive

Ironmongery and Hardware

Door leaf <2299mm high 3 hinges must be used

Door leaf >2300mm high 4 hinges must be used

Blade height 90-120mm

Blade width (excl. knuckle) 30-35mm

Fixings Minimum of 4No- 30mm long-No 8 steel woodscrews per blade

Materials Steel, stainless steel or brass

Hinge Positions (to top of blade)
Top 120-150mm from the head
Bottom: 180mm-200mm from the foot
3rd and 4th Equally spaced between the top and bottom

Intumescent Pyrohinge® 300 I gaskets

Latches and Locks

Maximum forends and strike plates 200mm high x 28mm wide x 4mm thick

Maximum body dimensions 18mm thick x 100mm wide x 160mm high

Materials All parts essential to the locking/latching action to be steel or stainless steel

Intumescent Protection Pyrohinge® 300I 1mm thick encasing the body and under the forend and keep in addition to 7mm of edge seal remaining continuous.

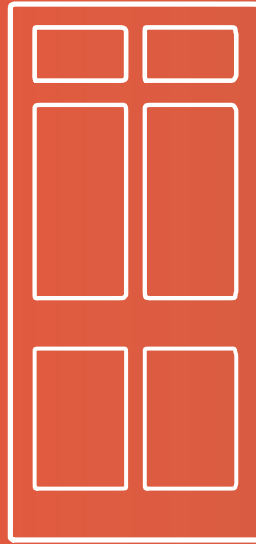
Automatic Closing Automatic closing devices must demonstrate contribution to the required integrity performance to this type of door-set design when tested to BS 476: Part 22: 1987 or BSEN 1634-1: 2000
NB Concealed head mounted closers are not acceptable with Palusol® SW Panel door-sets.

Intumescent Protection The top pivots to floor-springs assemblies must be protected by lining all sides with 1mm thick Pyrohinge® 300 I SA gaskets.

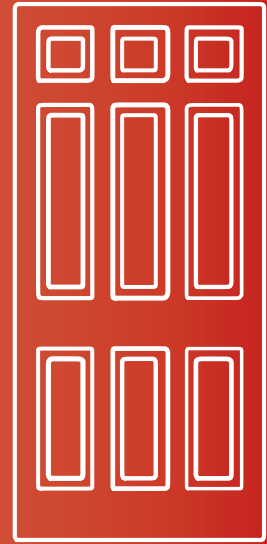
Flush Bolts	Flush bolts may be incorporated into the top and bottom of the meeting edge of the inactive leaf of a double doorset provided the following maximum dimensions are not exceeded; 200mm long x 20mm deep x 20mm wide.
Intumescent Protection	Flush bolts must be steel or brass and the mortice must be tight to the mechanism as is compatible with its operation. All edges of the mortice must be lined with 2mm thick Pyrohinge 300 I SA intumescent gaskets.
Pull Handles	These must be surface-fixed to the door leaf provided they are steel or brass and the length is limited to 1200mm between fixing points. No additional intumescent protection is required provided that the hole for the bolt through the leaf is tight.
Push Plates/Kick Plates	These may be fitted to Palusol ® SW Panelled doors provided that their fitting does not remove any part of the door leaf. Maximum area per door leaf 10%
Door Selectors	These may be freely used provided that they are not invasive in the leaf edges or door frames.
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. Lenses must be bedded in Pyromas® A intumescent sealant. The viewers must be fitted through solid framing members.
Acoustic Weather and Dust Seals	Mann McGowan Enviroseal® ACS 1 Mann McGowan Enviroseal® Flexifin Twin Mann McGowan Pyrostrip® Flexifin Twin When these are fitted they must not hinder the self closing function of the door-leaves.
Threshold Seals	Mann McGowan Enviroseal® DD1
Letter Boxes Plates	Use Mann McGowan Pyrostrip® letter plate liners. The top of the letter plate must be located 1000mm from the threshold Other letter boxes/plates may be fitted. Please contact our technical department on T 00 44 (0) 1252 333601 or technical@mannmcgowan.co.uk



Single Panel
Raised & Fielded Door



6 Panel
Flat Panelled Door



9 Panel
Raised & Fielded Door

Technical

Our technical department can be consulted regarding Palusol® SW door constructions and any other Mann McGowan product

CPD Services



Palusol® SW forms part of our two certified CPD presentations. For further details please contact our CPD coordinator.

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Palusol® SW is produced by



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Advanced Intumescent Technology