Frame Materials & Specifications:

Details in this section show minimum dimensions for frames for use with fire rated door assemblies.

Frame materials for use with fire doors should comply with the recommendations to be found by reference to BS8214 : 2008.

Frame material for FD30 door assemblies may be softwood or hardwood of not less than 510kgs/m^3 density @15% moisture content. OR, Min. 700kgs/m^3 MDF.

NOTE: MDF frames are not approved for storey height frames with transoms.

Frame material for FD60 door assemblies must be hardwood (***Excluding Beech*** - *Fagus Sylvatica*) of not less than 640kgs/m^3 @ 15% moisture content.

The minimum quality standard for frames for fire door assembly applications is defined in the following terms:

All timber used for fire rated door assemblies including frames, lippings & beading, must be straight grained, joinery quality, free from knots, splits and checks. Any defects should be repaired and, as far as possible, orientated away from areas of intumescent seal activation.

Frames must be installed plumb and square and assembled with mortice and tenon, mitred, butt or half lap joints with mechanical assembly fixings *(e.g. screwed)*. All joints must be of a tight fit.

NOTE: Joints may be glued and screwed.

Unless otherwise stated in project specifications: The moisture content of material used for frames should be 9 - 13% average. moisture content before the application of finishes for internal joinery designed for use in heated buildings providing room temperatures of 12°C to 21°C.

NOTE: For 'Q-Mark' fire rated door assemblies refer to 'Section 2 - FLAMEBREAK™ Fire Door Applications'.

FSC

The mark of responsible forestry

Pacific Rim Wood Ltd., recommends the use of timber obtained from FSC approved sources.

Structures:

It is the Designers responsibility to ensure that structures to receive fire door assemblies comply with National and Local Regulations and that they are suitable for the design performance.

NOTE: Refer to the various parts of BS9999 for further guidance.

The fire test / assessment data applicable to FLAMEBREAK™ based door assemblies anticipates that the assemblies will be fitted into blockwork, brickwork, concrete, (*or similar*). ***OR***, timber stud partitioning.

Where door assemblies are to be fitted into metal stud partitioning, the hollow metal stud at the door assembly positions must be filled with softwood unless the partitioning manufacturer can provide for fire test / assessment data to demonstrate that this is not necessary.

The finished partition thickness shall not be less than the partition thickness described for the door frame.

The gap between the frame and the surrounding structure must be treated in accordance with the recommendations to be found by reference to BS 8214 : 2016 according to performance. OR, as recommended by reference to: *Section 14 - Fire Door Installation.*

Architrave:

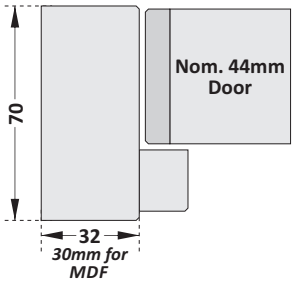
The use of architrave is recommended for fire doors. These should be Min. 15mm thickness and conform with the material specifications applicable to frames for the relevant fire performance. The architrave must cover the gap between the frame and the surrounding structure. *(See Section 14 - Fire Door Installation).*

Where the door assembly is fitted within the partition thickness, the architrave should be scribed on site to suit the wall conditions.

Intumescent mastics, ceramic cords and similar products may be used in lieu of architrave where these have a proven performance under fire test conditions with wood door assemblies. These materials must be used strictly in accordance with the manufacturers handling and use instructions.

Minimum Recommended Frame Dimensions FD30 Door Assemblies.

Fig. 7.1

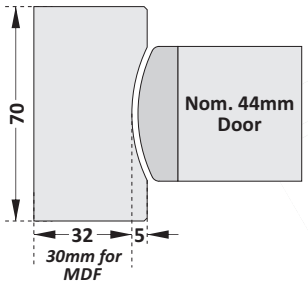


Recommended minimum frame dimensions for FD30 Single Action Doorsets.

- Frame material to be softwood or hardwood of minimum 450kg/m^3 density *(@15% moisture content),* straight grained, joinery quality, free from knots, splits and checks.
- 700kg/m^3 density MDF.

NOTE: The 32mm section dimension for the frame is reduced from 32mm to 30mm for use with MDF frames.

Fig. 7.2



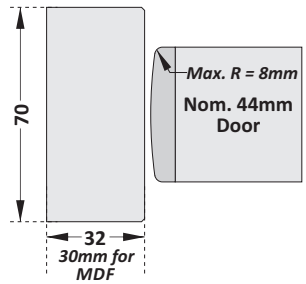
Recommended minimum frame dimensions for FD30 Double Action - Hanging Jambs

- Frame material to be softwood or hardwood of minimum 450kg/m^3 density *(@15% moisture content),* straight grained, joinery quality, free from knots, splits and checks.
- 700kg/m^3 density MDF.

NOTE 1: The 32mm section dimension for the frame is reduced from 32mm to 30mm for use with MDF frames.

NOTE 2: The radius at the hanging stile will usually be determined by the location of the double action pivot centre. A 50mm radius to the door edge will suit most popular brands of double action fittings, with a 52mm radius scallop in the frame.

Fig. 7.3



Recommended minimum frame dimensions for FD30 Double Action - Closing Jambs

- Frame material to be softwood or hardwood of minimum 450kg/m^3 density *(@15% moisture content),* straight grained, joinery quality, free from knots, splits and checks.
- 700kg/m^3 density MDF.

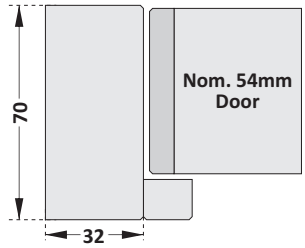
NOTE: The 32mm section dimension for the frame is reduced from 32mm to 30mm for use with MDF frames.

Minimum Recommended Frame Dimensions FD60 Door Assemblies.

Recommended minimum frame dimensions for FD60 Single Action Doorsets.

- Frame material for FD60 door assemblies must be hardwood (***Excluding Beech*** - *Fagus Sylvatica*) of not less than 640kgs/m^3 @ 15% moisture content straight grained, joinery quality, free from knots, splits and checks.

Fig. 7.4

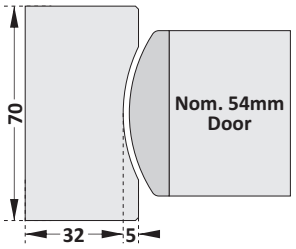


Recommended minimum frame dimensions for FD60 Double Action - Hanging Jambs

- Frame material for FD60 door assemblies must be hardwood (***Excluding Beech*** - *Fagus Sylvatica*) of not less than 640kgs/m^3 @ 15% moisture content straight grained, joinery quality, free from knots, splits and checks.

NOTE: The radius at the hanging stile will usually be determined by the location of the double action pivot centre. A 50mm radius to the door edge will suit most popular brands of double action fittings, with a 52mm radius scallop in the frame.

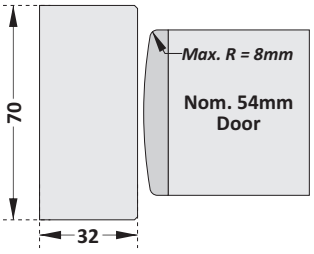
Fig. 7.5



Recommended minimum frame dimensions for FD60 Double Action - Closing Jambs

- Frame material for FD60 door assemblies must be hardwood (***Excluding Beech*** - *Fagus Sylvatica*) of not less than 640kgs/m^3 @ 15% moisture content straight grained, joinery quality, free from knots, splits and checks.

Fig. 7.6

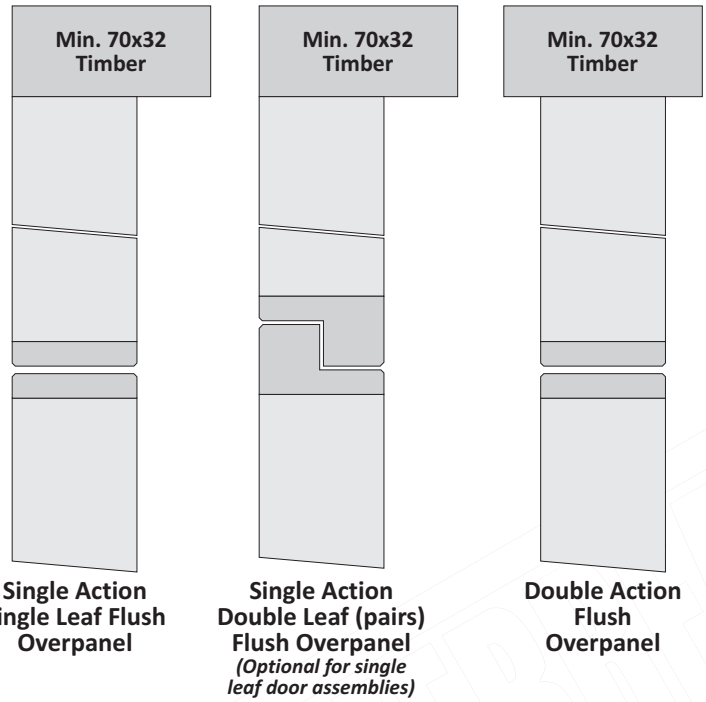


Storey Height Door Assemblies with Overpanels:

Door Assemblies with Transomed Overpanels:

FLAMEBREAK™ 430 constructions only.

Fig. 7.7



Flush Overpanels:

Overpanels must be of the same construction as the door leaves and must be fully contained within the door frame.

NOTE: Use of flush overpanels used without a transom is only approved for FLAMEBREAK™ 430 designs only. See Sections 2 & 4.

The overpanel must be located to align with the centre thickness of the door leaf and secured using a minimum of three steel screw fixings per length passing through the rear of the frame to align centre thickness of the panel to a minimum depth of 30mm into the panel. Fixings must be located not more than 50mm from each corner and at not more than 250mm centres.

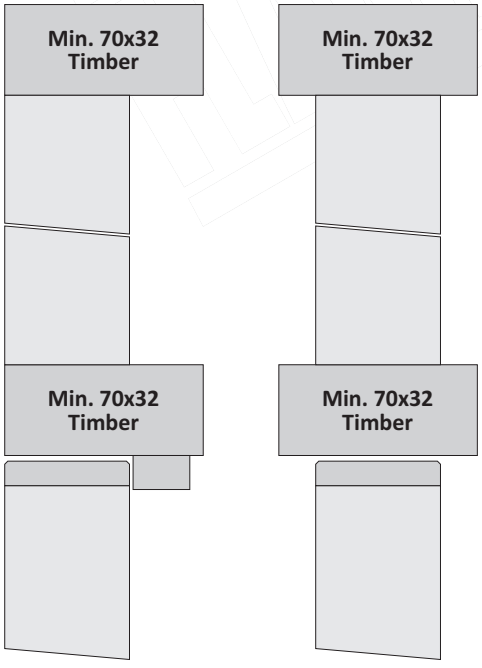
Overpanels must be fitted tight to the frame with no gaps.

Maximum over panel heights for fire rated flush or transomed overpanels:

Single leaf door assemblies = 2000mm.
Double leaf (pairs) door assemblies = 1500mm.

Door Assemblies with Transomed Overpanels:

Fig. 7.8



NOTE: A 44mm transom section is recommended for double action door assemblies to receive double action pivot fixings.

Transomed Overpanels:

Overpanels must be of the same construction as the door leaves and must be fully contained within the door frame.

The overpanel must be located to align with the centre thickness of the door leaf and secured using a minimum of two steel screw fixings per length passing through the rear of the frame to align centre thickness of the panel to a minimum depth of 30mm into the panel. Fixings must be located not more than 100mm from each corner and at not more than 250mm centres.

Transom rails for door assembly designs using overpanels for either FD30 or FD60 applications are to be of a minimum 70x32mm section and manufactured using hardwood with a minimum density of 640kg/m³ *(@15% moisture content)*. ***Use of Beech -*** *(Fagus Sylvatica)* ***is not approved for FD60 applications.***

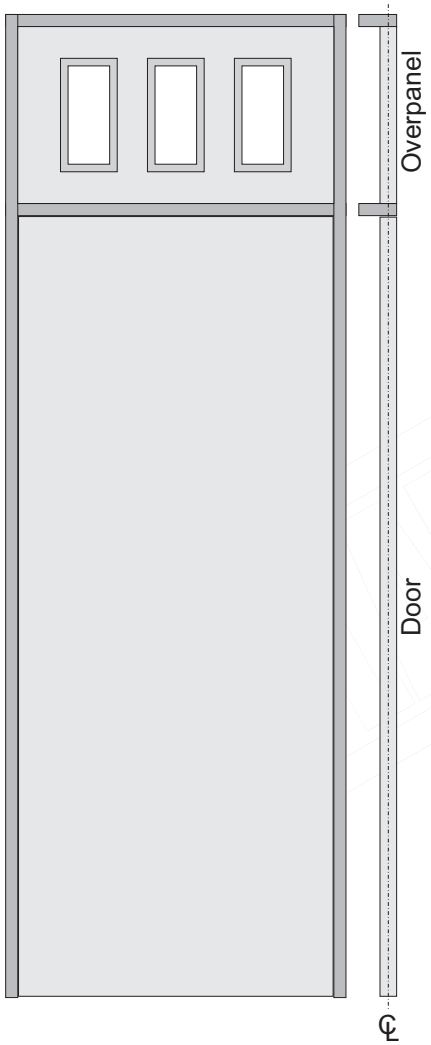
A maximum 2mm gap between the overpanel and the frame components is approved where intumescent seals for the required performance are applied to all edges of the overpanel fitted to either the frame or the overpanel.

NOTE 1: The use of MDF frames is not approved for the storey height door assemblies with transomed overpanels.

NOTE 2: The use of frame designs using transom rails are not approved for fire rated door assemblies using metal frames.

Storey Height Door Assemblies with Glazed Overpanels:

Glazed Overpanel *Fig. 7.9*



Glazed Overpanel:

For door assemblies with transomed overpanels the overpanels can be glazed as approved for door leaves.

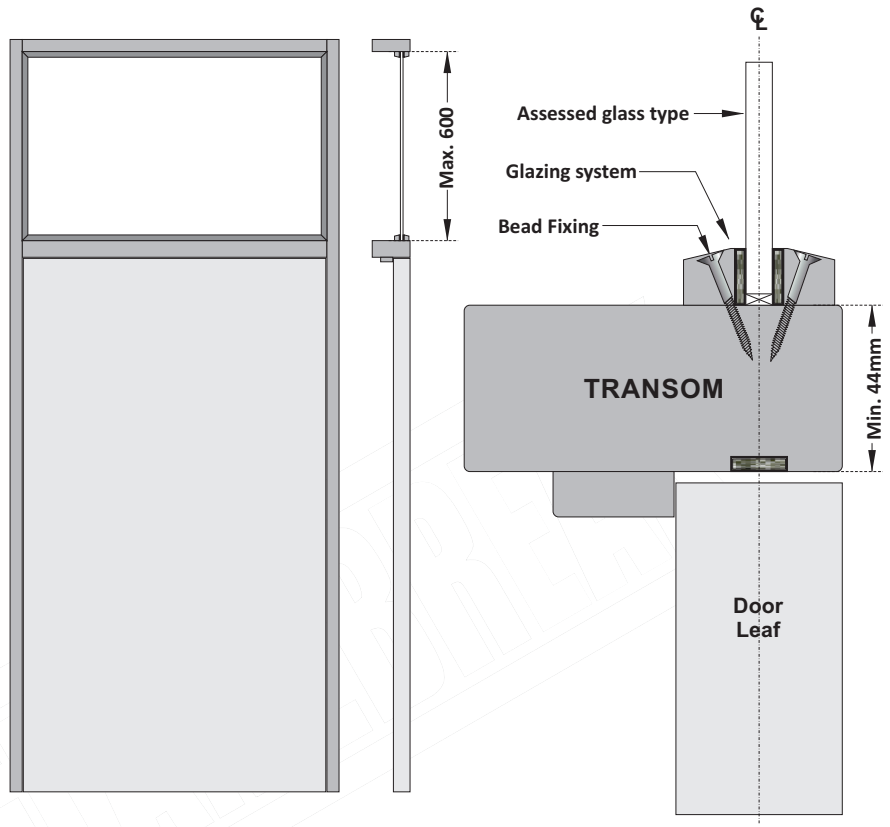
The overpanels must be constructed and fitted as described by reference to page ***7.4.***

The glass type and glazing system must be of approved types for use with FLAMEBREAK™ door constructions by reference to Section ***6***.

The glass apertures must be located in accordance with approved details as described for door leaves by reference to Section ***6***.

Glazed Fanlights - FD30 - General

Glazed Fanlights - FD30 - General *Fig. 7.10*



Configuration	Height (mm)	Width
Single & Double leaf doorsets	≤ 600	Overall door width

Glazed Fanlights - FD30 - General

Unless otherwise approved by reference to 'dedicated' glazing and glazing system details - See pages ***7.10 ~ 7.19*** - fanlights for use with FD30 fire rated FLAMEBREAK™ based door assemblies must comply with the following:

Frame & Beading Material: The timber frame and glazing beads must be hardwood with a minimum density of 640kg./m³ whilst the frame section for the transom must be a minimum of 70x44mm.

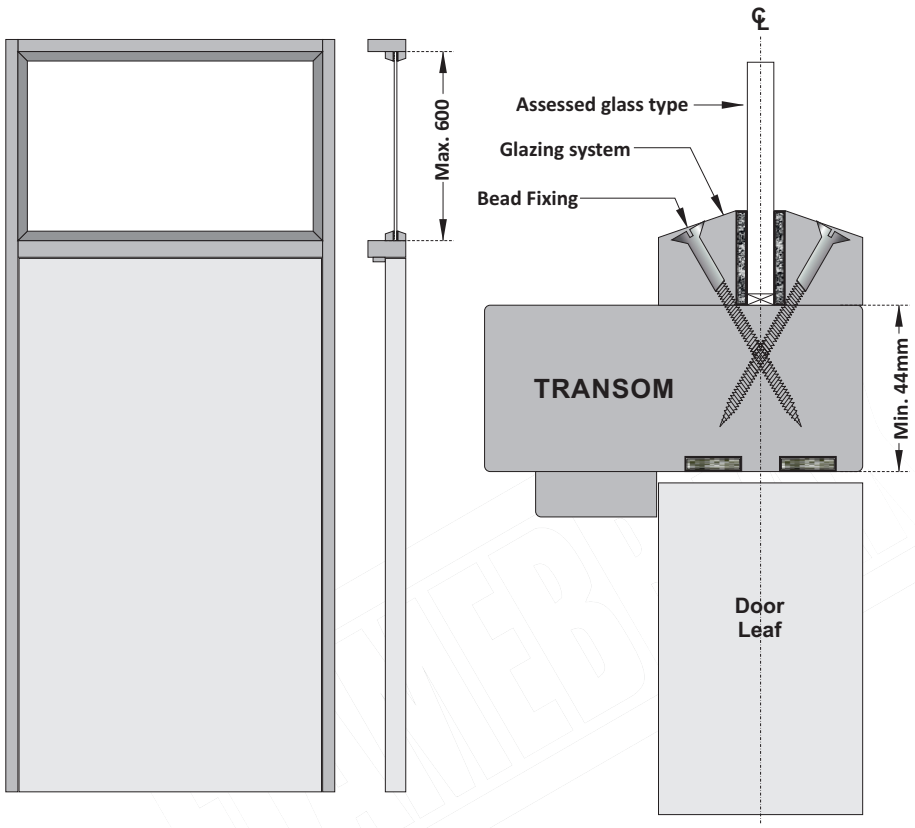
Frame Material: The timber door frame must comply with the specifications described by reference to pages ***7.2.***

Glass & Glazing System: The glass must be located to align as far as possible with the centre thickness of the door leaf and fitted to the assembly using a glass type and glazing system that has been tested as a window or a screen in accordance with BS 476 Pt.22 : 1987 or BS EN 1634-1 for the required pane dimensions.

NOTE: The use of steel or MDF frames is not approved for this application.

Glazed Fanlights - FD60 - General

Glazed Fanlights - FD60 - General *Fig.7.11*



Configuration	Height (mm)	Width
Single & Double leaf doorsets	≤ 600	Overall door width

Glazed Fanlights - FD60 - General

Unless otherwise approved by reference to 'dedicated' glazing and glazing system details - See pages ***7.20 ~ 7.23*** - fanlights for use with FD60 fire rated FLAMEBREAK™ based door assemblies must comply with the following:

Frame & Beading Material: The timber frame and glazing beads must be hardwood - ***(Excluding Beech -*** *Fagus Sylvatica)* - with a minimum density of 640kg./m³ whilst the frame section for the transom must be a minimum of 70x44mm.

Frame Material: The timber door frame must comply with the specifications described by reference to: ***7.3.*** The use of steel or MDF frames is **not** approved for this application.

Glass & Glazing System: The glass must be located to align as far as possible with the centre thickness of the door leaf and fitted to the assembly using a glass type and glazing system that has been tested as a window or a screen in accordance with BS 476 Pt.22 : 1987 or BS EN 1634-1 for the required pane dimensions.

NOTE: The use of steel or MDF frames is not approved for this application.

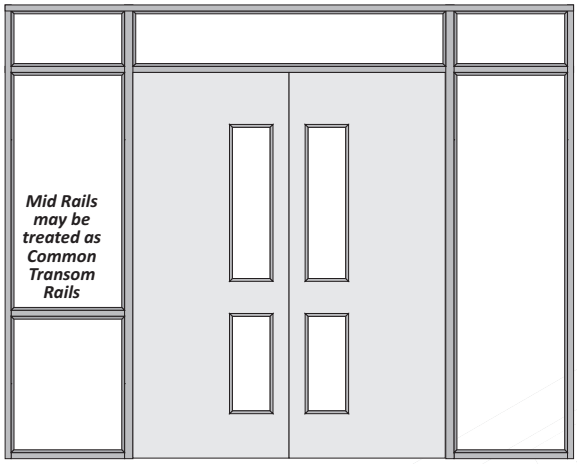
Glazed Fanlights & Side Screens - General

Transom & Rails - General.

Fig.7.12

FLAMEBREAK™ based door constructions may be used with FD30 and FD60 door assembly designs with glazed side screens and fanlights.

Where a common transom rail is used, the sectional dimensions of the frame components shall not be less than that approved for the particular door assembly or the screen / fanlight construction - whichever is the greater.

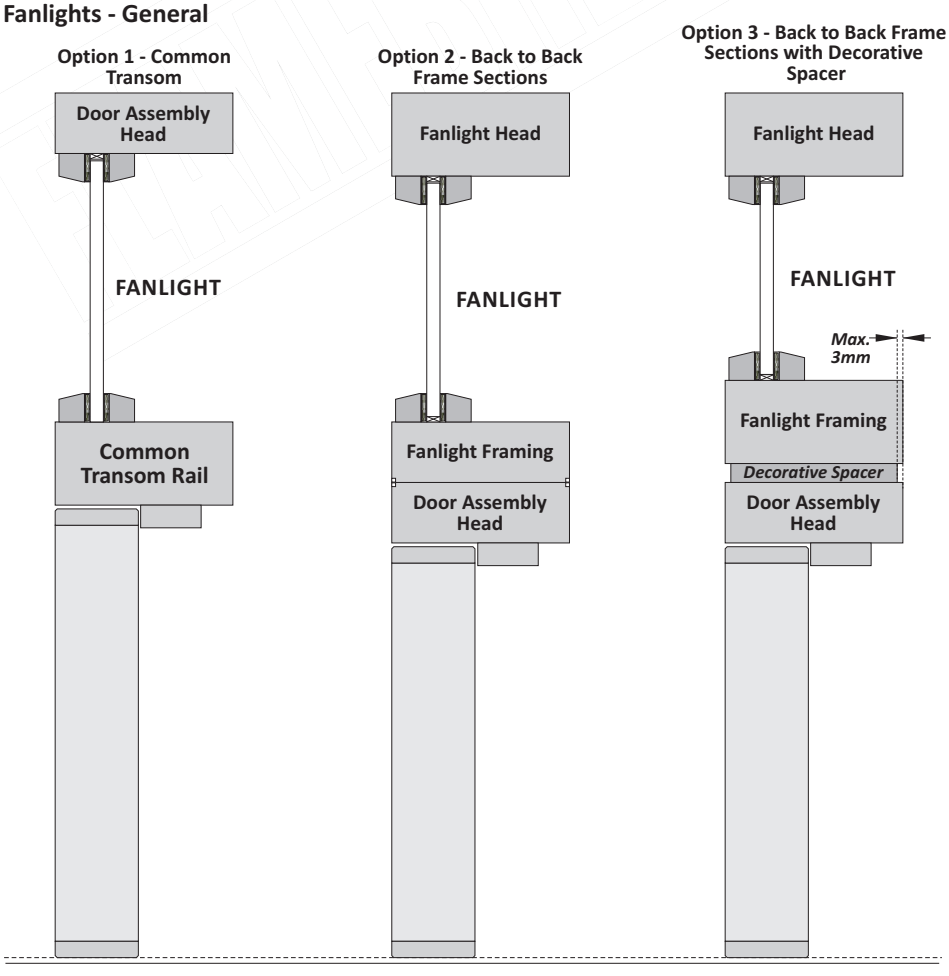


Where separate fanlights and door assemblies are joined together (*with or without a decorative spacer*) the frame section dimensions for the door assembly shall not be less than that approved for the particular door assembly design and the screen frame dimensions shall not be less than that approved for the particular screen design.

The door assemblies and fanlights to be connected using appropriate steel screw fixings and glued using Urea Formaldehyde or polyurethane adhesives. Screws must be positioned within 100mm of each corner and otherwise located equi-spaced at not more than 600mm centres and to a depth of approximately 2/3 depth of the adjacent timber section.

Glazed Fanlights - General

Fig.7.13



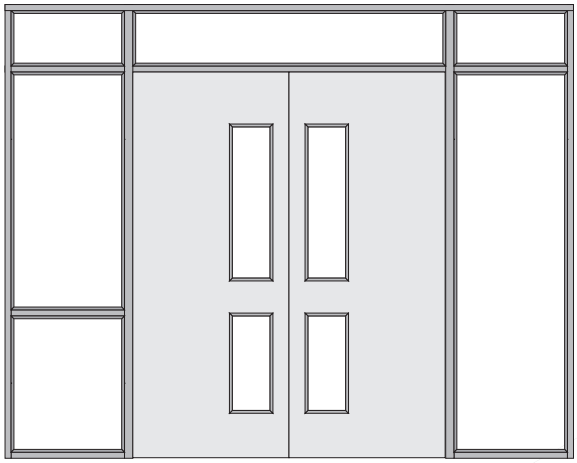
Glazed Fanlights & Side Screens - General

Side Screens - General:

Fig. 7.14

FLAMEBREAK™ based door constructions may be used with FD30 and FD60 door assembly designs with glazed side screens.

Where a common mullion is used, the sectional dimensions of the common frame components shall not be less than that approved for the particular door assembly or the screen design - whichever is the greater.



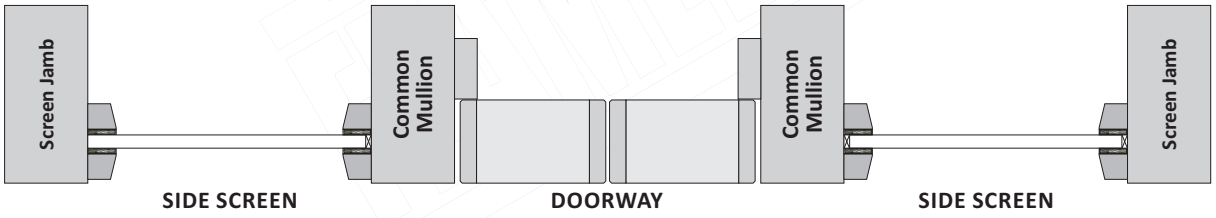
Where separate screen and door assemblies are joined together (*with or without a decorative spacer*) the frame section dimensions for the door assembly shall not be less than that approved for the particular door assembly design and the screen frame dimensions shall not be less than that approved for the particular screen design.

The door assemblies and side screens to be connected using appropriate steel screw fixings and glued using Urea Formaldehyde or polyurethane adhesives. Screws must be positioned within 100mm of each corner and otherwise located equi-spaced at not more than 600mm centres and to a depth of approximately 2/3 depth of the adjacent timber section.

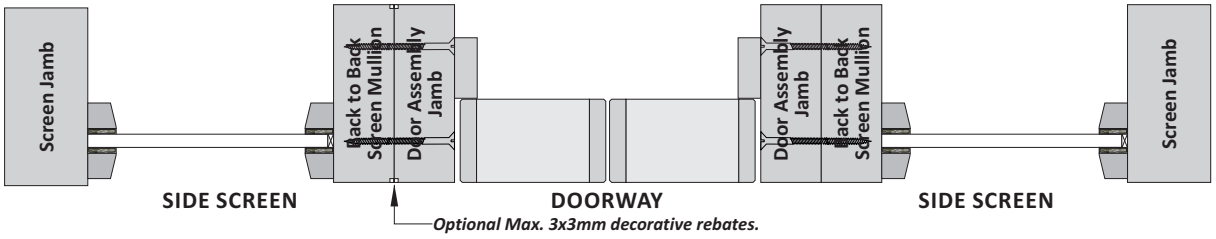
Side Screens - General:

Fig. 7.15

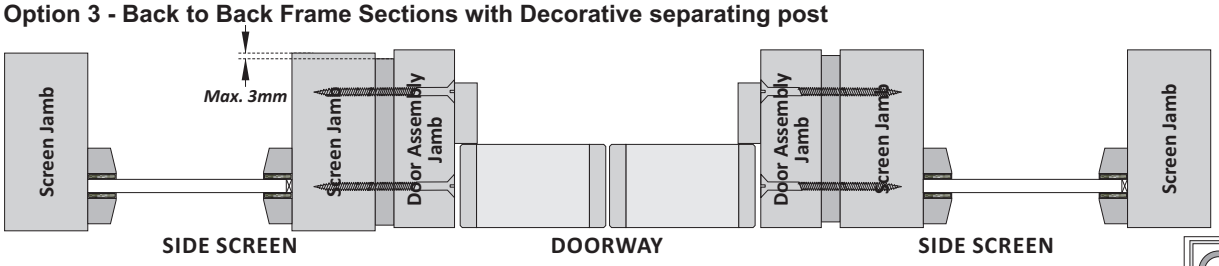
Option 1 - Common Mullion (*Transom Rail*)



Option 2 - Back to Back Frame Sections



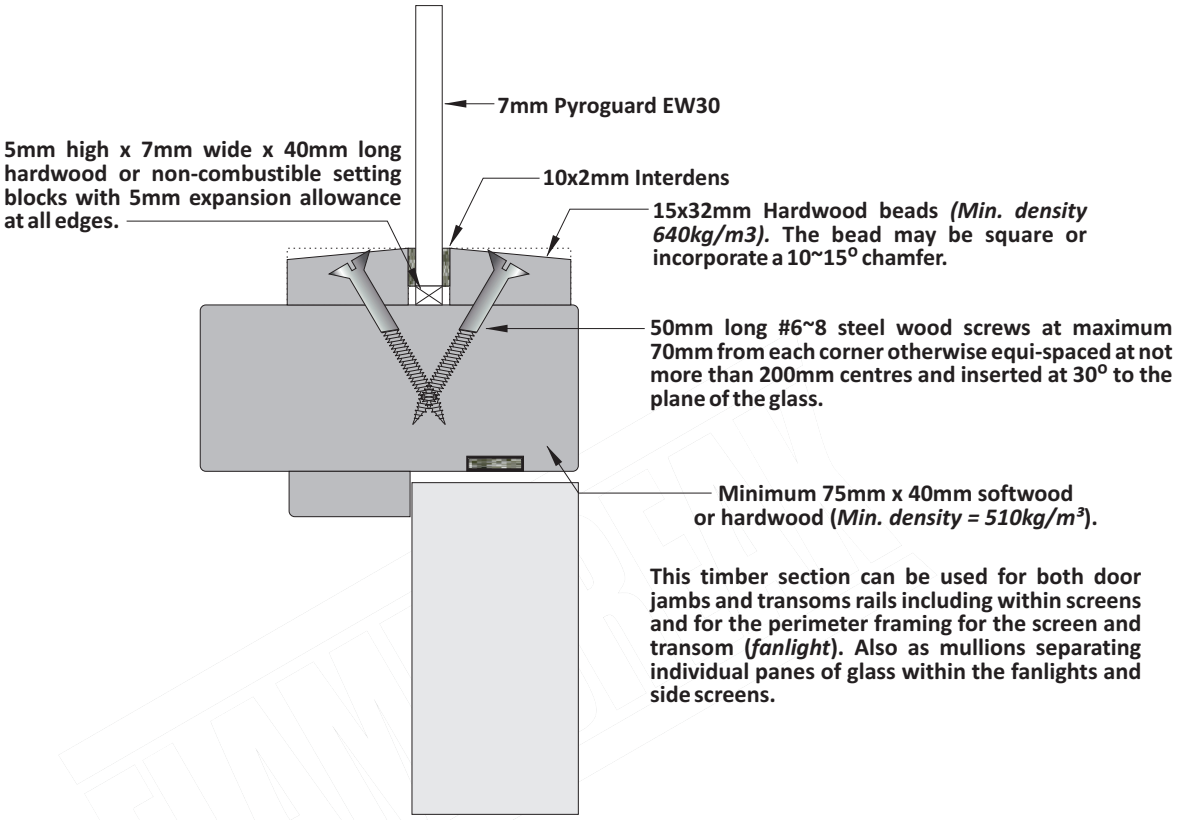
Option 3 - Back to Back Frame Sections with Decorative separating post



Glazed Screens & Fanlights - FD30 - Pyroguard EW30 (7mm thick Glass)

(Pyroguard UK Ltd.)

Glazed Screens & Fanlights - FD30 - Pyroguard EW30 *Fig. 7.16*



Element		Height (mm)	Width
Fanlight	From	1074	808
	To	808	2600
Side Screen		2500	1000

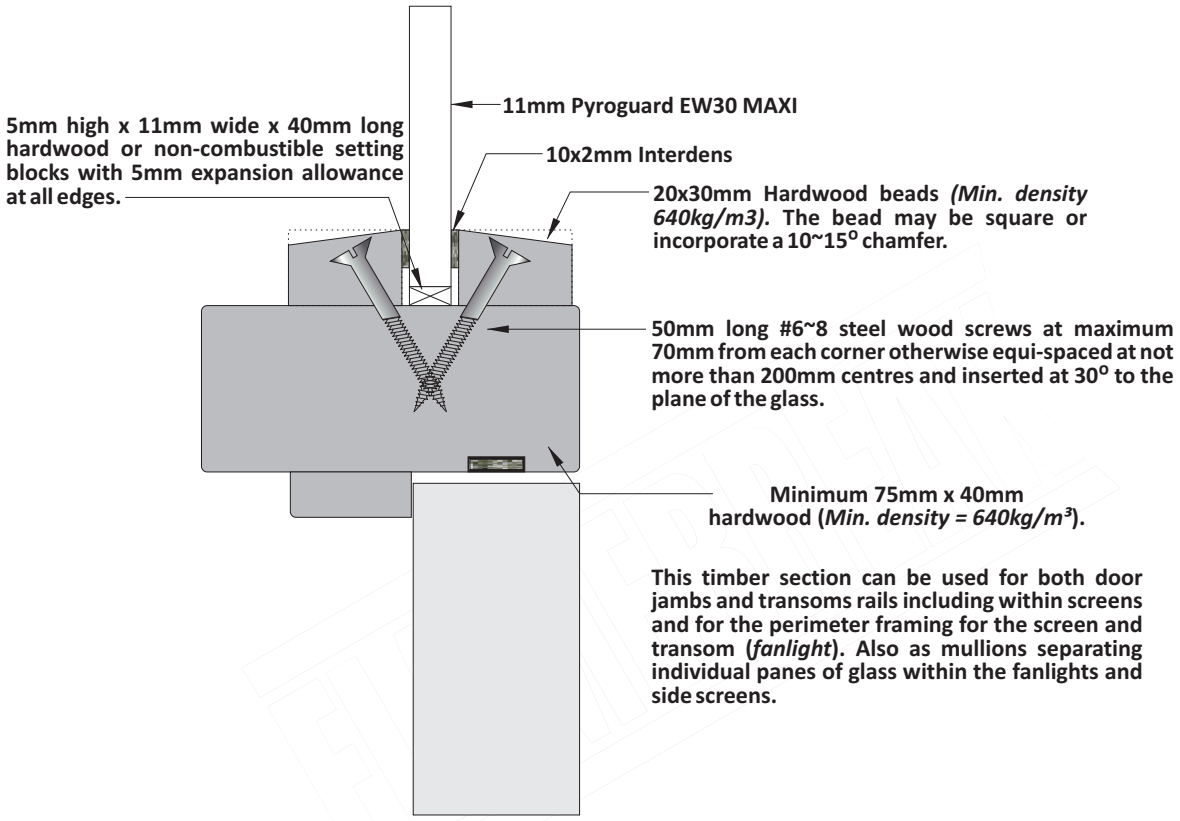
Glazed Screens & Fanlights - FD30 - Pyroguard EW30

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- Transom rails supporting single panes in excess of 900mm wide must be equally separated by at least one vertical mullion.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

Glazed Screens & Fanlights - FD30 - Pyroguard EW30 MAXI (11mm thick Glass)

(Pyroguard UK Ltd.)

Glazed Screens & Fanlights - FD30 - Pyroguard EW30 MAXI *Fig. 7.17*



Element		Height (mm)	Width
Fanlight	From	967	2525
	To	808	3000
Side Screen		2700	1500

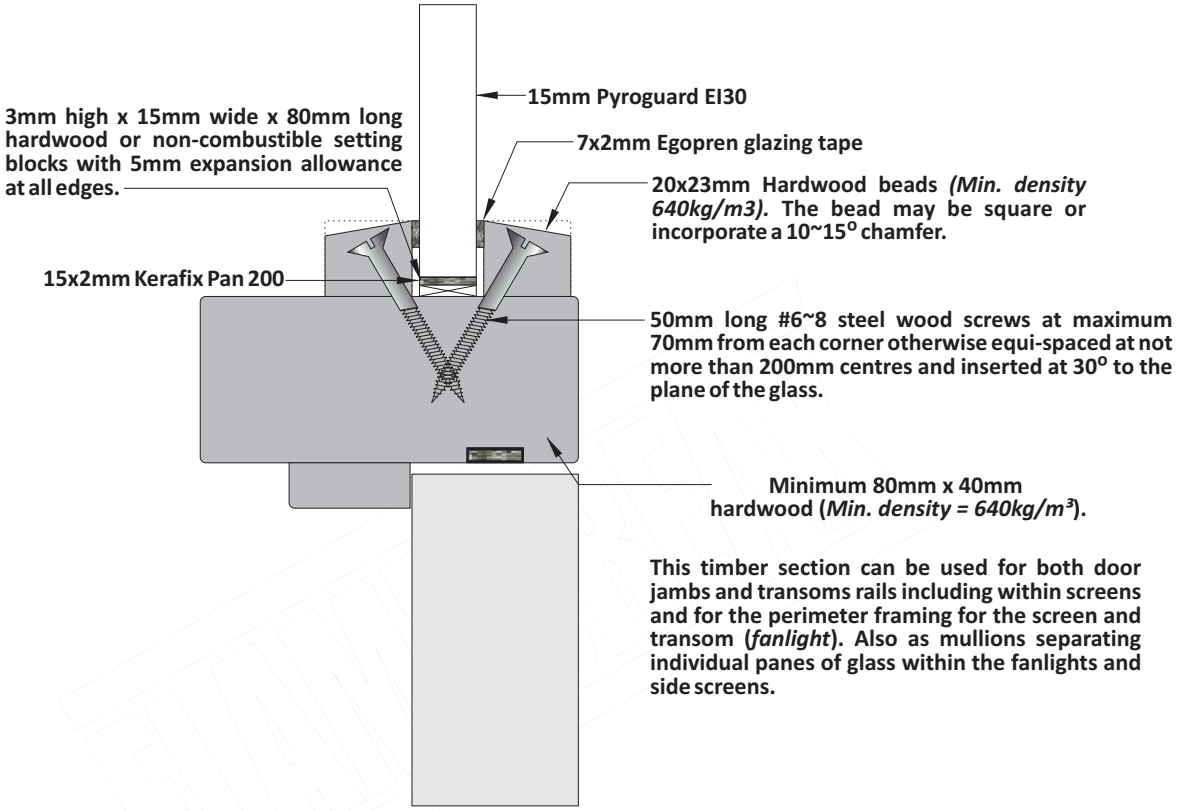
Glazed Screens & Fanlights - FD30 - Pyroguard EW30 MAXI

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

Glazed Screens & Fanlights - FD30 - Pyroguard EI30 (15mm thick Glass)

(Pyroguard UK Ltd.)

Glazed Screens & Fanlights - FD30 - Pyroguard EI30 *Fig. 7.18*



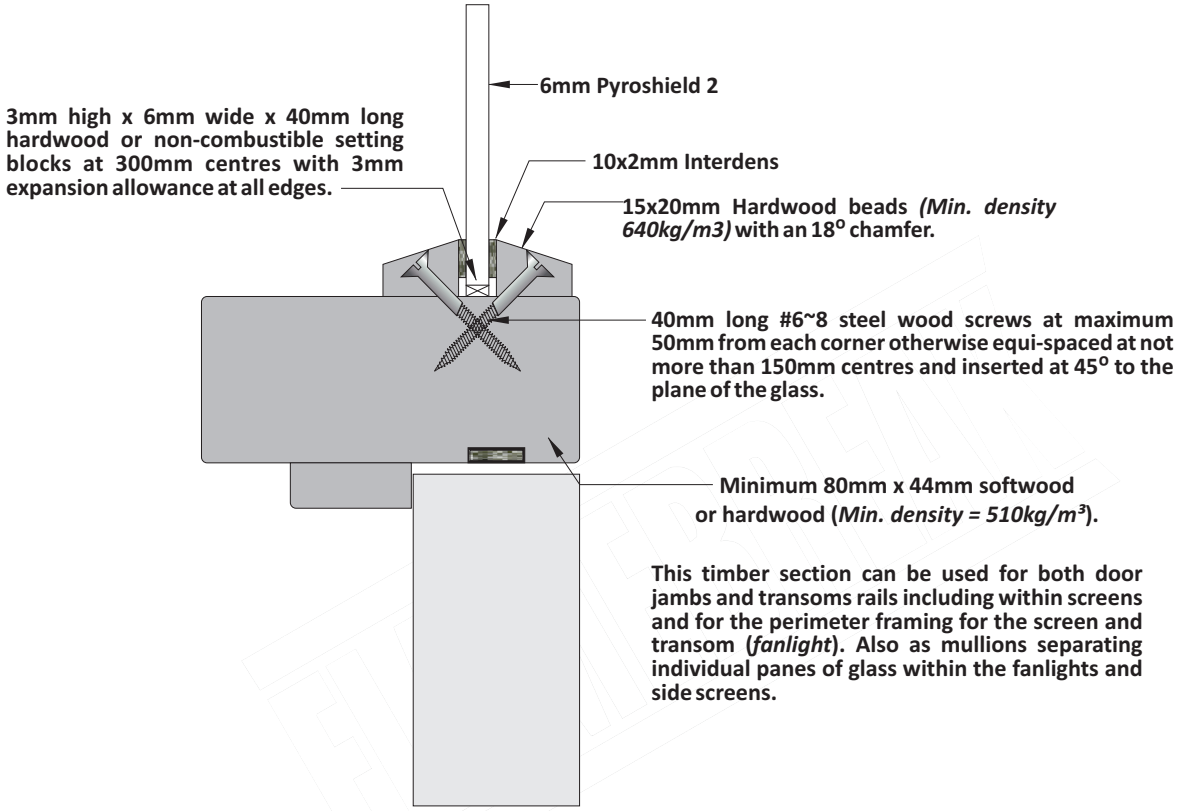
Element		Height (mm)	Width
Fanlight		350	2890
Side Screen	From	2520	225
	To	1141	1100

Glazed Screens & Fanlights - FD30 - Pyroguard EI30

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- Transom rails supporting single panes in excess of 1100mm wide must be equally separated by at least one vertical mullion.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

Glazed Screens & Fanlights - FD30 - Pyroshield 2 (6mm thick Glass)
(Pilkington Group Ltd.)

Glazed Screens & Fanlights - FD30 - Pyroshield 2 *Fig. 7.19*



Element	Height (mm)	Width
Fanlight	810	1830
Side Screen	2040	485

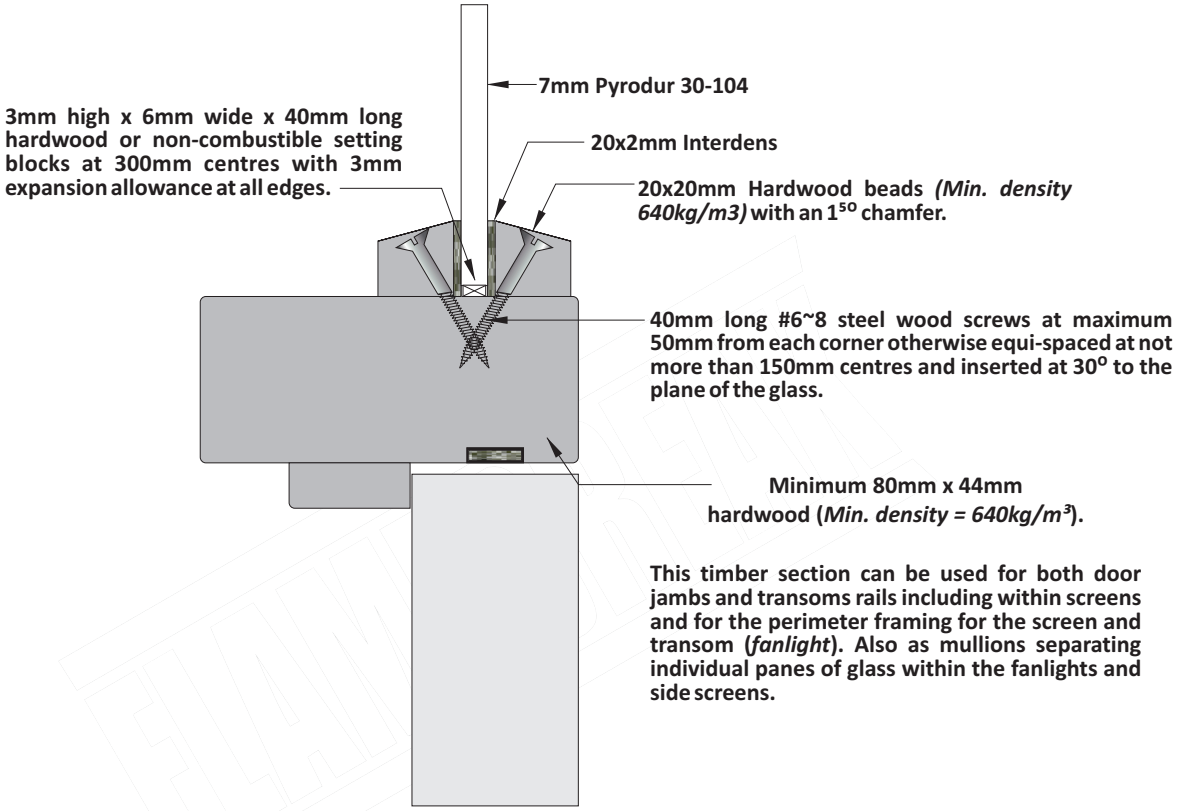
Glazed Screens & Fanlights - FD30 - Pyroshield 2

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

Glazed Screens & Fanlights - FD30 - Pyrodur 30-104 (7mm thick Glass)

(Pilkington Group Ltd.)

Glazed Screens & Fanlights - FD30 - Pyrodur 30-104 *Fig. 7.20*



Element	Height (mm)	Width
Fanlight	810	1670
Side Screen	2057	956

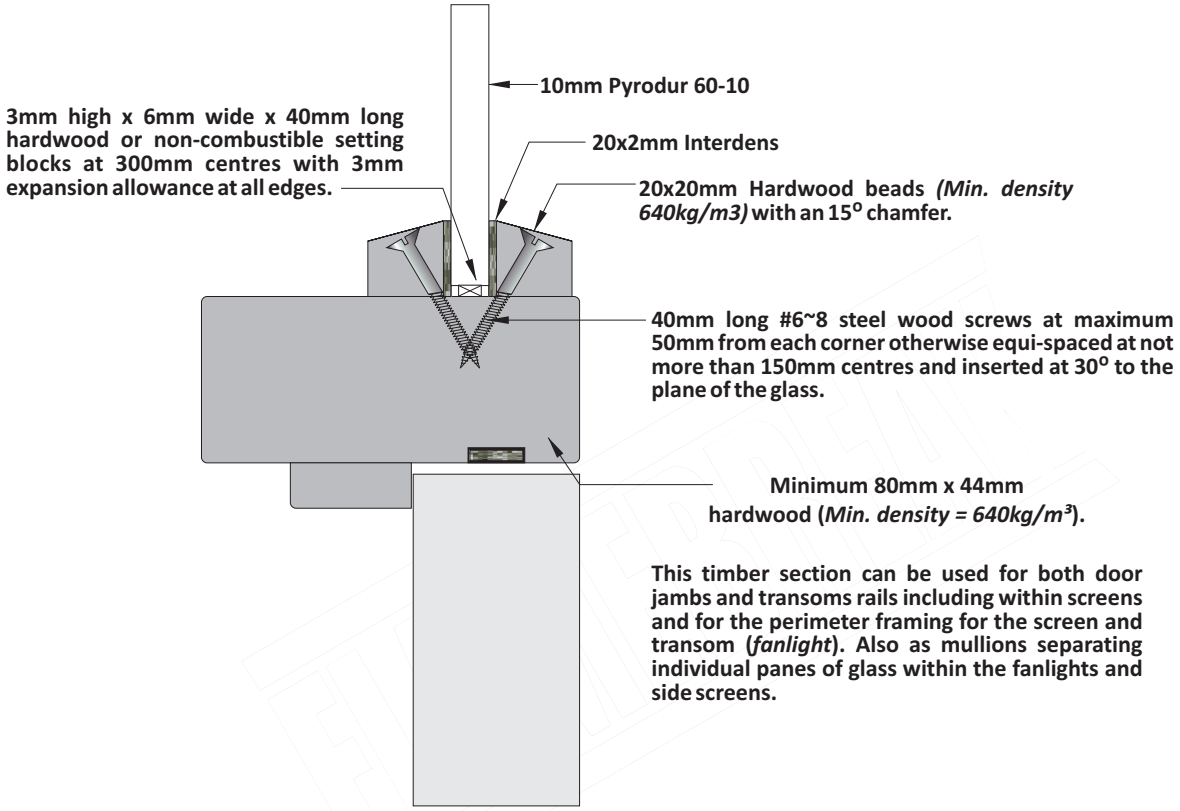
Glazed Screens & Fanlights - FD30 - Pyrodur 30-104

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

Glazed Screens & Fanlights - FD30 - Pyrodur 60-10 (10mm thick Glass)

(Pilkington Group Ltd.)

Glazed Screens & Fanlights - FD30 - Pyrodur 60-10 *Fig. 7.21*



Element	Height (mm)	Width
Fanlight	810	1670
Side Screen	2057	956

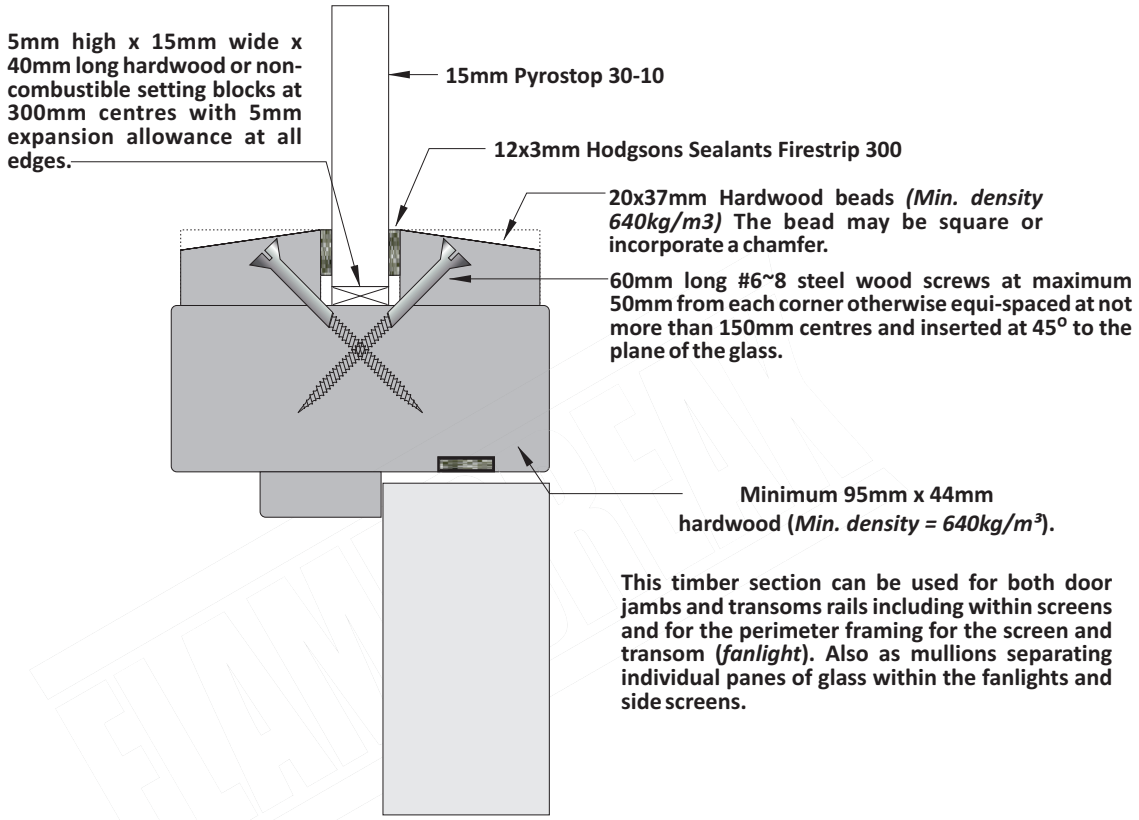
Glazed Screens & Fanlights - FD30 - Pyrodur 60-10

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

Glazed Screens & Fanlights - FD30 - Pyrostop 30-10 (15mm thick Glass)

(Pilkington Group Ltd.)

Glazed Screens & Fanlights - FD30 - Pyrostop 30-10 *Fig. 7.22*



Element	Height (mm)	Width
Fanlight	733	1001
Side Screen	2870	1366

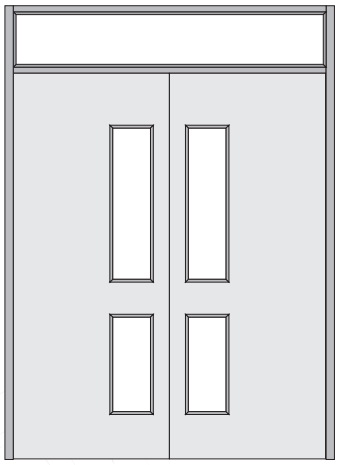
Glazed Screens & Fanlights - FD30 - Pyrostop 30-10

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

FD30 Glazed Fanlights - *Norsound Vision 30 Glazing Systems*

FD30 Assemblies with Glazed Fanlights - *Norsound Vision 30B & 30T Glazing Systems*

Fig.7.23



FLAMEBREAK™ doors in timber frames may include glazed fanlights using approved FD30 glass types 1~12 ***(See Section 6 page 5)*** provided that the glass has also demonstrated adequate performances when tested as a window or a screen in accordance with BS476 Pt.22 : 1987 or BS EN 1634-1 at the required pane dimensions.

Fanlights may comprise multiple panes of glass provided that the overall door assembly height including the fanlight does not exceed 2950mm.

All timber must be straight grained, joinery quality free from knots, splits & checks. Minimum 70mm x 32mm (*Min. density = 510kg/m³*). This timber section can be used for both door frame jambs and transom rails including within screens and for the perimeter framing for the screen and transom (*fanlight*).

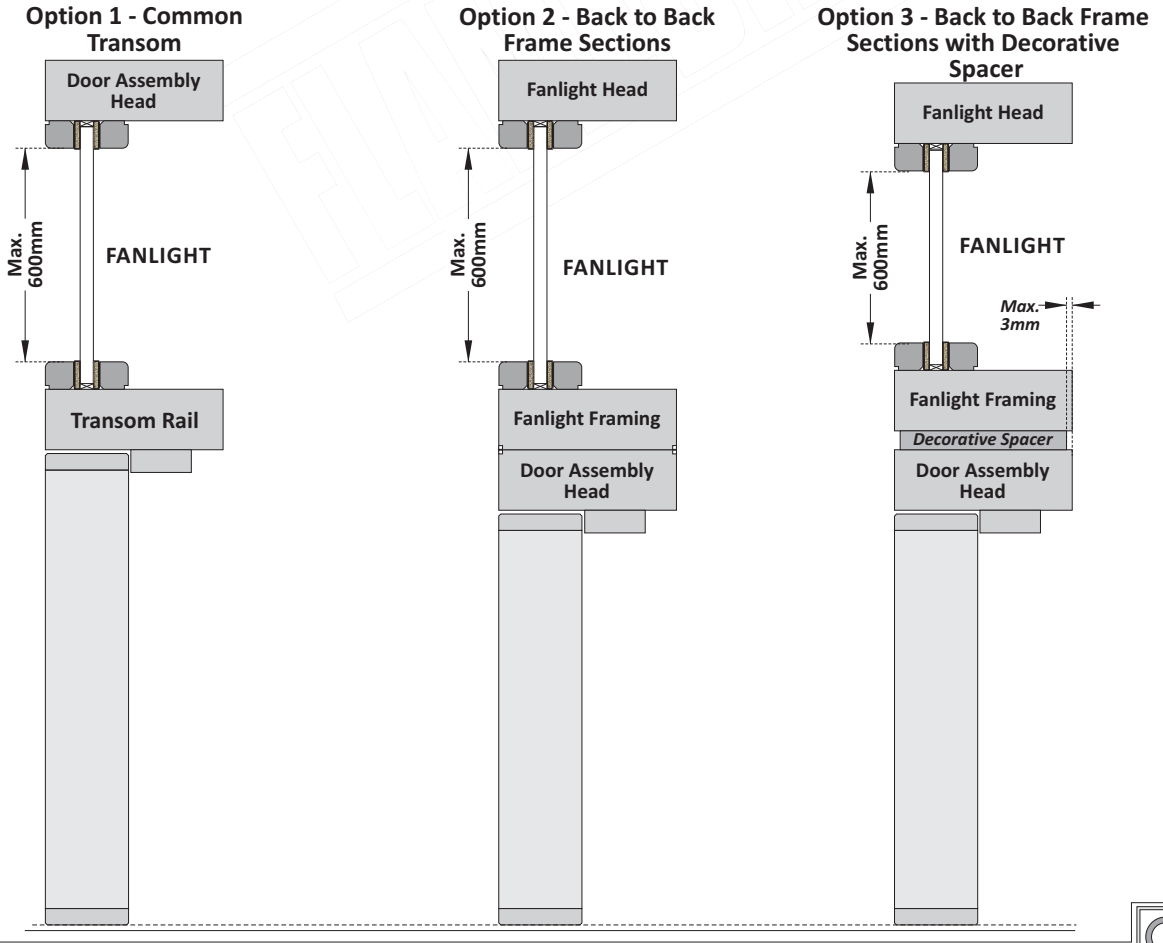
See page ***7.19*** for details of the Norsound Vision 30B & 30T glazing system.

See page ***7.8*** for further assembly requirements.

Assembly Element	Configuration	Max. Height (mm)	Max. Width (mm)
Fanlight	Single & Double leaf door assemblies	≤ 600	Overall door width

FD30 Assemblies with Glazed Fanlights - *Norsound Vision 30B & 30T Glazing Systems*

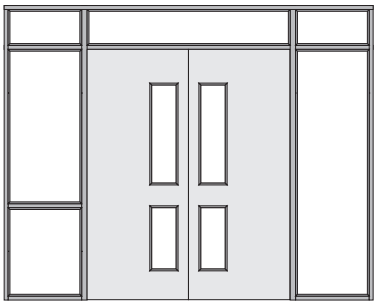
Fig.7.24



FD30 Glazed Side Screens - *Norsound Vision 30 Glazing Systems*

FD30 Assemblies with Glazed Side Screens - *Norsound Vision 30B & 30T Glazing Systems*

Fig.7.25



FLAMEBREAK™ door assembly designs in timber frames may include glazed fanlights and side screens using approved FD30 glass types 1~12 ***(See Section 6 page 5)*** provided that the glass has also demonstrated adequate performances when tested as a window or a screen in accordance with BS476 Pt.22 : 1987 or BS EN 1634-1 at the required pane dimensions.

Fanlights and side screens may comprise multiple panes of glass provided that the overall door assembly height including the fanlight does not exceed 2950mm. Side screens are limited to one screen to one or both sides of a door assembly with a clear glass width not exceeding 600mm.

All timber must be straight grained, joinery quality free from knots, splits & checks. Minimum 70mm x 32mm (*Min. density = 510kg/m³*). This timber section can be used for both door frame jambs and transoms rails including within screens and for the perimeter framing for the screen and transom (*fanlight*).

NOTE : The frame section is increased to min. 70x40mm to the full height of the door assembly where a common mullion is used to link the door assembly with the side screen(s).

See page ***7.19*** for details of the Norsound Vision 30B & 30T glazing system.

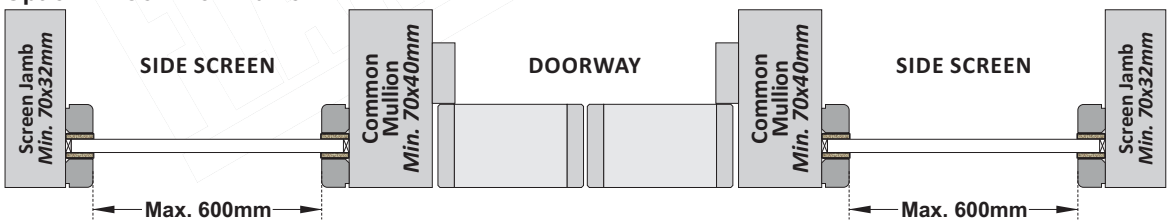
See page ***7.8*** for further assembly requirements.

Assembly Element	Configuration	Max. Height (mm)	Max. Width (mm)
Side Screens	Single & Double leaf door assemblies	Overall door assembly height	≤ 600

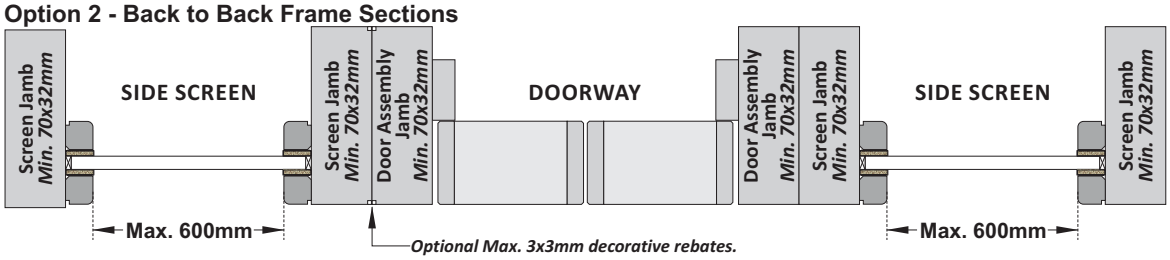
FD30 Assemblies with Glazed Side Screens - *Norsound Vision 30B & 30T Glazing Systems*

Fig.7.26

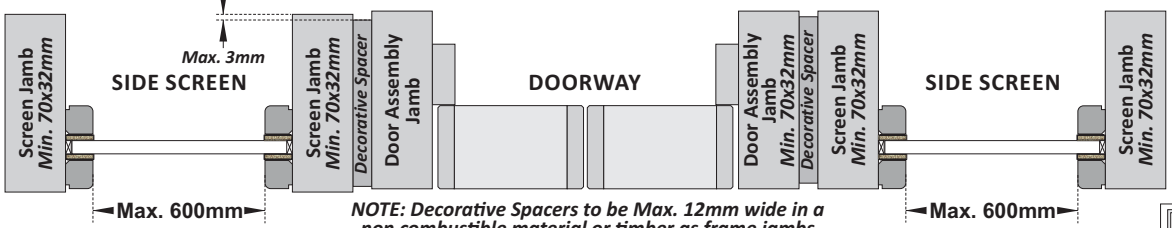
Option 1 - Common Mullion



Option 2 - Back to Back Frame Sections



Option 3 - Back to Back Frame Sections with Decorative full height vertical Spacer.



NOTE: Decorative Spacers to be Max. 12mm wide in a non combustible material or timber as frame jambs

FD30 Glazed Side Screens & Fanlights - *Norsound Vision 30 Glazing Systems*

FD30 Assemblies with Glazed Transoms & Side Screens - *Norsound Vision 30B & 30T Glazing Systems*

The glazing system and beads must meet the specifications described for the Norsound Vision 30 glazing system illustrated below with the Norsound Vision 30B or 30T intumescent seals to project 0.5mm above the sight line of the glass.

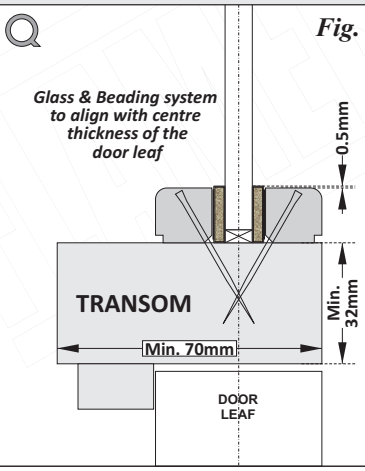
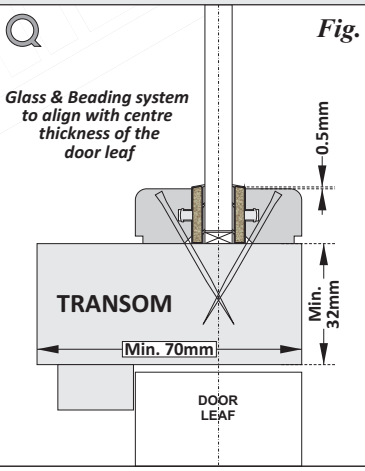
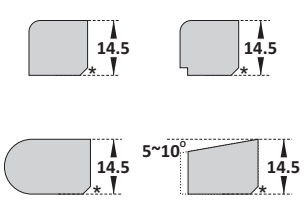
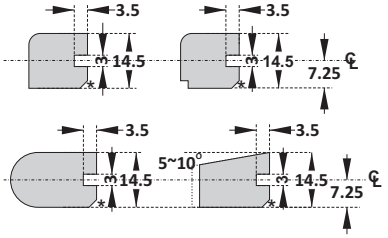
NOTE: The position of the groove in the rear of the bead is critical for the installation of the Vision 30T glazing system.

Expansion gaps between the glass and the framing must be set in accordance with the glass manufacturers approved details including the use of non-combustible or hardwood setting blocks.

Glazing beads must be retained in position with minimum 40mm long x 1.5mm diameter steel pins *OR* minimum 40mm long #6~8 steel wood screws inserted at 35~40° to the vertical at not more than 40mm from each corner, with intermediate fixings located equi-spaced at not more than 150mm centres.

Pneumatically fired pins are acceptable providing the pins meet the specification given by reference to Section ***6.*** *page* ***3***.

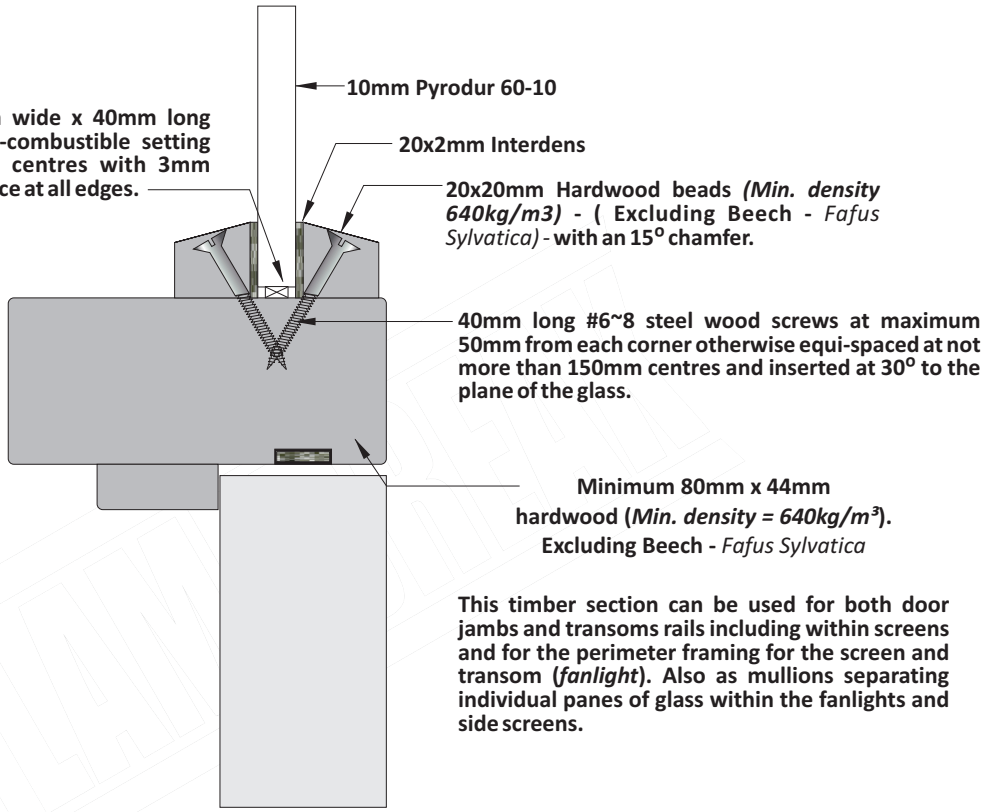
Screen Element	Configuration	Height (mm)	Width (mm)
Fanlight	Single & Double leaf door assemblies	≤ 600	Overall door width
Side Screen	Single & Double leaf door assemblies	Overall door assembly height	≤ 600

System Name		Norsound Vision 30B	Norsound Vision 30T
Typical Installation		*Fig. 7.27*  	*Fig. 7.29* 
Dimensions	Bead Height	Nominally 14.5mm	Nominally 14.5mm
	Intumescent Seal(s)	15mm high x 3mm thick	15mm high x 3mm thick + Plug dimension
Aperture Liner		Not Required	Not Required
Glazing Bead Profiles *All timber for glazing beads must be straight grained, joinery quality free from knots, splits & checks.* *Approved material:* *Min. 450kg/m³ Softwood* *Min. 450kg/m³ Hardwood* *Min. 700kg/m³ MDF.* *See Section 6 Glass & Glazing - page 6.20 for further Bead profile details.*		*Fig. 7.28*  * = 2mm splay applicable to all bead profiles	*Fig. 7.30*  * = 2mm splay applicable to all bead profiles

Glazed Screens & Fanlights - FD60 - Pyrodur 60-10 (10mm thick Glass)

(Pilkington Group Ltd.)

Glazed Screens & Fanlights - FD60 - Pyrodur 60-10 *Fig. 7.31*



Element	Height (mm)	Width
Fanlight	810	1670
Side Screen	2057	956

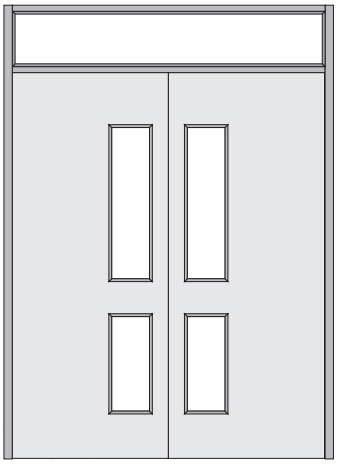
Glazed Screens & Fanlights - FD60 - Pyrodur 60-10

- The pane dimensions given above represent the maximum permitted width relative to maximum permitted height. Panes of smaller dimensions are acceptable.
- The fanlights and side screens may comprise multiple panes of glass providing the total dimensions for the door assembly and screen / fanlight does not exceed 2950mm high and that the transom rail / mullion specifications are complied with.
- The overall width of multiple screens is unlimited.
- The total screen assembly must not include more than 1No. single leaf or double leaf door assembly.

FD60 Glazed Fanlights - *Norsound Vision 60 Glazing Systems*

FD60 Assemblies with Glazed Fanlights - *Norsound Vision 60B & 60T Glazing Systems*

Fig. 7.32



FLAMEBREAK™ doors in timber frames may include glazed fanlights using approved FD60 glass types 1~8 ***(See Section 6 page 5)*** provided that the glass has also demonstrated adequate performances when tested as a window or a screen in accordance with BS476 Pt.22 : 1987 or BS EN 1634-1 at the required pane dimensions.

Fanlights may comprise multiple panes of glass provided that the overall door assembly height including the fanlight does not exceed 2950mm.

All timber must be straight grained hardwood (**Excluding Beech** - *Fagus Sylvatica*), joinery quality free from knots, splits & checks. Minimum 70mm x 32mm (*Min. density = 640kg/m³*). This timber section can be used for both door frame jambs and transom rails including within screens and for the perimeter framing for the screen and transom (*fanlight*).

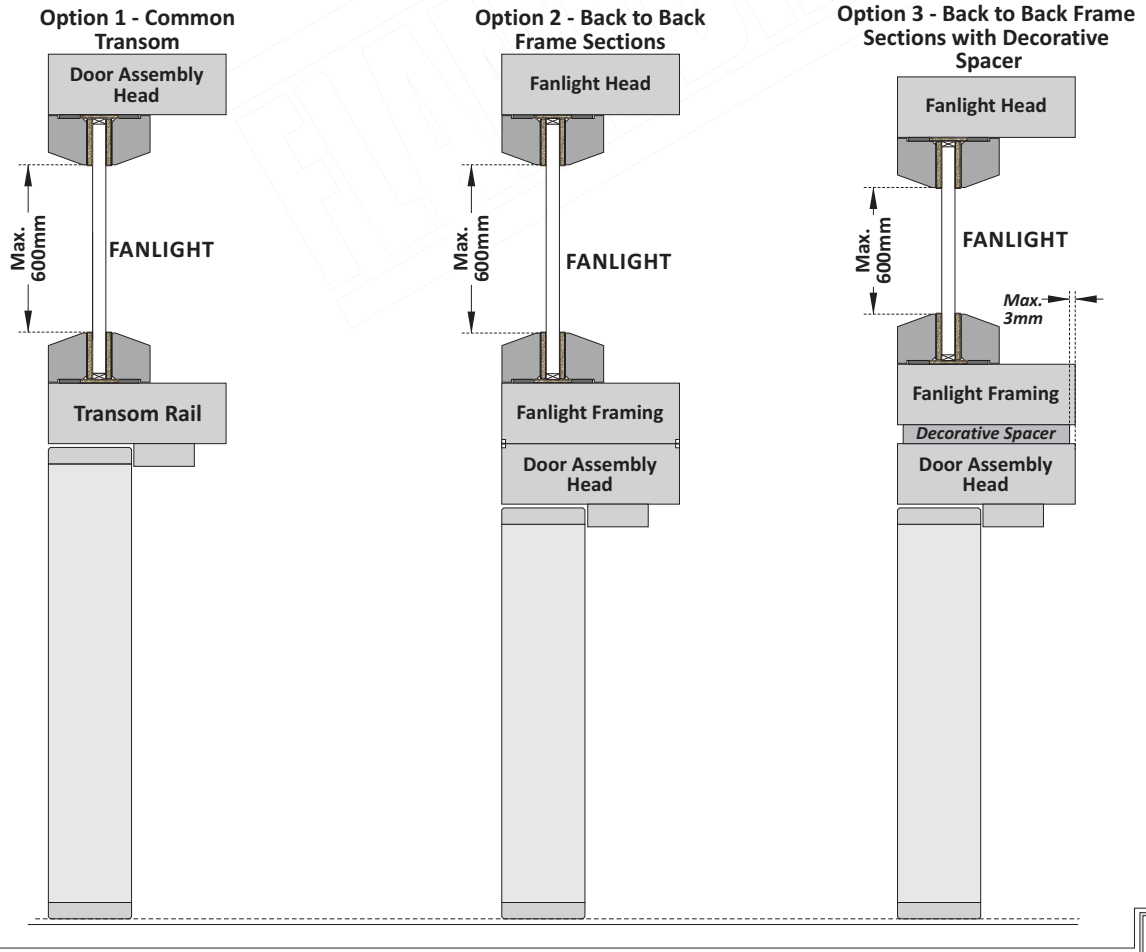
See page ***7.23*** for details of the Norsound Vision 60B & 60T glazing system.

See page ***7.8*** for further assembly requirements.

Assembly Element	Configuration	Max. Height (mm)	Max. Width (mm)
Fanlight	Single & Double leaf door assemblies	≤ 600	Overall door width

FD60 Assemblies with Glazed Fanlights - *Norsound Vision 60B & 60T Glazing Systems*

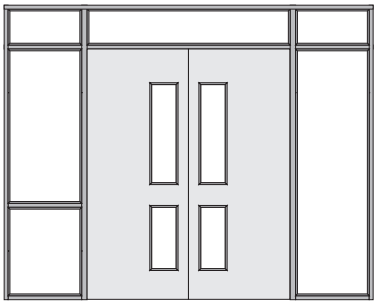
Fig. 7.33



FD60 Glazed Side Screens - *Norsound Vision 60 Glazing Systems*

FD60 Assemblies with Glazed Side Screens - *Norsound Vision 60B & 60T Glazing Systems*

Fig. 7.34



FLAMEBREAK™ door assembly designs in timber frames may include glazed fanlights and side screens using approved FD60 glass types 1~8 ***(See Section 6 page 5)*** provided that the glass has also demonstrated adequate performances when tested as a window or a screen in accordance with BS476 Pt.22 : 1987 or BS EN 1634-1 at the required pane dimensions.

Fanlights and side screens may comprise multiple panes of glass provided that the overall door assembly height including the fanlight does not exceed 2950mm. Side screens are limited to one screen to one or both sides of a door assembly with a clear glass width not exceeding 600mm.

All timber must be straight grained hardwood (**Excluding Beech** - *Fagus Sylvatica*), joinery quality free from knots, splits & checks. Minimum 70mm x 32mm (*Min. density = 640kg/m³*). This timber section can be used for both door frame jambs and transoms rails including within screens and for the perimeter framing for the screen and transom (*fanlight*).

NOTE : The frame section is increased to min. 70x40mm to the full height of the door assembly where a common mullion is used to link the door assembly with the side screen(s).

See page ***7.23*** for details of the Norsound Vision 60B & 60T glazing system.

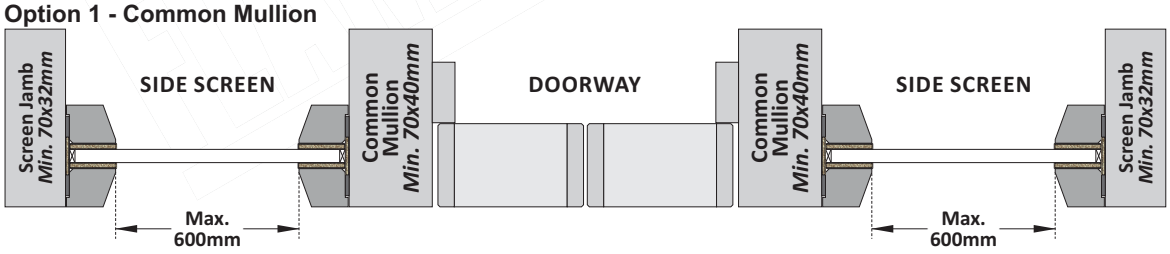
See page ***7.8*** for further assembly requirements.

Assembly Element	Configuration	Max. Height (mm)	Max. Width (mm)
Side Screens	Single & Double leaf door assemblies	Overall door assembly height	≤ 600

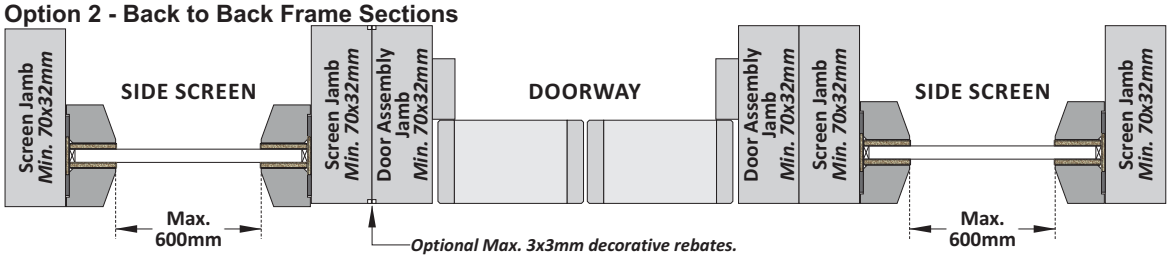
FD60 Assemblies with Glazed Side Screens - *Norsound Vision 60B & 60T Glazing Systems*

Fig. 7.35

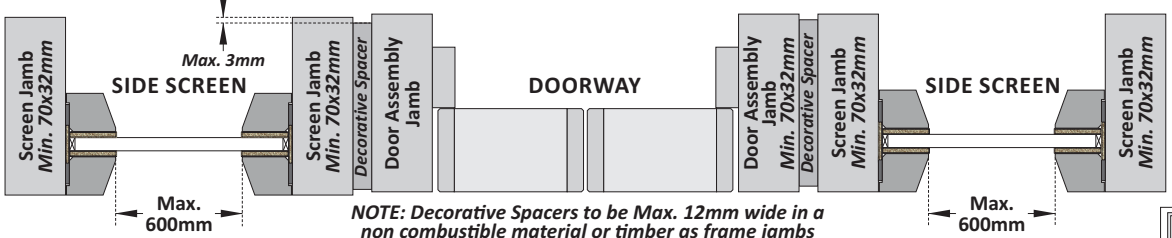
Option 1 - Common Mullion



Option 2 - Back to Back Frame Sections



Option 3 - Back to Back Frame Sections with Decorative full height vertical Spacer.



NOTE: Decorative Spacers to be Max. 12mm wide in a non combustible material or timber as frame jambs

FD60 Glazed Side Screens & Fanlights - *Norsound Vision 60 Glazing Systems*

FD60 Assemblies with Glazed Transoms & Side Screens - *Norsound Vision 60B & 60T Glazing Systems*

The glazed aperture must be lined with the Norsound 5202LNR liner that is supplied at 52mm wide and may be reduced to a minimum of 42mm wide - liners must be fitted centrally in the glazed aperture.

The glazing system and beads must meet the specifications described for the Norsound Vision 60 glazing system illustrated below with the Norsound Vision 60B or 60T intumescent seals to project 0.5mm above the sight line of the glass.

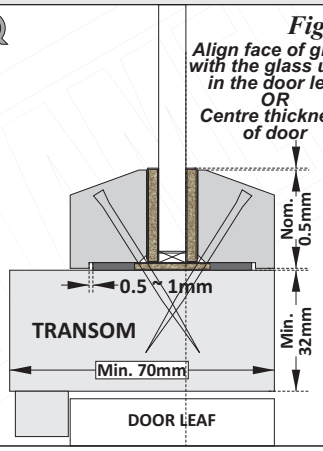
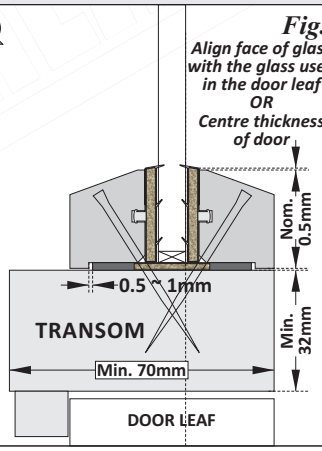
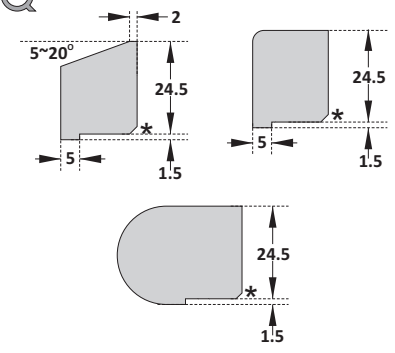
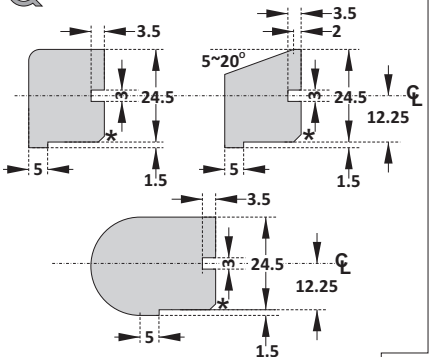
NOTE: The position of the groove in the rear of the bead is critical for the installation of the Vision 60T glazing system.

Expansion gaps between the glass and the framing must be set in accordance with the glass manufacturers approved details including the use of non-combustible or hardwood setting blocks.

Glazing beads must be retained in position with minimum 50mm long x 2mm diameter steel pins *OR* minimum 50mm long #6~8 steel wood screws inserted at 35~40° to the vertical at not more than 50mm from each corner, with intermediate fixings located equi-spaced at not more than 150mm centres.

Pneumatically fired pins are acceptable providing the pins meet the specification given by reference to Section ***6.*** *page* ***3***.

Screen Element	Configuration	Height (mm)	Width (mm)
Fanlight	Single & Double leaf door assemblies	≤ 600	Overall door width
Side Screen	Single & Double leaf door assemblies	Overall door assembly height	≤ 600

System Name		Norsound Vision 60B	Norsound Vision 60T
Typical Installation		*Fig. 7.36*  	*Fig. 7.38* 
Dimensions	Bead Height	Nominally 24.5mm	Nominally 24.5mm
	Intumescent Seal(s)	25mm high x 3mm thick	25mm high x 3mm thick + Plug dimension
Aperture Liner		NOR5202 reduced to Min. 42x2mm	NOR5202 reduced to Min. 42x2mm
Assessed Bead Profiles ***All timber for glazing beads must be straight grained, joinery quality free from knots, splits & checks.*** ***Approved material:*** ***Min. 640kg/m³ Hardwood.*** ***(Excluding Beech*** *- Fagus Sylvatica).* ***See Section 6 Glass & Glazing - page 6.20 for further Bead profile details.***		*Fig. 7.37*  * = 2mm splay applicable to all bead profiles	*Fig. 7.39*  * = 2mm splay applicable to all bead profiles

Frame Designs for Fire Door Applications:

The design of frames for door assemblies is beyond the scope of this manual. However, certain indicative parameters can be advised to illustrate frame designs that can be 'Q' marked as being suitable for fire door applications up to FD60 *(BS476 Pt.22).*

Materials approved for the manufacture of frames for fire door applications are given by reference to ***Section 2*** of this manual with further advice concerning the minimum approved sectional dimensions advised by reference to pages ***7.2 & 7.3.***

Generally frames will fall into two basic categories:
1/ 1st. Fix Frames: Frames that are installed into *(and becoming part of)* the structure in advanced of the application of final finishes to walls or partitions.

NOTE: 1st. Fix frame designs are generally installed while 'wet trades' are still active on site. This can influence the moisture content of timber and induce raised grain. Whereas this might be a suitable option for painted frames the use of 1st. Fix frame designs is not recommended where frame are in polished hardwoods.

2/ 2nd. Fix Frames: Frames that are installed into pre formed *(prepared openings)* in the structure. A 'fitting in' installation gap is required between the frame and the surrounding structure. 2nd. Fix frames can be installed into walls or partitions that are completely finished including the application of decoration.

NOTE: 2nd. Fix frame designs can generally be fitted into completely finished areas of the building allowing for joinery to be delivered at a late stage in the construction programme with a consequent reduction of the risk of damage due to construction activities. The use of 2nd. Fix frame designs is recommended where polished hardwood frames are used.

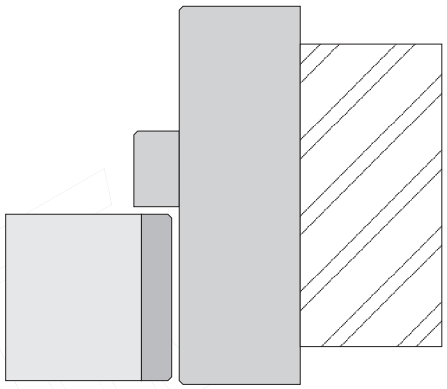
Proposed frame designs for any particular project can be independently assessed by Exova Warringtonfire where required.

Method of Jointing:
The following methods of jointing can be used for the construction of frames for fire door applications up to FD60:
Mortise & Tenon Joints.
Butt Joints.
Half Lapped Joints.
Mitred joints.
Frames may be assembled using dry joints with mechanical *(screw)* fixings or glued and screw fixed.

The following details are not approved for 'Q-Mark' applications:

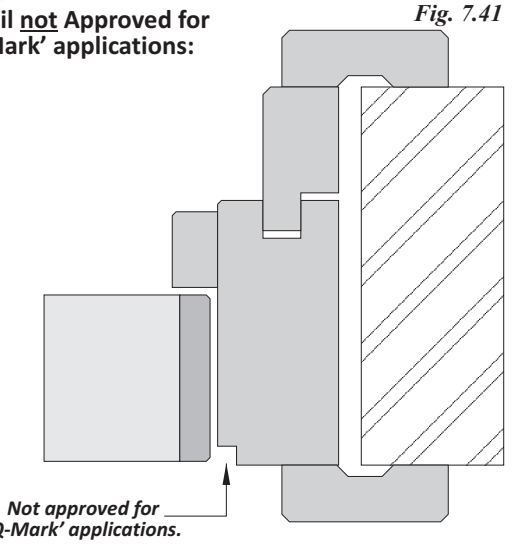
Frames projecting beyond the face of the wall / partition:

Detail not Approved for 'Q-Mark' applications: *Fig. 7.40*



Frames with feature rebates to the door leaf or the frame at the operating gap positions between the door leaf and the frame:

Detail not Approved for 'Q-Mark' applications: *Fig. 7.41*

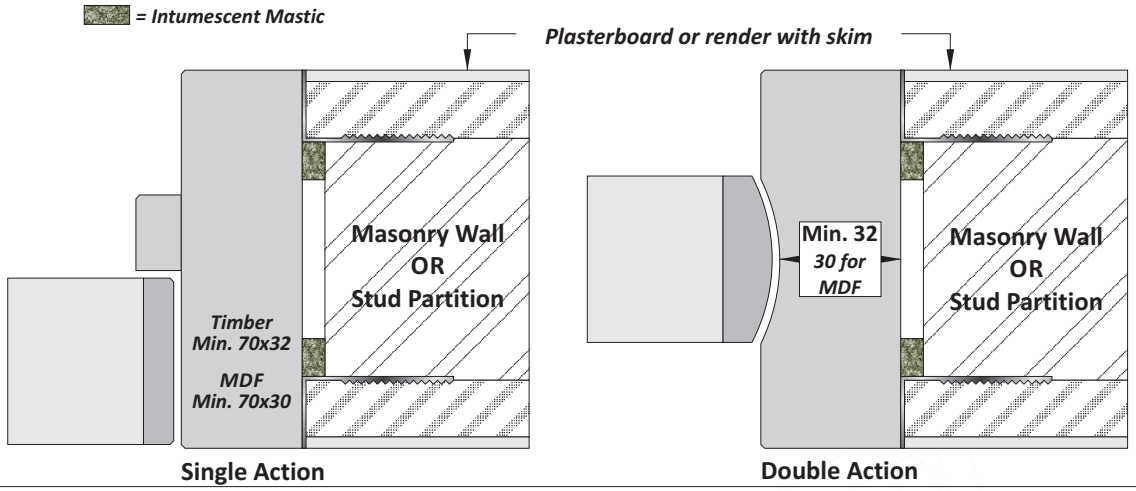


The following details illustrate guidance details for frame designs that have been 'Q-Mark' assessed as being suitable for fire door applications for performances up to FD60 *(BS476 Pt.22)* subject to the use of materials that are approved for the particular performance by reference to *Section 2 - Fire Door Applications* of this manual.

Flush Frame - No Architrave - (1st. Fix).

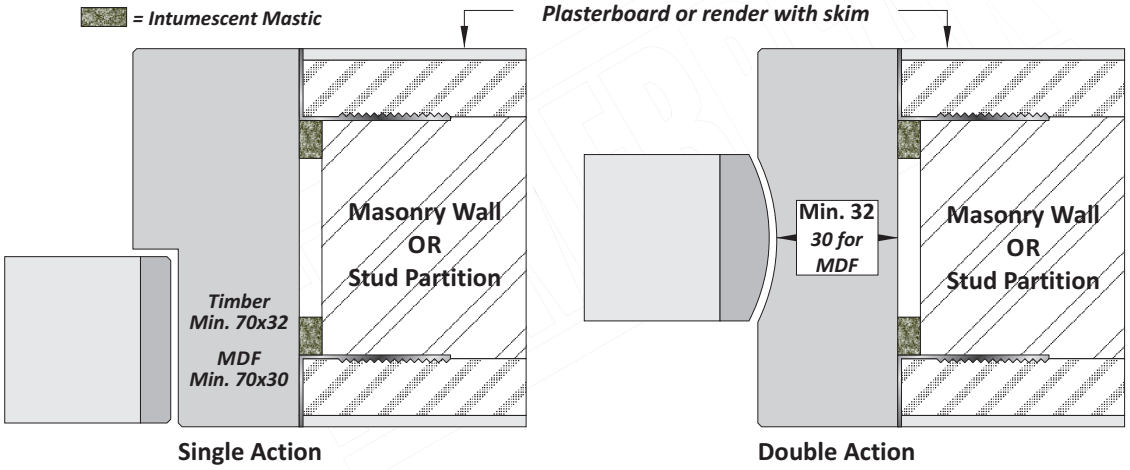
One piece lining with planted doorstop

Fig. 7.42



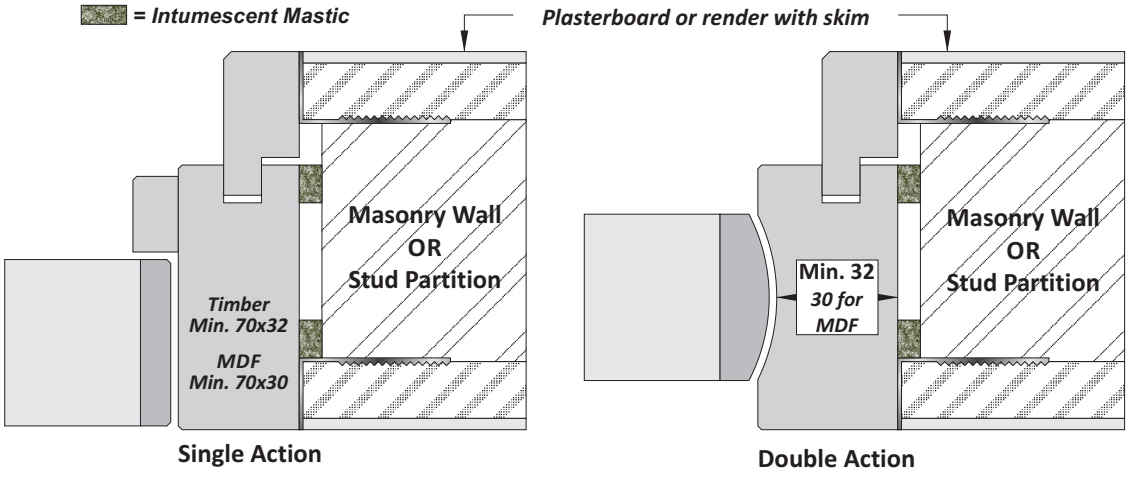
One piece lining with moulded doorstop

Fig. 7.43



Frame with extension lining.

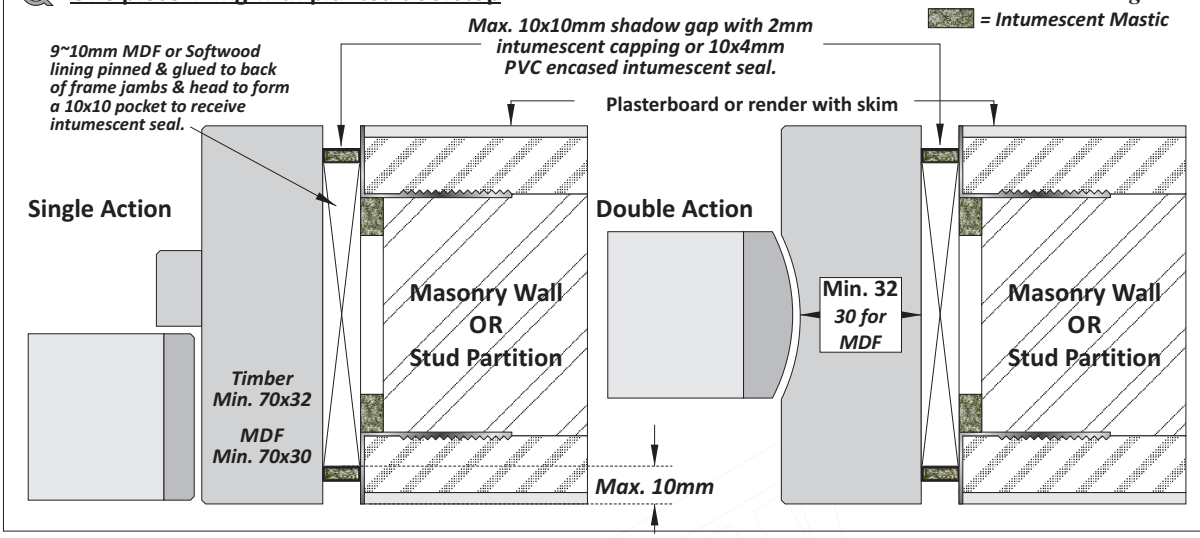
Fig. 7.44



Shadow Gap Frame - (1st. Fix).

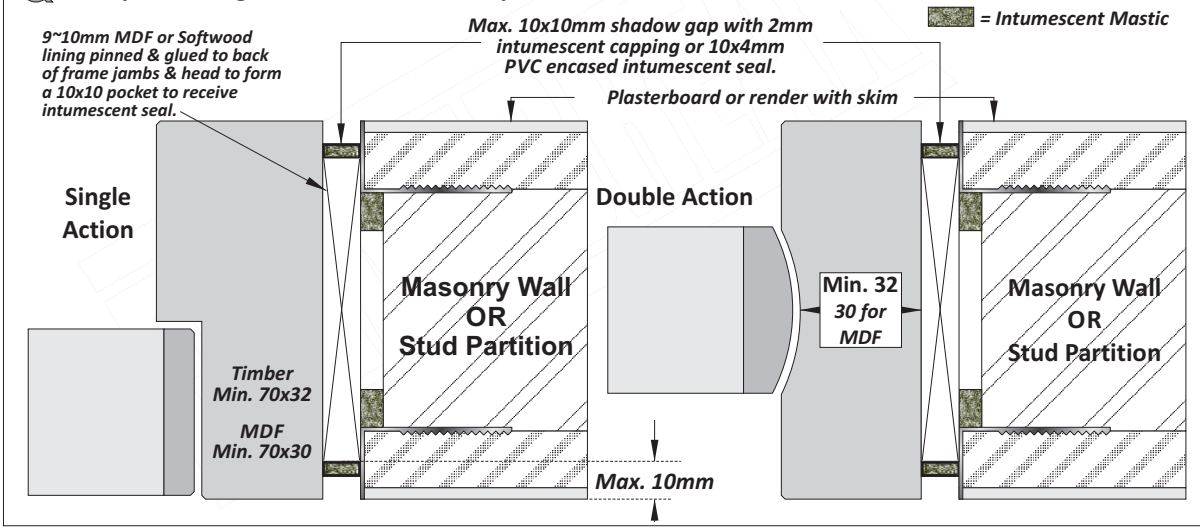
One piece lining with planted doorstop

Fig. 7.45



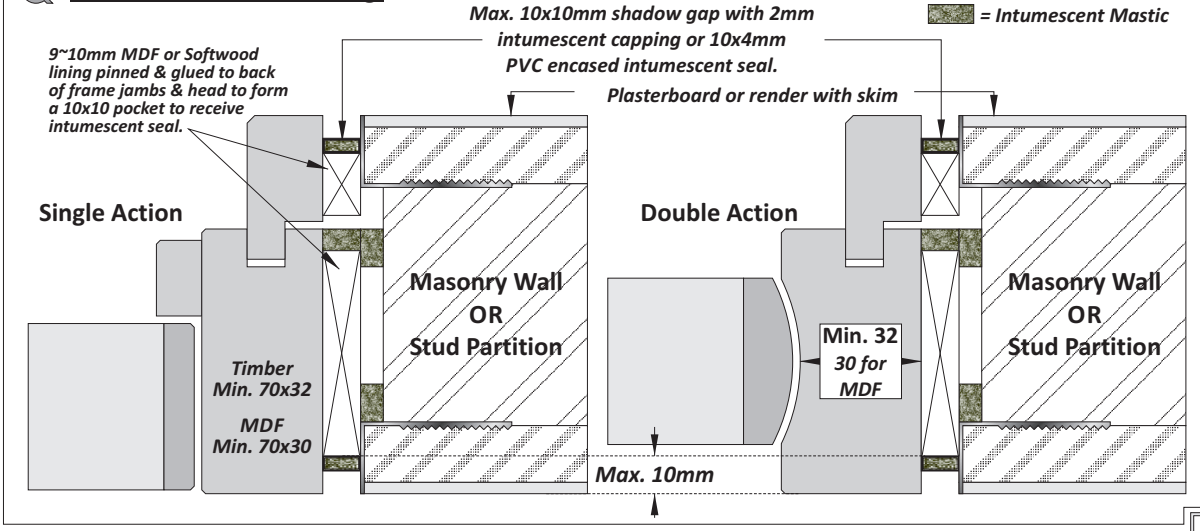
One piece lining with moulded doorstop

Fig. 7.46



Frame with extension lining.

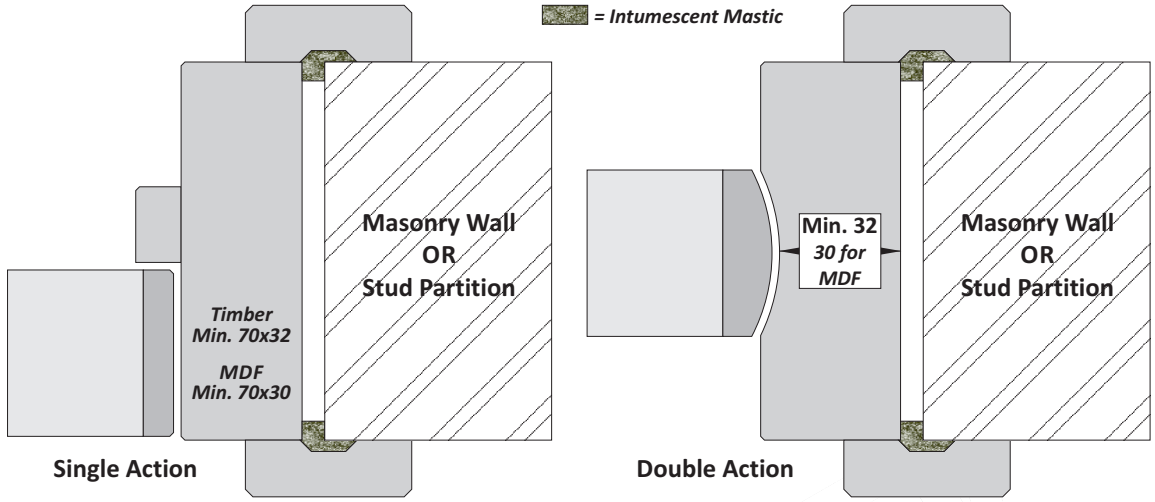
Fig. 7.47



Traditional Frame - With Architrave - (2nd. Fix)

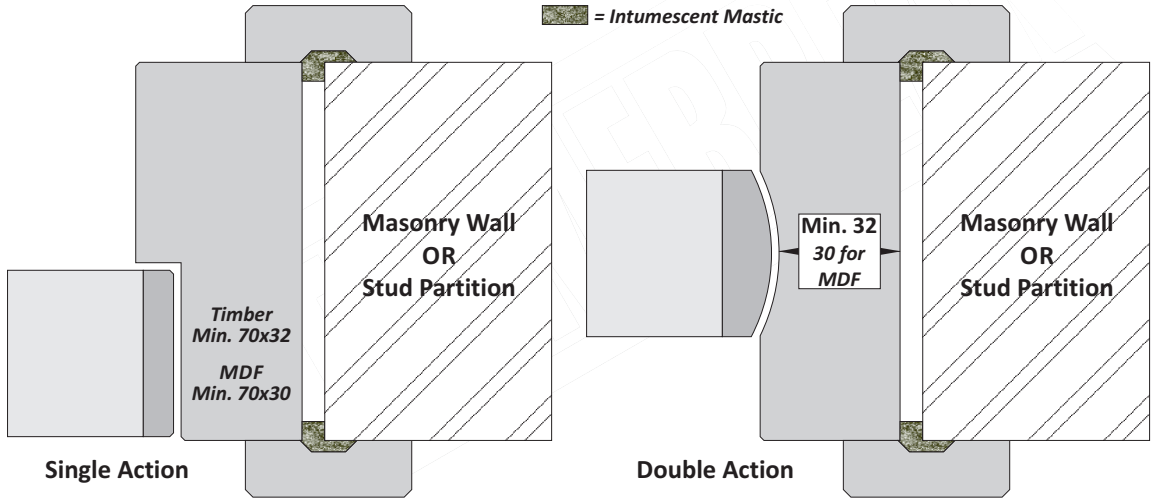
One piece lining with planted doorstop

Fig. 7.48



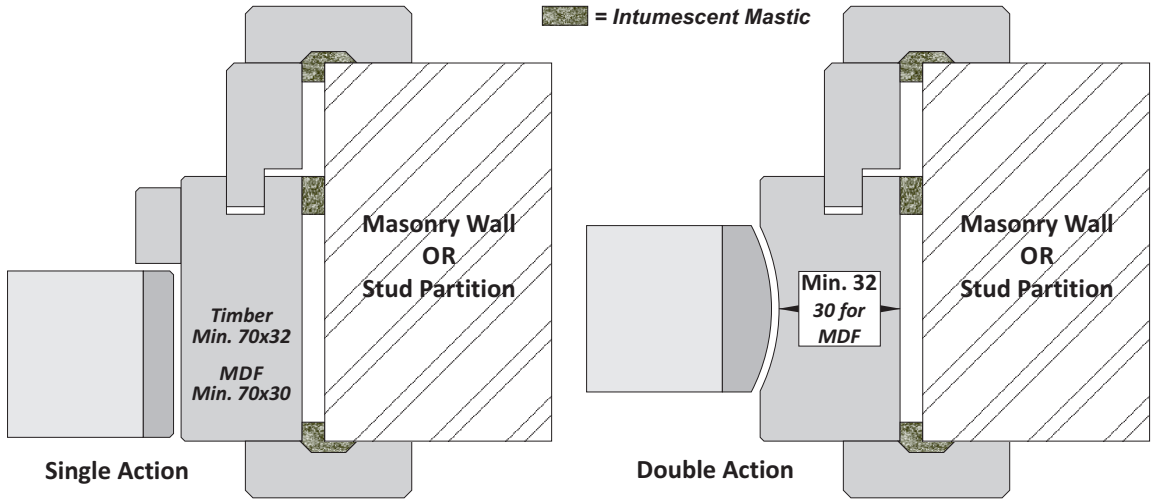
One piece lining with moulded doorstop

Fig. 7.49



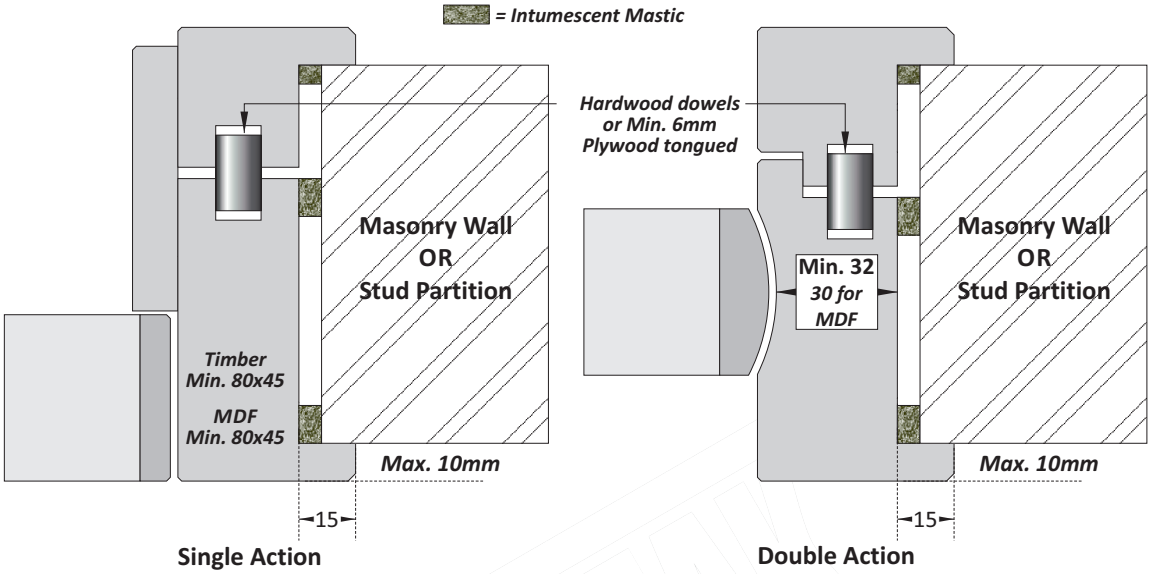
Frame with extension lining.

Fig. 7.50



Split Frame - With Intregal Architrave - (2nd. Fix).

Two piece frame with integral architrave. *Fig. 7.51*



Alternative Frame Intumescent Sealing:

The back of frame components can be grooved to receive low pressure intumescent seals that can be fitted to the frames before installation to provide for an alternative to the use of intumescent mastics.

This option is a preferred method for use with 2nd. Fix frame designs, particularly where used in conjunction with high quality polished hardwoods.

An additional benefit resulting from this method of sealing is that the frame components are more resistant to distortion if subjected to environmental conditions that result in variations to moisture content.

Fig. 7.52

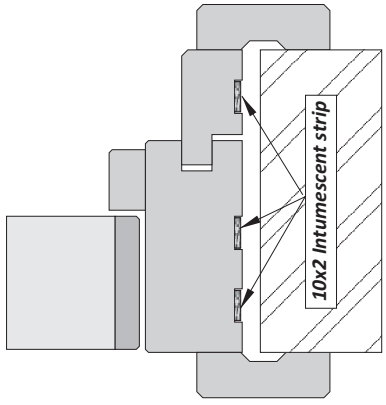
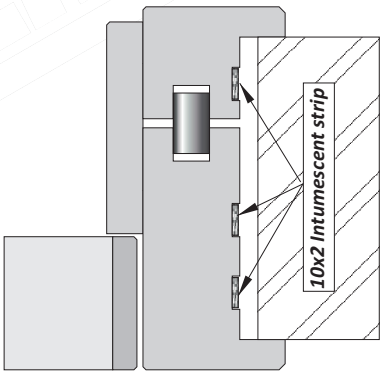


Fig. 7.53



Approved Intumescent material suitable for this application:

2mm Interdens - Dufalite Developments Ltd.
2mm MAP paper - Lorient Polyproducts Ltd.
2mm Therm-A-Strip - Intumencent Seals Ltd.
2mm Pyrostrip 300 - Mann McGowan Fabrications Ltd.

Figs. 7.42~7.53 illustrate the approved locations for the sealing between the door frame and the surrounding structure to suit various frame designs when using intumescent sealants.
Further guidance relating to the installation of fire rated door assemblies with wood frames is given by reference to ***Section 14 - Fire Door Installation*** of this manual.

Softwood and Hardwoods for use with frames for FLAMEBREAK™ based doors.

1/ The following lists of Softwoods & Hardwoods is culled from BS EN 942 : 2007.
2/ These lists show the nominal density for the species @ 15% moisture content.
3/ The lists identify suitability for fire door applications based upon BS8214 : 2016 recommendations and current fire test / assessment data.
4/ The lists are provided as a guide to users and may not describe all available softwoods or hardwoods.

Frame Materials - Softwoods

Item	Species	*Latin Name*	Characteristics	Avg. Density	Fire Door	
					FD30	FD60
1	**Douglas Fir**	*Pseudotsuga menziesii*	Pale reddish brown heartwood, paler sapwood. Growth rings clearly defined and inclined to show through paint. Discolours in contact with ferrous metal. Non-ferrous fittings and fastenings are recommended. Long clear lengths available.	530Kg/m3	OK	NR
2	**Hemlock, western**	*Tsuga heterphylla*	Pale brown in colour. Growth rings dstinguishable. Straight grain, fine even texture. Shipments include amabilis fir (less dense, less strong). Good paint performance in service. Long clear lengths available.	470Kg/m3 to 500Kg/m3	OK	NR
3	**Parana Pine**	*Araucaria angustifolia*	Golden brown, sometimes with red streaks. Straight grain, fine uniform texture, generally available knot free. Liable to distort on machining. Good paint performance in service.	550Kg/m3	OK	NR
4	**Pine, lodgpole**	*Pinus contorta*	Heartwood yellow to pale brown tinged with red, paler sapwood. Where present, knots are small and tight. Resinous smell. Fine even texture, straight grained. Paints well.	470Kg/m3	NR	NR
5	**Pine, ponderosa**	*Pinus ponderosa*	Very wide pale yellow sapwood. Dark yellow to reddish brown heartwood, with fine prominent resin ducts. Paints well, but resin exudation can be troublesome.	480Kg/m3	OK	NR
6	**Pine, southern**	*Pinus echinata, Pinus taeda & others*	Yellow / reddish brown resinous heartwood, paler sapwood. Growth rings distinct, course appearance. Paints fairly satisfactorily	590Kg/m3	OK	NR
7	**Pine, sugar**	*Pinus lambertiana*	Pale straw to reddish brown heartwood, white sapwood. Soft even texture. Paints well.	430Kg/m3	NR	NR
8	**Redwood: Scots pine**	*Pinus sylvestris*	Pale yellowish brown to red brown heartwood, paler sapwood. Medium texture. Growth rings clearly marked. Good paint performance in service.	510Kg/m3	OK	NR
9	**Western Red Cedar**	*Thuja plicata*	Variable reddish brown heartwood, distinct white sapwood. Straight grain, course texture. Discolours in contact with ferrous metal if damp. Non-ferrous fittings and fastenings are recommended. Good paint performance in service. Particularly suited for exterior use.	390Kg/m3	NR	NR
10	**Whitewood**	*Picea abies and Abies alba*	White to pale yellowish brown. Straight grain, rather fine texture. Good paint performance in service.	470Kg/m3	NR	NR

Avg. Density = Average density @ 15% moisture content.

NOTES:

- ***The densities for Softwoods and Hardwoods described in BS EN 942 are the <u>average</u> densities for the particular species at 15% moisture content.***

- ***Some species listed as 'NR' may be used for FD30 and FD60 applications where there is test evidence to support the use of the particular species or the frame material is selected from available stocks to suit the fire performance density requirement. e.g. American Cherry selected to provide for a minimum density of 640kg/m^3 may be used for FD60 applications.***

- ***Similarly, materials listed as 'OK' for fire door applications must provide for the minimum density requirement to suit the fire performance.***

Frame Materials - Hardwoods

Item	Species	*Latin Name*	Characteristics	Avg. Density	Fire Door	
					FD30	FD60
1	**Abura**	*Hallan ciliata*	Pale brownish coloured heartwood and sapwood, plain appearance. Medium / fine texture. Tendency to split on nailing. Stains well.	580Kg/m3	OK	NR
2	**Afromosia**	*Pericopsis elata*	Deep brown heartwood, pale brown sapwood. plain appearance. Medium / fine texture. Discolours in contact with ferrous metal if damp. Pre-bore before nailing.	710Kg/m3	OK	OK
3	**Afzelia**	*Afzelia spp.*	Reddish brown timber, straw coloured sapwood. Grain often interlocked, texture course. Pre-bore before nailing. Can stain masonry and textiles if damp.	830Kg/m3	OK	OK
4	**Agba**	*Gossweilerodendron balsamiferum*	Pale pinkish brown heartwood of uniform appearance, sapwood slightly paler (border sometimes indistinct). Medium texture. Resin, resinous odour frequent.	510Kg/m3	OK	NR
5	**Ash, American**	*Fraxinus americana, F. nigra & others.*	Coarse texture. Sapwood nearly white, White ash heartwood greyish brown, tough. Black ash darker, lower density, less tough.	660Kg/m3	OK	OK
6	**Ash, European**	*Fraxinus excelsior*	Generally white to pale brown. Medium / course texture. Very good bending timber, very tough.	710Kg/m3	OK	OK
7	**Beech, European**	*Fagus sylvatica*	Pale reddish brown; if steamed, pink. Fine even texture. Good bending. Stains, polishes well.	720Kg/m3	OK	NR
8	**Birch, yellow**	*Betula alleghaniensis*	Wide variation in colour from cream to reddish brown, can include sweet birch (denser, darker). Fine even texture. Stains and polishes well.	700Kg/m3	OK	OK
9	**Cedar, Central & South American**	*Cedrela odorata, C. fissilis*	Colour pale to dark reddish brown and properties highly variable. Very low density. Occasional interlocked grain, coarse texture. Fragrant odour. Resin exudation, resin pockets may occur.	480Kg/m3	OK	NR
10	**Cherry, American**	*Prunus serotina*	Colour varies from pale straw to reddish brown. Straight fine grain, fine texture. Pith flecks and small gum pockets are common. Stains, polishes well.	590Kg/m3	OK	NR
11	**Chestnut, sweet**	*Castanea sativa*	Yellowish brown heartwood, similar to oak. Sapwood distinct. Course texture, tendency to spiral grain. Discolours in contact with ferrous metal if damp. Non-ferrous fittings or fastenings are recommended.	560Kg/m3	OK	NR
12	**Elm**	*Ulmus spp.*	Pale greyish brown. Straight but sometimes interlocked grain, course texture. Good bending properties.	580Kg/m3	OK	NR
13	**Guarea**	*a/ Guarea cedrata* *b/Guarea thompsonii*	Can be brought separately. Pinkish brown colour, sapwood pale. Fine texture, often interlocked grain. a/ occasionally exudes resin.	590Kg/m3 640Kg/m3	OK OK	NR OK
14	**Idigbo**	*Terminalia ivorensis*	Yellowish to pale yellowish brown colour heartwood, sapwood somewhat paler. Coarse texture. Discolours in contact with ferrous metal, can stain masonry if damp. Non-ferrous fittings or fastenings are recommended.	560Kg/m3	OK	NR
15	**Iroko**	*Milicia excelsa and m. regiam.*	Colour varies from yellowish brown to dark brown, with pale yellow sapwood. Interlocked grain, coarse texture. Very hard, strong.	660Kg/m3	OK	OK
16	**Keruing**	*Dipterocarpus spp.*	Numerous species of similar characteristics. Pinkish brown to dark brown heartwood, plain appearance. Sapwood grey. Straight grain, occasionally interlocked. Exudes resin, sometimes making finishing troublesome. Prone to severe distortion during drying.	740Kg/m3	OK	OK

Avg. Density = Average density @ 15% moisture content.

Frame Materials - Hardwoods

Item	Species	*Latin Name*	Characteristics	Avg. Density	Fire Door	
					FD30	FD60
17	**Lauan, Meranti, Seraya**	*Shorea spp. Parashorea spp.*	Name depends on origin: Philippines, Malaysia/Indonesia Sabah respectively. Produced from numerous species, the timber is sold in a wide variety of colour (dark red, red, light red, yellow, white) with wildly varying characteristics. Those with higher density are generally stronger, stiffer and more durable than those with lower density. Interlocked grain, coarse texture.	Dark Red 710Kg/m3 Light Red 550Kg/m3	OK OK	OK NR
18	**Mahogany, African**	*Khaya spp.*	Reddish brown heartwood, yellowish brown sapwood. Interlocked grain, moderately coarse texture.	530Kg/m3	OK	NR
19	**Mahogany, American**	*Swietenia spp.*	Pale to dark reddish brown. Some interlocked grain, texture slightly coarse: gives excellent finish.	560Kg/m3	OK	NR
20	**Makore**	*Teieghemella heckelii*	Lustrous, pinkish brown to dark red heartwood, paler sapwood. Straight grain, fine texture. Discolours in contact with ferrous metal. Tends to split on nailing.	640Kg/m3	OK	OK
21	**Maple, rock**	*Acer saccharum*	Pale brown heartwood, white sapwood. Straight grain, fine texture. A strong, taut timber, bends well. Stains, polishes well.	740Kg/m3	OK	OK
22	**Maple, soft**	*Acer rubrum, A. saccharinum*	Creamy white heartwood, sapwood indistinct. Similar to rock maple but softer, less strong.	610Kg/m3	OK	NR
23	**Niangon**	*Heritiera utilis, H. densiflora*	Pale sapwood, pink to reddish-brown heartwood. Interlocked grain gives stripy appearance, affects machining.	640Kg/m3	OK	OK
24	**Oak American, Red**	*Quercus spp*	Colour varies, depending on species, from pale yellow brown to reddish mid brown. Sapwood distinct, paler. Straight grain, all species medium texture except European, which may be coarse. Discolours in contact with ferrous metals. Non-ferrous fittings and fastenings are required. Nailing difficult, pre-bore. Difficult to dry, tendency to check, split and honeycomb.	Am.Red 790Kg/m3	OK	OK
25	**Oak American, White**	*Quercus spp*		Am.White 770Kg/m3	OK	OK
26	**Oak European**	*Quercus spp*		European 720Kg/m3	OK	OK
27	**Oak Japanese**	*Quercus spp*		Japanese 670Kg/m3	OK	OK
28	**Obeche**	*Triplochiton scleroxylon*	Pale straw coloured. Interlocked grain, moderately coarse even texture. A stable, lightweight, easy to work timber. Stains well. Not suitable for stairs.	390Kg/m3	NR	NR
29	**Poplar American - yellow**	*Liriodendron tuplipifera*	Yellowish to olive brown heartwood with some dark streaks, whitish sapwood. Straight grain, fine even texture. Smooth finish, good nailing and staining.	510Kg/m3	OK	NR
30	**Ramin**	*Gonystylus spp.*	White to pale straw colour. Straight grain, fine texture. Splits on nailing. Stains well. Not suitable for stairs.	670Kg/m3	OK	OK
31	**Sapele**	*Entandrophragma cylindricum*	Medium to dark reddish brown heartwood with a pronounced stripe. Sapwood whitish. Interlocked grain, fine texture.	640Kg/m3	OK	OK
32	**Sycamore**	*Acer pseudoplantanus*	White to yellowish, lustrous. Generally straight grain, fine even texture.	630Kg/m3	OK	NR
33	**Teak (Burma)**	*Tectona grandis*	Golden brown heartwood sometimes with dark markings, pale yellowish brown sapwood. Straight or wavy grain, course texture. Very stable. Pre-boring recommended for nailing.	660Kg/m3	OK	OK
34	**Utile**	*Entandrophragma utile*	Reddish or purplish brown heartwood, pale sapwood. Interlocked grain, open texture.	660Kg/m3	OK	OK
35	**Walnut (African)**	*Lovoa trichilioides*	Bronze brown heartwood, with occasional black streaks, distinct buff coloured sapwood. Interlocked grain, fine texture.	560Kg/m3	OK	NR
36	**Walnut (American)**	*Juglans nigra*	Rich dark brown heartwood, pale sapwood. Grain varies from straight to curly, texture course.	660Kg/m3	OK	OK
37	**Wenge**	*Millettia laurentii*	Sapwood whitish, heartwood dark brown with fine blackish veining. Straight grained, coarse texture. Difficult to polish.	880Kg/m3	OK	OK

Avg. Density = Average density @ 15% moisture content.