

Doorframes



Frame Materials & Specifications:

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

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

Frame material for FD30 doorsets may be softwood or hardwood of not less than 450kgs/m³ density @15% moisture content. OR, Min. 700kgs/m³ MDF. Additionally, Falcon Panel Products Ltd. 'Streframe' can be used for all approved FD30 fire door applications.

Excepting where the use of MDF frames is specifically approved (**See Sections 2 & 4**), frame material for FD60 doorsets must generally be hardwood of not less than 640kgs/m³ @ 15% moisture content. However, Falcon Panel Products Ltd. 'Streframe' medium density hardwood is approved with reduced dimensional applications for FD60 Fire Door applications.

The minimum quality standard for frames for fire doorset applications is joinery quality, J30 specification is to low for doorset usage.

NOTE: All timber used for fire rated doorset including frames, lippings & beading, must exceed Class J30 as specified in BS EN 942 : 2007, any defects should be repaired and, as far as possible, orientated away from areas of intumescent seal activation.

Frames should 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 should 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, as required by reference to BS EN 942 : 2007 for internal joinery designed for use in heated buildings providing room temperatures of 12°C to 21°C.

NOTE: For 'Q' Mark fire rated doorsets refer to 'Section 2 - Strebord Fire Door Applications'.



Falcon Panel Products Ltd., recommends the use of timber obtained from FSC approved sources.

Doorframes

Structures:

It is the Designers responsibility to ensure that structures to receive fire doorsets 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 Strebord[®] based doorsets anticipates that the doorsets will be fitted into blockwork, brickwork, concrete, (*or similar*). OR, timber stud partitioning.

Where doorsets are to be fitted into metal stud partitioning, the hollow metal stud at the doorset 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 should be treated in accordance with the recommendations to be found by reference to BS 8214 : 2008 according to performance. (*See also Section 14 - Fire Door Installation*).

Architrave:

The use of architrave is recommended for fire doors. These should be Min. 12mm thickness and conform with the material specifications applicable to frames for the relevant fire performance. The architrave should cover the gap between the frame and the surrounding structure. (*See Section 14 - Fire Door Installation*).

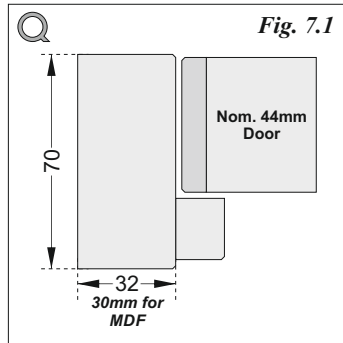
Where the doorset is fitted within the partition thickness, the architrave should be scribed on site to suit the wall conditions.

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 doorsets. These materials must be used strictly in accordance with the manufacturers handling and use instructions.



Minimum Recommended Frame Dimensions FD30 Doorsets.

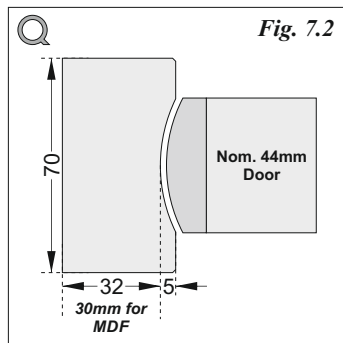
ADVICE: MDF frames may be substituted for softwood or hardwood frames for FD30 applications. See Sections 2 and 4 for further details.



Recommended minimum frame dimensions for FD30 Single Action Doorsets.

- Frame material to be softwood or hardwood of minimum 450kg/m³ density (@15% moisture content), complying with Class J30 BS EN 942 : 2007.
- 700kg/m³ density MDF.
- Falcon Panel Products Ltd. 'Streframe' medium density hardwood.

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

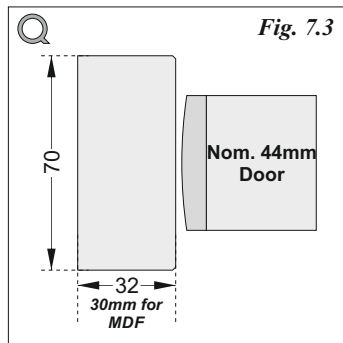


Recommended minimum frame dimensions for FD30 Double Action - Hanging Jambs

- Frame material to be softwood or hardwood of minimum 450kg/m³ density (@15% moisture content), complying with Class J30 BS EN 942 : 2007.
- 700kg/m³ density MDF.
- Falcon Panel Products Ltd. 'Streframe' medium density hardwood.

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.



Recommended minimum frame dimensions for FD30 Double Action - Closing Jambs

- Frame material to be softwood or hardwood of minimum 450kg/m³ density (@15% moisture content), complying with Class J30 BS EN 942 : 2007.
- 700kg/m³ density MDF.
- Falcon Panel Products Ltd. 'Streframe' medium density hardwood.

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



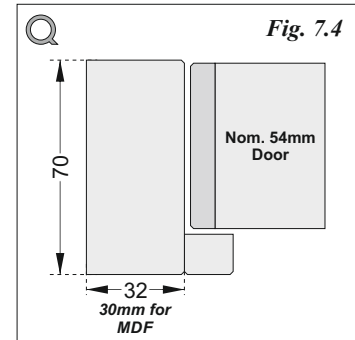
Minimum Recommended Frame Dimensions FD60 Doorsets.

WARNING: For FD60 fire rated doorsets, MDF frames may be used with limited applications with regard to intumescent seal types and doorset dimensions. See Section 2 pages 2.G1 & 2G.2. and Section 4 pages 4.116 ~ 4.119 for further details.

Q Recommended minimum frame dimensions for FD60 Single Action Doorsets.

- Frame material to be hardwood of minimum 640kg/m³ density (@15% moisture content), complying with Class J30 BS EN 942 : 2007.
- 700kg/m³ density MDF. *(Limited applications)*
- Falcon Panel Products Ltd. 'Streframe' medium density hardwood. *(Limited applications - See pages 7.11 & 12)*

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

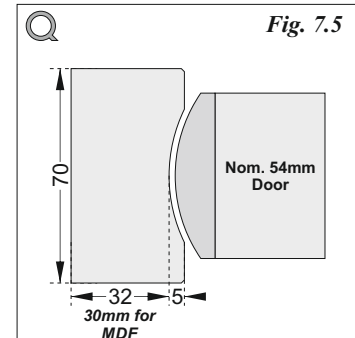


Q Recommended minimum frame dimensions for FD60 Double Action - Hanging Jamb

- Frame material to be hardwood of minimum 640kg/m³ density (@15% moisture content), complying with Class J30 BS EN 942 : 2007.
- 700kg/m³ density MDF. *(Limited applications)*
- Falcon Panel Products Ltd. 'Streframe' medium density hardwood. *(Limited applications - See pages 7.11 & 12)*

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

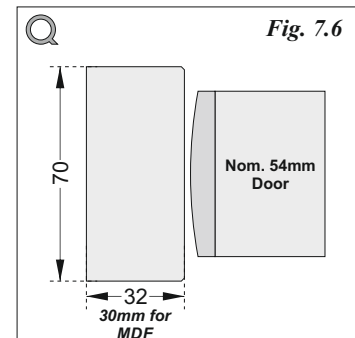
NOTE: The radius at the hanging stile will usually be determined by the location of the double action pivot centre. A 50mm radius to the door edge will suit most popular brands of double action fittings, with a 52mm radius scallop in the frame.



Q Recommended minimum frame dimensions for FD60 Double Action - Closing Jamb

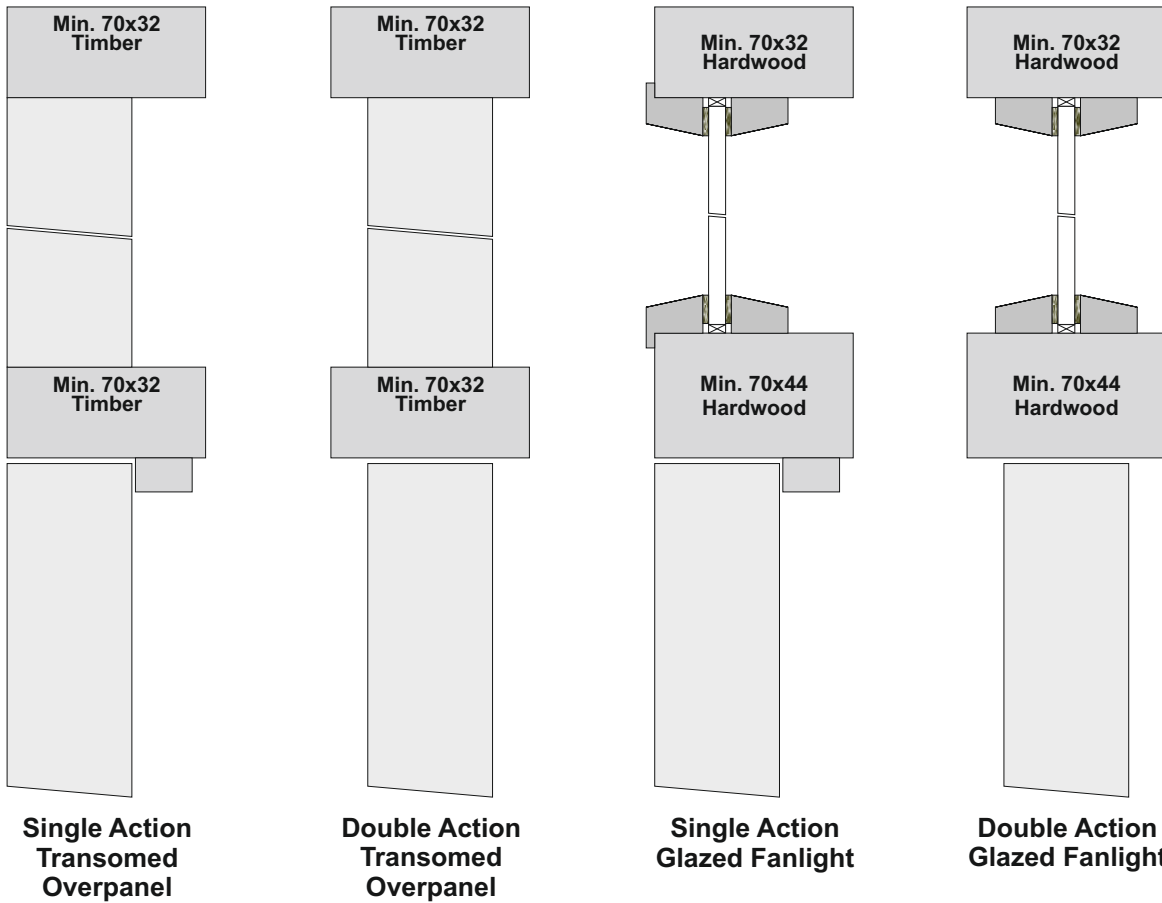
- Frame material to be hardwood of minimum 640kg/m³ density (@15% moisture content), complying with Class J30 BS EN 942 : 2007.
- 700kg/m³ density MDF. *(Limited applications)*
- Falcon Panel Products Ltd. 'Streframe' medium density hardwood. *(Limited applications - See pages 7.11 & 12)*

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



Q Doorsets with Transoms - General

Fig. 7.7



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

Q Transomed Overpanels:

For doorsets with transomed overpanels, the transom rail must be softwood or hardwood (to suit fire rating) with minimum section of 70x32mm. Please see section 2 of this manual for maximum sizes allowed.

The overpanel must be located to align with the centre thickness of the door leaf and secured using steel screw fixings 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. Overpanels must be fitted tight to the frame with no gaps.

Q Glazed Fanlights:

Transom rails for doorset designs using glazed fanlights for either FD30 or FD60 applications are to be of a minimum 70x44mm section and manufactured using hardwood with a minimum density of 640kg/m³ (@15% moisture content).

The glass and glazing system used for the fanlight must be able to demonstrate a fire performance that is at least equal to the required doorset performance when tested as a window or screen in accordance with BS476 Pt.22 : 1987 or BS EN 1634-1 : 2008.

NOTE 1: Storey height doorsets are not approved for use with MDF frames.

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

NOTE 3: See Section 6 - Glass & Glazing - pages 6.28, 6.30, 6.31 & 6.32 for further details when using Norsound Vision 30 & Vision 60 glazing systems.



Frame Designs for Fire Door Applications:

The design of frames for doorsets 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 frames are produced from 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 BM TRADA 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.

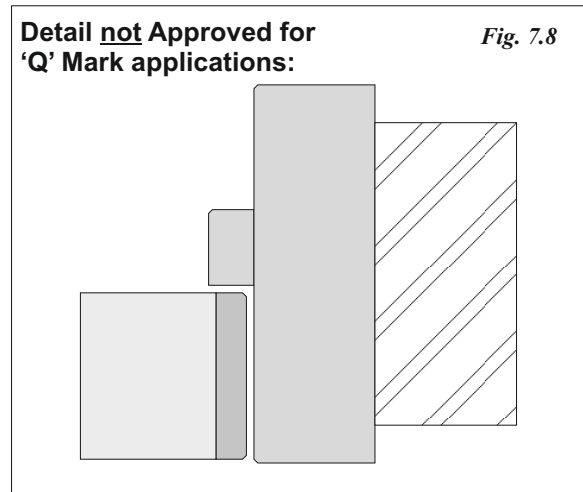
Half Lapped Joints.

Mitred joints.

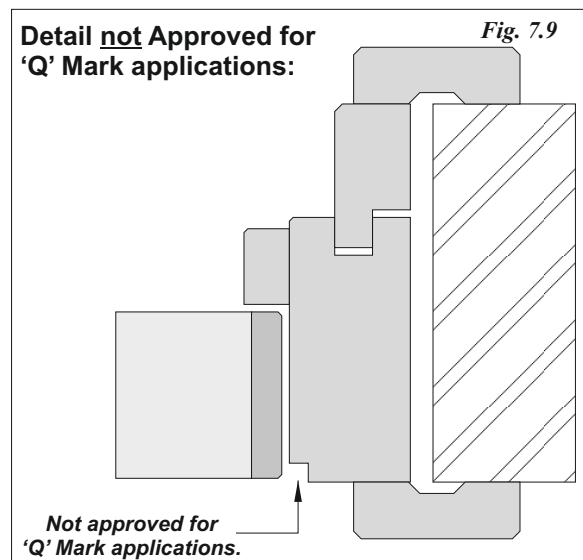
Frames may be assembled using dry joints with mechanical (*screw*) fixings or glued and screw fixed.

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

Frames projecting beyond the face of the wall / partition:



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

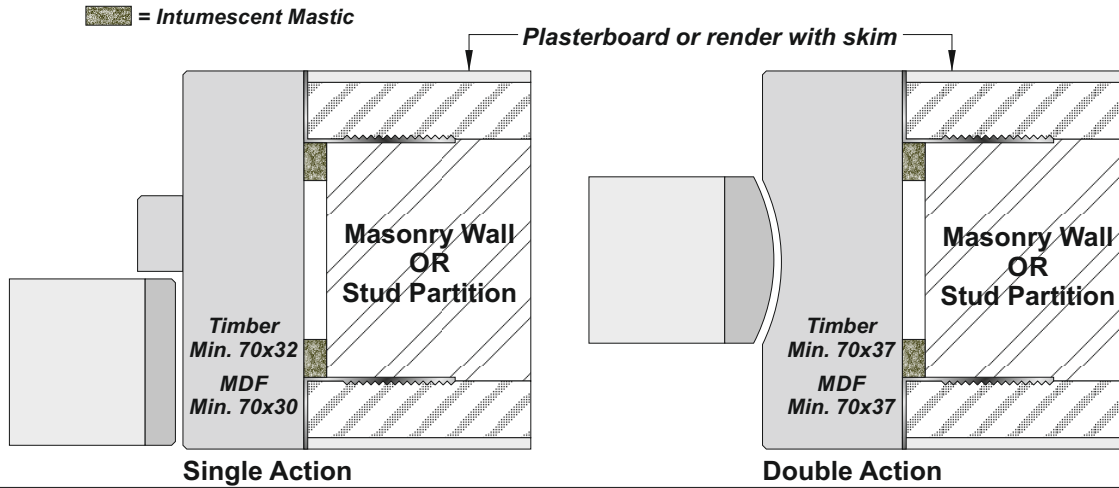


The following details illustrate guidance details for frame designs that have been 'Q' Mark assessed as being suitable for fire door applications for performances up to FD60 (*BS476 Pt.22*) subject to the use of materials that are approved for the particular performance by reference to *Section 2 - Fire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

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

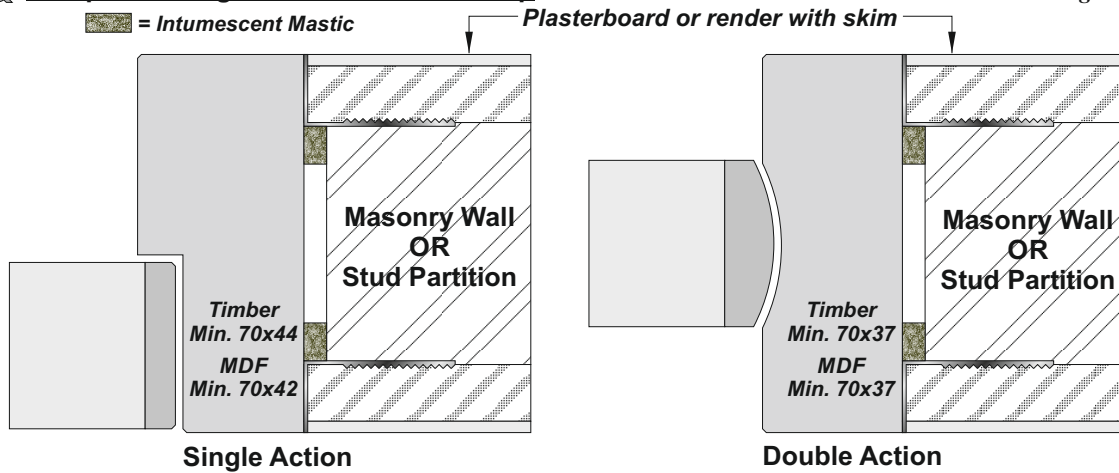
Q One piece lining with planted doorstop

Fig. 7.10



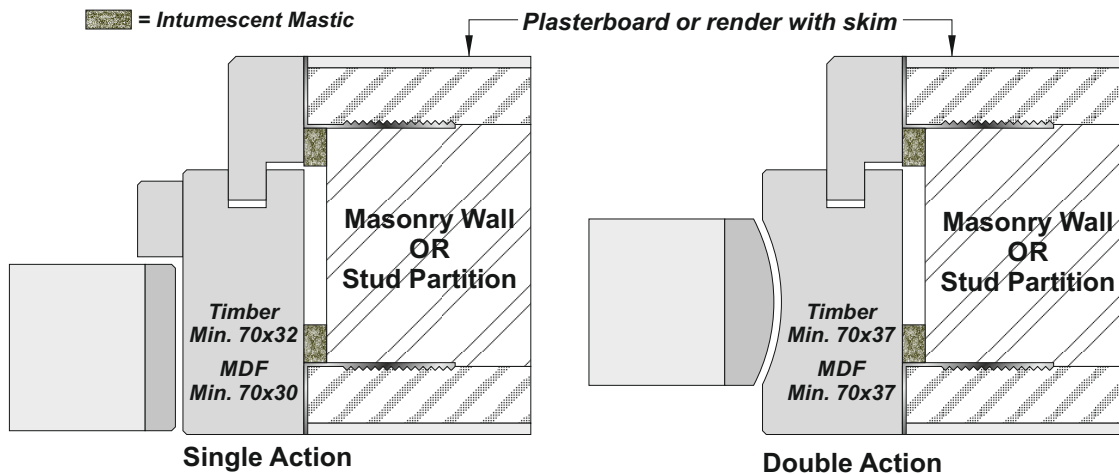
Q One piece lining with moulded doorstop

Fig. 7.11

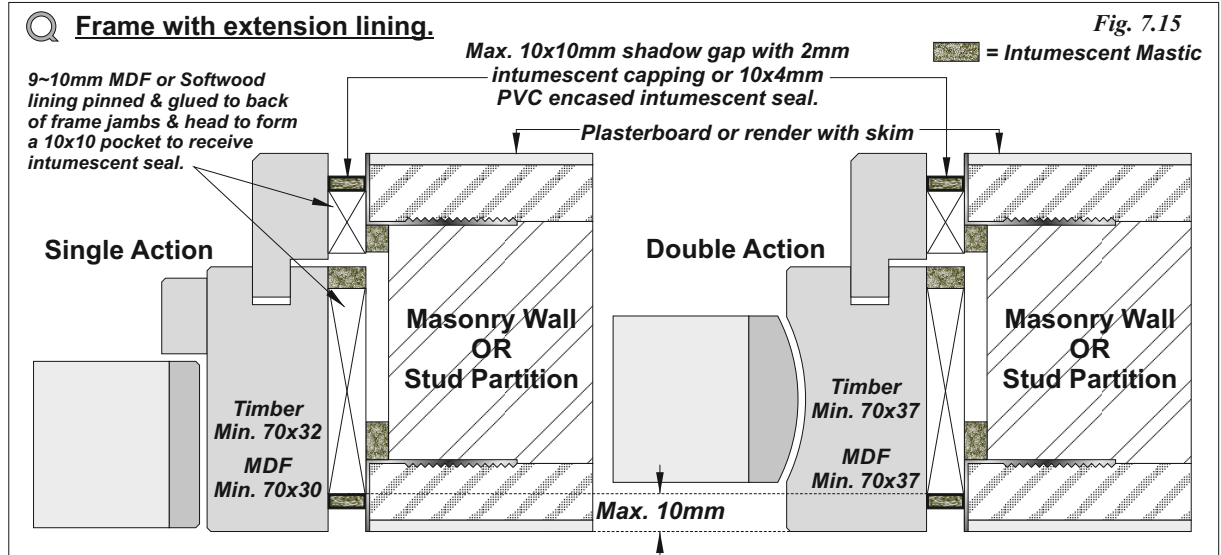
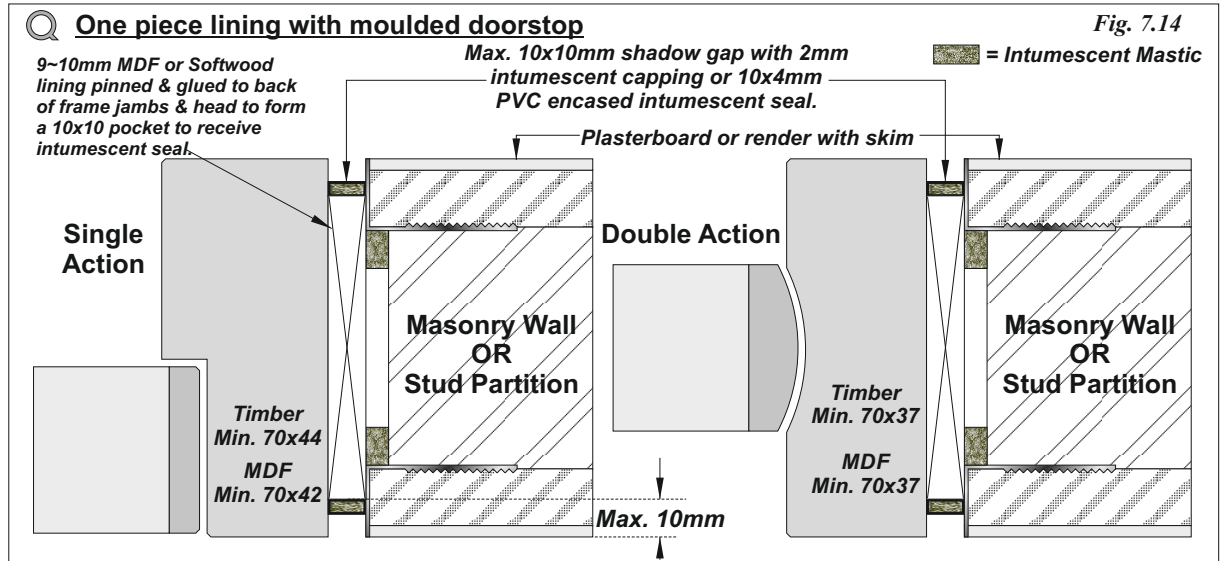
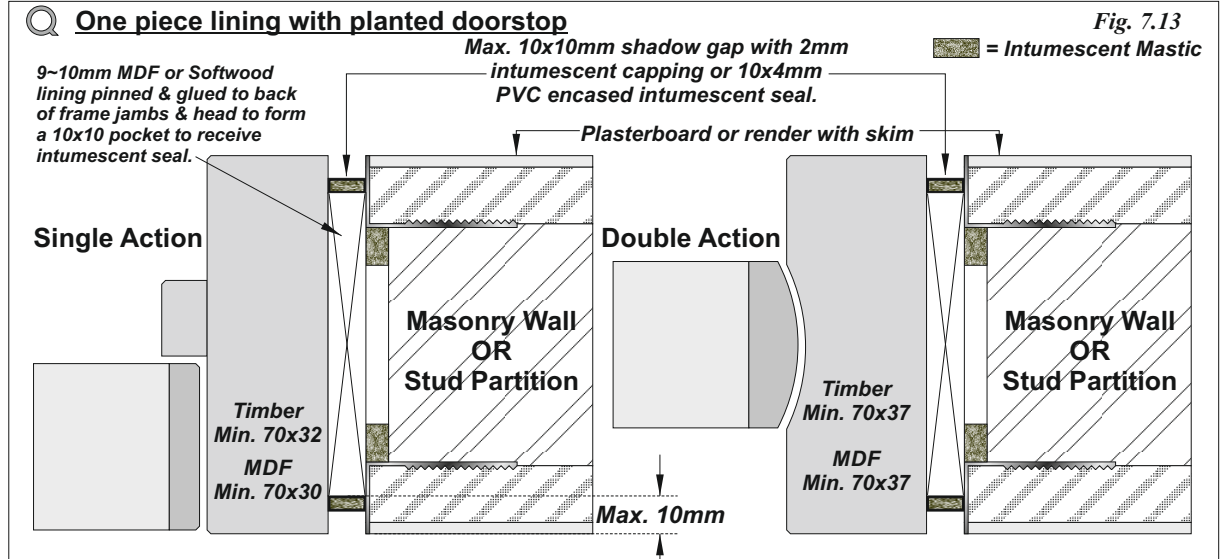


Q Frame with extension lining.

Fig. 7.12



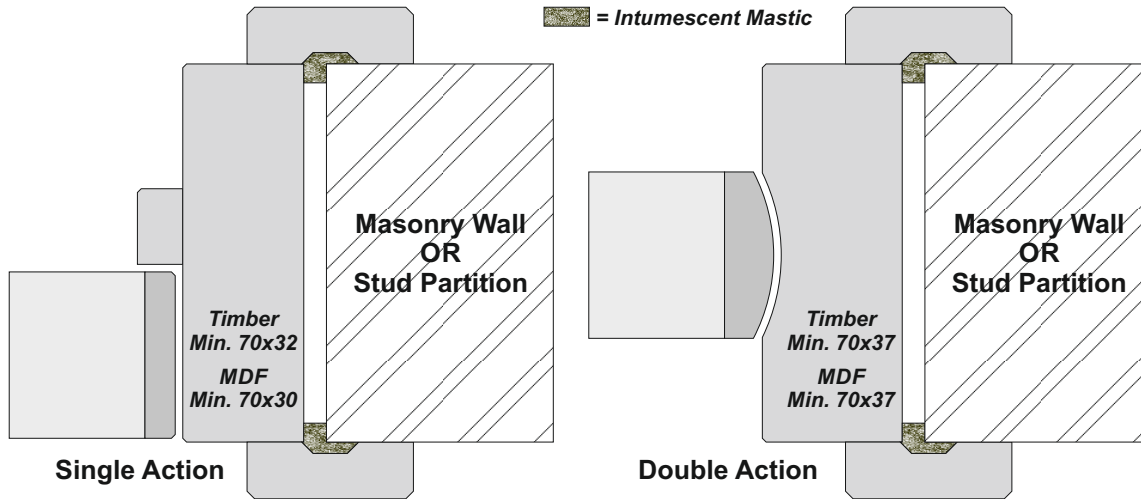
Shadow Gap Frame - (1st. Fix).



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

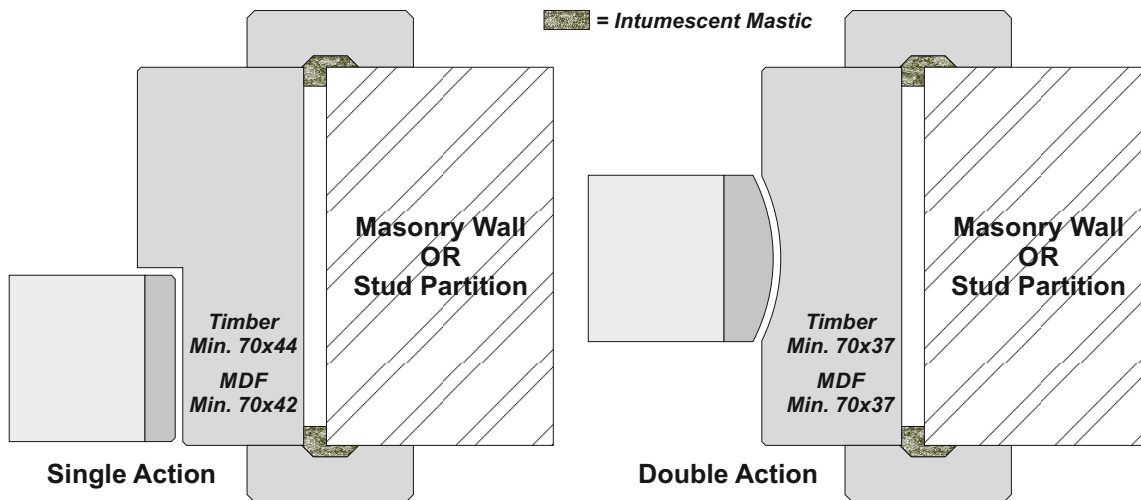
Q One piece lining with planted doorstop

Fig. 7.16



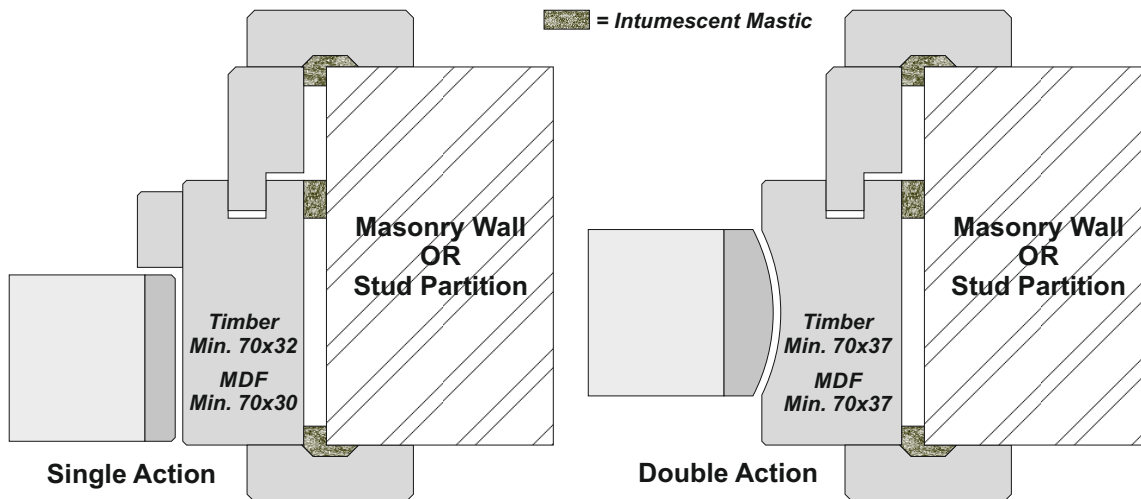
Q One piece lining with moulded doorstop

Fig. 7.17



Q Frame with extension lining.

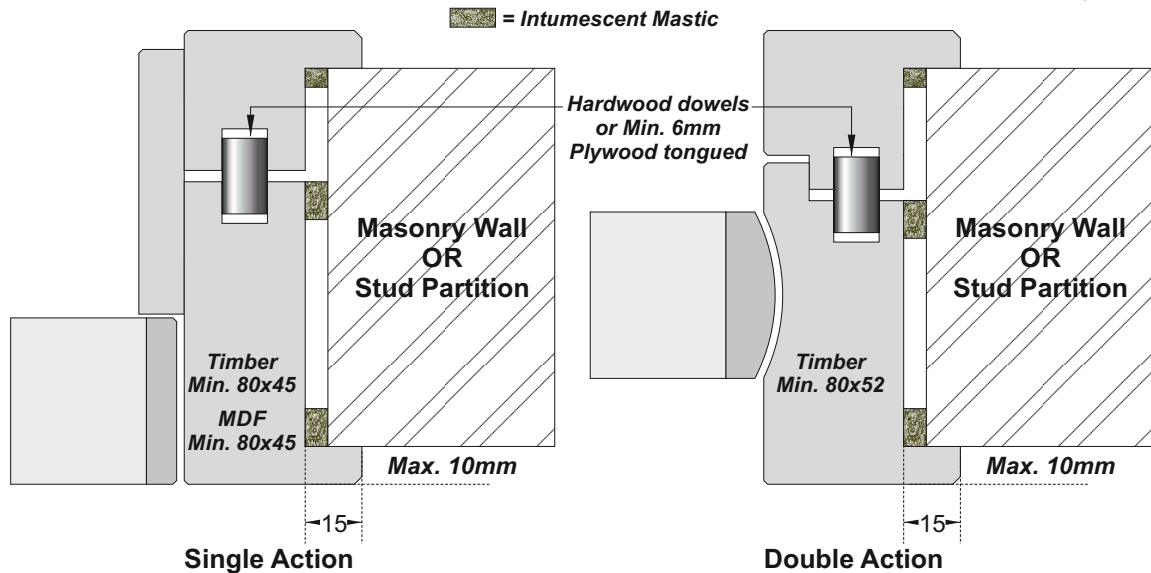
Fig. 7.18



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

Q Two piece frame with integral architrave.

Fig. 7.19



Alternative Frame Intumescent Sealing:

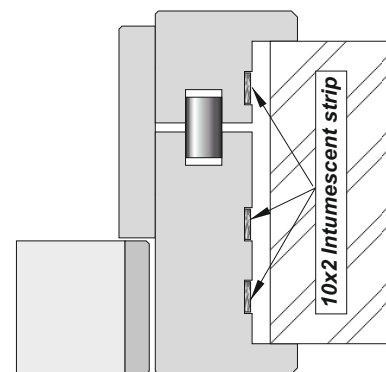
The back of frame components can be grooved to receive low pressure intumescent seals that can be fitted to the frames before installation to provide for an alternative to the use of intumescent mastics.

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.

Q

Fig. 7.21

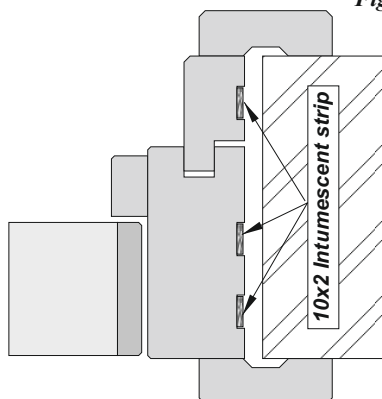


Approved Intumescent material suitable for this application:

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

Q

Fig. 7.20



Further guidance relating to the installation of fire rated doorsets with wood frames is given by reference to Section 14- Fire Door Installation of this manual.



Doorframes

Streframe®

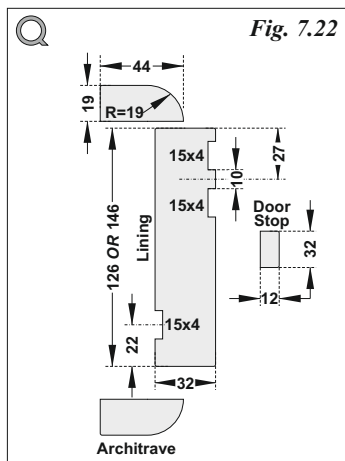
The Falcon Panel Products Ltd. *Streframe®* provides users with a material that can be used for the construction of frames to compliment Strebord based door constructions. *Streframe®* is suitable as a frame material for all 'Q' Mark approved FD30 fire door applications and has been tested (*BS476 : Pt.22*) to provide for useful dimensional applications for FD60 performances (*See 'Q' Mark approved dimensional applications below*). *Streframe®* can also be used as a frame material for all acoustic door applications identified in this manual.

Streframe® is a Nom. 450kg/m³ hardwood obtained from sustainable, managed forests and supplied with full FSC (*Forest Stewardship Council*) certification.

The tight grain and uniform (*light mahogany*) colour provides for a timber offering a consistency of appearance that is ideally suited to receive a wide range of finishes including painting, staining and clear lacquer finishing.

Streframe® is available in minimum packs of 2m³ as sawn boards in 38mm (1½in) sections for subsequent processing by users to suit particular project requirements. Sawn boards are available in 2100, 2200, 2300, 2400, & 2500mm lengths with board widths ranging from 135mm in 10mm increments up to 205mm.

Additionally, *Streframe®* can be supplied as machined sections in 2100, 2200, 2300, 2400 & 2500mm lengths as detailed below:

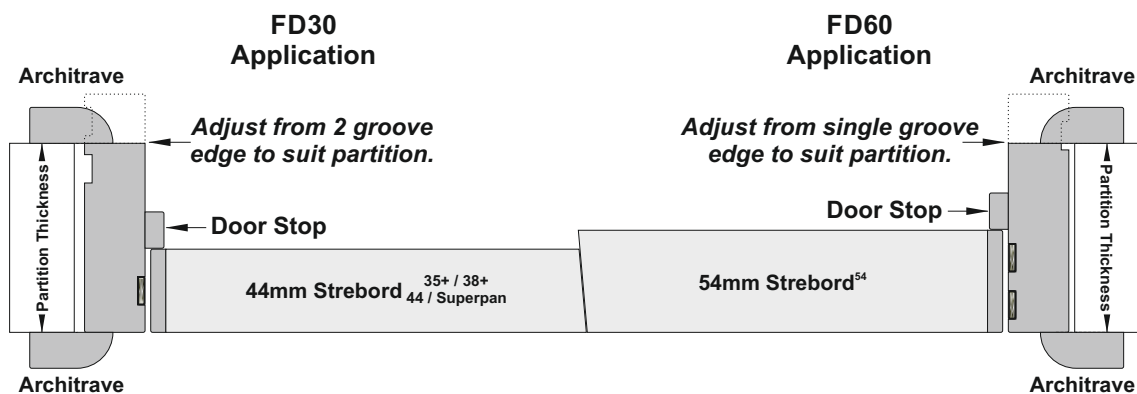


Streframe® Machined Sections		
Ref:	Section (mm)	Lengths (mm)
126 Lining	126x32	2100, 2200, 2300, 2400, 2500.
146 Lining	146x32	2100, 2200, 2300, 2400, 2500.
Door Stop	32x12	2100, 2200, 2300, 2400, 2500.
Architrave	44x19	2100, 2200, 2300, 2400, 2500.

Notes:

- 1: All components supplied with pencil round to corners.
- 2: Linings grooved to receive 15x4 intumescent seals.
- 3: Min. pack size = 2m³

Streframe® Adjustment & Assembly - FD30 & FD60 Fig. 7.23



NOTE: Intumescent seals not included in supply.

Machined section *Streframe®* can be used for all single action FD30 applications using any 15x4 intumescent seal approved by reference to Sections 2 & 4. See pages 7.11 & 7.12 for 'Q' Mark approved FD60 applications.



'Streframe'
**Door Height Assemblies &
 Storey Height Assemblies with Transom**

Strebord^{®54}
 Streframe[®] Door Core

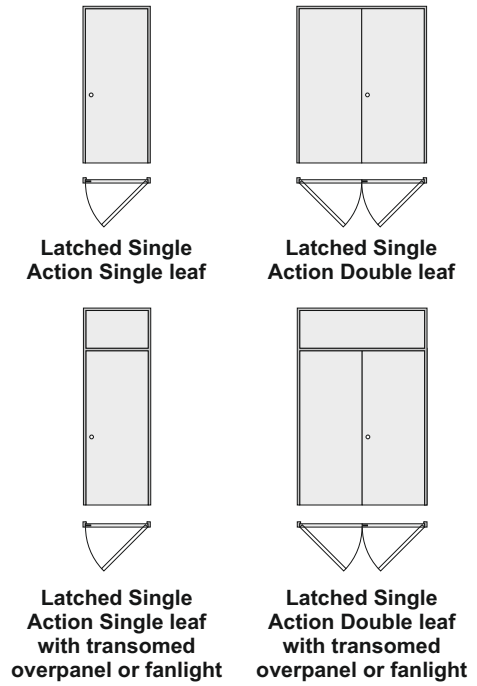
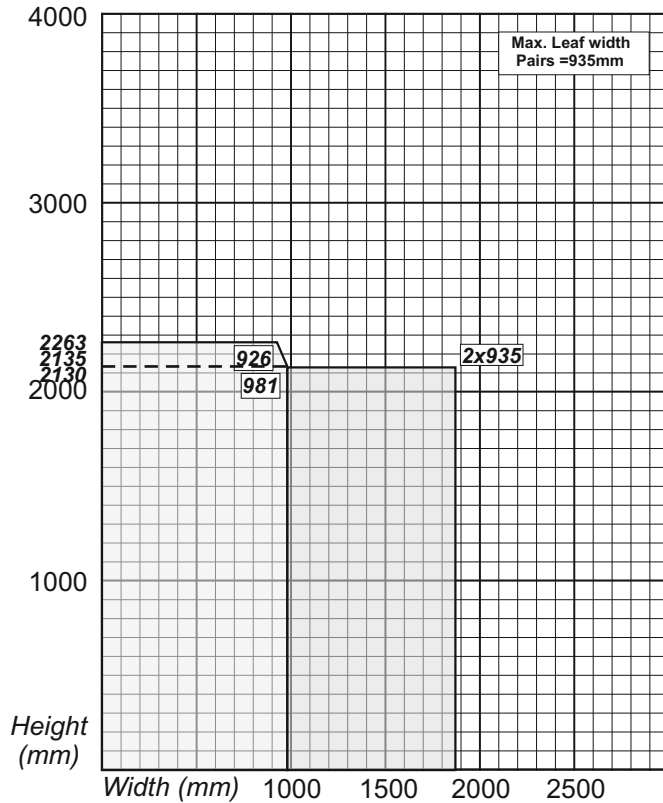
FD60 - BS476 Pt.22 :1987

v9.1

**2x15x4mm - Any PVC encased
 Intumescent Approved by
 Reference to Section 2**

LATCHED DOORSETS

7.11



Configuration		Height (mm)	Width (mm)
Latched Single Action Single Door (LSASD)	From	2135	981
	To	2263	926
Latched Single Action Double Door (LSADD)	From	2130	935
	To	2130	935

Doorframes

Maximum Glazed Area See Section 6:	Single door doorset Double door doorset	0.72m ²	Maximum Overpanel height	Single door doorset Double door doorset	2000mm 1500mm
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Frame Specification 'Streframe [®] ' NOTE: Machined section Streframe cannot be used for double action applications.	Single door doorset Double door doorset	Falcon Panel Products Ltd. Streframe [®]
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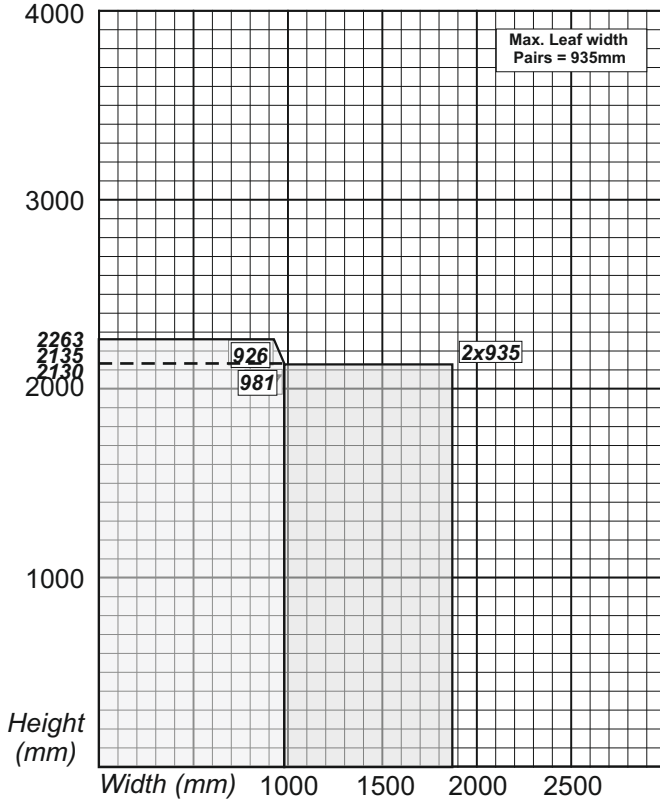
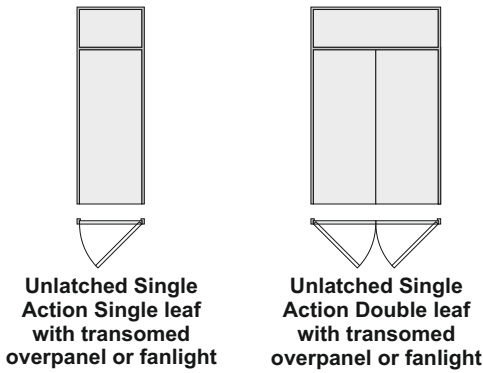
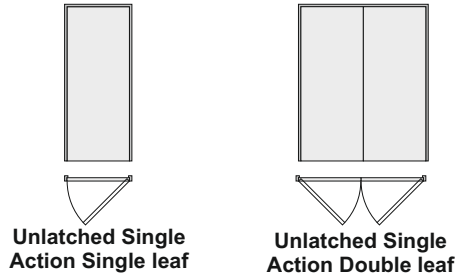
Intumescent Seals 2x15x4mm PVC encapsulated Any approved for FD60 applications by reference to Section 2 See Section 4 - Intumescent Seals and Section 9 - Hardware for further information	Head: 2No. 15x4mm exposed, separated by 10mm and fitted centrally in the leaf or frame head. Jambs & Overpanel: 2No. 15x4mm exposed, separated by 10mm and centrally fitted to leaf or frame. Meeting edges: Square: 2No. 15x4mm spaced 10mm apart and centrally fitted in one leaf. Rebated: NOT APPROVED
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UNLATCHED DOORSETS

'Streframe'
**Door Height Assemblies &
Storey Height Assemblies with Transom**

**2x15x4mm - Any PVC encased
Intumescent Approved by
Reference to Section 2**



Configuration		Height (mm)	Width (mm)
Unlatched Single Action Single Door (ULSASD)	From	2135	981
	To	2263	926
Double Action Single Door (DASD)	From	2135	963
	To	2220	926
Unlatched Single Action Double Door (ULSADD)	From	2130	935
	To	2130	935
Double Action Double Door (DADD)	From	2130	935
	To	2130	935

Maximum Glazed Area See Section 6:	Single door doorset Double door doorset	0.72m ²	Maximum Overpanel height	Single door doorset Double door doorset	2000mm 1500mm
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Frame Specification 'Streframe' [®] NOTE: Machined section Streframe cannot be used for double action applications.	Single door doorset Double door doorset	Falcon Panel Products Ltd. Streframe [®]
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Intumescent Seals 2x15x4mm PVC encapsulated Any approved for FD60 applications by reference to Section 2 See Section 4 - Intumescent Seals and Section 9 - Hardware for further information	Head: 2No. 15x4mm exposed, separated by 10mm and fitted centrally in the leaf or frame head. Jams & Overpanel: 2No. 15x4mm exposed, separated by 10mm and centrally fitted to leaf or frame. Meeting edges: Square: 2No. 15x4mm spaced 10mm apart and centrally fitted in one leaf. Rebated: NOT APPROVED
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Softwood and Hardwoods for use with frames for Strebord® 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 : 2008 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	<i>Pseudotsuga menziesii</i>	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	<i>Tsuga heterophylla</i>	Pale brown in colour. Growth rings distinguishable. 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	<i>Araucaria angustifolia</i>	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	<i>Pinus contorta</i>	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	<i>Pinus ponderosa</i>	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	<i>Pinus echinata, Pinus taeda & others</i>	Yellow / reddish brown resinous heartwood, paler sapwood. Growth rings distinct, coarse appearance. Paints fairly satisfactorily	590Kg/m3	OK	NR
7	Pine, sugar	<i>Pinus lambertiana</i>	Pale straw to reddish brown heartwood, white sapwood. Soft even texture. Paints well.	430Kg/m3	NR	NR
8	Redwood: Scots pine	<i>Pinus sylvestris</i>	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	<i>Thuja plicata</i>	Variable reddish brown heartwood, distinct white sapwood. Straight grain, coarse 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	<i>Picea abies and Abies alba</i>	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.

NOTE:

The densities for Softwoods and Hardwoods described in BS EN 942 are the average densities for the particular species at 15% moisture content.

Some species listed as 'NR' may be used for FD30 and FD60 applications where 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/m³ 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	<i>Hallan ciliata</i>	Pale brownish coloured heartwood and sapwood, plain appearance. Medium / fine texture. Tendency to split on nailing. Stains well	580Kg/m3	OK	NR
2	Afromosia	<i>Pericopsis elata</i>	Deep brown heartwood, pale brown sapwood. Medium / fine texture. Discolours in contact with ferrous metal if damp. Pre-bore before nailing.	710Kg/m3	OK	OK
3	Afzelia	<i>Afzelia spp.</i>	Reddish brown timber, straw coloured spwood. Grain often interlocked, texture course. Pre-bore before nailing. Can stain masonry and textiles if damp.	830Kg/m3	OK	OK
4	Agba	<i>Gossweilerodendron balsamiferum</i>	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	<i>Fraxinus americana, F. nigra & others.</i>	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	<i>Fraxinus excelsior</i>	Generally white to pale brown. Medium / course texture. Very good bending timber, very tough.	710Kg/m3	OK	OK
7	Beech, European	<i>Fagus sylvatica</i>	Pale reddish brown; if steamed, pink. Fine even texture. Good bending. Stains, polishes well.	720Kg/m3	OK	-
8	Birch, yellow	<i>Betula alleghaniensis</i>	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	<i>Cedrela odorata, C. fissilis</i>	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	<i>Prunus serotina</i>	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	<i>Castanea sativa</i>	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	<i>Ulmus spp.</i>	Pale greyish brown. Straight but sometimes interlocked grain, course texture. Good bending properties.	580Kg/m3	OK	NR
13	Guarea	a/ <i>Guarea cedrata</i> b/ <i>Guarea thompsonii</i>	Can be brought separately. Pinkish brown colour, sapwood pale. Fine texture, often interlocked grain. a/ occasionally exudes resin.	590Kg/m3 640Kg/m3	OK	NR OK
14	Idigbo	<i>Terminalia ivorensis</i>	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	<i>Milicia excelsa</i> and <i>m. regia</i>	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	<i>Dipterocarpus spp.</i>	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

Doorframes

Frame Materials - Hardwoods

Item	Species	Latin Name	Characteristics	Avg. Density	Fire Door	
					FD30	FD60
17	Lauan, Meranti, Seraya	<i>Shorea spp.</i> <i>Parashorea spp.</i>	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 widely 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 NR
18	Mahogany, African	<i>Khaya spp.</i>	Reddish brown heartwood, yellowish brown sapwood. Interlocked grain, moderately coarse texture.	530Kg/m3	OK	NR
19	Mahogany, American	<i>Swietenia spp.</i>	Pale to dark reddish brown. Some interlocked grain, texture slightly coarse: gives excellent finish.	560Kg/m3	OK	NR
20	Makore	<i>Teiaghemella heckelii</i>	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	<i>Acer saccharum</i>	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	<i>Acer rubrum,</i> <i>saccharinum</i>	A. Creamy white heartwood, sapwood indistinct. Similar to rock maple but softer, less strong.	610Kg/m3	OK	NR
23	Niangon	<i>Heritiera utilis,</i> <i>densiflora</i>	H. Pale sapwood, pink to reddish-brown heartwood. Interlocked grain gives stripey appearance, affects machining.	640Kg/m3	OK	OK
24	Oak American, red	<i>Quercus spp</i>	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.	Am.Red 790Kg/m3	OK	OK
25	Oak American, white	<i>Quercus spp</i>	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.White 770Kg/m3	OK	OK
26	Oak European	<i>Quercus spp</i>		European 720Kg/m3	OK	OK
27	Oak Japanese	<i>Quercus spp</i>		Japanese 670Kg/m3	OK	OK
28	Obeche	<i>Triplochiton scleroxylon</i>	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	<i>Liriodendron tuplipifera</i>	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	<i>Gonystylus spp.</i>	White to pale straw colour. Straight grain, fine texture. Splits on nailing. Stains well. Not suitable for stairs.	670Kg/m3	OK	OK
31	Sapele	<i>Entandrophragma cylindricum</i>	Medium to dark reddish brown heartwood with a pronounced stripe. Sapwood whitish. Interlocked grain, fine texture.	640Kg/m3	OK	OK
32	Sycamore	<i>Acer pseudoplatanus</i>	White to yellowish, lustrous. Generally straight grain, fine even texture.	630Kg/m3	OK	NR
33	Teak (Burma)	<i>Tectona grandis</i>	Golden brown heartwood sometimes with dark markings, pale yellowish brown sapwood. Straight or wavy grain, coarse texture. Very stable. Pre-boring recommended for nailing.	660Kg/m3	OK	OK
34	Utile	<i>Entandrophragma utile</i>	Reddish or purplish brown heartwood, pale sapwood. Interlocked grain, open texture.	660Kg/m3	OK	OK
35	Walnut (African)	<i>Lovoa trichilioides</i>	Bronze brown heartwood, with occasional black streaks, distinct buff coloured spwood. Interlocked grain, fine texture.	560Kg/m3	OK	NR
36	Walnut (American)	<i>Juglans nigra</i>	Rich dark brown heartwood, pale sapwood. Grain varies from straight to curly, texture course.	660Kg/m3	OK	OK
37	Wenge	<i>Millettia laurentii</i>	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.

Wood Doors with Metal Frames - Considerations:

Under fire conditions, steel (*and most metals*) will heat up and expand on the fire side first. Most metals are good conductors of heat, and the temperature may rise quite rapidly on the non fire side with a risk of premature failure due to ignition of combustible material on the non fire side as a consequence of this thermal bridging.

When wood and wood based products are subjected to fire conditions, any moisture in the product will attempt to move away from the heat source and will be evident as 'sweating' on the non fire side. Further, the wood on the fire side will char. The charring provides for a fire retardant layer but this is also associated with shrinkage on the fire side.

The effect of these conditions is that the steel tends bow towards the fire while wood based products bow in the opposite direction. If the differential bowing becomes excessive gaps will be created between the door and the frame giving rise to failures under fire test conditions.

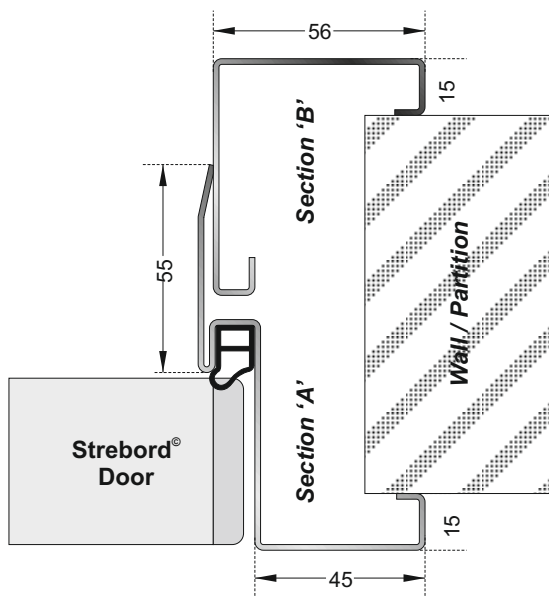
One method for delaying the transfer of heat through a metal product is to provide for a heat absorbing facility. In the case of metal door frames, this can be achieved back filling hollow metal frames with cementitious materials e.g. mortar or concrete.

NOTE: Plasterboard, mineral fibre, glass fibre and ceramic wool should not be used for backfilling hollow metal frames.

For the reasons identified above, fire certification valid for use of wood based doors with wood frames is not valid for application to cover the use of wood based doors with metal frames.

Strebord® based doorsets have been successfully tested with hollow metal frames (*without backfilling*) for FD30 and FD60 applications.

Q Nordform Telescopic Mild Steel Frame *Fig. 7.24*



NOTE: Illustrated dimensions may be varied to suit Client requirements subject to tooling limitations.



See Appendix. Section 15 Appendix. page 15.36 for further information concerning Nordform Frames.

Further information can also be accessed by reference to:

www.nordform.co.uk

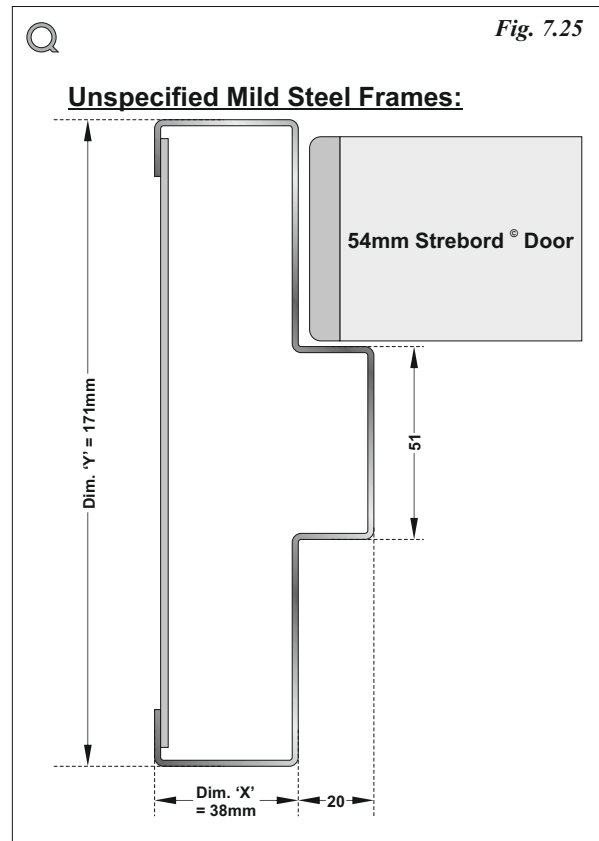
Q Nordform Telescopic Mild Steel Frame:

- Strebord® 44mm and 54mm doors have been successfully tested in conjunction with Nordform telescopic mild steel frame designs for FD30 and FD60 applications.
- The door leaves are to be hardwood lipped (640kg/m^3) on all edges.
- The Nordform telescopic frame is supplied in 2 sections. Section 'A' is a variable section manufactured to suit specified door leaf thicknesses while Section 'B' is manufactured to suit advised wall / partition thickness dimensions. **NOTE: This design facilitates installation into pre formed openings and provides for a means of adjustment to accommodate partition thickness tolerances.**
- The Nordform telescopic frame can be supplied with welded corners or as 'knock down' frame kits with bolted corners suitable for site assembly.
- Nordform frames are offered with primed finishes suitable for painting or factory powder coat finished to any RAL colour.
- Frames are generally factory prepared to receive most specified hardware. **NOTE: Hardware requirements must be determined in advance of manufacture of the frame.**

Q Strebord® 54 Doors with Unspecified Steel Frames:

Strebord®₅₄ doors can be used with mild steel or Grades 304 or 316 stainless steel for FD30 or FD60 applications subject to the following:

- Frames to be hollow metal or backfilled with mortar or concrete.
- The frame is to be manufactured using 1.5mm (+100% - 0%) mild or stainless steel.
- The frame section is to be as detailed by reference to Fig. 7.9 subject to the following permitted variants:
Dim. 'Y' = +/- 50%
(providing the frame reveal dimensions are maintained)
Dim. 'X' = +/- 30%
- Frame fixings must be of an appropriate type and length for the structural medium into which they are fixed and must include a minimum of 1No. fixing for no more than 600mm of vertical edge, with a fixing no more than 350mm from the top and bottom corners. Two fixings are required to the frame head.
- Gaps between the door frame and the structural opening must be protected using proprietary materials (e.g. intumescent mastics) that have been successfully tested for this applications.



Q Strebord® Doors with Metal Frames - General Requirements - Fire Door Applications:

1/ Strebord® based doors for use as fire doors with metal frames are to be hardwood lipped on all edges. Lipping thickness = 8 ~ 13mm with hardwood to be of a minimum density of 640kg/m³.

2/ Storey height doorsets using flush overpanels, overpanels with transoms or glazed fanlights are **not** approved for fire door applications.

3/ The doorsets are to be fitted with approved intumescent seals as defined by reference to Sections 2 and 4 of this manual.

4/ Frame installation fixings and fire stopping between the frame and the surrounding structure should comply with the frame manufacturer's test based installation guidance for use with wood doors with metal frames.

5/ Strebord® based doorsets with steel frames may be fitted into any of the following structure types:

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 45x45mm softwood stiffeners to the vertical edges).**



Acrovyn Clad Frames

Acrovyn Clad Timber Frames:

2mm Acrovyn can be formed to suit timber profiles using line bending machinery or purchased ready formed for adhering to timber cores.

When calculating doorset & component dimensions it is important to allow for the 2mm thickness of the Acrovyn.

Construction Specialities (UK) Ltd. (*UK Suppliers of Acrovyn*) recommend as follows:

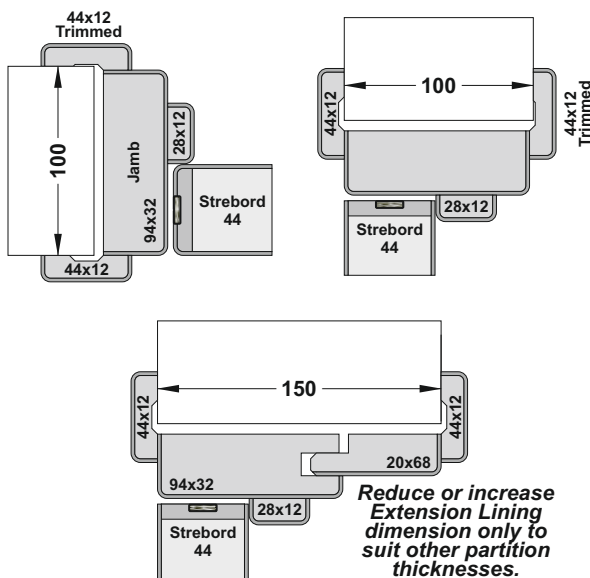
- Acclimatise Acrovyn in the installation environment (*or similar temperature*) for a minimum of 24hrs. prior to use.
- Surfaces to receive Acrovyn facings must be clean, smooth, dry and free of dust, grease or other foreign matter.
- Porous surfaces must be sealed using a suitable primer / sealer. *e.g. thinned adhesive solution.*
- The use of contact adhesives such as 'Fastbond 10', 'Fastbond 30', and 'Grabfast' should be used with the recommendation that the bonding is tested for 24hrs. before commencing manufacture.

Corners must be profile to receive Acrovyn. These details show a 'Typical Acrovyn clad Frame' and provide for a 3mm radius to all corners.

NOTE: Where corners are too tight the texture finishes to the Acrovyn can be adversely effected. Similar effects can occur if line bending or plastic forming machinery is operated at too high a temperature.

The following details illustrate a possible Acrovyn faced frame / doorset system for reference as a guide.

FD30 Acrovyn Clad Frames Fig. 7.26



For ease of manufacture and consistency of appearance it is recommended that the number of components required to make up a frame are kept to a minimum.

In this case a standard 100x94mm (ex. 100x38mm) timber lining is used for all applications for partitions of 100mm or more. A 'standard' 44x12mm (core size) architrave is used with trimming of one 'leg' of the architrave if necessary.

A 'standard' 28x12mm (core size) door stop is used.

All corners are have a 3mm radius profile to all corners where the Acrovyn is to be applied.

The 20x68mm (core size) 'Extension Lining' shown in this detail allows for a +/- 5mm adjustment without the need to further cut components. The 68mm dimension can be varied to suit actual partition thicknesses.

FD60 Acrovyn Clad Frames Fig. 7.27

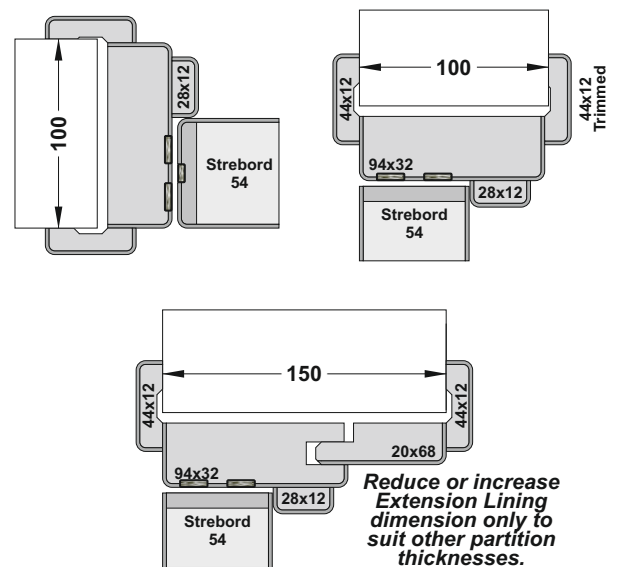


Fig. 7.26 shows a 'typical detail' for an FD30 application where the 15x4mm intumescent seal can be fitted to the door leaf.

For FD60 application 2No. 15x4mm perimeter intumescent seals are required. These need to be recessed into the jambs and Head (and transom where applicable).

The frame component shown for this FD60 application are otherwise identical to the components shown for the FD30 application.

An additional 10x4mm intumescent seal is required to the hanging stiles (and closing stiles for single leaf doorsets) to provide for separation of the door facing Acrovyn 'pans'.

The specification for the frame component core material must be as described by reference to pages 7.2 & 7.3.



Acrovyn Clad Timber Frames:

Acrovyn clad Transom Rails can be used with Acrovyn clad frames either with a Glazed Fanlight or with a solid (*Acrovyn clad as door leaves*) over panel.

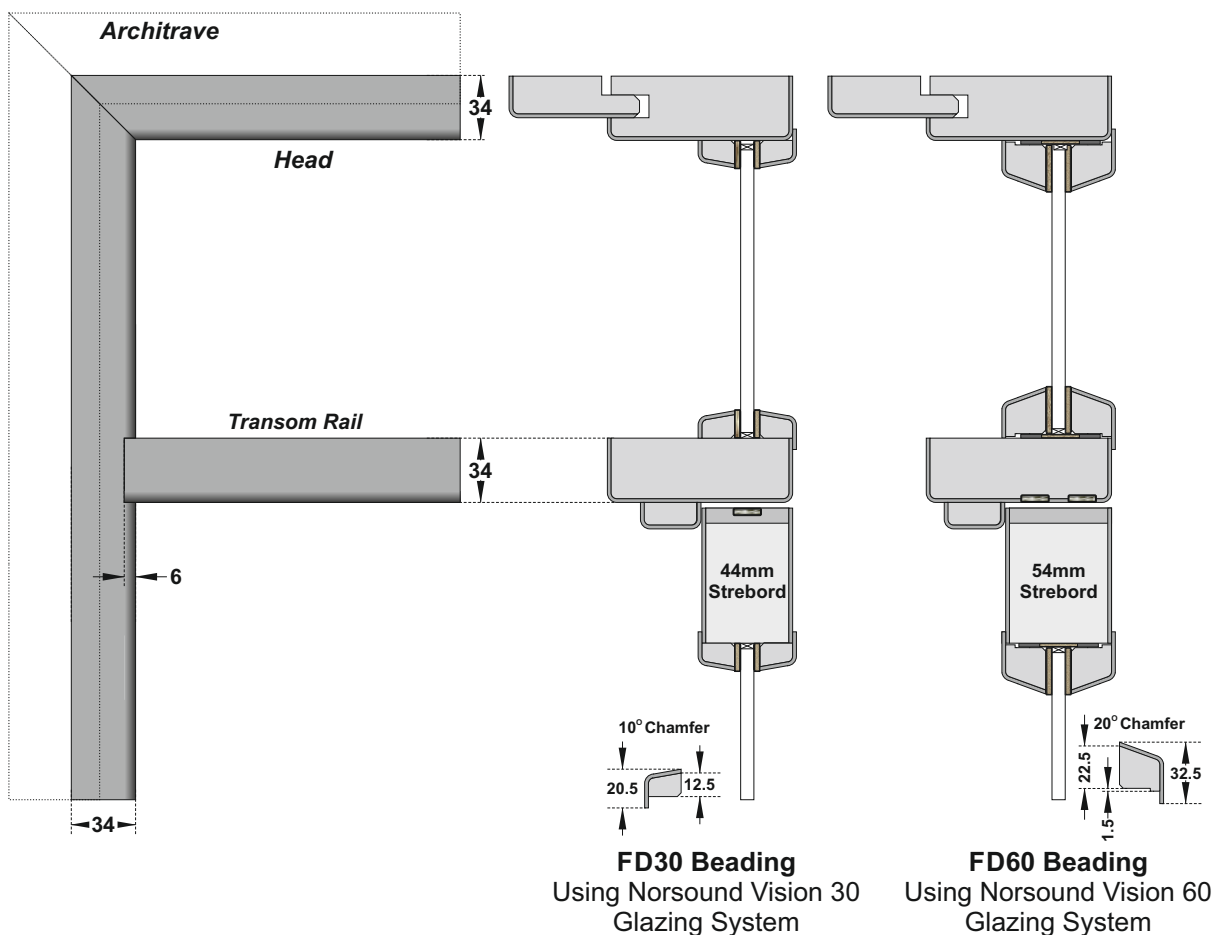
This detail illustrates the use of the identical 94x34mm 'standard' Frame Lining component (*detailed by reference to page 7.18*) used as a Transom Rail. The Jamb is notched to a depth of 6mm with the transom rail being cut to the tight 'shoulder width' + 12mm. The transom rail is secured using a wood dowel and / or screw fixings (*with adhesives*) through the back of the frame.

Glazing bead can also be clad with Acrovyn as illustrated below. The use of the Norsound Vision 30B and 60B systems are detailed. Alternatively, the Norsound Vision 30T or 60T systems could be used with the careful location of the slot to receive the 'plug in' fixing. - (*See Section 6 - Glazing - pages 6.19 & 6.20*)

Reference must be made to Construction Specialities (UK) Ltd. for further guidance and advice concerning the use of Acrovyn.

Acrovyn Clad Frames with Transoms & Glazed Fanlights.

Fig. 7.28



The Acrovyn Clad frame systems shown in this manual are indicative only. Alternative details could be used as a core frame structure, including 'split frame' details - See page 7.9

