General:

FLAMEBREAK© is a laminated wood core product providing for universal screw fixing without the necessity to provide for additional timber bocking to receive hardware.

For use with fire rated doorsets, the following recommendations apply:
a/ Reference should be made to BS8214 : 2008. Code of Practice for Fire Door Assemblies.
b/ Reference should be made to the 'Hardware for Timber Fire and Escape Doors' Code of Practice published jointly by the DHF *(Door & Hardware Federation)* and the GAI *(Guild of Architectural Ironmongery).*

Fixings: All hardware fitted to FLAMEBREAK© based doors should be fixed with wood screws. Where fixings are likely to screw into end grain, the use of fully threaded 'Twinfast' or Chipboard screws is recommended. The screw size for load bearing items should suit the particular item of ironmongery, otherwise Min. 1 1/2in. No.8 fixing screws should be used, in all cases, the use of pilot holes to suit screw sizes is recommended.

Fire Door Applications:
NOTE: For 'product assured' items, the fixing instructions provided by the hardware manufacturer should be strictly adhered to and these instructions take precedence over BS8214 and Code of Practice general recommendations in the event of any conflict.

FLAMEBREAK© based doors, like other wood and wood based doors, rely on the core material to erode at a predictable rate for their fire performance. Intumescent seals fill gaps around the door(s) that may occur as a result of shrinkage or distortion under fire conditions. The removal of core and intumescent material to accommodate hardware creates weaknesses that can be exploited under attack by fire. Large areas of metal, when used with a wood door can induce excessive distortion and premature failure. It is recommended that hardware is selected with care in consideration of these risks.

It is not unusual for hardware to be specified prior to the specification of the doors and without knowledge, at the time of preparation of hardware schedules, of the fire performances that need to be satisfied. It is a Designer's responsibility to ensure that the dooset designs meet the requirements of national and local regulations for the purpose of fire certification. *(See: BS5588 or BS9999).*

FLAMEBREAK© like other wood based products provides for very good insulation performances with a potential to provide for an insulation performance equal to the integrity performance. *(See BS476 Pt.22)*. Metal passing through the door from one face to another creates a path for thermal bridging, (***i.e. The transfer of heat from one side of the door to the other***), this will reduce the insulation properties of the door and in extreme cases may give rise to ignition on the non fire face of the door**.**

Under BS476 Pt.20 fire test conditions the pressure 'normal' in the furnace occurs at *(approx.)* 1000mm above floor level. Areas of door above the normal are subjected to increasing positive pressure from the furnace side while areas below the normal are subjected to negative pressure from the furnace side. This results in 'cold' air entering the furnace under the door with a cooling effect on this edge. Hardware items, particularly locks & latches, should be positioned below the 'normal' where possible.
NOTE: The pressure normal is lowered to 500mm above floor level for testing to BS EN 1634-1.

Where the door / frame seals are interrupted to receive hardware it may be necessary to provide for replacement sealing. The use of pressure intumescent seals *(e.g. Palusol P100 or Graphite)* may be unsuitable for this purpose due to a risk that pressure seals could compete with door / frame seals in an unpredictable manner. The replacement intumescent sealing should generally be of the low pressure type. *(Usually Phosphate based)*. Low pressure intumescent is available in sheet form *(often pre cut dedicated gaskets to suit particular items of hardware)*.
Examples:
MAP Paper - Lorient Polyproducts Ltd.
Therm-a-Strip - Intumescent Seals Ltd.
Pyrostrip 300 - Mann McGowan Ltd.

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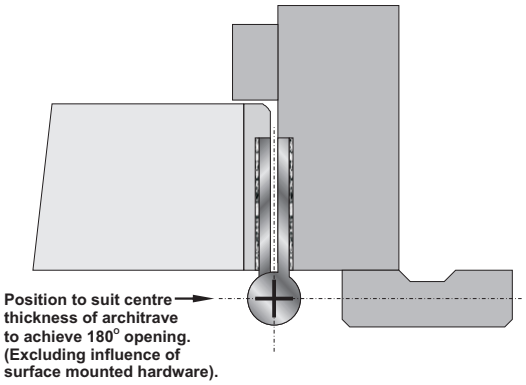
Fire Door Applications - Hanging devices - Hinges:

Hinges - FD30:

Fig. 8.1

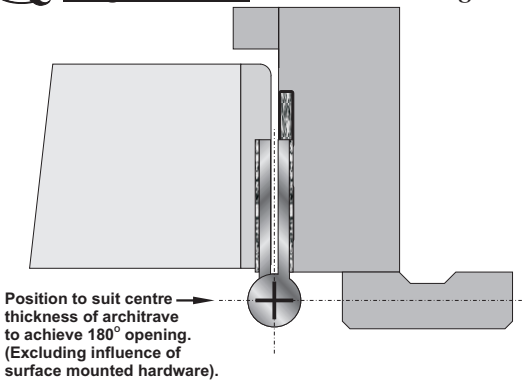


Hinge Specification FD30:

Blade Height	**90~120mm**
Blade Width (excluding knuckle)	**32~35mm**
Blade Thickness	**2.5 ~ 4mm**
Fixings	**Min. 4No. 30mm long No. 8 or No.10 steel wood screws per hinge blade.**
Materials	**Brass (800°C melting point). Steel or Stainless Steel**
Intumescent Protection ***Required under all hinge blades for door leaves greater than 2400mm high.***	**1mm Interdens - Dufalite Developments Ltd.** **1mm MAP paper - Lorient Polyproducts Ltd.** **1mm Pyrostrip 300 - Mann McGowan Fabrications Ltd.** **1mm Therm-A-Strip - Intumescent Seals Ltd.** **1mm G30 - Sealmaster Ltd.**
Hinge Positions:	**See page 3**

Hinges - FD60:

Fig. 8.2



Hinge Specification FD60:

Blade Height	**90~120mm**
Blade Width (excluding knuckle)	**30~35mm**
Blade Thickness	**2.5 ~ 4mm**
Fixings	**Min. 4No. 30mm long No. 8 or No.10 steel wood screws per hinge blade.**
Materials	**Steel or Stainless Steel**
Intumescent Protection	**1mm Interdens - Dufalite Developments Ltd.** **1mm Therm-A-Strip - Intumescent Seals Ltd.** **1mm G30 - Sealmaster Ltd.**
Hinge Positions:	**See page 3**

In addition, the hinges should provide for the appropriate BS EN 1935 : 2002 performance according to the door weight and anticipated usage.

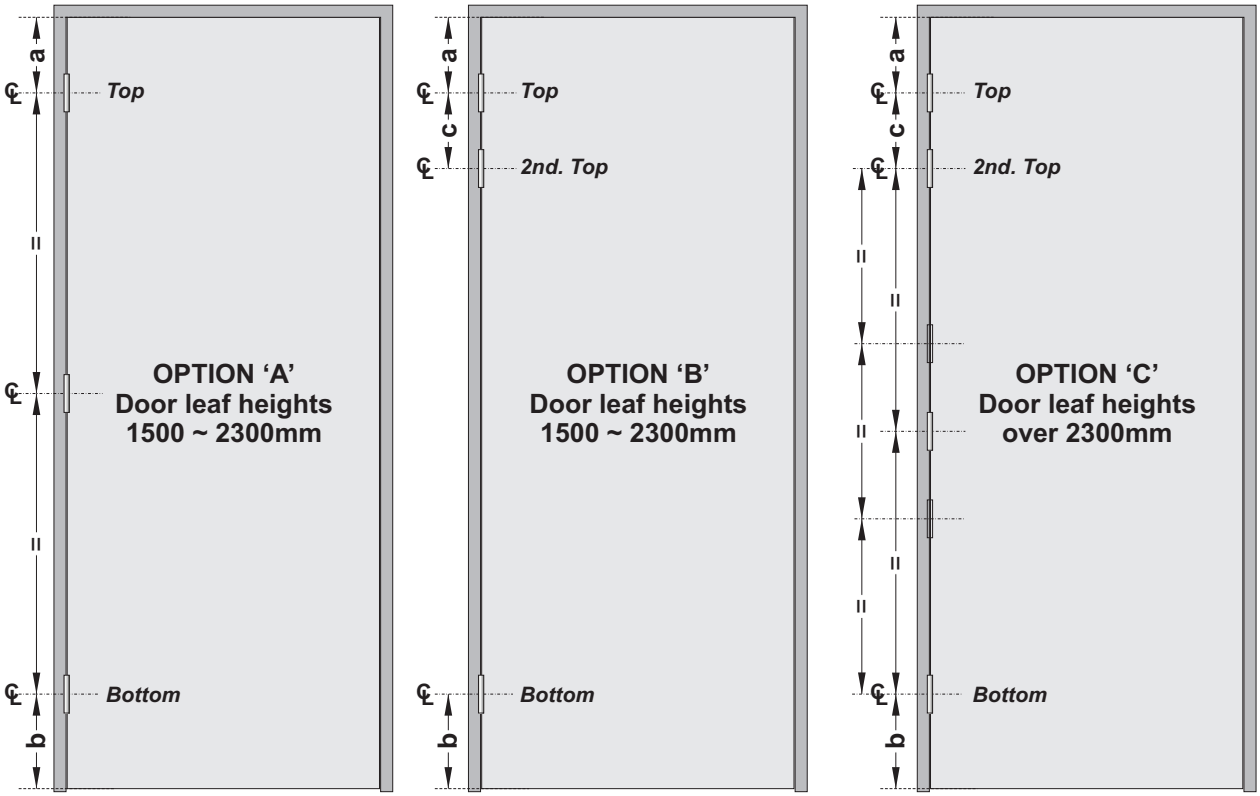
The hinge knuckle centre should be set as near to the door face as possible to minimise the 'door growth' during operation. *(See 'Growth Formula' - Section 9 - page 9.43- Coordination)*.

A hinge knuckle centre at the centre line of the architrave thickness will allow for 180° opening *(excluding the influence of other surface mounted hardware)*.

Pilot holes should be drilled to receive hinge fixing screws with hinges fixed to the door leaf using Min. 30mm long No.8 wood screws.

Fire Door Applications - Hanging devices - Hinges:

Fig. 8.3



OPTION 'C' :
Add 1No. hinge for each 500mm increase in door height over 2300mm with hinges equispaced between the 2nd. top and bottom hinges.

Hinge Location - Fire rated doorsets:

3No. hinges are required for use with door leaf heights 1500mm ~ 2300mm located as follows:

OPTION 'A':
Top Hinge = dim. a = 200 ~ 220mm from top of door leaf.
Centre Hinge = located equi-spaced between top and bottom hinge
Bottom Hinge = dim. b = 220 ~ 300mm from bottom of door leaf.

OPTION 'B'
Top Hinge = dim. a = 200 ~ 220mm from top of door leaf.
Centre Hinge = dim. c = 200mm from centre line of top hinge.
Bottom Hinge = dim. b = 220 ~ 300mm from bottom of door leaf.

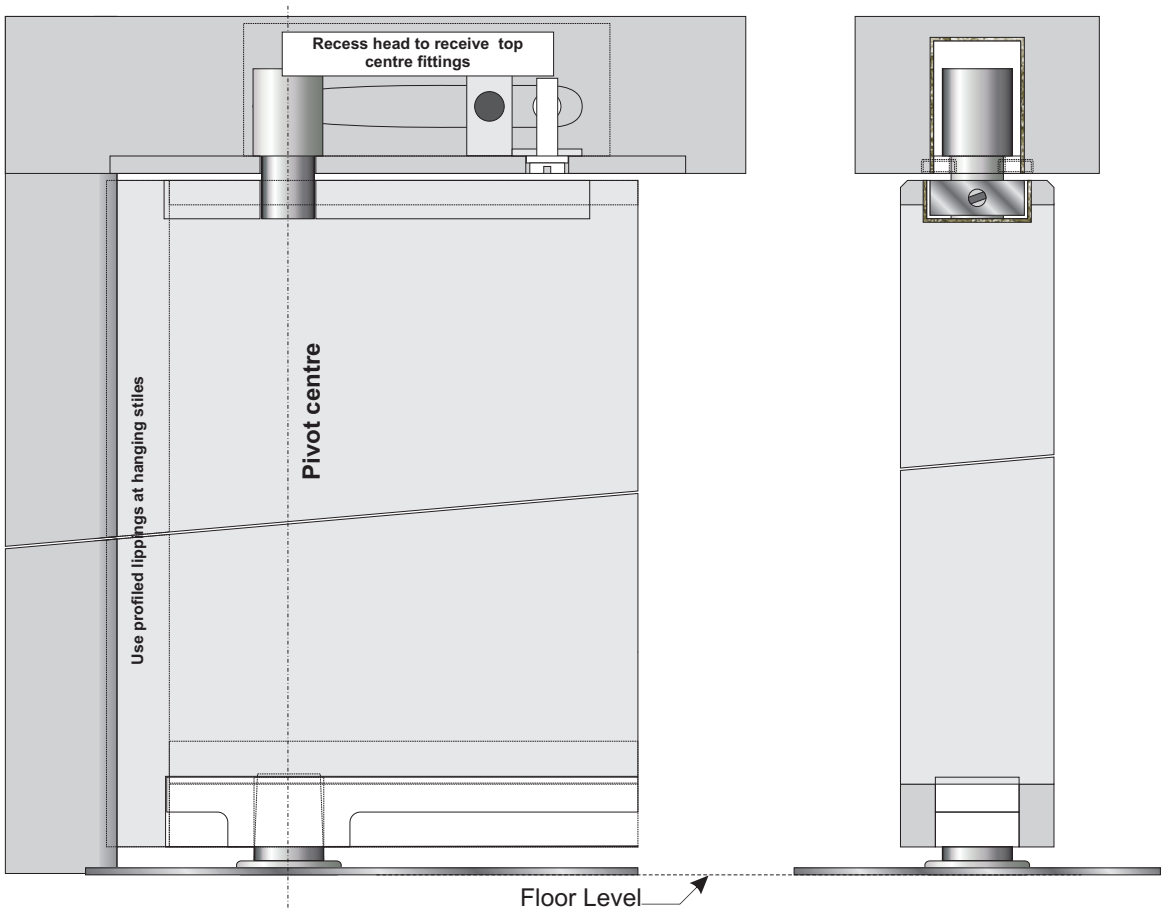
For door heights over 2300mm *(or where otherwise specified in project details)* additional hinges are used located as follows:

OPTION 'C'
Top Hinge = dim. a = 200 ~ 220mm from top of door leaf.
2nd. Top Hinge = dim. c = 200mm from centre line of top hinge.
Centre Hinge(s) = located equi-spaced between 2nd. top and bottom hinge with a further hinge for each additional 500mm in door height.
Bottom Hinge = dim. b = 220 ~ 300mm from bottom of door leaf.

For door heights less than 1500mm doors may be hung on 2No. hinges located to suit dims. 'a' & 'b' in these details.

Fire Door Applications - Hanging devices - Floor Mounted Closers - Double Action:

Floor Mounted Closers - Double Action - FD30 & FD60: *Fig. 8.4*



Double Action Pivots FD30 & FD60:

Automatic closing devices must have demonstrated contribution to the required performance of similar wood based types of doorset design when tested to BS 476 Pt.22 : 1987 or BS EN 1634-1 : 2000 with wood doors.

The top pivots to floor spring assemblies must be protected with intumescent gaskets as described for hinges but in 2mm thickness. Alternatively a dedicated intumescent pack provided by the floor spring supplier may be used.

The above illustration indicates use of the DORMA BTS series floor mounted closer with double action fittings.

Hanging stile lippings must be profiled *(to suit pivot centre)*.

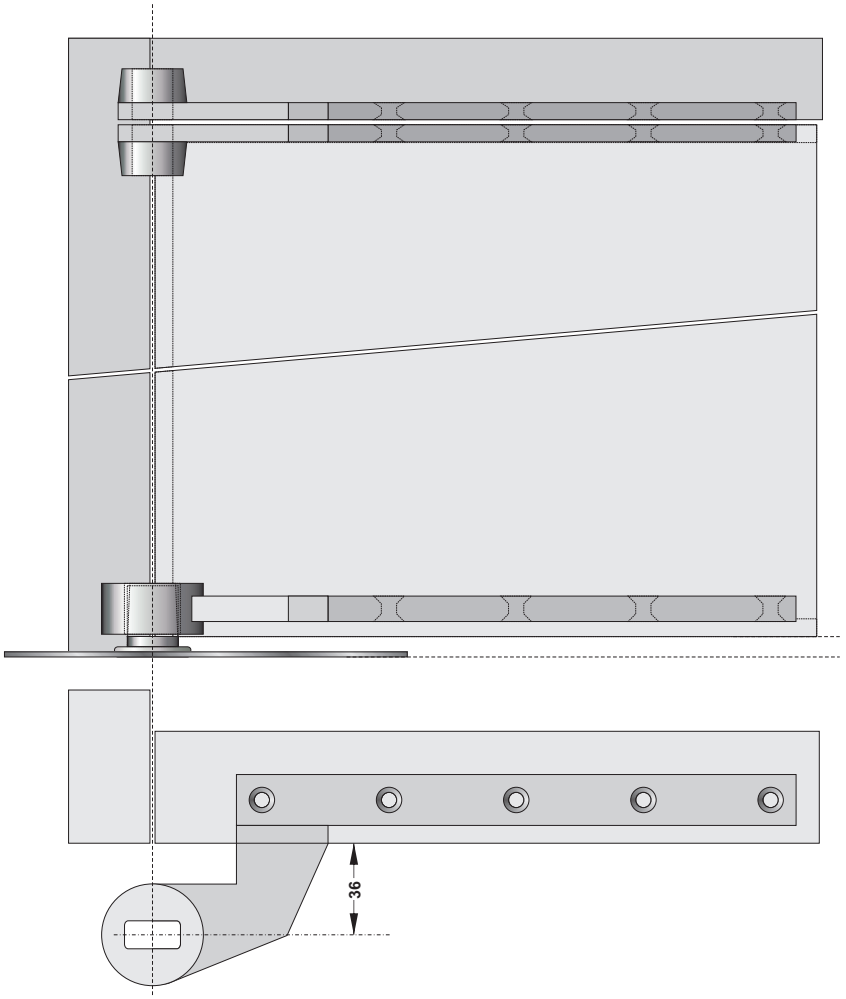
Pilot holes should be drilled to receive screw fixings. Min. 1 1/2in. No.8 wood screws should be used for fixing.

NOTE 1: Bottom strap fittings can be over recessed to provide for required under door clearances.

NOTE 2: Transom mounted double action closers are <u>not</u> approved for 'Q' Mark applications but may be used in reliance upon test / assessment data provided 'by others'. (e.g. Dorma RTS 85).

Fire Door Applications - Hanging devices - Floor Mounted Closers - Single Action:

Floor Mounted Closers - Single Action - FD30 & FD60: *Fig. 8.5*



Single Action Pivots FD30 & FD60:

Automatic closing devices must have demonstrated contribution to the required performance of similar wood based types of doorset design when tested to BS 476 Pt.22 : 1987 or BS EN 1634-1 : 2000 with wood doors.

The top pivots to floor spring assemblies must be protected with intumescent gaskets as described for hinges but in 2mm thickness. Alternatively a dedicated intumescent pack provided by the floor spring supplier may be used.

The above illustration indicates use of the DORMA BTS series floor mounted closer with single action fittings.

Pilot holes should be drilled to receive screw fixings. Min. 1 1/2in. No.8 wood screws should be used for fixing.

NOTE: Bottom strap fittings can be over recessed to provide for required under door clearances.

WARNING: The pivot centre for these fittings extends a considerable distance from the opening face of the door. This can give rise to operational problems when used with narrow or thick door. See 'Growth Formula' Section 9 - page 9.43 - Coordination

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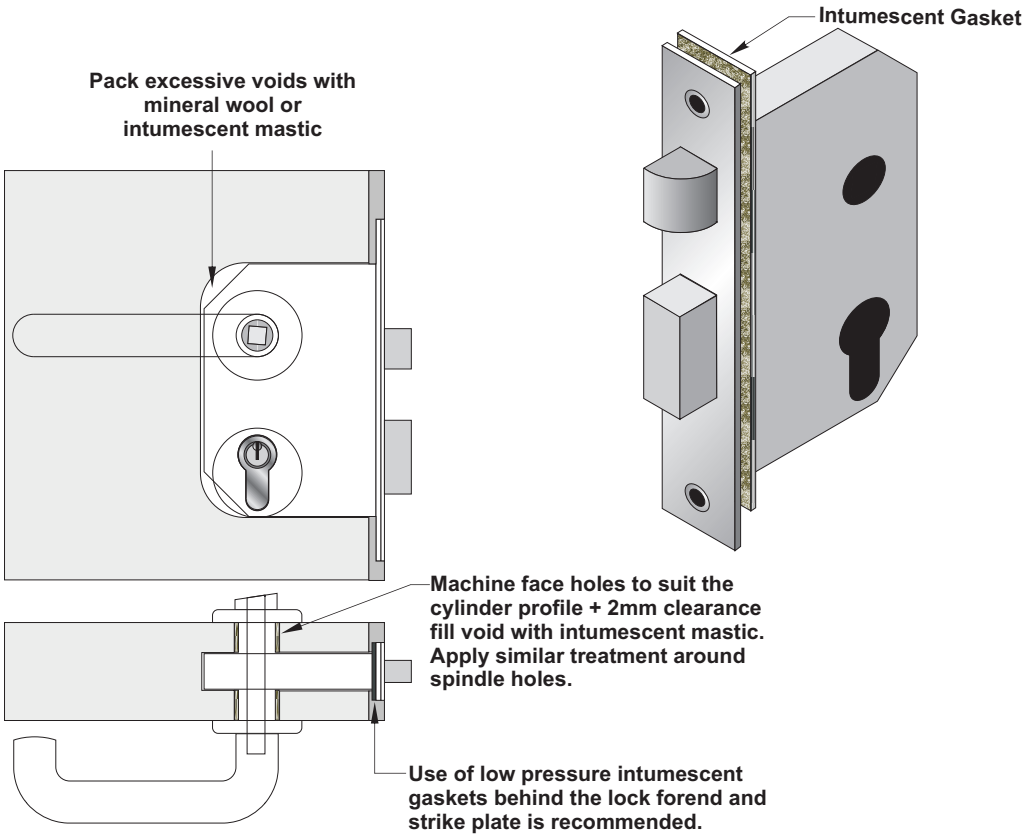
Fire Door Applications - Securing devices - Locks & Latches:

Locks & Latches - FD30 & FD60:

Fig. 8.6



Locks & Latches - FD30 & FD60:

Latches and locks must be either 'as tested', alternatively components complying with the following specifications are acceptable:

Lock / Latch Specification FD30:

Maximum forend & strike plate dimension.	235mm high by 24mm wide by 4mm thick
Maximum body dimensions	18mm thick by 100mm wide by 165mm high
Intumescent Protection Not Required for single leaf doorsets. For Double Leaf Doorsets *Under forend & keep plate .*	1mm Interdens - Dufalite Developments Ltd. 1mm Therm-A-Strip - Intumescent Seals Ltd. 1mm G30 - Sealmaster Ltd. 1mm MAP Paper - Lorient Polyproducts Ltd. 1mm Pyrostrip 300 ISA - Mann McGowan Ltd.
Materials	All parts essential to the locking / latching action (including the latch bolt, forend and strike) to be steel or brass, *melting point* $\geq 800^{o}C$.

Lock / Latch Specification FD60:

Maximum forend & strike plate dimension.	235mm high by 24mm wide by 4mm thick
Maximum body dimensions	18mm thick by 100mm wide by 165mm high
Intumescent Protection *Under forend & keep plate .*	1mm Interdens - Dufalite Developments Ltd. 1mm Therm-A-Strip - Intumescent Seals Ltd. 1mm G30 - Sealmaster Ltd. 1mm MAP Paper - Lorient Polyproducts Ltd. 1mm Pyrostrip 300 ISA - Mann McGowan Ltd.
Materials	All parts essential to the locking / latching action (including the latch bolt, forend and strike) to be steel or stainless steel.

Fire Door Applications - Securing devices - Flush Bolts:

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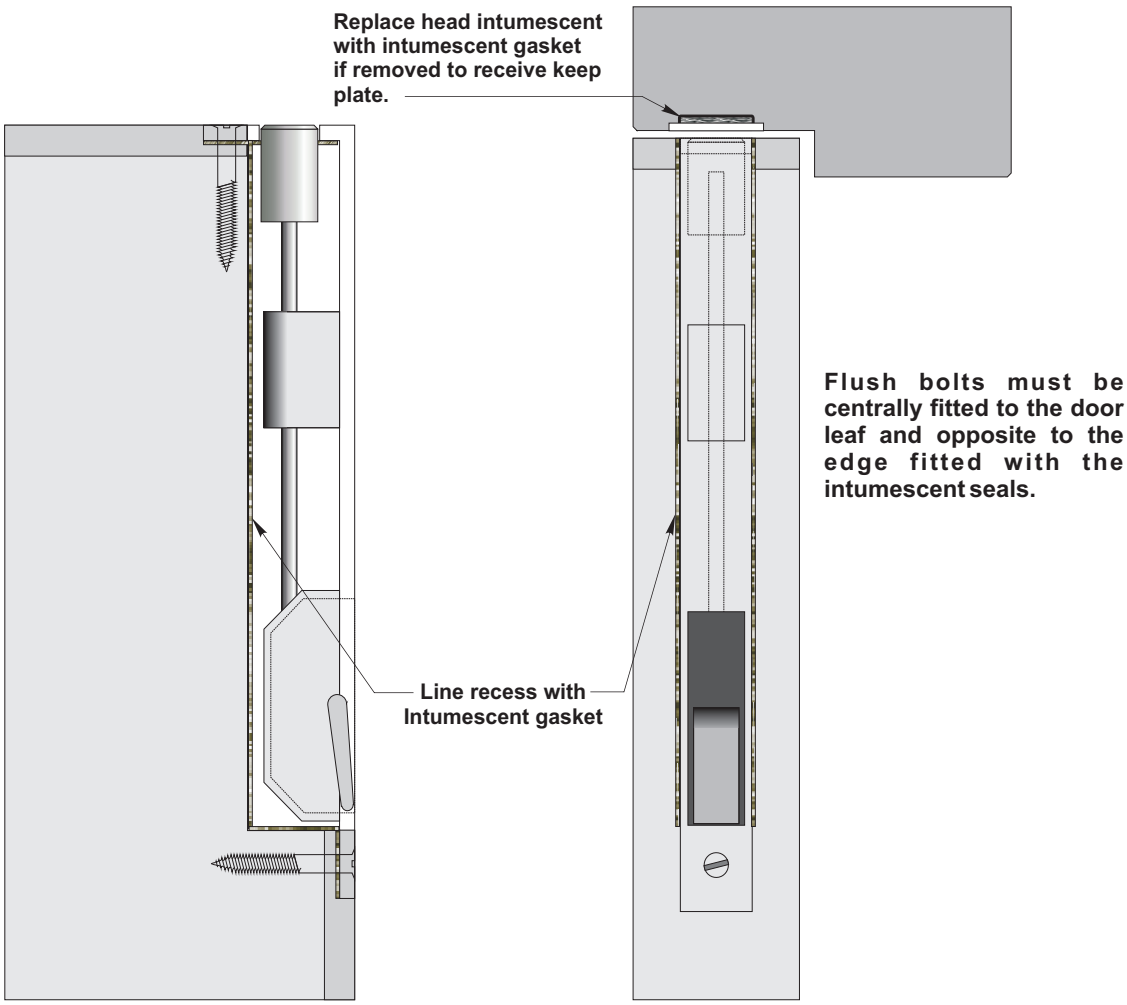
Flush Bolts - FD30 & FD60:

Fig. 8.7



Flush Bolts FD30 & FD60:

Bolts may be required to secure the secondary leaf of pairs. There are no restrictions on the use of surface mounted bolts *(e.g. Barrel bolts)* that do not interfere with the edge sealing of the doors.

Edge fixed flush bolts are approved for FD30 and FD60 fire door applications subject to the following:

Flush Bolt Specification FD30:

Flush bolts may be incorporated into the top and bottom of the meeting edge of the inactive *(or secondary)* leaf of a double leaf doorset *(pair)*, provided that the following maximum dimensions are not exceeded:
Length = 200mm.
Depth = 20mm.
Width = 20mm.
Flush bolts may be in steel or brass.

Flush Bolt Specification FD60:

Flush bolts may be incorporated into the top and bottom of the meeting edge of the inactive *(or secondary)* leaf of a double leaf doorset *(pair)*, provided that the following maximum dimensions are not exceeded:
Length = 200mm.
Depth = 20mm.
Width = 20mm.
Flush bolts must be in steel.

For both FD30 and FD60 applications the mortise to receive flush bolts should be as tight to the mechanism as is compatible with its operation and the mortice must be lined with an intumescent gasket using:
FD30 only:
2mm Pyrostrip 300 - Mann McGowan Fabrications Ltd. *OR*
2mm MAP Paper - Lorient Polyproducts Ltd. *OR*
2mm Therm-A-Flex - Intumencent Seals Ltd.

FD30 & FD60:
2mm Interdens - Dufalite Developments Ltd. *OR*
2mm Therm-A-Strip - Intumencent Seals Ltd. *OR*
2mm G30 - Sealmaster Ltd.

Fire Door Applications - Other Hardware:

Operating Devices - *Automatic Closing - FD30 & FD60:*

Automatic closing devices e.g. Single Action Overhead Closers, must either be tested or components of equal specification that have demonstrated contribution to the required performance of these types of FD30 or FD60 doorset designs when tested to BS476 Pt.22 : 1987 or, BS EN 1634-1 : 2000.

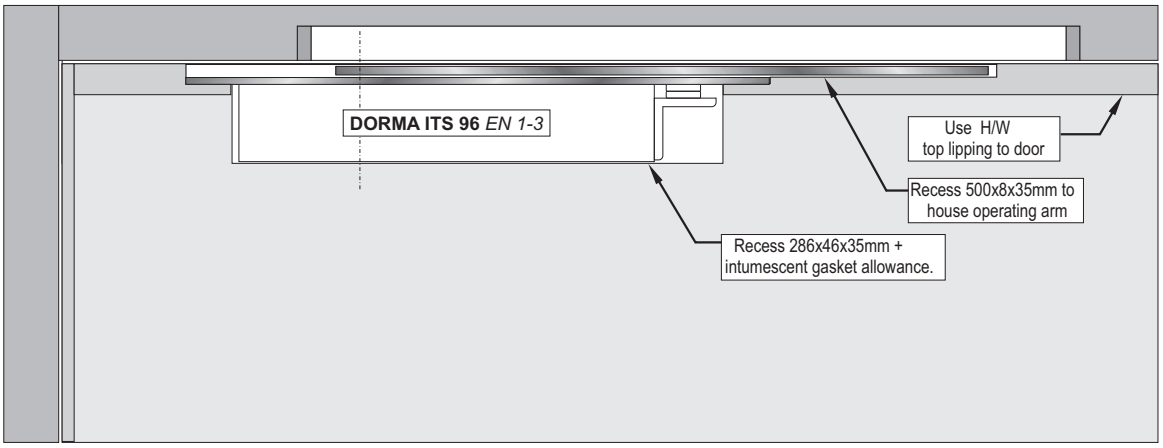
NOTE: Concealed Closers (illustrated):
Some concealed closer designs have been successfully tested for fire door applications in wood doors and may be used with FLAMEBREAK© core doors in reliance upon that test data. However, these do require the removal of a large amount of core material to house the closer and its dedicated intumescent pack leaving minimal thickness door material either side of the mortise.

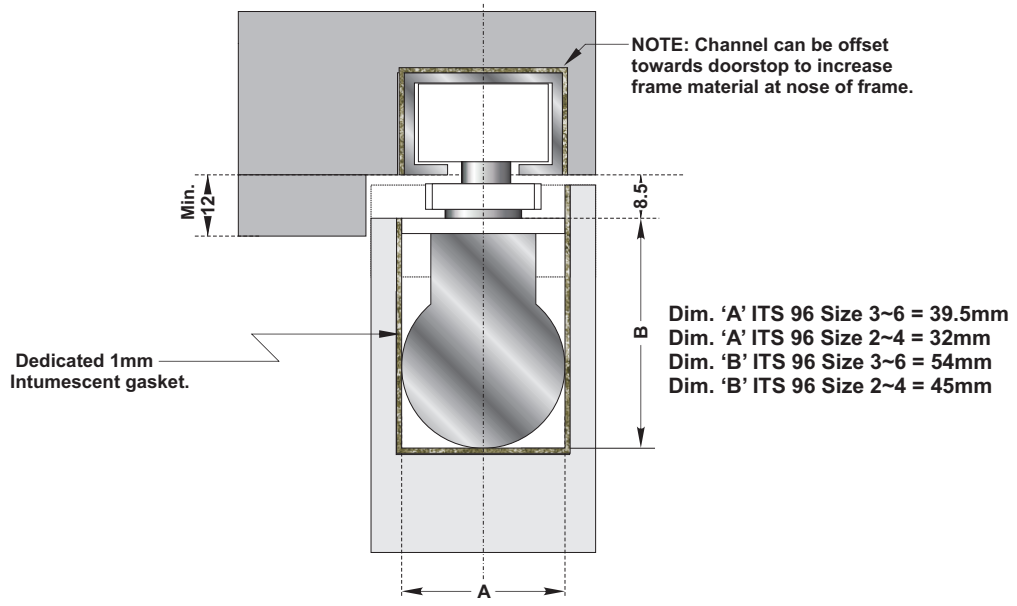
It is recommended that these are used with min. 50mm thickness doors to minimise the risk of 'telegraphing' of the mortise on the face of the door and a risk of mechanical failures at the mortise position.

It is further recommended that doors are hardwood lipped on the top edge to provide for improved fixing.

Concealed Closers: *Fig. 8.8*

NOTE: This detail is not approved for 'Q' Mark Fire Door applications.





Fire Door Applications - Other Hardware:

Securing Devices - *Barrel Bolts - FD30 & FD60:*

Barrel Bolts of a maximum length of 450mm can be surfaced fixed to the top closing corner of double leaf doorsets provided that the particular item does not require the removal of any material from the door leaf or the frame and does not interfere with perimeter intumescent sealing.

Operating Devices - *Pull Handles - FD30 & FD60:*

Pull handles may be surface fixed to both FD30 & FD60 door provided that they are steel or brass and the length is limited to 1200mm between the fixing points.

Bolt through fixing pull handles up to the same length may also be used for fire door applications with no additional intumescent sealing required, provided that the hole through the door to receive the bolt provides for a tight fit.

Operating Devices - *Push, Buffer and Kick Plates - FD30 & FD60:*

Face fixed only push, buffer and kick plates may be fitted to FLAMEBREAK© doors for fire door applications provided that their fitting does not require the removal of any part of the door core.

These items of hardware are permitted up to a maximum of 20% of the door leaf area when screw fixed or 30% of the door leaf area when fixed with a contact or other thermally softening adhesive.

Plates must not return around the door edges.

Operating Devices - *Door Selectors - FD30 & FD60:*

Door selectors may be freely applied for use with FLAMEBREAK© doors for FD30 and FD60 fire door applications, provided that they are not invasive in the door leaf edges or the door frame. Those that are invasive will require fire resistance test / assessment evidence to support their use. Additional intumescent protection is not required unless fire test / assessment documentation relating to the particular device requires otherwise.

Operating Devices - *Panic Hardware - FD30 & FD60:*

Panic hardware may be used with FLAMEBREAK© doors for FD30 and FD60 fire door applications, provided that the installation does not require the removal of any core material from the door leaf or the removal of any timber from the door leaf, doorstop or frame reveal. Further, the panic hardware must not, in any way, interfere with the self-closing action of the fire doors.

Miscellaneous Devices - *Door Security Viewers - FD30 & FD60:*

Door security viewers may be used with FLAMEBREAK© core doors for FD30 and FD60 applications provided that the viewers are manufactured from brass or steel with viewer bodies of a diameter of 15mm *(or less)* and provided that the through-hole is bored tight to the case of the viewer with a maximum tolerance of +1mm. Lenses must be glass.

Viewers must be bedded in intumescent mastic unless otherwise approved for use without additional intumescent by reference to fire test / assessment data relating to the particular viewer design when tested in wood doors.

Miscellaneous Devices - *Acoustic, Weather and Dust Perimeter Seals - FD30 & FD60:*

Acoustic, weather and dust seals with a proven flame retardant performance may be fitted to FLAMEBREAK© based doorsets for FD30 and FD60 applications providing that the fitting of the seals does not interfere with the activation of the doorset intumescent seals or hinder the self closing function of the door leaves.

Miscellaneous Devices - *Automatic Threshold Seals - FD30 & FD60:*

Fully mortised automatic threshold drop seals may be fitted to FLAMEBREAK© based doorsets for FD30 and FD60 applications provided that the body of the automatic drop seal does not exceed 35mm high x 15mm wide *(excluding fixing flanges)*. The body of the automatic drop seal must be in metal, aluminium or steel and the device is to be mortised centre thickness of the door.

Alternatively, surface mounted automatic drop seals may be used where the fitting of these does not require the removal of any core material.

NOTE: 'Q' Mark approved automatic threshold drop seals include:

Norsound	***NOR 810***
Lorient Polyproducts	***IS8010si***
Raven	***RP8si***
Pemko	***411-AR***
Athmer	***Schall-ex Duo L-15***

Fire Door Applications - Other Hardware:

Miscellaneous Devices - *Air Transfer Grilles - FD30 & FD60:*

Air transfer grilles not exceeding 0.2m^2 for FD30 and 0.1m^2 for FD60, may be fitted to FLAMEBREAK© based doorsets for FD30 and FD60 applications provided that the particular grille design is supported by fire test evidence to BS476 Pt.22 : 1987 or BS EN 1634-1 : 2000 that demonstrates an integrity performance that is at least equal to the desired fire performance of the doorset when installed in a wood door leaves of a compatible thickness.

Margins for apertures to receive grilles are to be as described for glazing *(See Section 6)* with the grille located towards the bottom of the door *(i.e. in the low / negative pressure area of the door under test conditions)* unless the fire test / assessment data relating to the particular grille design provides for alternative locations in a wood based door.

Grilles must be fitted precisely in accordance with the grille manufacturers test / assessment data, including all hardwood lining, intumescent seals, fixings etc. as required for the relevant fire performance.

NOTE: When used with glazed doors, the maximum permitted area for glazing approved for the particular fire performance should be reduced by an amount that is at lease equal to the area of the door that is occupied by the grille.

'Q' Mark approved air transfer grilles for use in fire doors include:

Pyroplex Ltd:

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

**** ATG 2251 & ATG 2250 must only be used above 1000mm height from the threshold of the door.***

Miscellaneous Devices - *Letter Plates / Boxes - FD30 & FD60:*

Letter plates *(boxes)* may be fitted to FLAMEBREAK© based doorsets for FD30 and FD60 applications provided that the particular letter plate *(box)* design is supported by fire test evidence to BS476 Pt.22 : 1987 or BS EN 1634-1 : 2000 that demonstrates an integrity performance that is at least equal to the desired fire performance of the doorset when installed in a wood door of a compatible thickness.

Margins to the leaf edges must not be less than the margins approved for glazing *(See Section 6 - Glazing).*

Letter plates *(boxes)* must be located towards the bottom of the door *(i.e. not more than 1000mm above the threshold level)* unless the fire test / assessment data relating to the particular letter plate *(box)* provides for alternative locations in a wood based door.

Miscellaneous Devices - *Cable Ways for electric locks / strike plates - FD30 & FD60:*

Cable ways to provide for a route for the connection of electric locks / strikes with command units are permitted for use with FLAMEBREAK© core doors subject to the following:

- Door leaf dimensions must not exceed 2100mm x 900mm.
- The particular device must be supported by fire test evidence to demonstrate suitability for use in timber based doors to the required fire performance.
- The device must be fitted precisely in accordance with the manufacturers test / assessment data, including intumescent seals, fixings etc. as required for the relevant fire performance.
- The cable-ways must be located to provide for a minimum margin of 90mm from any aperture in the door leaf.
- The cable way hole must not exceed10mm dia. and must be drilled centrally in the door thickness and horizontally across the width of the door at a height of not more than 1500mm above finished floor level.
- The cable must be not less than 2mm in diameter smaller than the hole through the leaf.

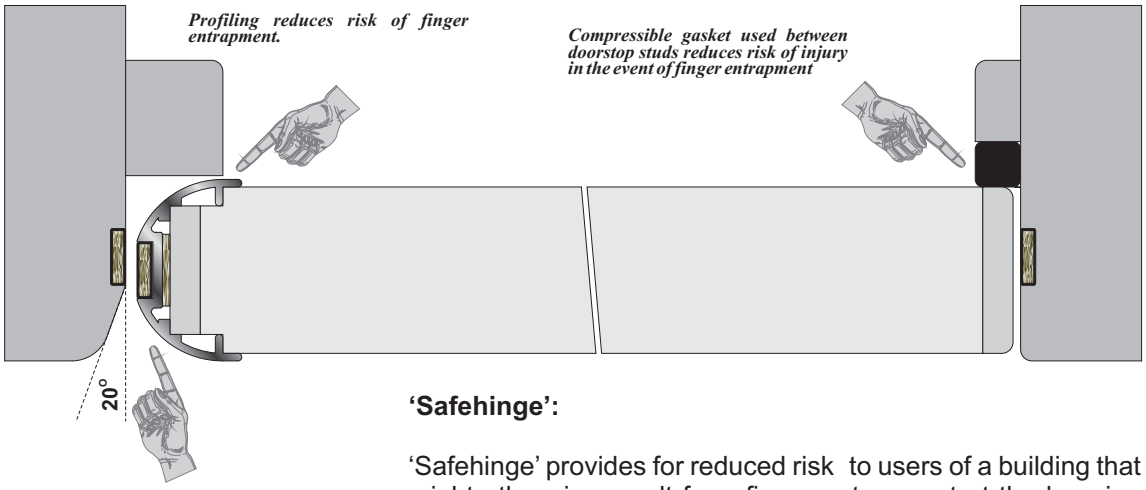
WARNING: The use of hardware items with a proven fire performance when used with metal doors should not be used with wood based fire doors (and vice versa) without the benefit of further testing.

Fire Door Applications - Other Hardware:

'Safehinge'

Fig. 8.9

NOTE: This detail is not approved for 'Q' Mark Fire Door applications.



Profiling reduces risk of finger entrapment when used with backcheck closer, limiting stay or stop to limit opening angle.

'Safehinge':

'Safehinge' provides for reduced risk to users of a building that might otherwise result from finger entrapment at the hanging stiles of doors.

The Norsound 'Fingersafe' compressible seal can be surface applied to the face of the doorstop to reduce the risk of injury at the closing stile.

See: www.norsound.co.uk ***for further information.***

'Safehinge'

'Safehinge' provides for a door hanging pivot system with design features that minimises the risk of injury due to finger entrapment at the hanging stiles.

At the closing stile, the face of the doorstop can be fitted with the Norsound *'Fingersafe'* compressible gasket that provides for a similar injury reduction function.

Being a pivot system, the *'Safehinge'* can be used with both single action and double action doors, but with opening limited to slightly more than 90°.

NOTE 1: 'Safehinge' is not a 'Q' Mark approved product but may be used with fire rated doorsets in reliance upon test / assessment data provided 'by others'.

NOTE 2: The 'Safehinge ALU30 has been approved for use with 44mm FLAMEBREAK© doors for FD30 (BS476 Pt.22) applications by reference to IFC (International Fire Consultants Ltd) Field of Application Report IFCA/08160 - Rev. B - April 2010 in the following dimensions. Reference should be made to the full assessment before using this product with fire rated doorsets:

IFCA/08160 - Rev. B	Standard Intumescent Seal Specification		Enhanced Intumescent Seal Specification	
Configuration (Door Type)	Maximum leaf height (x associated width)	Maximum leaf width (x associated height)	Maximum leaf height (x associated width)	Maximum leaf width (x associated height)
LSASD	2301 x 727	966 x 1845	2606 x 786	1045 x 2090
ULSASD & DASD	2256 x 713	947 x 1809	2555 x 771	1024 x 2049
LSADD	N/A	N/A	2350 x 836	2350 x 836
ULSADD & DADD	N/A	N/A	2327 x 827	2350 x 836

LSASD = Latched single action single door. ULSASD = Unlatched single action single door. DASD = Double action single door.
LSADD = Latched single action double door. ULSADD = Unlatched single action double door. DADD = Double action double door.