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Title

Field of Application for:

Falcon Strebord® 54 Doorsets

For 60 Minutes Fire Resistance

Report No.:

Chilt/A02067 Revision N

Issue Date:

31st January 2025

Valid Until:

31st January 2030

Job Reference:

WF547265

Prepared for:

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The version/revision stated on the front of this Field of Application supersedes all previous versions/revisions and must be used to manufacture doorsets from the stated validity date on this front cover. Previous revisions of the Field of Application cannot be used once an updated Field of Application has been issued under a new revision.

10 Hardware

10.1 General

The following section details the permitted scope and constraints for fitting hardware to this door design. The following items of hardware must also bear the UKCA or CE Mark in addition to the requirements outlined in the following sections. The UKCA or CE mark must indicate that the hardware is suitable for fire doors in the classification code and declaration of performance issued by the hardware manufacturer:

- Latches & locks: Test Standard EN 12209
- Single axis hinges: Test Standard EN 1935
- Controlled door closing devices: Test Standard EN 1154
- Electrically powered hold-open devices: Test Standard EN 1155
- Door co-ordinators: Test Standard EN 1158
- Emergency exit hardware: Test Standard EN 179
- Panic exit hardware: Test Standard EN 1125.

Where an item of hardware is not covered by the scope of a relevant harmonised or designated standard, and cannot therefore be UKCA or CE Marked, inclusion of the hardware is only permitted with this doorset design, if it meets the specific requirements of the appropriate section within this Field of Application (i.e. supporting test evidence and specification). All items of hardware must be fitted in accordance with requirements of this assessment.

The following sections consider what tested and assessed alternative items of essential and non-essential hardware can be used on the doorset range.

Items of hardware have been considered and approved via the following means:

- The component has been successfully tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a suitably similar type of doorset e.g. timber leaf in timber frame
- As a result of an assessment of the appropriateness of the item of hardware, based on test evidence not commissioned by Falcon Timber Limited.
- As a result of the Certifire approval of the item of hardware

Each section will consider the named item of hardware and detail if there are any limitations associated with:

- Leaf size
- Configuration
- Intumescent seals
- Intumescent protection
- Frame configuration requirements

No item of hardware should be within 200mm of another item of hardware unless there is test evidence to demonstrate they can be in closer proximity.

Hardware items should generally be fitted in accordance with the manufacturer's instructions. **However, the parameters and requirements of this assessment always take precedence, including specified protection such as hardware gaskets.** Referenced Certifire approved hardware may be incorporated subject to the design, material and dimensional limitations identified within this assessment report and identified on the relevant Certifire certificate.

10.3 Essential Hardware

The following table details the essential hardware for the various doorset configurations that are referenced in this assessment.

Configuration	Hardware
LSASD	• Latch • Handle • Hinges • Self-closing device (closer)
ULSASD	• Hinges • Self-closing device (closer)
DASD	• Top pivot & bottom strap • Self-closing device (closer)
LSASD+OP	• Latch • Handle • Hinges • Self-closing device (closer)
ULSASD+OP	• Hinges • Self-closing device (closer)
LSADD	• Latch • Handle • Hinges • Self-closing device (closer) • Flush bolt
ULSADD	• Hinges • Self-closing device (closer)
DADD	• Top pivot & bottom strap • Self-closing device (closer)
LSADD+OP	• Latch • Handle • Hinges • Self-closing device (closer) • Flush bolt
ULSADD+OP	• Hinges • Self-closing device (closer)

10.4 Latches & Locks

Unless explicitly detailed within the sections below only 1No. lock or latch shall be applied within any individual doorset. When fitted, the lock or latch body shall be installed within the vertical edge of the door leaf in all cases, at a height as detailed within the relevant section below. Refer to specific notes contained within each section for further considerations on lock or latch type.

10.4.1 Single Point Engagement

The details within this section outline tested and assessed single point locks and latches that are morticed centrally (unless fire tested in an offset position) within the door leaf thickness and are to be used in conjunction with the handles and escutcheons detailed in section 10.7, along with cylinders detailed in section 10.4.3.

Locks and latches to be used in conjunction with electronic hardware and access control are detailed independently within section 10.6.

The table below details the tested latches and locks that are approved.

Element	Manufacturer & Product Reference
Locks & latches	• Zoo Hardware ZDL7260RSS (WF523041 Doorset B) • Rutland RDL-ESL-55-SSR (CFR2104282) • Eurospec Easi-Exit DLS7260ESC (WF413865) • ASSA Abloy EL160_100180 mortice latch (WF435986 Doorset B) • Zoo tubular latch (Chilt/RF12077 Doorsets A, B & C) • Henderson Hardware 63mm tubular mortice latch (Chilt/RF99113 & Chilt/RF00169) • E*S tubular mortice latch (Chilt/RF07035 & Chilt/RF05035)

Single Leaf doorsets

Frame option: 1 & 2

Alternatively, Certifire approved components certified for use within 60-minute fire resistance applications on 54mm thick timber door and timber frames with the following specification are also deemed acceptable for single leaf doorsets.

Element	Specification
Maximum forend and strike plate dimensions	235mm high x 25mm wide x 4mm thick
Maximum body dimensions	165mm high x 100mm wide x 18mm thick
Intumescent protection	see section 10.2
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point ≥ 800^0 C
Location[1,2]	Zone 1 - Between 750 – 1200mm from the threshold[3]
	Zone 2 - Between 1201 – 1875mm from the threshold[3, 4]

Notes:

1. A single lockcase may be positioned in either of the two location zones specified above.

2. A maximum of 2 latches or locks may be included within the same leaf provided there is a minimum of 200mm between lock forends or keeps. The locks must be located within the height limitations from the threshold as defined in the table above.
3. Threshold is defined as the bottom edge of the leaf.
4. Locks and latches in Zone 2 must always be fitted with intumescent gaskets under the forend and keep and on all sides of the mortice for the lock using one of the intumescent gaskets noted in section 10.2 (excluding the STS DIN 60 Kit).

Single leaf doorsets

Frame option: 3

Certifire approved components certified for use within 60-minute fire resistance applications on 54mm thick timber door and steel frames with the following specification are also deemed acceptable for single leaf doorsets.

Element	Specification
Maximum forend and strike plate dimensions	85mm high x 25mm wide x 4mm thick
Maximum body dimensions	75mm high x 25mm wide x 18mm thick
Intumescent protection	see section 10.2
Location	Zone 1 - Between 750 – 1200mm from the threshold

Single leaf doorsets

Frame option: 4

Certifire approved components certified for use within 60-minute fire resistance applications on 54mm thick timber door and steel frames with the following specification are also deemed acceptable for single leaf doorsets.

Element	Specification
Maximum forend and strike plate dimensions	160mm high x 25mm wide x 4mm thick
Maximum body dimensions	138mm high x 100mm wide x 18mm thick
Intumescent protection	see section 10.2
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point ≥ 800^0 C
Location	Zone 1 - Between 750 – 1200mm from the threshold

Note:

The lockcase dimensions permitted above are based on test WF415618 doorsets B which included concealed hinges. At the forend sizes permitted above the amount of intumescent material protection present at the lock location would be the same as that tested protecting the concealed hinges. The Strebord® 54 door blank has shown in various tests that when tested with various items of morticed hardware protected with intumescent the leaf design is capable of achieving in of the 60 minute integrity requirement.

Double leaf doorsets

Frame option: All frame Options

Certifire approved components certified for use within 60-minute fire resistance applications on 54mm thick timber door and timber frames with the following specification are also deemed acceptable for double leaf doorsets.

Element	Specification
Maximum forend and strike plate dimensions	235mm high x 25mm wide x 4mm thick
Maximum body dimensions	165mm high x 100mm wide x 18mm thick
Intumescent protection	see section 10.2
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point ≥ 800^0 C
Location[1,2]	Zone 1 - Between 750 – 1200mm from the threshold[3]
	Zone 2 - Between 1201 – 1400mm from the threshold[3, 4]

Notes:

1. A single lockcase may be positioned in either of the two location zones specified above.
2. A maximum of 2 latches or locks may be included within the same leaf provided there is a minimum of 200mm between lock forends or keeps. The locks must be located within the height limitations from the threshold as defined in the table above.
3. Threshold is defined as the bottom edge of the leaf.
4. Locks and latches in Zone 2 must always be fitted with intumescent gaskets under the forend and keep and on all sides of the mortice for the lock using one of the intumescent gaskets noted in section 10.2 (excluding the STS DIN 60 Kit).

10.4.2 Latches & Locks – Multi Point Engagement

These items are suitable in the following applications only:

Frame option: 1

Configurations: LSASD

The table below details the tested multi point latch that is approved.

Element	Manufacturer & Product Reference
Locks & latches	1. Winkhaus AV2 (BMT/FEP/F14233 AR1 Doorset B)

Notes:

1. When the Winkhaus AV2 multi-point latch is fitted, the leaf perimeter edge intumescent must be as tested in fire test WF518622 Doorset A. Further justification is provided within section 4.5.5.2.
2. Leaf size envelope is restricted to that shown in Section 4.5.5.2.
3. Lorient Polyproducts 1mm thick MAP Intumescent protection is required to be fitted:
   a. Lining the sides of all latch bodies.
   b. Under all latch keeps.

4. The centre, top and bottom keep plates must be the same size and must be manufactured from the same material as tested. The strike element of the keep plates may feature a flat, 45° or 90° leading edge, as supplied by the lock manufacturer.
5. The top and bottom hook locks must be engaged for fire performance.
6. In all instances the location of the handle must be between 800–1200mm from the threshold.

10.4.3 Cylinders

These items are suitable in the following applications only:

The table below details the tested cylinders that are approved.

Element	Manufacturer & Product Reference
Cylinder	• Zoo Hardware cylinder Ref. V5EP80CTPBE (WF417777 & WF415618 Doorset B) • ATK attack series TS008 3* KM586153 cylinder (WF435986 Doorset B) • ERA high security 3 star cylinder, with thumb turn (CFR2201122) • Assa Abloy CY326 half cylinder (CFR2109152) • Brisant ULTION 3* PLUS cylinder (WF523041 Doorset B)

Alternatively, components with the following specification are also deemed acceptable.

- Where required for use with either single or multi point latches, the cylinder must be constructed of either brass or steel with a melting point in excess of 800^0C.
- The cylinder must be compatible with the lock/latch.
- Cylinder dimensions may be up to 33mm high x 17mm wide at the maximum dimension and may be of euro profile or oval.
- Single and double cylinders, along with cylinder & turn are permitted.
- Door preparation for single cylinders shall penetrate only half the door thickness.
- Intumescent protection and tightness of fitting:
    - If the lock body is not protected with an intumescent material, the maximum clearance between leaf and cylinder is 1mm to each edge.
    - If the lock body is protected with an intumescent material, maximum clearance between leaf and cylinder is 3mm to each edge.
    - 1mm thick MAP or non-pressure forming graphite intumescent around the cylinder is optionally permitted.

10.5 Cable Loops

The cable loop detailed in the following section has been successfully tested with the Strebord ® 54 door blank and is therefore suitable for use within the scope stated herein.

10.5.1 Assa Abloy EA280

This item has been successfully tested in test reference WF386959 and CFR2109152, with cable channels, and is suitable for use within the following scope:

- Frame: 1 & 2 – for minimum section size refer to Cableway options in section 5.8.
- Door configuration: LSASD, LSADD
- Intumescent protection:
  (a) Sealed Tight Solutions - Graphite ST302 liner trimmed to suit, 2 mm fitted under the forend and lining the cut out.
  (b) Intumescent Seals Ltd, 2mm thick Therm-A-Strip, fitted to all faces of the body and to the rear of the forend.
- May be used with cableways which must be fitted and protected as detailed in section 5.8.
- Minimum of 2No 15x4mm fitted centrally and 10mm apart in the frame hanging jamb(s), such that both strips are only partially interrupted at the cable loop with at least 10% remaining.
- Cable loop must be fitted no higher than 1150mm from the bottom of the door jamb(s).
- Cable loop must not be within 100mm of hinge or other items of hardware along the frame jamb.

10.6 Electronic Hardware & Access Control

10.6.1 GEM GK700 Electric Strike

The GEM GK700 electric strike has been successfully tested in test reference WF386959 Doorset B which comprised a latched single action double leaf doorset with the strike set in fail locked mode.

The GEM GK700 electric strike may be fitted provided the intumescent protection and other details are restricted to the following parameters:

- Frame Option: 1 (Hardwood only) – with minimum section size of 32mm thick x 70mm deep (excluding stop).
- Door configuration: LSASD, LSADD.
- Intumescent protection:
  - 2mm Sealed Tight Solutions 2mm graphite intumescent gasket around all mortices of the keep.
  - Graphite based intumescent strip – minimum of 2No 15x4mm fitted centrally and 10mm apart in the frame hanging jamb(s) or meeting stile of double leaf doorsets, such that both strips are only partially interrupted at the cable loop with at least 10% remaining.
  - Strike must be fitted no between 750 & 1120mm from the bottom of the door jamb.
- Alternative strikes from the GEM GK700 range are permitted provided the dimensions are smaller than or as tested in WF386959 Doorset B.
- The electronic strike can be used in conjunction with a cableway as described in section 5.8.
- The electronic strike is to be installed following the electronic strikes manufacturers guidance, taking into account the necessary details for fire resistance as stated above.

10.6.2 Assa Abloy EL560 Electronic Mortice Lock

The following Assa Abloy electronic lock and associated hardware have been successfully tested in test reference CFR2109152, as follows:

Element	Manufacturer & Product Reference
Lockcase	• Assa Abloy EL560 ○ Forend: 235x24x3mm forend ○ Body: 168.5x93x60mm ○ Backset: 60mm
Strike	• Assa Abloy EA322 strike
Cylinder	• Assa Abloy CY326 half cylinder
Handles	• Assa Abloy: INOXI 3-19SS / DH072

The Assa Abloy EL560 electronic lock may be fitted provided the intumescent protection and other details restricted to the following parameters:

- Frame Option: 1
  - Minimum frame section size: Minimum 32mm thick x 75mm deep for frame head and jambs (excluding stop).
- Door configuration: LSASD and LSADD
- Location: Between 750 – 1200mm from the threshold.
- Intumescent seals:
  a. Frame reveal (LSASD) and meeting edges (LSADD): 2no. 15x4mm minimum, graphite, positioned central to the leaf thickness and spaced 10mm apart.
- Intumescent protection: Intumescent Seals Ltd, 1mm thick Therm-A-Strip, around the latch body and under the latch forend and keep.
- The maximum permitted lock body and backset dimensions must not exceed those tested in fire test CFR2109152.

Note: A second (mechanical only) single point engagement lock is permitted, for details refer to section 10.4.1.

10.6.3 Maglocks

These items are suitable in the following applications only:

Frame options: 1

Configurations: All configurations

The Securefast Slimline surface mounted magnetic lock has been successfully fire tested in test reference WF414533 on both the exposed and unexposed faces of the door leaf and are approved for use on the proposed door designs when restricted to the following parameters:

- Minimum frame section size
  - Minimum 40mm thick x 102mm deep for frame head and jambs (excluding stop) for the frame component that houses the maglock.
  - Minimum 32mm thick x 102mm deep for other frame components (excluding stop).
- The armature plate may be bolted through the head of the door leaf.
- Maximum Permitted Maglock Body Dimensions: 250 (l) x 47 (w) x 26 (d)
- Intumescent Protection: None required

Alternatively, maglocks which have supporting fire resistance test evidence when applied to a timber-based door leaf in a timber frame which has achieved greater than 60 minutes integrity performance when tested to BS 476: Part 22: 1987 or EN 1634-1, may be fitted, providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and it does not interfere with the self-closing action of the door leaf.

The fitting of mag locks is not considered to change the latching arrangement of the doorset and therefore the permitted leaf size shall be established using unlatched doorset configurations as detailed within section 4.5 where no further mechanical latch is fitted.

10.6.4 CQR Maximal FC620 Flush Contact

The CQR Maximal FC620 Door Contacts were included in the successful fire test WF386959 Doorset B and are approved for use on the proposed door designs when restricted to the following parameters:

- Frame Option: 1
  - Minimum frame section size: Minimum 32mm thick x 75mm deep for frame head and jambs (excluding stop).
- Door configuration: LSASD and LSADD
- Intumescent seals: Frame reveal and meeting edges: 2no. 15x4mm minimum, graphite, positioned 10mm apart.
- The door contact may be fitted in the:
  a. Head of the door leaf at a minimum of 300mm from the vertical edges.
  b. Vertical edges of the door leaf at a minimum of 300mm down from the leaf head.
- The door contact must be positioned centrally in the 10mm space between the two intumescent strips.
- Intumescent protection: None required

10.6.5 Arrone AR525-MC Digi Lock

Based on fire test WF518622 – Doorset A the above tested and assessed electro-mechanical locksets are permitted for use with the doorset design subject to the following parameters:

- Frame Option: 1 (Hardwood only) – with minimum section size of 32mm thick x 70mm deep (excluding stop).
- Configurations: LSASD, ULSASD
- The frame intumescent shall consist of a specification which has a minimum of 2No. 15mm x 4mm intumescent seals applied centrally within the frame jambs 10mm apart.
- The frame must be fitted with a stop of minimum 12mm.
- Intumescent Protection: 1mm Mann McGowan Pyrostrip Interdens around the latch body, under forend and keep.
- Locks may be fitted between 700mm – 1600mm from the floor level to the spindle.

Note: The Arrone AR525-MC Digi Lock may be included as a second single point engagement lock, for details refer to section 10.4.1.

10.7 Handles

The table below details the tested handles that are approved.

Element	Manufacturer & Product Reference
Handles	• Arrone: AR961/60-SP-SSS-SS304 (WF518622 – Doorset A) • Hoppe: Paris lever handle (CFR2104282 & CFR2201122) • Assa Abloy: INOXI 3-19SS / DH072 (CFR2109152) • Zoo Hardware: ZCS2030SS (WF417777) • Zoo Hardware: ZCS030RSS (WF415618 Doorset B)
Escutcheons	• Zoo Hardware: ZCS001S (CFR2112211) • Zoo Hardware: VS001 (WF415618 Doorset B)

Alternative handles are permitted providing they meet the specification given below:

- Steel, stainless steel, brass, aluminium or bronze are permitted.
- Surface fixings or through fixings are permitted. If through fixed there must be no more than 0.5mm clearance between the hole and the fixing.
- The hole through the leaf to facilitate the spindle must be no greater than 20mm diameter.

The design may be either lever on rose or lever on back plate up to the following maximum sizes:

- Lever on rose with a rose diameter up to 54mm
- Lever on back plate with a back plate size up to 243mm high x 56mm wide
- Lever handle length 250mm

The handle must be compatible with the lock/latch, such that the closing action of the doorset is not impeded.

Alternative escutcheons are permitted providing they meet the specification given below:

- Steel, stainless steel, brass, aluminium or bronze are permitted.
- Surface fixings or through fixings are permitted. If through fixed there must be no more than 0.5mm clearance between the hole and the fixing.
- The escutcheon may be up to Ø52mm overall and up to 8mm thick.

10.8 Hinges

10.8.1 Butt and Lift Off Hinges

Frame options: 1, 2 & 3

The table below details hinges that have been successfully tested in the Strebord® 54 door assembly system for 60 minute applications and are approved:

Element	Manufacturer & Product Reference
Hinges	• Royde & Tucker H101 (Chilt/RF13082, Chilt/RF13111, Chilt/RF13242 & WF386959 Revision A - Doorset B) • Royde & Tucker H102 (Chilt/RF10011 Doorset B) • Royde & Tucker H105 (Chilt/RF99113, Chilt/RF00169, Chilt/RF02020, Chilt/RF07035 & Chilt/RF08051) • Royde & Tucker H207 (TA087-9&10 – Doorset B) • Zoo Hardware Ltd: ZHSS243S & ZHSS243RS (CFR2112211 & WF523041 Doorset B) • Hoppe AR812 & AR8180 (WF518622 – Doorset A) • Eurospec HIN1433/13SSS/R (WF413865)

This Field of Application also considers hinges tested in similarly constructed timber-based door assemblies where the evidence is made available to the sponsor.

Hinges are permitted for use with all single acting doorset configurations.

Based on the dimensions of the hinges tested in the Strebord® 54 doorset design, hinges which meet the following specification are acceptable, providing the hinges have been tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a timber door assembly having a maximum 54mm thick door leaf and achieved a minimum of 60 minutes.

Alternatively, components with the following specification are also deemed acceptable.

Element	Specification
Blade height:	90 - 120mm
Blade width (excluding knuckle):	30 - 35mm
Blade thickness	2.5 - 4mm
Fixings:	Minimum of 4 No. 30mm long No. 8 or No.10 steel wood screws per blade
Materials:	Steel or stainless steel

In all instances, the hinge positioning must be the following specifications:

Element		Specification	
Hinge positions:	If 3 hinges are required:	Top	100 –180mm from the head to top of hinge
		2nd	Minimum 200mm from top hinge or centrally fitted between top and bottom hinge
		Bottom	150 - 250mm from the foot of leaf to bottom of hinge
	If 4 hinges are required (Refer to Point 1 below):	Top	100-180mm from the head to top of hinge
		2nd & 3rd	Equispaced between top and bottom or 2nd hinge 200mm from top hinge and 3rd hinge equally spaced between 2nd and bottom hinge
		Bottom	150 - 250mm from the foot of leaf to bottom of hinge
Intumescent protection:		See section 10.2	

Notes:

1. Frame Option 3 requires a minimum of four hinges.
2. Leaves less than 2400mm (h) must be hung on a minimum of 3 hinges. Leaves greater or equal 2400mm (h) must be hung on 4 hinges.
3. For Frame types 1 & 2, Certifire approved hinges approved for 60 minutes in an ITT door assembly (i.e. a door assembly containing intumescent, a timber frame and a timber leaf) are acceptable providing all the requirements for intumescent and frame are complied with.
4. For Frame type 3, Certifire approved hinges approved for 60 minutes in an ITM door assembly (i.e. a door assembly containing intumescent, a metal frame and a timber leaf) are acceptable providing all the requirements for intumescent and frame are complied with.
5. Additional intermediate hinges may be included within door assemblies in between the hinges required for the leaf as specified in the table above, provided there is a minimum 100mm between hinges. Where intermediate hinges are introduced, their positioning may influence 2nd and 3rd hinge parameters. No more than 5 hinges at the hanging edge of doorsets may be fitted and providing the spacing requirements of this assessment can be met.
6. Rising butt hinges are not assessed for the Strebord 60 minute doorset system.

10.8.2 Concealed Hinges

The table below details the tested concealed hinges that are approved.

Element	Manufacturer & Product Reference	Frame Type
Concealed Hinges	• Simonswerk Tectus TE527FR (WF414533)	1
	• Arrone AR8990-60 3D (WF525485)	1
	• Atomika Karakter (WF415618 Doorset B)	4

10.8.2.1 Simonswerk Tectus TE527FR

Frame options: 1

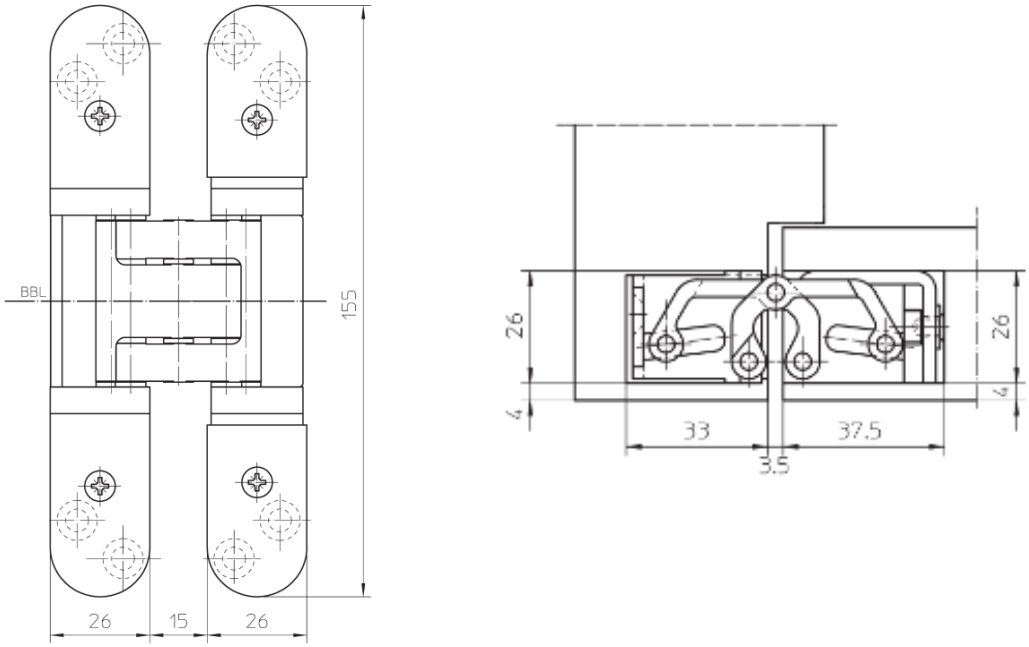
Element	Specification
Maximum Blade height:	155mm
Maximum Blade width	26mm
Maximum Blade Depth	33mm into frame, 37.5mm into door leaf.
Fixings:	Minimum of 4 No. fixings per hinge blade. The manufacturers supplied fixings must be used.
Materials:	Steel or stainless steel
Intumescent	Hinge manufacturer supplied Graphite kit – Ref 8820

In all instances, the hinge positioning must be the following specifications:

Element		Specification	
Hinge positions:	If 3 hinges are required:	Top	200 - 220mm from the head to the centre of hinge
		2nd	Centrally fitted between top and bottom hinge
		Bottom	195 - 220 from the foot of leaf to bottom of hinge
	If 4 hinges are required:	Top	200 - 220mm from the head to top of hinge
		2nd & 3rd	Equispaced between top and bottom or 2nd hinge 200mm from top hinge and 3rd hinge equally spaced between 2nd and bottom hinge
		Bottom	195 - 220 from the foot of leaf to bottom of hinge

Note:

Leaves less than 2400mm (h) must be hung on a minimum of 3 hinges. Leaves greater or equal 2400mm (h) must be hung on 4 hinges.



Simonswerk Tectus TE527FR Dimensional Data

The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above.

The mortice for concealed hinges must no closer than 50mm to any aperture, recessed area or other mortice within the door leaf.

The minimum permitted frame thickness excluding stop is 44mm.

10.8.2.2 Arrone AR8990-60 3D

Frame options: 1

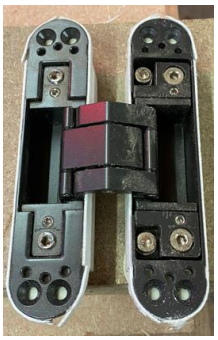
Assessed frame profiles are:

- Type 1 with a minimum thickness of 32mm, not including the doorstop and must be a minimum density of 640kg/m^3.

Note:

- The material of the Arrone AR8990-60-3D hinges must remain as tested.
- The mortice must be as tight to the hinge body as is compatible with its operation.
- Fixings for the hinges must be those supplied and tested with the hinges.
- The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above.
- The mortice for concealed hinges must no closer than 50mm to any aperture or other mortice or recessed area within the door leaf.
- The hinges may be used in conjunction with a twin strip perimeter graphite based intumescent arrangement (minimum dimensions 15 x 4).
- Intumescent protection as shown in the table below must be installed for the Arrone AR8990-60 3D hinge.

The following tables define the permitted intumescent protection and installation details required for use with the tested Arrone AR8990-60 3D hinges.

Element		Specification	
Hinge positions:	If 3 hinges are required:	Top	150 - 180mm from the head to the centre of hinge
		2nd	Centrally fitted between top and bottom hinge
		Bottom	180 - 250 from the foot of leaf to bottom of hinge
	If 4 hinges are required:	Top	200 - 220mm from the head to top of hinge
		2nd & 3rd	Equispaced between top and bottom or 2nd hinge 200mm from top hinge and 3rd hinge equally spaced between 2nd and bottom hinge
		Bottom	195 - 220 from the foot of leaf to bottom of hinge
Intumescent protection:		Mann McGowan 1mm Pyrostrip, encasing the both the frame and door leaf bodies as illustrated below. 	

Note:

Leaves less than 2400mm (h) must be hung on a minimum of 3 hinges. Leaves greater or equal 2400mm (h) must be hung on 4 hinges.

10.8.2.3 Atomika KaraKter K8080

Frame options: 4

Element	Specification
Maximum Blade height:	160mm
Maximum Blade width	28mm
Maximum Blade Depth	31.5mm into frame, 34mm into door leaf.
Fixings:	Minimum of 4 No. fixings per hinge blade. The manufacturers supplied fixings must be used.
Materials:	Steel or stainless steel
Intumescent	Manufacturer Lorient, 1mm Graphite encasing the hinge body in the door leaf only (refer to image below).

In all instances, the hinge positioning must be the following specifications:

Element		Specification	
Hinge positions:	If 3 hinges are required:	Top	200 - 220mm from the head to the centre of hinge
		2nd	Centrally fitted between top and bottom hinge
		Bottom	195 - 220 from the foot of leaf to bottom of hinge
	If 4 hinges are required:	Top	200 - 220mm from the head to top of hinge
		2nd & 3rd	Equispaced between top and bottom
		Bottom	195 - 220 from the foot of leaf to bottom of hinge

Note:

Leaves less than 2400mm (h) must be hung on a minimum of 3 hinges. Leaves greater or equal 2400mm (h) must be hung on 4 hinges.

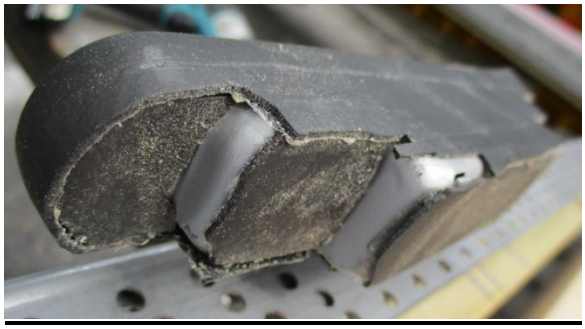
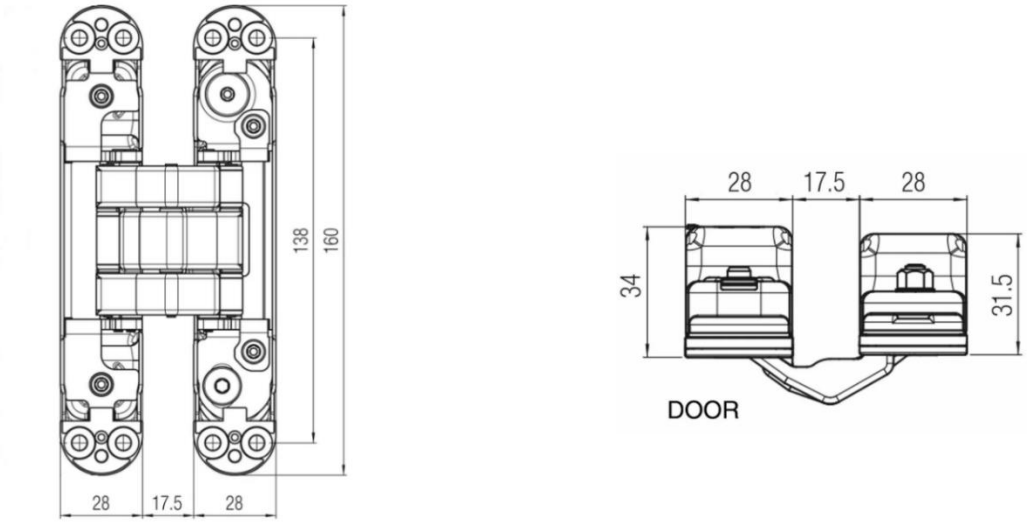


Image showing intumescent protection applied to the hinge body (leaf blade only)



Atomika KaraKter K8080 Dimensional Data

The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above.

The mortice for concealed hinges must no closer than 50mm to any aperture, recessed area or other mortice within the door leaf.

10.9 Doorset Self Closing

Doorset automatic self-closing can be provided by:

- Overhead face fixed closers
- Concealed jamb mounted closers
- Concealed overhead closers
- Floor springs with top pivots and bottom straps

Automatic doorset self-closing devices such as transom mounted closers, and offset pivots used with floor springs are not considered acceptable for use with the Strebord® 54 Doorsets.

10.9.1 Overhead Face Fixed Closer

The table below details the tested overhead face-fixed closers that are approved.

Element	Manufacturer & Product Reference
Overhead face-fixed closers	• Dorma TS73V • Dorma TS83V • Rutland TS3204 • Rutland TS4204 • Rutland TS.24 Ezykam • Rutland TS5024 • Rutland TS5204BC

Alternatively, components with the following specification are also deemed acceptable.

For frame types 1, 2 & 3:

- Certifire approved overhead face-fixed closers for 60-minute fire resistance applications on 54mm thick timber door with timber frames (ITT).

For frame types 4 & 5:

- Certifire approved overhead face-fixed closers for 60-minute fire resistance applications on 54mm thick timber door with steel frames (ITM).

Note:

It must be ensured that the closer is of sufficient strength and power to ensure the door leaf/leaves fully engage into the frame reveal.

10.9.2 Frame Jamb Mounted Closer

Frame options: 1 & 2

The table below details the tested concealed jamb mounted closers that are approved.

Element	Manufacturer & Product Reference
Jamb mounted concealed closer	• Astra Door Controls - Astra 4003 (WF413865)

The Astra 4000 series concealed jamb mounted closer, must be installed in accordance with the manufacturer's instructions. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Astra 4000 series jamb mounted closer, may only be used within the following specifications:

Door configuration:

- All single acting configurations without flush overpanels.

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Astra 4000 series must be used with 8-15mm (t) hardwood or Strelip® lippings at the vertical edges as a minimum (all other lipping details are to be according to section 5.3)

Frame:

- Frame 1 Only, Hardwood timber of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- The frame must have a minimum thickness of 32mm.

Door Dimensions:

- Maximum leaf size is as for the Type 617 envelopes in section 4.5, where 2No. 15 x 4mm seals are specified at the perimeter. Intumescent location and protection for the closer must be as detailed in this section (see below)

Perimeter intumescent seals:

- 2No. 15 x 4mm Type 617 – Lorient Polyproducts centrally fitted within the frame reveal spaced 10mm apart.
- Both seals are partially interrupted with a minimum of 4mm width of both seals running past the face plate in the frame reveal
- 1mm (t) Therm-A-Strip – Intumescent Seals Ltd must be fitted to encase the closer body in the door leaf and be fitted under the forend and keep.

Location:

- The closer must be located between 800mm and 1000mm from the bottom edge of the leaf.

Alternatively, components with the following specification are also deemed acceptable.

- Certifire approved jamb mounted closers for 60-minute fire resistance applications on 54mm thick timber door with timber frames (ITT).

Note:

- It must be ensured that the jamb mounted concealed closer is of sufficient strength and power to ensure the door leaf/leaves fully engage into the frame reveal.

10.9.3 Concealed Overhead Self Closing Device

10.9.3.1 Single Action Doorsets

The following overhead single acting concealed closers have either been directly tested in the Strebord 54 door design or have been assessed based on test evidence on a fundamentally similar door design. The test evidence is cited in Section 3 of this report.

The following construction requirements (e.g. frame profile, lipping, perimeter intumescent, gaskets) must be followed for each of the closer options and the details below take precedence over the specification given for those specific items elsewhere in this report.

Overhead concealed closers are not permitted with steel frames.

10.9.3.1.1 Dorma ITS 96 3-6 with G96 EMF arm & channel

The Dorma ITS 96 3-6 with G96 EMF arm & channel has been successfully tested and detailed in the test report referenced WF379042 summarised in Section 3 of this report.

Based on the tested closer and slide channel, the Dorma ITS 96 2-4 concealed closer option and the alternative slide channels listed below are considered acceptable:

Dorma ITS 96 closer option:

- Dorma ITS 96 2-4
- Dorma ITS 96 3-6 (as tested)

Dorma ITS 96 arm & channel options:

- G96 N
- G96 N20
- G96 EMF (as tested)

The above alternative closer and slide channels are acceptable as they are of smaller dimensions and would therefore require a smaller section of timber material to be removed from the leaf and frame head for their installation, which is considered to be less onerous in terms of fire resistance performance.

The closers and slide channels are to be installed in accordance with the manufacturer's instructions, including the tested and approved spindle length as supplied by Dorma. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Dorma ITS 96 concealed closers and slide channels referenced above may only be used within the following specifications:

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Dorma ITS 96 concealed closers may be used with leaves without lipping at the head or with lipping between 6-15mm thick at the head of the door leaf

Frame:

- Frame Type 1 only
- Hardwood timber frames of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- When using the G96 EMF slide channel – the frame head must have a minimum thickness of 44mm, excluding the door stop. The frame jambs must be a minimum thickness of 32mm, excluding the door stop.
- When using the G96 N or G96 N20 slide channels – all frame elements must have a minimum thickness of 32mm, excluding the door stop.
- A minimum of 20mm deep rebated or 20mm thick planted doorstop is required at the frame head.

Note: for all slide channels, a minimum of 10mm thick timber must remain at the back of the mortice in the frame head in order to provide sufficient material for the slide channel fixings.

Door configuration:

- All single acting configurations without flush overpanels.

Door Dimensions:

- Maximum leaf size is as for the Pyroplex envelopes where 2No. 15 x 4mm seals are specified at the perimeter, in the following sections:
    - Section 4.5.5.1 - LSASD
    - Section 4.5.6.1 - ULSASD
    - Section 4.5.10.1 - LSADD
    - Section 4.5.11.1 - ULSADD

Intumescent location and protection for the closer must be as detailed in this section.

Perimeter intumescent seals:

- 2No. PVC encased Pyroplex Rigid Box 8700 (Fire Only seal), 15mm wide x 4mm thick. Alternatively, one of the two seals may be Rigid Box 8724 which includes a single flipper (per Certifire approval CF355).
- Seals must be fitted centrally, 10mm apart in the frame head and jambs. 1st seal (from the opening face) may only be partially interrupted by the channel with at least 10mm of the seal running continuous. 2nd seal may be fully interrupted by the channel.

Note: If using Rigid Box 8724 as one of the two seals, the 8724 seal must be the 1st seal which is to be only partially interrupted.

Intumescent protection:

- Closer: 1mm thick Interdens® intumescent kit supplied by Dormakaba, covering all concealed faces of the closer body and behind the faceplate.
- Slide channel: 2mm thick Interdens® intumescent kit supplied by Dormakaba, covering all concealed faces of the slide channel.

10.9.3.1.2 Synergy Hardware Ltd - Synergy S1000

The Synergy S1000 concealed overhead closer has been successfully tested and is detailed in the test report referenced WF324426 Issue 3, summarised in Section 3 of this report.

The Synergy S1000 concealed overhead closer and slide channel are to be installed in accordance with the manufacturer's instructions, including the tested and approved spindle length as supplied by Fortress Industrial. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Synergy S1000 concealed closer and slide channel referenced above may only be used within the following specifications:

Slide channel:

The Synergy S1000 closer is approved with the following tested slide channel:

- Synergy S1000 guide rail - 31 x 20mm

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Synergy S1000 concealed closer may be used with leaves without lipping at the head or with lipping between 6-15mm thick at the head of the door leaf.

Frame:

- Frame Type 1 only
- Hardwood timber frames of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- The frame head must have a minimum thickness of 37mm, excluding the door stop. The frame jambs must have a minimum thickness of 32mm, excluding the door stop.
- A minimum of 40mm (w) x 20mm (d) rebated or 20mm (t) planted doorstop is required at the frame head.

Note: for the slide channel, a minimum of 10mm thick timber must remain at the back of the mortice in the frame head in order to provide sufficient material for the slide channel fixings.

Door configuration:

- All single acting configurations without flush overpanels.

Door Dimensions:

- Maximum leaf size is as for the Therm-A-Seal envelopes where 2No. 15 x 4mm seals are specified at the perimeter, in the following sections:
    - Section 4.5.5.1 - LSASD
    - Section 4.5.6.1 - ULSASD
    - Section 4.5.10.1 - LSADD
    - Section 4.5.11.1 - ULSADD

Intumescent location and protection for the closer must be as detailed in this section.

Perimeter intumescent seals:

- 2No. PVC encased Therm-A-Seal, 15mm wide x 4mm thick
- Seals must be fitted 10mm apart and centrally in the frame head and jambs. The first seal is to be located 7mm from the closing face. The seals in the frame reveal head may be partially interrupted by the slide channel with a minimum width of 5mm of both seals running continuous either side of the slide channel.

Intumescent protection:

- Closer: 2mm (t) Lorient Polyproducts Interdens sheet, lining all sides of the mortice for the concealed closer
- Slide channel: 2mm (t) Lorient Polyproducts Interdens sheet, lining all sides of the mortice for the slide channel in the frame head

10.9.3.1.3 Synergy Hardware Ltd – Synergy 1036

The Synergy S1036 concealed overhead closer has been successfully tested and is detailed in the test report referenced WF375219 Issue 2, summarised in Section 3 of this report.

The Synergy S1036 concealed overhead closer and slide channel are to be installed in accordance with the manufacturer's instructions, including the tested and approved spindle length as supplied by Fortress Industrial. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Synergy S1036 concealed closer and slide channel referenced above may only be used within the following specifications:

Slide channel:

The Synergy S1036 closer is approved with the following tested slide channel:

- Synergy S1036 guide rail - 31 x 20mm

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Synergy S1036 concealed closer may be used with leaves without lipping at the head or with lipping between 6-15mm thick at the head of the door leaf.

Frame:

- Frame Type 1 only
- Hardwood timber frames of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- The frame head must have a minimum thickness of 37mm, excluding the door stop. The frame jambs must have a minimum thickness of 32mm, excluding the door stop.
- A minimum of 40mm (w) x 20mm (d) rebated or 20mm (t) planted doorstop is required at the frame head.

Note: for the slide channel, a minimum of 10mm thick timber must remain at the back of the mortice in the frame head in order to provide sufficient material for the slide channel fixings.

Door configuration:

- All single acting configurations without flush overpanels.

Door Dimensions:

- Maximum leaf size is as for the Pyroplex envelopes where 2No. 15 x 4mm seals are specified at the perimeter, in the following sections:
    - Section 4.5.5.1 - LSASD
    - Section 4.5.6.1 - ULSASD
    - Section 4.5.10.1 - LSADD
    - Section 4.5.11.1 - ULSADD

Intumescent location and protection for the closer must be as detailed in this section.

Perimeter intumescent seals:

- 2No. PVC encased Pyroplex, 15mm wide x 4mm thick
- Seals must be fitted 10mm apart and centrally in the frame head and jambs. The first seal is to be located 7mm from the closing face. The seals in the frame reveal head may be partially interrupted by the slide channel with a minimum width of 5mm of both seals running continuous either side of the slide channel.

Intumescent protection:

- Closer: 2mm (t) Lorient Polyproducts Interdens sheet, lining all sides of the mortice for the concealed closer
- Slide channel: 2mm (t) Lorient Polyproducts Interdens sheet, lining all sides of the mortice for the slide channel in the frame head.

10.9.3.1.4 Geze Boxer 2-4

The Geze Boxer 2-4 concealed overhead closer has been successfully tested and is detailed in the test report referenced WF414533 summarised in Section 3 of this report.

The Geze Boxer 2-4 closer and slide channel are to be installed in accordance with the manufacturer's instructions, including the tested and approved spindle length as supplied by Geze. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Geze Boxer 2-4 concealed closer and slide channels referenced above may only be used within the following specifications:

Slide channel:

The Geze Boxer 2-4 closer is approved with the following tested slide channel:

- Non-hold open single action guide rail for Boxer with lever arm - 20 x 12mm

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Geze Boxer 2-4 concealed closers **must** be used with 10-15mm thick lipping at the head of the door leaf Frame:
- Hardwood timber frames of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- Frame Type 1 only, the frame head must have a minimum thickness of 40mm, excluding the door stop. The frame jambs must have a minimum thickness of 32mm, excluding the doorstop.
- A minimum of 45mm (w) 18mm (d) rebated or 18mm (t) planted doorstop is required at the frame head.

Note: for the slide channel, a minimum of 10mm thick timber must remain at the back of the mortice in the frame head in order to provide sufficient material for the slide channel fixings.

Door configuration:

- All single acting configurations without flush overpanels.

Door dimensions:

- Maximum leaf size is as for the Type 617 envelopes where 2No. 15 x 4mm seals are specified at the perimeter, in the following sections:
    - Section 4.5.5.1 - LSASD
    - Section 4.5.10.1 - LSADD

Intumescent location and protection for the closer must be as detailed in this section.

Perimeter intumescent seals:

- 2No. PVC encased Lorient Polyproducts Type 617, 15mm wide x 4mm thick.
- Seals must be fitted centrally, 10mm apart in the frame head and jambs. The seals in the frame reveal head may be partially interrupted by the slide channel with a minimum width of 8mm of both seals running continuous either side of the slide channel

Intumescent protection:

- Closer: 1mm (t) intumescent kit supplied by Geze, covering all concealed faces of the closer body and 1mm (t) gasket to top face plate of closer in leaf head
- Slide channel: 1mm (intumescent kit supplied by Geze, covering all concealed faces of the slide channel).

10.9.3.1.5 Hoppe AR7383

The Hoppe AR7383 concealed overhead closer has been successfully tested and is detailed in the test report referenced BMT/FEB/F16012, summarised in Section 3 of this report.

The Hoppe AR7383 concealed overhead closer and slide channel are to be installed in accordance with the manufacturer's instructions, including the tested and approved spindle length as supplied by Hoppe. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Hoppe AR7383 concealed closer and slide channels referenced above may only be used within the following specifications:

Slide channel:

The Hoppe AR7383 closer is approved with the following tested slide channel:

- Non-hold open single action guide rail - 23 x 15mm

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Hoppe AR7383 concealed closer must be used with lipping between 6-15mm thick at the head of the door leaf.

Frame:

- Frame Type 1 only.
- Hardwood timber frames of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- The frame head must have a minimum thickness of 44mm, excluding the door stop. The frame jambs must have a minimum thickness of 32mm, excluding the doorstop.
- A minimum of 45mm (w) 12mm (d) rebated or 12mm (t) planted doorstop is required at the frame head.

Note: for the slide channel, a minimum of 10mm thick timber must remain at the back of the mortice in the frame head in order to provide sufficient material for the slide channel fixings.

Door configuration:

- All single acting configurations without flush overpanels.

Door dimensions:

- Maximum leaf size is as for the Pyroplex envelopes where 2No. 15 x 4mm seals are specified at the perimeter, in the following sections:
    - Section 4.5.5.1 - LSASD
    - Section 4.5.6.1 - ULSASD
    - Section 4.5.10.1 - LSADD
    - Section 4.5.11.1 - ULSADD

Intumescent location and protection for the closer must be as detailed in this section.

Perimeter intumescent seals:

- 2No. PVC encased Pyroplex, 15mm wide x 4mm thick.
- Seals must be fitted 10mm apart in the frame head and jambs. The first seal is to be located 9mm from the closing face. The seals in the frame reveal head may be partially interrupted by the slide channel with a minimum width of 7mm of the first seal (toward closing face) and 10mm width of the second seal running continuous either side of the slide channel

Intumescent protection:

- Closer: 2mm (t) intumescent kit supplied by Hoppe, covering all concealed faces of the closer body
- Slide channel: 2mm (t) intumescent kit supplied by Hoppe, covering all concealed faces of the slide channel.

10.9.3.1.6 Rutland ITS.11204

The Rutland ITS.11204 concealed overhead closer has been successfully tested and is detailed in the test report referenced TA087-9&10 – Doorset B, summarised in Section 3 of this report.

The Rutland ITS.11204 concealed overhead closer and slide channel are to be installed in accordance with the manufacturer's instructions. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Rutland ITS.11204 concealed closer and slide channels referenced above may only be used within the following specifications:

The Rutland ITS.11204 closer is approved with the following tested slide channel:

- Non-hold open single action guide rail - 23 x 15mm

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Rutland ITS.11204 concealed closer must be used with lipping between 8-15mm thick at the head of the door leaf.

Frame:

- Frame Type 1 only.
- Hardwood timber frames of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- The frame head must have a minimum thickness of 44mm, excluding the door stop. The frame jambs must have a minimum thickness of 32mm, excluding the doorstop.
- A minimum of 30mm (w) 15mm (d) rebated or 15mm (t) planted doorstop is required at the frame head.

Note: for the slide channel, a minimum of 10mm thick timber must remain at the back of the mortice in the frame head in order to provide sufficient material for the slide channel fixings.

Door configuration:

- All single acting configurations without flush overpanels.

Door dimensions:

- Maximum leaf size is as for the Mann McGowan 500P envelopes where 2No. 15 x 4mm seals are specified at the perimeter, in the following sections:
    - Section 4.5.5.1 - LSASD
    - Section 4.5.6.1 - ULSASD
    - Section 4.5.10.1 - LSADD
    - Section 4.5.11.1 - ULSADD

Intumescent location and protection for the closer must be as detailed in this section.

Perimeter intumescent seals:

- 2No. PVC encased Mann McGowan 500P, 15mm wide x 4mm thick.
- Seals must be fitted 10mm apart in the frame head and jambs. The first seal is to be located 9mm from the closing face. The seals in the frame reveal head may be partially interrupted by the slide channel with a minimum width of 7mm of the first seal (toward closing face) and 10mm width of the second seal running continuous either side of the slide channel.

Intumescent protection:

- Closer & Slide Channel: Rutland IP.114, 2mm intumescent as supplied by Rutland, covering the top of the mechanism and around the slide channel. (t) intumescent kit supplied by Rutland, covering all concealed faces of the closer body

- Slide channel: 2mm (t) as part of the IP.114 intumescent kit supplied by Rutland, covering all concealed faces of the slide channel.

10.9.3.2 Double Action Doorsets

10.9.3.2.1 Rutland ITS.11204 & Rutland PS190 Pivots

The Rutland ITS.11204 concealed overhead closer and Rutland PS190 pivots have been successfully tested and detailed in the test report referenced CFR2109081 Revision 1, summarised in Section 3 of this report.

The Rutland ITS.11204 concealed overhead closer, slide channel and Rutland PS190 pivots are to be installed in accordance with the manufacturer's instructions, including the tested and approved closer spindle length as supplied by Rutland. The minimum specifications detailed below must also be complied with.

Based on the tested door construction, the Rutland ITS.11204 concealed closer, slide channel and Rutland PS190 pivots referenced above may only be used within the following specifications:

Slide channel:

The Rutland ITS.11204 closer is approved with the following tested slide channel:

- Non-hold open single action guide rail - 23 x 15mm

Leaf:

- The leaf core thickness must be a minimum of 53.2mm excluding facings.
- Lipping – the Rutland ITS.11204 concealed closer must be used with lipping between 18-20mm thick at the head and bottom of the door leaf.

Frame:

- Frame Type 1 only.
- Hardwood timber frames of minimum density of 640kg/m^3. Beech (Fagus species) is not permitted.
- The frame head must have a minimum thickness of 44mm, excluding the door stop. The frame jambs must have a minimum thickness of 34mm, excluding the doorstop.

Note: for the slide channel, a minimum of 10mm thick timber must remain at the back of the mortice in the frame head in order to provide sufficient material for the slide channel fixings.

Threshold:

- Maximum gap: 2mm

Test CFR2109081 Revision 1 included a Norseal 620 aluminium threshold, 60 (w) x 5 (d) set between the frame jambs and is therefore approved for use. Alternative aluminium thresholds of a similar construction and not exceeding 60 (w) x 5 (d) are permitted, provided the threshold is capable of maintaining the maximum permitted threshold gap.

Door configuration:

- All double acting configurations without flush overpanels.

Door dimensions:

- Maximum leaf size is as for the ISL Therm-A-Seal envelopes as specified in the following sections:
    - Section 4.5.7.1 – DASD – Envelope Ref. CH7
    - Section 4.5.12.1 – DADD - Envelope Ref. IH7

Intumescent location and protection for the closer must be as detailed in this section.

Perimeter intumescent seals:

Head & Jambs:

- 2No. PVC encased Intumescent Seals Ltd Therm-A-Blade, 20mm wide x 4mm thick.
- Seals must be fitted 10mm apart in the frame head and jambs. The first seal is to be located 9mm from the closing face. The seals in the frame reveal head may be partially interrupted by the slide channel with a minimum width of 7mm of the first seal (toward closing face) and 10mm width of the second seal running continuous either side of the slide channel.

Leaf Head:

- 1No. Intumescent Seals Ltd Therm-A-15x4mm, Fitted centrally in the leaf thickness.

Intumescent protection:

Rutland ITS.11204 Closer

- Closer: 2mm (t) intumescent kit supplied by Rutland, covering all concealed faces of the closer body
- Slide channel: 2mm (t) intumescent kit supplied by Rutland, covering all concealed faces of the slide channel.

Rutland PS190 Pivot Set

- **Top Pivot:** Rutland UK, PS190 pre-cut kit. 1mm thick Mono Ammonium Phosphate set between the top pivot face plate and cover plate.
- **Top Strap:** Rutland UK, 2mm thick graphite based intumescent covering the external face of the top strap.
- **Bottom Strap:** Rutland UK, PS190 pre-cut kit, 6mm thick in total, comprising 3 layers of 2mm thick graphite based intumescent covering the external face of the bottom strap.
- **Floor Pivot:** Rutland UK, IP.114, 2mm thick graphite based intumescent lines the base of the rebate for the bottom pivot plate.

Note:

1. It must be ensured that the concealed overhead closer is of sufficient strength and power to ensure the door leaf/leaves fully engage into the frame reveal.
2. Intumescent protection shall be as detailed within the above table, as tested.
3. The dimensions of the concealed overhead door closer must not exceed the dimensions given within the table above.

10.9.3.2.2 Ruland Self Centring Magnet

The Rutland Self Centring magnet has been successfully tested and is detailed in the test report referenced CFR2109081 Revision 1, summarised in Section 3 of this report.

Frame Type 1 only.

Dimensions

Magnet Body: 31x32x12mm

Coverplate: 65x38x1.3mm

Intumescent Protection:

Rutland IP114, 2mm thick graphite based intumescent.

Minimum Spacing:

Coverplate to leaf edge: 18mm

Distance to other ironmongery: As tested or minimum 200mm from adjacent ironmongery.

Note:

1. The distance between the magnet and closer cannot be reduced from that tested, the **minimum** leaf width permitted when the Rutland Self Centring magnet is installed is 926mm.
2. Flush bolts cannot be used in conjunction with the Rutland Self Centring magnet.
3. The magnet in the frame and door leaf head are recessed in order to permit the intumescent strips to run over the 2mm graphite affixed to the Coverplate. As shown below:

Primary Leaf

Secondary Leaf

Note: The Rutland ITS.11204 has been tested without the self-centring magnets and therefore it is considered by this report that the magnets are optional.

10.9.4 Floor Spring Self Closing Device

Frame options: 1

The following floor spring and pivot set have been tested with the Strebord® 54 door design, they are permitted for use in double acting leaf configurations without flush overpanels.

The table below details the tested pivots that are approved.

Manufacturer & Product Reference	Test Report	Frame Type
Rutland Pivot Set PS190, comprising floor pivot, door top strap, frame top pivot and Rutland TS7104 double acting floor spring	WF417777	1

The following intumescent protection is required for the Rutland PS190 pivots and Rutland Floor spring:

- **Top Pivot:** Rutland UK, PS190 pre-cut kit. 1mm thick Mono Ammonium Phosphate set between the top pivot face plate and cover plate.
- **Top Strap:** Rutland UK, 2mm thick graphite based intumescent covering the external face of the top strap
- **Bottom Strap:** Rutland UK, PS190 pre-cut kit, 6mm thick in total, comprising 3 layers of 2mm thick graphite based intumescent covering the external face of the bottom strap.
- **Floor Spring:** Manufacturers kit fitted under the floor spring cover plate – 1mm thick.

The frame head dimensions must be a minimum of 90mm wide x 44mm deep to accommodate the body of the top pivot.

Alternatively, components with the following specification are deemed acceptable.

- Certifire approved pivot sets and double acting floor springs may be used with the Strebord® 54 door design providing they are approved for 60 minutes, when installed within a minimum 54mm thickness leaf, in an ITT door assembly (i.e. a door assembly containing intumescent, a timber frame and a timber leaf) and providing all the requirements for intumescent and frame detailed in this assessment are complied with. Where the Certifire Certificate identifies the pivot manufacturer's specific intumescent kit this must be used.

Notes:

- Pivots may be used conjunction with their associated double acting floor spring (supplied by the same manufacturer as the pivot set).
- The pivots are to be fitted in accordance with manufacturer's instructions taking into account the necessary details for fire resistance as stated above.
- Offset pivot variations are not allowed by this assessment

10.10 Flush Bolts

These items are suitable in the following applications only:

Configurations: LSADD, ULSADD & DADD

Flush bolts may be incorporated centrally into the top and bottom of one meeting edge, providing the following maximum dimensions are not exceeded and the components are fitted opposite the edge fitted with intumescent strips:

- 205mm long x 20mm deep x 20mm wide.

Flushbolts are:

- Permitted for use with doorsets with transomed overpanels / fanlights.
- Not permitted for use with doorsets with flush overpanels.

Flush bolts must be steel, and the mortice must be as tight to the mechanism as is compatible with its operation. All edges of the mortice of the keep and body must be protected with intumescent gaskets as specified in section 10.2. Alternatively, the hardware manufacturers tested gaskets may be used.

Flush bolt installation and intumescent protection

10.11 Non-Essential Hardware

Only the following items of non-essential hardware are permitted in addition to the prescribed essential hardware as detailed within sections 10.3 – 10.10.

10.11.1 Pull Handles

The table below details the tested push plates that are approved.

Element	Manufacturer & Product Reference
Pull Handles	• Touchpoint S/S Bolt through -Ø19 x 300mm centres (Test WF518622)

Steel, stainless steel or bronze handles may be surface-fixed or bolted through the door leaf, providing the length is limited to 1200mm between the fixing points. If through fixed, there must be no more than 1mm clearance between the hole and stud.

The above scope of application is provided as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted away from the edge of the door leaf, therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and therefore cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

10.11.2 Push Plates & Kick Plates

The table below details the tested push plates that are approved.

Element	Manufacturer & Product Reference
Push & Kick Plates	• 1.5mm Stainless Steel (Test WF518622)

Alternatively, components with the following specification are also deemed acceptable as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted away from the edge of the door leaf, therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and therefore cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

Approved specification:

- Polymeric or metal (excluding aluminium) face-fixed hardware such as push plates and kick plates up to 2mm thick may be surface fitted to the doorset. These items of hardware are permitted up to a maximum of 20% of the door leaf area if mechanically fixed and a maximum of 30% if bonded with a contact or other thermally softening adhesive. Plates must not return around the door edges or ‘notch out’/interrupt the door stop.

10.11.3 Security Viewers

The table below details the tested security viewers that are approved.

Element	Manufacturer & Product Reference
Security viewers	• Sealed Tight Solutions Ltd. STS4008 (WF386959 Revision A - Doorset B)

Alternatively, components with the following specification are also deemed acceptable.

- Door security viewers with brass or steel bodies of a diameter less than or equal to 15mm may be used provided that the through-hole is bored tight to the case of the viewer (maximum tolerance +1 mm). Lenses must be glass and the item must be protected with a tested acrylic intumescent mastic.
- Must be fitted no closer than 100mm to door edge, glazing or any other hardware component.
- Maximum height from the bottom of the door leaf must not exceed 1800mm.

It is permitted that 2 No. viewers may be fitted per door leaf provided that they comply with the constructional and location restrictions above.

10.11.4 Air Transfer Grilles

10.11.4.1 General

The following air transfer grilles are permitted based on suitable test evidence to BS 476: Part 22: 1987 or BS EN 1634-1, which is cited in section 3.

10.11.4.2 Pyroplex Air Transfer Grilles

The following Pyroplex air transfer grilles have been considered acceptable for use with the Strebord© 54 door design based on the testing conducted in WF146521 (summarised in Section 3):

Part No.	**Dimensions** (mm)	**Air Flow** (sq. cm)	**Compatible Faceplates**
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

Notes:

- The Pyroplex air transfer grilles must be installed in accordance with the manufacturer's installation details, which include a 6mm thick hardwood (excluding beech (Fagus species)) aperture liner and Pyroplex intumescent mastic applied around the perimeter of the grille. Full details can be obtained from Pyroplex Ltd.
- The grilles must be fitted 100mm from the edge of the door leaf and 80mm apart if more than one grille is to be fitted.
- The area occupied by the air transfer grille must be deducted from the area of glazing, if both elements are fitted.
- The grilles may be fitted between 1000mm and 2200mm from the leaf threshold. The aperture cut out for the air transfer grille must be fully contained within this region of the door leaf.

10.11.4.3 Mann McGowan Air Transfer Grilles

The following Mann McGowan air transfer grilles have been considered acceptable for use with the Strebord© 54 door design based on the testing conducted in TA087-910 (summarised in Section 3):

Part No.	**Maximum Dimensions** (mm)
Pyrogrille 25*	300 x 300
Pyrogrille 100*	600 x 600

* Pyrogrille 25 be located between 700mm and 2275mm from the threshold to the top of the grille based on the pressure regime used within the supporting test and the location of the grille within the doors tested.

* Pyrogrille 100 may be located up to 825mm from the threshold to the top of the grille

The aperture cut out for the air transfer grille must be fully contained within this region of the door leaf.

Notes:

- The Pyrogrille air transfer grilles must be installed in accordance with the manufacturer's installation details, which include 2No. 3.8 diameter x 35mm screws per vertical edge located 35mm (Pyrogrille 25) and 55mm (Pyrogrille 100) from the corners. A steel framework is to be fitted on both sides of the grille to the face of the door leaf using 2No. 4mm diameter x 35mm long screws per vertical edge located 55mm (Pyrogrille 25) and 140mm (Pyrogrille 100) from the corners. Full details can be obtained from Mann McGowan Ltd.
- The grilles must be fitted 100mm from the edge of the door leaf and 80mm apart if more than one grille is to be fitted.
- The area occupied by the air transfer grille must be deducted from the area of glazing, if both elements are fitted.

10.11.4.4 Lorient Polyproducts Air Transfer Grilles

The following Lorient Polyproducts air transfer grilles have been considered acceptable for use with the Strebord© 54 door design based on the testing conducted in WF 380214 (summarised in Section 3):

Part No.	**Dimensions** (mm)
LVV40*	600 x 300

* LVV40 must be located at a maximum of 1035mm from the threshold of the door leaf to the top of the air transfer grille aperture, based on the pressure regime used within the supporting test and the location of the grilles within the door.

Notes:

- The LVV40 air transfer grilles must be installed in accordance with the manufacturer's installation details, which include a 6mm (t) hardwood lining to all edges of the aperture, fixed in position using polyurethane adhesive. The grille is to be bedded onto 8mm thick bead of Lorient Intumescent Sealant with a fillet of sealant on both faces at the junction between the liner and the air transfer grille Full details can be obtained from Lorient Polyproducts Ltd.
- The grilles must be fitted 100mm from the edge of the door leaf and 80mm apart if more than one grille is to be fitted.
- The area occupied by the air transfer grille must be deducted from the area of glazing, if both elements are fitted.

10.11.5 Environmental Seals

These items are suitable in the following applications only:

Frame options: 1, 2 & 4

A number of different environmental seals have been successfully tested as part of the Strebord® 54 doorset design. For example, the Lorient IS1212 Batwing seal was successfully tested in timber frame in report Chilt/RF11171 and report WF415618 Doorset B included the Lorient LAS1010 batwing seal with a steel frame.

On this basis, silicon or Polyvinyl Chloride (PVC) based flame retardant acoustic, weather and dust seals (for example those referenced above or Lorient IS1212, IS1511, IS7025, IS7060 or Sealed Tight Solutions Ltd. ST1009) may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

Where required, the seals may be fitted either rebated into the timber door stop or leaf edge.

10.11.6 Threshold drop Seals

Leaf options: All

Frame options: All

Configurations: All configurations

Drop seals have been successfully tested within the doorset design and are therefore, acceptable for use in the door designs considered herein. The table below details the permitted threshold Drop Seals as tested and summarised within section 3:

Manufacturer & Product Reference (Test Reference)	Body Dimensions H x W (mm)	Intumescent Protection
Norseal NOR810 drop seal (WF414533)	35 x 14	No Intumescent Protection
Lorient Polyproducts LAS8001si (WF435986 Doorset B)	35 x 14	No Intumescent Protection
Mann McGowan DD-1703ACU (CFR2112211)	29 x 13	Mann McGowan, 1mm thick Pyrostrip Interdens to all edges of the rebate between the drop seal casing and the leaf.
Sealmaster 2712 (CFR2109152)	27 x 12	Intumescent Seals Ltd, 2mm thick Therm-A-Strip, fitted to the top and both sides of the drop seal.

Notes:

1. If a rebated drop seal is fitted to the doorset then flush bolts, if approved, may not also be fitted to the bottom of the doorset.

The following alternative drop seals are deemed acceptable, recessed centrally within the leaf thickness in the bottom of the door leaves and fitted with a minimum 1mm thick Interdens or the drop seal manufacturers proprietary gasket to all edges of the rebate between the drop seal casing and the leaf:

Product	Manufacturer
LAS8007/0935A00	Lorient Polyproducts Ltd.
IS8010si	KIlargo – Dorma Kabba
RP8Si	Raven Products Ltd.
NOR810S, NOR810dB+	Norsound Ltd.
STS422, STS422GT	Sealed Tight Solutions Ltd

Alternatively, the components meeting all of the following specifications are also deemed acceptable, recessed into the bottom of leaves:

- Certifire approved threshold drop seals for 60-minute fire resistance applications on 54mm thick timber / cellulosic doors in timber / cellulosic frames.
- The threshold drop seal must not exceed:
    - Body dimensions of 35mm (h) x 14mm (t) and
    - Face plate dimensions of 57mm (h) x 21mm (w) x 1.5mm (t).
- The Certifire certificate shall be adhered to for intumescent protection and fitting requirements.
-

Note: In all instances, if a rebated drop seal is fitted to the doorset then flush bolts, if approved, may not be fitted to the bottom of the doorset.

10.11.7 Letter Boxes / Plates

Based on the proven capability of the Strebord® 54 door design to tolerate apertures for glazing and air transfer grilles, components with the following specification are also deemed acceptable.

- Letter boxes/plates must be Certifire approved for 60 minutes in doorsets with solid timber door leaves. Restrictions relating to size, location and intumescent protection around the letter box/plate detailed within the associated Certifire certificate must be complied with.
- The area of the letter plate (and air transfer grille if present) plus any glazing must not exceed the total permitted area for glazing in the leaf.

10.11.8 Knockers, Numerals & Signage

Components with the following specification are deemed acceptable as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted away from the edge of the door leaf, therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and therefore cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

Approved specifications:

Knockers:

- Steel, stainless steel, aluminium or bronze knockers, may be surface fixed or bolted through the door leaf, providing they are fitted no closer than 75mm from the leaf edge, other elements of building hardware or to any glazing and are no greater than 200mm high x 120mm wide. If through fixed, there must be no more than 1mm clearance between the hole and stud. It is only permitted to fit 1No. knocker to any one doorset.

Numerals & Signage:

- Steel, stainless steel, aluminium or bronze numerals or signage may be surface fixed to the door leaf, providing they are fitted no closer than 35mm from the leaf edge, other elements of building hardware or to any glazing. The dimension of each numeral or sign must be no greater than 200mm high x 100mm wide x 4mm thick. Up to 5No. numerals or signs may be applied to a doorset, numerals and signs may be applied adjacent to each other providing the 35mm from other elements as detailed above is maintained.

10.11.9 Fire Door Identification Plates

Plastic or metal fire door identification plates may be glued or screwed to the face of the door leaves providing they are fitted no closer than 35mm from the leaf edge, other elements of building hardware or to any glazing. The dimension of any applied plate must be no greater than 100mm high x 100mm wide x 3mm thick.

As examples, these may be required to identify the following:

a) To be kept closed when not in use (Fire Door Keep Shut)
b) To be kept locked shut when not in use (Fire Door Keep Locked Shut)
c) Held open by an automatic release mechanism or free swing device (Automatic Fire Door Keep Clear).

When applied to a door leaf the plate shall be surface mounted to the face without removing material from the leaf.

10.11.10 Security Chains

Components with the following specification are also deemed acceptable as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted with fixings positioned away from the edge of the door leaf and therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

Approved specification:

- Metallic security chains may be surface fixed to the face of the door leaf and frame, providing they are fitted such that they do not interfere with the junction between the leaf edge and the frame, and no material is removed in order to facilitate the fitting of the security chain. Screws to affix the security chain shall be no greater than 25mm long.

10.11.11 Panic Hardware

These items are suitable in the following applications only:

Frame options: 1 & 2

Configurations: All configurations

The table below details the tested panic hardware that is approved.

Element	Manufacturer & Product Reference
Panic Hardware (WF525485)	• Arrone AR515-PK Digilock • Arrone AR200S/10-SP lever handle • Arrone AR8805 OAD External Locking Attachment • Arrone Panic Latch AR882 • Arrone AR885 Panic Outside Access Device

Fire test WF525485 successfully included the Arrone components listed in the table above and these are permitted by this assessment to be installed within the doorsets provided that the following criteria are met:

- The item of panic hardware which controls the latching function must be fitted between 850 -1200mm from the bottom of the door leaf.
- Intumescent materials for surface mounted components is not required.
- The hole through the leaf to facilitate the spindle must be no greater than 20mm
- Machining and intumescent requirements for cylinders must be compliant with the stipulations of Sections 10.4.3.
- Where the operation of the panic hardware is required to co-ordinate with levers and cylinders located on the opening face of the doorleaf or with lockcases morticed into the leaf edges the machining for the cylinder must be in accordance with the details given in Section 10.4.3.
- The inclusion of the panic hardware must not cut into or reduce the perimeter intumescent, except where a single point lock which complies with the requirements of Section 10.4.1. is to be included. Installation of the panic hardware must not interfere with or amend the door to frame gap, essentially the association between the frame, door leaf and door stops must remain unchanged.

- Surface mounted vertical bars are permitted providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and they do not interfere with the self-closing action of the door leaf.

Alternatively, components with the following specification are also deemed acceptable.

- Single or multipoint (for example top and bottom latching locations) surface mounted panic hardware, providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and it does not interfere with the self-closing action of the door leaf.
- Panic exit devices that are Certifire approved to "TS26 – The contribution of Panic Exit Devices to the Fire Resistance of Door Assemblies", for 30-minute fire resistance applications with 54mm thick timber door and timber frames

The fitting of surface mounted panic hardware is not considered to change the latching arrangement of the doorset and therefore the permitted leaf size shall be established using unlatched doorset configurations as detailed within section 4.5.

Fitting of the panic hardware must not interfere with the self-closing action of the door leaf

10.11.12 Tuscan Flush Pull Handle

The Tuscan Flush Pull Handle has been considered acceptable for use with the Strebord© 54 door design based on the testing conducted in PF14168 Rev. A (summarised in Section 3):

- Dimensions:
    - 150x150mm (footprint size)
    - 154x154x22mm (recess into door leaf)
- Door configuration: All configurations
- Flush pulls must be a minimum of a distance of 100mm (to the outer edge of the flush pull) from the door leaf edge, apertures or surface mounted or edge or face morticed hardware
- Where handles are recessed into each face of the door leaf they must be staggered, being separated by a minimum of 100mm of leaf core material
- Intumescent Protection:
    - Fitted on the back face of the pull handle:
        - 1mm Therm-A-Line – Intumescent Seals Ltd.
    - Fitted encasing the sides of the pull handle
        - 1mm Therm-A-Flex – Intumescent Seals Ltd.
    - Fitted inside the body of the handle8mm
        - Therm-A-Flex – Intumescent Seals Ltd.