NEWLINE JOINERY
FIRE DOORS AND FRAMES

Installation of Fire Rated Doors

General guidance for the preparation,installation and maintainence of a fire rated door assembly



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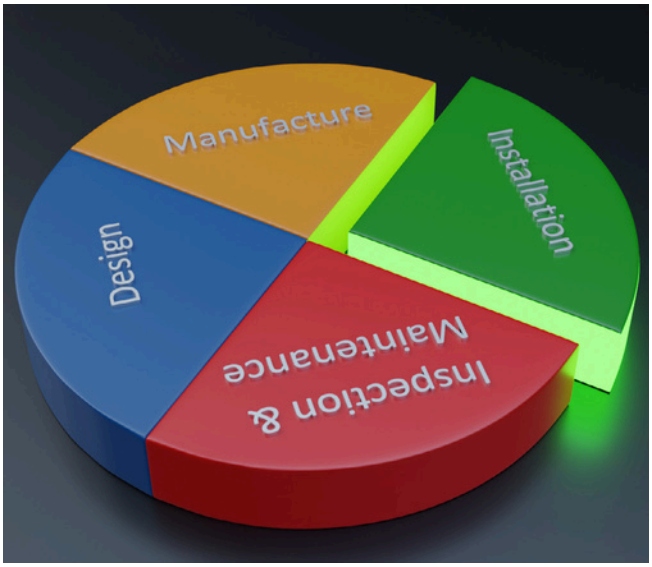
1. Introduction

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This manual will provide guidance for the preparation, installation and maintenance of a fire rated doorset[8] or door assembly[9] that uses a NEWLINE'S door core or door blank.
Always follow the doorset manufacturer's installation instructions. This manual is written to compliment general advice from manufacturers, but should not be used in isolation or as a substitute for manufacturer's installation instructions. Whilst every effort has been made to ensure the accuracy of the advice herein, NEWLINE JOINERY cannot accept liability for loss or damage arising from the use of this information.

If you are in any doubt of the quality of the installation of a performance doorset, please contact the Responsible Person. If concerns are not dealt with by the Responsible Person, please contact the manufacturer, the systems house[3], the notified body[4] or the Building Safety Regulator (HSE).

Terminology within this document that is followed by a superscript number can be found in the Glossary - for example, Field of Application report[1].
Doorsets (and door assemblies) are not freestanding products and they will not provide for any design performance until they have been competently installed into a suitable structure. Installation is as vital to saving lives as the specification of the doorset itself. If the installed doorset is poorly installed or difficult to operate, it will not provide the required performance, and could lead to users of a building disabling elements of the doorset on the basis of convenience, with consequential safety risks, for example by wedging the doors in an open position. An incorrectly installed doorset can also risk property insurance, may invalidate the certification provided with the doorset and could become a legal issue for the Responsible Person[2] in the event of a fire.



The four phases in the life cycle of a fire resistant doorset - all elements are equally important

1.1 Rules and regulations relating to installation

It is vital that performance doorsets are installed by competent tradesmen and it is strongly recommended that the installer is a member of a recognised quality assurance scheme. Installers should be familiar with the content of BS 8214: 2016 'Timber-based fire door assemblies - code of practice'.

The Building Regulations for Fire safety Approved Document B states –

'Recommendations for the specification, design, construction, installation and maintenance of fire doorsets constructed with non-metallic door leaves are given in BS 8214: 2016. Guidance on timber fire resisting doorsets, in relation to the new European test standard, may be found in Timber Fire Resisting Doorsets: Maintaining Performance Under the New European Test Standard published by TRADA.' The Regulatory Reform (Fire Safety) Order 2005 (RRO) requires that all 'non-dwelling'

buildings are subject to regular and ongoing fire risk assessments, in which fire doors should be inspected and maintained. The order also designates a Responsible Person (RP) for a building and makes them responsible for the fire risk assessment. Failure to do so may make the Responsible Person liable for any failures in fire safety. Further regulation and guidance documents that should be considered in relation to fire doors in England and Wales include –

Approved Document B – Fire Safety
Approved Document E – Resistance to the passage of sound
Approved Document K – Protection from falling, collision and impact
Approved Document L – Conservation of fuel and power
Approved Document M – Access to and use of buildings
Approved Document Q – Security in dwellings
Approved Document 7 – Materials and Workmanship
Regulation 38 – requires the handover of 'as built' fire safety information to the Responsible Person.

1.2 Third-party certification for the installation of fire doors

Third-party certified[6] installers undergo training and are subject to annual audits to ensure continued quality. A third-party certified installer can only install fire doors using products and techniques for which they hold sufficient evidence. This means that all elements of their installations have been tested or allowed through expert assessment and certified by a UKAS[5] accredited body.

Some third-party certification installation schemes are shown below, although others are available.

- **Q Mark Fire Door Installation**
- **FIRAS**
- **IFCC**

1.3 Labelling

Performance doorsets should be labelled or marked appropriately to enable quick and easy identification of the fire and security rating. Doors can also be labelled to assist with distribution on site or to assist with manufacturing and chain of custody[7] requirements.

Doorsets manufactured under third-party certification need to be labelled as required by the scheme. The mode of labelling varies across the schemes.

- **Q Mark Fire – Plugs**
- **Q Mark Security – Silver labels**
- **IFCC – Labels**
- **Certifire – Labels**

Labels for third-party certified doorset will generally be obtained from the certification body[12] as part of the membership scheme.



Q Mark Fire and Security Labelling

2. Preparation

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2.1 Delivery and storage of doorsets

Doorsets are a second-fix item and should therefore be delivered to site at the latest possible moment in a build schedule.

Doorsets can be affected by changes in humidity and temperature, as this may cause timber to swell or contract, thereby changing the crucial gaps that have been allowed during manufacture and possibly jeopardizing the stability of the product. For this reason, it is also vital that doorsets are not stored in damp or exposed areas for any length of time. Doorsets should not be installed before wet trades have completed their works and sufficient time has been allowed for drying.

Delivery

Doorsets are heavy, with a standard FD30 single door leaf typically weighing around 50kg alone. Ensure that there are sufficient offloading and distribution facilities available, and that any persons handling the door components are suitably trained in manual handling.

Doors should be lifted evenly and securely to avoid any bending or damage to the components or surrounding area.

Any protective packing should be left on the doors for as long as possible.

Check the doors for any damage, defect or incorrect specification on delivery and mark this on the delivery note.

Storage

Store in a dry, well ventilated area. Do not store in any area that is damp or exposed to weather or near standing water. Do not store in direct sunlight as ultra violet light can cause discolouration of timber products.

Store on the supplied pallet/bearers or on at least 3 equally distributed flat bearers on a flat surface. More bearers may be required for larger blanks.

Protect doorsets from dirt and damage from other trades where necessary, but do not restrict the air flow. Ensure that any doorsets with projecting hardware or thresholds have adequate spacers to separate them when stacked. Internal doors should be conditioned slowly to the temperature and humidity of the building once operational, this applies before and after installation.

Do not store doors in areas where wet trades are still working and ensure the building has sufficiently dried out before taking delivery.

Storage on site should be kept to a minimum until the environmental conditions within the building are settled to the future conditions.

2.2 Specifying the correct door for the application

It is important to ensure that the doorsets being installed comply with the appropriate performance criteria for the application required. Consider the fire, acoustic, thermal and security requirements prior to specification. You will also need to consider the location, for example internal doors[11] and external doors[10] will require different specifications.

Whilst specifying your doorsets, you will also need to consider what works need to be carried out in the factory, and what works, if any, can be completed on site. This would include paint or lacquer finishing and hardware recessing. Ensure that the opening is properly surveyed, and that the frame will suit the height, width

and depth of the opening.

The following tables show the range of door products available from NEWLINE JOINERY.

Speak to your NEWLINE JOINERY representative for more information.

Proprietary Core Performance Summary

	Core			Thickness (mm)			Fire				App.					Certification			COC						
	Particleboard	Solid Timber	Specialist	35	44	54	FD30	FD60	FD90	FD120	Internal	External	Max dB (RW)	Security	Thermal / U Value	Certifire	Q Mark	IFCC	FSC	PEFC	EUTR	DD171/BS EN 1192	BS EN 13986	Perimeter Framing	Recessed Panels
Strebord 35	✓			✓			✓				✓						✓		✓	*	✓		E1		
Strebord 44	✓				✓		✓				✓		35	✓		✓	✓	✓	✓	*	✓	✓	E1		✓
Strebord 54	✓					✓	✓	✓			✓		36	✓		✓	✓	✓	✓	*	✓	✓	E1		✓
Strebord® particleboard is the market leader for fire-rated, as well as non fire-rated door cores. As the most versatile door core product, Strebord® is available in a wide range of thicknesses and sizes, is particularly robust and manufactured to close tolerances that suit modern joinery practices.																									
Stredor 44		✓			✓		✓				✓	✓	33	✓		✓	✓		✓		✓		E1		
Stredor 54		✓				✓	✓	✓			✓	✓	37	✓			✓		✓		✓		E1		
A lighter-weight, solid laminated timber core with premium beech veneered or MDF faces, Stredor® solid timber door blanks are unlipped blanks ready for further processing and are suitable for both internal and external use.																									
Duocore 44		✓			✓		✓				✓	✓	33				✓		✓		✓		E1		
Duocore is the lightest weight solid timber blank available, with proven class-leading thermal insulation and UKAS certified hot plate test evidence for superior performance. Duocore can be freely resized to accommodate any leaf dimension without the need for a timber perimeter.																									
Fibrecore 44			✓		✓		✓				✓						✓			✓	✓		E1		
Fibrecore 54			✓			✓		✓			✓							✓		✓	✓		E1		
Fibrecore is a solid MDF blank, successfully tested to British and European standards.																									

* If specified at the point of order



Distributed Core Performance Summary

	Core			Thickness (mm)			Fire				App.					Certification			COC							
	Particleboard	Solid Timber	Specialist	44	54	Other	FD30	FD60	FD90	FD120	Internal	External	Max dB (RW)	Security	Thermal / U Value	Certifire	Q Mark	IFCC	FSC	PEFC	EUTR	DD171/BS EN 1192	BS EN 13986	Perimeter Framing	Recessed Panels
TriSound S3K	✓		✓		✓		✓				✓		44					✓	*	✓	✓		E1	✓	
TriSound S3D	✓		✓			57		✓			✓		41					✓	*	✓	✓		E1	✓	
TriSound is supplied as a 3-ply core material with cork outer layers, just add timber perimeter and chipboard or MDF facings. Trisound has been rigorously teste for both fire and acoustic performance to large sizes.																									
Warm Springs Tectonite System			✓			57		✓	✓	✓	✓						✓	✓			✓			✓	
The Warm Springs Tectonite system offers excellent fire performance from a raw mineral door core. WSCP doorsets can be configured to accommodate a wide variety of constructions, and is one of the lightest and most durable mineral cores on the market.																									
Ramkor 90/90+	✓					✓			✓		✓						✓	✓	✓		✓		E1		
Ramkor 120	✓					✓				✓	✓							✓	✓		✓		E1		
Ramkor door cores are the result of years of testing experience and are designed specifically to over-perform. Light weight and cost-competitive, these FD90 an FD120 rated cores attain exceptional fire resistance and are certified by a wide range of internationally recognised certification bodies.																									
Flamebreak 44		✓		✓			✓				✓	✓	33	**	1.1		✓		✓		✓	✓	E1		
Flamebreak 54		✓			✓		✓	✓			✓	✓	36	**	1.1		✓		✓		✓	✓	f1		
Flamebreak are engineered 3 layer light hardwood cores for an extremely strong, flat and stable blank. Suitable for machining and conversion.																									
Blankfort 30/30+		✓		✓			✓				✓		34				✓		✓		✓	✓	E1		
Blankfort 60/60+		✓			✓			✓			✓		36				✓		✓		✓	✓	E1		
Blankfort is a high quality, high performing door blanks, with strong finger-jointed softwood cores.																									
Moralt FireSmoke 44		✓		✓			✓				✓		36				✓	✓	✓		✓	✓	E1		
Moralt FireSmoke 54		✓			✓		✓	✓			✓		40					✓	✓		✓	✓	E1		
Moralt LAMINESSE FireSmoke door blanks are of engineered construction, which provides exceptional stability with a low deformation classification.																									
Moralt FireSound 44			✓	✓			✓				✓		40				✓	✓	✓		✓	✓	E1		
Moralt FireSound 54			✓		✓		✓	✓			✓		42				✓	✓	✓		✓	✓	E1		
Moralt FireSound 59			✓				✓	✓	✓		✓		44				✓	✓	✓		✓	✓	E1		
Moralt LAMINESSE FireSound sandwich panels are available in multiple formats, standard as well as individual sizes. They provide you with all the options to produce functional door assemblies of excellent quality with the highest flexibility and a great diversity in shape and style.																									
Moralt FireSmoke Xtreme			✓			58	✓	✓	✓		✓		35				✓		✓		✓		E1		
Moralt FireSound Xtreme			✓			58	✓	✓	✓	✓	✓		39				✓		✓		✓		E1		
Moralt LAMINESSE Xtreme door blanks provide high-end solutions for FD90 and FD120 fire resitance, without the need to compromise on smoke or acoustic performance.																									
Moralt Passiv Kit			✓			98							30-42	***	1.54	✓	✓	✓	✓	✓	✓			✓	
Moralt Passiv KlimaKit			✓			98							32-37	***	0.69	✓	✓	✓	✓	✓	✓			✓	
Moralt Passiv and PassivKlima Door Kits are delivery ready, CE Marked Doorsets to be finished and fitted to a Passive House, as certified by the Passive House Institute. These high quality, robust doorset kits can be supplied in a variety of sizes and veneer finishes, and are supplied with all necessary components to inst a fully-operational doorset. The door kit comes with a 10 year guarantee.																									

* If specified at the point of order

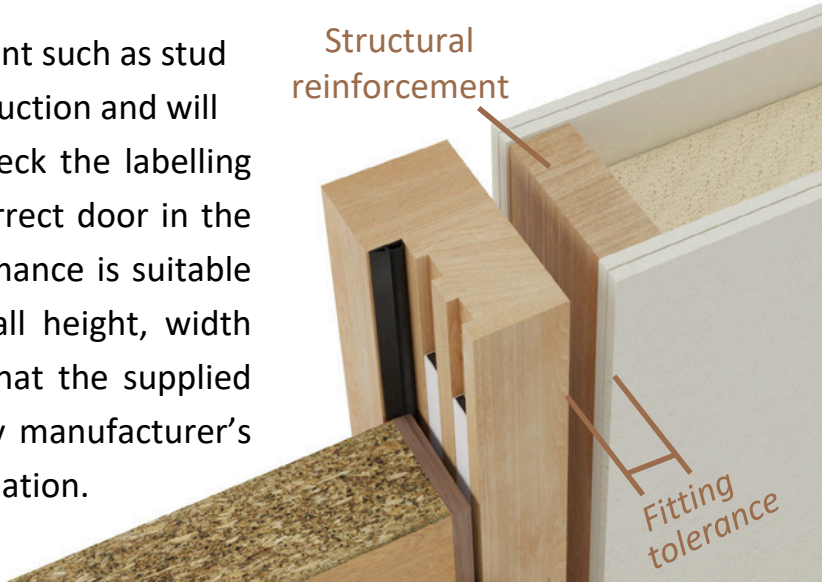
** PAS24 Testing

*** RC2/RC3 Testing

2.3 Preparing for installation

Ensure that the work area is clean and clear of debris, and that it is accessible with a doorset. Check that the structural opening is square and plumb, and has enough tolerance to fit the frame. The required tolerance would generally be between 7mm and 50mm, with a lower figure in that range being more desirable. Check that your fire stopping medium is suitable for the fitting tolerance. Gaps below 7mm may inhibit the ability to apply fire stopping medium.

Check that any structural reinforcement such as stud work is in place within the wall construction and will provide suitable screw retention. Check the labelling to ensure that you are fitting the correct door in the correct opening and that the performance is suitable for the application. Check the overall height, width and depth of the frame to ensure that the supplied product is the correct size. Keep any manufacturer's instructions on hand during the installation.



2.4 Undercut and floor finish

Before installing a doorset, ensure that it has been manufactured with an undercut that is suitable for the final floor finish. The undercut is the measurement which refers to the length of the frame jamb that extends below the bottom of the door leaf, allowing for the operating gap and for any floor finish, threshold or sill. The floor finish refers to carpet and underlay, vinyl, tiles, etc. that will likely be installed after the doorset has been fitted.



Bottom of the leaf and frame, showing undercut, floor finish and structural frame

3. Frame Installation

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3.1 Preparing the frame

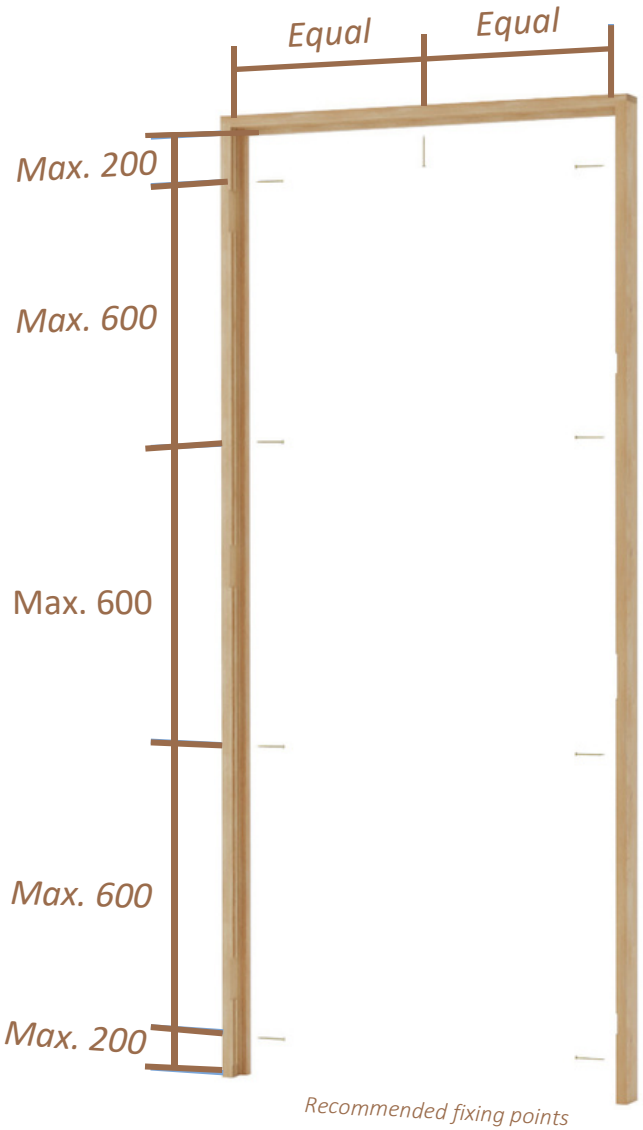
Prior to positioning the frame in the opening, you should prepare the fixing points.

All fixing points must be pilot-drilled and counter bored to prevent the timber from splitting. Remove any loose timber fibres from the edges of the hole with a fine grade sandpaper.

If the fixings are to be concealed by an intumescent strip or a plant-on door stop, the counter-bored cavity only needs to be as deep as a screw head. If the fixings are not concealed, allow a slightly deeper counter-bore so that a timber pellet can be fitted over the screw head.



Counter-bored pilot hole in intumescent seal groove



Recommended fixing points

On the frame jambs, the top fixing should usually be located within 200mm of the underside of the frame head. The bottom-most fixing should usually be located within 200mm of the base of the jamb. Any intermediate fixings should usually be located at centres no greater than 600mm.

A fixing to the centre of the frame head is recommended for door leaves over 900mm in width. It is recommended that in masonry wall constructions, the fixings are at least 25mm from the face of the wall in the depth of the frame.

The positioning of installation fixings should be planned to avoid conflicts with hardware, sealing systems and other building elements.

3.2 Locating the frame in the opening

Ensure that the frame is central in the width of the opening, with equal tolerances on both sides.

Ensure that the frame is plumb, level, square and that none of the tolerances are excessive.

Check that the frame covers the depth of the wall required. Take into account any decorative wall finishes that are yet to be applied.

Fit plastic, timber or non-combustible packers into the tolerance gap, between the back of the frame and the wall. Make sure that you use packers of the correct thickness that fully fill the tolerance gap, but don't distort the frame. This will also prevent the frame from being distorted when the fixings are applied.



Pilot-drilling the frame to opening fixing with packer fitted

Packers should be located at the fixing points already pilot-drilled in the frame. Refer to the approved fire stopping methods for details of permitted packer material. Drill pilot holes through the existing frame holes and packers into the wall construction, of a suitable size and depth for the fixing type.

For a masonry wall construction, fit wall plugs to each fixing point in the wall, or consider using other expanding fixings.

3.3 Fixing the frame to the supporting construction

Fixings should typically penetrate the wall construction by a minimum depth of 40mm, so consider the thickness of the frame, the depth of the counter-bored cavity and the tolerance gap when selecting a fixing.

Steel wood screws are approved for use with timber stud wall constructions, and for use with steel stud wall constructions that incorporate a timber infill. When fixing to proprietary metal stud partitions without timber infill, the fixings should be of a size and type approved by reference to the partition manufacturer's supporting evidence.



Frame to opening fixings being fitted through the packer

Insert screws slowly and do not over tighten as this may cause distortion in the frame. Ensure that the screw heads are tightly against the frame and are below the flush level of the frame within the counter-bored cavity.

Once all the fixings are applied, check that the frame is still square, plumb and is free from distortion. Check that the rebate size of the frame is correct to accommodate the door leaf to be swung.

3.4 Fitting seals to the frame

Fire rated doorsets require intumescent seals that expand in extreme heat to fill and close operating gaps in the event of a fire. Typically, these seals are located in the frame or around the sides and top of the door leaf. Smoke-rated and acoustic-rated doorsets will often also require an additional perimeter seal to close the operating gap when the door is shut in the frame.



Intumescent and smoke/acoustic seals being fitted to the frame

Intumescent seals will be fitted into a groove appropriate to the size of the seal. Loose smoke or acoustic seals are generally fitted against the door stop, check the manufacturer's fitting instructions for specific seals. Combined fire/smoke/acoustic seals are also available and will generally be fitted into a groove. It is preferable that grooves are factory-machined, however this may also be carried out onsite by competent operatives.

Always check the manufacturer's instructions for compliance with certification.

Many installers will choose the fit seals on site, once the frame has been fully finished and installed. In this case, the thickness of any finish should be taken into consideration when machining intumescent grooves, as the intumescent seal should finish flush with the face of the frame. Some seals may be painted over, check the manufacturer's instructions.

It is important to ensure that the seals extend the full height and width of the perimeter, to enable suitable sealing at the top joints of the frame. Make sure that the seals are fitted tightly into the corners. If it is necessary to joint intumescent seals, ensure that the joints are offset on opposing jambs.

TIP!

Squareness can be checked by measuring diagonally across a square or rectangular shape, such as a door leaf orframe. Measure diagonally in both directions, and if both measurements are equal it is square.

Ensure that the seals are undamaged as this may affect the performance of the seal. Ensure that the seal grooves are machined cleanly and are free of any deviation, defect or contaminant prior to installation of the seal. Seals should fit tightly into machined grooves. Cut the seal to size before removal of adhesive cover. Peel off the adhesive cover and ensure the adhesive does not contact fingers, or any other contaminants. Place the seal directly into the groove or onto the area required, applying firm, overall pressure to achieve a good bond to the contact area. **Do not remove the seal once fitted.**

If the surface has been primed, lacquered, or painted, it must be completely dry before the seal is fitted.

If surface materials and/or the self-adhesive tape are too cold the adhesive will harden, severely affecting the bonding process. Store and apply the seals in temperatures above 10°C, and ideally between 20°C - 30°C. The seal will withstand extremes of cold and heat when properly installed.

3.5 Fitting frame hardware

If the doorset has a lock, latch or flush bolt it will typically need metal keeps fitting to the frame. Recessing for keeps can be carried out in the factory or on site by a competent operative.

Check the door manufacturer's supplied documentation for details on hardware compatibility and for details on setting out restrictions, for example the height of the lock.

Hardware such as lock keeps will often require intumescent protection. This is generally supplied in sheet form and cut to fit behind the ironmongery. This intumescent is designed to expand and fill any gaps in the event of a fire. It is important to ensure that the intumescent protection does not inhibit the movement of any working parts.

Check the door manufacturer's supplied documentation and instructions for the fitting of hardware protection to ensure that you have the correct specification, size, thickness and location.



Hardware recess in frame



Hardware intumescent protection fitted in frame

It may be required to fit keeps on site once the frame has been fully finished and installed. In this case, the thickness of any finish and intumescent protection should be considered when factory machining for keeps, as usually the foremost surface of the keep should finish flush with the face of the frame.

Ensure that the recessing is machined cleanly and is free of any deviation, defect or contaminant.

Ensure that appropriate fixing screws are used. Check the manufacturer's instructions for the required specification. Suitable fixings are often supplied with the hardware.

If any additional protection is required, ensure that it is in place before you fix the hardware.

Pilot-drill holes suitable for the screws to prevent the frame from splitting.

Secure the hardware ensuring that all screws are installed, that the heads are flat and that screws are not over-tightened.



Pilot-drill for hardware fixings



Multi-point lock style keep fitted to frame

3.6 Fitting a planted or loose door stop

Integral door stops may be formed by rebating into the frame section (as shown elsewhere in this manual). Alternatively door stops may be supplied loose for fixing on site.

A loose door stop is typically fitted after the leaf is hung, allowing the installer to ensure that the door stop is in the correct position in relation to the closed door leaf.

Check if additional smoke or acoustic seals need to be fitted to the door stop. In this case, apply the seals after the door stop has been fitted ensuring a suitable tolerance is allowed for sufficient pressure on the seal and that any latch can engage unhindered.



Plant on door stop fitted to the frame

Where required, door stops must be fitted full-length of the head and jambs of the frame, with no breaks or joints. The door stops should be tightly fitted with a butt or mitre joint in the corners of the frame.

Generally door stops should be fixed with adhesive and mechanical fixings that will penetrate a minimum depth of 25mm into the main frame section. Mechanical fixings should be pins or wood screws. If using wood screws, ensure that you pilot-drill and counter-bore to reduce the chance of splitting and to conceal the screw head. Fixing heads should be below the surface of the door stop to allow for a pellet or filler.



Plant on stop has seals and adhesive applied, and is mechanically fixed to the frame

Where smoke or acoustic seals are used, check the manufacturer's instructions for the optimal gap between the leaf and the door stop. In all other cases the door stop should be tight to the push face of the door leaf as practicable, holding the door leaf so that the pull face is flush with the frame.

Apply adhesive to door stop and position on the frame. Ensure that the gap between the leaf and the door stop remains consistent along the entire length. Apply mechanical fixings as necessary.

Ensure that the gap between the leaf and the door stop remains consistent all around.


Stop fitted with seal compressed


Frame installed, ready to fit the leaf

4. Leaf Installation

4.1 Resizing leaves on site

Resizing of door leaves on site should be kept to a minimum. The extent to which door leaf adjustments may be necessary will be influenced by a number of factors including provisions made at the time of manufacture, environmental conditions affecting the moisture content during transportation and storage, and quality of installation.

When installed, the operating gaps between door and frame, and at the meeting stiles of pairs, should comply with the relevant supporting evidence when measured from the opening face of the door leaf, usually 3mm (±1mm). It is recommended that the moisture content of the door leaf is checked before attempting

adjustment, and that possible shrinkage should be considered. Doors should be acclimatised to the environment to which they will be subjected in day to day use before any adjustments are carried out.

Check the manufacturer's instructions and supporting evidence for the maximum amount of material that can be removed for trimming/easing.

Do not to remove any labelling during the adjustment.

Making any adjustments to glazing apertures or cut new glazing or air transfer grille apertures could invalidate certification.

4.2 Fitting leaf perimeter seals and drop seals

Fire-rated doorsets may require intumescent or combined fire/smoke/acoustic seals to be fitted to the edges and top of the door leaf. Typically, this is required where it is not possible to fit the seals to the frame.

Fire-rated double doorsets will require intumescent or combined fire/smoke/acoustic seals to be fitted to the meeting stiles. Please follow the advice given earlier in this document regarding the machining and fitting of intumescent or combined fire/smoke/acoustic seals. Doorsets designed for acoustic performance will often require drop down threshold seals, otherwise called drop seals, fitted to the bottom edge of the door leaf.



Drop seal fitted to the bottom of the leaf

It is preferable for mechanical drop seals to be factory fitted, however there are occasions where they may be fitted on site.

Ensure that the groove for the drop seal is located correctly and is of suitable dimension. If additional intumescent protection is required ensure this is fitted prior to fixing. Locate the drop seal into the groove, and fix using the supplied fixings. Check the manufacturer's instructions for details on fitting and operation.

Check that the drop seal operates correctly once fitted. Always lock the drop seal in the raised position whilst hanging the door leaf and adjust for function once final checks of the door leaf are complete. This will reduce the chance of damaging the drop seal.

4.3 Fitting leaf hardware

Leaf hardware can be factory prepared and fitted, or this can be done on site. Protruding items such as door handles or letter plate security cowls may be fitted on site for ease of transportation and storage. Loose face-fixed items such as signage, kick plates and push plates will also often be supplied loose for site fixing.

Check the door manufacturer's documentation for details on all hardware compatibility, size restrictions, fixing details, and details on setting out - for example, the allowable height of the lock. Check the door manufacturer's documentation and instructions for the fitting of hardware protection to ensure that you have the correct specification, size, thickness and location. **Do not exceed these requirements**. Check that the correct hardware protection is in place before fitting any hardware. When installing hardware, ensure that the fixing used is a compatible size and material, ensuring that pilot holes are drilled to prevent splitting. All screw heads should be flat and not overtightened.

Make sure that there is no damage to hardware components, that all components fit tightly into recessing and that all screws are fitted where required.



Handle being fitted to the leaf

4.4 Hanging the leaf

The hinges should be fitted to the leaf first for the purpose of hanging. Fit any required additional intumescent protection to the leaf hinge cut out. Fit all hinges into the leaf recesses, drill pilot holes into the leaf through the hinge screw holes and fix the hinges to the leaf using the supplied fixings. All screw heads should be flat and not overtightened.

Position the leaf at around 90 degrees to the frame, with the hinges in the frame hinge recesses. Use packers, wedges or a specialist device at the bottom of the leaf to hold it at the correct height if required. Take care not to damage the bottom of the leaf or the drop seal. Fit any required additional intumescent protection to the frame hinge cut out. Drill pilot holes into the frame through the hinge screw holes. Apply two fixings to each hinge into the frame. Remove the packers or wedges from under the door leaf, check that the door swings freely, closes into the frame correctly and that the operating gaps around the door are within parameters. For correct tolerance parameters always refer to the manufacturers documentation. Acceptable tolerances will generally be 3mm at the head, jambs and meeting stiles, and maximum 10mm undercut. Where a doorset is required to inhibit the passage of smoke a threshold seal should be used. Where this is impracticable, the undercut should not exceed 3mm. Apply the final fixings to the frame hinges, check that all hinge screws are flat and not overtightened.

Adjust the drop seal and ensure that it is operating correctly and drops far enough to make contact with the threshold or final floor covering. Ensure that any smoke or acoustic seals make continuous contact with the door leaf perimeter.



Leaf with hinges fitted is lined up with hinge recesses in frame using wedges



Hinges fixed to the frame



Leaf operation tested and gaps checked

5. Sealing to Structural Opening

Sealing the doorset to the structural opening is the application of materials (linear gap joint seal) to the fitting tolerance gap (the gap between the wall and door frame), with the intention of sealing the gap to prevent the spread of fire and smoke around the doorset. This process is a vital part of ensuring that the product performs as desired.

Sealing to the structural opening should be carried out in accordance with the requirements of each project. For example, a project may require an installation in line with BS 8214:2016, or may require a tested or assessed method for sealing the doorset to the structural opening. It is vital to check the requirements of a project prior to fitting the doorsets.

The process of sealing the door into the structural opening should only happen once all dimensional and operational checks have been completed on the fitted doorset.

5.1 Sealing to structural opening from BS 8214:2016

Guidance for various methods of sealing the door assembly to the structural opening is given in BS 8214: 2016, 'Code of Practice for Fire Door Assemblies'.

Section 9.4.2 of this standard states that an approved linear gap joint seal must have been successfully tested to linear gap type test standards BS 476-20:1987 or BS EN 1366-4.

Furthermore, it is imperative that the substrate materials either side of the fitting tolerance gap are tested to relevant standards and that the test includes gap filling from both a horizontal and vertical orientation. Please note that the scope of BS 8214: 2016 is limited to door assemblies only and does not apply to doorsets. The methods for installation of doorset systems should be requested from the manufacturer or systems house as appropriate. The following methods cover most door assembly installation situations and are distilled from the advice in BS 8214: 2016. For further details, the standard can be purchased at the BSI website.

1. Mineral rock fibre with architraves

Fire integrit yperformance	30 and 60 minutes
Wall construction	Timber stud/masonry
Architrave	15mm thick, overlapping 15mm on each side
Suitable for smoke control	No
Linear gap joint seal	Mineral rock fibre packed full depth
Maximum gap	20mm
Reference to standard	BS 8214:2016 - Table 2 - Item 4 - 30 mins BS 8214:2016 - Table 4 - Item 3 - 60 mins



2. Mineral rock fibre and mastic with architraves

Fire integrity performance	30and 60minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	15mm thick, overlapping 15mm on each side
Suitable for smoke control	Yes
Linear gap joint seal	Mineral rock fibre packed and capped with 10mm depth of intumescent mastic
Maximum gap	20mm
Reference to standard	BS 8214:2016 - Table 2 - Item 4 - 30 mins BS 8214:2016 - Table 3 - Item 2 - 30 mins BS 8214:2016 - Table 4 - Item 2 - 60 mins BS 8214:2016 - Table 4 - Item 3 - 60 mins BS 8214:2016 - Table 5 - Item 2 - 60 mins BS 8214:2016 - Table 5 - Item 3 - 60 mins



3. Mineral rock fibre and mastic with architraves, fixed to perpendicular wall

Fire integrity performance	30 and 60 minutes
Wall construction	30 = Timber stud/masonry and steel stud 60 = Timber stud/masonry
Architrave	Minimum 10mm quadrant
Suitable for smoke control	Yes
Linear gap joint seal	Mineral rock fibre packed and capped with 10mm depth of intumescent mastic
Maximum gap	30 mins - 20mm 60 mins - 15mm
Reference to standard	BS 8214:2016 - Table 2 - Item 7 - 30 mins BS 8214:2016 - Table 3 - Item 4 - 30 mins BS 8214:2016 - Table 4 - Item 4 - 60 mins



4. Mineral rock fibre and mastic

Fire integrity performance	30and 60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	None
Suitable for smoke control	Yes
Linear gap joint seal	Mineral rock fibre packed and capped with 10mm depth of intumescent mastic
Maximum gap	Up to 15mm
Reference to standard	BS 8214:2016 - Table 2 - Item 1 - 30 mins BS 8214:2016 - Table 3 - Item 1 - 30 mins BS 8214:2016 - Table 4 - Item 1 - 60 mins BS 8214:2016 - Table 5 - Item 1 - 60 mins



5. Expanding foam with architraves

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry
Architrave	15mm thick, overlapping 15mm on each side
Suitable for smoke control	No
Linear gap joint seal	Expanding foam
Maximum gap	20mm
Reference to standard	BS 8214:2016 - Table 2 - Item 5 - 30 mins



6. Expanding foam and mastic with architraves

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	15mm thick, overlapping 15mm on each side
Suitable for smoke control	Yes
Linear gap joint seal	Expanding foam capped with 10mm depth of intumescent mastic
Maximum gap	20mm
Reference to standard	BS 8214:2016 - Table 2 - Item 6 - 30 mins BS 8214:2016 - Table 3 - Item 3 - 30 mins



7. Mastic with architraves

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry
Architrave	15mm thick, overlapping 15mm on each side
Suitable for smoke control	Yes
Linear gap joint seal	Minimum 10mm depth of intumescent mastic
Maximum gap	10mm
Reference to standard	BS 8214:2016 - Table 2 - Item 2 - 30 mins



8. Intumescent strip with architraves

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry
Architrave	15mm thick, overlapping 15mm on each side
Suitable for smoke control	No
Linear gap joint seal	Intumescent strip fitted to a groove in the back of the frame
Maximum gap	5mm
Reference to standard	BS 8214:2016 - Table 2 - Item 3 - 30 mins



5.2 Assessed methods for sealing to structural opening

The following methods for sealing the doorset to structural opening are taken from Field of Application[1] reports for the application of firestopping products and methods.
Field of Application reports are based on primary test evidence and therefore may allow for alternative fire stopping methods than those detailed in guidance documents such as BS 8214: 2016. The materials noted in the following sections may also be used as part of BS 8214: 2016 compliant installations as detailed in Section 5.1 of this manual.

5.2.1 Sealed Tight Solutions Ltd - Q Mark

Report Number	WF419831
Report Title	Sealed Tight Solutions The Installation of Timber Based Doorsets for: 30 & 60 Minutes Fire Resistance

This Field of Application report is based on fire resistance test evidence using the Sealed Tight Solutions Ltd ST88 intumescent mastic and ST99 Fire Foam.
The use of timber and plastic packers has been proven in the testing for this Field of Application.
Packers may be installed with their faces exposed, so it is not necessary to hide the edges of the packers with mastic or foam prior to the application of architraves. Where the method of installation requires architraves, they must overlap each side by 15mm.
Architraves may be MDF, softwood or hardwood with a minimum density of 510kg/m^3, irrespective of required door frame material. The requirement for architrave varies between installation methods, please note relevant section in each method below.
Very small gaps (i.e. <5mm) between the back of the frame and the supporting construction may be protected with a bead of mastic gunned into the gap, pushed into the gap as far as is practicable, aiming to achieve a 10mm deep bead of mastic which is then protected by architraves.

1. Gaps up to 10mm must be sealed on both sides with a minimum 10mm depth of ST88 intumescent mastic. The use of mineral fibre or ST99 Fire Foam between the mastic beads is optional.

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Optional (Architraves fitted, no architraves fitted, or architraves fitted to fire exposed face only)
Suitable for smoke control	Yes
Linear gap joint seal	Minimum 10mm depth of ST88 acrylic intumescent mastic
Maximum gap	10mm



2. Gaps between 10mm and 20mm must be tightly packed with mineral fibre or ST99 Fire Foam, capped on both sides with a minimum 10mm depth of ST88 acrylic intumescent mastic.

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Optional (Architraves fitted, no architraves fitted, or architraves fitted to fire exposed face only)
Suitable for smoke control	Yes
Linear gap joint seal	Mineral rock fibre or ST99 Fire Foam capped with 10mm depth of ST88 acrylic intumescent mastic
Maximum gap	20mm



3. Gaps up to 20mm may be filled with ST99 Fire Foam, additional mastic capping is not required. Joints must be fitted with architraves.

Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Required
Suitable for smoke control	Yes
Linear gap joint seal	ST99 Fire Foam
Maximum gap	20mm



4. Timber-based or non-combustible sub-frame up to 50mm thick, with gaps up to 10mm between the components filled on both sides with 10mm depth of ST88 acrylic intumescent mastic **or** full depth ST99 Fire Foam. Joint must be fitted with minimum 8mm thick architraves.

Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Required
Suitable for smoke control	Yes
Linear gap joint seal	Timber or non-combustible subframe, remaining gap filled with ST99 Fire Foam **or** minimum 10mm depth of ST88 acrylic intumescent mastic
Maximum gap	60mm



5. Gaps up to 20mm must be tightly packed with mineral fibre or ST99 Fire Foam, capped on both sides with a minimum 10mm depth of ST88 acrylic intumescent mastic.

Fire integrity performance	60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Required
Suitable for smoke control	Yes
Linear gap joint seal	Mineral rock fibre or ST99 Fire Foam capped with 10mm depth of ST88 acrylic intumescent mastic
Maximum gap	20mm



6. Shadow gaps may be maximum 10x10mm. Shadow gap arrangements must be filled with timber of the same or greater density as the frame or non-combustible material such as plasterboard, and capped with 2mm ST88 acrylic intumescent or with a 10x4mm PVC encased intumescent seal.

Fire integrity performance	60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Not required
Suitable for smoke control	When using mastic capping
Linear gap joint seal	Filled with timber of the same density as the frame or a non-combustible material such as plasterboard, capped with 2mm ST88 acrylic intumescent or with a 10x4mm PVC encased intumescent seal
Maximum gap	10mm



5.2.2 Fire and Acoustic Seals Ltd - Q Mark

Report Number	WF385912
Report Title	Fire and Acoustic Seals Ltd Fire Door Foam. For use as a fire stopping seal: 30, 60 and up to 120 Minute Fire Resisting Timber Doorsets

This Field of Application report is comprised from fire resistance test evidence using the Fire and Acoustic Seals Ltd Fire Door Foam and Intumescent and Acoustic Acrylic Sealant as a fire stopping seal when used with timber joinery and timber-based fire resisting doorsets for 30, 60 and up to 120 minute applications.

The maximum height of the structural opening permitted in this Field of Application report is **2800mm** from the finished floor level.

The use of plastic packers has been proven in the testing for this Field of Application report for use with 30 and 60 minute doorsets only, providing;

- They are manufactured from polypropylene and are no wider than 28mm.
- Their design does not include a hollow internal section penetrating the full width of the frame which might allow the passage of flame or hot gasses.
- They are fitted using the varying thicknesses available to tightly fill the fitting tolerance gap, across the full width of the frame, and are held firmly in position by the frame fixings.
- Packers sitting proud of the frame should be trimmed back flush with the frame. They should be fully encased (top and bottom across the full width) by Fire and Acoustic Seals Fire Door Foam.

'Horseshoe' shaped plastic packers are considered an acceptable alternative for use with 30 and 60 minute doorsets only, providing;

- They are manufactured from polypropylene with each 'leg' no more than 28mm apart.
- Their design does not include a hollow internal section penetrating the full width of the frame which might allow the passage of flame or hot gasses.
- The internal void between each 'leg' is fully filled using Fire and Acoustic Seals Fire Door Foam.
- They are fitted as above.

The use of timber packers has been proven in this Field of Application report for use with 30 and 60 minute doorsets only, providing;

- The density of the packer should be ≥ that of the door frame. Provided that the density restrictions are met, the frame and packers need not be the same species (e.g. MDF packer with a European Redwood frame).
- They are fitted as above.

For 90 or 120 minute doorsets, the packer type and material must be as tested for the specific doorset design and have been tested in accordance with BS 476-22:1987 or BS EN 1634-1.

1. Gaps up to 10mm may be sealed on both sides with a minimum 10mm depth of Intumescent and Acoustic Acrylic Sealant. The use of architrave is optional.

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry, steel stud, concrete
Architrave	Optional
Suitable for smoke control	Yes
Linear gap joint seal	10mm deep Intumescent and Acoustic Acrylic Sealant
Maximum gap	10mm
Minimum wall depth	N/A



2.Where walls are minimum 100mm in depth, gaps up to 25mm may be filled with Fire Door Foam, capped on both sides with a minimum 10mm depth of Intumescent and Acoustic Acrylic Sealant. The use of architrave is optional.

Fire integrity performance	30 minutes
Wall construction	Timber stud/masonry, steel stud, concrete
Architrave	Optional
Suitable for smoke control	Yes
Linear gap joint seal	Minimum 80mm Fire Door Foam capped with 10mm deep Intumescent and Acoustic Acrylic Sealant
Maximum gap	25mm
Minimum wall depth	100mm



3.Where walls are minimum 70mm in depth, gaps up to 25mm may be filled full depth with Fire Door Foam. The use of architrave is required.

Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry, steel stud, concrete
Architrave	Minimum 18mm thick x 45mm wide, must be timber or MDF, may be fitted to one face or both
Suitable for smoke control	Yes
Linear gap joint seal	Fire Door Foam
Maximum gap	25mm
Minimum wall depth	70mm



4.Where walls are minimum 100mm in depth, gaps up to 25mm may be filled full depth with Fire Door Foam. The use of architrave is optional.

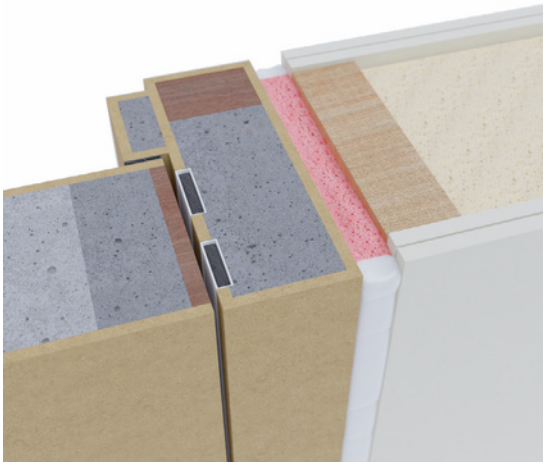
Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry, steel stud, concrete
Architrave	Optional
Suitable for smoke control	Yes
Linear gap joint seal	Fire Door Foam
Maximum gap	25mm
Minimum wall depth	100mm



5.For additional performance, where walls are minimum 132mm in depth, gaps up to 25mm may be filled with Fire Door Foam, capped on both sides with a minimum 10mm depth of Intumescent and Acoustic Acrylic Sealant. The use of architrave is optional.

Fire integrity performance	Up to 120 minutes
Wall construction	Timber stud/masonry, steel stud, concrete
Architrave	Optional
Suitable for smoke control	Yes
Linear gap joint seal	Minimum 80mm Fire Door Foam capped with 10mm deep Intumescent and Acoustic Acrylic Sealant*
Maximum gap	25mm
Minimum wall depth	132mm

*Fire Door Foam should be applied to the full depth, allowed to cure, then scraped back to create a void of minimum 10mm on each face, which should be filled with Intumescent and Acoustic Acrylic Sealant.



5.2.3 Fire and Acoustic Seals Ltd - IFC

Report Number	PAR 18385/01
Report Title	Engineering Assessment of Frame Installation Using Fire and Acoustic Seals Ltd 'Fire Door Foam' and/or Fire and Acoustic Seals Ltd 'Intumescent Acrylic Sealant' for 30, 60, 90 or 120 Minute Timber-Based Door Assemblies and Glazed Screens

This Field of Application report is comprised from fire resistance test evidence using the Fire and Acoustic Seals Ltd 'Fire Door Foam' and 'Intumescent and Acoustic Acrylic Sealant' as a fire stopping seal when used with timber joinery and timber-based fire resisting doorsets for 30, 60, 90 or 120 minute applications.

The maximum height of the structural opening permitted in this Field of Application report is **2750mm** from the finished floor level.

Unless evidence for the respective assembly gives more restrictive specifications, the frame must be fixed back to suitable fixing points within the supporting construction using steel fixings at centres not exceeding 600mm on the vertical edges (minimum 200mm from the top and bottom of each jamb). Screws should be of sufficient length to penetrate the wall by at least 40mm and should be positioned so that they will not be effected by charring of the frame, irrespective of the direction of fire exposure (this may necessitate a twin line of screws). PVC, timber (density ≥ frame material), MDF (density ≥ 700kg/m^3) or hardboard (density ≥ 800kg/m^3) packers shall be used at all fixing positions.

Minimum frame depths are outlined in the following table, unless the evidence for the respective assembly specifies deeper frames. The choice of frame material must be as tested/assessed for specific door/glass types, and the methods of fire stopping in this Field of Application report would only be applicable if the respective document for the door/glass type permits the use of the following frame materials.

Fire Resistance	Frame Material	Minimum Frame Depth	Minimum Density
30 minutes	MDF	78mm	700kg /m^3
	Softwood or Hardwood *	78mm	510kg /m^3*
60 minutes	MDF **	90mm	700kg/m^3
	Hardwood (not Beech - *Fagus Sylvatica*)	90mm	600kg/m^3
90 minutes	Hardwood (not Beech - *Fagus Sylvatica*)	132mm	640kg /m^3
120 minutes	Hardwood (not Beech - *Fagus Sylvatica*)	132mm	640kg /m^3

* Ifonly Fire and Acoustic Seals Ltd 'Intumescent Acrylic Sealant' is being used in isolation without any backing material then the frame must be minimum density of 600kg/m^3

** MDF frames in FD60 applications require 19mm thick architraves and minimum foam/frame depth of 81mm.

1. Gaps up to 25mm may be sealed with full depth Fire Door Foam, the use of additional mastic capping is not required. The use of architrave is optional.

Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Optional
Suitable for smoke control	No
Linear gap joint seal	Fire Door Foam
Minimum gap	2.5mm
Maximum gap	25mm
Minimum wall depth	30 mins - 78mm 60 mins - 90mm



2. Gaps up to 5mm may be sealed on both sides with a minimum 15mm depth of Intumescent Acrylic Sealant. The use of architrave is optional.

Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Optional
Suitable for smoke control	Yes
Linear gap joint seal	Intumescent Acrylic Sealant
Minimum gap	n/a
Maximum gap	5mm
Minimum wall depth	30 mins - 78mm 60 mins - 90mm

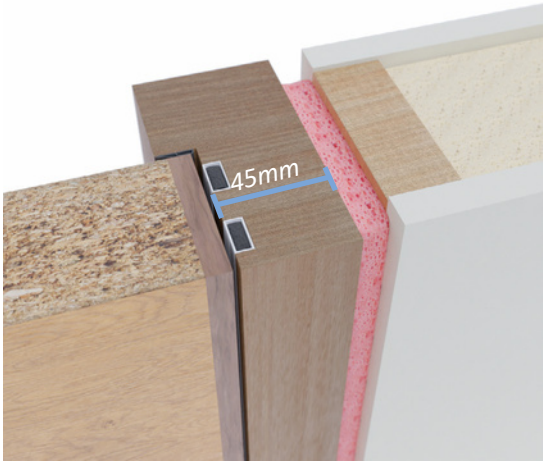
Frame material must be hardwood with minimum density of 600kg/m^3



3.Shadow gaps may be maximum 10mm wide x 5mm deep as long as the depth of Fire Door Foam is a minimum of 78mm and the frame is a minimum of 45mm thick (not including door stop).

Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	n/a
Suitable for smoke control	Yes
Linear gap joint seal	Fire Door Foam
Minimum gap	n/a
Maximum gap	10mm
Minimum wall depth	Foam must be minimum of 78mm deep

Frame must be minimum 45mm thick (not including door stop)



4.For additional performance, where walls are minimum 132mm in depth, gaps up to 25mm may be filled with Fire Door Foam, capped on both sides with a minimum 10mm depth of Intumescent and Acoustic Acrylic Sealant. The use of architrave is optional.

Fire integrity performance	90 and 120 minutes
Wall construction	Masonry and steel stud
Architrave	Optional
Suitable for smoke control	Yes
Linear gap joint seal	Fire Door Foam capped with minimum 10mm deep Intumescent and Acoustic Acrylic Sealant
Minimum gap	5mm
Maximum gap	90 mins - 25mm 120 mins - 15mm
Minimum wall depth	132mm

*Fire Door Foam should be applied to the full depth, allowed to cure, then scraped back to create a void of minimum 10mm (on the 'fire risk' side or both sides if 'fire risk' side is unknown), which should be filled with Intumescent and Acoustic Acrylic Sealant.



5.2.4 Fire and Acoustic Seals Ltd - Certifire

Certificate Number	CF 5839
Certificate Title	n/a

This Certificate of Approval relates to the use of Fire and Acoustic Seals Ltd 'Fire Door Foam' for the protection of joints between walls and timber-based door frames.

It should be ensured that for good adhesion, the surfaces of the building element are free of any dust or grease and are suitably primed.

The Certificate of Approval does not limit the dimensions of the doorset and does not pass comment on allowable packer configurations.

For 30 minute applications, door frames may be softwood, MDF or hardwood. For 60, 90 and 120 minute applications, door frames must be hardwood.

1. For 30 and 60 minutes integrity, gaps may be filled full depth with Fire Door Foam. The use of architrave is optional.

Fire integrity performance	30 and 60 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Optional
Suitable for smoke control	No
Linear gap joint seal	Fire Door Foam
Maximum gap	30 mins - 30mm 60 mins - 25mm
Minimum wall depth	30 mins - 78mm 60 mins - 119mm



2. For 90 and 120 minutes integrity, gaps may be filled with Fire Door Foam, capped with minimum 10mm of Intumescent and Acoustic Acrylic Sealant. The use of architrave is optional.

Fire integrity performance	90 and 120 minutes
Wall construction	Timber stud/masonry and steel stud
Architrave	Optional
Suitable for smoke control	Yes
Linear gap joint seal	Fire Door Foam capped with minimum 10mm deep Intumescent and Acoustic Acrylic Sealant
Maximum gap	25mm
Minimum wall depth	130mm



5.3 Tested methods for sealing to structural opening

The following methods for sealing the doorset to structural opening have been directly tested with NEWLINE'S range of door cores. These methods are a curated selection taken from the extensive portfolio of testing carried out over a 25 year span.

5.3.1 Expanding Foam



Test ref.	Wall type	Linear gap joint seal	Material 1	Material 2	Architrave	Packers	Min. gap	Max. gap	Test duration	Core
WF414882	Steel stud	Foam	FAS Fire Door Foam	n/a	No	Softwood	2.5	13.8	32	Strebord 44
WF411193	Timber stud	Foam	FAS Fire Door Foam	n/a	No	Plastic	16	23	37	Strebord 44
RK141-2	Masonry	Foam	HILTI CF 125-50	n/a	Yes	Timber	10	11.5	60	Strebord 54

5.3.2 Mastic



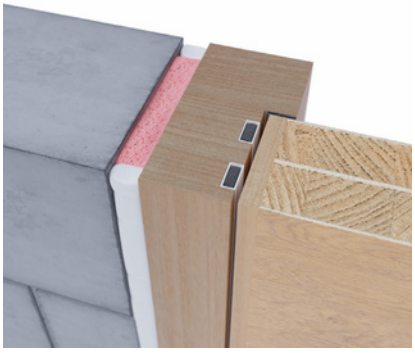
Test ref.	Wall type	Linear gap joint seal	Material 1	Material 2	Architrave	Packers	Min. gap	Max. gap	Test duration	Core
Chilt/ RF11115	Timber stud	Mastic	Mann McGowan Pyromas		Yes	Timber	5	10	31	Fibrecore 44
RF08125	Timber stud	Mastic	Mann McGowan Pyromas	n/a	Yes	Timber	5	10	49	Strebord 44
RF08088	Timber stud	Mastic	Pyroplex intumescent mastic	n/a	Yes	Timber	5	10	44	Strebord 44
WF391843	Timber stud	Mastic	STS ST88	n/a	Yes	Timber	12.5	12.5	47	Stredor 44 Ply

5.3.3 Mineral fibre and mastic



Test ref.	Wall type	Linear gap joint seal	Material 1	Material 2	Architrave	Packers	Min. gap	Max. gap	Test duration	Core
WF416690	Steel stud	Mineral Fibre and Mastic	Rockwool RWA 45	Everbuild Fire Sealant 300	Yes	Timber	13	19	34	Stredor 44 Ply
CFR1812191_1	Timber stud	Mineral Fibre and Mastic	Unifrax Insulfrax LTX blanket	Firewise Intumescent and Acoustic Acrylic Sealant	No	Timber	3	18	71	Stredor 54 Ply
CFR1902142	Steel stud	Mineral Fibre and Mastic	Unifrax Insulfrax S blanket	Mann McGowan Pyromas	No	Timber	4	8	63	Strebord 54
WF432578	Blockwork	Mineral Fibre and Mastic	Rockwool Flexi	Mann McGowan Pyromas	No	Timber	6	13	46	Stredor 44 Ply
WF421795	Steel stud	Mineral Fibre and Mastic	Rockwool mineral fibre	STS ST88	No	Timber	12	20	35	Strebord 44
BMT/FEP/ F14265	Timber stud	Mineral Fibre and Mastic	Rockwool mineral fibre	Astroflame Acoustic Acrylic	Yes	Timber	10	15	47	Strebord 44
WF421964	Steel stud	Mineral Fibre and Mastic	Rockwool mineral fibre	FAS Intumescent and Acoustic Acrylic Sealant	No	Timber	12	20	33	Strebord 44
WF407334	Timber stud	Mineral Fibre and Mastic	Rockwool mineral fibre	Norseal Firewizard	Yes	Timber	8	15	65	Stredor 54 Ply
WF419865	Steel stud	Mineral Fibre and Mastic	Rockwool mineral fibre	Polyseam ASF Mastic	No	Timber	10	10	34	Strebord 44

5.3.4 Expanding foam and mastic



Test ref.	Wall type	Linear gap joint seal	Material 1	Material 2	Architrave	Packers	Min. gap	Max. gap	Test duration	Core
SF013-10A	Masonry	Foam and Mastic	Wurth Fire Resistant Foam	Kilargo Intumescent Acoustic Acrylic Sealant	Yes	Timber	10	10	79	Strebord 54
SF013-10B	Masonry	Foam and Mastic	Wurth Fire Resistant Foam	Mann McGowan Pyromas	Yes	Timber	5	5	127	Ramkor 120+
WF386959	Timber stud	Foam and Mastic	STS ST99 Foam	STS ST88	Yes	Plastic	10	10	32	Strebord 44
WF385685	Steel stud	Foam and Mastic	STS ST99 Foam	STS ST88	Yes	Plastic	10	15	40	Stredor 44
RK141-5A	Masonry	Foam and Mastic	TKK PU Expanding Foam	Lorient CE Intumescent and Acoustic Acrylic Sealant	Yes	Timber	9.5	10	42	Strebord 44
SF013-9	Masonry	Foam and Mastic	Pyroplex Fire Rated Expanding Foam	Pyroplex Intumescent Acrylic Sealant	Yes	Timber	10	10	44	Strebord 44

6. Finishing the Installation

NEWLINE JOINERY
FIRE DOORS AND FRAMES

6.1 Automatic hold-open devices

Automatic hold-open devices can be used in certain circumstances to prevent a fire door from closing until it is required in the event of a fire.

It is stated in Approved Document B that 'If a self-closing device would be considered to interfere with the normal approved use of the building, self-closing fire doors may be held open by one of the following.

- A fusible link, but not if the doorset is in an opening provided as a means of escape unless it complies with paragraph C7.
- An automatic release mechanism activated by an automatic fire detection and alarm system.
- A door closer delay device'

You should always check the door manufacturer's documentation to ensure that any ardware fixed to the leaf or frame is acceptable.

6.2 Automatic closing devices

Automatic closing devices, otherwise known as door closers, will generally be the last piece of hardware fitted, after the frame is sealed to the structural opening.



It is stated in Approved Document B that 'All fire doorsets, including to flat entrances and between a dwellinghouse and an integral garage, should be fitted with a self-closing device, except for all of the following.

- Fire doorsets to cupboards.
- Fire doorsets to service ducts normally locked shut.
- Fire doorsets within flats and dwellinghouses.'

Door closers are available in a variety of styles and closing methods, and you must ensure that the chosen door closer is suitable for the specific performance class, leaf size and leaf weight. You should also consider the efficiency of the closer, the resistance from edge seals, hinge friction, latch resistance and differential air pressure, and the combined effect that these elements will have on opening force. When specifying and adjusting a door closer, fire protection and accessibility have equal importance.

Regarding fire protection, door closers should be selected to comply with the Field of Application report for the specified core or have components of equal specification that have demonstrated contribution to the required performance of doorsets when tested to BS 476-22:1987, BS EN 1634-1 or BS EN 1634-2. Closers must also bear the CE Mark and must have been tested to BS EN 1154:1997.

For accessibility, Approved Document M (Access to and use of buildings) and BS 8300-2:2018 (Design of an accessible and inclusive built environment. Buildings.) are the most important documents to consider. To comply with these documents, closer forces should be as noted in BS 8300-2:2018 -

The opening force, when measured at the leading edge of the door, should be not more than 30 N from 0° (the door in a closed position) to 30°, and not more than 22.5 N from 30° to 60° of the opening cycle.

Note - Where measurements cannot be taken at the leading edge, they may be taken at a point on the face of the door up to 60mm from the leading edge, a position approximately in line vertically with centre of the handle or push plate, in which case the opening force limits can be increased by approximately 2 N. Due to the inaccuracy of force measuring equipment, and the difficulties of accurately measuring forces, any measurements are subject to a degree of imprecision which could give rise to variation of 2 - 3 N.

Check the manufacturer's instructions for details of how to adjust the door closer.

Ensure that any recessing required for the door closer is clean and free of defect and is tight to the product.

Ensure that any additional intumescent protection required is fitted before the door closer.

Fixings for door closers will typically be supplied with the product. Drill pilot holes before fixing to prevent any timber splitting.

6.3 Signage

The requirements for fire door signage are laid out in BS EN ISO 7010:2020+A1:2020, and further advice on non-fire signage can be found in The Health and Safety (Safety Signs and Signals) Regulations 1996. The following table is a summary of the type of signage that may need to be fixed to a fire rated doorset.

Type	Purpose	Shape	Colour/Design	Example
Mandatory	Signs that require actions that will contribute to safety	Circular	Blue background with white symbol or text	
Prohibition	Signs that prohibit actions that will be detrimental to safety	Circular	White background with black symbol or text and a red border and crossbar	
Safe Conditions	Signs that indicate emergency exit routes	Rectangular	Green background with white symbol or text	
Warning	Signs that highlight potential risks	Triangular	Yellow background with black symbol or text and a black border	

Mandatory fire door signage must comply with BS EN ISO 7010:2020+A1:2020 according to the required function of the door. The following table shows a selection of common mandatory fire door signage.

Doorset function	Example of compliance	Sign required	Example
To be kept closed when not in use	Latched or held closed with a door closer	Fire Door Keep Shut	
To be kept locked shut when not in use	Locked with a deadlock or E-Mag lock	Fire Door Keep Locked Shut	
Held open until the event of a fire	Held open by an automatic hold-open device	Automatic Fire Door Keep Clear	

Where a doorset is to be used within an NHS building, signage should comply with HTM 58 – Internal Doorsets, HTM Building Component Series, NHS Estates. The signage must not exceed 45mm diameter and can be fitted flush with the leaf face, a minimum of 50mm from any edge.

6.4 Architrave

If required, architrave should be applied after the doorset is sealed to the structural opening. The use of architrave is considered to have a positive impact on the fire performance of a doorset, please see Section 5 of this manual regarding sealing to structural opening for details on the necessity of architrave for your installation.

Architrave should typically be a minimum of 12mm thick, and conform with the frame material requirements given in the manufacturer's documentation.



6.5 Final Checks

It is important to ensure that throughout the installation process, all necessary steps are taken to achieve the highest quality of installation possible. Once all elements of the installation have been completed, a final inspection should be undertaken by the installer.

The checklist included on the following page can be used to carry out a final check on the installation of a fire-rated doorset. This checklist is intended to assist in ensuring a quality installation, but should not be used as a substitute for full and final sign off by the Responsible Person.

6.5.1 Fire door installation check list

Door leaf	
Core specification is suitable for the required fire resistance performance	
Free from damage or defect	
Fitting plumb, level and square in the frame	
Consistent gap between leaf and frame that complies with relevant fire certification	
Ensure that the door is hung with correct handing	
Labels or plugs are in tact and easily visible	
Door frame	
Timber species and frame specification are suitable for the required fire resistance performance	
Free from damage or defect	
Quantity, size and location of frame to wall fixings	
Labels or plugs are intact and easily visible (where required)	
Fire, smoke and acoustic seals	
Seals are suitable for the required fire resistance performance	
Seals extend to the full height and width in the frame or leaf edge (no gaps)	
Seals are flush in grooves	
Smoke seals fill the gap between leaf and frame with a good contact all around	
Ensure that any threshold seals fully engage across the entire length of the seal	
Free from damage or defect	
Signage	
Signage is suitable for required fire resistance performance, is correctly positioned and is securely fixed	
Hardware	
Hardware is suitable for the required fire resistance performance	
All fixings are of the correct specification and are in place	
Hardware is fixed securely and is tight fitting with recesses	
Lock engages securely with the keep	
Hardware is fitted with the correct intumescent protection	
Free from damage or defect	
Automatic closing devices are correctly configured for closing speed and force	
CE Marked where required	
Vision panels	
Glass, glazing beads, seals and intumescent materials are of the correct specification for the required fire resistance performance	
Check that the label or plugs indicate a glazed door and that the glazing was factory fitted	
Fitting tolerance gap	
Ensure that the fitting tolerance gap is sealed with a suitable material and technique for the size of the gap	
Hand over of documents	
Ensure that the Responsible Person has all relevant documents, such as Care and Maintenance Manuals, Fire Certification, details about the doorset manufacturer	

7. Inspection and maintenance

Defects or damage to a fire rated doorset may have a severe and detrimental affect on the required performance of the doorset in the event of a fire. It is vital that performance doorsets undergo a regular and detailed inspection and maintenance regime following the installation and during the lifetime of the doorset to prevent this.

As stated earlier in this document, The Regulatory Reform (Fire Safety) Order 2005 (RRO) requires that all 'non-dwelling' buildings are subject to regular and ongoing fire risk assessments, in which fire doors should be inspected and maintained. The order also designates a Responsible Person (RP) for a building and makes them responsible for the fire risk assessment. Failure to do so may make the Responsible Person liable for any failures in fire safety.

Inspections should be carried out at least once every six months, and more regularly for doorsets that are newly installed or are in high traffic areas.

Inspections should be carried out by Competent Persons. Inspectors may report breaches of the RRO, to persons that have the authority to prosecute, or even close buildings down when breaches are discovered. General maintenance should be carried out regularly, and immediately if any defects or
damages are found. Maintenance work should be performed by competent operatives, that are registered members of the scheme relevant to the doorset. Some key points an inspector will check are;

- **Scheme identification still intact and visible (labelling, etc.).**
- **Any wear and tear, dents, holes or delamination of the door leaf or frame.**
- **Seals, glazing gaskets, and ironmongery (including door closers) all as installed and not damaged.**
- **All elements are operational in accordance with appropriate criteria and are easy to use.**

8. Glossary

NEWLINE JOINERY
FIRE DOORS AND FRAMES

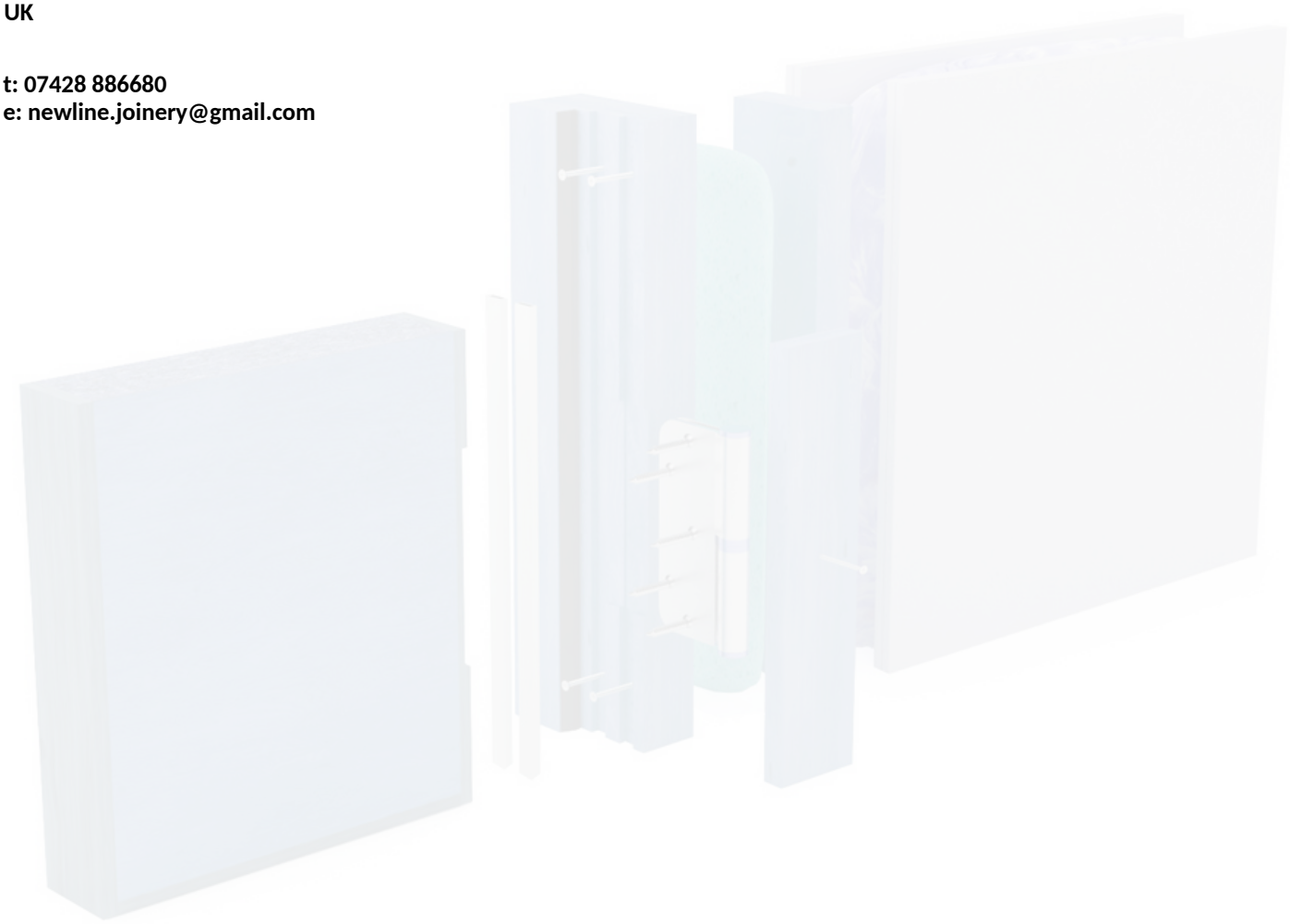
This glossary aims to reduce misinterpretation of this manual by explaining some of the industry jargon used within the document.

	Term	Definition
1	Field of Application report	A document that uses established empirical methods of extrapolation and experience of fire testing similar door assemblies in order to extend the scope of application by determining limits for the designs based on the tested constructions and performances obtained. These documents have previously been known as 'Global Assessments'.
2	Responsible Person	As defined in The Regulatory Reform (Fire Safety) Order 2005; In most circumstances the owner, employer or occupier of the premises is responsible for ensuring and maintaining correct fire safety and procedures – known as the "Responsible Person". In relation to a workplace, the Responsible Person is the employer, if the workplace is to any extent under his control. In relation to any premises other than workplaces, the Responsible Person is; • The person who has control of the premises (as occupier or otherwise) in connection with the carrying on by him of a trade, business or other undertaking (for profit or not); or • The owner, where the person in control of the premises does not have control in connection with the carrying on by that person of a trade, business or other undertaking
3	Systems house	An assembly designer which uses components manufactured either by them or by others for conducting initial type testing of the assembly design. These systems are then made available to assemblers/fabricators/manufacturers under agreement.
4	Notified body	An organisation that has been designated by a state to assess the conformity of certain products, before being placed on the market, with the applicable essential technical requirements. These essential requirements are publicised in directives or regulations.
5	UKAS	UKAS is the National Accreditation Body for the United Kingdom, appointed by government to assess and accredit organisations that provide services including certification, testing, inspection and calibration. UKAS is a member of ILAC, as are many equivalent global National Accreditation Bodies, with the aim of providing the free-trade goal of 'a product tested once and accepted everywhere'.
6	Third-party certification/ certified	Door manufacturers can use this to prove that the door products supplied are manufactured in accordance with the certifiable scope. Any queries regarding certification can be directed to the accredited body who will support the certificate holder as required.
7	Chain of custody	The chronological documentation and paper trail of ownership of the components or completed doorset.
8	Doorset	A complete door unit consisting of a door frame and a door leaf or leaves, supplied with all essential parts, including seals and hardware, from a single source. The term 'doorset' is often also used colloquially to mean a door leaf and frame.
9	Door assembly	A door unit that consists of parts having been purchased from varying suppliers for final assembly on site.
10	External door	A door that joins an internal space to any external or outside space. If the door is subject to any weather (including wind at any distance) it should be considered an external door.
11	Internal door	A door that internal space to any other internal space (including for example, an apartment to an enclosed corridor).
12	Certification body	An organization accredited by a recognized accrediting body for its competence to audit and issue certification confirming that an organization meets the requirements of a standard.

For technical support, training and guidance

NEWLINE JOINERY Factory
and Head Office
Unit 1-2
Frith Court Farm
Pluckley
Kent
TN27 0SY
UK

t: 07428 886680
e: newline.joinery@gmail.com



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FIRE DOORS AND FRAMES

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NEWLINE JOINERY
Unit 1-2
Frith Court Farm
Pluckley
Kent TN27 0SY
E newline.joinery@gmail.com

Registered in England & Wales No: 09424285

www.newlinejoinery.co.uk