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Acoustic, Smoke and Fire Seals for Door Assemblies



protecting against
sound, smoke and fire



Fire and smoke protection measures are essential, life-saving precautions in a building. What’s more, they protect the property from the devastating consequences of the fire itself, and the damaging effects of hot and cold smoke. So it’s essential to get the product selection right, every time.

Lorient is a company with a respected reputation for designing and manufacturing a wide range of products for fire and smoke containment. Products are also designed with acoustic, thermal and weather containment in mind, as well as accessibility – so you can be assured that a Lorient system provides an integrated, cost-effective solution.

With more than 30 years’ experience and accumulated knowledge, we pride ourselves on offering ground-breaking innovations, underpinned by technical excellence and exceptional quality. Our dedicated R&D centre not only generates successful product developments for Lorient; it also allows us to work in partnership with customers to develop and test their own products too. Our indicative fire test furnace is particularly popular, giving customers real insight into their own products’ performance and helping to save substantial testing costs.

Always keen to keep raising the bar, we are committed to gaining third party certification for our products wherever a suitable scheme exists. Many products hold CERTIFIRE certification, and we also hold approvals from both the BBA and IFC.

We embrace the highest management standards too, and hold both BS EN ISO 9001:2008 and BS EN ISO 14001:2004 certificates for our quality and environmental management systems. Achieving ISO 14001 is just one part of our ongoing commitment to operate in a sustainable way: many initiatives are planned and already underway to reduce materials and energy usage, as well as waste.

In addition to our UK operation, we have sister companies in Australia, Hong Kong, North America and the Middle East – which means we’re always up to date with the latest product developments and industry thinking from around the world. We can also provide support for clients with their projects, from start to finish, wherever they are in the world.

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Fire and Smoke – Life Threatening Forces

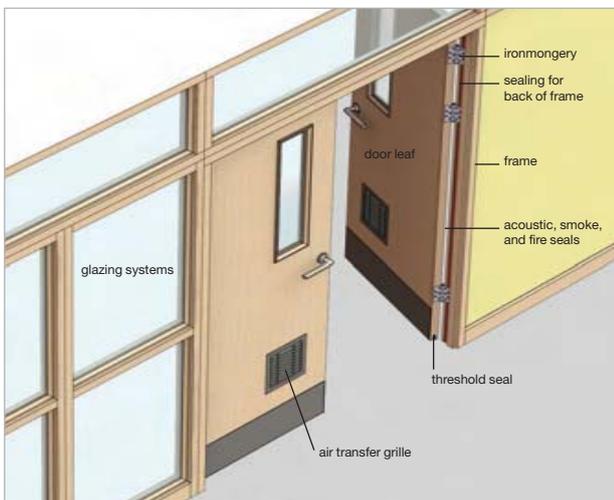
On average **430 people are killed** and **12,100 are injured*** in fires each year in the UK alone. Many of the casualties are attributable to breathing the toxic products of combustion from a remote fire.

Fire and smoke also cause extensive damage to building fabric and contents. **£2.52 billion*** per annum is the estimated total of fire-related losses. The majority of these deaths, injuries and losses occur in buildings where fire and smoke protection measures have been inadequate.

Design Needs and Regulatory Requirements

When fire breaks out in a building the threat is twofold. Firstly, there is the fire itself and the hot smoke generated in the immediate vicinity. Secondly, there is cold smoke which will spread rapidly through the building, threatening people and property some distance from the fire. The Building Regulations take both these threats into account, and supporting documents give criteria for how they can be managed. Details can be found in Approved Document B (England & Wales), Technical Booklet E (N Ireland), and Technical Handbook Section 2 (Scotland).

The Regulations require large buildings to be divided into smaller fire and smoke resistant ‘compartments’, to reduce the risk of damage to the building as a whole and also to save lives in the case of a fire. Building a fire resistant wall or floor to make a compartment is relatively simple. However, building design becomes much more complex when the compartments need to be linked in some way – essential to make the building usable. Every time an aperture is cut into one of the compartment boundaries (for example, to install a door in a fire resistant wall, or to pass ductwork through a wall or ceiling) the aperture must be filled with something that will preserve the fire and smoke integrity of the compartment. That’s the role of Lorient’s products – to work with the surrounding elements of the building to preserve the integrity of the fire and smoke resistant compartments. Our fire and smoke seals can be fitted into fire rated doors; our glazing products can be fitted into doors, screens or fire rated partitions; our air transfer grilles can be installed into doors, walls and ducts.



Fire and smoke protection products must be tested to prove their performance, and indeed, separate tests are required for fire and smoke. Our products are all extensively tested, and our test reports are freely available on request. Just call our Technical Services team on **01626 834252**.

Relevant Requirements

Fire and Smoke:

The requirements for fire and smoke containment with regard to ‘means of escape’ are contained in the following documents:

- Approved Document B (England and Wales), Technical Booklet E (N. Ireland), Technical Handbook Section 2 (Scotland);
- BS 476: Pt.22: 1987: Methods for determination of the fire resistance of non-loadbearing elements of construction;
- BS 476: Section 31.1: 1983: Methods for measuring smoke penetration through doorset and shutter assemblies;
- BS 8214: 1990: Code of practice for fire door assemblies with non-metallic leaves;
- BS EN 1634-1: 2000: Fire resistance tests for door and shutter assemblies. Part 1 – Fire doors and shutters;
- BS 9999: Code of practice for fire safety in the design, management and use of buildings.

A study of these requirements shows that practically all internal fire resistant door assemblies are also required to prevent the passage of cold smoke. Cold smoke performance needs to be considered separately from fire and hot smoke performance, and a separate test report is required.

In the guidance documents a door which provides at least 30 minutes fire protection is designated FD30. A door which provides the same protection and also protects against cold smoke is designated FD30S.

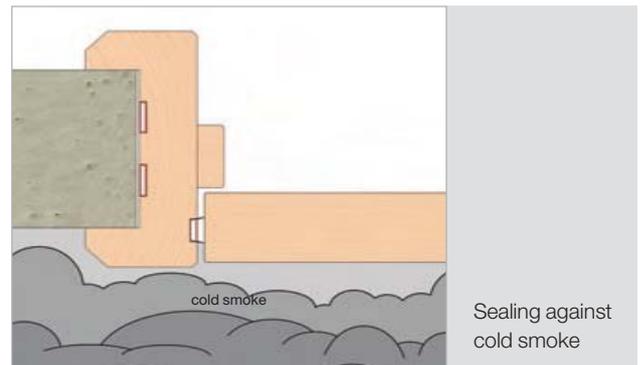
Similarly, a door which provides at least 60 minutes fire protection is designated FD60, or FD60S if the door also provides protection against cold smoke.

The Regulatory Reform (Fire Safety) Order 2005 also gives requirements for fire and smoke performance in certain buildings. Please refer to our specific guide ‘Common Sense Solutions for Acoustic, Smoke and Fire Containment’ for more information.

* Source: Communities and Local Government Website 2009.

The Solution

The Lorient solution is to fit a seal system which, properly located and secured, prevents the passage of cold smoke, fire and hot smoke.



Such a system would typically comprise:

- **Intumescent Seals** fitted into the head and jambs of the door frame or alternatively into the top and sides of the door leaf itself. In the event of fire intumescent seals expand to 5 – 10 times their original size sealing the gaps around the door and providing an effective barrier to fire and hot smoke.
- **Cold Smoke Seals** which seal the gaps around the door – including the threshold – when the door is closed. They provide a permanent barrier to the passage of cold smoke and also provide useful thermal or acoustic insulation.

Our range centres on a unique collection of seals, which can provide the highest standard of protection against sound (Approved Document E); smoke at all temperatures and fire (Approved Document B); while offering low frictional resistance for ease of door operation (Approved Document M). Furthermore, our seals are tested for air tightness under BS 476: Pt. 31.1: 1983 – so will make a positive contribution to thermal containment. Our acoustic, smoke and fire seals are tested for durability with many achieving over 1,000,000 cycles on a full-size door assembly without failure.

We manufacture products for all four sides of single doors and also for meeting the stiles of double doors to provide the highest standard of protection against sound, smoke and fire; as well as providing thermal containment too.

Sealing against Fire and Hot Smoke

Our seals provide protection when used in conjunction with a fire resisting doorset. Such a doorset typically consists of:

- the door leaf or leaves;
- the frame;
- the ironmongery.

The type and number of seals required and their location in the doorset are dependent on a number of factors, including:

- the degree of fire resistance required – our fire seals used in conjunction with suitable doorsets are capable of contributing to fire resistance from 30 minutes to in excess of 120 minutes;
- door configuration;
- the materials and design of the leaves and frame;
- the type and location of the ironmongery components;
- consult the door manufacturers' test evidence (where possible).

Currently, there are no standards laid down for protection against hot smoke but our seals have been shown in research projects to provide outstanding performance.

Sealing against Cold Smoke

It's often wrongly assumed that a fire door of proven performance will provide protection against cold smoke. Tests clearly show that doors closing onto rebates without seals do not provide an effective barrier to the transfer of smoke. Smoke and toxic fumes can be fatal at temperatures well below those required to activate intumescent materials. Cold smoke control must, therefore, be considered separately, and specific performance standards are laid down.

All our seals which protect against cold smoke, work by sealing the gaps around the door when it is closed (see diagram above). Furthermore our seals have been tested in accordance with BS 476: Section 31.1: 1983 and meet the requirements of the relevant parts of BS 9999 and Approved Document B to the Building Regulations.

In order to meet the requirements of BS 9999 the maximum allowable smoke leakage should not exceed 3 cubic metres per hour per metre of door perimeter. All our combined fire and smoke seals will easily meet this requirement, performing at 1.5m³/m/hr or even less, under the conditions of BS 476: Section 31.1: 1983.

At the same time, everyday operational characteristics have been taken into account and all our designs meet the stringent durability CERTIFIRE requirements alongside low opening and closing resistance.

Sound Containment

Wherever noise influences human activity, effective acoustic sealing is essential. Whether preserving the confidentiality of discussions in a private office or doctor's surgery, or reducing noise from adjacent rooms in hotels; preservation of privacy is paramount. Legislation is now in place giving guidelines for acoustic performance of door assemblies in a number of situations.



Approved Document E



Building Bulletin 93 for schools

Relevant Requirements

Sound:

Guidance and requirements for sound containment are found in Approved Document E (England and Wales), Technical Booklet G (N. Ireland) and Technical Handbook Section 5 (Scotland).

Document E gives specific acoustic performance requirements for door assemblies in a number of situations.

In "dwelling-houses, flats and rooms for residential purposes" (Requirement E1), a minimum acoustic performance of 29dB Rw is stated.

Further clauses in Approved Document E (2.26, 4.20 and 6.6) relate this requirement to door assemblies:

"Ensure that any door has good perimeter sealing (including the threshold where practical), and a minimum mass per unit area of 25kg/m², or a minimum sound reduction index of 29dB Rw (measured

according to BS EN ISO 140-3: 1995 and rated according to BS EN ISO 717-1: 1997). The door should also satisfy the Requirements of Building Regulation Part B – Fire safety."

Approved Document E also covers acoustic conditions in schools. Requirement E4 states:

"Each room or other space in a school building shall be designed and constructed in such a way that it has the acoustic conditions and the insulation against disturbance by noise appropriate to its intended use."

Section 8 of Document E recognises Building Bulletin 93, "The Acoustic Design of Schools" as an Approved Document, and the normal way of satisfying requirement E4.

This document gives "performance standards for airborne sound insulation between circulation spaces and other spaces used by students – minimum sound reduction index Rw":

*"All spaces except music rooms 30 dB
Music rooms 35 dB"*

It's therefore now essential to take into account the requirements of Approved Document E when specifying and installing sealing systems for door assemblies.

Please refer to our "Real Doorsets Real Solutions" document for further information.

Relevant Standards

The British Standards below refer to seals for doors:

- BS EN ISO 140-3: 1995: Acoustics – Measurement of sound insulation in buildings and of building elements. Part 3 – Laboratory measurement of airborne sound insulation of building elements;
- BS EN ISO 717-7: 1997: Acoustics – Rating of sound insulation in buildings and of building elements. Part 1 – Airborne sound insulation.

The Solution

The Lorient solution is to fit a seal system which, properly located and secured, prevents the passage of sound and helps the efficient energy management of a building.



Lorient Document E Packs



DS Acoustic, Smoke and Fire Seals

Sealing against Sound

Door assemblies are an integral part of buildings, and while there must be gaps around the perimeter of the door for it to operate efficiently, these gaps also allow sound to pass through. Sealing gaps around the door is crucial, to reduce the amount of sound entering or leaving the room. We manufacture seals for all four sides of the door and for the meeting stiles of double doors; to provide a complete and continuous barrier around the door when it's closed - maintaining the acoustic integrity of the doorset:

- Seals designed for the gap between the door and frame or the gap between a pair of doors are termed perimeter seals.
- Seals designed for the gap between the bottom of the door and floor are termed threshold seals.

Our seals are rigorously tested and proven to achieve acoustic ratings up to 36dB Rw. Tests were conducted in accordance with BS EN ISO 140-3:1995 and ASTM-E413-94.

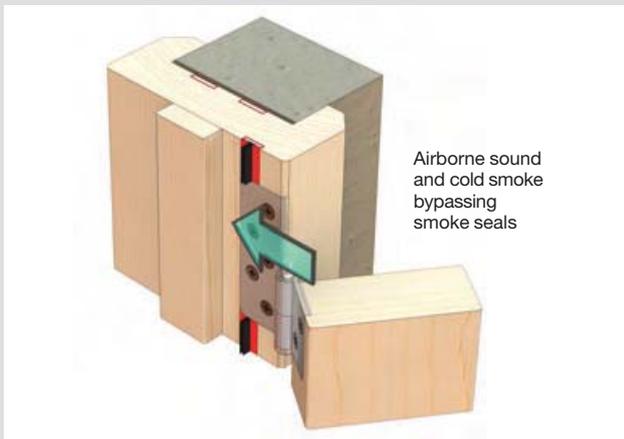
Our acoustic sealing systems provide excellent resistance to airborne sound, significantly improving the acoustic attenuation of the door assembly (door leaf, frame and seals). Our Doc E packs are available to suit the most common situations encountered in practice (see above). Further information can be found in our 'Acoustic Sealing Systems for Door Assemblies' brochure.

Under our extensive acoustic testing programme, tests were undertaken on a typical FD30S door assembly, in conjunction with the IS8010 si automatic threshold seal. Smoke seals with elastomeric fins were proven to provide a far superior acoustic performance to a traditional brush type seal.

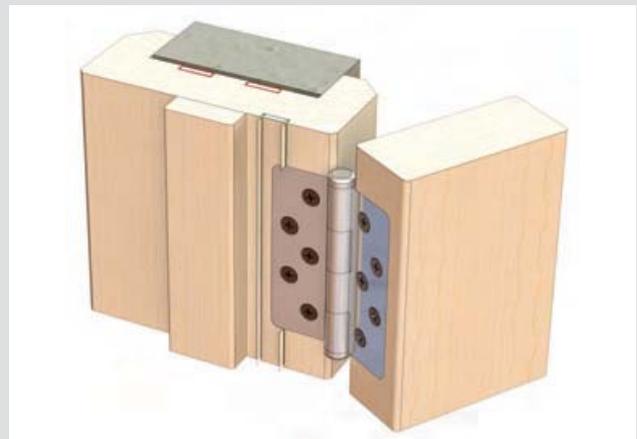
- Our DS seal gave a result of 31dB Rw.
- The brush type smoke seals performed to only 23dB Rw – not sufficient enough to meet the requirements of Approved Document E.

Sealing against Leakage

Interrupting a smoke or acoustic door seal at hinges or other ironmongery can seriously reduce its effectiveness, and may even mean that the regulatory requirements will not be met. That's why it's vital to ensure a continuous seal all around the door.



Leakage at hinges



Our Finesse™ (shown) or DS seal provides continuous acoustic and smoke protection at ironmongery points

Leakage at Hinges

An unprotected hinge (shown above) can lead to more than 11 cubic metres of smoke leakage per hour on an average sized door – falling well short of the requirements of BS 9999. The acoustic performance of the doorset will also be seriously compromised.

To provide a permanent barrier to smoke and sound it's essential that an effective smoke seal is maintained at the hinges (shown above on the right). If locks are also unprotected the door will not meet regulatory requirements. Our products are designed to enable an effective smoke and acoustic seal to be maintained.

Leakage at the Threshold

A study of smoke and sound behaviour clearly shows that it is not sufficient to seal only the tops and sides of doors. Both cold smoke and sound will transfer to an adjacent compartment through the gap at the threshold. We can supply a range of threshold seals which will provide protection against smoke and when coupled with an effective perimeter seal will meet the requirements of Approved Document E. For further information on the products please refer to our 'integrity® Architectural Seals' brochure.

Further advice on sealing at the threshold can be found in the relevant parts of BS 9999 or can be provided by us. Please call our Technical Services team on **01626 834252**.

Other Areas of Potential Smoke Leakage

It's essential for glazed apertures, air transfer grilles and other similar features of a door to be evaluated with regard to smoke leakage. Further information can be found in our following brochures entitled:

Fire Resistant Glazing Systems

Fire and Smoke Resistant Damper / Air Transfer Grilles

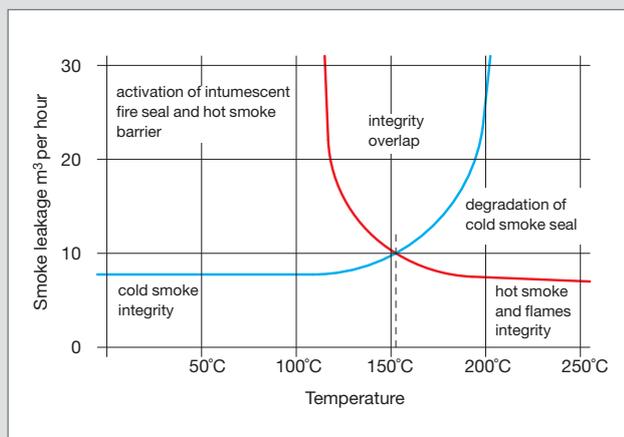
Specialised Fire Resistant Door Hardware

Back of Frame

If not suitably protected, the back of frame can present a risk in the case of a fire. The gap between the frame and wall should be filled with a suitable fire resistant material; we recommend using two LP2004 fireseals (as represented throughout this brochure), our intumescent sealant or our bespoke seal for the back of the frame (please ask for details).

Intumescent Materials and Performance

Our intumescent fire seals and combined acoustic, smoke and fire seals consist of intumescent material encased in rigid PVC which, for the combined seals also provides the carrier for an acoustic and smoke seal.



Hot and Cold Smoke Leakage Rates

The sodium silicate intumescent material is activated at temperatures of between 100 – 150°C, forming a rigid foam with a high level of thermal insulation; it expands to 5 – 10 times its original size.

The intumescent material is activated at a much lower temperature than that at which the smoke seal material degrades. Long before the seal has burned away, the intumescent material has expanded sealing the gaps around the door. This seals the gap between the door and the frame, so providing an effective barrier to the passage of fire and hot smoke.

For more specialised applications, we're able to utilise alternative intumescent core materials in our manufacturing process, or create bespoke sealing solutions. Please contact our Technical Services team for further information.

The intumescent material used in the mainstream range of our seals is sodium silicate based. This material has been chosen for several reasons:

- it has been proven in many hundreds of fire tests, world-wide;
- it's renowned for its comprehensive spread of performance characteristics;
- it has demonstrated outstanding consistency, reliability and durability.

Cold Smoke Sealing

We offer a range of smoke seal profiles, which incorporate either a polypropylene brush pile; or elastomeric fins which offer durable, low-friction performance for ease of door operation, and enhanced smoke and acoustic protection.

Our range of cold smoke seals include products which can be used to upgrade existing fire rated doors to provide protection against cold smoke and sound. Specially designed to overcome the problems described above, they can be retro-fitted with minimal disruption to the door assembly.

Our Curved Fin Batwing® is especially recommended for upgrading fire rated doors. Refer to page 11 for further details.

Sealing for Thermal Containment

Our seals are tested for air tightness under BS 476: Pt. 31.1: 1983 – this makes a positive contribution to thermal containment between spaces within a building, as well as for external doors; helping in the efficient energy management of a building.

Other Considerations – Accessibility

Approved Document M (England and Wales), Technical Booklet R (N. Ireland) and Technical Handbook Section 4 (Scotland) specify the size and location for glazed panels in doors in various situations, in order to promote safety and accessibility. Visual contrast on the leading edge of doors is also included, as are opening and closing forces for ease of door operation, threshold height and door width requirements.

In addition to providing acoustic insulation and fire/smoke protection, doors must allow free passage. It's crucial that the sealing system fitted to a door assembly has minimal effect on the opening and closing operation of the assembly.

Independent Quality and Performance Accreditation

Three independent accreditation schemes exist that are particularly relevant to fire seals and smoke seals. Their purpose is to set benchmark quality and performance requirements, which go beyond simply passing a single fire or smoke test. In addition, these schemes monitor ongoing production. Audits are carried out to ensure that the quality and performance specifications of the originally tested items are properly maintained.

Our commitment to these independent approvals demonstrates ongoing responsibility and accountability for the performance of the company's products, undertaken at the highest possible level. It provides assurance to customers and specifiers that the products have not only been successful in the appropriate laboratory tests, but they will also be fully serviceable and operational to the same level, for many years to come.

IFC

In 2008 we were awarded IFC certification on a range of our seals, making us the first seal manufacturer to receive this endorsement. IFC Certification Ltd is a UKAS approved and internationally recognised provider of third party certification services. We were awarded this certification having met the requirements of the SD13 schedule for Penetration and Linear Gap seals on a number of fireseal and combined smoke and fire seal products.



CERTIFIRE

CERTIFIRE is an accredited independent product conformity scheme operated by Exova Warrington Fire Certification Limited.



As part of the CERTIFIRE schedule products are required:

- to add minimal resistance to opening and closing;
- to meet the requirements of BS 9999 when tested for smoke leakage according to BS 476 Section 31.1: 1983, even after an endurance test of 100,000 opening and closing cycles;
- to maintain consistent seal quality according to the disciplines of a recognised quality assurance scheme, for example BS EN ISO 9001:2008;
- to prove long term performance under a variety of service conditions;
- to be permanently marked so they can be easily identified.

In addition, under CERTIFIRE schedule TS35 the manufacturing process is subject to more thorough auditing, and more stringent production controls are required on the part of the manufacturer. Products submitted for CERTIFIRE approval must also now initially undergo more extensive pressure, expansion and humidity testing than in the past, along with a defined fire test to either BS or EN standards. These measures serve to ensure that only products demonstrating a consistently high quality and proven performance carry the CERTIFIRE marque.

British Board of Agrément

BBA approvals provide independent assurance for the designer, specifier and end-user as to the 'fitness-for-purpose' of building products.



To achieve this accreditation, our seals underwent a comprehensive appraisal, conducted over a two year period. This verified that:

- contribution to fire protection and smoke control meets regulatory requirements;
- the seals meet the requirements of the relevant British Standards when they are fitted to single leaf, double leaf, single swing, double swing, latched and unlatched doors;
- the seals are durable (an extensive survey of actual installations is undertaken periodically);
- the seals are easy to install and maintain;
- materials of appropriate quality are used in manufacture;
- manufacture is carried out under the disciplines of a recognised quality assurance scheme, for example, BS EN ISO 9001:2008.

Rigorous audits of the manufacturer's procedures are conducted regularly. It is also a condition of BBA approval that a complete re-appraisal of the relevant products is carried out at maximum, 3 year intervals. Our seals have successfully completed this review process on each occasion since the original approval was awarded.

Note: CERTIFIRE and BBA accreditations achieved by Lorient apply to the mainstream range of sodium silicate-based acoustic, smoke and fire seal products and some non-intumescent acoustic and smoke seals. However, all our products are designed and manufactured to the same high levels of fitness-for-purpose, under the disciplines of BS EN ISO 9001:2008.

Acoustic, Smoke and Fire Seals for Door Assemblies

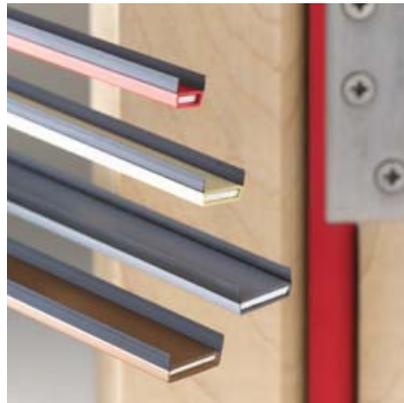
product solutions

Acoustic, Smoke and Fire Seals

Our DS and Finesse™ seals offer the ultimate in acoustic, smoke and fire protection with the added benefit of thermal containment too. Their unique design means that whichever way around the product is installed, the seal can always be fitted in the correct place, maintaining the integrity of the acoustic and smoke seal at the ironmongery points.

DS and Finesse™ Seals

- Superior acoustic performance to meet the requirements of Approved Document E.
- Successfully tested for fire and smoke performance in accordance with BS 476: Pt.22: 1987, BS 476: Pt.31.1: 1983 and BS EN 1634-1:2000 (Approved Document B).
- Exceptionally low frictional resistance for ease of door operation (Approved Document M).
- Successfully tested for air tightness under BS 476: Pt.31.1: 1983 – this makes a positive contribution to thermal containment between spaces within a building, as well as for external doors.
- Highly durable – has achieved over 1,000,000 opening and closing cycles on a full size door assembly.
- A choice of sizes to cover both 30 and 60 minute applications.
- Available in standard lengths of 1m and 2.1m. Other lengths to special order.



DS Seal

- Available in a range of standard colours, with black fins – to blend or contrast with the doorset as required. White fins are also available (please ask for details).
- Its unique shape allows the product to be stacked, ensuring minimal storage space and protection of the fins.



Finesse™ Seal

- Available in a range of standard colours, plus woodgrain and metallic finishes for superior aesthetics.
- Its transparent fin construction provides a virtually invisible fitted product – ideal for upgrading doorsets in heritage projects.



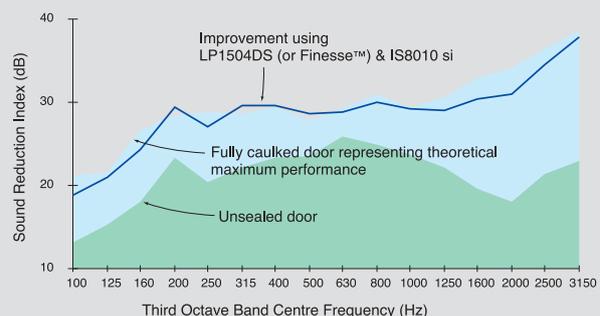
Acoustic Performance

Acoustically tested in accordance with BS EN ISO 140-3:1995. Tests were undertaken on a typical FD30S door assembly, in conjunction with the IS8010 si automatic threshold seal. The sealing system performed to 31dB Rw (see improvement in graph below).

Weighted Sound Reduction (Rw): 31dB

Sound Transmission Class (STC): 31dB

Typical Architectural Solid Core Door



Acoustic and Smoke Seals

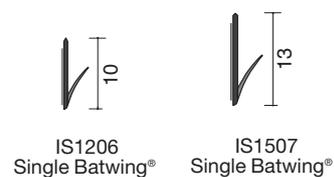
Our Batwing® acoustic and smoke seal minimises the opening and closing resistance of the door leaf due to its unique, curved elastomeric fins. These also help to ensure ongoing performance and durability in service.

Curved Fin Batwing® Seal

- Excellent acoustic performance – its symmetrical design ensures fins are always in contact with two surfaces of the door leaf (Approved Document E).
- Curved fins allow easier door operation (Approved Document M).
- Proven smoke performance from ambient up to 200°C.
- Highly durable – has achieved over 1,000,000 opening and closing cycles on a full size door assembly.
- Strong self-adhesive backing tape for fixing – tested on many surfaces including MDF and powder coated steel.
- Available in a range of colours including white, cream, silver, grey, light brown, dark brown and black.
- Available in standard lengths of 1m and 2.1m. Other lengths to special order.
- Min / max gap size required: 3mm / 4mm.



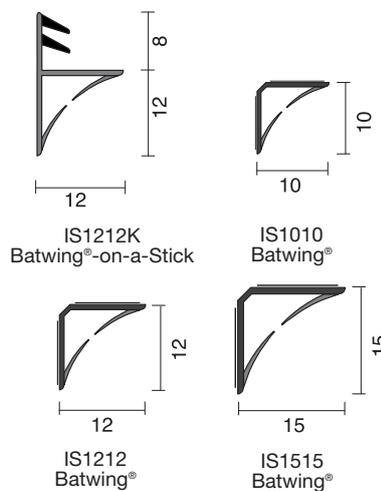
Single Batwing®



Firtree™ Seal

A highly effective acoustic seal, which also provides additional cold smoke protection around the perimeter of fire rated doors.

- Smoke seal material: Elastomeric fins.
- Available in standard lengths of 1m and 2.1m.
- Available in black and white.
- Min / max gap size 3mm / 4mm and 6mm.

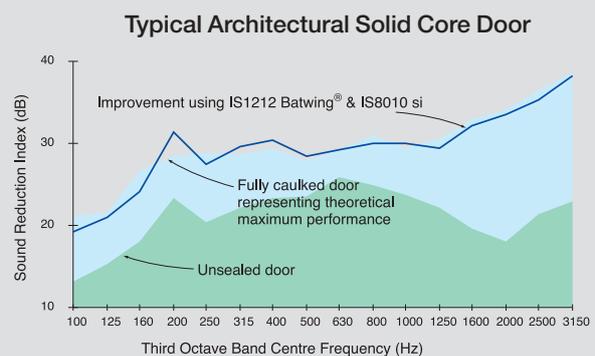


Acoustic Performance

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Weighted Sound Reduction (Rw): 31dB

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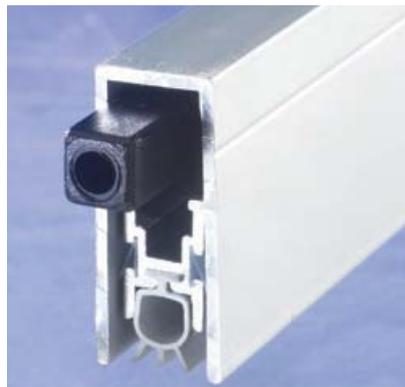
integrity® Automatic Threshold (Door Bottom) Seals

Threshold sealing is essential for effective sound and smoke containment. We offer a choice of automatic, concealed and face-fixed seals suitable for use with fire rated doors. These seals lift clear of the floor as soon as the door is opened by a few millimetres.



IS8005 si

- A slim-line, concealed automatic threshold seal.



IS8010 si

- A medium duty, concealed automatic threshold seal.



IS8036 si

- A medium duty, face-fixed, automatic threshold seal.

The following benefits apply to IS8005 si, IS8010 si and IS8036 si:

- Internal fins provide superior acoustic properties. Seals are acoustically tested in accordance with BS EN ISO 140-3: 1995.
- Seals meet the smoke leakage performance requirements of BS 9999 when tested in accordance with BS 476: Pt.31.1: 1983.
- Tested for up to 60 minutes under the conditions of BS 476: Pt.20/22: 1987 without compromising fire performance.
- Seals require no power connection and are self-levelling on uneven surfaces.
- Highly durable – featured seals have achieved over 1,000,000 cycles on a full size door assembly, without degradation.



Application Details

The following pages show examples of how our seals can be used to achieve the levels of protection against sound, smoke and fire required by Building Regulations and British Standard codes of practice.

The examples shown result from many years' experience and the analysis of hundreds of fire, smoke and sound tests. If sealing against cold smoke and sound isn't required, the combined fire and smoke seals shown can be replaced with fire seals of the same size.

Our seals give equal performance whether placed in the door leaf or the frame, but it's preferable to fit them in the frame where they will not interfere with any size adjustments which may subsequently be made to the door leaf.

A third party certified timber doorset is the best guarantee that all elements, ironmongery, acoustic, smoke and fire seals and sometimes glazing, are fully tested to the relevant standards.

However, for specialist doors, and particularly imported door blanks, it's essential to consult the manufacturer to determine exactly what configuration of seal has been tested.

The following illustrations are a selection of our recommended solutions for achieving fire protection of up to 60 minutes. However, it's possible to achieve fire protection beyond this level. For more information on further solutions from the our product range, please call our Technical Services team on **01626 834252**.

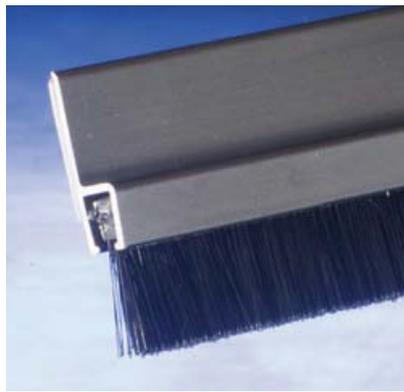
integrity® Perimeter and Threshold Seals

We provide numerous options for sealing the gap between the door and frame, and for meeting stiles of double doors. integrity® perimeter seals are designed to offer exceptional acoustic and smoke containment.



IS4010

- A low profile threshold plate – only 6mm high.
- Prevents rain, draught and smoke penetration when used in conjunction with a threshold seal.
- Vinyl feet to provide cushioning and levelling on uneven surfaces.



IS5010

- A hard-wearing sweep action brush seal.
- Suitable for use with low profile threshold plate.
- Available in silver or bronze anodised aluminium, black nylon brushes.



IS7025 si

- A slim-line, face-fixed acoustic and smoke perimeter seal featuring a silicone bulb.
- Superior acoustic performance - tested in accordance with BS EN ISO 140-3: 1995.
- Meets the smoke leakage performance requirements of BS 9999 when tested in accordance with BS 476: Pt.31.1: 1983.
- Highly durable - has achieved over 1,000,000 cycles on a full size door assembly.
- Easily installed without removing the door.



CF136

Use of symbols



indicates that the arrangement is suitable for single leaf, single swing doors.



indicates that the arrangement is suitable for single leaf, double swing doors.



indicates that the arrangement is suitable for double leaf, single swing doors.



indicates that the arrangement is suitable for double leaf, double swing doors.



indicates that the seals featured provide protection against fire and hot smoke.



indicates that the seals featured provide protection against cold smoke.



indicates that the seals featured provide protection against sound.

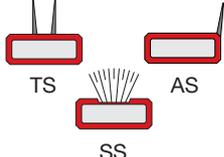
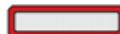
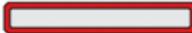


FD30S indicates that the arrangement is suitable for 30 minutes fire protection, and protection against cold smoke.



FD60S indicates that the arrangement is suitable for 60 minutes fire protection, and protection against cold smoke.

Combined Acoustic, Smoke and Fire Seals:

	DS	Finesse™	Fire Seal	TS, AS and SS
				
	The complete solution for acoustic, smoke and fire containment	The complete solution for acoustic, smoke and fire protection with superior aesthetics	Intumescent fire seal for use where no smoke sealing is required	Smoke and fire seals with a choice of elastomeric fins or brush pile smoke seal inserts
10 x 3mm & 10 x 4mm seals Can provide 30 minutes fire resistance.* Two parallel seals can provide 60 minutes fire resistance in hardwood constructions.	 10 x 4mm (LP1004DS)		 10 x 3mm (LP1003)  10 x 4mm (LP1004)	Available in TS, AS and SS profiles SS 10 x 3mm non intumescent AS to special order
15 x 4mm seals Suitable for softwood constructions or where the gap between the door and the frame is greater than usual.	 15 x 4mm (LP1504DS)	 15 x 4mm (Finesse™)	 15 x 4mm (LP1504)	Available in TS, AS and SS profiles AS to special order
20 x 4mm seals Can provide 60 minutes fire resistance.* Can be notched to fit around hinges.	 20 x 4mm (LP2004DS)	 20 x 4mm (Finesse™)	 20 x 4mm (LP2004) May also be used between the door frame and masonry.	Available in TS, AS and SS profiles AS to special order
25 x 4mm seals These large seals help control door distortion.	 25 x 4mm (LP2504DS)		 25 x 4mm (LP2504)	Available in TS, AS and SS profiles AS to special order
Smoke seal material	Elastomeric fins 4mm or 6mm	Elastomeric fins 4mm	n/a	TS – Elastomeric fins 4mm or 6mm, AS – Elastomeric fin 4mm or 6mm, SS – Polypropylene brush pile 4mm
Min/max gap size	3mm / 4mm**	3mm / 4mm**	3mm / 4mm	3mm / 4mm**

Nominal seal sizes

All seals are available in standard lengths of 1m and 2.1m. Other lengths are available to special order. We can also produce fire seals ranging from 10mm – 70mm wide and from 2.5mm – 15mm deep. e.g. LP3004 (30 x 4mm), LP3804 (38 x 4mm) LP4004 (40 x 4mm)

Fitting

All our intumescent fire seals have a self-adhesive backing. The adhesive used has been specially selected to provide excellent adhesion on a wide range of materials, including MDF on which it is usually difficult to obtain an effective bond.

Finish

All our acoustic, smoke and fire seals are available in a range of standard and special colours – see the colour chart on page 21.

*Refer to Application Details, pages 15 – 20

**Seals suitable for larger gaps available on request

Single Leaf / Single Swing



Lorient product references

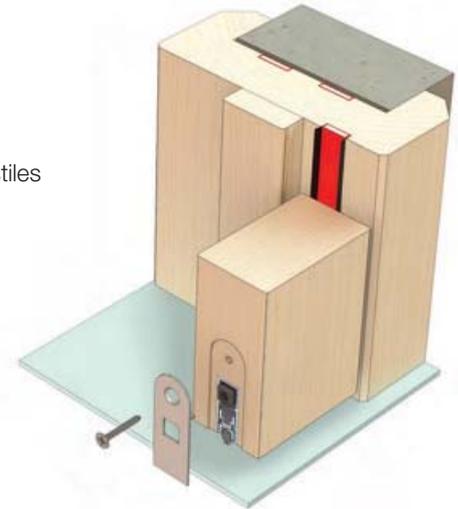
LP1504DS (or LP1504 Finesse™)
 IS8010 si
 LP2004 (x2)

Acoustic performance for
 product combination pictured:

Location

head, latch stiles, hinge stiles
 threshold
 back of frame

31dB ^{Rw} _{STC}



Lorient product references

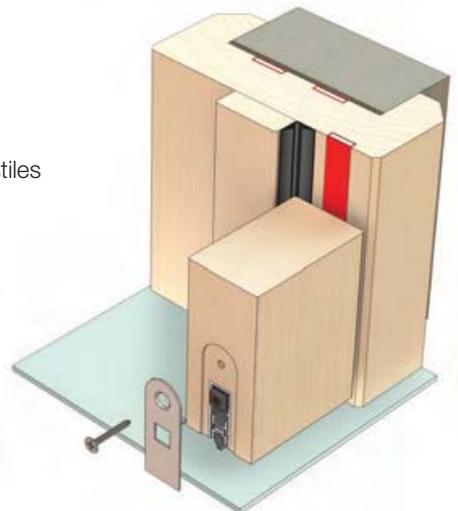
LP1504 (or LP1004) plus Batwing® IS1212
 IS8010 si
 LP2004 (x2)

Acoustic performance for
 product combination pictured:

Location

head, latch stiles, hinge stiles
 threshold
 back of frame

31dB ^{Rw} _{STC}



Lorient product references

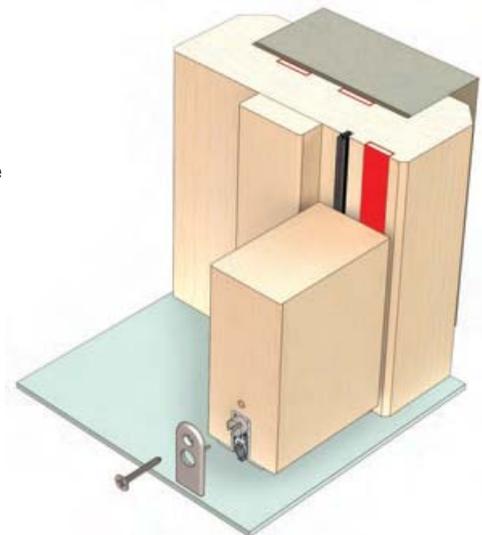
LP1504 (or LP1004) plus Firtree™ IS1511
 IS8005 si
 LP2004 (x2)

Acoustic performance for
 product combination pictured:

Location

head, latch stiles, hinge
 threshold
 back of frame

31dB ^{Rw} _{STC}



Note: We recommend that hinges which interrupt fire seals should be bedded on our intumescent sealant or special hinge pads.

Single Leaf / Single Swing



Lorient product references

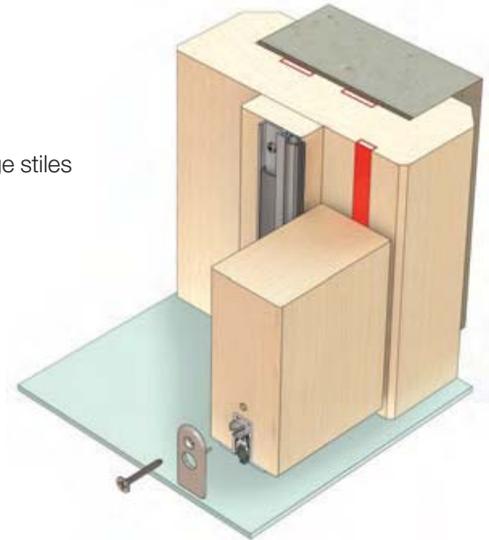
LP1004 (or LP1504) plus IS7025 si
 IS8005 si
 LP2004 (x2)

Acoustic performance for
 product combination pictured:

Location

head, latch stiles, hinge stiles
 threshold
 back of frame

31dB ^{Rw} _{STC}



Double Leaf / Single Swing



Lorient product references

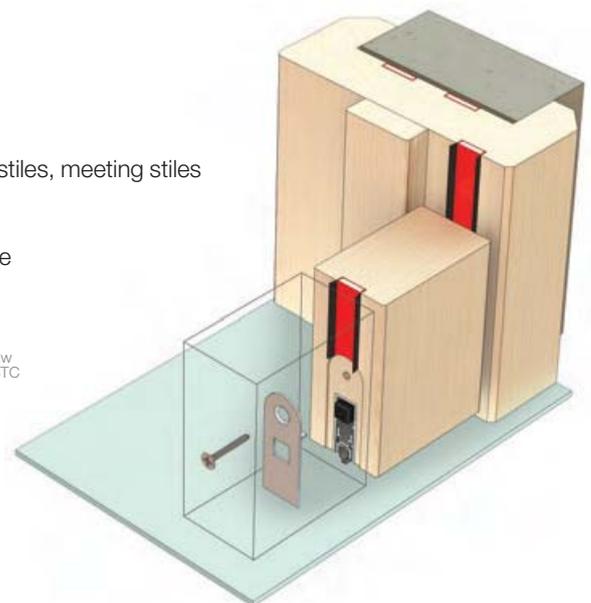
LP1504DS (or LP1504 Finesse™)
 IS8010 si
 LP2004 (x2)

Acoustic performance for
 product combination pictured:

Location

head, hinge stiles, meeting stiles
 threshold
 back of frame

31dB ^{Rw} _{STC}



*Notes: Rebated stiles not recommended.
 We recommend that hinges which interrupt fire seals should
 be bedded on our intumescent sealant or special hinge pads.*

Single Leaf / Double Swing



Lorient product references

LP1004 plus LP1004DS

IS5010 with IS4010

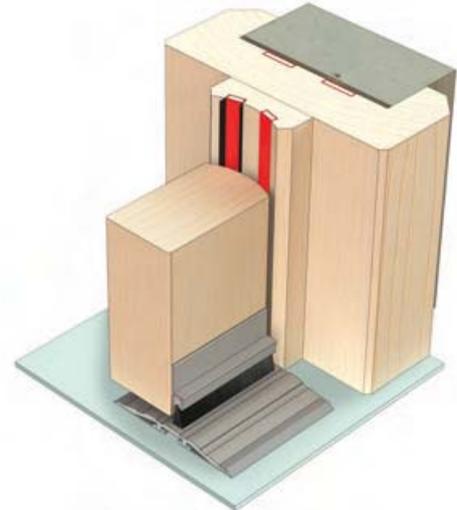
LP2004 (x2)

Location

head, heel stiles

threshold

back of frame



Double Leaf / Double Swing



Lorient product references

LP1004 plus LP1004DS

LP1004 (x3) plus LP1004DS

IS5010 with IS4010

LP2004 (x2)

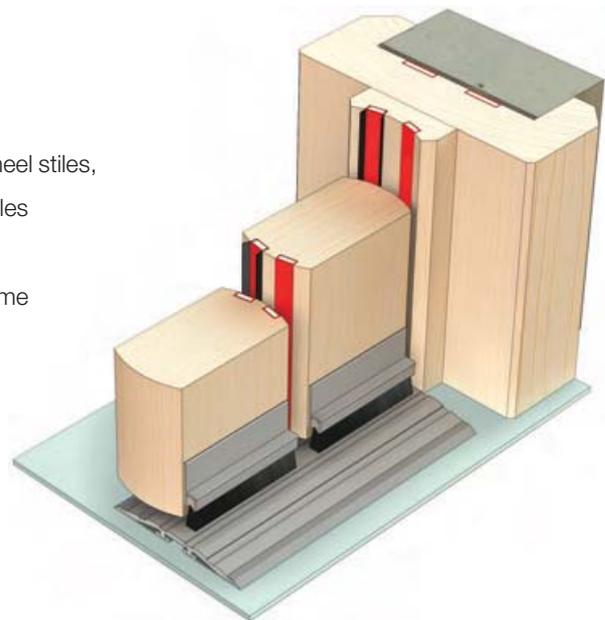
Location

head and heel stiles,

meeting stiles

threshold

back of frame



Notes: Rebated stiles not recommended. Only one combined acoustic, smoke and fire seal is required at meeting stiles, i.e. 3 x LP1004 plus 1 x LP1004DS. We recommend that pivot hardware which interrupts fire seals should be bedded on our intumescent sealant.

Single Leaf / Single Swing



Lorient product references

LP2004DS (or LP2004 Finesse™)

IS8005 si

LP2004 (x2)

Acoustic performance for product combination pictured:

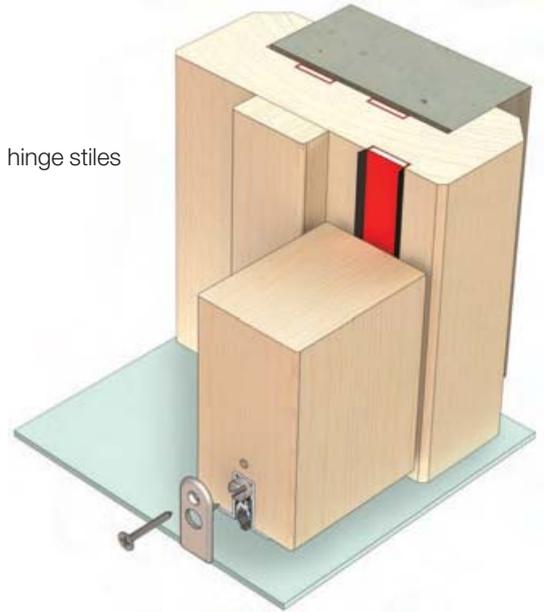
Location

head, latch stiles, hinge stiles

threshold

back of frame

31dB ^{Rw} _{STC}



Single Leaf / Single Swing



Lorient product references

LP1004 plus LP1004DS

IS8010 si

LP2004 (x2)

Acoustic performance for product combination pictured:

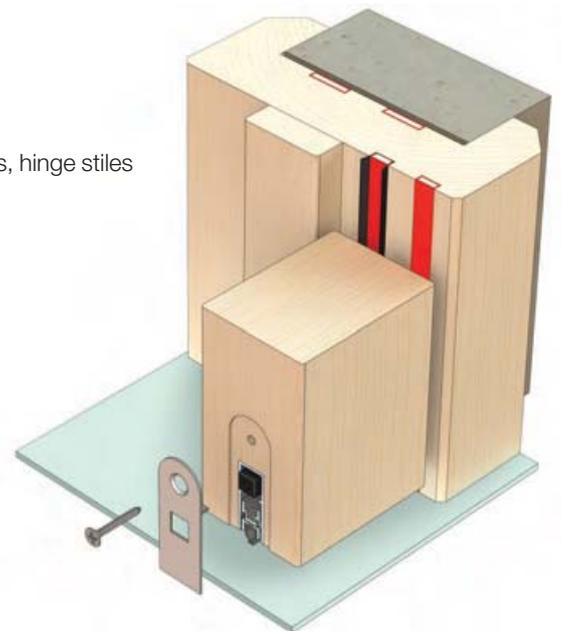
Location

head, latch stiles, hinge stiles

threshold

back of frame

31dB ^{Rw} _{STC}



Note: We recommend that hinges which interrupt fire seals should be bedded on our intumescent sealant or special hinge strips. We also recommend that the threshold seal is protected with the addition of an intumescent cladding kit.

Double Leaf / Single Swing



Lorient product references

LP2004DS (or LP2004 Finesse™)
 LP2004 plus LP2004DS or LP2004 Finesse™
 IS8010 si
 LP2004 (x2)

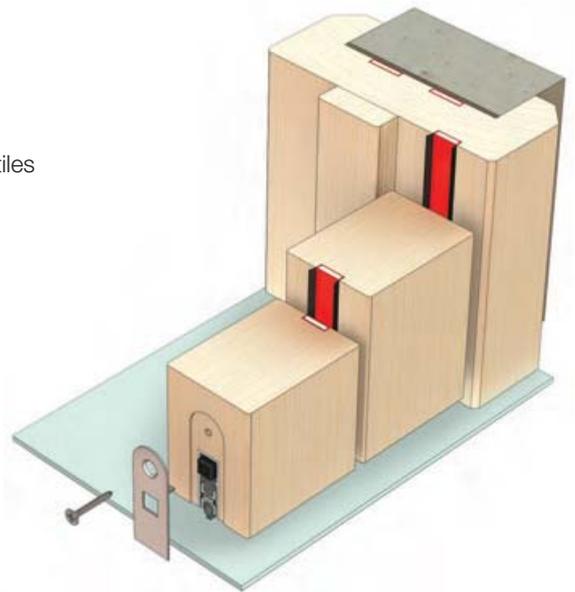
Acoustic performance for product combination pictured:

Note: We recommend that the threshold seal is protected with the addition of an intumescent cladding kit.

Location

head, hinge stiles
 meeting stiles
 threshold
 back of frame

30dB^{Rw}_{STC}



Double Leaf / Single Swing



Lorient product references

LP1004 plus LP1004DS
 LP1004 (x3) plus LP1004DS
 IS8010 si
 LP2004 (x2)

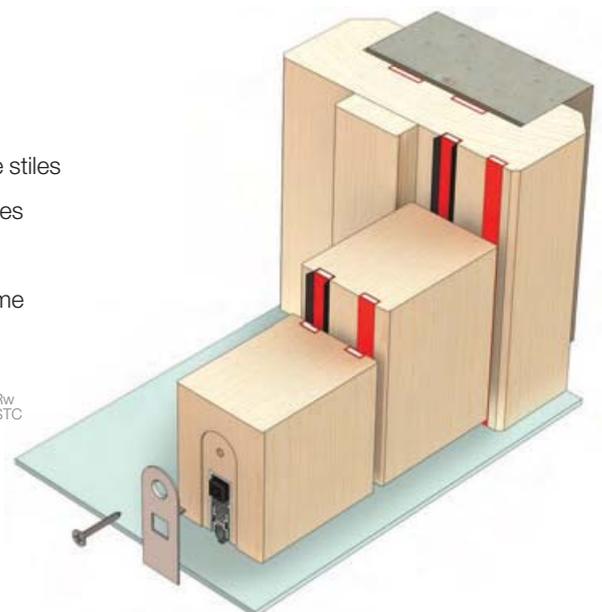
Acoustic performance for product combination pictured:

*Notes: Rebated stiles not recommended.
 Only one combined fire and smoke seal is required at meeting stiles, i.e. 3 x LP1004 plus 1 x LP1004DS.
 We recommend that hinges which interrupt fire seals should be bedded on our intumescent sealant or special hinge strips.
 We also recommend that the threshold seal is protected with the addition of an intumescent cladding kit.*

Location

head, hinge stiles
 meeting stiles
 threshold
 back of frame

30dB^{Rw}_{STC}



Single Leaf / Double Swing



Lorient product references

LP2004DS (or LP2004 Finesse™)

IS5010 with IS4010

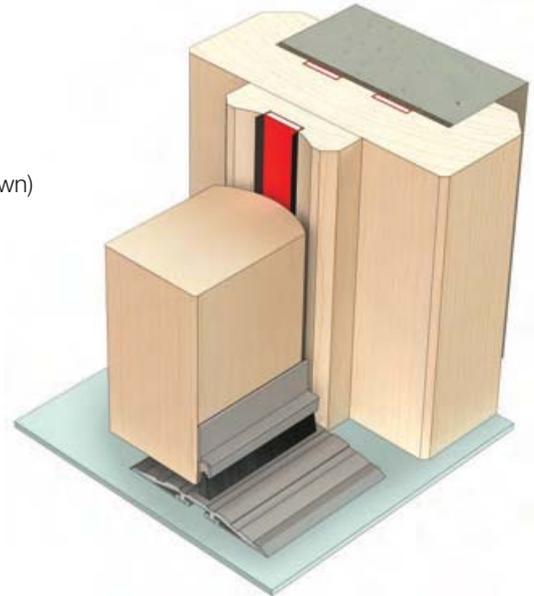
LP2004 (x2)

Location

head, latch stiles,
heel stiles (as shown)

threshold

back of frame



Double Leaf / Double Swing



Lorient product references

LP2504DS

LP2504DS

IS5010 with IS4010

LP2004 (x2)

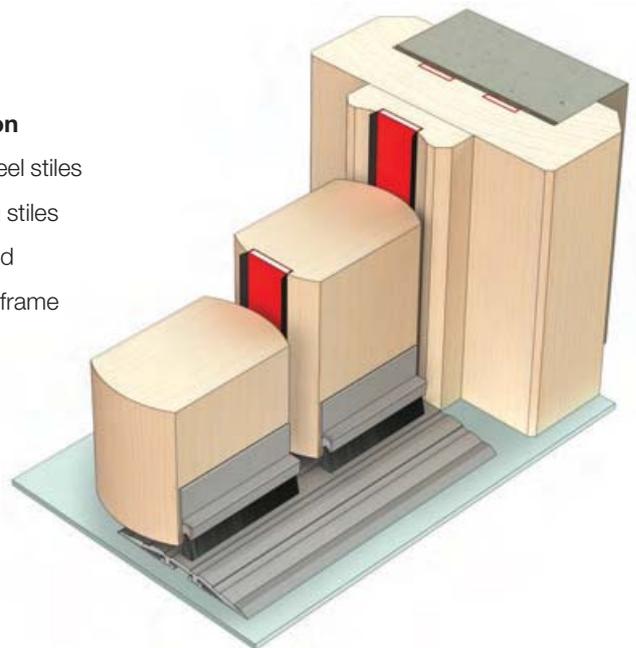
Location

head, heel stiles

meeting stiles

threshold

back of frame



*Note: Rebated stiles not recommended.
We recommend that pivot hardware which interrupts
fire seals should be bedded on our intumescent sealant.*

Colour Range

Our comprehensive range of finishes and their reference numbers can be found on this page.

Standard Colours

All our intumescent seals are available in a standard range of colours, some of which have been selected to harmonise with commonly specified timbers.

Please note that the DS, SS, TS and AS profiles are normally supplied with black brushes or fins; white fins are also available. Grey brushes are available by special request. The Finesse™ profile is supplied with translucent fins as standard.

Woodgrain Finishes

Many seals are available with a woodgrain or metallic finish. Our range of woodgrain finishes replicates the beauty and ageless appeal of real timber. Both these finishes are achieved by laminating special polyester films directly onto the PVC casing of the seal.

There is a small extra charge for these finishes but there are no set-up charges and no minimum order quantities.

We would recommend samples are obtained, and suitability checked for match, before an order is placed as colour and grain in timber species can vary. It should also be remembered that timber darkens with age and can change colour significantly when polishes and other clear finishes are applied.

Special Colours

We also offer many special finishes and a precise colour matching service. No minimum production run is necessary but a modest set-up charge is made to cover costs. Please ask for further details.

Note: The limitations of the printing process mean the colours and finishes shown here may not be exactly the same as the seals supplied. We can supply free samples to assist colour matching.

Standard Colours



White (0303)



Cream (1047)



Maple (1740)



Gold (0502)



Bronze (0501)



Copper (0503)



Red (3073)



Light Brown (8018)



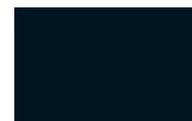
Dark Brown (8004)



Silver (0701)



Grey (D838)



Black (0001)

Woodgrain Finishes



American Sycamore (W042)



Limed Oak (W532)



Beech (W046)



Ash (W047)



American White Oak (W502)



Medium Oak (W512)



European Walnut (W018)



American Cherry (W552)



American Red Oak (W542)



Sapele (W501)



Teak (W522)



American Black Walnut (W804)

Metallic Finishes

Satin Anodised Aluminium (M203)

Bright Polished Chrome (M403)

Satin Stainless Steel (M404)

Note: Please contact Lorient for colour samples.



Fitting Instructions – Lorient Intumescent Seals

Careful fitting and attention to detail are essential. Seals must be fitted into a groove just wide enough and deep enough to accept them. The PVC casing should be flush with the surrounding surface.

- Ensure the groove is dry, flat, clean and free of dust and grease.
- Peel off the protective tape.
- Press the seal into position to activate the adhesive backing properties.
- Application should be at a temperature no less than 10°C.

All our intumescent seals are supplied with square cut ends to enable neat butt joints to be made. The seals may be cut by the installer using a hacksaw, sharp knife or shears.

Once installed our fire seals may, if required, be painted over. Do not paint the flexible elements of combined acoustic, smoke and fire seals. Paint needs to fully dry and cure before the seals are installed.

Comprehensive fitting instructions are included with each consignment.

Technical References

Lorient is quality assured under the disciplines of BS EN ISO 9001:2008.

Accreditation to this standard is a guarantee that we conduct our business to the complete satisfaction of our customers with regard to design solutions, manufacturing consistency and management procedures.

In addition, this internationally recognised standard for quality management generates customer confidence and eliminates the risk of poor performance. Regular audits of our company procedures are undertaken by qualified BSI staff to ensure ongoing compliance with all aspects of the standard.



BS EN ISO 9001:2008
Certificate No. Q6104



BS EN ISO 14001:2004
Certificate No. EMS 541906

Lorient has attained BS EN ISO 14001:2004 accreditation for environmental management, making us the first seal manufacturer

to have achieved this important award. This internationally recognised standard represents that we have demonstrated our commitment to responsible environmental behaviour, including prevention of pollution, control and reduction of waste, and ongoing monitoring and improvement of our environmental performance. Achieving ISO 14001 is just one part of our ongoing commitment to operate in a sustainable way.

additional information

Handling and Storage

No special precautions are required when handling our fire seals but they should always be treated with care and not bent or twisted. Safety data sheets are available on request. The products do not fall within the scope of COSHH regulations.

Our intumescent seals should be stored flat in a clean, dry, dust-free area away from heat and at a storage temperature of between 5°C and 40°C.

Maintenance

Periodic inspection/cleaning is recommended for all types of seals. The appearance and performance of brush seals will benefit from a wipe with a damp cloth at least once a year. Worn or damaged seals should be replaced without delay.

Further guidance is contained in the relevant sections of BS 8214: 1990 "Code of practice for fire door assemblies with non-metallic leaves".

Guarantee of Origin

Each production batch of Lorient seals is identified unobtrusively on the edge of the profile with the Lorient name and a code reference. This ensures the product and details of its production can be traced should the need arise.

Unidentifiable substitute products should never be accepted.



Trade Associations

Lorient is a member of the Glass and Glazing Federation Fire Resistant Glazing Group (GGF) and is a founder member of the Intumescent Fire Seals Association (IFSA).



Founder Member of
the Intumescent Fire
Seals Association



Fire Resistant Glazing Group
Glass and Glazing Federation

Lorient is also a member of the British Woodworking Federation (BWF) (Associate); the Architectural and Specialist Door Manufacturers Association (ASDMA); the Guild of Architectural Ironmongers (GAI); and is also an Approved Supplier to the BWF CERTIFIRE Fire Door and Doorset Scheme.



Intellectual Property

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We are committed to continually enhancing and improving our product range. We reserve the right to change product specifications from time to time without prior notice. E&OE.

Continuing Professional Development Seminars

We offer two fully-accredited CPD seminars. Impartially presented by knowledgeable speakers, the seminars are structured to be technically informative, and give practical advice.



Performance Door Design: The Basics of Sound Reduction

Effective acoustic containment helps to improve the quality of the built environment, preserving privacy as well as excluding unwanted noise. With changing regulations, it's essential to be informed of the relevant requirements and the implications for door assemblies.

Our acoustic CPD seminar covers:

- the nature of sound, examining airborne transmission of sound;
- regulatory requirements and British Standards that relate to acoustic performance;
- test procedures and interpretation of test reports;
- effective design of door assemblies for acoustic performance, including door construction and the influence of sealing systems;
- design conflicts between acoustic performance, durability and ease of operation of the door;
- independent accreditation.

The Role and Performance of Fire and Smoke-Resisting Door Assemblies

The importance of fire and smoke resisting door assemblies is illustrated by the **430 annual deaths** in fire tragedies in the UK alone. Apart from the human toll, **property losses each year approach £2.52 billion**.

Our fire and smoke containment CPD seminar covers:

- hard facts concerning deaths, injuries and property damage caused by fire and smoke;
- regulatory requirements for fire and smoke resisting door assemblies;
- the nature and behaviour of smoke;
- effective design of door assemblies for smoke containment, including the threshold gap;
- design conflicts between fire containment, smoke containment, durability and ease of operation of the door;
- independent accreditation.

Both Lorient seminars are certified by the Construction CPD Certification Service and each is valued at one hour. Comprehensive notes are provided and attendance certificates awarded.

If you're interested in booking either seminar, please contact our Marketing department or e-mail cpd@lorientuk.com.

We continue to lead the way in research and development: As a company we have over 30 years' experience, so our experts are well equipped to listen, help and advise you on your acoustic, smoke and fire containment needs.

comprehensive support

Technical Services

We're happy to provide specialist advice on acoustic, smoke and fire protection for refurbishment and new build projects. If you need assistance, you can call our Technical Services team.

Alternatively, we can arrange a site visit to get a clearer idea of your needs and how we can help you. We also provide copies of test reports and samples where needed and can give guidance on how best to meet Building Regulations and Standards.

Customisation

If you have a particular requirement which isn't covered by the applications in this brochure, we may be able to supply an existing non-standard item, or even develop a customised solution for you.

Web Support

We have a comprehensive, user-friendly website which features our extensive range of products, CAD drawings and details on the services we offer. Our entire collection of brochures can be downloaded, as can copies of certification and specification texts.



For further information about Lorient
products please visit our website

The logo for National Seal Systems Limited features a stylized graphic on the left consisting of three horizontal bars of varying lengths and shades of blue. To the right of this graphic, the company name is written in a bold, sans-serif font, stacked in three lines: "National", "Seal Systems", and "Limited".

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 LORIENT

