



Fire and Smoke Resistant Dampers / Air Transfer Grilles





high performance fire containment & air transfer

Fire and smoke protection measures are provided as a life saving precaution. This places a great responsibility on designers and manufacturers – they must have complete confidence in the measures they recommend.

Lorient is an acknowledged leader in the design and manufacture of a wide range of sealing systems embracing fire and smoke control, acoustic and thermal containment, and weather exclusion.

The company operates from the UK, Australia, Hong Kong, North America and the Middle East.

With more than 30 years of experience and accumulated knowledge, Lorient also enjoys an enviable reputation for innovation, technical excellence and product quality.

Lorient has its own professionally staffed research and development facility, with a comprehensive range of development and testing equipment, including colour-matching machinery, a smoke chamber, specialised performance rigs, and an analytical laboratory. In addition Lorient also has its own acoustic laboratory.

This dedicated technical and development resource not only provides successful innovation for the company, but also helps Lorient to partner its customers in developing and testing their own products.

Lorient operates under the strict disciplines of BS EN ISO 9001:2000 quality procedures and the products are supported with CERTIFIRE certification. The Lorient commitment to independent approvals demonstrates ongoing responsibility and accountability for the performance of the company's products, undertaken at the highest possible level.



Contents

Fire and Smoke - Life Threatening Forces	2
Ventilation with Fire and Smoke Protection	3
Fire and Smoke Resistant Dampers / Air Transfer Grilles System Benefits	3
Product Range	4 - 5
Operation	6
Lorient Smoke Control Systems	6 - 8
Product Solutions	9 - 18
- Doors	13 - 14
- Walls	15
- Floors & ceilings	16
- Ducts	17 - 18
Mastic	19
Finishes	19
Additional Information	19
Comprehensive Support	20 - 21

Fire and smoke – Life Threatening Forces

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, if unchecked, spreads rapidly, preceding the fire and hot smoke, threatening people and property some distance from the fire.

Design Needs

Every year in the UK alone some 491 people are killed and 14,000 injured in fires, many of the casualties being attributable to breathing the toxic products of combustion from a remote fire. Fire and smoke also cause extensive damage to building fabric and contents. It has been estimated that the total value of fire related losses is some 3.3 billion per annum*. The majority of these deaths, injuries and losses occur in buildings where fire and smoke protection measures have been inadequate.

* source: Department of Communities and Local Government, 2004.

Regulatory Requirements

The Building Regulations require large buildings to be sub-divided into smaller volumes or areas bounded by building elements which resist the spread of fire and smoke. Building a fire resistant wall or floor is a relatively simple task. However, systems of natural and mechanical ventilation require the movement of air through ducts and grilles formed in fire resistant constructions. Ensuring these airways remain open and yet provide protection against fire, hot smoke and cold smoke is a more complex problem.

The Solution

The Lorient solution is to fit fire containment air transfer grilles at the point of penetration. Under normal circumstances these allow air to pass freely between compartments. In the event of fire the slats and framing components swell to many times their original thickness, fusing together to form a non-combustible mass which provides fire resistance to match the surrounding construction and prevents the passage of hot smoke and gases. The fire containment air transfer grilles contain no moving parts which results in low maintenance.

The Lorient range of intumescent air transfer grilles combined with automatic smoke control systems provides protection against cold smoke. These electrically powered dampers are connected to a standard smoke or fire alarm/detection system which, when triggered, causes the dampers to close thereby preventing the passage of cold smoke. Under normal circumstances the dampers remain open allowing the free passage of air.

The requirements for fire and smoke containment with respect to 'means of escape' are contained in Approved Document B (England and Wales), Technical Booklet E (N. Ireland), Technical Handbook Section 2 (Scotland). It is vital that means of escape are not endangered by fire and smoke transmission through doors or ventilation ducts.



Relevant Standards

There are several British Standards which relate to the products and solutions featured in this brochure. They include:

- 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 5588: Fire precautions in the design and construction of buildings. (An Approved Document for compliance with Building Regulations)
- BS ISO 10294-5:2005: Fire-resistance tests. Fire dampers for air distribution systems. Intumescent fire dampers
- BS EN 1634-1:2000: Fire resistance tests for door and shutter assemblies. Fire doors and shutters

Ventilation with Fire and Smoke Protection

Designers recognise the need for buildings to be well ventilated for the health and comfort of occupants. Frequent changes of air flush out airborne infections, and warm and cool air need to be circulated to maintain comfortable temperatures.

Ventilation through Doors, Walls, Floors & Ceilings

A study of regulatory requirements reveals that nearly all internal fire resistant doors (and, therefore, the walls in which they are located) also need to provide protection against cold smoke. Any steps taken to allow ventilation through such walls and doors must not allow the passage of cold smoke in the event of fire.

The common practice of undercutting the door in the belief that the threshold is a low risk area has now been totally discredited. It creates a major smoke hazard. Similarly, fitting a conventional grille to a wall or door will totally negate other measures taken to prevent the spread of fire, hot smoke and cold smoke.

Lorient intumescent air transfer grilles and automatic smoke control systems provide protection against fire, hot smoke and cold smoke.

Ventilation through Ducting

Experience has shown that ducting can, in the event of fire, provide a conduit for fire, hot smoke and cold smoke. An intumescent fire damper, fitted into the duct at the point where it penetrates a fire resistant construction, will prevent the passage of fire and hot smoke. Lorient intumescent fire dampers fitted in conjunction with a Lorient automatic smoke control system will also provide protection against cold smoke. They have been

shown by specific testing to be equivalent to a conventional damper, not only in fire and smoke barrier properties but also by exhibiting insulation values.

Lorient fire resistant dampers / air transfer grilles can be:

- factory fitted in a tested fire resisting doorset
- "retro fit" to an already installed fire door
- fitted in fire resisting walls, partitions, floors and ceilings
- installed in duct work (LVC40, LVH44, LVHC44 and LVH54)

Fire and Smoke Resistant Dampers / Air Transfer Grilles



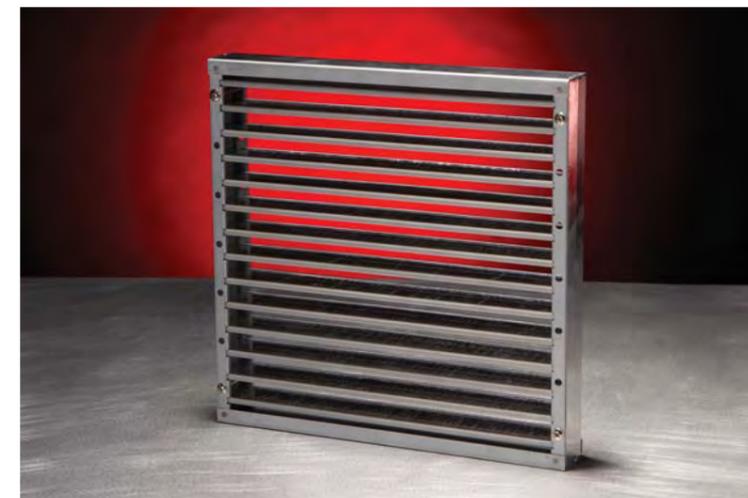
System benefits include:

- A comprehensive range of dampers / air transfer grilles providing protection against fire and smoke at all temperatures
- Test evidence second to none
- Fire performance ratings from 30 minutes to in excess of 180 minutes
- Fully tested for smoke performance
- Products for all applications - doors, walls, ducts, floors & ceilings
- Low maintenance
- Co-ordinated with other Lorient products and ironmongery

Product Range

Listed below are the features and attributes of each product in the Lorient damper / air transfer grille range. Further information on the products, including sizes, shapes and finishes, can be found on pages 10 and 11.

Application details and additional performance information can be found on pages 13 to 18.



Non-vision Style **LVN20** and **LVN25**

- can be used to provide up to 60 minutes resistance to fire and hot smoke
- angled slats ensure complete visual privacy
- supplied in two halves to accommodate different door thicknesses
- complete seal achieved in approximately five minutes when tested in accordance with BS 476: Pts. 20 & 22
- allows bi-directional air flow
- easy to keep clean
- contain no moving parts
- no site testing is necessary

Vision Style **LVV40** and **LVC40**

- can be used to provide up to 60 minutes resistance to fire and hot smoke
- excellent airflow characteristics which result in silent efficient operation in normal use
- complete seal achieved in approximately five minutes when tested in accordance with BS 476: Pts. 20 & 22 and BS EN 1634-1: 2000
- allows bi-directional air flow
- simple to install
- no maintenance required
- contain no moving parts
- resistant to clogging

High performance Vision Style **LVH44** and **LVHC44**

Heavy duty intumescent air transfer grille / fire dampers designed for use in aggressive environments.

- can be used to provide up to 180 minutes resistance to fire and hot smoke
- complete seal achieved in approximately two minutes when tested in accordance with BS 476: Pts. 20 & 22 and BS EN 1634-1: 2000
- exhibit excellent airflow characteristics and give silent efficient operation with normal to high air velocities
- can be used in ducting where the steel and aluminium casing protects the intumescent material from the corrosive effect of hot gases travelling at high velocities

- can be used to provide up to 180 minutes fire resistance
- have a steel frame which contributes to fire resistance by preventing the inward deformation of surrounding structures thus protecting the intumescent materials
- resistant to vibration damage
- suitable for horizontal and vertical applications
- suitable for external applications
- low maintenance
- contain no moving parts

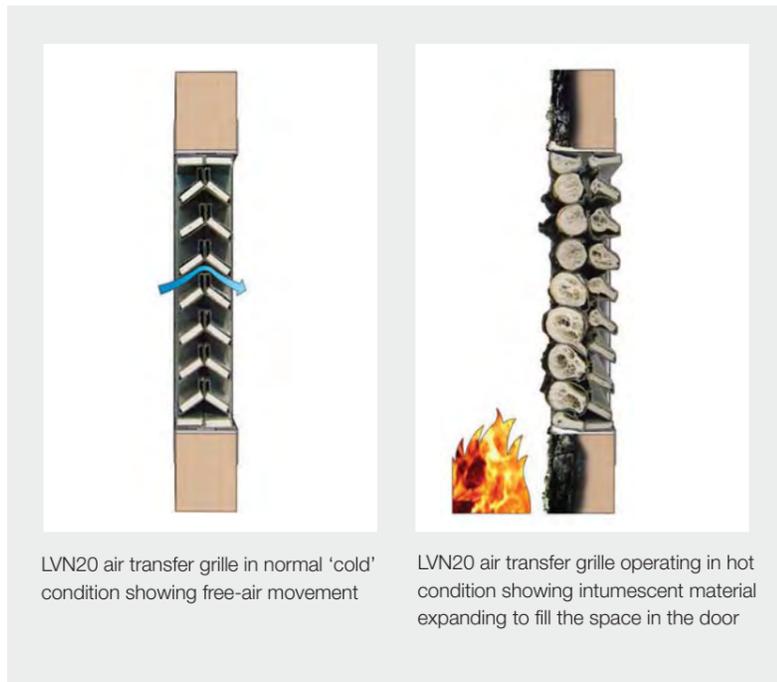
LVH54

- has been specifically designed to meet the tough requirements of BS ISO 10294 Pt. 5
- forms a complete seal within 2 minutes
- can withstand a 300P pressure differential across the damper
- maintains its fire integrity for a period of four hours
- has a zinc steel frame and stainless steel slat, which is ideal for harsh duct environments, including high humidity
- suitable for vertical applications
- low maintenance

Operation - Vision, Non-vision and High Performance Styles

Lorient fire containment air transfer grilles / dampers are made up of either PVC or metal slats with an intumescent core.

A sudden increase in temperature resulting from the presence of flames or hot gases causes the slats and framing components to swell to many times their original thickness, fusing together to provide an effective barrier to the passage of fire and hot smoke.



LVN20 air transfer grille in normal 'cold' condition showing free-air movement

LVN20 air transfer grille operating in hot condition showing intumescent material expanding to fill the space in the door

Control Systems for Smoke Damper Assemblies

The Talkback system can control up to sixteen dampers and features a status monitoring display.

Talkback Damper Control System

Most large buildings require a significant number of FD30S and FD60S fire doors (30 or 60 minute fire doors which also provide protection against cold smoke) within any one fire zone. These doors may be a considerable distance apart, or even on different floors.

The Talkback system has been designed to control up to sixteen damper assemblies from one centralised status monitoring unit. A unique 2-way communication system operates between the Damper Control and Monitor Unit (DCM) and the damper actuators. This facilitates a rapid assessment of the status of the installation and immediately identifies and locates any defective dampers.

Talkback is designed to give peace of mind to a building's occupants in that it:

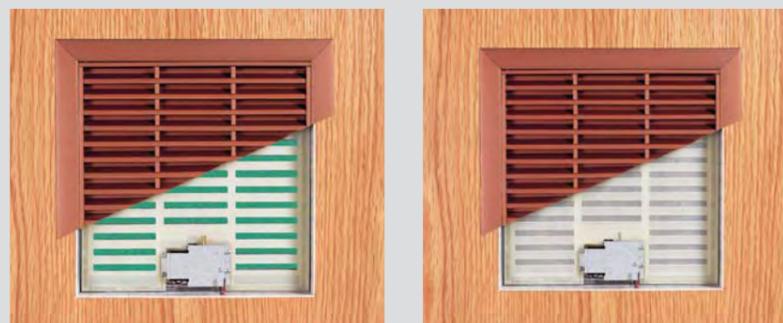
- is fail-safe – the dampers will automatically close in the event of an alarm, power failure or damage to the wiring
 - resets automatically – when the alarm is cancelled or power restored
 - is self-testing – every 24 hours the dampers are automatically closed and opened to check they are working and to dislodge any dust and debris between the moving parts
 - continuously monitors the status of each damper and displays this on the DCM
 - is easy and quick to install – simple loop wiring is used and the damper units are supplied ready assembled and tested
- uses a safe 12V DC supply to open and close the dampers
 - has been successfully tested in accordance with the requirements of the Electro Magnetic Compatibility and Low Voltage Directive and therefore bears the CE mark (copies of the relevant test reports are available on request)

Lorient Smoke Control System

All ducts and airways in doors and walls can be protected against fire and hot smoke using Lorient intumescent air transfer grilles. However, these grilles will not prevent the passage of cold smoke which can be equally dangerous.

Damper / Shutter Assembly

To address this problem Lorient has developed a smoke damper assembly for use in conjunction with Lorient intumescent air transfer grilles.* The assembly comprises three slotted plates - two fixed plates sandwiching a central moving plate. The central plate is operated by a fail-safe motorised actuator. A movement of just 10mm changes the relative positions of the slots from "through flow" to "fully closed".

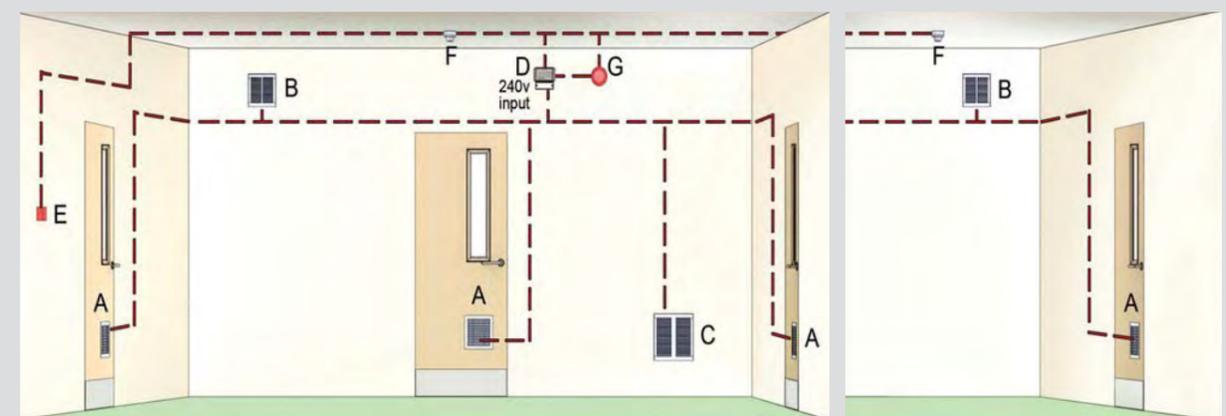


Talkback damper in "through flow" position

Talkback damper in "fully closed" position

*Note: 'S' suffix added to product code. Shutter assembly cannot be added to standard air transfer grilles retrospectively.

Typical Installation of the Lorient Talkback System



- A: Door mounted fire and smoke dampers
- B: End of duct fire and smoke dampers
- C: Wall mounted fire and smoke damper
- D: Power and monitor unit

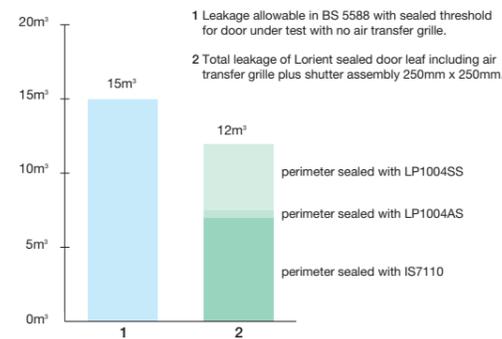
- E: Fire point
- F: Smoke sensors
- G: Fire alarm

Performance

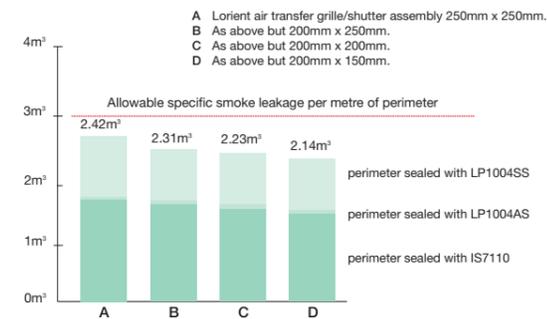
The dampers are supplied factory assembled and tested. When used in conjunction with Lorient fire containment intumescent air transfer grilles, tests have shown that they provide an effective barrier to fire and smoke at all temperatures.

It is therefore possible to create airways through fire resistant constructions and still meet the requirements of Building Regulations and the recommendations of BS 5588. The graphs show the estimated smoke leakage rates determined from tests carried out under the conditions of BS 476: Pt 31.1. The results have been interpolated to show the leakage rates using different sizes of damper/shutter assemblies.

Smoke leakage determined under the conditions of BS 476 Part 31.1 at a pressure differential of 25Pa. Door size 2023 x 822mm



Total smoke leakage of door leaf and damper / air transfer grille related to door perimeter



Installation

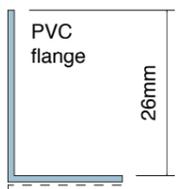
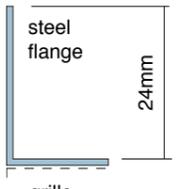
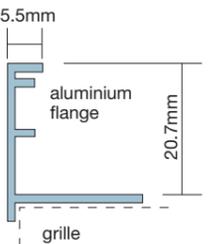
Lorient provides free technical support for the design, specification and installation of its smoke control systems.

Given the importance of the protection provided, it is recommended that Lorient is involved in the earliest stages of specification to ensure the most effective and economical system is specified and installed.

A comprehensive technical companion which covers the design and operation of Lorient smoke control systems is available; please consult our Technical Department.



Fire and Smoke Resistant Dampers / Air Transfer Grilles
product solutions

Product	LVN20 & LVN25	LVV40 & LVC40	LVH44 & LVHC44	LVH54	LVHCTD	Smoke Control System	Cover Grilles	Flanges
	 	 	 	 		 Damper & actuator Talkback DCM		 grille LV1826  grille LV2516  grille LV2221
	two sizes of non-vision intumescent air transfer grille supplied in two halves to accommodate different door thicknesses	standard vision intumescent air transfer grille for walls, doors and rectangular or circular ventilation ducts suitable for use in some horizontal applications. Please refer to Lorient's Technical Department	high performance steel vision intumescent air transfer grille for use in doors, walls, floors, ceilings and ventilation ducts	high performance steel intumescent fire damper for use in doors, walls, floors, ceilings and ventilation ducts LVH54 is not currently tested in the horizontal plane	duct mounted fire and smoke damper	Talkback	optional cover grilles for walls, doors and ends of ducts pressed steel and aluminium options available weather louvre options available for use on external applications (refer to Lorient for details)	
Width:	100mm - 600mm (in 50mm increments)	100mm - 600mm (in 25mm increments)	100mm - 600mm† (any size in between)	100mm - 600mm† (nominal) in 50mm increments. Custom sizes also available	450mm	standard sizes available are: 200mm – 600mm (in 50mm increments) Modular systems are available, please ask for details	sizes to suit standard dampers / air transfer grilles larger sizes available (refer to Lorient for details)	
Height:	100mm - 600mm (in 50mm increments)	100mm - 600mm (in 25mm increments)	100mm - 600mm† (any size in between)	100mm - 600mm† (nominal)	450mm (maximum)			
Diameter:		up to 600mm diameter (nominal to suit standard PVC pipes or steel ducts)	up to 600mm diameter (nominal to suit standard steel ducts)					
Thickness:	2 pieces x 20mm or 2 pieces x 25mm	40mm	44mm	54mm				
Free area:	30% approx.	60% approx. (circular is different)	60% approx.	60% approx.	30% approx.	30% approx.	NB: will change the free air flow characteristics of the air transfer grille	
Can be used with:	integral steel, PVC or aluminium flanges no cover grille required	metal cover grille (optional)	metal cover grille (optional) NB: LVH44 and LVHC44 can be used in external applications		LVH44 LVH54		LVV40 LVH44 LVH20S	
Fitting:	screwed and bedded in Lorient intumescent mastic	screwed and bedded in Lorient intumescent mastic	screwed and bedded in Lorient intumescent mastic	screwed and bedded in Lorient intumescent mastic	refer to Lorient's Technical Department	NB: for special applications, the Lorient smoke dampers can be used on their own. Please refer to Lorient's Technical Department	screw fixed	screw fixed
Materials and Finish:	PVC, silver as standard also available in white	PVC, silver as standard	zintec steel Note: † Larger apertures possible. Please refer to Lorient's Technical Department	zintec steel	zintec steel	DCM off-white	pressed steel, white, silver, primer or mill matching colours are available: aluminium, natural satin anodized / powder coated	refer to Lorient for details

The following pages show the levels of protection provided by Lorient fire resistant dampers / air transfer grilles when used in doors, compartment walls, ducts, floors and ceilings.

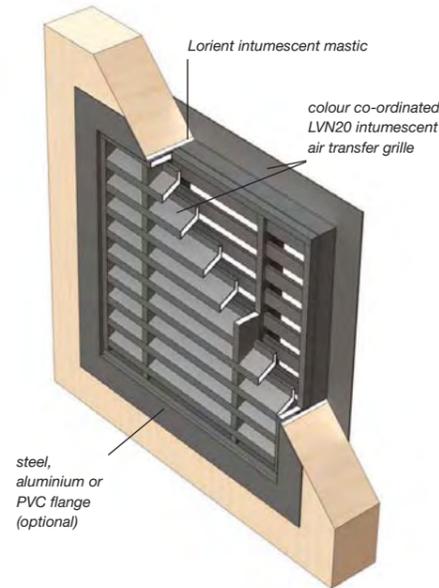
Use of symbols

-  indicates that the application detail shown provides protection against fire
-  indicates that the application detail shown provides protection against cold smoke
- 60** indicates in minutes the fire protection provided by the intumescent air transfer grille / fire damper

level of protection	type of protection	vertical / horizontal	doors	walls	floors & ceilings	ducts
30		vertical	LVN20 page 13	n/a	n/a	n/a
		vertical	LVN25 page 13	n/a	n/a	n/a
		vertical	LVV40/LVC40 page 13	n/a	n/a	n/a
		horizontal	n/a	n/a	n/a	n/a
60	 	vertical	LVN20S page 14	n/a	n/a	n/a
		vertical	LVN25 page 13	n/a	n/a	LVH44 page 17
		vertical	LVV40/LVC40 page 13	LVV40/LVC40 page 15	n/a	LVC40 page 17
		horizontal	n/a	n/a	LVH44/LVHC44 page 16	LVH44/LVHC44 page 18
90	 	vertical	LVN20S page 14	LVV40S page 15	n/a	n/a
		vertical	LVH44/LVHC44 page 13	n/a	n/a	n/a
		horizontal	n/a	n/a	LVH44/LVHC44 page 16	LVH44/LVHC44 page 18
		vertical	LVH20S page 14	n/a	n/a	n/a
120	 	vertical	LVH44/LVHC44 page 13	LVH44/LVHC44 page 15	n/a	LVH44/LVHC44 page 18
		horizontal	n/a	n/a	LVH44/LVHC44 page 16	LVH44/LVHC44 page 18
		vertical	LVH20S page 14	LVH44S page 15	n/a	n/a
		vertical	LVH44/LVHC44 page 13	LVH44/LVHC44 page 15	n/a	LVH44 page 18
180	 	vertical	n/a	n/a	LVH44/LVHC44 page 15	n/a
		horizontal	n/a	n/a	LVH44/LVHC44 page 16	n/a
		vertical	n/a	n/a	LVH44S page 15	n/a
		vertical	n/a	n/a	n/a	n/a
240	 	vertical	n/a	n/a	n/a	LVH54 n/a
		vertical	n/a	n/a	n/a	n/a

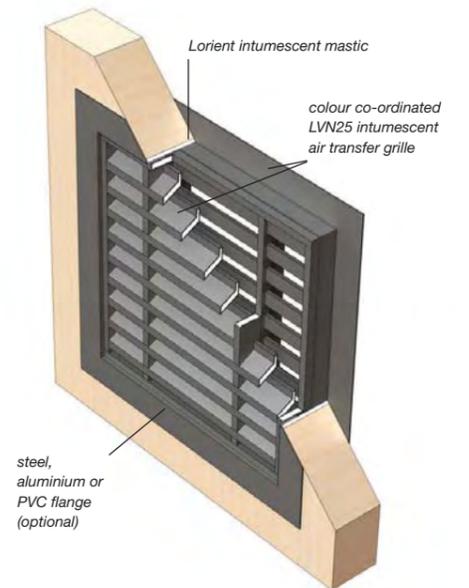
LVN20 (for 44mm & 54mm)

For installation in lower half of door leaf

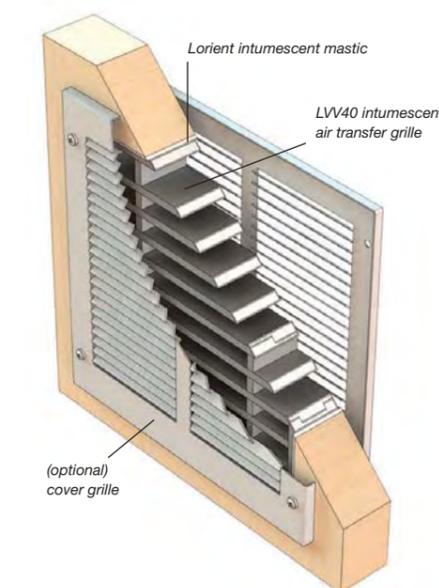


LVN25 (for 54mm only)

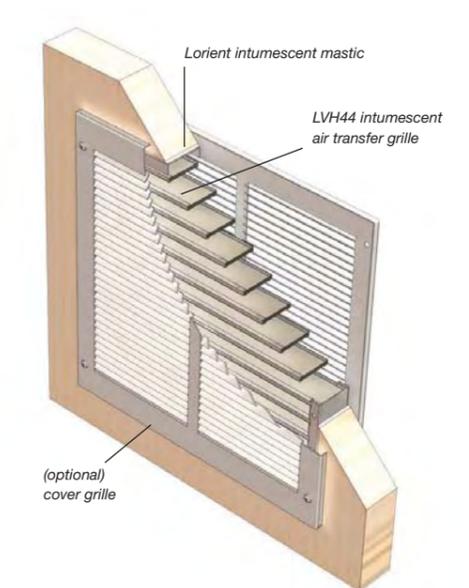
For installation in lower half of door leaf



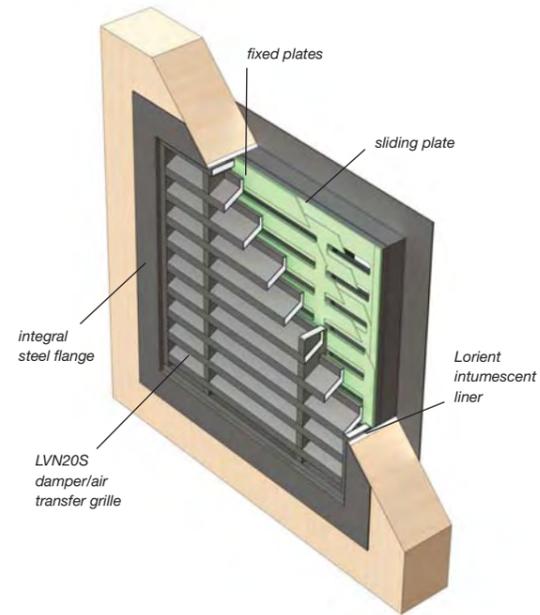
LVV40 & LVC40



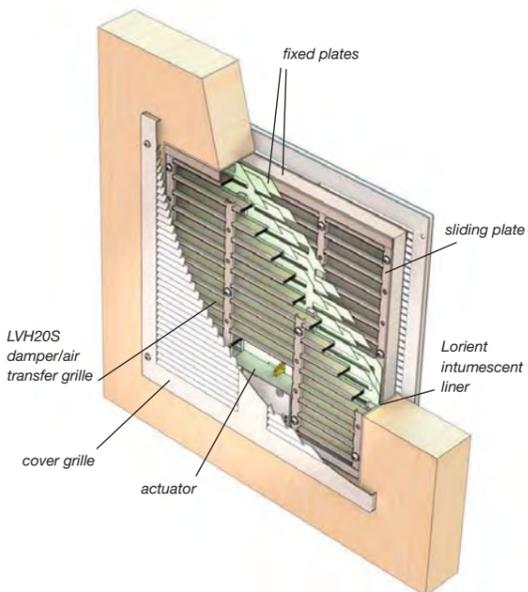
LVH44 & LVHC44



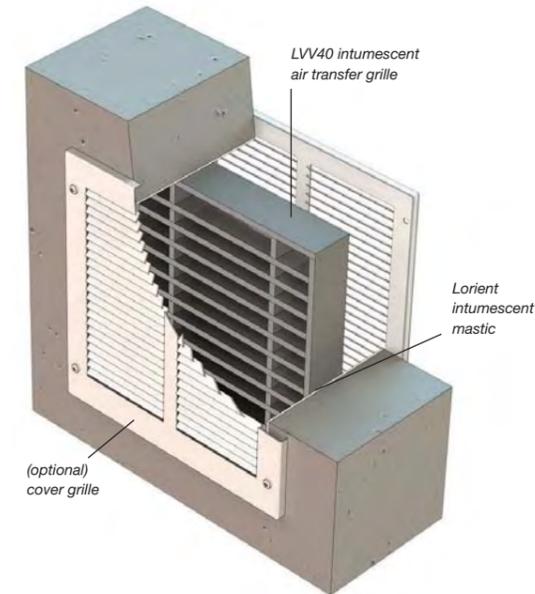
LVN20S – door thickness min. 44mm



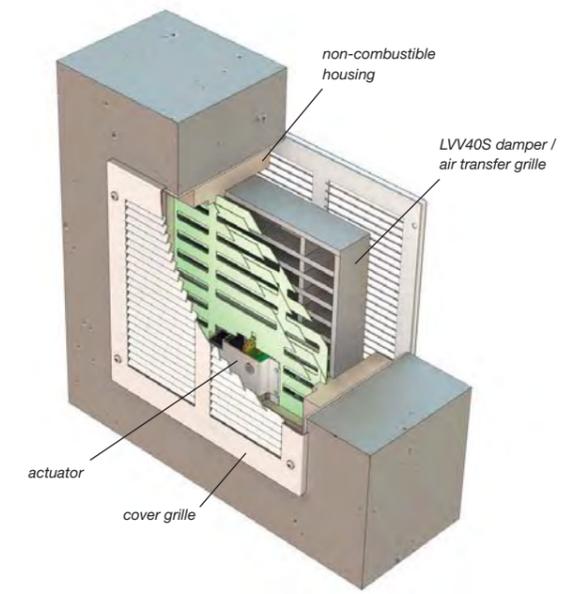
LVH20S – door thickness min. 50mm



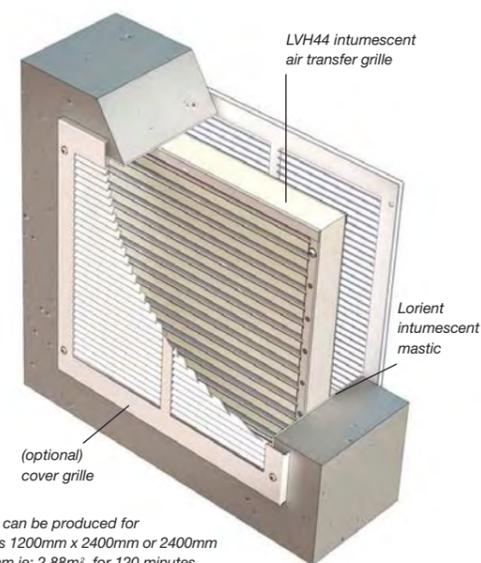
LVV40 & LVC40



LVV40S – wall thickness min. 80mm



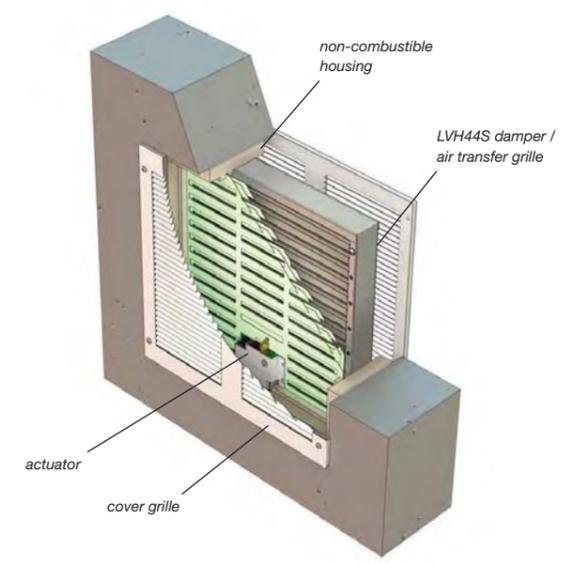
LVH44 & LVHC44



Note:
LVH44's can be produced for
apertures 1200mm x 2400mm or 2400mm
x 1200mm ie: 2.88m², for 120 minutes

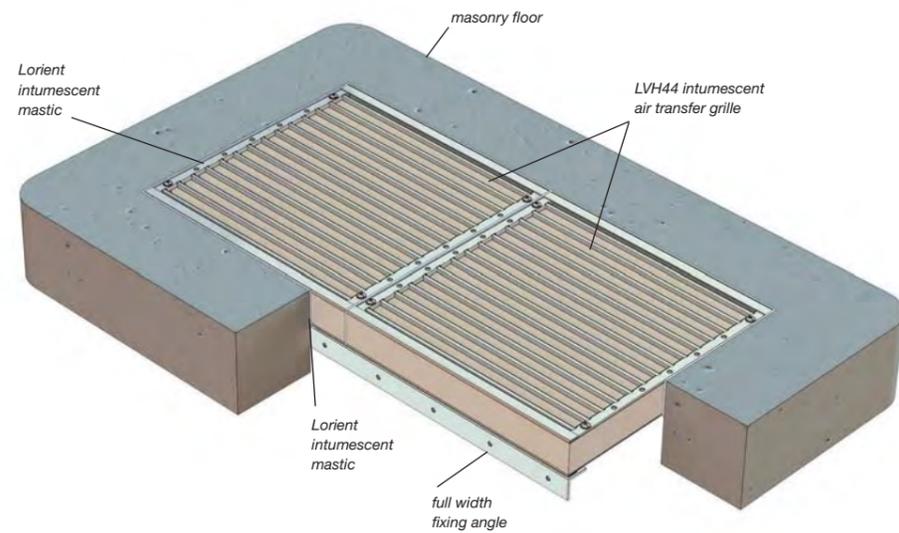
Please refer to Lorient's Technical Department

LVH44S – wall thickness min. 80mm



LVH44 & LVHC44 – floor thickness min. 50mm

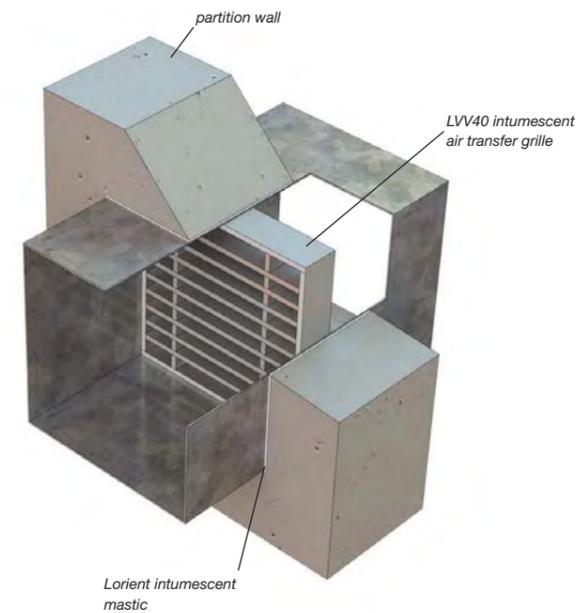
120 180



Note: Modular installation shown. The maximum size for this method of installation is 1200mm x 600mm. Please consult Lorient for larger sizes

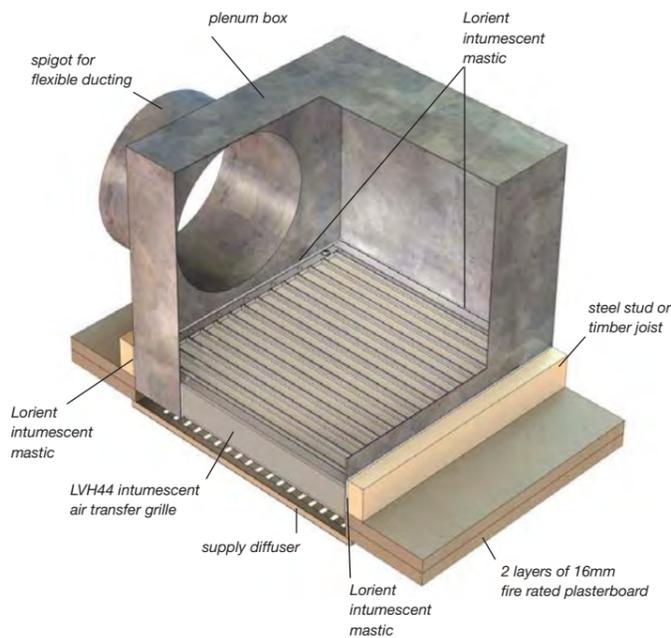
LVV40

60



LVH44 & LVHC44 – ceiling thickness min. 50mm

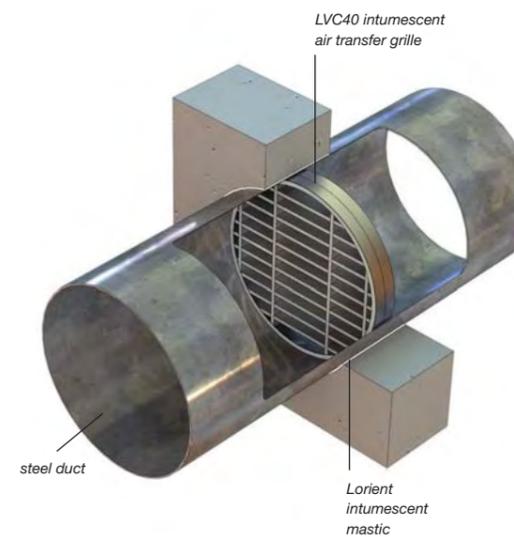
120 180



Note: The maximum size for this installation is 600mm x 600mm

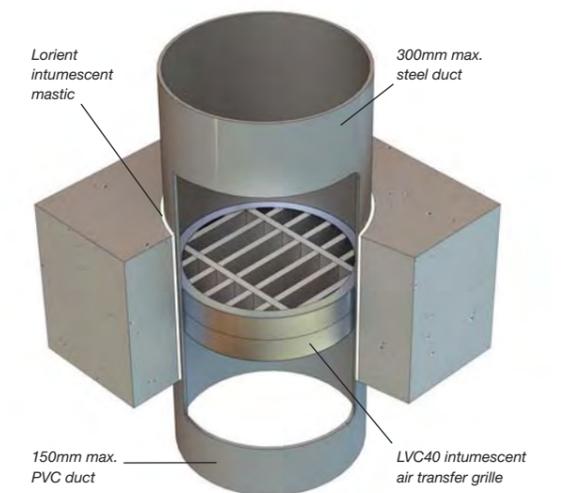
LVC40

60

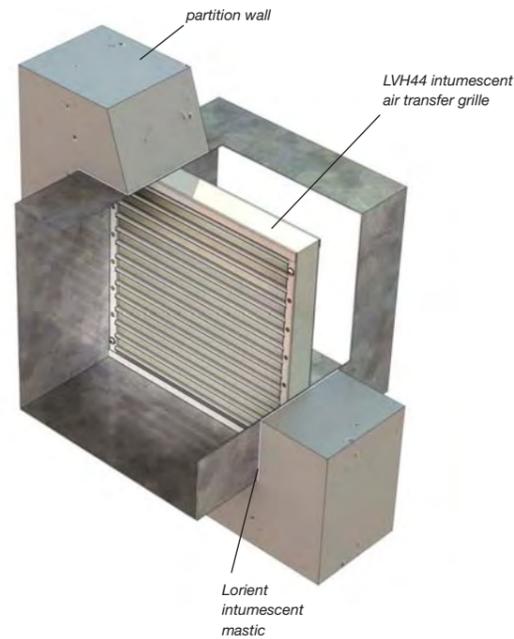


LVC40

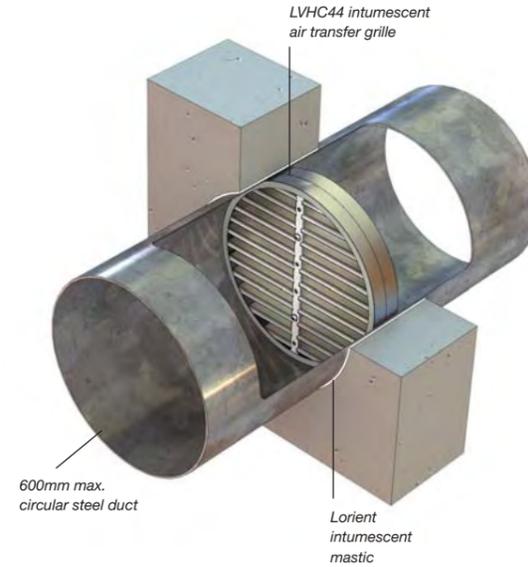
60



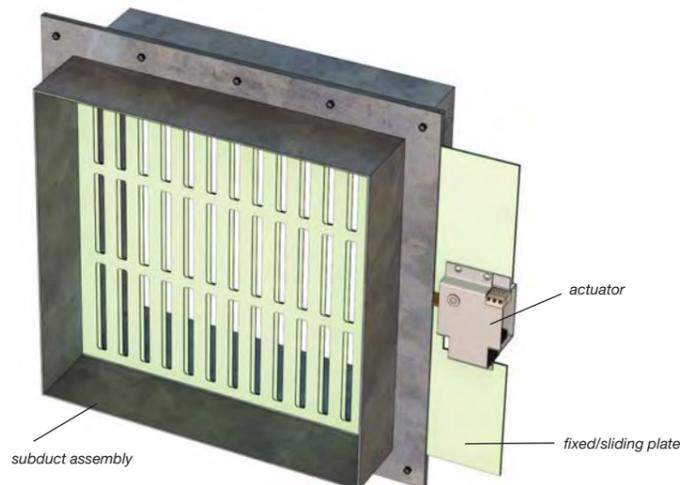
LVH44



LVHC44



LVHCTD



Mastic

Lorient produces intumescent mastic for bedding in dampers / air transfer grilles.

- When exposed to fire, it will expand to many times its original volume while maintaining adhesion
- Suitable also for sealing gaps between fire resistant walls and floors, between conduits and walls/floors and between fire resistant walls and structural supports



Finishes

Fire door assemblies and dampers / air transfer grilles are often chosen for their appearance as well as their performance.

Standard Colours



Silver (0701)

White (0303)

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

Special Colours

Lorient offers a colour matching service and can usually formulate a precise colour match on receipt of appropriate details such as a BS or RAL colour reference or a material sample. A modest set up charge is made to cover costs, please ask for further details.

PVC/steel flanges and air transfer grilles can be colour matched.

Additional information

Technical References

Lorient is quality assured under the disciplines of BS EN ISO 9001: 2000.

Accreditation to this standard is effectively a guarantee of Lorient's ability to conduct its business to the complete satisfaction of the customer in terms of design solutions, manufacturing consistency and management procedures.

The status of this internationally recognised accreditation generates customer confidence and eliminates the risk of poor performance. Regular audits of the company procedures are carried out by qualified BSI staff to ensure continuing compliance with all aspects of the Standard.

Handling and Storage

No special precautions are required when handling Lorient dampers / air transfer grilles but they should always be treated with care. The products do not fall within the scope of COSHH regulations.

Lorient dampers/air transfer grilles should be stored away from heat, in the dry, and protected from impact damage.

Maintenance

Lorient intumescent air transfer grilles, including those positioned behind cover grilles, will require periodic cleaning with a damp cloth.

The use of intumescent materials means there are no moving parts. The product is trouble free in operation and easy to maintain – periodic testing is unnecessary.

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).



Lorient is also an associate member of the British Woodworking Federation (BWF), 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.



BS EN ISO 9001:2000
Certificate No. Q6104