



**FIRE + SMOKE**

**RESISTANT**

**AIR TRANSFER**

**GRILLES**

FIRE +  
RESIST  
AIR  
TRANS  
GRILL



# We've been designing and manufacturing high performance sealing systems for over 40 years.

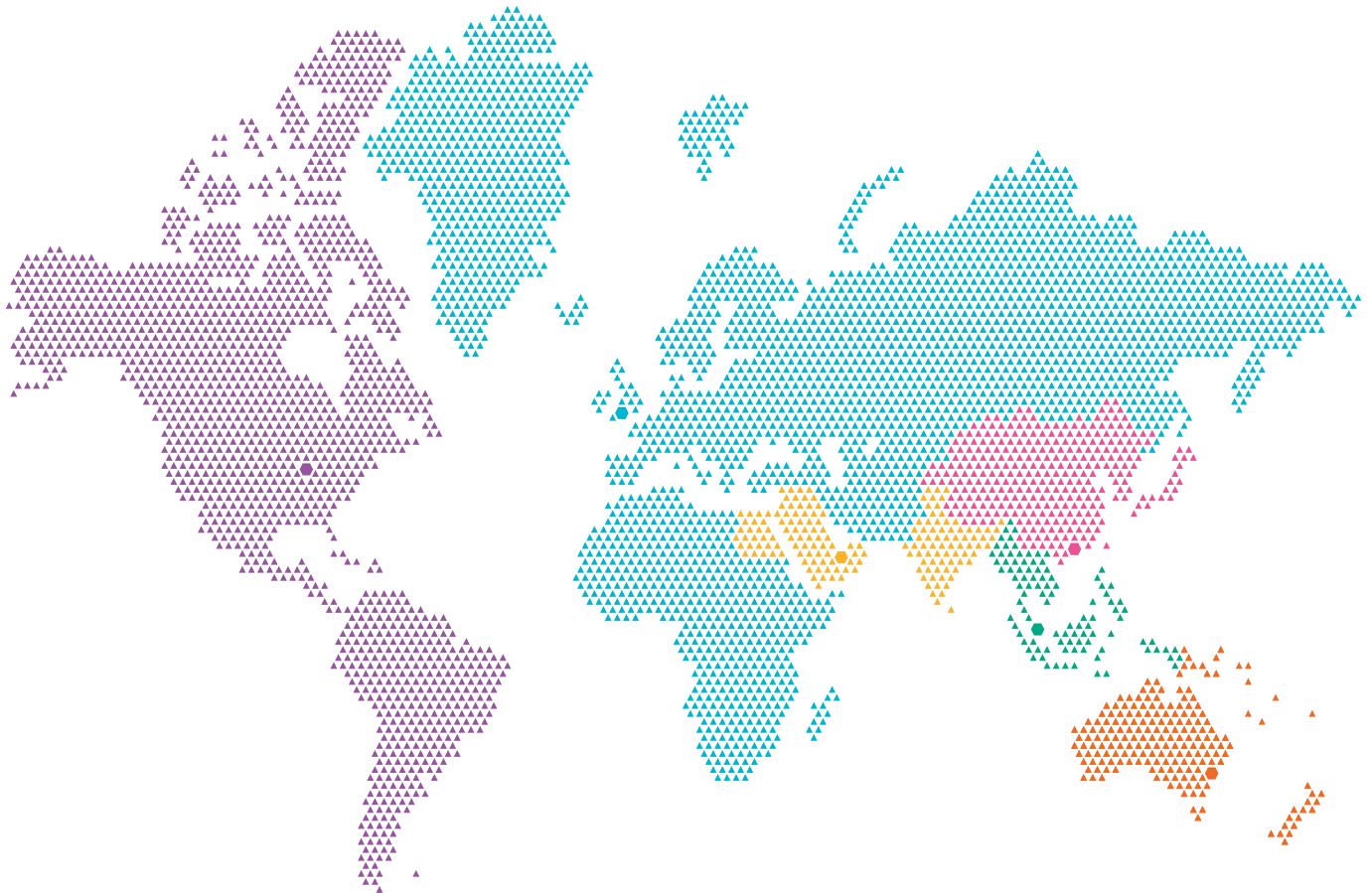
And we're passionate about the products we make. Our dedicated R&D and testing facilities rigorously put our sealing systems through their paces – enabling us to enhance product form and function. We've built a strong reputation for design innovation; and for producing the highest quality sealing systems embracing acoustic, smoke, fire and thermal containment; as well as accessibility.

Respected throughout the industry for our technical expertise, we play an active role in helping to shape standards and best practice. We believe in providing excellent levels of customer service; and are at our best working in partnership with you.

Lorient's range of intumescent air transfer grilles can be used in all applications where there is a need for free air movement through a fire barrier. Designed to be fitted in doors, walls and ducts they provide a cost effective solution in allowing free air movement and yet maintain the integrity of the door or wall in a fire situation. Under normal conditions they allow the free passage of air. In the event of a fire the slats and framing components swell to many times their original size, fusing together to form a non-combustible mass which provides a barrier to fire, hot smoke and gases.









# SEALING DOORS WORLDWIDE



**The UK is home to our head office, manufacturing operation and dedicated R&D testing facility. Our UK & Europe head office supports operations around the world, delivering the best solutions locally to our customers across four continents.**

By keeping abreast of technical developments and changes to regulations and standards across the world, we deliver the highest levels of expertise and support.

 UNITED KINGDOM (HQ)  
 AUSTRALIA  
 SINGAPORE

 HONG KONG  
 USA  
 UAE

# FIRE + SMOKE RESISTANT AIR TRANSFER GRILLES

## CONTENTS

### ICONS EXPLAINED

The following icons are used throughout this brochure to give clear and easy recognition of a particular seal's function or possible application. Use of the icons does not necessarily indicate that test evidence exists. Please check with the Lorient Technical team.



Fire protection



Smoke protection



Door application



Wall application



Duct application



Floor application



Integrity only



Ceiling application



Integrity + insulation



Fire resistance (minutes)

### PRODUCT ILLUSTRATIONS

All dimensions in this brochure are in millimetres.

# AIR TRANSFER GRILLES: FIRE

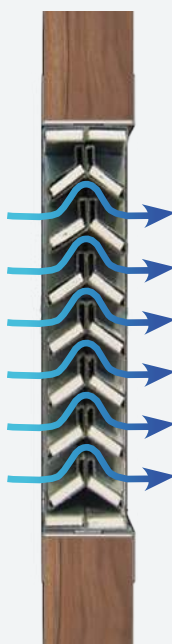
Our intumescent air transfer grilles combine air movement with fire protection. Designed to be fitted in doors, walls, ducts, floors + ceilings; they provide a cost effective solution in allowing free air movement and yet maintain the integrity of the application in a fire situation.

## Operation

Available in a range of vision and non-vision styles, Lorient fire containment air transfer grilles 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. The fire containment air transfer grilles contain no moving parts which results in low maintenance.

- ▶ **Cold condition:** free air movement;
- ▶ **Hot condition:** expanded intumescent material.



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



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

# AIR TRANSFER GRILLES: FIRE + SMOKE

Our range of combined intumescent fire + smoke air transfer grilles can be used in all applications where cold smoke containment is required. The air transfer grilles are connected, via a control panel, to a standard fire alarm system. In the event of an alarm condition, or power failure, the smoke shutters shut, preventing the passage of cold smoke.

## System features

A comprehensive range of air transfer grilles providing protection against fire and smoke at all temperatures, features include:

- ▶ 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;
- ▶ Low maintenance;
- ▶ Auto-reset;
- ▶ Low maintenance;
- ▶ Co-ordinated with other Lorient products and ironmongery.



▲  
LVH20S intumescent fire + smoke  
air transfer grille

# BUILDING REGULATIONS

The Building Regulations provide guidance as to the minimum building standards to be achieved. They reference the relevant British and European Standards defining the test requirements and performance of the fire door assembly or fire doorset.

There are several aspects of the Buildings Regulations that must be considered in conjunction with each other when specifying and installing fire resistant glazing systems. The regional variations of the Building Regulations:

<b>ENGLAND</b>	Approved Documents
<b>WALES</b>	Approved Documents
<b>SCOTLAND</b>	Technical Handbooks
<b>N.IRELAND</b>	Technical Booklets
<b>IRELAND</b>	Technical Booklets

	<b>ENGLAND</b>	<b>WALES</b>	<b>SCOTLAND</b>	<b>N.IRELAND</b>	<b>IRELAND</b>
<b>FIRE</b>	Approved Document B	Approved Document B	Technical Handbook 2	Technical Booklet E	Technical Guidance Document B
<b>ACOUSTICS</b>	Approved Document E	Approved Document E	Technical Handbook 5	Technical Booklet G	Technical Booklet G
<b>ACCESSIBILITY</b>	Approved Document M	Approved Document M	Technical Handbook 3	Technical Booklet R	Technical Booklet R
<b>VENTILATION</b>	Approved Document F	Approved Document F	Technical Handbook 3	Technical Booklet K	Technical Booklet K
<b>THERMAL</b>	Approved Document L	Approved Document L	Technical Handbook 6	Technical Booklet F	Technical Booklet F
<b>SECURITY</b>	Approved Document Q	Approved Document Q	-	-	-



# STANDARDS + REGULATIONS

The requirements for fire and smoke containment with regard to 'means of escape' are contained in the following standards:

## FIRE + SMOKE

STANDARD	TITLE
<b>BS 476-20:1987</b>	Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction (general principles)
<b>BS 476-22:1987</b>	Methods for determination of the fire resistance of non-loadbearing elements of construction
<b>BS 476-31.1:1983</b>	Fire tests on building materials and structures. Methods for measuring smoke penetration through doorsets and shutter assemblies. Method of measurement under ambient temperature conditions
<b>BS EN 1634-3:2004</b>	Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Smoke control test for door and shutter assemblies
<b>BS EN 1634-1:2014+A1:2018</b>	Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware. Fire resistance test for door and shutter assemblies and openable windows.
<b>BS 8214:2016</b>	Code of practice for fire door assemblies
<b>BS 9999:2017</b>	Code of practice for fire safety in the design, management and use of buildings
<b>BS EN 1366-12:2014+A1:2019</b>	Fire resistance tests for service installations. Non-mechanical fire barrier for ventilation ductwork
<b>BS EN 1364-5:2017</b>	Fire resistance tests for non-loadbearing elements. Air transfer grilles
<b>BS EN 1366-10:2011+A1:2017</b>	Fire resistance tests for service installations. Smoke control dampers
<b>BS ISO 10294-5:2005</b>	Fire-resistance tests. Fire dampers for air distribution systems. Intumescent fire dampers

# VENTILATION WITH FIRE + 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 air transfer grille, 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 air transfer grilles 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 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).



▲  
**LVN20S intumescent fire + smoke  
air transfer grille**



Fire door  
keep  
shut

# PRODUCT RANGE

Further information on the products, including sizes, shapes and finishes, can be found on pages 24 – 40. Application details and additional performance information can be found on pages 17 – 23.

AIR TRANSFER GRILLES: FIRE

(PAGES 24–34)

▲  
LVN20

▲  
LVV40

▲  
LVH44

▲  
LVN25

▲  
LVC40

▲  
LVHC44

COVER GRILLES (PAGES 48–51)

▲  
LVH50



▲  
LVH54

▲  
COVER GRILLES

LVN20S	LVN25S	LVV40S
LVH20S	LVH44S	LVHCTD
HINGE (PAGE 34)	TALKBACK (PAGES 41- 46)	SEALANT (PAGE 50)

CONDUCTOR HINGE	TALKBACK DAMPER CONTROL SYSTEM	CE INTUMESCENT ACOUSTIC ACRYLIC SEALANT
SEALANT (PAGE 51)	FLANGES	

INTUMESCENT SEALANT	LV2516 STEEL FLANGE	LV2221 ALUMINIUM FLANGE
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System	 	Building Element	Thickness	Protection	Product
Door 1	▲	Timber Fire Door	44mm/ 54mm	FD30/FD60	<b>LVV40</b>
Door 2	▲	Timber Fire Door	44mm	FD30	<b>LVN20</b>
Door 3	▲	Timber Fire Door	Min. 50mm	FD30	<b>LVN25</b>
Door 3	▲	Timber Fire Door	54mm	FD60	<b>LVN25</b>
Door 4	▲	Mineral Composite	45mm	FD120	<b>LVH44</b>
Door 5	▲	Timber Fire Door	Min. 44mm	FD120	<b>LVH44</b>
Door 6	▲	Steel Fire Door	Min. 44mm	FD120	<b>LVH44</b>
Door 7	▲ ▲	Timber Fire Door	44mm	FD30S	<b>LVN20S</b>
Door 8	▲ ▲	Timber Fire Door	54mm	FD60S	<b>LVN20S</b>
Door 9	▲ ▲	Timber Fire Door	Min. 50mm	FD30S	<b>LVN25S</b>
Door 10	▲ ▲	Timber Fire Door	54mm	FD60S	<b>LVN25S</b>
Door 11	▲	Timber frame	*Frame	FR120	<b>LVH44</b>
Door 12	▲	Timber frame	*Frame	FR120	<b>LVH44</b>
Door 13	▲	Timber frame	*Frame	FR120	<b>LVH44</b>
Door 14	▲	Steel frame	*Frame	FR120	<b>LVH44</b>
Door 15	▲	Steel frame	*Frame	FR120	<b>LVH44</b>
Door 16	▲	Steel frame	*Frame	FR120	<b>LVH44</b>
Wall 1	▲	Rigid wall construction	-	FR120	<b>LVH44</b>
Wall 2	▲	Rigid wall construction	-	FR120	<b>LVH44</b>
Wall 3	▲	Rigid wall construction	-	FR120	<b>LVH44</b>
Wall 4	▲	FR Flexible Wall	-	FR120	<b>LVH44</b>
Wall 5	▲	FR Flexible Wall	-	FR120	<b>LVH44</b>
Wall 6	▲	FR Flexible Wall	-	FR120	<b>LVH44</b>
Wall 7	▲	Rigid wall construction	-	FR120	<b>LVH44</b>
Wall 8	▲	Modular System for rigid wall constructions	-	FR120	<b>LVH44</b>
Wall 9	▲	Modular System for rigid wall constructions	-	FR120	<b>LVH44</b>
Wall 11	▲	Rigid wall construction	-	FR120/EI90	<b>LVH44</b>
Wall 12	▲	Rigid wall construction	-	FR60	<b>LVV40</b>
Wall 13	▲	Rigid wall construction	-	FR60	<b>LVC40</b>
Wall 14	▲	Rigid wall construction	-	E1120	<b>LVV40</b>
Wall 15	▲	FR Flexible Wall	-	EI60	<b>LVV40</b>
Wall 16	▲ ▲	Rigid wall construction	-	EI60S/FR90S	<b>LVV40S</b>
Wall 17	▲ ▲	FR Flexible Walls	-	EI60S	<b>LVV40S</b>
Wall 18	▲ ▲	Rigid wall construction	-	FR120	<b>LVH44S</b>
Wall 19	▲ ▲	FR Flexible Wall	-	FR120	<b>LVH44S</b>
Wall 20	▲ ▲	Rigid wall construction	-	E60S	<b>LVH20S</b>

\*Timber or steel frame as part of associated doorset framing system.

Test Standard	Report No.	Max Size	Certifire	Certifire Max Size
BS 476-20:1987	WF185829/A	600mm x 600mm	CF564	600mm x 600mm
BS 476-22:1987	WFRC C122567	0.36m <sup>2</sup>	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	WFRC C122567	0.36m <sup>2</sup>	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	WFRC C122567	0.36m <sup>2</sup>	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	WFRC C397901	0.2025m <sup>2</sup>	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	WFRC C397901	0.2025m <sup>2</sup>	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	WFRC C397901	0.2025m <sup>2</sup>	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	-	0.16m <sup>2</sup>	CF564	0.16m <sup>2</sup>
BS 476-22:1987	APPLUS-19-19940-1428	350mm x 350mm	CF564	0.16m <sup>2</sup>
BS 476-22:1987	-	400mm x 400mm	CF564	0.16m <sup>2</sup>
BS 476-22:1987	APPLUS-19-19940-1428	350mm x 350mm	CF564	0.16m <sup>2</sup>
BS 476-22:1987	WRFC C121316 (AW4T1)	1200mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW4T2)	1200mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW4T3)	1200mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW4S1)	1200mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW4S2)	1200mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW4S3)	1200mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW1)	600mm x 600mm	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	WRFC C121316 (AW2)	600mm x 600mm	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	WRFC C121316 (AW3)	600mm x 600mm	CF564	0.2025m <sup>2</sup>
BS 476-22:1987	FSP 1970 / FRT 230055	600mm x 600mm	-	-
BS 476-22:1987	FSP 1970 / FRT 230055	600mm x 600mm	-	-
BS 476-22:1987	FSP 1970 / FRT 230055	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW7)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW8)-	1800mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AW9)	1200mm x 600mm	-	-
BS EN 1364-5:2017	19/19894-253	1000mm (w) x 500mm (h)	-	-
BS 476-22:1987	WF185829/A	600mm x 600mm	CF564	600mm x 600mm
BS 476-22:1987	WF185829/A	600mm x 600mm	CF654	600mm x 600mm
BS EN 1364-5:2017	19/19894-253	600mm x 600mm	-	-
BS EN 1364-5:2017	LBO-1333/19E	600mm x 600mm	-	-
BS 476-20:1987 BS EN 1364-5:2017	18/17274-1071	600mm (w) x 400mm (h) (640mm x 440mm overall)	CF564	0.2025m <sup>2</sup>
BS EN 1364-5:2017	LBO-1333/19E	600mm (w) x 400mm (h) (640mm x 440mm overall)	-	-
BS 476-22:1987	WRFC C121316	600mm x 600mm (640mm x 640mm overall)	-	-
BS 476-22:1987	WRFC C121316	600mm x 600mm (640mm x 640mm overall)	-	-
BS EN 1364-5:2017	19/19894-253	600mm x 600mm	-	-

System	 	Building Element	Thickness	Protection	Product
Duct 1	▲	Circular plastic pipe	-	FR60	LVC40
Duct 2	▲	Circular steel duct	-	FR60	LVC40
Duct 3	▲	Rectangular steel duct	-	FR120	LVH44
Duct 4	▲	Insulated duct section	-	FR120	LVH44
Duct 5	▲	Rigid wall construction with angle fixings to wall (Duct to Duct)	-	FR120	LVHC44
Duct 6	▲	Rigid wall construction with angle clamps (Duct to Duct)	-	FR120	LVHC44
Door 7	▲	FR Flexible wall with angle fixings to wall	-	FR120	LVHC44
Duct 8	▲	FR Flexible wall with angle clamps	-	FR120	LVHC44
Duct 9	▲	Rigid wall construction with angle fixings (Duct to Grilles)	-	FR120	LVHC44
Duct 10	▲	Rigid wall construction (Duct to Duct)	-	FR120	LVH44
Duct 11	▲	FR Flexible wall (Duct to Duct)	-	FR120	LVH44
Duct 12	▲	FR Flexible wall (Duct to Grille)	-	FR120	LVH44
Duct 13	▲	Rigid wall construction with metal casing (Duct to Grille)	-	FR120	LVH44
Duct 14	▲	Rectangular steel duct	-	E240/EI30	LVH54
Duct 15	▲ ▲	Rectangular steel duct	-	FR120*/ FR240**	LVHCTD + LVH44*/ LVH54**
Floor 1	▲	Masonry floor with angle fixings	-	FR120	LVHC44
Floor 2	▲	Masonry floor with angle clamps	-	FR120	LVHC44
Floor 3	▲	Masonry floor with angle fixings	-	FR120	LVH44
Floor 4	▲	Masonry floor with Z section fixings	-	FR120	LVH44
Floor 5	▲	Masonry floor with Z section fixings using pre-cast slab to suit	-	FR120	LVH44
Floor 6	▲	Fixing on top of masonry floor with angle fixings	-	FR120	LVH44
Floor 7	▲	Modular system for masonry floor	-	FR120	LVH44
Floor 8	▲	Fixing on top of masonry floors with angle fixings (modular systems)	-	FR120	LVH44
Floor 9	▲	Masonry floor (duct to duct)	-	FR120	LVH44



Test Standard	Report No.	Max Size	Certifire	Certifire Max Size
BS 476-20:1987	WF185829/A	150mm diameter	-	-
BS 476-22:1987	WF185829/A	*600mm diameter **450mm diameter	-	-
BS 476-22:1987	WRFC C121316	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (OW1) WRFC 397901	600mm diameter	-	-
BS 476-22:1987	WRFC C121316 (OW2) WRFC 397901	600mm diameter	-	-
BS 476-22:1987	WRFC C121316 (OW3) WRFC 397901	600mm diameter	-	-
BS 476-22:1987	WRFC C121316 (OW4) WRFC 397901	600mm diameter	-	-
BS 476-22:1987	WRFC C121316 (OW5) WRFC 397901	600mm diameter	-	-
BS 476-22:1987	WRFC C121316 (W-SERIES)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (W-SERIES)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (W-SERIES)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (W-SERIES)	600mm x 600mm	-	-
ISO 10294-5	BRE 227730	600mm x 600mm	-	-
BS 476-22:1987* ISO 10294-5**	WRFC C121316* BRE 227730**	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (OF1)	600mm diameter	-	-
BS 476-22:1987	WRFC C121316 (OF2)	600mm diameter	-	-
BS 476-22:1987	WRFC C121316 (AF1)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AF2)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AF3)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AF5)	600mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AF6)	1200mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (AF7)	2400mm x 600mm	-	-
BS 476-22:1987	WRFC C121316 (F1)	1200mm x 600mm	-	-



**NOTE:** Mechanical Services Engineers, Specifiers and Certifiers should always request access to manufacturers' primary fire test approvals and satisfy themselves that these relate to the products they are specifying or certifying.

Lorient **DOES NOT** endorse the use of test reports which reference Lorient intumescent air transfer grilles being used to support the certification of other manufacturers' intumescent air transfer grille products.



# APPLICATION DETAILS

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

Protection			Orientation	Application			
			Vertical / horizontal	Doors	Walls	Floors + ceilings	Ducts
FR30	▲		Vertical	LVN20	-	-	-
FR30	▲		Vertical	LVN25	-	-	-
FR30	▲		Vertical	LVV40/LVC40	-	-	-
FR30	▲		Horizontal	-	-	-	-
FR30	▲	▲	Vertical	LVN25S	-	-	-
FR30	▲	▲	Vertical	LVN20S	-	-	-
FR60	▲		Vertical	LVN25	-	-	LVH44
FR60	▲		Vertical	LVV40/LVC40	LVV40/LVC40	-	LVV40/LVC40
FR60	▲		Horizontal	-	-	LVH44/LVHC44	LVH44/LVHC44
FR60	▲	▲	Vertical	LVN25S		-	-
FR60	▲	▲	Vertical	LVN20S	LVV40S	-	-
FR90	▲		Vertical	LVH44/LVHC44	-	-	-
FR90	▲		Horizontal	-	-	LVH44/LVHC44	LVH44/LVHC44
FR90	▲		Vertical	LVH20S	-	-	-
FR120	▲		Vertical	LVH44/LVHC44	LVH44/LVHC44	-	LVH44/LVHC44
FR120	▲		Horizontal	-	-	LVH44/LVHC44	LVH44/LVHC44
FR120	▲	▲	Vertical	LVH20S	LVH44S	-	-
FR180	▲		Vertical	-	LVH44/LVHC44	-	LVH44
FR180	▲		Horizontal	-	-	LVH44/LVHC44	-
FR180	▲	▲	Vertical	-	LVH44S	-	-
FR240	▲		Vertical	-	-	-	LVH54
FR240	▲	▲	Vertical	-	-	-	LVHCTD

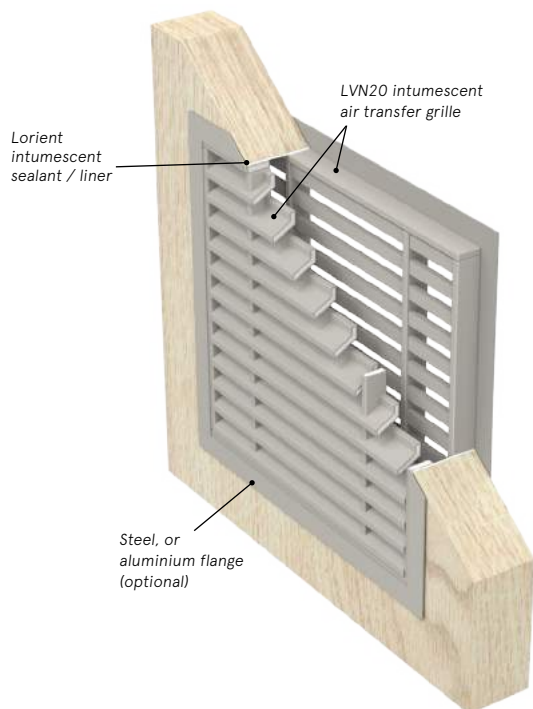


## LVN20 (for 44mm)

For installation in lower half of door leaf



30



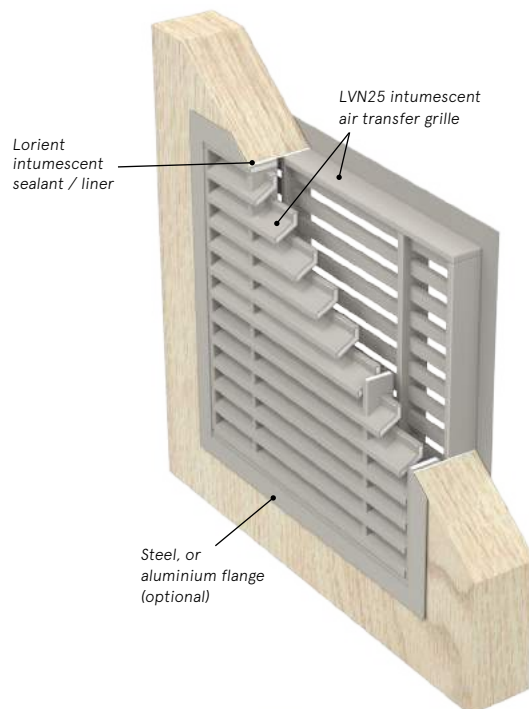
## LVN25 (for 54mm only)

For installation in lower half of door leaf



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60

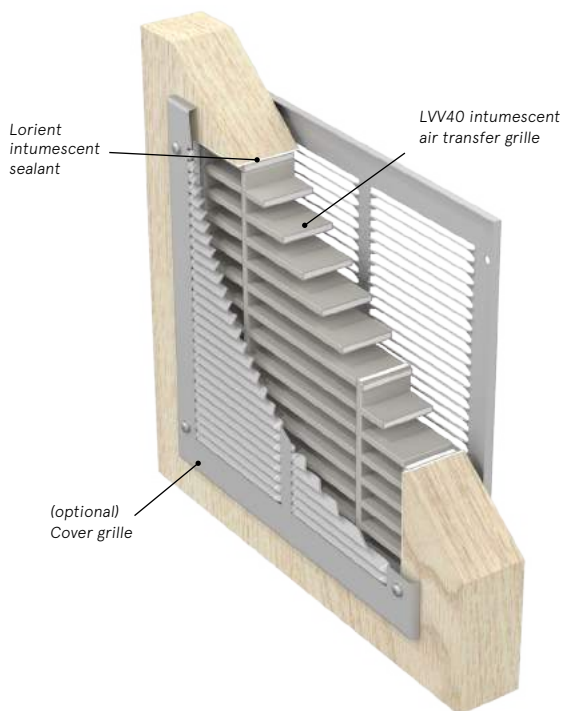


## LVV40 & LVC40



30

60

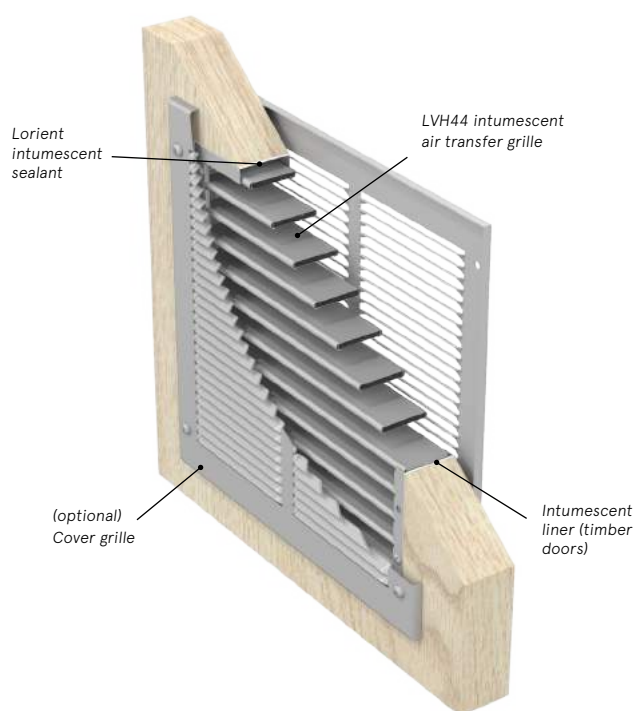


## LVH44 & LVHC44

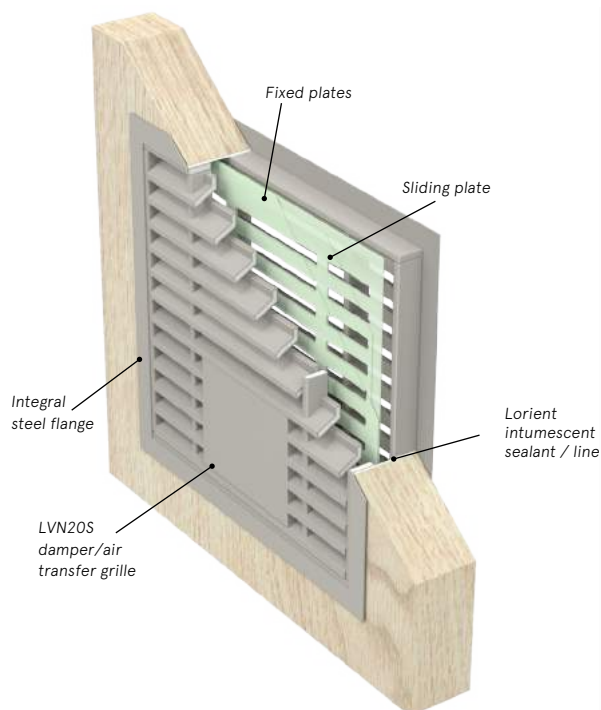


30

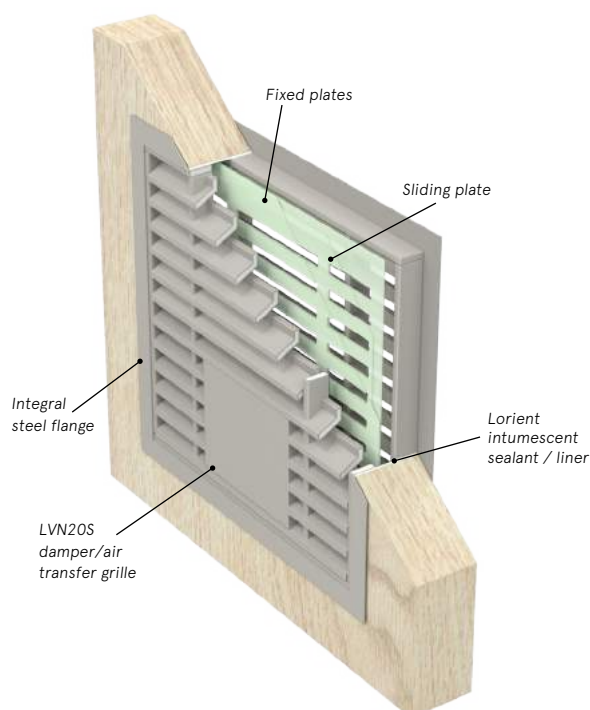
60



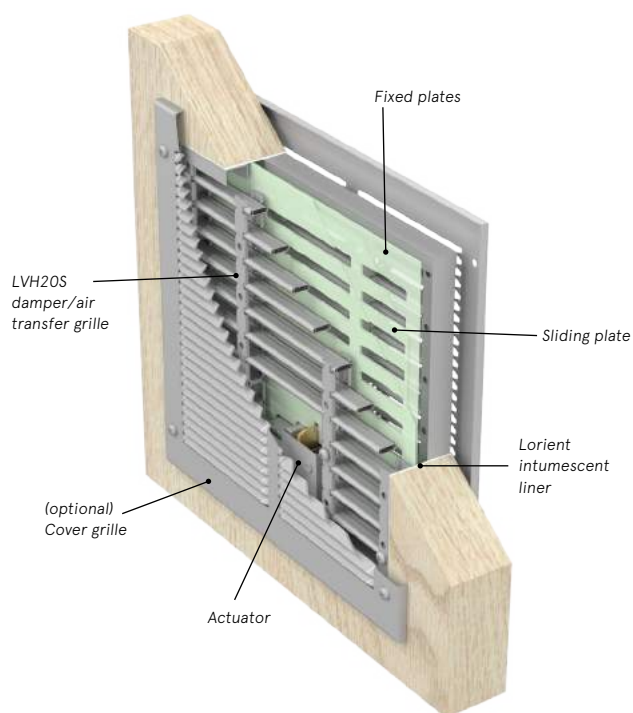
## LVN20S – door thickness min. 44mm



## LVN25S – door thickness min. 54mm



## LVH20S – door thickness min. 50mm



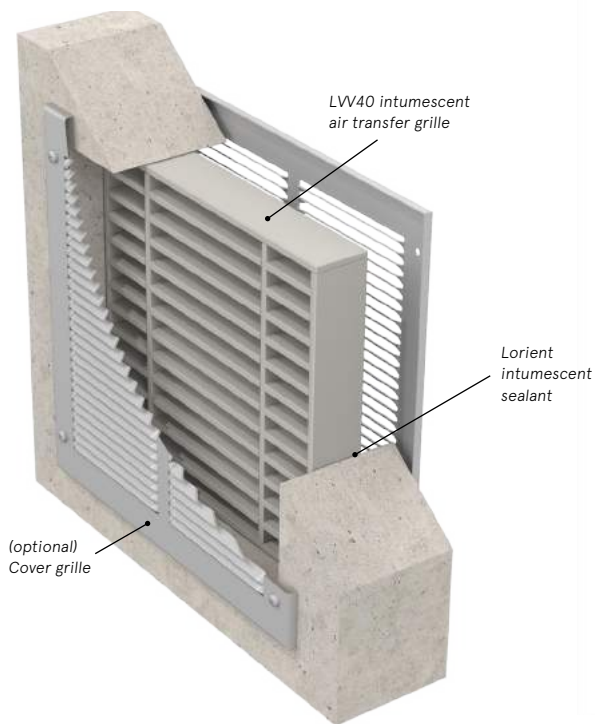


WALL APPLICATIONS

## LVV40 & LVC40



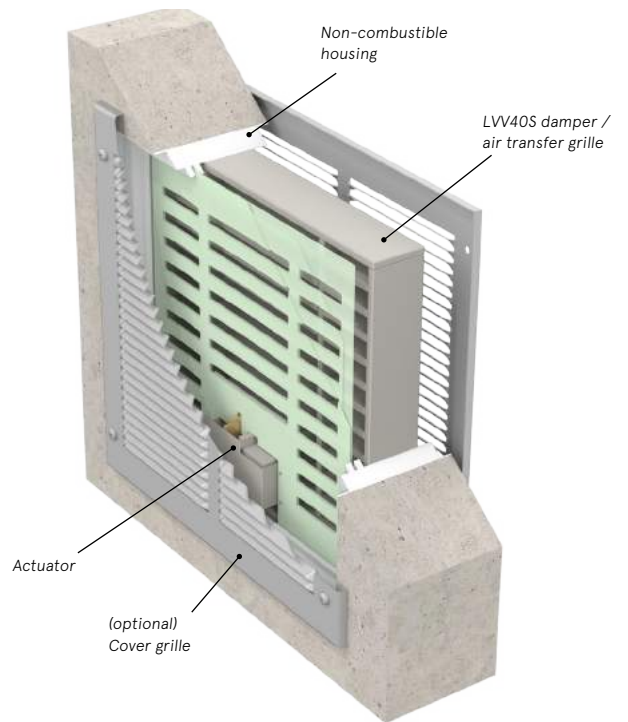
60



## LVV40S – wall thickness min. 90mm



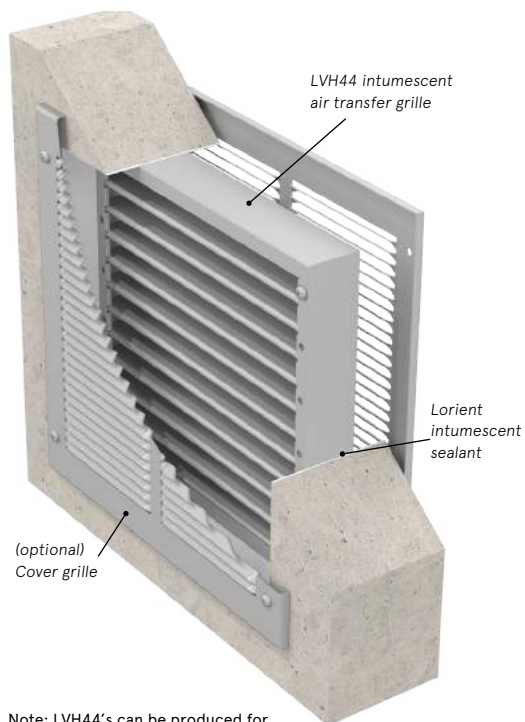
60



## LVH44 & LVHC44



120

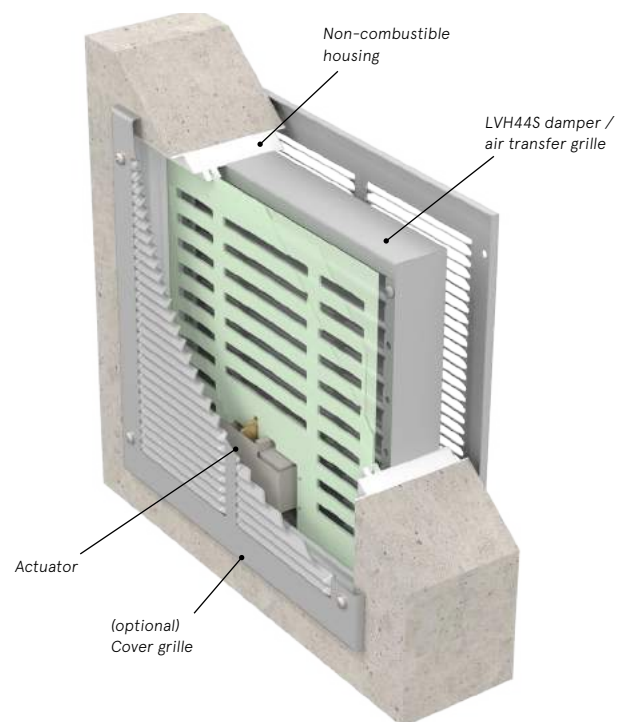


## LVH44S – wall thickness min. 95mm



60

120

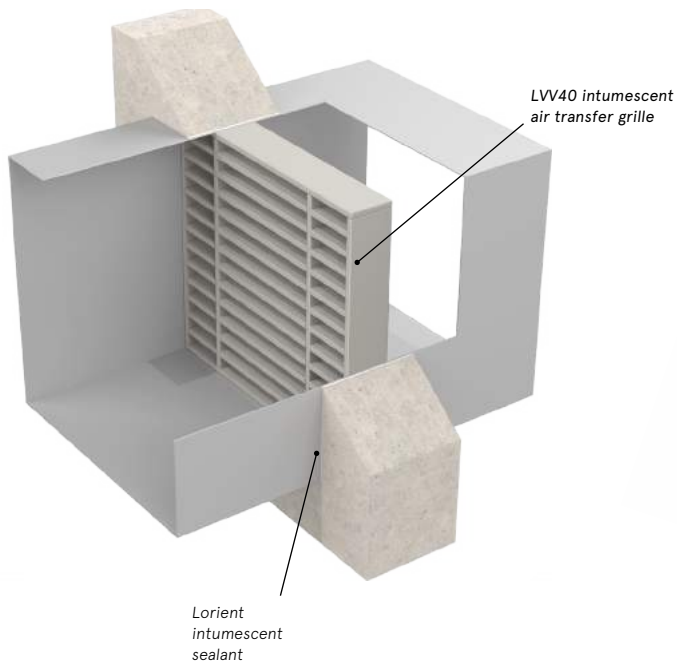


Note: LVH44's can be produced for apertures 1800mm x 600mm ie: 1.08m<sup>2</sup>, for 120 minutes. Please refer to Lorient's Technical Department.

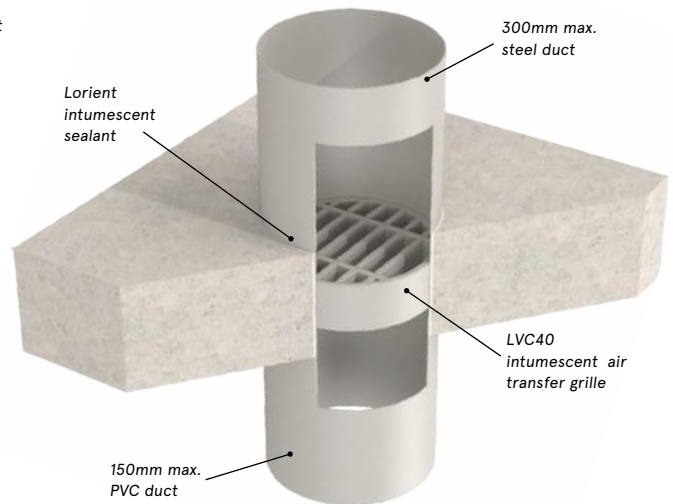




## LVV40

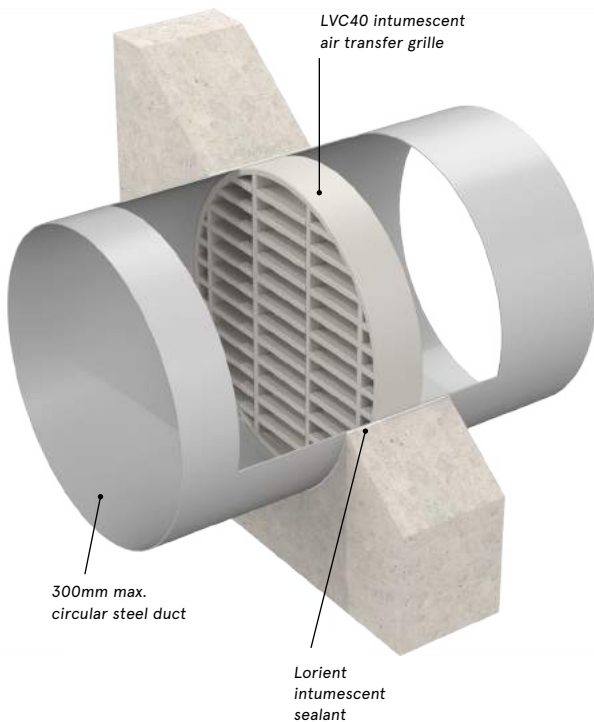


## LVC40

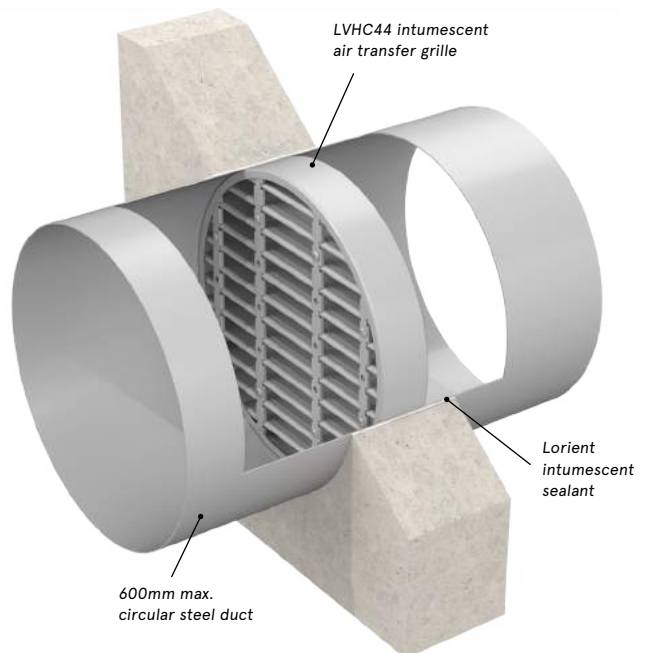


DUCT APPLICATIONS

## LVC40



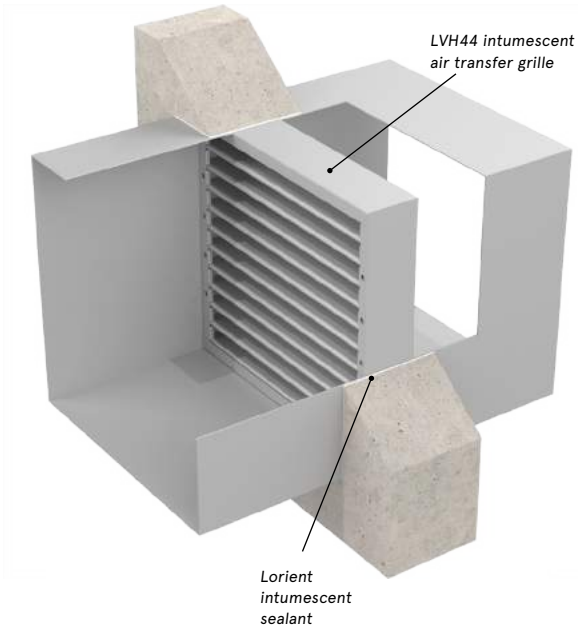
## LVHC44



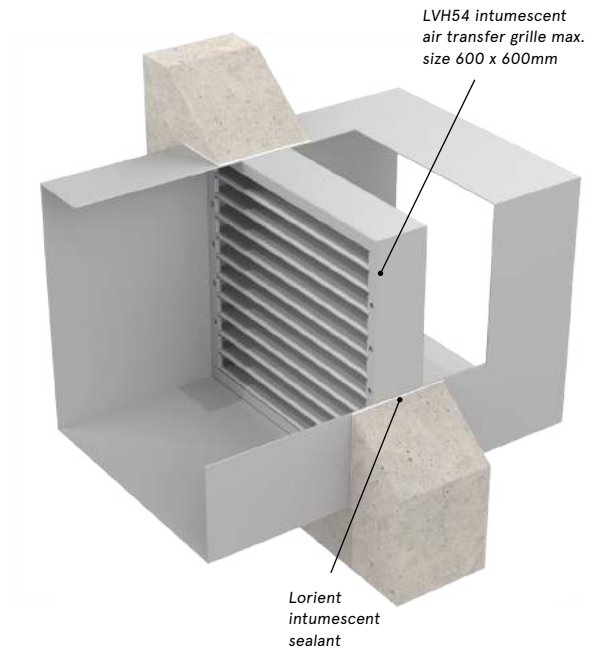


DUCT APPLICATIONS

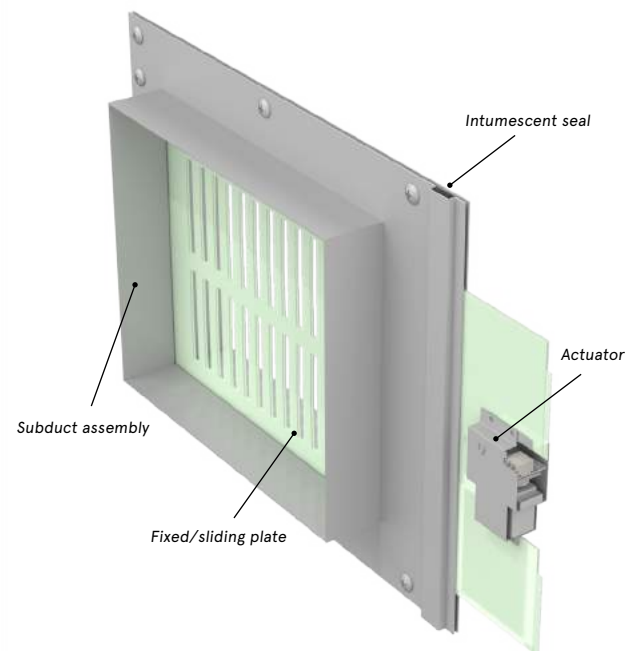
## LVH44



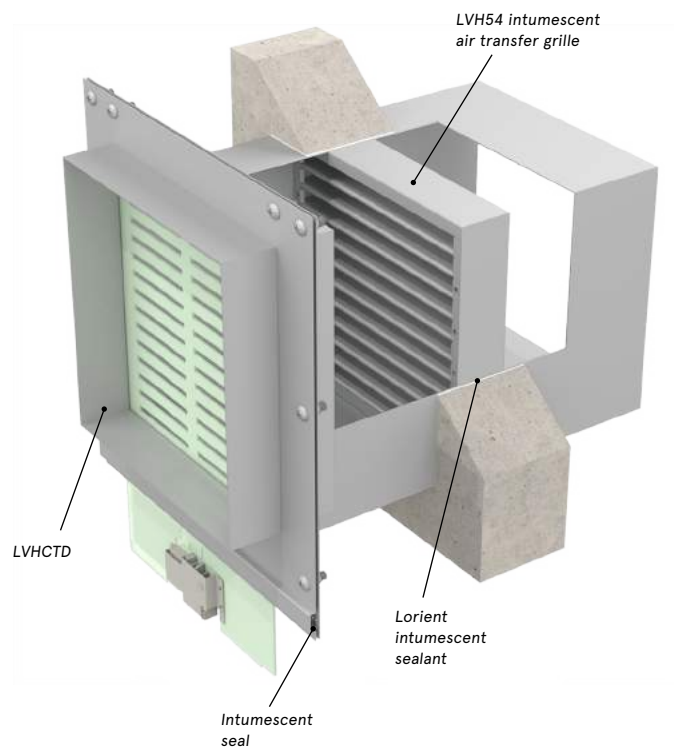
## LVH54



## LVHCTD

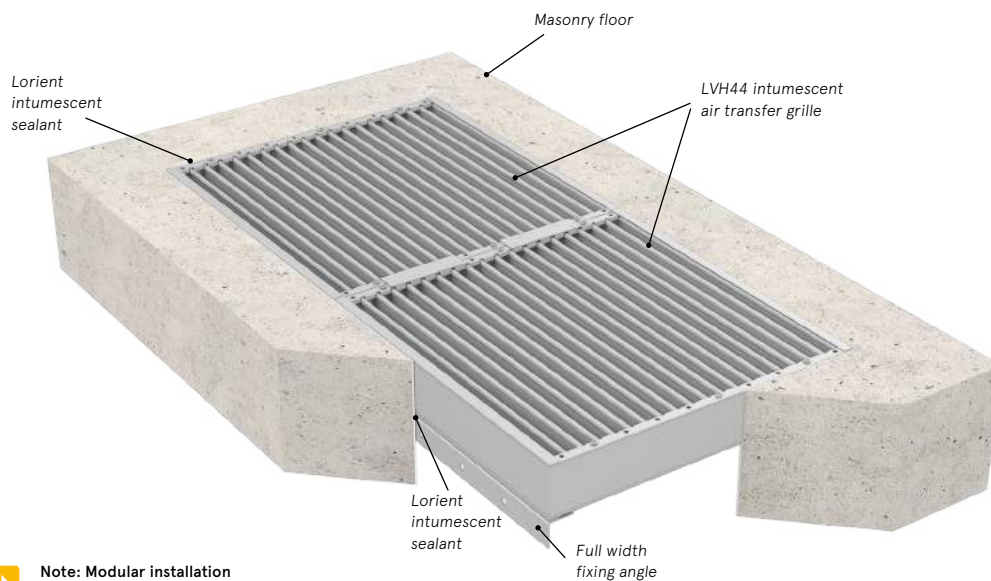


## LVH54 + LVHCTD



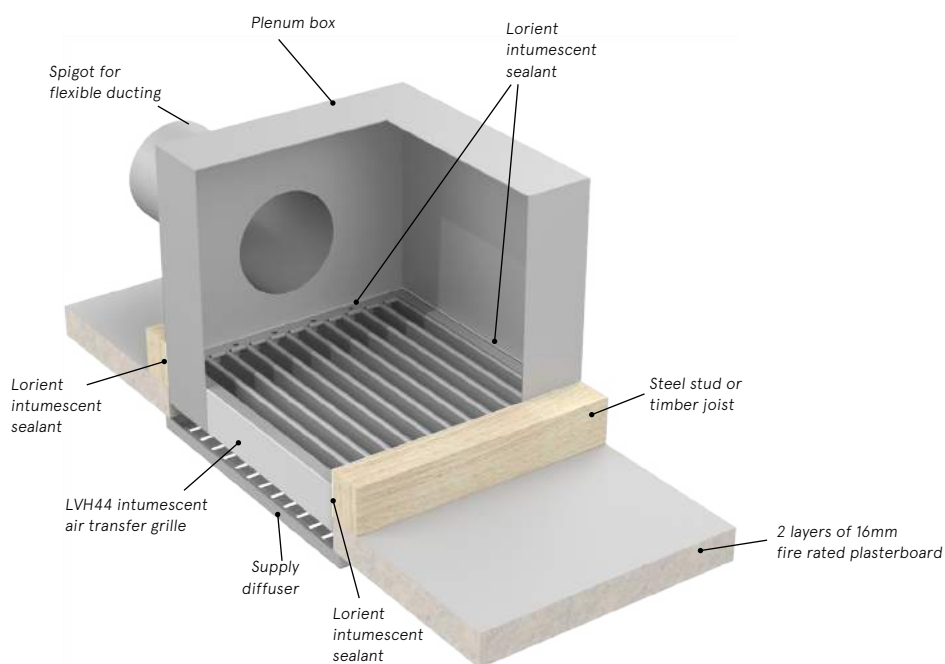


## LVH44 & LVHC44 – floor thickness min. 50mm



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

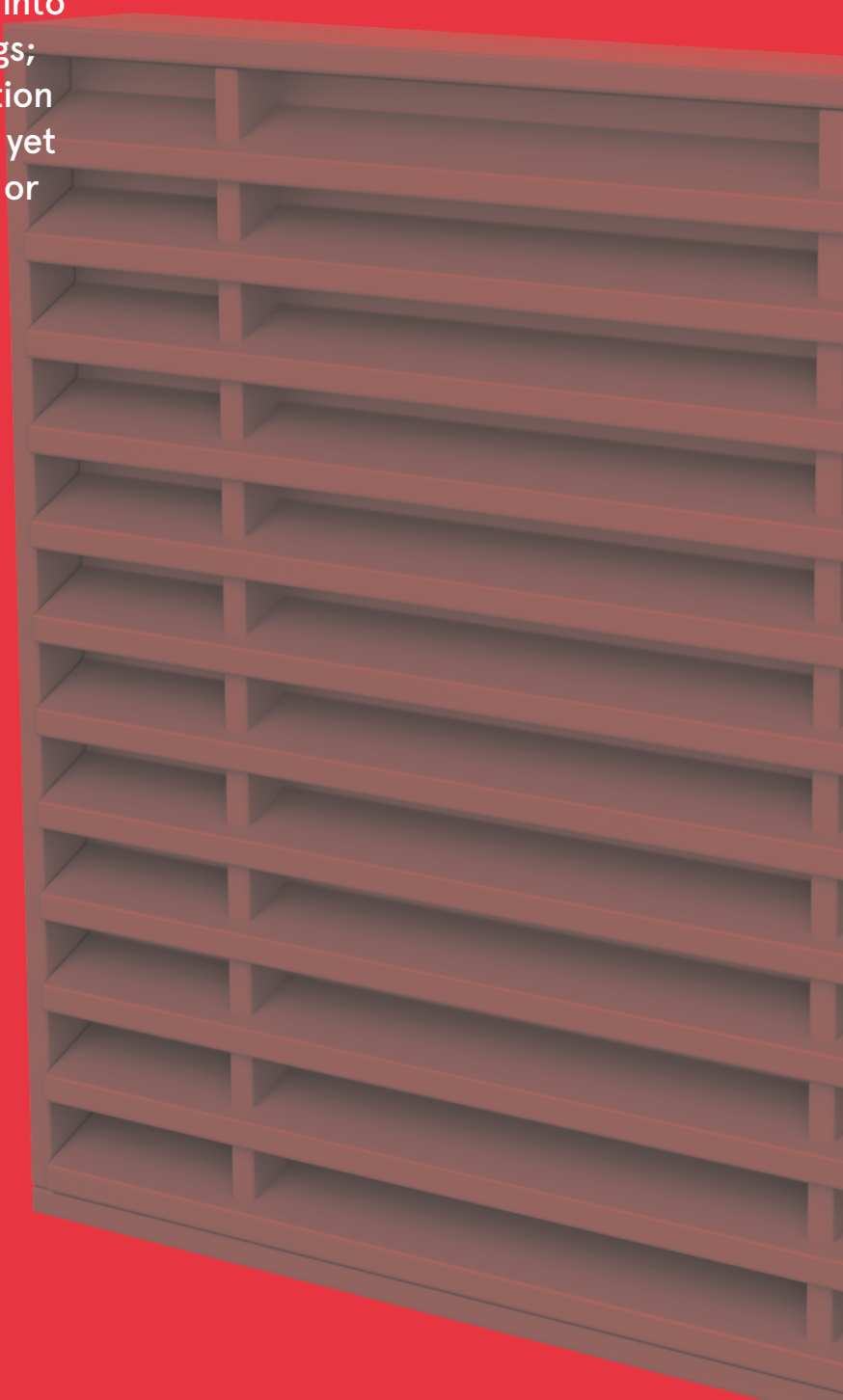
## LVH44 & LVHC44 – ceiling thickness min. 50mm



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

# AIR TRANSFER GRILLES: FIRE

Our intumescent air transfer grilles combine air movement with fire protection. Designed to be fitted into doors, walls, ducts, floors + ceilings; they provide a cost effective solution in allowing free air movement and yet maintain the integrity of the floor or ceiling in a fire situation.



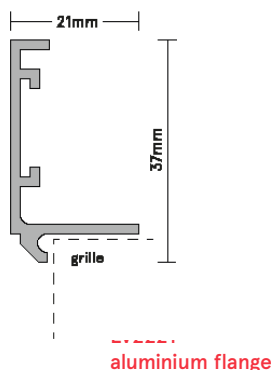
# LVN20

## HIGH PERFORMANCE NON-VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

The LVN20 is a non-vision intumescent air transfer grille. Supplied in two pieces, it lends itself to easy installation in a standard 44mm thick fire door. When finished with a colour co-ordinated edge flange, results in an attractive but efficient air transfer feature.

### Key benefits

- ▶ Louvred slats give privacy
- ▶ Bi-directional airflow
- ▶ No site testing necessary
- ▶ No moving parts
- ▶ Attractive facade on both sides
- ▶ Colour match available
- ▶ Easy to keep clean.



LVN20 shown with  
aluminium flange

INTUMESCENT AIR TRANSFER GRILLES

### AIR TRANSFER GRILLE SELECTOR (MM)

ATG NOMINAL SIZE	200 x 200	300 x 300	400 x 400
ATG ACTUAL SIZE	198 x 198	298 x 298	398 x 398
FLANGE SIZE	201 x 201	301 x 301	401 x 401
APERTURE SIZE	205 x 205	305 x 305	405 x 405

### STANDARD SIZES AVAILABLE (MM)

WIDTH	98	148	198	248	298	348	398	448	498	598
HEIGHT	98	148	198	248	298	348	398	448	498	598

Other non-standard sizes may be available – please ask for details.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.

#### Performance

- ▶ Can be used to provide up to 30 minutes resistance to fire.

#### Size

- ▶ Width: 100mm – 600mm (in 50mm increments).
- ▶ Height: 100mm – 600mm (in 50mm increments).

#### Thickness

- ▶ 2 pieces x 20mm.

#### Free area

- ▶ Approx 30% free area.

#### Material

- ▶ Rigid PVC slats with an intumescent core.

#### Application

- ▶ Suitable for doors.
- ▶ Note: in applications where high levels of humidity or wetness are anticipated, it is recommended that an LVH44 product should be employed.

#### Orientation

- ▶ LVN20 is best suited in the vertical plane.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 800mm from floor level.

#### Finish

- ▶ Silver as standard.

#### Use with

- ▶ Aluminium flange as standard.
- ▶ Cover grille can be supplied when not using a flange.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a door of the same nominal dimensions. E.g. a 198mm x 198mm nominal size air transfer grille will suit a 200mm x 200mm aperture, if fitted with aluminium flange, a 205 x 205mm aperture will be required.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Certification

(CF564)

# LVN25

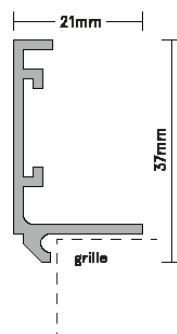
## HIGH PERFORMANCE NON-VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

The LVN25 is a non-vision intumescent air transfer grille supplied in two halves, to accommodate doorsets with a minimum door thicknesses of 50mm. When finished with a colour co-ordinated edge flange, it results in an attractive but efficient air transfer feature.



### Key benefits

- ▶ Louvred slats give privacy
- ▶ Bi-directional airflow
- ▶ No site testing necessary
- ▶ No moving parts
- ▶ Attractive facade on both sides
- ▶ Colour match available
- ▶ Easy to keep clean.



aluminium flange



▶ LVN25 shown with aluminium flange

### AIR TRANSFER GRILLE SELECTOR (MM)

ATG NOMINAL SIZE	200 x 200	300 x 300	400 x 400
ATG ACTUAL SIZE	198 x 198	298 x 298	398 x 398
FLANGE SIZE	201 x 201	301 x 301	401 x 401
APERTURE SIZE	205 x 205	305 x 305	405 x 405

### STANDARD SIZES AVAILABLE (MM)

WIDTH	98	148	198	248	298	348	398	448	498	598
HEIGHT	98	148	198	248	298	348	398	448	498	598

Other non-standard sizes may be available – please ask for details.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.

#### Performance

- ▶ Can be used to provide up to 60 minutes resistance to fire.
- ▶ FD30: minimum door thickness of 50mm.
- ▶ FD60: minimum door thickness of 54mm.

#### Size

- ▶ Width: 100mm – 600mm (in 50mm increments).
- ▶ Height: 100mm – 600mm (in 50mm increments).

#### Thickness

- ▶ 2 pieces x 25mm.

#### Free area

- ▶ Approx 30% free area.

#### Material

- ▶ Rigid PVC slats with an intumescent core.

#### Application

- ▶ Suitable for doors of minimum 50mm thickness.
- ▶ Note: in applications where high levels of humidity or wetness are anticipated, it is recommended that an LVH44 product should be employed.

#### Orientation

- ▶ LVN25 is best suited in the vertical plane.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 800mm from floor level.

#### Finish

- ▶ Silver as standard.

#### Use with

- ▶ Aluminium flange as standard.
- ▶ Cover grille can be supplied when not using a flange.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a door of the same nominal dimensions. E.g. a 198mm x 198mm nominal size air transfer grille will suit a 200mm x 200mm aperture, if fitted with aluminium flange, a 205 x 205mm aperture will be required.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Certification

(CF564)

# LVV40

## HIGH PERFORMANCE VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

A high performance, standard vision intumescent air transfer grille for doors, walls and ducts. To be used where air movement/flow via fan is stopped in the event of a fire. Provides excellent airflow characteristics, which result in low sound power level and efficient operation in normal use.

### Key benefits

- ▶ Fits directly into ducts, doors or wall apertures
- ▶ No moving parts
- ▶ Excellent fire integrity + insulation performance
- ▶ EI rating in conjunction with cover grilles
- ▶ Not prone to clogging
- ▶ No access panels required
- ▶ Robust construction
- ▶ No maintenance.

### STANDARD SIZES AVAILABLE (MM)

WIDTH	98	148	198	248	298	348	398	448	498	598
HEIGHT	98	148	198	248	298	348	398	448	498	598

Other non-standard sizes may be available – please ask for details.



LVV40

INTUMESCENT AIR TRANSFER GRILLES

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Fire: BS EN 1634-1:2014.
- ▶ Fire: BS EN 1364-5:2017.
- ▶ Fire: NEN 6069:2005+A1:2016.

#### Performance

- ▶ Can be used to provide up to 60 minutes resistance to fire.
- ▶ EI rating of 120 minutes when used in conjunction with a cover grille. Please speak to our Technical Department for details.

#### Size

- ▶ Width: 100mm – 600mm (in 25mm increments).
- ▶ Height: 100mm – 600mm (in 25mm increments).

#### Thickness

- ▶ 40mm.

#### Finish

- ▶ Silver as standard.

#### Free area

- ▶ Approx 60% free area.
- ▶ Low sound power level +.

#### Application

- ▶ Suitable for doors, walls and ducts.
- ▶ Note: in applications where high levels of humidity or wetness are anticipated, it is recommended that an LVH44 product should be employed.

#### Orientation

- ▶ Suitable for use in vertical applications.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 3000mm from floor level.
- ▶ The lower edge of the grille shall be no closer than 400mm to floor level.
- ▶ Other positional requirements available, please speak to our Technical Department for further information.

#### Material

- ▶ PVC slats with an intumescent core.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a duct or other aperture of the same nominal dimensions. E.g. a 198mm x 198mm nominal size air transfer grille will suit a 200mm x 200mm aperture.
- ▶ Screwed and bedded in Lorient intumescent sealant.
- ▶ Note: fitting is determined by application. Please refer to separate fitting instructions.

#### Use with

- ▶ Metal cover grille (optional).

#### Certification

(CF564)



# LVC40

## HIGH PERFORMANCE CIRCULAR VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

A high performance, standard vision intumescent air transfer grille for doors, walls and ducts. Ideal for toilet extraction systems in residential premises, hotels and many other buildings. The design allows space savings, ease of installation and avoids the need for operational function checks.



↑  
LVC40

### STANDARD DIAMETER SIZES AVAILABLE (MM)

DIAMETER	148	198	248	298	348	398	448	598
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Other non-standard sizes may be available – please ask for details.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Fire: BS EN 1634-1:2014.
- ▶ Fire: BS EN 1634-5:2017.
- ▶ Fire: NEN 6069:2005+A1:2016.

#### Performance

- ▶ Can be used to provide up to 60 minutes resistance to fire.
- ▶ EI rating of 120 minutes when used in conjunction with a cover grille. Please speak to our Technical Department for details.

#### Size

- ▶ Up to 600mm diameter (nominal to suit standard PVC pipes or steel ducts)

#### Thickness

- ▶ 40mm.

#### Free area

- ▶ Low sound power level +.

#### Application

- ▶ Suitable for doors, walls and ducts.
- ▶ Please note: in applications where high levels of humidity or wetness are anticipated, it is recommended that an LVHC44 product should be employed.

#### Orientation

- ▶ LVC40 products can be installed either vertically or up to 300mm diameter horizontally.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 3000mm from floor level.
- ▶ The lower edge of the grille shall be no closer than 400mm to floor level.

#### Material

- ▶ PVC slats with an intumescent core.

#### Finish

- ▶ Silver as standard.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a duct or other aperture of the same nominal dimensions. E.g. a 198mm diameter nominal size damper will suit a 200mm diameter aperture.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Use with

- ▶ Metal cover grille (optional).

#### Certification

(CF564)



# LVH44

## HIGH PERFORMANCE VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

A high performance, standard vision intumescent air transfer grille for walls, doors, floors and ventilation ducts. The LVH44 can be assembled in multi-modules to protect large apertures. Can provide up to 120 minutes fire resistance.



### Key benefits

- ▶ Exhibits excellent airflow characteristics + gives silent efficient operation with normal to high air velocities
- ▶ Fits directly into ducts, doors or wall apertures
- ▶ Good free area up to 65%
- ▶ Tolerant of high humidity
- ▶ Withstands harsh environments
- ▶ Not prone to clogging
- ▶ No moving parts
- ▶ Robust construction.



LVH44

### STANDARD SIZES AVAILABLE (MM)

WIDTH	98	148	198	248	298	348	398	448	498	548	598
HEIGHT	98	148	198	248	298	348	398	448	498	548	598

Other non-standard sizes may be available - please ask for details.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Fire: BS EN 1634-1:2014.
- ▶ Fire: BS EN 1364-5:2017.
- ▶ Fire: NEN 6069:2005+A1:2016.

#### Performance

- ▶ Can be used to provide up to 120 minutes resistance to fire to BS 476.
- ▶ EI rating of 120 minutes when used in conjunction with a cover grille.

#### Size

- ▶ Width: 100mm – 600mm (in 25mm increments).
- ▶ Height: 100mm – 600mm (in 25mm increments).
- ▶ Please note: Larger apertures possible. Refer to Lorient's Technical department or view our Air Transfer Grille Installation Manual.

#### Thickness

- ▶ 44mm.

#### Free area

- ▶ Approx 65% free area.

#### Application

- ▶ Suitable for doors, walls and ducts.
- ▶ Suitable for external applications.

#### Orientation

- ▶ LVH44 dampers can be installed in any orientation.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 3000mm from floor level.
- ▶ The lower edge of the grille shall be no closer than 200mm to floor level.

#### Material

- ▶ Z275 galvanised steel.
- ▶ Metal slats with an intumescent core.

#### Finish

- ▶ Silver as standard.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a duct or other aperture of the same nominal dimensions. E.g. a 198mm x 198mm nominal size air transfer grille will suit a 200mm x 200mm aperture.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Use with

- ▶ Metal cover grille (optional).

#### Certification

(CF564)

# LVHC44

## HIGH PERFORMANCE CIRCULAR VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

A high performance, standard vision intumescent air transfer grille for walls, doors and ventilation ducts. Can provide 120 minutes fire resistance.

### Key benefits

- ▶ Exhibits excellent airflow characteristics + gives silent efficient operation with normal to high air velocities
- ▶ Fits directly into ducts, doors or wall apertures
- ▶ Good free area up to 60%
- ▶ Tolerant of high humidity
- ▶ Withstands harsh environments
- ▶ Not prone to clogging
- ▶ No moving parts
- ▶ Robust construction
- ▶ Available in a multitude of sizes
- ▶ No maintenance.



LVHC44

### STANDARD DIAMETER SIZES AVAILABLE (MM)

DIAMETER	98	148	198	248	298	348	398	448	498	548	598
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Other non-standard sizes may be available - please ask for details.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Fire: BS EN 1634-1:2014.
- ▶ Fire: BS EN 1364-5:2017.
- ▶ Fire: NEN 6069:2005+A1:2016.

#### Performance

- ▶ Can be used to provide up to 120 minutes resistance to fire.
- ▶ EI rating of 120 minutes when used in conjunction with a cover grille.

#### Size

- ▶ Up to 600mm diameter (nominal to suit standard PVC pipes or steel ducts).

#### Thickness

- ▶ 44mm.

#### Free area

- ▶ Approx 60% free area.

#### Application

- ▶ Suitable for doors, walls and ducts.
- ▶ Suitable for external applications.

#### Orientation

- ▶ LVH44 air transfer grilles can be installed in any orientation.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 3000mm from floor level.
- ▶ The lower edge of the grille shall be no closer than 200mm to floor level.

#### Material

- ▶ Z275 galvanised steel.
- ▶ Metal slats with an intumescent core.

#### Finish

- ▶ Silver as standard.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a duct or other aperture of the same nominal dimensions. E.g. a 198mm diameter nominal size air transfer grille will suit a 200mm diameter aperture.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Use with

- ▶ Metal cover grille (optional).

#### Certification

(CF564)



# LVH50

## HIGH PERFORMANCE VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

A high performance, standard vision intumescent air transfer grille for walls, doors and ventilation ducts. This all-purpose air transfer grille can be relied upon to function in extremes of climate and environment. It can suffer considerable abuse during and after installation without losing effectiveness in the control of fire and hot gases.

The LVH50 can be assembled in multi-modules in order to protect large apertures.

### Key benefits

- ▶ Fits directly into ducts, walls or doors
- ▶ Tolerant of high humidity
- ▶ Good free area up to 65%
- ▶ Only 50mm thick
- ▶ Withstands harsh environments
- ▶ Not prone to clogging
- ▶ Available in a multitude of sizes
- ▶ Can be installed directly into duct
- ▶ No access panels required
- ▶ No need for regular function checks.

### STANDARD SIZES AVAILABLE (MM)

WIDTH	98	148	198	248	298	348	398	448	498	548	598
HEIGHT	98	148	198	248	298	348	398	448	498	548	598

Other non-standard sizes may be available - please ask for details.



LVH50

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS EN 1364-5:2017.
- ▶ Fire: NEN 6069:2005+A1:2016.

#### Performance

- ▶ Can be used to provide up to 120 minutes resistance to fire to BS 476.
- ▶ EI rating of 120 minutes when used in conjunction with a cover grille.

#### Size

- ▶ Width: 100mm - 600mm (in 25mm increments).
- ▶ Height: 100mm - 600mm (in 25mm increments).
- ▶ Please note: Larger apertures possible. Refer to Lorient's Technical department.

#### Thickness

- ▶ 50mm.

#### Free area

- ▶ Approx 65% free area.

#### Application

- ▶ Suitable for doors, walls and ducts.
- ▶ Suitable for external applications.

#### Orientation

- ▶ LVH50 air transfer grilles can be installed in any orientation.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 3000mm from floor level.
- ▶ The lower edge of the grille shall be no closer than 200mm to floor level.

#### Material

- ▶ Z275 galvanised steel.
- ▶ Metal slats with an intumescent core.

#### Finish

- ▶ Silver as standard.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a duct or other aperture of the same nominal dimensions. e.g. a 198mm x 198mm nominal size air transfer grille will suit a 200mm x 200mm aperture.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Use with

- ▶ Metal cover grille (optional).

# LVH54

## HIGH PERFORMANCE VISION STYLE INTUMESCENT AIR TRANSFER GRILLE

A high performance, standard vision intumescent air transfer grille for ventilation ducts. Can provide up to 240 minutes fire resistance.



### Key benefits

- ▶ Forms a complete seal in 2 minutes
- ▶ Can withstand 300Pa differential across the air transfer grille
- ▶ Low leakage rates
- ▶ Tolerant of high humidity
- ▶ Withstands harsh environments
- ▶ Not prone to clogging
- ▶ No moving parts
- ▶ Robust construction
- ▶ Available in a multitude of sizes
- ▶ No maintenance.



LVH54

### STANDARD SIZES AVAILABLE (MM)

WIDTH	200	250	300	350	400	450	500	550	600
HEIGHT	200	250	300	350	400	450	500	550	600

Other non-standard sizes may be available – please ask for details.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS ISO 10294-5:2005.

#### Performance

- ▶ Can be used to provide up to 240 minutes resistance to fire.

#### Size

- ▶ Width: 100mm – 600mm (in 50mm increments).
- ▶ Height: 100mm – 600mm (in 50mm increments).

#### Thickness

- ▶ 54mm.

#### Free area

- ▶ Approx 70% free area.

#### Application

- ▶ Suitable for ducts.

#### Orientation

- ▶ Suitable for vertical applications.

#### Material

- ▶ Z275 galvanised steel.
- ▶ Metal slats with an intumescent core.

#### Finish

- ▶ Silver as standard.

#### Fixing

- ▶ Each air transfer grille is manufactured 2mm less than a nominal aperture size to provide clearance when installed in a duct or other aperture of the same nominal dimensions. E.g. a 198mm x 198mm nominal size air transfer grille will suit a 200mm x 200mm aperture.
- ▶ Screwed and bedded in Lorient intumescent sealant.

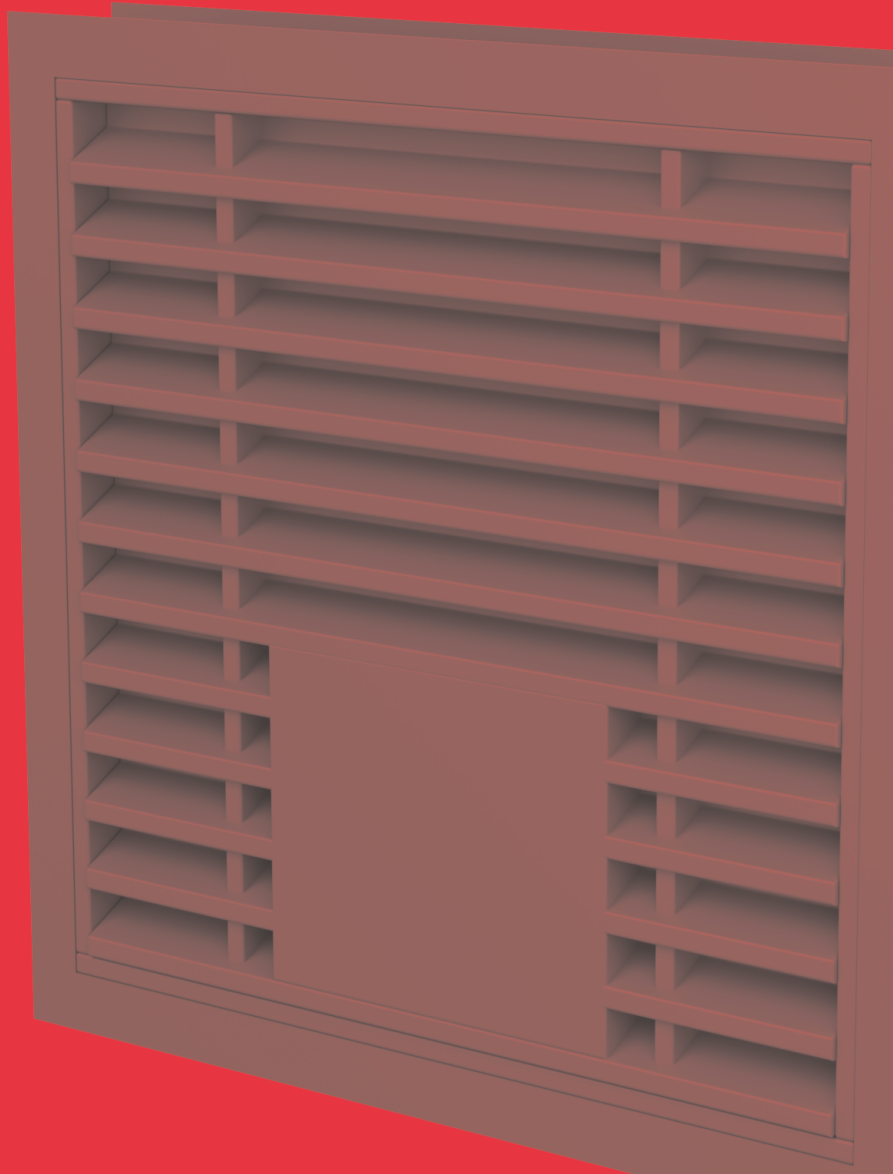
#### Use with

- ▶ Metal cover grille (optional).

#### Specification

# AIR TRANSFER GRILLES: FIRE + SMOKE

Our range of combined intumescent fire + smoke air transfer grilles can be used in all applications where cold smoke containment is required. These are connected, via a control panel, to a standard fire alarm system. In the event of an alarm condition, or power failure, the smoke shutters close, preventing the passage of cold smoke.



# LVN20S

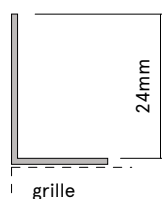
## HIGH PERFORMANCE NON-VISION FIRE + SMOKE AIR TRANSFER GRILLE

The LVN20S provides a unique solution to the problem of containing both fire and smoke in emergency conditions yet offering good air transfer through doors in everyday use. Using the same intumescent louvred slat configuration as the LVN20, but incorporating an electro mechanically operated smoke shutter mechanism. Can provide up to 60 minutes fire and smoke resistance.

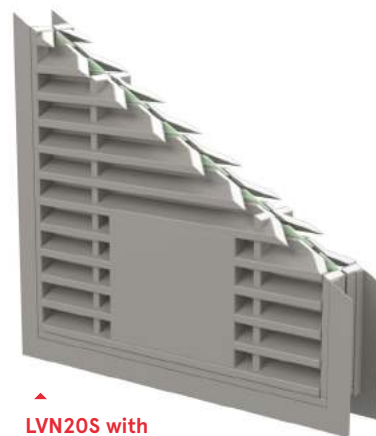


### Key benefits

- ▶ Contains cold smoke + toxic gases remote from the source of fire
- ▶ Simple installation
- ▶ Auto reset + fail-safe
- ▶ Safe low DC voltage
- ▶ Status reporting + auto-cycling via Talkback Damper Control Monitor (DCM)
- ▶ Optional audio warning facility
- ▶ Connects to fire panel +/- BMS
- ▶ BMS alarm notification via Alarm Monitoring System (AMS)
- ▶ Nominal 5mA current open/closed
- ▶ Max 200mA in operation
- ▶ Allows bi-directional airflow
- ▶ Louvred slats give privacy.



LV2516  
steel flange



LVN20S with  
integral steel flange

### AIR TRANSFER GRILLE SELECTOR (MM)

ATG NOMINAL SIZE	200 x 200	300 x 300	400 x 400
ATG ACTUAL SIZE	198 x 198	298 x 298	398 x 398
FLANGE SIZE	201 x 201	301 x 301	401 x 401
APERTURE SIZE	209 x 209	309 x 309	409 x 409

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Smoke: BS 476-31.1:1983 (shutterplate).

#### Performance

- ▶ Can be used to provide up to 60 minutes resistance to fire + cold smoke.

#### Size

- ▶ Width: 200mm - 400mm (in 50mm increments).
- ▶ Height: 200mm - 400mm (in 50mm increments).

#### Thickness

- ▶ 2 pieces x 20mm.

#### Free area

- ▶ Approx 30% free area.

#### Finish

- ▶ Silver as standard.

#### Orientation

- ▶ LVN20S must be used in the vertical plane.

#### Application

- ▶ Suitable for doors.
- ▶ Note: in applications where high levels of humidity or wetness are anticipated, please speak to our Technical Department for alternatives.

#### Positional requirements

- ▶ Certifire: The upper edge of the grille shall be no higher than 800mm from floor level.
- ▶ Test Report Applus 19/19940-1428: The upper edge of the grille shall be no higher than 1350mm from floor level.

#### Material

- ▶ Rigid PVC slats with an intumescent core.
- ▶ Steel flange.
- ▶ Electro mechanically operated smoke shutter mechanism.

#### Fixing

- ▶ Requires an aperture 9mm over size. E.g. a 300mm x 300mm needs an aperture 309mm x 309mm to accommodate the flange and liner.
- ▶ Screwed into door with an aperture lined with Lorient intumescent liner (B24402).

#### Use with

- ▶ Talkback damper control system.
- ▶ Conductor hinges.
- ▶ Optional Alarm Monitoring System (AMS) and battery backup.

#### Certification

(CF564)

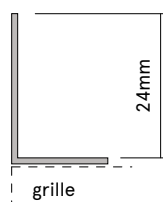
# LVN25S

## HIGH PERFORMANCE NON-VISION FIRE + SMOKE AIR TRANSFER GRILLE

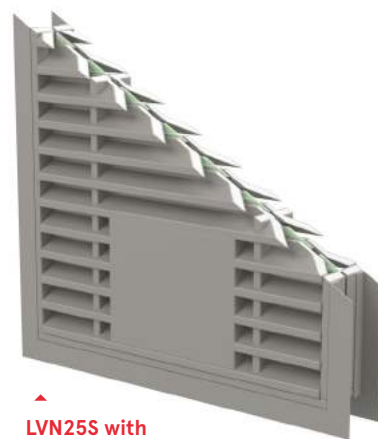
The LVN25S provides a unique solution to the problem of containing both fire and smoke in emergency conditions yet offering good air transfer through doors in everyday use. Using the same intumescent louvred slat configuration as the LVN25, but incorporating an electro mechanically operated smoke shutter mechanism. Can provide up to 60 minutes fire and smoke resistance.

### Key benefits

- ▶ Contains cold smoke + toxic gases remote from source of fire
- ▶ Simple installation
- ▶ Auto reset + fail-safe
- ▶ Safe low DC voltage
- ▶ Status reporting + auto-cycling via Talkback Damper Control Monitor (DCM)
- ▶ Optional audio warning facility
- ▶ Connects to fire panel +/- or BMS
- ▶ BMS alarm notification via Alarm Monitoring System (AMS)
- ▶ Nominal 5mA current open/closed
- ▶ Max 200mA in operation
- ▶ Allows bi-directional airflow
- ▶ Louvred slats give privacy.



LVN2516  
steel flange



LVN25S with  
integral steel flange

### AIR TRANSFER GRILLE SELECTOR (MM)

ATG NOMINAL SIZE	200 x 200	300 x 300	400 x 400
ATG ACTUAL SIZE	198 x 198	298 x 298	398 x 398
FLANGE SIZE	201 x 201	301 x 301	401 x 401
APERTURE SIZE	209 x 209	309 x 309	409 x 409

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Smoke: BS 476-31.1:1983 (shutterplate).

#### Performance

- ▶ Can be used to provide up to 60 minutes resistance to fire + cold smoke.
- ▶ FD30: minimum door thickness of 50mm.
- ▶ FD60: minimum door thickness of 54mm.
- ▶ EI rating of 60 minutes in accordance with BS 476 (Test report: Applus 19/19940-1428).

#### Size

- ▶ Width: 200mm - 400mm (in 50mm increments).
- ▶ Height: 200mm - 400mm (in 50mm increments).

#### Thickness

- ▶ 2 pieces x 25mm.

#### Free area

- ▶ Approx 30% free area.

#### Finish

- ▶ Silver as standard.

#### Application

- ▶ Suitable for FD30 & FD60 doors, greater than 50mm.
- ▶ Note: in applications where high levels of humidity or wetness are anticipated, please speak to our Technical Department for alternatives.

#### Orientation

- ▶ LVN25S must be used in the vertical plane.

#### Positional requirements

- ▶ Certifire: The upper edge of the grille shall be no higher than 800mm from floor level.
- ▶ Test Report Applus 19/19940-1428: The upper edge of the grille shall be no higher than 1350mm from floor level.

#### Material

- ▶ Rigid PVC slats with an intumescent core.
- ▶ Steel flange.

- ▶ Electro mechanically operated smoke shutter mechanism.

#### Fixing

- ▶ Requires an aperture 9mm over size. e.g. a 300mm x 300mm needs an aperture 309mm x 309mm to accommodate the flange and liner.
- ▶ Screwed into door with an aperture lined with Lorient intumescent liner (B24402).

#### Use with

- ▶ Talkback damper control system.
- ▶ Conductor hinges.
- ▶ Optional Alarm Monitoring System (AMS) and battery backup.

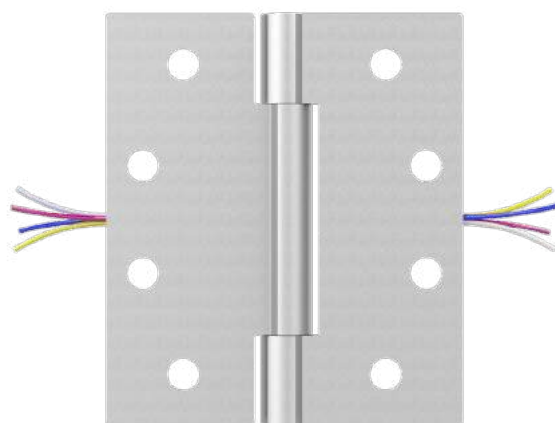
#### Certification

(CF564)

# CONDUCTOR HINGE

Our electrical conductor hinges designed for concealed transfer of power from fire + smoke air transfer grilles into the door leaf. The hinge utilises advanced polymer bushes to provide a totally maintenance free, low friction hinge.

Tested to BS EN 1935:2002 and Certifire Approved.  
Capable of carrying 24v at 2 amps.



Conductor hinge



Cable way with intumescent sleeve  
(available separately)

## SYSTEM SPECIFICATIONS

### Test evidence

- ▶ Building hardware: BS EN 1935:2002.
- ▶ CE Certificate no.: 1121-CPR-AC0063.
- ▶ Durability: Tested to 200,000 cycles.

### Size

- ▶ Height: 100mm.
- ▶ Width: 88mm.
- ▶ Thickness: 3mm.

### Cable detail

- ▶ Standard length: 1m frame side and leaf side.
- ▶ 4-core cable supplied as standard (3-core + spare). Other options available for special order.

### Material

- ▶ Brushed stainless steel 304 as standard. 316 stainless steel available to special order.

### Application

- ▶ Suitable for timber fire doors.
- ▶ Minimum door thickness 44mm.
- ▶ 30 and 60 minute timber and mineral-based assemblies.
- ▶ Maximum leaf weight: 120kg.

### Use with

- ▶ Talkback damper control system.
- ▶ LVN20S / LVN25S.
- ▶ 10mm Intumescent sleeve for cable way (included).

### Fixing

- ▶ FD30: To be fitted with 1mm MAP intumescent hinge pads.
- ▶ FD60: To be fitted with 2mm MAP intumescent hinge pads.
- ▶ Supplied with manufacturer's wood screws (M5 x 32mm).

## Certification

(CF209)

## Classification

 4 (1-4)	 7 1-7	 6 (0-7)	 1 (0/1)	 1 (0/1)	 2/4 (0-4)	 0 (0/1)	 13 (1-14)
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# LVV40S

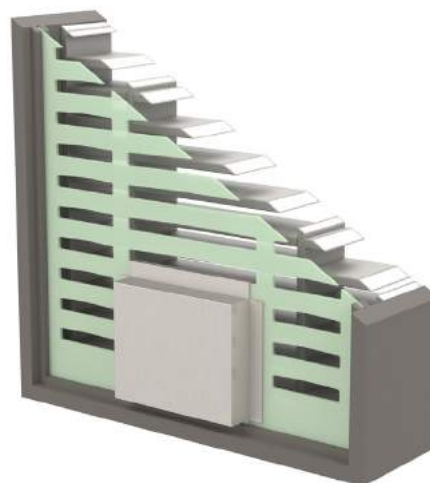
## HIGH PERFORMANCE WALL MOUNTED FIRE + SMOKE AIR TRANSFER GRILLE

This system provides a unique solution to the problem of containing both fire and smoke in emergency conditions yet allowing good air flow in everyday use. Using the same intumescent configuration as the LVV40, but incorporating an electro mechanically operated smoke shutter mechanism. Can provide up to 60 minutes fire and smoke resistance.



### Key benefits

- ▶ Contains cold smoke + toxic gases remote from source of fire
- ▶ Simple installation
- ▶ Auto reset + fail-safe
- ▶ Safe low DC voltage
- ▶ Status reporting + auto-cycling via Talkback Damper Control Monitor (DCM)
- ▶ Optional audio warning facility
- ▶ Connects to fire panel +/- or BMS
- ▶ BMS alarm notification via Alarm Monitoring System (AMS)
- ▶ Nominal 5mA current open/closed
- ▶ Max 200mA in operation
- ▶ Allows bi-direction airflow.



LVV40S

### STANDARD SIZES AVAILABLE (MM)

WIDTH	150	200	250	300	350	400	450	500	550	600
HEIGHT	150	200	250	300	350	400	450	500	550	600

### STANDARD DEPTHS AVAILABLE (MM)

DEPTH	100	150	200	225	250	300
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Other non-standard sizes may be available - please ask for details. **Note:** The LVV40S is housed within a 20mm non-combustible enclosure. Aperture sizes should take account of the 40mm excess in height/width. Such that for a 200x200mm LVV40S, then the overall size with enclosure, will be 240x240mm.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Fire: BS EN 1364-5:2017.
- ▶ Smoke: BS 476-31.1:1983 (shutterplate).

#### Performance

- ▶ Can be used to provide up to 60 minutes resistance to fire + cold smoke.

#### Size

- ▶ Width: 150mm - 600mm (in 25mm increments).
- ▶ Height: 150mm - 600mm (in 25mm increments).

#### Minimum wall depth

- ▶ Minimum wall thickness 90mm.

#### Free area

- ▶ Approx 30% - 37% free area.
- ▶ Size dependent.

#### Application

- ▶ Suitable for rigid + flexible walls.

#### Orientation

- ▶ LVV40S must be in the vertical plane.

#### Positional requirements (Certifire)

- ▶ The upper edge of the grille shall be no higher than 3000mm from floor level.
- ▶ The lower edge of the grille shall be no closer than 400mm to floor level.

#### Material

- ▶ PVC slats with an intumescent core.
- ▶ Electro mechanically operated smoke shutter mechanism.

#### Finish

- ▶ Silver as standard.

#### Fixing

- ▶ Each fire + smoke air transfer grille is manufactured to size. When ordering please ensure the aperture can accommodate the non-combustible housing and allow up to a 5mm gap around the perimeter.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Use with

- ▶ Talkback damper control system.
- ▶ Optional Alarm Monitoring System (AMS) and battery backup.
- ▶ Optional cover grille.

#### Certification

(CF564)

# LVH44S

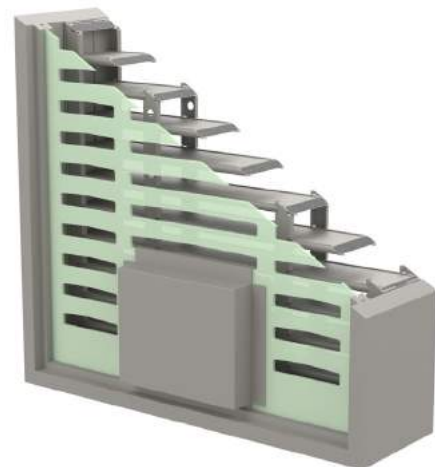
## HIGH PERFORMANCE FIRE + SMOKE AIR TRANSFER GRILLE

These products provide a unique solution to the problem of containing both fire and smoke in emergency conditions yet offering good air transfer through apertures in elements of building construction. Using the same intumescent configuration as the LVH44, but incorporating an electro mechanically operated smoke shutter mechanism. Can provide up to 120 minutes fire and smoke resistance.



### Key benefits

- ▶ Contains cold smoke + toxic gases remote from source of fire
- ▶ Simple installation
- ▶ Auto reset + fail-safe
- ▶ Safe low DC voltage
- ▶ Status reporting + auto-cycling via Talkback Damper Control Monitor (DCM)
- ▶ Optional audio warning facility
- ▶ Connects to fire panel +/- BMS
- ▶ BMS alarm notification via Alarm Monitoring System (AMS)
- ▶ Nominal 5mA current open/closed
- ▶ Max 200mA in operation
- ▶ Allows bi-direction airflow.



LVH44S

### STANDARD SIZES AVAILABLE (MM)

WIDTH	200	250	300	350	400	450	500	550	600
HEIGHT	200	250	300	350	400	450	500	550	600



Other non-standard sizes may be available – please ask for details. **Note:** The LVH44S is housed within a 20mm non-combustible enclosure. Aperture sizes should take account of the 40mm excess in height/width. Such that for a 200x200mm LVH44S, then the overall size with enclosure, will be 240x240mm.

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: BS 476-20 & 22:1987.
- ▶ Fire: BS EN 1634-1:2014.
- ▶ Fire: BS EN 1364-5:2017.
- ▶ Smoke: BS 476-31.1:1983 (shutterplate).

#### Performance

- ▶ Can be used to provide up to 120 minutes resistance to fire + cold smoke.
- ▶ EI rating of 120 minutes when used in conjunction with a cover grille.

#### Size

- ▶ Width: 200mm – 600mm (in 50mm increments).
- ▶ Height: 150mm – 600mm (in 50mm increments).

#### Minimum wall depth

- ▶ Minimum wall thickness 95mm.

#### Free area

- ▶ Approx 30% free area.

#### Application

- ▶ Suitable for rigid + flexible walls.

#### Positional requirements

- ▶ The upper edge of the grille shall be no higher than 3000mm from floor level.
- ▶ The lower edge of the grille shall be no closer than 400mm to floor level.

#### Finish

- ▶ Silver as standard.

#### Material

- ▶ Z275 galvanised steel.
- ▶ Metal slats with an intumescent core.
- ▶ Electro mechanically operated smoke shutter mechanism.

#### Orientation

- ▶ LVH44S is best suited in the vertical plane.

#### Fixing

- ▶ Each fire + smoke air transfer grille is manufactured to size. When ordering please ensure the aperture can accommodate the non-combustible housing and allow up to a 5mm gap around the perimeter.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Use with

- ▶ Talkback damper control system.
- ▶ Optional Alarm Monitoring System (AMS) and battery backup.
- ▶ Optional cover grille.

#### Specification



# LVH20S

## HIGH PERFORMANCE VISION FIRE + SMOKE AIR TRANSFER GRILLE

The LVH20S air transfer grille is a unique combination of intumescent slats to provide two hour fire resistance and excellent insulation properties together with a servo powered set of shutter plates that control cold and warm smoke. Ideal for low velocity air handling systems, it can be operated as a stand-alone unit or in multiple units. It can be interfaced with a fire alarm panel through the Lorient Talkback damper control system.

### Key benefits

- ▶ Contains cold smoke + toxic gases remote from source of fire
- ▶ Simple installation
- ▶ Auto reset + fail-safe
- ▶ Safe low DC voltage
- ▶ Status reporting + auto-cycling via Talkback Damper Control Monitor (DCM)
- ▶ Optional audio warning facility
- ▶ Connects to fire panel +/- BMS
- ▶ BMS alarm notification via Alarm Monitoring System (AMS)
- ▶ Nominal 5mA current open/closed
- ▶ Max 200mA in operation
- ▶ Allows bi-directional airflow.

### STANDARD SIZES AVAILABLE (MM)

WIDTH	198	248	298	348	398	448	498	548	598
HEIGHT	198	248	298	348	398	448	498	548	598

Other non-standard sizes may be available – please ask for details.



LVH20S

### SYSTEM SPECIFICATIONS

#### Test evidence

- ▶ Fire: AS1530.4:2014.
- ▶ Fire: BS 476-20:1987.
- ▶ Fire: BS EN 1364-5:2017.
- ▶ Smoke: BS 476-31.1:1983 (shutterplate).

#### Performance

- ▶ Can be used to provide up to 120 minutes resistance to fire + cold smoke.
- ▶ May provide 30mins insulation when used in conjunction with a cover grille.

#### Size

- ▶ Width: 200mm – 600mm (in 50mm increments).
- ▶ Height: 200mm – 600mm (in 50mm increments).
- ▶ Other non-standard sizes may be obtained by arrangement.

#### Thickness

- ▶ 47mm.

#### Free area

- ▶ Approx 30% free area.

#### Application

- ▶ Suitable for doors, walls & ducts.

#### Orientation

- ▶ LVH20S must be used in the vertical plane.

#### Material

- ▶ Z275 galvanised steel.
- ▶ Metal slats with an intumescent core.
- ▶ Electro mechanically operated smoke shutter mechanism.

#### Finish

- ▶ Silver as standard.

#### Fixing

- ▶ Each air transfer grille is manufactured 5mm less than a nominal aperture size to provide clearance when installed in a duct or other aperture of the same nominal dimensions. E.g. a 195mm x 195mm nominal size air transfer grille will suit a 200mm x 200mm aperture.
- ▶ Screwed and bedded in Lorient intumescent sealant.

#### Use with

- ▶ Talkback damper control system.
- ▶ Conductor hinges.
- ▶ Optional Alarm Monitoring System (AMS) and battery backup.
- ▶ Optional cover grille.

#### Specification

## AIR TRANSFER GRILLES

# LVHCTD + LVH44/LVH54

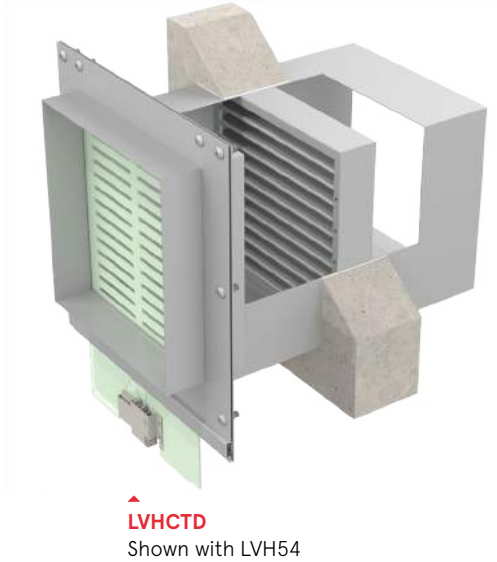
## CASSETTE TYPE DAMPER

Lorient's Cassette Type Damper allows simple and rapid duct installation in small spaces, along with excellent access during commissioning and servicing. When used with an LVH44 or LVH54 air transfer grille can provide up to 240 minutes fire and smoke resistance.



### Key benefits

- ▶ Sliding cold smoke shutter module allows easy access for servicing
- ▶ Easy installation of air transfer grille into fire compartment boundary
- ▶ Shutter plates tolerate a pressure differential of 300Pa
- ▶ Low cold smoke leakage rates
- ▶ May be used purely as a cold smoke damper by excluding the air transfer grille
- ▶ Can incorporate either LVH44 or LVH54 air transfer grilles
- ▶ Controlled by 'Talkback' system providing status information + auto-cycling.



### STANDARD SIZES AVAILABLE (MM)

WIDTH	200	200	250	250	300	300	300	300	350	400	400	400	450	450	450	600	600	600
HEIGHT	150	200	200	250	150	200	250	300	250	150	250	300	250	300	450	150	250	300

Other non-standard sizes may be available – please ask for details.

### SYSTEM SPECIFICATIONS

#### Performance

- ▶ Inclusion of LVH44 air transfer grille will provide up to 120 minutes fire resistance.
- ▶ Inclusion of LVH54 air transfer grille will provide up to 240 minutes fire resistance and 30 minutes insulation.

#### Size

- ▶ Width: 200mm – 600mm (in 50mm increments).
- ▶ Height: 150mm – 300mm (in 50mm increments).

#### Thickness

- ▶ Depth: Subject to application.

#### Free area

- ▶ Approx 40% free area.

#### Application

- ▶ Suitable for ducts.

#### Material

- ▶ Manufactured using welded galvanised steel sheet with the smoke shutter plate location formed by galvanised steel spacer strips.
- ▶ Intumescent fire seal strip prevents hot gas leakage.
- ▶ Shutter plate assembly is produced from 3 sheets of fire resistant glass reinforced plastic of low toxicity.
- ▶ Actuator motor and circuit board are protected within a removable galvanised steel enclosure.

#### Use with

- ▶ Talkback damper control system.
- ▶ LVH44 or LVH54 air transfer grilles (optional).

#### Specification

# TALKBACK DAMPER 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 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 air transfer grille assemblies from one centralised status monitoring unit. A unique 2-way communication system operates between the Damper Control and Monitor Unit

(DCM) and the air transfer grille actuators. This facilitates a rapid assessment of the status of the installation and immediately identifies and locates any defective air transfer grilles.

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

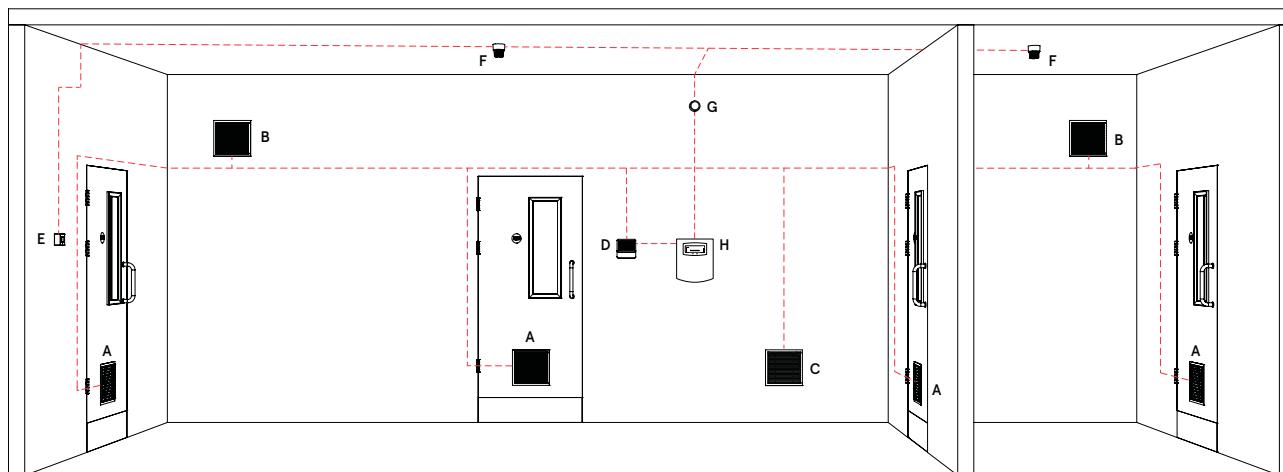
- ▶ is fail-safe – the smoke shutters will automatically close in the event of an alarm, power failure or damage to the wiring
- ▶ resets automatically – when the alarm is cancelled or power restored
- ▶ is self-testing – every 24 hours the dampers are automatically closed and opened to check they are 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).



**\*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 + smoke air transfer grilles  
B: End of duct fire + smoke air transfer grilles  
C: Wall mounted fire + smoke air transfer grilles

D: Power + monitor unit  
E: Fire point  
F: Smoke sensors

G: Fire alarm  
H: Fire alarm panel

# TALKBACK DAMPER CONTROL SYSTEM

The talkback damper control system offers a number of operating features as standard, including:

FEATURE	DETAIL
<b>FAIL SAFE</b>	Designed to close automatically in the event of a fire alarm being activated, a power failure or wiring damage.
<b>AUTO RESET</b>	Will reset automatically to the open position when the fire alarm is cancelled or power restored.
<b>AUTO CYCLING</b>	Once in every twenty-four hours each air transfer grille/shutter is closed and re-opened to prevent a build up of dust or debris between moving parts.
<b>RING WIRING</b>	Up to 16 air transfer grilles/shutters can be connected via a 3-core cable that can be arranged in a ring. The Damper Control Monitor (DCM) powers the dampers/shutters using only safe low DC voltages.
<b>CONTINUOUS MONITORING</b>	"Talkback" air transfer grilles are monitored continuously by the Lorient DCM which identifies the status of each individual air transfer grille/shutter through its unique address.
<b>POSITIVE CLOSING</b>	Energy stored within a capacitor on each air transfer grille/shutter actuator is used to power the electric motor to the closed position in the event of a fire alarm being activated.
<b>SOLID STATE</b>	Solid state microchip technology is employed to provide versatility and reliability.
<b>ASSEMBLED / TESTED</b>	Each air transfer grille/shutter is assembled and fully tested at Lorient, therefore requiring no adjustment to the mechanism on site, facilitating simple installation. It is only necessary to confirm that each damper has been allotted its own address and resetting if required.
<b>COMPATIBILITY</b>	The "Talkback" system is designed to interface with any fire alarm panel and subsequent to the initial installation, additional air transfer grilles/shutters can be incorporated up to a maximum of 16 per DCM.
<b>C E MARKING</b>	Successfully tested in accordance with the requirements of Electro Magnetic Compatibility and Low Voltage Directive, and therefore bears the CE mark. (Conformité Européen).
<b>ADDRESSABLE ACTUATORS</b>	Each actuator address number can be set on site but air transfer grilles must not be allotted a shared number on the same DCM.

## OPTIONAL FEATURES:

<b>AUDIO WARNING</b>	An extra optional Audio Monitoring System (AMS) can be connected to the DCM wiring circuit. This device would be incorporated to draw attention to the DCM status display in the event of a fault occurring.
<b>B.M.S MONITORING</b>	The Audio Monitor can be used to communicate with a Building Management System (BMS) or fire panel. A no volt contact (normally open) is provided for within the AMS in order to provide a fault indicator to the BMS.
<b>BATTERY BACK UP</b>	The DCM incorporates a connection for a battery back up option. An appropriate re-chargeable battery and enclosure is available from Lorient if required.

# TALKBACK SPECIFICATION



## ATG MODELS: LVN20S, LVH20S, LVH44S, LVV40S, LVHCTD, TALKBACK

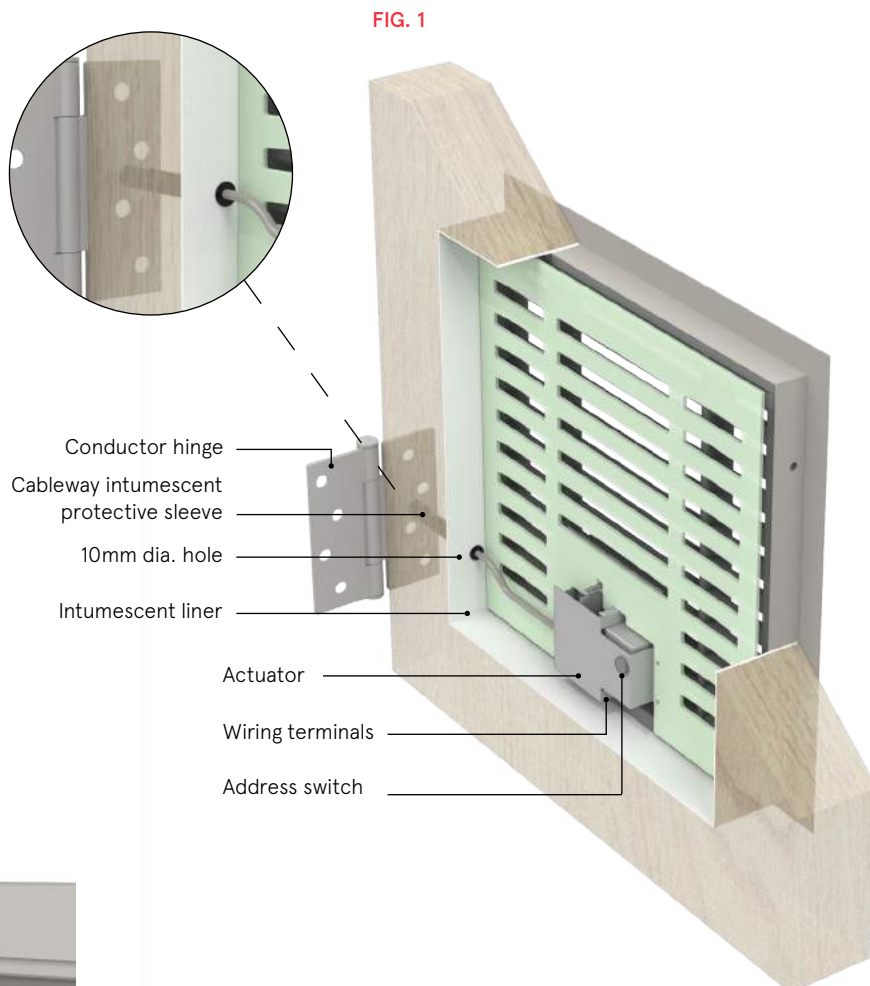
<b>TEST STANDARDS</b>	BS 476-31/31.1 BS 476-20/22 BS EN 1364-5 (LVV40S + LVH44S) AS 1530-4 (LVH20S) EN 58001-1:1992 EN 58002-1:1992 IEC 1010-1:1990, Amendment 1:1992 and Amendment 2:1995
<b>DESIGNATION</b>	Smoke control shutter system. Provides fire + smoke resistance in conjunction with intumescent air transfer grille.
<b>APPLICATION</b>	Door, wall + duct: Effective for cold smoke.
<b>SUPPLY VOLTAGE</b>	230 VAC 50/60 Hz
<b>OUTPUT VOLTAGE</b>	12.8 VDC
<b>INPUT TRIGGER FIRE PANEL</b>	24 VDC or No Volt Contact
<b>B.M.S TRIGGER</b>	No Volt Contact
<b>SHUTTER ACTUATOR CURRENT DRAW</b>	5mA per actuator in open position / 200mA on opening
<b>BATTERY BACKUP (OPTIONAL)</b>	Capacity 12 VDC 1.2 Ah
<b>CABLE RUNS</b>	Ring Circuit (Max 1 Circuit): 1.5mm <sup>2</sup> 3 core cable max 150m 2.5mm <sup>2</sup> 3 core cable max 250m Radial Circuit (Max 2 Circuits): 1.5mm <sup>2</sup> 3 core cable max 75m 2.5mm <sup>2</sup> 3 core cable max 125m
<b>DCM DIMENSIONS</b>	165 w x 155 h x 125 d mm
<b>BATTERY BACKUP DIMENSIONS</b>	160 w x 120 h x 72 d mm
<b>AMS DIMENSIONS</b>	105 w x 105 h x 55 d mm
<b>SMOKE SHUTTER DIMENSIONS</b>	Max size determined by air transfer grille choice and application. Various options covered under third party certification : Certifire CF564
<b>DCM CONNECTIONS</b>	Mains Supply: (+ve / -ve) Alarm Interface 1: 24V Normally On (+ve / -ve) Alarm Interface 2: 0 Volt Normally Closed (+ve / -ve) Supply/Signal 1: 12.8 VDC (+ve / -ve / Sig) Supply/Signal 2: 12.8 VDC (+ve / -ve / Sig) Battery Backup: (+ve / -ve)
<b>SYSTEM MONITORING</b>	Auto cycles each damper every 24hrs DCM displays damper status (Open/Closed/Fault or Not Connected) Communication between DCM & damper every 10s Fail Safe within 10s of signal loss Manual Test override for alarm simulation



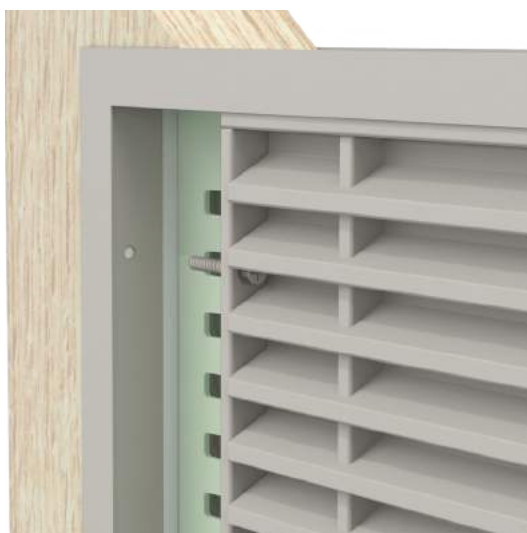
# TALKBACK APPLICATION: DOORS + PANELS

Door mounted smoke shutters are installed within an aperture at the centre of the thickness as shown in Fig. 1. These may be protected with pressed steel cover grilles fitted to both faces of the door.

Where fire resistance is required, a pair of louvered intumescent air transfer grilles is fitted within the aperture, one to either face of the shutter as shown in Fig. 2. In both cases wiring for the actuator is usually routed from the door leaf to the frame via a conductor hinge as shown in Fig. 3.



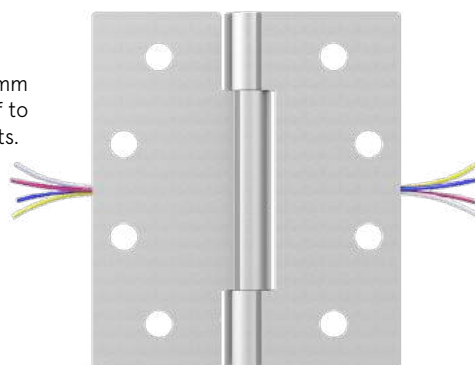
**FIG. 2**



Fixing screws pass through pre-drilled holes in the intumescent grille uprights and screwed through flange into door leaf.

**FIG. 3**

These positions to be marked with 6mm dia hole in the leaf to establish drill points.



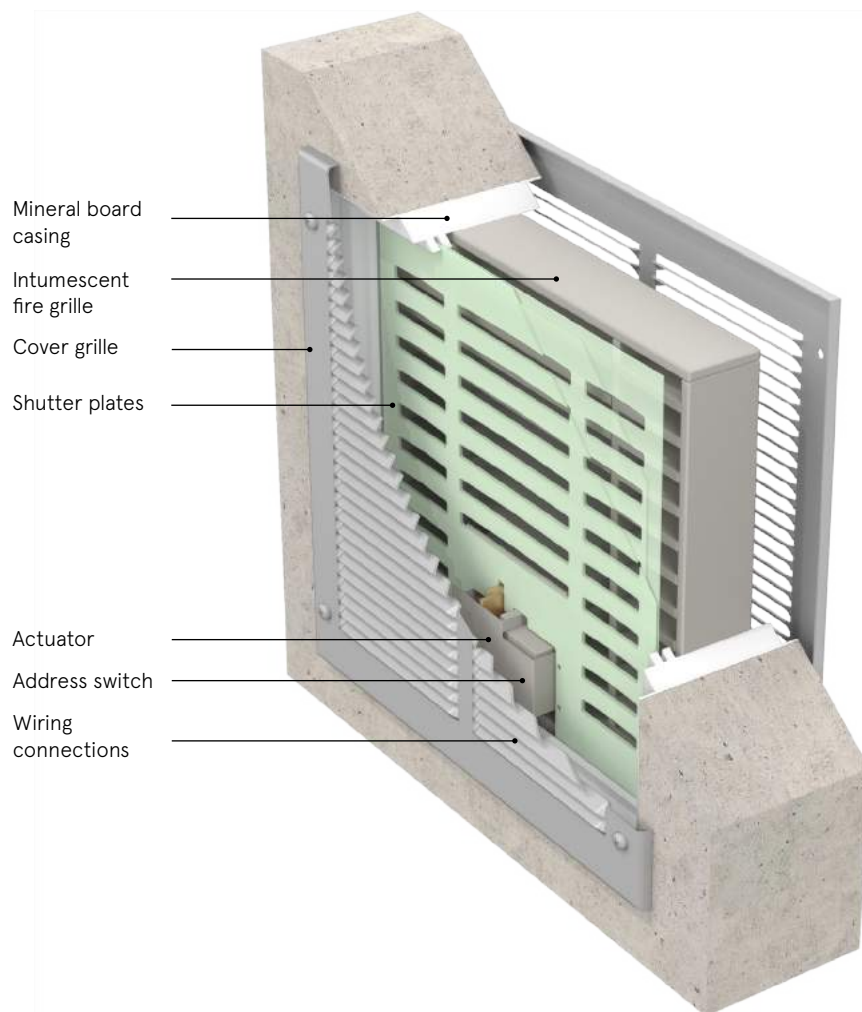
# TALKBACK APPLICATION: WALLS



Wall mounted air transfer grilles with fire + cold smoke containment should be installed with the fire grille as close to the centre of the wall thickness as possible. It is usual to protect the internal components with pressed steel cover grilles fixed to each face as shown in Fig. 4.

The period of fire integrity may be varied by using different types of Lorient fire grilles e.g. 60 minutes, 120 minutes etc. Where only smoke containment is required the fire grille can be omitted.

FIG. 4







# TALKBACK APPLICATION: DUCTS

The electrically driven shutter plates provide cold and warm smoke control and where fire resistance is required an intumescent air transfer grille such as a Lorient LVH54 is included in the assembly as shown below in Fig. 5.

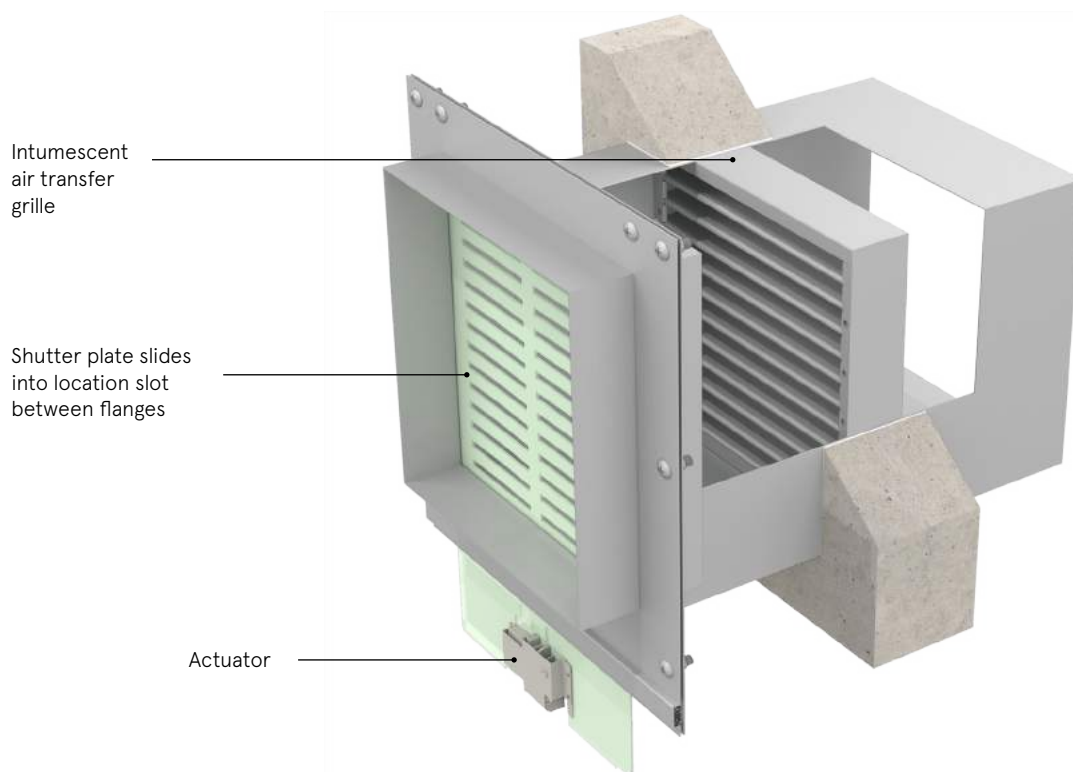
## Combined air transfer grille and ventilation duct damper system

In some installations it is desirable to have door mounted air transfer grilles and dampers mounted in ventilation ducts controlled by the same system, particularly where zone control is needed. Lorient air transfer grilles and duct mounted dampers can be controlled by a common "Damper Control & Monitor" (DCM) and if required may be interfaced with the Building Management System. It is also possible to control other manufacturer's mechanical dampers with a DCM using a Lorient interface device.

## General description "Talkback"

The "Talkback" system comprises a DCM and up to 16 uniquely addressed smoke control units. The interconnecting 3-core cable can be installed as a "ring" for greater reliability and maximum range, or for a limited number of damper/shutters they may be connected by spurs if necessary. The unique 2 way communication system between the DCM and the smoke control unit actuators facilitates rapid assessment of serviceability of the installation and immediately identifies the location of a defective damper.

FIG. 5







# COVER GRILLES + FIXINGS

Lorient cover grilles offer flexibility when considering aesthetics. They are available in a wide range of colours and finishes and are face fixed to walls or doors providing a cost-effective solution.

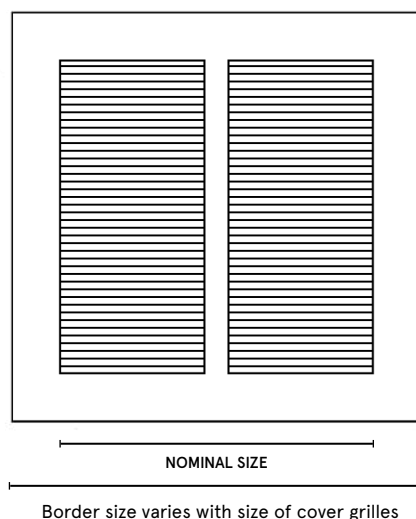


# STEEL COVER GRILLES (RVCG)

Lorient steel cover grilles are face fixed to doors, walls or end of ducts, offering an aesthetic appearance to the range of intumescent air transfer grilles. They are supplied with a powder coat finish and fixing screws as standard.



COVER GRILLES + FIXINGS



Mild steel grille

AIR TRANSFER GRILLE / COVER GRILLE SELECTOR (MM)

ATG NOMINAL SIZE	200 x 200	300 x 300	400 x 400
ATG ACTUAL SIZE	198 x 198	298 x 298	398 x 398
MAX APERTURE SIZE	205 x 205	305 x 305	405 x 405
	210 x 210	310 x 310	410 x 410
	Doors + 5mm Walls +10mm	Doors + 5mm Walls +10mm	Doors + 5mm Walls +10mm
COVER GRILLE OVERALL SIZE	251 x 251 (+51mm of actual size)	351 x 351 (+51mm of actual size)	451 x 451 (+51mm of actual size)

F + S AIR TRANSFER GRILLE / COVER GRILLE SELECTOR (MM)

ATG NOMINAL SIZE	200 x 200	300 x 300	400 x 400
ATG ACTUAL SIZE	240 x 240	340 x 340	440 x 440
MAX APERTURE SIZE	245 x 245	345 x 345	445 x 445
	250 x 250	350 x 350	450 x 450
	Doors + 5mm Walls +10mm	Doors + 5mm Walls +10mm	Doors + 5mm Walls +10mm
COVER GRILLE OVERALL SIZE	341 x 341 (+101mm of actual size)	441 x 441 (+101mm of actual size)	541 x 541 (+101mm of actual size)

## SYSTEM SPECIFICATIONS

### Construction

- Manufactured from 20swg mild steel with pre-set angled vanes at a 30° downward deflection and 8.5mm pitch. Vanes are horizontal and allow bi-directional airflow.

### Size

- Cover grilles can be supplied in a wide range of sizes to suit the intumescent air transfer grilles. Sizes from 100 x 100mm up to 600 x 600mm in 50mm increments, in either configuration, offer great flexibility when selecting grille sizes.
- Each cover grille is manufactured to the nominal aperture size + 51mm.

### Material

- Pressed steel and aluminium options available.

### Free area

- Typical free areas of steel cover grilles are:
  - 150 x 150mm: 67%
  - 200 x 200mm: 65%
  - 300 x 300mm: 69%
  - 450 x 450mm: 70%
  - 600 x 600mm: 70%
- Note: Will change the free air flow characteristics of the air transfer grille.

### Application

- Suitable for walls, doors or end of ducts.
- Weather louvre options available for external applications.
- Note: Not recommended for external wall applications or high levels of moisture. Please refer to weather louvres which can be supplied as alternatives.

### Finish

- Standard powder coat finishes are white and silver.
- Other colours to suit customer requirements are available. (Non-standard - charges and lead times apply).

### Fixing

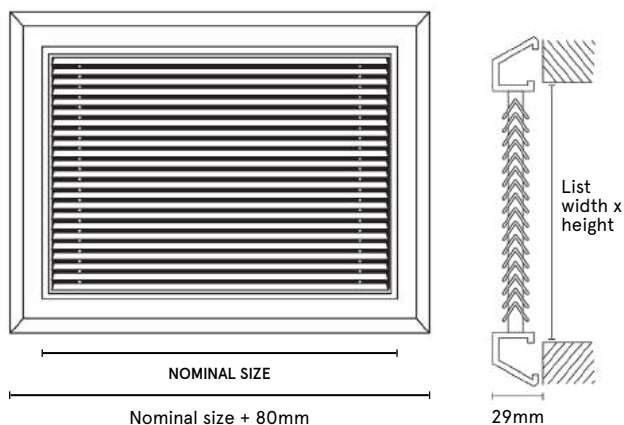
- Screw fixed. Supplied with fixing screws as standard.
- Max aperture size is the ATG actual size +10mm for walls and +5mm for doors.

### Use with

- LVV40, LVH44, LVV40S, LVH44 + LVH20S.

# ALUMINIUM COVER GRILLES (NV6)

Lorient Vision proof flanged grille suitable for surface mounting onto doors, wall or partitions. Especially useful for narrow doors or fireblock installations. The aluminium 'V' shape chevron blade mounted on a close 8mm pitch renders see through vision impossible.



Aluminium cover grille

COVER GRILLES + FIXINGS

## AIR TRANSFER GRILLE / COVER GRILLE SELECTOR (MM)

<b>ATG NOMINAL SIZE</b>	200 x 200	300 x 300	400 x 400
<b>ATG ACTUAL SIZE</b>	198 x 198	298 x 298	398 x 398
<b>MAX APERTURE SIZE</b>	205 x 205 Doors + 5mm Walls +10mm	305 x 305 Doors + 5mm Walls +10mm	405 x 405 Doors + 5mm Walls +10mm
<b>COVER GRILLE OVERALL SIZE</b>	280 x 280 (+80mm of actual size)	380 x 380 (+80mm of actual size)	480 x 480 (+80mm of actual size)

## F + S AIR TRANSFER GRILLE / COVER GRILLE SELECTOR (MM)

<b>ATG NOMINAL SIZE</b>	200 x 200	300 x 300	400 x 400
<b>ATG ACTUAL SIZE</b>	240 x 240	340 x 340	440 x 440
<b>MAX APERTURE SIZE</b>	245 x 245 Doors + 5mm Walls +10mm	345 x 345 Doors + 5mm Walls +10mm	445 x 445 Doors + 5mm Walls +10mm
<b>COVER GRILLE OVERALL SIZE</b>	400 x 400 (+160mm of actual size)	500 x 500 (+160mm of actual size)	600 x 600 (+160mm of actual size)

## SYSTEM SPECIFICATIONS

### Construction

- Manufactured from extruded aluminium. Vanes are horizontal and allow bi-directional airflow.

### Size

- Cover Grilles can be supplied in a wide range of sizes to suit the intumescent dampers. Sizes from 100 x 100mm up to 1200 x 1200mm in either configuration offer great flexibility when selecting grille sizes.
- Each cover grille is manufactured to the nominal aperture size + 80mm.

### Material

- Aluminium

### Free area

- Approx. 45%.
- Note: Will change the free air flow characteristics of the air transfer grille.

### Application

- Suitable for walls, doors or partitions.
- Weather louvre options available for external applications.
- Note: Not recommended for external wall applications or high levels of moisture. Please refer to weather louvres which can be supplied as alternatives.

### Fixing

- Flange screw fixing using self tapping screws provided.

### Finish

- Standard powder coat finishes are white and silver.
- Other colours to suit customer requirements are available. (Non-standard - charges and lead times apply).

### Use with

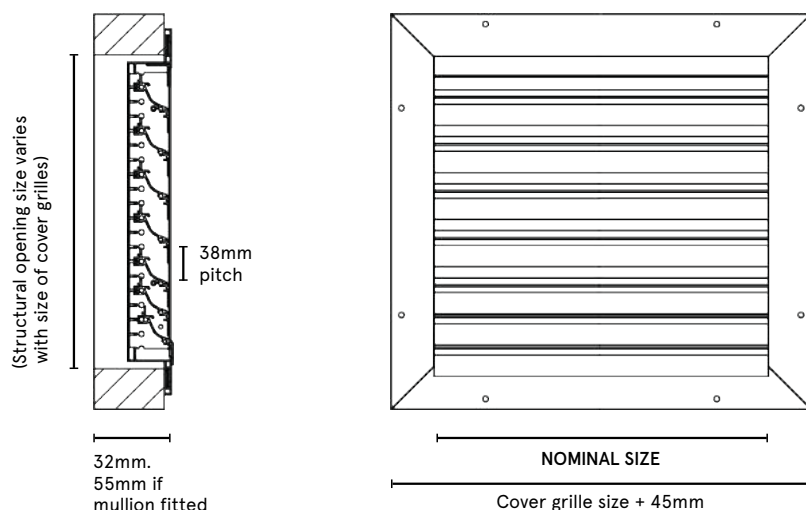
- LVV40, LVH44, LVV40S, LVH44 + LVH20S.

# WEATHER LOUVRES (WHF38)

The unique blade profiles utilised on the Lorient high performance louvre have been designed to offer maximum weather protection when spaced at louvre pitches of 38mm. Designed for small and medium scale louvre applications in exposed areas with high wind or rain.



COVER GRILLES + FIXINGS



## SYSTEM SPECIFICATIONS

### Construction

- ▶ Manufactured from extruded aluminium. Vanes are pre-set angled at a 30° downward deflection and allow bi-directional airflow.

### Size

- ▶ Available in a wide range of sizes from 200 x 200mm up to 1000 x 1000mm. Above this size units are supplied in multiple sections.

### Blade pitch

- ▶ 38mm.

### Material

- ▶ Aluminium.

### Free area

- ▶ Approx. 45%.
- ▶ Note: Will change the free air flow characteristics of the air transfer grille.

### Application

- ▶ Suitable for walls.
- ▶ For external applications.

### Fixing

- ▶ Flange screw fixing using pre-drilled countersunk fixing holes and screws. Flanges can be supplied un-drilled upon request.

### Finish

- ▶ White or silver as standard.

### Options

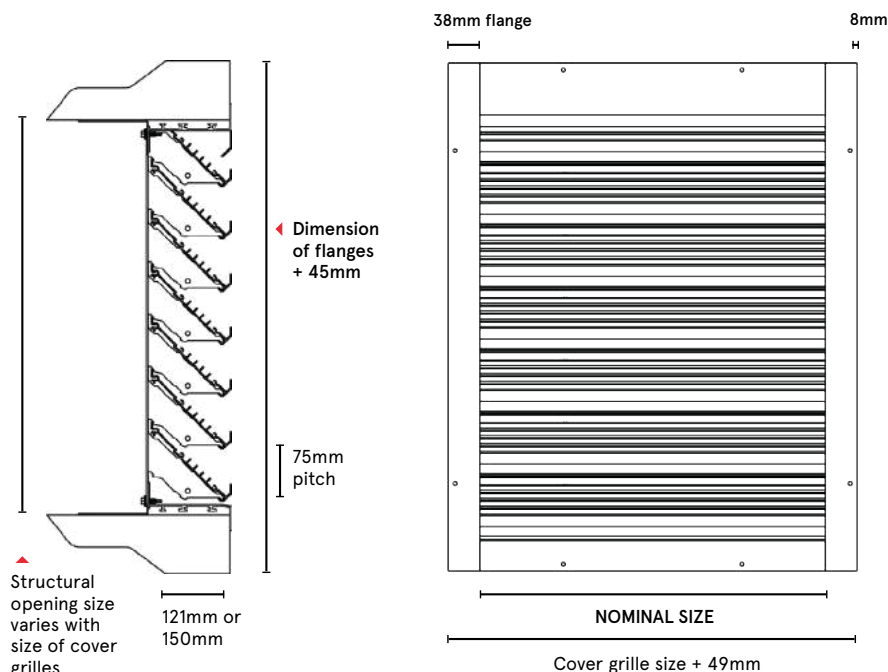
- ▶ Birdguard as standard.
- ▶ Insect screen (optional).

### Use with

- ▶ LVH44 + LVH50.

# WEATHER LOUVRES (WHF75)

The unique blade profiles utilised on the Lorient high performance louvre have been designed to offer maximum weather protection when spaced at louvre pitches of 75mm. Designed for medium to large scale louvre applications in exposed areas with high wind or rain.



## SYSTEM SPECIFICATIONS

### Construction

- ▶ Manufactured from extruded aluminium. Vanes are pre-set angled at a 30° downward deflection and allow bi-directional airflow.

### Size

- ▶ Available in a wide range of sizes from 300 x 300mm up to 1500 x 1800mm. Above this size units are supplied in multiple sections.

### Blade pitch

- ▶ 75mm.

### Material

- ▶ Aluminium.

### Free area

- ▶ Approx. 50%.
- ▶ Note: Will change the free air flow characteristics of the air transfer grille.

### Application

- ▶ Suitable for wall or window fitting.
- ▶ For external applications.

### Fixing

- ▶ Flange screw fixing using pre-drilled countersunk fixing holes and screws. Flanges can be supplied un-drilled upon request.

### Finish

- ▶ White or silver as standard.

### Options

- ▶ Birdguard as standard.
- ▶ Insect screen (optional).

### Use with

- ▶ LVH44 + LVH50.



# CE INTUMESCENT ACOUSTIC ACRYLIC SEALANT

Lorient CE Marked Intumescent Acoustic Acrylic Sealant designed to cover the Construction Products Regulation 2011 (CPR) requirement for linear gap seals and penetration seals.



When exposed to fire, it expands in volume to fill all cavities; providing a necessary hot smoke seal.

It's suitable for sealing gaps between fire resistant walls and floors, between conduits and walls/floors and between fire resistant walls and structural supports. Lorient Intumescent sealant is also recommended for sealing the perimeter of fire and smoke resistant air transfer grilles.



CE Intumescent Acoustic Acrylic Sealant

## SYSTEM SPECIFICATIONS

### Test evidence

- ▶ CE Marked.
- ▶ Fire: BS EN 1366-3:2004.
- ▶ Fire: BS EN 1366-4:2006.
- ▶ Fire: BS EN 13501-2:2016.
- ▶ Acoustic: BS EN ISO 10140-2:2010.
- ▶ Building Construction: BS EN ISO 8339:2005.
- ▶ Building Construction: BS EN ISO 9046:2004 for the types Z<sub>1</sub> + Z<sub>2</sub> use categories specified in ETAG 026-3.
- ▶ ETA 21/0975, ETA 21/0976, ETAG 026-2 + ETAG 026-3.

### Performance

- ▶ Provides effective acoustic containment.
- ▶ Can provide up to 240 minutes fire resistance.

### Applications

- ▶ Specially formulated for adhesion to a wide range of materials including: wood, metal, plastic, concrete, masonry and plasterboard materials.
- ▶ A linear gap seal for gaps in wall and floor constructions and as a linear joint seal where wall and floor constructions abut.
- ▶ A penetration seal around metallic pipes and electrical cables to reinstate the fire resistance performance of wall and floor constructions.
- ▶ Sealing the perimeter around fire and smoke resistant air transfer grilles in doors, walls, ducts floors and ceilings.

### Material

- ▶ Polymer content increased for improved flexibility - tolerates differential movement in everyday service.

### Availability

- ▶ Supplied in individual 310ml cartridges or in boxes of 25 units.

### Finish

- ▶ White as standard. Other colours available to special order

### Storage + cleaning

- ▶ Store in cool dry conditions between 5°C - 30°C. Do not allow to freeze.
- ▶ Water based - tools can be cleaned using soap and water.

# INTUMESCENT SEALANT

Lorient Intumescent Sealant is a versatile seal solution to fill gaps and movement joints; and for use where rigid seals are impractical.

When exposed to fire, it expands in volume to fill all cavities; providing a necessary hot smoke seal.

It's suitable for sealing gaps between fire resistant walls and floors, between conduits and walls/floors and between fire resistant walls and structural supports. Lorient Intumescent sealant is also recommended for sealing the perimeter of fire and smoke resistant damper/air transfer grilles.



Intumescent Sealant

COVER GRILLES + FIXINGS

## SYSTEM SPECIFICATIONS

### Test evidence

- ▶ Fire: BS 476-20:1987.

### Performance

- ▶ Provides effective acoustic containment.
- ▶ Can provide up to 240 minutes fire resistance.

### Material

- ▶ Polymer content increased for improved flexibility - tolerates differential movement in everyday service.

### Availability

- ▶ Supplied in individual 310ml cartridges or in boxes of 25 units.
- ▶ Also available in 600ml foils.

### Finish

- ▶ White, grey + brown as standard. Other colours available to special order.

### Applications

- ▶ Specially formulated for adhesion to a wide range of materials including: wood, metal, plastic, concrete, masonry and plasterboard materials.
- ▶ A linear gap seal for gaps in wall and floor constructions and as a linear joint seal where wall and floor constructions abut.
- ▶ A penetration seal around metallic pipes and electrical cables to reinstate the fire resistance performance of wall and floor constructions.
- ▶ Sealing the perimeter around fire and smoke resistant air transfer grilles in doors, walls, ducts floors and ceilings.

### Storage + cleaning

- ▶ Store in cool dry conditions between 5°C - 30°C. Do not allow to freeze.
- ▶ Water based - tools can be cleaned using soap and water.



# ACOUSTIC, AIRFLOW + PRESSURE LOSS

Knowing the pressure drop through an air transfer grille is a critical consideration when designing a new system or upgrading an existing layout. It is therefore critical that accurate information is available to the designer.

To ensure confidence when specifying Lorient air transfer grilles we have conducted extensive pressure and acoustic testing programs across our range of intumescent air transfer grilles.

The tests were conducted at the Noise Control Research Laboratories in Ireland to the following International Standards:

## ISO 5135:1999

Acoustics: Determination of sound power levels of noise from air-terminal devices, air terminal units, dampers and valves by measurement in a reverberation room.

## ISO 3741:2010

Acoustics: Determination of sound power levels of noise sources using sound pressure. Precision methods for reverberation rooms.

NCRL test report BF2001-SP 22/06/00 outlines the pressure loss and acoustic characteristics of Lorient LVH44 intumescent fire dampers. Test data has been summarised and presented in various nomograms to allow engineers to make accurate informed decisions that allow specification of the correct product at the optimum size.



Images: NCRL Acoustic and pressure loss test



# AIR TRANSFER GRILLES: NOMOGRAM

## Guide on how to use the Lorient Nomogram Tool

TABLE 1

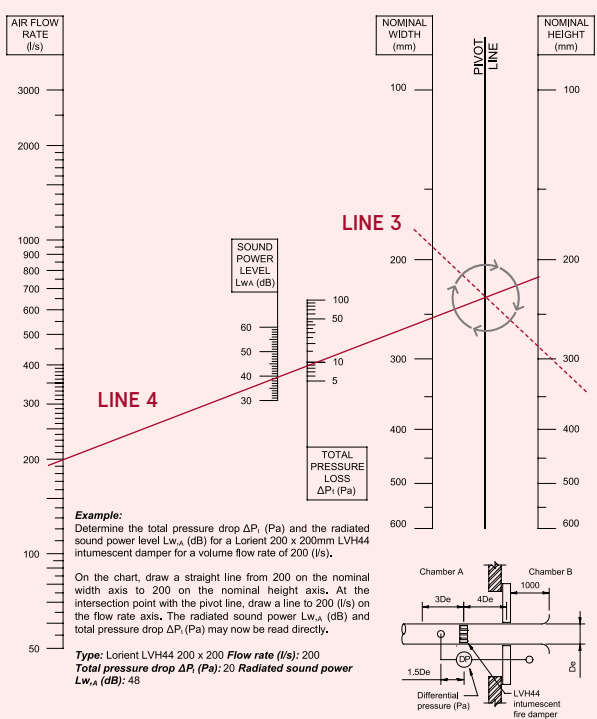
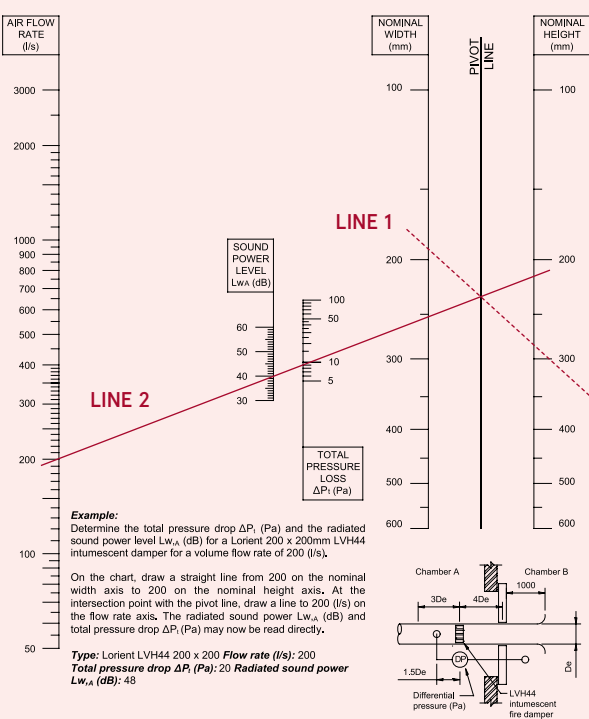
Obtaining pressure loss and acoustic information for a Lorient intumescent air transfer grille of a known size

Draw a line to connect the width and height dimensions of the air transfer grille (Line 1).  
Select the desired system airflow rate value and connect this to the point where Line 1 intersects the Pivot Line (Line 2). Pressure loss and acoustic sound power levels can now be read off the two scales.

TABLE 2

Selecting an appropriate size Lorient intumescent air transfer grille when system pressure drops and airflow rates are known

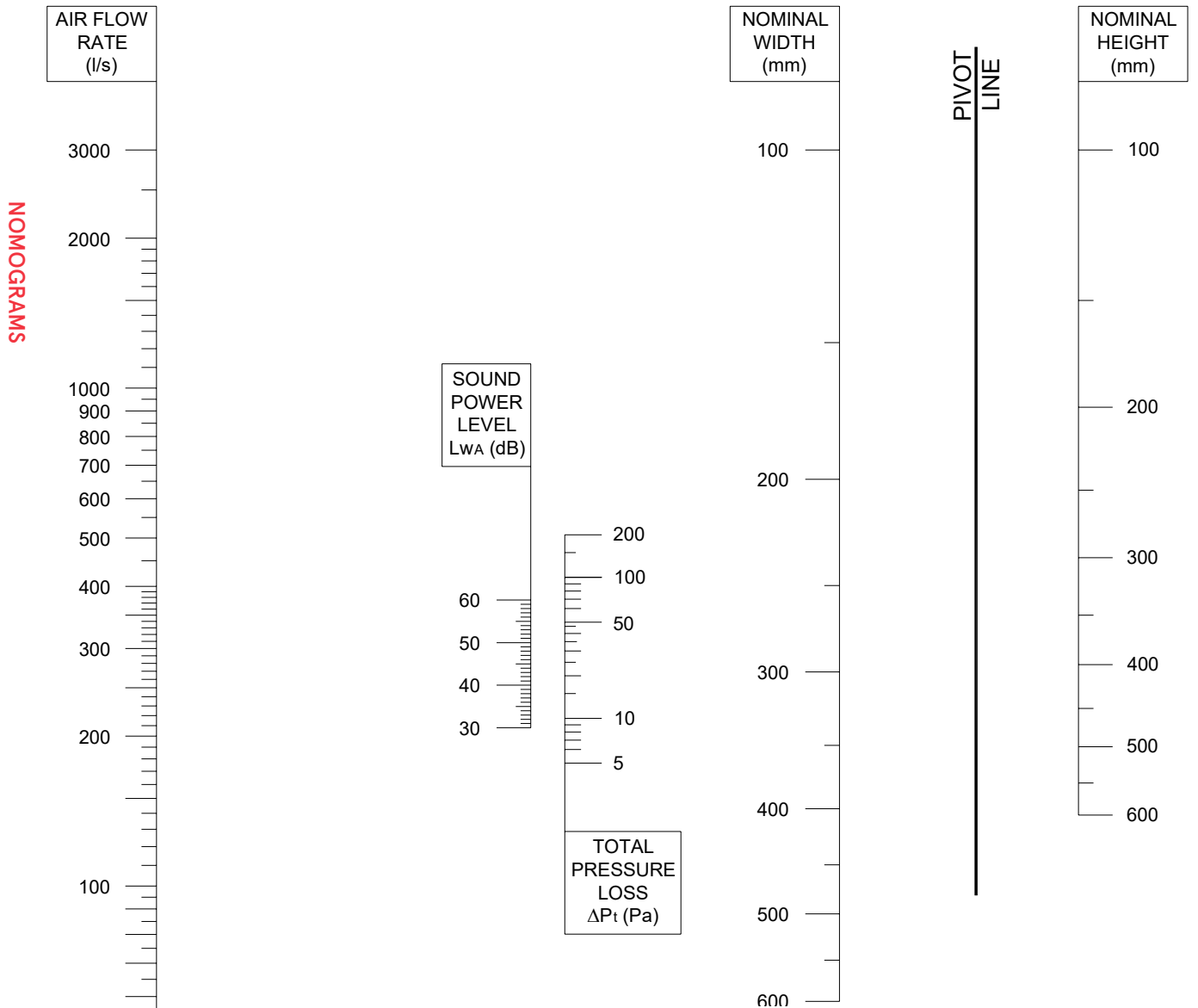
Draw a line between the known flow rate and pressure loss values and extend this to the pivot line (Line 3).  
A line can now be drawn through this pivot line intersection (Line 4) and rotated to choose an appropriate air transfer grille height and width.



► **Note:** Nomogram information based on Lorient sponsored test: NCRL report BF2001-SP 22/06/00

# LVV40 NOMOGRAM FOR WALL/DOOR MOUNTED APPLICATIONS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a wall/door mounted application with a Lorient Polyproducts LVV40 intumescent air transfer grille fitted with cover grilles.



## Example:

Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{w,A}$  (dB) for a Lorient 200 x 200 LVV40 intumescent damper for a volume flow rate of 150 (l/s).

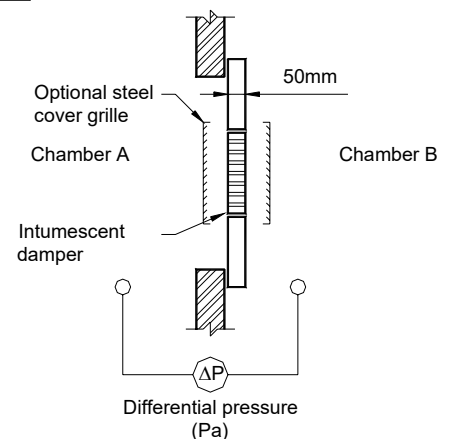
On the chart, draw a straight line from 200 on the nominal width axis to 200 on the nominal height axis. At the intersection point with the pivot line, draw a line to 150 (l/s) on the flow rate axis. The radiated sound power  $L_{w,A}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVV40 200 x 200

**Flow rate (l/s):** 150

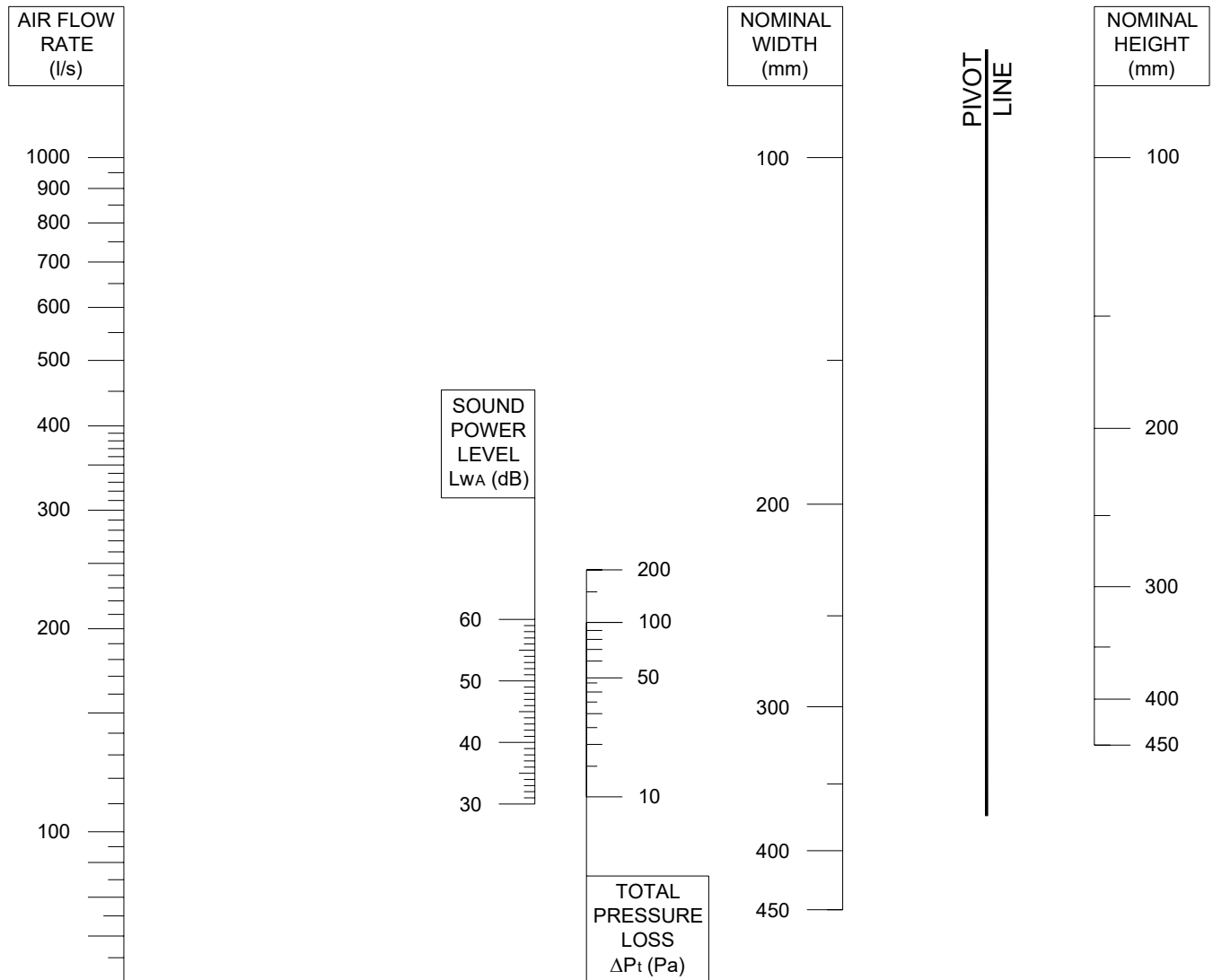
**Total pressure drop  $\Delta P_t$  (Pa):** 52

**Radiated sound power  $L_{w,A}$  (dB):** 52



# LVN20 NOMOGRAM FOR WALL/DOOR MOUNTED APPLICATIONS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a wall/door mounted application with a Lorient Polyproducts LVN20 intumescent air transfer grille fitted with no cover grilles.



## Example:

Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{w,A}$  (dB) for a Lorient 200 x 200 LVN20 intumescent damper for a volume flow rate of 50 (l/s).

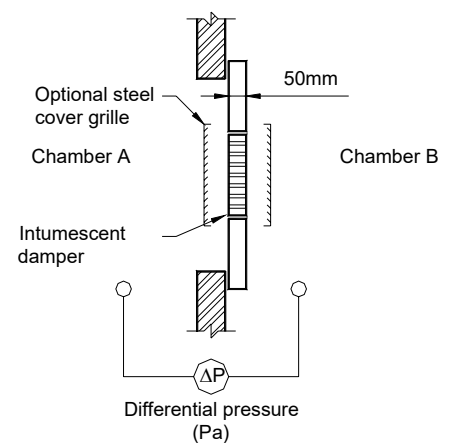
On the chart, draw a straight line from 200 on the nominal width axis to 200 on the nominal height axis. At the intersection point with the pivot line, draw a line to 50 (l/s) on the flow rate axis. The radiated sound power  $L_{w,A}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVN20 200 x 200

**Flow rate (l/s):** 50

**Total pressure drop  $\Delta P_t$  (Pa):** 15

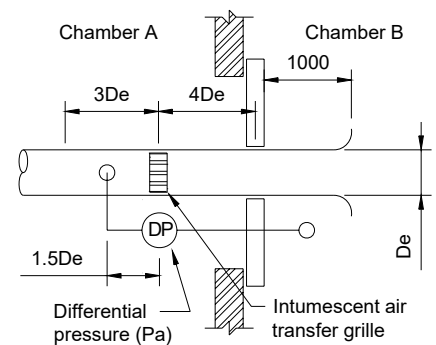
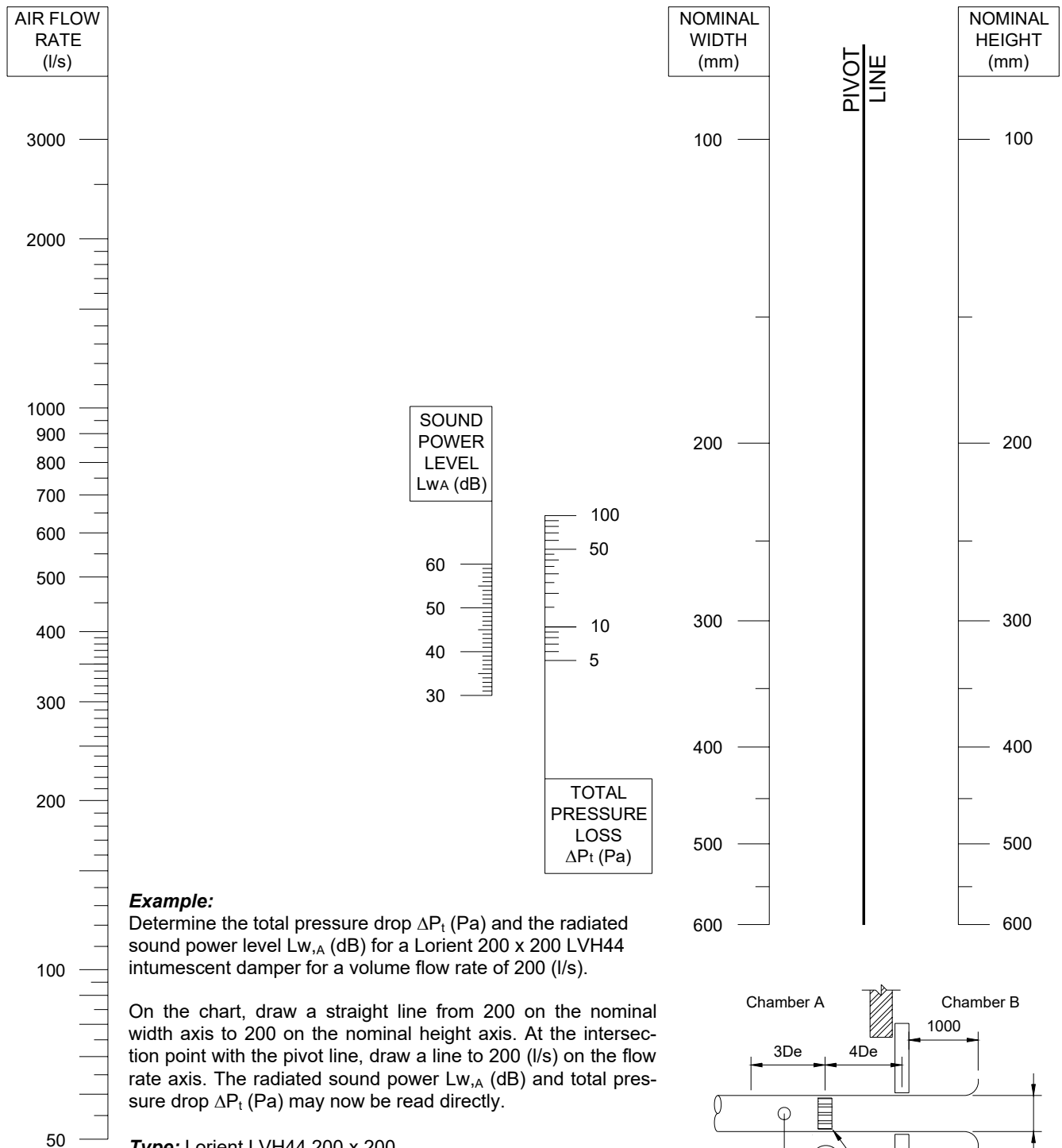
**Radiated sound power  $L_{w,A}$  (dB):** 37





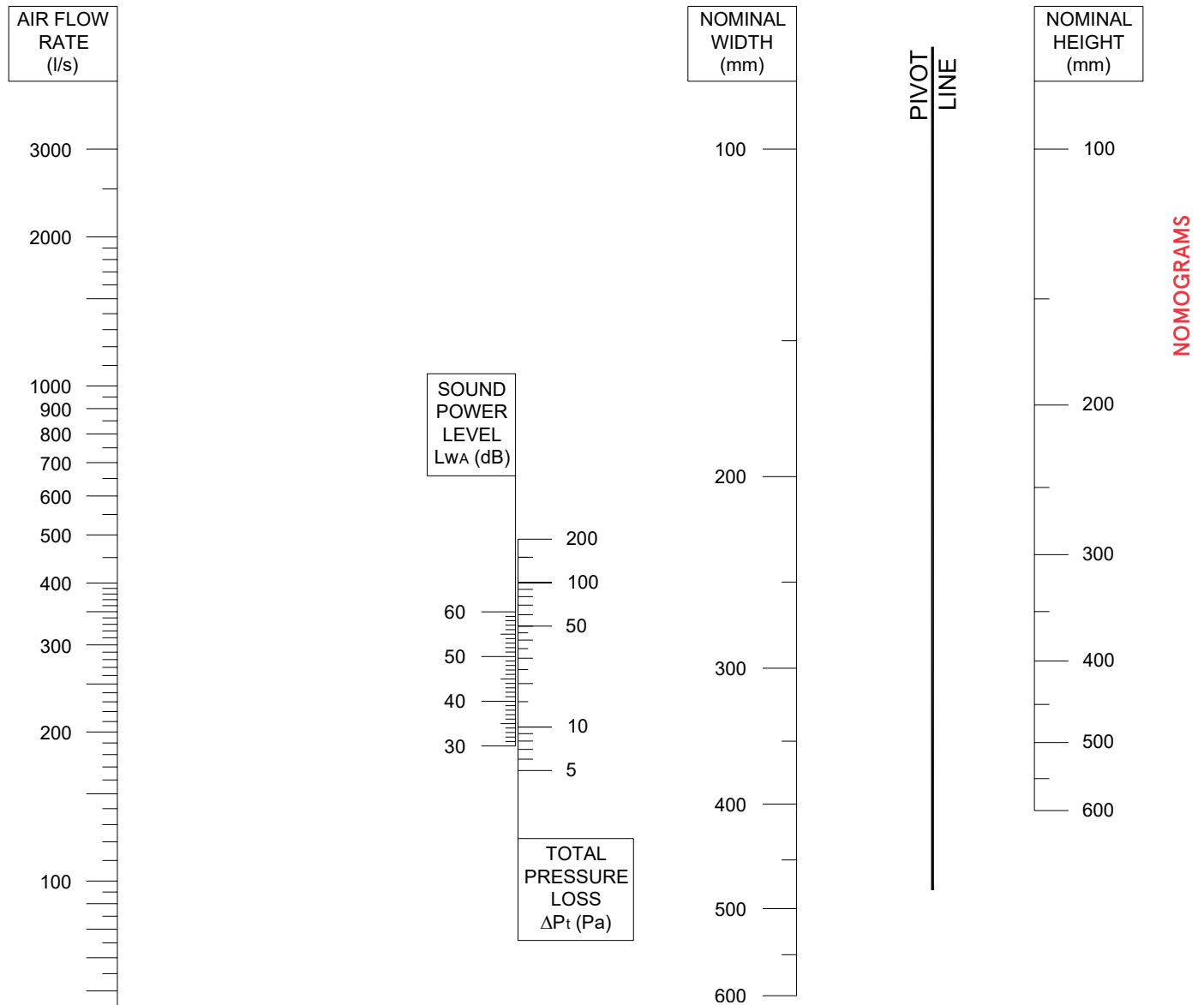
# LVH44 NOMOGRAM FOR RECTANGULAR DUCTS

- **Performance Criteria:** The acoustic + aerodynamic performance is based on a duct mounted application with a Lorient Polyproducts LVH44 intumescent air transfer grille installed within a rectangular duct.



# LVH44 NOMOGRAM FOR WALL/DOOR MOUNTED APPLICATIONS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a wall/door mounted application with a Lorient Polyproducts LVH44 intumescent air transfer grille fitted with cover grilles.



## Example:

Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{w,A}$  (dB) for a Lorient 200 x 200 LVH44 intumescent damper for a volume flow rate of 100 (l/s).

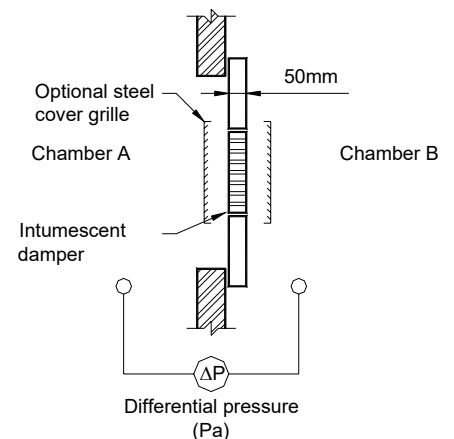
On the chart, draw a straight line from 200 on the nominal width axis to 200 on the nominal height axis. At the intersection point with the pivot line, draw a line to 100 (l/s) on the flow rate axis. The radiated sound power  $L_{w,A}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVH44 200 x 200

**Flow rate (l/s):** 100

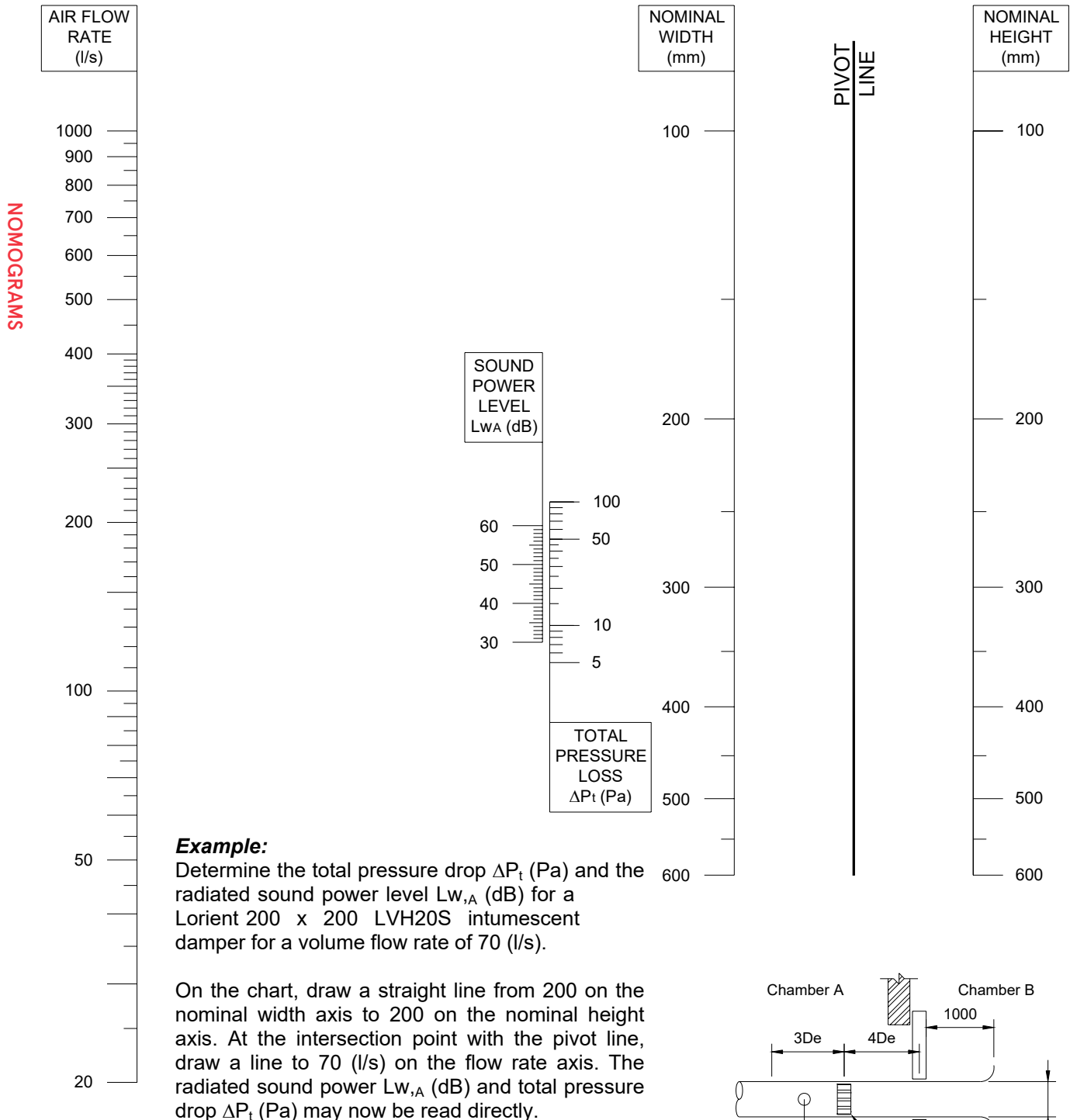
**Total pressure drop  $\Delta P_t$  (Pa):** 28

**Radiated sound power  $L_{w,A}$  (dB):** 48



# LVH20S NOMOGRAM FOR RECTANGULAR DUCTS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a duct mounted application with a Lorient Polyproducts LVH20S fire + smoke rated intumescent air transfer grille installed within a rectangular duct.

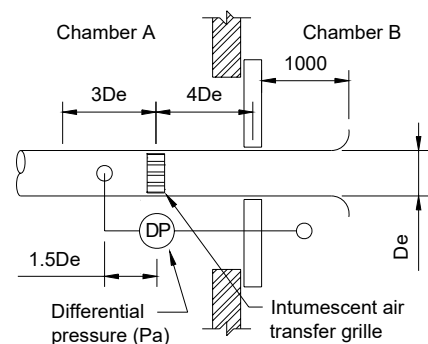


**Type:** Lorient LVH20S 200 x 200

**Flow rate (l/s):** 70

**Total pressure drop  $\Delta P_t$  (Pa):** 27

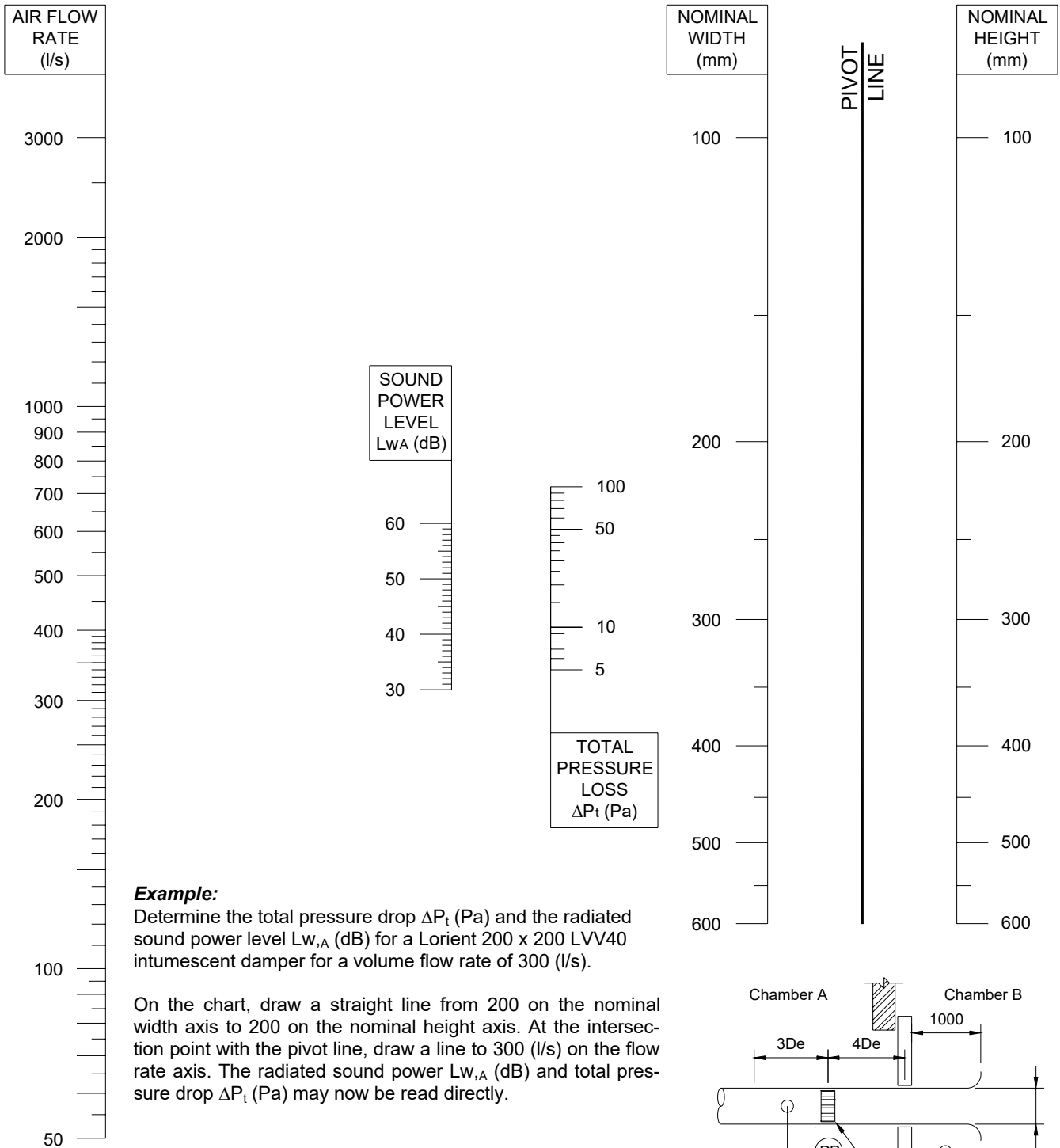
**Radiated sound power  $L_{w,A}$  (dB):** 47



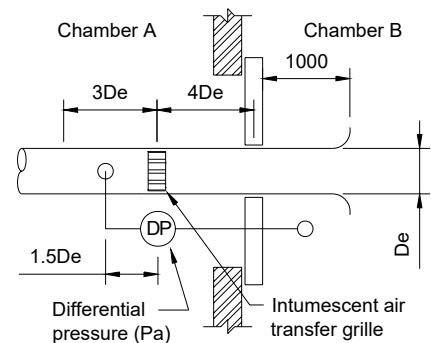


# LVV40 NOMOGRAM FOR RECTANGULAR DUCTS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a duct mounted application with a Lorient Polyproducts LVV40 intumescent air transfer grille installed within a rectangular duct.



**Type:** Lorient LVV40 200 x 200  
**Flow rate (l/s):** 300  
**Total pressure drop  $\Delta P_t$  (Pa):** 35  
**Radiated sound power  $L_{wA}$  (dB):** 49

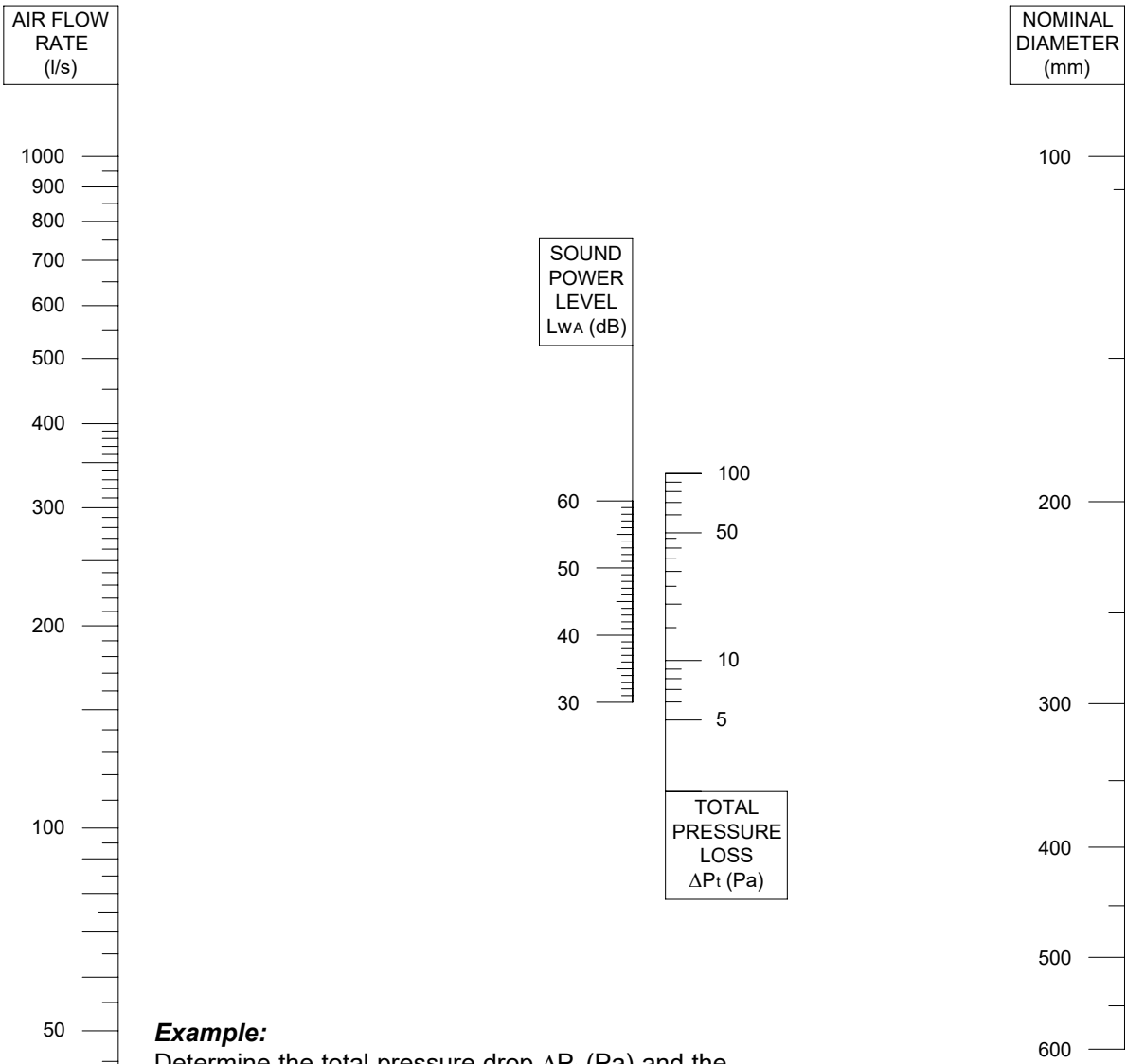


NOMOGRAMS



# LVC40 NOMOGRAM FOR CYLINDRICAL DUCTS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a duct mounted application with a Lorient Polyproducts LVC40 intumescent air transfer grille installed within a cylindrical duct.

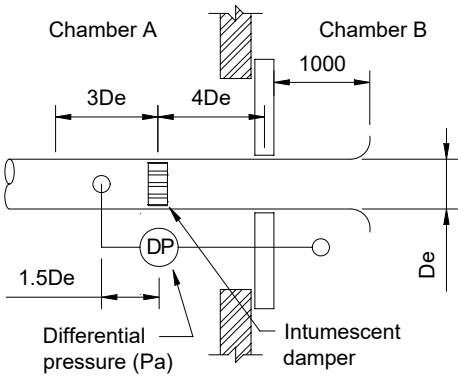


**Example:**

Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{w,A}$  (dB) for a Lorient 250 Ø LVC40 intumescent damper for a volume flow rate of 300 (l/s).

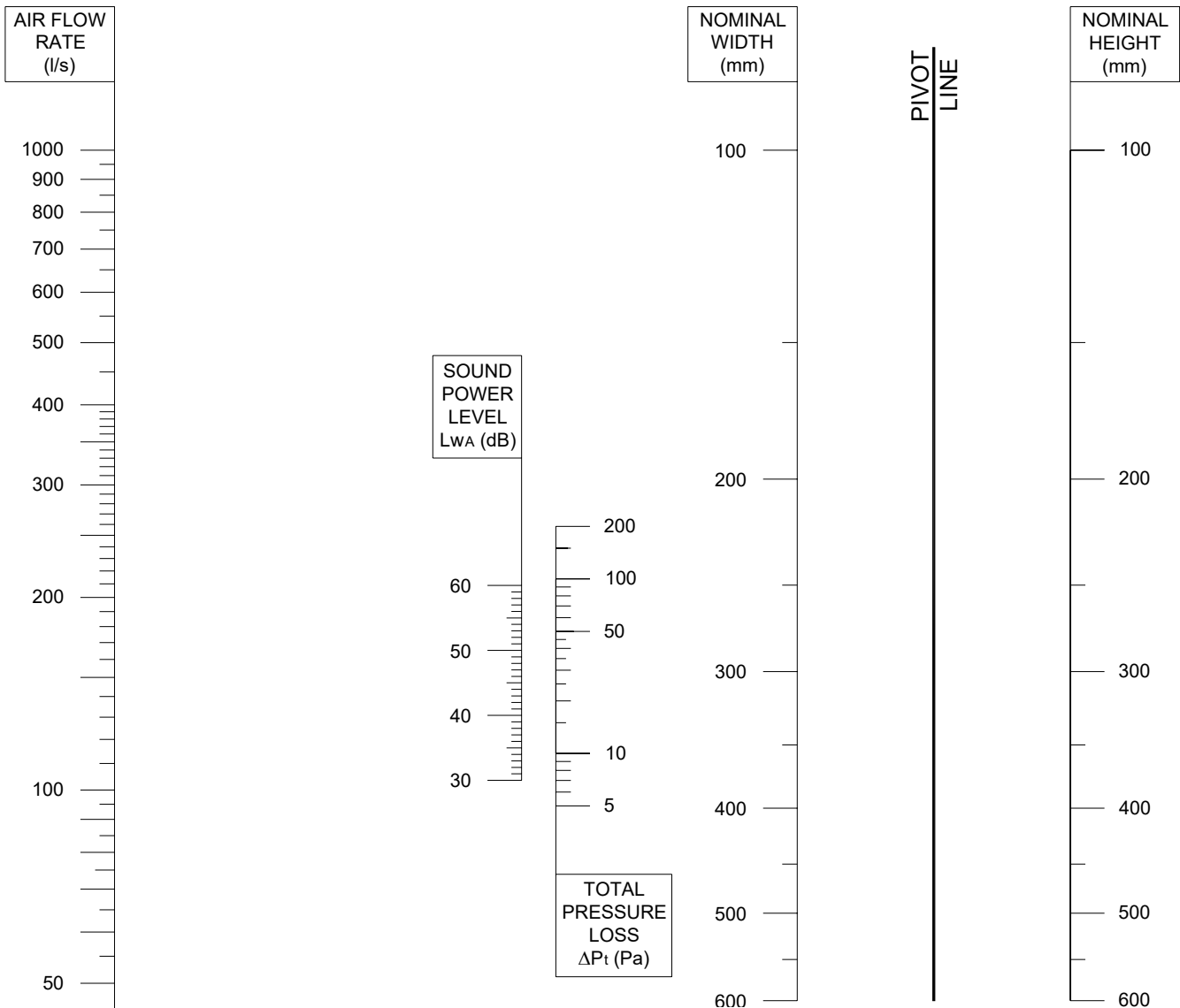
On the chart, draw a straight line from 250 Ø on the nominal diameter axis to 300 (l/s) on the flow rate axis. The radiated sound power  $L_{w,A}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVC40 250 Ø  
**Flow rate (l/s):** 300  
**Total pressure drop  $\Delta P_t$  (Pa):** 33  
**Radiated sound power  $L_{w,A}$  (dB):** 51



# LVH20S NOMOGRAM FOR WALL/DOOR MOUNTED APPLICATIONS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a wall/door mounted application with a Lorient Polyproducts LVH20S fire + smoke rated intumescent air transfer grille fitted with cover grilles.



## Example:

Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{w,A}$  (dB) for a Lorient 200 x 200 LVH20S intumescent damper for a volume flow rate of 80 (l/s).

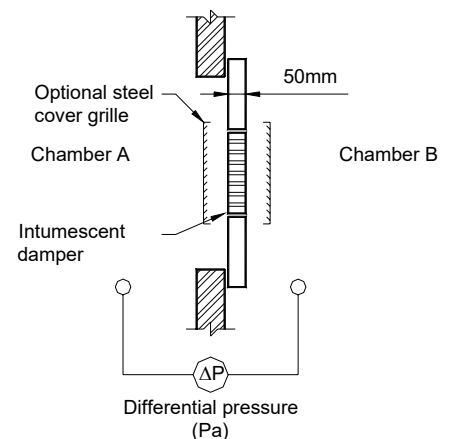
On the chart, draw a straight line from 200 on the nominal width axis to 200 on the nominal height axis. At the intersection point with the pivot line, draw a line to 80 (l/s) on the flow rate axis. The radiated sound power  $L_{w,A}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVH20S 200 x 200

**Flow rate (l/s):** 80

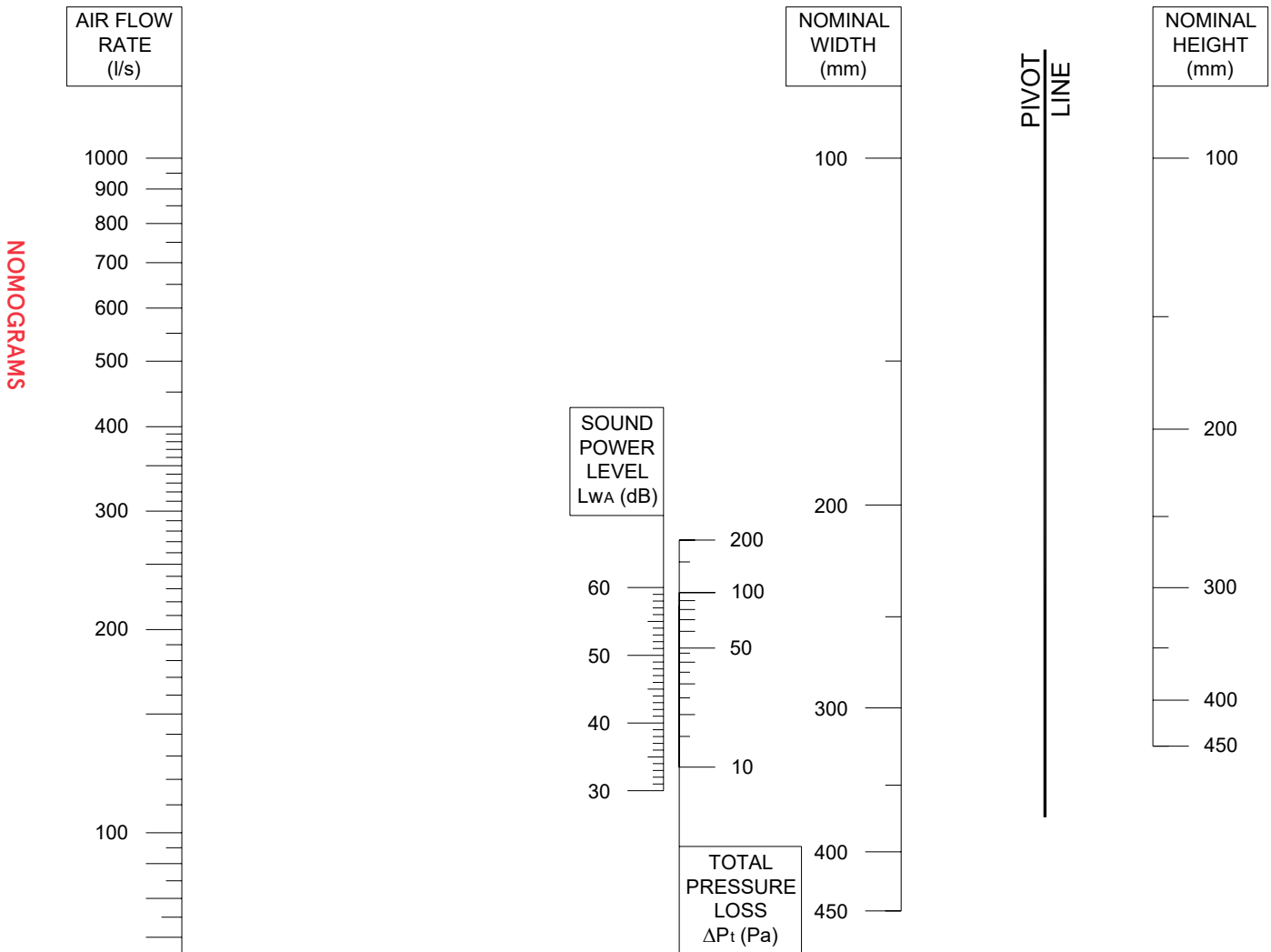
**Total pressure drop  $\Delta P_t$  (Pa):** 40

**Radiated sound power  $L_{w,A}$  (dB):** 48



# LVN20S NOMOGRAM FOR DOOR MOUNTED APPLICATIONS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a wall/door mounted application with a Lorient Polyproducts LVN20S fire + smoke rated intumescent air transfer grille fitted with no cover grilles.



## Example:

Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{wA}$  (dB) for a Lorient 200 x 200 LVN20S intumescent damper for a volume flow rate of 60 (l/s).

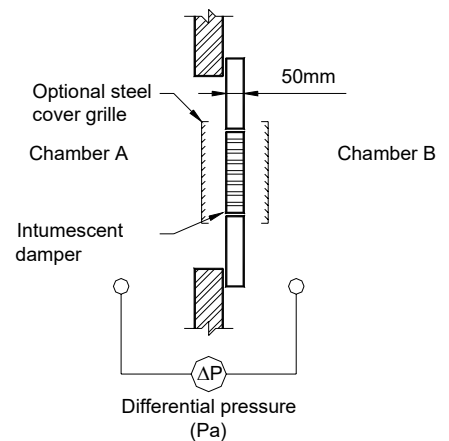
On the chart, draw a straight line from 200 on the nominal width axis to 200 on the nominal height axis. At the intersection point with the pivot line, draw a line to 60 (l/s) on the flow rate axis. The radiated sound power  $L_{wA}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVN20S 200 x 200

**Flow rate (l/s):** 60

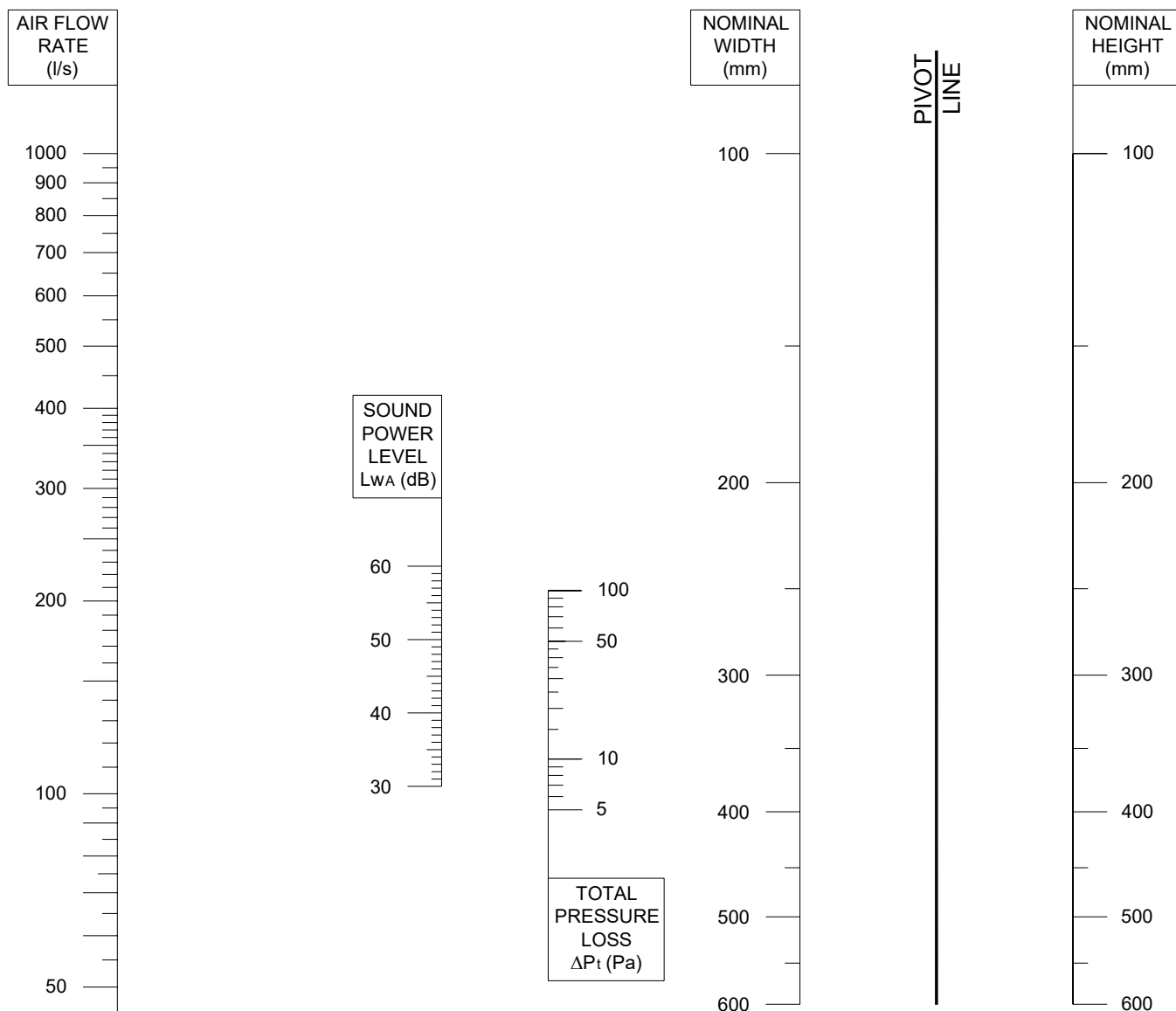
**Total pressure drop  $\Delta P_t$  (Pa):** 42

**Radiated sound power  $L_{wA}$  (dB):** 45



# LVV40S NOMOGRAM FOR WALL MOUNTED APPLICATIONS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a wall mounted application with a Lorient Polyproducts LVV40S fire + smoke rated intumescent air transfer grille fitted with cover grilles.



## Example:

Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{w,A}$  (dB) for a Lorient 200 x 200 LVV40S intumescent damper for a volume flow rate of 60 (l/s).

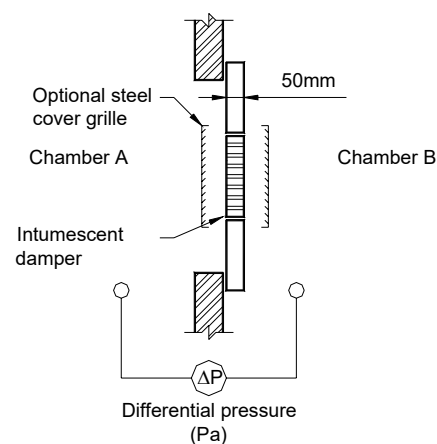
On the chart, draw a straight line from 200 on the nominal width axis to 200 on the nominal height axis. At the intersection point with the pivot line, draw a line to 60 (l/s) on the flow rate axis. The radiated sound power  $L_{w,A}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVV40S 200 x 200

**Flow rate (l/s):** 60

**Total pressure drop  $\Delta P_t$  (Pa):** 23

**Radiated sound power  $L_{w,A}$  (dB):** 34

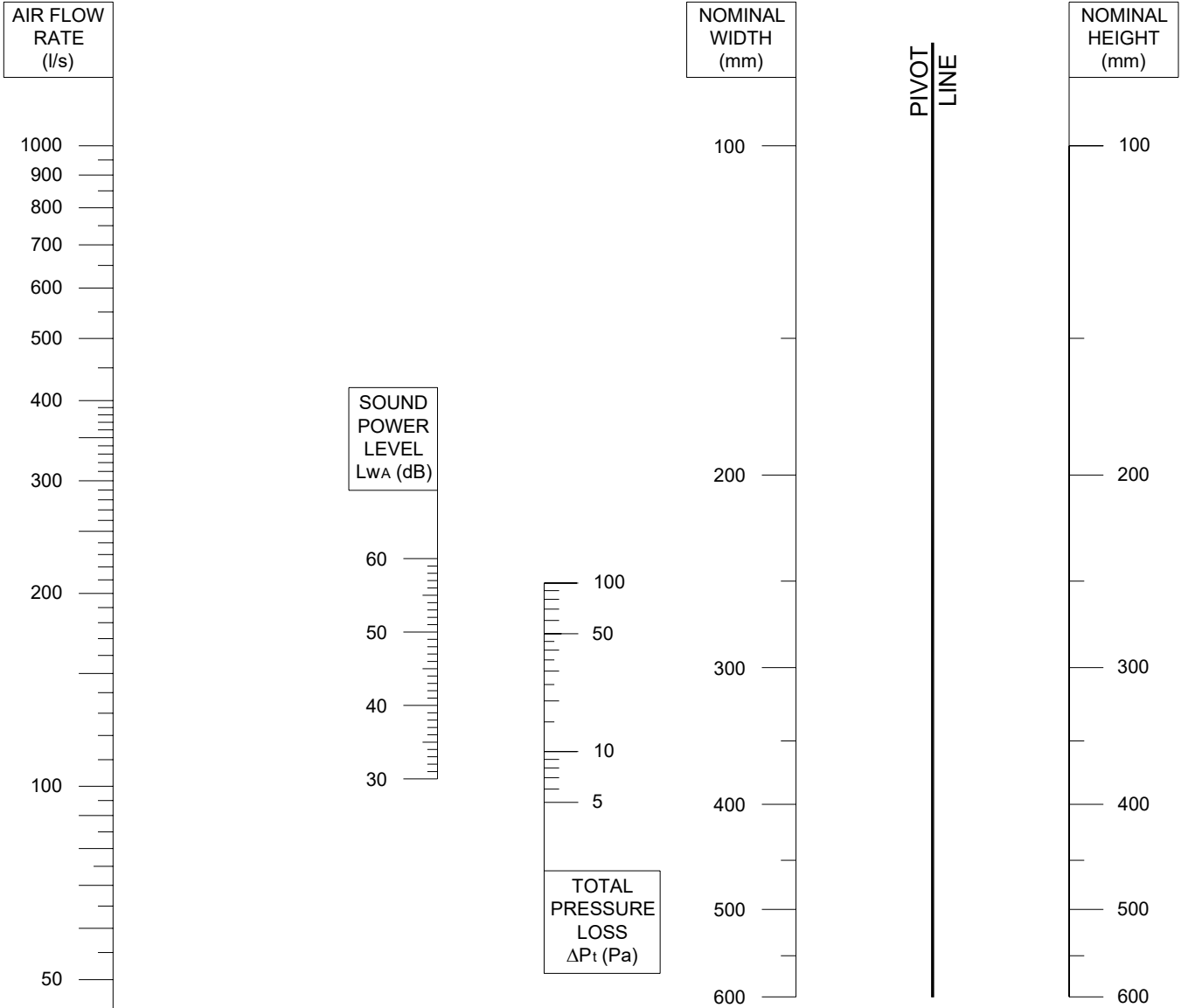




# LVH44S NOMOGRAM FOR WALL MOUNTED APPLICATIONS

► **Performance Criteria:** The acoustic + aerodynamic performance is based on a wall mounted application with a Lorient Polyproducts LVH44S fire + smoke rated intumescent air transfer grille fitted with cover grilles.

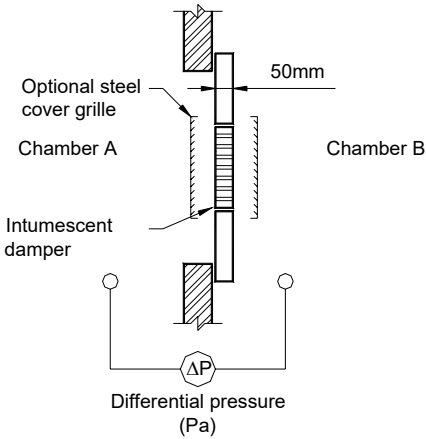
NOMOGRAMS



**Example:**  
Determine the total pressure drop  $\Delta P_t$  (Pa) and the radiated sound power level  $L_{w,A}$  (dB) for a Lorient 200 x 200 LVH44S intumescent damper for a volume flow rate of 60 (l/s).

On the chart, draw a straight line from 200 on the nominal width axis to 200 on the nominal height axis. At the intersection point with the pivot line, draw a line to 60 (l/s) on the flow rate axis. The radiated sound power  $L_{w,A}$  (dB) and total pressure drop  $\Delta P_t$  (Pa) may now be read directly.

**Type:** Lorient LVH44S 200 x 200  
**Flow rate (l/s):** 60  
**Total pressure drop  $\Delta P_t$  (Pa):** 23  
**Radiated sound power  $L_{w,A}$  (dB):** 34



# FREE AREA

## CHARACTERISTICS

'Free Area' is the area within an aperture unobstructed by the components of an air transfer grille product when in the normal or open position through which air is free to flow.

Its size can be given in square metres, square centimetres, square millimetres, square feet or square inches.

The sketch shows a typical air transfer grille fitted in a door where the aperture size is indicated by the heavy line i.e. W x H. The shaded area represents the components of the grille and the non-shaded area within the aperture is the 'free area'.

As can be seen the free area equals the aperture area minus the shaded area and is often expressed as a percentage of the area of the aperture.

i.e. FREE AREA =

$$\frac{\text{unshaded area}}{\text{width} \times \text{height of aperture}}$$

### Example

If the overall dimensions of the grille are 0.298 metre by 0.298 metre this gives an area of 0.08804 square metres. If the components of the grille are each 6mm thick then the free area (un-shaded) will be found from:

$$\frac{(298 - (16 \times 6)) \times (298 - (4 \times 6))}{1000 \quad 1000}$$

= **0.0553 sq.meters**

Divide the shaded area by the aperture area to give the percentage of free area:

$$0.0553 / 0.298 \times 0.298 \times 100$$

= **62.33%**

### Air Velocity

Is the speed of passage of air and is usually measured in metres per second or in imperial terms in feet per second.

An indication of velocities can be gauged by noting that 2 metres per second is approximately equivalent to 7.2 kilometres per hour or 4.5 miles per hour (a brisk walking pace).

### Volumetric Flow

Is the volume of air movement in a specific time and is usually given in cubic metres per hour or litres per second. Volumetric flow through a damper is calculated by multiplying the free area of the product by the velocity of the air passing through it.

### Example

The free area 0.0553 sq. metres from the previous example shown in figure one multiplied by preferred velocity of **2.0 metres per second** gives a **volumetric flow** of:

$$0.0553 \times 2.0 = 0.1106 \text{ cubic metres per second or } 398.16 \text{ cubic metres per hour.}$$

### Pressure Differential

In order to create air movement through any ventilation system it is necessary to create a pressure differential from one end of the system to the other. Though this can be achieved by natural phenomena in the building such as "stack effect" it is more usual to incorporate motor driven fans.

The pressure differential created reduces as the distance from the fan increases due to frictional losses along the route, e.g. Duct walls. The differential will be further reduced when the air stream meets a partial obstruction such as a damper.

Loss of pressure differential means that the volumetric airflow will also be reduced. It is therefore important to make allowances for the pressure losses that will be encountered when dampers or any other products that cause a degree of obstruction to the airflow are incorporated in the system.

To assist in these calculations each Lorient air transfer product has been tested to measure the pressure losses

incurred through a range of pressure differentials and velocities. Values can be selected from the differential pressure charts provided in this publication.

Air pressure differentials in the UK and Europe are usually given in Pascals (Pa).

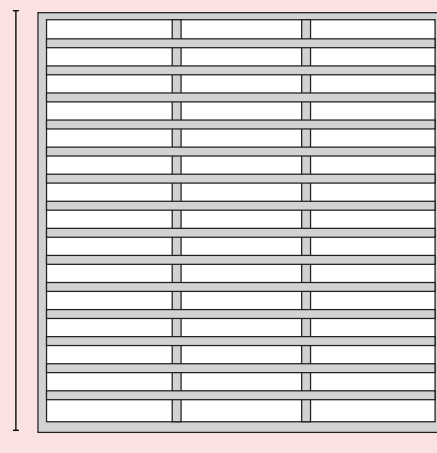


Fig. 1



### Air Changes

The number of air changes that are required within a room in a given period so that the air quality can be maintained at an acceptable level when the room is used for its intended purpose.

The following are general recommendations to maintain satisfactory air quality within certain locations:

- ▶ Boiler house or plant room: **15 – 30**
- ▶ Hospital operating theatres: **15 – 17**
- ▶ Canteens: **8 – 12**
- ▶ Lavatories and toilets: **6 – 7**
- ▶ Hospital general rooms and wards: **6**
- ▶ Offices: **4 – 6**
- ▶ Factories and Laundries (subject to special regulations): **more than 4.**

### Example of Air Volume Calculation:

In order to establish the volume of air required per hour for a particular room the room volume should be multiplied by the number of changes needed per hour.

A hospital ward measuring 10 metres x 6 metres x 3.2 metres high and needing 6 air changes per hour requires:

$10 \times 6 \times 3.2 \times 6 = 1152$  cubic metres of air supply per hour.

It is worth noting that if the air change is induced by extraction at the above rate "make up" air must

be introduced into the room at the same rate. In most cases it is necessary to provide fire and smoke protection along both the "supply air" and the "extract air" routes.

### Example of Calculation of Air Transfer Grille Requirements:

It has been decided that air will be extracted from the above ward through ducting and the supply air will be introduced through air transfer grilles mounted in the 2 doors that give access to the ward. If one grille is to be used per door then the volumetric flow needed will be:  $1152/2 = 576$  cubic metres per hour. Given that the free area of the relevant grille type is 62% and the velocity is 2.0 metres per second, then the area of the grille can be calculated:

$$\frac{576 \times 100}{2.0 \times 60 \times 60 \times 62} = 0.129\text{m}^2$$

This gives a theoretical grille size of 0.36 x 0.36 metres.

### Selection of Appropriate Air Transfer Grille

Having calculated the theoretical grille size, select the next standard size above (i.e. from the example 400mm x 400mm) then check the acoustic and pressure drop charts to confirm acceptable performance values.

### Useful Conversion Data

#### Pressure:

1 Pascal (Pa) = 1 Newton / per m<sup>2</sup>

1 Bar = 105 N/ m<sup>2</sup> = 0.1 mega Pascals = 14.7 pounds per square inch

**Note:** A Newton is that force which, applied to a mass of one kilogram, gives it an acceleration of one metre per second per second.

1 N = 1 kg m/s<sup>2</sup>

#### Length:

One foot = 305 mm or 30.5 cm

#### Area:

One square foot = 930 cm<sup>2</sup>

#### Volume:

1 metre<sup>3</sup> = 1000 litres or 1000 000 cm<sup>3</sup> = 35 feet<sup>3</sup> or 60700 inch<sup>3</sup>.



Images: LVH44 air transfer grille

# FREE AREA

# CHARACTERISTICS

LVV40	MM	CM	M	% FREE AREA
100 X 100	4,650mm <sup>2</sup>	46.5cm <sup>2</sup>	0.00465m <sup>2</sup>	46.50%
150 X 150	12,555mm <sup>2</sup>	125.7cm <sup>2</sup>	0.0125m <sup>2</sup>	55.80%
200 X 200	23,280mm <sup>2</sup>	233cm <sup>2</sup>	0.0233m <sup>2</sup>	58.20%
250 X 250	38,250mm <sup>2</sup>	383cm <sup>2</sup>	0.0383m <sup>2</sup>	61.20%
300 X 300	54,180mm <sup>2</sup>	542cm <sup>2</sup>	0.0542m <sup>2</sup>	60.20%
350 X 350	75,636mm <sup>2</sup>	756cm <sup>2</sup>	0.0756m <sup>2</sup>	61.74%
400 X 400	97,600mm <sup>2</sup>	977cm <sup>2</sup>	0.0976m <sup>2</sup>	61%
450 X 450	128,790mm <sup>2</sup>	1,288cm <sup>2</sup>	0.128m <sup>2</sup>	63.60%
500 X 500	155,500mm <sup>2</sup>	1,554cm <sup>2</sup>	0.155m <sup>2</sup>	62.20%
550 X 550	192,280mm <sup>2</sup>	1,922cm <sup>2</sup>	0.192m <sup>2</sup>	64%
600 X 150	53,998mm <sup>2</sup>	539cm <sup>2</sup>	0.0539m <sup>2</sup>	59.90%
600 X 500	189,400mm <sup>2</sup>	1,894cm <sup>2</sup>	0.189m <sup>2</sup>	63.13%
600 X 600	227,520mm <sup>2</sup>	2,278cm <sup>2</sup>	0.227m <sup>2</sup>	63.20%



LVC40 SIZE	MM	CM	M	% FREE AREA
LVC 100Ø	2,868mm <sup>2</sup>	28.7cm <sup>2</sup>	0.0028m <sup>2</sup>	38.03%
LVC 150Ø	8,185mm <sup>2</sup>	81cm <sup>2</sup>	0.0081m <sup>2</sup>	47.58%
LVC 200Ø	15,550mm <sup>2</sup>	155.5cm <sup>2</sup>	0.0155m <sup>2</sup>	55.25%
LVC 250Ø	26,389mm <sup>2</sup>	263cm <sup>2</sup>	0.0263m <sup>2</sup>	53.75%
LVC 300Ø	41,765mm <sup>2</sup>	417.6cm <sup>2</sup>	0.0417m <sup>2</sup>	59.88%
LVC 350Ø	48,923mm <sup>2</sup>	489cm <sup>2</sup>	0.048m <sup>2</sup>	50.85%
LVC 400Ø	75,241mm <sup>2</sup>	752.4cm <sup>2</sup>	0.0752m <sup>2</sup>	60.47%
LVC 450Ø	77,412mm <sup>2</sup>	774cm <sup>2</sup>	0.0774m <sup>2</sup>	48.50%
LVC 500Ø	107,054mm <sup>2</sup>	1,070.5cm <sup>2</sup>	0.1070m <sup>2</sup>	54.96%
LVC 550Ø	120,537mm <sup>2</sup>	1,205cm <sup>2</sup>	0.1205m <sup>2</sup>	50.73%
LVC 600Ø	147,671mm <sup>2</sup>	1,476.7cm <sup>2</sup>	0.1476m <sup>2</sup>	64.50%



LVH44	MM	CM	M	% FREE AREA
100 X 100	4,240mm <sup>2</sup>	42.4cm <sup>2</sup>	0.00424m <sup>2</sup>	42.40%
150 X 150	10,800mm <sup>2</sup>	108cm <sup>2</sup>	0.0108m <sup>2</sup>	48%
200 X 200	22,520mm <sup>2</sup>	225.5cm <sup>2</sup>	0.0225m <sup>2</sup>	56.30%
250 X 250	35,438mm <sup>2</sup>	354cm <sup>2</sup>	0.0354m <sup>2</sup>	56.70%
300 X 300	54,900mm <sup>2</sup>	549.8cm <sup>2</sup>	0.0549m <sup>2</sup>	61%
350 X 350	73,872mm <sup>2</sup>	738cm <sup>2</sup>	0.073m <sup>2</sup>	61%
400 X 400	98,240mm <sup>2</sup>	982.3cm <sup>2</sup>	0.09824m <sup>2</sup>	61.40%
450 X 450	121,095mm <sup>2</sup>	1,211cm <sup>2</sup>	0.121m <sup>2</sup>	59.80%
500 X 500	157,750mm <sup>2</sup>	1,578cm <sup>2</sup>	0.157m <sup>2</sup>	63.10%
550 X 550	188,416mm <sup>2</sup>	1,884cm <sup>2</sup>	0.1884m <sup>2</sup>	62.28%
600 X 600	231,660mm <sup>2</sup>	2,316cm <sup>2</sup>	0.231m <sup>2</sup>	64.35%



LVH50	MM	CM	M	% FREE AREA
100 X 100	4,240mm <sup>2</sup>	42.4cm <sup>2</sup>	0.00424m <sup>2</sup>	42.40%
150 X 150	10,800mm <sup>2</sup>	108cm <sup>2</sup>	0.0108m <sup>2</sup>	48%
200 X 200	22,520mm <sup>2</sup>	225.5cm <sup>2</sup>	0.0225m <sup>2</sup>	56.30%
250 X 250	35,438mm <sup>2</sup>	354cm <sup>2</sup>	0.0354m <sup>2</sup>	56.70%
300 X 300	54,900mm <sup>2</sup>	549.8cm <sup>2</sup>	0.0549m <sup>2</sup>	61%
350 X 350	73,872mm <sup>2</sup>	738cm <sup>2</sup>	0.73m <sup>2</sup>	61%
400 X 400	98,240mm <sup>2</sup>	982.3cm <sup>2</sup>	0.09824m <sup>2</sup>	61.40%
450 X 450	121,095mm <sup>2</sup>	1,211cm <sup>2</sup>	0.121m <sup>2</sup>	59.80%
500 X 500	157,750mm <sup>2</sup>	1,578cm <sup>2</sup>	0.157m <sup>2</sup>	63.10%
550 X 550	188,416mm <sup>2</sup>	1,884cm <sup>2</sup>	0.1884m <sup>2</sup>	62.28%
600 X 600	231,660mm <sup>2</sup>	2,316cm <sup>2</sup>	0.231m <sup>2</sup>	64.35%



LVH54	MM	CM	M	% FREE AREA
100 X 100	4,240mm <sup>2</sup>	42.4cm <sup>2</sup>	0.00424m <sup>2</sup>	42.40%
150 X 150	10,800mm <sup>2</sup>	108cm <sup>2</sup>	0.0108m <sup>2</sup>	48%
200 X 200	22,520mm <sup>2</sup>	225.5cm <sup>2</sup>	0.0225m <sup>2</sup>	56.30%
250 X 250	35,438mm <sup>2</sup>	354cm <sup>2</sup>	0.0354m <sup>2</sup>	56.70%
300 X 300	54,900mm <sup>2</sup>	549.8cm <sup>2</sup>	0.0549m <sup>2</sup>	61%
350 X 350	73,872mm <sup>2</sup>	738cm <sup>2</sup>	0.073m <sup>2</sup>	61%
400 X 400	98,240mm <sup>2</sup>	982.3cm <sup>2</sup>	0.09824m <sup>2</sup>	61.40%
450 X 450	121,095mm <sup>2</sup>	1,211cm <sup>2</sup>	0.121m <sup>2</sup>	59.80%
500 X 500	157,750mm <sup>2</sup>	1,578cm <sup>2</sup>	0.157m <sup>2</sup>	63.10%
550 X 550	188,416mm <sup>2</sup>	1,884cm <sup>2</sup>	0.1884m <sup>2</sup>	62.28%
600 X 600	231,660mm <sup>2</sup>	2,316cm <sup>2</sup>	0.231m <sup>2</sup>	64.35%



LVH44C	MM	CM	M	% FREE AREA
LVHC 98Ø	2,967mm <sup>2</sup>	29.6cm <sup>2</sup>	0.0029m <sup>2</sup>	39.34%
LVHC 148Ø	8,527mm <sup>2</sup>	85.2cm <sup>2</sup>	0.0085m <sup>2</sup>	52.36%
LVHC 200Ø	16,766.2mm <sup>2</sup>	167cm <sup>2</sup>	0.0167m <sup>2</sup>	53.36%
LVHC 248Ø	27,532mm <sup>2</sup>	275.3cm <sup>2</sup>	0.0275m <sup>2</sup>	56.9%
LVHC 300Ø	14,388mm <sup>2</sup>	143cm <sup>2</sup>	0.0143m <sup>2</sup>	**
LVHC 350Ø	55,732mm <sup>2</sup>	557cm <sup>2</sup>	0.00557m <sup>2</sup>	58.59%
LVHC 400Ø	mm <sup>2</sup>	cm <sup>2</sup>	m <sup>2</sup>	
LVHC 450Ø	74,520mm <sup>2</sup>	745cm <sup>2</sup>	0.00745m <sup>2</sup>	47.27%
LVHC 498Ø	97,876mm <sup>2</sup>	978.7cm <sup>2</sup>	0.0978m <sup>2</sup>	50.25%



COVER GRILLES	MM	CM	M	% FREE AREA
100 X 100	6,300mm <sup>2</sup>	63cm <sup>2</sup>	0.0063m <sup>2</sup>	63%
150 X 150	15,187mm <sup>2</sup>	152cm <sup>2</sup>	0.0152m <sup>2</sup>	67.50%
200 X 200	26,200mm <sup>2</sup>	262cm <sup>2</sup>	0.0262m <sup>2</sup>	65.50%
250 X 250	42,375mm <sup>2</sup>	424cm <sup>2</sup>	0.0424m <sup>2</sup>	67.80%
300 X 300	62,550mm <sup>2</sup>	626cm <sup>2</sup>	0.0625m <sup>2</sup>	69.50%
400 X 400	103,040mm <sup>2</sup>	1,031cm <sup>2</sup>	0.103m <sup>2</sup>	64.4%
450 X 450	142,155mm <sup>2</sup>	1,422cm <sup>2</sup>	0.142m <sup>2</sup>	70.20%
500 X 500	172,500mm <sup>2</sup>	1,726cm <sup>2</sup>	0.172m <sup>2</sup>	69%
600 X 600	253,800mm <sup>2</sup>	2,539cm <sup>2</sup>	0.254m <sup>2</sup>	70.50%



# FREE AREA

## CHARACTERISTICS

LVN20 SIZE	MM	CM	M	% FREE AREA
200 X 200	10,666mm <sup>2</sup>	106.6cm <sup>2</sup>	0.0106m <sup>2</sup>	27.20%
250 X 250	16,387mm <sup>2</sup>	163cm <sup>2</sup>	0.0163m <sup>2</sup>	26.22%
300 X 300	26,446mm <sup>2</sup>	264.4cm <sup>2</sup>	0.02644m <sup>2</sup>	29.78%
350 X 350	3,3811mm <sup>2</sup>	338cm <sup>2</sup>	0.0338m <sup>2</sup>	27.60%
400 X 400	50,911mm <sup>2</sup>	509.1cm <sup>2</sup>	0.0509m <sup>2</sup>	32.14%
450 X 450	63,266mm <sup>2</sup>	632cm <sup>2</sup>	0.0632m <sup>2</sup>	21.24%
500 X 500	8,527mm <sup>2</sup>	769.5cm <sup>2</sup>	0.0769m <sup>2</sup>	31.02%
550 X 550	90,169mm <sup>2</sup>	901cm <sup>2</sup>	0.09m <sup>2</sup>	29.80%
600 X 600	126,392mm <sup>2</sup>	1,263cm <sup>2</sup>	0.126m <sup>2</sup>	35.10%



LVN25 SIZE	MM	CM	M	% FREE AREA
200 X 200	12,512mm <sup>2</sup>	125.1cm <sup>2</sup>	0.0125m <sup>2</sup>	31.9%
300 X 300	31,013mm <sup>2</sup>	310.1cm <sup>2</sup>	0.0310m <sup>2</sup>	34.92%
450 X 450	73,962mm <sup>2</sup>	739cm <sup>2</sup>	0.0739m <sup>2</sup>	36.50%
600 X 600	130,416mm <sup>2</sup>	1,304.1cm <sup>2</sup>	0.1304m <sup>2</sup>	36.46%



TALKBACK F+S DAMPERS	MM	CM	M	% FREE AREA
200 X 200	8,240mm <sup>2</sup>	82.4cm <sup>2</sup>	0.0082m <sup>2</sup>	20.6%
250 X 250	15,437mm <sup>2</sup>	154.3cm <sup>2</sup>	0.0154m <sup>2</sup>	24.7%
300 X 300	26,640mm <sup>2</sup>	266.4cm <sup>2</sup>	0.0266m <sup>2</sup>	29.6%
350 X 350	37,975mm <sup>2</sup>	379.7cm <sup>2</sup>	0.0379m <sup>2</sup>	31.0%
400 X 400	50,880mm <sup>2</sup>	508.8cm <sup>2</sup>	0.0508m <sup>2</sup>	31.8%
450 X 450	69,862mm <sup>2</sup>	692.5cm <sup>2</sup>	0.0692m <sup>2</sup>	34.2%
500 X 500	86,250mm <sup>2</sup>	862.5cm <sup>2</sup>	0.0862m <sup>2</sup>	34.5%
600 X 600	133,200mm <sup>2</sup>	1,332cm <sup>2</sup>	0.1332m <sup>2</sup>	37.0%



LVN20S	MM	CM	M	% FREE AREA
150 X 150	2,590mm <sup>2</sup>	25.9cm <sup>2</sup>	0.0025m <sup>2</sup>	11.8%
200 X 200	8,089mm <sup>2</sup>	80.8cm <sup>2</sup>	0.0080m <sup>2</sup>	20.6%
250 X 250	14,059mm <sup>2</sup>	140.5cm <sup>2</sup>	0.0140m <sup>2</sup>	22.8%
300 X 300	25,024mm <sup>2</sup>	250.2cm <sup>2</sup>	0.0250m <sup>2</sup>	28.1%
350 X 350	37,440mm <sup>2</sup>	374.4cm <sup>2</sup>	0.0374m <sup>2</sup>	30.9%
400 X 400	49,234mm <sup>2</sup>	492.3cm <sup>2</sup>	0.0492m <sup>2</sup>	31.8%
450 X 450	64,985mm <sup>2</sup>	649.8cm <sup>2</sup>	0.0649m <sup>2</sup>	32.3%
500 X 500	76,844mm <sup>2</sup>	768.4cm <sup>2</sup>	0.0768m <sup>2</sup>	30.9%
550 X 550	90,386mm <sup>2</sup>	903.8cm <sup>2</sup>	0.0903m <sup>2</sup>	30%
600 X 600	130,416mm <sup>2</sup>	1,304.1cm <sup>2</sup>	0.1304m <sup>2</sup>	36.4%



LVN25S	MM	CM	M	% FREE AREA
150 X 150	2,590mm <sup>2</sup>	25.9cm <sup>2</sup>	0.0025m <sup>2</sup>	11.8%
200 X 200	8,089mm <sup>2</sup>	80.8cm <sup>2</sup>	0.0080m <sup>2</sup>	20.6%
250 X 250	14,059mm <sup>2</sup>	140.5cm <sup>2</sup>	0.0140m <sup>2</sup>	22.8%
300 X 300	25,024mm <sup>2</sup>	250.2cm <sup>2</sup>	0.0250m <sup>2</sup>	28.1%
350 X 350	37,440mm <sup>2</sup>	374.4cm <sup>2</sup>	0.0374m <sup>2</sup>	30.9%
400 X 400	49,234mm <sup>2</sup>	492.3cm <sup>2</sup>	0.0492m <sup>2</sup>	31.8%
450 X 450	64,985mm <sup>2</sup>	649.8cm <sup>2</sup>	0.0649m <sup>2</sup>	32.3%
500 X 500	76,844mm <sup>2</sup>	768.4cm <sup>2</sup>	0.0768m <sup>2</sup>	30.9%
550 X 550	90,386mm <sup>2</sup>	903.8cm <sup>2</sup>	0.0903m <sup>2</sup>	30%
600 X 600	130,416mm <sup>2</sup>	1,304.1cm <sup>2</sup>	0.1304m <sup>2</sup>	36.4%



LVV40S	MM	CM	M	% FREE AREA
100 X 100				
150 X 150	4,013mm <sup>2</sup>	40.13cm <sup>2</sup>	0.004m <sup>2</sup>	17.80%
200 X 200	8,089mm <sup>2</sup>	80.89cm <sup>2</sup>	0.00808m <sup>2</sup>	20.22%
250 X 250	14,059mm <sup>2</sup>	140.59cm <sup>2</sup>	0.014m <sup>2</sup>	22.49%
300 X 300	25,024mm <sup>2</sup>	250.24cm <sup>2</sup>	0.025m <sup>2</sup>	27.80%
350 X 350	37,440mm <sup>2</sup>	374cm <sup>2</sup>	0.0374m <sup>2</sup>	30.56%
400 X 400	47,208mm <sup>2</sup>	472cm <sup>2</sup>	0.0472m <sup>2</sup>	29.50%
450 X 450	40,575mm <sup>2</sup>	405cm <sup>2</sup>	0.04m <sup>2</sup>	20.03%
500 X 500	110,000mm <sup>2</sup>	1,100cm <sup>2</sup>	0.11m <sup>2</sup>	33%
550 X 550	103,011mm <sup>2</sup>	1,030cm <sup>2</sup>	0.103m <sup>2</sup>	34%
600 X 600	80,000mm <sup>2</sup>	800cm <sup>2</sup>	0.08m <sup>2</sup>	32%



LVH44S	MM	CM	M	% FREE AREA
100 X 100	mm <sup>2</sup>	cm <sup>2</sup>	m <sup>2</sup>	
150 X 150	4,013mm <sup>2</sup>	40.13cm <sup>2</sup>	0.004m <sup>2</sup>	17.80%
200 X 200	8,089mm <sup>2</sup>	80.89cm <sup>2</sup>	0.008m <sup>2</sup>	20.22%
250 X 250	14,059mm <sup>2</sup>	140.59cm <sup>2</sup>	0.014m <sup>2</sup>	22.49%
300 X 300	25,024mm <sup>2</sup>	250.24cm <sup>2</sup>	0.025m <sup>2</sup>	27.80%
350 X 350	37,440mm <sup>2</sup>	374cm <sup>2</sup>	0.037m <sup>2</sup>	30.56%
400 X 400	47,208mm <sup>2</sup>	472cm <sup>2</sup>	0.047m <sup>2</sup>	29.50%
450 X 450	40,575mm <sup>2</sup>	405cm <sup>2</sup>	0.04m <sup>2</sup>	20.03%
500 X 500	110,000mm <sup>2</sup>	1,100cm <sup>2</sup>	0.11m <sup>2</sup>	33%
550 X 550	103,011mm <sup>2</sup>	1,030cm <sup>2</sup>	0.103m <sup>2</sup>	34%
600 X 600	80,000mm <sup>2</sup>	800cm <sup>2</sup>	0.08m <sup>2</sup>	32%





▼

# ADDITIONAL INFORMATION



# DESIGN + SPECIFICATION

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

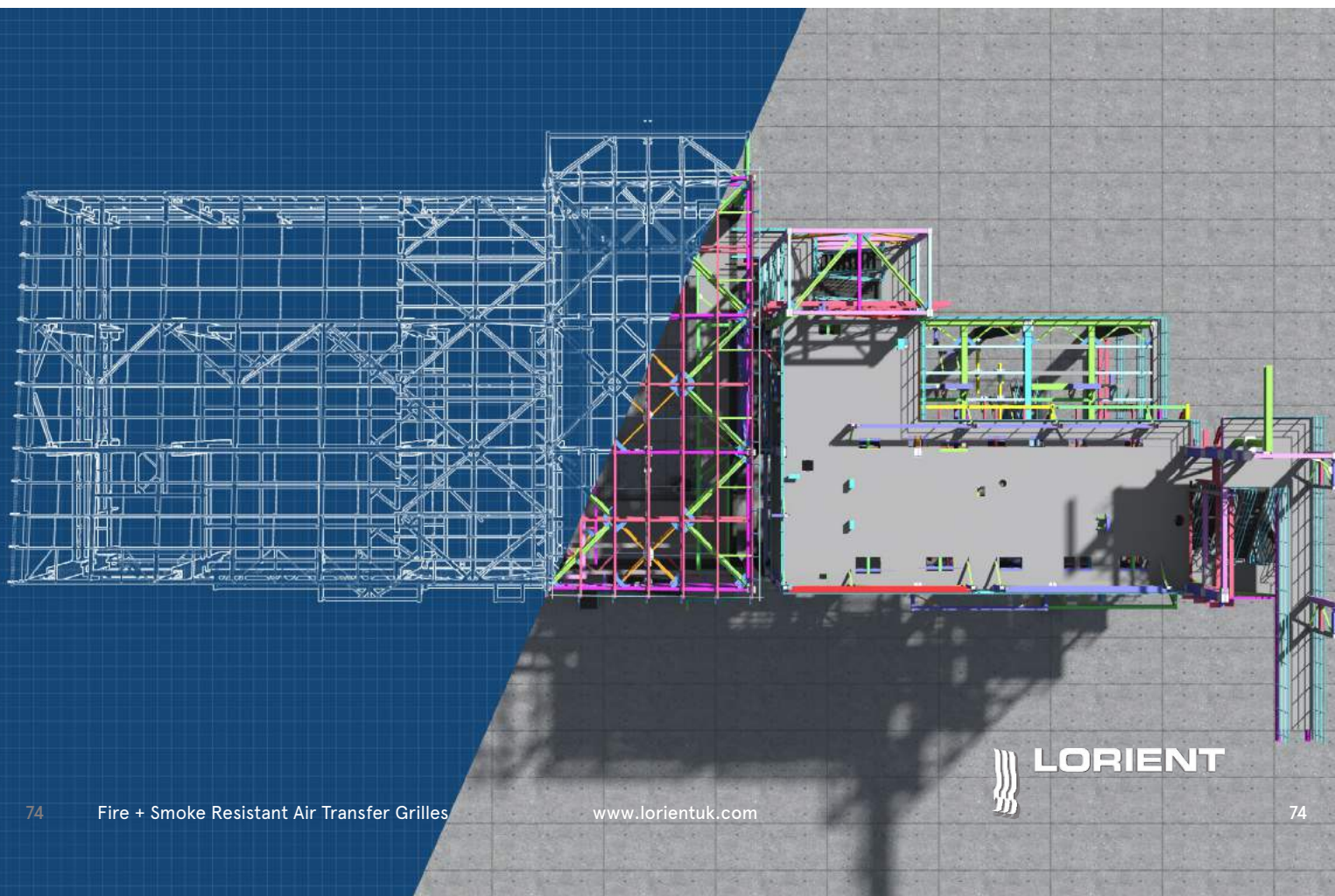
Given the importance of the protection provided, it is recommended that Lorient is involved in the earliest stages of specification to ensure the most effective and economical system is specified and installed.

A comprehensive specification overview which covers the design and operation of Lorient smoke control systems is available; please visit our website or consult our Technical Department.

Call our Technical Services team  
**+44 (0)1626 834252**

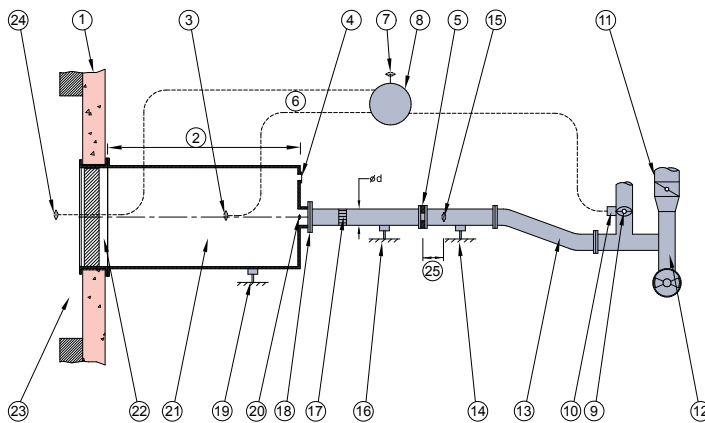


▲  
LVN20S fire + smoke resistant  
air transfer grille



# TEST METHODS

**Figure 1:** Example of a general test arrangement - air transfer grilles



**Current ISO 10294-5 / AS1530.4 Fire Test Methods for dampers and air transfer grilles installed in ducts**

## Legend

- |                                      |  |  |
|--------------------------------------|--|--|
| 1. Supporting construction (wall)    | 8. Pressure differential control box     | 18. Flange   |
| 2. 2 x diagonal (to a maximum of 2m) | 9. Pressure control dilution damper      | 19. Support  |
| 3. Pressure sensor (on centreline)   | 10. Pneumatic actuator or manual control | 20. Thermocouple at exit from connecting duct              |
| 4. Observation port                  | 11. Balancing damper                     | 21. Connecting duct  |
| 5. Orifice plate or venturi          | 12. Fan                                  | 22. Test air transfer grille                               |
| 6. Pressure differential (300 Pa)    | 13. Flexible connecting duct             | 23. Furnace chamber  |
| 7. Pressure sensor in laboratory     | 14. Support                              | 24. Pressure sensor (on centreline of air transfer grille) |
|                                      | 15. Thermocouple                         | 25. Distance: thermocouple to orifice = 2d                 |
|                                      | 16. Support                              |  |
|                                      | 17. Flow straightener                    |  |

**Lorient LVH54/LVH44 intumescent air transfer grilles are approved in accordance with the latest air transfer grille test method detailed in IS 10294-5/ AS 1530.4.**

This stringent test method is based on a fire test with the additional burden of a negative 300Pa pressure differential applied to the unexposed face of the air transfer grille during the test period (essentially drawing hot furnace gasses through the air transfer grille). Failure is now determined when the leakage rate exceeds 360m<sup>3</sup>/hr/m<sup>2</sup> (corrected to STP).

**Specifiers should ensure that air transfer grilles are approved in accordance with the latest test requirements rather than relying on data that relates to old superseded test methods.**



**LVH44 intumescent air transfer grille**



**AS1530.4 2014 air transfer grille testing**



# SMOKE LEAKAGE

The air transfer grilles 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 9999. The graphs show the estimated smoke leakage rates determined from tests carried out under the conditions of BS EN 1634-3. The results have been interpolated to show the leakage rates using different sizes of air transfer grilles/shutter assemblies.

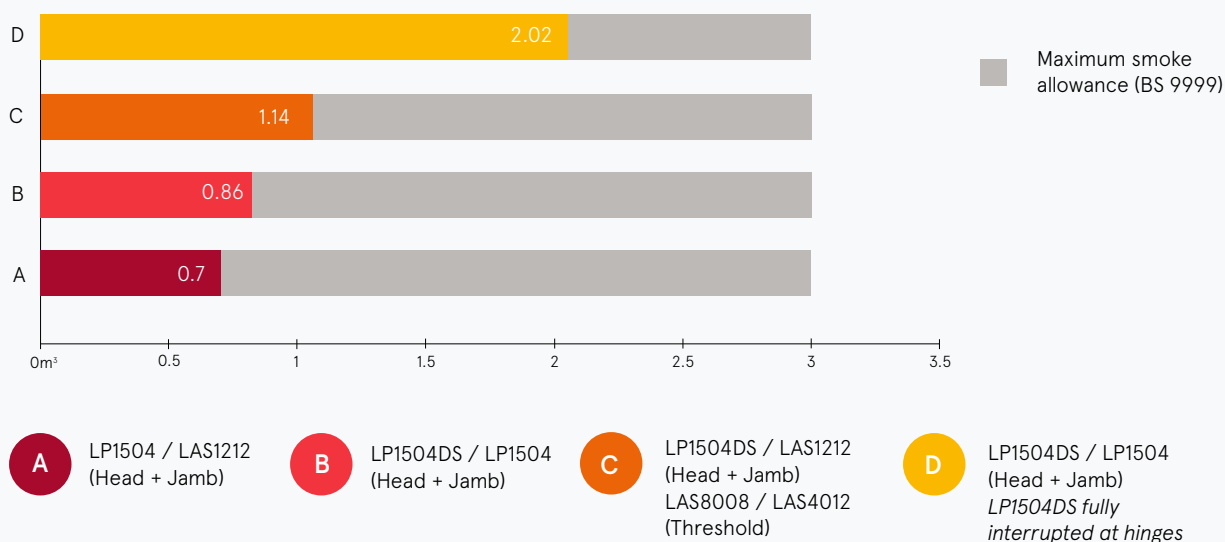
Lorient fire containment air transfer grilles are made up of either PVC or metal slats with an intumescent core.

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.



▲  
LVN20S fire + smoke resistant  
air transfer grille

Smoke leakage determined under the conditions of BS 476-31.1 / BS EN 1634-3 at a pressure differential of 25Pa (positive). Total smoke leakage of door leaf and 200mm x 200mm LVN20S air transfer grille.



# COMMISSIONING + MAINTENANCE

We offer a professional and expert commissioning service for fire and smoke air transfer grilles.

**We check and test the installation and components of Lorient fire + smoke air transfer grilles; and issue a fully detailed service report, highlighting status and compliance.**

Our comprehensive service covers a number of factors, including:

- ▶ Checking the system is installed as per Lorient recommendations and is compliant with test evidence.
- ▶ Checking the full functionality of the system, which can be coupled with witness testing to demonstrate functionality and compliance if required.

- ▶ Providing documented evidence that the system is functioning as per requirements.
- ▶ Providing documented installation detail, which can be used in off-site support and/or included in site handover.
- ▶ Reducing delays caused by improper installation which require technical support.

Please contact our Testing + Technical Services team for pricing and further information on **+44 (0)1626 834252** or email **[testing@lorientuk.com](mailto:testing@lorientuk.com)**



▲  
LVH20S in through flow position



▲  
LVH20S in closed position

# FINISHES

# INFORMATION

**Our wide range of colours and finishes provides inspiration for all types of buildings; from luxurious and contemporary hotels, to bright and bold nurseries and schools – there's a perfect colour or finish available to suit every project.**

An in-house, RAL colour matching service is available for those wishing to coordinate air transfer grilles or flanges with other architectural features, such as door furniture and trims. Special colours are created using a powder coated finish for a higher aesthetic or to complement bespoke interiors. Please ask for bespoke project pricing and lead times on these specials.

All air transfer grilles are manufactured in Lorient's UK facility, to exacting standards and have been designed and developed to deliver the perfect combination of stylish looks and outstanding performance.

We extend our offering way beyond colour and finishes – specialising in assisting and developing customised solutions through collaboration with our customers. Utilising in-house expertise, custom-made products are created to suit customers' requirements.



# TESTING + TECHNICAL SERVICES

We've built our reputation on the quality and dependability of our products, and our investment in R&D has played a pivotal role in keeping our products at the forefront of our industry. Our dedicated Testing and Technical Services division has established itself as an important facility for manufacturers and designers of doors, windows, glazing systems and hardware, to name just a few.

## TESTING SERVICES

Whether you're investigating new materials, or developing new or existing products, right through to durability testing and benchmarking performance – our team of experts will support you throughout the process. We are able to offer:

- ▶ Fire testing (indicative)
- ▶ ATG commissioning and maintenance for fire & smoke resisting air transfer grilles
- ▶ Mechanical cycling
- ▶ Environmental chamber analysis
- ▶ Attendance at external fire tests
- ▶ Consultancy services.







# ADDITIONAL INFORMATION

## TECHNICAL REFERENCES

Lorient is quality assured under the disciplines of BS EN ISO 9001:2015.

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

As a result, this internationally recognised standard for quality management generates customer confidence. 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 9001:2015 Certificate No. Q6104

Lorient has attained the BS EN ISO 14001:2015 accreditation for environmental management, making us the first seal manufacturer to have achieved this important award. This internationally recognised standard shows 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.



BS EN ISO 14001:2015 Certificate No. EMS 541906

## FITTING INSTRUCTIONS

Comprehensive fitting instructions are available to download from our website [www.lorientuk.com](http://www.lorientuk.com)

## 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.

## HANDING + STORAGE

No special precautions are required when handling Lorient air transfer grilles / dampers, 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.

## GUARANTEE OF ORIGIN

Each production is identified unobtrusively on the edge of the air transfer grille 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.

## MADE IN BRITAIN

We are proud to have been granted the prestigious Made in Britain marque for our products, designed and manufactured at our main facility in South West of the UK.



## INTELLECTUAL PROPERTY

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This brochure is protected by copyright and neither the drawings nor the text may be reproduced or transmitted in any form without prior consent from Lorient. Lorient products described in this brochure are protected by patents and design registrations in Great Britain and other countries. 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.

February 2023.

## TRADE ASSOCIATIONS

Lorient is a member and active contributor to the following:



## ACCREDITATIONS

### BBA

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

### CERTIFIRE

Operated by Exova Warringtonfire, CERTIFIRE is an accredited independent product conformity scheme that requires products to meet the requirements of the tests, to add minimal resistance to opening and closing forces, to prove long term performance under a variety of service conditions, and to be permanently marked for easy identification.

### IFC

IFC Certification Ltd is a UKAS approved and internationally recognised provider of third party Certification services – designed to give confidence to specifiers, users, occupiers, owners and enforcement bodies that products have been thoroughly and independently evaluated and will continue to be manufactured to the same specification as originally tested.

### UL

UL is a global independent safety science company that tests a diverse range of products; representative samples of a product must be tested and meet UL's stringent requirements to carry the marque. These requirements are based primarily on UL's published and nationally recognised Standards for Safety. Businesses, consumers and regulatory authorities around the world recognise the trusted rigour and technical excellence of UL certifications. Lorient is proud to have achieved the UL Mark on many of its products. These are detailed on individual pages.



# CPDs

We offer three fully-accredited CPD seminars. Impartially presented by knowledgeable speakers, the seminars are structured to be technically informative, and provide 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 216 fire related fatalities and 6,910 casualties in fires (2019/20). 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.

## The Regulatory Reform (Fire Safety) Order 2005 and its implications for fire doors

The RRO consolidated 70 pieces of legislation; shifted responsibility for fire safety management; abolished the Fire Safety Certificate; established the Fire Risk Assessment and created major change in legal liability.

### Our RRO CPD seminar covers:

- ▶ an overview of the RRO;
- ▶ product solutions;
- ▶ the dangers of fire and smoke;
- ▶ the importance of fire doors – including installation and maintenance.

Our CPD materials have been independently verified and certified by the RIBA as CPD approved. A certificate for 1 hour's CPD will be provided, which contributes to Continuing Professional Development requirements.

If you are interested in booking a seminar, please contact our Marketing department or email [cpd@lorientuk.com](mailto:cpd@lorientuk.com)





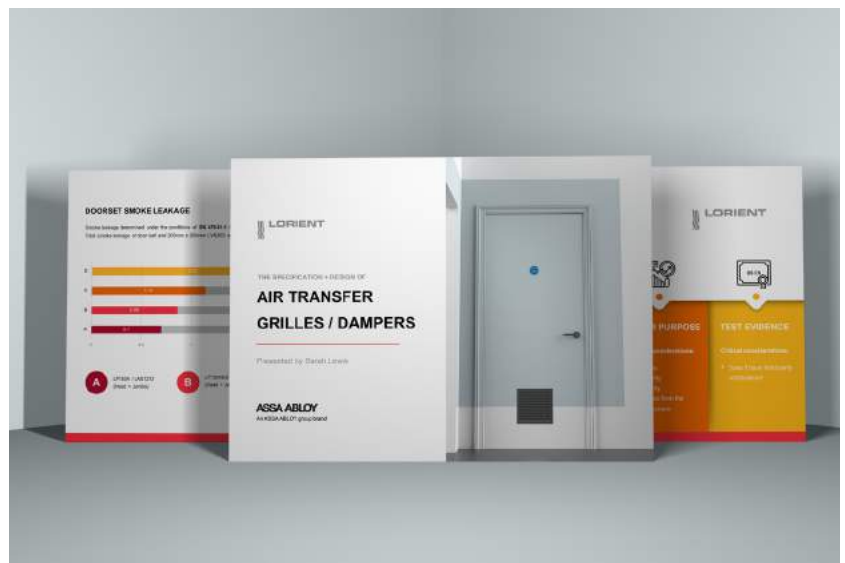
# AIR TRANSFER GRILLE CPD WEBINAR

We're delighted to offer a CPD entitled:  
The Specification + Design of Air Transfer Grilles / Dampers.

This is a fantastic addition to our growing collection of CPD seminars and explores:

- ▶ the latest test standards and building regulations;
- ▶ the major difference between intumescent air transfer grilles and dampers;
- ▶ the importance of correct specification, installation and maintenance;
- ▶ plus it offers practical solutions to fire and smoke containment over a range of applications.

All of our CPD seminars are available to view virtually, please speak to our Marketing Department for further information on 01626 834252 or email [mktg@lorientuk.com](mailto:mktg@lorientuk.com)



# COMPREHENSIVE SUPPORT

We continue to lead the way in Research + Development. As a company we have over 40 years' experience, so our experts are well equipped to listen, help and advise you on your sealing system requirements.

## 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.

## Web Support

Our website features a comprehensive range of supporting documents covering the entire range of products, including installation guides and CAD drawings. All of our brochures and product datasheets are also available for download, together with copies of certification and specification texts.

## 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. Utilising in-house expertise, bespoke products are created to your requirements; from a functional or aesthetic perspective, or both.

Lorient's dedicated Technical Services team supports and works as part of your design team, offering informed product advice and guidance on regulatory requirements and standards.



**Call our Technical  
Services team**

**+44 (0) 1626 834252**

**[www.lorientuk.com](http://www.lorientuk.com)**

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# SEALING SOLUTIONS

Detailed information about our products can be found in the following brochures:

## **Acoustic Sealing Systems for Door Assemblies**

A comprehensive series of acoustic sealing systems for various types of door construction.

## **Acoustic, Smoke and Fire Seals for Door Assemblies**

Our core range of high performance acoustic, smoke and fire seals.

## **AURA® Architectural Seals**

A discerning selection of drop seals, perimeter seals, door bottom seals, threshold plates and ramps - all with strong design accents.

## **Lorient Architectural Seals**

A variety of complementary door sealing systems including perimeter seals, drop seals, threshold plates, door bottom seals etc.

## **Fire Resistant Door Hardware Protection**

Letterplates, door viewers, door edge protectors and intumescent kits that can safely be installed into fire rated doors without compromising the fire/smoke performance.

## **Fire Resistant Glazing Systems**

Fire resistant glazing systems for doors, screens and partitions.

## **Fire and Smoke Resistant Air Transfer Grilles**

A comprehensive range of intumescent air transfer grilles for doors, walls, ducts, floors and ceilings.

Copies of these brochures are available by calling **01626 834252** or download from our website **[www.lorientuk.com](http://www.lorientuk.com)**

# GLOSSARY OF TERMS

## A

### AIR TRANSFER GRILLE: FIRE RESISTANT

A device that when activated by a rise in temperature of the air stream provides containment of fire + hot gases in addition to the normal function of an air transfer grille, but is not intended to control cold smoke.

### AIR TRANSFER GRILLE: FIRE + SMOKE RESISTANT

A device which provides containment of cold smoke, fire + hot gases by either interface with smoke sensors or by a rise in temperature of the air stream in addition to the normal function of an air transfer grille.

### AIR VELOCITY

Is the speed of passage of air and is usually measured in metres per second or in imperial terms in feet per second.

### ASSESSMENTS

For test data based on BS 476 series of tests, documents from competent persons or fire test bodies providing broad ranges of application based on a range of fire test data. Products and systems may only be used in applications covered in the range of the assessment.

In the case of BS EN test and classification systems, formal rules for direct and extended application of test data are used. Previous use of 'assessments' are limited to permitted processes within the formal rules. Assessment of arbitrary methods may not be forthcoming!

## B

### BREAK-AWAY DUCT JOINT

A joint connecting a fire damper spigot or sleeve to the attached duct work which will allow collapse of the ductwork during a fire without disturbing the integrity of the fire damper. 'Break-away' and flexible joints incorporate materials, fixings, clamps, etc, that are manufactured from a non - fire resistant material with a low melting point such as aluminium, plastic, etc

## C

### CAVITY BARRIERS

Construction, other than a smoke curtain, provided to close a concealed space against penetration of smoke or flame, or provided to restrict the movement of smoke or flame within such a space.

### COMPARTMENTATION

The division of a building into areas by using solid walls and floors to prevent the spread of fire and/or smoke.

### COMPARTMENT WALL

A fire resisting wall used to separate one fire compartment from another.

### COMPARTMENT FLOOR

A floor used to separate one fire compartment from another.

## D

### DUCT/DUCTWORK

A system of enclosure of any cross sectional shape for the distribution or extraction of air.

## E

### EXPANSION FRAME

A factory fitted installation frame supplied by the air transfer grille (ATG) manufacturer that forms a complete assembly with the appropriate ATG fitted therein. This frame allows the ATG to expand under fire conditions and must be to a design which has been successfully fire tested.

## F

### FIELD OF APPLICATION OF TEST DATA

In the European classification system, formal rules exist for direct and extended rules for the field of application of fire test data. The rules will be provided in BS EN 1366-2 and BS EN 15882-2 respectively.

### FIRE COMPARTMENT

Enclosed space, which may be sub-divided, separated from adjoining spaces by fire barriers / fire separating elements.

### FIRE CONTAINMENT

Precautions which contain the fire to the smallest possible area, and control the threat to life safety and the extent of property damage.

### FIRE SEPARATING ELEMENT

A compartment wall, compartment floor, cavity barrier and construction enclosing a protected escape route and/or a place of special fire hazard (as defined in Approved Document B).

### FIRE-STOP

A linear joint seal provided to close an imperfection of fit or design tolerance between elements or components to restrict the passage of fire and smoke. The fire-stopping system must be fire tested as part of the fire damper system.

### FREE AREA

Is the area within an aperture unobstructed by the components of an air transfer grille product when in the normal or open position through which air is free to flow. Its size can be given in square metres, square centimetres, square millimetres, square feet or square inches.

## I

### INSULATION [I]

This is the time in completed minutes for which the fire damper continues to maintain its separating function during the test without developing temperatures on its unexposed surface for which either:

- a) increases the average temperature above the initial average temperature by more than 140°C or
- b) increases at any location (including the roving thermocouple) above the initial average temperature by more than 180°C.

### INTEGRITY [E]

After the start of the fire test, the leakage through the fire damper shall not exceed 360m<sup>3</sup>/h/m<sup>2</sup> (corrected to 20°C). The integrity around the perimeter of the fire damper shall continue to maintain its separating function during the test without either:

- *causing the ignition of a cotton pad*
- *permitting a penetration of a gap gauge*
- *resulting in sustained flaming.*

### INTUMESCENT

A material which does not immediately melt on exposure to elevated temperature but first expands to a cellular structure many times its original volume, sometimes accompanied by pressure development.

## L

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### LEAKAGE [S]

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Leakage through a fire damper shall not exceed  $200\text{m}^3/\text{h}/\text{m}^2$  (corrected to  $20^\circ\text{C}$ ). The requirement for leakage during the ambient leakage test need not be met after 5 minutes test duration.

NOTE - The result of the fire test shall be stated in terms of time elapsed to the completed minute from the commencement of the heating to the time when the fire damper failed to satisfy the criteria for integrity, insulation or leakage, or the termination of the heating, whichever is the shortest.

## N

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### NON COMBUSTIBLE MATERIAL

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See Approved Document B Table 6, which includes the following text:

*Any material which when tested to BS 476-11:1982 does not flame nor cause any rise in temperature on either the centre (specimen) or furnace thermocouples. Products classified as non-combustible under BS 476-4:1970.*

*Any material classified as class A1 in accordance with BS EN 13501-1:2002.*

*Products made from one or more of the materials considered as Class A1 without the need for further testing as defined in European Commission Decision 2003/424/EC of 6 June 2003 amending Decision 96/603/EC, etc.*

## P

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### PENETRATION SEAL

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The system used to restore/maintain the fire rating of the fire barrier at the position where the damper/ductwork to pass through the barrier. The penetration seal system must be tested as part of the air transfer grille / fire damper system.

### PRESSURE DIFFERENTIAL

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In order to create air movement through any ventilation system it is necessary to create a pressure differential from one end of the system to the other. Though this can be achieved by natural phenomena in the building such as "stack effect" it is more usual to incorporate motor driven fans.

## R

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### RESPONSIBLE PERSON

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The term 'Responsible person' is defined in several ways:-

[a] in relation to a workplace, the employer, if the workplace is to any extent under his control.

[b] in relation to any premises not falling within [a]

[i] 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

[ii] 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.

## S

### SLEEVE + ANGLE INSTALLATION METHOD

This method applies a sleeve to the outside of the damper casing, to which angles are fitted on either side of the compartment wall to hold the damper in position.

Particular attention must be paid to the individual fire damper manufacturer's data and fixing instructions. Failure to do so may result in a non-compliant installation.

### SUPPORT SYSTEM

The components used for suspending and/or fixing a damper assembly to either the fire barrier itself or an adjacent floor, wall or soffit.

## T

### TEST EVIDENCE

Data obtained from a fire resistance test carried out to determine the suitability of a product, system or combinations to seal service penetrations. In respect to fire dampers, this means fire testing to BS EN 1366- 2 and classification of performance to BS EN 13501-3:2005. Historical data to BS476-20/22 will only be applicable in certain instances (e.g. fan shut-down on detection of fire) see Approved Document B: Fire safety. Tests to be undertaken by an UKAS accredited laboratory or equivalent.

The following text is provided for clarity: *The definition of the three elements of the performance criteria of dampers tested to BS EN 1366-2 (1999) are:*

- *integrity [E]*
- *insulation [I]*
- *leakage [S].*

## V

### VOLUMETRIC FLOW

Is the volume of air movement in a specific time and is usually given in cubic metres per hour or litres per second. Volumetric flow through an air transfer grille is calculated by multiplying the free area of the product by the velocity of the air passing through it.

# ESM TANT FER ES

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