Intumescent Fire Dampers

Fire resistant walls and floors in a building play an important part in containing the spread of fire and smoke. However, a building also needs to be well ventilated for the health and comfort of its occupants. Systems of natural and mechanical ventilation often require ducting to pass through fire resistant walls and floors, and this can compromise the fire containment in the building.

Generally, any fire rated wall, floor or ceiling penetrated by a supply air or return air duct or associated inlet or outlet, requires a fire damper – except for smoke spill fire rated ducting, ducting contained within a fire rated shaft, or supply air ducts used for pressurisation or purging systems.

The Lorient solution is to fit intumescent fire dampers / air transfer grilles at the point where the fire resistant wall or floor is breached. Under normal circumstances these dampers / grilles allow air to pass freely through the building. However, in the event of fire, the slats and frame swell to many times their original thickness, fusing together to form a non-combustible mass which provides fire resistance to match the surrounding construction.

Ventilation through Ducting

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, plus warm and cool air need to be circulated to maintain comfortable temperatures.

Experience has shown that ducting can provide a conduit for fire & hot smoke in the event of fire. Intumescent fire dampers / air transfer grilles, fitted into the duct, at the point where they penetrate fire resistant constructions, prevent the passage of fire and hot 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 as they exhibit high insulation values.

What are Intumescent Fire Dampers?

The Lorient intumescent fire damper incorporates a designated number of parallel intumescent slats, reinforced with impact resistant steel edging, housed in a rigid steel frame. In a fire situation, increasing temperature causes the slats to swell (intumesce) to many times their original thickness, fusing together to provide a barrier to the passage of fire & hot smoke.

Their lightweight and slim-line design provides for quick, easy, trouble-free installation.

Unlike mechanical type fire dampers, the Lorient intumescent fire damper does not incorporate any moving components, hence do not require any commissioning release tests or ongoing physical mechanism operation checks.
Standards and Regulations

The Lorient LVH Series intumescent fire damper range have been fully fire tested in accordance with AS1530.4 and comply with the requirements of AS/NZS1668.1 (1998). Air leakage testing has also been conducted to AS1682.1 (1990) to comply with the Building Code of Australia. They provide an alternative to antiquated, relatively unreliable mechanical blade type or curtain type fire dampers.

Lorient intumescent fire dampers are tested to ensure compliance with the 'deemed-to-satisfy' requirements of the Building Code of Australia Section C 3.15 Openings for service installations ‘ventilation & air-conditioning’, plus C3.12 Openings in floors and ceilings for services. The installation of these services must be in accordance with AS/NZS1668: The use of mechanical ventilation & air-conditioning in buildings, Part1: Fire & Smoke Control in multi-compartment buildings. This requires fire damper applications to be tested to AS1530.4: Fire resistance tests of elements of building construction, and smoke leakage tested to AS1682.1: Fire Dampers (Part 1– Specification).


This standard sets out the minimum requirements for the design, construction, installation and commissioning of mechanical ventilation and air-conditioning systems for fire & smoke control in multi-compartment buildings.

Section 2.4 (Air Dampers)
Clearly differentiates between mechanical fire dampers (sub section 2.4.1) & intumescent fire dampers (sub section 2.4.2)

2.4.1 Mechanical Fire Dampers
Fire dampers of the thermally released or motorized type shall be manufactured & installed in accordance with AS1682.1 & AS1682.2. Motorized dampers shall fail to the closed position by a thermally operated device located in the airstream. Damper closure retaining devices shall be incorporated.
2.4.2 Intumescent Fire Dampers
Fire dampers of the intumescent type shall be manufactured to close under fire conditions as a result of swelling of the intumescent material. Intumescent fire dampers shall be tested in accordance with AS1530.4 with an extended fully closed-off period of 120s. Dampers shall also comply with the air leakage of AS1682.1 & installed in accordance with the relevant requirements of AS1682.2.

Fire Testing

Both mechanical & intumescent fire dampers must be fire tested to:

AS1530.4  Methods of fire tests on building materials, components & structures – Part 4: Fire resistant tests of elements of building construction

This Standard sets out the fire test methodology for fire resistant testing of fire dampers.

AS1530.4 Fire testing

The LVH series Intumescent Fire Dampers have been fire tested for up to 4 hours.

Current approvals cover the following applications:

- Walls (masonry, plasterboard, hebel)
- Shaftwalls (masonry, plasterboard)
- Concrete Floors
- Plasterboard Ceilings
- Fire Doors

(See System Tables for each application in their relevant section for full details).
Smoke Air Leakage Testing

The current version of AS1682.1 (1990) requires a new fire damper specimen to be tested for air leakage at ambient temperature only (independently of fire tests) and at pressures up to 1250Pa. (This is to simulate the effects of a fan not tripping in fire mode).

Lorient have subjected the LVH series intumescent fire dampers to a 90 second fire test (to activate the intumescent) and then the standard air leakage test. The results of these tests have shown that the leakage through the LVH series intumescent fire dampers is under 50% of that allowed by the failure criteria in AS1682.1 at all pressure differentials.

In fact the observed air leakage at all AS 1682.1 designated points was below the 0.325 l/s lower calibrated limit of the device. These excellent results indicate that the LVH series intumescent fire damper provides an effective hot smoke seal in fully developed fires.

Maintenance Requirements

Maintenance provisions for intumescent fire dampers are now clearly identified in AS1851.

AS1851-2005: Maintenance of fire protection systems and equipment

This standard sets out requirements for the inspection, test, preventive maintenance and survey of fire protection systems and equipment.

Routine inspections (functional checks by visual means) are mandatory and required to be performed on 20% of fire dampers (within a building) yearly – so that all fire dampers will have been inspected by the end of the fifth year.

Inspections include:

• Check and ensure that the fire damper is in place, free from obstruction and is capable of operation
• Check fire dampers, including casings and mounting flanges for corrosion
• Check for signs of tampering or modification

Maintenance should be completed at the specified intervals and scheduled in the project’s operation and maintenance manuals.
Other Performance Testing

Many tests have been conducted to provide Fire Safety Engineers with adequate data for determining the suitability of the LVH series intumescent fire damper range, in many rigorous applications.

Dust & Lint Testing

Independent testing at the University of NSW has shown that dust and lint, even in high humidity environments, is unlikely to build up on the LVH series IFD significantly enough to cause a measurable pressure drop. Dust buildup can potentially impede the operation of a fire damper that incorporates moving parts. The Lorient LVH series IFD has no moving parts and is proven to be unaffected by dust and lint accumulation.

Kitchen Exhaust Testing

For residential apartments it is proving more difficult to avoid the use of fire dampers in kitchen exhausts. Grease build up can potentially impede the closure of mechanical type fire dampers and even if this can be overcome, the lack of insulating qualities means that radiant heat may ignite grease on the unexposed side of the fire damper, even after it has closed.

Testing against grease attack, combined with the inherent insulating qualities and reduced maintenance requirements if the Lorient IFD’s, means that designers can be confident of a system that provides high reliability in residential kitchen exhaust systems.

Physical Obstruction Testing

Concrete splatter and electrical cables sometimes find their way into the most amazing places. One of those may be in the closure path of a fire damper! We have conducted tests to show that the Lorient LVH series IFD’s will close around these types of obstructions.

Salt Spray Testing

BHP Laboratories have conducted a 585 hour salt spray test on the LVH series square and rectangular intumescent fire dampers. The galvanized coating required by AS1682.1 is deemed to have failed when 5% red rust is reached. The report concluded that there were no specific areas of weakness identified (eg, joints and fastenings). This same sample was then subjected to the standard fire test and shown to be operational.

Pressure Drop & Noise Testing

Extensive pressure drop and noise testing conducted at the Noise Control and Research Laboratory in Ireland on a range of sizes of Lorient LVH series IFD’s, has taken the guess work out of calculations. Nomograms give measured total pressure loss and noise data to designers.
Additional Performance Based Testing

Originally developed for the Channel Tunnel passenger trains project, the Lorient LVH series intumescent fire damper has been submitted to the most onerous of tests to meet customer demand. Some of these tests include:

- Vibration tests
- High velocity tests
- Toxicity tests
- Humidity tests
- Chemical resistance tests
- False activation tests

We realize that not every project will have standard Building Code of Australia requirements. Occasionally some performance based data is needed to satisfy special project designs.

Locally Manufactured Products

Lorient is proud to locally manufacture it’s range of intumescent fire dampers here in Australia. This provides us with the flexibility to offer quality compliant products with a trusted reputation and an unparalleled level of service and support.

New & Custom Made Products

Adopting an innovative approach, Lorient is continually developing new technology and expanding it’s comprehensive range of products. If you do not find your exact requirement within this catalogue, please contact our office. We may be able to supply an existing non-standard item or develop a customized solution for you.

Technical Services & Support

Lorient is always happy to provide specialist advice on Fire Dampers and their application, for both refurbishment and new projects.

We offer:

- Technical helpline
- Advice on installations
- Copies of relevant test approvals
- Product Samples
- Technical & performance specifications
- Advice on meeting Building Regulations & Standards

Ordering, Supply & Delivery

Readily available and stocked throughout Australasia by our exciting network of Distributors, offering a wide range of standard stocked sizes, with non-standard and modular products made-to-order.

Please contact Lorient for details on your nearest local distributor.

To find out more about the advantages of intumescent dampers, and to ensure you are up to date with the latest standards and requirements, go on line to download our complete Lorient IFD Catalogue or contact Lorient on 1300 858 010.
Lorient Fire Damper System Selector

Fire damper selection, application and specification has never been easier with the introduction of the Lorient System Selector, which is now featured in the new Lorient catalogue as well as on the web site.

Lorient System Selector has been designed to enable engineers and users alike to easily review and apply Lorient Intumescent technology. Knowing that all of the critical required information is at your finger tips enables an accurate and compliant selection to be made with confidence.