

FIRE AND SMOKE DAMPER MAINTENANCE

The objective of this technical bulletin is to inform BESA members of specific considerations when testing and maintaining fire and smoke dampers. It should be used alongside BESA publications:

- [DW145](#) Installation of Fire and Smoke Dampers;
- [DW144](#) Sheet Metal Ductwork;
- [TR19®](#) Internal Cleanliness of Ventilation systems and
- [TR19®](#) Grease Fire Risk Management of Grease Accumulation within Kitchen Extraction Systems.
- [TR40](#) A Guide to Good Practice for Local Exhaust Ventilation

Reference should also be made to:

- [BS9999](#) Fire safety in the design, management and use of buildings,
- [HTM 03-01](#) Heating and ventilation of health sector buildings and
- [HTM 05-01](#) Managing Healthcare fire safety
- [CIBSE Guide M](#) Maintenance engineering and management
- [Fire stopping of service Penetrations](#). Best Practice in Design and Installation
- [BS EN 15780](#) Ventilation for buildings. Ductwork. Cleanliness of ventilation systems
- [BS 7974](#) Application of fire safety engineering principles to the design of buildings.
- [Approved Document B](#) - Fire Safety - Building Regulations
- [ASFP Grey Book](#) - EN Fire Dampers
- [ASFP Red Book](#) - Fire Stopping

STANDARDS

BS 9999 provides a best practice framework for fire safety and includes standards for the definition, maintenance and testing of fire dampers. It states that all fire dampers should meet the criteria of fire resistance for a stated period of time and that:

'Arrangements should be made for all fire dampers to be tested by a competent person on completion of the installation and at least annually, and to be repaired or replaced immediately if found to be faulty. Spring-operated fire dampers should be tested annually and fire dampers situated in dust-laden and similar atmospheres should be tested much more frequently, at periods suited to the degree of pollution.'*

Within the context of this VH001 guidance document tested* means the demonstration of the operational function of the damper.

In addition; guidelines have been introduced by the department of health that encourage regular testing of fire dampers. In Part B of Health Technical Memorandum HTM 03-01, fire dampers are required to be tested and maintained annually. Inspection and function of smoke and fire dampers should be specified by the manufacturer.

Spring operated fusible link dampers

Spring operated fusible link fire dampers are commonly designed to activate when the temperature exceeds the manufacturers predetermined threshold (typically 72°C). The fusible link releases the spring loaded blades/curtain to contain the fire/hot gasses, preventing spread from one fire compartment to the next.

BS 9999 defines a fusible link as a 'device that releases a component such as a fire damper or fire shutter at a set temperature'.

INSTALLATION

Fire Dampers

Fire dampers must be installed in accordance with the manufacturer's instructions. A break-away duct joint connecting a fire damper spigot, sleeve or flange to the attached ductwork is required, unless it is fire resisting which will allow collapse of the ductwork during a fire without disturbing the integrity of the fire damper. Breakaway and flexible joints incorporate materials, fixings, clamps, etc. that are manufactured from non-fire resistant material with a low melting point such as aluminium, plastic etc. (DW145 B.2.2). Self-drilling screws should not be used.

Access Doors

To enable the Fire Dampers to be tested, inspected and reset access panels need to be installed. Access panels shall be quick release insulated sealed panels, all manufactured and installed to BESA specification DW144. Required location of access panel, along with party responsible for provision of the panel is prescribed in Table 3 of BESA publication TR19®. Where there is restricted access preventing full testing and maintenance of the fire damper, consideration should be given to suitable removable duct sections. Self-drilling screws should be avoided when installing access doors as they could cause injury when maintaining the damper or cleaning the internal surfaces of the ductwork.

Kitchen Extract Ventilation

Fire dampers should not be fitted (BS 9999:2017 Clause 32.5.2.2 and 32.5.4). Where fire dampers are still found in older installations, these systems should be tested annually, as a minimum, as required by BS 9999 and TR19® Grease, or removed from the system entirely. Removal if recommended and will require a review of the fire risk assessment and overall fire strategy of the building.

Fire Stopping

The penetration seal between the damper and structural element often referred to as “Fire Stopping” materials and include, but are not limited to, vertical or horizontal builders work structures, dry-lining partitions and vertical fire blankets. The penetration seal is used to restore and maintain the fire classification of the fire separating element/barrier at the position where the damper/ductwork pass through the barrier. The penetration seal must be installed and certified in accordance with fire test and installation methods with the tested arrangements and manufacturers instructions for use when penetrated by a damper, and be compliant to Building Regs - Approved Document B, Fire Safety which states that:

‘The damper assembly shall have a fire integrity classification equal to the fire barrier it penetrates’.

Details are included in The Association for Specialist Fire protection (ASFP) Grey Book Volume 1-EN Fire dampers. BESA publication DW145, D.9 states that:

‘The penetration seal, often referred to as ‘firestopping’, is a critical component of a successful installation and the system designer must ensure that advice is taken from the damper manufacturer in terms of the appropriate seal relative to the manufacturer’s test results.’

TESTING

Testing as defined in this guidance is the demonstration of the operational function of the damper to suit its intended purpose. It should be carried out according to manufacturer’s recommendations however, additional procedures may be required by the client or local authority.

Prior to testing a full health and safety risk assessment should be carried out. Where dampers are fitted, specific considerations should be given to accessibility in small sized ducts. Where there is restricted access to enable full testing and maintenance of the fire damper, consideration should be given to suitable removable duct sections. All contractors need to have sufficient training to carry out maintenance work. Testing should include, but not limited to the following steps:

- an inventory of all dampers to be tested
- all manually resettable dampers will be released to ensure the integrity of the spring loaded shutter, blade pack or curtain
- on motorised fire dampers the control mode should be operated to ensure that the blades are moving from the open to the closed position and vice versa
- the Fusible link should be inspected for any deformity or damage
- where accessibility allows, the fire damper and side channels must be cleaned in its entirety
- the fire damper should be locally activated (automated) or released (mechanical) and reset to correct position
- a review of the previous inspection report to check if any modifications have been made, outstanding remedial actions have been completed

REPORTS

Reports should include, but are not limited to:

- test results with client information including position within the building/system, date, and name of operative shall be recorded and any comments noted if further action is required
- asset register to include damper location and ID number
- where the damper is not fully or only partially accessible due to inadequate access either in ductwork or the building fabric it must be reported to the client and remedial action recommended.
- inspection results including details of failed damper operation
- explanation of failed operation and recommended corrective or remedial action
- if a fusible link has failed it should be reported to client who must take remedial action immediately
- any severe corrosion or damage found shall be reported to the client
- if drawings are provided, update and annotate details
- digital photographic evidence of damper condition prior to, during and after testing procedures unless otherwise specified by client
- visual assessment of fire stopping integrity and/or damage observed to immediate area of fire damper and any other visible fire stopping
- damper fixing should be checked where reasonably practicable and photographic evidence and commentary provided where there is a clear issue that requires the client to take remedial action. If your site report raises the fixings as a defect e.g self-drilling screws, the defect would require remedial action
- fire closure to be checked to correctly indicate on the relevant fire panel where applicable
- where lubrication is required to the damper manufacturer’s specific instructions should be followed or, in the absence of these, a temperature resistant lubricant should be used to minimise adhesion of dust.

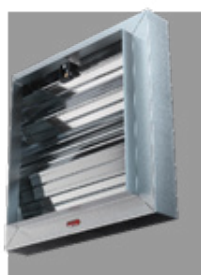
Examples of closed and open dampers



Damper types



Motorised fire damper



Curtain bladed fire damper



Intumescent fire damper

SFG20, the definitive standard for planned maintenance, sets out the specific actions required. These are summarised as follows:

CRITICALITY	ACTIONS	FREQUENCY	SKILL SET
High	<p>All Fire and Combined Fire/Smoke Dampers</p> <p>Visually inspect the fire damper's internal components for signs of corrosion, dirt or dust. In line with the manufacturer's instructions, clean and lubricate the damper and perform a drop test. Collect digital photographic evidence of damper condition prior to, during and after testing procedures.</p>	12 months	Competent Person
High	<p>Electro-Mechanical Fire Dampers and Combined Fire/Smoke Dampers</p> <p>Inspect latching mechanism, operating cable and remote controller (incl. indicator lamp). Ensure cleanliness of damper guide channels, springs and around the units on completion. Check and ensure correct operation of shutter mechanism. Ensure free fall of damper(s). Check and ensure security of all access doors and gaskets. State possible sources of air leakage. Report any defects and record all actions undertaken. Collect digital photographic evidence of damper condition prior to, during and after testing procedures.</p>	12 months	Competent Person
High	<p>Air Transfer Fire Dampers and Combined Fire/Smoke Dampers</p> <p>Inspect latching mechanism, operating cable and remote controller (incl. indicator lamp). Ensure cleanliness of damper guide channels, springs and around the units on completion. Check and ensure correct operation of shutter mechanism. Ensure free fall of damper(s). Check and ensure security of all access doors and gaskets. Check for air leaks. Report any defects and record all actions undertaken. Collect digital photographic evidence of damper condition prior to, during and after testing procedures.</p>	12 months	Competent Person
High	<p>Intumescent Block Fire Dampers</p> <p>This type of damper can become blocked and impeded. They should therefore be part of the maintenance programme.</p>	12 months	Competent Person

LEGISLATION

With the enactment of the [Regulatory Reform \(Fire Safety\) Order 2005 England and Wales](#), it is now the employer's responsibility to maintain their fire safety systems.

In Scotland, separate fire service and fire safety legislation was introduced: the [Fire Safety \(Scotland\) Regulations 2006](#) plus a number of other relevant fire safety documents. More information is available at the Scottish Government website.

In Northern Ireland the [Fire Safety Regulations \(Northern Ireland\)](#) were introduced in 2010.

VH001 - Fire Damper Maintenance, will be incorporated into the BESA publication

DW/145 - Installation and Maintenance of Fire Dampers, is currently under review and will be republished as a BESA specification.

Note: This document is based on knowledge available at the time of publication and is meant for general purposes, not for reliance on in relation to specific technical legal issues, in which case you should always seek independent advice. No responsibility of any kind for any injury, death, loss, damage or delay however caused, resulting from the use of this advice and recommendations contained herein is accepted by the authors or others involved in its publication (including the Building Engineering Services Association). August 2022.

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