



Fire Damper Briefing Document

The following document has been issued by SVHSoc. to help clarify Healthcare Ventilation maintenance requirements for fire and smoke dampers.

It highlights a number of commonly encountered problems and provides specific guidance and advice on the minimum standards to be provided to ensure patient safety in healthcare premises.

Acknowledgments

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Introduction

As with all fire safety systems, to achieve compliance in accordance with the Regulatory Reform (Fire Safety) Order 2005 (and or similar regulations for Scotland and Northern Ireland), there is a mandatory requirement for fire and smoke damper installations to be properly serviced, tested and certified accordingly.

**Note – for ease of reference RRO (England) has been used as primary reference document, however similar provisions are made for all of the UK.*

Background & Guidance

Under the RRO (2005) Part 2 Section 17 all facilities, equipment and devices provided in respect of fire safety, Must be subject to a suitable system of maintenance and be maintained in an efficient state, in efficient working order and in good repair.

BS 9999 (2017) in Annex W.1 requires 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 (previously 2 yearly in the 2006 edition), 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 Annex V of BS EN 9999 further detailed guidance is provided for smoke extraction / control systems;

V.3.5 Smoke Control Systems

For means of escape states actuation of the system should be simulated once a week. It should be ensured that any fans and powered exhaust ventilators operate correctly, smoke dampers close (or open in some systems), natural exhaust ventilators open, automatic smoke curtains move into position, etc.

V.5 Three Monthly

In addition to the checks recommended in V.2, V.3 and V.4, the actuation of all smoke control systems should be simulated once every three months. All zones should be separately tested and it should be ensured that any fans and powered exhaust ventilators operate correctly, smoke dampers close (or open in some systems) etc.

V.7 Yearly

In addition to the checks recommended in V.2 to V.6 arrangements should be made for annual inspections and tests of the following to be carried out by competent persons, for any defects to be logged and the necessary action taken, and for certificates of testing to be obtained.

However within BS EN 15650 - Ventilation for Buildings - Fire Dampers Section 8.3 states regular testing/inspection should be undertaken to meet regulatory requirements, or at intervals not exceeding six months.

HTM 03-01 Part B Clause 4.13 states that all fire dampers should be tested as part of the annual verification.

Approved Document B, Volume 2 Clause 10.12 states adequate means of access must be provided to allow inspection, testing and maintenance of both fire damper and its actuating mechanism.

HVCA in SFG 20 states a 6 monthly inspection and test; Check action and proper operation (test drop and re-set). Inspect all dampers, apply a few drops of oil to the mechanism. Replace fusible links if required.

From these standards a number of issues are apparent;

- the installation and on-going maintenance MUST be undertaken by a “competent person”
- the frequency of maintenance / function testing is in some cases contradictory, however should be based on local assessment of risk and environment, however should as an absolute minimum be annual.
- Fire and Smoke Dampers are different beyond the application of a motorised element and their installation and application should be assessed and recorded, especially if the ventilation system forms part of the fire strategy with regards to smoke control or extraction.

Practical Aspects

The most frequent issue encountered in the maintenance of fire and smoke dampers relates to the safe access for in-situ testing. Dampers are often obscured by other services (pipes and cable trays), suspended ceiling grids or at a height where access is not possible within a ceiling void. All of these issues should be avoided through appropriate service co-ordination at design and installation stage, and is a legal obligation under the Construction Design and Management Regulations (2016), however from practical experience is often not the case.

Risk Assessment

Full and detailed risk assessments, safe systems of work, emergency actions and contingency plans should be provided in advance of any works commencing. In addition full details of any individuals undertaking the works must be provided along with full details of their skills, knowledge, training and experience.

Careful consideration is required when specifying what PPE should be used to mitigate or minimise identified risks. Gloves are often needed to protect hands and fingers, however these can also restrict manual dexterity and lead to accidents if inappropriate types are used. Also the provision of kevlar or similar forearm guards are often useful to minimise the risk of cuts and abrasions, however these can also restrict arm movement if the wrong types are specified. Most of the work involves working at heights from steps or access platforms and as such “lone working” should be avoided at all times.

The risk assessment process should not only record the precautions to be taken when completing the maintenance inspection and testing process, but should also include actions to be taken in the event of a foreseeable issue such as potential blood or fluid contamination of the ductwork during the maintenance works and the corrective action necessary to ensure appropriate de-contamination of the ductwork / area after.

Access

To enable the Fire Dampers to be tested and reset access panels need to be installed. Access panels shall be quick release insulated neoprene sealed panels, all manufactured and installed to BESA specification DW/144.

Required location of access panel, along with party responsible for provision of the panel is prescribed in Table 3 of BESA publication TR/19, however as a minimum should be either side of the damper and large enough to facilitate adequate access. Where access doors are not practical consideration should be given to a removable flanged spigot duct which can be removed for damper testing purposes and

re-instated after. In these circumstances it is essential not to compromise the independent support bracketary of either the damper or ductwork systems.

Method Statement

A detailed method statement and safe system of work should be completed / provided prior to commencing any fire or smoke damper inspection and testing programme. It should include an assessment of risk and what specific methods are appropriate to use during the test process. In some circumstances additional test equipment may be used to facilitate access and re-setting, however this equipment must not restrict or interfere with the operation of the damper.

Sample of Fire Damper Advice Note for Fire Damper testing using “Winbag” air bags or other proprietary devices

Fire damper testing is a difficult, strenuous task on most sites due to the location of the fire dampers.

Advice note states

‘Every Fire damper within the ventilation system of the site MUST be inspected and drop tested at least annually. The drop Test MUST be recorded to demonstrate the continued integrity and functionality of the passive fire precautions of the facility.

- *Prior to undertaking drop tests inform users in areas serviced by ventilation plant. Isolate ventilation plant (as appropriate).*
- *Drop test instruction*
- *Gain access to damper*
- *Visually inspect duct and access door*
- *Open access door and inspect internal condition and cleanliness of ductwork*
- *Insert deflated Winbag air bag under fire damper at bottom of duct making sure it is under the fire damper drop zone*
- *Release fusible link and allow damper to fully close*
- *The Fusible link should be inspected for any deformity or damage.*
- *The Fire/Smoke Damper will be cleaned and lubricated within the closed position.*
- *Inflate Winbag to full size allowing access under damper to lift back into place*
- *Re-set damper and replace fusible link*
- *Remove Winbag from duct*
- *Close access hatch*
- *Inspect and record and signs of damage to the surrounding fire compartmentation*
- *Record findings/ observations*
- *Complete and attach test label to record date and outcome of test (pass/fail)*
- *Upon completion of all tests reinstate ventilation plant to normal operation.*

Frequency

As previously stated the frequency of maintenance / function testing is in some cases contradictory, however should be based on local assessment of risk and environment, however should as an absolute minimum be annual. BS 9999:2017 and HTM 03-01 both specify a minimum frequency of annual, however BS 15650:2010 and SFG 20 both state 6 monthly. Ultimately the size and complexity of the task including issues of access and disruption will need to be assessed locally against the environmental conditions and fire risk to identify and agree a suitable frequency for every ventilation system / site.

Training and Competency

This type of specialist preventative maintenance must be completed by suitably trained and experienced service engineers who not only have the technical knowledge about the subject matter, but also the capability to overcome the various accessibility challenges which may be encountered.

HTM 05-03A defines the requirements for a Competent Person(s) clause 2.28 states “wherever a competent person in respect of fire safety is recommended within a Firecode Health Technical Memorandum, the following definition applies: *Competent Person: a person recognised as having sufficient technical training and actual experience, or technical knowledge and other qualities both to understand fully the dangers involved, and to undertake properly the statutory and Firecode provisions referred to in this Health Technical Memorandum.*”

HTM 03-01 Part B re-enforces this requirement within the following clauses / sections;

Competent Person (Ventilation) (CP(V))

2.10 The CP(V) is defined as a person designated by Management to carry out maintenance, validation and/or periodic testing of ventilation systems.

Training

2.18 Routine inspection and maintenance procedures can cause risks to the health of staff carrying out the work and those receiving air from the plant. All those involved should be made aware of the risks, and safe systems of work should be agreed. Suitable safety equipment should be provided as necessary, and training in its use should be given.

2.19 Any training given should be recorded, together with the date of delivery and topics covered.

2.20 Training in the use of safety equipment and a safe system of work will need to be repeated periodically in order to cater for changes in staff.

All training and proof of competency must be recorded and available to demonstrate that anyone engaged in the management or maintenance of healthcare engineering systems and in particular fire safety devices or equipment (such as fire dampers) Must be Competent to undertake the duties required of them.

Asset Schedule

A comprehensive asset register or inventory of all dampers should be established and maintained. The schedule should include;

- Asset number for each damper,
- Type of damper (fire/smoke)
- Physical location,
- System which the damper is on (area served and associated AHU plant),
- Damper / Duct size
- Manufacturer details

Ideally as part of the damper asset register a schematic drawing of the ventilation ductwork distribution system should show the location of the dampers to ensure that maintenance personnel are aware and can access all dampers.

Records & Photos

Fire damper inspection and maintenance reports should include but are not limited to the following items:

- Location within the building/system, date, and name of maintenance operative shall be recorded and any comments noted if further action is required.
- Asset register to include damper location and ID number.
- Inspection results including details of failed damper operation or access issues.
- If drawings are available, update and annotate details.
- Digital photographic evidence of damper condition prior to and after testing procedures.
- Explanation of failed operation and recommended corrective or remedial action.

It is also recommended that given the nature of the work an inspection of both the internal cleanliness of the distribution ductwork and the condition and integrity of any other services penetrations of the fire compartment barrier where the fire / smoke damper is located is undertaken and recorded. Ideally each damper should be labelled to demonstrate the date when the inspection and drop test was completed.

It is also worth stating that the opportunity to inspect cancelled services should also ideally include a visual inspection for any air leakage or damaged / perished ductwork components such as flexible duct final connections to plenum boxes or grilles.

References

Regulatory Reform (Fire Safety) Order 2005

The Fire (Scotland) Act 2005

The Fire Safety Regulations (Northern Ireland) 2010

Building Regulations Approved Document B, Volume 2:2006

HTM03-01 Specialised ventilation for healthcare premises. Part A Design and installation

HTM03-01 Specialised ventilation for healthcare premises. Part B Operational management and performance verification

SHTM03-01 Specialised ventilation for healthcare premises. Part B Operational management and performance verification

HTM 05-03:2013 Firecode – fire safety in the NHS Operational provisions Part A: General fire safety

National Health Service Model Engineering Specification C04 – Mechanical Ventilation & Air Conditioning Systems (Revision 3: 1997)

BS EN 15650:2010 Ventilation for Buildings – Fire Dampers

BS 9999:2017 Code of practice for fire safety in the design, management and use of buildings

BESA specification DW/144:2016 (3rd Edition) Sheet Metal Ductwork Specification

HVCA DW/145:2010 Good Practice Guidance for the Installation of Fire and Smoke Dampers

HVCA SFG 20 – Standard Maintenance Specification for Services in Buildings

BESA publication TR/19 Guide to Good Practice Internal Cleanliness of Ventilation Systems

Actionair Ltd Fire & Fire/Smoke Damper Installation Manual : October 2016