

# **Fire, Smoke, and Combination Damper Inspection, Testing and Maintenance Requirements**

Fire- and Life-Safety Group (FLS)

## **Introduction**

The following is a brief summary of the code requirements pertaining to Fire and Smoke (F/S) Dampers. The following requirements are from the 2009 Edition of NFPA-90A, *the Standard for the Installation of Air-Conditioning and Ventilating Systems*, as well as the 2007 Edition of NFPA-105, *the Standard for the Installation of Smoke Door Assemblies and Other Opening Protectives*, the 2009 Edition of NFPA-92B, *the Standard for Smoke Management Systems in Malls, Atria, and Large Spaces*, and the 2007 Edition of NFPA-80, *the Standard for Fire Doors and Other Opening Protectives*.

The following is a list of the code sections used in the preparation of this document: NFPA-80 19.3-19.5.5, NFPA-105 6.4-6.6.6, NFPA-90A 5.4.7, 5.4.3.1, 5.4.3.2 and NFPA-92B 8.4.5-8.4.5.4.

## **I. Commissioning (New Installations)**

### **1. Fire Dampers**

- a. After installation is completed an operational test needs to be conducted.
- b. The damper needs to fully close (automatically) from the open position. Please note that the fusible link needs to be removed for this test. The fusible link needs to be re-installed after the completion of the test.
- c. For dynamic dampers, system airflow where the damper is installed needs to be verified to be within the velocity rating of the damper listing.
- d. The operational test needs to verify that the damper operation is not obstructed.
- e. The operational test needs to verify that there is full and unobstructed access to the damper and all components.
- f. The fusible link's operating temperature needs to be in accordance with NFPA-90A.
- g. Following the completion of the test, a visual inspection needs to be made of the assembly to ensure no obstructions have been introduced.
- h. All inspections and testing need to be documented indicating the location of the damper, date of inspection, name of the inspector and deficiencies discovered. The documentation needs to have a space to indicate when and how the deficiencies were corrected.
- i. Reset the damper in (the open) position

### **2. Smoke and Combination F/S Dampers**

- a. After installation is completed an operational test needs to be conducted after the buildings HVAC system has been balanced.

- b. The test must determine that the system functions as intended.
- c. The test must be conducted under normal HVAC airflow conditions as well as no-flow conditions.
- d. The test needs to verify that the damper operation is not obstructed.
- e. The test needs to verify that there is full and unobstructed access to the damper and components
- f. It needs to be verified that all indicating devices work and report to the intended location.
- g. Following the completion of the test, a visual inspection needs to be made of the assembly to ensure no obstructions have been introduced.
- h. All inspections and testing need to be documented indicating the location of the damper, date of inspection, name of the inspector and deficiencies discovered. The documentation needs to have a space to indicate when and how the deficiencies were corrected.

## **II. Periodic Inspection and Testing (Fire Dampers, Smoke Dampers and Combinations F/S Dampers, as applicable)**

1. Each damper needs to be tested and inspected 1 year after installation. Tests and Inspections then need to be completed in all buildings every 4 years, except in hospitals, where the frequency is every 6 years.
2. All tests need to be completed safely by personnel wearing protective equipment.
3. Unobstructed access to the damper needs to be verified and corrected as required.
4. The damper needs to be actuated and cycled as a part of the associated smoke detector testing in accordance with NFPA-72 (as applicable).
5. If the damper has a fusible link, the link needs to be removed for testing to ensure full closure and lock-in-place if so equipped.
6. The operation test of the damper needs to verify that there is no damper interference due to rusted, bent, misaligned or damaged frame or blades, or defective hinges or parts.
7. The damper frame must not be penetrated by any foreign objects that would affect fire damper operations.
8. The damper must not be blocked from closure in any way.
9. The fusible link (if applicable) needs to be reinstalled after the completion of testing.

10. If the fusible link (if applicable) is damaged or painted, it should be replaced with a link of the same size, temperature and load rating.
11. All inspections and testing need to be documented indicating the location of the damper, date of inspection, name of inspector and deficiencies discovered.
12. The documentation needs to have space to indicate when and how the deficiencies were corrected.
13. All documentation needs to be maintained and made available for review by the AHJ.

### **III. Maintenance (Fire Dampers, Smoke Dampers and Combination F/S Dampers)**

1. Reports of changes in airflow or noise from the duct system need to be investigated to verify that they are not related to damper operation.
2. All exposed moving parts of the damper need to be dry lubricated as required by the manufacturer.
3. If a damper is inoperable, repairs need to begin without delay.
4. Following any repairs, the damper needs to be tested for operation in accordance with the requirements for Periodic Inspection and Testing.
5. All maintenance needs to be documented in accordance with sections II.11-13, above.
6. The following maintenance needs to be performed at least every 4 years:
7. Fusible links (where applicable) need to be removed.
8. All dampers need to be operated to verify that they close fully.
9. The latch, if provided, needs to be checked.
10. Moving parts need to be lubricated as necessary.
11. Fusible links and other system component need to be fully and correctly reassembled and tested.

#### **IV. Additional Testing Requirements for Atria and Large Spaces**

1. Smoke dampers need to be tested at least semi-annually by persons who are knowledgeable in the operation, testing and maintenance of the systems.
2. The results of the tests need to be documented and made available for inspection.
3. Smoke management systems need to be operated for each sequence in the current design criteria.
4. The tests need to be conducted under standby power if necessary.

#### **V. Smoke Control Systems**

##### **1. Dedicated Smoke Control Systems**

- a. Dedicated smoke control systems need be tested in the following manner at least semi-annually: Operate the smoke-control system for each control sequence in the current design criteria, and observe the operation of the correct outputs for each given input. Tests need to also be conducted under standby power, if applicable.

##### **2. Non-dedicated Smoke Control Systems**

- a. Non-dedicated smoke control systems need be tested in the following manner at least semi-annually: Operate the smoke-control system for each control sequence in the current design criteria, and observe the operation of the correct outputs for each given input. Tests need to also be conducted under standby power, if applicable.