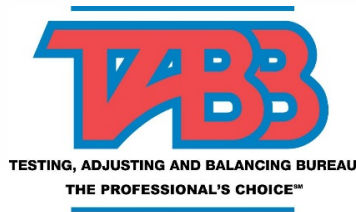


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# FIRE & FIRE / SMOKE DAMPERS

## PERIODIC DAMPER INSPECTION

- **INSPECTION**
- **FUNCTIONAL TESTING**
- **MAINTENANCE**
- **REPAIR/REPLACE**
- **DETAILED DOCUMENTATION & REPORTS**
- **NATIONAL & STATE COMPLIANCE ASSISTANCE**

## Introduction

Fire Dampers (FD), Smoke Dampers (SD), and Fire Smoke Dampers (FSD) are key elements of safety in the event of a fire. These dampers are the “first responders” when a fire strikes, instantly operating to protect people and property even before the Fire Department arrives on scene. Their purpose is simple; contain the fire and smoke. Their importance is unrivaled; save human lives and prevent costly damage.

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The importance of these dampers is already established. The industry is riddled with examples of historic catastrophes such as the 1980 MGM fire where needless deaths and injuries were a direct result of Fire and Smoke Damper neglect. Due to the nature of what's at stake, many codes such as NFPA 80 and NFPA 105 now exist. These codes dictate proper installation, maintenance, and periodic testing of fire and smoke dampers. Records of compliance are to be held by the building owner.



## Customer Information

### Requirements:

Sacramento City requires compliance with NFPA 80, NFPA 90A, and NFPA 105 as required by Sacramento City code.

**NFPA 80 19.4.1.1** The test and inspection frequency *shall be every 4 years*, except in hospitals, where the frequency *shall be every 6 years*.

**NFPA 105-6.5** Periodic inspection and testing

**6.5.2** Each damper shall be tested and inspected one year after installation. The test and inspection frequency *shall be every 4 years*, except in hospitals, where the frequency *shall be every 6 years*.

The National Fire Protection Association (NFPA), International Code Council, State Fire Marshall, and Insurance Risk Auditors require a periodic inspection of fire and fire smoke dampers.

The administrative section of codes state that all mechanical and electrical systems must be kept in working order and an individual section may state that all life safety devices and systems must be operable. NFPA 80 (Fire) & NFPA 105 (Smoke) require periodic testing and repair of dampers as soon as possible after any deficiency is uncovered.

### Repairs/Replacement:

Fire & smoke dampers are considered to be appliances and field replacement of components is to be expected when failure of any component occurs.

- **NFPA 80 (Fire Dampers) – Section 19.5.3:**

*“If the damper is not operable, repairs shall begin without delay.”*

- **NFPA 105 (Smoke Dampers) – Section 6.6.3:**

*“If the damper is not operable, repairs shall begin as soon as possible.”*

## Airco Automation is Qualified:

Our Fire Life Safety Technicians are certified by the National Energy Management Institute (NEMI) as Fire Life Safety Technicians.

Additionally, our technicians have the benefit of being certified as Test Adjust and Balance Technicians by the Test Adjust Balance Bureau (TABB) – an organization recognized by the American National

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## **Certified Report:**

A certified report will be submitted to you at the conclusion of work. This will be your proof of inspection to regulatory agencies (Fire Marshalls, Insurance Underwriters, the Joint Commission, etc.)

Our inspection testing procedures meet code requirements of 2002 NFPA 90A Code and the 2007 NFPA 80 Code.

## **Testing and Inspection:**

Airco Certified Technicians perform a thorough inspection that meets and exceeds current industry standards.

Our technicians utilize a comprehensive 15 point checklist ensuring the most complete and stringent work is executed and documented.

## **Replacement or Repair:**

With over thirty years in the mechanical industry, Airco Automation is capable of all testing, repairing and replacement of fire/smoke dampers and their related components.

Our mechanical installers and service technicians can immediately make repairs as mandated by code.

All repairs will follow code and maintain the integrity of the dampers UL listing.

**Q: Can I have *my own* staff test the dampers?**

**A: *Yes*, if they meet at least one of the qualifications listed below:**

***This requirement is required by the California Fire Code:***

### **2007 California Fire Code:**

#### **907.20.1 Maintenance required**

Whenever or wherever any device, equipment, system, condition, arrangement, level of protection or any other feature is required for compliance with the provisions of this code, such device, equipment, system, condition, arrangement, level of protection or other features shall thereafter be continuously maintained in accordance with applicable NFPA requirement or as directed by the Authority Having Jurisdiction. (AHJ)

#### **909.18.8.2 Qualifications:**

Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

**Sacramento City Code further enforces this requirement:**

### **15.36.010 Adoption of California and International Codes**

In order to prescribe regulations governing conditions hazardous to life and property from fire or explosion, the city shall adopt (a) the 2007 edition of Title 24, Part 9 of the California Code of Regulations, and (b) the 2007 edition of the International Fire Code, International Building Code, and International Mechanical Code.

#### **15.36.010 Adoption of California and International Codes**

In order to prescribe regulations governing conditions hazardous to life and property from fire or explosion, the city council adopted (a) the 2007 version of Title 24, Part 9 of the California Code of Regulations, known as the California Fire Code, incorporating portions of the 2006 edition of the International Fire Code published by the International Code Council;(b) those provisions of the 2006 edition of the International Fire Code that were not incorporated into the current California Fire Code; and (c) local amendments relating to local climatic, topographical and geologic conditions that are set forth in this chapter. Copies of these codes shall remain on file with the city clerk or the fire marshal. (Ord. 2008-009 § 2)

## **Hospitals and Health Care Facilities**

### **The Joint Commission:**

*“All new dampers installed must be inspected within the first twelve months after installation, then again every six years.”*

Airco Automation strictly follows procedures established by Hospitals, Pharmaceutical Manufacturers, Medical Office Buildings, Diagnostic Centers, Nursing Homes and Research Laboratories to ensure our inspection services are in compliance with the facilities safety mandates.

Airco technicians and procedures adhere to the Healthcare Facility’s Infection Control Departments Infection Control Risk Assessment (ICRA) guidelines.

Airco technicians will communicate with the healthcare staff throughout the project. Communication guarantees that all work being performed will not negatively affect staff or patients.



## **Deaths Accounted to Smoke**

**Coconut Groove nightclub – Boston**

## Coconut Groove nightclub – Boston

1942

- The only exit, a revolving door, was blocked by over 200 victims of smoke inhalation. Estimated 492 deaths from smoke inhalation.

## MGM – Las Vegas

1980

- 84 deaths and 679 injuries resulted from smoke spreading through pipe chases, laundry chutes, and ductwork shafts.
- Started on first floor and spread 19 feet per second.
- Majority of deaths and injuries occurring in the upper floors far from the source of the fire.
- “Smoke-Free” stairwell, crucial to escape, filled with smoke.
- National Fire Protection Agency (NFPA) investigation found:
  - “HVAC systems operated during the fire and contributed to smoke spread through the high-rise tower. The equipment, as far as could be determined, was not equipped with smoke detectors arranged to shut down the systems upon sensing products of combustion. In addition, some fire dampers were arranged so that they would not close when fusible links melted, and others did not close completely. High-rise tower corridors were utilized for supply air to guests’ rooms: this arrangement contributed to smoke movement in corridors and exposure to guests’ rooms.”
  - The report identified negligence to ensure damper compliance and emphasized the need for a comprehensive program for identification of damper types, their rating, locations, accessibility, inspection, functional testing, and maintenance.

## World Trade Center- New York

2001

- U.S. Department of Commerce’s National Institute of Standards and Technology (NIST) Investigation of Active Fire Protection Systems Sub-Tasks Report states, *“Installation of combination fire/smoke dampers in HVAC ductwork, which was not required in WTC1 or WTC2 would have acted to slow the development of hazardous conditions on the uppermost floors of the building...”*

## Hilton- New York

2005

- 33 people went to the hospital for smoke inhalation.
- Fire was limited to a shaft running the length of the building.
- Smoke spread rapidly through the hotel. Patrons complained hallways were thick with smoke.

### NOTE:

*Contributing factors related to dampers were not the only reason for loss of life in these fires. However, NFPA confirms that building owners, managers, and industry professionals must take proactive measures to ensure compliance to minimize the risks and liabilities.*

## Conclusion:

The successful operations of all building systems, including fire and smoke dampers, can mean the difference between a nuisance fire and a catastrophe.

Proper installation, compliance with codes and standards, inspection, and regular maintenance are inextricable linked to the successful operation of such dampers in the event of a fire incident.

Unlike both World Trade Center fires which were the result of deliberate acts, most fire disasters are the result of small deficiencies working in an unintended “domino effect” that result in total building failure.

Unlike both World Trade Center fires which were the result of deliberate acts, most fire disasters are the result of small deficiencies working in an unintended “domino effect” that result in total building failure.

## Frequently Asked Questions: Fire and Fire/Smoke Dampers

- **What is the purpose of a fire damper?**

Fire dampers are used to maintain the required ratings of fire rated barrier (walls, partitions, floors) when they are penetrated by ductwork.

- **How does a fire damper work?**

A fire damper is designed to close automatically upon detection of heat. It also serves to interrupt migratory airflow, resist the passage of fire, and maintain the integrity of the fire rated separation.

- **What is the purpose of a smoke damper?**

Smoke dampers are installed in ductwork and air transfer openings that are designed to resist the passage of air and smoke. Smoke dampers may be controlled either automatically by a smoke detection system, or opened and closed from a remote fire command station if required.

- **What is a fire wall?**

A fire-resistance rated wall, having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof. Also known as a Building Separation Wall.

- **How does a smoke damper work?**

Typically smoke dampers are operated by smoke detectors in the ductwork that will close the smoke damper when smoke is detected.

In the event of a fire, these dampers will delay the spread of noxious smoke and fumes to other floors of a building and rooms on the same floor. These dampers combat smoke only and are not effective in preventing the spread of fire. In HVAC systems, smoke dampers are installed in air ducts and in air transfer openings.

- **What is a combination fire and smoke damper?**

These dampers are used in areas in where both smoke and fire barriers are located to prevent the passage of both smoke and flames.

- **What is a corridor damper?**

Corridors are means of egress travel to an exit. Corridor dampers are fire and smoke dampers that have been designed for use in corridors.

- **What is a ceiling damper?**

Ceiling dampers protect HVAC penetrations in fire resistive ceiling/roof assemblies. These dampers are designed to limit radiant heat to the joists above the ceiling.

- **What is a smoke barrier?**

A smoke barrier consists of walls, partitions, floors and openings designed to prevent the transmission of smoke or gases through the construction.

- **What is the Authority Having Jurisdiction?**

A smoke barrier consists of walls, partitions, floors and openings designed to prevent the transmission of smoke or gases through the construction.

- **What is the Authority Having Jurisdiction?**

The final authority who writes the "Certificate of Occupancy Permit" in a municipality. This can be the building code official/inspector or fire inspector. Since each municipality is different, the "authority having jurisdiction" may also be different from town to town. Check with local officials to verify who has final jurisdiction. Industrial facilities and hospitals may have other "jurisdictions."