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SMACNA ANNUAL CONVENTION

Maui, Hawaii

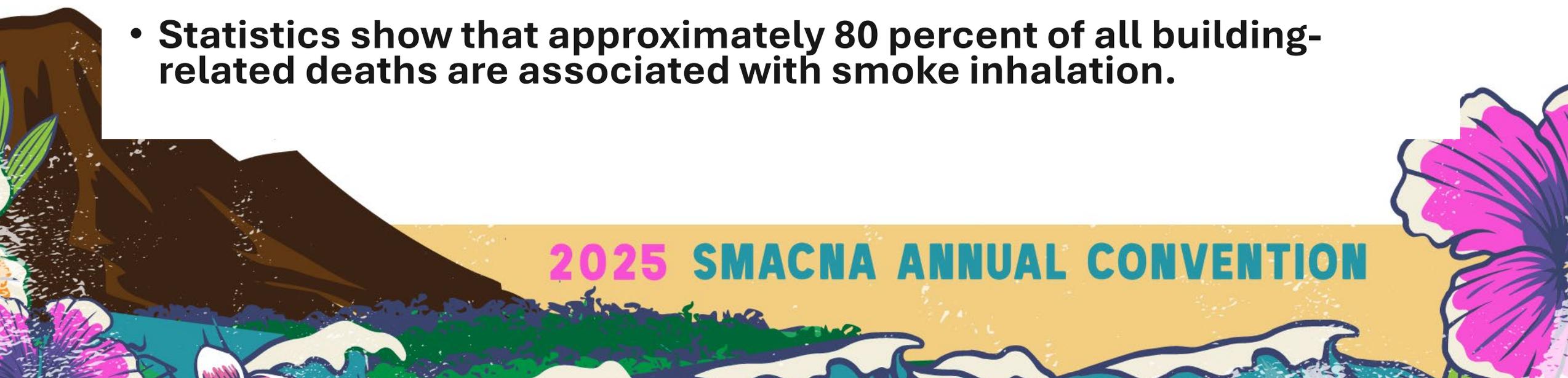
OCTOBER 26-29



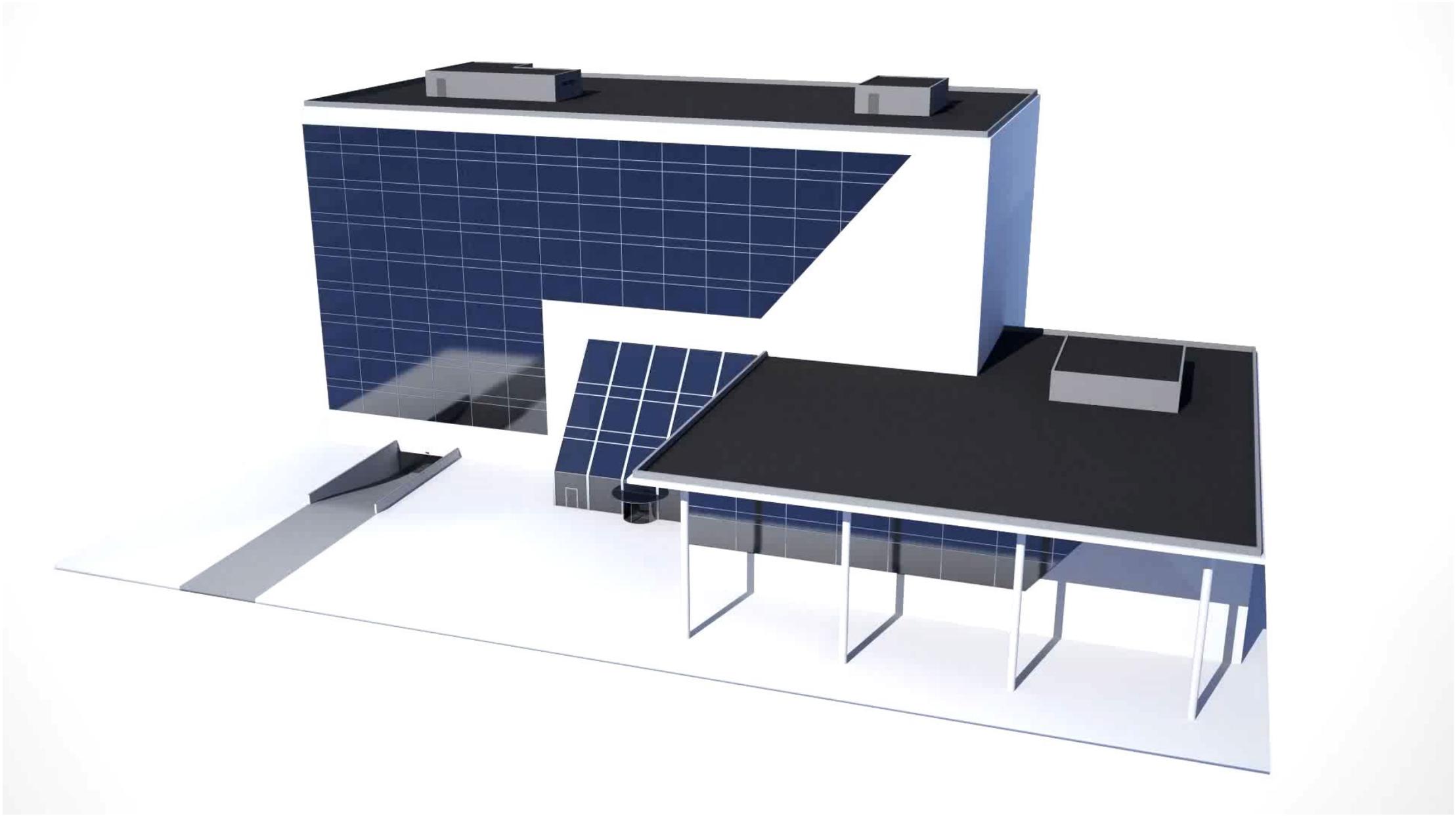
- **Fire Smoke Damper (FSD)
and Smoke Control Systems (SCS)
Testing Requirements**

But we have Sprinklers...

- According to the National Fire Protection Association (NFPA), smoke travels at 120-420 feet per minute (fpm) during an active fire.
- Most victims are not located in the same room as the fire's origin.
- Statistics show that approximately 80 percent of all building-related deaths are associated with smoke inhalation.



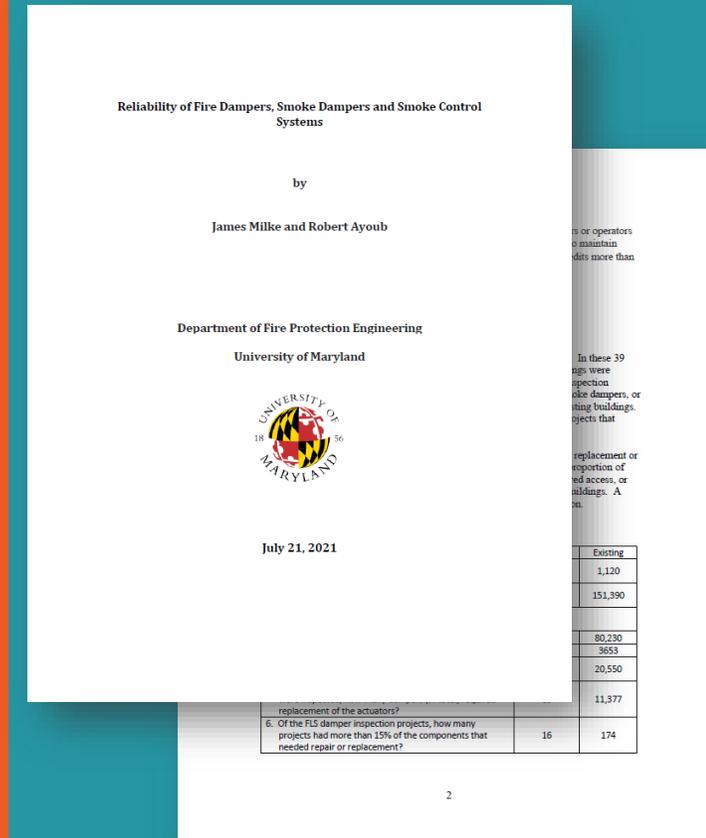
2025 SMACNA ANNUAL CONVENTION



University of Maryland Study

Reliability of Fire Dampers, Smoke Dampers and Smoke Control Systems

- ✓ Released July 21, 2021
- ✓ 170,354 dampers included
- ✓ 53% of dampers in existing buildings needed repairs
- ✓ 3,653 dampers needed replacement
- ✓ 20,550 needed better access installed





Local Code

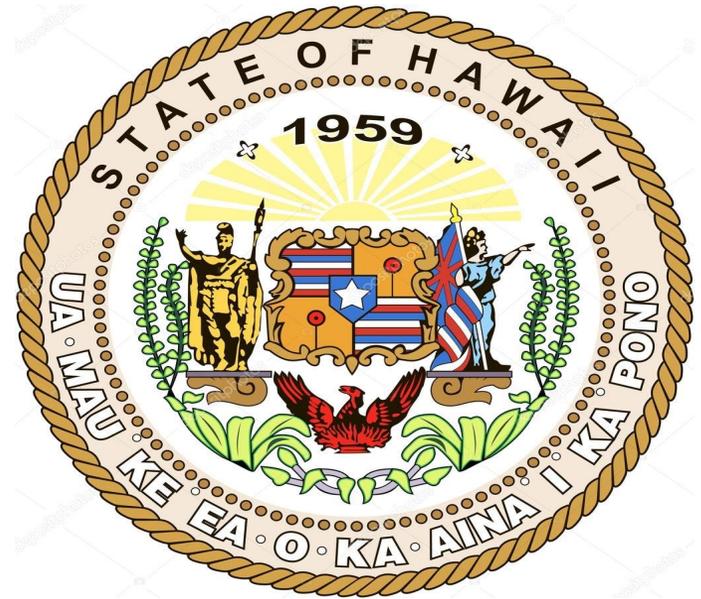
What is Required?



Periodic Damper Inspections

Current
Requirements

State of Hawaii
2025



Current requirements for the State of Hawaii

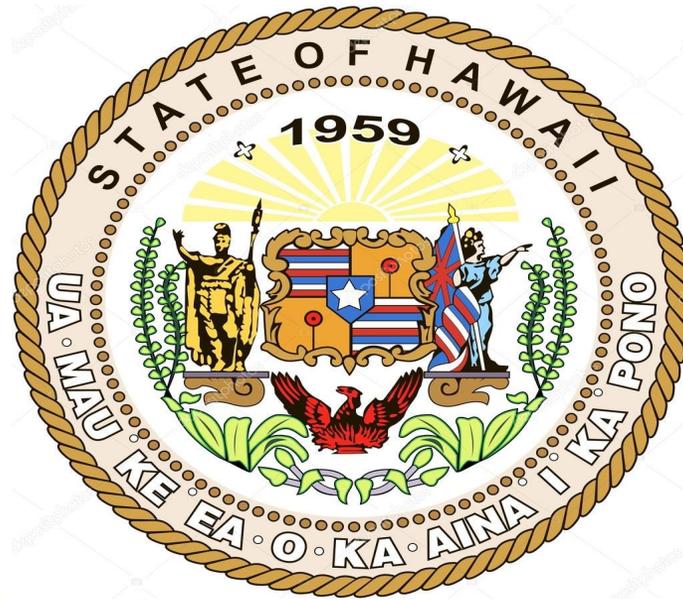
Hawai'i Administrative Rules (HAR)

- Title 12, Subtitle 7, Chapter 45.4 – State Fire Code
- Adopts **NFPA 1, 2018 Edition**, with state-specific amendments
- If a county does not adopt within 2 years, the State Fire Code automatically becomes the county's fire code until an adopting ordinance is passed.

Hawai'i State Fire Council (SFC)

- **City & County of Honolulu** – Honolulu Fire Department (HFD)
- **County of Maui** – Maui Fire Department (MFD)
- **County of Hawai'i** – Hawai'i Fire Department
- **County of Kaua'i** – Kaua'i Fire Department

Fire Smoke Dampers (FSD)



Hawai'i State Fire Code

Calls for FLS dampers to be inspected and maintained in accordance with NFPA 80 and 105.

DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

Repeal of Chapter 12-45.3 and adoption of Chapter 12-45.4
Hawaii Administrative Rules

1. Chapter 12-45.3, Hawaii Administrative Rules, entitled, "State Fire Code", is repealed.

SUMMARY

2. Chapter 12-45.4, Hawaii Administrative Rules, entitled "State Fire Code", is adopted.

NFPA[®] 1
Fire Code
2018

1



- Section 12.9.5.4 Installation, Testing, and Maintenance
 - Air-conditioning, heating, and ventilating ductwork and related equipment, including smoke dampers and combination fire/smoke dampers, shall be installed in accordance with NFPA 90A, NFPA 90B, NFPA 105, or NFPA 80, as applicable.
- Smoke dampers and combination fire/smoke dampers required by this Code shall be inspected, tested, and maintained in accordance with NFPA 105.
- 12.9.5.5 Access and Identification
 - Access shall be provided for inspection, testing, and maintenance.
 - Dampers must have permanent identification at each access point (e.g., FIRE/SMOKE DAMPER, SMOKE DAMPER, FIRE DAMPER).

2016 NFPA 80

Standard for Fire Doors and Other Opening Protectives

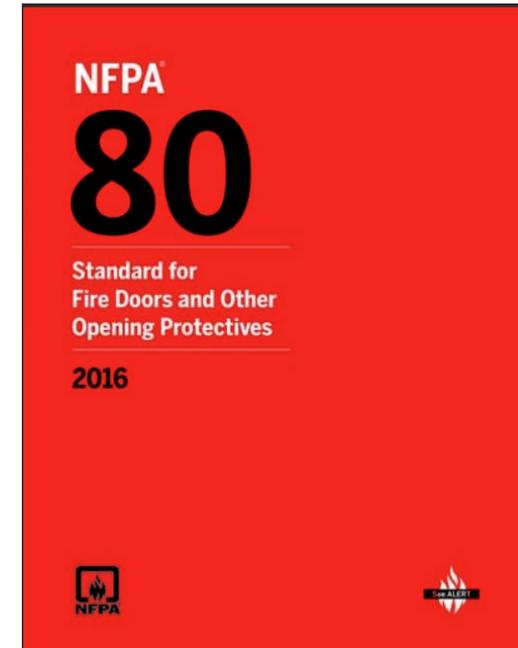
- **Fire Dampers SHALL be tested (1) year after acceptance testing, every (4) years after that except for buildings containing a hospital which is every (6) years.**

- ❖ **19.5 Periodic Testing**

- 19.5.1. Testing Frequency**

- 19.5.1.1 Each damper shall be tested and inspected 1 year after acceptance testing**

- 19.5.1.2 The test and inspection frequency shall than be every 4 years, except in buildings containing a hospital, where the frequency shall be every 6 years**





2016/2019 NFPA 80

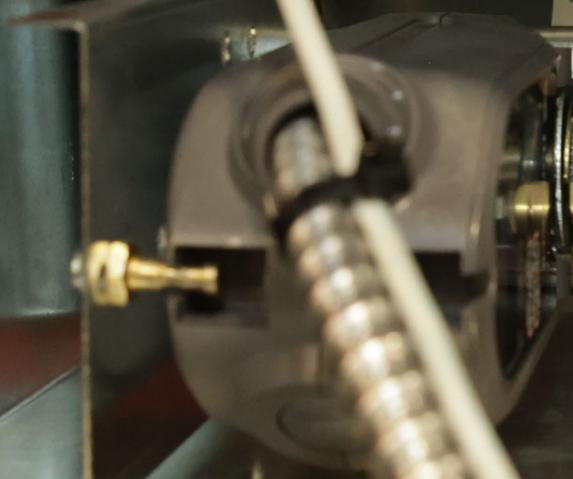
- Testing Procedure includes a visual confirmation of proper operation (2019 allows for remote inspection if damper is capable and after initial visual inspection)
 - 19.5.2 Test Method
- Maintenance
 - 19.6.3 If the damper is not operable, repairs shall begin without delay



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1 of 1 DATT

Smoke Damper
Leakage Resistance Class 1



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 GREENHECK

PUSH
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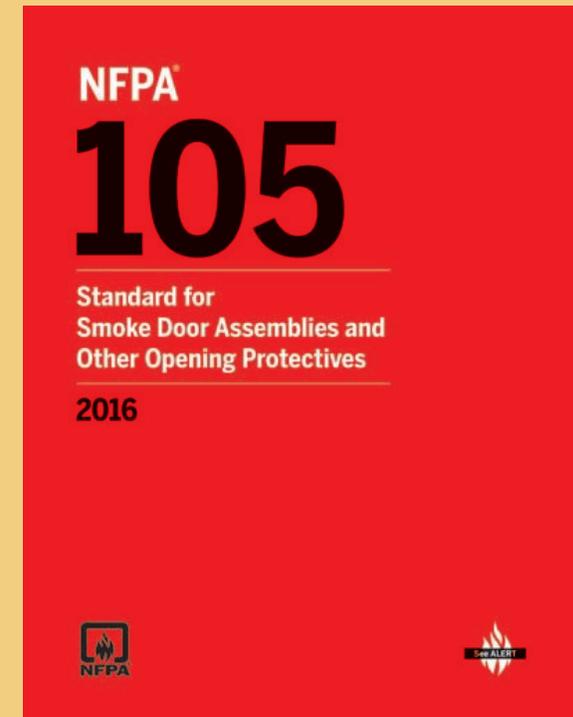
ESD-211

2019/2016 NFPA 105

Standard for Smoke Door Assemblies and Other Opening Protectives

Smoke Dampers SHALL be tested (1) year after acceptance testing, every (4) years after that except for buildings containing a hospital which is every (6) years.

- 7.6.2 Testing Frequency
 - 7.6.2.1 Each Damper shall be tested and inspected 1 year after installation
 - 7.6.2.2 The test inspection shall then be every 4 years, except in buildings containing a hospital, where the frequency shall be every 6 years.
- 7.6.1 General
 - 7.6.1.1 Smoke Dampers for dedicated and nondedicated smoke control systems shall be inspected and tested in accordance with NFPA 92
 - 7.6.1.2 Combination fire/smoke dampers shall be inspected and tested in accordance with NFPA 80.



2016/2019 NFPA 105

- Testing Procedure includes a visual confirmation of proper operation (2019 allows for remote inspection if damper is capable and after initial visual inspection)
 - 7.6.3 Test Method
- Maintenance
 - 7.7.3 If the damper is not operable, repairs shall begin as soon as possible



FSD Testing and Inspection Procedure



Smoke Damper Test (Fail)

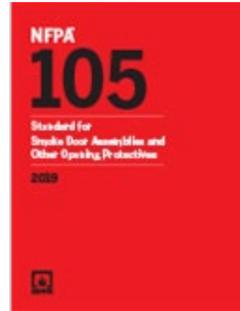


Smoke Damper Pass (or Fail?)

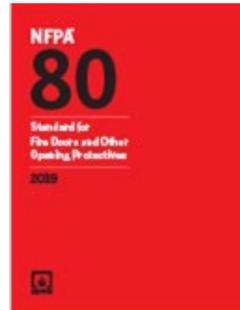


Operational and Acceptance Testing – Prior to Occupancy

- Operational Test
- Acceptance Test



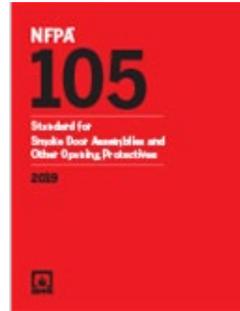
- NFPA 105
- 7.4 Operational Test
- 7.5 Acceptance Testing



- NFPA 80
- 19.3 Operational Test
- 19.4 Acceptance Testing

Periodic Testing – Post Occupancy

- Periodic Inspection and Testing



- NFPA 105
- 7.6 Periodic Inspection and Testing
- 7.6.3 Test Method



- NFPA 80
- 19.5.2.2 Periodic Testing For Fusible Link Operated Dampers
- 19.5.2.3 Periodic Testing For Dampers That Do Not Use A Fusible Link To Operate

Sample MOP

- ✓ Technician
- ✓ Owner
- ✓ AHJ



Method of Procedure (MOP)

Training Aid to Assist in Developing Combination Fire & Smoke Damper Testing Procedure

1. Locate Damper
 - 1.1. Locate damper, assign a number, and document location on facilities drawings
 - 1.2. Verify full unobstructed access
 - 1.3. Take a picture of damper prior to inspection
2. Operational Test
 - 2.1. Verify FLS system is in a test mode and responsible parties are aware of the testing.
 - 2.2. If possible, conduct test with normal HVAC airflow
 - 2.2.1. Be alert to any possible damage caused by closing the FLS damper (resulting high duct pressure)
 - 2.2.2. Insure that other zones in the system will not be negatively affected (comfort or safety pressure relationships)
 - 2.3. If any external or internal springs are present, exercise caution. Springs are under high torsion and may cause serious injury.
 - 2.4. All tests shall be completed in a safe manner by personal wearing personal protective equipment
 - 2.5. Fusible Link (if applicable)
 - 2.5.1. Design
 - 2.5.1.1. Upon sensing heat, the Fusible Link is designed to melt resulting in a closed damper. The damper will not open until manually opened and the Fusible Link is replaced.
 - 2.5.2. Testing Procedure
 - 2.5.2.1. Verify fusible link or other moveable parts are not painted or coated unless listed by the testing agency.
 - 2.5.2.2. Remove fusible link with the damper in an open position.
 - 2.5.2.3. Verify latch operates correctly if applicable
 - 2.5.2.4. Check closure spring if applicable
 - 2.5.2.5. Verify that there is no damper interference
 - 2.5.2.6. Ensure blades close and seal as designed without assistance.
 - 2.5.2.7. Take a picture of the damper in a full closed position.
 - 2.5.2.8. Re-install fusible link
 - 2.5.2.8.1. Replace fusible link if damaged or painted
 - 2.5.2.8.2. Replace a functionally equivalent fusible link.
 - 2.6. Thermal Disk (if applicable)
 - 2.6.1. Design
 - 2.6.1.1. Upon sensing heat, the disc will dimple and stop the flow of electricity to the actuator, causing the damper to close. Once the disc cools, and resets, the path of electricity to the actuator will result in the damper opening.
 - 2.6.2. Testing Procedure

verifying thermal disc

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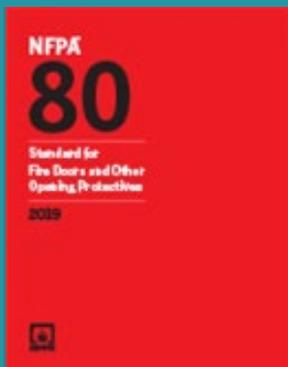
NFPA 80 - 2019

19.5.3 Documentation

19.5.3.1 All inspections and testing **shall** be documented, indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.



19.5.3.2 All documentation **shall** be maintained for at least three test cycles and made available for review by the AHJ.



NFPA 105 - 2019

7.6.4 Documentation.

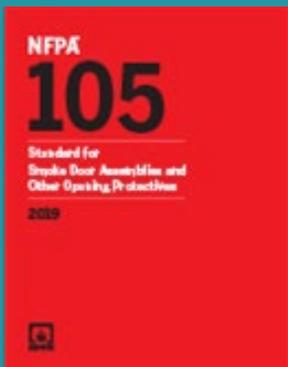
7.6.4.1 All inspections and testing **shall** be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered.



7.6.4.2 The documentation **shall** have space to indicate when and how the deficiencies were corrected.



7.6.4.3 All documentation **shall** be maintained for at least **three test cycles** and made available for review by the AHJ.



Project:

Address:

Structure Inspected
By / Date

Approved By / Date

Damper Identification							Comments
Damper Identification	Type	Level	Location	Test 1 Passed Yes / No	Test 2 Passed Yes / No	Test 3 Passed Yes / No	
FD-100-01	FD	1ST FLOOR	WEST SIDE	FAIL T.D. 3/19/17	FAIL T.D. 3/19/17	PASS T.D. 3/29/19	Fire Damper
SD-100-01	SD	1ST FLOOR	WEST SIDE	PASS T.D. 3/29/19			Smoke Damper
FSD-101-01	FSD	2ND FLOOR	SOUTH SIDE	PASS T.D. 3/29/19			Fire Smoke Damper
FD-100-03 DD	DD	1ST FLOOR	EAST CORRIDOR	REMOVED A.E.K. 3/29/2019			Decomissioned Damper

Sample Cover Sheet

- Developed in Coordination with local contractors and the AHJ



Fire Smoke Damper (FSD) Report Cover Sheet and Summary

TABB
TESTING, INSULATING AND BALANCING BUREAU
THE PROFESSIONAL'S CHOICE

Fire Smoke Damper (FSD) Report Cover Sheet and Summary

Date of Report Submission: _____

Building Information

Building Name:	
Building Address:	
Job Number:	

Building Contact Information

Primary Contact Name:	
Primary Contact Title:	
Primary Contact Email:	
Primary Contact Phone:	

Scope of Work: _____

Referenced Code or Standard: _____

Initial Test Results

Test Date(s)	
Dampers Tested	
Dampers Passed	
Dampers Failed	

Repairs and Adjustments

Damper Number	Location	Repair or Adjustment	Date

Page 1 of 2

SCS Report Cover Sheet

TABB
TESTING, INSULATING AND BALANCING BUREAU
THE PROFESSIONAL'S CHOICE

SCS Report Cover Sheet

Date of Report Submission: _____

Building Information

Building Name:	
Building Address:	
Job Number:	

Building Contact Information

Primary Contact Name:	
Primary Contact Title:	
Primary Contact Email:	
Primary Contact Phone:	

Scope of Work: _____

Referenced Code or Standard: _____

Initial Test Results

Test Date(s)	
Test Description	
Initial Test Results	

Repairs and Adjustments

Equipment	Location	Repair or Adjustment	Date

Page 1 of 2

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test cycles

PA Standards
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requirements.
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th a removable duct.

- o 19.6.3 If the damper is not operable, repairs shall begin without delay.

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Underwriters Laboratories Inc.



▶ DAMPER ACTUATORS

- ▶ “... field mounting or substitution of actuators is not covered within the scope of the UL certification of the product. However, this does not necessarily preclude replacement of actuators in the field. Like any appliance, field servicing of these products is not covered under the scope of the UL certification. As with any part of the damper, it is expected that replacement of actuators in the field be done in accordance with the damper manufacturer’s normal field servicing program.”

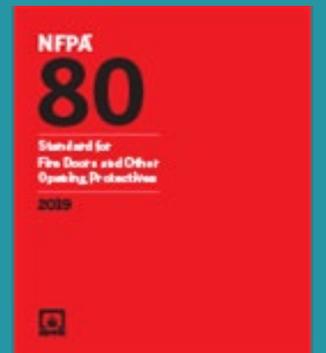
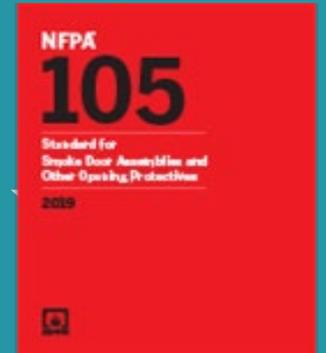
What If A Damper Is Inoperable?

NFPA 80:

19.7.1 Any field modification made to the damper shall be in accordance with the damper manufacturer's installation instructions and listing.

NFPA 105:

7.8.1 Any field modification made to the damper shall be in accordance with the damper manufacturer's installation instructions and listing.



Open



Closed





FSS 20/21

B. *3 EXT. 7.7/16



UNDERWRITERS' L
CLASS
FIRE D
FIRE RESISTANCE
RATING 1 1/2 HR.
SEE U.S. QUALIFIED
RUSKIN



















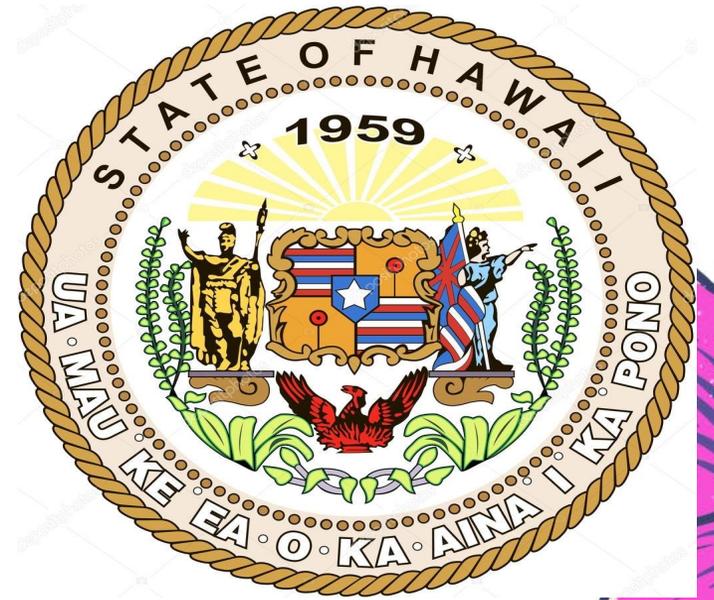






Smoke Control Systems(SCS)

Smoke control systems are intended to provide a tenable environment for the evacuation or relocation of occupants.





“Grenfell Tower’s smoke ventilation system failed days before fire”

The smoke ventilation system at Grenfell Tower was reported to have failed eight days before the fatal blaze claimed 71 lives, but a proposal to fix it for £1,800 (\$2,329) was ignored, the public inquiry has heard. – The Gaurdian, 180605

Booth also revealed that an earlier proposal for a 12-month maintenance contract involving six-month maintenance visits for the system, costing £3,600 (\$4,659), was ignored. – The Gaurdian, 180605

Hawai'i State Fire Code

Calls for smoke control systems to be installed, tested, and maintained in accordance with NFPA 92 and the manufacturer's instructions.

DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

Repeal of Chapter 12-45.3 and adoption of Chapter 12-45.4
Hawaii Administrative Rules

1. Chapter 12-45.3, Hawaii Administrative Rules, entitled, "State Fire Code", is repealed.

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NFPA[®] 1
Fire Code
2018

1



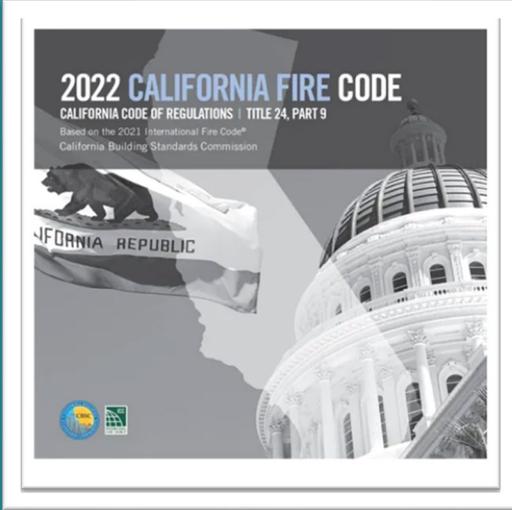
- **Section 11.8 – Smoke Control Systems**

- **11.8.1 General**

Smoke control systems are addressed in NFPA 1 via Section 11.8. They must comply with **NFPA 92, Standard for Smoke Control Systems.**

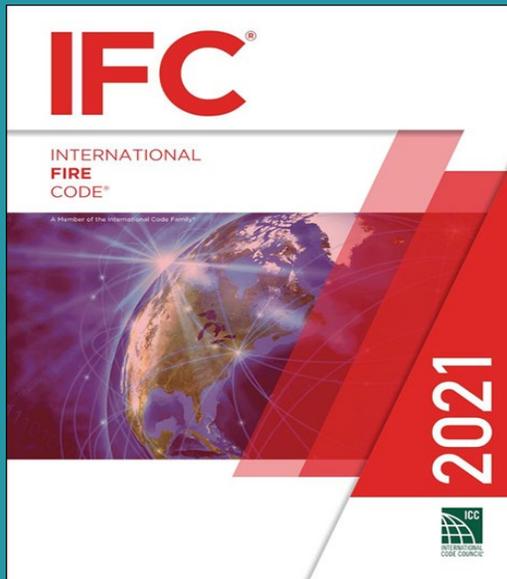
- **11.8.2 Acceptance and Periodic Testing**

Acceptance testing and periodic testing requirements for smoke control systems are set forth in NFPA 1 § 11.8 and cross-referenced with NFPA 92 testing protocols.



2022 CA Fire Code

Calls for system being maintained per **Manufacturer's Recommendations**, routine maintenance and operational testing, **annual testing of nondedicated** smoke control systems, and **semiannual testing of dedicated** smoke control systems



- 909.22 Maintenance. Smoke control systems shall be maintained to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. **The system shall be maintained in accordance with the manufacturer's instructions** and Sections 909.22.1 through 909.22.6.

Ruskin

Maintenance Instructions

- Requires Maintenance be completed per NFPA 80 and NFPA 105.

RUSKIN®

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

OPERATION & MAINTENANCE INSTRUCTIONS

While required frequency of periodic operation and testing varies by local jurisdiction, most local municipalities' reference one of two national standards, NFPA 80 covers the requirements for fire dampers and NFPA 105 covers the requirements for smoke dampers. Both documents contain the frequency requirements for periodic operational testing:

In addition, NFPA 72 and NFPA 92 describe the periodic testing requirements for smoke control systems. Dampers that are part of a smoke control system shall be cycled as part of this testing. When possible, the dampers should be operated under normal air flow conditions.

NFPA 105

- After damper installation is completed, an operational test shall be conducted.
- Each damper shall be tested and inspected 1 year after installation.
- In buildings not containing a hospital, each damper shall be tested and inspected every 4 years.
- In buildings containing a hospital, each damper shall be tested and inspected every 6 years.
- The test shall be conducted with normal HVAC airflow.
- All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.
- All documentation shall be maintained by the property owner and available for review by the AHJ.

OPERATIONAL TESTING SMC

Dampers with Position Indication

- Use the signal from the damper's position indication device position.
- Remove electrical power (or air pressure) from the actuator.
- Use the signal from the damper's position indication device closed position.
- Reapply electrical power (or air pressure) to open the damper.
- Use the signal from the damper's position indication device opened position.

Dampers without Position Indication

- Visually confirm that the damper is in the fully opened position.
- Ensure that all obstructions are out of the path of the damper blades.
- Visually confirm that the damper has fully closed.
- Reapply electrical power (or air pressure) to open the damper.
- Visually confirm that the damper returns to the open position.

MAINT

Although regular physical inspections are not required by ICC, regular maintenance is required. When maintenance is performed, the following shall be followed:

- Check actuator and tighten the linkage or coupling as necessary.
- Clean the damper blades and other working parts as necessary.
- Lubricate linkage, bearings, and other moveable parts with a product as they could cause excessive dust buildup.
- Cycle the damper/actuator following the instructions above.
- Consult Ruskin if problems are encountered.

FSDOM-514/Replaces FSDOM-413

PERIODIC PERFORMANCE TESTING FOR (D)IBD, (D)FD AND CFD DAMPERS

The recommended procedure for performing the periodic operational testing on fusible link operated dampers is described below.

- With the damper in the fully opened position, remove the fusible link. Care should be taken to ensure that there are no obstructions, including hands, in the path of the damper blades before the fusible link is removed.
- Once the fusible link is removed, ensure that the damper closes completely without assistance. If the damper is designed with a latch to hold in the fully closed position, confirm that the damper latches properly.
- Return the damper to the fully opened position and replace the fusible link. If the link appears damaged, replace with a functionally equivalent link.

NFPA 80

- After damper installation is completed, an operational test shall be conducted.
- Each damper shall be tested and inspected 1 year after installation.
- In buildings not containing a hospital, each damper shall be tested and inspected every 4 years.
- In buildings containing a hospital, each damper shall be tested and inspected every 6 years.
- The test shall be conducted with normal HVAC airflow.
- All inspections and testing shall be documented indicating the location of the damper, date of inspection, name of inspector, and deficiencies discovered. The documentation shall have a space to indicate when and how the deficiencies were corrected.
- All documentation shall be maintained by the property owner and available for review by the AHJ.

MAINTENANCE

When maintenance is performed the following checklist should be followed.

- Check closure springs. If damaged or defective, repair or replace.
- Clean the damper blades and other working parts as necessary.
- Lubricate linkage, bearings, and other moveable parts with a silicone or graphite lubricant. Do not use petroleum-based products as they could cause excessive dust buildup.
- Cycle the damper/actuator following the instructions above.
- Consult Ruskin if problems are encountered.

Note:

Due to their construction (including size) and/or accessibility, dynamic curtain type fire dampers may be very difficult and in some cases impossible to test (close and re-open). If the damper is determined to be impossible to test, Ruskin recommends a thorough examination to ensure nothing exists which would prohibit the damper from closing. The examination should include the damper square-ness and blade channel is free of any obstructions.

! Warning

If the damper(s) have closure springs, caution needs to be taken to ensure injury does not occur.

Greenheck

Maintenance Instructions

- Dampers and their actuator(s) must be maintained, cycled, and tested a minimum in accordance with:
- **Smoke Dampers**
- The latest editions of NFPA 92, 101, **105**, UL864, AMCA 503-03 and local codes.
- **Fire & Combination Dampers**
- The latest editions of NFPA **80**, 90A, 92, 101, **105**, UL864, AMCA 503-03 and local codes.

Damper Maintenance

Dampers do not typically require maintenance as long as they are kept dry and clean. If cleaning is necessary, use mild detergents or solvents. If lubrication is desired for components such as axle bearings, jackshaft bearings and jamb seals, do not use oil-based lubricants or any other lubricants that attract contaminants such as dust.

Dampers and their actuator(s) must be maintained, cycled, and tested a minimum in accordance with:

- The latest editions of NFPA 92, 101, 105, UL864, AMCA 503-03 and local codes.
- Actuator manufacturer recommendations.

Damper Troubleshooting

The following is a possible cause and correction list for common concerns with the dampers.

Symptom	Possible Cause
Damper does not fully open and/or close	Frame is 'racked' causing blades to bind on jamb seals
	Actuator linkage loose
	Defective motor
	Screws in damper linkage
Damper does not operate	Contaminants on damper
	No power supplied to the actuator

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice. Specific Greenheck product warranties can be located on greenheck.com within the product area tabs and listed in the Library under Warranties.



Phone: (715) 359-6171 • Fax: (715) 355-2399 • E-mail: gfcinfo@greenheck.com
464804 • HSD-401 Rev. 7, March 2018

Damper Maintenance

Dampers do not typically require maintenance as long as they are kept dry and clean. If cleaning is necessary, use mild detergents or solvents. If lubrication is desired for components such as axle bearings, jackshaft bearings and jamb seals, do not use oil-based lubricants or any other lubricants that attract contaminants such as dust.

Dampers and their actuator(s) must be maintained, cycled, and tested a minimum in accordance with:

- The latest editions of NFPA 80, 90A, 92, 101, 105, UL864, AMCA 503-03 and local codes.
- Actuator manufacturer recommendations.

Damper Troubleshooting

The following is a possible cause and correction list for common concerns with the dampers.

Symptom	Possible Cause	Corrective Action
Damper does not fully open and/or close	Frame is 'racked' causing blades to bind on jamb seals	Adjust frame such that it is square and plumb
	Actuator linkage loose	Close damper, disconnect power, adjust and tighten linkage
	Defective motor	Replace
	Screws in damper linkage	Damper installed too far into wall. Move out to line as designated on damper label
RRL or TOR sensor tripped	Heat	Push reset button located on backside of RRL or TOR
	Contaminants on damper	Clean with a non-oil based solvent (see Damper Maintenance)
Damper does not operate	No power supplied to the actuator	Add power supply



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Phone: 1.833.881.0565 • Fax: 715.355.2399 • E-mail: info@vencoproducts.com • Website: www.vencoproducts.com

481318 • FSD, DFD, FSD-3xxV Rev. 5 December 2017

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Pottorff

Maintenance Instructions

- Fire Dampers
- Regular inspection and maintenance is essential to ensure that life-safety systems will perform as intended during emergencies. Dampers shall be cycled and tested in accordance with **NFPA 90** recommendations and local codes.
- Smoke and Fire-Smoke Damper
- Regular inspection and maintenance is essential to ensure that smoke-control systems will perform as intended during emergencies. Dampers shall be cycled and tested in accordance with **NFPA 90 and 92A** recommendations and local codes

POTTORFF®

fire damper
operation and maintenance instructions

Maintenance

Dampers do not typically require maintenance provided they are kept clean and dry. All moving parts are self-lubricating and additional lubrication is not required. If additional lubrication of multi-blade damper axle bearings, jackshaft bearings or jamb seals is desired, use a silicone or dry graphic lubricant. **Do not use petroleum-based lubricants or other lubricants that attract contaminants and collect dust.**

Regular inspection and maintenance is essential to ensure that life-safety systems will perform as intended during emergencies. Dampers shall be cycled and tested in accordance with NFPA 90 recommendations and local codes.

Operational Testing

Simulated Fire Closure

- *Non-Spring Assisted Dampers*
Operate the damper by removing the fusible link (or by 'meltin'
CAUTION - Avoid injury - keep clear of blade travel path.
Take care not to rack, deform or damage the blades while reo

- *Dynamic Rated OR Spring Assisted Dampers*
Due to spring assisted closure force, removing the fusible link
'melt' the fusible link with an appropriate heat source and all
travel path. Lift the blade package to the top of the damper
blades when reopening.

Reopening Spring Assisted OR Dynamic Rated Fire Dam
impossible or impractical to test or reopen, then a thorough
damper from closing. Common obstructions include: r
contaminants.

**CAUTION - Testing Spring Assisted OI
not recommended and m**

Troubleshooting Guide

Problem	Poss
Damper does not open and/or close fully	Installation screw: damper blade or l
	Frame is 'racked' bind
	Contaminants on
Fusible link is separated	Excessive heat

Information is subject to change without notice or obligation.

POTTORFF® 5101 Blue Mound Road, Fort Worth, Texas 76

POTTORFF®

smoke and fire-smoke damper
operation and maintenance instructions

Maintenance

Dampers do not typically require maintenance provided they are kept clean and dry. All moving parts are self-lubricating and additional lubrication is not required. If additional lubrication of axle bearings, jackshaft bearings or jamb seals is desired, use a silicone or dry graphic lubricant. **Do not use petroleum-based lubricants or other lubricants that attract contaminants and collect dust.**

Regular inspection and maintenance is essential to ensure that smoke-control systems will perform as intended during emergencies. Dampers shall be cycled and tested in accordance with NFPA 90 and 92A recommendations and local codes.

CAUTION - Power must be applied to the damper actuator to open the damper. Do not manually position damper blades. Disconnecting actuator linkage, loosening actuator set screws, disconnecting damper linkage or jack shafting may void the product warranty and invalidate UL ratings.

Operational Testing

Simulated Fire Closure

Depress the disc on DRS-30 or HS-10 (located inside the duct. This will disconnect power to the actuator and cause the damper to close. Push the reset button (located outside the duct) to reengage power and reopen the damper.

Position Indicator Switch Testing (if applicable)

- *Open Damper Indicator Switch* - Apply power to open damper and confirm damper-open indicator light is on.
- *Closed Damper Indicator Switch* - Disconnect power to close damper and confirm damper-closed indicator light is on.
- *Intermediate or 'Fault' Indication (if applicable)* - While damper is cycling (open-to-close or close-to-open) confirm that the 'fault' light is on when the damper is between open and closed (~25 to 70 degrees of stroke). **Do not insert objects between damper blades to restrict damper travel.** Objects may destroy blade edge seals, deform blades and/or damage linkage, which will void the product warranty and invalidate UL ratings.

Troubleshooting Guide

Problem	Possible Cause	Solution
Damper does not operate, or will not open and/or close fully	Installation screws interfering with damper blade or linkage travel	Inspect and remove interfering screws or debris
	Damper heat responsive device is tripped.	Push reset button (located outside the duct)
	Frame is 'racked' causing blades to bind	Adjust frame to be square and plumb
	Contaminants on damper	Clean with compressed air, mild detergent or mild non-petroleum based solvent
	Loose actuator set screws or linkage	Disconnect power to close damper, loosen actuator set screws, adjust linkage (if applicable), tighten actuator set screws, reapply power
	No power supplied to the actuator	Connect power
Corresponding control panel indicating light does not illuminate when damper is open and/or closed	Defective actuator	Disconnect power and loosen actuator set screws, cycle actuator. If good, reconnect. If bad, contact the factory
	System wiring/program is faulty	Verify wiring is correct. If it is, then disconnect system wires from damper indicator switch and test open/closed switch continuity directly. If good, reconnect system wires and correct system fault. If bad, contact the factory.
	Defective switch	Contact factory if above test shows no continuity with damper either full open or full closed

Smoke and Fire-Smoke Dampers: IFBDDMM (1/1) May 2008

Information is subject to change without notice or obligation.

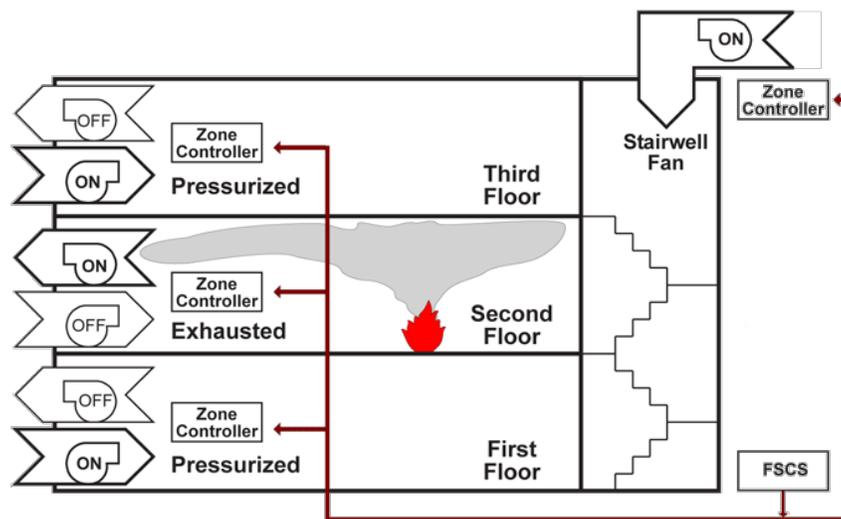
POTTORFF® 5101 Blue Mound Road, Fort Worth, Texas 76106

NOTE: Dimensions in parentheses () are in millimeters.

www.pottorff.com

Smoke Control Systems

Testing and Verification



The Fire
Consultants, Inc.

SMOKE CONTROL REPORT

MOFFETT PLACE BUILDING 3
GOOGLE TENANT IMPROVEMENT
SUNNYVALE, CALIFORNIA

Prepared for:

Woods Bagot
228 Grant Avenue, 5th Floor
San Francisco, CA 94108

14-1719

May 23, 2017



1981 N. Broadway, Suite 400
Walnut Creek, CA 94596

ph: (925) 979-9993
fax: (925) 979-9994

internet:
www.thefireconsultants.com

Acceptance Testing – Prior to Occupancy

909.18 Acceptance Testing

Devices, equipment, components and sequences shall be individually tested. These tests, in addition to those required by other provisions of this code, shall consist of determination of function, sequence and, where applicable, capacity of their installed condition.



2019 CA Fire Code - 909.18 Acceptance Testing

Acceptance Testing – Prior to Occupancy

- Detection Devices Tested at Maximum and Minimum Airflow (909.18.1)
- Duct Traverse to determine actual air quantities (909.18.2)
- Dampers function as designed in their installed condition (909.18.3)
- Inlets and outlets measured to verify actual air volume (909.18.4)



2019 CA Fire Code - 909.18 Acceptance Testing

Acceptance Testing – Prior to Occupancy

Continued...

- Fans shall be examined for correct rotation, volts, amps, RPM and Belt Tension (909.18.5)
- Pressure Differential measurements, with calibrated instruments, using across all smoke barriers (doors, floors, etc.) for all possible smoke control conditions.(909.18.6)



2019 CA Fire Code - 909.18 Acceptance Testing

Documentation

- A copy of the **final report shall be filed with the fire code official** and an **identical copy shall be maintained in an approved location at the building.** (909.18.3.1)



2019 CA Fire Code - 909.18 Acceptance Testing

Maintenance – Periodic Testing

Post Occupancy

- Operational testing of the smoke control system shall include all equipment such as initiating devices, fans, dampers, controls, doors, and windows. (909.22.3)
- **Dedicated** smoke control systems shall be tested **twice a year**. (909.22.4)
- **Non-dedicated** smoke control systems shall be tested **once a year** (909.22.5)



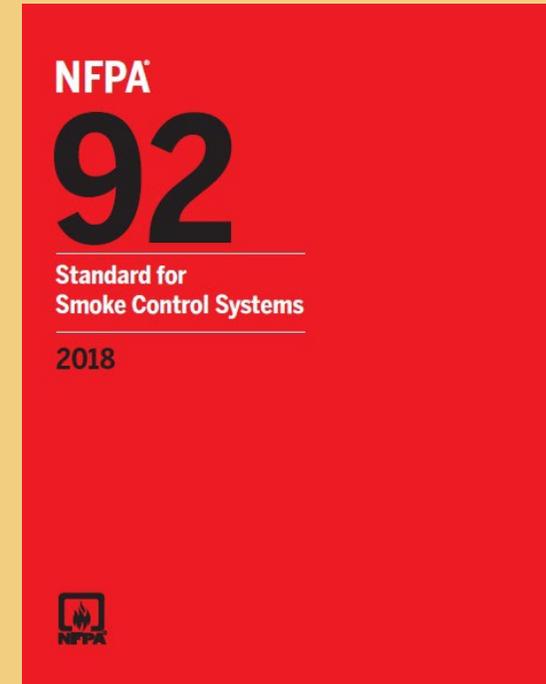
2019 CA Fire Code - 909.18 Acceptance Testing

2018 NFPA 92

Standard for Smoke Control Systems

Testing Requirements

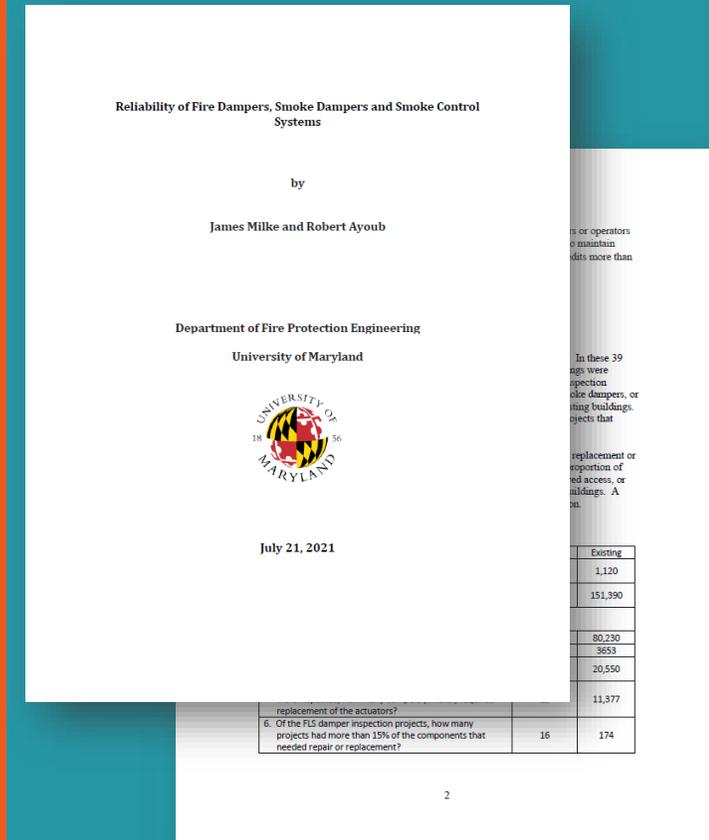
- 8.6 Periodic Testing
- 8.6.3 The periodic tests shall determine the **airflow quantities** and the **pressure differences** at the following locations:
 1. Across smoke barrier openings
 2. At the air makeup supplies
 3. At smoke exhaust equipment



University of Maryland Study

Reliability of Fire Dampers, Smoke Dampers and Smoke Control Systems

- 740 Smoke Control System Projects
 - ✓ Stairwells Requiring repairs or adjustment
 - 85% of New Building
 - 41% of Existing Buildings Stairwells
 - ✓ Zoned Systems required repairs or adjustment
 - 86% of New Building
 - 12% of Existing Buildings
 - Atrium Systems required repairs or adjustment
 - 81% of New Building
 - 22% of Existing Buildings





Quality Control – Need for Workforce Standards

NEMI
NATIONAL ENERGY MANAGEMENT INSTITUTE



WHAT IS THE FIRE & LIFE SAFETY ECOSYSTEM?



The Fire & Life Safety Ecosystem has **8 components**; each plays a critical role in protecting people and property.

FSD Testing – Qualifications

- NFPA 80
- 19.4.1 Acceptance testing of fire dampers **shall** be performed by a **qualified person with knowledge and understanding** of the operating components of the type of assembly being subject to testing and the system in which it is installed.
- NFPA 80
- 19.4.1 Acceptance testing of smoke dampers **shall** be performed by a **qualified person with knowledge and understanding** of the operating components of the type of assembly being subject to testing and the system in which it is installed.

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International Certification Board (ICB) Certifications

Fire Smoke Damper (FSD)

- ❖ Technician
- ❖ Supervisor
- ❖ Contractor

Smoke Control System (SCS)

- ❖ Technician
- ❖ Supervisor
- ❖ Contractor



The background features a stylized illustration of a tropical landscape. On the left, a brown volcano with a grey crater is partially visible. The foreground is dominated by blue and green waves. Various tropical plants and flowers are scattered throughout, including green monstera leaves, white hibiscus flowers, and large pink and purple hibiscus blooms. The overall style is vibrant and illustrative.

Legislation

Passed Legislation

- ✓ New Mexico
- ✓ Nevada
- ✓ Washington
- ✓ New Jersey
- ✓ St Louis
- ✓ Wisconsin
- ✓ Delaware

Proposed Legislation

- ✓ Kansas
- ✓ Missouri
- ✓ California(Oakland)

Questions??



Thank You!

2025 SMACNA ANNUAL CONVENTION



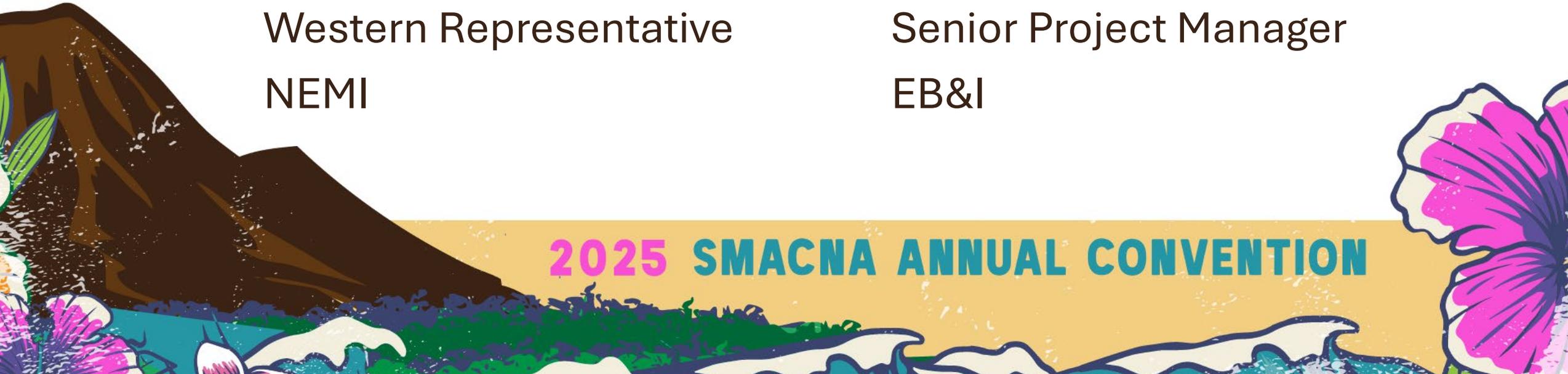
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NEMI

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EB&I

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NEMI Information



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Please take a moment to complete the session survey provided to you.

2025 SMACNA ANNUAL CONVENTION

A decorative illustration at the bottom of the slide. On the left, there are dark brown mountains with some green foliage. In the center, there are stylized waves in shades of blue and green. On the right, there is a large, vibrant pink and white hibiscus flower. The background of the bottom section is a solid yellowish-gold color.