Life Safety Dampers

Installation and Application





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Greenheck – Product Manager, Commercial Dampers

Chair: AMCA Smoke & Fire/Smoke Damper Taskforce

Member: AMCA Air Control Code Action & Review Committee (ACCARC)

Member: AMCA Damper Engineering Committee (DEC)

Member: NFPA Member: ASHRAE Member: USGBC (LEED Green Associate)







Agenda

- Building Codes/Test Standards
- Code Required Testing
- Life Safety Damper Overview
 - Damper Types
- Damper Installations
- Improper Installations



Underwriters Laboratories (UL) Directory



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All UL life safety products are listed in the UL Directories

www.UL.com



Building Codes & Test Standards



"I" Codes



- First published in 2000, combo of 3 legacy codes: BOCA National Building Code (BOCA/NBC), Uniform Building Code (UBC) & Standard Building Code (SBC)
- IBC design of building; IMC design of mechanical systems; IFC regulate fire hazards, testing, maintenance in existing buildings



International Building Code (IBC)

- → Ch. 7 Fire & Smoke Protection Features
 - → Sec. 717 Ducts & Air Transfer Openings
 - Baseline Requirements:
 - Dampers must be listed & labeled to applicable UL standard
 - Dampers must be installed in accordance
 with manufacturer's instructions
 - Defines the type of damper required to protect penetrations through each type of rated building element





Code Mandated Applications of Life-Safety Dampers

Section 717.5: Where Life-Safety Dampers are Required

- 717.5.1 Fire Walls
- 717.5.2 Fire Barriers
- 717.5.3 Shaft Enclosures
- 717.5.4 Fire Partitions (includes corridors)
- 717.5.5 Smoke Barriers
- 717.5.6 Exterior Walls
- 717.5.7 Smoke Partitions





The following table indicates what walls are regulated by Section 717.5 and where these requirements are referenced from.

IBC Chapter 7 Section 717.5 Ducts & Air Transfer Openings

The provisions of this section shall govern the protection of duct penetrations and air transfer openings in assemblies required to be protected and duct penetrations in nonfireresistance-rated floor assemblies.

SECTION	WALL TYPE	REFERENCED FROM	TYPE OF DAMPER
717.5.1 (IMC 607.5.1)	Fire walls	706.11	Fire damper
717.5.1.1 (IMC 607.5.1.1)	Fire wall – Horizontal exits	706.11	Fire damper, Smoke damper
717.5.2 (IMC 607.5.2)	Fire barriers	707.10	Fire damper
717.5.2.1 (IMC 607.5.2.1)	Fire barriers – Horizontal exits	707.10	Fire damper, Smoke damper
717.5.3 (IMC 607.5.5)	Shaft enclosures	713.10	Fire damper, Smoke damper
717.5.4 (IMC 607.5.3)	Fire partitions	708.9	Fire damper
717.5.4.1 (IMC 607.5.3 and 607.5.4)	Fire partitions – Corridors	708.9	Fire damper, Smoke damper
717.5.5 (IMC 607.5.4)	Smoke barriers	709.8	Smoke damper
717.5.6 (IMC 607.5.6)	Exterior walls	705.10	Fire damper
717.5.7 (IMC 607.5.7)	Smoke partitions	710.8	Smoke damper



NFPA Standards

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NFPA 80	NFPA 90A	NFPA 92A	NFPA 105
Standard for	Standard for the	Standard for	Standard for
Fire Doors	Installation of	Smoke-Control	Smoke Door
and Other	Air-Conditioning	Systems	Assemblies and
Opening Protectives	and Ventilating	Utilizing Barriers	Other Opening
2013 Edition	Systems	and Pressure	Protectives
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 NFPA <u>standards</u> contain recommended practices and technical data for determining fire-resistive requirements



NFPA Standards

National Fire Protection Association

- Installation, Testing and Maintenance
 - NFPA 80
 - Standard for Fire Doors
 - NFPA 105
 - Standard for Smoke Doors
 - NFPA 90A and 90B
 - Standard for Installation of Air-conditioning and Ventilating Systems
 - NFPA 92
 - Standard for Smoke-Control System

80	
100 million (1990)	NFPA* 80
	Standard for
**	Fire Doors and Other
NFPA 105 Standard for Smoke Door Assemblies and	Opening Protectives
Other Opening Protectives 2016 Edition	NFPA* 90A Standard for the Installation of Air-Conditioning and Ventilating Systems
en en ensiste ander en de ser	2015 Edition



UL Test Standards



Underwriters Laboratories

Testing, Evaluation and Certification

- UL 555 standard for Fire dampers
- UL 555<u>S</u> standard for <u>S</u>moke dampers
- UL 555<u>C</u> standard for <u>C</u>eiling Radiation dampers

UL's "Follow-Up Service" ensures that dampers are built as they were tested





Life Safety Damper Code Required Testing



Code Required testing of Dampers

The various model building codes do not detail all of the periodic testing requirements. They refer to the NFPA standard that applies to the damper type.

After commissioning, the testing requirements generally are as follows:

Each damper shall be tested and inspected 1 year after installation.

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(NFPA: 105, 6.5.2, NFPA 80: 19.4.1)
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 Each damper shall be tested and inspected every 4 years thereafter, except in hospitals where the frequency shall be every 6 years.

(NFPA 105: 6.5.2.1, 6.5.2.2., NFPA 80: 19.4.1.1)



NFPA Standards

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NFPA 80	NFPA 90A	NFPA 92A	NFPA 105
Standard for	Standard for the	Standard for	Standard for
Fire Doors	Installation of	Smoke-Control	Smoke Door
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 NFPA <u>standards</u> contain recommended practices and technical data for determining fire-resistive requirements



Periodic Test Requirements NFPA 80

Standard for Fire Doors and Other Opening Protectives

Frequency

"After the installation of a damper is completed, an operational test shall be conducted."

Test Method

"The damper shall fully close from the open position."

"The operational test shall verify that there is full and unobstructed access to the fire damper and all listed components."

"All indicating devices shall be verified to work and report to the intended location."

"The operational test shall be conducted under non-fire HVAC airflow conditions as well as static flow conditions."





Code Required testing of Dampers

- <u>Smoke Control System damper testing</u>: After initial commissioning and testing:
 - <u>Dedicated</u> smoke control systems must be tested
 2x/year
 - <u>Non-dedicated</u> systems must be tested **1x/year**.



Periodic Test Requirements NFPA 105

Standard for the Installation of Smoke Door Assemblies and Other

Opening Protectives

Frequency

"An operational test shall be conducted after the building's HVAC system has been balanced."

Test Method

"The operational test shall be conducted under normal HVAC airflow conditions as well as static flow conditions. The damper shall fully close/seal under both test conditions."

"All indicating devices shall be verified to work properly and report to the intended location."

"Combination fire/smoke dampers shall also meet the testing requirements contained in NFPA 80."





Life Safety Damper Types

- Fire Dampers
- Smoke Dampers
- Combination Fire/Smoke Dampers

- Corridor Dampers

Ceiling Radiation Dampers





"A device, installed in an air distribution system, designed to close automatically upon detection of heat, to interrupt migratory airflow, and to **restrict the passage of flame**." (NFPA 80)





Why do we need Fire Dampers?

Principles of Protection:

- Containment & Compartmentation *limit spread of fire*
- Provide effective fire resistive continuity to *allow for egress* in fire event
- "Defend in Place" strategy, especially in Healthcare and similar occupancies

Lessons Learned...

Major US fire incidents shaped modern day code requirements:

• MGM Grand Hotel Fire (1980)



MGM GRAND HOTEL FIRE

November 21, 1980

85 people died, over 700 injured ~\$223 Million in legal settlements

- Area of origin was "The Deli"; an area that was vacant and closed. Faulty wiring in a display case caused the initial fire.
- Fire spread rapidly due to the ignition of wallpaper, pvc piping, glue and plastic mirrors.
- Toxic fumes/smoke spread due to faulty smoke dampers within the ventilation ductwork and throughout the air circulation system.

"Dampers in the main unit over the casino were...bolted in such a manner as to make them inoperable."

Source: "MGM Fire Investigation Report", Clark County Fire Department





Fire Dampers: Types



Curtain Fire Damper



True Round Fire Damper



Multi-blade Fire Damper



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Curtain Fire Damper Enclosure Types



Type A (No Transition) Frame and blades in the air stream



Type B Blades out of the airstream



Type C Square Square Transition collar



Type C Round Round transition collar



Type C Oval Flat oval transition collar

Type C damper have blades and frame out of the airstream for maximum free area. They are available in low pressure and high pressure (sealed) casings.



Fire Dampers: How do they work?



Curtain Fire Damper



Typical Fusible Link



Damper



Fire Dampers: UL Rating Qualifications

- Static or Dynamic
- Hourly Rating 1-1/2 hr. or 3 hr.
- Mounting Position Vertical (Walls/Partitions) or Horizontal (Ceilings/Floors)
- Installation "In Wall" or "Out of Wall"



Fire Dampers: Static vs. Dynamic

"**Fans Off**" during fire emergency = **STATIC** System

"Fans On" during fire emergency = DYNAMIC System (i.e. Smoke Control system) Velocity/Pressure Rating – min. 2000 fpm @ 4 in. w.g.

– 1000 fpm increments and 1 in. w.g. increments



Fire Dampers: UL555 Dynamic Testing

UL555 6th edition (July 2002) incorporated new test requirements for Fire Dampers including:

- Airflow ratings of 2000, 3000, and 4000 fpm with minimum test velocities of 2400, 3400, and 4400 fpm, respectively.
- Pressure ratings of 4, 6, and 8 in-w.g. with minimum test pressures of 4.5, 6.5, and 8.5 in-w.g., respectively.
- Bidirectional airflow testing.



Hourly Fire Resistance Rating

IBC table 717.3.2.1

Type of Penetration	Minimum Damper Rating (hours)
Less than 3 hour fire resistance rated assemblies	1½
3 hour or greater fire resistance rated assemblies	3

2 hour assembly rating = **1.5** hour rated damper

- **3** hour assembly rating = **3** hour rated damper
- 4 hour assembly rating = 3 hour rated damper



Smoke Dampers

"A device within the air distribution system to **control the movement of smoke**." (NFPA 80)











UL Rating Qualifications

- Leakage Class I, II (or III*)
- Velocity 2000, 3000, or 4000 fpm
- Pressure 4, 6, or 8 in-w.g.
- Operational Temperature 250 °F or 350 °F
- Fail Position Open or Closed

Smoke Dampers: Leakage Class

- UL 555S Classifications
 - -Class | (8 cfm/sq. ft. @ 4 in. w.g.)
 - Class || (20 cfm/sq. ft. @ 4 in. w.g.)
 - -Class III* (80 cfm/sq. ft. @ 4 in. w.g.)



"Amount of time" to fill a room with Smoke based on Leakage Class



- Class I = 100 minutes
- Class II = 40 minutes
- Class III = 10 minutes



Combination Fire/Smoke Dampers

"A device that meets **both the fire damper and smoke damper requirements**." (NFPA80)





Purpose of Fire / Smoke Damper

- Provide the same level of protection as individual fire and smoke dampers
- Fire rating UL555 certified
- Leakage rating UL555S certified
 - Always supplied with factory mounted actuator
- Always dynamically rated





UL Rating Qualifications

- Hourly Rating 1-1/2 hr. or 3 hr.
- Leakage Class I, II, or III
- Velocity 2000, 3000, or 4000 fpm
- Pressure 4, 6, or 8 in-w.g.
- Temperature 250 °F or 350 °F
- Mounting Position Vertical or Horizontal
- Installation "In Wall" or "Out of Wall"


Smoke & Fire/Smoke Actuators

- Actuators must be factory installed, per UL.
- Electric (120V, 24V, 230V) or Pneumatic.
- Two position (open/closed) and Modulating (Balancing) types.
- Different torque ratings, selection based on tested size of assembly.*
- May be externally or internally mounted.*









Ceiling Radiation Dampers

"A device installed to limit radiant heat transfer through an air outlet or air inlet opening in the ceiling of a floor-or roof-ceiling assembly having not less than a 1 hour fire resistance rating." (NFPA 90A)









Why do we need Ceiling Dampers?

- Ceiling Radiation Dampers protect the structural integrity of floor/ceiling or roof/ceiling assemblies.
- Falling through roofs/floors is a common cause of injury and death among firefighters.





Fire Damper vs. Ceiling Damper?

- Limits spread of flame (UL555)
- Rated walls/floors/partitions

- Limits Heat
 - Approved floor/ceiling or roof/ceiling assemblies only





Damper Options & Accessories



Fire/Smoke Damper Closure Devices

Fusible Link



- RRL
 - Electronic link
 - Wired in series with actuator
- RRL/OCI
 - Same as RRL
 - Plus open close indicator
- TOR
 - Secondary override
- PRV
 - Pneumatic relief valve



RRL



RRL/OCI



TOR



PRV





Fire/Smoke Damper Testing Options

- Test Switches
- Purpose: Test the operation of the damper
 - Greenheck Test Switch (GTS)
 - Factory mounted or loose
 - Test at the damper or remote location
 - Momentary Test Switch
 - Factory mounted
 - Test at the damper
 - Toggle Switch
 - Factory mounted
 - Test at the damper







Life Safety Damper Installation



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Required Elements of an "Approved" Life-Safety Damper Installation





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Fire Damper - Curtain Type Typical Installation

① UL CLASSIFIED FIRE DAMPER - DYNAMIC OR STATIC

<u>1 1/2 Hr. Label</u> - For fire separations up to 2 Hrs.

<u>3 Hr. label</u> - For fire separations up to 4 hrs.

- 2 FIRE SEPARATION
- **③** RETAINING ANGLES
- (4) BREAKAWAY JOINT
- (5) SLEEVE (DUCT GAUGE MIN. SMACNA/NFPA 90A SPEC.)
- **6** EXPANSION CLEARANCE
- ⑦ UL LISTED HEAT RESPONSE DEVICE (FUSIBLE LINK)
- 8 DUCT
- 9 ACCESS DOOR





Combination Fire/Smoke Damper Typical Installation

- 1. UL CLASSIFIED AS BOTH A DYNAMIC FIRE DAMPER AND A LEAKAGE RATED SMOKE DAMPER
- 2. UL QUALIFIED DAMPER/ACTUATOR ASSEMBLY <u>Pneumatic or Electric Actuators</u>
- 3. FIRE SEPARATION & SMOKE BARRIER
- 4. RETAINING ANGLES
- 5. EXPANSION CLEARANCE
- 6. SLEEVE
- 7. BREAKAWAY JOINT
- 8. STEEL DUCT
- 9. ACCESS DOOR

10. UL LISTED HEAT RESPONSIVE DEVICE





Smoke Damper Typical Installation

- ① UL CLASSIFIED LEAKAGE RATED SMOKE DAMPER
- 2 UL QUALIFIED ACTUATOR/DAMPER ASSEMBLY

Pneumatic or Electric Actuators

- **3** SMOKE BARRIER
- (d) DUCT
- 5 1st DUCT OUTLET
- 6 ACCESS DOOR





Alternative Installation Methods

Single Side Installation

- No annular space requirements
- Angles must be attached to both the sleeve and the barrier
- Allowable damper sizes:
 - Vertical Mount:
 - 80"x50"
 - 50"x80"
 - 40"x100"
 - Horizontal Mount
 - 144"x96"







Alternative Installation Methods

3 Sided Retaining Angle Installation Method

- The retaining angle may be omitted from any of the four sides
- UL approved











True Round Life-Safety Dampers





Framing Requirements

Retaining

- Framing of Opening
 - Vertical studs must run floor to ceiling
 - Double vertical over 36 in. x 36 in.
 - Wood studs must be covered with sheet rock
 - Steel studs do not need to be covered with sheet rock





Square Opening







Sleeve Requirements

Sleeve Requirements

All fire dampers must be installed in a steel sleeve of the required gauge and length. Note that DFD-150X and FD-150X series dampers are provided with an integral sleeve. See **Table on page 10** for required minimum sleeve gauges. Maximum sleeve thickness is 10 gauge (3.5mm). Sleeve inside dimensions must equal damper outside dimensions.

Sleeves shall extend a maximum of 6 in. (152mm) beyond the wall or floor opening on each side. When a factory mounted access door is incorporated as a part of the sleeve the sleeve may extend a maximum of 16 in. (406mm) beyond the wall or floor opening on the access door side.

Fire dampers must be attached to sleeves as shown in **Figure 6**. All four sides of the damper frame must be attached to the sleeve with one row of attachments on each side of the blade channel. Attachments must be spaced a maximum of 6 in. (152mm) on centers and a maximum of 2 in. (51mm) from corners. A minimum of 4 attachments (2 on each side of the blade channel) per side (16 per damper) are required. One of the methods of attachment shown below must be used:

- tack or spot welds
- #10 sheet metal screws
- 1/4 in. (6mm) bolts and nuts
- 3/16 in. (4.7mm) steel pop rivets



Figure 6: Field attachment of fire dampers to sleeves.



Sleeve Extension

GREENHECK Building Value in Air.

X series Fire Damper Models' (Part #481324)

Dampers' (Part #481318) for additional details.

Installation Instructions for FD, DFD, DFD X series, and FD

Installation Instructions for FSD-XXX, DFD-XXX, and

SSFSD-XXX Series Fire & Combination Fire Smoke

Document number 462103

Installation Instruction Supplement

FD & DFD Series

1¹/₂ Hour Curtain Fire Dampers and FSD Series

Combination Fire Smoke Dampers

"UL CLASSIFIED (see complete marking on product)"

"UL CLASSIFIED to Canadian safety standards (see complete marking on product)"

Standard 555 and 555S (Listing #R13317)



Application

Refer to:

Factory installed sleeves may need to be extended in the field. This supplement covers the following applications:

. When the factory sleeve extends all the way through the rated barrier (Figure 1)

. When the factory sleeve ends in the plane of the rated barrier (Figure 2).





Inserting Damper - FSD-311

- Label on the outside of the sleeve for the recommended location of the damper
- Centerline of damper frame remains within the plane of the wall or floor
- Do not penetrate the "No screw area"
- 16 in. maximum sleeve beyond the wall or floor on actuator side, and 6" opposite side





Inserting Damper - OFSD-311

- Out of Wall
 - Grille access
 - Continuing duct
 - Dampers shall not be mounted more than 7½ in. out of the wall/floor for stud or masonry
 - Dampers shall not be mounted than 6¹/₂ in. wood stud walls





Duct to Sleeve Connections

Sleeve Gauge and Connection Type Requirements

The size of the damper/duct determines the required sleeve gauge and the required duct to sleeve connection (see table to the right). The sleeve thickness must also not be less than the gauge of the connecting duct. Any duct connection other than the breakaway connections described below are considered rigid.

Sleeve Gauge	Duct Dimension	Type of Duct to Sleeve Connection Permitted
14 ga. (0.075 in.) - 10 ga. (0.138 in.) [2mm - 3.5mm]	All duct sizes	Rigid or Breakaway
16 ga. (0.060 in.) [1.5mm]	36 in. (914mm) max. width 24 in. (610mm) max. height 24 in. (610mm) diameter	Rigid or Breakaway
16 ga. (0.060 in.) [1.5mm]	All duct sizes	Breakaway only
18 ga. (0.048 in.) [1.2mm]	85 in. (2159mm) wide and over	
20 ga. (0.036 in.) [0.9mm]	55 in 84 in. wide (1397mm - 2134mm)	
22 ga. (.030 in.) [0.76mm]	31 in 54 in. wide (787mm - 1372mm)	
24 ga. (0.024) [0.6mm]	13 in 30 in. wide (330mm - 762mm)	
26 ga. (0.018 in.) [0.46mm]	12 in. wide and under (305mm)	
See Breakaway Conr	nection section for additional info	ormation.





Duct to Sleeve Connections





Clearance Requirements



Document number 481324 CURTAIN FIRE DAMPERS

DFD, DFD-150X, FD, FD-150X, SSDFD, SSFD, AND KFD Series $1^{1\!/_2}$ and 3 Hour Curtain Fire Dampers

Vertical and Horizontal Mount

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage!

- For galvanized steel fire dampers and sleeves: ¹/₂ in. per foot (3mm per .3 m) of damper width and ¹/₂ in. per foot (3mm per .3 m) height with a minimum clearance of ¹/₄ in. (6mm), maximum of 1¹/₂ in. (38mm).
- For stainless steel fire/smoke dampers and stainless steel or galvanized sleeves: $\frac{1}{16}$ in. per foot (5mm per .3 m) of damper width and height with a minimum clearance of $\frac{1}{4}$ in. (6mm), maximum of 2 in. (51mm).

Although the minimum requirements are listed above, for ease of installation the following are the recommended clearances for galvanized dampers:

- Width/Height of 48 in. (1219 mm) or less 1/2 in. (13mm) clearance
- Width/Height between 48.01 in. (1220 mm) and 96 in. (2438 mm): 1 in. (25mm) clearance
- Width/Height greater than 96 in. (2438 mm): 11/2 in. (38 mm) clearance



Clearance Requirements (FD/FSD)

- The centerline of the damper must be within the plane of the wall.
- The required thermal expansion clearances between the damper sleeve and wall/floor opening must be maintained. "Annular Space"





Retaining Angles



POC RETAINING ANGLE

Greenheck's one piece retaining angle, the POC (literally named for being a "Piece of Cake") makes damper installation a breeze. The POC angle is designed by fastening four pieces together to form one piece. When installed the angles simply wraps around the sleeve of the damper and is fastened in place.

Construction

20 ga. (1mm) or 16 ga. (1.5mm) galvanized steel.

11/2 in. x 11/4 in. (38mm x 32mm) or 21/2 in. x 11/4 in. (64mm x 32mm) for sizes greater than 48 inches (1219mm)

Retaining angles for 1½ hour rated fire and combination fire smoke dampers with a width and height 48 in. (1219mm) or less must be a minimum of 20 ga. (1mm) steel. Retaining angles for all 3 hour rated dampers and all dampers with a width or height greater than 48 in. (1219mm) must be a minimum of 16 ga. (1.5mm). If damper width plus damper height is less than or equal to 44 in. (1117mm) then the POC angles ships in one piece. If damper width plus damper height is greater than 44 in. (1117mm) then the POC angles ships in two pieces.

Meets requirements of UL 555 and UL 555S.



four sides are connected together by rivets in three corners allowing for easy installation.



Retaining Angle

- Meets the requirements of NFPA 90A
- Two sided
 - Attached to the damper sleeve on both sides
- Single sided
 - Attached to the damper sleeve and wall/floor
 - 80 x 50 or 50 x 80 or
 40 x 100 on vertical mount
 - 144 x 96 on horizontal mount





Installation Books & QR codes



Document 481318 MULTI-BLADE FIRE AND COMBINATION FIRE SMOKE DAMPERS

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7.0

.9-10

. 12

DFD-XXX, DFDAF-XXX, DFDTF-XXX, FSD-XXX, FSD-XXXV, IMO-XXX, SEDFD-XXX, SEFSD-XXX, AND SSFSD-XXX 1½ and 3 Hour Fire & Combination Fire Smoke Dampers (with factory installed sleeve and actuator) Vertical and Horizontal Mount

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble. inst), operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage!

These instructions apply to 1½ and 3 hour rated fire and combination fire smoke dampers mounted in: 1) masonry, block, or stud walls and 2) concrete floors. Specific requirements in these instructions are mandatory. Dampers must be installed in accordance with these instructions to meet the requirements of UL 555 and/or UL 555S. Note: Combination fire smoke and fire damnars are manufactured and labelad for either vertical or horizontal installation. The dampers must be installed in accordance with labeling



	Assemblies
	Maximum Assembly Tables
	Inserting Damper into Wall/Fle Openings
	 Securing the Damper/Sleeve Assembly to Wall/Floor Openi
	Duct to Sleeve Connection
	Actuator & Temperature Resp Device Connections
-	Maintenance

Table of Contents

Pre-Installation Guidalines

• Preparation of Openings

Clearances Required Between Damper

Sleeves & Wall/Floor Openings

General Information

lectrical Guidelines

Receiving and Handlin

and hidden damage. If damage is found, record all necessary information on the bill of lading and file a claim with the final carrier. Check to be sure that all parts of the shipment, including accessories, are accounted for.

Dampers must be kept dry and clean. Indoor storage and protection from dirt, dust and the weather is highly recommended. Do not store at temperatures in excess of 100°F (38°C)

This manual is the property of the owner and is required for future maintenance. Please leave it with the owner when the jobs is complete.

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	Safety Warning
oper installa aintenance o sath. Read th	tion, adjustment, alteration, service an cause property damage, injury se installation, operating, and

or de maintenance instructions thoroughly before installing or servicing this equipment.

481318 Multi-Blade Fire and Combination Fire Smoke Dampers





Document number 481324 CURTAIN FIRE DAMPERS

DFD, DFD-150X, FD, FD-150X, SSDFD, SSFD, AND KFD Series 1% and 3 Hour Curtain Fire Dampers

Vertical and Horizontal Mount

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble. install, operate or maintain the product described. Protect yourself and others by observing all safety information Failure to comply with instructions could result in personal injury and/or property damage!

These instructions apply to 11/2 and 3 hour rated fire dampers mounted (blades must be horizontal) in: 1) masonry, block, or stud walls and 2) concrete floors. Specific requirements in these instructions are mandatory. Dampers must be installed in accordance with these instructions to meet the requirements of UL 555.

Note: Fire dampers are manufactured and labeled for either vertical or horizontal installation. The dampers must be installed in accordance with labeling.



Table of Contents General Information Pre-Installation Guidelines Installation 3,12 · Preparation of Openings . Clearances Required Between Damper Installing Multiple Section Assemblies ... 5 Maximum Assembly Tables Sleeve Length Requirements... Securing the Damper/Sleeve Assembly to Wall/Floor Openings7-9 No Connecting Duct or Transfer Opening 12 Maintenance . 12 Troubleshooting 12

a claim with the final carrier. Check to be sure that all parts of the shipment, including accessories, are Dampers must be kept dry and clean. Indoor storage and protection from dirt, dust and the weather is highly recommended. Do not store at temperatures in

Receiving and Handling on receiving dampers, check for both obvious

and hidden damage. If damage is found, record all

necessary information on the bill of lading and file

accounted for.

/H

excess of 100°F (38°C).

Safety Warning

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.

This manual is the property of the owner and is required for future maintenance. Please leave it with the owner when the jobs is complete

481324 Curtain Fire Dampers



Access Doors

• NFPA 105

 Dampers equipped with fusible links and/or internal operators shall be provided with an access door that is not less than 12 in.² or provided with removable duct

section.



- NFPA 80
 - The damper access panel shall be labeled the words "Fire Damper", "Smoke Damper", or "Fire Smoke Damper" in letters not less than 1 in. height.





Installation FAQs



Common question: Do <u>I HAVE TO seal around retaining angles?</u>

- Sealing of retaining angles is NOT REQUIRED.
- Sealing of retaining angles IS PERMITTED when done in accordance with UL approved installation instructions.
- Specific requirements for location and type of sealant to be used.

Consult manufacturer's installation manual for specific requirements for each damper manufacturer and damper type.



Building Value in Air.

Refer to:

'Installation Instructions for FD, DFD, DFD X, and FD X series Fire Damper models' (Part # 481324)

'Installation Instructions for FSD-xxx, DFD-xxx, & SSFSD-xxx series Fire & Combination Fire Smoke Dampers' (Part # 481318) for additional details.

The field or factory installation of a sleeve on a fire rated damper does not require any application of sealant to maintain the UL 555 classification of the fire damper assembly. However, the sealant can be used along any seams of a fire rated damper assembly (except along blade edges) to help prevent air leakage in high pressure applications.

The general installation of a fire rated damper is addressed in the UL 555 (Standard for Fire Dampers Seventh Edition July 12, 2006) in Section 18 "Installation and Operating Instructions". In reference

to the use of a sealant in the area between the inside of a wall opening and the outside of the fire damper sleeve (referred to as the "annular space" see Figure 1), UL 555 provides the following information:

18 General

- 18.1 A copy of the installation and operating instructions shall be used as a reference in the examination and testing of the damper. For these purposes, a final printed copy is not required.
- 18.2 Each shipping container that contains a damper(s) shall be provided with legible instructions pertaining to the installation and operation of the damper Illustrations are used with the required instructions to clarify the intent. Dampers shipped in a common container are required to be provided with one copy of the installation and operating instruction only.
- 18.3 The instruction shall specify:

a) the type of wall or partition (masonry or gypboard) or floor, as applicable;

b) the clearances required for expansion of the fire damper, as applicable;



Document 462703 Sealant Usage in Conjunction with Fire Rated Dampers



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Common question: Do <u>I HAVE TO seal around retaining angles?</u>

When might this come up?

NFPA 1: Fire Code 12.7.7.1 (NFPA 101: 8.3.4.1)

12.7.7 Opening Protectives.

12.7.7.1 Every opening in a fire barrier shall be protected to limit the spread of fire and restrict the movement of smoke from one side of the fire barrier to the other. [101: 8.3.4.1]





Common question: Do <u>I HAVE TO fill the gap around fire dampers?</u>

- The space around a fire damper or fire/smoke damper is commonly referred to as the annual space or expansion gap.
- Almost every manufacturer and damper on the market states "DO NOT" to fill the gap!!
- There is only 1 manufacturer (*that I am aware of) that has an optional installation method using fire stopping caulk around the damper in the gap. THIS INSTALLATION IS VERY SPECIFIC.

Consult manufacturer's installation manual for specific requirements for each damper manufacturer and damper type.





Common question: Do <u>I HAVE TO</u> anchor the retaining angle into the wall?



- Anchoring the retaining angle into the wall is usually NOT REQUIRED on a standard 2 sided angle installation (partition wall).
- Anchoring the retaining angle into the wall is usually REQUIRED on a standard 1 sided angle installation (shaft wall).

Consult manufacturer's installation manual for specific requirements for each damper manufacturer and damper type.



Improper Installations

DON'T DO IT.



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The damper not installed square, plumb, straight, it is installed racked The installation screw is in the track of the damper



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Bending of Components

Resizing Damper in the Field





Modifying the damper in the field without approval from the AHJ







Not following Damper Manufacturer's IOM for approved installations!





Thank you for your time!







The mission of Greenheck is to be the market leader in the development, manufacture and worldwide sale of quality air moving and control equipment with total commitment to customer service.

