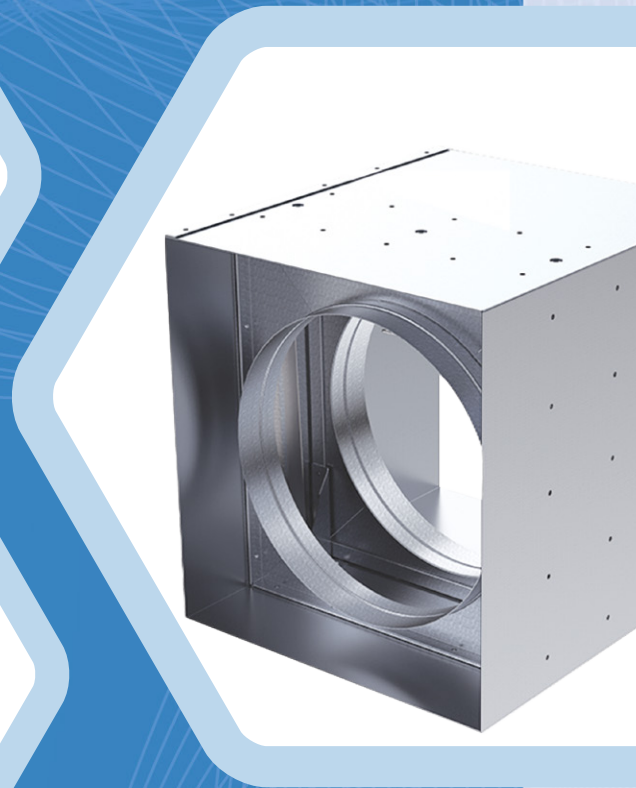
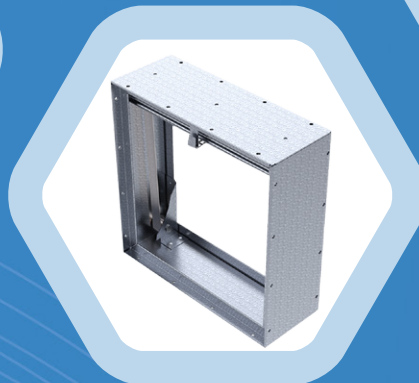
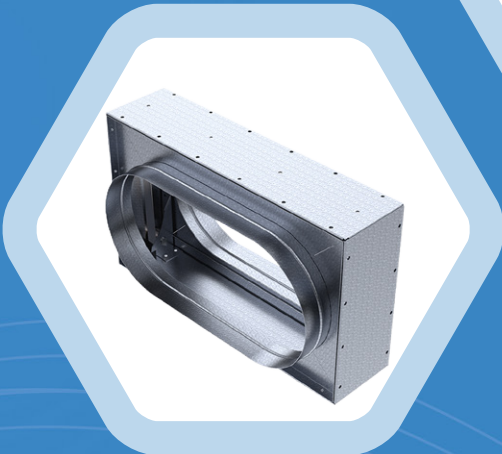
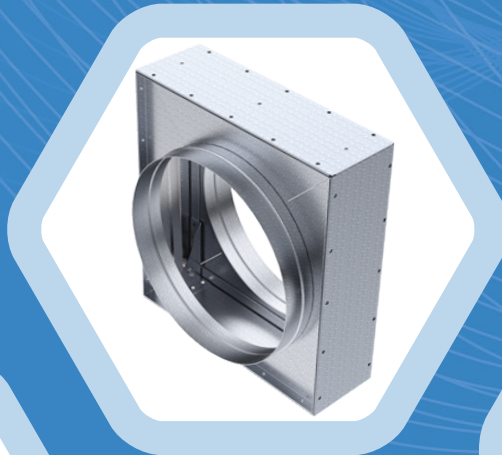




METAL FACTORY

شركة محمد عبدالرحمن فرحات للصناعة
Mohammad A. Farhat Co. For Industry



Curtain Type Fire Damper

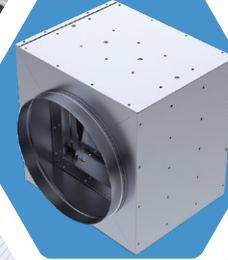
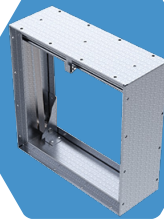


Assure Success with
Customer Together

R-00



**Assure
Success
with
Customer
Together**



ABOUT US

FMC Metal Factory, founded in 2021 in the city of Jeddah, for its Excellence, Engineering, Professionalism, and Experience in the field of fabrication of HVAC duct and its Accessories. The company has been a forerunner in the Construction field with his vast experience, commitment, adoption of new technologies and challenges by emerging as one of a key player. It offers a wide range of services for Supply, Installation, Testing and Commissioning in HVAC field. The group is leading under the supreme guidance of Mr. Mohamed Abdul Rahman Farhat, who has a long life experience in the Saudi market.

Vision

Our ambition is to amplify the presence of FMC as a recognized company in the field of construction. We aspire to extent our professional services abroad in the coming years.

Mission

Form valuable long-term relationships with our clients and partners.

Manage large and complex projects.
Be a reliable company.

Compete successfully in the Construction market of the region with high efficiency, professionalism and honesty in order to maintain, our outstanding reputation.

Objective

Our aim is to enhance the lifestyle of the communities we serve through consistent, timely, efficient and added value delivery of engineered, innovative, and tailor-made technology solutions that never fails to exceed expectations

Commitment

Constantly strive to ensure that amidst all the projects exists a great deal of passion and commitment to provide quality services and to deliver clients satisfaction.

Maintain leadership in project management capability.

Provide an open and flexible approach towards the needs of our clients by listening and respecting their views and by being ahead of emerging trends.

Deliver superior value through our consistent implementation of advanced methods and state of the art solutions.

Our Team

FMC's work force is the main asset which represent and implement all projects in professional manors due to the on going training programs that we provide to our, head office employees, engineers, supervisors, technicians, drivers, labors and all of our working force whom reflect their professions on sites.

OUR PRODUCTS MAINTAINING THE HIGHEST INTERNATIONAL STANDARDS.

GENERAL OVERVIEW

A curtain fire damper is a critical safety component installed in HVAC systems to prevent the spread of fire through ductwork in a building. When exposed to high temperatures, the damper's UL listed fusible link melts, allowing the damper blades to close, effectively sealing off airflow and containing fire to a specific area. This helps maintain safe exit routes and minimizes fire damage to other parts of the building.

Curtain fire dampers are designed to meet compliance standards like **UL 555**, which specifies rigorous testing requirements for fire dampers to ensure they can withstand extreme conditions. The **SMACNA** guidelines provide the best practices for installing and maintaining these dampers, ensuring reliable performance and proper integration into HVAC systems. Together, UL 555 and SMACNA standards support fire safety by establishing high-performance criteria for curtain fire dampers.

Fire dampers are required to be installed within a steel sleeve. Retaining angles on each side of the wall, partition, or floor secure the fire damper assembly in place. Ductwork is attached to the sleeve on both sides as necessary, designed to break away if the ductwork collapses during a fire. This setup ensures the damper and sleeve assembly stays in the wall, maintaining the integrity of the fire barrier.

NFPA 90A mandates that fire barriers with a rating of less than 3 hours shall utilize 1 ½ hour rated fire damper, while fire barriers rated for 3 hours or more require a 3-hour rated fire damper.

A temperature-sensitive device designed to keep the damper components in an open position, allowing air to flow through. When the fusible link reaches its temperature limit and activates, it releases the damper components, causing them to close. Once closed, the damper remains in this position until the fusible link is replaced. Standard fusible links are rated at 165°F, with other temperature ratings available if needed.

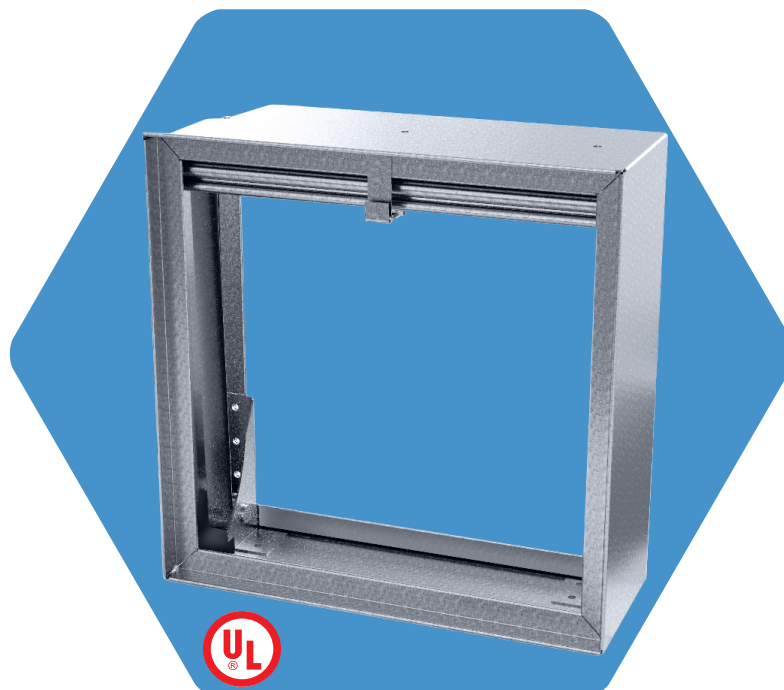


Figure 1- Curtain Type Fire Damper

STANDARD CONSTRUCTION

Table 1-Standard Construction

Standard Construction	
Frame	114mm wide x 20-gauge double hemmed bent profile galvanized steel.
Sleeve (Optional)	Integrated Sleeve or Field Installation Sleeve. 16 gauge bent profile galvanized steel and connection SMACNA. length according to UL installation instructions.
Blades	Interlocking type, 22-gauge roll formed profile galvanized steel.
Fusible Link	Elsie brand Model B Fusible Link (UL listed). Standard for fusing temperatures of 165F.
Blade Closure	stainless steel coil tension spring with constant force ensuring powerful blade closure when fusible link activate.
Mounting & Rating	The curtain-type fire damper is rated for 3 hours when installed vertically in a masonry wall or horizontally in a masonry floor (concrete slab/floor) . Additionally, it has a 1-1/2-hour fire rating for vertical installation in gypsum walls .

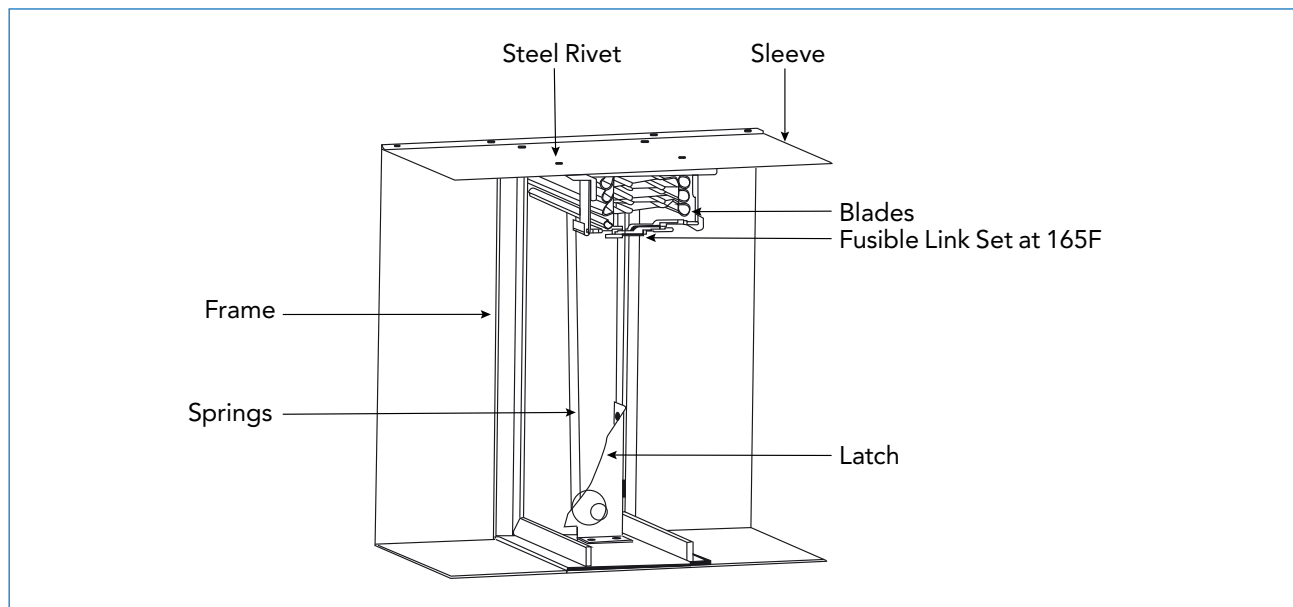


Figure 2- Fire Damper Construction

FIRE DAMPER FOR USE IN STATIC SYSTEMS

Table 2 - Fire Damper for Use in Static Systems

Model	Installation	Maximum Single Section Size		Maximum Multiple Section Size	
		Width, in.	Height, in.	Width, in.	Height, in.
FD100, FD101, FD102, FD103, FD104, FD106, FD107, FD108, FD109, FD110, FD116, FD117, FD118, FD124, FD125, FD126, FD127, FD128, FD158, FD159, FD161 and FD162	V, H	36	36	-	-

Model series FD dampers are of curtain blade type construction for vertical and horizontal installation for static applications. The dampers are intended for use in heating, ventilating and air conditioning duct systems passing through fire resistive walls, partitions, and floors in accordance with the Standard for Installation of Air Conditioning and Ventilating Systems, NFPA 90A. The fire resistance ratings of the damper are rated up to 3 hours.

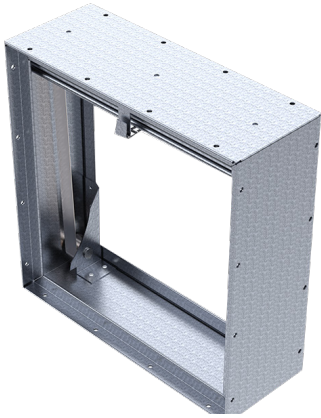
FIRE DAMPER MODELS

Table 3- Fire Damper Models

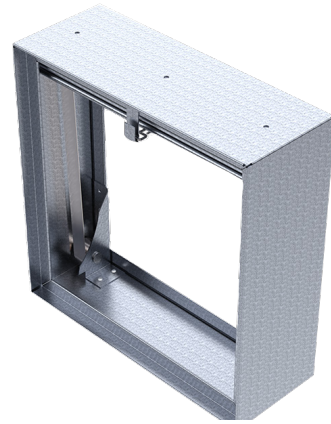
Model	Description	Minimum Size (mm)	Maximum Size (mm)
FD100	Without Sleeve, Totally In-Stream (With option to easy fix with field sleeve by rivets).	150x150	914x914
FD101	Without Sleeve, Totally In-Stream.	150x150	914x914
FD102	Without Sleeve, Partially Out-Stream.	100x100	914x824
FD103	Without Sleeve, Totally Out-Stream, Rectangular Frame Collar, Raw Connection.	100x100	862x798
FD104	Without Sleeve, Totally Out-Stream, Rectangular Frame Collar, S&C Connection.	100x100	862x798
FD106	Without Sleeve, Totally Out-Stream, Round Frame Collar.	100	795
FD107	Without Sleeve, Totally Out-Stream, Oval Frame Collar.	200x150	862x795
FD108	With Sleeve, Totally In-Stream, Inline Sleeve Raw Connection.	150x150	914x914
FD109	With Sleeve, Totally In-Stream, Inline Sleeve S&C Connection.	150x150	914x914
FD110	With Sleeve, Totally In-Stream, Inline Sleeve DuctMate35 Connection.	150x150	914x914
FD116	With Sleeve, Partially Out-Stream, Inline Sleeve Raw Connection.	150x150	914x914
FD117	With Sleeve, Partially Out-Stream, Inline Sleeve S&C Connection.	150x150	914x914
FD118	With Sleeve, Partially Out-Stream, Inline Sleeve DuctMate35 Connection.	150x150	914x914
FD124	With Sleeve, Totally Out-Stream, Rectangular Sleeve Raw Connection.	100x100	862x798
FD125	With Sleeve, Totally Out-Stream, Rectangular Sleeve S&C Connection.	100x100	862x798
FD126	With Sleeve, Totally Out-Stream, Rectangular Sleeve DuctMate35 Connection.	100x100	862x798
FD127	With Sleeve, Totally Out-Stream, Round Sleeve.	100	795
FD128	With Sleeve, Totally Out-Stream, Oval Sleeve.	200x150	862x795
FD158	With Sleeve, Totally Out-Stream, Rectangular Fram Collar Raw Connection.	100x100	862x798
FD159	With Sleeve, Totally Out-Stream, Rectangle Fram Collar S&C Connection.	100x100	862x798
FD161	With Sleeve, Totally Out-Stream, Round Frame Collar.	100	795
FD162	With Sleeve, Totally Out-Stream, Oval Frame Collar.	200x150	862x795

Table 4-Fire Damper Models with Pictures

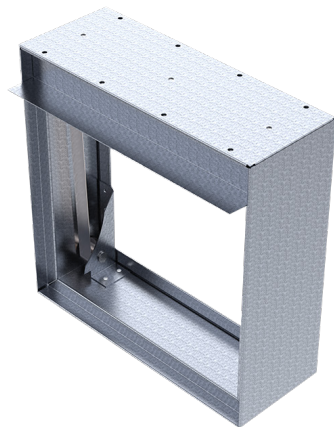
FD100



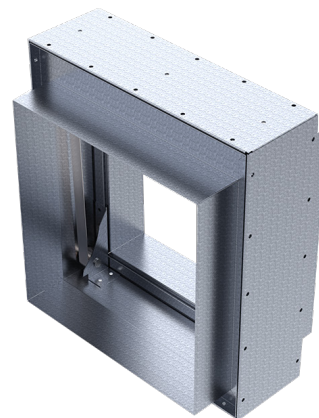
FD101



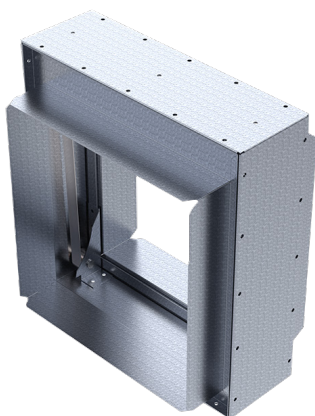
FD102



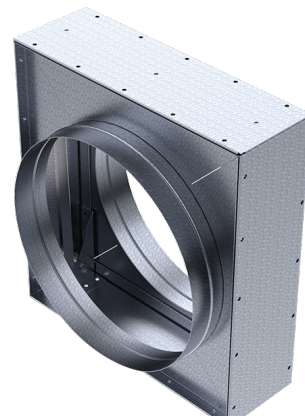
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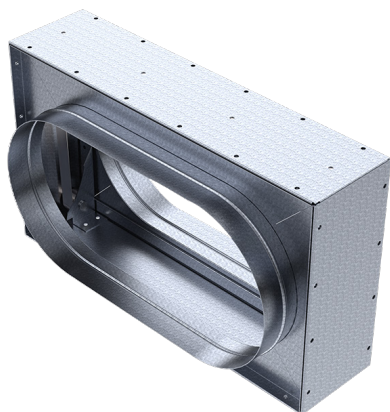
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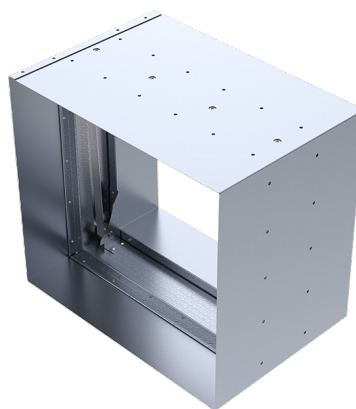
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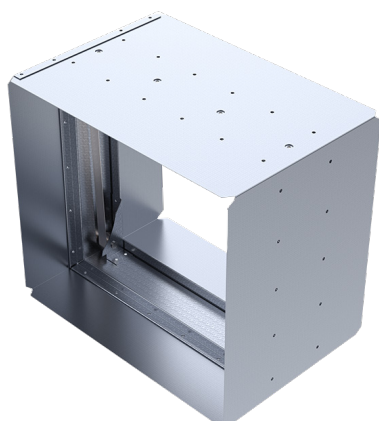
FD107



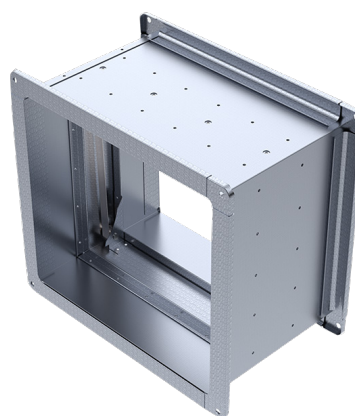
FD108



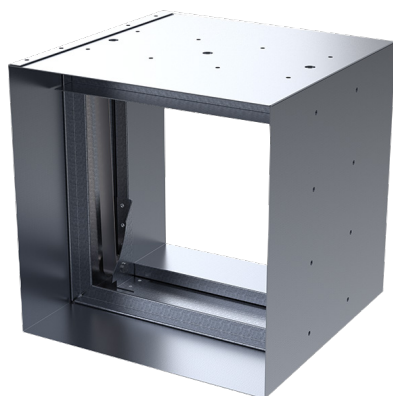
FD109



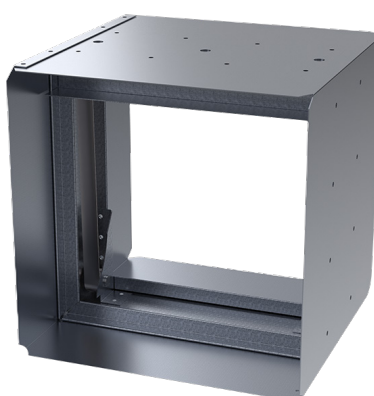
FD110



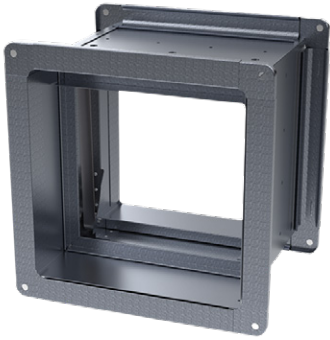
FD116



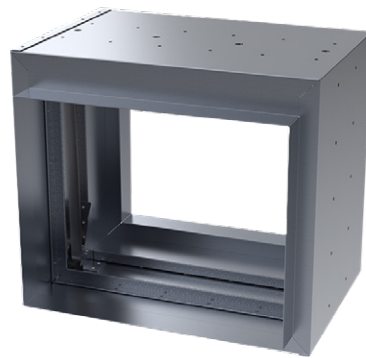
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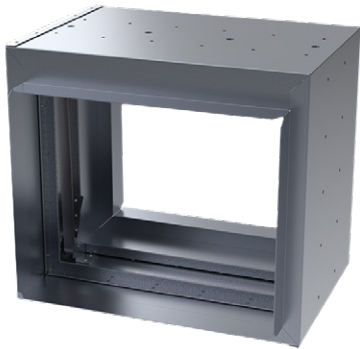
FD118



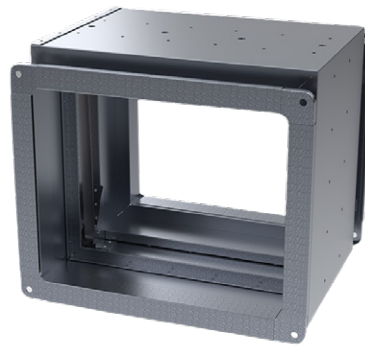
FD124



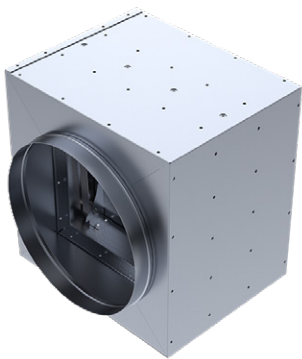
FD125



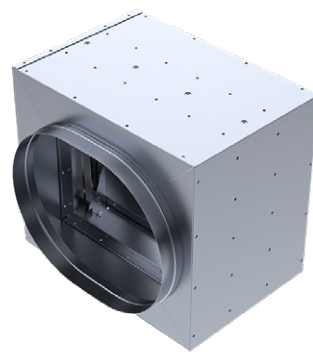
FD126



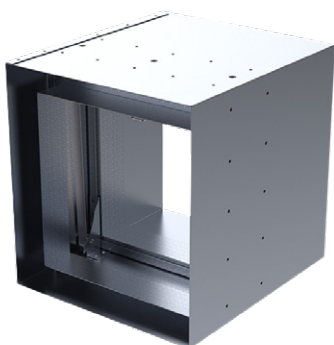
FD127



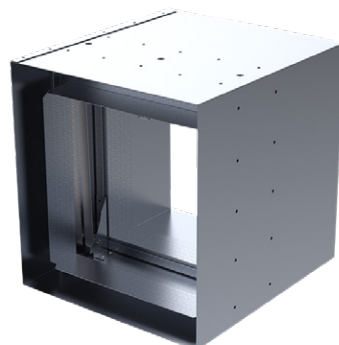
FD128

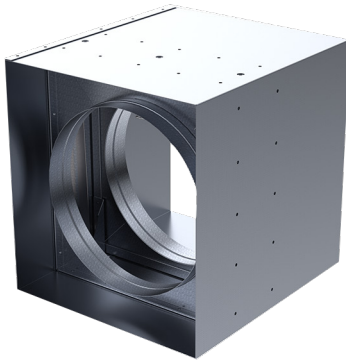
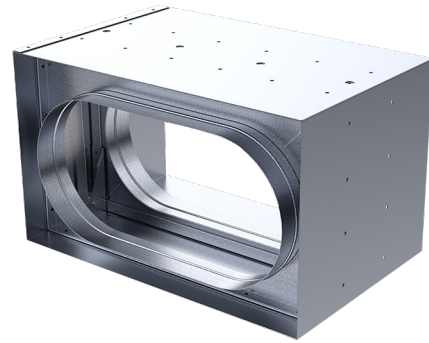


FD158



FD159



FD161

FD162


FMC provides curtain type fire dampers with models covering all the required configurations on the site. All models are applicable for vertical and horizontal installation. Here is a detailed table showing availability of features such as Sleeve, Stream, Collar and Connection Type for the above models.

Table 5 - Table showing availability of features such as Sleeve, Stream, Collar and Connection Type for Fire Damper Models

Model	Sleeve Type	Stream Type	Collar Type	Connection Type	Connection Location
FD100	No Sleeve	Totally In-stream	N/A	N/A	Connection in Separate Sleeve
FD101	No Sleeve	Totally In-stream	N/A	N/A	N/A
FD102	No Sleeve	Partially Out-stream	N/A	N/A	N/A
FD103	No Sleeve	Totally Out-stream	Rectangular	Raw Connection	Connection in Frame
FD104	No Sleeve	Totally Out-stream	Rectangular	S&C Connection	Connection in Frame
FD106	No Sleeve	Totally Out-stream	Round	Raw Connection	Connection in Frame
FD107	No Sleeve	Totally Out-stream	Oval	Raw Connection	Connection in Frame
FD108	With Sleeve	Totally In-stream	Inline	Raw Connection	Connection in Sleeve
FD109	With Sleeve	Totally In-stream	Inline	S&C Connection	Connection in Sleeve
FD110	With Sleeve	Totally In-stream	Inline	DuctMate35	Connection in Sleeve
FD116	With Sleeve	Partially Out-stream	Inline	Raw Connection	Connection in Sleeve
FD117	With Sleeve	Partially Out-stream	Inline	S&C Connection	Connection in Sleeve
FD118	With Sleeve	Partially Out-stream	Inline	DuctMate35	Connection in Sleeve
FD124	With Sleeve	Totally Out-stream	Rectangular	Raw Connection	Connection in Sleeve
FD125	With Sleeve	Totally Out-stream	Rectangular	S&C Connection	Connection in Sleeve
FD126	With Sleeve	Totally Out-stream	Rectangular	DuctMate35	Connection in Sleeve
FD127	With Sleeve	Totally Out-stream	Round	Raw Connection	Connection in Sleeve
FD128	With Sleeve	Totally Out-stream	Oval	Raw Connection	Connection in Sleeve
FD158	With Sleeve	Totally Out-stream	Rectangular	Raw Connection	Connection in Frame
FD159	With Sleeve	Totally Out-stream	Rectangular	S&C Connection	Connection in Frame
FD161	With Sleeve	Totally Out-stream	Round	Raw Connection	Connection in Frame
FD162	With Sleeve	Totally Out-stream	Oval	Raw Connection	Connection in Frame

FMC'S CURTIN TYPE FIRE DAMPER (FD-SERIES) ADVANTAGES

FMC's Curtain-Type Fire Dampers provide a versatile range of options, including additional features designed for easy, fast, and efficient site installation. The FD-Series range stands out by offering advanced functionality and improvements over the standard fire dampers, delivering enhanced performance and convenience to FMC's customers.

The double-hemmed frame in the FD-Series enhances rigidity, enabling it to achieve a 3-hour fire rating even with reduced material thickness. This feature provides superior performance while minimizing costs, making it an efficient and economical solution.

The FD-Series introduces pre-holed fire dampers and retaining angles, ensuring precise installation and significant time savings on site. This feature enhances accuracy and efficiency during the installation process.

The retaining angles utilize the bolts and nuts for quick installation, precise alignment, and enhanced rigidity. This feature ensures high accuracy and saves significant time during site installation.

The FD-Series is UL-certified for both vertical and horizontal installations, offering flexibility and reliability. This feature ensures adaptability to various installation requirements while maintaining high standards of performance.

The FD-Series meets UL certification standards for 1.5 hours and 3 hours fire ratings, making it suitable for all types of fire-rated walls. These certifications deliver exceptional flexibility and credibility, ensuring compliance with various installation and safety requirements.

The FD-Series is rated for **3-hours** when installed **vertically in a masonry wall** or **horizontally in a masonry floor (concrete slab/floor)**. Additionally, as an extra advantage of our FD-Series it has a **1.5-hour fire rating** for **vertical installation in gypsum walls**.

CURTIN FIRE DAMPER TYPICAL INSTALLATION

1. The fire damper^[1] may rest at the bottom of the opening and not need to be centered.
2. The fire damper^[1] should be installed in a rectangular galvanized steel sleeve^[2], which is optional by fire damper manufacturer, the fire damper should be attached to the sleeve on 30mm at the corners and 90mm spacing with:
 - a. 12 mm long welds.
 - b. 6 mm bolts and nuts.
 - c. 5 mm galvanized steel rivets (recommended).
3. The damper is suitable for rectangular opening only.
4. Allowance for expansion^[6] between sleeve and surrounding masonry in both horizontal and vertical installations to be 10 mm per linear meter of fire damper width and height.
5. The sleeve^[2] should be of suitable length to extend through the wall with minimum distance to cover the fitting of retaining angles and ductwork connections and maximum spacing of 152mm from each side.
6. The retaining angles^[3] should be attached to the sleeve on 30mm at the corners and 90mm spacing with:
 - a. 12 mm long welds.
 - b. 6 mm bolts and nuts (recommended).

7. The retaining angles^[3] should not be fastened to the wall / floor material.
8. The retaining angles^[3] should form a complete frame around the sleeve and cover over the expansion gap^[6], the four corners on the retaining angles need to be fastened with M8 bolts. retaining angles will be sent in loose parts and to be installed in the site.
9. The retaining angles^[3] shall be of such a size as always to form a minimum overlap with wall by 25mm, also it shall be of such a size as always to form a minimum overlap with sleeve by 30mm.
10. A fusible link is UL tested, Elsie brand, set at 165° F
11. The duct - sleeve connection to be as per what shown in figure 4, site installation shall comply with NFPA 90A.
12. Fixing the frame must be positioned clear of the damper blades path, so it's not affecting the damper closure.
13. Sleeve thickness must not be less than the gauge of the connecting duct, for more details check table 6.
14. Fire damper's maximum size is 914mm x 914mm.

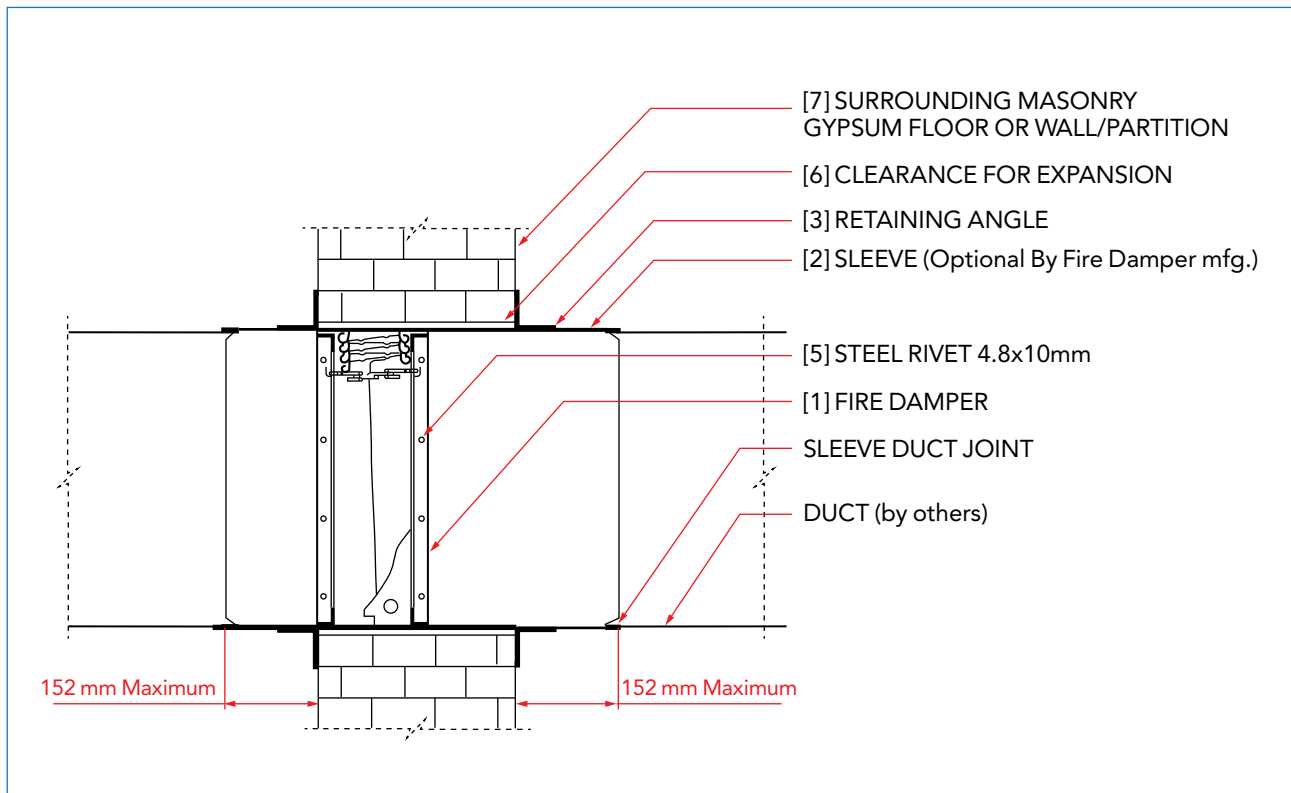


Figure 3-Typical Site Installation

RIGID & BREAKAWAY JOINT

Table 6 - Minimum Sleeve Thickness for Fire Dampers

Sleeve Gauge	Duct Dimension	Type of Duct to Sleeve Connection Permitted
16 Gauge	All Duct Sizes	Rigid or Breakaway

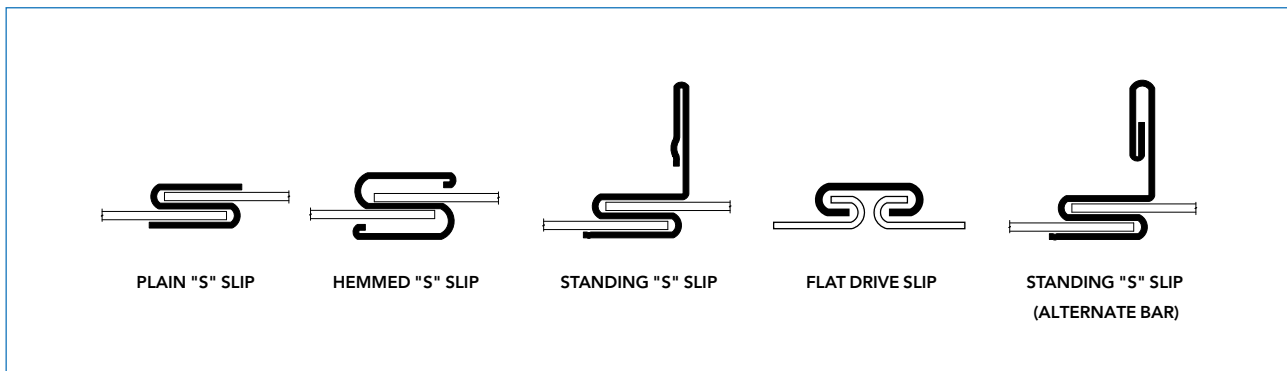


Figure 4 - Breakaway Connections.

- Breakaway connections, as shown in Figure 4, must include no more than two #10 (4.8 mm diameter) sheet metal screws per side and on the bottom. These screws should be centered within the slip pocket and penetrate both sides of it.
- Vertical Fire Dampers: Breakaway connections, as shown in Figure 4, must be placed on the top and bottom of horizontal ducts, as well as on the sides. Alternatively, they may be positioned on the top and bottom of horizontal ducts with flat drive slips on the sides, as shown in Figure 4. The length of the flat drive slips must not exceed 20 inches (508 mm).
- Horizontal Fire Dampers: Breakaway connections, as shown in Figure 4, must either be present on all sides of vertical ducts or on one pair of opposite sides, with flat drive slips installed on the other pair of opposite sides. Flat drive slips, as shown in Figure 4, must also not exceed 20 inches (508 mm) in length.
- Round or Flat Oval Spiral Ducts connected to round or oval collars, which are part of a fire damper sleeve used as breakaway connections, must be secured using #10 (4.8 mm diameter) sheet metal screws evenly spaced around the duct circumference, as outlined below (for flat oval ducts the diameter is considered the largest (major) dimension of the duct).
 - o Duct diameters of 22 inches (560 mm) or smaller must have three screws.
 - o Duct diameters greater than 22 inches (560 mm) and up to 36 inches (914 mm) must have five screws.
- Flange System Breakaway Connections (Rigid) Flanged connection systems manufactured by FMC, as shown in Figure-5 & Installed as Figure-6

RETAINING ANGLE

- Retaining angle is made of galvanized steel and is supplied by FMC factory upon request, FMC's retaining angles save installation time and have more rigidity at the same time by using flush corners and pre-drilled angles.
- FMC's retaining angle is 30mm x 40mm x 2.8mm.
- FMC's retaining angles are joined together by two M8 bolts and nuts at each corner.
- FMC's retaining angles are joined to sleeve by 6 mm bolts and nuts with maximum spacing of 90mm.

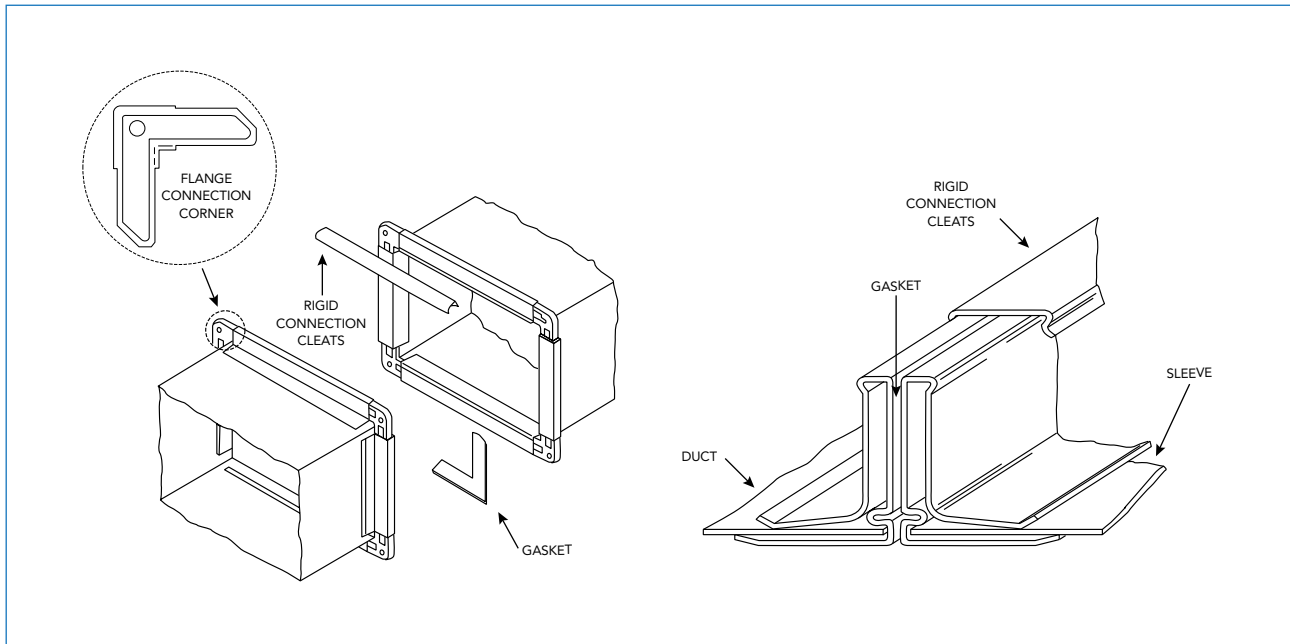


Figure 5- Rigid Connection.

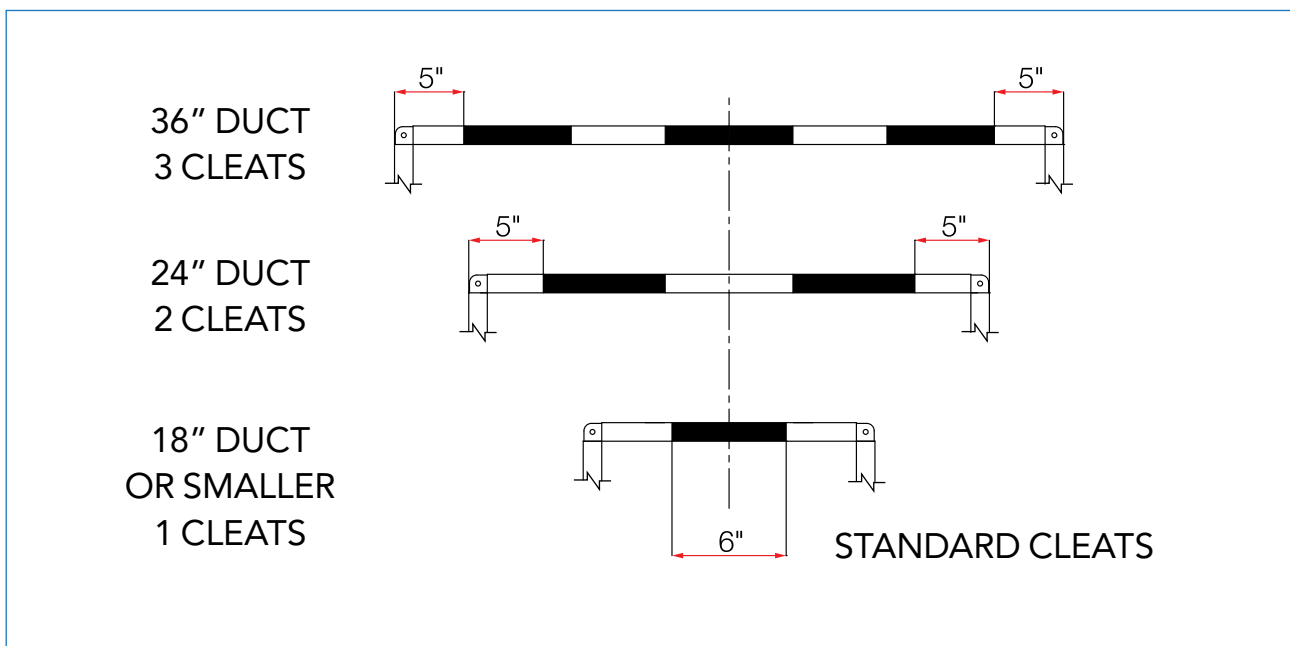


Figure 6-Rigid Connection Installation.

NOTES:

- Sleeve thickness must not be less than the gauge of the connecting duct.
- UL Standard 555 requires all ducts to terminate at fire damper sleeves.

UL CERTIFICATE OF COMPLIANCE

Certificate of Compliance

Certificate Number:

20250225-R41480

Report Reference:

R41480-20250225

Issue Date:

2025-02-26

Issued to:

**Mohammad A. Farhat Co. For Industry
3rd Industrial City, Makkah Region
Jeddah Saudi Arabia**

This certificate confirms that representative samples of:

DAMPERS FOR FIRE BARRIER AND SMOKE APPLICATIONS

See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

UL 555, Standard for Fire Dampers

Additional Information:

See UL Product iQ® at <https://iq.ulprospector.com> for additional information.

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

USC - Fire Dampers for Use in Static Systems, Models FD100, FD101, FD102, FD103, FD104, FD106, FD107, FD108, FD109, FD110, FD116, FD117, FD118, FD124, FD125, FD126, FD127, FD128, FD158, FD159, FD161 and FD162.



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David Piecuch
UL Mark Certification Program Owner

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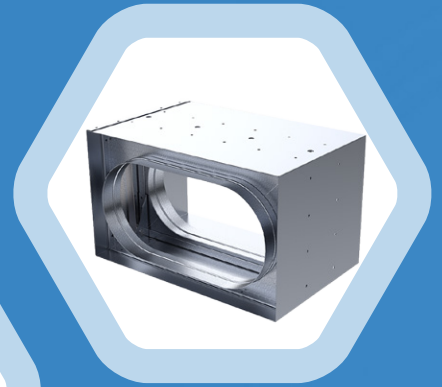
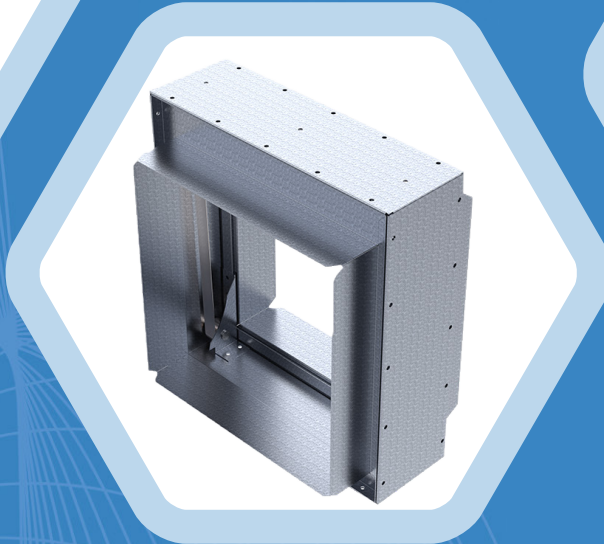
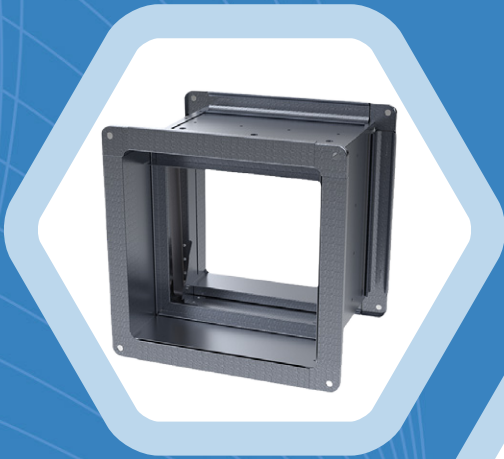
ORDERING CODE

	FD100	G	1	2	0	0	-	500	x	500	x	350	
FD SERIES													
* all selection in blue highlighted are defaults													
MODEL	1												
FD100 FD162													
<i>*Default model is FD100, select other models from table 2.</i>													
MATERIAL	2												
G G90													
H G115													
FUSIBLE LINK	3												
1 165 °F													
FIRE RATING / INSTALLATION	4												
1 Vertical 1.5 Hrs													
2 Vertical 3.0 Hrs													
3 Horizontal 1.5 Hrs													
4 Horizontal 3 Hrs													
SLEEVE THICKNESS	5												
U Gauge16													
0 No Sleeve													
RETAINING ANGLE CODE	6												
0 Without													
1 40x30x3 Bent													

WIDTH / DIA.

HEIGHT

SLEEVE LENGTH



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