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# ICC-ES Evaluation Report

# ESR-2213

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Reissued 04/2018  
This report is subject to renewal 04/2019.

**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**SECTION: 07 81 33—MINERAL-FIBER FIREPROOFING**

**REPORT HOLDER:**

**THERMAL CERAMICS, INC.**

**POST OFFICE BOX 923  
AUGUSTA, GEORGIA 30903**

**EVALUATION SUBJECT:**

**FIREMASTER® FASTWRAP XL FIRE PROTECTION SYSTEM FOR GREASE DUCTS**



*“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”*



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**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**Section: 07 81 33—Mineral-Fiber Fireproofing**

**REPORT HOLDER:**

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**EVALUATION SUBJECT:**

**FIREMASTER® FASTWRAP XL FIRE PROTECTION SYSTEM FOR GREASE DUCTS**

**1.0 EVALUATION SCOPE**

**Compliance with the following codes:**

- 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2015, 2012 and 2009 *International Mechanical Code*® (IMC)
- 2015, 2012 and 2009 IAPMO *Uniform Mechanical Code* (IAPMO UMC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)<sup>†</sup>

<sup>†</sup>The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

- Other Codes (see Section 8.0)

**Properties evaluated:**

- Durability
- Fire resistance
- Noncombustibility
- Surface burning characteristics

**2.0 USES**

FireMaster flexible blankets, as described in this report, are used to construct zero-clearance, fire-resistance-rated grease duct enclosure assemblies serving Type I kitchen hoods. The duct wrap materials comply with 2015 and 2012 IMC Section 506.3.11 and 2009 IMC Section 506.3.10, and are an alternative to the one- and two-hour fire-resistance-rated enclosure requirements of 2015 and 2012 IBC Section 713.4, 2009 IBC Section 708.4 and IAPMO Section 510.7, when installed in accordance with Section 4.0.

**3.0 DESCRIPTION**

**3.1 FireMaster® FastWrap XL Insulating Blanket:**

The FireMaster® FastWrap XL Insulating Blanket is a calcium magnesium silicate blanket totally encapsulated with a polypropylene/aluminum foil scrim. The blanket, nominally 1½ inches (38 mm) thick, is delivered to the jobsite in rolls 25 feet (7.6 m) long by 2 or 4 feet (610 or 1219 mm) wide. The blanket has a nominal density of 6 pcf (96 kg/m<sup>3</sup>), and has a flame-spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E84.

**3.2 Duct System:**

Grease ducts serving Type I hoods must be constructed of minimum 0.055-inch-thick (1.40 mm) (No. 16 gage) carbon steel or of stainless steel at least 0.044 inch (1.12 mm) (No. 18 gage) thick. Joints and seams of grease ducts must comply with 2015, 2012 or 2009 IMC Section 506.3.2 or 2015 IAPMO UMC Section 510.5.3 or 2012 and 2009 IAPMO UMC Section 510.5.2, as applicable. Duct supports must comply with IMC Section 506.3.3, 2015 and 2012 IAPMO UMC Section 510.1.6 or 2009 IAPMO UMC Section 510.1.7, as applicable, and Section 4.2.3 of this report. When the duct system penetrates a floor/ceiling assembly required to be protected in accordance with 2015 and 2012 IBC Section 713 or 2009 IBC Section 708, as applicable, the duct system must be supported as described in Figures 3 and 4. Maximum duct size is 24 inches by 48 inches (610 mm by 1219 mm) or 34 inches by 36 inches (864 mm by 914 mm).

**3.3 Duct Wrap Tape:**

Two types of tape are used with the enclosure system. Pressure-sensitive aluminum foil tape, a minimum of 3 inches (76.2 mm) wide, is used to seal cut edges of the blanket material. High-performance filament tape, a minimum of ¾ inch (19.1 mm) wide is used to secure the blanket material.

**3.4 Banding Material:**

Banding material must be minimum 0.015-inch-thick (0.38 mm) carbon steel or Type 304 stainless steel. The banding is a minimum of ½ inch (12.7 mm) wide.

**3.5 Firestop Sealant:**

The following sealants are used for through-penetration fire-stops described in Section 4.3.

**3.5.1 TREMstop™ Silicone (Fyre-sil):** TREMstop Silicone is a single-component, neutral cure, silicone elastomeric sealant, manufactured by TREMstop™ Fire

Protection Systems Group. The cure time is from 7 to 14 days at 77°F (25°C) and 50 percent relative humidity. The sealant is packaged in caulking tubes, sausages and pails.

**3.5.2 TREMstop™ Acrylic (GG) Gun Grade Acrylic Firestopping Sealant:** TREMstop™ Acrylic (GG): This is a single-component, water-based, acrylic firestop sealant manufactured by TREMstop™ Fire Protection Systems Group. The cure time is from three to five days at 77°F (25°C) and 50 percent relative humidity. The sealant is packaged in caulking tubes, sausages and pails.

**3.5.3 3M Fire Barrier 1000 NS:** 3M Fire Barrier 1000 NS is a one-component silicone elastomeric sealant, manufactured by the 3M Company, that cures upon exposure to atmospheric humidity to form a flexible seal, and is for use on horizontal and vertical assemblies. The working time is 5 to 10 minutes, and the cure time is from 14 to 21 days at 77°F (25°C) and 50 percent relative humidity. The sealant is packaged in caulking tubes and pails.

**3.5.4 Specified Technologies Inc. Pensil® Pen300:** Pensil® Pen300 is a single-component, neutral cure silicone sealant manufactured by Momentum for STI. The sealant is packaged in caulking tubes and pails.

**3.5.5 Rectorseal Metacaulk® 835+:** Metacaulk® 835+ is a single-component, neutral cure, silicone elastomeric sealant manufactured by Rectorseal. The cure time is 14 days at 77°F (25°C) and 50 percent relative humidity. The sealant is packaged in caulking tubes and pails.

### 3.6 Prefabricated Access Doors:

DuctMate Industries, Inc., Ultimate Door and F2-HT may be used in lieu of field-fabricated access doors, when installed as described in Section 4.2.2.3 of this report. The doors and their components are sized for the clean-out opening and are provided with threaded rods and wing nuts for securing the insulation blanket. The Ultimate Door system includes an appropriately sized outer insulation plate. The outer insulation plate for the F2-HT system must be site-fabricated from No. 16 gage [0.055 inch (1.4 mm)] steel. Both systems must use the DuctMate-supplied 2300°F gasket.

## 4.0 INSTALLATION

### 4.1 General:

The FireMaster® wrap materials are installed with zero clearance from the ducts, and may be installed with zero clearance from the insulating material to combustible construction. Grease ducts protected with the FireMaster® system are permitted to penetrate nonfire-resistance-rated wall, floor-ceiling and roof-ceiling assemblies, provided the duct is protected from the point of penetration in accordance with this report. The system is also permitted to penetrate concrete fire-resistance-rated assemblies when the through-penetration is protected in accordance with Section 4.3 of this report. The system complies with the requirements of IMC Section 602.2.1 and IAPMO UMC Section 602.2 for installation in plenums.

### 4.2 Two-hour Fire-resistance-rated Enclosure Assembly:

**4.2.1 Enclosure Assembly:** A total of two 1½-inch thick (38.1) layers of FireMaster blanket material are installed around the grease duct. The inside layer is cut to sufficient length to wrap completely around the duct and provide a tight butt-joint. Adjacent blankets on the inside layer are installed with tight butt-joints between blankets. The outside layer is cut to a length sufficient to wrap completely

around the perimeter of the grease duct and provide a minimum 3-inch (76.2 mm) overlap. Aluminum foil duct wrap tape is used to seal cut edges of the blanket. All joints between layers are staggered a minimum of 12 inches (305 mm), and all overlaps of adjacent blankets on the outside layer are a minimum of 3 inches (76 mm). As an alternative to 3-inch (72 mm) perimeter and longitudinal overlap of adjacent blankets on the outside layer, the blankets may be installed using a butt-joint/collar method. When two blanket layers are encapsulated in one bag, the butt-joint/collar method must be used. The methods are illustrated in Figure 1. Each layer of blanket material is temporarily held in place with minimum ¾-inch-wide (19.1 mm) filament tape, placed circumferentially 1½-inches (38 mm) from the edges of each blanket and spaced 10½-inches (267 mm) on center.

Steel banding is used to hold the outer layer of the blanket enclosure system in place. The bands are placed circumferentially 1½-inches (38 mm) from the edges of the blanket and are spaced 10½-inches (267 mm) on center. The tension of the banding material must be sufficient to firmly hold the blanket materials in place, but must not be so great as to cause any cutting or damage to the blanket material. See Figure 1 for details. For maximum duct sizes, see Section 4.2.3.

For duct dimensions greater than 24 inches (610 mm), No. 10 or No. 12 gage copper-coated steel insulation pins, long enough to extend through the two layers of blanket insulation, are welded in columns spaced 12 inches (305 mm) apart, between 6 and 12 inches (152 and 305 mm) from each edge and 10½-inches (267 mm) on center along the bottom of the horizontal duct runs and along the outside of vertical duct runs, to prevent blanket sag. The blankets are locked into place over the pins with 1½-inch-by-1½-inch (38 mm by 38 mm) galvanized steel speed clips.

During installation, the duct wrap must have a snug fit around the duct.

### 4.2.2 Grease Duct Access Doors:

**4.2.2.1 General:** Installation of grease duct access doors must comply with IMC Section 506.3.8, or IAPMO UMC Section 510.3, as applicable. Grease duct access doors must be protected with three layers of FireMaster blanket material.

**4.2.2.2 Field-fabricated Access Doors:** Each access door assembly has four threaded rods, one welded to each corner of the door opening. Each threaded rod measures ¼ inch (6.4 mm) in diameter and 4½ to 5 inches (114 to 127 mm) in length. Four-inch-long (102 mm) hollow steel tubes fit over the threaded rods and act as protective sleeves for the blanket material when the door is fastened. In addition, four copper-coated steel insulation pins, with a No. 10 or No. 12 gage diameter and lengths of 4 to 5 inches (102 to 127 mm), are welded to the steel door panel, for blanket installation. Two layers of the blanket material are installed over the welded insulation pins, with the second layer having a perimeter 1½ inches (38 mm) wider than the first. The third layer of blanket material is cut in a similar manner and installed over the second layer. Each subsequent layer must have a minimum overlap of 1½ inches (38 mm) around the perimeter of the door and any previous blanket layers. The blanket layers are held in place with 1½-inch (38 mm) square or round speed clips, and wing nuts for ¼-inch-diameter (6.4 mm) rod. Access door labels must be applied to all access doors. See Figure 2 for details of protection for field-fabricated access doors.

**4.2.2.3 Prefabricated Access Doors:** The DuctMate Ultimate and F2-HT prefabricated access doors must be installed in accordance with DuctMate Industries, Inc. installation instructions and the applicable code. The first layer is cut to the size of the door and each successive layer has an overlap of  $1\frac{1}{2}$  inches (38 mm) over the lower layer. All edges of insulation blanket must be protected with aluminum tape. A No. 16 [0.055 inch (1.4 mm)] gage outer plate the same dimension as the outer layer of insulation blanket is held in place over the insulation using threaded rod and wing nuts provided with the doors. See Figure 2 of this report for assembly details.

**4.2.3 Duct Support:** Horizontal duct assemblies with maximum dimensions of 24 inches by 48 inches (610 mm by 1219 mm) or 34 inches by 36 inches (864 mm by 914 mm) are supported with minimum  $\frac{3}{8}$ -inch-diameter (9.5 mm), all-thread steel rods and 2-inch-by-2-inch-by- $\frac{1}{8}$ -inch (51 mm by 51 mm by 3.2 mm) steel angles, spaced a maximum of 60 inches (1524 mm) on center along the length of the duct. A maximum clearance of 6 inches (152 mm) is permitted between the edge of the protected duct and the steel rod. See Figure 3.

Vertical duct assemblies with maximum dimensions of 24 inches by 48 inches (610 mm by 1219 mm) are supported with  $1\frac{1}{2}$ -inch-by- $1\frac{1}{2}$ -inch-by- $\frac{1}{8}$ -inch-thick (38 mm by 38 mm by 3.2 mm) angle brackets, as shown in Figure 4. The brackets are located on opposite sides of the duct on the top and bottom of each floor/ceiling assembly, and are attached to the duct with welds or mechanical fasteners. As an alternative, the brackets are supported by minimum  $\frac{3}{8}$ -inch-diameter (9.5 mm) all-thread rod. Maximum vertical spacing between supports is 12 feet (3658 mm).

### 4.3 Through-penetrations:

**4.3.1 General:** Where the systems penetrate fire-resistive assemblies, the through-penetration must be protected with an approved through-penetration fire-stop system. Section 4.3.2 describes a two-hour F- and T-rated through-penetration firestop assembly for walls, and Section 4.3.3 describes a two-hour F- and T-rated through-penetration firestop assembly for floor/ceilings. Where the grease duct enclosure system penetrates other than the concrete or concrete masonry assemblies described in those sections, or penetrates a roof/ceiling assembly, the through-penetration must be protected with a through-penetration firestop assembly complying with the applicable code provisions, and use of the firestop assembly must be approved by the code official.

**4.3.2 Wall Assemblies Two-hour F- and T-rated Through-penetration Fire-stop Assembly:** Where the grease duct protected with the FireMaster® enclosure assembly penetrates a fire-resistance-rated concrete or concrete masonry wall assembly complying with 2015 and 2012 IBC Table 721.1(2) or 2009 IBC Table 720.1(2), as applicable, and the penetration requires protection, the annular space of the penetration must be protected as follows:

- Penetration opening: The maximum area of the opening in the fire-resistance-rated wall assembly is 3,069 square inches (1.98 m<sup>2</sup>), with a maximum perimeter dimension of 93 inches (2362 mm).
- Duct wrap material: The grease duct must be wrapped with the blanket material as described in Section 4.2.1.
- Packing material: Minimum  $4\frac{1}{2}$ -inch-wide (114 mm) unfaced scrap duct wrap material or 3 pcf (48 kg/m<sup>3</sup>) mineral wool batt insulation is firmly packed into the opening as a permanent form. The packing material

must be recessed a minimum of  $\frac{1}{4}$  inch (6.4 mm) from both surfaces of the wall, to accommodate the sealant material.

- Sealant material: The recessed voids created by the packing material must be filled to a minimum depth of  $\frac{1}{4}$  inch (6.4 mm) with one of the firestop sealants described in Section 3.5.

### 4.3.3 Floor/Ceiling Assemblies—Two-hour F- and T-rated Through-penetration Fire-stop Assembly:

Where the grease duct protected with the FireMaster® enclosure assembly described in Section 4.2.1 penetrates a minimum  $4\frac{1}{2}$ -inch-thick (114 mm) fire-resistive concrete floor/ceiling assembly complying with 2015 and 2012 IBC Table 721.1(3) or 2009 IBC Table 720.1(3), the annular space of the penetration must be protected as illustrated in Figure 5 and as described below:

- Penetration opening: The annular space on each side of the wrapped duct shall be between  $\frac{1}{2}$  inch (12.7 mm) and  $4\frac{3}{4}$  inches (121 mm). The duct must be located centrally within the opening. The maximum area of the opening in the floor/ceiling assembly is 1,122 square inches (0.724 m<sup>2</sup>), with a maximum opening dimension of 51 inches (1295 mm) when the duct wrap is continuous through the opening. When the duct wrap is terminated at the top and bottom surface of the floor/ceiling assembly, the maximum area of the opening is 752 square inches (0.485 m<sup>2</sup>), with a maximum opening dimension of 47 inches (1193 mm).
- Duct wrap material: The grease duct must be wrapped with the blanket material as described in Section 4.2.1.
- Packing material:  $4\frac{1}{4}$ -inch-wide (108 mm) strips of duct wrap material are layered to a thickness approximately twice the dimension of the annular space, then compressed to half the original thickness and placed into the annular space, flush with the lower surface of the slab and recessed a minimum of  $\frac{1}{4}$  inch (6.4 mm) from the upper surface, as shown in Figure 5.
- Sealant material: The recessed void created by the packing material must be filled to a minimum depth of  $\frac{1}{4}$  inch (6.4 mm) with one of the firestop sealants described in Section 3.5.

## 5.0 CONDITIONS OF USE

The FireMaster® grease duct enclosure system described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- The enclosure system shall be constructed and installed in accordance with this report and the manufacturer's instructions. In the event of a conflict between this report and the manufacturer's instructions, this report governs.
- The blanket materials are manufactured in Augusta, Georgia, under a quality control program with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

- Data in accordance with the ICC-ES Acceptance Criteria for Field-Applied Grease Duct Enclosure Assemblies (AC101.1), dated December 2012 (editorially revised November 2015).
- Reports of tests in accordance with ASTM E2336 testing for fire-resistive grease duct enclosure

systems in accordance with 2015 and 2012 IMC Section 506.3.11 and 2009 IMC Section 506.3.10.

## 7.0 IDENTIFICATION

The FireMaster<sup>®</sup> blanket material bears a label indicating the product name (FireMaster<sup>®</sup> FastWrap XL), the name of the manufacturer (Thermal Ceramics), the evaluation report number (ESR-2213), and “NOTICE – FIRE PROTECTION WRAP SYSTEM – Contact building or local inspection official before cutting or removing. This is a life safety application.” are inscribed on the blanket materials at regular intervals, and must be visible when the materials are in an installed condition. Firestop sealants used for through-penetration fire-stops are labeled with the sealant manufacturer's name and the product name. Prefabricated access doors are labeled with the DuctMate Industries, Inc., name, the product name and the model number.

## 8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the following codes:

- 2006 *International Building Code*<sup>®</sup> (2006 IBC)
- 2006 *International Mechanical Code*<sup>®</sup> (2006 IMC)
- 2006 IAPMO *Uniform Mechanical Code* (2006 IAPMO UMC)

The products comply with the above-mentioned codes as described in Sections 2.0 through 7.0 of this report, except the applicable code sections are as follows for the report sections cited:

- Section 2.0:
  - Grease duct enclosures:
    - 2006 IMC Section 506.3.10
  - Shaft enclosures:
    - 2006 IBC Section 707.4
    - 2006 IAPMO UMC Section 510.7.1
- Section 3.2:
  - Joints and seams of grease ducts:
    - 2006 IMC Section 506.3.2
    - 2006 IAPMO UMC Section 510.5.2
  - Duct supports:
    - 2006 IMC Section 506.3.3
    - 2006 IAPMO UMC Sections 510.1.7 and 510.5.1
  - Penetration of floor/ceiling assembly:
    - 2006 IBC Section 707
- Section 4.1:
  - 2006 IMC Section 602.2.1
  - 2006 IAPMO UMC Section 602.2
- Section 4.2.2.1:
  - 2006 IMC Section 506.3.8
  - 2006 IAPMO UMC Section 510.3.
- Section 4.3.2:
  - 2006 IBC Table 720.1 (2)
- Section 4.3.3:
  - 2006 IBC Table 720.1 (3)
- Section 5.2:
  - 2006 IMC Section 506.3.3.1
- Section 6.2:
  - Reports of tests in accordance with 2006 IMC Section 506.3.10.

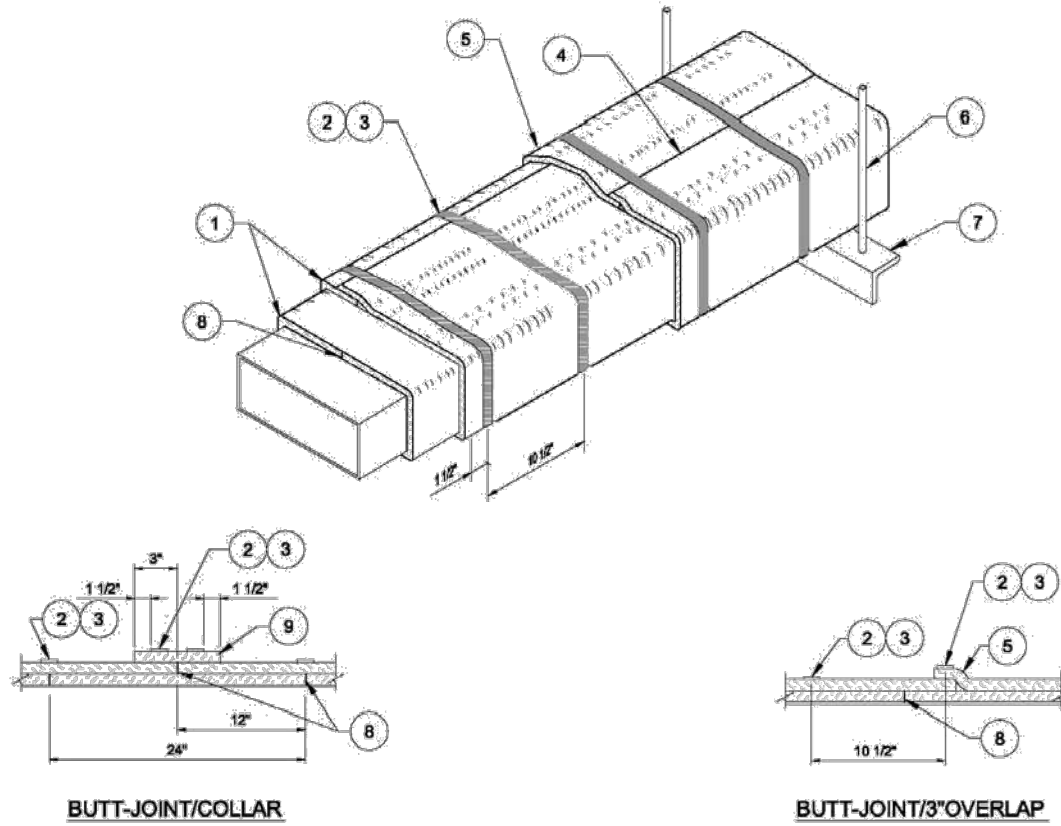
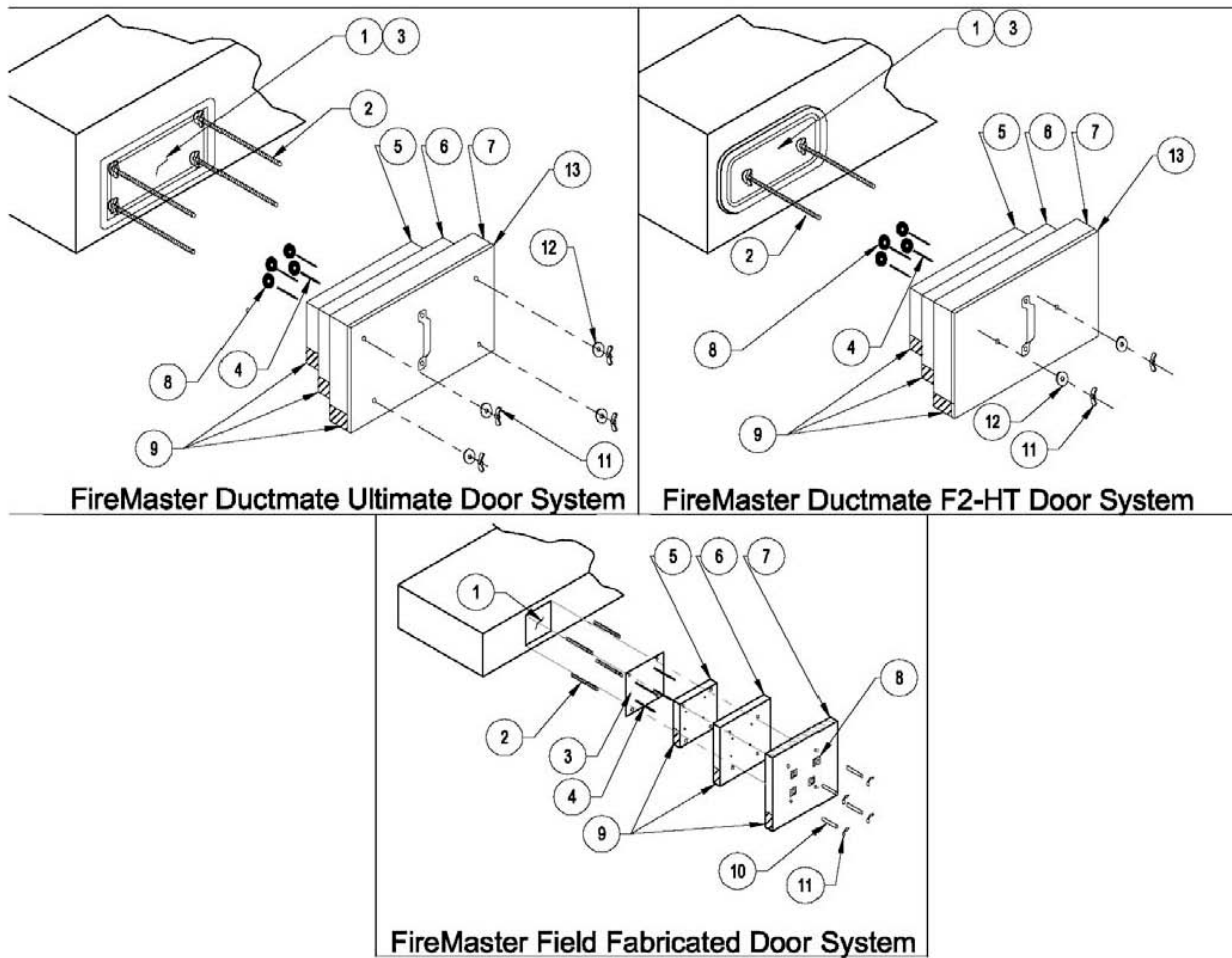


Figure 1 – Legend	
1	Two layers FireMaster FastWrap XL
2	Filament tape
3	Steel banding
4	3" longitudinal overlap
5	3" transverse overlap
6	Min. 3/8" diameter hanger rod
7	2" x 2" x 1/8" angle
8	1" compressed butt joint
9	6" wide FireMaster FastWrap XL collar

FIGURE 1—FIREMASTER® FASTWRAP® XL INSTALLATION METHODS



**Figure 2 - Legend**

1	Door hole
2	All thread rods (3/8" - Ultimate, 1/4" - F2-HT, 1/4" - Field Fabricated)
3	16 Gage Access cover (Field Fab Door) or DuctMate Door System
4	Insulation pins - welded to plate or access cover
5	One layer FireMaster Duct Product (See note below)*
6	One layer FireMaster Duct Product, 1 1/2" Overlap*
7	One layer FireMaster Duct Product, 1 1/2" Overlap*
8	1-1/2" Round or Square Speed clips
9	Aluminum tape at edges
10	Spool pieces for threaded rods (Field fab. only)
11	Wing nuts sized to fit All Thread Rod in Item 2
12	Washers sized to fit All Thread Rod in Item 2
13	Insulation plate

**FIGURE 2—FIREMASTER® FASTWRAP® XL ACCESS DOOR SYSTEMS**

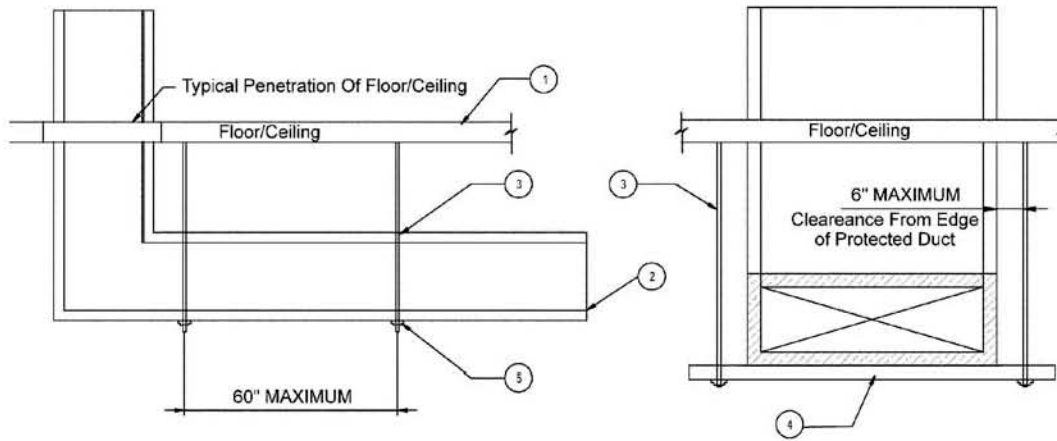


FIGURE 3 - LEGEND	
1	FLOOR/CEILING ASSEMBLY
2	16 GAGE CARBON STEEL OR 18 GAGE STAINLESS STEEL DUCT MAXIMUM 24X48" OR 34X36"
3	MIN. 3/8" ALL-THREAD ROD
4	2"x2"x1/8" STEEL ANGLE
5	STEEL WASHER & NUT SIZED TO FIT ITEM 3

FIGURE 3—FIREMASTER® FASTWRAP® XL HORIZONTAL SUPPORT DETAILS

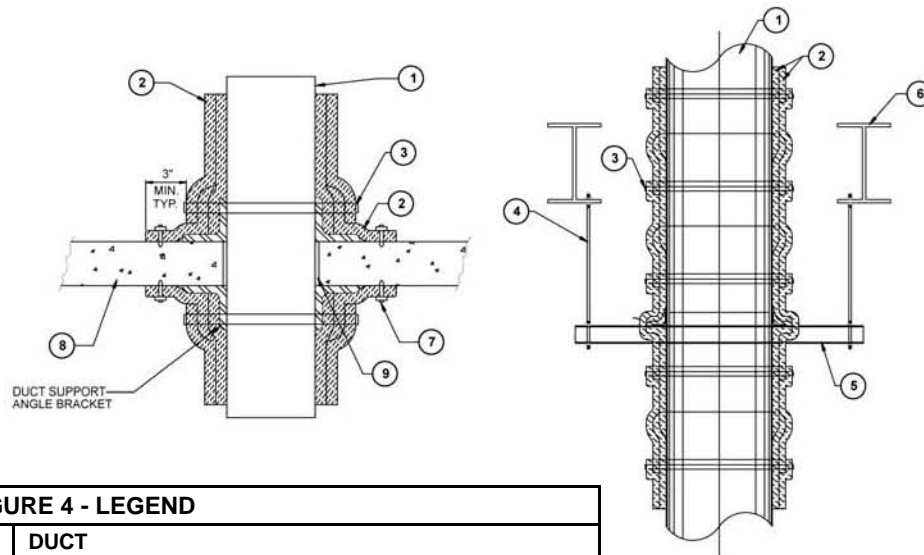
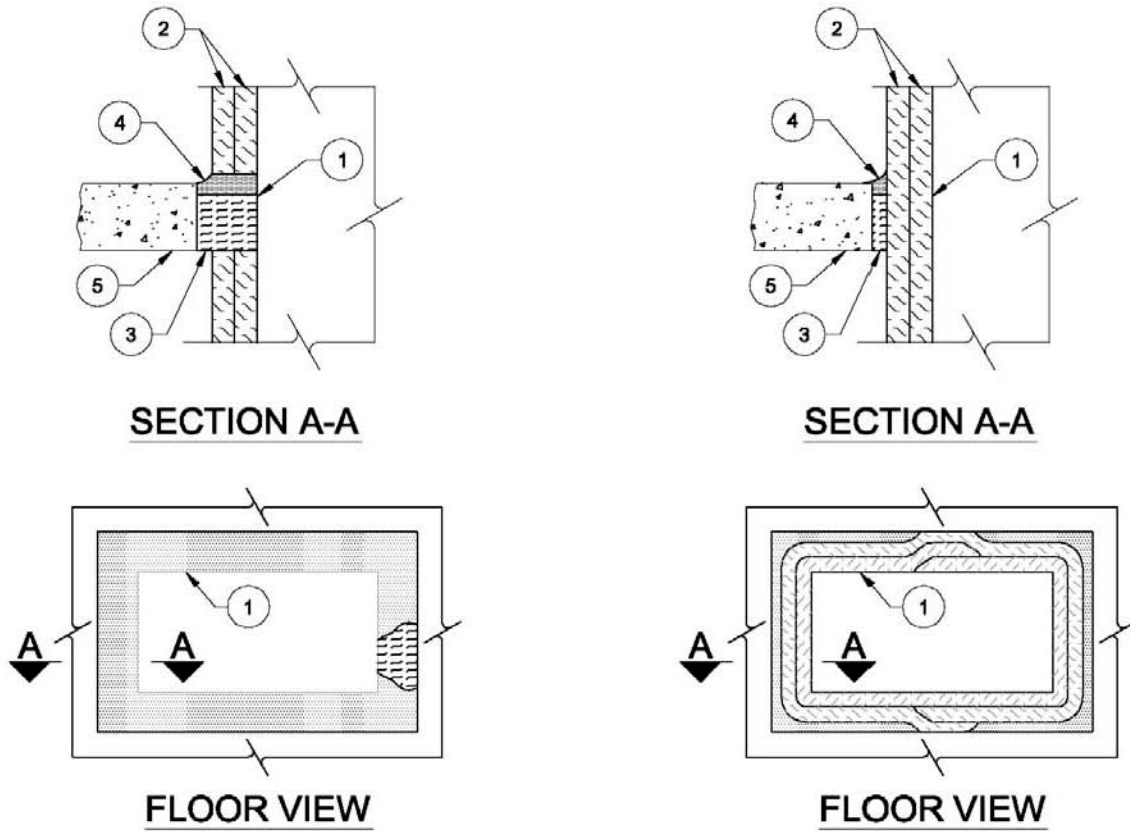


FIGURE 4 - LEGEND	
1	DUCT
2	TWO LAYERS FIREMASTER FASTWRAP XL
3	STEEL BANDING
4	MIN. 3/8" HANGER ROD
5	MIN. 1 1/2"x1 1/2"x1/8" ANGLE
6	BUILDING STEEL FRAMING BY REGISTERED DESIGN PROFESSIONAL
7	MECHANICAL FASTENERS & WAHERS
8	RATED FLOOR
9	FIRESTOP SEALANT IN SECTION 3.5

FIGURE 4—FIREMASTER® FASTWRAP® XL VERTICAL SUPPORT DETAILS





FastWrap XL Terminated At The Top And Bottom Surface Of The Floor/Ceiling Assembly

FastWrap XL Continuous Through The Floor/Ceiling Assembly

Figure 5 – Legend	
1	Duct
2	Two layers Firemaster FastWrap XL
3	Scrap pieces of Firemaster FastWrap XL
4	Firestop Sealant Listed in Section 3.5
5	Rated Floor or Ceiling Assembly

FIGURE 5—FIREMASTER® FASTWRAP® XL 1 TO 2 HOUR FLOOR/CEILING THROUGH PENETRATION FIRESTOP SYSTEM DETAILS