

FireMaster® FastWrap® XLS Grease Duct Installation and Design Guidelines

Thermal Ceramics



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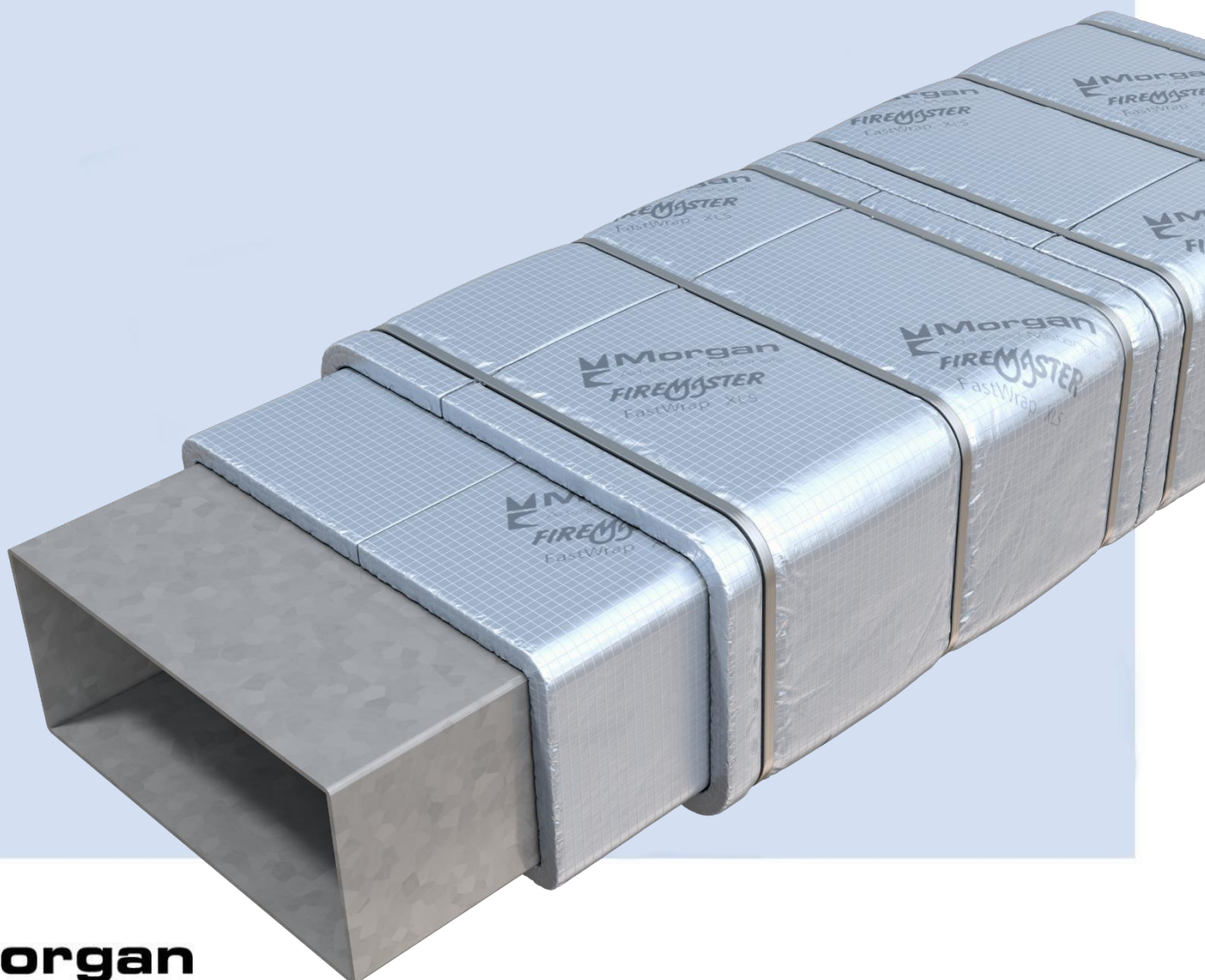




Table of Contents

FireMaster FastWrap XLS Product Description	3
Specifications - Division 23 07 13 – Duct Insulation	3
Physical Characteristics and Performance	4
Grease Duct Listings/Building Code Report	4
Test and Code Standards	5
Storage	6
Installation Guidelines	6
Maintenance and Repair	12
Limitations	12





FireMaster FastWrap XLS Fire-Rated Duct Wrap

1. Product Description

FireMaster FastWrap XLS is a fire-rated blanket specially developed for fire-rating steel ductwork. A flexible blanket composed of high-temperature fibres classified for temperatures up to 2192°F (1200°C), FireMaster FastWrap XLS is fully encapsulated in a foil..

FireMaster FastWrap XLS encapsulation decreases water, moisture or grease ingress, ensuring good insulation integrity and avoiding the promotion of mold growth.

FireMaster FastWrap XLS has a core blanket manufactured using our advanced Superwool® low biopersistent fibre manufacturing technology. The core blanket provides exceptionally low thermal conductivity, which yields in reduced thickness and density over traditional materials while meeting fire rating requirements, space savings and easier installation through increased flexibility and reduced handling weight.

Product Features

- 25% lighter than existing 2-hour fire-rated blankets on the market
- Butt-Joint installation resulting in easier installation labor and reduced labor
- No taping of joints
- Provides a 2-hour enclosure and firestop system for kitchen exhaust ducts tested to ASTM E2336 for grease ducts
- Provides zero clearance to combustibles throughout the installed system
- Complies with IMC, NFPA-96, UMC, CMC, CNBC
- Intertek Listed Grease duct installation with butt joints at all seams on both layers
- UL Environment validated as a 'Low VOC Emitting Material' and 'Mold Resistant'

2. Specifications - Division 23 07 13 – Duct Insulation

Installation shall be in strict accordance with manufacturer's published installation instructions, Intertek Listings, and shop drawings.

The duct enclosure system shall be listed by Intertek per ASTM E2336, CAN/ULC S144 and CAN/ULC S115 for a 2-hour rating and zero clearance to combustibles and tested per ASTM E84 or UL 723 for a flame/smoke rating less than 25/50.

Insulation shall have a nominal thickness of 1.5" (38mm) and density of 4.4 pcf (70kg/m³).



3. Physical Characteristics and Performance

Properties	FireMaster FastWrap XLS
Colour of Encapsulation	Silver*
Classification Temperature, °F (°C)	2192 (1200)
Density, pcf (kg/m ³)	4.4 (70)
Surface Burning and Smoke Generation	<25/50, ASTM E84
R Value @ 75°F (24°C)	6.5 per layer, ASTM C518
Low VOCs	Validated, CA Section 01350
Mold resistant	Validated, ASTM C1338

*Black foil option available upon request

4. Grease Duct Listings/Building Code Report

The following design listings and Building Code Report are available for FireMaster FastWrap XLS:

Grease Duct Listings and Building Code Reports		
<u>Description</u>	<u>Laboratory</u>	<u>Listing or Report Number</u>
ASTM E2336 Grease Duct Assembly	Intertek	TC/BI 120-04
ASTM E814 Through Penetration Firestops	Intertek	TC/BI 120-07
ASTM E814, ULC-S115 Through Penetration Firestops	Intertek	TC/BI 120-06
ULC-S144 Grease Duct Assembly	Intertek	TC/BI 120-05
Grease Duct Code Compliance Report	Intertek	CCRR No. 0402



5. Test and Code Standards

FireMaster FastWrap XLS has been tested in accordance with the following, as required for compliance with US and Canadian grease duct certification.

Test Standard	Description of Test Standard
ASTM E2336	Standard Test Methods for Fire Resistant Grease Duct Enclosure Systems
ASTM C518	Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM E84	Test Method for Surface Burning Characteristics of Building Materials
ASTM E119	Test Method for Fire Tests of Building Construction and Materials
ASTM E136	Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 1382°F (750°C)
ASTM E814	Test Method for Fire Tests of Penetration Firestop Systems
ASTM C411	Standard Test Method of Hot Surface Performance of High Temperature Thermal Insulation
CAN/ULC-S144	Standard Method of Fire Resistance Test – Grease Duct Assemblies
CAN/ULC-S115	Standard Method of Fire Tests of Firestop Systems
Code Standard	Edition of Code Standard
International Mechanical Code (IMC)	2012 - 2021 Editions
International Building Code (IBC)	2012 - 2021 Editions
IAPMO Uniform Mechanical Code (IAPMO UMC)	2012 - 2021 Editions
NFPA 96 Standard for Ventilation and Fire Protection of Commercial Cooking Operations	2014 - 2021 Editions
National Building Code of Canada	2015 & 2020 Editions



6. Storage

FireMaster FastWrap XLS is supplied in corrugated cardboard cartons. It must be stored in a dry warehouse environment on pallets. Pallets should not be stacked. Do not store in outside conditions.

7. Installation

FireMaster FastWrap XLS shall be installed by a qualified contractor in accordance with manufacturer's instructions and laboratory design listings.

Materials and Equipment

- FireMaster FastWrap XLS
- Aluminum foil tape or Foil scrim tape
- Glass filament reinforced tape (optional)
- Carbon steel or stainless-steel banding material, minimum 0.5" (13 mm) wide, minimum 0.015" (0.4mm) thick, with steel banding clips
- Hand banding tensioner and crimping tool
- Minimum 12 gage (3mm) steel insulation pins; steel speed clips, minimum 1.5" (38mm) square or 1.5" (38mm) diameter, or equivalent sized cup-head pins
- Capacitor discharge stud gun
- Approved firestop sealant

General

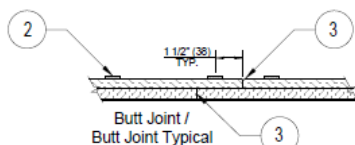
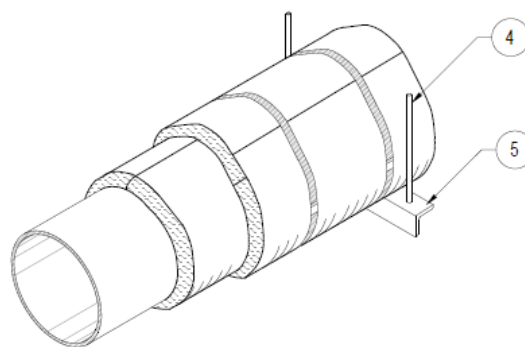
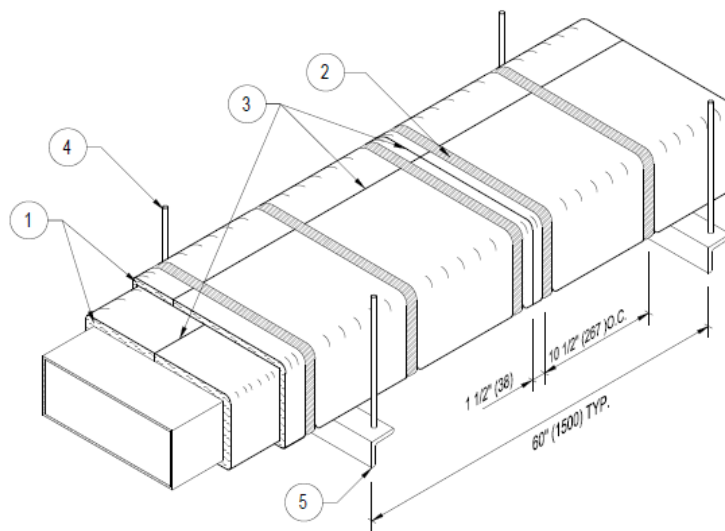
- Cut edges of the blanket shall be taped with an approved tape to prevent exposed edges of the insulation from absorbing grease and moisture in the event of a compromised grease duct joint or condensation.
- Tight butt and staggered joints are used to block heat transfer in the event of duct deformation resulting from thermal expansion.
- Filament tape is suggested to hold the blanket in place until steel banding or pinning is installed to permanently secure the blanket.
- Metal banding is not required on the inner layer.



i. Installation on Grease Duct per ASTM E2336 and CAN/ULC S144 (Figure 1)

- System requires two layers of insulation applied directly to the duct with tight butt joints minimum 1.5" (38mm) compression at all seams on both layers.
- The first layer of insulation is cut to a length sufficient to wrap around the duct and provide a tight butt joint where the blanket ends meet.
- Adjacent blankets on the first layer are tightly butted together with longitudinal seams offset minimum 6" (150mm).
- The second layer of insulation is installed in the same method as the first layer, with seams between layers offset a minimum of 6" (150mm).
- Banding and/or pinning per Section iii is used to permanently secure the insulation to the duct.

Figure 1: FireMaster FastWrap XLS Commercial Kitchen Grease Duct Enclosure System Shaft Alternative / Zero Clearance to Combustibles



TWO LAYER INSTALLATION (Grease Duct per ASTM E2336)

XLS001-0

LEGEND	
1	Two Layers of FastWrap XLS Insulation for ASTM E2336 and CAN/ULC S144 Grease Duct Enclosures
2	Steel banding minimum 1/2" wide by 0.015" thick.
3	Tight butt joints (no overlap) at perimeter and longitudinal joints; both layers
4	Min. 3/8" diameter hanger rod
5	Min. 2" x 2" x 1/8" angle

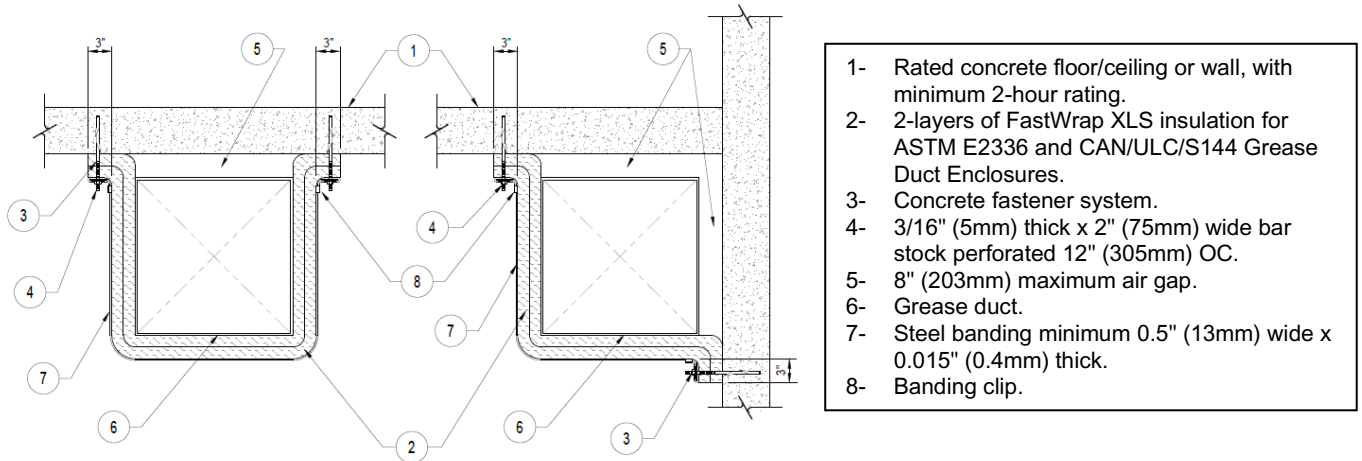
The integrity of Firemaster duct systems is limited to the quality of the installation.



ii. 2 & 3-Sided Wrap Installation (Figure 2)

- When space does not allow for a complete wrap applied to the duct on all four sides, the FireMaster FastWrap XLS may be used for 2 or 3-sided installations with mechanical attachment to a rated concrete or CMU assembly. (See Figure 2 for installation details.)

Figure 2: FireMaster FastWrap XLS Commercial Kitchen Grease Duct Enclosure System Shaft Alternative / Zero Clearance to Combustibles 2 and 3-Sided Wrap Detail for Attaching to Walls and/or Ceilings.



Note: Ducts must be independently supported per code

*The integrity of FireMaster duct system is limited to the quality of the installation.

iii) Mechanical Attachment Methods

- **Banding** - Minimum 0.5" (13mm) wide carbon steel or stainless-steel banding, 0.015" (0.4mm) thick, is placed around the entire perimeter of the insulated duct on maximum 10.5" (270mm) centers and 1.5" (38mm) from each blanket edge. The banding is placed around the blanket and tightened to firmly hold the FastWrap XLS in place against the duct, but not cause any cutting or damage to the blanket.
- **Pinning** - Pinning on all sides of the duct may be used as an alternative to banding. For ducts wider than 24" (610mm) pinning is required on the bottom of horizontal runs, or on one side of vertical runs (in addition to steel banding). When applicable, 12-gage (3mm) copper-coated, steel pins are installed on 12" (305mm) centers along the width of the duct and 10.5" (270mm) centers along the length of the duct. Pins that extend beyond the outer blanket layer shall be turned down or the excessive length cut off to prevent sharp edges. Shoot through pins (cup head pins) may be used in conjunction with steel banding to prevent blanket sag.



iv) Access Doors

- **Field Fabricated Access Doors:** Each access door assembly has four threaded rods 0.25" (6mm) in diameter and 5" (127mm) in length, with one welded to each corner of the door opening. Hollow steel tubes, 4.5" (114mm) long is installed outside the access cover plate and over the threaded rods. Four 12 gage (3mm) and 5" (127mm) long steel insulation pins are welded to the access cover plate corners to allow for installation of the three layers of FireMaster FastWrap XLS. One layer of FireMaster FastWrap XLS is cut to approximately the same size as the access panel and impaled over the insulation pins on the panel. A second layer of FireMaster FastWrap XLS is cut to overlap the first layer a minimum of 1.5" (38mm) per side. It is essential that the first and second layer fit tightly against the surrounding wrap with no through openings. The third and outside layer should be cut to overlap the second insulation layer by a minimum of 1.5" (38 mm) per side. Minimum 1.5" (38mm) round or square insulation clips are installed on the insulation pins to secure the three layers of insulation to the access cover plate. All cut edges of the insulation shall be taped with minimum 3" (75 mm) wide aluminum foil tape. Wing nuts and washers are installed on the four threaded rods and tightened against the hollow steel tubes to seal the access cover plate to the duct.
- **Prefabricated Access Doors:** Install a Listed inner access door per manufacturer's installation instructions. Once installed, the access door is to be insulated with 3 layers of FireMaster FastWrap XLS. The inner layer of insulation should match the dimensions of the access door. Each following layer should be stepped such that insulation dimensions are 3" (75mm) wider and taller than the previous layer. Access door should be fitted with two (2) minimum 6" (15mm) long, 3/8" (10mm) diameter steel threaded rods, passing through blanket layers. Install a 16-gage (2mm) cover plate having dimensions of the 3rd layer of insulation with holes drilled to match the 2 threaded rods attached to the access door. Fasten the cover plate, using washers and wing nuts.

v. Through Penetration Firestop System

- When the duct penetrates a fire rated assembly, an approved firestop system must be employed. Firestops that are listed for use with FireMaster FastWrap XL may also be used with FireMaster FastWrap XLS duct systems, providing that the FireMaster FastWrap XLS filler blanket used through the supporting construction or used as packing material is compressed by a factor of 1.36 more than required by the FastWrap XL listings. Table 1 provides a summary of listed firestop design listings which can be found by searching the UL Product iQ™ database.
- Additional firestops may be installed per Figure 3 and 4. Prior to installing any firestop system, the surfaces of all openings and penetrating items must be clean and dry. The FireMaster FastWrap XLS filler blanket must be compressed into the annular space. The packing material must be recessed a minimum depth from the surface of the concrete or gypsum assembly. The recessed opening must be filled with a minimum thickness of an approved firestop sealant.
- The packing material type and compression, minimum recess (typically 0.25" (6mm)), and approved firestop sealant and thickness (typically 0.25" (6mm)) shall be as specified in an approved firestop design listing. When there is not sufficient annular space around the duct to run the FireMaster FastWrap XLS enclosure system continuous through the fire rated assembly, the enclosure may terminate above and below the floor/ceiling assembly or on either side of a wall assembly as shown in Figure 3 and 4.



Table 1 : 2-Hour Grease Duct Firestop Designs per ASTM E814 / UL 1479

<u>UL Listing</u>	<u>Construction</u>	<u>Termination</u>	<u>Firestop Sealant</u>
C-AJ-7018	Concrete / CMU	Wrap Through	STI, Nelson
C-AJ-7021	Concrete / CMU	Terminate at	STI, Tremco, DAP
C-AJ-7098	Concrete / CMU	Wrap Through	Hilti, Rectorseal, STI, Tremco
C-AJ-7153	Concrete / CMU	Terminate at	Hilti
F-C-7036	Wood / Gypsum Floor	Wrap Through	Nelson, Hilti, Rectorseal, STI, Tremco, FireMaster Putty
W-L-7041	Gypsum Wall	Wrap Through	Tremco
W-L-7099	Gypsum Wall	Wrap Through	STI
W-L-7121	Gypsum Wall	Wrap Through	Nelson, Hilti, Rectorseal, STI, Tremco

Figure 3: 2-Hour Grease Duct Firestop Designs per ASTM E814 / UL 1479

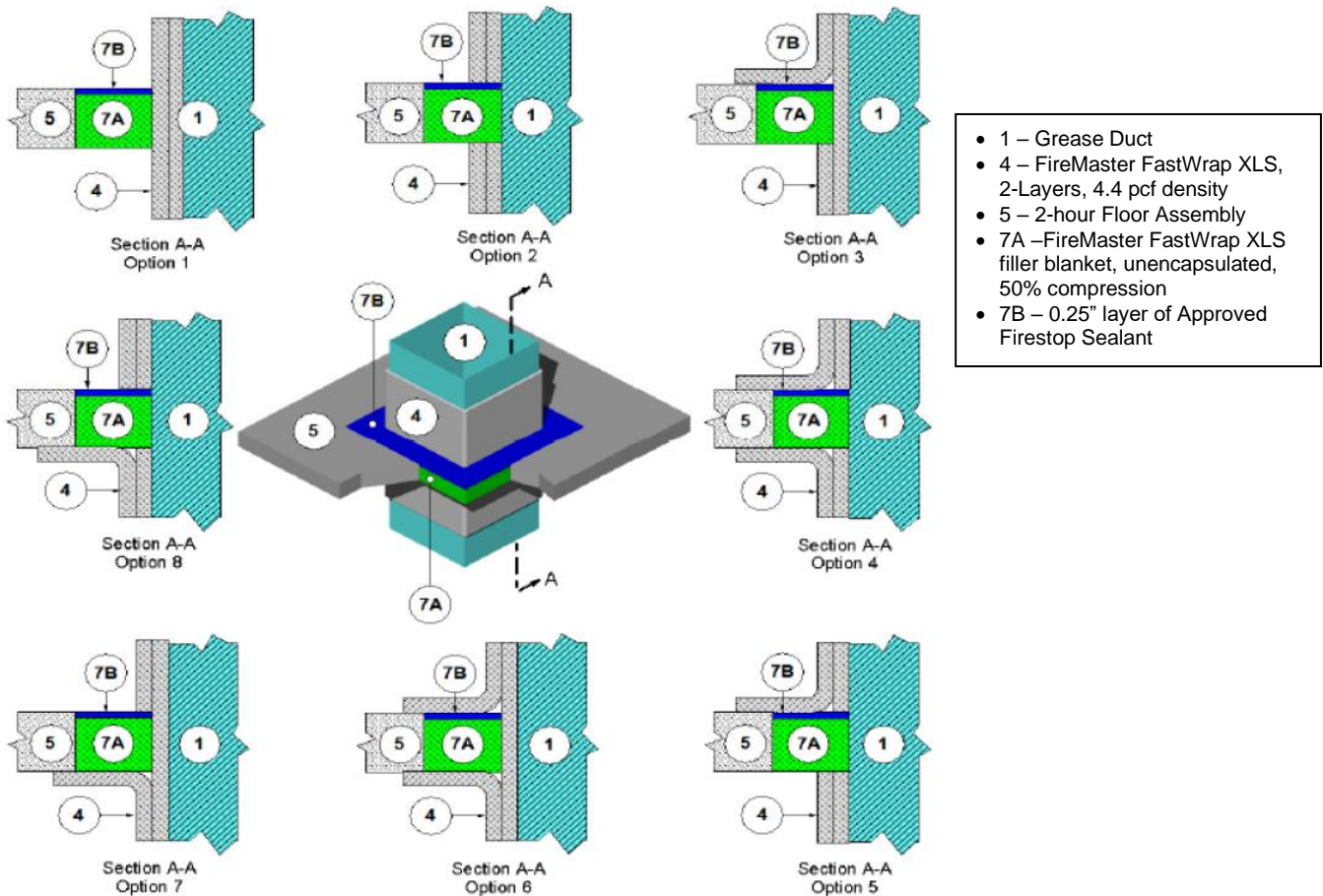
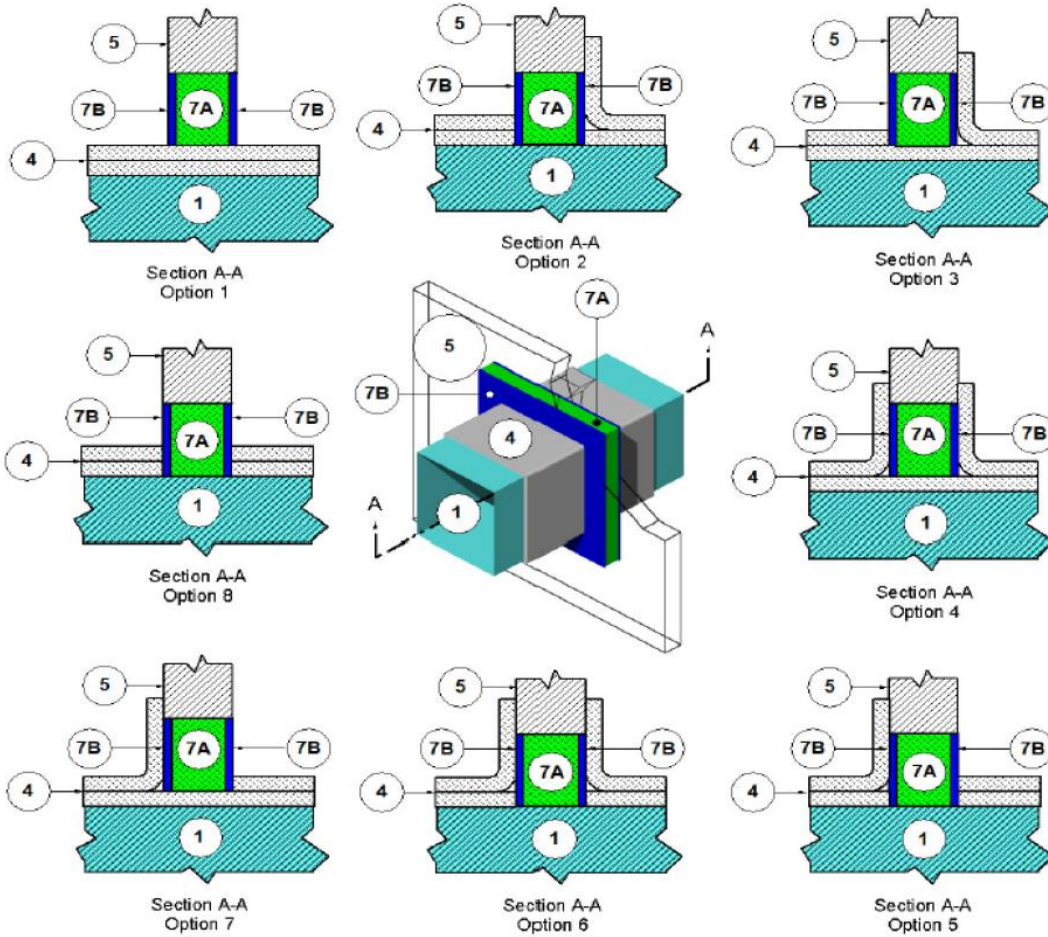




Figure 4: 2-Hour Grease Duct Firestop Designs per ASTM E814 / UL 1479



- 1 – Grease Duct
- 4 – FireMaster FastWrap XLS, 2-Layers, 4.4 pcf density
- 5 – 2-hour Wall Assembly
- 7A – FireMaster FastWrap XLS filler blanket, unencapsulated, 50% compression
- 7B – 0.25" layer of Approved Firestop Sealant



vi) Support Hanger Systems

Trapeze support hangers shall be spaced on maximum 60" (1500mm) centers. Hanger rods or straps shall be anchored with steel drop in or wedge expansion type masonry anchors. Threaded rods should be spaced a minimum of 1" (25mm) from the insulated grease duct. No additional protection is required for hangers and supports meeting the requirements of the Table below.

<u>Hanger Cross Section, in (mm)</u>	<u>Maximum Perimeter, in (mm)</u>	<u>Trapeze Support, or equivalent Yield Strength, in (mm)</u>
3/8 (10) threaded rod	144 (3658)	2x2x1/8 (51x51x3)

8. Maintenance and Repair

- No maintenance is required when installed in accordance with Morgan Advanced Materials' installation instructions.
- If damage is limited to the foil facing, approved tape can be used to repair the foil facing. If an area of blanket is found to be damaged the following procedure must be incorporated.
- If the damaged area is larger than 8" x 8" (203 x 203mm), the entire wrap section must be removed and replaced according to Morgan Advanced Materials installation instructions.
- If the damaged area is small (less than 8" x 8" (203mm x 203mm), the damaged area must be cut away and replaced with a new section 1" (25mm) larger in length and width than the cut out, such that the new section can be compressed tightly into the cut-out area.
- All cut edges of the new section must be taped and sealed with an approved tape.
- The new section must be held in place with either pinning or banding per Morgan Advanced Materials installation instructions.

9. Limitations

Morgan Advanced Materials FireMaster FastWrap XLS shall be installed in accordance with these installation instructions and appropriate laboratory design listings. The integrity of FireMaster FastWrap XLS systems is limited to the quality of the installation.

* For personal protective equipment recommendations, please see Morgan Advanced Materials SDS Number 350.

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