

### Product Data & Installation Guide

#### 1. Product Description

Thermal Ceramics' new Pyroscat<sup>®</sup> Duct Wrap XL is the thinnest and lightest flexible wrap material available that passes the ASTM E 2336 test standard required by the 2006 IMC and NFPA 96 for reduced clearance enclosure materials used to provide 1 or 2 hour fire rating for kitchen exhaust ducts. Duct Wrap XL is also UL Classified and Labeled per ISO 6944 as an alternative to a 1 or 2 hour rated enclosure for air ventilation ducts. The Duct Wrap XL core blanket is manufactured using Thermal Ceramics patented Superwool<sup>®</sup> fiber, a 2000°F rated, non-combustible, alkaline-earth silicate wool with low biopersistence. Duct Wrap XL is the product of extensive research and development resulting in break-through improvements in fiberization technology with significant enhancements in thermal properties beneficial to fire protection applications. Duct Wrap XL when used in combination with an approved firestop sealant provides an effective through penetration firestop in rated floor and wall assemblies. Duct Wrap XL is UL Classified and is part of UL's Listing and Follow-Up Service Program to ensure the consistent quality essential to the critical nature of this life-safety application.

#### Product Features

- Zero clearance to combustibles at any location
- Thin and Lightweight at 1-1/2 inch thick, 6 pcf density
- Contours easily to complex duct designs
- Butt Joints on inside layer - save labor, space, and material
- Fully foil encapsulated for fast and clean installation
- Completely inorganic and non-combustible
- Contains 2000°F rated fibers for added safety margin
- Contains no low temperature mineral or glass fibers
- Wide variety of through penetration systems
- Resistant to mold growth
- Extensive Listings and detailed installation instructions
- Offered in 50 and 100 square foot rolls
- Available in 48 inch widths for less joints and installation labor

#### 2. Applications

- Applied in 2 layers to provide 1 or 2 hour fire protection to grease ducts exhausting Type 1 hoods per 2006 IMC, NFPA 96 and 2006 IAPMO UMC
- Applied in 1 layer as an alternative to a 1 or 2 hour rated enclosure for air ventilation ducts

#### 3. Physical Characteristics

Product	Unit	Size	Units/ Ctn.	Wt./ Ctn.
Duct Wrap XL	Roll	1-1/2" x 24" x 25'	1	37.5 lbs.
Duct Wrap XL	Roll	1-1/2" x 48" x 25'	1	75 lbs.
Duct Wrap XL Collar	Roll	1-1/2" x 6" x 25'	4	37.5 lbs.
Color	White blanket with silver foil encapsulation			



#### 4. Performance Specifications

Reference Standard	Standard No.	Performance
<b>Grease Duct Enclosure System</b>	ASTM E2336	Pass
Section 16.1 - Non-Combustibility	ASTM E136	Pass
Section 16.2-Fire Resistance (wall)	ASTM E119	Pass
Section 16.3 - Durability Test	ASTM C518	Pass
Section 16.4 - Internal Fire Test	ASTM E2336	Pass
Section 16.5 - Fire Engulfment (duct)	ASTM E814/E119	Pass
<b>Surface Burning Characteristics</b>		
Flame Spread (foil/blanket)	ASTM E84	5/0
Smoke Developed (foil/blanket)	ASTM E84	5/0
<b>Thermal Resistance (R-value @ 70°F)</b>	ASTM C518	7.3 per layer
<b>Mold Growth (75% -95% humidity)</b>	ASTM D6329	Resistant
<b>Air Ventilation Duct Enclosure</b>	ISO 6944	Pass
<b>Grease Duct Enclosure System</b>	UL 1978*	Pass

\* Laboratory Listings will be withdrawn January 1, 2009 forcing systems to be tested to ASTM E2336.

#### 5. Listings/Building Code Reports

Listed Uses	Agency	Listing
Grease Duct Enclosure System (Zero Clearance) - AC101 (ASTM E2336)	UL	G18
Grease Duct Enclosure System (Zero Clearance) - ASTM E2336	ICC-ES*	ESR 2832
Through Penetration FireStop System - ASTM E814/UL 1479	UL	See Figure 2
Ventilation Duct Enclosure System - ISO 6944	UL	V19

\* International Code Council - Engineering Service

## 6. Storage

Duct Wrap XL must be stored in a dry warehouse environment on pallets. Pallets should not be stacked.

## 7. Installation

Duct Wrap XL shall be installed by a qualified contractor in accordance with manufacturer's instructions and design listings. See figures 1 to 5 for complete details.

### Materials and Equipment

- Duct Wrap XL blanket
- Aluminum foil tape
- Minimum 1/2" wide filament tape (optional)
- Carbon steel or stainless steel banding material, minimum 1/2" wide, minimum 0.015" thick, with steel banding clips
- Hand banding tensioner and crimping tool
- Minimum 12 gage steel insulation pins; steel speed clips, minimum 1-1/2" x 1-1/2" square or 1-1/2" dia., or equivalent sized cup-head pins;
- Capacitor discharge stud gun
- Field Fabricated Door Hardware
- An approved firestop sealant

### General

To minimize waste, Duct Wrap XL blanket should be rolled out tautly before measuring. Cut edges of the blanket shall be taped with aluminum foil tape to prevent exposed edges of the insulation absorbing grease and moisture in the event of a compromised grease duct joint. Overlaps are used to block heat transfer in the event of duct deformation resulting from thermal expansion.

#### A. First Layer

**1) Butt Joint for ASTM E2336 compliant grease duct enclosure (Figure 1)** - The first layer of Duct Wrap XL is cut to completely wrap around the perimeter of the duct with enough excess to provide a tight butt joint where the blanket ends meet. The joints of adjacent blankets are firmly butted against each other. This interior layer can be held temporarily in place with filament tape until either the second layer is installed, or permanent attachment as described in Section D is accomplished. While not required, the inside layer can be installed with 3" overlaps along perimeter and adjacent blankets.

**2) Overlap for ISO 6944 compliant air ventilation duct enclosure (Figure 1)** - For single layer enclosure systems, the first layer of Duct Wrap XL is cut to completely wrap around the perimeter of the duct with enough excess to overlap itself by a minimum of 3". The joints of adjacent blankets must overlap each other by a minimum 3". Filament tape is suggested to temporarily hold the blanket in place until steel banding or pinning is installed to permanently secure the blanket.

#### B. Second Layer – 3" Overlap, or 6" Collar (Figure 1)

The second layer of Duct Wrap XL is cut to completely wrap around the perimeter of the first layer, with enough excess to overlap itself not less than 3". Joints in the second layer should be staggered a minimum of 12 inches from joints on the inner layer. Adjacent blankets on the second layer must overlap each other by not less than 3". As an alternative to

overlaps on adjacent blankets installed on the second layer, adjacent blankets can be tightly butt jointed and wrapped with a 6" wide Duct Wrap XL collar centered over the butt joint. This outside layer can be held temporarily in place with filament tape spaced 1-1/2" from each blanket edge, and spaced on nominal 10-1/2" centers along the center of the blanket. Mechanical attachment as described in Section D must be used to make the installation permanent.

#### C. 2 & 3 Sided Wrap Installation (Figure 5)

When space does not allow for a complete wrap applied to the duct on all four sides, the Duct Wrap XL is approved for 2 or 3 sided installations with mechanical attachment to a concrete or CMU assembly. The Duct Wrap XL is installed on the 2 or 3 sides of the duct as described in one of the installation methods described in sections A or B with the starting edge of the blanket attached to the concrete or CMU assembly and then wrapped around the duct until the other end can be attached to the other concrete or CMU assembly, thus encapsulating the duct with insulation around all accessible sides. The blanket is to flange out onto the concrete or CMU assembly. It shall be secured to the adjoining assembly with min 3/16" diameter, 4" long concrete anchors, footed to a minimum 1-1/2" wide x 3/16" thick steel strip/strap with pre-drilled holes spaced a maximum 10" on center. The steel strip is to be placed around the entire perimeter of the duct in the exposure area. The Duct Wrap XL insulation wrap is secured to the duct with minimum 1/2" wide steel banding 10-1/2" centers. The ends of the banding are to loop into the steel strips/straps that foot the blanket to the concrete floor or wall, and tightened down.

#### D. Mechanical Attachment Methods for Insulation Wrap

**1) Banding (Figure 1)** - Minimum 1/2" wide carbon steel or stainless steel banding, 0.015" thick, is placed around the entire perimeter of the insulated duct with maximum 10-1/2" spacing centers and 1-1/2" from each blanket edge or 1-1/2" from each collar edge when using the butt joint and collar method. When banding, filament tape can be used to temporarily hold the blanket in place until the banding is applied. The banding is placed around the blanket and tightened so as to firmly hold the Duct Wrap XL in place against the duct, but not cause any cutting or damage to the blanket.

**2) Pinning (Figure 4)** - For duct spans larger than 24", min. 12 gage, 3 or 5" long steel insulation pins are welded to the duct in columns spaced 12" apart, 6" - 12" from each edge and on 10-1/2" centers along bottom horizontal and outside vertical runs to prevent blanket sag. Pins are also required 1" from the end of a duct and 1" from any edge near a 90° bend, spaced on 6" centers. Pins are locked into place with 1-1/2" diameter round or square, galvanized steel, speed clips or cup head pins. Pins that extend beyond the outer blanket wrap layer shall be turned down to eliminate sharp edges or the excess length cut off. Cup head pins should only be used in conjunction with banding.

#### E. Grease Duct Access Door Installation (Figure 3)

Four galvanized steel threaded rods, 1/4" diameter by 4-1/2"

to 5" long are welded to the duct at the corners of the door opening. Four 4" long steel tubes fit over the threaded rods to hold the door to the duct and protect the wrap from damage as the door is removed. Four 5" long 12 gage insulation pins are welded to the door panel for installation of the blanket. Three layers of Duct Wrap XL are impaled over the 12 gage insulation pins on the 16 gauge door panel and held in place with speed clips. Each layer must have minimum 1" overlap over the previous layer. When the door is installed, this first and second layer must fit tightly against the wrap surrounding the door opening to form tight butt joints. Pins that extend beyond the outer layer of Duct Wrap XL shall be turned down to avoid sharp points on the door. The steel tubes are placed over the threaded rods. The insulated door panel is placed over the threaded rods covered by the steel tubes and held in place with washers and wing nuts. DuctMate® F2-HT and Ultimate Access Doors are tested and approved per ESR 2832 as alternatives to field fabricated doors.

#### **F. Through-Penetration Fire Stop System (Figure 2)**

When the duct penetrates a fire rated wall, ceiling, or floor, an approved fire stop system must be employed. Prior to installing this firestop system the surfaces of all openings and penetrating items needs to be clean and dry. Cut the aluminum scrim facing off Duct Wrap XL blanket to expose the core blanket. Duct Wrap XL scrap blanket must be packed into the annular space at minimum 50% compression. The packing material must be recessed a minimum 1/4" from the surface of the concrete or gypsum wall. Install a minimum of 1/4" of approved firestop sealant into the recessed opening. When there is no room in the remaining annular space to wrap the duct with Duct Wrap XL material, the enclosure may terminate above and below the floor/ceiling or wall assembly as shown in figure 2 by mechanically attaching the Duct Wrap XL to the termination point above and below the termination area with bands or pins.

#### **G. Support Hanger Systems**

Support hanger systems do not need to be wrapped provided that the hanger rods are at least a minimum of 3/8" diameter and spaced a maximum of 60" on center along the length of the duct, and the angle iron is a minimum of 2" x 2" x 1/8" or SMACNA equivalent support system (excludes band strap support systems). Horizontal trapeze support system may be incorporated into the wrap enclosure.

#### **8. Maintenance and Repair**

No maintenance is required when installed in accordance with Thermal Ceramics installation instructions.

If damage is limited to the foil facing, aluminum foil 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" the entire wrap section must be removed and replaced according to Thermal Ceramics installation instructions.
- If the damaged area is small (less than 8" x 8"), the damaged area must be cut away and replaced with a new sec-

tion 1" larger in length and width than the cut out are, 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 aluminum foil tape. The new section must be held in place with either pinning or banding per Thermal Ceramics installation instructions.

#### **9. Limitations**

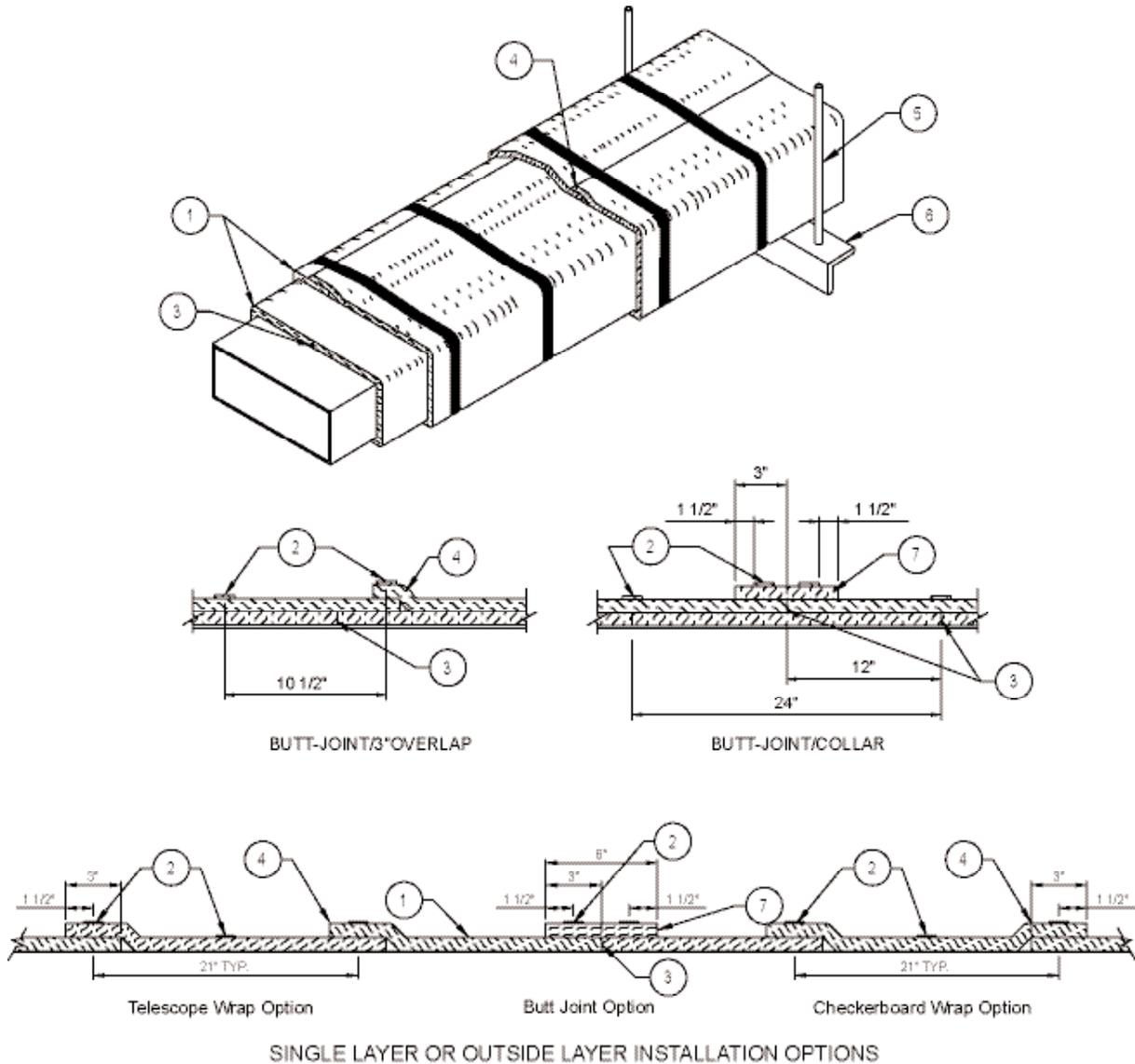
Thermal Ceramics Pyroscat Duct Wrap XL shall be installed in accordance with these installation instructions. The integrity of Duct Wrap XL systems is limited to the quality of the installation.

\*For personal protective equipment recommendations see the MSDS.

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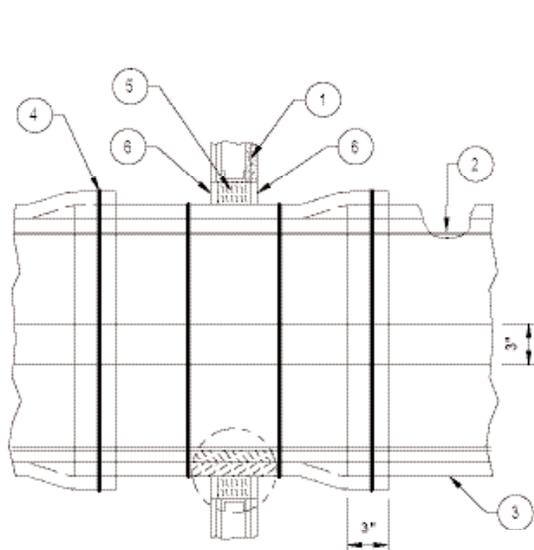
**Pyroscat Duct Wrap XL**  
**Commercial Kitchen Grease Duct Enclosure System**  
**Air Ventilation Duct Enclosure System**  
**1 or 2 Hour Shaft Alternative/Zero Clearance to Combustibles**



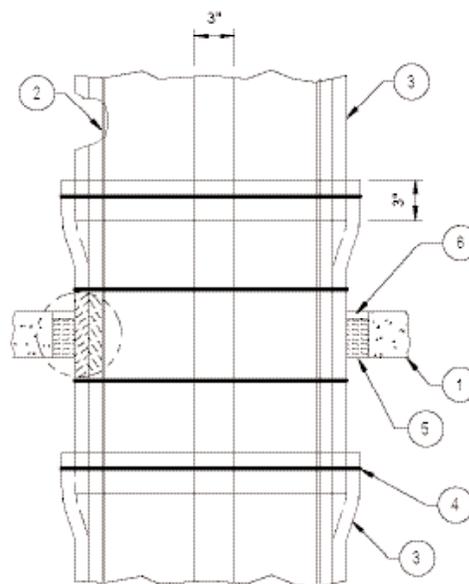
**Figure 1**

1.	Two layers Duct Wrap XL for grease duct enclosure system One layer Duct Wrap XL for air ventilation duct enclosure system
2.	Steel banding minimum 1/2" wide by 0.015" thick
3.	Tight Butt Joints on inner layer
4.	Minimum 3" overlap on perimeter and between adjacent blankets on outside layer
5.	Minimum 3/8" diameter hanger rod
6.	Minimum 2" x 2" x 1/8" angle for grease duct enclosure system Minimum 1-1/2" x 1-1/2" x 1/8" angle or SMACNA equivalent for air ventilation duct enclosure system
7.	Optional 6" Duct Wrap XL collar

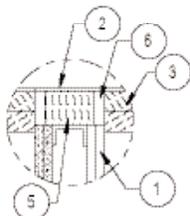
**Pyroscat Duct Wrap XL**  
**Commercial Kitchen Grease Duct Enclosure System**  
**Air Ventilation Duct Enclosure System**  
**Through Penetration System**



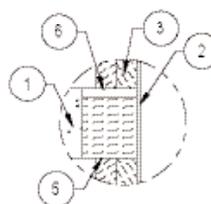
Duct Wrap XL continuous through rated wall



Duct Wrap XL continuous through rated floor/ceiling assembly



Duct Wrap XL terminated on both side of the rated wall assembly



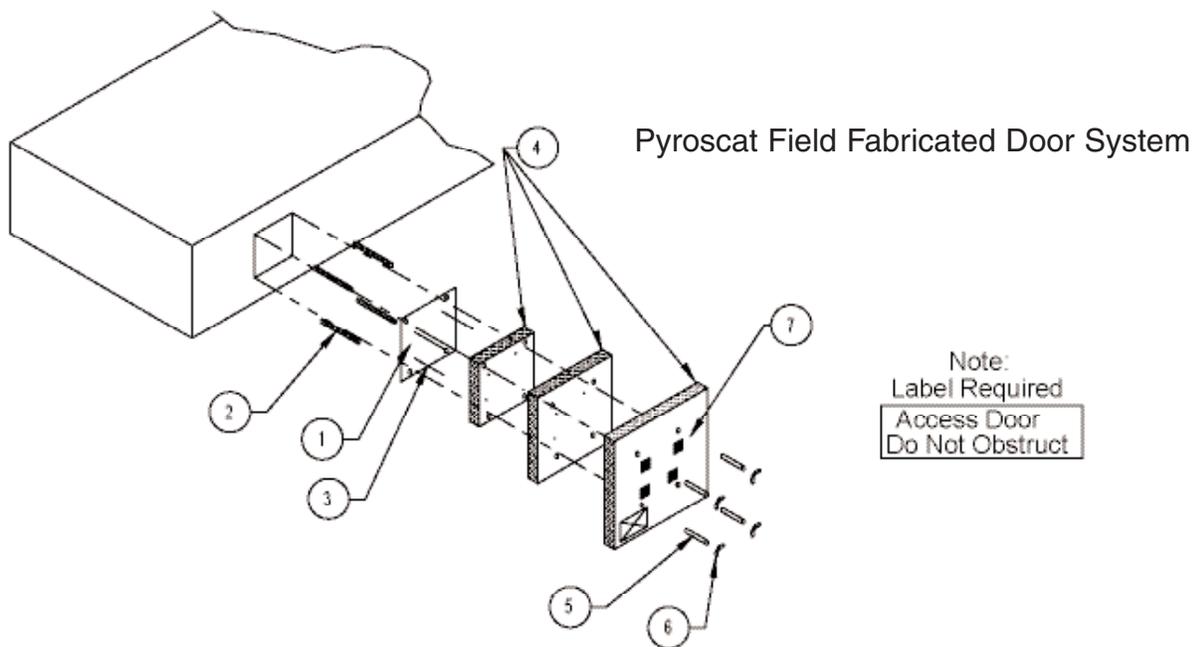
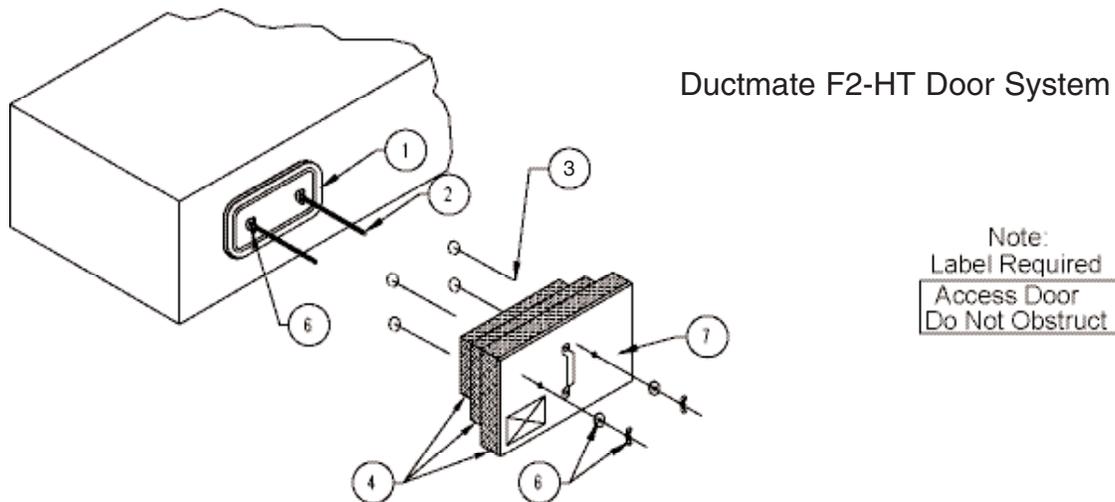
Duct Wrap XL terminated at the top and bottom surface of the floor/ceiling assembly

<b>Figure 2</b>	
1.	Rated floor/ceiling or wall assembly
2.	Duct
3.	Two layers Duct Wrap XL for grease duct enclosure system One layer Duct Wrap XL for air ventilation duct enclosure system
4.	Steel banding minimum 1/2" wide by 0.015" thick or pinning
5.	Duct Wrap XL (packing material)
6.	Approved through penetration firestop sealant

<b>UL Listings per E 814/UL 1479 Through Penetration</b>	
C-AJ-1562	C-AJ-7004
C-AJ-7012	C-AJ-7014
C-AJ-7019	C-AJ-7021
C-AJ-7047	C-AJ-7095
C-AJ-7098	C-AJ-7119
F-A-1093	F-A-1094
F-A-3048	F-C-7036
F-C-7037	W-L-7009
W-L-7121	W-L-7145
W-J-7086	

*Go to [www.ul.com](http://www.ul.com) and select  
Certifications to find design details.*

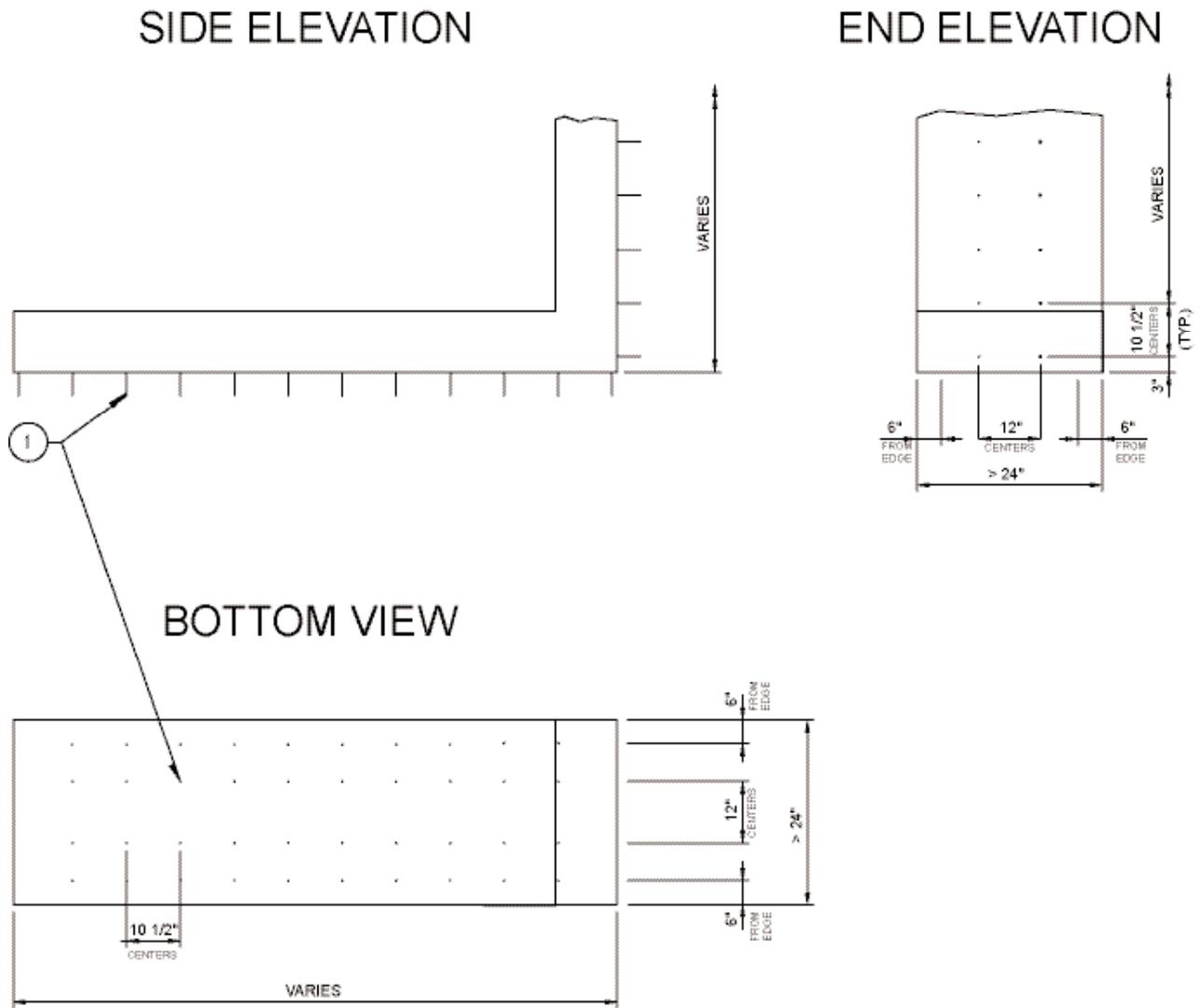
**Pyroscat Duct Wrap XL  
Access Door Systems  
Commercial Kitchen Grease Duct**



**Figure 3**

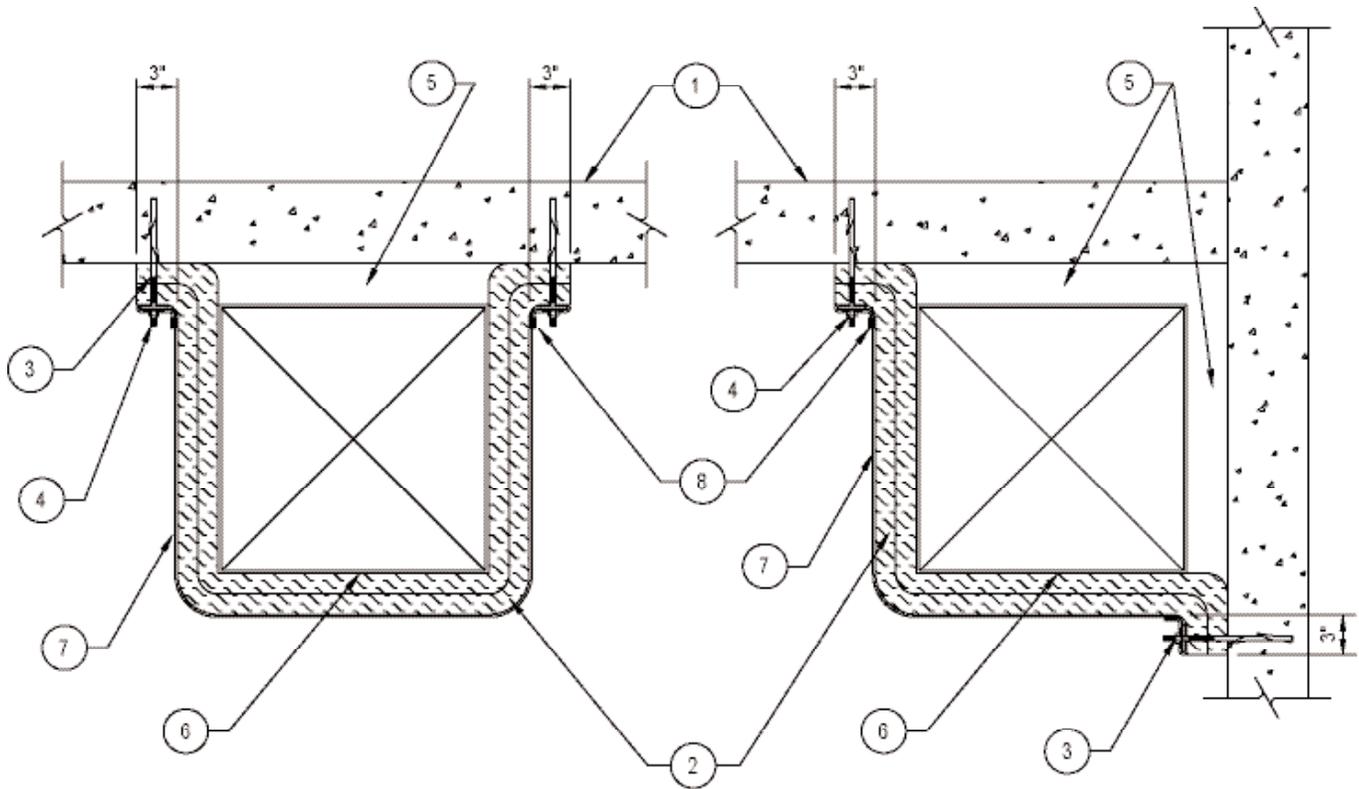
1.	DuctMate® F2-HT Access Door or 16 gauge field fabricated access door cover plate
2.	All thread rods
3.	Installation pins with speed clips
4.	Three layers Duct Wrap XL with minimum 1" overlaps and all edges sealed with aluminum tape
5.	Spool pieces
6.	Wing nuts and washers
7.	Outer cover plate labeled "ACCESS DOOR - DO NOT OBSTRUCT"

**Pyroscat Duct Wrap XL**  
**Typical Insulation Pin Layout for**  
**Duct Spans > 24" Wide to Prevent Blanket Sag**



<b>Figure 4</b>	
1.	Minimum 12 gauge steel insulation pin

**Pyroscat Duct Wrap XL**  
**Commercial Kitchen Grease Duct Enclosure System**  
**Air Ventilation Duct Enclosure System**  
**1 or 2 Hour 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

<b>Figure 5</b>	
1.	1 or 2 hour rated concrete floor, ceiling or wall
2.	Two layers Duct Wrap XL for grease duct enclosure system One layer Duct Wrap XL for air ventilation duct enclosure system
3.	Concrete fastener system
4.	3/16" thick x 2-3" wide bar stock perforated 12" o.c.
5.	Air gap (8" max.)
6.	Duct
7.	Steel banding minimum 1/2" wide by 0.015" thick
8.	Banding clip