Thermal Ceramics

Insulating Our World

Pyroscat® Enclosure Systems

Duct Wrap XL

CSM Plenum Blanket

Morgan Crucible

Thermal Ceramics
Insulating Our World

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Pyroscat® Duct Wrap XL

Commercial Kitchen Grease Duct Enclosure System
Air Ventilation Duct Enclosure System

Product Data & Installation Guide

1. Product Description

Thermal Ceramics' new Pyroscat® 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® 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
Grease Duct Enclosure System	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
Surface Burning Characteristics		
Flame Spread (foil/blanket)	ASTM E84	5/0
Smoke Developed (foil/blanket)	ASTM E84	5/0
Thermal Resistance (R-value @ 70°F)	ASTM C518	7.3 per layer
Mold Growth (75% -95% humidity)	ASTM D6329	Resistant
Air Ventilation Duct Enclosure	ISO 6944	Pass
Grease Duct Enclosure System	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 unitl 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 permantely 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.

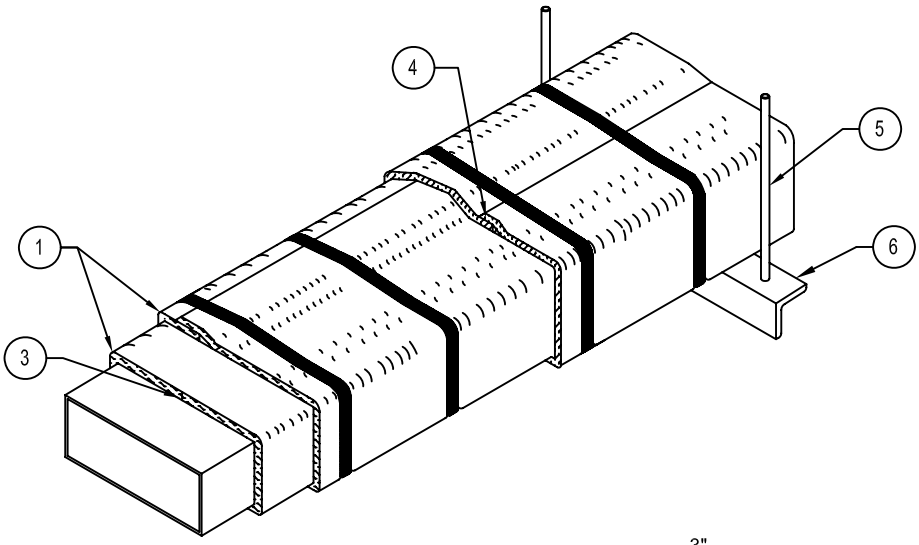
- If the damaged area is larger than 8” x 8” the entire wrap section must be removed and replaced according to Thermal Ceramics installation instructions.
- If the damaged area is small (less than 8” x 8”), the damaged area must be cut away and replaced with a new section 1” larger in length and width 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 wth aluminum foil tape. The new section must be held in place with either pinning or banding per Thermal Ceramics installation instructions.

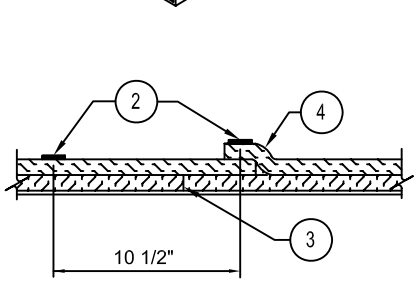
9. Limitations
Thermal Ceramics Pyroscat Duct Wrap XL shall be installed in accordance with these installation instructions. The integrity of Duct Wrap XL systems is limited to the quality of the installation.

*For personal protective equipment recommendations see the MSDS.

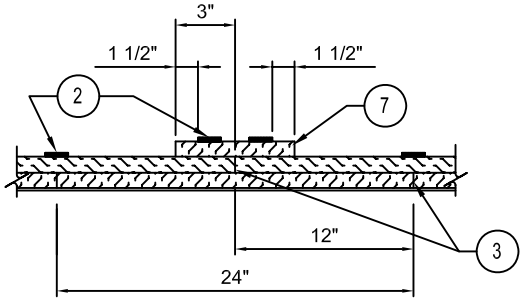
Thermal Ceramics

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

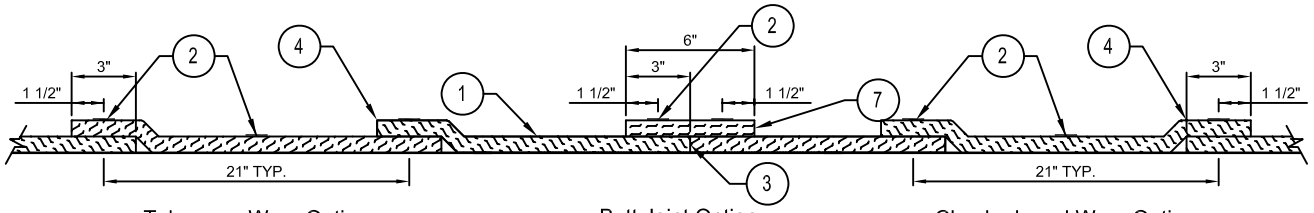




BUTT-JOINT/3"OVERLAP



BUTT-JOINT/COLLAR



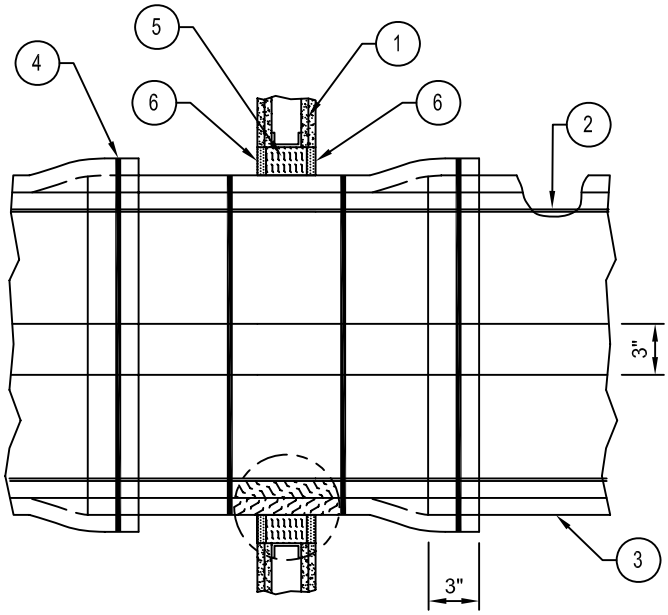
Telescope Wrap Option | Butt Joint Option | Checkerboard Wrap Option

SINGLE LAYER OR OUTSIDE LAYER INSTALLATION OPTIONS

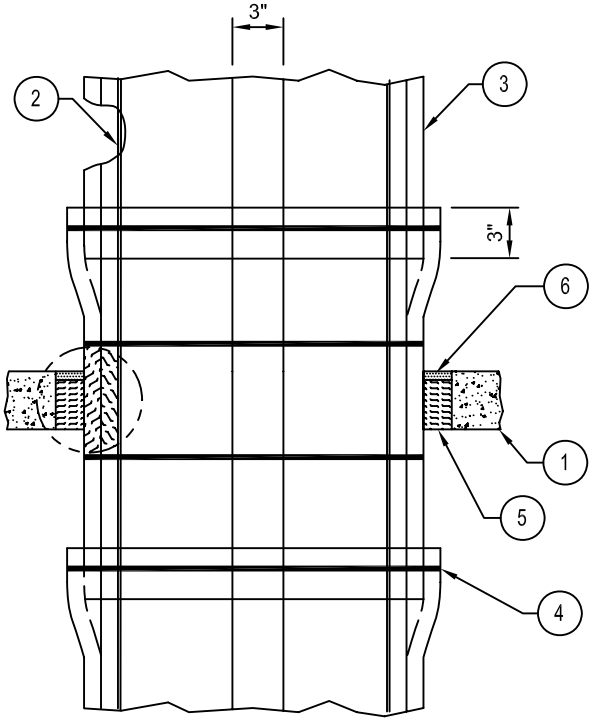
LEGEND	
1	Two Layers of Pyroscat Duct Wrap XL Blanket for Grease Duct Enclosures One Layer of Pyroscat Duct Wrap XL Blanket for Air Ventilation Duct Enclosures
2	Steel banding minimum 1/2" wide by 0.015" thick.
3	Tight butt joints on inner layer
4	Min. 3" overlap on perimeter and between adjacent blanket on outside layer
5	Min. 3/8" diameter hanger rod
6	Min. 2" x 2" x 1/8" angle for Grease Duct Enclosures Min. 1-1/2" x 1-1/2" x 1/8" angle or SMACNA Equivalent for Air Ventilation Duct Enclosures
7	Optional 6" FireMaster Pyroscat Duct Wrap XL collar

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

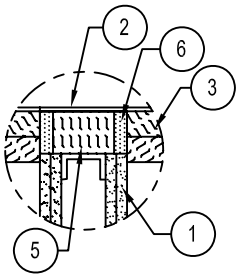
Thermal Ceramics
Pyroscat® Duct Wrap XL
Commercial Kitchen Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
Through Penetration Systems



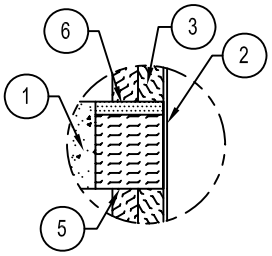
Duct Wrap XL continuous through rated wall assembly



Duct Wrap XL continuous through rated floor/ceiling assembly



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



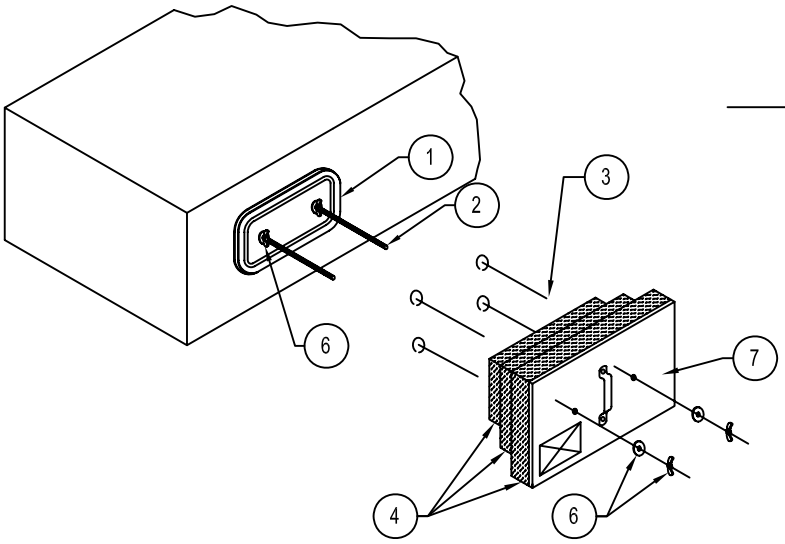
Duct Wrap XL terminated at the top and bottom surface of the floor/ceiling assembly

LEGEND	
1	Rated Floor/ceiling or wall assembly
2	Duct
3	Two Layers of Pyroscat Duct Wrap XL for Grease Duct Enclosures One Layer of Pyroscat Duct Wrap XL for Air Ventilation Duct Enclosures
4	Steel banding minimum 1/2" wide by 0.015" thick or pinning
5	Pyroscat Duct Wrap XL (packing material)
6	Approved through-penetration firestop sealant

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

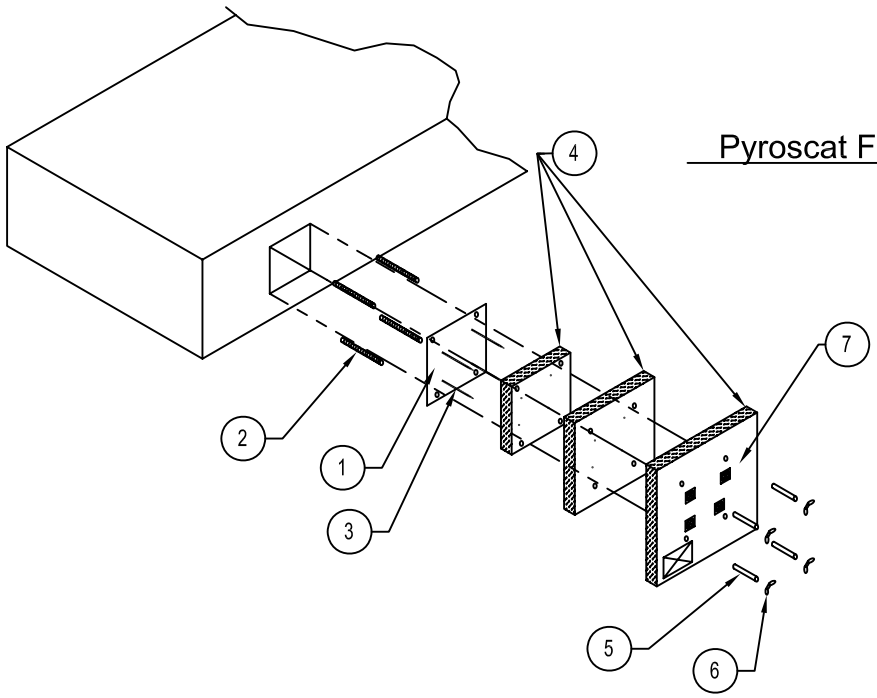
UL Listings Per E 814 / UL 1479 Through Penetration	
C-AJ-1562	C-AJ-7004
C-AJ-7012	C-AJ-7014
C-AJ-7019	C-AJ-7021
C-AJ-7047	C-AJ-7095
C-AJ-7098	C-AJ-7119
F-A-1093	F-A-1094
F-A-3048	F-C-7036
F-C-7037	W-L-7009
W-L-7121	W-L-7145
W-J-7086	

Thermal Ceramics
Pyroscat® Duct Wrap XL
Access Door Systems
Commercial Kitchen Grease Duct Enclosure System



DuctMate® Door System

Note:
Label Required
"Access Door"
Do Not Obstruct



Pyroscat Field Fabricated Door System

Note:
Label Required
"Access Door"
Do Not Obstruct

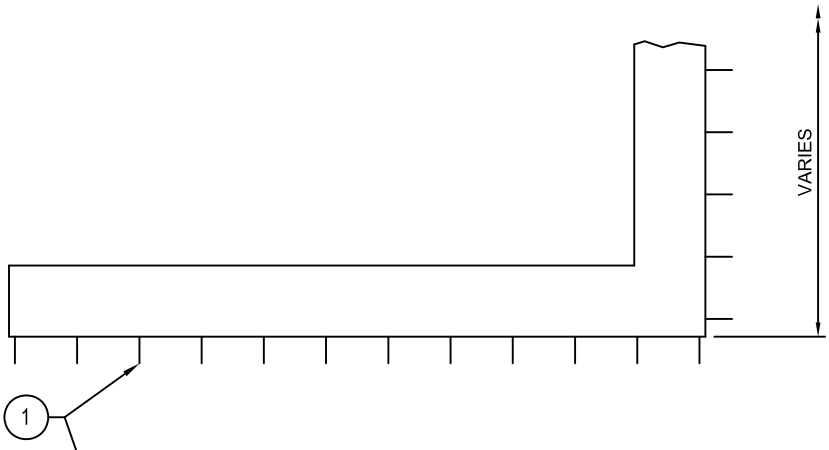
LEGEND	
1	DuctMate F2-HT Access Door or 16 Gage Field Fabricated Access Door.
2	All Thread Rods.
3	Installation Pins with Speed Clips.
4	Three Layers of Pyroscat Duct Wrap XL Blanket with Minimum 1" Overlaps and All Edges Sealed with Aluminum Tape.
5	Spool Pieces for Threaded Rods
6	Wing Nuts and Washers
7	Outer Cover Plate Labled "ACCESS DOOR - DO NOT OBSTRUCT"

The integrity of the duct wrap insulation product is limited to the quality of the installation

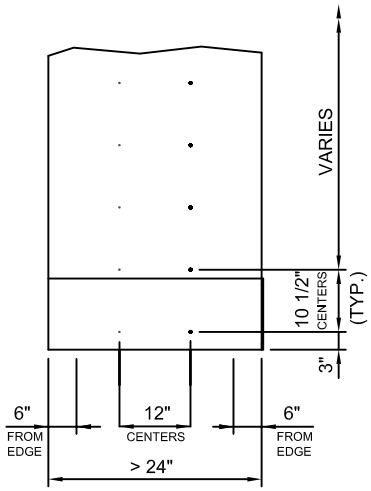
Thermal Ceramics

Pyroscat® Duct Wrap XL
TYPICAL INSULATION PIN LAYOUT
FOR DUCT SPANS > 24" WIDE
To Prevent Blanket Sag

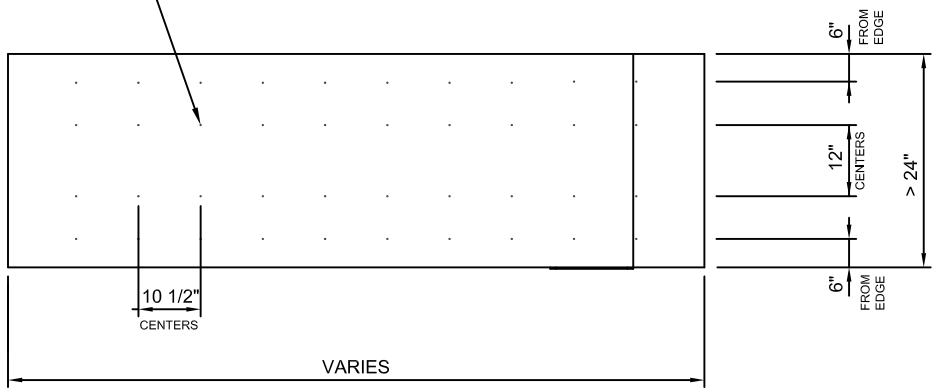
SIDE ELEVATION



END ELEVATION



BOTTOM VIEW

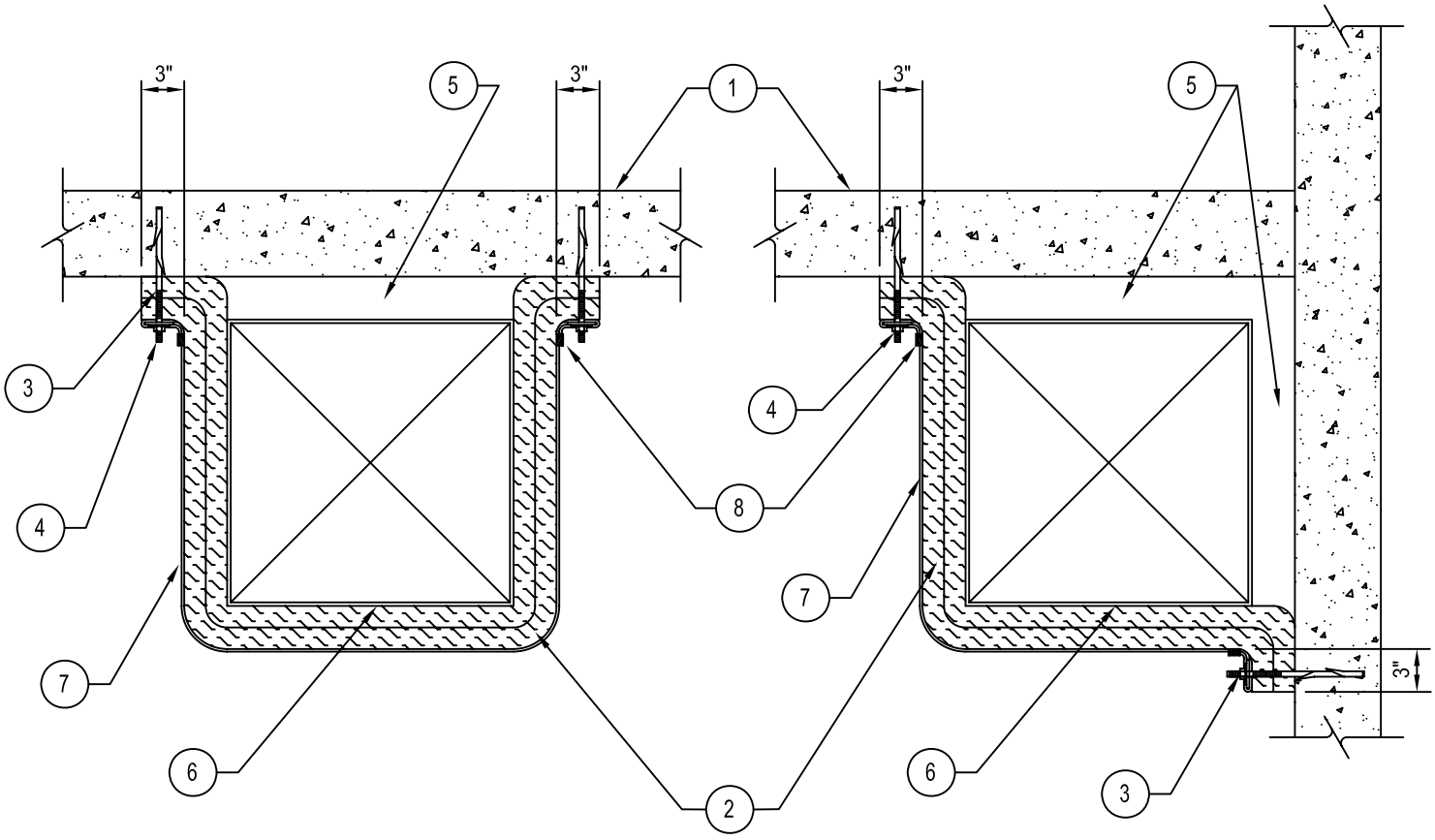


LEGEND	
1	Minimum 12 gauge steel insulation pins

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

Thermal Ceramics

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



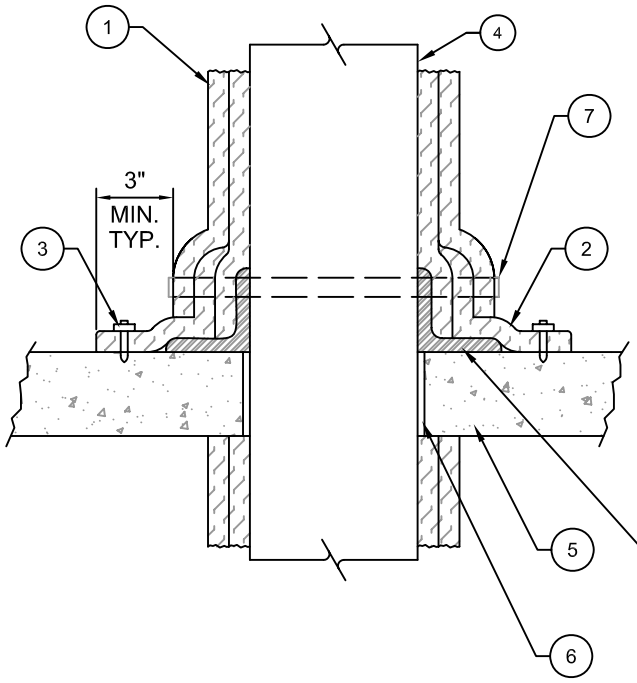
Note: Ducts must be independently supported per code

LEGEND	
1	1 or 2 Hour Rated Concrete floor, ceiling, or wall
2	Two layers of Pyroscat Duct Wrap XL for Grease Duct Enclosures One layer of Pyroscat Duct Wrap XL for Air Ventilation Duct Enclosures
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 min. 1/2" wide by 0.015" thick.
8	Banding clip

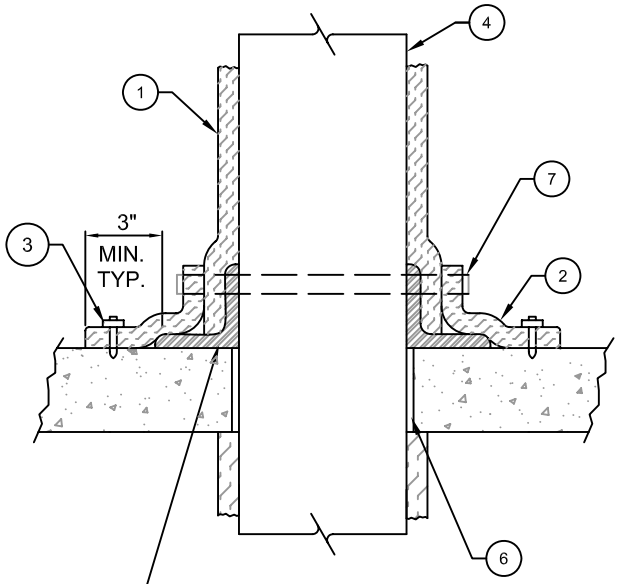
The integrity of Pyroscat duct systems is limited to the quality of the installation.

Thermal Ceramics
Pyroscat® Duct Wrap XL
Commercial Kitchen Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
Suggested Wrapping Detail for Vertical Duct with Angle Supports

Double Layer Installation



Single Layer Installation



DUCT SUPPORT ANGLE BRACKET

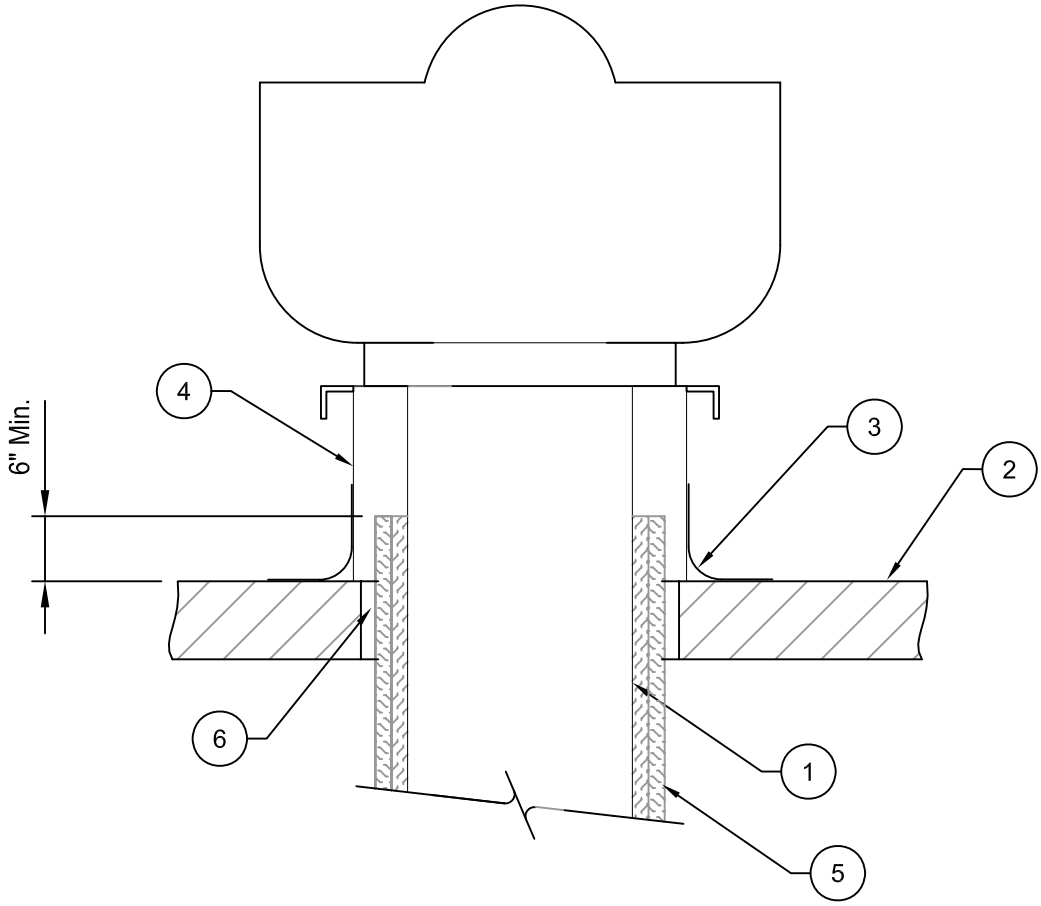
Note:
1. Support Mechanism Should Be In Compliance With The Code.
2. Optional Bracket On Bottom Per Mechanical Designer Requirements.

LEGEND	
1	Two layers of Pyroscat Duct Wrap XL for Grease Duct Enclosures One layer of Pyroscat Duct Wrap XL for Air Ventilation Duct Enclosures
2	Pyroscat Duct Wrap XL skirt lapped onto rated floor/ceiling
3	Mechanical fasteners & washers
4	Duct
5	Fire-resistive concrete floor/ceiling assembly
6	Approved through-penetration firestop sealant
7	Steel banding min. 1/2" wide by 0.015" thick

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

Thermal Ceramics

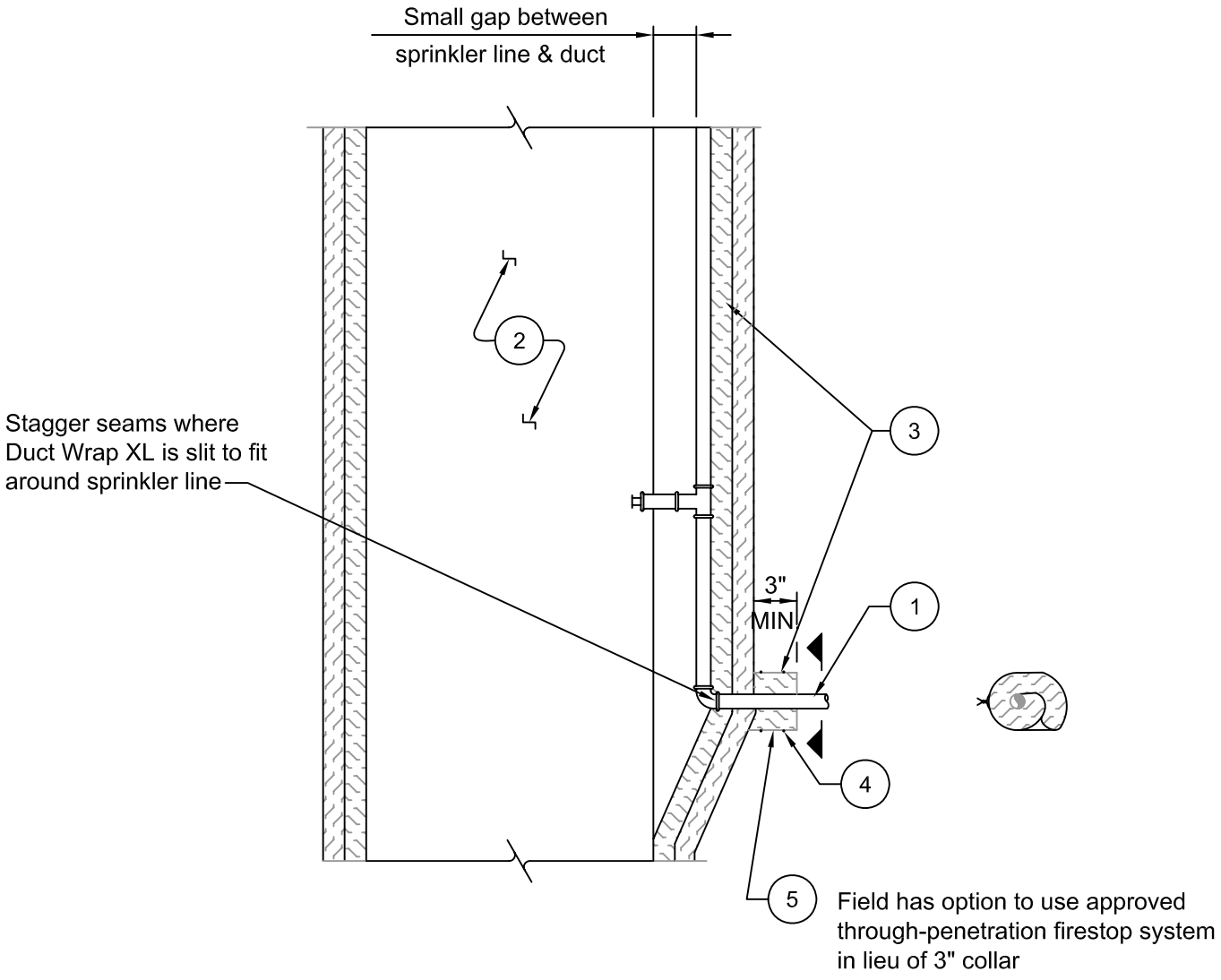
Pyroscat® Duct Wrap XL
Suggested Installation
For Grease Duct Exiting Roof



LEGEND	
1	Duct
2	Roof
3	Roof over-flashing
4	Vent flashing
5	Two layers Pyroscat Duct Wrap XL
6	Pyroscat Firestop System (only needed for rated roofs)

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

Thermal Ceramics
Pyroscat® Duct Wrap XL
Detail For Incorporating
Sprinkler Lines Into Grease Duct Systems

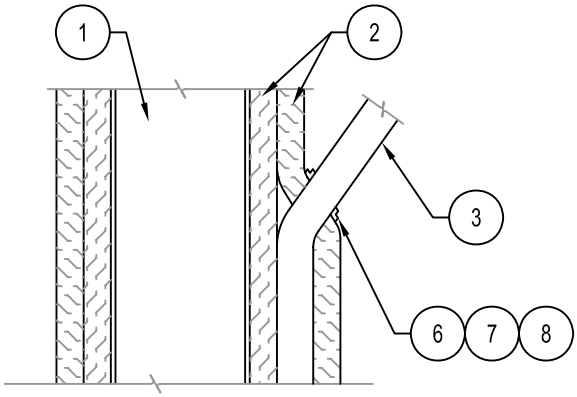


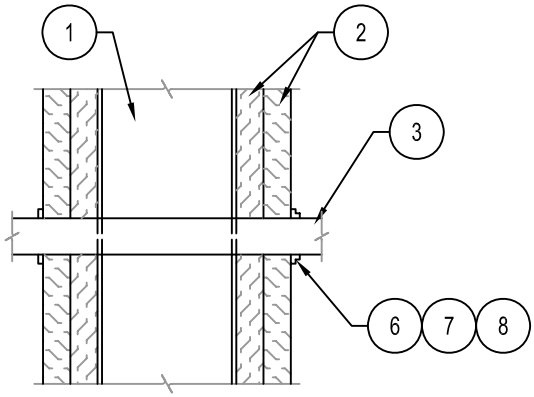
LEGEND	
1	Steel sprinkler line
2	Duct
3	Two layers Pyroscat Duct Wrap XL
4	SS wire ties min. 16 ga.
5	One layer Pyroscat Duct Wrap XL - 3" minimum collar

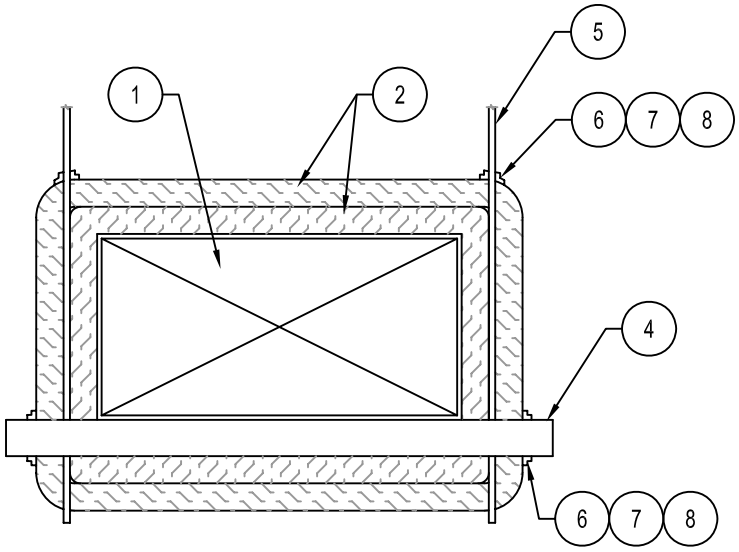
The integrity of Pyroscat duct systems is limited to the quality of the installation.

Thermal Ceramics

Pyroscat® Duct Wrap XL
Commercial Kitchen Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
Suggested Installation For Pipe, Conduit, Or Support Hanger Penetration Of Wrap



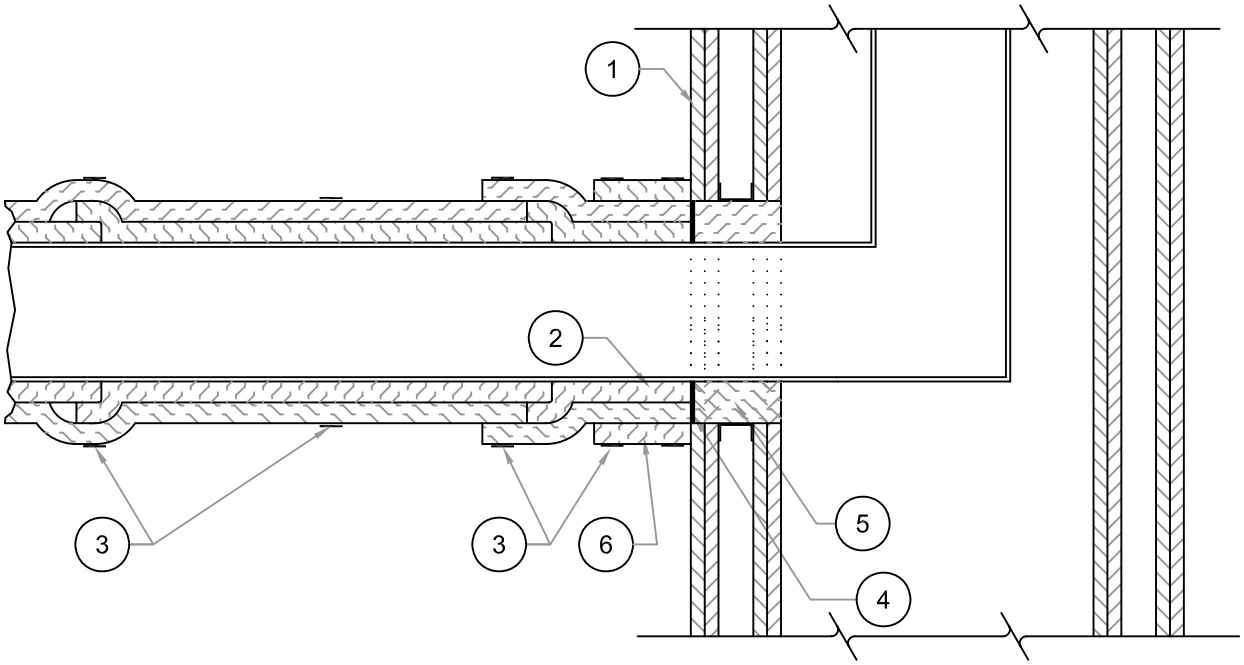




LEGEND	
1	Duct
2	Two layers of Pyroscat Duct Wrap XL for Grease Duct Enclosures One layer of Pyroscat Duct Wrap XL for Air Ventilation Duct Enclosures
3	Non-Combustible Conduit or Pipe
4	Support hanger brackets
5	Support hanger rods (min. 3/8")
6	Filament tape
7	Approved through-penetration firestop system
8	Aluminum tape

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

Thermal Ceramics
Pyroscat® Duct Wrap XL
Commercial Kitchen Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
Suggested Installation Detail For Rated Shaft Transition

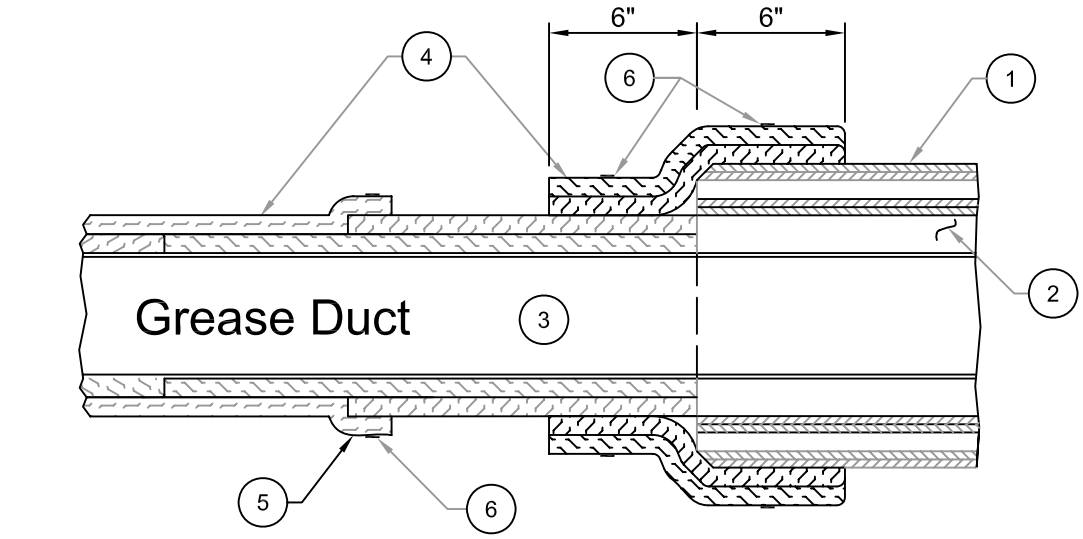


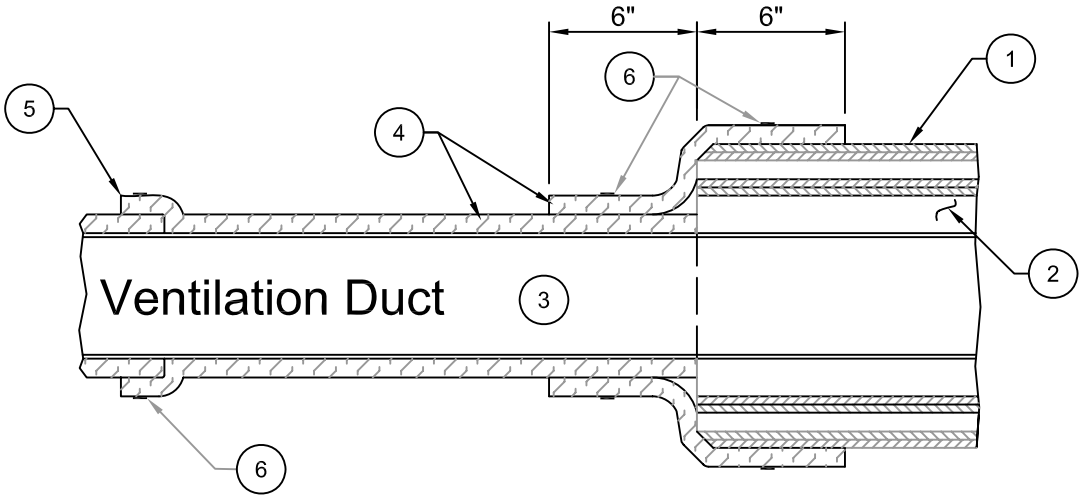
Based on UL System Nos. W-L-7041, W-L-7099, W-L-7121, W-L-7145

LEGEND	
1	Rated Shaft
2	Two layers of Pyroscat Duct Wrap XL for Grease Duct Enclosures One Layer of Pyroscat Duct Wrap XL for Air Ventilation Duct Enclosures
3	Steel banding 1/2" wide min.
4	1/4" approved through-penetration firestop sealant
5	Scrap pieces Of Pyroscat Duct Wrap XL
6	Pyroscat Duct Wrap XL Collar (6" Wide)

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

Thermal Ceramics
Pyroscat® Duct Wrap XL
Suggested Installation Detail For Transition To Rated Shaft

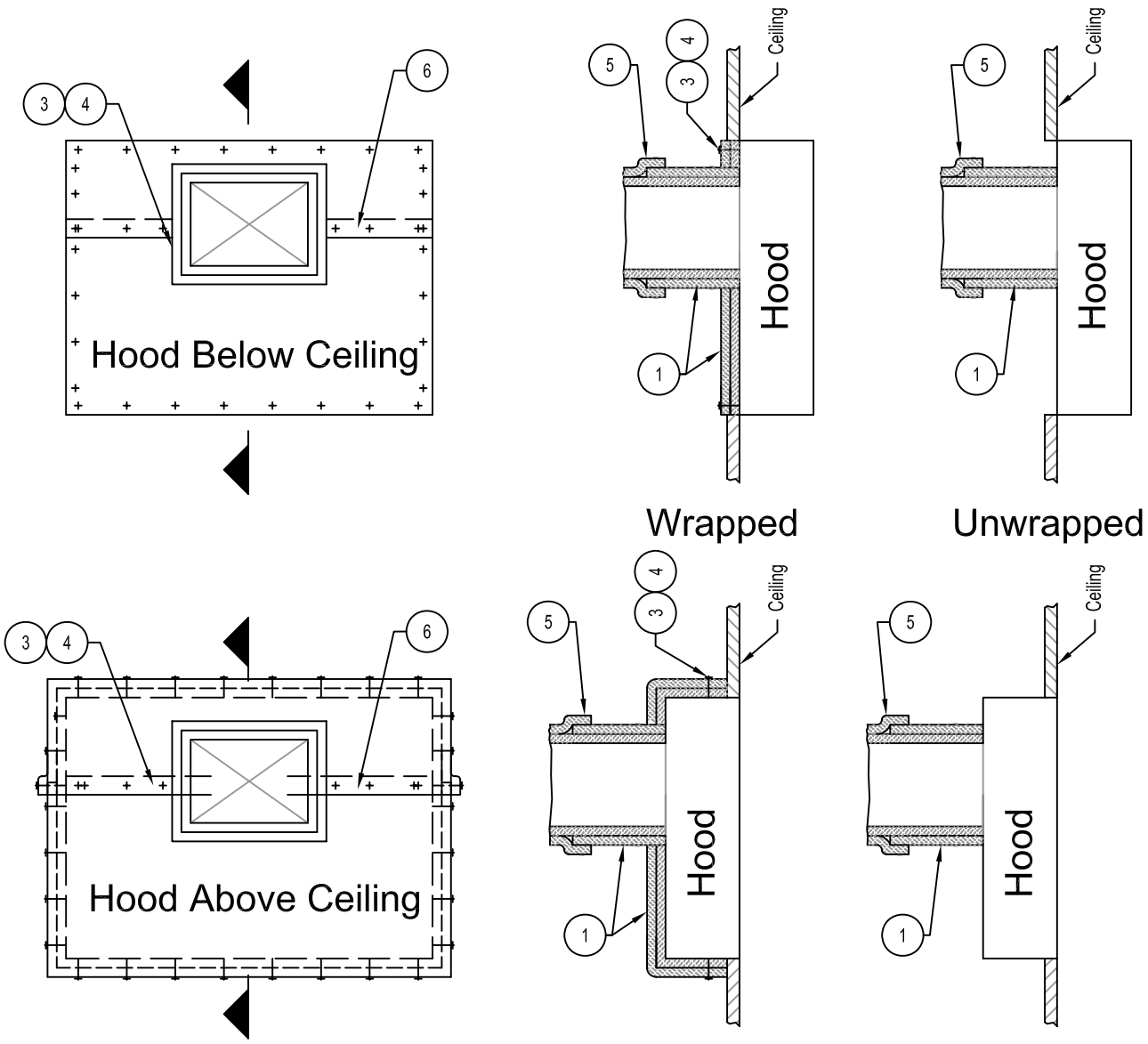




LEGEND	
1	Rated shaft
2	Air gap
3	Duct
4	Two layers of Pyroscat Duct Wrap XL for Grease Duct Enclosures One Layer of Pyroscat Duct Wrap XL for Air Ventilation Duct Enclososures
5	3" minimum overlap
6	Steel banding min.1/2" wide by 0.015" thick

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

Thermal Ceramics
Pyroscat® Duct Wrap XL
Suggested Installation Detail For Grease Hoods



Notes:
All joints should be installed with a 3" overlap and anchored in place with insulation pins and speed clips.
Pin pattern for overlap construction should be 10 1/2" o.c.
Hood installation must be approved and in compliance with the code.
There is no test standard for wrapping grease duct hoods. Approval is subject to the Authority Having Jurisdiction

LEGEND	
1	Two layers Pyroscat Duct Wrap XL
2	Steel banding 1/2" wide min.
3	10 or 12 gauge steel insulation pins
4	Speed clips
5	3" min perimeter overlap
6	3" min seam overlap

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

Grease Duct Assemblies

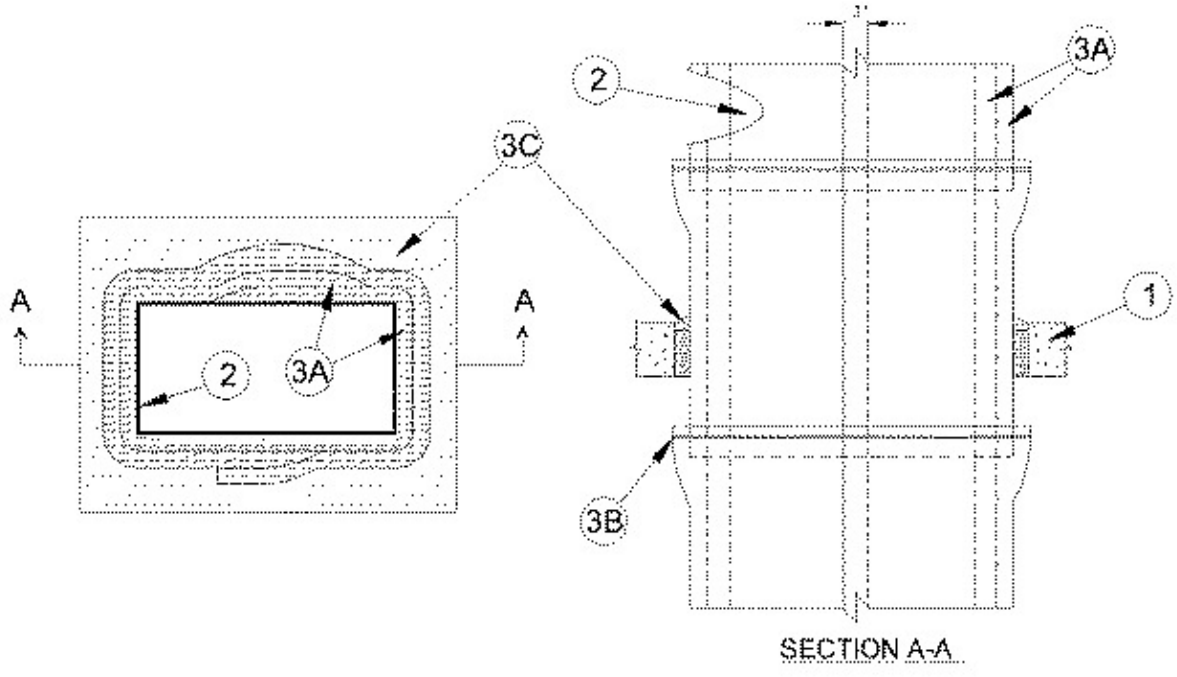
Assembly No. G-18

May 5, 2009

Assembly Rating — 2 Hr

Classified in accordance with the SBCCI Public Safety Testing and Evaluation Services Inc. Evaluation Guide on Fire Resistance Construction (Flexible Duct Wrap Enclosure Systems), dated January 1, 1998 as an alternate to 2 Hr fire resistance rated shaft enclosures with a minimum zero clearance to combustibles.

Classified in accordance with ICBO Evaluation Services, Inc. Acceptance Criteria for Grease Duct Enclosure Systems, dated April 2001 as an alternate to 2 Hr fire resistance rated shaft enclosures with a minimum zero clearance to combustibles. Also Classified in accordance with the requirements of ASTM E 2336-04, "Standard Test Methods For Fire Resistive Grease Duct Enclosures".



1. **Floor or Wall Assembly —** Min 4-1/2 in. thick reinforced lightweight or normal weight (100 - 150 pcf) concrete floor or min 4-3/4 in. thick reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks.

See **Concrete Blocks** (CAZT) category in Fire Resistance Directory for names of manufacturers.

2. **Steel Grease Duct —** Min 16 gauge (0.059 in.) thick steel duct having dimensions of 24 in. high and 48 in. wide.

3. **Fire Resistive System —** The fire resistive system shall consist of the following:

A. **Batts and Blankets* —** Nom 1-1/2 thick blanket totally encapsulated within foil-scrim facers. The steel duct shall be wrapped with two layers of duct wrap installed with min 3 in. transverse joints and longitudinal overlaps or tightly butted transverse joints, in accordance with the manufacturer's installation instructions. All cut edges and ends shall be sealed with 3 in. wide pressure sensitive aluminum foil tape.

The Classification of the grease duct assembly is dependent upon the product type and test standard as shown in the table below:

Product Type	Test Method
FireMaster FastWrap XL and Pyroscat Duct Wrap XL	ICBO, SBCCI, ASTM E2336

THERMAL CERAMICS INC —FireMaster® Fast Wrap XL or Pyroscat Duct Wrap XL

B. **Collars —** Fabricated from Batts and Blankets* - Nom 1-1/2 thick, 6 in. wide blanket totally encapsulated within foil-scrim facers. The transverse butt joints on the second layer shall be wrapped using a collar. The butt joint shall be located nom 3 in. from the edge of the collar. The collar shall be installed with 3 in. longitudinal overlaps. All cut edges and ends shall be sealed with 3 in. wide pressure sensitive aluminum foil tape.

THERMAL CERAMICS INC — FireMaster® Fast Wrap XL or Pyroscat Duct Wrap XL

C. **Steel Banding Straps —** Min 1/2 in. wide by 0.015 in. thick carbon steel or stainless steel banding straps used in conjunction with min 1 in. long stainless steel crimp clips. Banding straps spaced a max 12 in. O.C. and 1-1/2 in. from transverse joints of duct wrap.

D. **Firestop System —** When the grease duct passes through a fire rated wall or floor assembly, the through openings shall be firestopped in accordance with Systems No. C-AJ-7018, C-AJ-7119 or C-AJ-7098.

4. **Hanger System —** (Not shown) - No additional protection is required for hanger systems by providing that a min 3/8 in. diameter threaded steel hanger rod is used in conjunction with min 2 in. by 2 in. by 1/8 in. angle with steel drop in or wedge expansion type masonry anchors.

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*Bearing the UL Classification Mark

Assembly No. HNLV V-19

March 11, 2008

Duct A

Stability Rating - 2 Hr

Integrity Rating - 2 Hr

Insulation Rating - 2 Hr

(Ratings applicable for Ventilation Ducts installed with or without branches)

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
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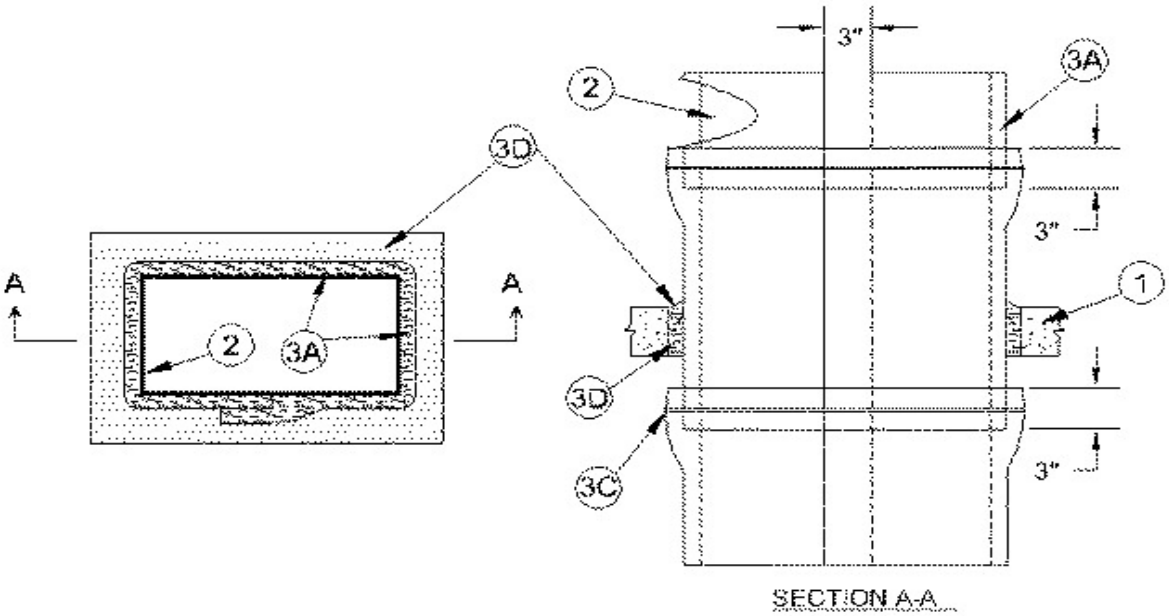
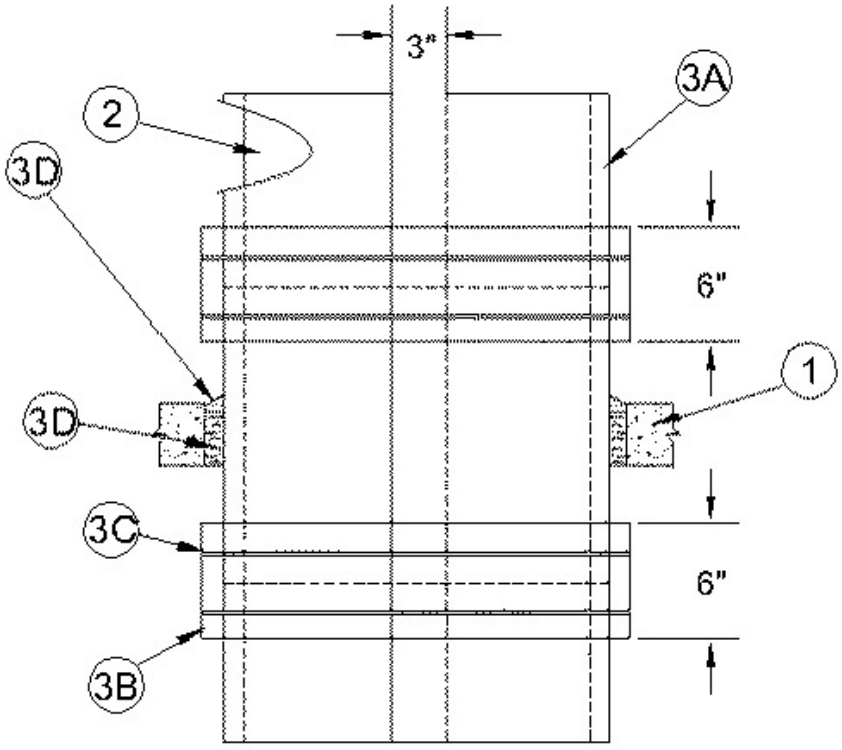


SECTION A-A



SECTION A-A

1. **Floor or Wall Assembly —** Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m^3) concrete floor or min 4-3/4 in. (121 mm) thick reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified **Concrete Blocks.**

See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Steel Air Duct —** Min 0.030 in. (No. 22 gauge or 0.71 mm) thick (or heavier) steel duct having a max width to height ratio of 4 to 1 with max individual dimension of 39 in (0.99 m) and constructed in accordance with SMACNA HVAC Duct Construction standards. The sections shall be assembled using bolted flanges or SMACNA approved Transverse Joint Reinforcements. Duct to be rigidly supported in accordance with SMACNA requirement and as specified in Item 4.

3. **Fire Resistive System —** The fire resistive system shall consist of the following:

A. **Batts and Blankets* —** Nom 1-1/2 in. (38 mm) thick, 6 pcf (96 kg/m^3) blanket totally encapsulated within foil-scrim facers. The steel duct shall be wrapped with one layer of duct wrap installed with 3 in. (76 mm) transverse and longitudinal overlaps, or tightly butted transverse joints, in accordance with the manufacturer's installation instructions. All cut edges and ends shall be sealed with 3 in. (76 mm) wide pressure sensitive aluminum foil tape.

THERMAL CERAMICS INC — FireMaster FastWrap+ or FireMaster FastWrap XL or Pyroscat Duct Wrap XL

B. **Collars —** Fabricated from Batts and Blankets* — Nom 1-1/2 in. (38 mm) thick, 6 pcf (96 kg/m^3), 6 in. (152 mm) wide blanket totally encapsulated within foil-scrim facers. The transverse butt joints shall be wrapped using a collar. The butt joint shall be located nom 3 in. (76 mm) from the edge of the collar. The collar shall be installed with 3 in. (76 mm) longitudinal overlaps. All cut edges and ends shall be sealed with 3 in. (76 mm) wide pressure sensitive aluminum foil tape.

THERMAL CERAMICS INC — FireMaster FastWrap+ or FireMaster FastWrap XL or Pyroscat Duct Wrap XL

C. **Steel Banding Straps —** Min 1/2 in. (13 mm) wide by 0.015 in. (0.38 mm) thick carbon steel banding straps used in conjunction with min 1 in. (25 mm) long stainless steel crimp clips. Banding straps spaced a max 12 in. (305 mm) OC and 1-1/2 in. (38 mm) from edges of collars.

C1. **Steel Pins —** (Not shown)—As an alternate to steel banding straps, for use with the butt joint collar technique, min 0.135 in. (3.4 mm) thick, 6 in. (152 mm) long steel insulation pins used in conjunction with 1-1/2 by 1-1/2 in. (38 by 38 mm) square or 1-1/2

in. (38 mm) diameter, 0.016 in. (.40 mm) thick, galvanized steel speed clips. Pins spaced 1-1/2 in. (38 mm) either side of the butt joint and 10 in. (254 mm) max, transversely around the duct, to secure the duct wrap and collar. Additional pins spaced 15 in. (381 mm) max between collars, required to support duct wrap on duct underside and to secure longitudinal lap. Pins installed in accordance with the manufacturers installation instructions.

D. **Firestop System —** When the ventilation duct passes through a fire rated wall or floor assembly, the through openings shall be firestopped in accordance with System Nos. C-AJ-7095. See Through—Penetration Firestop Systems in Vol. 2 of the Fire Resistance Directory.

4. **Hanger System —** (Not shown)—No additional protection is required for hanger systems providing that a min 3/8 in. (10 mm) diameter threaded steel hanger rod is used in conjunction with min 1-1/2 by 1-1/2 by 3/16 in. (38 by 38 by 5 mm) angle or 1-5/8 by 1-5/8 in. (38 by 38 mm) by min 0.060 in. (1.5 mm) steel channel with steel drop in or wedge expansion type masonry anchors.

UL General Requirements for Ventilation Ducts

The fire resistive performance of a ventilation duct assembly is investigated in accordance with the requirements of ISO 6944-1985, "Fire Resistance Tests - Ventilation Ducts." The purpose of this test is to measure the ability of a representative ventilation duct assembly to resist the spread of fire from one compartment to another without the aid of fire dampers.

ISO 6944 defines performance requirements for ventilation duct assemblies in terms of insulation, integrity and stability. Stability is the measurement of a ventilation duct assembly's ability to resist collapse which would prevent the ventilation duct assembly from performing its intended function. Integrity is a measurement of the ventilation duct assembly's ability to resist the passage of flames and hot gases into a non-fire environment. Insulation is a measurement of the ventilation duct assembly's ability to limit the temperature rise on the surface of the ventilation duct assembly in a non-fire environment from reaching an average temperature rise of 140°C (252°F) and a maximum temperature rise of 180°C (324°F).

ISO 6944 is applicable to vertical and horizontal ducts, with or without branches, taking into account the joints, air supply and exhaust openings, as well as the basic duct construction.

ISO 6944 contains requirements for two types of ventilation duct assemblies, identified as Duct A and Duct B. The requirements for Duct A are intended for ventilation duct assemblies that pass through the fire environment without openings. The requirements for Duct B are intended for ventilation duct assemblies where the duct contains openings within the fire environment.

ISO 6944 recommends the ventilation duct assembly tested represent the maximum width to height ratio intended for use. The Standard also recommends the tested duct be 250 mm by 1000 mm. The Classification for all ventilation duct assemblies is based upon data from fire tests on 250 mm by 1000 mm ducts unless reported otherwise.

Ventilation duct assemblies have been investigated for a flame spread rating of 25 or less and a smoke developed rating of 50 or less in accordance with the requirements of Par. 2-3.3 of NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."

Ventilation duct assemblies are intended to be installed in accordance with the manufacturer's installation instructions provided with the product.

Where a ventilation duct assembly penetrates a fire rated floor or wall assembly, the resulting opening around the ventilation duct assembly should be firestopped with a firestop system tested in accordance with ANSI/UL 1479, "Fire Tests of Through-Penetration Firestops". Each individual ventilation duct assembly includes reference to one or more through-penetration firestop systems described in Volume 2 of UL's Fire Resistance Directory.

The F and T Ratings of the firestop system should be equal to or greater than the hourly insulation rating of the ventilation duct assembly, and the F Rating of the firestop system should be equal to or greater than the hourly integrity and stability ratings of the ventilation duct assembly.

Authorities Having Jurisdiction should be consulted as to the particular requirements covering the installation and use of these Classified assemblies. Those materials identified by an (*) in the assembly description text are eligible to be produced under UL's Follow-Up Service Program. The Classification Mark of Underwriters Laboratories Inc. on the product is the only method provided by UL to identify products manufactured under its Classification and Follow-Up Service.

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*Bearing the UL Classification Mark

Through-penetration Firestop Systems

System No. C-AJ-7119

May 5, 2009

F Rating — 2 Hr

T Rating — 2 Hr

Design/System/Construction/Assembly Usage Disclaimer

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- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
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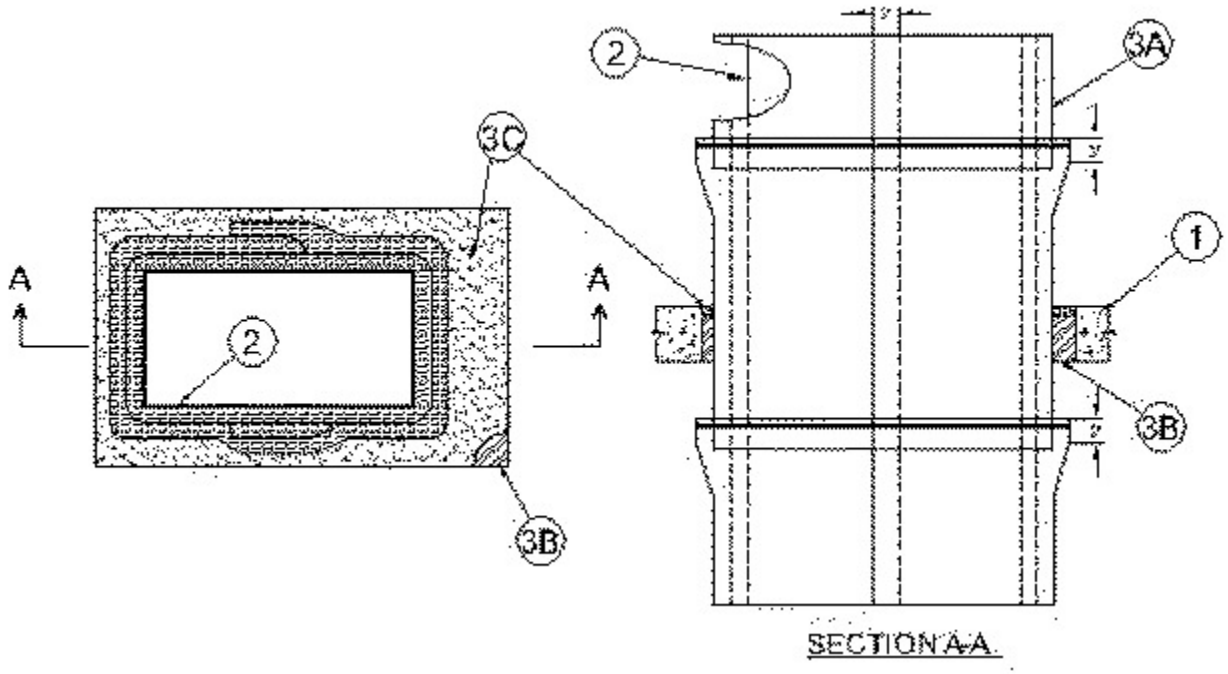

SECTION A-A

1. **Floor or Wall Assembly** — Min 4-1/2 in. thick reinforced lightweight or normal weight (100 - 150 pcf) concrete floor or min 4-3/4 in. thick reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max area of opening is 3249 sq in. with max dimension of 57 in.

See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Steel Grease Duct** — Nominal 24 by 48 in. No. 16 gauge (or heavier) steel grease duct. One steel grease duct to be installed either concentrically or eccentrically within the firestop system. Duct to be rigidly supported on both sides of the floor or wall assembly.

3. **Firestop System** — The firestop system shall consist of the following:

A. **Duct Wrap Materials*** — Nom 1-1/2 thick ceramic blanket totally encapsulated within foil-scrim facers. The steel duct shall be wrapped with two layers of duct wrap installed in accordance with the Grease Duct Assembly No. G-18. See Grease Duct Assemblies Vol. 2 of the Fire Resistance Directory. The annular space between the insulated duct and the periphery of the opening shall be a min 1/2 in. to a max 4-3/4 in.

THERMAL CERAMICS INC — FireMaster Fast Wrap XL or Pyroscat Duct Wrap XL

B. **Packing Material** — Min 4-1/4 in. thickness of unfaced scrap duct wrap material firmly packed into opening as a permanent form. Packing material to be recessed from

the top surface of the floor or both surfaces of wall as required to accommodate the required thickness of fill material.
C. **Fill, Void or Cavity Material* - Sealant —** Min 1/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.

TREMCO INC — Fyre-Sil Sealant or Fyre-Sil S/L Sealant (for floor assemblies only)

SPECIFIED TECHNOLOGIES INC — Pensil 300

RECTORSEAL — 835+ Sealant

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS One Sealant

*Bearing the UL Classification Mark

Through-penetration Firestop Systems

System No. C-AJ-7095

May 5, 2009

F Rating — 2 Hr

T Rating — 2 Hr

Design/System/Construction/Assembly Usage Disclaimer

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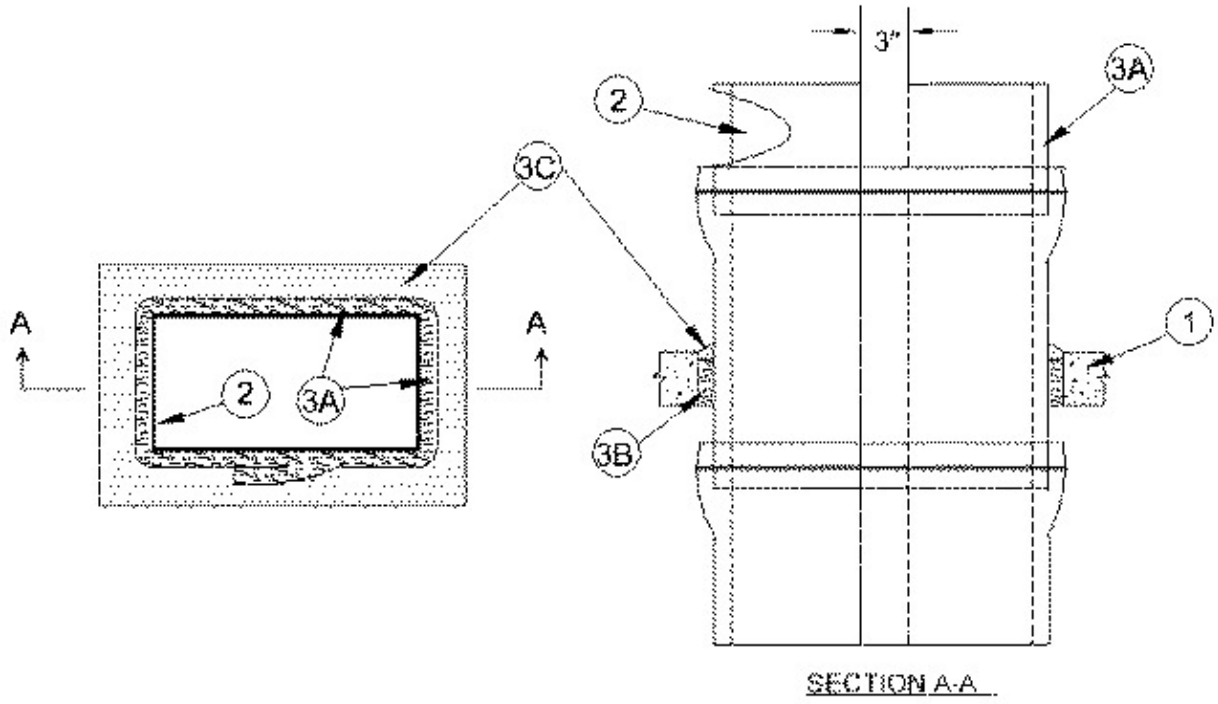

1. **Floor or Wall Assembly** — Min 4-1/2 in. thick reinforced normal weight (140-150 pcf) concrete floor or min 4-3/4 in. thick reinforced normal weight concrete wall. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max area of opening is 912 sq in. with max dimension of 48 in.

See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through-Penetrant** — One steel duct to be installed within the firestop system. Duct to rigidly supported on both sides of floor or wall assembly. The following types of through-penetrants may be used:

A. **Steel Air Duct** — Min 0.030 in. (22 gauge) thick (or heavier) steel duct having a max width to height ratio of 4 to 1 with max individual dimension of 39 in and constructed in accordance with SMACNA HVAC Duct Construction standards. The sections shall be assembled using bolted flanges or SMACNA approved Transverse Joint Reinforcements. Reinforcement to consist of min 1-1/2 by 1-1/2 by 1/8 in. thick transverse stiffening angles, approximately 2 in. less in length than the max dimension, screw attached 8 in. OC to the duct 3 in. beyond the top surface of the floor and both surfaces of the wall.

3. **Firestop System** — The firestop system shall consist of the following:

A. **Duct Wrap Materials*** — Nom 1-1/2 in. thick, 6 pcf, ceramic blanket totally encapsulated within foil-scrim facers. The steel duct shall be wrapped with one layer of duct wrap installed in accordance with the Ventilation Assembly No. V-19. See

Ventilation Duct Assemblies in Vol. 2 of the Fire Resistance Directory. A nom annular space of 3 in. is required between the insulated duct and the periphery of the opening.

THERMAL CERAMICS INC — FireMaster FastWrap+ or FireMaster FastWrap XL or Pyroscat Duct Wrap XL

B. **Packing Material —** Min 4 in. thickness of unfaced scrap duct wrap material or min 3 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from the top surface of the floor or both surfaces of wall as required to accommodate the required thickness of fill material.
C. **Fill Void or Cavity Material* — Sealant —** Min 1/4 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS ONE Sealant

RECTORSEAL — 835+ Sealant

SPECIFIED TECHNOLOGIES INC — Pensil 300

TREMCO INC — Fyre-Sil Sealant or Fyre-Sil S/L Sealant (for floor assemblies only)

*Bearing the UL Classification Mark

Through-penetration Firestop Systems

System No. F-C-7037

May 5, 2009

F Ratings — 1 and 2 Hr (See Item 1)

T Ratings — 1 and 2 Hr (See Item 1)

Design/System/Construction/Assembly Usage Disclaimer

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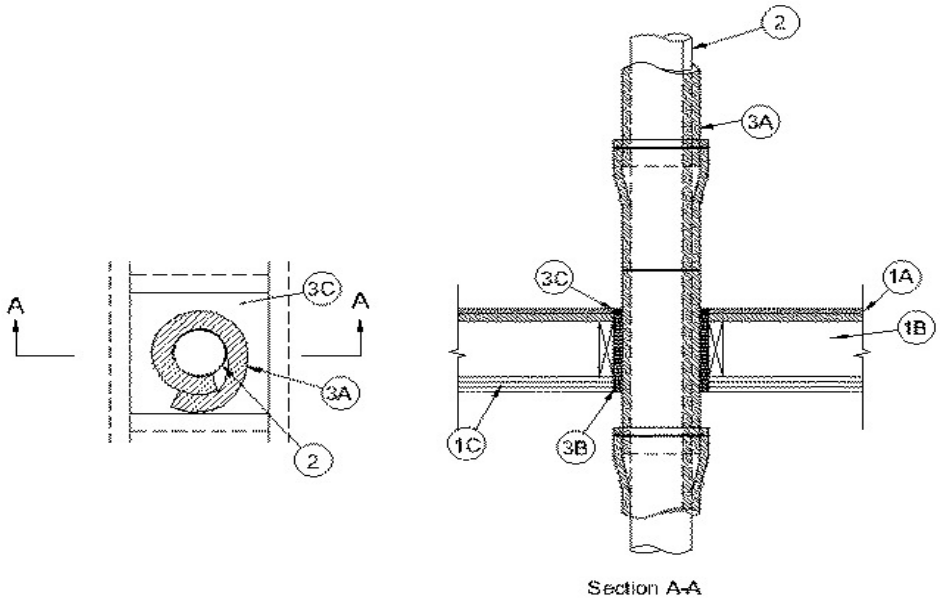

Section A-A

1. **Floor-Ceiling Assembly —** The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The 2 hr fire-rated wood joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in Design Nos. L505, L511 or L536 in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:

A. **Flooring System —** Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Max area of floor opening is 100 in.^{2} (645 cm^2) with a max dimension of 10 in. (254 mm).

B. **Wood Joists —** For 1 hr fire-rated floor-ceiling assemblies nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped. For 2 hr fire-rated floor-ceiling assemblies, nom 2 by 10 in. (51 by 254 mm) lumber joists spaced 16 in. (406 mm) OC with nom 1 by 3 in. (25 by 76 mm) lumber bridging and with ends firestopped. Additional framing members installed to form a square enclosure around the perimeter of the opening in the floor and ceiling.

C. **Furring Channels —** (Not Shown) - In 2 hr fire-rated assemblies, resilient galv steel furring installed perpendicular to wood joists between first and second layers of gypsum board (Item 1D). Furring channels spaced max 24 in. (610 mm) OC. In 1 hr fire-rated assemblies, resilient galv steel furring installed perpendicular to wood joists between gypsum board and wood joists as specified in the individual Floor-Ceiling Design. Furring channels spaced max 24 in. (610 mm) OC. If furring channels are used within the assembly, additional furring channels to be installed along the periphery of the opening.

D. **Gypsum Board* —** Nom 4 ft (1.2 m) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. First layer of gypsum board secured to wood joists or furring channels as specified in the individual Floor-Ceiling Design. Second layer of

gypsum board (2 hr fire-rated assembly) screw-attached to furring channels as specified in the individual Floor-Ceiling Design. Max area of ceiling opening is 100 in.2 (645 cm^2) with a max dimension of 10 in. (mm).

The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the floor-ceiling in which it is installed. *Bearing the UL Classification Mark

2. **Steel Air Duct —** Max 4 in. (102 mm) diam by min 0.022 in. (0.56 mm) thick galv steel air duct to be centered within the firestop system. Max one steel air duct to be installed within opening. Steel duct to be rigidly supported on both sides of floor-ceiling assembly.
3. **Firestop System —** The firestop system shall consist of the following:

A. **Duct Wrap Materials* —** Nom 1-1/2 in. (38 mm) thick, blanket totally encapsulated within foil-scrim facers. steel air duct shall be wrapped with one layer of duct wrap installed in accordance with Ventilation Assembly No. V-19. See Ventilation Duct Assemblies in Vol. 2 of the Fire Resistance Directory. The annular space between the insulated steel duct and the periphery of the opening shall be a nom 1-1/2 in. (38 mm).

THERMAL CERAMICS INC — FireMaster Fast Wrap+ or FireMaster FastWrap XL or Pyroscat Duct Wrap XL

B. **Packing Material —** Min 10-3/8 in. (264 mm) and 11-5/8 in. (295 mm) thickness of unfaced scrap duct wrap material compressed 50 percent into opening as a permanent form between the insulated steel duct and the periphery of the opening for 1 and 2 hr floor-ceiling assemblies, respectively. Packing material to be installed flush with bottom surface of ceiling and recessed from top surface of floor to accommodate the required thickness of fill material.

C. **Fill, Void or Cavity Material* - Sealant —** Min 1/4 in. (6 mm) thickness of fill material applied within annulus on top surface of floor.

TREMCO INC — Fyre-Sil, TREMstop Acrylic or TREMstop Intumescent Acrylic Sealant, FyreCaulk or TREMstop IA+

SPECIFIED TECHNOLOGIES INC — SpecSeal 100 Sealant, SpecSeal 150 Sealant, SpecSeal LE600 Sealantor SpecSeal LCI Sealant

RECTORSEAL — 835+ Sealant

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS ONE Sealant

EGS NELSON FIRESTOP — ES1399 or LBS3 Sealant

Through-penetration Firestop Systems

System No. W-L-7121

May 5, 2009

F Ratings — 1 and 2 Hr. (See Item 1)

T Ratings — 1 and 2 Hr. (See Item 1)

Design/System/Construction/Assembly Usage Disclaimer

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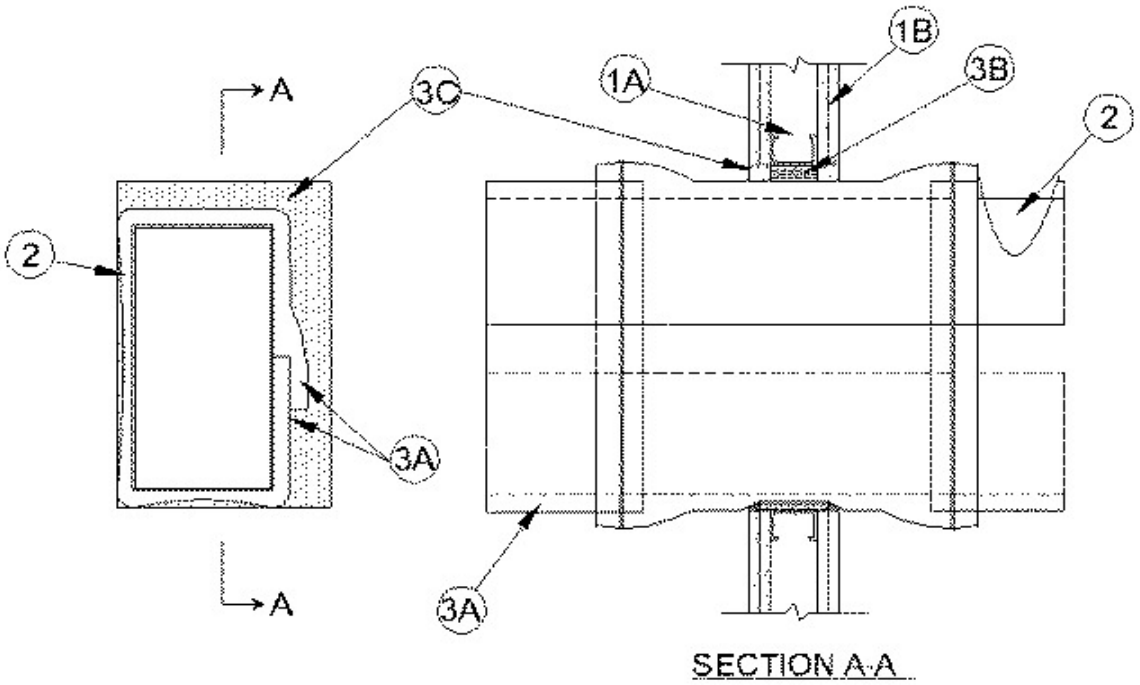
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.



1. **Wall Assembly —** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Design in the Fire Resistance Directory and shall include the following construction features:

A. **Studs —** Wall framing shall consist of min 3-1/2 in. (89 mm) wide channel shaped steel studs spaced max 24 in. (610 mm) OC. Additional framing members shall be installed in stud cavity to form a rectangular box around the penetrant.

B. **Gypsum Board*** — 5/8 in. (16 mm) thick with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400 or V400 Wall and Partition Design. Max area of opening is 7 ft.2 (0.65 m^2) with a max dimension of 35 in. (889 mm).

The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Through Penetrant —** One steel duct to be installed within the firestop system. Duct to be rigidly supported on both sides of wall assembly. The following types of steel ducts may be used:

A. **Steel Air Duct —** Min 26 gauge (0.5 mm) galv steel duct having a max perimeter dimension of 108 in. (0.274 m) and a max individual dimension of 30 in. (762 mm).

B. **Steel Grease Duct —** Min 16 gauge (1.5 mm) thick carbon steel duct having a max perimeter dimension of 108 in. (0.274 m) and a max individual dimension of 30 in. (762 mm) **Grease duct assemblies are for use only in 2 hr rated walls.**

3. **Firestop System —** The firestop system shall consist of the following:

A. **Duct Wrap Materials* —** Nom 1-1/2 in. (38 mm) thick blanket totally encapsulated within foil-scrim facers. The steel grease duct shall be wrapped with one layer of duct wrap installed in accordance with Grease Duct Assembly No. G-14. See Grease Duct Assemblies in Vol. 2 of the Fire Resistance Directory. The steel air duct shall be wrapped with one layer of duct wrap installed in accordance with Ventilation Assembly No. V-19. See Ventilation Duct Assemblies in Vol. 2 of the Fire Resistance Directory. The annular space between the insulated duct and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm).

THERMAL CERAMICS INC — FireMaster Fast Wrap+ or FireMaster FastWrap XL or Pyroscat Duct Wrap XL

B. **Packing Material —** Min 3-1/2 in. (89 mm) thickness of unfaced scrap duct wrap material compressed 50 percent into opening as a permanent form between the insulated steel duct and the periphery of the opening. Packing material shall be firmly packed to max extent possible at gypsum board/insulated steel duct interface on both sides of the wall. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material.

C. **Fill, Void or Cavity Material*- Sealant —** Min 1/4 in. (6 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. A min 1/4 in. (6 mm) diam bead of sealant shall be applied at the gypsum board/insulated duct interface on both surfaces of wall assembly.

EGS NELSON FIRESTOP — ES1399 or LBS3 Sealant

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant

RECTORSEAL — 835+ Sealant

SPECIFIED TECHNOLOGIES INC — SpecSeal 100, SpecSeal 150, or SpecSeal LCI Sealant

TREMCO INC — Fyre-Sil, TREMstop Acrylic or TREMstop Intumescent Acrylic Sealant

W R GRACE & CO - CONN — FS 900+ Sealant, FS 1900 Sealant

*Bearing the UL Classification Mark

Through-penetration Firestop Systems

System No. W-L-7145

May 5, 2009

F Ratings — 1 and 2 Hr. (See Item 1)

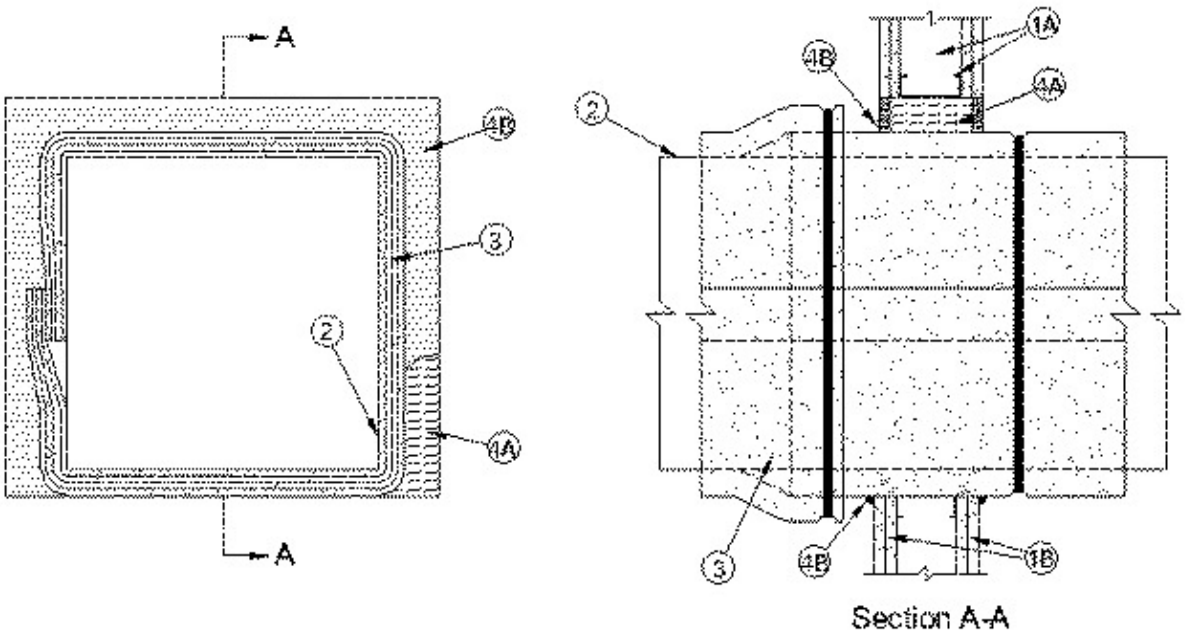
T Ratings — 1 and 2 Hr. (See Item 1)

L Rating At Ambient - Less Than 1 CFM/sq ft

L Rating At 400 F - Less Than 1 CFM/sq ft

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered as Classified, Listed, or Recognized.



Section A-A

1. **Wall Assembly —** The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400 or V400 Series Wall and Partition Design in the Fire Resistance Directory and shall include the following construction features:

A. **Studs —** Wall framing shall consist of min 3-1/2 in. (89 mm) wide channel shaped steel studs spaced max 24 in. (610 mm) OC. Additional framing members shall be installed in stud cavity to form a rectangular box around the penetrant.

B. **Gypsum Board* —** 5/8 in. (16 mm) thick with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U400 or V400 Wall and Partition Design. Max area of opening is 78 ft.2 (7.3 m^2) with a max dimension of 107 in. (272 cm).

The hourly F and T Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

2. **Steel Air Duct —** One steel duct to be installed within the firestop system. Duct to be rigidly supported on both sides of wall assembly. Min 26 gauge (0.5 mm) galv steel duct having a max perimeter dimension of 400 in. (0.274 m) and a max individual dimension of 100 in. (762 mm).

3. **Firestop System —** The firestop system shall consist of the following:

A. **Duct Wrap Materials* —** Nom 1-1/2 in. (38 mm) thick blanket totally encapsulated within foil-scrim facers. The steel air duct shall be wrapped with one layer of duct wrap installed in accordance with Ventilation Assembly No. V-19. See Ventilation Duct Assemblies in Vol. 2 of the Fire Resistance Directory. When steel angles (Item 3D) are used, the edges of the duct wrap material are to about the protruding leg of the angle and

the tight seam is to be covered with an additional 6 in. (152 mm) wide "collar" of duct wrap. The annular space between the insulated duct and the periphery of the opening shall be min 0 in. (0 mm, point contact) to max 2 in. (51 mm).

THERMAL CERAMICS INC — FireMaster Fast Wrap+ or FireMaster FastWrap XL or Pyroscat Duct Wrap XL

B. **Packing Material —** Min 3-1/2 in. (89 mm) and 4-3/4 in. (121 mm) thickness of unfaced scrap duct wrap material or min 4 pcf (64 kg/m^3) mineral wool batt insulation firmly packed into the opening as a permanent form for 1 and 2 hr rated walls, respectively. Packing material to be recessed from both surfaces of wall as required to accommodate the required thickness of fill material (Item 4B).
C. **Fill, Void or Cavity Material*— Sealant —** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall assembly. A min 1/4 in. (6 mm) diam bead of sealant shall be applied at the gypsum board/insulated duct interface on both surfaces of wall assembly.

SPECIFIED TECHNOLOGIES INC — SpecSeal 100, SpecSeal LC150, SpecSeal LCI Sealant, or Pensil 300 Silicone Sealant

D. **Retaining Angles —** (Not Shown) —When dimensions of duct exceed 84 by 84 in. (213 by 213 cm), min No. 16 gauge (0.059 in. or 1.5 mm thick) galv steel angles sized to lap steel duct a min of 2 in. (51 mm) and to lap wall surfaces a min of 1 in. (25 mm) shall be attached to steel duct. Angles attached to steel duct on both sides of wall within 1 in. (25 mm) of wall with min No. 10 by 1/2 in. (13 mm) long steel sheet metal screws or welds located a max of 1 in. (25 mm) from each end of steel duct and spaced a max of 6 in. (152 mm) OC.

*Bearing the UL Classification Mark

ICC Evaluation Service, Inc.
www.icc-es.org

Business/Regional Office ■ 5360 Workman Mill Road, Whittier, California 90601 ■ (562) 699-0543
Regional Office ■ 900 Montclair Road, Suite A, Birmingham, Alabama 35213 ■ (205) 599-9800
Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2300

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07815—Flexible Blanket Fireproofing

REPORT HOLDER:

THERMAL CERAMICS
2102 OLD SAVANNAH ROAD
AUGUSTA, GEORGIA 30903
(760)560-4038
www.thermalceramics.com

EVALUATION SUBJECT:

PYROSCAT DUCT WRAP XL ENCLOSURE SYSTEM

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Mechanical Code*® (2006 IMC)
- 2003 *International Mechanical Code*® (2003 IMC)
- 2006 *International Building Code*® (2006 IBC)
- 2003 *International Building Code*® (2003 IBC)
- 1997 ICBO *Uniform Mechanical Code* (ICBO UMC)
- 1997 *Uniform Building Code*™ (UBC)
- 2006 IAPMO *Uniform Mechanical Code* (2006 IAPMO UMC)
- 2003 *IAPMO Uniform Mechanical Code* (2003 IAPMO UMC)

Properties evaluated:

- Durability
- Fire resistance
- Noncombustibility
- Surface burning characteristics

2.0 USES

Pyroscat Duct Wrap XL 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 Section 506.3.10 of the IMC and are an alternative to the one- and two-hour fire-resistance-rated enclosure requirements of Section 707.4 of the IBC, Section 507.6 of the ICBO UMC, Section 711 of the UBC and Section 510.7.1 of the IAPMO UMC when installed in accordance with Section 4.0.

3.0 DESCRIPTION

3.1 Pyroscat Duct Wrap XL Insulating Blanket:

The Pyroscat Duct Wrap XL Insulating Blanket is a calcium magnesium silicate blanket totally encapsulated with a polypropylene/aluminum foil scrim. The blanket, nominally $1^1/_2$ 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^3), 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 E 84 (UBC Standard 8-1).

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 2006 IMC Section 506.3.2, 2003 IMC Section 506.3.3, ICBO UMC Section 507.3.2, or IAPMO UMC Section 510.5.2, as applicable. Duct supports must comply with IMC Section 506.3.3, ICBO UMC Section 507.3.3, or 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 IBC Section 707 or UBC Section 711, 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 $^3/_4$ 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 $^1/_2$ inch (12.7 mm) wide.

3.5 Firestop Sealant:

The following sealants are used for through-penetration firestops 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 seven to fourteen 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 fourteen to twentyone 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. (STI) 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 fourteen 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 Pyroscat 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 Pyroscat 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 Section 602.2.1 of the IMC, Section 602.2 of the IAPMO UMC and Section 601.4 of the ICBO UMC for installation in plenums.

4.2 Two-hour Fire-resistance-rated Assembly:

4.2.1 Enclosure Assembly: A total of two $1^1/_2$-inch-thick (38.1 or 51 mm) layers of Pyroscat blanket material are installed around the grease duct. Each 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 are a minimum of 3 inches (76 mm). Each layer of blanket material is temporarily held in place with minimum $^3/_4$-inch-wide (19.1 mm) filament tape, placed circumferentially $1^1/_2$ inches (38 mm) from the edges of each blanket and spaced $10^1/_2$ 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 $1^1/_2$ inches (38 mm) from the edges of the blanket and are spaced $10^1/_2$ 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 $10^1/_2$ inches (267 mm) on center along the bottom of 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 $1^1/_2$-inch-by-$1^1/_2$-inch (38 mm by 38 mm), galvanized steel speed clips. As an alternative to a 3-inch (72 mm) perimeter and longitudinal overlap of adjacent blankets, the blankets may be installed using a butt-joint/overlap method or a butt-joint/collar method. These methods are illustrated in Figure 1. When two blanket layers are encapsulated in one bag, the butt-joint/collar method must be used.

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 2006 IMC Section 506.3.8, 2003 IMC Section 506.3.9, ICBO UMC Sections 506.3.8 and 507.5, or IAPMO UMC Section 510.3, as applicable. Grease duct access doors must be protected with three layers of Pyroscat 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 $^1/_4$ inch (6.4 mm) in diameter and $4^1/_2$ 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 $1^1/_2$ 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 $1^1/_2$ inches (38 mm) around the perimeter of the door and any previous blanket layers. The blanket layers are held in place with $1^1/_2$-inch (38 mm) square or round speed clips, and wing nuts for $^1/_4$-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 $1^1/_2$ inches (38 mm) over the lower layer. All edges of insulation blanket must be protected with aluminum tape. A No. 16 gage [0.055 inch (1.4 mm)] 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 $^3/_8$-inch-diameter (9.5 mm), all-thread steel rods and 2-inch-by-2-inch-by-$^1/_8$-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 $1^1/_2$-inch-by-$1^1/_2$-inch-by-$^1/_8$-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 $^3/_8$-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 firestop 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 Firestop Assembly: Where the grease duct protected with the Pyroscat® enclosure assembly penetrates a fire-resistance-rated concrete or concrete masonry wall assembly complying with IBC Table 720.1(2) or UBC Table 7-B, and the penetration requires protection, the annular space of the penetration must be protected as follows:

a. Penetration opening: The maximum area of the opening in the fire-resistance-rated wall assembly is 3,069 square inches (1.98 m^2), with a maximum perimeter dimension of 93 inches (2362 mm).

b. Duct wrap material: The grease duct must be wrapped with the blanket material as described in Section 4.2.1.

c. Packing material: Minimum $4^1/_2$-inch-wide (114 mm), unfaced, scrap duct wrap material or 3 pcf (48 kg/m^3), mineral wool batt insulation is firmly packed into the opening as a permanent form. The packing material must be recessed a minimum of $^1/_4$ inch (6.4 mm) from both surfaces of the wall, to accommodate the sealant material.

d. Sealant material: The recessed voids created by the packing material must be filled to a minimum depth of $^1/_4$ inch (6.4 mm) with one of the firestop sealants described in Section 3.6.

4.3.3 Floor/Ceiling Assemblies—Two-hour F- and T-rated Through-penetration Firestop Assembly: Where the grease duct protected with the Pyroscat® enclosure assembly described in Section 4.2.1 penetrates a minimum $4^1/_2$-inch-thick (114 mm) fire-resistive concrete floor/ceiling assembly complying with IBC Table 719.1(3) or UBC Table 7-C, the annular space of the penetration must be protected as illustrated in Figure 5 and as described below:

a. Penetration opening: The annular space on each side of the wrapped duct shall be between $^1/_2$ inch (12.7 mm) and $4^3/_4$ 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^2), 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^2), with a maximum opening dimension of 47 inches (1193 mm).

b. Duct wrap material: The grease duct must be wrapped with the blanket material as described in Section 4.2.1.

c. Packing material: $4^1/_4$-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 $^1/_4$ inch (6.4 mm) from the upper surface, as shown in Figure 5.

d. Sealant material: The recessed void created by the packing material must be filled to a minimum depth of $^1/_4$ inch (6.4 mm) with one of the firestop sealants described in Section 3.6.

5.0 CONDITIONS OF USE

The Pyroscat® 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:

5.1 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.

5.2 The blanket materials are manufactured in Augusta, Georgia, and Pachuca, Hildalgo, Mexico, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

6.0 EVIDENCE SUBMITTED

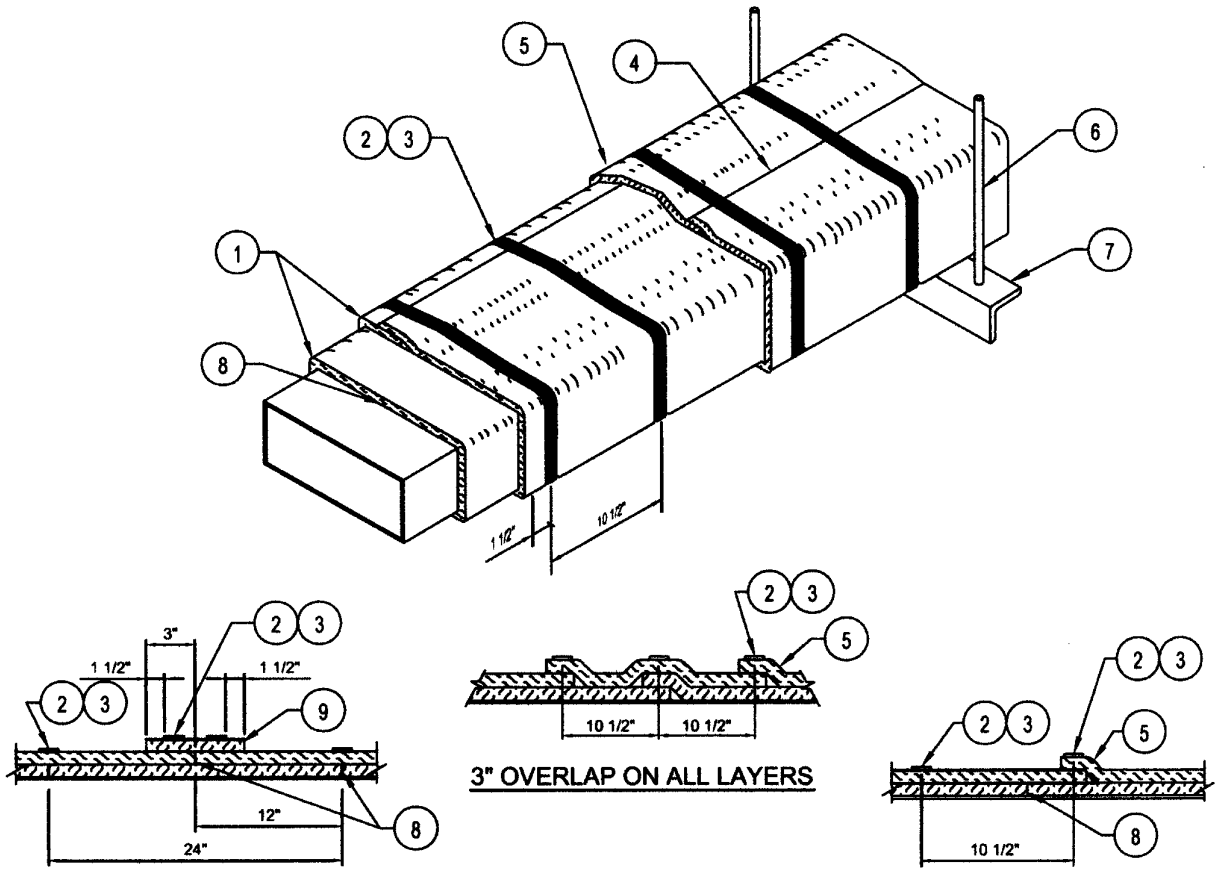
6.1 Data in accordance with the ICC-ES Acceptance Criteria for Grease Duct Enclosure Assemblies (AC101), dated April 2001 (editorially revised October 2004).

6.2 Report of ASTM E 2336-04 testing for fire-resistive grease duct enclosure systems in accordance with 2006 IMC Section 506.3.10.

7.0 IDENTIFICATION

The Pyroscat® blanket material bears a label indicating the product name (Pyroscat Duct Wrap XL), the name of the manufacturer (Thermal Ceramics), the evaluation report number (ESR-2832), and the name of the inspection agency (Underwriters Laboratories Inc.). The words "FIRE RESISTIVE ENCLOSURE, DO NOT REMOVE" 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.

Figure 1: Pyroscat® Duct Wrap XL Installation Methods



3" OVERLAP ON ALL LAYERS

BUTT-JOINT/COLLAR

BUTT-JOINT/3"OVERLAP

Figure 1 - Legend	
1	Two layers Pyroscat Duct Wrap 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 Pyroscat Duct Wrap XL collar

Figure 2: Pyroscat® Duct Wrap XL Access Door Systems

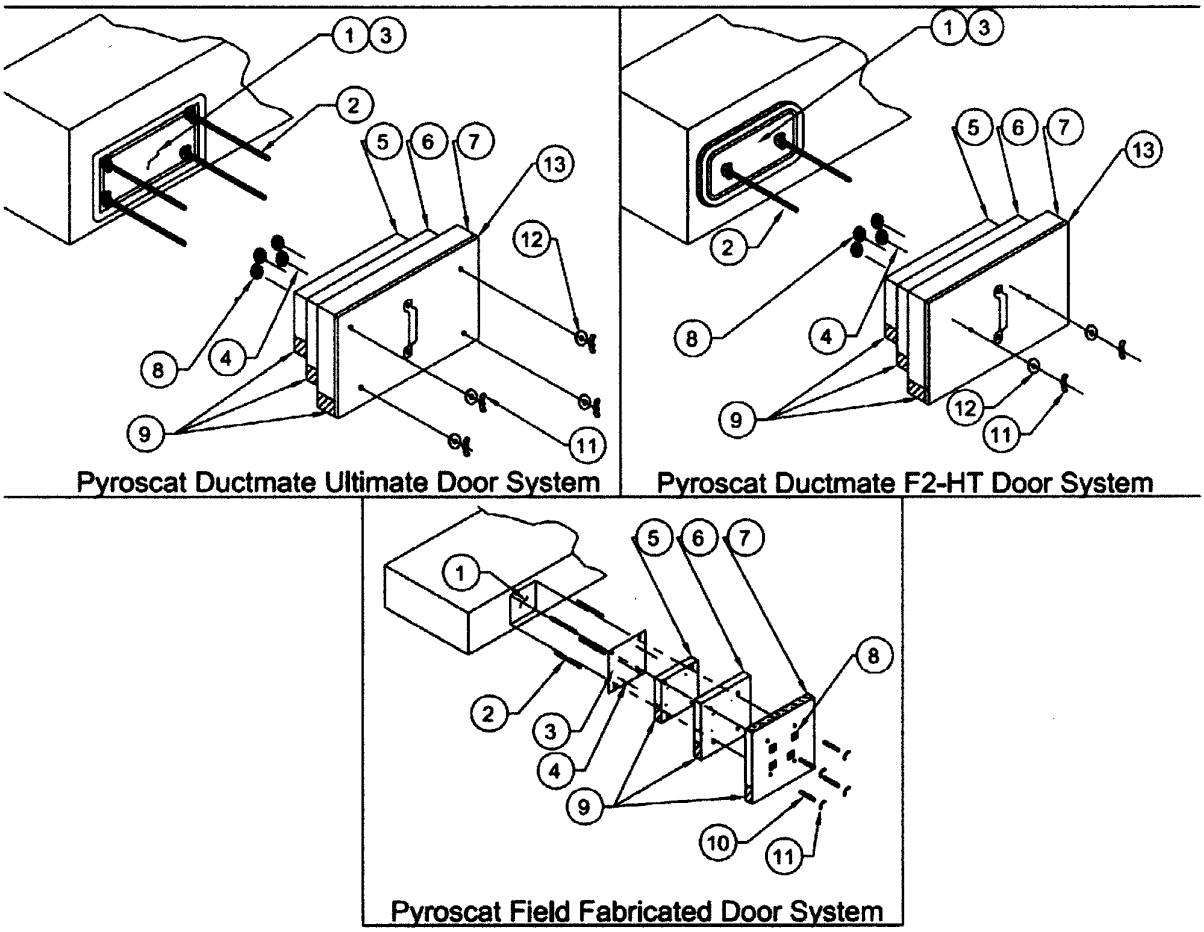


Figure 2 - Legend	
1	Door hole
2	All thread rods (3/8" - Ultimate, 1/4" - F2-HT, 1/4" - Field Fabricated)
3	16 Gage Access cover (Field Fab Door) or DuctMate Door System
4	Insulation pins - welded to plate or access cover
5	One layer Pyroscat Duct Wrap XL Product (See note below)*
6	One layer Pyroscat Duct Wrap XL, 1 1/2" Overlap*
7	One layer Pyroscat Duct Wrap XL, 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 3: Pyroscat® Duct Wrap XL Horizontal Support Details

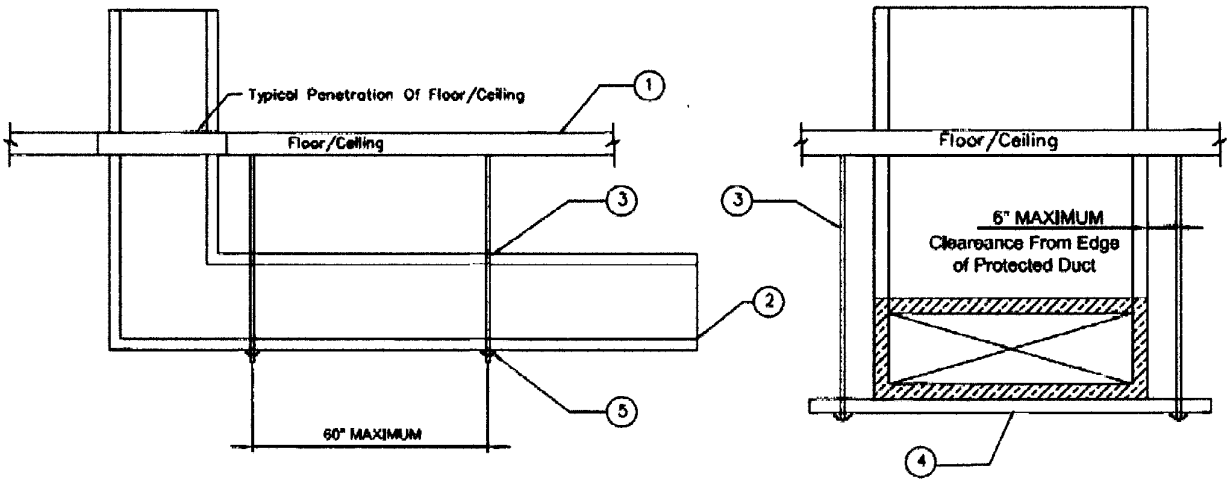


FIGURE 3 – LEGEND	
1	FLOOR/CEILING ASSEMBLY
2	18 GAGE CARBON STEEL OR 18 GAGE STAINLESS STEEL DUCT MAXIMUM 24X48" OR 34X36"
3	MIN. 3/8" ALL-THREAD ROD
4	2"x2"x1/8" STEEL ANGLE
5	STEEL WASHER & NUT SIZED TO FIT ITEM 3

Figure 4: Pyroscat® Duct Wrap XL Vertical Support Details

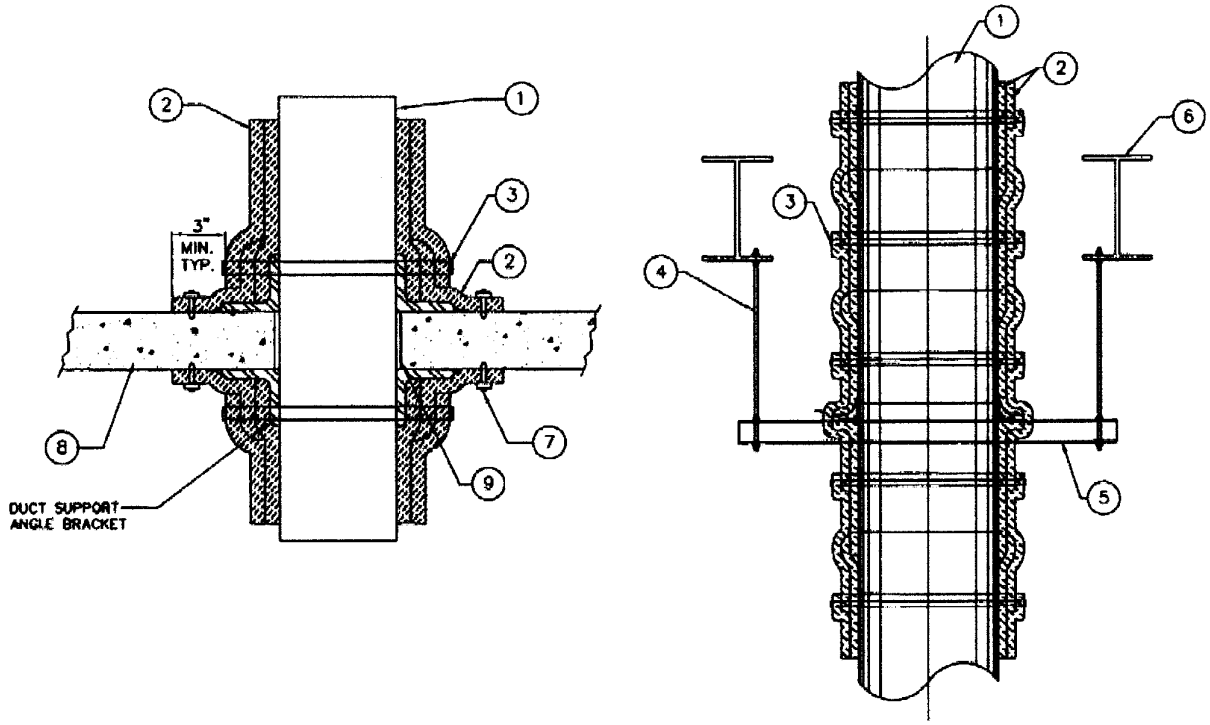
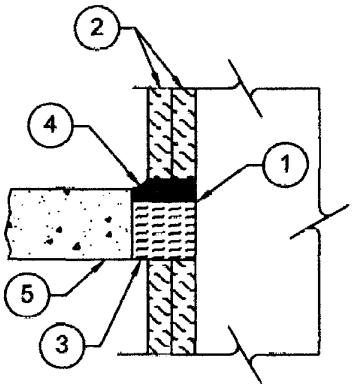
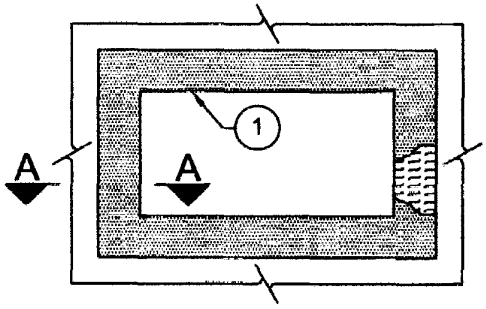


FIGURE 4 – LEGEND	
1	DUCT
2	TWO LAYERS Pyroscat DUCT WRAP XL
3	STEEL BANDING
4	MIN. 3/8" HANGER ROD
5	MIN. 1 1/2"x1 1/2"x1/8" ANGLE
6	BUILDING STEEL FRAMING BY REGISTERED DESIGN PROFESSIONAL
7	MECHANICAL FASTENERS & WASHERS
8	RATED FLOOR
9	FIRESTOP SEALANT LISTED IN SECTION 3.5

Figure 5: Pyroscat® Duct Wrap XL
1 or 2 hour Floor/Ceiling Through Penetration Firestop System Details

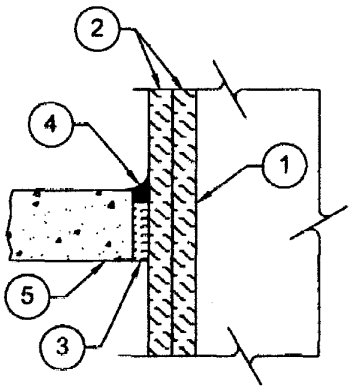


SECTION A-A

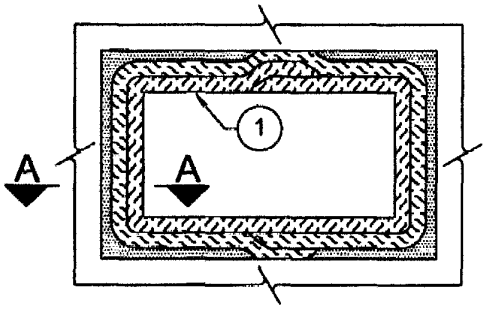


FLOOR VIEW

Pyroscat Duct Wrap XL
Terminated At The Top And Bottom
Surface Of The Floor/Ceiling Assembly



SECTION A-A



FLOOR VIEW

Pyroscat Duct Wrap XL
Continuous Through
The Floor/Ceiling Assembly

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

Plenum Blanket
Plastic Pipe and Cable
Product Information

1. Product Description
Pyroscat® CSM Plenum Blanket is a flexible fire barrier product designed for wrapping combustible products located within air plenums, such as plastic pipe and plastic sheathed electrical cables. Pyroscat CSM Plenum Blanket can be installed using F1 (one side foiled) or F2E (encaspulated with foil/scrim).

References

Agency	Reference Standard/File No.
Underwriters Laboratory	UL 1887, UL 910
NFPA	262 and 90-A, 2004 Edition
International Mechanical Code	Section 602, 2003 Edition
Omega Point Laboratories	Listing Nos. 15606-2; Design nos. PP106P and PP107P
Wisconsin Evaluation	200315-G

2. Physical Characteristics
Non-combustible per ASTM E-136
Surface Burning Characteristics, per ASTM E-84, UL 723

Flame Spread Index	0
Smoke developed Index	0
Blanket Color	white
Foil Facing Color	Metallic w/Black Print
Thickness, in.	½
Density, pcf	8
Roll Size	24" x 450"
	48" x 450"

Chemistry Options:

CSM Grade	Alkaline Earth Silicate (AES) wool

3. Applications
- Plastic pipe (wet or dry)
- Telecommunications wires
- Electrical control cables
- Power cables

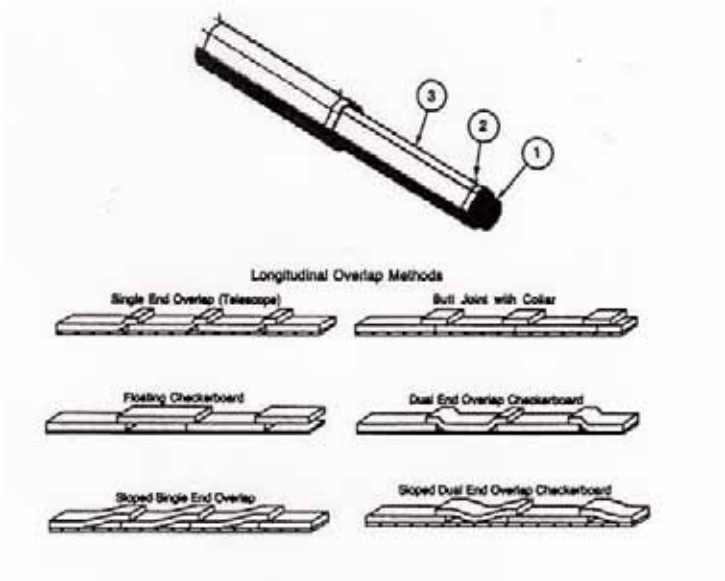
Installation Procedure for Pipe or Cable Assembly
Cover the pipe or cable assembly with a single layer of Pyroscat CSM Plenum Blanket. Use blanket fully encapsulated with foil scrim facing (F2E) or faced on one side with foil (F1) exposed. Place one end of the insulation on the pipe assembly and wrap the insulation completely around the pipe assembly. Overlap the other end of the insulation a minimum of 1" around the perimeter. Overlap the blanket onto the first blanket a minimum of 1". Overlap adjacent blankets using one of the following methods: (1) telescoping method where each adjacent blanket has one edge exposed and one edge covered by the next blanket, (2) various checkerboard patterns detailed where both edges of each alternating blanket are covered by each adjacent blanket whose edges are exposed, or (3) a butt splice with collar method where the blankets are butted together and a minimum 2" wide collar of blanket is centered over the butt splice overlapping each adjacent blanket a minimum of 1".

Tape: Apply pressure sensitive tape with aluminum foil facing to all exposed edges of the insulation. Overlap tape onto insulation a minimum of 1".

Fastener: Use either wire ties or steel banding to secure each piece of insulation applied around the pipe assembly. When banding is selected, use a minimum 1/2" wide stainless steel bands, which are nominally 0.015" thick or 1/2" wide carbon steel banding equivalent. Place the bands a maximum 1" from each blanket edge. Tension the banding material to hold the insulation in place without causing any cutting or damage to the blanket. When wire ties are selected, use minimum 24 GA steel wire ties. Place the wire ties a maximum 1" from each blanket edge. Tension the wire ties by twisting them together to hold the insulation in place without causing any cutting or damage to the blanket.

The use of filament tape as a temporary hold for the insulation is permitted.

Thermal Ceramiics
Pyroscat Plenum Blanket
Plastic Pipe and Cable



The values given herein are typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Therefore, the data contained herein should not be used for specification purposes. Check with your Thermal Ceramics office to obtain current information.

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