

FyreWrap® MAX 2.0 Duct Insulation – Two-Layer ICC ES System

Introduction

Unifrax Corporation's FyreWrap® MAX 2.0 Duct Insulation is a high-temperature insulation blanket specifically designed to provide a flexible enclosure for one- and two-hour rated kitchen exhaust ducts. FyreWrap MAX 2.0 Duct Insulation provides a tested, fire-protective enclosure acceptable as an alternate to a traditional fire-rated shaft. Installed as a two-layer system, FyreWrap MAX 2.0 complies with ICC ES Acceptance Criteria for Grease Duct Enclosure Assemblies, AC101 (formerly ICBO). FyreWrap MAX 2.0 Duct Insulation offers the following product features:

- Complies with ICC ES, Report No. ER-5899
- Two-layer system; inner layer utilizes butt joint
- High-temperature, biosoluble insulation
- Zero clearance to combustibles, at any location
- 2-hour fire endurance rating
- Alternate to shaft enclosure

Product Components

Core Material: FyreWrap MAX 2.0 incorporates Insulfrax® Thermal Insulation as its core material. Insulfrax is a high-temperature insulation made from a calcia, magnesia, silica

Typical Product Properties

ICC Evaluation Services (formerly ICBO)	Legacy Report ER-5899	
Intertek Laboratories (OPL) Listed.....	File 16341-3, Design No. GD 524F, GD 529F, GD 564F	
AC101 Internal Grease Duct Test	Zero Clearance to Combustibles at all locations on wrap	
ASTM E-119 Full Scale Engulfment Test	2-hour Fire Rating	
ASTM E-84/UL 723 Surface Burning Characteristics	UL File No. R14514	
	Unfaced Blanket	Encapsulated
Flame Spread Rating:	Zero	<25
Smoke Developed Rating:	Zero	<50
ASTM E-814 Firestop Test.....	F-Rating = 2 Hours T-Rating = 2 Hours	
ASTM E-136 Non-Combustibility Test	Passes	
ASTM C-518 Durability Test.....	Passes	

Data are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

Complies with: NFPA 96 (all editions), 1997 ICBO Uniform Mechanical Code (UMC), 1997 ICBO Uniform Building Code (UBC), 2000 and 2003 International Mechanical Code (IMC), 2000 and 2003 IAPMO UMC (Uniform Mechanical Code).

Refer to the product Material Safety Data Sheet (MSDS) for recommended work practices and other product safety information.



FyreWrap® MAX 2.0 Duct Insulation

chemistry designed to enhance biosolubility. It provides excellent insulation in a noncombustible blanket product form.

Encapsulating Material: The core insulation blanket is completely encapsulated in an aluminum foil fiberglass reinforced scrim covering. This scrim provides additional handling strength as well as protection from moisture absorption and tearing.



Typical Product Parameters

Thickness	2"
Density	8pcf
Standard Product Form	Scrim Encapsulated
Nonstandard Product Form	Unfaced Blanket
Product Availability	24"w x 20LF
	48"w x 20LF

Installation

The FyreWrap MAX 2.0 Duct Insulation ICC ES System consists of a two-layer system applied directly to the duct surface. When desired, unfaced blanket is permitted for use as the inner layer. The outer layer requires encapsulated blanket. The FyreWrap MAX 2.0 insulation system may be installed at zero clearance to combustibles at any point.

The first layer can be installed with transverse (perimeter) joints butted and minimum 3" longitudinal overlaps on the topside of horizontal ducts. All overlaps for the second, or outer layer, are required to be a minimum of 3". For the second layer, transverse (perimeter) overlaps of adjacent blankets may be installed using one of the following three methods:

Telescoping Overlap Wrap Technique:

This wrap technique is the most common method of installing FyreWrap MAX 2.0 where each adjacent blanket has one edge exposed and one edge covered by the next blanket. (Shown in Figure 1.)

Cut the first piece of inner layer insulation to a length sufficient to wrap around the duct and provide a 3" longitudinal overlap on the topside of the duct. Install the adjacent inner layer piece so that the blanket edge is butted against the preceding piece, forming a tight perimeter joint. This

piece also requires a 3" longitudinal overlap on the topside of the duct. Space the starting edge of the outer layer a maximum 3" from the exposed edge of the inner layer. All joints on the second layer require a minimum 3" overlap. Ends of the outer overlaps occur on the topside of the horizontal section and backside of the vertical section of the duct, alternating nominal 8" on either side of the longitudinal centerline with each successive wrap piece. All cut edges shall be sealed with aluminum foil tape.

Checkerboard Overlap Wrap Technique:

This installation uses a 3" overlap pattern with both edges of each alternating blanket covered by each adjacent blanket whose edges are exposed. The overlap joints in alternate layers of blanket resemble a checkerboard pattern in the completed installation. This technique is often utilized when a small section of duct wrap must be repaired.

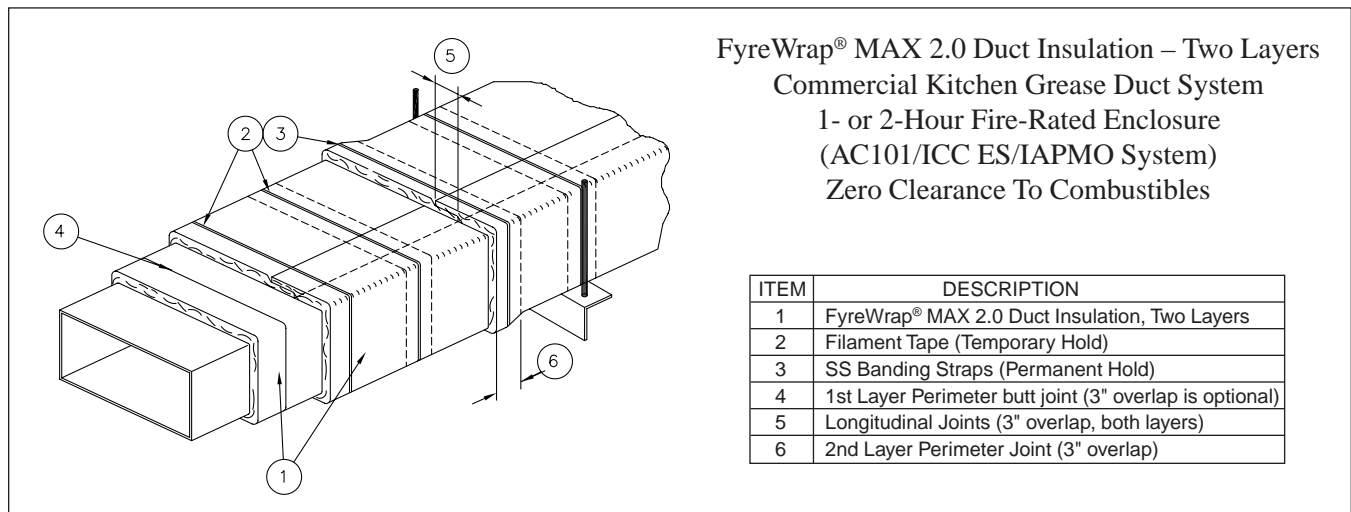
Butt Splice with Collar Wrap Technique:

This wrap technique permits installation with the blanket edges butted together and a 6" wide collar of blanket that is centered over the butt splice, overlapping each adjacent blanket 3". The collar can be field fabricated from FyreWrap MAX 2.0 rolls or purchased separately.

Vertical Duct Runs

For vertical runs, the insulation can be applied to the duct in a continuous length applied parallel with the length of the duct as opposed to wrapping around the duct. All overlaps are to be maintained at a minimum 3" and are to occur a minimum of 6" from any corner of the duct. The second layer is to be centered over the overlapped seam of the first layer. Pins spaced a maximum 8" o.c. are to be placed at the centerline of all vertically oriented overlaps.

Figure 1. 2-layer detail



FyreWrap® MAX 2.0 Duct Insulation – Two Layers
 Commercial Kitchen Grease Duct System
 1- or 2-Hour Fire-Rated Enclosure
 (AC101/ICC ES/IAPMO System)
 Zero Clearance To Combustibles

ITEM	DESCRIPTION
1	FyreWrap® MAX 2.0 Duct Insulation, Two Layers
2	Filament Tape (Temporary Hold)
3	SS Banding Straps (Permanent Hold)
4	1st Layer Perimeter butt joint (3" overlap is optional)
5	Longitudinal Joints (3" overlap, both layers)
6	2nd Layer Perimeter Joint (3" overlap)

Attachment Options

Three attachment options are available for installers. Choices are limited by the duct width dimension. Details on each option are provided below.

Banding Only: For Duct Widths 24" or Less

To temporarily secure the insulation, optional use of filament tape is permitted. Place stainless steel bands (min. ½" wide, nom. 0.015" thick) over joints and within the field around the wrap. Locate bands 1½" from each edge of each blanket overlap. Place a minimum of two additional bands in the field area between the overlaps on maximum 8" centers. Tighten banding to firmly hold the wrap system in place but not so tight as to cut or damage the blanket. Pins are NOT required when this banding technique is used.

Banding and Pins: For Duct Widths Up To 48"

Weld 12-gauge steel insulation pins to the underside of horizontal runs and backside of vertical runs. Place pins at maximum 12" rows and on maximum 10½" centers. To temporarily secure the insulation, optional use of filament tape is permitted. Impale FyreWrap MAX 2.0 over the pins

and hold in place with minimum 1.5" square or round galvanized steel speed clips (washers). Turn down or cut off exposed ends of pins to eliminate safety hazards. Locate carbon steel or stainless steel bands (min. ½" wide, nom. 0.015" thick) 1½" from each edge of an overlap joint. Locate a second band midpoint between the overlapped joints, approximately 10½" on center. Tighten banding to firmly hold the wrap system in place but not so tight as to cut or damage the blanket. Cup head style pins are also permitted and shall be located at the same spacing as pre-welded pins.

Pins Only: For Any Duct Width

Weld 12-gauge steel insulation pins on all sides of the duct. Place insulation pins in rows (perpendicular to the length of the duct) spaced maximum 10½" on center. Pins in each row are maximum 5" from each duct edge and maximum 8" on center. Locate insulation overlaps so they are centered on the pins. Impale FyreWrap MAX 2.0 over the pins and hold in place with minimum 1.5" square or round galvanized steel speed clips (washers) to keep the system from sagging. Turn down or cut off exposed ends of pins to eliminate safety hazards. Cup head style pins are also permitted and shall be located at the same spacing as pre-welded pins.

Attachment Options (Summary Chart):

Duct Dimension	Banding Only	Banding & Pins (Pins on Bottom)	Pins Only (All Four Sides)
Width ≤ 24"	●	●	●
Width Up To 48"		●	●
Width > 48"			●



Access Door

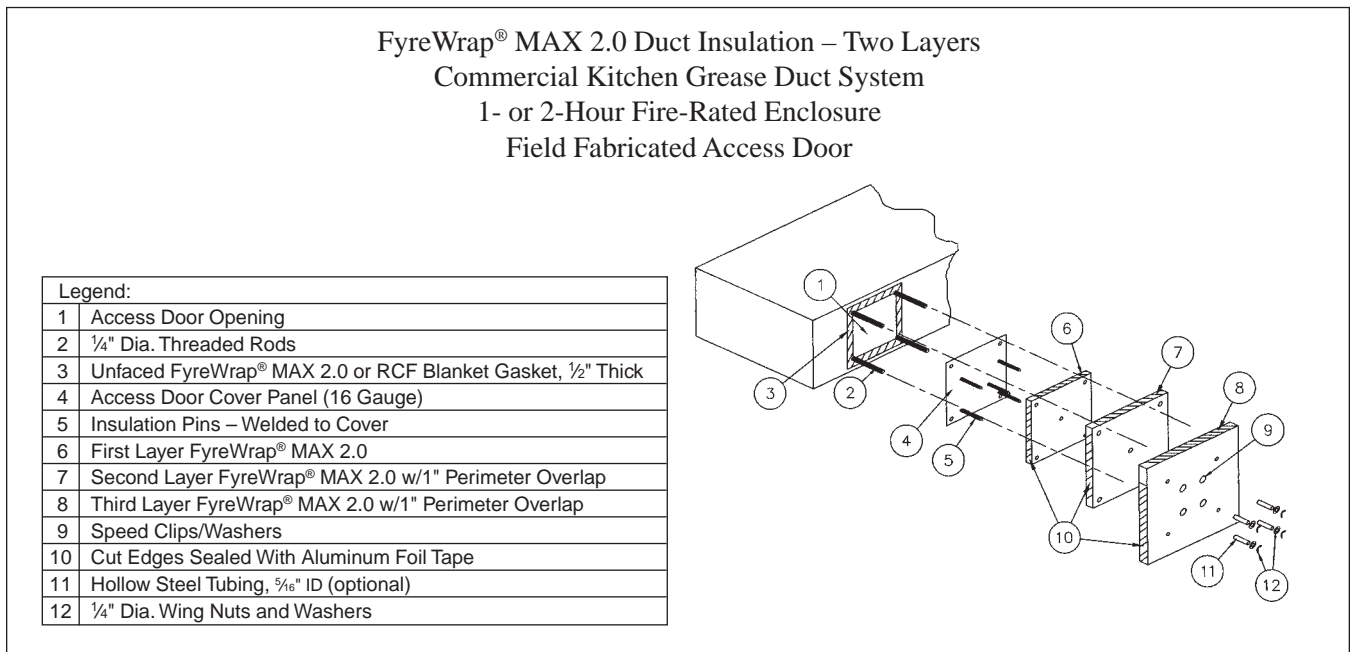
Field fabricated access doors are protected with three layers of FyreWrap MAX 2.0 Duct Insulation. A gasket of 0.5" thick unfaced FyreWrap or ceramic fiber blanket is initially installed between the duct and the access door cover. Weld threaded rod to each corner of the access door opening. Cover with hollow steel tubes (optional) for easy removal of blanket. Weld at least five steel insulation pins to the outside of the door cover panel, 1" from each corner and approximately in the door center. Cut through the two layers of FyreWrap MAX 2.0 Duct Insulation already covering the duct and access door opening. Leave the interior piece in place. Cut back the outer layer to form an opening with perimeter dimensions that extend 1" beyond the inner layer. Cut a piece of FyreWrap MAX 2.0 that matches the dimensions of the opening and install over pins to fit tightly within the existing material. Cut an additional piece of insulation with perimeter dimensions that extend 1" beyond the layer below. Install over


the insulation pins. Throughout the installation process, seal all cut edges with aluminum foil tape. Secure with washers and bend over excess pin lengths to eliminate safety hazards. Place washers on threaded rod and secure with nuts. Do not install banding over this area. See Figure 2 for details.

Duct Support

Horizontal duct support systems do not require FyreWrap insulation when constructed using a minimum 0.5" diameter uninsulated all-thread steel rod and 2" x 2" x 0.25" un-insulated steel angle spaced a maximum 60" on center along the length of the duct. A minimum clearance of 1" is required between the protected duct and the steel rod. For all other duct support configurations, a single layer of FyreWrap MAX 2.0 Duct Insulation is required on all components. Utilize a minimum 3" overlap (approximately one quarter turn) on all joints.

Figure 2. Access Door



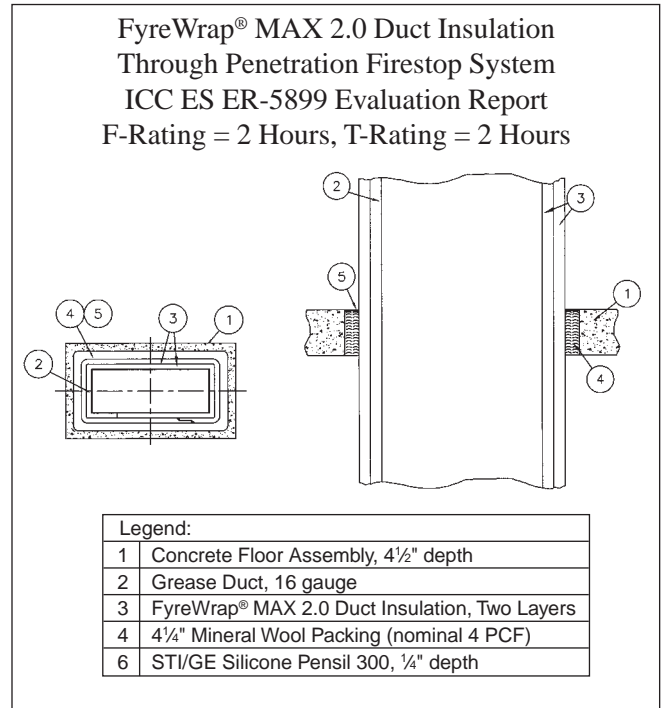
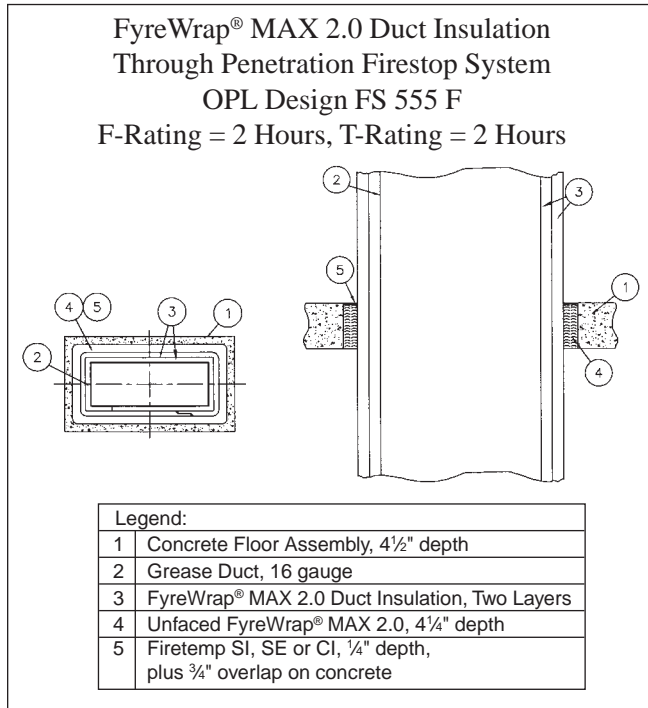
 Listed <small>Reference Directory of Listed Building Products, Materials & Assemblies for Specifiers www.opl.com</small>	APPLIED FIRE PROTECTION UNIFRAX CORPORATION New Carlisle, IN. Listing # 16341-3
	FYREWAP® 0.5, 1.5, MAX 2.0 Maximum Density: 8 pcf Tested per: UL 1978 (June 2002) - Sec. 14 & 15 - Passed ASTM E 119 - Fire Resistance Rating: 2 hr. ASTM E 814 - T-Rating: 2 hr., F-Rating: 2 hr. AC 101 (Engulfment) - Passed AC 101 (Internal) - Passed ISO 6944 - Duct Type: A, Stability, Insulation & Integrity Rating of 1-2 hr. UL 1887 - Max. Flame Spread: 0.01 ft., Max. Smoke (o.d.): 0.01, Avg. Smoke (o.d.): 0.00

Firestop Systems

Where ducts insulated with FyreWrap MAX 2.0 pass through fire-rated walls and floors, the penetration opening shall be firestopped to maintain the fire rating of the assembly. Two Firestop Systems acceptable for use with FyreWrap MAX 2.0

ICC ES System are detailed below. Contact Unifrax Application Engineering Group at 716-278-3888 for additional information on newly available firestop systems.

Figure 3. Firestop Systems



OPL Design No. FS 555F

Fill annular space using unfaced 2 inch thick, 8pcf FyreWrap MAX 2.0 blanket. Cut the blanket into 9-inch strips. Then fold the blanket into a "U" shape and compress it approximately 37% and insert it into the opening to fill the entire annular space. Recess the surface of packing material a minimum ¼ inch from the top surface of the floor, as required to accommodate the necessary depth of caulk fill material.



ICC ES ER-5899 Recognized System

Fill annular space to a depth of 4¼ inches using minimum 4pcf mineral wool batt insulation firmly packed into the opening. The annular space between the insulated duct and the periphery of the opening shall be a maximum of 1" with the duct centrally located within the opening. Packing material shall be recessed from the top surface of floor or both surfaces of the wall as required to accommodate the required thickness of firestop sealant. Install a minimum ¼" thickness of sealant within the annulus, flush with top surface of the floor and with both surfaces of the wall.



The test data shown are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

Other Fire Protection Products and Applications

Unifrax offers many UL listed Fiberfrax® and FyreWrap® product forms and FyreWrap fire protection materials for passive fire protection applications, such as:

Product	UL File Number
FyreWrap® Duct Insulation	R14514
Insulfrax® 1800 Blanket	R14514
Fiberfrax® Durablanket® Ceramic Fiber Blanket	R14514
Fiberfrax® Duraboard® Ceramic Fiber Board LD	E75289
Fiberfrax® Ceramic Fiber Papers (110/440)	E75289
Fiberfrax® Ceramic Fiber Papers (970)	MH7030
Fiberfrax® Lo-Con™ Felt	MH7030
Fiberfrax® Moist Pak-D®	E75289

These products offer solutions in applications such as:

- Cable Trays, Conduits
- Control System Covers
- Above Ground Storage Tanks
- Marine Bulkheads, Decks
- Structural Steel
- Construction Joints
- Curtain Walls/Safing
- Circuit Protection
- Grease, HVAC Ducts
- Railroad Tank Cars
- Transit Cars
- Ships
- Expansion Joints
- Fire Door Seals
- Chimney Liners
- Ceiling Air Diffusers
- Hazardous Material Storage Containers



Unifrax has a wide range of FyreWrap fire protection materials available to provide passive fire protection solutions in a variety of applications in the commercial building, industrial facility and transportation industries.

For additional information about product performance or to identify the recommended product for your fire protection application, please contact the Unifrax Application Engineering Group at 716-278-3888.



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Unifrax Corporation
Corporate Headquarters
2351 Whirlpool Street
Niagara Falls, New York 14305-2413
Telephone: 716-278-3800
Telefax: 716-278-3900
Internet: www.unifrax.com
Email: info@unifrax.com