FyreWrap

TECHNICAL BULLETIN

Technical Bulletin: FP-2005-3
May 9, 2005

FyreWrap Specification Documents Available from FirstSource, Inc.

Unifrax has developed three new documents in conjunction with FirstSource, Inc. to ensure up-to-date information on FyreWrap Duct Insulation is available for design professionals. These documents include:

Product Information – Unifrax company listing providing product information used to assist with preliminary product selection.

- Product description, applications
- Features, Advantages
- Construction, Materials, Finishes
- Properties, Performance
- Company Contact Information
- Photos - illustrate application ideas

Spec-Data – FyreWrap datasheet that provides accurate performance data, technical and installation information for specification change requests.

- Organized in a 10-part format to simplify review by engineers and specifiers.
- Easy to compare and select products based upon technical attributes.

Manu-Spec – FyreWrap specification that provides manufacturer guide specifications in the CSI 3-part SectionFormat™.

- Available in word processor, .pdf, MASTERSPEC®, and SPECTEXT™ formats.
- Easy insertion in specifications for commercial and government projects.

First Source
www.FirstSourceONL.com

SPEC DATA® MANU SPEC®

Copies of all three documents are attached and are also available for free online downloading at www.FirstSourceONL.com (search using Unifrax or FyreWrap key words) or the Unifrax web site at www.unifrax.com.

Unifrax also provides FyreWrap and generic flexible duct enclosure educational sessions for Architects, Engineers and Spec Writers. To obtain assistance with specifying FyreWrap or to schedule an educational session, please contact:

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Unifrax Corporation

Niagara Falls, NY

FyreWrap® Duct Insulation

Unifrax Corporation is a leading producer of high-temperature insulation products for a wide variety of industrial applications. Unifrax has offered its worldwide customers high quality products, service and support for over 60 years.

Product Description, Applications

FyreWrap® fire protection insulation products are a family of high-temperature insulation blankets specifically designed to provide flexible fire protection wrap and utilized as an alternative to fire resistance rated shaft enclosures. Applications include kitchen exhaust grease ducts, ventilation ducts, stairwell pressurization ducts, smoke extraction, chemical fume exhaust ducts, and refuse and trash chutes. It can be used to cover plastic pipe and cables to limit flamespread and smoke generation in fire-rated air plenums.

FYREWRAP® EZ 1.5 DUCT INSULATION
FyreWrap EZ 1.5 Duct Insulation is an optimized single layer flexible enclosure for 1- and 2-hour fire-rated kitchen exhaust and chemical fume ducts. The slim, compact design results in significant weight, space and labor savings compared to traditional gypsum shaftwalls or competitive wrap systems. The 1.5" (38 mm), 6 pcf (96 kg/m^3) density system complies with the IMC code requirements and is tested per UL 1978.

FYREWRAP® 1.5 DUCT INSULATION
FyreWrap 1.5 Duct Insulation is a high-temperature insulation blanket specifically designed to provide a flexible enclosure for 1- and 2-hour rated ventilation ducts. FyreWrap 1.5 Duct Insulation provides a tested, alternate fire protective enclosure in lieu of constructing a traditional shaftwall enclosure. The single layer 1.5" (38 mm) thick system is tested per ISO 6944.

FYREWRAP® MAX 2.0 DUCT INSULATION
FyreWrap MAX 2.0 Duct Insulation is a high-temperature insulation blanket specifically designed to provide a flexible enclosure for 1- and 2-hour rated kitchen exhaust ducts. FyreWrap MAX 2.0 Duct Insulation provides a tested, fire-protective enclosure acceptable as an alternate to constructing a traditional rated shaftwall. The 2-layer system utilizing 2" (51 mm), 8 pcf (128 kg/m^3) blankets complies with ICC-ES AC101 acceptance criteria and UMC code requirements.

Features, Advantages

- High-temperature, biosoluble insulation
- Zero clearance to combustibles at all locations on wrap
- Alternate to fire-rated shaft enclosure
- Easy to cut, fabricate and install around ducts

Construction, Materials

FyreWrap incorporates Insulfrax® Thermal Insulation, a high-temperature insulation made from a calcia, magnesia, silica chemistry designed to enhance biosolubility. The core insulation blanket is completely encapsulated in an aluminum foil, fiberglass reinforced scrim covering that provides additional handling strength and protection from tearing and moisture absorption.

Contact

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Unifrax Corporation

1. Product Name

- FyreWrap® EZ 1.5 Duct Insulation
- FyreWrap® 1.5 Duct Insulation
- FyreWrap® MAX 2.0 Duct Insulation
- FyreWrap® 0.5 Plenum Insulation

2. Manufacturer

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3. Product Description

FyreWrap® fire protection product family

BASIC USE

FyreWrap® fire protection insulation products are a family of high-temperature flexible insulation blankets specifically designed to provide a fire protective wrap, and are utilized as an alternative to fire resistance rated shaft enclosures. Applications include kitchen exhaust grease ducts, ventilation ducts, stairwell pressurization ducts, smoke extraction ducts, chemical fume exhaust ducts, refuse and trash chutes, and dryer and toilet exhaust ducts. It can be used to cover plastic pipe and cables to limit flamespread and smoke generation in fire-rated air plenums.

FyreWrap® EZ 1.5 Duct Insulation

FyreWrap EZ 1.5 Duct Insulation is an optimized single layer flexible enclosure for 1- and 2-hour fire-rated kitchen exhaust and chemical fume ducts. The slim, compact design results in significant weight, space and labor savings compared to traditional gypsum shaftwalls or competitive wrap systems. The 1.5" (38 mm), 6 pcf (96 kg/m^3) density system complies with the IMC and NFPA 96 code requirements and is tested per UL 1978.

FyreWrap® 1.5 Duct Insulation

FyreWrap 1.5 Duct Insulation is a high-temperature insulation blanket specifically designed to provide a flexible enclosure for 1- and 2-hour rated ventilation ducts. FyreWrap 1.5 Duct Insulation provides a tested, alternate fire protective enclosure in lieu of constructing a traditional shaftwall enclosure. The single layer 1.5" (38 mm) thick system is tested per ISO 6944. A 2-layer FyreWrap 1.5 system is UL classified per UL 1978 for 2 hour protection of grease ducts, and complies with IMC and NFPA 96 code requirements.

FyreWrap® MAX 2.0 Duct Insulation

FyreWrap MAX 2.0 Duct Insulation is a high-temperature insulation blanket specifically designed to provide a flexible enclosure for 1- and 2-hour rated kitchen exhaust ducts. FyreWrap MAX 2.0 Duct Insulation provides a tested, fire-protective enclosure acceptable as an alternate to constructing a traditional rated shaftwall. The 2-layer system utilizing 2" (51 mm), 8 pcf (128 kg/m^3) blankets complies with ICC-ES AC101 acceptance criteria and UMC, IAPMO UMC, IMC and NFPA 96 code requirements.

FyreWrap® 0.5 Plenum Insulation

FyreWrap 0.5 Plenum Insulation is a high temperature insulation blanket specifically designed to provide a single-layer, flexible enclosure around combustible items located within fire-rated return air plenums. New construction, building renovations or modifications to the electrical and mechanical systems may result in the installation of plastic pipe that cannot meet the minimum combustibility requirements defined in the Mechanical Code. FyreWrap 0.5 Plenum Insulation provides fire protection for these installed items by preventing flame propagation and smoke development in the plenum area.

COMPOSITION & MATERIALS

FyreWrap incorporates Insulfrax® Thermal Insulation, a high-temperature insulation made from a calcia, magnesia, silica chemistry designed to enhance biosolubility. The core insulation blanket is completely encapsulated in an aluminum foil, fiberglass reinforced scrim covering that provides additional handling strength and protection from tearing, moisture and grease absorption.

4. Technical Data

APPLICABLE STANDARDS

ASTM International

- ASTM C411 Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation
- ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
- ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

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- ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops

Underwriters Laboratories, Inc. (UL)
- UL 1887 Fire Test of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics (modified)
- UL 1978 Standard for Grease Ducts (FyreWrap EZ 1.5 Duct Insulation only)

International Organization for Standardization (ISO) - ISO 6944 Fire resistance tests -- Ventilation ducts (FyreWrap 1.5 Duct Insulation only)

APPROVALS

ICC Evaluation Services (ICC ES)
- FyreWrap EZ 1.5 Duct Insulation - Legacy Report NER-609
- FyreWrap 1.5 Duct Insulation - Research Report No. NER-609
- FyreWrap MAX 2.0 Duct Insulation - Legacy Report ER-5899; ICC-ES AC101 Acceptance Criteria for Grease Duct Enclosure Assemblies

Omega Point Laboratories (OPL)
- FyreWrap EZ 1.5 Duct Insulation - File No. 16341-4, Design Nos. GD 572F, GD 573F, CFD 510F, FS 589W, FS 590F, FS 591W
- FyreWrap 1.5 Duct Insulation - Applied Fire Protection, File No. 16341-3, Design Nos. VAD 537F, NBW 338, FS 554W, FS 580W
- FyreWrap MAX 2.0 Duct Insulation - File No. 16341-3, Design Nos. GD 564F, FS 555F, FS 580W
- FyreWrap 0.5 Plenum Insulation - File No. 16341-3, Design Nos. PP 102, PP 103

Underwriters Laboratories, Inc. (UL)
- Grease Duct Enclosure, YYET, File R14514 (FyreWrap 1.5 only)
- Firestop System C-AJ-7048 - F-Rating, 2 hours; T-Rating, 2 hours (FyreWrap 1.5 only)

National Fire Protection Association (NFPA) - NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

Southern Building Code Congress International (SBCCI)
- Standard Mechanical Code
- Standard Building Code

International Association of Plumbers and Mechanical Officials (IAPMO)
- Uniform Mechanical Code
- IAPMO Mechanical Code

International Conference of Building Officials (ICBO) - Uniform Building Code

International Code Council (ICC) - International Mechanical Code

PHYSICAL/CHEMICAL PROPERTIES

FyreWrap EZ 1.5 Duct Insulation
- Thickness - 1.5" (38 mm)
- Density - 6 pcf (96 kg/m^3)
- Internal Grease Duct Test (UL 1978 Sect. 12, 13) - Zero clearance to combustibles at all locations on wrap
- Full Scale Engulfment Test (ASTM E119) - 2-hour fire endurance rating
- Through-Penetration Firestop Test (ASTM E814) - F-Rating, 2 hours; T-Rating, 2 hours
- Flamespread (ASTM E84) - Unfaced blanket, 0; encapsulated, < 25
- Smoke developed (ASTM E84) - Unfaced blanket, 0; encapsulated, < 50
- Noncombustibility Test (ASTM E136) - Pass
- Thermal Transmission/Durability Test (ASTM C518) - Pass
- Hot Surface Performance Test (ASTM C411) - Pass

FyreWrap 1.5 Duct Insulation
- Thickness - 1.5" (38 mm)
- Density - 8 pcf (128 kg/m^3)
- Full Scale Engulfment Test (ISO 6944) - 2 hour fire rating for ventilation air ducts (VAD)
- Internal Grease Duct Test (UL 1978) - Zero clearance to combustibles; 2-layer system
- Full Scale Engulfment Test (ASTM E119) - 2-hour fire rating; 2-layer system
- Full Scale Wall Test (ASTM E119) - 2-hour fire rating; 2-layer system
- Through-Penetration Firestop Test (ASTM E814) - F-Rating, 2 hours; T-Rating, 2 hours
- Flamespread (ASTM E84) - Unfaced blanket, 0; encapsulated, < 25
- Smoke developed (ASTM E84) - Unfaced blanket, 0; encapsulated, < 50
- Noncombustibility Test (ASTM E136) - Pass
- Thermal Transmission/Durability Test (ASTM C518) - Pass
- Hot Surface Performance Test (ASTM C411) - Pass

FyreWrap MAX 2.0 Duct Insulation
- Thickness - 2" (51 mm)
- Density - 8 pcf (128 kg/m^3)
- Internal Grease Duct Test (AC 101) - Zero clearance to combustibles at any location on wrap
- Full Scale Engulfment Test (ASTM E119) - 2-hour fire rating
- Flamespread (ASTM E84) - Unfaced blanket, 0; encapsulated, < 25
- Smoke developed (ASTM E84) - Unfaced blanket, 0; encapsulated, < 50

FyreWrap® duct insulation

- Through-Penetration Firestop Test (ASTM E814) - F-Rating, 2 hours; T-Rating, 2 hours
- Noncombustibility Test (ASTM E136) - Pass
- Thermal Transmission/Durability Test (ASTM C518) - Pass
- Hot Surface Performance Test (ASTM C411) - Pass

FyreWrap 0.5 Plenum Insulation
- Thickness - 0.5" (12.7 mm)
- Density - 8 pcf (128 kg/m^3)
- Plastic Pipe Test (UL 1887) - Pass
- Flamespread (ASTM E84) - Unfaced blanket, 0; encapsulated, < 25
- Smoke developed (ASTM E84) - Unfaced blanket, 0; encapsulated, < 50
- Noncombustibility Test (ASTM E136) - Pass
- Thermal Transmission/Durability Test (ASTM C518) - Pass
- Hot Surface Performance Test (ASTM C411) - Pass
- Plastic pipe and cable types - PVC, CPVC, PB, PE, PP, PVDF and ABS
- Plastic pipe size - 1" (25.4 mm) or larger individual pipes or bundles
- Plastic coated cable groupings - 3 or more multi-stranded telecommunication wires

5. Installation

PREPARATORY WORK

Handle and store product according to Unifrax Corporation's recommendations. Contact manufacturer for information.

METHODS

FyreWrap EZ 1.5 Duct Insulation

This product consists of a single-layer system applied directly onto the duct surface. Use only encapsulated or scrim faced one-side blanket to ensure the outer surface of the insulation is protected. The insulation system may be installed at zero clearance to com-

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bustibles at all locations on the wrap, at material overlaps, and in the field between overlaps. Install insulation with a 3" (76 mm) minimum overlap on all joints. Seal all cut edges with aluminum foil tape.

Installation Techniques (3)

- Telescoping overlap - One edge exposed, one edge covered by the adjacent blanket (most common technique)
- Checkerboard overlap - Both edges of each alternating blanket are covered by each adjacent blanket whose edges are exposed (most often utilized for duct wrap repairs)
- Butt splice with collar - Blanket edges are butted together and a 6" (152 mm) wide collar of blanket is centered over the butt splice, overlapping each adjacent blanket 3" (76 mm)

Vertical Duct Runs

Insulation may be applied to the duct in a continuous length parallel to the vertical length of the duct. All material overlaps are minimum 3" (76 mm) and are to occur a minimum of 6" (152 mm) from any corner of the ducts. Pins are used to attach the blanket to the duct surface and are spaced 8" (203 mm) on center.

Attachment Options (3)

- Banding only (for duct widths 24" (610 mm) or less) - Use stainless steel bands (minimum 1/2" (12.7 mm) wide, 0.015" (0.4 mm) thick) to hold blanket securely to duct surface. Locate 1 1/2" (38 mm) from each blanket edge and on 8" (203 mm) centers
- Banding and pins (for duct widths up to 24" x 48" (610 x 1219 mm)) - Weld 12 gauge steel insulation pins to the underside and backside of duct runs. Place on maximum 12" (305 mm) rows and on maximum 10 1/2" (267 mm) centers. Impale blanket over pins and hold in place with 2 1/2" (64 mm) square galvanized steel speed clips. In addition, use stainless steel bands (minimum 1/2" (12.7 mm) wide, 0.015" (0.4 mm) thick) located 1 1/2" (38 mm) from each blanket edge and on 10 1/2" (267 mm) centers to secure blanket to the duct surface
- Pins only (for any duct width, mandatory for ducts > 48" (1219 mm) wide) - Weld 12 gauge steel insulation pins on all sides of duct. Place on maximum 10 1/2" (267 mm) rows and on maximum 8" (203 mm) on centers. Hold in place with 2 1/2" (64 mm) square galvanized steel speed clips

FyreWrap® EZ 1.5 Duct Insulation in area with limited space and access

FyreWrap 1.5 Duct Insulation

For 1- and 2-hour fire-rated Ventilation Air Ducts (VAD), a single layer system is applied directly on to the duct. Install insulation blanket with a 3" (76 mm) minimum overlap on all joints. Steel banding is used to permanently attach the blanket to the duct, placed 1 1/2" (38 mm) from blanket edges and 10 1/2" (267 mm) on center. For ducts greater than 24" (610 mm) wide, steel insulation pins shall be welded on the bottom and backside of duct runs. Space pins in columns 12" (305 mm) on center and 10 1/2" (267 mm) apart. Secure blanket with speed clips.

FyreWrap MAX 2.0 Duct Insulation

This product consists of a 2-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. This system may be at zero clearance to combustibles at any point.

The first layer can be installed with transverse (perimeter) joints butted and minimum 3" (76 mm) longitudinal overlaps on the topside of horizontal ducts. All overlaps for the second, or outer layer, are required to be a minimum of 3" (76 mm).

Secure the insulation to the duct with stainless steel banding (minimum 1/2" (12.7 mm) wide, 0.015" (0.4 mm) thick) located 1 1/2" (38 mm) from each blanket edge and on 10 1/2" (267 mm) centers to secure blanket to the duct surface. For ducts greater than 24" (610 mm) wide, steel insulation pins shall be welded on the bottom and backside of duct runs. Space pins in columns 12" (305 mm) on center and 10 1/2" (267 mm) apart. Secure blanket with speed clips.

FyreWrap 0.5 Plenum Insulation

This system consists of a single layer applied directly on to the surface of the combustible item. Install insulation blanket so that all material joints are overlapped a minimum 1" (25.4 mm). Temporarily secure the insulation with optional 1" (25.4 mm) wide filament tape. Stainless steel tie wire or banding is utilized for permanent attachment, spaced 1/2" (12.7 mm) from blanket edge and approximately 11 1/2" (292 mm) on center.

Complete installation recommendations are available from the manufacturer.

BUILDING CODES

Current data on building code requirements and product compliance may be obtained from the manufacturer's technical support specialists. Installation must comply with the requirements of applicable local, state and national code jurisdictions.

6. Availability & Cost

AVAILABILITY

Consult manufacturer for information on local availability.

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COST

Budget installed cost information may be obtained from the manufacturer.

7. Warranty

Complete warranty terms and conditions are available from the manufacturer. Consult Unifrax Corporation for details.

8. Maintenance

When installed per Unifrax FyreWrap installation instructions, FyreWrap does not require maintenance. If any part of the FyreWrap Duct Insulation is damaged to the point that the core insulation blanket is damaged, the affected areas shall be repaired. Cut the necessary banding or remove the insulation washers (speed clips) on the damaged blanket pieces and remove. Cut new blanket pieces with the exact dimensions of those removed. Install on ductwork in the same configuration as previously existed, ensuring the same minimum material overlap is created.

Replace permanent attachment (steel banding straps or insulation washers) to secure the blanket firmly in place.

9. Technical Services

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

10. Filing Systems

- Reed First Source
- MANU-SPEC®
- Additional product information is available from the manufacturer upon request.

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This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Manual of Practice*, including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets [ ]; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies flexible high temperature insulation blankets manufactured by Unifrax Corporation. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

SECTION 07840
FIRESTOPPING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifier's practice.

1. Materials and installation for flexible high temperature insulation blanket used to protect kitchen grease exhaust, chemical fume exhaust, dryer exhaust, toilet exhaust and other ventilation air ducts along with refuse and laundry chutes.
2. Materials and installation for flexible high temperature insulation blanket used to protect PVC, CPVC, PB, PE, PP, PVDF and ABS pipe and cable sheathing.

B. Related Sections:

1. Division 1 Section: Submittal Procedures.
2. Division 1 Section: Quality Control.
3. Division 1 Section: Closeout Submittals.
4. Division 7 Section: Batt and Blanket Insulation.
5. Division 7 Section: Applied Fireproofing.
6. Division 15 Section: Thermal Insulation for Ducting.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 1 References Section may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section. Retain only those reference standards to be used within the text of this Section. Add and delete as required for specific project.

1.02 REFERENCES

A. ASTM International:

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1. ASTM C411 Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
2. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
3. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials.
5. ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
6. ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
7. ASTM E2336 Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems.

B. International Association of Plumbing and Mechanical Officials (IAPMO):
1. IAPMO Uniform Mechanical Code (UMC).

C. International Code Council (ICC):
1. ICC International Mechanical Code (IMC), 2003.
2. ICC International Building Code (IBC), 2003.
3. ICC Uniform Building Code (UBC), 1997.
4. ICC Legacy Report ER-5899, 2004.

D. International Organization for Standardization (ISO):
1. ISO 6944 Fire Resistance Tests - Ventilation ducts.

E. National Fire Protection Association (NFPA):
1. NFPA 90A Standard for the Installation of Air-Conditioning and Ventilating Systems.
2. NFPA 90B Standard for the Installation of Warm Air Heating and Air Conditioning Systems.
3. NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
4. NFPA 101 Life Safety Code.

F. Omega Point Laboratories (OPL):
1. Applied Fireproofing, files 16341-3 and 16341-4.

G. Underwriters Laboratories of Canada (ULC):
1. CAN-ULC-S101-04 Standard Methods of Fire Endurance Tests of Building Construction and Materials.
2. Grease Duct Insulation Listing, File CR2700.
3. Fire Resistant Duct Listing, File CR2828.

H. Underwriters Laboratories, Inc. (UL):
1. UL 1887 Standard for Fire Test of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics.
2. UL 1978 Standard for Grease Ducts.
3. Grease Duct Enclosure Classification (YYET), File R14514.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Division 1 Submittal Procedures Section.

1.03 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures.

B. Product Data: Submit manufacturer's product data and installation instructions for Duct and Plenum Insulation, including manufacturer's SPEC-DATA® product sheet. Include fire endurance rating, thickness, density and available sizes.

C. Drawings:
1. Submit shop drawings detailing installation procedures, including layout, dimensions, and support placement.

D. Quality Assurance:

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1. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
2. Manufacturer's Instructions: Manufacturer's installation instructions.

Specifier Note: Coordinate paragraph below with Part 3 Field Quality Requirements Article. Retain or delete as applicable.

E. Manufacturer's Field Reports: Indicate and interpret test results for compliance with performance requirements.

F. Closeout Submittals: Submit the following:

1. Warranty: Warranty documents specified herein.
2. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during installation.
3. Fabricator Qualifications: Fabrication performed in quality controlled manufacturing environment by experienced fabricators with references indicating multiple satisfactory experiences fabricating high temperature insulation blanket as required for this project.

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Division 1 Regulatory Requirements Section. Repetitive statements should be avoided.

B. Regulatory Requirements: Provide high temperature insulation blankets that comply with following requirements:

1. IAPMO Uniform Mechanical Code (UMC).
2. ICC International Mechanical Code (IMC).
3. ICC International Building Code (IBC).
4. ICC Uniform Building Code (UBC).
5. NFPA 96.
6. NFPA 101.

C. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings).

1.05 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirements.

B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Delivery, Storage and Protection:

1. Store insulation blankets to prevent accidental damage prior to installation.

Specifier Note: Coordinate article below with Conditions of the Contract and with Division 1 Closeout Submittals (Warranty).

1.06 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

PART 2 PRODUCTS

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Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as “or equal” or “or approved equal” or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining “or equal” products.

2.01 FLEXIBLE HIGH TEMPERATURE INSULATION BLANKET

A. Manufacturer: Unifrax Corporation.

1. Contact: 2351 Whirlpool St., Niagara Falls, NY 14305-2413; Telephone: (716) 278-3800; Fax: (716) 278-3900; E-mail: info@unifrax.com; website: www.unifrax.com.

B. Proprietary Products/Systems: Unifrax FyreWrap Insulation.

Specifier Note: Specify FyreWrap 0.5 Plenum Insulation for enclosure of combustible items within fire-rated return air plenums.

1. FyreWrap 0.5 Plenum Insulation:

a. High temperature insulation core of calcia, magnesia and silica with aluminum foil, fiberglass-reinforced scrim encapsulation.

b. 1/2 inch (12.7 mm) thick × [24 inches (610 mm)] [48 inches (1220 mm)] wide × 25 feet (7620 mm) long.

c. Density: 8 pcf (128 kg/m^3).

d. Flamespread (ASTM E84): Unfaced blanket, 0; encapsulated, < 25.

e. Smoke Developed (ASTM E84): Unfaced blanket, 0; encapsulated, < 50.

f. Passes ASTM E136, noncombustibility test, ASTM C518, thermal transmission/durability test and ASTM C411, hot surface performance test.

g. Passes modified UL 1887 with single-layer system.

h. Designed to protect minimum 1 inch (25.4 mm) pipe or pipe bundles.

i. Designed to protect minimum of 3 multi-stranded telecommunication wires, each minimum 24 gauge and 26 strands.

Specifier Note: FyreWrap 1.5 Duct Insulation may be specified for 1- and 2-hour rated enclosures for kitchen exhaust ducts and HVAC ducts.

2. FyreWrap 1.5 Duct Insulation:

a. High temperature insulation core of calcia, magnesia and silica with aluminum foil, fiberglass-reinforced scrim encapsulation.

Specifier Note: Specify 1-layer system to obtain 1-hour fire endurance rating from ISO 6944 for ULC and OPL, and 2-hour rating for OPL. Specify 2-layer system to obtain 2-hour fire endurance rating from ISO 6944 for ULC and 2-hour fire endurance rating per UL 1978.

b. [One-] [Two-] layer system.

c. 1.5 inch (38 mm) × [24 inches (610 mm)] [48 inches (1220 mm)] × 25 feet (7620 mm).

d. Density: 8 pcf (128 kg/m^3).

e. Flamespread (ASTM E84): Unfaced blanket, 0; encapsulated, < 25.

f. Smoke Developed (ASTM E84): Unfaced blanket, 0; encapsulated, < 50.

g. Passes ASTM E136, noncombustibility test, ASTM C518, thermal transmission/durability test and ASTM C411, hot surface performance test.

h. 2-hour fire rating per ASTM E119 Full Scale Wall and Engulfment Tests.

i. F-rating and T-rating of 2 hours per ASTM E814 Firestop Test.

j. 2-hour, 2-layer and 1-hour, 1-layer fire resistant HVAC duct rating per ULC File CR2828, Designs No. FRD-14, FRD-16.

k. 1- and 2-hour applied fire protection for 1-layer HVAC ducts per OPL file 16341-3.

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l. 2-hour applied fire protection for 2-layer grease ducts per OPL file 16341-3 and UL Classified system per UL 1978, file R14514.

Specifier Note: FyreWrap EZ 1.5 Duct Insulation may be specified for 1- and 2-hour fire-rated enclosures for kitchen exhaust ducts and chemical fume ducts.

3. FyreWrap EZ 1.5 Duct Insulation:
   a. High temperature insulation core of calcia, magnesia and silica with aluminum foil, fiberglass-reinforced scrim encapsulation.
   b. 1.5 inch (38 mm) × [24 inches (610 mm)] [48 inches (1220 mm)] × 25 feet (7620 mm).
   c. Density: 6 pcf (96 kg/m^3).
   d. Flamespread (ASTM E84): Unfaced blanket, 0; encapsulated, < 25.
   e. Smoke Developed (ASTM E84): Unfaced blanket, 0; encapsulated, < 50.
   f. Passes ASTM E136, noncombustibility test, ASTM C518, thermal transmission/durability test and ASTM C411, hot surface performance test.
   g. 2-hour fire rating per ASTM E119 Full Scale Engulfment Test.
   h. F-rating and T-rating of 2 hours per ASTM E814 Firestop Test.
   i. 2-hour applied fire protection for single-layer grease ducts per UL 1978, OPL listed in file 16341-4.

Specifier Note: FyreWrap MAX 2.0 Duct Insulation may be specified for 1- and 2-hour fire-rated enclosures for kitchen exhaust ducts to obtain 2-hour fire endurance rating with ICC compliance from Legacy Report ER-5899, or for ULC listing for Grease Duct Insulation, Design No. FRD-15.

4. FyreWrap MAX 2.0 Duct Insulation:
   a. High temperature insulation core of calcia, magnesia and silica with aluminum foil, fiberglass-reinforced scrim encapsulation.
   b. Two-layer system.
   c. 2 inches (51 mm) thick × [24 inches (610 mm) wide] [48 inches wide (1220 mm)] × 20 feet (6096 mm) long.
   d. Density: 8 pcf (128 kg/m^3).
   e. Flamespread (ASTM E84): Unfaced blanket, 0; encapsulated, < 25.
   f. Smoke Developed (ASTM E84): Unfaced blanket, 0; encapsulated, < 50.
   g. Passes ASTM E136, noncombustibility test, ASTM C518, thermal transmission/durability test and ASTM C411, hot surface performance test.
   h. 2-hour fire rating as per ASTM E119 Full Scale Engulfment Test.
   i. F-rating and T-rating of 2 hours per ASTM E814 Firestop Test.
   j. 2-hour applied fire protection for 2-layer grease ducts per AC101 (ASTM E2336), OPL listed in file 16341-3.

Specifier Note: Include following sentence for 2-layer system when used in Canada.

   k. ULC listed for Grease Duct Insulation File CR2700, Design No. FRD-15.
5. Access Door: 16 gauge steel.
6. Threaded Rods: 1/4 inch (6.4 mm) diameter.
7. Gasket: 1/2 inch (12.7 mm) [Unfaced FyreWrap] [Ceramic fiber blanket].

Specifier Note: Edit article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 1 Project Requirements (Product Substitutions Procedures) Section.

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted.

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PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

Specifier Note: Article below is an addition to the CSI *SectionFormat* and a supplement to MANU-SPEC. Revise article below to suit project requirements and specifier's practice.

A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions and Unifrax Corporation's SPEC-DATA sheets.

3.02 EXAMINATION

A. Site Verification of Conditions:

1. Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.
2. Examine area to receive insulation for compliance with installation clearances.

3.03 INSTALLATION

A. FyreWrap 0.5 Plenum Insulation:

1. Apply insulation directly to surface of combustible item.
2. Cut insulation lengths to wrap around combustible item providing 1 inch (25.4 mm) longitudinal overlap.
3. Seal cut edges with aluminum foil tape.
4. Provide 1 inch (25.4 mm) perimeter overlap with adjacent insulation blanket.

Specifier Note: Use of the following sentence is optional for temporary securement of insulation blanket.

5. Secure plenum insulation with 1 inch (25.4 mm) wide filament tape, located 1/2 inch (12.7 mm) from blanket edge and on 11 inch (280 mm) centers.
6. Permanently attach insulation with stainless steel tie wire or banding.
7. Tighten wire or banding to secure insulation firmly without damaging blanket.

B. FyreWrap EZ 1.5 Duct Insulation:

1. Apply encapsulated or scrim-faced, one-side insulation directly to duct surface.
2. Install with minimum 3 inch (76 mm) joint overlap.
3. Seal cut edges with aluminum foil tape.

Specifier Note: Any one of the following 3 techniques is acceptable for transverse overlap joints of adjacent blankets. The telescoping technique is the most common method and the checkerboard technique is often used when repairing a small section of duct wrap. Delete the following article where there is no need to use adjacent blankets longitudinally. See manufacturer's literature for detailed diagrams.

4. [Telescope overlap transverse joints by leaving one edge exposed and overlapping other edge with adjacent blanket.] [Overlap both edges of alternating blankets, leaving both edges of others exposed (checkerboard).] [Cover blanket butt edges with 6 inch (152 mm) blanket collar centered on splice.].

Specifier Note: The wrapping technique specified in the following article is optional for vertical duct runs.

5. Apply insulation in continuous length parallel to vertical length of duct with overlaps minimum of 6 inches (152 mm) from duct corners. Space pins 8 inches (203 mm) oc at centerline of vertically oriented overlaps.

Specifier Note: The following attachment option is required for any ducts wider than 48 inches (1220 mm) and is optional for all others.

6. Pins:
   a. Weld 12 gauge steel insulation pins on all sides of duct in rows spaced maximum 10 1/2 inches (267 mm) oc along duct length.
   b. Space pins 8 inches (203 mm) oc around duct and maximum 6 inches (152 mm) from duct edges.
   c. Center insulation overlaps on pins.

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d. Impale FyreWrap EZ 1.5 over pins and hold in place with 2 1/2 inches (64 mm) square galvanized steel speed clips (washers).

e. Turn down or cut off exposed pin ends.

Specifier Note: The following attachment option may be selected and specified for duct widths greater than 24 inches (610 mm) up through 48 inches (1220 mm) where the above option is not chosen, and is an optional attachment method for duct widths 24 inches (610 mm) or less.

7. Pins and Banding:

a. Weld 12 gauge steel insulation pins to underside of horizontal runs and backside of vertical runs in rows spaced maximum 10 1/2 inches (267 mm) oc along duct length.

b. Space pins 12 inches (305 mm) oc across duct width.

Specifier Note: Use of the following is optional to specify temporary securement of insulation blanket.

c. Secure insulation with filament tape.

d. Impale FyreWrap EZ 1.5 over pins and hold in place with 2 1/2 inches (64 mm) square galvanized steel speed clips (washers).

e. Turn down or cut off exposed pin ends.

f. Locate stainless steel bands (minimum 1/2 inch (12.7 mm) wide, nominal 0.015 inch (0.4 mm) thick) 1 1/2 inches (38 mm) from edge of overlap joints.

g. Space remaining bands at midpoint between overlap joints or at 10 1/2 inches (267 mm) oc.

h. Tighten steel bands to secure insulation firmly without damaging blanket.

Specifier Note: The following attachment option must be specified for duct widths 24 inches (610 mm) or less when neither of the above two methods will be used.

8. Banding:

Specifier Note: Use of the following article is optional to specify temporary securement of insulation blanket.

a. Secure insulation with filament tape.

b. Place stainless steel bands (minimum 1/2 inch (12.7 mm) wide, nominal 0.015 inch (0.4 mm) thick) 1 1/2 inches (38 mm) from edge of overlap joints.

c. Place minimum of 2 bands at maximum 8 inches (203 mm) oc in field between overlaps.

d. Tighten steel bands to secure insulation firmly without damaging blanket.

C. FyreWrap 1.5 Duct Insulation:

Specifier Note: Specify the 1-layer system from the following article for 1-hour and 2-hour fire-rated OPL Ventilation Air Ducts (VADs) and for 1-hour fire-rated ULC Canada Ventilation Ducts.

1. One-Layer System:

a. Apply insulation directly to duct surface.

b. Install with minimum 3 inch (76 mm) joint overlap.

Specifier Note: Specify the 2-layer system from the following section for 2-hour fire-rated UL Classified Grease Ducts and for 2-hour fire-rated ULC Ventilation Ducts.

2. Two-Layer System:

Specifier Note: An unfaced blanket may be used as the inner layer in a 2-layer system.

a. Butt perimeter and longitudinal joints of [Unfaced] [Scrim encapsulated] first layer.

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b. Install second layer with minimum 3 inch (76 mm) joint overlaps offset minimum of 12 inches (305 mm) from first layer joints.

3. Seal cut edges with aluminum foil tape.

Specifier Note: Include the following paragraph for duct widths of 24 inches (610 mm) or less.

4. Attachment:

Specifier Note: Use of the following article is optional to specify temporary securement of insulation blanket.

a. Secure duct insulation with 1 inch (25.4 mm) wide filament tape located 1 1/2 inches (38 mm) from blanket edge and on 10 1/2 inch (267 mm) centers.

b. Permanently attach blanket with stainless steel banding located 1 1/2 inches (38 mm) from blanket edge and on 10 1/2 inch (267 mm) centers.

c. Tighten steel bands to secure insulation firmly without damaging blanket.

Specifier Note: Include the following article for duct widths greater than 24 inches (610 mm).

5. Attachment:

a. Weld 12 gauge steel insulation pins to underside of horizontal runs and backside of vertical runs in rows spaced maximum 10 1/2 inches (267 mm) oc along duct length, 6 inches - 12 inches (152 - 305 mm) from duct edges.

b. Space pins 12 inches (305 mm) oc across duct width.

c. Impale FyreWrap EZ 1.5 over pins and hold in place with 2 1/2 inch (64 mm) square galvanized steel speed clips (washers).

d. Turn down or cut off exposed pin ends.

D. FyreWrap MAX 2.0 Duct Insulation:

1. Two-Layer System:

Specifier Note: An unfaced blanket may be used as the inner layer in a 2-layer system.

a. Butt transverse joints of [Unfaced] [Scrim encapsulated] first layer. Install longitudinal joints with minimum 3 inch (76 mm) joint overlaps.

b. Install second layer with minimum 3 inch (76 mm) joint overlaps offset minimum of 12 inches (305 mm) from first layer joints.

2. Seal cut edges with aluminum foil tape.

Specifier Note: Any one of the following 3 techniques is acceptable for transverse overlap joints of adjacent blankets on the second layer. The telescoping technique is the most common method and the checkerboard technique is often used when repairing a small section of duct wrap. Delete the following sentence where there is no need to use adjacent blankets longitudinally; see manufacturer's literature for detailed diagrams.

3. [Telescope overlap transverse joints by leaving one edge exposed and overlapping other edge with adjacent blanket.] [Overlap both edges of alternating blankets, leaving both edges of others exposed (checkerboard).] [Cover blanket butt edges with 6 inch (152 mm) blanket collar centered on splice.].

Specifier Note: The following attachment option is required for any ducts wider than 48 inches (1220 mm) and is optional for all others.

4. Pins:

a. Weld 12 gauge steel insulation pins on all sides of duct in rows spaced maximum 10 1/2 inches (267 mm) oc along duct length.

b. Space pins 8 inches (203 mm) oc around duct and 5 inches (127 mm) from duct edges.

c. Center insulation overlaps on pins.

d. Impale FyreWrap MAX 2.0 over pins and hold in place with 2 1/2 inch (64 mm) square galvanized steel speed

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clips (washers).

e. Turn down or cut off exposed pin ends.

Specifier Note: The following attachment option may be chosen for duct widths greater than 24 inches (610 mm) up through 48 inches (1220 mm) where the above option is not chosen, and is an optional attachment method for duct widths 24 inches (610 mm) or less.

5. Pins and Banding:

a. Weld 12 gauge steel insulation pins to underside of horizontal runs and backside of vertical runs in rows spaced maximum 10 1/2 inches (267 mm) oc along duct length.

b. Space pins 12 inches (305 mm) oc across duct width and 1 1/2 inches (38 mm) from duct edges.

Specifier Note: Use of the following sentence is optional for temporary securement of insulation blanket.

c. Secure insulation with filament tape.

d. Impale FyreWrap MAX 2.0 over pins and hold in place with 2 1/2 inch (64 mm) square galvanized steel speed clips (washers).

e. Turn down or cut off exposed pin ends.

f. Locate stainless steel bands (minimum 1/2 inch (12.7 mm) wide, nominal 0.015 inch (0.4 mm) thick) 1 1/2 inches (38 mm) from edge of overlap joints.

g. Space remaining bands at midpoint between overlap joints or at 10 1/2 inches (267 mm) oc.

h. Tighten steel bands to secure insulation firmly without damaging blanket.

Specifier Note: The following attachment option must be specified for duct widths 24 inches (610 mm) or less when neither of the above two methods will be used.

6. Banding:

Specifier Note: Use of the following sentence is optional for temporary securement of insulation blanket.

a. Secure insulation with filament tape.

b. Place stainless steel bands (minimum 1/2 inch (12.7 mm) wide, nominal 0.015 inch (0.4 mm) thick) 1 1/2 inches (38 mm) from edge of overlap joints.

c. Place minimum of 2 bands at maximum 8 inches (203 mm) oc in field between overlaps.

d. Tighten steel bands to secure insulation firmly without damaging blanket.

Specifier Note: The wrapping technique outlined in the following sentence is optional for vertical duct runs.

7. Apply insulation in continuous length parallel to vertical length of duct with overlaps minimum of 6 inches (152 mm) from duct corners. Space pins 8 inches (203 mm) oc at centerline of vertically oriented overlaps.

E. Access Door:

1. Cut and remove installed insulation to dimension 2 inches (51 mm) larger than opening.

2. Seal cut edges of remaining insulation with aluminum foil tape.

3. Cut access opening in duct.

4. Weld 1/4 inch (6.4 mm) diameter threaded rod to corners of opening.

Specifier Note: Use the following optional article to specify easy removal of insulation.

5. Cover rods with hollow steel tubes.

6. Cut 16 gauge cover plate with dimensions 2 inches (51 mm) larger than opening.

7. Drill holes in cover plate to match rod pattern.

8. Place 1/2 inch (12.7 mm) ceramic fiber or unfaced FyreWrap gasket between duct and access door cover.

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9. Install cover over rods.

Specifier Note: Specify a minimum of 4 pins for ducts with single layer insulation, and a minimum of 5 pins for ducts with a double layer of insulation. For the double layer system, the pins should not be spaced greater than at 12 inch (305 mm) centers.

10. Weld [4] [5] [__] steel insulation pins to outside of door panel, 1 inch (25.4 mm) from corners.
11. Cut first insulation piece to size of access door, seal cut edges with aluminum foil tape and install over pins within cutout area.
12. Cut second insulation piece with dimensions 2 inches (51 mm) larger than first piece, seal cut edges with aluminum foil tape and install over pins.

Specifier Note: Include the following article or access door openings in ducts where the 2-layer system has been used.

13. Cut third insulation piece with dimensions 2 inches (51 mm) larger than second piece, seal cut edges with aluminum foil tape and install over pins.
14. Place washers on pins and bend over excess pin lengths.
15. Place washers on threaded rods and secure with nuts.

Specifier Note: Delete the following article for FyreWrap 1.5 systems if the duct support system is constructed using a minimum 1/2 inch (12.7 mm) diameter uninsulated all-thread steel rod and 2 inch × 2 inch × 0.25 inch (51 × 51 × 6.4 mm) uninsulated steel angle spaced a maximum of 60 inches (1524 mm) oc along the duct length with a minimum 2 inches (51 mm) clearance between the protected duct and the steel rod.

Specifier Note: Delete the following article for FyreWrap EZ 1.5 systems if the duct support system is constructed using a minimum 1/2 inch (12.7 mm) diameter uninsulated all-thread steel rod and 2 inch × 2 inch × 0.25 inch (51 × 51 × 6.4 mm) uninsulated steel angle spaced a maximum of 120 inches (3048 mm) oc along the duct length with a minimum 3 inch (76 mm) clearance between the protected duct and the steel rod.

Specifier Note: Delete the following article for FyreWrap MAX 2.0 systems if the duct support system is constructed using a minimum 1/2 inch (12.7 mm) diameter uninsulated all-thread steel rod and 2 inch × 2 inch × 0.25 inch (51 × 51 × 6.4 mm) uninsulated steel angle spaced a maximum of 60 inches (1524 mm) oc along the duct length with a minimum 1 inch (25.4 mm) clearance between the protected duct and the steel rod.

F. Duct Support Systems:
   1. Provide one layer of FyreWrap insulation to support components. Maintain 3 inch (76 mm) overlap.

Specifier Note: Regular maintenance of Unifrax FyreWrap is not required when installed as per installation instructions. The following article specifies repair procedures should damage occur.

3.04 MAINTENANCE

A. Cut banding or insulation washers on damaged blanket areas and remove.
B. Cut and remove damaged blanket.
C. Cut new blanket piece with exact dimensions as that removed and install on ductwork in same configuration as previously.
D. Ensure same minimum overlap is created.
E. Replace permanent attachment.

3.05 FIELD QUALITY CONTROL

Specifier Note: Use the following Articles only when manufacturer's field services are desired to verify the quality of the installed components. Establish the number and duration of periodic site visits required by Manufacturer and specify below. Consult Manufacturer for services required. Delete if field services are not required.

A. Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, and protection of its product[s], and submit written reports in acceptable format to verify compliance of Work with Contract.

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B. Schedule site visits to review Work as installation is about to begin.

3.06 COMPLETION & CLEANUP

A. After installation and prior to final acceptance, inspect insulation for any damage. Repair damage and ensure exposed insulation edges are sealed with aluminum foil tape.

B. On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

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