UNI/PHV 120-04

FIRE PENETRATION SEAL (Ventilation Duct)

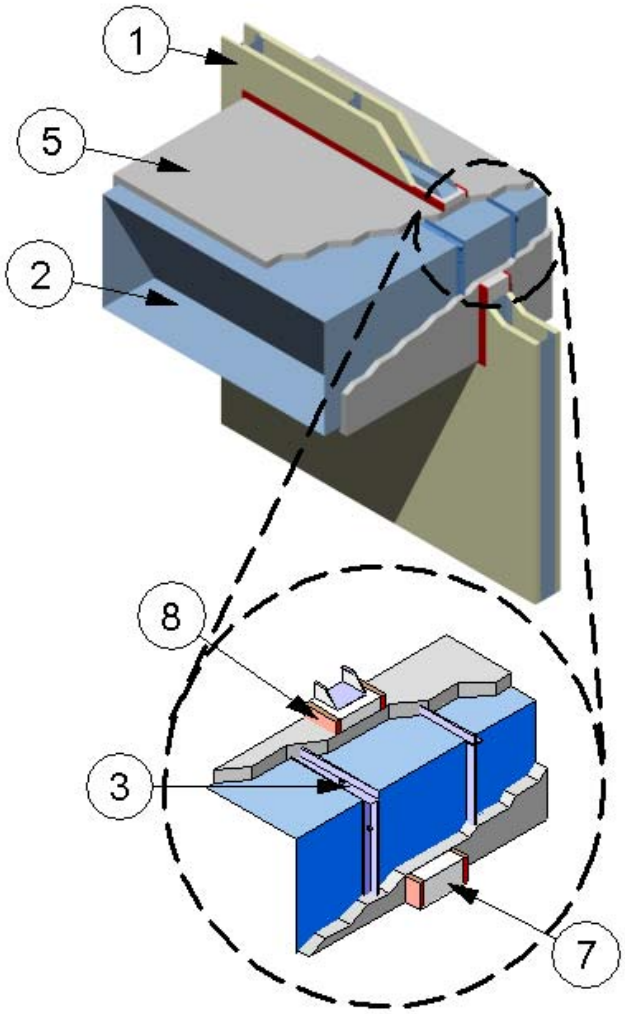
Unifrax I LLC

Unifrax FyreWrap® Elite™ 1.5

ASTM E 814-09

F-Rating – 2 hr

T-Rating – 2 hr



1. GYPSUM WALL ASSEMBLY: Construct a nominal 6-1/8-inch deep, two-hour rated wall assembly using minimum 25-gauge, 3-5/8-inch deep with 1-1/4-inch legs, steel studs spaced maximum 24 inches on center (o.c.). Secure studs with minimum #6 x 3/8-inch steel stud framing screws to 25-gauge steel, channel-shaped, floor and ceiling runners measuring 1/2-inch high by 3-5/8-inch deep. Secure floor and ceiling runners to the floor and ceiling with 1-inch long fasteners, suitable for the mounting substrate and spaced maximum 18 inches o.c. Cover studs and runners with two layers of 5/8-inch thick, Type X gypsum board on each face. Fasten the bottom layers of gypsum board with #6, minimum 1-inch long bugle head Phillips drywall screws spaced maximum 24 inches o.c. Fasten the face layers of gypsum board

with #6, minimum 1-5/8-inch long bugle head Phillips drywall screws spaced maximum 12-inches o.c. Apply to exposed layer of gypsum board on each face, minimum 2-inch wide joint tape and two coats of joint compound (vinyl or casein, dry or premixed) over all exposed joints with the joint tape embedded into first coat of joint compound. Create an opening in the wall assembly and frame the opening with 25-gauge steel studs. Establish the clearance to the penetrating item (Item 2) (ventilation air duct) no greater than 3 inches and no less than 2 inch.

2. PENETRATING ITEM: Use a SMACNA compliant ventilation air duct constructed of minimum 26-gauge galvanized steel with maximum 1296-inch^2 area, maximum 54-inch width and maximum 24-inch height. Position the ventilation air duct concentrically or eccentrically in the opening in the gypsum wall assembly (Item 1) so that the width of the annular space is no greater than 3 inches and no less than 2 inches. Support the ventilation air duct in accordance with the International Mechanical Code or NFPA 96 requirements as applicable.

3. DUCT REINFORCEMENT: Position 1-inch by 1-inch by 1/8-inch steel angles to all four sides of the penetrating item (Item 2) (ventilation air duct) and on both sides of the gypsum wall assembly (Item 1) 3 inches from each side of the gypsum wall assembly (Item 1). Mechanically fasten steel angles to all four sides of the penetrating item (Item 2) (ventilation air duct) and on both sides of the gypsum wall assembly (Item 1) using #8, 1/2-inch long self-drilling Phillips Modified Truss Head screws spaced 6-inches o.c. on the sides and the top of the duct and using #12, 3/4-inch long self-drilling hex-head screws spaced 6-inches o.c. on the bottom of the duct.

4. PINS: (Not Shown) Use one of the following options:

   Option 1: Use this pin installation option in combination with banding (Item 6). Use minimum 12-gauge, minimum 3-1/2-inch long or 5-inch long (use longer pins when indicated below), CD weld pins and weld them to the penetrating item (Item 2) (ventilation air duct) at the following locations:

   - Bottom only of penetrating item (Item 2) (ventilation air duct)
   - Transverse spacing (widthwise) – 3 inches from edges of penetrating item (Item 2) (ventilation air duct) and maximum 12 inches o.c.
   - Longitudinal spacing (lengthwise) - 3-1/2 inches from each side of the gypsum wall assembly (Item 1) welded directly to the duct reinforcement (Item 3) (steel angle) and then maximum 10-1/2 inches o.c. welded to the duct wall.
   - All insulation (Item 5) overlap joint locations at the bottom of the duct along the centerline of the joint overlap using spacing indicated above and using minimum 5-inch long pins.

   Option 2 (Pins Only): Use this pin installation option when no banding (Item 6) is employed. Weld the pins on all four sides of the penetrating item (Item 2) (ventilation air duct). Follow the same pin transverse and longitudinal spacing as described in Option 1.

   Option 3 (No Pins): Requires no pins when penetrating item (Item 2) width is equal to or less than 24 inches Refer to Banding (Item 6), Option 3, “Banding Only” method.

5. CERTIFIED COMPANY: Unifrax I LLC

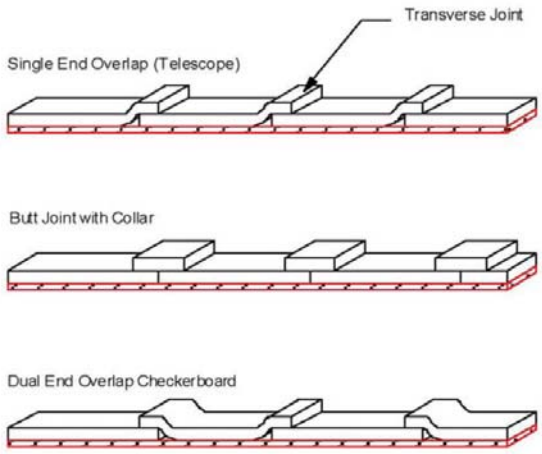
   CERTIFIED PRODUCT: Duct Insulation

   MODEL: FyreWrap® Elite™ 1.5 (6 pcf)

   INSULATION: Use only the above duct insulation indicated as certified, bearing the Intertek mark. Use one layer of nominal 1-1/2-inch thick, nominal 6-pcf duct insulation to insulate the penetrating item (Item 2) (ventilation air duct). Use insulation that is fully encapsulated or single-faced with a poly-foil-scrim material.

Install insulation (facing exposed) with 3-inch overlaps using one of the following three methods as depicted in the drawings to follow:

- 3-inch overlap telescoping method where each adjacent insulation blanket has one edge exposed and one edge covered by the next insulation blank,
- Butt splice with collar method where the blankets are butted together and a 6-inch wide collar of poly-foil-scrim-encapsulated insulation blanket is centered over the butt splice overlapping each adjacent insulation blanket by 3-inches, or
- 3-inch overlap checkerboard pattern where both edges of each alternating insulation blanket are covered by the adjacent insulation blankets whose edges are exposed.



Install the insulation so that it continues through the opening in the gypsum wall assembly (Item 1) extending at least 3 inches beyond the faces of the gypsum wall assembly (Item 1).

If the insulation does not extend far enough beyond either of the faces of the gypsum wall assembly (Item 1) such that the insulation overlap would not preclude proper installation of the packing material (Item 7) and the fill, void or cavity material (Item 8) (sealant), then install the packing material (Item 7) and the fill, void or cavity material (Item 8) (sealant) prior to installing the adjacent, overlapping section of insulation. Allow the fill, void or cavity material (Item 8) (sealant) to reach a "skinned over" condition prior to completing the installation of the insulation.

Secure the insulation to the pins (Item 4) with 2-1/2-inch square or round galvanized steel speed clips. Turn down or cut off pins (Item 4) that extend beyond the outer layer of insulation.

6. BANDING: (Not Shown) Use one of the following options:

Option 1: Use this banding method in combination with pins (Item 4), Option 1. Use minimum 1/2-inch wide, minimum 0.015-inch thick stainless steel or carbon steel bands. When required, use filament tape as a temporary holding method for the insulation (Item 5) prior to banding for ease of handling. Place bands on overlap joints 1-1/2 inches from edges of insulation (Item 5) blankets and between overlaps spaced maximum 10-1/2 inches o.c. Tension the banding to hold the insulation (Item 5) in place without tearing or damaging the insulation (Item 5) or penetrating item (Item 2) (ventilation air duct).

Option 2 (No Banding): Banding not required when pins (Item 4), "Pins Only" Option 2, installation method is used.

Option 3 (Banding Only): Option available when penetrating item (Item 2) width equal to or less than 24 inches: pins not required. When selected, use minimum 1/2-inch wide, minimum 0.015-inch thick carbon steel or stainless steel bands. When required, use filament tape as a temporary holding method for the insulation (Item 5) prior to banding for ease of handling. Locate and center bands on the overlap joint (1-1/2 inches from edges of insulation (Item 5) for 3-inch overlaps), and locate in the field area

between the overlaps spaced a maximum of 10-1/2 inches o.c.

7. CERTIFIED COMPANY: Unifrax I LLC

   CERTIFIED PRODUCT: Duct Insulation

   MODEL: FyreWrap® Elite™ 1.5 (6 pcf)

   PACKING MATERIAL: Use only the above duct insulation indicated as certified, bearing the Intertek mark. Remove the poly-foil-scrim facing or encapsulation material from the duct insulation, exposing the core fiber insulation blanket. Use the core fiber insulation blanket as the packing material for the annular space. Cut the core fiber insulation blanket a minimum of 10-inches wide. Use core fiber insulation blanket thickness that is at least 1/2 the width of the annular space between the gypsum wall assembly (Item 1) and the uninsulated penetrating item (Item 2) (ventilation air duct). Cut the core fiber insulation blanket as needed to achieve the required thickness. Pack the core fiber insulation blanket into the annular space (except at the insulation (Item 5) overlap location) in the 6-1/8-inch deep gypsum wall assembly (Item 1) such as to create a 1/2-inch recess on each side of the gypsum wall assembly (Item 1).

   Cut two more pieces of core fiber insulation blanket 2-1/4 inches wide by 3/4 inches thick and 1 inch longer than the insulation (Item 5) overlap at the opening of the gypsum wall assembly (Item 1). Pack one piece of insulation from each side of the gypsum wall assembly (Item 1) at the insulation (Item 5) overlap location such as to create a 1/2-inch recess on each side of the gypsum wall assembly (Item 1).

8. CERTIFIED COMPANY: 3M

   CERTIFIED PRODUCT: Firestop Sealant

   MODEL: Fire Barrier™ 1000 NS;

   CERTIFIED COMPANY: TREMCO

   CERTIFIED PRODUCT: Firestop Sealant

   MODEL: TREMstop Fyre-Sil GG;

   LISTED COMPANY: HILTI

   LISTED PRODUCT: Firestop Sealant

   MODEL: FS-ONE; or,

   LISTED COMPANY: SPECIFIED TECHNOLOGIES, INC. (STI)

   LISTED PRODUCT: Firestop Sealant

   MODEL: SpecSeal® Series SSS

   FILL, VOID OR CAVITY MATERIAL:

   Use only the above sealants indicated as certified, bearing the Intertek mark or listed sealants as indicated above, bearing the corresponding listing agency's mark. Apply minimum 1/2-inch depth of sealant to the recess of the packing material (Item 7) from both sides of the gypsum wall assembly (Item 1). Overlap the sealant onto the gypsum board and the penetrating item (Item 2) (ventilation air duct) a minimum of 1 inch.