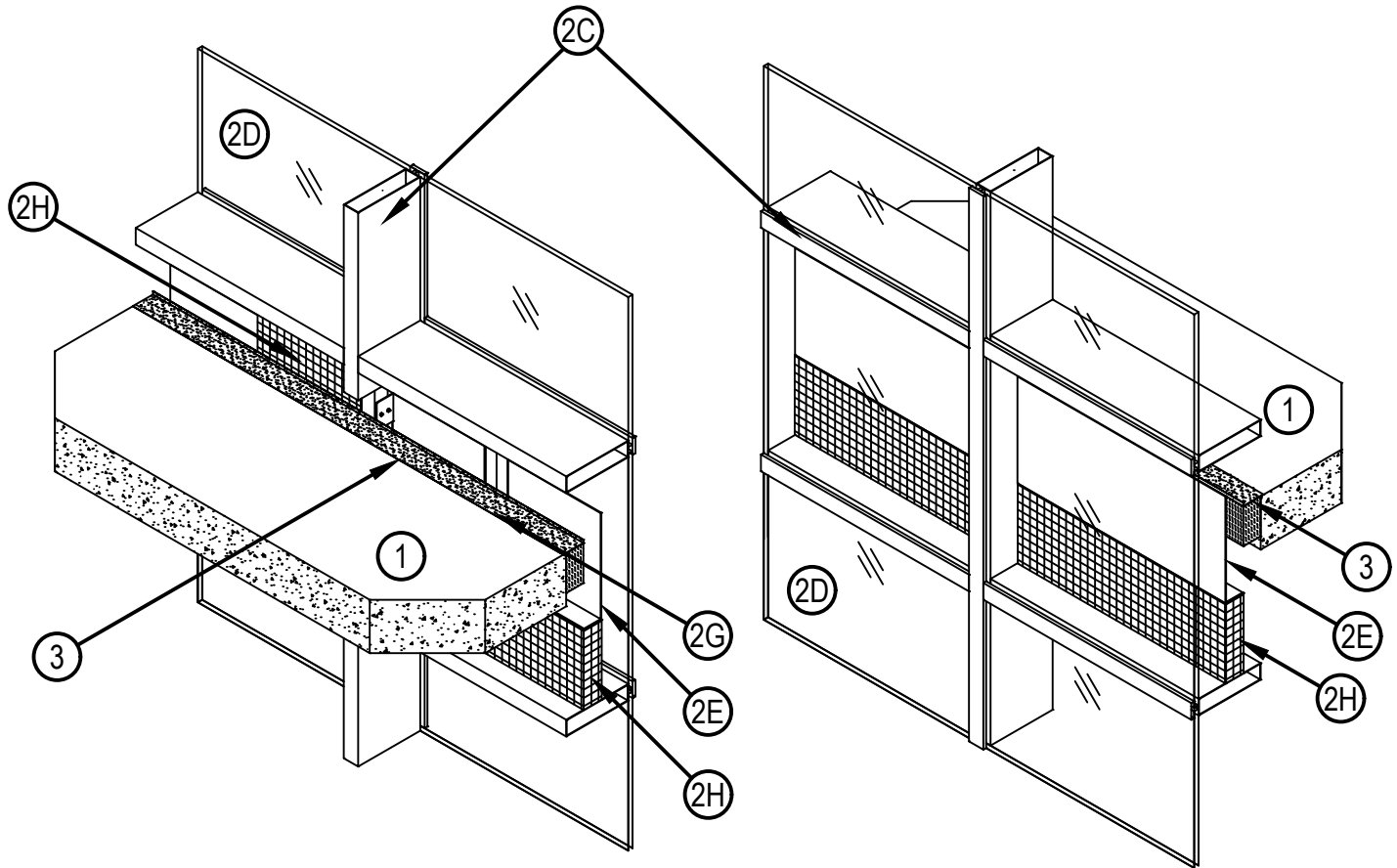


Hilti Corporation
Design No. HI/BPF 120-28
Perimeter Fire Barrier System
CFS-SP WB Firestop Joint Spray
ASTM E 2307, UL 2079 (Air Leakage)
Table 1.

	CFS-SP WB Firestop Joint Spray
F-Rating	2 Hour
T-Rating	86 Minutes
Cycling	None
Air Leakage	<1.0 SCFM/LF



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1. **CONCRETE FLOOR ASSEMBLY:** Minimum 2 hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100 to 150 pcf, having a min. thickness of 8 in. at the joint face. When a longitudinal recess (blockout) is required to contain an architectural joint system, increase concrete floor assembly thickness to maintain a min. thickness of 8 in. and accommodate depth of blockout formed in the concrete: blockout width unrestricted.

A. **CAST-IN INSERT (Not Shown)** - The concrete floor assembly (Item 1) shall have Hilti anchor channels approved by the curtain wall manufacturer, embedded in the face of the concrete floor assembly at each vertical mullion (not at false mullions). Center the anchor channel at each vertical mullion with a mounting attachment (Item 2A). Position the bottom of anchor channel a min. 3 in. above bottom of concrete floor assembly. In addition, ensure the placement of the anchor channel allows for an in-joint mounting attachment to be recessed a min. 1 in. below top of concrete floor assembly. Install anchor channel in accordance with manufacturer's instructions.

2. **CURTAIN WALL ASSEMBLY:** The curtain wall assembly shall incorporate the following construction features:

A. **MOUNTING ATTACHMENT (Not Shown)** - Mounting attachments to consist of 1/2 in. thick steel angles. Mounting attachments are to be secured to curtain wall assembly by attaching one steel angle on each side of the vertical steel tube framing (Item 2B) with a steel bolt (inserted through both angles on each side of the steel tube framing and then secured with a nut and washer). The mounting attachment is secured to the anchor channels embedded into the concrete floor assembly (Item 1) with a steel bolt that is inserted through each steel angle.

B. **STEEL TUBE FRAMING (Not Shown)** - Steel tube framing consists of min. 1/4 in. thick, min. 2 in. wide, and min. 8 in. deep hollow rectangular steel tubes that are clad in aluminum framing (Item 2C). Steel tube framing is only installed vertically spaced at max. 80 in. on center. In the spandrel area the aluminum framing (interior U-shaped section) may be omitted on the interior side of the steel tube framing so that the interior face of the steel tube framing projects a min. of 2-1/2 in. from the aluminum framing (exterior U-shaped section).

C. **ALUMINUM FRAMING** - The aluminum framing consists of extruded aluminum with overall dimensions of min. 0.125 in. thick, min. 3-1/2 in. wide, and min. 11 in. deep. The aluminum framing members consist of two U-shaped extrusions which are keyed together to form a rectangular section. The aluminum framing is installed over the vertical steel tube framing (Item 2B) and is also installed horizontally to form transoms. The bottom of the upper transom is located a min. of 12 in. above the top of the concrete floor assembly (Item 1). The top of the lower transom is located min. 16 in. below the top of the concrete floor assembly.

D. **GLASS PANELS AND SPANDREL PANELS** - Size and install glass panel to curtain wall framing according to the curtain wall system manufacturer's guidelines. Use a system that has a min. 1 in. thickness (with or without an air space) consisting of a min. 1/4 in. thick tempered or heat-strengthened glass. Secure the panels with a thermal break (rubber extrusion or silicone gaskets) and aluminum compression plates. Alternatively, secure the glass panels with a thermal break (rubber extrusion or silicone gasket) and structural sealant.

E. **SPANDREL REINFORCEMENT** - Between vertical framing members, install a spandrel reinforcement consisting of 16 GA steel with angled 3 in. bottom flange and angled 3 in. side flanges. The lower 3 in. flange is located min. 11 in. below top of concrete floor assembly (Item 1), and the top of the spandrel reinforcement is located min. 5 in. above top of concrete floor assembly (Item 1). Flanges face towards the concrete floor assembly, with the bottom flange to provide a shelf so curtain wall insulation (Item 2H) is recessed a max. of 1-7/8 in. from interior face of the aluminum framing (Item 2C). Where required, side flanges of spandrel reinforcement to have notched slots that allow them to fit around the mounting attachments (Item 2A). Flanges may extend max. 3/4 in. beyond face of steel tube framing (Item 2B).



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Spandrel reinforcement is installed in the spandrel in two pieces, with 3 in. overlap at the seam. At the seam location, the spandrel reinforcements are joined together with three No. 10 sheet metal screws located 1 in. from top, 1 in. from bottom and at the center of the bottom flange. Spandrel reinforcement may also consist of a single piece with no seam. Spandrel reinforcement secured to vertical steel tube framing using gas-actuated fastening (Hilti GX 3 on plus (+) setting driving X-S 14 G3 MX pins) or with min. No. 10 x 3/4 in. long self-tapping sheet metal screws driven through pilot holes in the steel tube framing (Item 2B). Two fasteners are located below mounting bracket. Three fasteners, in a triangular pattern are located above mounting bracket. Fasteners shall be spaced max. 2 in. oc. Additionally, when the total height of the spandrel reinforcement exceeds 40 in., install additional fasteners at max. 12 in. oc., starting from the top and bottom of the concrete floor assembly (Item 1).

As an alternative to integral side flanges, the spandrel reinforcement can be secured to the vertical steel tube framing (Item 2B) with 20 GA, 3 in. by 3 in. steel angle. The angle is fastened to the steel tube framing (Item 2B) with min. of three No. 8 sheet metal screws spaced max. 6 in. on center and secured to the spandrel reinforcement with min. of three No. 8 sheet metal screws spaced max. 6 in. on center.

F. UPPER TRANSOM SUPPORT ANGLE (Not Shown) - For spandrel lengths greater than 60 in. (inside-to-inside of mullions) install a steel angle, 20 GA, 3 in. by 3 in. by 12 in. centered between vertical steel tube framing (Item 2B) with the 3 in. flange directed toward interior. Edge of angle recessed 1-1/2 in. from face of aluminum framing to align with spandrel reinforcement (Item 2E). Angle attached to underside of upper transom with gas-actuated fastening (Hilti GX 3 on minus (-) setting driving GC 41 pins). Three fasteners, in a triangular pattern, are installed at each end of upper transom support angle.

G. T-BAR REINFORCEMENT - For spandrel lengths greater than 60 in. (inside-to-inside of mullions) install a vertical reinforcement consisting of two back-to-back, 20 GA, 2 in. by 2 in. steel angles forming a "T" with T-stem pointing towards the interior of assembly. T-flanges (top of "T" shape) to be flush with vertical legs of upper transom support angle (Item 2F) and spandrel reinforcement (Item 2E). Vertical T-bar butted to the underside of horizontal leg of upper transom support angle (Item 2F) and extended down to 1 in. from bottom of spandrel reinforcement (Item 2E). T-bar flanges secured to upper support angle (vertical leg) and spandrel reinforcement using three No. 10 sheet metal screws, in a triangular pattern.

For each vertical T-bar, install a horizontal T-bar, made of two back-to-back, 20 GA, 1-1/2 in. by 1-1/2 in. steel angles forming a "T" with T-stem pointing downward. Fasten one end to the underside of the concrete floor assembly (Item 1) using four nominal 1/4 in. diameter by 1-3/4 in. long concrete anchors and 1 in. steel flat washers (two fasteners for each individual angle of the T-bar). Fasten the other end to the vertical T-bar (Item 2G) by straddling the T-stem of the vertical T-bar and fastening with two No. 10 sheet metal screws.

H. CURTAIN WALL INSULATION - Use only mineral wool batt insulation that is bearing an Intertek Certified Label and meets the following minimum requirements. Use a min. of 3 in. thick 8 pcf density mineral wool batt insulation faced on one side with aluminum foil scrim which is exposed to the room interior. Curtain wall insulation to be compressed min. 1/8 in. in all directions to allow a friction fit in the spandrel area. Seams in insulation, along with the interface between the insulation and framing is sealed with min. 2 in. wide aluminum tape. Insulation recessed max. 1-7/8 in. from interior face of aluminum framing (Item 2C).

(Optional) - As an addition to the required curtain wall insulation, Intertek certified, min. 3 in. thick, 8 pcf mineral wool insulation can be friction-fit to fill the area below the spandrel reinforcement (Item 2E). Tape all adjacent edges between the curtain wall insulation, between aluminum framing (Item 2C) or steel tube framing (Item 2B) and curtain wall insulation, with pressure sensitive aluminum foil tape, centered over seams.



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- I. SHADOW BOX (Optional, Not Shown) - An aluminum or steel shadow box may be installed between the spandrel reinforcement (Item 2E) and the glass panels (Item 2D) secured to the aluminum framing (Item 2C) per the curtain wall manufacturer's instructions.
3. PERIMETER JOINT PROTECTION: The perimeter joint (linear opening) shall not exceed 3 in. nominal joint width (joint width at installation) between the face of the concrete floor assembly (Item 1) and the interior face of the curtain wall insulation (Item 2H). Interior face of steel tube framing (Item 2B) may be max. 3-1/2 in. from face of concrete floor assembly. The perimeter joint treatment shall incorporate the following construction features:
- A. PACKING MATERIAL - Use only mineral wool batt insulation that is bearing the Intertek Certified Label and meeting the following minimum requirements. Use a min. of 4 in. tall, 4 in. thick, 4 pcf density mineral wool batt insulation installed with the fibers running parallel to the concrete floor assembly (Item 1) edge. The mineral wool batt insulation shall be compressed at min. 25% and at max. 50% in the nominal joint width. Compress the mineral wool batt insulation into the perimeter joint such that the top surface is flush with the top surface of the concrete floor assembly. At mounting attachments (Item 2A), mineral wool compression is maintained while ensuring that space between the steel angle mounting attachments (Item 2A) is filled. At mounting attachments, mineral wool depth is increased to extend at least down to the bottom of mounting attachment. Splices (butt joints) in the lengths of the mineral wool batt insulation are to be compressed together (min. 1/4 in. compression).
- B. CERTIFIED MANUFACTURER: Hilti Corporation
- CERTIFIED PRODUCT: Joint Spray or Sealant
- CERTIFIED MODEL: CFS-SP WB Firestop Joint Spray
- FILL, VOID, OR CAVITY MATERIAL - To be applied (sprayed, brushed, or troweled) to cover the top exposed surface of the packing material (Item 3A) installed in the perimeter joint. Apply at 1/8 in. wet thickness and overlap the material a min. 1/2 in. onto the adjacent curtain wall assembly (Item 2) and concrete floor assembly (Item 1). If spraying process is stopped and the applied material cures to an elastomeric film before the process is restarted, then overlap the edge of the cured material with at least 1/8 in. of the newly applied material.
- C. PERIMETER JOINT PROTECTION INSULATION (Not Shown) - Use only foil-faced mineral wool insulation that is bearing the Intertek Certified Label and meeting the following minimum requirements. Use a min. of 2 in. thick, 8 pcf density, foil-faced mineral wool insulation installed with the fibers running parallel to the concrete floor assembly (Item 1) and with the foil-face side of the insulation facing towards the interior of the room. Install the foil-faced mineral wool insulation flush with the top of the CFS-SP WB Firestop Joint Spray (Item 3B) and with the interior surface of the curtain wall insulation (Item 2H) for the entire length of the perimeter joint. The foil-faced mineral wool insulation shall extend a min. of 9-1/2 in. high along the entire horizontal length of the perimeter joint. Foil-faced mineral wool insulation shall be secured to the interior face of the curtain wall insulation with impaling pins, min. 4 in. long, into curtain wall insulation. Impaling pins spaced at max. 12 in. on center in one row located a min. 4 in. above the CFS-SP WB joint spray.