

**3M****Fire Protection Products**

<b>ENGINEERING JUDGMENT FOR:</b>
9/26/2016
Michael Palmacci
General Insulation
378 Commercial Street
Malden, MA 02148

<b>Project:</b> The Park Danforth	<b>Contractor:</b> Northeast Firestopping
<b>Fire Stopping Category:</b> Joints / Perimeter	<b>Hourly Rating Requested/ Type:</b> 2 Hour / F <b>Obtainable Rating:</b> (*See Below)
<b>Joint Type:</b> Perimeter	<b>Maximum Joint Width:</b> 4 Inch
<b>Curtain Wall:</b> Glass Spandrel	<b>Slab Assembly:</b> Concrete Floor
<b>Type of Movement:</b> Dynamic	

**Special Conditions:** Field condition like Intertek design 3MU/JS 120-17 with deviation of 19 gauge aluminum shadow box installed in lieu of minimum 22 ga. steel backpan and stiffeners, 3 in. thick 8 pcf curtain wall insulation and steel retaining angles have also eliminated from the assembly. Upper transom is at the top surface of the floor in lieu minimum 20 in. above the floor with a 9-1/2 in. overall spandrel height between transoms. Joint width is max 4 in.

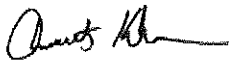

**Application Details:** To firestop this application, install in accordance with Intertek Design 3MU/JS 120-17 with the following modifications/clarifications:

1. Install minimum 4 pcf mineral wool compressed 33%. Installed with the fibers running parallel to the edge of concrete floor assembly and curtain wall/shadow box assembly. Mineral wool to be flush with the top surface of the floor.
2. Install a 1/8 wet thickness of FireDam Spray 200 over the mineral wool.
  - FireDam Spray 200 to overlap minimum 1/2 in. onto the top of the concrete slab and face of the aluminum shadow box, mullions and transoms when present. .
3. \*Due to the elimination of the steel back pan, backpan stiffeners, curtain wall insulation, steel retaining angles, and reduced transom height, the obtainable rating in this scenario is reduced to "Up to or as long as the curtain wall assembly remains fully intact in a fire scenario."

**3M Fire Barrier Material:** FireDam Spray 200

**Based On:** 3MU/JS 120-17

This Engineering Judgment (EJ) is based upon the sole and exclusive use of 3M brand Fire Protection Products as described within. Modification of any of the parameters of this EJ, including, without limitation, the use of non-3M brand Fire Protection Products, shall render this EJ null and void. This perimeter fire barrier design is expected to achieve the hourly rating indicated above. This engineering judgment is based on performance results obtained in testing with independent laboratories which have been tested in accordance to ASTM E 2307 and / or internal 3M fire tests.

Engineering Judgment Prepared By:  Anthony Kilmer Technical Service Representative	Reviewed By:  577989 cc: Ryan Fenstermaker Email: rfenstermaker@mmm.com
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## Design Number 3MU/JS 120-17

(Formerly OPL Design No. CEJ 266 P)

November 14, 2011

### PERIMETER FIRE BARRIERS

3M Company

FireDam™ Spray 200, Fire Barrier 1000 NS Silicone Sealant and

Fire Barrier 1003 SL Silicone Sealant

ASTM E 2307

T-Rating 3/4 hr

F-Rating 2 hr

ASTM E 2307/ASTM E 1399 Cycling

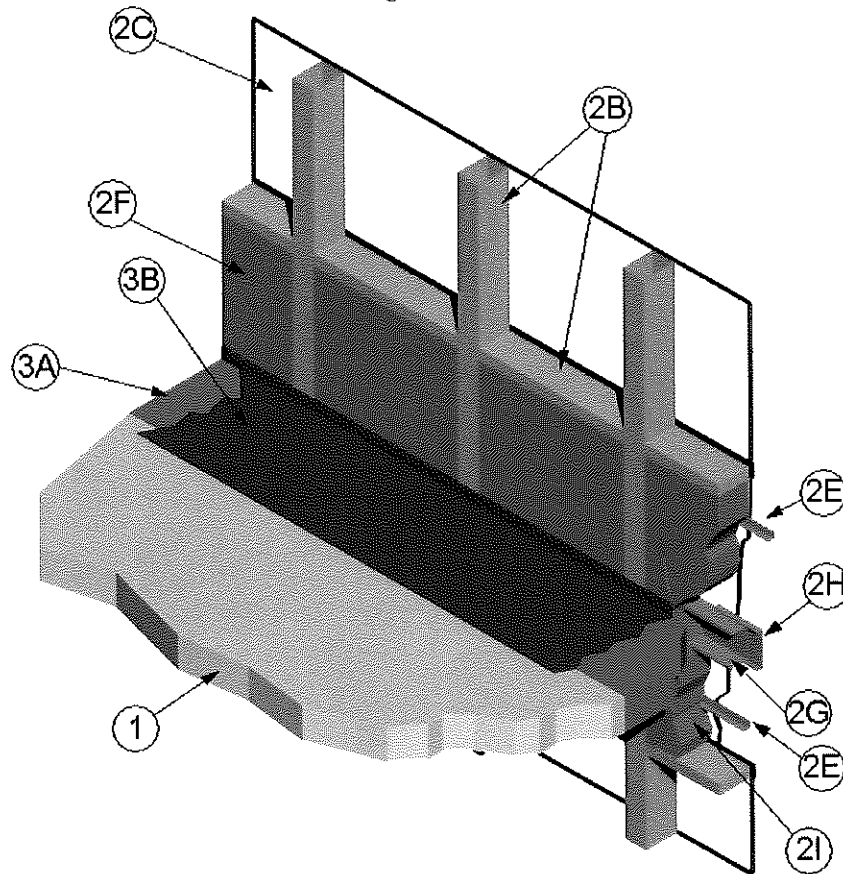
Class IV: 500 cycles @ 30 cpm

Rated for ± 10% horizontal movement @ 33% Compression (Reference Item 3A)

Rated for ± 6.25% vertical shear movement @ 33% Compression (Reference Item 3A)

UL 2079

L-Rating <1.0 SCFM/LF



1. **CONCRETE FLOOR ASSEMBLY:** Two-hour rated concrete floor assembly made from either lightweight or normal weight concrete with a density of 100 to 150 pcf, having a minimum thickness of 4-1/2" 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 minimum thickness of 4-1/2" and accommodate depth of blockout formed in the concrete; blockout width unrestricted.
2. **CURTAIN WALL ASSEMBLY:** Incorporate the following construction features:
  - A. **Mounting Attachment:** (Not shown) Attach aluminum framing (Item 2B) to the structural framing according to the curtain wall manufacturer's instructions. When required, connect the mounting attachments to the joint face of the concrete floor assembly (Item 1) according to the curtain wall manufacturer's instructions. Limit distance between mounting attachments to maximum 60" oc.
  - B. **Aluminum Framing:** Use hollow rectangular aluminum extruded tubing with minimum overall dimensions of 0.100" thick, 4" high and 2-1/2" wide. Locate mullions (vertical aluminum framing) minimum 60" oc and locate transoms (horizontal aluminum framing) a minimum 48-1/2" oc. For the spandrel region, locate the upper transom (horizontal aluminum framing) a minimum 20" above the concrete floor assembly (Item 1) as measured from the top surface of the concrete floor assembly (Item 1) to the underside of the transom (horizontal aluminum framing).
  - C. **Glass Panels:** Sized and installed into aluminum framing (Item 2B) according to the curtain wall system manufacturer's guidelines. Use minimum 1/4" thick clear, heat strengthened (HS) glass or tempered glass with a maximum width and height less than the aluminum framing (Item 2B) oc spacing, which allows the glass to be secured between the notched shoulder of the aluminum framing (Item 2B) and pressure bar. Secure glass panels with a thermal break (rubber extrusion), pressure bar (aluminum extrusion), minimum 1/4-20 x 5/8" long screws, and a snap face (aluminum extrusion).
  - D. **Aluminum Anchor Brackets:** (not shown) Use minimum 9/16" thick aluminum anchor brackets to serve as part of the mounting attachment (2A) and are rigidly secured to the aluminum framing (2B) with 1/2" diameter, 2-1/4" long, Grade 5, anchor bolts.

Construction Joints

Perimeter Joint

JS

**Design No. 3MU/JS 120-17 continued**

- E. **Steel Retainer Angle** – Place a minimum 22 GA, 1-1/2 x 1-1/2" angle horizontally 12" above and below the floor line in the spandrel area, and is secured to the aluminum framing (2B) with No. 10 sheet metal screws. Orient the angle so that the horizontal flange is below the vertical flange and situate the horizontal flange to fully embed into the curtain wall insulation of the steel back pan.
- F. **Steel Backpan**: Install minimum 22 GA, galvanized steel backpan filled with curtain wall insulation (2I) adhered to the back pan with latex adhesive and steel face facing the interior face of the aluminum framing in the spandrel region. Secure the backpan to the aluminum framing (2B) with 1" long, hex-head, sheet steel screws.
- G. **Backpan Stiffener**: Secure minimum 18 GA, galvanized, hat-shaped, stiffener placed horizontally and measuring 4" wide x 3" deep and having 1" flanges to the backpan with No.10, sheet steel screws. Position the lower flange of the stiffener within the plane of the packing material (3A), and space the screw holding the top flange of the stiffener to the backpan (2F) a minimum of 2-7/32" above the top surface of the concrete floor assembly (Item 1).
- H. **Steel Patches**: Where required, horizontally place 6" wide, 22 GA, galvanized steel C-shaped patches measuring 6" wide and 1-1/2" deep, centered on the outside of the backpan stiffener (2G) and secure patches to the stiffener with No. 10, sheet steel screws.
- I. **Curtain Wall Insulation**: Fill the cavity of the steel backpan (Item 2F) with nominal 3" thick, 8-pcf density, mineral wool batt insulation faced on one side with aluminum foil scrim (vapor retarder), which faces the room interior. Tightly fit, compress at least 1/4" in all directions, the mineral wool batt insulation within the backpan (Item 2F) and adhere to the backpan with latex adhesive. Use only Intertek certified products meeting the above minimum requirements.
3. **PERIMETER JOINT PROTECTION**: Do not exceed an 6" nominal joint width (joint width at installation). Incorporate the following construction features for the perimeter joint protection (also known as perimeter fire barrier system):
- A. **Packing Material**: Use a minimum 4" thick, 4-pcf density, mineral wool batt insulation installed with the fibers running parallel to the edge of concrete floor assembly (Item 1) and curtain wall assembly (Item 2). Cut packing material width to achieve required compression, refer below, when installed in the nominal joint width. Compress the packing material into the perimeter joint. Tightly compress together splices (butt joints) in the lengths of packing material by using minimum 1/4" compression per piece of packing material. When a spray coating is used, locate the top surface of the packing material flush with the top surface of the concrete floor assembly (Item 1). When the non-sag or self leveling silicone sealant is used, recess the top surface of the packing material 1/4" from the top surface of the concrete floor assembly (Item 1). Use only Intertek certified products meeting the above minimum requirements.
- I. When 33% compression is required cut the width of the packing material 1.5 times wider than the nominal joint width.
- B. **CERTIFIED MANUFACTURER**: 3M Company  
**CERTIFIED PRODUCT**: FireDam™ or Fire Barrier™  
**MODEL**: FD Spray 200 (Elastomeric, Sprayable) or FB 1000 N/S Silicone Sealant (Non-sag) or FB 1003 S/L (Self Leveling)  
**Fill, Void or Cavity Material**: Apply either spray coating or sealant over the packing material (Item 3A) as follows:  
**Spray Coating** – Spray apply the liquid to cover the exposed top surface of the packing material (Item 3A) compressed and installed in the perimeter joint. Apply a minimum wet film thickness of 1/8" and overlap the spray coating a minimum 1/2" onto the adjacent curtain wall assembly (Item 2) and concrete floor assembly (Item 1). When the spraying process is stopped and the applied spray coating cures to an elastomeric film before installation process is restarted, then overlap the edge of the cured spray coating at least 1/8" with the liquid spray coating.  
**Sealant** – Apply non-sag or self leveling sealant to cover the exposed surface of the packing material (Item 3A) compressed and installed in the perimeter joint. Apply minimum 1/4" thickness non-sag or self leveling sealant over the packing material (Item 3A) and finish flush with the top surface of the concrete floor assembly (Item 1).
- C. **Support Clips**: (Optional) Recommended for installations subject to vertical shear movement. Use standard 20 GA galvanized steel Z-shaped clips having the following nominal dimensions: 1" wide by 3" high with a 2" upper leg and a 3" lower leg.

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