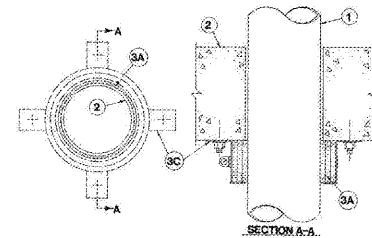


Design No. C-AJ-2001



XHEZ - Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems

System No. C-AJ-2001
May 18, 2005
F Rating -- 2 Hr

T Ratings -- 0, 1-1/2 and 2 Hr (See Item 3)

L Rating at Ambient -- 7 CFM/sq ft (See Item 3B)

L Rating at 400 F -- 1 CFM/sq ft (See Item 3B)

1. Floor or Wall Assembly -- Lightweight or normal weight (100-150 pcf or 1600 - 2400 kg/m³) concrete. Except as footnoted for floor assembly in table under Item 3, min thickness of solid concrete floor or wall assembly is 4-1/2 in. (114 mm). Floor assembly may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow core Precast Concrete Units. Wall may also be constructed of any UL Classified Concrete Blocks. Diam of opening through floor or wall to be 0 to 1/4 in. (0 to 6 mm) larger than the outside diam of nom 2 in. (51 mm) diam and smaller pipes or conduits. Diam of opening to be 0 to 1/2 in. (0 to 13 mm) larger than the outside diam of nom 2-1/2 in. (64 mm) diam and larger pipes or conduits. Max diam of opening is 7 in. (178 mm). Use Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in Fire Resistance Directory for names of manufacturers.

2. Through Penetrants -- One nonmetallic pipe or conduit to be centered in the through opening. Pipe or conduit to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:

- A. Polyvinyl Chloride (PVC) Pipe -- Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid-core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
- B. Cellular -- Core Polyvinyl Chloride (ccPVC) Pipe -- Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
- C. Chlorinated Polyvinyl Chloride (CPVC) Pipe -- Nom 6 in. (152 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
- D. Acrylonitrile Butadiene Styrene (ABS) Pipe -- Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid-core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- E. Cellular Core Acrylonitrile Butadiene Styrene (ccABS) Pipe -- Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- F. Polybutylene (PB) Pipe -- Nom 3 in. (76 mm) diam (or smaller) SDR11 (or heavier) PB pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
- G. Rigid Nonmetallic Conduit -- Nom 4 in. (102 mm) diam (or smaller) (Schedule 40 or 80) PVC conduit installed in accordance with Article 347 of the National Electric Code (NFPA No. 70).
- H. Flame Resistant Polypropylene (FRPP) Pipe -- Nom 4 in. (102 mm) diam (or smaller) Schedule 40 (or heavier) FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. See Rigid Nonmetallic Conduit (DZKT) category in UL Electrical Construction Materials Directory for names of manufacturers.

3. Firestop System -- The details of the firestop system shall be as follows:
A. Fill, Void or Cavity Materials -- Wrap Strip -- Nom 1/4 in. (6 mm) thick intumescent elastomeric material faced on one side with aluminum foil, supplied in 1 and 2 in. (25 and 51 mm) wide strips. Strips lightly wrapped around nonmetallic pipe (foil side exposed) with the edges butted against the underside of the concrete floor or both sides of wall surface. Sufficient layers of wrap strip shall be installed to lap a min of 3/16 in. (5 mm) on the concrete around the entire perimeter of the through opening. The min wrap strip width and the min number of layers of wrap required is dependent upon the pipe type, the nom pipe diam, the wall of floor thickness and the hourly T Rating required, as shown in the following table.

Pipe Type	Nom Pipe Diam In.	Min Wall or Floor Thick In.	Wrap Strip Width In.	Min Wrap Strip Layers	T Rating Hr
PVC, ccPVC or CPVC	1/2 to 1-1/2 (13 to 38)	2-1/2 (64)	1 (25)	1	0
ABS, ccABS or FRPP(a)	1/2 to 1-1/2 (13 to 38)	2-1/2 (64)	1 (25)	1	1
PVC, ccPVC or CPVC	1/2 to 2 (13 to 51)	2-1/2 (64)	2 (51)	1	0
PVC, ccPVC or CPVC	2 (51)	2-1/2 (64)	1 (25)	2	0
ABS, ccABS or FRPP(a)	2 (13 to 38)	2-1/2 (64)	1 (25)	2	1
PVC, ccPVC or CPVC	2-1/2 to 3 (64 to 76)	2-1/2 (64)	2 (51)	2	0
PVC, ccPVC or CPVC	3-1/2 to 4 (89 to 102)	2-1/2 (64)	2 (51)	3	0
PVC, ccPVC or CPVC	1/2 to 1-1/2 (13 to 38)	4-1/2 (114)	1 (25)	1	2
ABS, ccPVC or FRPP(a)					
PVC, ccPVC, CPVC, ABS	2 (13 to 38)	4-1/2 (114)	1 (25)	2	2
ABS, ccABS or FRPP(a)					
PVC, ccPVC, CPVC	2-1/2 to 3 (64 to 76)	4-1/2 (114)	1 (25)	2	2
ABS, ccABS or FRPP(a)					
PVC, ccPVC, CPVC, ABS	2-1/2 to 3 (64 to 76)	4-1/2 (114)	2 (51)	2	2
ccPVC, ccABS or FRPP(b)					
PVC, ccPVC or CPVC	3-1/2 to 4 (89 to 102)	4-1/2 (114)	2 (51)	2	1-1/2
PVC, ccPVC or CPVC	3-1/2 to 4 (89 to 102)	4-1/2 (114)	2 (51)	3	2
ABS, ccABS or FRPP(b)					
PVC	6 (152)	4-1/2 (114)	3 (76)	3	0

- (a) -- Requires use of aluminum tape detailed in Item 3E.
 - (b) -- Requires use of pipe covering detailed in Item 3D.
 - (c) -- For nom 6 in. (152 mm) diam pipe, 1 in. and 2 in. (25 and 51 mm) wide wrap strips are "Stacked" to attain nom 3 in. (76 mm) wrap strip width.
- Each layer of wrap strip to be installed with butted seam with butted seams in successive layers staggered. Wrap strip layers temporarily held in position using aluminum foil tape, steel wire tie, or equivalent. In wall assemblies, the wrap strip is to be installed in the same manner used for floor assemblies, but it shall be installed symmetrically on both sides of the wall assembly.
- 3M COMPANY -- FS-195+

B. Fill, Void or Cavity Materials -- Caulk, Sealant or Putty -- (Not Shown) -- Generous bead of caulk or putty to be applied to outer perimeter of wrap strip at its interface with floor or wall surface(s).
3M COMPANY -- CP 25WB+ caulk; FB-3000 WT sealant; Type MP+ Sds putty or CP 15WB+ caulk (Note: L Ratings apply only when Type CP 25WB+ caulk or FB-3000 WT sealant is used. CP 25WB+ not suitable for use with CPVC pipes.)

C. Steel Collar -- Nom 1, 2 or 3 in. (25, 51 or 76 mm) deep collar, dependent upon wrap strip width, with 1-1/4 in. (32 mm) wide by 2 in. (51 mm) long anchor tabs and min 1/2 in. (13 mm) long tabs to retain wrap strip layers. Coils of precut 0.016 in. (0.41 mm) thick (26 gauge) galv sheet steel available from wrap strip manufacturer. As an alternate, collar may be field-fabricated from min 0.016 in. (0.41 mm) thick (26 gauge) galv sheet steel in accordance with instruction sheet supplied by wrap strip manufacturer. Steel collar, with anchor tabs bent outward 90 deg, wrapped tightly around wrap strip layers with min 1 in. (25 mm) overlap at seam. Anchor tabs to be pressed tightly against floor or wall surface(s) and collar to be compressed around wrap strip layers using a min 1/2 in. (13 mm) wide by 0.028 in. (0.71 mm) thick stainless steel band clamp at the collar midheight. Two band clamps are required for 3 in. (76 mm) high collar on nom 6 in. (152 mm) diam pipe. As an alternate to the band clamps, 1 in. and 2 in. (25 and 51 mm) deep collars may be secured by a means No. 10 by 1/2 in. (13 mm) long steel metal screws installed in the vertical axis at the center of the 1 in. (25 mm) overlap along the perimeter joint of the collar. A min of two and three screws are required for 1 and 2 in. (25 and 51 mm) deep collars, respectively. Collar to be secured to floor or wall surface(s) with 1/4 in. (6 mm) diam by min 1-1/2 in. (38 mm) long steel expansion bolts, or equivalent, in conjunction with steel nuts and min 1-1/4 in. (32 mm) diam steel fender washers. Anchor bolts to be used with every other anchor tab or as described in the following which ever is greater. Two anchor bolts, symmetrically located, required for nom 1/2 in. (13 mm) to nom 2 in. (51 mm) diam pipes. Three anchor bolts, symmetrically located, required for nom 2-1/2 to 3 in. (64 to 76 mm) diam pipes. Four anchor bolts, symmetrically located, required for nom 3-1/2 and 4 in. (89 to 102 mm) diam pipes. For 6 in. (152 mm) diam pipes, anchor bolts to be used with each anchor tab. Retainer tabs to be bent 90 deg toward pipe to lock wrap strip layers in position.

D. Pipe Covering -- Nom 1 in. (25 mm) thick hollow cylindrical heavy density glass fiber units jacketed on the outside with an all service jacket. When required (see table), min 6 in. (152 mm) length of pipe covering installed around pipe at its egress from the steel collar (Item C) on the underside of floor or on both sides of wall. Pipe covering secured to pipe with steel wire ties spaced max 4 in. (102 mm) OC. Edge of pipe covering abutting steel collar to be sealed with a min 1/4 in. (6 mm) diam bead of caulk or putty (Item B).

See Pipe and Equipment Covering -- Materials (BRGU) category in Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

- E. Foil Tape -- When required (see tables), nom 4 in. (102 mm) wide, 3 mil thick aluminum tape installed around pipe prior to installation of wrap strip (Item 3A) or Firestop Device (Item 3F). Min one layer wrapped around pipe with top edge of tape flush with bottom surface of floor and extending downward. In walls, min one layer wrapped around pipe flush with both sides of wall and extending outward.
- F. Firestop Device -- (Not Shown) -- As an alternate to Items A and C when nom 1-1/2, 2, 3, 4 or 6 in. (38, 51, 76, 102 or 152 mm) diam nonmetallic pipes are used, a firestop device consisting of a sheet-steel split collar lined with intumescent material and provided with steel clips for attachment may be used. Firestop device to be installed on underside of floor or on both sides of wall in accordance with the accompanying installation instructions. The firestop device type to be used is dependent upon the wall of floor thickness, the pipe type and nom pipe diam, as tabulated below:

Pipe Type	Nom Pipe Diam In.	Min Wall or Floor Thick In.	Firestop Device
PVC, ccPVC or CPVC	1-1/2 (38)	2-1/2 (64)	PPD 1.5 or PPD 150
ABS, ccABS or FRPP(a)			
PVC, ccPVC or CPVC	2 (51)	2-1/2 (64)	PPD 2 or PPD 200
ABS, ccABS or FRPP(a)			
PVC, ccPVC or CPVC	3 (76)	2-1/2 (64)	PPD 300
PVC, ccPVC or CPVC	4 (102)	2-1/2 (64)	PPD 400
PB	1-1/2 (38)	4-1/2 (114)	PPD 150
PB	2 (51)	4-1/2 (114)	PPD 200
PVC, ccPVC or CPVC	3 (76)	4-1/2 (114)	PPD 3 or PPD 300
ABS, ccABS or FRPP(a)			
PB	3 (76)	4-1/2 (114)	PPD 400
PVC, ccPVC or CPVC	4 (102)	4-1/2 (114)	PPD 4 or PPD 400
ABS, ccABS or FRPP(a)			
PVC	6 (152)	4-1/2 (114)	PPD 6

- (a) -- Requires use of aluminum tape detailed in Item 3E.
 - (b) -- Requires use of pipe covering detailed in Item 3D.
- 3M COMPANY
++Bearing the UL Listing Mark
*Bearing the UL Classification Mark

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