System No. W-L-2002
November 20, 2009

1. **Wall Assembly** – The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs** – Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 3-5/8 in. (92 mm) wide by 1-3/8 in. (35 mm) deep channels spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board** – 5/8 in. (16 mm) thick, 4 ft (122 cm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 7 in. (178 mm).

2. **Nonmetallic Pipe or Conduit** – One nonmetallic pipe or conduit is centered within the firestop system. Pipe or conduit to be installed near center of stud cavity width and to be rigidly supported on both sides of wall. The following types and sizes of nonmetallic pipes or conduit may be used:
   A. Nom 6 in. (152 mm) diam (or smaller) Schedule 40 solid-core polyvinyl chloride (PVC) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. Nom 4 in. (102 mm) diam (or smaller) Schedule 40 cellular core polyvinyl chloride (PVC) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   C. Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid-core acrylonitrile-butadiene-styrene (ABS) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   D. Nom 4 in. (102 mm) diam (or smaller) Schedule 40 fire retardant polypropylene (FRPP) pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   E. Nom 4 in. (102 mm) diam (or smaller) **Rigid Nonmetallic Conduit** formed of PVC.
   F. Nom 1 in. (25 mm) diam (smaller) **Electrical Nonmetallic Tubing** formed of PVC.
   G. Nom 6 in. (152 mm) diam (or smaller) SDR13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.

See **Rigid Nonmetallic Conduit** (DZKT) and **Electrical Nonmetallic Tubing** (FKHU) categories in UL Electrical Construction Materials Directory for names of manufacturers.

3. **Firestop System** – Installed symmetrically on both sides of wall assembly. The hourly F and T Ratings for the firestop system are dependent upon the type and size of nonmetallic pipe or conduit, the piping system type (closed systems such as process or supply piping or vented systems such as drain, waste or vent piping) and the hourly fire rating of the wall assembly in which it is installed, as shown in the following table.

<table>
<thead>
<tr>
<th>Pipe or Conduit Type</th>
<th>Nom Pipe Diam In. (mm)</th>
<th>Annular Space In. (mm)</th>
<th>Piping System (a)</th>
<th>Wall Fire Rating Hr</th>
<th>F Rating Hr</th>
<th>T Rating Hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRPP</td>
<td>1/2 to 2 (13 to 51)</td>
<td>0-3/16 (0-5)</td>
<td>C</td>
<td>2</td>
<td>1-1/2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>FRPP, PB</td>
<td>1/2 to 2 (13 to 51)</td>
<td>0-3/16 (0-5)</td>
<td>C</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>ABS</td>
<td>1/2 to 4 (13 to 102)</td>
<td>0-3/16 (0-5)</td>
<td>C,V</td>
<td>1</td>
<td>1</td>
<td>3/4</td>
</tr>
<tr>
<td>ABS</td>
<td>1/2 to 4 (13 to 102)</td>
<td>0-3/16 (0-5)</td>
<td>C,V</td>
<td>2</td>
<td>1-1/2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>PVC</td>
<td>1/2 to 4 (13 to 102)</td>
<td>0-3/16 (0-5)</td>
<td>C,V</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>PVC</td>
<td>1/2 to 4 (13 to 102)</td>
<td>0-3/16 (0-5)</td>
<td>C,V</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>FRPP+</td>
<td>2-1/2 to 4 (64 to 102)</td>
<td>0-3/16 (0-5)</td>
<td>C,V</td>
<td>2</td>
<td>1-1/2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>PVC+</td>
<td>5, 6 (127 to 152)</td>
<td>0-3/16 (0-5)</td>
<td>C,V</td>
<td>2</td>
<td>1-1/2</td>
<td>1-1/2</td>
</tr>
</tbody>
</table>

+Pipe covering material wrap required on pipe on both sides of wall.
(a) C = closed systems, V = vented systems.

The details of the firestop system shall be as follows.
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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 2 in. (51 mm) wide strips. Nom 2 in. (51 mm) wide strips tightly wrapped around nonmetallic pipe or conduit (foil side exposed) with the edges butted against the surface of the wall. Sufficient layers of wrap strip shall be installed to lap a min of 3/16 in. (5 mm) on the wall surface around the entire perimeter of the circular through opening. For nom 1/2 in. (13 mm) to nom 2 in. (51 mm) diam pipes or conduits, a min of one layer of wrap strip is required. For nom 2-1/2 in. (64 mm) and nom 3 in. (76 mm) diam pipes, a min of two layers of wrap strip is required. For nom 3-1/2 in. (89 mm) and nom 4 in. (102 mm) diam pipes, a min of three layers of wrap strip is required. For nom 5 and 6 in. (127 and 152 mm) diam, two tiers (4 in. (102 mm) overall length) of three layers of wrap strip is required, with adjoining wrap strip layer edges between tiers tightly butted. Each layer of wrap strip to be installed with butted seams, with butted seams in successive layers staggered. Wrap strip layers temporarily held in position using aluminum foil tape, steel wire tie or equivalent.

3M COMPANY – Type FS-195+

B. Steel Collar – Nom 2 or 4 in. (51 or 102 mm) deep collar with 1-1/4 in. (32 mm) wide by 2 in. (51 mm) long anchor tabs and min 3/4 in. (19 mm) long tabs to retain wrap strip layers. Coils of precut 0.016 in. (0.41 mm) thick (No. 30 28 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 (No. 30 28 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 the seam. With steel collar anchor tabs pressed tightly against wall surface, compress collar 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 with worm drive tightening mechanism at the collar midheight. As an alternate to the stainless steel band clamp, the steel collar may be compressed around nom 4 in. diam (or smaller nonmetallic pipes using two min 16 SWG (0.0625 in. (0.016 mm) diam) steel wires secured with multiple twists. As an alternate to the band clamps or steel wires, collars may be secured by a means No. 10 by 1/2 in. (13 mm) long sheet 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 three screws is required. Secure collar to wall surface with 3/16 in. (5 mm) diam steel toggle bolts in conjunction with min 1-1/2 in. (38 mm) diam steel washers.

Three bolts, symmetrically located, required for 2 in. (51 mm) deep steel collar for nom 1/2 in. (13 mm) to nom 3 in. (76 mm) diam pipes. Four bolts, symmetrically located, required for 2 in. (51 mm) deep steel collar for nom 3-1/2 and 4 in. (89 and 102 mm) diam pipes. Five to seven bolts (every other anchor tab) required for 4 in. (102 mm) deep steel collar for nom 5 and 6 in. (127 and 152 mm) diam pipes. As a final step, bend retainer tabs 90 deg toward pipe to lock wrap strip layers in position.

C. Fill, Void or Cavity Materials* – Caulk, Sealant or Putty – Generous bead of caulk applied to outer perimeter of wrap strip at interface with wall surface and to perimeter of pipe or conduit at its egress from the wrap strip layers.

3M COMPANY – CP 25WB+ caulk and MP+ Stix putty, IC 15WB+ caulk, FireDam 150+ caulk, or FB-3000 WT sealant (Note: L Ratings apply only when CP 25WB+ caulk or FB-3000 WT sealant is used. CP 25WB+ and FireDam 150+ not suitable for use with CPVC pipes.)

D. Pipe Covering* – (Not Shown) – Nom 1 in. (25 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) 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 PVC pipe at its egress from steel collar 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 (Item C).

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 Mark with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

E. Firestop Device* – (Not shown) – As an alternate to Items A, B and C for nom 1-1/2, 2, 3 or 4 in. (38, 51, 76 or 102 mm) diam nonmetallic pipes, a firestop device consisting of a sheet-metal split collar lined with intumescent material and provided with steel clips for attachment may be used. Firestop device to be installed on both sides of wall in accordance with the accompanying installation instructions.

3M COMPANY – Types PPD 150, PPD 200, PPD 300, PPD 400

*Bearing the UL Classification Mark

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Note: Systems with Nonmetallic Through Penetration(s) have not been evaluated with a pressure differential of 50 Pa between the exposed and unexposed surfaces as required by the National Building Code of Canada.