Chapter Comm 84
PLUMBING PRODUCTS

Comm 84.01 Scope. The provisions of this chapter govern the quality and installation of materials, fixtures, appliances, appurtenances, and equipment relating to plumbing.

Comm 84.02 Penalties. Penalties for violations of this chapter shall be assessed in accordance with s. 145.12, Stats.

Comm 84.03 Definitions. In this chapter:
1. “Health care plumbing appliance” means a plumbing appliance, the function of which is unique to health care activities.
2. “Laboratory plumbing appliance” means a plumbing appliance, the function of which is unique to scientific experimental or research activities.
3. “Prefabricated plumbing” means concealed drain piping, vent piping or water supply piping or a combination of these types of piping, contained in a modular building component, which will not be visible for inspection when delivered to the final site of installation.

Comm 84.10 Department approval. No fixture, appliance, appurtenance, material, device or product may be sold for use in a plumbing system or may be installed in a plumbing system, unless it is of a type conforming to the standards or specifications of chs. Comm 81 and 83 and this chapter and ch. 145, Stats.

Comm 84.14 Chemical or biochemical treatments for private sewage systems.
Comm 84.15 Health care and laboratory plumbing appliances.
Comm 84.20 Plumbing fixtures, appliances and equipment.
Comm 84.25 POWTS holding components or treatment components.
Comm 84.30 Plumbing materials.
Comm 84.40 Joints and connections.
Comm 84.45 Alternate approvals and experimantal approvals.

The department may impose specific conditions in granting an approval. Violations of the conditions under which an approval is granted shall constitute a violation of this chapter.

(a) If, upon review, the department determines that a product does not conform to provisions of chs. Comm 82, 83 and this chapter and ch. 145, Stats., the request for approval shall be denied in writing.

(b) The department shall review and make a determination on an application for a product approval within 40 business days of receipt of all fees, plans, drawings, specifications and other information required to complete the review.

(c) If an approved plumbing product is modified or additional assertions of function or performance are made, the approval shall be considered null and void, unless the change is submitted to the department for review and the approval is reaffirmed.

(g) Approvals for plumbing products issued by the department prior to November 1, 1985, shall expire 30 months after the effective date of this section.

(h) Approvals for plumbing products issued by the department after November 1, 1985, shall expire at the end of the 60th month after the date of approval issuance.

Table 84.10 SUBMITTALS TO DEPARTMENT

<table>
<thead>
<tr>
<th>Product Categories</th>
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</thead>
<tbody>
<tr>
<td>1. Chemical or biochemical treatments for private sewage systems</td>
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<tr>
<td>2. Health care plumbing appliances</td>
</tr>
<tr>
<td>3. Laboratory plumbing appliances</td>
</tr>
<tr>
<td>4. Prefabricated holding or treatment components for POWTS</td>
</tr>
<tr>
<td>5. Prefabricated plumbing</td>
</tr>
<tr>
<td>6. Water treatment devices not listed by a nationally recognized listing agency as complying with NSF Standard 44</td>
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</tbody>
</table>

(3) VOLUNTARY POWTS COMPONENT REVIEW. (a) The department may issue an approval, upon request and review, for specific methods or technologies that are proposed to be utilized as POWTS holding, treatment or dispersal components which conform to the standards or specifications referenced in chs. Comm 81, 82, 83 and this chapter, but do not require approval under sub. (2) or s. Comm 84.50.

(b) Each request for approval shall be made on a form provided by the department.

Notes:
(a) See appendix for a reprint of the form and addresses of the department where the form may be obtained.
(b) The submittal shall be accompanied by sufficient data and information to determine if the method or technology complies with the provisions of chs. Comm 81, 82 and 83, and this chapter. The submittal shall include, but not be limited to, all of the following:
1. Plans and specifications.
2. Theory of operation.
3. Testing protocol.
4. Testing data.
5. Limits of reliable operation.
6. Installation requirements and procedures.
7. Inspection checklist and worksheet.
8. Inspection requirements and procedures.
9. Operation and maintenance requirements.
10. Operation and maintenance schedule.
11. Operation and maintenance checklist and worksheet.
   (d) 1. The department shall review a submittal under this subsection with input from a technical advisory committee.
   2. The members on the technical advisory committee under subd. 1. shall be appointed by the department for staggered 3-year terms and shall include representatives of at least the following groups or organizations:
      a. The department of natural resources.
      b. Local governmental unit.
      c. POWTS designer.
      d. Academic or scientific community.
      e. Plumber.
      f. Environmental group.
      g. POWTS component manufacturer.
   (e) 1. After review by the technical advisory committee under par. (d) but prior to issuing an approval under par. (f), the department shall seek public comments on a submittal under this subsection.
      2. a. The department shall place the notice requesting public comment under subd. 1. in the official state newspaper.
         Note: The official state newspaper at the time this rule goes into effect, July 1, 2000, is the Wisconsin State Journal.
      b. The department shall include a time limit for public comment in each notice.
      3. If the department receives a significant amount of public comment under subd. 2., the department may elect to recognize the specific method or technology through the rule-making process under ch. 227, Stats., and to cite the recognition in s. Comm 83.61.
   (f) 1. If, upon review, the department determines that the method or technology conforms to the provisions of chs. Comm 81, 82 and 83 and this chapter, the department shall issue an approval in writing.
   2. The department may impose specific conditions in granting an approval, including a provision to provide training to POWTS installers and POWTS inspectors.
   3. Violations of the conditions under which an approval is granted shall constitute a violation of this chapter.

   (g) If, upon review, the department determines that the method or technology does not conform to the provisions of chs. Comm 81, 82 and 83 and this chapter, the request for approval shall be denied in writing.

   (h) The department shall review and make a determination on an application for a method or technology approval within 3 months of receipt of all fees, plans, drawings, specifications and other information required to complete the review, unless the department elects to review the method or technology as part of the rule-making process under ch. 227, Stats.

   (i) If an approved method or technology is modified or additional assertions of function or performance are made, the approval shall be considered null and void, unless the change is submitted to the department for review and the approval is reaffirmed.

   (4) REVOCATION. The department may revoke any approval issued under this section for any false statements or misrepresentation of facts on which the approval was based, or as a result of the product's failure, or if data indicate a health hazard or threat to the waters of the state.

   (5) LIMITATIONS. An approval of a plumbing product by the department may not be construed as an assumption of any responsibility for defects in design, construction or performance of any product nor for any damages that may result. All products shall be installed in accordance with the manufacturer's printed instructions and as specified in chs. Comm 82–84. If there is a conflict between the manufacturer's printed instructions and requirements of chs. Comm 82–84, the requirements of chs. Comm 82–84 shall take precedence.

   (6) FEES. Fees for product approval review shall be submitted in accordance with s. Comm 2.66.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; correction made in (6) under s. 13.03 (2)(am)(b) 7., Stats., Register, February, 1994, No. 458; emerg. am. Table 84.10, (2) (a) (intro.), r. (2), (2) (a) 2., eff. 3-12-94; cl. (2) (a) (intro.), 1. and 2. to be 1., 2. and 3., r. (2) (b) 3., am. Table 84.10, Register, October, 1994, No. 466, eff. 11-1-94; am. Table 84.10 and r. and recr. (3), Register, April, 2000, No. 532, eff. 7-1-00, s. (2) (a) 2., r. (2) (a) (intro.) and 1. to be (2) (a) 1. and 2. and am. (2) (a) 2., am. (5), (6) and Table 84.10, Register, July, 2000, No. 535, eff. 9-1-00; am. (4) and (5), Register, December, 2000, No. 540, eff. 1-1-01.

Comm 84.11 Device listing. Cross connection control devices and water treatment devices complying with the referenced standard in Table 84.11 shall be listed by a nationally recognized listing agency acceptable to the department.

Note: See appendix for acceptable listing agencies.
### Table 84.11

<table>
<thead>
<tr>
<th>Device</th>
<th>Referenced Standard</th>
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</thead>
<tbody>
<tr>
<td>Atmospheric Type Vacuum Breakers</td>
<td>CAN/CSA B64.1.1</td>
</tr>
<tr>
<td>Back Siphonage Vacuum Breakers</td>
<td>ASSE 1056</td>
</tr>
<tr>
<td>Backflow Preventers for Carbonated Beverage Machine</td>
<td>ASSE 1022</td>
</tr>
<tr>
<td>Backflow Preventers with Intermediate Atmospheric Vent</td>
<td>ASSE 1012</td>
</tr>
<tr>
<td>Double Check Backflow Prevention Assemblies</td>
<td>ASSE 1015</td>
</tr>
<tr>
<td>Double Check Detector Assembly Preventers</td>
<td>ASSE 1048</td>
</tr>
<tr>
<td>Double Check Valve Type Backflow Preventers</td>
<td>CAN/CSA B64.5</td>
</tr>
<tr>
<td>Dual Check Valve Type with Atmospheric Port Backflow Preventers</td>
<td>CAN/CSA B64.3</td>
</tr>
<tr>
<td>Hand Held Showers</td>
<td>ASSE 1014</td>
</tr>
<tr>
<td>Hose Connection Backflow Preventers</td>
<td>ASSE 1052</td>
</tr>
<tr>
<td>Hose Connection Type Vacuum Breakers</td>
<td>CAN/CSA B64.2</td>
</tr>
<tr>
<td>Hose Connection Vacuum Breakers</td>
<td>ASSE 1011</td>
</tr>
<tr>
<td>Laboratory Faucet Backflow Preventers</td>
<td>ASSE 1035</td>
</tr>
<tr>
<td>Laboratory Faucet Type Vacuum Breakers</td>
<td>CAN/CSA B64.7</td>
</tr>
<tr>
<td>Pipe Applied Atmospheric Type Vacuum Breakers</td>
<td>ASSE 1001</td>
</tr>
<tr>
<td>Pressure Type Vacuum Breakers</td>
<td>CAN/CSA B64.1.2</td>
</tr>
<tr>
<td>Pressure Vacuum Breakers</td>
<td>ASSE 1020</td>
</tr>
<tr>
<td>Pressurized Flushing Devices (Flushometers) for Plumbing Fixtures</td>
<td>ASSE 1037</td>
</tr>
<tr>
<td>Reduced Pressure Detector Assembly Backflow Preventers</td>
<td>ASSE 1047</td>
</tr>
<tr>
<td>Reduced Pressure Principle Backflow Preventers</td>
<td>ASSE 1013</td>
</tr>
<tr>
<td>Reduced Pressure Principle Type Backflow Preventers</td>
<td>CAN/CSA B64.4</td>
</tr>
<tr>
<td>Water Closet Flush Tank Backflows</td>
<td>ASSE 1002</td>
</tr>
<tr>
<td>Wall Hydrants, Freeze Resistant, Automatic Draining Type</td>
<td>ASSE 1019</td>
</tr>
<tr>
<td>Residential Cation Exchange Water Softeners</td>
<td>NSF 44</td>
</tr>
</tbody>
</table>

**History:** Cr. Register, May, 1998, No. 355, eff. 9–1–98.

### Comm 84.20

#### Plumbing fixtures, appliances, and equipment

1. **Design and construction.** All plumbing fixtures, appliances and equipment shall be designed and constructed to:

   a. Ensure durability, proper service and sanitation;
   
   b. Be free from defects;
   
   c. Be free from concealed fouling surfaces;
   
   d. Not require undue efforts in cleaning and operating; and
   
   e. Prevent unpotable liquids, solids or gasses from being introduced into a potable water supply system through cross-connections.

2. **Materials.** (a) Plumbing fixtures shall have smooth surfaces that are impervious to water.

   (b) All plumbing fixture fittings which are end-point devices, covered by the scope of NSF 61, section 9 and installed to supply water intended for human ingestion, shall conform to NSF 61, section 9.

   **Note:** The scope of NSF 61, section 9 defines which devices are intended for use for human ingestion in response to the Federal clean drinking water act.

3. **Water conserving faucets, spouts and plumbing fixtures.** Water conserving faucets, spouts and plumbing fixtures which meet or exceed the water conservation requirements established in par. (b) shall be installed as specified in par. (a).

   a. 1. All lavatory faucets, showerheads, urinals, urinal flushing devices, water closets and water closet flushing devices shall conform to par. (b).

   b. 2. All faucets installed on kitchen sinks of dwelling units and living units shall conform to par. (b) 4.

   (b) 1. General. Flow control or flow restricting devices shall be installed on the water inlet side or shall be an integral part of the faucet, spout or fixture. A flow controlling or restricting apparatus shall be considered to be an integral part of a faucet or spout.
2. Lavatory faucet. a. The maximum discharge rate of lavatory faucets shall be 3 U.S. gallons per minute at an 80 psi (552 kPa) flowing supply pressure.

b. Lavatory faucets which are of the self-closing type shall allow a maximum of one U.S. gallon to flow through the faucet after the handle or actuator is released.

3. Shower heads. The maximum discharge rate of shower heads shall be 3 U.S. gallons per minute at an 80 psi (552 kPa) flowing supply pressure.

4. Sink faucets. The maximum discharge rate of sink faucets shall be 3 U.S. gallons per minute at an 80 psi (552 kPa) flowing supply pressure.

5. Urinals. Urinals shall function properly with a maximum of 1.5 U.S. gallons per flush per fixture use at static test pressures of 20 psi and 80 psi.

6. Urinal flushing devices. The flushing cycle for urinal flushing devices shall discharge a maximum of 1.5 U.S. gallons per flush per fixture use at static test pressures of 20 psi and 80 psi.

7. Water closets. Water closets shall function properly with a maximum of 4 U.S. gallons per flush over the range of static test pressures specified in Table 84.20.

8. Water closet flushing devices. The flushing cycle for water closet flushing devices shall discharge a maximum of 4 U.S. gallons over the range of static test pressures specified in Table 84.20.

**Table 84.20**

<table>
<thead>
<tr>
<th>Tank Type</th>
<th>Flushometer Type</th>
<th>Sp Honic</th>
<th>Blow Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 to 80 psi</td>
<td>25 to 80 psi</td>
<td>35 to 80 psi</td>
<td></td>
</tr>
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</table>

(4) **GENERAL REQUIREMENTS.** (a) **Fixture outlets.** 1. The outlet passageway of a fixture shall be free from impairments and of sufficient size to insure proper discharge of the fixture contents under normal conditions.

2. The outlet connection of a fixture which directly connects to the drain system shall be an air and watertight joint.

(b) **Installation of fixtures.** 1. Access for cleaning. Plumbing fixtures shall be so installed as to afford easy access for cleaning both the fixture and the area around it.

2. Securing wall mounted fixtures. Wall mounted fixtures shall be rigidly supported by a hanger which is attached to structural members so that the load is not transmitted to the fixture drain connection or any other part of the plumbing system. The hanger for a wall mounted water closet shall conform to ASME A112.6.1M.

3. Water supply protection. The water supply pipes and fittings within every plumbing fixture shall be so installed as to prevent backflow.

4. Design of overflow. A fixture which is provided with an overflow outlet shall be designed and installed so that standing water in the fixture cannot rise in the overflow when the fixture's stopper is closed, and so that no water remains in the overflow when the fixture is empty.

5. Connection of overflows. The overflow from any fixture shall discharge into the drain system on the inlet or fixture side of the trap.

6. Overflows in flush tanks. Flush tanks shall be provided with overflows discharging to the fixture served and shall be of sufficient size to prevent flooding the tank at the maximum rate at which the tanks are supplied with water.

7. Strainers. All plumbing fixtures other than water closets, clinic sinks, trap standard service sinks with flush rims, urinals, standpipes and waste sinks shall be provided with strainers, cross bars or pop-up stoppers which restrict the clear opening of the waste outlet.

8. Flushometer valves. Flushometer valves shall be equipped with vacuum breakers which conform to ASSE 1001. Flushometer valves may not be used where the water pressure is insufficient to properly operate them. When the valve is operated, it shall complete the cycle of operation automatically, opening fully and closing positively under the water supply pressure. Each flushometer shall be provided with a means for regulating the flow through it.

9. Safing. a. The floor of all site-constructed shower stalls and shower rooms shall be protected with a safing material installed beneath the finished floor of the entire enclosure or room and upward along the sides to a minimum of 6 inches above the curb or maximum water level of the room or enclosure. The corners of the enclosure or room shall be safeguarded to a height of 6 feet and at least 3 inches in each direction from the corners.

b. All floor drains or other similar fixtures shall be installed with a safing material extending a minimum of 12 inches from the fixture.

c. The safing material shall conform to s. Comm 84.30 (6).

d. The safing material shall be properly drained.

e. All installations directly over an unexcavated portion of a building are exempt from this subdivision.

Note: Chapters Comm 50 to 64 contain provisions for toilet rooms and sanitary facilities, for public buildings and places of employment concerning toilet facilities for the handicapped, fixture compartments, number of fixtures for the different types of occupancies and toilet room finishes.

(5) **PLUMBING FIXTURES AND PLUMBING APPLIANCES.** (a) **Automatic clothes washers.** Residential type automatic clothes washers shall conform to ASSE 1007.

(b) **Bathtubs.** 1. a. Enamel coated iron bathtubs shall conform to ASME A112.19.1M.

b. Porcelain enameled steel bathtubs shall conform to ASME A112.19.4.

c. Plastic bathtubs shall conform to ANSI Z124.1.

2. Bathtubs shall have waste outlets and overflows at least 1-1/2 inches in diameter. A closing device shall be provided on the waste outlet.

3. All whirlpool piping for bathtubs shall drain by gravity to the trap serving the bathtub.

4. All waterways of the whirlpool pump for a bathtub shall drain by gravity to the trap serving the bathtub.

(c) **Bidets.** Viscous china bidets shall conform to the material requirements in ASME A112.19.2M.

1. A bidet may not be located closer than 15 inches from its center to any side wall, partition, vanity or other obstruction, nor closer than 30 inches center to center from a water closet.

2. Bidets with submerged inlet fittings shall be protected by vacuum breakers which conform to ASSE 1001 or CAN/CSA B64.1.1.

(i) **Chemical dispensing systems.** Chemical dispensing systems shall conform to ASSE 1055.

(e) **Dishwashing machines.** 1. Residential type dishwashing machines shall conform to ASSE 1006.

2. Commercial type dishwashing machines shall conform to ASSE 1004.

(f) **Drinking fountains.** 1. Drinking fountains and water coolers shall conform to ARI 1010 or ASME A112.19.2M.

2. Drinking fountains may not be installed in toilet rooms.

3. The water supply for drinking fountains shall be provided with an adjustable valve fitted with a loose key or an automatic self-closing valve permitting regulation of the rate of flow of water. The water supply issuing from the nozzle shall be of sufficient volume and height so that persons using the fountain need not come in direct contact with the nozzle or officer.
4. A drinking fountain may not have a waste outlet less than 1-1/2 inches in diameter.

(g) **Floor drains.** 1. Floor drains shall be provided with removable strainers of sufficient strength to carry the anticipated loads.

2. The floor drain shall be so constructed that it can be cleaned, and the drain inlet shall be accessible at all times.

3. Floor drains shall be of a size to efficiently serve the intended purpose. The floor drain outlet shall not be less than 2 inches in diameter.

(h) **Food waste grinders.** 1. Residential type food waste grinders shall conform to ANSI A112.108. Commercial type food waste grinders shall conform to ASSE 1009.

2. Food waste grinders shall be connected to a drain of sufficient size to serve the unit, but not less than 1 1/2 inches in diameter.

3. Food waste grinders shall be connected to a drain and trapped separately from any other fixtures or sink compartments.

4. All food waste grinders shall be provided with an adequate supply of cold water at a sufficient flow rate to insure proper functioning of the unit.

(i) **Laundry trays.** Each compartment of a laundry tray shall be provided with a waste outlet not less than 1 1/2 inches in diameter.

(j) **Lavatories.** 1. a. Enamel cast iron lavatories shall conform to ASME A112.19.1M.

b. Vitreous china lavatories shall conform to ASME A112.19.2M.

c. Stainless steel lavatories shall conform to ASME A112.19.3.

d. Porcelain enameled steel lavatories shall conform to ASME A112.19.4.

e. Plastic lavatories shall conform to ANSI Z124.3.

2. Cultured marble vanity tops with an integral lavatory shall conform to ANSI Z124.3.

3. Lavatories shall have waste outlets not less than 1 1/2 inches in diameter.

(k) **POWTS design packages and POWTS components.** POWTS design packages and POWTS components shall function and perform in accordance with assertions submitted to and approved by the department under s. Comm 84.10.

(L) **Showers.** 1. Prefabricated plastic showers and shower compartments shall conform to ANSI Z124.2.

2. Except for combination bathtub–shower units, waste outlets serving showers shall be at least 2 inches in diameter and shall have removable strainers of sufficient strength for the anticipated loads.

3. Where a waste outlet serves more than one shower space or shower head, the waste outlet shall be at least 2 inches in diameter and the waste outlet shall be so located and the floor so pitched that waste water from one shower does not flow over the floor area serving another shower.

Note: Section Comm 52.60(5)(a) specifies slip-resistant requirements for shower rooms and compartments in public buildings and places of employment.

4. All shower compartments, regardless of shape, shall have a minimum finished interior of 900 square inches and shall be capable of encompassing a circle with a diameter of 30 inches. The minimum required area and dimension shall be measured in a horizontal plane 24 inches above the top of the threshold and may not extend beyond the centerline of the threshold. The minimum area and dimensions shall be maintained to a point 70 inches above the shower waste outlet with no protrusions other than the fixture valve or valves, showerheads, soap dishes, retractable seats and safety grab bars or rails.

Note: See Appendix for further explanatory materials.

(m) **Sinks.** 1. a. Enamel cast iron sinks shall conform to ASME A112.19.1M.

b. Vitreous china sinks shall conform to ASME A112.19.2M.

c. Stainless steel sinks shall conform to ASME A112.19.3.

d. Porcelain enameled formed steel sinks shall conform to ASME A112.19.4.

e. Plastic sinks shall conform to ANSI Z124.6.

2. Sinks shall be provided with waste outlets not less than 1 1/2 inches in diameter.

(n) **Urinals.** 1. a. Vitreous china urinals shall conform to ASME A112.19.2M and A112.19.6.


2. A urinal may not be located closer than 15 inches from its center to any side wall, partition, vanity or other obstruction, nor closer than 30 inches center to center, between urinals. When the space between stall type urinals or a stall type urinal and a side wall is less than 12 inches, the space shall be filled flush with the front and top of the urinal with nonabsorbent material.

Note: See Appendix for further explanatory material.

3. Stall type urinals shall be set into the floor and the floor shall be pitched toward the fixture.

4. Automatic siphon urinal flush tanks may not be installed.

5. Pressurized flushing devices to serve urinals shall conform to ASSE 1037.

(o) **Water closets.** 1. a. Vitreous china water closets shall conform to ASME A112.19.2M and A112.19.6.

b. Plastic water closets shall conform to ANSI Z124.4.

2. Except as permitted in subd. 3, all water closets required to be provided in public buildings and places of employment shall be of an elongated bowl type, and provided with either:

   a. Hinged, open-front seats without covers; or

   b. Hinged, closed-front seats, without covers, which are encased with a continuous plastic sleeve capable of providing a clean surface for every user and for which a specific material approval under s. Comm 50.19 has been issued.

3. Water closets which are required to be provided in day care centers or individual living units or sleeping units of residential occupancies within the scope of either ch. Comm 57 or 61 may be of a round–bowl type with a hinged, closed front seat with or without a cover.

4. A water closet may not be located closer than 15 inches from its center to any side wall, partition, vanity, or other obstruction, nor closer than 30 inches center to center, between water closets. There shall be at least 24 inches clearance in front of a water closet to any wall, fixture or door.

Note: See Appendix for further explanatory material.

5. No person may install or maintain pan, plunger, offset washout, washout, large hopper, frostproof and other types of water closets having invisible seats or ventilated spaces or walls not thoroughly cleansed at each flushing.

6. Each water closet shall be individually equipped with a flushing device. Pressurized flushing devices shall conform to ASSE 1037. All flushing devices shall be readily accessible for maintenance and repair. Ballocks and fill valves shall be of the anti-siphon type and shall conform to ASSE 1002. The critical level mark on the ballock and fill valve shall be located at least one inch above the full opening of the overflow pipe.

(p) **Water heaters.** 1. Listed equipment. All water heaters shall bear the label of a listing agency approved by the department. Listing agencies approved by the department shall include:

   a. Underwriters Laboratories, Inc.;

   b. American Gas Association;

   c. American Society of Mechanical Engineers; and

   d. ETL Testing Laboratories, Inc.

2. Design, a. All pressurized water heaters and pressurized hot water storage tanks, except those bearing the label of the American Society of Mechanical Engineers, shall be designed and
constructed to withstand a minimum test pressure of 150% of the maximum allowable working pressure of the heater or tank.

b. All pressurized water heaters and pressurized hot water storage tanks shall be rated for a minimum working pressure of 125 psi.

c. A drain valve shall be installed at the lowest point of each water heater and hot water storage tank. Drain valves shall conform to ASSE 100S.

3. Safety devices. a. Relief valves shall be listed by the American Gas Association, Underwriters Laboratories, Inc. or American Society of Mechanical Engineers when the heat input to a water heater is less than or equal to 200,000 Btu per hour.

b. Relief valves shall be listed by the American Society of Mechanical Engineers when the heat input to a water heater exceeds 200,000 Btu per hour.

c. Pressure relief valves shall be set to open at either the maximum allowable working pressure rating of the water heater or storage tank at 150 psi, whichever is smaller.

d. Temperature and pressure relief valves shall be set to open at a maximum of 210°F and in accordance with subd. 3. c.

Notes: See Sec. 82.40(5)(a) 1. concerning the sizing of temperature and pressure relief valves.

4. Hot water dispensers. Nonpressurized point-of-use water heaters shall conform to ASSE 102S.

(q) Water meters. A water meter which is used pursuant to s. Comm 83.18(10) shall conform to AWWA C700, AWWA C701, AWWA C702, AWWA C704, AWWA C706, AWWA C707, AWWA C708, or AWWA C7-0.

(r) Water treatment devices. 1. Water softeners shall conform to NSF-44.

Notes: See Sec. 82.40 for limitations as to the types of water treatment devices which may discharge to a POWTS.

2. a. Except as provided in subd. 2. b., water treatment devices shall function and perform in accordance with the assertions submitted to the department under s. Comm 84.10, relating to rendering inactive or removing contaminants.

b. A water treatment device which injects a water treatment compound into a water supply system shall maintain the compound concentration in the system over the working flow rate and pressure range of the device.

3. Except as specified in subd. 4., water treatment compounds introduced into the water supply system by a water treatment device shall be listed as an acceptable drinking water additive by a listing agency approved by the department. Listing agencies approved by the department shall include:

a. United States environmental protection agency;

b. United States food and drug administration; and

c. National sanitation foundation.

4. A water supply system shall be protected from backflow when unlisted water treatment compounds, which may affect the potability of the water, are introduced into the system. The department shall determine the method of backflow protection. Water supply outlets for human use or consumption may not be installed downstream of the introduction of an unlisted water treatment compound.

5. Water treatment devices designed for contaminated water supplies shall be labeled to identify the following information:

a. The name of the manufacturer of the device;

b. The device's trade name; and

c. The device's model number.

(s) Other plumbing fixtures, appliances and equipment. Plumbing fixtures, appliances and equipment not specifically covered in this subsection shall conform to the applicable performance standards of this chapter and chs. Comm 82 and 83.

(6) Faucets, spouts and fixture supply connectors. (a) Except for circular and semi-circular wash fountains, all faucets and showerheads shall conform to ASME A112.18.1M or CAN/CSA B125.

(b) Circular and semi-circular wash fountains shall conform to the working pressure, burst pressure, discharge rate and product marking requirements of ASME A112.18.1M or CAN/CSA B125.

(c) All fixture supply connectors shall be designed and constructed to withstand a minimum pressure of 100 psi at 180°F.

(d) Flexible hose and spray assemblies for residential sinks shall conform to ASSE 102S.

(e) Hand-held showers shall conform to ASSE 1014.

(f) Fixed bathtubs shall conform to ASME A112.19.9 or ANSI Z21.61.

(g) All fixed showers shall conform to ASME A112.19.8 or ANSI Z21.61.

(h) All fixed sprayers shall conform to ASME A112.19.20 or ANSI Z21.61.

Register, April, 2001, No. 544
(3) **STRENGTH.** Tank assemblies, including fittings and access openings, shall be capable of withstanding loads and pressures that the tanks are intended to encounter and remain watertight.

(4) **PROTECTION FROM ELEMENTS.** (a) **Concrete tanks.** 1. The interior of a concrete tank assembly, including fittings and access openings, shall have a protective coating or be constructed of material, above the lowest liquid level expected in the tank, that will inhibit the deterioration of the concrete due to internal environmental effects.

2. Under subd. 1., concrete with a water cement ratio not exceeding 0.45 shall be considered resistant to deterioration due to internal environmental effects.

(b) **Steel tanks.** 1. Steel tank assemblies, including fittings and access openings, shall have a protective coating that will inhibit the deterioration of the steel due to internal and external environmental effects.

2. Steel tank assemblies, including fittings and access openings, installed underground shall be provided with cathodic protection in accordance with UL Standard 1746 or STI-P3.

(c) **Tanks constructed of materials other than concrete or steel.** Tank assemblies, including fittings and access openings, constructed of materials other than concrete or steel shall be protected against deterioration due to internal and external environmental effects.

(5) **VENTING.** (a) Each tank, except camping unit transfer containers, shall be provided with a means of venting gases formed inside of the tank to the atmosphere.

(b) The tank vent shall terminate in accordance with s. Comm 82.31 (16).

(6) **PIPE CONNECTION.** All pipe connection openings to a tank shall be designed to allow connections in accordance with s. Comm 84.40.

(7) **ACCESS.** (a) Each covered tank shall be provided with one or more openings of sufficient size and located in such a manner to provide a means for inspection or required servicing or maintenance of the tank.

(b) Inspection openings for tanks located below ground shall extend at least to the finished ground.

(c) Servicing and maintenance openings for treatment tanks located below ground shall extend to at least within 6 inches below finished grade.

(d) Servicing and maintenance openings for holding components shall comply with all of the following:

1. Extend to at least 4 inches above finished grade when the holding component is below ground.

2. Be located to allow inspection and maintenance of pumps or siphons located in the holding component.

(e) Inspection, maintenance and servicing openings shall terminate with a means that prevents entrance of deleterious materials.

(f) Covers located at or above ground for openings larger than 8 inches in diameter shall be provided with locking devices and shall remain locked except for cleaning or maintenance purposes.

(8) **WARNING LABEL.** (a) Covers for all tank openings larger than 8 inches in diameter shall be provided with a permanent warning label indicating the dangers of entering the tank, in accordance with this subsection.

(b) The warning label shall be securely attached and made of a noncorrosive metal or plastic bearing the legend “DO NOT ENTER WITHOUT PROPER EQUIPMENT” or “DANGEROUS GASES EXIST IN TANK” or similar language.

(c) The label shall be rectangular in shape with minimum dimensions of 4 by 5 inches.

(d) The wording on the label shall be a minimum of ½ inch in height and be either indented or raised.

(9) **DOSING APPARATUS.** (a) Pumps for POWTS used to disperse air, treated wastewater or final effluent shall be rated by the pump manufacturer for such use.

(b) Siphons for POWTS shall be rated by the siphon manufacturer for wastewater use.

(c) All other dosing apparatus for POWTS shall be constructed of corrosive resistant materials and designed to perform as intended.

(10) **ALARM SYSTEM.** (a) All pump and alarm controls for POWTS shall be specifically designed by the manufacturer for such use.

(b) The use of pressure diaphragm switches in POWTS tanks shall be prohibited.

(11) **TANK LABEL.** (a) **Anaerobic tanks.** Each anaerobic treatment tank or holding component shall be labeled near an inlet or outlet opening. The label shall be embossed, impressed, or securely attached to the tank. The label shall include all of the following information:

1. Name or trademark of the manufacturer.

2. Capacity of each compartment.

3. Manufacturer’s model number.

(b) **Aerobic tanks.** 1. Each aerobic treatment tank shall be provided with 2 label plates. Label plates shall be inserted to be easily read and understood, and be securely attached.

2. One label plate shall be attached to the front of the electrical control box. The second label plate shall be attached to the aeration equipment assembly, tank, or riser at a location normally subject to access during inspection of the unit.

3. Each label plate shall include all of the following information:

   a. Name or trademark of the manufacturer.

   b. Model number.

   c. Rated daily flow capacity of the unit.

(12) **OTHER TREATMENT COMPONENTS.** A treatment component not specifically covered in this section may not be sold for use in a POWTS or may not be installed in a POWTS, unless it has received department approval and conforms to the applicable performance standards of this chapter and chs. Comm 82 and 83, and ch. 145, Stats.

History: C. Register, April, 2000, No. 532, eff. 7-1-00.

**Comm 84.30 Plumbing materials.**

(1) **GENERAL.** When selecting the material and size for a plumbing system, due consideration shall be given to the soil, liquid, and atmospheric environments that will eventually surround the plumbing system.

(a) The bending or offsetting of flexible pipe or tubing shall be in accordance with the applicable material standard or the instructions of the manufacturer of the pipe or tubing.

(b) Pipe or tubing with gouges, cuts or deep scratches may not be installed.

(c) Pipe or tubing which has been kinked may not be installed.

(d) The bending or offsetting of rigid pipe shall be prohibited.

(e) Nailing plates shall be installed to protect copper or plastic pipe or tubing from puncture.

Note: See s. Comm 84.30 (4) (f) concerning the bending of polyethylene water distribution pipe and tubing.

(2) **SANITARY DRAIN AND VENT SYSTEMS.** Sanitary drain systems and vent systems shall be of such material and workmanship as set forth in this subsection.

(a) **Above ground drain and vent pipe.** Except as provided in s. Comm 82.33 (2), drain pipe and vent pipe installed above ground shall conform to one of the standards listed in Table 84.30-1.

(b) **Underground drain and vent pipe.** Except as provided in par. (d), drain pipe and vent pipe installed underground shall conform to one of the standards listed in Table 84.30-2.
(c) Sanitary building sewer pipe. Sanitary building sewer pipe shall conform to one of the standards listed in Table 84.30–3.

(d) Treated wastewater piping. 1. Nonpressurized, nonperforated drain piping conveying treated wastewater from a POWTS treatment or holding component to a POWTS treatment or holding component, distribution cell or disposal zone shall conform to one of the standards listed in Table 84.30–3.

2. Nonpressurized perforated drain piping conveying treated wastewater in a POWTS soil treatment or dispersal component shall conform to one of the standards listed in Table 84.30–4.

3. Pressurized perforated drain piping conveying treated wastewater in a POWTS treatment or dispersal component shall conform to one of the standards listed in Table 84.30–5 and shall be perforated in accordance with the POWTS design.

(e) Pressurized drain pipe. Except as provided in par. (d) 3, pressurized drain pipe shall conform to one of the standards listed in Table 84.30–5 and shall be rated for the working pressure and temperature to which it will be subjected for a specific installation.

(f) Chemical drain and vent pipe. Drain systems and vent systems for chemical wastes shall be of approved corrosion resistant material. The manufacturer of the pipe shall indicate to the department the material's suitability for the concentrations of chemicals involved.

(g) Catch basins, interceptors and sumps. Catch basins, interceptors and sumps shall be constructed in a watertight manner of precast reinforced concrete, reinforced monolithic concrete, cast iron, coated 12-gauge steel, vitrified clay, fiberglass, plastic or other approved materials.

(b) Manholes. Manholes shall be constructed in a watertight manner of precast reinforced concrete, reinforced monolithic concrete, brick or block, fiberglass or other approved materials. Fiberglass manholes may be approved for use in traffic areas if the top section of the manhole is not made of fiberglass.

(i) Service suction lines. A service suction line or pump discharge line serving a holding tank for cleaning purposes shall conform to one of the standards listed in Table 84.30–5. Joints and connections for suction lines shall conform to s. Comm 84.40. The use of mechanical joints shall be in accordance with the recommendations and instructions specified by the manufacturer.

Table 84.30–1

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
<td>ASTM D1527; ASTM D2661; ASTM D2751; ASTM F628</td>
</tr>
<tr>
<td>Brass</td>
<td>ASTM B43</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASTM A74; CISPI 301</td>
</tr>
<tr>
<td>Copper</td>
<td>ASTM B42; ASTM B88; ASTM B306</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>ASTM A53</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>ASTM D2665; ASTM D1785; ASTM F891</td>
</tr>
<tr>
<td>Synthetic rubber hose*</td>
<td>AIAHM DW–1</td>
</tr>
</tbody>
</table>

Notes: a) The installation of synthetic rubber hose is limited in use to indirect waste piping or local waste piping from dishwashers in accordance with s. Comm 82.33 (9) (d).

Table 84.30–2

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
<td>ASTM D1527; ASTM D2661; ASTM D2751; ASTM F628</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASTM A74; CISPI 301</td>
</tr>
<tr>
<td>Concrete</td>
<td>ASTM C14; ASTM C76</td>
</tr>
<tr>
<td>Copper*</td>
<td>ASTM B42; ASTM B88; ASTM B306</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>ASTM D1785; ASTM D2665; ASTM D3034; ASTM F891</td>
</tr>
<tr>
<td>Vitrified clay</td>
<td>ASTM C700</td>
</tr>
</tbody>
</table>

Notes: a) Copper tubing, type M, may not be installed underground.

(b) Pipe and vent pipe. Drain pipe and vent pipe installed above ground and inside a building shall conform to one of the standards listed in Table 84.30–1, except black steel pipe conforming to ASTM A53 may be used for storm water conductors. Black steel conductors may not be embedded in concrete or masonry.

Table 84.30–3

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
<td>ASTM D1527; ASTM D2661; ASTM D2751; ASTM F628</td>
</tr>
<tr>
<td>Acrylonitrile butadiene styrene (ABS) composites*</td>
<td>ASTM D2680</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASTM A74; CISPI 301</td>
</tr>
<tr>
<td>Concrete</td>
<td>ASTM C14; ASTM C76</td>
</tr>
<tr>
<td>Copper*</td>
<td>ASTM B42; ASTM B88</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)*</td>
<td>ASTM D1785; ASTM D2665; ASTM D3034; ASTM F891</td>
</tr>
<tr>
<td>PVC Corrugated Sewer Pipe With a Stainless Insert and Fittings</td>
<td>ASTM F949</td>
</tr>
<tr>
<td>PVC Large-Diameter Plastic Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter</td>
<td>ASTM F979</td>
</tr>
<tr>
<td>PVC Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter</td>
<td>ASTM F994</td>
</tr>
<tr>
<td>Type FS–46 and Type FS–115 PVC Plastic Gravity Flow Sewer Pipe and Fittings</td>
<td>ASTM I789</td>
</tr>
</tbody>
</table>

*Thermoplastic sewer pipe shall be installed in accordance with ASTM D2331.

* Copper tubing, type M, may not be installed underground.

Table 84.30–4

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene (PE)*</td>
<td>ASTM F405; ASTM F810</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>ASTM D2729</td>
</tr>
</tbody>
</table>

Notes: a) Polyethylene (PE) pipe shall have 2 rows, and only 2 rows, of perforations parallel to the axis of the pipe and 120 ± 5° apart. The perforations shall be at the nominal 4 and 8 of clock positions when the pipe is installed.

Table 84.30–5

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)*</td>
<td>ASTM D1527; ASTM D2282; ASTM D2661; ASTM F628</td>
</tr>
<tr>
<td>Brass</td>
<td>ASTM B43</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASTM A74; ASTM A377; AWWA C15/A21.15; CISPI 301</td>
</tr>
<tr>
<td>Chlorinated Poly (Vinyl Chloride) (CPVC)*</td>
<td>ASTM D2846; ASTM F441/F441M; ASTM F442/F442M</td>
</tr>
<tr>
<td>Concrete</td>
<td>ASTM C14; ASTM C76</td>
</tr>
<tr>
<td>Copper*</td>
<td>ASTM B42; ASTM B88; ASTM B306</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>ASTM A377; AWWA C15/A21.15; AWWA C15/A21.51</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>ASTM A53</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>ASTM A53</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)*</td>
<td>ASTM D1785; ASTM D2241; ASTM D2665; ASTM D2672; AWWA C900</td>
</tr>
<tr>
<td>Polyethylene Pressure Pipe and Fitting, 4 in. through 63 in., for Water Distribution</td>
<td>AWWA C906</td>
</tr>
</tbody>
</table>

Notes: a) Thermoplastic sewer pipe shall be installed in accordance with ASTM D2331.

* Copper tubing, type M, may not be installed underground.

(3) Storm and clear water drain and vent systems. Storm and clear water drain and vent systems shall be of such material and workmanship as set forth in this subsection.

(a) Above ground drain and vent pipe. Drain pipe and vent pipe installed above ground and inside a building shall conform to one of the standards listed in Table 84.30–1, except black steel pipe conforming to ASTM A53 may be used for storm water conductors. Black steel conductors may not be embedded in concrete or masonry.

(b) Underground drain and vent pipe. Drain pipe and vent pipe installed underground shall conform to one of the standards listed in Table 84.30–2.
(c) Storm building sewer pipe. Storm building sewer pipe shall conform to one of the standards listed in Table 84.30–6.

(d) Subsoil drain pipe. Subsoil drains shall be open jointed, horizontally split, or perforated pipe conforming to one of the standards listed in Table 84.39–7.

(e) Roof drains. 1. Roof drains shall be provided with removable strainers of sufficient strength to carry the anticipated loads.

2. Roof drains shall be so constructed that the drains can be cleaned and the drain inlets accessible at all times.

3. Roof drains shall be sized in accordance with s. Comm 82.36 and the drain outlet shall not be less than 2\(\frac{1}{2}\) inches in diameter.

Note: See s. Comm 82.36 (18) for additional roof drain requirements.

(f) Area drain inlets. Area drain inlets shall be constructed in a watertight manner of precast concrete, reinforced monolithic concrete, brick or block, cast iron, coated 12 gauge steel, vitrified clay, fiberglass or other approved materials.

Table 84.30–6

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylic-lined butylene-synthetic (ABS) composite</td>
<td>ASTM D1527; ASTM D3661; ASTM D2251; ASTM F1628</td>
</tr>
<tr>
<td>Acrylic-lined butylene-synthetic (ABS) composite</td>
<td>ASTM D2808</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASTM A74; CISPI 301</td>
</tr>
<tr>
<td>Concrete, circular</td>
<td>ASTM C14; ASTM C76</td>
</tr>
<tr>
<td>Concrete, elliptical</td>
<td>ASTM C507/C507M</td>
</tr>
<tr>
<td>Copper</td>
<td>ASTM B42; ASTM B86</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>ASTM D1785; ASTM D2665; ASTM D3034; ASTM F891</td>
</tr>
<tr>
<td>PVC Corrugated Sewer Pipe With a Smooth Interior and Fittings</td>
<td>ASTM F949</td>
</tr>
<tr>
<td>PVC Large-Diameter Plastic Gravity Sewer Pipe and Fittings</td>
<td>ASTM F679</td>
</tr>
<tr>
<td>PVC Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter</td>
<td>ASTM F794</td>
</tr>
<tr>
<td>Type PS–46 and Type PS–115 PVC Plastic Gravity Flow Sewer Pipe and Fittings</td>
<td>ASTM F789</td>
</tr>
<tr>
<td>Vitrified clay</td>
<td>ASTM C700</td>
</tr>
</tbody>
</table>

\(^*\)Thermoplastic sewer pipe shall be installed in accordance with ASTM D2351.

\(^*\)Copper tubing, type M, may not be installed underground.

Table 84.30–7

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast iron</td>
<td>ASTM A74; CISPI 301</td>
</tr>
<tr>
<td>Clay drain tile</td>
<td>ASTM C4</td>
</tr>
<tr>
<td>Polyethylene (PE)</td>
<td>ASTM F405</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>ASTM D2729 (Perforated only)</td>
</tr>
<tr>
<td>Vitrified clay</td>
<td>ASTM C700</td>
</tr>
</tbody>
</table>

(4) WATER SUPPLY SYSTEMS. Water supply systems shall be of such material and workmanship as set forth in this subsection. All materials in contact with water, in a water supply system, shall be suitable for use with potable water. All pipes and pipe fittings for water supply systems shall be made of a material that contains not more than 0.01% lead.

(a) Water quality. A water supply system shall be resistive to corrosive action and degrading action from the water being conveyed.

(b) Soil and groundwater. The installation of water supply systems shall be prohibited in soil and groundwater that is contaminated with solvents, fuels, organic compounds or other detrimental materials which will cause permeation, corrosion, degradation, or structural failure of the piping material.

1. Where detrimental conditions are suspected, a chemical analysis of the soil and groundwater conditions shall be required to ascertain the acceptability of the proposed water supply system materials for the specific installation.

2. Where a detrimental condition exists, no underground water supply system may be installed until the detrimental condition can be:

   a. Eliminated and the source of the condition can be eliminated;

   b. Identified and the pipe and joining method can be proven resistant to the detrimental condition; or

   c. Avoided by choosing an alternate route that will not be affected by the detrimental condition.

(c) Certification of plastic pipe. Plastic pipe for a water supply system shall conform to NSF 14 and shall be certified by a nationally recognized testing agency as to conforming to NSF 14. Plastic pipe for water supply systems shall bear the certification mark of the testing agency.

(d) Water services and private water mains. 1. Water service pipe and private water mains shall conform to one of the standards listed in Table 84.30–8. Pipe and tubing for water services and private water mains shall have a minimum working pressure of 150 psig at 73.4°F.

2. A local governmental unit may by ordinance restrict the types of materials for water services and private water mains which are to be located within or beneath an area subject to an easement for a highway, street or public service right-of-way. Before adopting an ordinance restricting the types of materials for water services the local governmental unit shall submit a copy of the proposed ordinance to the department for review and approval.

3. Existing metallic water service piping or water distribution piping used for electrical grounding shall not be replaced with nonmetallic pipe or tubing until other approved electrical grounding means are provided.

(e) Water distribution pipe. 1. Except as provided in subd. 2., water distribution pipe shall have a minimum working pressure of 150 psig at 180°F and shall conform to one of the standards listed in Table 84.30–9.

2. Water distribution pipe installed underground for an exterior fire sprinkler system shall conform to one of the standards listed in Table 84.30–10. Water distribution pipe and fittings for exterior fire sprinkler systems shall have a minimum working pressure of 150 psig at 73.4°F. Water distribution pipe installed above ground for an exterior fire sprinkler system shall conform to subd. 1.

Note: Portions of a water supply system that supply water to a fire sprinkler system are to also conform to the requirements specified in s. Comm 51.23.

(f) Bending limitations. 1. The bending of polybutylene water service pipe or tubing shall be in accordance with the manufacturer's instructions.

2. a. The bending radius of polybutylene water distribution pipe or tubing shall meet or exceed the bending radius specified in Table 84.30–9m and shall meet or exceed the bending radius specified by the manufacturer of the pipe or tubing.

Note: See Appendix for further explanatory material.
h. Polybutylene water distribution pipe or tubing shall be supported or anchored at the beginning and end of long bends in accordance with the manufacturer's instructions.

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
<td>ASTM D1527; ASTM D2282</td>
</tr>
<tr>
<td>Brass</td>
<td>ASTM B43</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASTM A377; AWWA C115/A21.15</td>
</tr>
<tr>
<td>Chlorinated Poly (Vinyl Chloride) (CPVC)</td>
<td>ASTM D2866; ASTM F441/F441M; AS1714923M</td>
</tr>
<tr>
<td>Copper</td>
<td>ASTM B42; ASTM B88</td>
</tr>
<tr>
<td>Crosslinked Polyethylene/Aluminum</td>
<td>CANCSA B137.10, ASTM F1281</td>
</tr>
<tr>
<td>Crosslinked Polyethylene</td>
<td>ASTM F876; ASTM F877</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>ASTM A377; AWWA C115/A21.15; AWWA C151/A21.51</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>ASTM A53</td>
</tr>
<tr>
<td>Polybutylene (PB)</td>
<td>ASTM D2866; ASTM D2666; ASTM D3006; ASTM D3008; ASTM D3386</td>
</tr>
<tr>
<td>Polyethylene (PE)</td>
<td>ASTM D2239; ASTM D2737; ASTM D1104; ASTM D2647; ASTM D3035, AWWA C906</td>
</tr>
<tr>
<td>Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe</td>
<td>ASTM F1282</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>ASTM D1785; ASTM D2241; ASTM D2672; AWWA C900</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>ASME B36.10/B36.19M</td>
</tr>
</tbody>
</table>

Polyethylene water service shall be installed in accordance with ASTM D2774. Copper tubing, type M, may be be buried underground.

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
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</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
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<td>ASTM B43</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASTM A377; AWWA C115/A21.15</td>
</tr>
<tr>
<td>Chlorinated Poly (Vinyl Chloride) (CPVC)</td>
<td>ASTM D2866; ASTM F441/F441M</td>
</tr>
<tr>
<td>Copper</td>
<td>ASTM B42; ASTM B88</td>
</tr>
<tr>
<td>Crosslinked Polyethylene/Aluminum</td>
<td>CANCSA B137.10, ASTM F1281</td>
</tr>
<tr>
<td>Crosslinked Polyethylene</td>
<td>ASTM F876; ASTM F877</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>ASTM A377; AWWA C115/A21.15; AWWA C151/A21.51</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>ASTM A53</td>
</tr>
<tr>
<td>Polybutylene (PB)</td>
<td>ASTM D2666; ASTM D3006; ASTM D3386</td>
</tr>
<tr>
<td>Polyethylene (PE)</td>
<td>ASTM D2104; ASTM D2239; ASTM D2647; ASTM D3035, ASTM D2737</td>
</tr>
<tr>
<td>Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe</td>
<td>ASTM F1282</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC)</td>
<td>ASTM D1785; ASTM D2241; ASTM D2672; AWWA C900</td>
</tr>
</tbody>
</table>

Plastic pipe and tubing shall be in accordance with ASTM D2774. Copper tubing, type M, may not be installed underground.

(g) Circulating loops. Polybutylene pipe and tubing may not be used for continuously circulating hot water loops.

(h) Used piping. Piping which has been used for any other purpose than conveying potable water may not be used for water supply systems.

| PIPE FITTINGS AND VALVES. (a) Fittings. Pipe fittings shall conform to the pipe material standards listed in this chapter or one of the standards listed in Table 84.30-11. Threaded drain pipe fittings shall be of the recessed drainage type.

(b) Water supply valves. 1. Control valves for water services and private water mains shall be designed and constructed to withstand a minimum pressure of 125 psi at 73.4°F. |
2. Control valves for water distribution systems shall be
designed and constructed to withstand a minimum pressure of 100
psig at 180°F.

3. A control valve which serves 2 or more plumbing fixtures
shall have, with the valve in a fully open position, a flow through
passageway of not less than one nominal pipe size smaller than the
nominal size of the piping connecting to the valve.

4. A control valve which serves 2 or more plumbing fixtures
may not be a globe type valve.

(c) Special fittings and valves. 1. Water hammer arrestors
shall conform to ASME A112.26.1 or ASME 1010.

2. Relief valves and automatic gas shutoff devices for hot
water supply systems shall conform to ANSI Z21.22.

3. Backwater valves shall conform to ASME A112.14.1,
CAN/CSA B181.1 or CAN/CSA B181.2.

4. Pipe applied atmospheric type vacuum breakers shall con-
form to ASME 1001, and CAN/CSA B64.1.1.

5. Water pressure reducing valves and strainers for water
pressure reducing valves for domestic water supply systems shall
conform to ASME 1003.

6. Hose connection vacuum breakers shall conform to ASME
1011 or CAN/CSA B64.2.

7. Backflow preventers with intermediate atmospheric vent
shall conform to ASME 1012 and dual check type atmospheric port
backflow preventers shall conform to CAN/CSA B64.3.

8. Reduced pressure principle backflow preventers shall con-
form with ASME 1013 or CAN/CSA B64.4.

Note: Reduced pressure principle fire protection backflow preventers are not per-
mitted for cross connection control.

9. Double check backflow prevention assemblies shall con-
form to ASME 1015 or CAN/CSA B64.5.

Note: Double check fire protection backflow preventer assemblies are not per-
mitted for cross connection control.

10. Individual thermostatic, pressure balancing, and com-
bination pressure balancing and thermostatic control valves sav-
ing individual showers shall conform to ASME 1016 or CAN/CSA
B125.

11. Trip seal primer valves, water fed shall conform to ASME
1018.

12. Vacuum breaker wall hydrants, freeze resistant automatic
drainage type shall conform to ASME 1019, types A or B.

13. Pressure vacuum breaker assemblies shall conform to
ASME 1020 or CAN/CSA B4.1.2.

14. Laboratory faucet backflow preventers shall conform to
ASME 1035 and laboratory faucet type vacuum breakers shall con-
form to CAN/CSA B64.7.

15. Reduced pressure detector backflow preventers shall con-
form to ASME 1047.

16. Double check detector assembly backflow preventers
shall conform to ASME 1048.

17. Back siphonage backflow vacuum breakers shall conform
to ASME 1056.

18. Hose connection backflow preventers shall conform to
ASME 1052.

19. Backflow preventers for carbonated beverage machines
shall conform to ASME 1022.

(d) Pipe saddles. Pipe saddles shall be installed in accordance
with the instructions of the saddle manufacturer and the following
limitations:

1. Pipe saddles may be installed on private interceptor main
sewers, building sewers, underground drain and vent pipe and tub-
ing, and where otherwise approved by the department;

2. A saddle for drain piping shall have a radius in accordance
with s. Comm 82.30 (8) (a);

3. The material of the saddle shall be compatible with the
materials of the pipes which are to be connected to the saddle;

4. The hole in the pipe which is to receive the saddle shall be
drilled or cored to match the saddle outlet;

5. Straps or clamps which wrap around the pipe and saddle
shall be provided by the manufacturer of the saddle;

6. Saddles shall be installed with straps or clamps which wrap
around the pipe and saddle; and

7. Proper hangers or bedding shall be provided to maintain
alignment between the opening in the pipe and the saddle.

Table 84.30-11
PIPE FITTINGS

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
<td>ASTM D2468; ASTM D3311; ASTM F409</td>
</tr>
<tr>
<td>Cast bronze</td>
<td>ANSI B16.15; ANSI B16.24</td>
</tr>
<tr>
<td>Cast copper alloy</td>
<td>ANSI B16.18; ANSI B16.23; ASTM B16.26</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ANSI B16.6; ANSI B16.12; ASTM B16.1; ANSI B16.45</td>
</tr>
<tr>
<td>Chlorinated polyvinyl chloride (CPVC)</td>
<td>ASTM F437; ASTM F438; ASTM F439</td>
</tr>
<tr>
<td>Copper</td>
<td>ANSI B16.22; ANSI B16.29</td>
</tr>
<tr>
<td>Crosslinked Polyethylene (PEX)</td>
<td>ASTM F1807</td>
</tr>
<tr>
<td>Ductile iron and gray iron</td>
<td>ANSI/AWWA C110/A21.10; ANSI/AWWA C153/A21.63; ANSI B16.42</td>
</tr>
<tr>
<td>Maleable iron</td>
<td>ANSI B16.3</td>
</tr>
<tr>
<td>Polybutylene (PB)</td>
<td>ASTM D3140; MSS SP-103</td>
</tr>
<tr>
<td>Polyethylene (PE)</td>
<td>ASTM D2699; ASTM D2683; ASTM D3261</td>
</tr>
<tr>
<td>Polyvinyl Chloride (PVC)</td>
<td>ASTM D2464; ASTM D2466; ASTM D2467; ASTM D3311; ASTM F409; ASTM F1356</td>
</tr>
<tr>
<td>Polyvinyl Chloride (PVC) Gasketed Sewer Fittings</td>
<td>ASTM F1336</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>ASTM A403</td>
</tr>
<tr>
<td>Steel</td>
<td>ANSI B16.5; ANSI B16.9; ANSI B16.11; ANSI B16.28</td>
</tr>
<tr>
<td>Styrene-rubber (SR)</td>
<td>ASTM D2852</td>
</tr>
</tbody>
</table>

See s. Comm 84.30 (4) (intro.) concerning the maximum lead content for fit-
tings.

(c) Copper and copper alloy fittings conforming to MSS SP-103, may not be
installed underground.

(6) Special materials. (a) Sheet lead. Sheet lead for the fol-
lowing uses may not weigh less than indicated in subd. 1. and 2.
1. Site–fabricated flashings for vent pipes, 3 pounds per
square foot; and
2. Prefabricated flashings for vent pipes, 2½ pounds per
square foot.

(b) Traps and fixture drain connection fittings. Copper or
tubular brass traps and fixture drain connection fittings shall be at
least of 20 gage material.

(c) Sheet copper. Sheet copper for the following uses may not
weigh less than indicated in subd. 1. and 2. and shall conform to
ASTM B152.
1. Flashing for vent pipes, 8 ounces per square foot; and
2. Flush tank linings, 10 ounces per square foot.

(d) Cleanout plugs. Cleanout plugs shall be of brass or plastic.
Brass cleanout plugs shall be used with metallic piping only and
shall conform to ASTM A74. Plastic cleanout plugs shall conform
to the requirements of sub. (5) (a).

(e) Flush pipes and fittings. Flush pipes and fittings shall be
of nonferrous material and shall conform to ASTM A12.15.5.

(f) Sizing material. Sizing materials shall be waterproof when
subjected to 2 feet of hydrostatic head when tested in accordance
with ASTM C1306 or ASTM D4068. The material shall be recog-
nized by the manufacturer for use as a sizing material.
(g) Geotextile fabrics. Geotextile fabric used in a POWTS to prevent backfill material from entering the distribution cell shall meet the requirements listed in Table 84.30-12.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Minimum Average Roll Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab Tensile, lbs</td>
<td>ASTM D-632</td>
<td>35 lbs, minimum</td>
</tr>
<tr>
<td>Grab Elongation, %</td>
<td>ASTM D-632</td>
<td>50%, minimum</td>
</tr>
<tr>
<td>Puncture, lbs</td>
<td>ASTM D-833</td>
<td>10 lbs, minimum</td>
</tr>
<tr>
<td>Tensile tear, lbs</td>
<td>ASTM D-533</td>
<td>11 lbs, minimum</td>
</tr>
<tr>
<td>AOS, US Steve #</td>
<td>ASTM D-751</td>
<td>20 US steve #, minimum</td>
</tr>
<tr>
<td>AOS, US Steve #</td>
<td>ASTM D-751</td>
<td>70 US steve #, max.</td>
</tr>
</tbody>
</table>

(b) Leaching chambers. Leaching chambers for distribution cell components of POWTS shall meet all of the following requirements:
1. Constructed of corrosion resistant materials.
2. Designed to prevent soil surrounding the chamber from entering the chamber.
3. Capable of withstanding pressures that the leaching chamber is intended to encounter.

(i) Stone aggregate. Stone aggregate which is used as a filtering medium or to create a distribution cell in a treatment or dispersal component of a POWTS shall meet all of the following requirements:
1. Conform to ASTM Standard C33 for coarse aggregate prior to washing.
2. Be washed to remove fine material.
3. Be 3/8 to 1/2 inch in size.
4. Have a hardness value of at least 3 on Moh's Scale of Hardness.

(j) Sand. Sand which is used as a filtering medium in a treatment or distribution cell of a POWTS shall conform to ASTM Standard C33 for fine aggregate.

(b) Solvent cemented joints. Solvent cemented joints shall be made in accordance with ASTM D2235 and its appendix, ASTM D2661 or ASTM F628.
1. Joint surfaces shall be clean and free of moisture.
2. Solvent cement conforming to ASTM D2235 shall be applied to all joint surfaces and the joint shall be made while the cement is wet.
3. Solvent cement shall be handled in accordance with ASTM F402.
4. Solvent cement used on pipes and fittings of a water supply system shall conform to NSF 14 and shall be certified by a nationally recognized testing agency as to conforming to NSF 14. The container for the solvent cement shall bear the certification mark of the testing agency.

(c) Threaded joints. Threaded joints shall only be used on pipes of schedule 80 or heavier. Threaded joints shall conform to ASME B1.20.1. The pipe shall be threaded with dies specifically designed for plastic pipe. Thread lubricant or tape approved for such use shall be applied to the male threads only.

(3) Black steel pipe. Joints between black steel pipe or fittings shall be in accordance with ASME B1.20.1. Pipe joint compound or tape shall be used on the male threads only.

(b) Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

(c) Caulked joints. Caulked joints shall only be used for drain or vent piping. Caulked joints for hub and spigot piping and fittings shall be firmly packed with oakum or hemp. Molten lead shall be poured in one operation not less than one inch deep and not to extend more than 1/8 inch below the rim of the pipe, and caulked tight. Paint, varnish or other coatings may not be used on the joining material until the joint has been tested and approved.

1. Caulked joints for drain piping shall be used only in a vertical position.
2. Caulked joints for vent piping may be used for piping in a vertical or horizontal position.

(d) Welded joints. Joints between black steel pipe or fittings may be welded.

(4) Brass pipe. Joints between brass pipe or fittings shall be in accordance with the provisions of ASME B1.20.1.

(a) Brazed joints. All joint surfaces to be brazed shall be cleaned bright by other than chemical means. Brazing filler metal conforming to AWS A5.8 or other approved material shall be used. The joining of water supply piping shall be made with lead-free materials. Solder and fluxes containing in excess of 0.2% lead shall not be used.

(b) Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.
push-on joints and mechanical compression type joints for water supply systems which use flexible elastomeric seals shall conform to ASTM D3139.

(c) Soldered joints. All joint surfaces to be soldered shall be cleaned bright by other than chemical means. A nontoxic flux shall be applied to all joint surfaces. Solder conforming to ASTM B32 or other approved material shall be used. The joining of water supply piping shall be made with lead-free materials. Solders and fluxes containing in excess of 0.2% lead shall not be used.

(d) Threaded joints. Threaded joints shall conform to ASME B1.20.1. Pipe joint compound or tape shall be used on the male threads only.

(5) CAST IRON PIPE. Joints between cast iron pipe or fittings shall be installed in accordance with pars. (a) and (b).

(a) Caulked joints. 1. Drain and vent systems. Caulked joints for hub and spigot pipe of drain and vent systems shall be firmly packed with oakum or hemp. Molten lead shall be poured in one operation not less than one inch deep and not to extend more than 1/2 inch below the rim of the pipe, and caulked tight. Paint, varnish, or other coatings may not be used on the joining material until after the joint has been tested and approved.

2. Water supply systems. Joints for bell and spigot pipe of water supply systems shall be firmly packed with treated paper rope. Molten lead shall be poured in one operation to a depth of 2½ inches.

(b) Mechanical joints. 1. Drain and vent systems. a. Mechanical push-on joints for drain and vent systems shall have gaskets which conform to ASTM C564.

b. Mechanical sleeve joints for drain and vent systems shall have a rubber seal sleeve conforming to ASTM C564, CISP1 310 or FM 1680. Where a stainless steel band assembly is used, the band assembly shall conform to CISP1 310 or FM 1680. Mechanical joints shall be installed in accordance with the manufacturer’s instructions.

2. Water supply systems. Mechanical push-on joints and mechanical compression type joints for water supply systems shall conform to AWWA C111/A21.11. Lead tipped gaskets may not be used.

(c) Threaded joints. Threaded joints shall conform to ANSI B1.20.1. Pipe joint compound or tape shall be used on the male threads only.

(6) CPVC PLASTIC PIPE. Joints between chlorinated polyvinyl chloride plastic pipe or fittings shall be installed in accordance with the provisions of pars. (a) to (c).

(a) Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer’s instructions. Mechanical push-on type joints which use flexible elastomeric seals shall conform to ASTM D3139.

(b) Solvent cemented joints. Solvent cemented joints shall be made in accordance with ASTM D2846 and its Appendix or ASTM F493 and its Appendix.

1. Joint surfaces shall be clean and free of moisture. A primer conforming to ASTM F656 shall be applied to all joint surfaces. The primer shall be purple in color.

2. Solvent cement conforming to ASTM F493 shall be applied to all joint surfaces and the joint shall be made while the cement is wet.

3. Solvent cement shall be handled in accordance with ASTM F402.

4. Solvent cement shall be orange in color.

5. Primer and solvent cement used on pipes and fittings of a water supply system shall conform to NSF 14 and shall be certified by a nationally recognized testing agency as to conforming to NSF 14. The containers for the primer and the solvent cement shall bear the certification mark of the testing agency.

(c) Threaded joints. Threaded joints shall only be used on pipes of schedule 80 or heavier. Threaded joints shall conform to ANSI B1.20.1. The pipe shall be threaded with dies specifically designed for plastic pipe. Thread lubricant or tape approved for such use shall be applied to the male threads only.

(7) CONCRETE PIPE. (a) Circular pipe. Joints between circular concrete pipe or fittings shall be made by use of an elastomeric seal conforming to ASTM C443 or C590.

(b) Elliptical pipe. Joints between elliptical concrete pipe or fittings shall be made by use of materials conforming to ASTM C687 Type II or ASTM C590.

(8) COPPER PIPE AND TUBING. Joints between copper pipe, tubing or fittings shall be installed in accordance with pars. (a) to (e).

(a) Brazed joints. All joint surfaces to be brazed shall be cleaned bright by other than chemical means. Brazing filler metal conforming to AWS A5.8 or other approved material shall be used. The joining of water supply piping shall be made with lead-free materials.

(b) Flared joints. Flared joints may be used on annealed tubing for water supply systems and shall be made by the use of a tool designed for that operation.

(c) Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer’s instructions. Mechanical push-on joints and mechanical compression type joints for water supply systems which use flexible elastomeric seals shall conform to ASTM D3139.

(d) Soldered joints. All joint surfaces to be soldered shall be cleaned bright by other than chemical means. A nontoxic flux shall be applied to all joint surfaces. Solder conforming to ANSI B32 or other approved material shall be used. The joining of water supply piping shall be made with lead-free materials.

(e) Threaded joints. Threaded joints shall conform to ANSI B1.20.1. Pipe joint compound or tape shall be used on the male threads only.

(9) DUCTILE IRON PIPE. (a) Mechanical joints. Mechanical push-on joints and mechanical compression type joints for water supply systems shall conform to AWWA C111/A21.11. Lead tipped gaskets may not be used.

(b) Threaded joints. Threaded joints shall conform to ASME B1.20.1. Pipe joint compound or tape shall be used on the male threads only.

(10) GALVANIZED STEEL PIPE. Joints between galvanized steel pipe or fittings or between galvanized steel pipe and cast iron fittings shall be installed in accordance with pars. (a) to (c).

(a) Threaded joints. Threaded joints shall conform to ASME B1.20.1. Pipe joint compound or tape shall be used on the male threads only.

(b) Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer’s instructions. Mechanical push-on joints and mechanical compression type joints for water supply systems which use flexible elastomeric seals shall conform to ASTM D3139.

(c) Caulked joints. Caulked joints shall only be used for drain or vent piping. Caulked joints for hub and spigot pipe and fittings shall be firmly packed with oakum or hemp. Molten lead shall be poured in one operation not less than one inch deep and not to extend more than 1/2 inch below the rim of the pipe, and caulked tight. Paint, varnish or other coatings may not be used on the joining material until after the joint has been tested and approved.

1. Caulked joints for drain piping shall be used only for piping in a vertical position.

2. Caulked joints for vent piping may be used for piping in a vertical or horizontal position.

(11) LEAD PIPE. Joints between lead pipe or fittings shall be installed in accordance with pars. (a) and (b).
(a) **Burned joints.** Burned joints shall be uniformly fused together into one continuous piece. The thickness of the joint shall be at least as thick as the lead being joined. The filler metal shall be of the same material as the pipe.

(b) **Wiped joints.** A wiped joint shall be full wiped, having an exposed surface on each side of the joint not less than 3/4 inch and shall be at least 3/8 inch thick at the thickest point.

(12) PB **PLASTIC PIPE AND TUBING.** Joints between polybutylene plastic pipe and tubing or fittings shall be installed in accordance with paras. (a) to (c).

(a) **Flared joints.** Flared joints shall be made by use of a tool designed for that operation. Flared joints shall be made in accordance with ASTM D3140.

(b) **Heat fusion joints.** Heat fusion joints shall be made in accordance with ASTM D2657 and ASTM D3309. Heat fusion joints shall be of a socket fusion type.

1. Joint surfaces to be fused shall be clean and free of moisture.

2. All joint surfaces shall be heated to the temperature recommended by the pipe or fitting manufacturer and joined.

3. The joint shall be undisturbed until cool.

(c) **Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical push-on joints and mechanical compression type joints which use flexible elastomeric seals shall conform to ASTM D3139.

(13) PE **PLASTIC PIPE AND TUBING.** Joints between polyethylene plastic pipe, tubing or fittings shall be in accordance with paras. (a) to (c).

(a) **Flared joints.** Flared joints shall be made by use of a tool designed for that operation. Flared joints shall be made in accordance with ASTM D3140.

(b) **Heat fusion joints.** Heat fusion joints shall be made in accordance with ASTM D2657. Heat fusion joints shall be of a socket fusion type.

1. Joint surfaces to be fused shall be clean and free of moisture.

2. All joint surfaces shall be heated to the temperature recommended by the pipe or fitting manufacturer and joined.

3. The joint shall be undisturbed until cool.

(c) **Mechanical joints.** Mechanical joints may be installed in accordance with the manufacturer's instructions. Mechanical push-on joints and mechanical compression type joints which use flexible elastomeric seals shall conform to ASTM D3139.

(13m) PEX **PLASTIC TUBING.** Joints between crosslinked polyethylene plastic pipe, tubing or fittings shall be in accordance with the manufacturer's instructions.

(14) PVC **PLASTIC PIPE.** Joints between polyvinyl chloride plastic pipe or fittings shall be in accordance with paras. (a) to (c).

(a) **Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1. Drain and vent systems. Mechanical push-on joints for drain and vent systems shall conform to ASTM D3212.

2. Water supply systems. Mechanical push-on joints and mechanical compression type joints for water supply systems which use flexible elastomeric seals shall conform to ASTM D3139.

(b) **Solvent cemented joints.** Solvent cemented joints shall be made in accordance with ASTM D2855.

1. Joint surfaces shall be clean and free of moisture. A primer conforming to ASTM F656 shall be applied to all joint surfaces.

2. Solvent cement conforming to ASTM D2564 shall be applied to all joint surfaces and the joint shall be made while the cement is wet.

3. Solvent cement shall be handled in accordance with ASTM F402.

4. Primer and solvent cement used on pipes and fittings of a water supply system shall conform to NSF 14 and shall be certified by a nationally recognized testing agency as to conforming to NSF 14. The containers for the primer and the solvent cement shall bear the certification mark of the testing agency.

(c) **Threaded joints.** Threaded joints shall only be used on pipes of schedule 80 or heavier. Threaded joints shall conform to ASME B1.20.1. The pipe shall be threaded with dies specifically designed for plastic pipe. Thread lubricant or tape approved for such use shall be applied to the male threads only.

(15) STAINLESS STEEL. Joints between stainless steel pipe or fittings shall be installed in accordance with the provisions of paras. (a) to (c).

(a) **Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical push-on type joints which use flexible elastomeric seals shall conform to ASTM D3139.

(b) **Threaded joints.** Threaded joints shall conform to ANSI B1.20.1. Pipe joint compound or tape shall be used on the male threads only.

(c) **Welded joints.** Joints between stainless steel pipe or fittings may be welded.

(16) VITRIFIED CLAY PIPE. Joints between vitrified clay pipe or fittings shall be made by use of elastomeric seals conforming to ASTM C425.

(17) JOINTS BETWEEN PIPE AND FITTINGS OF DIFFERENT MATERIALS. Connections between pipes of different materials shall be made with mechanical compression type joints, installed in accordance with manufacturer's instructions or as specified in paras. (a) to (e).

(a) **Copper to cast iron.** Connections between copper pipe or tube and cast iron pipe shall be by means of either caulked joints in accordance with sub. (5) (a) or threaded fittings in accordance with sub. (5) (c).

(b) **Copper to galvanized steel.** Connections between copper pipe or tube and galvanized steel pipe shall be by use of an adapter fitting. The copper pipe shall be soldered to the adapter in accordance with sub. (8) (d). The galvanized steel shall be threaded to the adapter in accordance with sub. (10) (a).

(c) **Cast iron to steel or brass pipe.** Connections between cast iron pipe and galvanized or black steel or brass pipe shall be by means of:

1. Caulked joints in accordance with sub. (5) (a); or

2. Threaded joints in accordance with sub. (5) (c).

(d) **Plastic to other materials.** 1. Connections between plastic pipe and cast iron pipe shall be by means of:

a. Caulked joints in accordance with sub. (5) (a); or

b. Threaded joints in accordance with sub. (5) (c).

2. Connections between different types of plastic pipe or between plastic pipe and other piping materials other than cast iron shall be by means of threaded joints in accordance with sub. (14) (c).

(e) **Lead to other piping materials.** Connections between lead pipe and other piping materials shall be by use of an adapter fitting conforming to s. Comm 84.30 (5) (a). The lead pipe shall be caulked or burned to the adapter fitting in accordance with sub. (11).

(18) CONNECTION OF FIXTURES. Flanged fixtures which have integral traps shall be mechanically fastened to the drain piping by means of a compatible fitting. The joint between the fixture and the fitting shall be sealed with a watertight gasket or setting compound.
Comm 84.50 Alternate approvals and experimental approvals. (1) GENERAL. The provisions of chs. Comm 82 to 84 are not intended to prevent the use of a plumbing material or product not specifically addressed therein if the plumbing material or product has been approved by the department.

(2) ALTERNATE APPROVAL. (a) Plumbing materials or products determined by the department to comply with the intent of chs. Comm 82 to 84 and ch. 145, Stats., and not approved under s. Comm 84.10, shall be issued an alternate approval. Alternate approvals shall be issued by the department in writing.

(b) The department may require the submission of any information deemed necessary for review. Sufficient evidence shall be submitted to the department in substance:

1. Assertions of function and performance; and
2. Compliance with the intent of chs. Comm 82 to 84 and ch. 145, Stats.

(c) The department shall review and make a determination on an application for alternate approval within 3 months of receipt of all information and fees required to complete the review.

(d) The department may impose specific conditions in issuing an alternate approval, including an expiration date for the alternate approval. Violations of the conditions under which an alternate approval is issued shall constitute a violation of this chapter.

(e) If, upon review, the department determines that a plumbing material or product does not comply with the intent of chs. Comm 82 to 84 and ch. 145, Stats., the request for alternate approval shall be denied in writing.

(3) EXPERIMENTAL APPROVAL. (a) The department may allow the installation of a plumbing material or product for the purpose of proving compliance with the intent of chs. Comm 82 to 84 and ch. 145, Stats.

(b) An experimental approval shall be required for each plumbing material or product to be installed for the purpose of proving compliance with the intent of chs. Comm 82 to 84 and ch. 145, Stats. A separate experimental approval shall be obtained for each project where such a product is to be used. Experimental approvals shall be issued by the department in writing. Experimental approvals shall be denied by the department in writing.

(c) The department may require the submission of any information deemed necessary for review.

(d) The department may limit the number of applications it will accept for experimental approval of products.

(e) The department shall review and make a determination on an application for experimental approval within 6 months of receipt of all information and fees required to complete the review.

(f) The department may impose specific conditions in issuing an experimental approval. Violations of the conditions under which an experimental approval is issued shall constitute a violation of this chapter.

(g) If the department issues an experimental approval:

1. Plans detailing the installation of the plumbing material or product shall be submitted to the department in accordance with s. Comm 82.20 (4) or 83.22.

2. A copy of the experimental approval shall be attached to the submitted plans and approved plans.

3. A letter of consent from the owner of the installation shall be attached to the submitted plans and approved plans. The letter shall acknowledge that the owner has received and read a copy of the experimental approval and s. Comm 84.50.

4. The completed installation shall be inspected for compliance with the approved plans by the department. A report on the completed installation shall be written by the department.

5. A written report, from the party who was issued the experimental approval, shall be submitted to the department detailing the function and performance of the installed plumbing material or product. The report shall be completed at time intervals specified by the department, but not less than once a year.

6. On-site inspections shall be performed by the department at time intervals specified by the department, but not less than once a year. A report on the inspection shall be written by the department. The department may assess a fee for the inspection.

7. Five years after the date of the completed installation the department shall within 6 months order the removal of the plumbing material or product, issue an approval, or renew the experimental approval for another 5-year period to obtain additional information to determine the result of the experiment.

(h) If chs. Comm 82 to 84 or ch. 145, Stats., are revised to include or permit an experimental plumbing material or product to conform with the intent of chs. Comm 82 to 84 and ch. 145, Stats., the department shall waive the requirements of par. (f) as to that material or product.

(4) MODIFICATIONS. If a plumbing material or product with an alternate or experimental approval or the installation of an experimentally approved plumbing material or product is modified or additional assertions of function or performance are made, the alternate or experimental approval shall be considered null and void, unless the product is resubmitted to the department for review and the approval is reaffirmed.

(5) REVOCATION. The department may revoke an alternate or experimental approval issued under this section for any false statements or misrepresentations of facts or data on which the alternate or experimental approval was based or as a result of product failure.

(6) LIMITATIONS. An alternate or experimental approval of a plumbing material or product issued by the department may not be construed as an assumption of any responsibility for defects in design, construction, or performance of any plumbing material or product nor for any damages that may result from the use of such material or product.

(7) FEES. Fees for the review of a plumbing material or product under this section and any required on-site inspections shall be submitted in accordance with ch. Comm 2.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; correction in (7) made under s. 13.93 (2m) (b) 7., Stats., Register, August, 1988, No. 392; correction in (7) made under s. 13.93 (2m) (b) 7., Stats., Register, February, 1994, No. 458; am. (3) (g) 1. and 7., Register, April, 2000, No. 522, eff. 7-1-00.

Comm 84.60 Incorporation of standards by reference. History: Cr. Register, May, 1988, No. 389, eff. 5-1-88; am. Table 84.60-5, z, and recr. Table 84.60-9, Register, August, 1991, No. 428, eff. 9-1-91; am. Table 84.60-2, Register, April, 1992, No. 456, eff. 5-1-92; am. Tables 2 to 10, cr. Table 84.60-8, Register, September, 1992, No. 441, eff. 10-1-92; cr. Tables 84.60-10 and 84.60-11 to be Tables 84.60-11 and 12, cr. Table 84.60-10, Register, September, 1993, No. 453, eff. 10-1-93; am. Table 84.60-2, 84.60-5 and 84.60-7, r, and recr. Table 84.60-4, Register, February, 1994, No. 458, eff. 3-1-94; correction in (2) and (4) made under s. 13.93 (2m) (b) 7., Stats., Register, February, 1994, No. 458; recr. Tables 84.60-1 to 12., Register, February, 1997, No. 494, eff. 3-1-97; cr. Table 84.60-10 and r., Register, April, 2000, No. 532, eff. 7-1-00.