

Chapter ILHR 84

PLUMBING PRODUCTS

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Note: Chapter ILHR 84 as it existed on May 31, 1988 was repealed and a new chapter ILHR 84 was created effective June 1, 1988.

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

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88.

ILHR 84.02 Penalties. Penalties for violations of this chapter shall be assessed in accordance with ss. 145.12 and 145.25, Stats.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88.

ILHR 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 experimentation 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.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88.

ILHR 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. ILHR 82 and 83 and this chapter and ch. 145, Stats.

(1) **ALTERNATE OR EXPERIMENTAL PRODUCT APPROVAL.** If it is alleged that the approval of a fixture, appliance, appurtenance, material, device or product under this section would result in an adverse health effect or potentially adverse health effect on the waters of the state, the department may require an alternate or experimental product approval under s. ILHR 84.50.

(2) **PRODUCT REVIEW AND APPROVAL.** Each type of plumbing product which falls into one of the categories specified in Table 84.10 shall be approved by the department in accordance with this subsection before the prod-

uct may be sold for use in a plumbing system or installed in a plumbing system.

(a) Except as provided in subs. 1 and 2, specifications and plans or drawings for each type of product shall be submitted to the department for review. The submittal shall be accompanied by sufficient data and information to determine if the product and its performance complies with the provisions of chs. ILHR 82, 83 and this chapter and ch. 145, Stats.

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1. The submitter of a cross-connection control device listed under Table 84.10, line 2 may submit in lieu of specifications, plans or drawings evidence that the product is currently listed by a nationally recognized evaluation agency acceptable to the department. Evidence substantiating the listing by an evaluation agency shall include a research report from which it can be determined that the product conforms to the appropriate requirements of s. ILHR 84.30 (5) (c).

2. The submitter of a water-conserving type of product listed under Table 84.10, line 7 may submit in lieu of specifications, plans or drawings evidence that the product is currently listed by a nationally recognized evaluation agency acceptable to the department. Evidence substantiating the listing by an evaluation agency shall include a research report from which it can be determined that the product conforms to the requirements of s. ILHR 84.20.

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(b) The department may require that a submitter of a product for review have the product tested and its performance certified by an approved testing laboratory.

(c) If, upon review, the department determines that a product conforms to the provisions of chs. ILHR 82, 83 and this chapter and ch. 145, Stats., the department shall issue an approval in writing. 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.

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

(e) 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, specifi-

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cations and other information required to complete the review.

(f) 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

Product Categories
1. Chemical or biochemical treatments for private sewage systems
2. Cross-connection control devices
3. Health care plumbing appliances
4. Laboratory plumbing appliances
5. Prefabricated septic/holding tanks
6. Prefabricated plumbing
7. Water-conserving faucets, spouts and plumbing fixtures:*
a. Kitchen sink faucets for use in dwelling units and living units
b. Lavatory faucets
c. Shower heads
d. Urinals
e. Urinal flushing devices
f. Water closets
g. Water closet flushing devices
8. Water treatment devices

*See s. 145.25, Stats., and s. ILHR 84.20 (3) concerning water conserving fixtures.

(3) **PRODUCT LISTING.** The department may list, upon request, plumbing products which conform to the standards or specifications referenced in ch. ILHR 82, 83 or this chapter, but which do not require approval under sub. (2). Each request for listing shall be made on a form provided by the department.

Note: Request for product listing is to be made on form SBD 7557 which may be obtained from Safety and Buildings Division, P.O. Box 7969, Madison, Wisconsin 53707.

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

(5) **LIMITATIONS.** An approval or listing 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.

(6) **FEES.** Fees for product approval review and product listing shall be submitted in accordance with s. ILHR 2.66.

Register, February, 1994, No. 458

Note: See Appendix for further explanatory material.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; correction made in (6) under s. 13.93 (2m) (b) 7, Stats., Register, February, 1994, No. 458.

ILHR 84.11 Identification. Each length of pipe and each pipe fitting, trap, fixture, material, device and product to be used in plumbing shall be marked as required by the applicable standard specified by reference in this chapter or as specified in s. ILHR 83.15 for septic tanks and holding tanks, and s. ILHR 84.20 (5) (o) for water treatment devices.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88.

ILHR 84.12 Penetrations of fire-resistive assemblies. Penetrations of fire-resistive assemblies, such as walls and floor-ceiling systems, by plumbing systems or plumbing materials shall be protected in accordance with requirements of chs. ILHR 50 to 64.

Note: See Appendix for further explanatory material.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88.

ILHR 84.13 Chemical or biochemical treatments for private sewage systems. Chemical or biochemical treatments for private sewage systems shall function and perform in accordance with the assertions submitted to the department. Chemical or biochemical treatments for private sewage systems may not directly or indirectly adversely affect bacterial action in the systems, soil hydraulic conductivity in the absorption areas, or groundwater quality beneath the systems.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88.

ILHR 84.14 Health care and laboratory plumbing appliances. Health care plumbing appliances and laboratory plumbing appliances shall function and perform in accordance with the drain, vent, water supply and backflow protection requirements of ch. ILHR 82.

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88.

ILHR 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 nonpotable liquids, solids or gasses from being introduced into a potable water supply system through cross-connections.

(2) **MATERIALS.** Plumbing fixtures shall have smooth surfaces which are impervious to water.

(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, shower heads, urinals, urinal flushing devices, water closets and water closet flushing devices shall conform to par. (b).

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

3. All lavatory faucets installed in public restrooms shall be of a self-closing type.

(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 aerator 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 psig 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 psig flowing supply pressure.

4. Sink faucets. The maximum discharge rate of sink faucets shall be 3 U.S. gallons per minute at an 80 psig 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 psig and 80 psig.

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 psig and 80 psig.

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

STATIC TEST PRESSURES FOR WATER CLOSETS AND WATER CLOSET FLUSHING DEVICES

Tank Type	Flushometer Type	
	Siphonic	Blow Out
20 to 80 psig	25 to 80 psig	35 to 80 psig

(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 ANSI 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. The floors of all shower stalls, shower rooms, floor setting service sinks or receptors, sunken bathtubs or other similar fixtures shall be protected with a safing material installed beneath the finish floor of the entire fixture or room and upward along the sides to a minimum of 6 inches above the curb or maximum water level of the fixture. Safing materials shall conform to s. ILHR 84.30 (6). The corners of the fixture or room shall be safed to a height of 6 feet and at least 3 inches in each direction from the corners. The safing material shall be properly drained. Prefabricated fixtures and installations directly over an unexcavated portion of a building are exempt from safing requirements.

Note: Chapters ILHR 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.

Note: See Appendix for further explanatory material.

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

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(b) *Bathtubs*. 1. a. Enameled cast iron bathtubs shall conform to ANSI A112.19.1M.

b. Porcelain enameled formed steel bathtubs shall conform to ANSI 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 pop-up stopper or other 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*. Vitreous china bidets shall conform to the material requirements in ANSI 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.

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

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

(e) *Drinking fountains*. 1. Drinking fountains and water coolers shall conform to ARI 1010 or ANSI 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 orifice.

4. A drinking fountain may not have a waste outlet less than 1-1/4 inches in diameter.

(f) *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.

(g) *Food waste grinders*. 1. Residential type food waste grinders shall conform to ASSE 1008. 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.

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

(i) *Lavatories*. 1. a. Enameled cast iron lavatories shall conform to ANSI A112.19.1M.

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

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

d. Porcelain enameled formed steel lavatories shall conform to ANSI 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 1/4 inches in diameter.

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

2. Water distribution piping from the shower valve to the shower head outlet shall be securely attached to the structure.

3. 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.

4. 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 ILHR 52.60 (5) (a) specifies slip-resistant requirements for shower rooms and compartments in public buildings and places of employment.

5. 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 and safety grab bars or rails.

Note: See Appendix for further explanatory materials.

(k) *Sinks*. 1. a. Enameled cast iron sinks shall conform to ANSI A112.19.1M.

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

- c. Stainless steel sinks shall conform to ANSI A112.19.3.
- d. Porcelain enameled formed steel sinks shall conform to ANSI A112.19.4.

2. Sinks shall be provided with waste outlets not less than 1½ inches in diameter. Sinks on which a food grinder is installed shall have a waste opening not less than 3¼ inches in diameter.

(l) *Urinals*. 1. Vitreous china urinals shall conform to ANSI A112.19.2M-90 and A112.19.6-90.

2. A urinal may not be located closer than 16 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.

(m) *Water closets*. 1. a. Vitreous china water closets shall conform to either ANSI A112.19.2M-82 or ANSI A112.19.2M-90 and ANSI A112.19.6-90.

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. ILHR 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. ILHR 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, off-set washout, washout, long hopper, frostproof and other types of water closets having invisible seals or unventilated 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 con-

form to ASSE 1037. All flushing devices shall be readily accessible for maintenance and repair. Ballcocks and fill valves shall be of the anti-siphon type and shall conform to ASSE 1002. The critical level mark on the ballcock and fill valve shall be located at least one inch above the full opening of the overflow pipe.

(n) *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 psig.

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 1005.

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 or 150 psig, whichever is smaller.

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

Note: See s. ILHR 82.40 (5) (d) 1. concerning the sizing of temperature and pressure relief valves.

4. Hot water dispensers. Nonpressurized point-of-use water heaters shall conform to ASSE 1023.

(o) *Water meters*. A water meter which is used pursuant to s. ILHR 83.18 (10) shall conform to AWWA C700; AWWA C701, AWWA C702, AWWA C704, AWWA C706, AWWA C707, AWWA C708, or AWWA C710.

(p) *Water treatment devices*. 1. Water softeners shall conform to WQA S-100.

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

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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 range 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.

(q) *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. ILHR 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 ANSI A112.18.1M.

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

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

(d) Flexible hose and spray assemblies for residential sinks shall conform to ASSE 1025.

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

History: Cr. Register, May, 1988, No. 389, eff. 6-1-88; r. (5) (m) 2. to 5., cr. (5) (m) 2. and 3., renum. (5) (m) 7. and 8. to be (5) (m) 4. and 5., Register, March, 1991, No. 423, eff. 4-1-91; am. (5) (l) 1. and (m) 1. a., Register, April, 1992, No. 436, eff. 5-1-92; renum. (5) (o) and (p) to be (5) (p) and (q), cr. (5) (l) 5., (n) 1. d. and (o), am. (5) (m) 6., (n) 1. b. and c., Register, February, 1994, No. 458, eff. 3-1-94.

ILHR 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 atmosphere

environments that will eventually surround the plumbing system.

(a) The bending or offsetting of flexible or annealed 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. ILHR 84.30 (4) (f) concerning the bending of polybutylene 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. ILHR 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) *Effluent piping.* 1. Nonperforated drain piping conveying effluent from a sewage treatment tank to the distribution piping of a nonpressurized soil absorption system shall conform to one of the standards listed in Table 84.30-3.

2. Perforated drain piping distributing septic tank effluent in a nonpressurized soil absorption system shall conform to one of the standards listed in Table 84.30-4.

3. Drain piping distributing septic tank effluent in a pressurized soil absorption system shall conform to one of the standards listed in Table 84.30-5 and shall be perforated in accordance with s. ILHR 83.14 (3) (c).

(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