

IAPMO PS 59-2013

Wastewater Diverter Valves and Diversion Systems



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Wastewater Diverter Valves and Diversion Systems

1 Scope

- 1.1** This standard covers wastewater diverter valves and diversion systems and specifies requirements for materials, physical characteristics, performance testing, and markings. Diversion systems covered by this Standard can include irrigation systems.
- 1.2** The requirements of this Standard are not intended to prevent the use of alternative materials or methods of construction provided such alternatives meet the intent and requirements of this Standard.
- 1.3** Proposals for amendments to this Standard will be processed in accordance with the standards writing procedures of IAPMO.
- 1.4** The user's attention is called to the possibility that compliance with this Standard may require use of an invention covered by patent rights. By publication of this Standard, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details can be obtained from IAPMO.

2 Reference Publications

This Standard refers to the following publications, and where such reference is made, it shall be to the current edition of those publications, including all amendments published thereto.

ASTM B117	Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM C1277	Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings
ASTM C1541	Standard Specification for Shielded Transition Couplings Using Flexible Poly Vinyl Chloride (PVC) Gaskets to Connect Dissimilar DWV Pipe and Fittings
ASTM D1784	Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D2661	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D2665	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D2751	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings

ASTM D3311	Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns
ASTM D3965	Standard Classification System and Basis for Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings
CSA B1800	Thermoplastic nonpressure piping compendium
CSA B181.1	Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings
CSA B181.2	Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings
CSA B602	Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe
CSA C22.2 No. 14	Industrial Control Equipment
CSA C22.2 No. 66.1	Low Voltage Transformers - Part 1: General Requirements
CSA C22.2 No. 66.3	Low Voltage Transformers - Part 3: Class 2 and Class 3 Transformers
CSA C22.2 No. 68	Motor-operated appliances (household and commercial)
CSA C22.2 No. 108	Liquid Pumps
CSA C22.2 No. 223	Power Supplies With Extra-Low-Voltage Class 2 Outputs
IAPMO/ANSI UPC 1	Uniform Plumbing Code
IAPMO PS 90	Elastomeric Test Caps/Cleanout Caps, and Combination Test Caps/Shielded Couplings
UL 778	Motor-Operated Water Pumps
UL 1310	Class 2 Power Units
UL 1951	Electric Plumbing Accessories
UL 5085-1	Low Voltage Transformers – Part 1: General Requirements
UL 5085-3	Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers

3 Abbreviations

The following abbreviations shall apply in this Standard:

ABS — acrylonitrile-butadiene-styrene

PVC — polyvinylchloride

4 General Requirements

4.1 General

4.1.1 Waterways shall be smooth and free of obstructions.

4.1.2 The cross-sectional area of the sanitary outlet shall be equal to or larger than the cross-sectional area of the inlet.

4.1.3 Diverter valves shall allow selection of an outlet by hand or by using a tool or a remote control.

- 4.1.4** Diverter valves shall have a means to indicate which outlet is selected. When operated by a remote control, the control shall also have a means to indicate which outlet is selected.
- 4.1.5** Diverter valves operated by a motor, solenoid, or any other power-actuated mechanism only shall automatically revert to directing the flow through the sanitary drainage outlet in case of a power failure. Diverter valves or systems that can be manually operated shall be exempt from this requirement.
- 4.1.6** Diverter valves used in pressurized diversion systems shall be rated for pressure applications.
- 4.1.7** Diverter valves shall not restrict the flow or produce excessive turbulence.

4.2 Materials

- 4.2.1** Diverter bodies shall be made of
- (a) ABS compounds that comply with or exceed the properties of cell classification 32222 specified in ASTM D3965; or
 - (b) PVC compounds that comply with or exceed the properties of cell classification 12454 or 14333 specified in ASTM D1784.
- 4.2.2** Reworked materials may be used provided the components containing reworked material comply with all of the requirements of this Standard and shall be
- (a) clean;
 - (b) generated from the manufacturer's own production of diverter bodies and not supplied by any other manufacturer; and
 - (c) blended back into the same type of compound or product.
- 4.2.3** Other materials may be used provided they comply with all of the applicable requirements of this Standard
- 4.2.4** Other diverter parts shall be made of materials that will not corrode under their intended use.

4.3 Inlets and Outlets

- 4.3.1** Diverter valves shall have one inlet and at least two outlets.
- 4.3.2** Diverter inlets and outlets shall comply with the dimensional requirements of ASTM D2661, ASTM D2665, ASTM D2751, ASTM D3311, CSA B181.1, or CSA B181.2, as applicable.

4.4 Access for Maintenance

Diverter valves shall have a means of access for repair and maintenance. The size of the access opening(s) shall be adequate for performing repair and maintenance.

4.5 Electrical Requirements

- Diverter valves with electrical features shall comply with the applicable CSA or UL standards (e.g., CSA C22.2 No. 14, CSA C22.2 No. 68, or UL 1951) except when powered by a
- (a) direct plug-in Class 2 power supply that complies with the applicable CSA or UL standards (e.g., CSA C22.2 No. 223 or UL 1310);
 - (b) low-voltage circuit (i.e., a circuit involving a peak open-circuit potential of not more than 42.2 V supplied by a battery or by a Class 2 power supply); or
 - (c) battery.

4.6 Other Components

- 4.6.1** Factory-supplied pipe and fittings shall comply with ASTM D2661, ASTM D2665, CSA B181.1, CSA B181.2, or other nationally recognized standards, as applicable.
- 4.6.2** Factory-supplied elastomeric couplings shall comply with IAPMO PS 90, ASTM C1277, ASTM C1541, CSA B602, or other nationally recognized standards, as applicable.
- 4.6.3** Factory-supplied pumps shall comply with CSA C22.2 No. 108 or UL 778.

5 Testing Requirements

5.1 Hydrostatic Pressure Test

5.1.1 Test Procedure

The hydrostatic pressure test shall be conducted as follows:

- (a) Fill the test specimen with water.
- (b) Seal the inlet and the outlets.
- (c) Pressurize the test specimen to 69 kPa (10 psi).
- (d) Hold the pressure for 15 min.

5.1.2 Performance Requirement

There shall be no leakage.

5.2 Life Cycle Test

5.2.1 Test Procedure

The life cycle test shall be conducted as follows:

- (a) Install the test specimen in accordance with the manufacturer's installation instructions.
- (b) Subject moving parts to 10,000 cycles of operation.

5.2.2 Performance Requirements

The test specimen shall not leak and shall continue to operate as it did before the test.

5.3 Diversion Test

5.3.1 Test Procedure

The diversion test shall be conducted after conducting the life cycle test specified in Section 5.2, as follows:

- (a) Flow water through the test specimen at 7.6 L/min (2.0 gpm).
- (b) Direct the flow of water to the sanitary outlet. The test specimen shall direct the flow of water to the sanitary drainage outlet.
- (c) Wait 5 s.
- (d) Direct the flow of water to the diversion outlet. The test specimen shall divert the flow of water to the diversion outlet.

5.3.2 Performance Requirements

The test specimen shall operate as intended and shall not leak.

5.4 Corrosion Resistance Test for Metallic Parts

5.4.1 Test Procedure

The corrosion test for metallic parts shall be conducted in accordance with ASTM B117 and the following procedure:

- (a) Wipe the plated surfaces of the test specimens with a soft cloth and a solvent (e.g., clear naphtha, gasoline, or clear paint thinner). No abrasive shall be used.
- (b) Hang the test specimens in the test cabinet, using hangers that will not be affected by the salt fog. Care shall be taken not to touch or contaminate the cleaned surfaces.
- (c) Leave the test specimens in the test cabinet for 96 h.
- (d) Immediately after the conclusion of the 96 h test period, wash the test specimens under running water at 38 °C (100°F) or less and dry them. Care shall be taken not to rub the specimens during washing, drying, or before being examined. .
- (e) Examine the test specimens for corrosion spots (e.g., weeping areas). The corrosion spots may be gently rubbed or brushed before measuring them.

5.4.2 Performance Requirement

Metallic parts shall not exhibit more than one corrosion spot on any 645 mm² (1 in²) of surface; however, there may be a maximum of three minor corrosion spots on each 25 mm (1 in) length of parting line. Corrosion spots shall be not more than 0.8 mm (0.03 in) in any dimension.

6 Markings and Accompanying Literature

6.1 Diverter valves and diversion systems complying with this Standard shall be marked with the:

- (a) manufacturer's name or trademark;
- (b) nominal sizes;
- (c) model number;
- (d) material designation (e.g., ABS or PVC);
- (e) inlet, outlet to the sanitary drainage system, and diversion outlet; and
- (f) direction of flow.

6.2 Markings shall be permanent, legible, and visible after installation.

- 6.3** Diverter valves and diversion systems shall be accompanied by instructions for their installation, operation, and care and maintenance. In particular, such instructions shall indicate the need to comply with the applicable building and plumbing codes, including Chapter 16 of the Uniform Plumbing Code.