

IAPMO IGC 154-2019

**Shower and Tub/Shower
Enclosures, Bathtubs
with Glass Pressure-
Sealed Doors, and
Shower/Steam Panels**



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IAPMO Standard

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IAPMO IGC 154–2019

Shower and Tub/Shower Enclosures, Bathtubs with Glass Pressure-Sealed Doors, and Shower/Steam Panels

1 Scope

1.1 General

- 1.1.1** This Standard covers shower/steam panels, enclosures for showers and tub/shower combinations, bathtubs and tub/shower combinations with glass pressure-sealed doors, and floor-mounted showers intended for new and retrofit applications and specifies requirements for materials, physical characteristics, performance testing, and markings.

Note: *In this Standard, “enclosures for showers and tub/shower combinations” are referred to as “enclosures”.*

- 1.1.2** Shower/steam panels and enclosures covered by this Standard can include

- (a) factory-installed supply and waste fittings;
- (b) factory-formed shower thresholds; and
- (c) factory-plumbed shower doors.

1.2 Alternative Materials

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 Terminology

In this Standard,

- (a) “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy to comply with the Standard;
- (b) “should” is used to express a recommendation, but not a requirement;
- (c) “may” is used to express an option or something permissible within the scope of the Standard; and
- (d) “can” is used to express a possibility or a capability.

Notes accompanying sections of the Standard do not specify requirements or alternative requirements; their purpose is to separate explanatory or informative material from the text. Notes to tables and figures are considered part of the table or figure and can be written as requirements.

1.4 Units of Measurement

SI units are the primary units of record in global commerce. In this Standard, the inch/pound units are shown in parentheses. The values stated in each measurement system are equivalent in application, but each unit system is to be used independently. All references to gallons are to U.S. gallons.

1.5 Amendments

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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.

ASME A112.6.3	Floor and Trench Drains
ASME A112.19.15	Bathtubs/Whirlpool Bathtubs with Pressure Sealed Doors
ASME A112.18.1/CSA B125.1	Plumbing supply fittings
ASME A112.18.2/CSA B125.2	Plumbing waste fittings
ASME A112.18.6/CSA B125.6	Flexible water connectors
ASME A112.19.1/CSA B45.2	Enamelled cast iron and enamelled steel plumbing fixtures
ASME A112.19.3/CSA B45.4	Stainless steel plumbing fixtures
ASME A112.19.7/CSA B45.10	Hydromassage bathtub systems
ASME B16.22	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
ASSE 1016/ASME A112.1016/ CSA B125.16	Performance requirements for automatic compensating valves for individual showers and tub/shower combinations
ASSE 1061	Performance requirements for Push-Fit Fittings
ASSE 1070	Water Temperature Limiting Devices

ASTM A240	Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A276	Standard Specification for Stainless Steel Bars and Shapes
ASTM A653	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B88	Standard Specification for Seamless Copper Water Tube
ASTM D2661	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D5476	Standard Classification System for Thermoplastic Polyurethane Materials (TPU)
ASTM D2846	Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems
ASTM F877	Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems
ASTM G85	Standard Practice for Modified Salt Spray (Fog) Testing
CAN/CGSB-12.1	Tempered or Laminated Safety Glass
CFR Title 16, Chapter II, Part 1201	Safety Standard for Architectural Glazing Materials
CSA B45.5/IAPMO Z124	Plastic plumbing fixtures
CSA B137.6	Chlorinated polyvinylchloride (CPVC) pipe, tubing, and fittings for hot- and cold-water distribution systems,
CSA C22.2 No. 14	Industrial Control Equipment
CSA C22.2 No. 68	Motor-operated appliances (household and commercial)
CSA C22.2 No. 223	Power Supplies with Extra-Low-Voltage Class 2 Outputs
CSA C22.2 No. 60335-1	Safety of household and similar appliances - Part 1: General requirements
IAPMO PS 106	Tileable Shower Receptors and Shower Kits
IAPMO/ANSI Z1157	Ball Valves
ICC/ANSI A117.1	Accessible and Usable Building and Facilities
UL 508	Industrial Control Equipment
UL 1310	Class 2 Power Units
UL 1951	Electric Plumbing Accessories
UL 60335-1	Safety of Household and Similar Electrical Appliances, Part 1: General Requirements

3 Definitions and Abbreviations

3.1 Definitions

In addition to the definitions in ASME A112.18.1/CSA B125.1, ASME A112.19.1/CSA B45.2, and CSA B45.5/IAPMO Z124, the following definitions shall apply in this Standard:

Shower/Steam panel — a frame or structural element with plumbing components intended for spraying water onto a bather and/or discharge steam vapors.

Note: *Shower/steam panels can*

- (a) *include electrical components; and*
- (b) *be a free-standing column or part of a shower enclosure.*

Portable shower panel — a shower panel intended for temporary, retrofit installations and that only requires connection to the water supply for proper installation.

3.2 Abbreviations

The following abbreviation applies in this Standard:

- CFR** — Code of Federal Regulations
TPU — thermoplastic polyurethane

4 General Requirements

4.1 Enclosures and Shower/Steam Panels

4.1.1 General

Shower/Steam panels, enclosures, and factory-supplied components (e.g., plumbing supply fittings, plumbing waste fittings, connectors, piping, bathtubs, and shower pans) shall comply with the applicable requirements of this Standard.

4.1.2 Plastic Enclosures and Plastic Shower Panels

Plastic enclosures and plastic shower panels shall comply with the applicable requirements of CSA B45.5/IAPMO Z124, except that portable shower panels shall not need to comply with the ignitability and cigarette tests specified in Clauses 5.13 and 5.14 of CSA B45.5/IAPMO Z124.

4.1.3 Stainless Steel Shower/Steam Panels

Stainless steel shower/steam panels shall

- (a) comply with the applicable requirements of ASME A112.19.3/CSA B45.4; and
- (b) have a minimum wall thickness of 1.17 mm (0.046 in).

4.1.4 Aluminum Shower/Steam Panels

Aluminum shower/steam panels shall

- (a) have a minimum wall thickness of 2.16 mm (0.085 in); and
- (b) be anodized; and
- (c) not show any signs of corrosion, blistering, or discoloration when tested in accordance with Annex A1 of ASTM G85 for 24 h.

4.1.5 Wood Shower Panels

Wood shower panels shall comply with the following tests specified in CSA B45.5/IAPMO Z124:

- (a) Clause 5.10, colourfastness test;
- (b) Clause 5.11, stain resistance test;
- (c) Clause 5.12, cleanability and wear test;
- (d) Clause 5.15, chemical resistance test; and
- (e) Clause 5.25.4, water absorption test.

4.1.6 Coatings

Coatings, other than porcelain-enameled steel or cast iron, shall comply with the coating requirements specified in Clause 5.2 of ASME A112.18.1/CSA B125.1.

4.1.7 Portable Shower/Steam Panels

Portable shower/steam panels shall be designed to connect to the water supply without additional structural support.

4.1.8 Shower/Steam Panel Backsplash Enclosure

Galvanized sheet metal backsplash panel support enclosures shall comply with ASTM A653.

4.1.9 Steam Components

- (a) Steam nozzles shall be made of stainless steel material compliant to ASTM A276.
- (b) Steam diversion plates shall be made of stainless steel material compliant to ASTM A240.
- (c) Generated steam temperature shall not exceed 58 ± 2 °C (137 ± 3 °F) at the discharge interface of the panel.

4.2 Plumbing Components**4.2.1 Supply Fittings**

4.2.1.1 Control valves, diverter valves, shower heads, body sprays, and hand-held showers shall comply with the applicable requirements of ASME A112.18.1/CSA B125.1.

4.2.1.2 Automatic compensating valves shall comply with ASSE 1016/ASME A112.1016/CSA B125.16.

4.2.1.3 Ball valves shall comply with IAPMO/ANSI Z1157.

4.2.2 Connections

Connections shall comply with Clause 4.4 or 4.5 of ASME A112.18.1/CSA B125.1.

4.2.3 Flexible Connectors

Flexible connectors shall comply with ASME A112.18.6/CSA B125.6.

4.2.4 Plastic Piping Systems

- (a) PEX piping systems shall comply with ASTM F877.
- (b) ABS DWV pipe and fittings shall comply to ASTM D2661.
- (c) CPVC pipe shall comply with ASTM D2846 or CSA B137.6.

4.2.5 Copper Tubes

Copper water tubes shall comply with ASTM B88.

4.2.6 Copper Fittings

Copper fittings shall comply with ASME B16.22.

4.2.7 Flexible Thermoplastic Polyurethane (TPU) Spiral Tubing**4.2.7.1 Flexible TPU spiral tubing shall**

- (a) be made of materials complying with or exceeding classification 0253 as specified in ASTM D5476; and
- (b) comply with Section 5.4 of this Standard.

4.2.7.2 When using TPU spiral tubing with push-fit fittings, an internal support shall be inserted into the end of the tubing prior to assembly.**4.2.8 Push-Fit Fittings**

Push-fit fittings shall comply with ASSE 1061.

4.2.9 Waste Fittings and Trench Drains**4.2.9.1** Except when proprietary (i.e., non-standard) waste fittings are provided by the manufacturer, the dimensions of waste outlets shall comply with CSA B45.5/IAPMO Z124.**4.2.9.2** Factory-supplied waste fittings shall comply with ASME A112.18.2/CSA B125.2.**4.2.9.3** Trench drains shall comply with ASME A112.6.3.**4.3 Electrical Requirements**

Shower/steam panels and enclosures incorporating electrical components or features shall comply with the applicable CSA or UL standards (e.g., CSA C22.2 No. 14, CSA C22.2 No. 68, CSA C22.2 No. 60335-1, UL 508, UL 1951, or UL 60335-1) except when powered by a:

- (a) direct plug-in Class 2 transformer 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.

4.4 Glass Components**4.4.1** Glass inserts, glass doors, glass side or return panels, and other glass components shall comply with the requirements for Category II applications specified in

- (a) CFR Title 16, Chapter II, Part 1201, for products intended for the United States; and
- (b) CAN/CGSB-12.1, for products intended for Canada.

4.4.2 The joints between glass inserts and enclosures or shower/steam panels shall be watertight.

4.5 Bathtubs and Shower Receptors

4.5.1 Hydromassage Bathtubs

When supplied as part of an enclosure or shower/steam panel, hydromassage bathtubs shall comply with ASME A112.19.7/CSA B45.10.

4.5.2 Shower Receptors

When supplied as part of an enclosure or shower/steam panel, shower receptors shall comply with CSA B45.5/IAPMO Z124 or IAPMO PS 106, as applicable.

4.5.3 Bathtubs and Tub/Shower Combinations with Glass Pressure-Sealed Doors

Bathtubs and tub/shower combinations with glass pressure-sealed doors shall comply with the
(a) requirements for glass components of this Standard; and
(b) applicable requirements of ASME A112.19.15.

4.6 Thresholds

Thresholds shall comply with the applicable requirements of Sections 5.7 and 5.8. In addition, aluminum thresholds shall

- (a) be made of anodized aluminum; and
- (b) have a minimum wall thickness of 2.54 mm (0.100 in).

4.7 Doors

4.7.1 Metallic profiles of doors with factory-installed plumbing components shall

- (a) be protected with a non-corrosive coating; and
- (b) shall comply with Clause 5.2.2 of ASME A112.18.1/CSA B125.1.

4.7.2 Door hinges shall be made of brass, aluminum, zinc die castings, stainless steel, or steel coated with decorative organic coatings complying with Clause 5.2.4 of ASME A112.18.1/CSA B125.1.

4.8 Tie Bars

Tie bars shall be made of brass or aluminum having a minimum wall thickness of 1.22 mm (0.048 in).

4.9 Accessible Enclosures

Enclosures designed to be accessible shall comply with the applicable requirements of ICC/ANSI A117.1.

5 Testing Requirements

5.1 Test Specimens

Tests for enclosures and shower/steam panels shall be conducted on complete shower/steam panel or enclosure assemblies, unless otherwise specified in the test procedure.

5.2 Load Tests for Enclosures

5.2.1 Load Test for Complete Enclosures

5.2.1.1 Test Procedure

The load test for complete enclosures shall be conducted as follows:

- (a) Install the test specimen in accordance with the manufacturer's installation instructions.
- (b) Apply a horizontal force of 667 ± 22 N (150 ± 5 lbf) to each area where a fitting could be gripped.

Note: When the test specimen does not have factory-supplied fittings, use supply fittings that comply with ASME A112.18.1/CSA B125.1 for conducting the test.

- (c) Hold the load for 1 min.

5.2.1.2 Performance Requirements

The test specimen shall not pull away from the wall (or from the enclosure, when the test specimen is a shower/steam panel). In addition, fittings shall not pull away from the enclosure or shower/steam panel.

5.2.2 Load Test for Metal Panels of Enclosures

Metal panels of enclosures shall be tested in accordance with the load test for bathtub and shower wall surrounds specified in Clause 5.8.4 of CSA B45.5/IAPMO Z124.

5.3 Load Test for Shower/Steam Panels

5.3.1 Test Procedure

The load test for shower/steam panels shall be conducted as follows:

- (a) Install the test specimen in accordance with the manufacturer's installation instructions.
- (b) Apply a downward force of 667 ± 22 N (150 ± 5 lbf) to one of the fittings that can be gripped.
- (c) Hold the downward force for 1 min.
- (d) Apply a horizontal force of 667 ± 22 N (150 ± 5 lbf) to one of the fittings that can be gripped.
- (e) Hold the horizontal force for 1 min.

5.3.2 Performance Requirements

The shower/steam panel shall not move downward or pull away from the wall or from the enclosure. In addition, fittings shall not pull away from the shower/steam panel.