



**Summary of Substantive Changes
between the 2012 and 2018 editions of
ASME A112.18.1/CSA B125.1 “Plumbing Supply Fittings”**

Presented to the IAPMO Standards Review Committee on May 6, 2013

General: The changes to this standard may have an impact on currently listed products. The significant changes are:

- The scope was expanded, and definitions were added to cover commercial pre-rinse spray valves, low-pressure water dispensers and rain showers (see Sections 1.1 and 3.1).
- Added a temperature rating range from 110 to 210°F for low-pressure water dispensers (see Section 4.1.2).
- Added design requirements for high-efficiency commercial pre-rinse spray valves and household hot water dispensers with storage electrical heating systems (see Sections 4.18 and 4.19).
- Added a new seal test for low-pressure water dispensers (see Section 5.3).
- Added a new flow rate test for high-efficiency commercial pre-rinse spray valves (see Section 5.4).
- Added a maximum operating requirement of 10 lbf for accessible design low-pressure water dispensers (see Section 5.5).
- Added design requirements for service sink faucets that do not have a backflow prevention cast in the body of the faucet (see Section 5.9).
- Added a spray force test procedure and a minimum performance requirement of 1.4 ozf for the spray force of high -efficiency rain showers (see Section 5.12).
- Added requirements for the flow rate and spray force of high-efficiency commercial pre-rinse spray valves (see Section 5.13).
- Added a requirement to verify the high-efficiency flow rate markings with testing. Included the maximum flow rate marking requirements for high-efficiency showerheads and hand-held showers are added new marking requirements for kitchen, lavatory and metering faucets (see Section 6.1.3).
- Added a package marking requirements for kitchen, lavatory, and metering faucets (see Section 6.3).
- Added marking requirements for high-efficiency commercial pre-rinse spray valves (see Section 6.4).
- Added flow rates for commercial high-efficiency pre-rinse spray valves, laundry tub – low flow, and low-pressure water dispensers (see Table 1).
- Included the number of cycles for the life cycle tests for low-pressure water dispensers, low-pressure water dispenser swing spouts and commercial or commercial high-efficiency pre-rinse spray valves (see Table 3).
- Clarified the figures for the spray force balance test (see Figures 7(a) and 7(b)).
- Added new figures detailing the spray force test fixture set-up (see Figure 8).

Section 1, Scope: The scope was expanded to include commercial pre-rinse spray valves and low-pressure water dispensers as follows:

1.1

This Standard covers plumbing supply fittings and accessories located between the supply stop and the terminal fitting, inclusive, as follows:

- a) *automatic compensating valves for individual wall-mounted showering systems;*



- b) bath and shower supply fittings;
- c) bidet supply fittings;
- d) clothes washer supply fittings;
- e) [commercial pre-rinse spray valves](#);
- f) drinking fountain supply fittings;
- g) humidifier supply stops;
- h) kitchen, sink, and lavatory supply fittings;
- i) laundry tub supply fittings;
- j) lawn and sediment faucets;
- k) [low-pressure water dispensers](#);
- l) metering and self-closing supply fittings;
- m) showerheads, hand-held showers, and body sprays; and
- n) supply stops

Section 2, Reference publications: The following referenced standards were added or updated:

ASME (The American Society of Mechanical Engineers)/CSA Group

[ASME A112.18.2-~~2014~~2015/CSA B125.2-~~1115~~](#)

Plumbing waste fittings

[ASME A112.18.6-~~2009~~2017/CSA B125.6-~~0917~~](#)

Flexible water connectors

ASME (The American Society of Mechanical Engineers)

[A112.1.2-~~2004~~2017](#)

Air Gaps in Plumbing Systems (For Plumbing Fixtures and Water-Connected Receptors)

[A112.1.3-2000 \(R2015\)](#)

[Air Gap Fittings for Use with Plumbing Fixtures, Appliances, and Appurtenances](#)

CSA Group

[CAN/CSA-B64 Series-~~0711~~](#)

Backflow preventers and vacuum breakers

[B125.3-~~1112~~](#)

Plumbing fittings

[C22.2 No. 14-13](#)

[Industrial control equipment](#)

[C22.2 No. 24-15](#)

[Temperature-indicating and regulating equipment](#)

[C22.2 No. 68-09 \(R2014\)](#)

[Motor-operated appliances \(household and commercial\)](#)

[C22.2 No. 94.2-15](#)

[Enclosures for electrical equipment, environmental considerations](#)

[C22.2 No 250.0-08 \(R2013\)](#)

[Luminaires](#)

[CAN/CSA C22.2 No 250.13-14](#)

[Light emitting diode \(LED\) equipment for lighting applications](#)

[CAN/CSA C22.2 No. 60065:16](#)



[Audio, video and similar electronic apparatus - Safety requirements E60730 Series](#)

ASSE (American Society of Sanitary Engineering)/ASME (The American Society of Mechanical Engineers)/CSA Group

[ASSE 1016-~~2011~~2017/ASME A112.1016-~~2011~~2017/CSA B125.16-~~11~~17](#)

Performance requirements for automatic compensating valves for individual showers and tub/shower combinations

[1023-1979](#)

[Hot Water Dispensers Household Storage Type - Electrical](#)

ASTM International (American Society for Testing and Materials)

[F2324-13](#)

[Standard Test Method for Pre-rinse Spray Valves](#)

NSF International

[NSF/ANSI 61-~~2007a~~2017](#)

Drinking Water System Components — Health Effects

[NSF/ANSI 372-~~2010~~2016](#)

Drinking Water System Components — Lead content

UL (Underwriters Laboratories Inc.)

[50-15 UL Standard for Safety Enclosures for Electrical Equipment, Non-Environmental Considerations - Thirteenth Edition](#)

[873-07 UL Standard for Safety Temperature-Indicating and -Regulating Equipment - Twelfth Edition](#)

[1598-08 UL Standard for Safety Luminaires - Third Edition](#)

[1951-11 UL Standard for Safety Electric Plumbing Accessories - Second Edition](#)

[8750-15 UL Standard for Safety Light Emitting Diode \(LED\) Equipment for Use in Lighting Products - Second Edition](#)

[60065-15 UL Standard for Safety Audio, Video and Similar Electronic Apparatus — Safety Requirements - Eighth Edition](#)

[60730-1-16 UL Standard for Safety Automatic Electrical Controls — Part 1: General Requirements - Fifth Edition](#)

Section 3.1, Definitions: Definitions for commercial pre-rinse spray valve, hand-held-shower, low-pressure water dispensers and rain shower were added as follows:

Commercial pre-rinse spray valve — *a hand-held self-closing fitting that is used to spray water on dishes, flatware, and other food service items for the purpose of removing food residue before cleaning the items.*

Hand-held shower — *a showerhead that can be held or fixed in place for spraying water onto a bather and that is connected to a flexible hose.*

Low-pressure water dispenser — *a terminal fitting located downstream of a pressure reducing valve that dispenses drinking hot water above 71 °C (160 °F) or cold water or both at a pressure of 105 kPa (15 psi) or less.*



Rain shower — a showerhead designed to be mounted directly over the bather with the spray face parallel to the floor.

Note: The showerhead can be mounted directly from the ceiling or on an extended shower arm.

Section 4.1.2, Rated temperatures: Added a temperature rating range from 110 to 210°F for low-pressure water dispensers as follows:

4.1.2.1

Supply fittings shall be designed for rated supply temperatures from 5 to 71 °C (40 to 160 °F).

4.1.2.2

The hot water components of low-pressure water dispensers shall be designed for rated supply temperatures from 43 to 99 °C (110 to 210 °F).

Section 4.13, Fittings incorporating electrical features: Added a note to recommend some of the applicable CSA and UL electrical standards as follows:

4.13.1 General

4.13.1.2

Fittings incorporating electrical features other than low-voltage circuits shall comply with the applicable CSA or UL electrical Standards.

Note: These standards include the following:

For lighting products, CSA C22.2 No. 250.0 and CSA C22.2 No. 250.13 for Canada and UL 1598 or UL 8750 for the US.

For audio or video products, CSA C22.2 No. 60065 for Canada and UL 60065 for the US.

For controls, CSA C22.2 No. 24 or the applicable CSA E60730 series standard for Canada and UL 873 or the applicable UL 60730 series standard for the US.

For electric plumbing products and accessories, CSA C22.2 No. 14 or CSA C22.2 No. 68 for Canada and UL 1951 for the US.

For parts intended for installation in wet locations, CSA C22.2 No. 94.2 for Canada or UL 50 for the US, for the appropriate degree of protection from ingress of moisture if applicable.



Section 4.18, High-efficiency commercial pre-rinse spray valves: Added design requirements for high-efficiency commercial pre-rinse spray valves as follows:

4.18 High-efficiency commercial pre-rinse spray valves

Note: Commercial pre-rinse spray valves do not necessarily have to comply with the high-efficiency requirements specified in Clause 5.13 if they are not designated as high-efficiency pre-rinse spray valves.

4.18.1

If the high-efficiency commercial pre-rinse spray valve has more than one mode all modes shall comply with the maximum flow rate requirements specified in Clause 5.13.2; and at least one of the modes shall comply with the requirements specified in Clause 5.13.3 for high-efficiency commercial pre-rinse spray valves. The manufacturer shall indicate which mode is to be tested for high efficiency.

4.18.2

See Clause 6.4 for additional marking requirements for high-efficiency commercial pre-rinse spray valves.

Section 4.19, Household hot water dispensers with storage electrical heating systems: Added design requirements for household hot water dispensers with storage electrical heating systems as follows:

4.19 Household hot water dispensers with storage electrical heating systems

Household hot water dispensers with storage electrical heating systems shall comply with ASSE 1023.

Section 5.3, Pressure and temperature: Added a new seal test for low-pressure water dispensers as follows:

5.3.8 Low-pressure water dispensers

5.3.8.1 Failure criteria

Seals of low-pressure water dispensers shall not leak or otherwise fail when tested in accordance with Clause 5.8.3.2. This test shall be conducted after the life cycle test in Clause 5.6.

5.3.8.2

The specimen shall be brought to equilibrium test temperatures by running water through it at the manufacturer's rated temperature and pressure. The valve shall be closed and subjected to 1.5 times the manufacturer's rated pressure for 5 min.

Section 5.4, Flow rate: Added provisions to include flow rate testing of high-efficiency commercial pre-rinse spray valves as follows:

5.4.1 Supply fittings

Fittings and accessories shall meet the minimum and maximum flow rate requirements specified in Table 1, at the temperatures and flowing pressures specified in Clause 5.4.2.3, with the exception of high-efficiency commercial pre-rinse spray valves, which shall be tested in accordance with Clause 5.4.3. These requirements shall be met before and after the life cycle tests specified in Clause 5.6.

5.4.2.3.1

Fittings shall be tested at the maximum flow setting, if adjustable, with both hot and cold water valves fully open on combination fittings.

The flow rate test shall be conducted with water between 5 and 71 °C (40 and 160 °F) in accordance with the intended end use of the fitting and under the following conditions:



- a) *for minimum flow: at 140 ± 7 kPa (20 ± 1 psi) at the inlet when water is flowing; and*
- b) *for maximum flow for faucets: at 410 ± 7 kPa (60 ± 1 psi) at the inlet when water is flowing; and*
- c) *for maximum flow for low-pressure water dispensers: at $105 \text{ kPa} \pm 7 \text{ kPa}$ ($15 \text{ psi} \pm 1 \text{ psi}$) at the inlet when water is flowing.*

5.4.3 Test procedure for high-efficiency commercial pre-rinse spray valves

5.4.3.1 Specimens

Three production models shall be selected for testing.

5.4.3.2 Testing

The flow rate of pre-rinse spray valves shall be tested in accordance with the procedures in ASTM F2324 with the exception of Appendix XI.

Section 5.5, Operating requirements: Added a maximum operating requirement of 10 lbf for accessible design low-pressure water dispensers as follows:

5.5.3

Low-pressure water dispensers shall be tested at a flowing pressure of 140 ± 14 kPa (20 ± 2 psi), with water at 10 ± 6 °C (50 ± 10 °F) for cold water only applications or with water at $99 + 0, -6$ °C ($210 + 0, -10$ °F) for hot water only applications. Devices intended to dispense cold and hot water shall be tested at both water temperatures. Operating controls shall not require a moving force greater than 45 N (10 lbf) or 22 N (5 lbf) for accessible designs.

Section 5.9, Backflow prevention: Included an allowance to protect fittings with plain outlets with an ASME A112.1.3 air gap and added design requirements for service sink faucets that do not have a backflow prevention device cast into the body of the faucet as follows:

5.9.2 Fittings with plain outlets

5.9.2.1 Air gaps

Fittings with plain outlets shall be protected by an air gap in accordance with ASME A112.1.2 or A112.1.3. For deck-mounted fittings, the air gap shall be measured as the vertical distance from the plane of the mounting surface of the fitting to the lowest point of the outlet. Where the fittings incorporate threads to accept an aerator or similar device, this measurement shall be taken with the aerator or similar device installed (see Figure 1).

A critical level mark on the fittings may be used as an alternative to the air gap. The critical level shall be confirmed by the test method specified in Clause 5.9.2.2.

5.9.3 Fittings with submersible outlets

5.9.3.4 Service sink faucets

Service sink faucets shall be designed to prevent re-installation of the spout directly onto the faucet body with the backflow prevention device removed, when the faucet has a backflow prevention device that is not cast in the body of the faucet; has an inlet in line with its outlet; and has a disassembly torque of less than 81 N·m (60 lbf·ft).

Section 5.12, High-efficiency showerheads and hand-held showers: Added a minimum performance requirement of 1.4 ozf for the spray force of high-efficiency rain showers, clarified the spray force test



procedure applied to showerheads and hand-held showers, and included a spray force test procedure for rain showers as follows:

5.12.3 Spray force

5.12.3.1 Performance requirement

When tested in accordance with Clause 5.12.3.2, the minimum spray force for

- a) *high-efficiency showerheads and hand-held showers shall be not less than 0.56 N (2.0 ozf) at a flowing pressure of 140 ± 7 kPa (20 ± 1 psi) at the inlet. The specimen shall be deemed to exceed the minimum spray force requirement when the force-balance fixture rotates past $0.0 \pm 0.1^\circ$; and*
- b) *high-efficiency rain showers shall be not less than 0.40 N (1.4 ozf) at a flowing pressure of 140 ± 7 kPa (20 ± 1 psi) at the inlet. The specimen shall be deemed to exceed the minimum spray force requirement when the force-balance fixture rotates past $0.0 \pm 0.1^\circ$.*

5.12.3.3 Spray force-balance test fixture

The force-balance test fixture shall have a means for measuring the rotation from the horizontal or for determining the point of balance, or both, and shall be calibrated as follows:

- a) *ensure the force balance fixture is dry prior to calibration;*
- b) *establish the zero angle position when the target is at $45 \pm 1^\circ$ to the horizontal and the force-balance fixture is balanced;*
- c) *position a force gauge to be in contact perpendicularly with the centre of the target, as illustrated in Figure 89 a);*
- d) *zero the force gauge;*
- e) *place counterweights on the force-balance fixture so that it balances the force specified in Clause 5.12.3.1 applied at the centre and perpendicular to the target, while maintaining the $0.0 \pm 0.1^\circ$ position, as shown in Figure 89 b); and*
- f) *remove the force gauge from the force-balance fixture.*

The final angle position shall be a non-zero value, calibrated to the force specified in Clause 5.12.3.1.

5.12.3.5 Test procedure

The test procedure shall be as follows:

- a) *ensure the force balance fixture is dry prior to testing;*
- b) *for showerheads and hand-held showers, mount the specimen so the force target surface and showerhead faceplate are parallel, and the centre of the force target and the centre of the showerhead are aligned and 455 ± 6 mm (18 ± 0.25 in) apart, measured before the water flow is initiated;*
- c) *for rain showers, mount the specimen directly above the force target so that the centre of the rain shower aligns directly over the centre of the force target at 45° to the target and is parallel to the floor. The centre of the rain shower to the centre of the forced target should be 455 ± 6 mm (18 ± 0.25 in) apart (see Figure 7B), measured before the water flow is initiated;*
- d) *once the water flow has been initiated, adjust the specimen using only the standard components so that the centre of the spray pattern aligns with the centre of the target;*
- e) *maintain water flow for at least 1 min; and*
- f) *verify that the spray force meets the performance requirement specified in Clause 5.12.3.1.*

If the centre of the spray pattern cannot hit the centre of the target, the specimen shall be deemed to have not met the spray force performance requirement.



Section 5.13, High-efficiency commercial pre-rinse spray valves: Added requirements for the flow rate and spray force of high-efficiency commercial pre-rinse spray valves as follows:

5.13 High-efficiency commercial pre-rinse spray valves

5.13.1 General

High-efficiency commercial pre-rinse spray valves shall comply with Clauses 5.13.2 to 5.13.3.

In accordance with Clause 4.18.1, if the commercial pre-rinse spray valve has more than one mode, the manufacturer shall specify the mode or modes that are intended to comply with the high-efficiency requirements.

5.13.2 Flow rate

The maximum flow rate for high-efficiency commercial pre-rinse spray valves shall be specified by the manufacturer, but in no case shall be more than 4.85 L/min (1.28 gpm), verified through testing in accordance with Clause 5.4.3.

5.13.3 Spray force

5.13.3.1 Performance requirement

When tested in accordance with Clauses 5.13.3.2 to 5.13.3.5, the minimum spray force for high-efficiency commercial pre-rinse spray valves shall be not less than 1.1 N (4.0 ozf).

5.13.3.2

Three representative production samples shall be selected for performance testing.

5.13.3.3 Preparation of apparatus

The apparatus shall be prepared in accordance with Section 9 of ASTM F2324.

5.13.3.4 Spray force test fixture

The spray force test fixture apparatus shall comply with the requirements in ASTM F2324.

5.13.3.5 Test procedure

The spray force shall be tested in accordance with Section 10 of ASTM F2324.

Section 6.1 General: Added a requirement to verify the high-efficiency flow rate markings with testing, included the maximum flow rate marking requirements for high-efficiency showerheads and hand-held showers and added new marking requirements for kitchen, lavatory and metering faucets as follows:

6.1.2

Showerheads and hand-held showers shall be marked with the manufacturer's specified maximum flow rate, in L/min and gpm, verified in accordance with Clause 5.4.2.3.2 a) [or 5.12.2.1 \(high-efficiency\)](#).

6.1.3

Kitchen, lavatory, and metering faucets shall be marked with the manufacturer's specified maximum flow rate, in L/min and gpm or L/cycle and gpc, verified in accordance with Clause 5.4.2.3.1 b).



Section 6.3, Packaging: Added a package marking requirements to include the maximum flow rate on kitchen, lavatory, and metering faucets as follows:

6.3.2

Packaging ~~or other included literature~~ for showerheads and hand-held showers shall be marked with the manufacturer's specified maximum flow rate ~~determined~~ verified in accordance with Clause 5.4.2.3.2 a) or 5.12.2.1 (high-efficiency), and either Item a) or b), as follows:

- a) the manufacturer's specified minimum flow rate at 310 ± 7 kPa (45 ± 1 psi) verified in accordance with Clause 5.4.2.3.2 b) or 5.12.2.2.1 (high-efficiency), (e.g., minimum 5.7 L/min (1.5 gpm) at 45 psi);
or
- b) the statement "For use with automatic compensating valves rated at xxx L/min (yyy gpm) or less", where xxx L/min (yyy gpm) is the ~~lowest~~ manufacturer's specified minimum flow rate ~~recorded~~ verified in accordance with Clause 5.4.2.3.2 b) or 5.12.2.2.1 (high-efficiency).

6.3.3

Packaging for kitchen, lavatory, and metering faucets shall be marked with the manufacturer's specified maximum flow rate, in L/min and gpm or L/cycle and gpc, verified in accordance with Clause 5.4.2.3.1 b).

~~6.4.3~~ **6.3.4**

High-efficiency showerheads, body sprays, and hand-held showers shall not be packaged, marked, or provided with instructions directing the user to an alternative water-use setting that would override the maximum flow rate specified in Clause 5.12.2.1. Instructions related to the maintenance of the devices, including changing or cleaning showerhead components, shall direct the user on how to return the device to its intended maximum flow rate.

6.4 High-efficiency shower heads and hand-held showers

~~6.4.1~~

~~High-efficiency shower heads and hand-held showers shall be marked with the manufacturer's specified maximum flow rate determined in accordance with Clause 5.12.2.1 and expressed in L/min (gpm).~~

~~6.4.2~~

~~Packaging or other included literature for high-efficiency shower heads and hand-held showers shall be marked with the~~

~~(a) manufacturer's specified maximum flow rate in accordance with Clause 5.12.2.1;~~

~~(b) minimum flow rate at 310 ± 7 kPa (45 ± 1 psi) determined in accordance with Clause 5.12.2.2.2; and~~

~~(c) following statement "For use with automatic compensating valves rated at xxx L/min (xxx gpm) or less", where xxx L/min (xxx gpm) is the lowest minimum flow rate determined in accordance with Clause 5.12.2.2.1.~~



Section 6.4, High-efficiency commercial pre-rinse spray valves: Added marking requirements for high-efficiency commercial pre-rinse spray valves as follows:

6.4 High-efficiency commercial pre-rinse spray valves

6.4.1

High-efficiency commercial pre-rinse spray valves shall be marked with the manufacturer's specified maximum flow rate determined in accordance with Clause 5.13.2 and expressed in L/min (gpm).

6.4.2

Packaging or other included literature for high-efficiency commercial pre-rinse spray valves shall be marked with the manufacturer's maximum flow rate in accordance with Clause 5.13.2; and the minimum spray force determined in accordance with Clause 5.13.3.

6.4.3

High-efficiency commercial pre-rinse spray valves shall not be packaged, marked, or provided with instructions directing the user to an alternative water-use setting that would override the maximum flow rate specified in Clause 5.13.2. Instructions related to the maintenance of the devices, including changing or cleaning pre-rinse components, shall direct the user on how to return the device to its intended maximum flow rate.

Table 1, Minimum and maximum flow rates: The table was revised to add flow rates for commercial high-efficiency pre-rinse spray valves, laundry tub – low flow, and low-pressure water dispensers.

Table 3, Life cycle test: The table was revised to include the number of cycles for the life cycle test for low-pressure water dispensers, low-pressure water dispenser swing spouts, and commercial or commercial high-efficiency pre-rinse spray valves.

Figure 7: Clarified the figure for the spray force balance Figure 7(a) is for showerhead and hand-held showers and Figure 7(b) is for rain showers.

Figure 8 (a) through (k), Spray force test fixture set-up: Added new figures detailing the set-up and force balance for the spray force test.