

**PROPOSAL FOR AMENDMENT TO
ASSE 1016-2011/ASME A112.1016-2011/CSA B125.16-11**

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

(changes proposed are in underline and ~~strikeout~~ format)

Existing Language:

3.3 Minimum rated flow

Devices shall comply with the requirements in this Standard when tested at the manufacturer's minimum rated flow or 9.5 L/min (2.5 gpm), whichever is lower.

Proposed Language:

3.3 Minimum rated flow

Devices shall comply with the requirements in this Standard when tested at the manufacturer's minimum rated flow or ~~9.5~~ 5.7 L/min (~~2.5~~ 1.5 gpm), whichever is lower.

Rationale for Proposed Language:

The thermal protection afforded by automatic compensating valves can be compromised if the flow rate of the showerhead is less than the flow rate for which the protective components of the valve have been designed.

Showerheads with maximum flow rates significantly below 2.5 gpm (9.5 Lpm) are widely available on the market today, and simple replacement of a showerhead is typically not subject to prevailing local codes. Since shower valve components are located behind finished walls and because they have a longer physical life, replacement of showerheads is likely to be more frequent than replacement of shower valves. This is especially true as energy and water utilities encourage replacement of existing high-flow showerheads with high-efficiency heads, most of which are rated at 2.0 gpm (7.6 Lpm) and less.

This proposed change to the minimum rated flow rate seeks to reduce (or eliminate) the likelihood that consumers and residential property managers replacing a showerhead will risk the safety (thermal protection) of users by ensuring that new shower valves fully accommodate showerheads with flow rates lower than the current threshold in the standard of 2.5 gpm (9.5 Lpm). For example, the current U.S. EPA WaterSense specification for showerheads sets a maximum flow rate of 2.0 gpm (7.6 Lpm), and many showerheads are already available with flow rates between 2.0 (7.6 Lpm) and 1.5 gpm (5.7 Lpm). As manufacturers continue to innovate with more water- and energy-efficient high-performance showerheads (some of which are functioning as low as 1.0 gpm – 3.8 Lpm), the change proposed here will help ensure that new and renovated buildings installing compensating valves can protect building occupants at these low flow rates.

Note that this language does not require that the showerhead itself have a specific low flow rate, but simply that the automatic compensating shower valve provide the thermal protection necessary at flow rates below 2.5 gpm. In the event that the showerhead selected for initial installation has a flow rate of less than 1.5 gpm (5.7 Lpm), the standard would remain unchanged and require the valve to be tested and certified at that lesser flow rate.

Additional Technical Background

As noted by Martin and Johnson (2008) (as cited in Codes and Standards Enhancement Initiative (CASE), "Multi-Head Showers and Lower-Flow Shower Heads," *2013 California Building Energy Efficiency Standards*, California Utilities Statewide Codes and Standards Team, September 2011), combinations of valves and shower heads were tested to determine whether pressure-compensating valves and thermostatic valves rated for 2.5gpm would perform adequately at lower flow rates. The tests included 22 shower valves from six manufacturers, and the valves were assessed on their ability to maintain water temperature within certain bounds for a given time after a change in pressure event, as described by the ASSE 1016-2005 standard for shower valves. The results indicated that a significant share of shower valves rated for 2.5 gpm failed to provide the thermal protection specified by ASSE 1016 when tested at lower flow rates. As summarized in the CASE report (p. 15): "These results indicate that shower valve temperature maintenance is strongly affected by flow rate, and that new showers with lower-flow shower heads would have to be installed with valves that are designed for 2.0 and lower flow rates."

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Existing Language:

5.1 Markings

5.1.1 General

Devices covered by and complying with this Standard shall be marked with

- (a) the name of the manufacturer, trademark, or other mark known to identify the manufacturer or, in the case of private labeling, the name, trademark, or other mark of the customer for whom the device was manufactured;
- (b) the model; and
- (c) the type of the device (i.e., Type P, Type T, or Type T/P).

5.1.2 Visibility of Markings

Markings shall be clear, permanent, and visible after installation (e.g., during field servicing).

Proposed Language:

5.1 Markings

5.1.1 General

Devices covered by and complying with this Standard shall be marked with

- (a) the name of the manufacturer, trademark, or other mark known to identify the manufacturer or, in the case of private labeling, the name, trademark, or other mark of the customer for whom the device was manufactured;
- (b) the model; ~~and~~
- (c) the type of the device (i.e., Type P, Type T, or Type T/P); and
- (d) the minimum rated flow of the device.

5.1.2 Visibility of Markings

(a) Markings shall be clear, permanent, and visible after installation (e.g., during field servicing and post-installation).

(b) Marking specified in 5.1.1(d) shall be located on the exterior faceplate or escutcheon and shall be visible to the end-user after installation.

Rationale for Proposed Language:

The thermal protection afforded by automatic compensating valves can be compromised if the flow rate of the showerhead is less than the flow rate for which the protective components of the valve have been designed.

Showerheads with maximum flow rates significantly below 2.5 gpm (9.5 Lpm) are widely available on the market today, and simple replacement of a showerhead is typically not subject to prevailing local codes. Since shower valve components are located behind finished walls and because they have a longer physical life, replacement of showerheads is likely to be more frequent than replacement of shower valves. This is especially true as energy and water utilities encourage replacement of existing high-flow showerheads with high-efficiency heads, most of which are rated at 2.0 gpm (7.6 Lpm) and less. This is being done largely through massive give-away programs directed at residential customers and managers of multi-family housing.

This proposed change seeks to reduce (or eliminate) the likelihood that consumers and residential property managers replacing a showerhead will compromise the safety of users. For example, the current U.S. EPA WaterSense specification for showerheads sets a maximum flow rate of 2.0 gpm (7.6 Lpm), and many showerheads are already available with flow rates between 2.0 (7.6 Lpm) and 1.5 gpm (5.7 Lpm), yet valves are not usually able to protect at those lower rates. Manufacturers continue to innovate with more water- and energy-efficient high-performance showerheads, some of which are now rated as low as 1.0 gpm (3.8 Lpm). The marking change proposed here will help ensure that, in future years, when building occupants or managers replace showerheads, sufficient information is visible so that the heads selected are compatible with the compensating valve's capability to protect. Without a post-installation visible marking of the valve's rated minimum flow rate, a consumer is likely to install a showerhead that is unprotected. As such, safety would be compromised.

Note that this language does not require that the showerhead itself have a specific low flow rate, but simply that the automatic compensating valve be visibly and permanently marked with the rated minimum flow rate. A permanent mark in a visible location will provide an easy point of reference for building occupants and managers to consider when changing showerheads in future years.

Related Technical Background

As noted by Martin and Johnson (2008) (as cited in Codes and Standards Enhancement Initiative (CASE), "Multi-Head Showers and Lower-Flow Shower Heads," *2013 California Building Energy Efficiency Standards*, California Utilities Statewide Codes and Standards Team, September 2011), combinations of valves and shower heads were tested to determine whether pressure-compensating valves and thermostatic valves rated for 2.5gpm would perform adequately at lower flow rates. The tests included 22 shower valves from six manufacturers, and the valves were assessed on their ability to maintain water temperature within certain bounds for a given time after a change in pressure event, as described by the ASSE 1016-2005 standard for shower valves. The results indicated that a significant share of shower valves rated for 2.5 gpm failed to provide the thermal protection specified by ASSE 1016 when tested at lower flow rates. As summarized in the CASE report (p. 15): "These results indicate that shower valve temperature maintenance is strongly affected by flow rate, and that new showers with lower-flow shower heads would have to be installed with valves that are designed for 2.0 and lower flow rates."