LEONARD VALVE COMPANY
1360 Elmwood Avenue
Cranston, RI 02910
Ph (800) 222-1208 or (401) 461-1200
Fax (401) 941-5310
info@leonardvalve.com
www.leonardvalve.com

ASSE Standards – "Making Sense of It All"

This information is being provided to the Engineering Community in order to stay on top of changes to the ASSE Standards that directly relate to Thermostatic Mixing Valves for Domestic Hot Water Systems. All information is provided courtesy of the American Society for Sanitation Engineering; see www.asse-plumbing.org for specific product listings.

ASSE 1016 (2017) – Automatic Compensating Valves for Individual Showers, Tub/Shower Combinations

"Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations (herein referred to as the "device") are intended to control the water temperature to wall mounted showerheads either in individual shower or tub/shower combination fixtures in order to reduce the risk of scalding and thermal shock."

- This is the standard for shower and tub valves only. The shift has occurred to take under sink valves (point-of-use) and move them to ASSE 1070.
- Key performance test under this standard is that the valve must be able to shut down to less than 0.5 GPM on cold water loss within 5 seconds such that the outlet temperature does not exceed 120°F, ultimately preventing scalding and thermal shock to the user.
- May be listed as Type P, Type T or Type T/P
- EXAMPLE: A thermostatic or pressure-balanced valve in a shower.

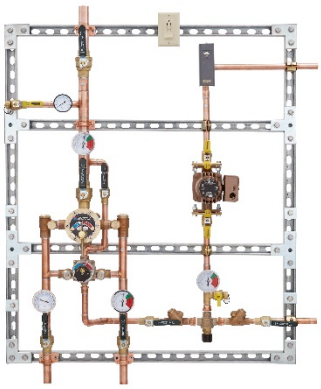


ASSE 1017 (2009) – Temperature Actuated Mixing Valves for Hot Water Distribution Systems

"Temperature Actuated Mixing Valves for Hot Water Distribution Systems are used for controlling in-line water temperatures in domestic hot water systems and shall be installed at the hot water source."

- These valves should be installed at the hot water source, in order to reduce high service water temperature to the building distribution system. They should be ***supplemented*** by a point-of-use device or in-line device designed to control final temperature to the fixtures.
- Key performance requirements of this standard involve permissible temperature variation based on outlet flow rate at 10 PSI Pressure differential (test condition).
  - Flow @ 10 PSI = 3.0 GPM < 5.0 GPM…..allowed +/- 3ºF
  - Flow @ 10 PSI = 5.0 GPM < 40.0 GPM…allowed +/- 5ºF
  - Flow @ 10 PSI = over 40 GPM……..allowed +/-7º F
- Be aware…some single valves may be listed to this standard ***BUT*** do not meet the toughest performance criteria of +/- 3ºF and are allowed +/- 7ºF performance.
- EXAMPLE: A thermostatic mixing valve located in a mechanical room with a hot water source supplying tempered water to the rooms and lav's within a hotel.



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ASSE 1069 (2005) – Automatic Temperature Control Mixing Valves

"These devices are intended to control water temperature to individual or multiple fixtures to reduce the risk of scalding and thermal shock."

- Not intended for individual showers and tubs, these valves control final outlet temperature to "gang showers", group showers and Sitz baths. They supply a wide range of flows, and are the final means of temperature control, with no further mixing downstream.
- EXAMPLE: A thermostatic mixing valve located remotely from the mechanical room and supplying tempered water to shower room with push button metering valves.

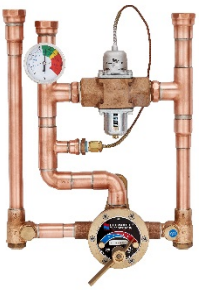
ASSE 1070 (2015) – Water Temperature Limiting Devices

"Water Temperature Control Devices shall control and limit the hot or tempered water temperature to fittings for fixtures such as sinks, bidets, lavatories or bathtubs and are intended to reduce the risk of scalding."

Devices covered by this standard shall comply with applicable requirements of NSF/ANSI 61.

- These valves provide temperature regulation and maximum temperature limiting of the hot water supplying the fixture, and shall be either the final temperature regulation or have water further tempered downstream of the device with the addition of cold water. These devices are not intended to provide protection against thermal shock.
- Key performance requirement under this standard is that upon loss of cold water, the valve must be able to shut down to 0.2 GPM or 20% of the manufacturers recommended minimum flow, such that the outlet temperature does not exceed 120°F
- EXAMPLE: A thermostatic mixing valve located remotely from the mechanical room and supplying tempered water to bank of lavatories with single level faucets.

ASSE 1071 (2012) – Temperature Actuated Mixing Valves for Plumbed Emergency Equipment



"Temperature Actuated Mixing Valves for Plumbed Emergency Equipment (herein referred to as "device"), including eyewash, eye/face wash, drench showers, and combination units are intended to be installed in systems that comply with ANSI Z358.1."

- Key performance requirements include: 1) Upon Hot Water Failure, the cold water shall continue to flow the manufacturer's stated by-pass flow rate at 30.0 psi differential pressure; 2) Upon Cold Water Failure, the hot water shall continue to flow at a rate not to exceed the values listed in Table 1 of the code.
- EXAMPLE: A thermostatic mixing valve located after the heat source and before a piece of emergency equipment, and supplying tepid water.

ASSE CRITERIA

Leonard Application	ASSE Standard	Title	Description	Example	Types	Range (°F)	Minimum Flow (GPM)	Output Temperature Flow Test	Life Cycle Test	Pressure &/or Temperature Variation
Showers, Tub/Shower Combos	1016-2017	Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	"Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations (herein referred to as the 'device') are intended to control the water temperature to wall-mounted showerheads either in individual shower or tub/shower combination fixtures in order to reduce the risk of scalding and thermal shock."	A thermostatic or pressure-balanced valve in a shower.	Type T, Type P, Type T/P	100 - 120	2.5 GPM or Manufacturer's minimum rated flow, whichever is less	2.25 GPM or Manufacturer's minimum rated flow ±10%	✓	Type P => With pressure variation of 50% to hot or cold inlet, must maintain +/-3.6°F of set output temperature, at all times. Type T=> Within the first five seconds after varying pressure 20% to a hot or cold inlet, temperature can exceed +5.4°F/-9°F, but it cannot last longer than 1.5s/1.0s respectively. After 5 seconds, must maintain +-3.6°F from the set point. Must meet parameters with hot water temperature increase of 25°F. Type T/P => Must meet both Type P & Type T test conditions.
Master Mixers	1017-2009	Temperature Actuated Mixing Valves for Hot Water Distribution Systems	"Temperature Actuated Mixing Valves for Hot Water Distribution Systems are used for controlling in-line water temperatures in domestic hot water systems and shall be installed at the hot water source."	A thermostatic mixing valve located in a mechanical room with a hot water source supplying tempered water to the rooms and lavatories within a hotel.	Thermostatic	105 – 120	Specific to device	NA	NA	Permissible temperature variation is based on flow at 10 psi +/- 0.5 psi. 3.0 – 5.0 GPM => Allowed +/-3°F Over 5.0 – 40.0 GPM => Allowed +/-5°F Over 40.0 GPM => Allowed +/-7°F
Gang Shower, Hydro-therapy	1069-2005	Automatic Temperature Control Mixing Valves	"These devices are intended to control water temperature to individual or multiple fixtures to reduce the risk of scalding and thermal shock. These devices are intended to be installed where the bather has no access to the temperature adjustment means, and where no further mixing occurs downstream of the device."	A thermostatic mixing valve located remotely from the mechanical room and supplying tempered water to shower room with push button metering valves.	Thermostatic	100 – 115, 120 max	2.5	Maintain 90% Manufacturer's published flow rate	✓	Within the first 5 seconds after varying pressure 20% to the inlets, temperature can exceed +5.4°F/-9°F, but it cannot last longer than 1.5s/1.0s respectively. After 5 seconds, must maintain +/-3.6°F from the set point. Must meet same parameters with hot water temperature increase of 25°F.
Lavs/Sinks	1070-2015	Water Temperature Limiting Devices	"Water Temperature Limiting Devices shall control and limit the hot or tempered water temperature to fittings or fixtures such as sinks, lavatories or bathtubs and are intended to reduce the risk of scalding."	A thermostatic mixing valve (a.k.a. point of use) located remotely from the mechanical room and supplying tempered water to bank of lavatories with single lever faucets.	Thermostatic	105 – 110	Specific to device		✓	Increase and decrease supply pressures 20% and increase inlet hot +25°F, the valve outlet shall remain < 120°F at all times; tested at flow equal to Manufacturer's stated minimum flow.
Safety Equipment	1071-2012	Temperature Actuated Mixing Valves for Plumbed Emergency Equipment	"Temperature Actuated Mixing Valves for Plumbed Emergency Equipment (herein referred to as 'device'), including eyewash, eye/face wash, drench showers, and combination units are intended to be installed in systems that comply with ANSI Z358.1."	A thermostatic mixing valve located after the heat source and before a piece of emergency equipment and supply tepid water.	Thermostatic	65 – 95, 100 max	Specific to device	NA	NA	Permissible temperature variation is based on flow at 30 psi. 1.5<7.0 GPM => Allowed +3°F/-5°F 7.0<20.0 GPM => Allowed +5°F/- 8.0°F 20.0<40.0 GPM => Allowed +7°F/- 12°F 40.0 GPM and over => Allowed +7°F/-15°F Device can net allow 100° F outlet.

LEONARD SOLUTIONS

Cold Water Failure	Hot Water Failure	Distribution	Shower	Emergency	Point of Use
Must reduce discharge to 0.5 GPM or 30% of minimum flow, whichever is less, before outlet water temperature reaches 120°F and within 5 seconds of pressure loss.	Must reduce discharge to 0.5 GPM or 30% of minimum flow, whichever is less, within 5 seconds.		Surfashower Type P or T p.16  PAM-II-ST-F Type P p.16  7600 Showermaster Type T p.16  6700 Advantage Type P p.16  4500 Aquatrol Type P p.16 		
NA	NA	Next Generation High-Low Systems p.6  LEAD-FREE High Capacity Systems p.6  LEAD-FREE Megatron p.6  LEAD-FREE TM-26-LF p.10 LEAD-FREE LV-Series p.10  LEAD-FREE XL-Series p.8  LEAD-FREE Nucleus Series p.4 	XL-690-LF p.14  LEAD-FREE		270-LF p.12  370-LF p.12 
Must reduce discharge to 0.5 GPM or less within 5 seconds to ensure output temperature does not exceed 120°F for devices 3/4" and smaller, or 1.0 GPM for devices 3/4" and larger.	NA	Megatron XL-690-LF pg. 14	XL-690-LF p.14  LEAD-FREE 269-LF p.14  369-LF p.14 		
Must reduce discharge to 0.2 GPM or 20% of Manufacturer's suggested minimum flow, whichever is greater, before outlet temperature reaches 120°F or Manufacturer's stated maximum temperature, whichever is lower.	NA	Megatron p.6  LEAD-FREE			170A-LF p. 12  170-LF p. 12  270-LF p.12  370-LF p. 12 
Upon cold water failure, and based on flow at 30 psi, the hot water shall continue to flow at a rate not to exceed the following conditions: 1.5<7.0 GPM => < 0.5 GPM 7.0<20.0 GPM => <1.0 GPM 20.0<40.0 GPM => <1.0 GPM 40.0 GPM and over => <1.0 GPM The output temperature shall not exceed 100°F prior to the reduction of flow to the device's maximum allowable flow rate, as stated above.	Must achieve Manufacturer's stated by-pass flow rate at 30 psi.			TA-300-LF p.18  TM-800-LF p.18  TM-600-LF p.18  TM-850-LF p.18