

TEST REPORT

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Report Number: 1052-07001 **Project No.:** 14375
Report Issued: October 31, 2007
Client: Showerstart LLC
16039 N. 82nd St.
Scottsdale, AZ 85260 **Contact:** Mr. Steve Dumas
Source of Samples: The samples were sent by Showerstart LLC and received by IAPMO R&T Lab in good condition on October 4, 2007.
Date of Testing: October 9, 2007 through October 31, 2007.
Sample Description: Flow shut-off devices with or without showerhead.
Models: SS-2100-CP, SS-2101-CP and SS-2104-CP (with showerhead)
SS-1002-CP (less showerhead)

Scope of Testing: The purpose of the testing was to determine if the samples tested of flow shut-off devices with or without showerhead met the applicable requirements of IAPMO IGC 244-2007a, entitled, "Flow Shutoff Device with or without Shower Head".

Conclusion: The samples tested of flow shut-off devices with or without showerhead, models as list above from Showerstart LLC **COMPLIED** with the applicable requirements of IAPMO IGC 244-2007a.

Note: Section 6.0 "Markings" was pending.

By our signatures below we certify that all the testing and sample preparation for this report was performed under continuous, direct supervision of IAPMO R&T Lab, unless otherwise stated.

Tested by,

Handwritten signature of Andy Ho in black ink.

Andy Ho, BSME, Test Engineer

Reviewed by,

Handwritten signature of Jeff Huang in black ink.

Jeff Huang, MSME, Manager, Fitting Testing

Primary Standard: IAPMO IGC 244-2007a Sections tested / evaluated:

4.1	Materials	4.2	Connections
4.3	Working Pressures	4.4	Working Temperatures
4.5	Shutoff Device with Thermal Actuator	4.6	Operating Control
4.7	Cross-flow	5.1	Shower Head and Shut off Device
5.2	Cycle Test	6.0	Markings and Identification

Sections of IAPMO IGC 244-2007a not listed above were considered not applicable to subject product.

Test Results: All tests and evaluations were conducted per the written procedures specified in the standards.

IAPMO IGC 244-2007a

4.1 Materials – COMPLIED

The shower heads and shut off devices complied with the applicable material requirements in ASME A112.18.1-2005 / CSA B125.1-05.

4.2 Connections – COMPLIED

The shut off devices were capable of being connected to a ½” NPT male thread and the threaded connections complied with Section 4.4 of ASME A112.18.1-2005 / CSA B125.1-05.

4.3 Working Pressures – COMPLIED

The shower heads and devices complied with the requirements in ASME A112.18.1-2005 / CSA B125.1-05.

4.4 Working Temperatures – COMPLIED

The shower heads and devices complied with the requirements in ASME A112.18.1-2005 / CSA B125.1-05.

4.5 Shutoff Device with Thermal Actuator – COMPLIED

The thermal actuator met the following performance requirements in Section 5.2 of this standard.

4.6 Operating Control – COMPLIED

The operating handle or stem did not fracture when a torque of 15 lbf-in was applied in the manner required to operate the control.

4.7 Cross-Flow – NOT APPLICABLE

The shower heads and devices had only one inlet and did not fall into the scope in Section 4.12 of ASME A112.18.1-2005 / CSA B125.1-05.

5.1 Shower Head and Shut off Device – COMPLIED

The shower heads and shut off devices complied with the applicable performance requirements in ASME A112.18.1-2005 / CSA B125.1-05.

In addition, the shut off device complied with Sections 3.1 and 3.2 of ASSE 1062 -2006. Refer to ASSE 1062-2006 portion of this report for details.

5.2 Cycle Test – COMPLIED

The device was tested to 10,000 cycles without failure when tested in accordance with the following steps:

- a) Water was flown through the device at an inlet pressure of 80 ± 1 psi and at a temperature of less than 87.8°F for one minute.
- b) The water temperature was gradually increased to 98.6°F . The device closed such that the flow of water was less than 0.2 gpm but not less than 0.05 gpm.
- c) The device was manually opened to the maximum flow condition (2.5 gpm maximum at 80 ± 1 psi) by turning the manual open lever.
- d) The water pressure was shut off to zero (0.0 psi) at the device inlet to automatically reset the device.

Findings: The device reduced the flow of water to 0.12 gpm during and after the life cycle test when the inlet water temperature was increased to 98.6°F .

6.0 Markings and Identification – PENDING

The devices should be permanently marked with the manufacturer's name and maximum flow rate.

ASME A112.18.1-2005 / CSA B125.1-05

4.1 Supply Fittings

4.1.1 Rated Pressure – COMPLIED

4.1.1.1 The devices were designed for a rated pressure of 100 psi.

4.1.1.2 The devices were designed to function at pressure between 20 psi and 125 psi.

4.1.2 Rated Temperatures – COMPLIED

The devices were designed for rated supply temperatures from 40°F to 160°F .

4.2 Servicing – COMPLIED.

The devices were designed to such that the replacement of wearing parts can be accomplished without removing the fittings from the supply system, without removing the piping from the body, without disturbing the finished wall, and by using standard tools or manufacturer provided tools.

4.4 Threads – COMPLIED

4.4.1(a) The 1/2" NPSM and NPT pipe threads conformed with ASME B1.20.1.

4.4.4 The showerheads for installation on standard shower arms were capable of being connected to a 1/2" NPT male thread.

4.7 Backflow Prevention – COMPLIED

The showerheads were designed to prevent backflow as required by an air gap when evaluated per Clause 5.9. Refer to Clause 5.9.

4.9 Toxicity

4.9.1 NSF 61-9 – NOT APPLICABLE

4.9.2 Metal Alloys – COMPLIED

All metal alloys in contact with potable water contained less than 8% lead as required. The brass connection housing contained 2.21% lead, brass inlet connection fitting contained 2.74% lead, brass ball joint contained 4.65% lead, and brass piston contained 4.50% lead. The stainless steel parts did not contain any lead. No solder and flux were used in the fittings.

4.11 Shower Heads – COMPLIED

The flow-restricting insert of the showerheads was mechanically retained at the point of manufacture to withstand a force of 8.0 lbf without pulling off.

4.12 Cross-flow – NOT APPLICABLE

The devices had one inlet and did not completely shut off the flow of water.

4.14 Materials – COMPLIED

The coupling nut was made of brass with 59.1% copper.

5.1 General – FOLLOWED

All applicable tests were conducted in accordance with Table B1.1 of this standard.

5.2 Coatings

5.2.1 General – COMPLIED

The significant surfaces of the plated surfaces were free of blisters, pits, roughness, cracks, and uncoated areas.

5.2.2 Corrosion – COMPLIED

All coatings were subjected to the corrosion test of ASTM B117 for Service Condition 2 for 24 h as specified in Section 5.2.2.2.1. After exposure there was no basis metal corrosion, blistering, cracking, peeling, or discoloration of the coating.

5.2.3 Adhesion – COMPLIED

5.2.3.2 The coatings on metals met the grind-saw test requirements as defined in ASTM B571.

5.2.3.3 The coatings on plastics met the thermal cycling test requirement when tested per Section 5.2.3.3.2. The plated plastic parts had:

- a) No copper corrosion spots, cracks, blisters, peeling, or discoloration on significant surfaces.
- b) No cracks longer than ¼” with a loss of adhesion between the base material and the coating.
- c) No blisters exceeding 0.01 in² in the area of an injection point.
- d) No warpage affecting the performance.

5.3 Pressure and Temperature

5.3.1 Static and Dynamic Seals – COMPLIED

The seals of the devices did not leak or otherwise fail when tested in accordance with Clause 5.3.1.3 to 5.3.1.4 of the standard. The devices were tested with flowing pressure of 20 psi and 125 psi for 5 minutes each.

5.3.5 Ball Joints – COMPLIED

The ball joint of the showerheads did not leak in any position more than 0.01 gpm measured over 5 minutes when tested at 50 psi flowing. The actual leakage was measured 0.00 gpm.

5.4 Flow Rate – COMPLIED

5.4.1 The devices met the flow rate requirements specified in Table 1, at the flowing pressure specified in Clause 5.4.2.3.

Findings: The flow rate at 80 psi was 2.35 gpm for models SS-2100-CP and SS-2101-CP, and 1.45 gpm for model SS-2104-CP. The maximum allowance was 2.5 gpm. The flow rate at 20 psi was 3.4 gpm for model SS-1002-CP. The minimum requirement was 2.4 gpm. The flow rate did not change after life cycle test.

5.5 Operating Requirements – COMPLIED.

5.5.1 The devices were operated with a torque not exceeding that specified in Table 2 when tested at the temperatures and pressures specified in Clause 5.3.1.4. The actual torque was 5.6 lbf-in for the spray pattern control and 1.8 lbf-in for the thermal actuator control.

5.5.4 The ball joint of the showerheads did not require a moving force greater than 10 lbf at the farthest point from the ball joint when tested at a supply pressure of 125 psi with water at 100 °F. The actual force was 7.75 lbf.

5.6 Life Cycle

5.6.1.4 Ball Joints – COMPLIED

When tested in accordance with Clause 5.6.3.5.6 for 10,000 cycles as specified in Table 3 of the standard, the showerhead assembly did not develop any defects that would adversely affect the serviceability of the unit. The ball joint did not leak more than 0.01 gpm in any position when tested in accordance with Clause 5.3.5. The actual leakage was 0.00 gpm. There was no need to tighten the ball joint packing nut more than once during the test to reduce leakage. The moving force was not greater than 10 lbf when measured at the farthest point from the ball joint with a supply pressure of 125 psi and the water temperature of 100 °F. The actual moving force was 5.5 lbf.

5.6.3.5 Other Devices (Spray Pattern Control) – COMPLIED (For Model SS-2100-CP Only)

The spray pattern control was tested to 10,000 cycles. During and after the test, the control mechanism continued to function as at the beginning of the test and did not develop any defects that could adversely affect its functionality, serviceability, or appearance. After the test, the operating torque was 6.2 lbf-in when tested in accordance with Clause 5.5 of the standard.

5.7 Resistance to Installation Loading

5.7.2 Thread Torque Strength – COMPLIED.

The ½” NPSM and NPT metal threaded connections withstood a torque load of 45 lbf-ft as specified in Table 4 of the standard without evidence of cracking or separation.

5.9 Backflow Prevention

5.9.2 Fittings with Plain Outlets – COMPLIED

The showerheads were designed to prevent backflow from outlet with an air gap in accordance with ASME A112.1.2. The actual air gap was dependent on field installation.

6.0 Markings

6.1 General – PENDING

The devices should be permanently marked with the manufacturer’s name and visible after installation.

6.3 Packaging – PENDING

No final production packaging was received for review.

ASSE 1062-2006

3.1 Working Pressure Test – COMPLIED

The device was installed in a test setup in accordance with Figure 1 and tested at a working pressure of 250.0 psi in accordance with Section 3.1.2 of this standard.

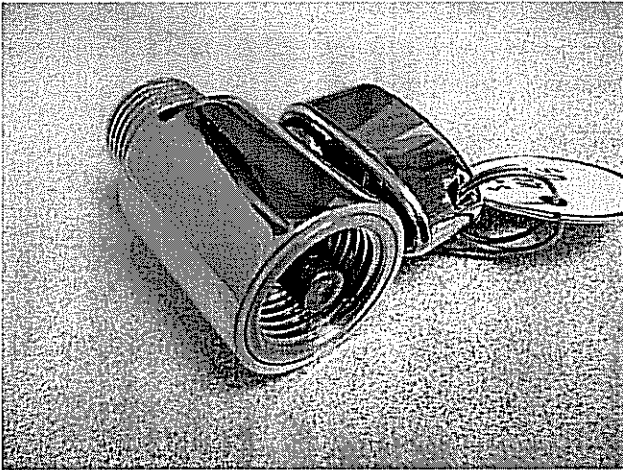
Findings: There was no indication of leakage or evidence of damage.

3.2 Deterioration at Extremes of Manufacturer's Temperature and Pressure – COMPLIED

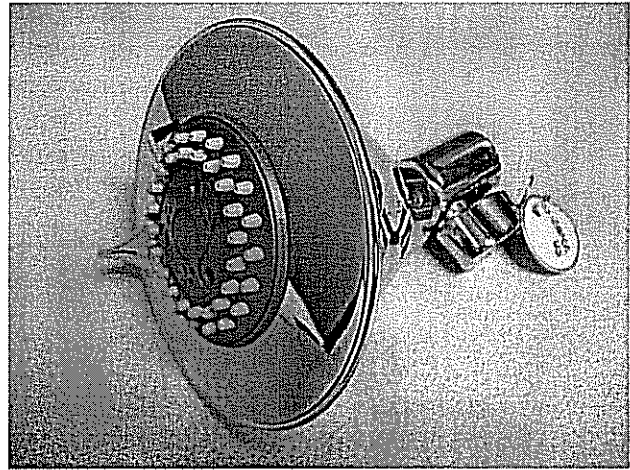
The device was installed in a test setup in accordance with Figure 1 and tested at a temperature of 200.0 ± 5.0 °F in accordance with Section 3.2.2 of this standard.

Findings: There was no indication of leakage or evidence of damage.

Photograph of Samples Tested:



Model SS-1002-CP



Model SS-2100-CP

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Trouble shooting Q & A

www.evolve showerheads.com

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the guide

Q: Why wouldn't the water flow when I turned on my shower?

A: In the event you turn on your shower and water only trickles, it is likely already hot and waiting for you to take a shower. To resume the water's normal flow simply flip evolve's toggle switch (*Using your showerhead Step #3*).

A little more detail...

evolve's Integrated ShowerStart™ technology prevents expensive hot water from unnecessarily running down the drain before you actually get in the shower. It does this by automatically entering trickle mode once the water reaches bathing temperature, approximately 95°F (35° C). If the water flowing to the showerhead has reached this temperature, your evolve valve will be in trickle mode the moment you turn your shower on. This typically happens when users are taking showers within a few minutes of one another. It could also happen if your bathroom became exceptionally hot - above 95° F (35° C). In either event, flipping the toggle switch will resume your showerhead's normal flow if it is in trickle mode when the water is turned on.

Limited Lifetime Warranty
For warranty claims please contact us at
www.evolve showerheads.com or call 480-496-2294

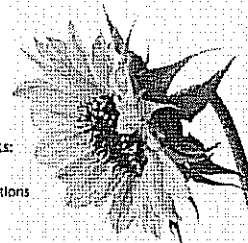
ShowerStart LLC warrants this product to be free from defects in materials and workmanship for a period of three years from the date of purchase. This warranty is limited to repairing or replacing, at ShowerStart's sole option, any such defective products. To obtain service under warranty you must obtain a Return Material Authorization (RMA) number from a ShowerStart representative. The product must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. This warranty does not apply to equipment which has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies to the original purchaser who must have properly registered the product within 15 days of purchase. EXCEPT AS PROVIDED HEREIN, SHOWERSTART MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some countries do not permit limitation or exclusion of implied warranties, therefore the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser. EXCEPT AS PROVIDED ABOVE, IN NO EVENT SHALL SHOWERSTART BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, ShowerStart is not liable for any costs, such as lost profits or revenues, loss of equipment, loss of use of equipment, costs of substitution, claims by third parties, or otherwise. This warranty gives you specific legal rights and you may also have other rights which may vary from location to location.

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be resourceful
discover the beauty of doing your
part without doing without

Outside



Package Contents:
evolve valve
Installation instructions
User's guide
Plumber's tape
Pull cord

Installation:



1. Wrap plumber's tape (included) in a clockwise direction tightly around the screw threads on the shower pipe. The tape will stretch. This is OK and is desired. Wrapping the tape creates a solid seal to prevent water leakage.



2. Screw your evolve valve in a clockwise direction on the shower pipe until the connection is tight. The valve will operate effectively in any position. However, the preferred position is to have the "toggle switch" located on the side of the shower pipe that is closest to your shower entry. This position makes it easy for you to reach the "toggle switch" without having to step in the shower.



3. Wrap the remaining Teflon tape over the exposed threads on evolve in the same manner as previously completed on the shower pipe. In Step 2, screw shower head onto evolve in a clockwise position until the connection is tight.



4. **Optional Pull Cord:**
Your evolve valve comes with a pull cord, allowing you to flip the toggle switch without having to reach all the way up to the main body of the unit.
To install: Thread the non-looped end through eyelet and then tread back through cord loop. Pull to tighten.

INSTALLATION NOTE: The pull cord works best when the toggle switch is positioned on the left or right side of the shower pipe.

IMPORTANT SAFETY INFORMATION:
evolve is NOT an anti-scald device.
- Lower water heater temperature to prevent scalding accidents. Water temperatures above 120° F can cause severe burns or even death.
- Always resume water flow and check water temperature before entering shower
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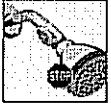
Registration:

Please visit us at www.evolve showerheads.com to register your evolve and for all your product and support questions & needs. Registration is quick, simple and allows us to help you in a more timely manner should you have any questions.

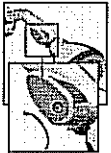
Using evolve



1. Turn on shower as usual.
Brush your teeth, grab a cup of coffee, make your bed, hug your kids because you no longer have to monitor your shower's water temperature - evolve does it for you.



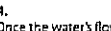
2. Your evolve valve is engineered with ShowerStart technology. ShowerStart allows your showerhead to automatically enter trickle mode when the water's flow is warm enough for a shower. ShowerStart prevents hot water from unnecessarily going down the drain when no one's in the shower.



3. Reach in the shower and give evolve's "toggle switch" a slight twist forward or backward to resume the water's normal flow.

The Toggle Switch has two uses:
1. resumes water flow after it has been automatically paused by evolve.

2. starts water flow any time you turn on shower and water doesn't flow from your showerhead.



4. Once the water's flow resumes, check it to make sure the temperature is right for taking a shower, step in and shower as usual. Always resume water flow before entering shower.

Inside

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the guide

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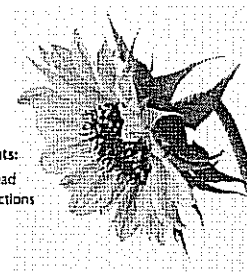
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ShowerStart LLC warrants this product to be free from defects in materials and workmanship for a period of three years from the date of purchase. This warranty is limited to repairing or replacing, at ShowerStart's sole option, any such defective products. To obtain service under warranty you must obtain a Return Material Authorization (RMA) number from a ShowerStart representative. The product must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and grade of date and place of purchase. This warranty does not apply to equipment which has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies to the original purchaser who must have properly registered the product within 15 days of purchase. EXCEPT AS PROVIDED HEREIN, SHOWERSTART MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some countries do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser. EXCEPT AS PROVIDED ABOVE, IN NO EVENT SHALL SHOWERSTART BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, ShowerStart is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, costs of installation, claims by third parties, or otherwise. This warranty gives you specific legal rights and you may also have other rights which may vary from location to location.

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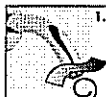
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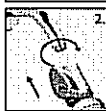
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User's guide
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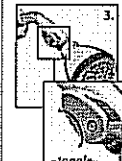
Using your evolve showerhead



1. Turn on shower as usual. Brush your teeth, grab a cup of coffee, make your bed, hug your kids because you no longer have to monitor your shower's water temperature - evolve does it for you.



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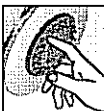
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- Not designed for use with tankless hot water heaters



Cleaning anti-clog spray nozzles:

Your evolve showerhead has easy to clean anti-clog spray nozzles. To remove mineral deposits simply glide your finger along the nozzle tips while the showerhead is running.



Changing your spray patterns:

If your evolve showerhead comes with multiple spray patterns you can switch from one pattern to another by turning the showerhead's outer ring. Simply rotate the ring to the left or right to select the spray pattern you prefer.

Registration:

Please visit us at www.evolve showerheads.com to register your showerhead and for all your product and support questions & needs. Registration is quick, simple and allows us to help you in a more timely manner should you have any questions.

Conforms to A112.18.1M 2.5 GFM

Inside