



City of Portland, Oregon
Bureau of Development Services
Office of the Director
FROM CONCEPT TO CONSTRUCTION

Ted Wheeler, Mayor
Rebecca Esau, Director
Phone: (503) 823-7300
Fax: (503) 823-6983
TTY: (503) 823-6868
www.portlandoregon.gov/bds

To: Tad Everhart

From: **Alternative Technology Advisory Committee:**
Joshua Klyber (chair) Aron Faegre Bob Sweeney
Jeff Cordial David Posada

RE: **Application #13-1, Waste Water Heat Recovery Water Heater for Shower – Final Recommendation**

Date: **June 25, 2019**

Summary of Proposal: The applicant requests that the Alternative Technology Advisory Committee review a waste water heat recovery (WWHR) system for a residential shower. The proposed waste water heat recovery pipe is manufactured by Q-Blue, and the specific Q-Blue product reviewed is the Showersave.

The Showersave consists of three separate concentric pipes that replaces a vertical section of waste water piping. Waste water from the shower is conveyed from the waste water pipe above the Showersave to the waste water piping below the Showersave by the inner copper pipe.

The inner copper pipe is surrounded by a tight-fitting second copper pipe. The two are separated by three separate small gaps, which allow any wastewater leaking through the inner pipe to drain down to the bottom where periodic inspection would allow leak detection. The third copper pipe is separated from the second copper pipe by a narrow gap designed for fresh cold water flowing from the water supply to the shower head. Since copper conducts heat well, heat in the waste water is transferred to the fresh water.

Applicable Building Code Section(s): Section 104.3.4 of the 2017 Oregon Plumbing Specialty Code (OPSC) allows the building official to approve an alternative material or method of construction if the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of the OPSC. The Showersave is not UL listed, so it does not comply with the OPSC.

Please note that following the findings and recommendations of this Committee or the Bureau of Development Services Administrative Appeals Board does not waive any other state or federal requirements.

Committee Findings:

1. The Showersave will be installed per the manufacturer's instructions included in the Installation Manual attached hereto as Exhibit A.

2. Although the application was specifically for System B on page 4 of the Installation Manual, the Committee recommends approval of all three systems outlined in the Installation Manual.
3. A maintenance schedule will be created and followed to visually inspect the system periodically for leaks.
4. A full-height access panel will be installed for maintenance of the system.
5. The air admittance valve must be installed 4 inches above the shower inlet.

Final Committee Recommendation:

Based on these findings, the Alternative Technology Advisory Committee recommends approval of the use of this technology for residential purposes.

Please note: The Bureau of Development Services and the Administrative Appeal Board are not bound by the recommendations of the Committee. A favorable recommendation of a technology by the Committee does not guarantee approval of a building code appeal.

Further instructions for the applicant:

You may submit your plumbing code appeal to use this technology in a site-specific project at any time by following the instructions found on the BDS website. A plumbing code appeal must be approved by BDS to be able to use this technology in a project. Please submit a copy of this Committee recommendation with your appeal application. Please contact the Appeal Board Secretary at (503) 823-7335 if you have any additional questions about the appeal process.

Showersave®

QB1-21

QB1-16

QB1-12



Installation Manual

Showersave®QB1-21 (heat exchanger)
QB1-16
QB1-12



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Showersave®QB1-21 (heatexchanger) QB1-16 QB1-12

1.0 General Information

This Installation Manual is about installation of the Q-Blue Showersave®QB1-series. This serie contains the Showersave®QB1-21, the Showersave®QB1-16 and the Showersave®QB1-12. The way these products work is identical, only the lenghts of the heatexchangers differ. Because the lenghts of the heatexchangers differ also the efficiencys and the pressurelosses differ (see points 4.0 and 4.1 of this manual).

On average, a shower uses 60 litres of water at a temperature of between 38 and 40 °C. This shower water goes straight down the drain, wasting a great deal of heat and energy. By running the hot waste water through the Showersave QB1 this heat can be transferred to the water on it's way to the boiler and/or the cold water tap of the shower's mixer tap. The heat transfer takes place simultaneously while you shower.

1.1 Description of the heat exchanger

In fact the Showersave®QB1 contains three copper pipes, the wastewater pipe, the outer pipe and a pipe in between which is connexed to the outer pipe. This is how a double barrier is realised between waste water and tap water. The miniscule space between the pipe in between and the wastewater pipe (wastewater pipe) contains air. If the inner pipe develops a leak, this becomes visual apparent as water will drip from the heat exchanger. This double wall seperation is according to EN1717:2000 and is tested and approved by KIWA. This system is also WRAS approved.

Each Showersave®QB1 has a label (see fig. 1) with printed on it a unique serial number and also technical information. This label should always stay on the Showersave®QB1 and may not be removed. If the label is removed or not readable garantee is no longer valid.

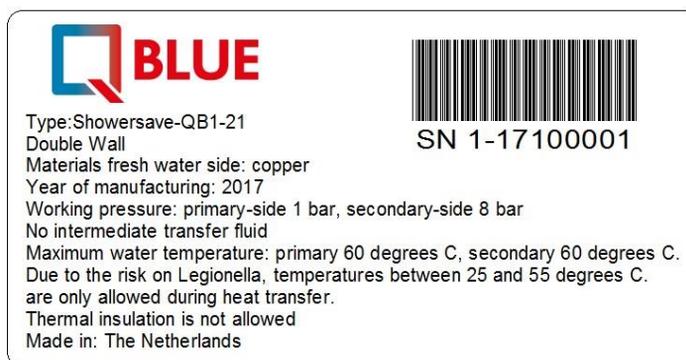


fig. 1

1.2 Safety and legionella

When no cold water is flowing up the Showersave®QB1, the temperature in the pipe should be prevented from becoming higher than 25°C. The Showersave®QB1 may therefore not be installed near heat conducting pipes, on warm surfaces or in spaces with constantly high temperatures (>25°C). The cold water pipe, connection and the outer wall of the Showersave®QB1 **may therefore not be insulated.**

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1.3 Maintenance and cleaning

Generally no maintenance is required. Efficiency can decrease as a result of dirt accumulating on the inside of the Showersave®QB1. However, the waste water from the showersave flows at a high speed ($>1\text{m/s}$) along the inner pipes wall. This is comparable to the water speed in a dishwasher. The water flows through the pipe in 2 seconds and therefore no dirt will accumulate (normally).

If, for what reason, dirt accumulates, then a soap based cleaning agent can be used to flush the pipe. Cleaning agents based on scouring or polishing agents are not allowed, because they can stick to the wall of the pipe and reduce efficiency.

Connecting a wash basin to the Showersave®QB1 is not recommended as shaving gel and toothpaste are very sticky and could adhere to the wall of the inner pipe.

2.0 Points of attention when installing:

- The Showersave®QB1 should be mounted vertically both from frontside as from the side
- The Showersave®QB1 is a device and should therefore be mounted easily accesable, so that it can be easily installed and uninstalled
- Before the freshwater connection a non-return valve and a shut-off valve should be installed (type EA) (see afb.1 page 5)
- The Showersave®QB1 may not be mounted in an area where the temperature normally is higher than $25\text{ }^{\circ}\text{C}$
- The Showersave®QB1, the water pipeline and the connections may not be insulated
- The waterconnections should be made with straight thread, so not with conical thread
- Hemp may not be used on the connections
- The tightening moment of the connection may not exceed 120 Nm (Tip : use a counter key)
- The label with the serial number and technical information may not be removed and should stay readable

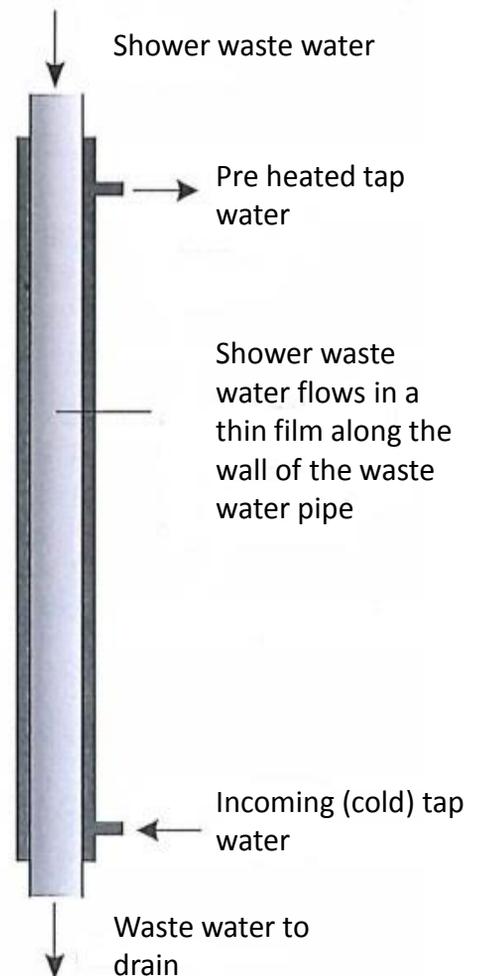


fig.2

Showersave® QB1-21 (heatexchanger)
 QB1-16
 QB1-12

3.0 Installation of the Showersave® QB1

3.1 Systems A, B en C

The inlet side of the Showersave® QB1 can be connected to the tap water system.

The outlet side can be installed in three different ways, namely:

System A: Combined connection to the shower mixer tap's cold water connection and the heater/boiler

System B: Connection of the cold water connection from the shower mixer

System C: Connection to the water heater/boiler

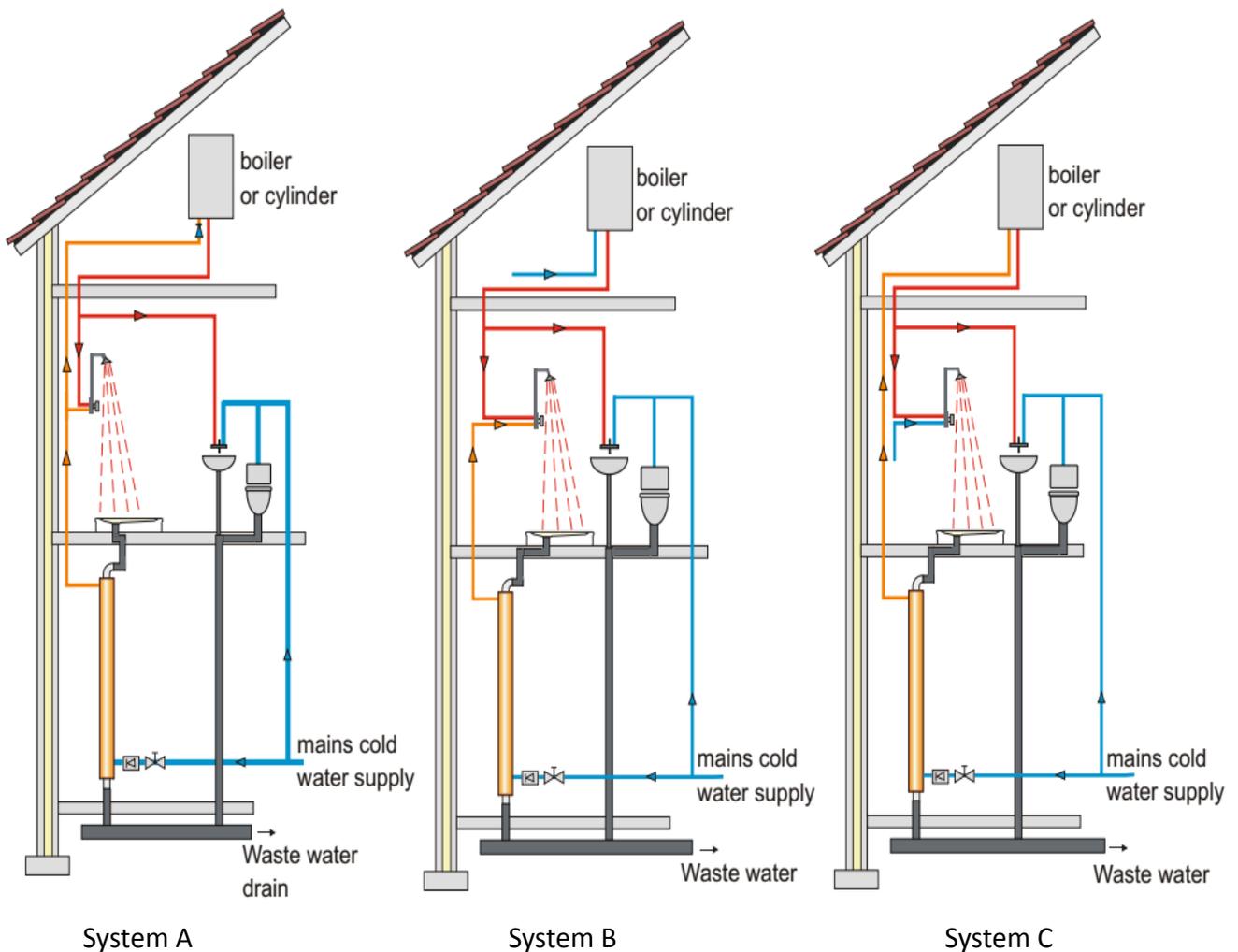


fig. 3

Showersave®QB1-21 (heatexchanger)

QB1-16

QB1-12

3.2 Connections

The tap water connections should be demountable. Just before the tap water connection a non-return valve and a shut-off valve should be mounted (type EA) (see afb. 1).



Extra aeration

Dearation of the Showersave®QB1 is not necessary, all air will disappear automatically because the water flows from the bottom on the top.

If aeration of the drainage area between the showerplace and the Showersave®QB1 is desired it can be achieved in two ways:

1. A connection to a relief pipe or stand pipe (with relief pipe) of the shower (see fig. 4).
2. By using an aerator. The aerator must be mounted vertically above the heat exchanger and may not be placed lower than 1 meter below the top of the shower place. The aerator can be placed on the rotator by replacing the 45 degrees bend for a T-connector (see fig. 5).
(note: aerator is not standardly supplied)

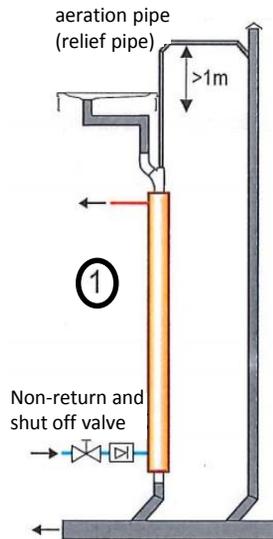


fig. 4

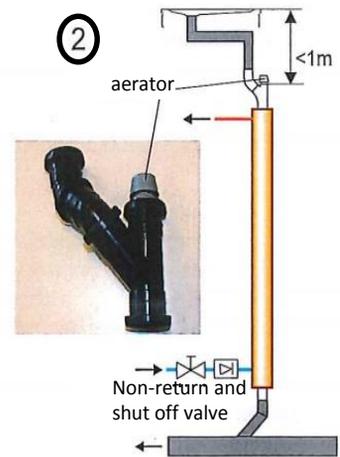


fig. 5

3.3 Positioning of the Showersave®QB1

The Showersave®QB1 is considered a device. The space it is installed in should be large enough so that inspections can be carried out properly and if necessary the Showersave®QB1 can be replaced easily. Access has to be possible without extra work. When this is not respected any guarantee claim will not be valid.

Possible positions of installation are a fixed cabinet, cilinder shaft with removable panel, technical area, stair cupboard etc.

Positioning in a Electrical meter cupboard is only allowed when properly compartmented and only when accordated by local building authority.

3.4 Fixation of the Showersave®QB1

The Showersave®QB1 is mounted to the wall with two special braces (see afb. 2). It is important to take good care of that the Showersave®QB1 is mounted strictly vertical, seen from the front as from the side.



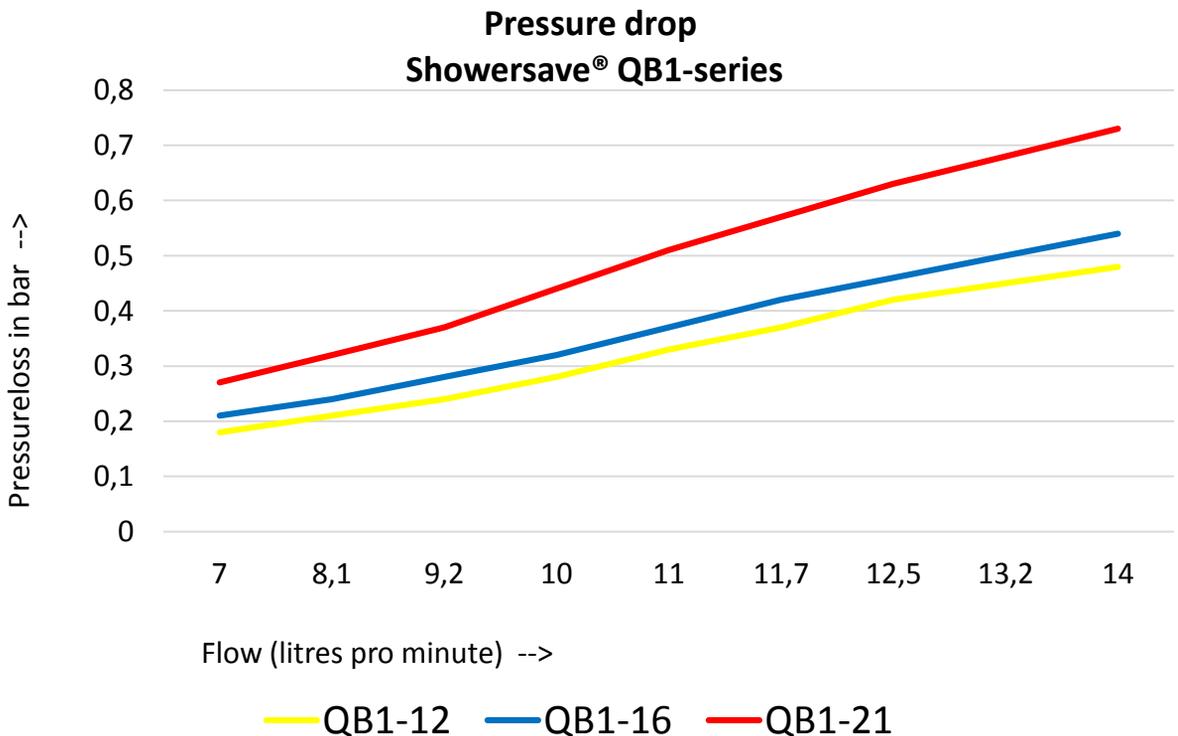
Afb. 2

Showersave® QB1-21 (heatexchanger)
 QB1-16
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4.0 Technical information of the Showersave® QB1

Specifications	QB1-21	QB1-16	QB1-12
Length	: 2100 mm	1680 mm	1270 mm
Weight	: 7,8 kg	6,1 kg	4,5 kg
Content water compatiment	: 0,52 liter	0,39 liter	0,28 liter
Diameter (outer) waste water connection	: 50 mm	50 mm	50 mm
Tap water connections	: G1/2"	G1/2"	G1/2"
Max. allowed tightning moment	: 150Nm	150Nm	150Nm
Max. allowed pressure wastewater	: 1 Bar	1 Bar	1 Bar
Max. allowed pressure tap water	: 8 Bar	8 Bar	8 Bar
Max. allowed temperature waste- or tap water	: 60 graden	60 graden	60 graden
Efficiency on system A en 12,5 l/min flow (*)	: 61,4%	56,1%	48,5%
Efficiency on system A en 9,2 l/min flow (*)	: 64,6%	60,1%	52,7%
(*) efficiencys measured by KIWA			

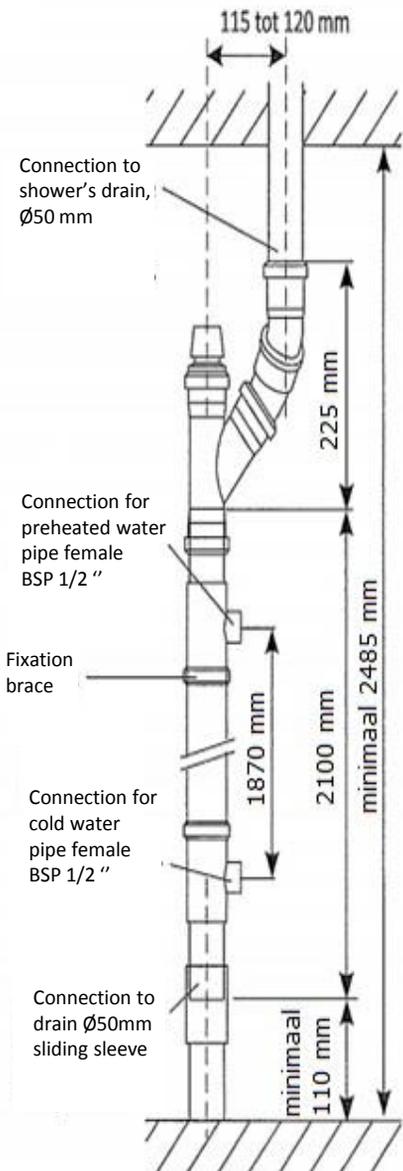
4.1 Pressureloss



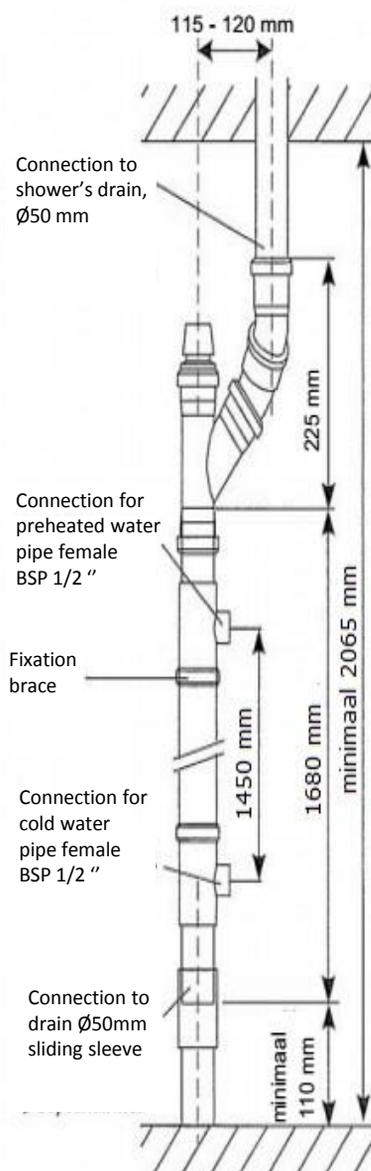
Showersave®QB1-21 (heatexchanger)
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4.1 Dimensioning (sizes) for mounting of the Showersave®QB1

QB1-21



QB1-16



QB1-12

