Which Type of Water Heater is Best For Emergency Safety Showers?

Storage Tank vs. Tankless
The debate continues to resurface- which water heater type is beneficial for tepid water delivery to emergency safety showers and eyewash systems? Is it storage or is it tankless? Let’s find out!

In recent years, many commercial and industrial facilities have considered switching from storage tank type water heaters to tankless water heaters as their source for tepid water delivery. Both water heater types have a place in the industry, each with their own advantages and disadvantages for certain applications. Let’s take a look at some of the pros and cons as well as some considerations a specifier should be aware of in regards to these two types of tepid water delivery systems.

**Storage & Tankless-A Quick Overview**

Storage, also known as tank type water heaters, have been the standard in the United States for decades. Most people are familiar with storage water heaters; essentially a tank of stored water with a thermostatic mixing valve that is ready and waiting to deliver 15 minutes of 85°F tepid water when it’s required. They can be heated with natural gas, electric heating elements, or any other method. They also have simple controls and design, making them easy to maintain and install.

On the other hand, within the past few decades, advanced technology has become more prevalent, making tankless water heaters a desirable option. The thought of a smaller footprint, unlimited hot water, and energy savings are some of the benefits discussed in the industry. While they do provide an unlimited supply of hot water, there are important differences in the way they work compared to the tank type models.

**Size, Space, and Installation**

Storage type water heaters are usually larger than tankless units and often take up usable floor space. They can be prone to standby heat loss, and may not be as high tech in function and aesthetics, but they do have a solid reputation for reliability, ease of installation, and simplistic design. Storage type water heaters are what we normally see in these settings, and usually equate to easy maintenance and replacement without the need for additional plumbing or power to run the unit. A notable feature of a storage type water heater is its reference gauge which indicates whether the water heater is working and ready to provide tepid water at an accurate tepid temperature, while a tankless water heater usually has no indication the water heater is malfunctioning until water is called for from the safety system and the equipment fails to supply the correct tepid water temperature (between 60°-100°F).

Tankless heaters are typically smaller in stature, offer newer technology, and can save on floor space. They also blend in with surroundings, offering a more modern alternative to storage tanks. But when it comes to commercial and industrial applications such as emergency drench systems, a typical tankless water heater will not handle the high flow
rate demands that come with an emergency safety shower drench system. These emergency systems require a specific minimum flow rate set by the ANSI/ISEA Z358.1-2014 Standard (23 GPM at 30 psi for a combination eyewash/safety shower), so tepid water is delivered at a consistent and precise temperature to the end user for 15 minutes. In order to achieve this flow rate, the unit size, plumbing, electrical supply, and capacity of the water heater will need to be increased in order to handle this demand.

This increase in electrical capacity means the size of the tankless water heater will inevitably need to be larger. For safety applications such as these, a tankless water heater is not comparable to your standard hang on the wall 11-27 kW unit most people envision when the word tankless comes to mind. Installation is also not quite as simple as it may seem. With commercial/industrial tankless water heaters, additional plumbing runs are often necessary, electrical services have to be increased to meet demands, and ample space is needed in order to accommodate the heater as well as its utilities. This can result in the tankless unit costing more up front than a storage tank, while it can also take up more space than what is typically expected.

**Energy and Efficiency**

Tankless water heaters are also known to be more energy efficient than storage tank types because they heat water on demand, but the increased electrical usage of an industrial tankless means they do not have the same energy efficiency advantage over storage tank water heaters. For emergency drench applications, a tankless water heater would require 150 kW of electrical power in order for it to heat water 40-85°F @ 23gpm. This is a substantial amount more power than what is necessary for a storage water heater, which would require a minimum of 1.5kW to complete the same task. A typical water heater (glass lined) has limitations in regards to high temperature water storage over time, but a Hubbell tank is like a battery of energy because the cement lining can store water at high temperatures, parceling out tepid water at the required flow rates using less immediate energy. While a storage tank has the ability to keep water hot, a tankless needs to use its energy supply to heat the water each time there is a demand. The same amount of energy is used in each instance, but with the cement storage tank design you can stretch the heat-up time over many hours, as opposed to a tankless where the heat-up needs to be immediate.

**Flow Rate, Pressure Drop, Water Supply**

Another aspect involved with safety shower and drench systems is flow rate and pressure drop. The pressure drop through a storage system at 23gpm is less than 4 psi while a tankless typically results in a pressure drop of 15 psi or more. A lower pressure could potentially result in not meeting the 30psi minimum water pressure requirements. Therefore the tankless may not meet ANSI/OSHA standards because the water that exits the system needs to meet the minimum flow rate and pressure. Tepid water at this pressure will help the end user to properly and adequately fix the issue of chemical or debris contamination.
The flow rate of a tankless also needs to be analyzed because tankless units heat water on demand and don’t store hot water like a storage tank. If a tankless water heater is being used and an application requires a high volume of water, more than one tankless unit may be necessary in order to comply with water demand. This is due to the fact that tankless heaters need to bring the water into the system and then heat it while a storage tank has hot water ready to be used. Many times, this is the case for emergency safety shower applications because the maximum flow rate of a tankless is not enough to support the water demand of these high flow rate applications. Water flow for an eyewash station (.4 gpm) will not activate a tankless that is sized for 23 gpm, in most cases. This results in more more installations, more plumbing connections, and higher costs if more tankless heaters are needed.

Using a storage tank type heater is more simplified. Because storage tanks can hold water at high temperatures, they are able to provide required flow rates using less energy to heat water over a period of time. If a tank can’t supply a specific volume of hot water, increasing the tank’s gallon capacity can resolve the issue as opposed to installing more units. Storage type water heaters can handle more than one task at a time, such as an emergency shower system in one room and an eyewash station in another. In the event that both need to be used simultaneously, a single tankless water heater would not be able to supply enough tepid water at an acceptable pressure.

To Wrap Up..

There are clear distinctions between these two water heater types, each with their own advantages and drawbacks. While the tankless is ideal for applications that don’t demand a high flow rate, there are certain instances where a storage type may be the better option. When one water heater must be used for multiple applications, it makes more sense to choose a storage type because it can handle the the demand of more than one emergency safety system. The electrical capacity of the water heater should also be considered because many times tankless units will need to increase in size and extra plumbing connections may be necessary. Therefore, the amount of space that is available for a water heater, as well as the location in which the water heater will be installed, are important factors that must also be analyzed in order to make an informed decision about which water heater type to use for an emergency safety shower system.

Hubbell Heaters

Hubbell is a leading manufacturer of water heaters used in a variety of applications including Industrial, Commercial, Food Service, and Offshore/Marine markets. We engineer emergency safety storage type, semi-instantaneous, and instantaneous type design water heaters. For more information on our emergency safety water heaters and other products please visit [http://www.hubbellheaters.com/](http://www.hubbellheaters.com/)

Related models: Model EMV, Model ETX