

Monday, September 6th, 2021

Commercial Gas Fired Water Heaters – The Battle Between Tankless & Storage: Risk and Reward

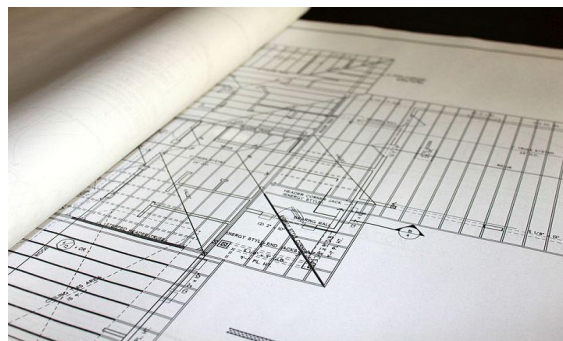
Monday Morning Minutes | by Norm Hall, September 6th, 2021

Gas fired tankless and tank storage water heaters are choices for the consulting engineer in commercial and institutional buildings. There are many marketing pieces supporting both choices. Today, we look at the risks and rewards for these choices.



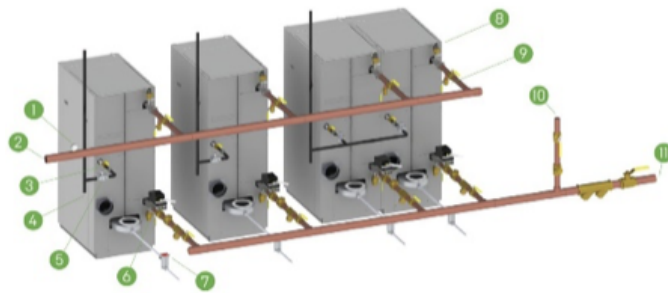
The Additional Pre-Construction Battles

The engineer is faced with the analysis of efficiency or cost of operation vs. first cost while choosing between the two technologies. We offered some information about this in our last R. L. Deppmann Monday Morning Minutes [Commercial Gas Fired Water Heaters – The Battle of Efficiency Between Tankless & Storage.](#)



There are other considerations. A tankless water heater may take up less space in the mechanical room. If it is wall hung, it takes up less space. If it is floor mounted, it may be less space than a tank type water heater or not. It depends on the model. For example, two PVI Conquest 130 water heaters need zero clearance between them. Tankless competitor “1” requires a couple of feet

between units. Storage wins. Two Aerco Innovation tankless water heaters may be installed with no space between them. PVI Tank type and Aerco tankless type tie in the space battle.



The same series of parallel tankless heaters may add more cost for installation. Some manufacturers do not header the vents at the factory. That means lower cost for the heater but increased cost in the field installation. There may also be significant limits to the length of the vent in these multi-unit water heaters. The engineer should review the venting requirements to match the installation requirements.

Risk vs. Reward – Capacities



Photo from Evanston Schools

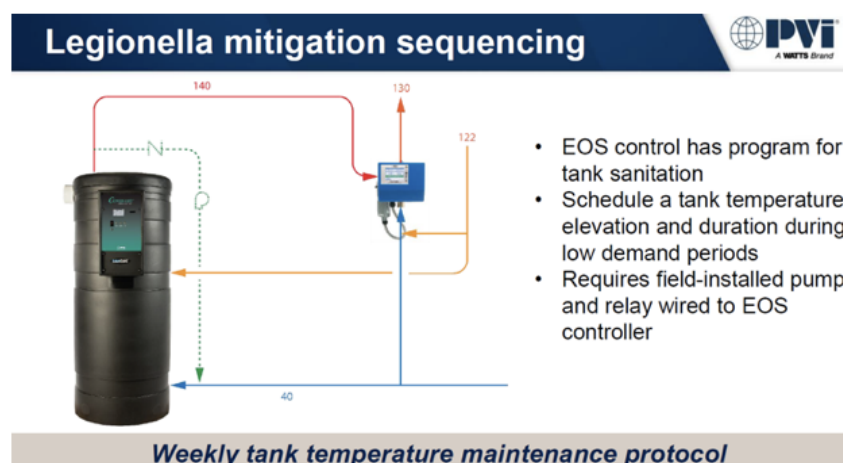
Risk: The client does not know all the discussion going on in these blogs. The client just wants hot water with no complaints.

Tankless water heaters have very little storage. They must react to the demand to provide constant water outlet temperature. There must be enough BTUH capacity whether, for example, the load is a simple 5 GPM domestic hot water recirculation system with no demand or an instantaneous demand of 40 GPM for showers.

The engineer must evaluate the maximum demand and assume the risk. The risk in tankless is the understanding of what the maximum demand will be. Tank storage water heaters may have a safety factor built into the storage. The engineer may choose a bit more storage to handle any unknowns. The tankless would require additional heaters for any “unknowns”.

Risk is limited when the building use is known and understood. Either tankless or tank type is applicable if the building loads are well known and there is little chance for a change in the use by the owner.

Risk vs. Reward – Safety



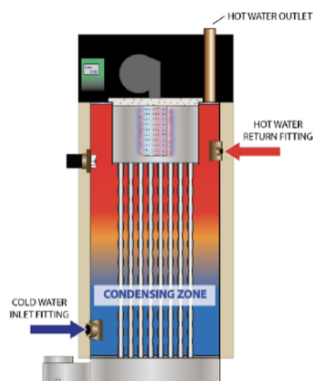
For all the rhetoric about space, efficiency, and cost, many engineers look at tankless water heaters as a step towards reducing the risk of Legionella in hot water plumbing systems.

The Aerco Innovation tankless water heater is designed for commercial applications and has several sizes for selection. Many projects have used this product where legionella is a concern.

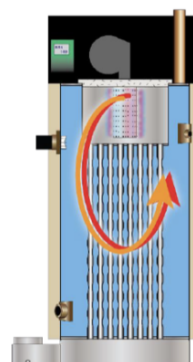
The engineer can also avoid the risk of legionella problems with a properly selected and sized tank type water heater. The first step is proper sizing of the storage. The days of putting 5000 gallons of storage with a 400,000 BTUH recovery are few and far between. Selecting the right storage capacity to avoid stagnant tanks is critical.

Another challenge is the storage temperature. ASHRAE/NSF Standard 514 is studying this and we await the recommendations. Meanwhile, most codes require storage of water at 140°F or more.

The PVI Conquest engineers their water heaters to assist in maintaining high temperatures while reducing the chances of stagnation. The dedicated HWR and tank circulator are two of these benefits.



Dedicated Building Return Fitting
Maintains a Cold Zone



Tank Circulator
Maintains 60% of Vessel at Temp

PVI also has a legionella mitigation system for those clients with proactive processes for safety.

I must also state that the risk of legionella has much to do with the design of the plumbing system to avoid dead legs and keep water moving using a domestic water recirculation system.

Risk vs. Reward – Comfort

We are all very busy. Although work from home can be nice and is certainly safer, it also adds some inefficiencies that do not exist in an office environment. Time is very precious and sometimes; we revert to our comfort zone in design.

You may be used to applying tank type water heaters and that is where you are comfortable. You may not have the time or want to spend the time to analyze a different technology.

You may be more innovative, and your natural tendency is to be an early adopter of new technology. You will not be satisfied with the design unless you examined all available new technologies.

The water heaters will work. The manufacturers represented by us, and competing with us, are strong and reliable. You have the knowledge to decide who wins the war. Rest easy that properly selected and applied, your water heater choice is the winner.

R. L. Deppmann stands ready to help you make a better decision. Please use our expertise.