

## Ditch The Tank

*Jason Fleming*

Go tankless, and never worry about hot water again

A number of things can go wrong in a restaurant that can upset customers. Most are inconveniences that probably will not pose an existential threat to your establishment. What will shut you down completely, however, is a broken water heater.

In a poll, facility managers were asked, "What is the single biggest item at a restaurant that causes you the most concern and can shut you down?" An overwhelming 95 percent responded with "water heater."

Restaurants need hot water in massive amounts to meet all of their cooking, washing and sanitation needs. According to the National Restaurant Association (NRA), quick-service restaurants consume 500 to 1,500 gallons of water daily, while full-service restaurants consume as much as 5,000—most of which is heated. Arguably, a restaurant needs hot water more than any other modern establishment. Indeed, by local ordinance, it cannot exist otherwise.

The threat of a failing water heater is not an empty one. The average lifespan of a commercial unit is between five and seven years due to the routine heavy use and high water temperatures, according to National Hot Water, an on-demand, nationwide water heating service. Furthermore, if you are a facility manager who generally avoids or delays preventive maintenance for financial reasons, the risk of failure increases exponentially. According to U.S. Department of Energy statistics, nearly 60 percent of commercial water heater replacements result from emergency breakdown or poor performance, meaning most managers run their units right up to doomsday.

Even if you practice preventive maintenance, you still face the risk of running out of hot water during periods of heavy use if the unit is improperly sized. Some contractors try to overcome this problem by installing more than one water heater. In that case, your peace of mind comes at the cost of housing two or more space-killing tanks that are always inefficiently running at their maximum BTU capacity.

### The Tankless Solution

If you have not heard of tankless water heaters, they are exactly what their name denotes: a water heater that, instead of heating— and sometimes reheating and reheating—stored water in a tank, uses a high-powered burner to quickly heat incoming cold water to meet demand.

When a hot water valve is turned on, the sensor in the tankless unit detects the water flow, and the burner inside automatically fires. Water flows through the tankless unit's secondary heat exchanger, where it is pre-heated by combustion gases as they escape up the flue. The pre-heated water then enters the primary

heat exchanger, which completes the process of raising the temperature to the desired level. Once activated, the tankless unit provides a continuous stream of hot water until the outlet is turned off.

Tankless units can vent using installer-friendly PVC piping, rather than category III stainless steel, because the pre-heating process cools combustion gases enough to be handled by PVC. In warmer climates, the tankless unit can be installed outdoors, eliminating the need for venting entirely.

A sufficient supply of hot water at the correct temperature for as long as needed sounds like the perfect solution for a restaurant. So, why has this technology not become more mainstream?

Traditional tank-type water heaters have dominated the market for so long that many consumers—and restaurant operators—are hesitant to switch. Despite this reality, tankless has been gaining ground. Widely available in North America since the early 2000s, tankless controls a growing share of the total water heating market and continues to outpace the annual growth of traditional tanks, as reported by the Air-Conditioning, Heating and Refrigeration Institute (AHRI). Especially important is the fact that tankless meets all plumbing code requirements nationwide.

Even as the tankless market grows, however, it must contend with several misconceptions and inferiority myths. Visually, tanktype water heaters are more reassuring with their size—since they are often accompanied by an additional storage tank—than their far-smaller tankless counterparts. It is difficult for many to believe that a medicine-cabinet-sized unit can produce unlimited hot water. Additionally, many balk at the higher up-front costs associated with tankless and opt for technology that they are more comfortable with.

With these myths aside, it is time to set the record straight about tankless water heaters, especially in high-demand commercial environments that cannot afford any interruption in service. As a restaurant owner or facility manager, you are doubtless looking for three main features when choosing a water heater: immediate access to sufficient supplies of hot water, equipment reliability and costeffective operation. Tankless provides all three.

### Unlimited and Immediate Hot Water

Your restaurant's water heater doesn't have to fail completely in order to cause serious problems. If it was improperly sized during installation, the tank may not hold enough hot water to meet demand during those crazy evenings when you are hosting two graduation parties and a wedding reception. Even when a water heater is properly sized, the risk always exists that an abnormally high demand will overwhelm it, meaning no hot water and no business.

Once a properly sized tankless unit turns on, it will continue providing sufficient amounts of hot water for as long as needed. Furthermore, there is no need to worry about the infamous "cold water sandwich," because all of the water will be heated as it passes through the unit's heat exchanger.

A hot-water recirculation system used in conjunction with an aquastat and timer can maximize energy savings. The timer will ensure that instant hot water is available in

the piping at peak times, and the aquastat will add even greater efficiency by overriding the timer if the pipe water is sufficiently hot. This eliminates the need for the system to run constantly. Hot water when it is needed for as long as it is needed—that's the tankless promise.

## Reliability

Tankless water heaters last longer than tank-types, even in taxing commercial environments. They can handle up to 12 years of heavy commercial use. Unlike tank-types, they do not need to run 24 hours per day to have hot water available. Instead, they run only when needed, meaning less wear and tear on a daily basis.

When tankless water heaters do give out, it is typically because their heat exchangers have failed. Oftentimes, you can simply replace the heat exchangers instead of having to purchase a brand new unit, extending the lifespan even further.

Facility managers can combine their tankless units to maximize efficiency. An engineered rack system connects one to six units with isolation valves, system and pump controllers, surge protectors, and even recirculation pumps and expansion tanks as needed. This allows for total BTU capacity to be split among multiple water heaters that have modulating burners, enabling the minimum amount of energy to be used to handle a particular demand.

For example, if a single faucet is turned on, only one tankless unit will fire, using the minimum necessary amount of its potential BTUs. In contrast, a conventional water heater without a modulating burner will immediately ramp up its full BTU capacity to deliver hot water to that one hand sink. Tankless units' ability to load-match ensures efficient operation and energy savings.

Combining multiple units also has the obvious benefit of peace of mind through redundancy. If you have only one unit and it fails, you may have to pay an exorbitant overnight repair or replacement fee just to stay in business. With multiple units, if one fails, it is still possible to operate until a replacement arrives.

## Cost Effectiveness

At the end of the day, cost is likely among your most important considerations when investing in a water heater. Up front, tankless water heaters cost more than tank-types due to their more powerful technology, but the savings gained over time will compensate for these costs, especially in a commercial setting:

- In a restaurant, tankless units run frequently during peak business hours and then cease almost completely until the next day. On-demand hot water usually translates into significant monthly energy savings over a tank-type heater, which would operate continuously.
- Tank-type water heaters are often oversized in anticipation of an overwhelming demand for hot water that may never materialize. But designers figure, "Better safe than sorry," specifying a much larger and therefore more costly unit than is actually needed. This jumbo-sized heater wastes far more energy and money than a properly sized tankless unit. This tendency to oversize is why the tank-versus-tankless cost difference is not as big as is often presumed.

- A tankless unit's longer life means more time between replacements. It is possible that you may go through two tank-type water heaters in the time it takes one tankless unit to fail. That in itself may justify the extra up-front cost to install a tankless water heater.

For restaurant owners and facility managers, tankless water heaters can be a business-saver, providing proper amounts of hot water to satisfy daily demand. When hooked together in a rack system, these units efficiently deliver the minimum amount of energy needed to meet the particular load, further saving energy.

### Tankless Maintenance

As with any appliance, preventive maintenance is strongly recommended with a tankless water heater, especially in a commercial setting. It is important to flush and descale your tankless water heater(s) on a regular basis, as frequently as every six months, depending on usage and water hardness. The high water temperatures required in a restaurant may result in quicker scale buildup. Tankless units are still more resistant to scale buildup than tank-type units would be under similar conditions, as an absence of stored water helps prevent sediments from settling.

It is also advised to filter incoming water in order to maximize quality and reduce the toll on the tankless system. This recommendation is not unique to tankless, however, as a tank-type water heater is prone to even worse damage from poorly treated water.

One additional cost factor to consider is the gas-line requirement for tankless water heaters, which may be larger because of the high water temperatures needed. Ensure that you supply the proper amount of gas by increasing the pipe diameter or water meter size, if necessary. For those concerned with the financial burden this may create, tankless units' efficient operation and long life should yield savings that will more than compensate for the higher up-front purchase and installation costs.

Meanwhile, the peace of mind gained from knowing enough hot water will always be there when needed, even when your facility is running at peak demand, is priceless.

Jason Fleming serves as Marketing and Customer Care Manager at Noritz America in Fountain Valley, Calif. He can be reached at [jfleming@noritz.com](mailto:jfleming@noritz.com)