



What Owners Need to Know About ...

# Tankless Water Heaters

*Cost, space, and safety benefits of tankless solutions*

By **KUNAL SHAH**  
**AERCO International Inc.**  
**Blauvelt, N.Y.**

For the new generation of mechanical rooms, lower operating costs, greater reliability, and environmental-friendliness are the name of the game. This is leading consulting-specifying engineers, architects, and facility owners and managers to leave no stone unturned in their search for the best possible return on investment (ROI). Considering water-heating systems typically are second only to HVAC systems in terms of energy consumption, even small gains in efficiency and cuts in operating expenses related to water heating can have a large impact on a facility's bottom line. For this reason, tankless water-heating systems are gaining traction.

Tankless water-heating systems offer a number of advantages over their tanked counterparts. For example, stored water in a tanked water-heating system

must be maintained at 140°F to prevent *Legionella* bacteria. Further, a tanked system requires a mixing valve to prevent scalding from the 140°F stored water. These are two factors that contribute to the higher operating costs and lower efficiency of tanked systems compared with tankless alternatives. Additionally, facility space has never been at a higher premium, and the more compact footprint of a tankless water heater reduces the square footage of a mechanical room.

## Tankless Design

Not all tankless water-heating solutions are alike. Factors to consider when selecting a water-heating solution include heat exchanger and material of construction.

Some tankless heaters feature a durable, highly efficient helical firetube heat exchanger that is impervious to thermal stress, providing greater reliability and extended life. All-stainless-steel construction

*Kunal Shah is a product solutions manager, water heaters, for AERCO International Inc., a Watts Water Technologies company. He has a bachelor's degree in computer engineering from Drexel University and a master-of-business-administration degree from Binghamton University, State University of New York.*



PHOTOS A and B. A mechanical room before (left) and after (right) tanked systems were replaced with tankless systems.

provides similar benefits. A water-heating solution that has corrugated tubes will have a greater effective heat-transfer surface area for thermal efficiencies as high as 99 percent. High turndowns of up to 30:1 complement the thermal efficiencies to reduce cycling and eliminate fuel waste, maximizing savings. Enhanced waterside flow distribution maintains constant minimum velocities across the heat exchanger; this keeps solids in suspension and greatly reduces scale dropout to maintain high-efficiency performance and long life.

A key specification when evaluating tankless water heaters is temperature control. A swing of 10°F to 15°F is unacceptable in most applications. Fortunately, a new generation of tankless units uses advanced algorithms to achieve extremely tight temperature control of  $\pm 4^\circ\text{F}$ . This allows the tankless water heater to provide a higher level of safety.

Today's tankless water-heating systems also leverage advanced communications technologies. These tools constantly check a system and immediately send alerts if there is a fault occurrence or decline in equipment performance. This reduces energy waste, increases productivity and efficiency, and prevents lost revenue caused by unexpected downtime.

### Benefits

Tankless water heaters help engineers, architects, and facility owners achieve the best possible ROI by lowering costs, maximizing space, providing a safe environment, and lasting much longer.

**Economic advantages.** Tankless water heaters lower operating costs with high efficiency (typically, 96 to 99 percent) and high turndown. With no hot-water storage, heat-radiation loss is less than one-quarter that of a tank-type water-heating system. Additionally, ancillary equipment, such as storage tanks, circulators, and mixing valves, is eliminated. This lowers installation and maintenance costs considerably.

**Space savings.** A tankless-water-heater solution requires one-quarter the square footage of a comparable tank-type system, resulting in more room that can be used to generate income instead of storing water. Photos A and B show a mechanical room before and after tanked systems were replaced with tankless systems.

**Safety.** Spikes in hot-water temperature can cause burns, especially among children and seniors. A tankless water heater can maintain water temperature at a safe level of less than 120°F to reduce the risk of scalding, while eliminating the need for costly system mixing valves. Because water volume is minimal and

circulation is continuous, a tankless design virtually eliminates the risk of *Legionella* bacteria growth as well.

**Life cycle.** With a life of 20-plus years, tankless water heaters last two to three times longer than tank-type heaters, which typically need to be replaced every eight to 10 years. Glass-lined storage tanks have even shorter service lives of three to five years and are prone to rust and failure when potable-water chemistry is less than ideal. Tankless water heaters with advanced condensing and modulating technology, along with a stainless-steel helical firetube heat exchanger, provide a highly reliable solution.

Tankless water heaters can be designed with onboard multiunit sequencing logic for efficient daisy-chaining to meet load requirements. This minimizes cycles per unit to extend the life of the heaters, while significantly reducing service and maintenance costs and maximizing system efficiency and turndown.

### Versatility

Virtually any facility in need of hot water can realize the benefits of tankless water heaters.

**Hospitality.** A tankless design that allows outlet temperatures to be set to 120°F without the risk of *Legionella* bacteria, as well as tight temperature control, will lower

operating costs and reduce the risk of guests being scalded. When this level of performance is paired with a proactive remote monitoring tool that prevents unexpected downtime, guests always will have hot water.

**Health care.** Hospitals, medical centers, and other health-care facilities must have continuous hot-water service. When selecting a tankless water heater, facility owners and managers do not have to be concerned with Legionnaires' disease or patients being scalded. Additionally, they avoid the cost associated with purchasing mixing valves, which are necessary for a

tanked system to provide similar assurances.

**Education.** For campus environments, engineers should select the tankless design with the highest possible turndown. This will allow the water heater to meet the low flow and peak demands commonly found in dormitories, which will lower operating costs.

**Multifamily.** Nowhere is mechanical-room space more critical than in a multifamily building. Use of a tankless water heater frees up space that can be used to generate revenue (e.g., an additional apartment and/or parking

spot). This is particularly important in a city or metropolitan area, where space is at a premium and real estate is expensive.

### Conclusion

From providing safe, non-scalding hot water instantaneously without the need for a storage tank to maximizing space with a reliable system built to last two to three times longer than tanked systems, tankless water heaters are the most advanced hot-water solution available and provide the greatest ROI.

Copyright © 2016 by Penton Media, Inc.

For more information on use of this content, contact Wright's Media at 877-652-5295.



# We've brought an end to the cold war.

If you're still using a tank to heat water, it's time to join AERCO's tankless revolution.

With Innovation's tankless design, you can say goodbye to storage tanks and standing water that has to be heated up and then mixed down.

AERCO Innovation water heaters – your best ally in the battle against inefficiency.



**AERCO**<sup>®</sup>  
A Watts Water Technologies Company

AERCO International Inc.  
800.526.0288 ■ [aerco.com](http://aerco.com)