

HOT WATER HEAVEN

by

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In the real world, it's difficult to be idealistic about hot water systems. If you take wonderful ideas about what could be and try to run with them, you'll be stopped point blank by the hard brick wall of reality. Hot water system improvements are shot down by compromises in cost, quality, expectation, and education. Egos get in the way, too. But sometimes we daydream about how good a hot water system could be if these obstacles were eliminated....

The Ideal Water Heater

Without question, the ideal water heater would be very safe. It would be supremely energy efficient and would easily last as long as the building it was installed in. The cost would be reasonable, and the system would be a pleasure to live with.

Impossible? No. But you're not going to get such a system installed by a plumber who isn't well educated and interested in hot water work. The plumbing industry is sorely challenged by the need to properly train the work force, both in things technical and in business basics and management. Customers will often resort to a relatively unskilled (and often unsafe) but cheaper handyman when the alternative is a high-priced, insufficiently-skilled plumber.

Superior Safety

It has to be at the top of the list. Two neglected areas of water heater safety are educated installation and informed upkeep/maintenance. Also, safety is a byproduct of water heating systems kept simple. Because they're less confusing, owners are less likely to do something which would make the system overheat, blow up, or be otherwise unsafe. Safe heaters would incorporate functional temperature and pressure relief valves with proper drain lines, drain pans with properly plumbed exits, and earthquake straps where needed. And we dream of old-fashioned heater controls which could actually be set to a temperature instead of relying on subjective terms like "warm" or "hot."

Efficiency: Keeping The Heat In

The past beckons. In 1906 condensing water heaters claimed 92% efficiency. These were point-of-use heaters with no waiting for hot water and no distribution losses. Unfortunately, these bath heaters were not particularly safe. Much safer and still very efficient are the old "U" tube heaters. These gas-fired tank heaters had a flue that went up, almost to the top, then turned about face and headed down again, exiting the tank near the bottom. This doubled the heat exchanger area of the flue and, even better, stopped much of the standby loss gas heaters suffer from. We dream that modern hot water engineers will look at old designs like these and incorporate the good ideas from the past into today's heaters.

Looking beyond the heater itself, we'd like to see metal distribution piping become a relic of the inefficient past. It steals BTU's from the hot water and holds too many gallons. Instead, we envision manifold systems that use 3/8" PEX tubing becoming the norm. This method provides quick hot water delivery, has much less waste water, and is installed more like wiring than rigid pipe, making retrofit much easier.

Though efficiency can be had with devices that use electronics, pumps, and various other active items, such things dilute our goal of long term reliability. Simplify. For example, when you can cut standby heat loss from an electric water heater with either a time clock or heavy insulation, opt for the latter because it isn't going to require maintenance or repair.

Currently there are rating systems for energy performance in new construction; let's do the same thing for hot water systems. Ratings could be based on total energy use per person, waiting time, etc. Desire for top ratings might motivate plumbers to do better than just meet code.

Efficiency: Recovering Lost Heat

In an effort to keep heat from being lost, folks have paid a lot of attention to combustion efficiency and

insulation--and then let all that heat go down the drain! Drain line heat exchangers recapture those fleeing BTU's. Using these devices makes more and more sense as actual costs, both monetary and environmental, are discovered.

Efficiency: Taking The Damper Off The Damper

We've been watching the development of a non-electric flue damper for several years. It is a simple and inexpensive device that fits under the draft hood and cuts standby losses about thirty percent. Installing such dampers on the millions of gas heaters out there could result in huge savings. However, the long and winding process of getting approvals, combined with egos and territorialism, have conspired to keep the device off the market. Wouldn't it be nice if more regulators and industry representatives were able to look at the common good rather than their own turf? Perhaps as energy and clean water grow ever more expensive, turf wars will be re-evaluated.

A Sediment-Handling Heater

Sediment is a problem in many modern heaters that affects safety, energy efficiency, longevity, cost, and leads to a definite lack of pleasure. One type of heater that could avoid most sediment problems is the "external flue" heater. This heater from the past had a narrow flue wrapping completely around the tank instead of the central flue common in modern heaters. Aside from increased surface area for better heat transfer, this heater allowed the lower tank head to be domed down. Great idea. Sediment would collect at the low point in the center and be easily removed by opening a drain valve attached there. With modern insulation, external flue heaters would have much lower standby losses, making them very attractive.

The Luxury Of Longevity

Have you heard of Monel? It's a mix of copper and nickel that lasts nearly indefinitely. It's used today on high-end boat fittings. But from the 1930's to the 1950's you could get water heaters made of Monel. Copper tanks were made, too. Both metals provided homeowners a tank that seldom, if ever, needed replacing. These long-lived tanks are now just a memory, no longer available. Manufacturers and consumers are caught in a trap where low cost is the prime goal, and quality takes a back seat. Roughly 85% of the nine million or so water heaters made yearly are sold as replacements, and planned obsolescence has become an accepted way of life. Yet we have many clients who long for a quality heater--and would gladly pay for it. In our dream, manufacturers would compete to produce the highest quality heater, just as their predecessors did, instead of competing to make the cheapest heater.

For some mysterious reason, while high-quality, long lived commercial T&P relief valves are made, comparable residential valves are not to be found. Commercial valves rarely fail; residential ones routinely do. Our dream heater deserves a quality residential T&P that will provide numerous years of trouble-free operation.

Price vs Cost

The cost of the hot water system needs to be put in perspective. Manufacturers and plumbers both compete on price, but how cost-effective is the cheapest product if it has a shorter service life and less reliability? Ideally, end users would be educated in the hows and whys of life-cycle costing, where all costs over time are taken into account. This is the only way you'll be able to know what's really a good deal. We'd love to see government and other institutions set a good example and help to retrain the home-owning public. Re-building desire and demand for quality, long-lived equipment would help make such equipment more readily available.

What Makes A Heater A Pleasure To Live With?

All of the above features contribute. If you put one of those dampers we mentioned on an external flue heater, you'll have one simple and high performance water heater! Keeping the design simple avoids complications. If really good quality heaters were available once again, you'd likely not suffer the worry and inconvenience of heater failure. Premature heater failure, as well as annoying noises and clogged aerators, can also be avoided with a heater that makes sediment control easy. A well-designed system can be efficient, ecologically sound, and cost effective. It delivers hot water where and when it's needed without waste.

The necessary technology already exists. Together we have the talent and muscle necessary to make dreams of safe, efficient, and easy-to-live-with systems a reality. The only thing lacking is consensus of all the players.