



WHAT GOES AROUND, COMES AROUND

It occurred to me recently that with the exception of large, custom homes, domestic hot water recirculation (DHWR) systems are not commonly installed in new houses. In addition, many of the systems in these custom home installations are the result of regulation.

British Columbia's Plumbing Code requires that any fixture more than 30 metres (100 feet) away from the hot water tank or source must be serviced with a DHWR system. This is in keeping with the design guidelines of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the American Society of Plumbing Engineers (ASPE).

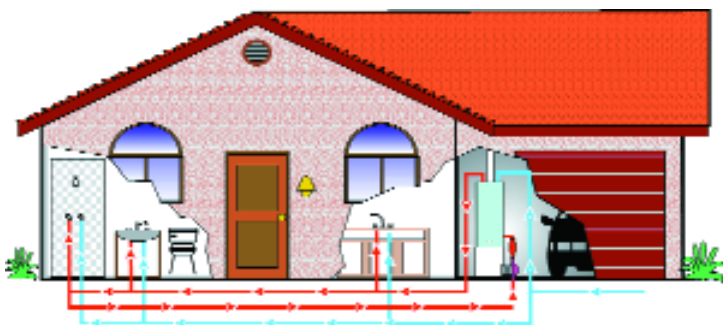
small number of new homes built in Vancouver would have a recirculation system," he stated.

I decided to take my quest a little further and do some field research. I found 10 volunteers and asked them to conduct a simple evaluation of their own hot water availability. The object was to time how long it took for usable (full temperature) hot water to reach the lavatory

were completely random in nature. The results are shown in *Figure 1*.

FIGURE 1

- Shortest draw time to lavatory
 - 7 seconds
- Longest draw time to lavatory
 - 146 seconds
- Shortest draw time to kitchen
 - 7 seconds
- Longest draw time to kitchen
 - 107 seconds
- Average of all draw times
 - 32 seconds



Hot water recirculation systems use a pump and hot water return line to circulate water through a home's hot water heater so hot water is available immediately upon opening the tap.

RESIDENTIAL CONSTRUCTION

Given that most of us don't live in such grand abodes, I conducted an impromptu survey of people within my socioeconomic sphere. The result was that, with one exception that was a retrofit, I did not find anyone who had a DHWR system installed in his or her home.

Wondering if this was unusual, I asked Gordon Jensen, trades inspections supervisor in the City of Coquitlam and David Pope, acting chief plumbing and gas inspector in the City of Vancouver. "I would say maybe one per cent of new home installations in Coquitlam would have a recirculation system," said Jensen. Pope offered a similar insight. "A very

faucet in their busiest bathroom, as well as the faucet in their kitchen. We'll call the time they waited the draw time. They were asked to do this at a time when the test fixture had not been used for at least one hour.

The test sample included single family detached homes as well as townhouses. Each home was serviced by its own hot water tank and none of the homes had a recirculation system installed as part of the hot water supply system. It seemed that the information would be most meaningful if the nature of the piping grid, proximity of the fixture to source, the type of homes included in the sample, and piping materials represented

APPLIANCE PERFORMANCE

Aside from eliminating the inconvenience of waiting 146 seconds for hot water, why would we want a DHWR system? Most automatic dishwashers require 140F water in order to clean the dishes satisfactorily. While fill times vary by manufacturer, it is safe to say that even if the draw time was 32 seconds (representing our average), the machine would have completed a substantial portion of its fill cycle before receiving full temperature hot water. Automatic clothes washers operate in a similar fashion, so for clothes that need to be washed in hot water, the problem is exactly the same. The washing machine will fill with cool water as the draw time elapses and may never fill with hot water to the temperature required.

ELIMINATE WASTE

Energy conservation is another factor. The past year has seen energy prices rise sharply in most markets. Considering that all of the water wasted during the draw time would have been heated to full temperature before cooling in the distribution piping, this constitutes significant waste. If the recirculation system

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is designed to operate only during peak use periods, it will consume little power and significantly reduce the energy waste associated with excessive draw times.

For anyone on a private water system, excessive draw times can be a serious issue as is shown in *Figure 2*. Recovery times for private water systems are not always

already calculated his draw times and recalled them instantly.

According to Austen, he had been “frustrated by the time, energy and water wasted waiting for hot water in the kitchen and ensuite bathroom.” His house was completely finished and while he had no desire to attempt an expensive

“If the recirculation system is designed only to operate during peak use periods, it will consume little power and significantly reduce the energy waste associated with excessive draw times.”

ideal, so wasting water can exacerbate dry season shortages. For homeowners who rely on septic fields, too much water can prematurely saturate the field. Peter Austen is the president of MPH Supply and his home is serviced with both a private water system and a septic system. He was one of the 10 people I canvassed for draw times, and strangely enough he had

re-pipe, he needed to do something. After doing some research, Austen opted for an aftermarket “retro-fit” system.

This product automatically recirculates water from the hot supply through the cold supply to drastically reduce the draw times. Did this work? Austen was quick to point out that after the retrofit, “The draw time dropped from 107 seconds to

FIGURE 2

Amount of heated water wasted* during longest draw period = 20.19 litres

Total amount of heated water wasted* during total of all draw times = 88.67 litres

If we annualize these results based on two use periods per household per day, a total of 64,730 litres of heated water would have been wasted.

(*Assumes a CSA approved fitting with a flow-restricted aerator that allows a maximum flow of 8.3 litres per minute)

six seconds in the kitchen where the recirculation system was installed, and from 146 seconds to 32 seconds in the ensuite bath which is just downstream of the kitchen.” Based on information provided in the manufacturer’s literature, his retrofit system will cost only pennies a day to operate, have a relatively short payback and conserve many thousands of gallons of water that might otherwise tax his water and septic systems.

PIPING CONSIDERATIONS

What do you need to consider if you want to install a DHWR system in your next job? Some piping methods lend themselves more readily to recirculation, those being the standard or branch-tee method and the combination or remote methods. Using either of these methods, you can easily integrate recirculation into the piping grid. A home piped using the true manifold or home-run method will prove much more difficult a proposition. This is because all of the hot water piping run-

ning supply to a given fixture must be made redundant in order to provide a return to source. Further, an extra manifold or at least a much larger manifold will be required to receive this return piping.

Ron Bisson of Advanced Plumbing works throughout Southern Alberta. He installs recirculation systems in virtually all the new homes he works on. “The cost of a system is only a few hundred dollars, which is usually less than three percent of the cost on most of the jobs we do,” said Bisson. Even if the customer does not specifically ask for a recirculation system, he will often install the recirculation piping anyway. The expectation is that the customer will call his company back after they have been in their home for a while. “It costs me very little to anticipate this need and we can go back, install a pump and complete the installation very quickly if we rough it in at the outset,” he explained.

So, this takes us back to the original question. With the benefits being so

obvious, why aren’t DHWR systems a given in all new homes? Rather than being content to fix the problem after the fact when costs are higher, some contractors have recognized that incorporating DHWR systems in the initial installation can be a profitable add-on – one that many homebuyers are willing to pay for if it is offered to them as an option.

■ *Mark Evans is a 20-year veteran of the Plumbing and Heating industry, with both sales and management experience in the wholesale distribution, rep agency and manufacturing sectors. He can be reached at writemarkevans@hotmail.com.*

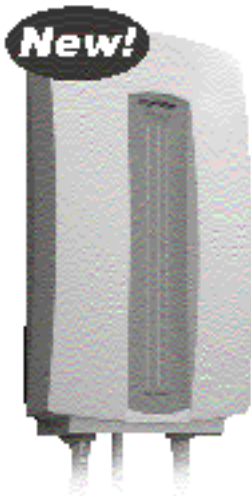
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