Adventures in Reverse Osmosis

Being prepared for all customer questions can help close a sale

By John Vastyan

Let's say you are at a home improvement show—or even in a homeowner's kitchen—and your prospective customers begin asking questions. Your familiarity with residential plumbing and water quality, through years of training and field expertise, has prepared you well to be in "selling mode."

But what if these folks are already in your camp, predisposed to purchasing the systems you recommend? To "nail" the deal, though, they get chatty, eager to see how fluent you are in a slightly off-track conversation.

To keep things simple, let's call the homeowners Ozzie and Harriet. They are smart and savvy. Ozzie is tall, in his early 40s and in his financial prime, so you smile at his bow tie but know better than to make fun of it. Harriet is a few years younger.

They explain that they just bought a "dandy, exotic fixer-upper that's ready to be modernized."

Ozzie adjusts his bow tie smartly and says: "We've been doing research on the Internet lately. Do you think there's any connection between freshwater shortages worldwide and the upswing of interest in reverse osmosis (RO)?"

One of the best-known methods of cleaning water—even saltwater—is the RO filtration process.

Harriet jumps in with another brain-twister: "I hear California's got the biggest RO system in the world. Is that so?"

But before you can begin to formulate an approach to their questions, they say, "Oh, and we hear a hot water recirculation system can save our family of four about 12,000 gal of water each year." In unison they blurt out, "Can you guarantee that?"

RO & Water Supply

One of the key global concerns right now is freshwater shortages. This is odd to contemplate if you have vacationed at the seashore recently or live near the ocean; after all, almost three-quarters of the Earth's surface is covered with water.

Unfortunately, most of it is saltwater. One of the best-known methods of cleaning water—even saltwater—is the RO filtration process. RO works well for desalination. And yes, California has the mother of all RO systems in the making. We will return to that.

First, let's get some answers about modern water treatment systems.

"What most of us in the industry know, but few

consumers realize, is that sink-top or under-sink carbon filtration units will remove only a small portion of the incoming contaminants from tap water," said Paul Ethier, national sales manager, Canada, for Watts Water Technologies. He recommends using either a steam distillation or RO system to produce high-quality water in the home. "Both systems do an admirable, thorough job," he explained. "Each has its best application, but the better, more diverse and convenient method, in my opinion, is RO."

But let's say that one of our customers—Harriet, this time—veers in another direction: "In real simple language," she implores, "how does RO work?"

Drop the Jargon

Many of us in the water treatment industry can quickly jump into a comfort zone talking about "dissolved inorganic solids being removed from a solution forced through a semi-permeable membrane." Understanding how RO works is important for those in the trade. But can you explain the process in simple terms?

"Reverse osmosis filtration is a very efficient method to clean water. It effectively separates wastes from the water through a tough, semi-porous filter. The membrane, or filter, is semi-permeable [because] it does not allow all particles to pass through it," said Bob Matthews, U.S. national sales manager of water treatment systems for Watts Water Technologies. "The RO membrane allows only water to pass from one area to another while screening out impurities. The movement of the water molecules from one area to another through the membrane is made possible by water pressure."

When feedwater reaches the membrane, it passes through, while contaminants like chemicals, bacteria and impurities are excluded and trapped. The purified water moves into a collecting basin or tank while impurities are drained off.

It is important to note that the success rate of RO varies depending on water temperature, the amount of impurities and other factors. Advantages of using RO filtration for water purification purposes include the following:

- It is efficient;
- Its success is supported by many research studies; and
- It removes contaminants with a high rate of success.

In addition to these benefits, RO technology is poised to help with the worldwide problem of freshwater shortages.

Water Reuse on the Rise

"I just spoke with a customer in Toronto who installed a zero-waste retrofit kit, fitting it to an RO system for his home," Ethier said. "He's storing the reject, or rinse line, water in a separate tank for plant irrigation. Now that's smart."

RO systems have an array of applications, from residential under-sink models, like the one pictured here, to municipal desalination plants.

Ethier is referring to technology from Watts: two systems that reclaim reject water from an RO system. A zero-waste RO system channels the reject water into the hot water stream, allowing it to be used when hot water taps are activated. The company also devised and made available retrofit kits that can be used for any residential RO system; these do the same thing, though in the case of one savvy, water-conscious homeowner, reject water is used for an especially green purpose.

"Perhaps it's worth mentioning that for homeowners in water-starved regions, finding innovative ways of reusing water is not just the responsible thing to do, it's becoming a necessity," Matthews said.

He added that water reuse is becoming more important on a global scale. "We have to get a lot closer to and more

Installation of a hot water recirculation system helped homeowner Kim Ireland save water.

comfortable with greywater," he said. "Commercially, car washes and carpet cleaning businesses have incorporated water reuse smartly. It's time to broaden its use here in the U.S. There's a lot that could be done in [the] residential and light commercial markets.

"We really should save and use greywater to flush toilets, wash house siding or water plants," Matthews added. "In addition to greywater reuse, another avenue for water conservation is rainwater harvesting."

Another Thirst Quencher

Another water conservation option is the installation of hot water recirculation systems in homes and businesses.

In Texas, and throughout the Southeast and Southwest, concerns about the availability of freshwater are taking on a new sense of urgency. Kim Ireland, a homeowner in Austin, Texas, wrote to legislators and water utility managers about the practical impact individuals can have.

"I became very concerned when I learned how depleted our aquifers have become, and can see shriveled reservoirs that contain a fraction of the water they did just a few years ago," Ireland said. "To think that my children could grow up in a parched environment right here in the U.S., and without attempting to improve conditions before they get worse, isn't possible.

"When I learned firsthand about the effectiveness of hot water recirculation, I began telling others about it," she continued. "I spoke about the technology at various meetings and wrote lots of letters. Think of it: When simple, inexpensive technology can save 12,000 gal of water a year for an average household of four, there's good reason to champion the cause."

The Ireland family moved from California to Texas a few years ago. With three young girls to raise, the Irelands knew that they would be using plenty of water. The home they purchased did not have a recirculation system, but Ireland had learned enough to know that it was something that would help them conserve water. "After all, as we waited several minutes for hot water at sinks and showers, perfectly clean water was wasted. We pay for every ounce of it, and then [pay] to dispose of it as well," she said.

Ireland's search for a solution took her to Bob Lemons, owner of Austin-based Mr. Tankless. With Lemons, she explored hot water recirculation solutions. He recommended TacoGenie, as it can be retrofitted to existing plumbing, eliminating the need for a new hot water return pipe.

The device is a silent pump that attaches to the hot and cold water lines in the cabinet under the most remote kitchen or bath fixture in the home. When the pump is activated, the cool water that normally escapes down the drain is recirculated back to the water heater through the cold water line.

About That Big RO Plant in California ...

Harriet was right. When completed in 2016, the $1 billion Carlsbad Desalination Plant in Carlsbad, Calif., will be the largest desalination plant in the Western Hemisphere and will produce 50 million gal per day through RO filtration.

Work crews there are building what promoters say represents California's best hope for a drought-proof water supply.

As the state moves though its fourth year of drought conditions, 15 desalination projects are proposed along the coast, from Los Angeles to San Francisco. The hope is that California, like Israel and Saudi Arabia, can finally turn to the ocean to quench its thirst.

Clearly, Ozzie and Harriet have come a long way. Yet new challenges continue to arise. Among them are water shortages. It is good to know that there are technologies designed specifically to help with these issues, but it is up to us to put them to use. **WQP**

John Vastyan, owner of Common Ground, is a journalist whose work focuses on the plumbing and mechanical, HVAC, geothermal and radiant heat industries. Vastyan can be reached at cground@ptd.net or 717.664.0535.