

# CASE STUDY

## MAJOR RENOVATION REVEALS HORROR OF A BADLY FAILED COPPER PLUMBING SYSTEM FOR BOSTON-AREA HOMEOWNER

**D'Angelo Plumbing Co.**  
Everett, MA  
Established: 1994

Gene Willette of Sudbury, Massachusetts, is like many other homeowners who want to settle in a convenient suburban Boston neighborhood. He and his family fell in love with a property and location, despite the fact that the existing dwelling was too small and outdated for their needs. Given the high cost and scarcity of prime real estate, it was a natural assumption that the current home could be remodeled and expanded without too much difficulty.

In Willette's case, however, "renovation" might be construed as somewhat of an understatement as he made plans to convert his 1,500-square-foot, split-level home (which he purchased in the fall of 2003) into a 4,500-square-foot, three-story home, complete with four bedrooms, three bathrooms, a game room, family room, wine cellar and two-car garage. All that was required for this massive transition was to rip off the roof and remove the entire back of the house, along with the existing one-car garage.

And one more thing—completely repipe the home's copper plumbing system! That's because a closeup view of the copper pipe behind the walls revealed that the system was failing beyond repair.

"To look at this pipe you would think the house had been plumbed with spaghetti; that's how bad it looked," said Willette. "It was so pitted and corroded, and you could see all the greenish spots where new leaks were about to develop."

How did Willette's plumber respond to the problem? With a strong recommendation to start over and repipe the entire home.

"He told me it wouldn't make sense to try to repair it, because it would be like applying Band-aids all over the place to offer only a temporary solution before the inevitable disaster occurred."

Although most homeowners in a similar situation would have been horrified to be faced with the additional expense of repiping on top of the already planned remodeling expenses, Willette was not surprised to hear the recommendation to repipe. A licensed contractor, himself, for more than six years, Willette was very familiar with the many pitfalls of copper pipe and its vulnerability to pitting, scaling and corrosion. In his work as Director of Facilities for a large commercial and multi-family real estate service organization, he routinely supervises work in 80+-year-old buildings where copper and brass fittings are wearing out and springing leaks. "I'm in the business so I know more than the average consumer," said Willette. "I see copper lines cut open after only several years of use with all the junk that forms inside them. These are the same pipes from which people are drinking. I'm aware that our wells have high mineral content that does terrible things to copper pipe."

Because of his experience, Willette played a more active role in the repipe work. In fact, it was Willette who even suggested to his plumber the exact type of plumbing pipe that be installed—FlowGuard Gold® CPVC pipe and fittings.

"He was not familiar with the product when I first mentioned it," said Willette of his plumber, George D'Angelo of D'Angelo Plumbing Co. in Everett, Massachusetts. "So the two of us flew to Cleveland and attended classes at FlowGuard Gold University."



BEFORE



AFTER

The University is located inside the headquarters of Lubrizol, the manufacturer of the CPVC compound used in FlowGuard Gold pipe and fittings. Created in the 1990s, FlowGuard Gold University offers a comprehensive, hands-on, two-day training program. While there, participants not only have the chance to actually plumb CPVC pipe and fittings in a real-world environment, but they are able to tour the company's extensive R&D facility to learn how the product is developed, tested and quality controlled. "I was very impressed with what I saw," said Willette. "I knew it was a good product, but it wasn't until I attended the University that I fully appreciated all of the testing that takes place to ensure the product performs in the field over the long term."

D'Angelo, who was initially a somewhat more reluctant participant, also expressed positive feedback about the University

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**Type of Construction:**  
Residential

**Installation Type:**  
New

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experience. "It was quite an extensive program that really helped to make me feel more confident in using the product," he said.

Today, D'Angelo is a strong supporter of the FlowGuard Gold product. "I was skeptical at first; I really didn't think I would like the product. I went along for the job. I never expected to use it again. But, surprisingly, I really like using it. It's so fast and easy. And at the end of the day, I don't feel as fatigued. I can't even begin to compare the speed of installation. Not only is the solvent cement bonding system more convenient, but the product offers more flexibility over copper. With the FlowGuard Gold system, I can position the joists in a straight run. With copper, I might have to cut the pipe into 20 or more pieces."

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For Willette, corrosion is the number one reason to avoid using copper pipe whenever possible. "I've seen corrosive water do bad things to pipes," he noted. The copper corrodes, pinhole leaks form, and the pipe either bursts or you're plagued with a slow leak; either way it's bad," he said. "I knew that the FlowGuard Gold system offered a better solution."

Willette continued, "I also like that CPVC pipe is quieter, so you're less likely to be bothered with the sound of water or banging pipes. And then there's all the sweating to contend with when you have metal pipes. The FlowGuard Gold pipe is self-insulating. So there is less condensation and lower utility bills."

Being in the trades himself, Willette was probably also more conscious of the labor savings than the average homeowner. "I actually supervised the work, so I know how fast it went," he said. "My plumber literally flew through the job. He only needed simple, easy hand tools for the bonding and the cutting. Cleanup was quick. And the pipe offered some degree of flexibility, which was important for this job because we had to drill through floor joists and fish pipe through existing areas."

Removing his tradesman hat and looking at the installation strictly from a concerned homeowner's point of view, Willette discovered two other benefits of using a CPVC alternative – safety and more consistent water quality.

"I've seen fires start and plumbers actually burn down buildings as a result of using a soldering torch while installing copper pipe," Willette said. Since the FlowGuard Gold system is installed via a one-step solvent cement bonding system, there is no need for an open flame on the job site. From a drinking water standpoint, the CPVC option helps to maintain water quality. There are no concerns about metal leaching into the water and compromising the quality of the water. That's an especially important consideration for someone like Willette who has a 16-month-old baby in the house.

In fact, the only negative thing you'll hear Willette say about the FlowGuard Gold system was the product's scarcity in his geographic area. "It was a little difficult to track down the product because not enough supply houses stock it in our area, but it was worth it," Willette said. "I believe the problem is that not enough people out here know about it, and those who do are slow to change old ways. I think education is important. People need to understand they have options. The copper pipe corrosion problem is rampant in Boston, but not everyone understands why. They complain about yellowing clothes and a strong metal taste in the water, but they don't realize they can do something about it."

Willette believes so strongly in the benefits of FlowGuard Gold pipe and fittings for residential applications that he would also like to see the product used in his commercial applications. However, current codes restrict the use of CPVC pipe in applications above six stories in the state of Massachusetts, even though most other states already allow the product in numerous high-rise applications.

"I have worked in commercial real estate management for roughly 16 years," said Willette. "I oversee all the trades. That means I select the materials and stand behind them. I know what's good. And the FlowGuard Gold CPVC system is definitely good. It makes a lot of sense."

As for D'Angelo, he still can't believe his change of attitude. "No one could have been more opposed to using plastic than me," he laughed. "But I will definitely be using it again!"

Since Lubrizol's development of CPVC plumbing systems over 45 years ago, more than four (4) billion feet of CPVC pipe has been installed in homes, condominiums, buildings, apartments and hotels, including OVER twelve (12) million homes. For more information on the FlowGuard Gold® plumbing system, including pipes, valves, joining cement, caulks, sealants and tools, call 1-888-234-2436, X7393, or visit [www.flowguardgold.com](http://www.flowguardgold.com).

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