

Weighing

Today's Residential Fire Sprinkler Options

Stand-alone vs. multipurpose?

What criteria are important for choosing the right system for a specific application?

by Matthew Kuwatch

valve being accidentally turned off, the homeowner would recognize the problem immediately, because the toilet wouldn't flush and there wouldn't be water flowing from the tap.

For many years, the installation of a residential fire sprinkler system was a relatively straightforward process. Systems were made of metallic piping in a stand-alone design. There were few options and even fewer decisions to make.

Later in the 1980s, a new fire sprinkler system design approach was introduced to the market. Known as a multipurpose system, the design combined the fire sprinkler system with the domestic cold water plumbing line in an effort to reduce the amount of piping used in the home. Although today, nearly 20 years later, there are still not many multipurpose residential systems installed, they offer an alternative to traditional stand-alone systems in which the fire sprinkler system operates completely independent of the plumbing system.

For the first time since the combination design was first introduced to the market, interest in multipurpose systems is starting to increase. What criteria are important for choosing the right system for a specific application?

Safety Criteria

Since fire sprinkler systems are designed to help protect human lives, a top consideration when choosing a system is how safely it performs. Proponents of stand-alone systems have long pointed to the superior integrity of two independent systems. In a stand-alone system, repairs and line modifications can be made on the plumbing side without compromising or interfering with the operation of the fire sprinkler line. In addition,

with a stand-alone design, an alarm bell can easily be tied into the system to alert neighbors and even the local fire department that a sprinkler head has been activated.

This is not the case with a multipurpose system, which would activate the alarm every time a toilet flushed (unless specialized pipe layout designs are incorporated to bypass larger water loads, such as an outdoor

Cost

As is the case with nearly every other part of the construction process, bottom-line costs affect the final decision as to which design and piping material will be used for the home's fire sprinkler system. Historically, multipurpose systems have been promoted as the more cost-effective alternative and, in theory, they certainly appear to be less expensive.



A BlazeMaster multipurpose residential fire sprinkler system. (Photo courtesy of The Lubrizol Corp.)

lawn sprinkler system, or special flow switch valves are integrated). These special design considerations can add cost to the fire sprinkler and plumbing system. The challenge of incorporating an alarm bell is one reason why so many jurisdictions still do not allow multipurpose systems today.

On the other hand, contractors favoring a multipurpose system like knowing that the system is working. Since the fire sprinkler line is tied in with the plumbing side, it's easy to determine if water is flowing through it. In the unlikely event of a

However, a recent side-by-side comparative cost study has negated the premise that a multipurpose system is less expensive to install. Engineered Fire Systems Inc. in California created three different blueprints for the same single-story home in Madison, Wis. Three designs were created: a CPVC stand-alone system; a combination CPVC multipurpose system; and a full PEX multipurpose system using a tee and branch fire sprinkler design.

Three local contractors offered bids to provide prevailing market rates. In the end, it was the CPVC stand-alone

system that edged out the second most cost-effective option — the CPVC multipurpose system.

The lower cost of the stand-alone system was largely a result of eliminating the need for additional tees and transition fittings needed to create the multipurpose systems. These items not only add to the total material costs but also labor costs. The PEX system was the most expensive option for a number of reasons. First, PEX pipe has to be looped up and down. This can require twice as much PEX pipe to be used as CPVC.

Ease Of Installation

Next to corrosion resistance, ease of installation is a primary reason why both CPVC and PEX systems continue to take market share from traditional metallic piping systems. Both materials feature a considerably easier installation method compared with the soldering or threading process required for metal piping systems.

Additional Considerations

Why are more homes today still sprinklered with a stand-alone vs. a multipurpose system?

One reason is code approval. Many jurisdictions still do not allow the installation of a multipurpose system. Beyond code, however, is the need for additional training for plumbers. One of the primary benefits of a multipurpose system is the fact that there is an option to have one trade — the plumber — install the entire system (although with an orange CPVC system, it is possible for a fire sprinkler



A PEX multipurpose residential fire sprinkler system used in a sidewall sprinkler head installation. (Photo courtesy of Lubrizol Corp.)

contractor to install the orange fire sprinkler side, cap it off and then have a plumber install the plumbing pipe and fittings using CPVC or PEX).

In response to increased market interest in multipurpose systems, a number of manufacturers are now providing training programs for new installers. Proper training — in the form of classroom education combined with hands-on experience — is critical because the successful installation of a fire sprinkler system requires knowledge of different rules and restrictions, spacing and strapping requirements, and the ability to accurately calculate hydraulics in order to offset varying water pressures between one home and another.

Although an engineering company typically draws up the initial designs, unexpected changes on the jobsite require the fire sprinkler installer to independently adapt the placement of pipe, loops and heads. The reality is that few homes are built exactly the way the blueprints are drawn, as homeowners

often want to change the location of a fireplace, a stove or bathroom, even late in the design stage. That means the installer of the fire sprinkler system must have the knowledge to understand how those changes will affect the overall design of the system and make the necessary adjustments.

There are many variables and considerations when choosing piping materials and a system design for a residential fire sprinkler system. It's important to match the needs of a project with system capabilities, because what's best for one installation might not be for the next. And, of course, always check local codes, because depending on the jurisdiction, you might not have as many options as you think. **PM**

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