

The Truth about Residential Fire Sprinklers

Jay F. Kramarczyk, MS, PE

The International Residential Code, which is the applicable code in 48 states and Washington D.C., is requiring all new residences to have fire sprinklers installed beginning January 1, 2011. Many people become slightly panic stricken when they hear of this requirement, although the benefits of sprinklers far outweigh the temporary chest pains one might experience.

According to the National Fire Protection Association, there is a reported fire every 20 seconds in the United States. A civilian is injured in a fire every 31 minutes. \$475 of property damage occurs every second. Worse still, more than 9 people die in a fire in the United States every day. 83% of those deaths occur in residences.

When people think of fire protection in their homes, they often think of their smoke detectors and a fire extinguisher, if they have one. Most homes have smoke detectors, although a significant number of those detectors don't work for various reasons (most often because the batteries are not replaced). Very few homes have fire sprinklers, although that will soon change.

Residential sprinklers are designed and installed to protect life safety and property. A fire, as we all know, can devastate a home. Fire sprinklers minimize the damage caused by the fire, usually containing or extinguishing the fire to only include the room of origin and its contents.

There are many misconceptions people have about fire sprinklers which may attribute to the panic.

“If one sprinkler head goes off, they will all go off!”

NOT TRUE! The sprinkler heads each activate individually. Most residential fires will activate one head, sometimes two. The sprinkler heads all going off together only happens in the movies.

“The sprinklers are going to cause more water damage than they are worth!”

This is not true. Typical residential sprinkler heads spray 12-24 gallons of water per minute. By the time the fire truck arrives, the fire is larger and hotter... and a fire truck can spray 250-500 gallons of water per minute.

“Smoke detectors are sufficient to protect my home!”

Actually, no. Smoke detectors do nothing to protect your home. They protect you, if you are home, and your detector works, but if you are not home, the detector is useless unless you have it wired to an alarm monitoring company.

“Sprinkler systems will add too much to the cost of the home!”

Residential sprinkler systems are engineered to be both effective at protecting your home from fire and to be cost-effective. The typical cost increase will be \$1-\$1.50 per square foot (\$2,000-3,000 for a 2,000 square foot home). The increased protection is expected to also increase the value of the house (not just the cost) as well as provide homeowners an additional deduction on their insurance premiums.

“The sprinklers will leak or go off when there is no fire and flood my house!”

Sprinkler heads, like any other device, can fail. They do not fail often and are tested to ensure their safety. The most common failures are related to improper installation or a lack of required maintenance. When residential fire sprinklers are first installed widespread, I expect a significant increase in the number of sprinkler-related insurance claims, although I also expect that spike to subside as the installers become more proficient and technology evolves.

Residential Sprinkler System Basics

There are two main types of residential sprinkler systems: standalone systems and multi-purpose systems. A standalone system is a separate system from the plumbing in the rest of the house—it stands alone. A multi-purpose system is a sprinkler system that operates basically the same as a standalone system, but it is plumbed into the home with the rest of the plumbing system in a large loop. A multi-purpose sprinkler system is easier and less expensive to install.

Residential sprinklers can be plumbed using solid metal pipe, plastic (CPVC) pipe, or PEX (flexible hose). PEX is reportedly the “latest and greatest” and saves significant time during the installation phase of the project as the hose is flexible, not rigid, so elbows are not required. PEX is also resistant to freeze damage as it can expand if necessary, while CPVC or metal will fracture.

Required Maintenance

NFPA 25 is the code for the inspection, testing, and maintenance of sprinkler systems. It does not, however, apply to residential systems. It is still a worthwhile reference document, but it is not enforceable. The maintenance that is required is based on the type of system installed and the manufacturer. Standalone systems require more maintenance than multi-purpose systems. Either way, the required maintenance is minimal, although it is the responsibility of the installer to explain whatever maintenance is required to the homeowner. Typical maintenance includes visually checking the sprinkler heads for leaks and problems.

Insurance & Subrogation

The addition of fire sprinklers into homes will likely cause premiums to drop for the homeowners, but with the addition of the sprinkler system the risk of a water-related insurance claim will increase. Insurance claims adjusters, subrogation professionals, and experts will all need to become more familiar with sprinkler systems and their failure modes in order to effectively investigate and subrogate sprinkler-related claims. Additionally, in the event of a fire the sprinkler system may have a drastic effect on the growth and spread of a fire, so fire investigators will need to become more familiar with the systems and the effect of the systems on the fires.

Continuing Education

As these changes come about, Phoenix Investigations and Engineering will be offering a number of classes and seminars on residential fire protection systems and what to look for while investigating these claims. Stay tuned for more information on these classes—and as always, if you would like Phoenix to teach a class for your company during a lunch hour or a full day, just let us know and we will be happy to set up a class that meets your needs (usually without charge).

About the Author

Jay Kramarczyk is a licensed Fire Protection Engineer in multiple states. His bachelor's degree is in mechanical engineering, and his master's degree is in fire protection engineering, both from Worcester Polytechnic Institute (WPI) in Worcester, Massachusetts. Jay is active on the national committee responsible for writing the fire protection engineering professional engineering examination for potential applicants. Additionally, Jay is a Certified Fire and Explosion Investigator through the National Association of Fire Investigators. He can be reached at Phoenix at (303) 762-8487 or at jkramarczyk@phoenix-investigations.com.