Plastic Pipe Residential Fire Sprinkler Systems

Plastic pipe fire sprinkler systems are available in CPVC and PEX from several manufacturers and are designed to be installed in certain residential and/or light hazard applications. Plastic systems are specially listed for use in wet fire sprinkler systems. They should be installed by qualified contractors in accordance with the products UL listing and The NFPA 13, 13D and 13R Standards. Listed plastic fire sprinkler systems offer an affordable measure of protection of life and property from fire.

The purpose of the residential sprinkler systems is to provide a system that aids in detection and control of residential fires and thus, provides improved protection against injury, loss of life and property damage.

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NFPA 13D: *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Hom*es, allows for stand alone or multipurpose systems. Garages, bathrooms, attics, crawl spaces and small closets are not required to have sprinklers. Systems are sized for two sprinklers activating. Pipe is installed per NFPA 13D and applicable plumbing code requirements (multipurpose systems), to the product manufacturers UL Approved installation instructions. Some system components are not required to be listed. As of 1999, NFPA 13D allows both multipurpose systems and stand alone systems.

NFPA 13R: *Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height,* allows only stand alone systems. Garages must be sprinklered, however like 13D, bathrooms, attics, and small closets are not required to be sprinklered. Sizing is done to allow for four sprinklers activating. 13R also requires all components, to be listed, including hangers. NFPA 13R applications include apartments, condos, and similar residential occupancies up to four stories in height. A fire department connection is required; therefore, all system materials must be rated at 175 psi.

NFPA 13 is used for residential occupancies greater than four stories in height. This standard is more demanding than 13R or 13D. CPVC systems can be used in light hazard occupancies per NFPA 13 applications, check with the manufacturer.

Systems include:

Stand Alone Systems - A CPVC sprinkler system can be installed as a stand alone system separate from the cold water distribution system with a dedicated water source.

Combination (Multipurpose) Systems – CPVC and PEX Combination or Multipurpose systems supply the fire sprinklers and cold water for the plumbing fixtures with common pipes. Usually, the cold water piping is run overhead, supplying the sprinkler heads and drops down to supply the fixtures in the home. The three common types of sprinkler layouts for residential applications are gridded, looped or tree. The main water source could service both the sprinkler and domestic water needs, either at a split at the entry point into the residence, a loop, or a network. An additional type of system is the network system. This fully integrated system can use ½" pipe provided proper design rules are followed in section 8.4.3.3 of NFPA 13D.

Residential sprinklers have higher spray patterns than commercial sprinklers to wet the walls.

These sprinkler systems are pressure-tested at normal system operating pressures. NFPA 13D and 13R are designed for life safety while NFPA 13 is a design for property protection. The main goal for life safety is to get the people out and save lives while the main goal for property protection is to save the building.

There may be protection requirements for exposed piping. Typical protection can be 3/8 in. gypsum wallboard, certain suspended ceilings, or ½" plywood, check with the manufacturer.

Another standard for residential systems is **ASSE Series 7000, Standard 7010** and 7020 *Professional Qualifications for Plumbing Based Residential Fire Protection Systems Installers and Inspectors.* These standards are used to ensure plumbers are trained to properly install and inspect multipurpose residential fire sprinkler systems.

Residential Sidewall Sprinkler – Note "RES" marking and other data marked on unit

Frequently Asked Questions

What is the average cost?

This depends on a number of factors, but a thermoplastic system usually falls between $1.00 to a $2.50 per square foot – or about 1% to 1.5% of the total construction cost of a home depending on the market.

But won't plastic pipes melt in a fire?

No, the heads are designed to rapidly activate when ceiling temperatures indicate a fire is occurring in the room long before excessive temperatures are reached, water in the pipe is dispersed immediately when the head is activated. Also, any piping systems are typically installed behind the drywall of the ceiling or wall – an effective fire barrier. Based on extensive fire exposure tests, CPVC systems are listed for use exposed or without protection.

Don't all the heads activate at once?

No, that only happens in the movies! Heads must reach a predetermined high temperature to activate, and typically only one or two heads are used to control or extinguish a fire in a residential building..

Aren't they ugly or distracting?

Residential heads are smaller than commercial units and there are even fully recessed models that are concealed by a cover plate that can be matched to the ceiling. The cover is held in place by a heat activated metallic fuse, and the head drops down when activated.

Can I install them myself?

This is not recommended. Life safety systems must be installed in compliance with codes and standards so that the design is correct and an adequate water supply to the heads is available. Properly trained and qualified contractors should install fire sprinklers.

Can any plastic pipe be used to install a fire sprinkler system?

No. Only specialty listed products that have been tested by an independent laboratory for fire sprinkler service can be used.

What else is important to know?

Always check the chemical compatibility of antifreezes, thread sealants, firestops, and construction products used with the systems with the manufacturer. Incompatible materials may damage the systems and void any warranty.

Who manufactures these systems?

Follow the following PPFA link to contact our member companies for more information on these systems.

www.ppfahome.org/firesprinkler/index.html