

Residential Sprinkler Systems Reduce Fire Losses

Automatic sprinkler systems have been protecting commercial occupancies, including office buildings and schools, for more than 100 years. Recently, there has been increased interest in sprinklers for one and two family residential occupancies. The main purpose of residential sprinklers is life safety: to control fire long enough to allow occupants to escape the building unharmed. Research shows that residential sprinklers do reduce fire losses in terms of both life safety and property damage. Impediments to universal acceptance of residential sprinkler requirements include perceived cost and potential water damage.

According to NFPA data, approximately 85 percent of "civilian" (non fire service personnel) fire deaths occur in one and two-family structures. In 2010, there were 362,000 residential building fires, resulting in 2,555 civilian fire deaths and 13,275 civilian fire injuries in the United States. An average of seven people die in home fires every day. Studies also show that the chance of dying in a fire in homes with sprinkler systems decreases by 69 percent. When both sprinklers and smoke detectors are present, the risk is reduced by 82 percent. Smoke detectors alone represent a 63 percent reduction.

The NFPA standard calls for automatic fire sprinkler systems in new construction of all residential

occupancies other than one or two family dwellings, and recommends sprinklers for one and two family occupancies as well. NFPA 13D is the Standard for Installation of Sprinkler Systems in One- and Two- Family Dwellings and Manufactured Homes. It includes rules for design, placement and maintenance of residential sprinkler systems. The International Residential Code (IRC) includes requirements for residential sprinkler systems for one and two family homes and townhouses. In order for these requirements to become law, the codes must be adopted on a municipal or state level.

NFPA has a comprehensive education program designed to help local fire departments educate their residents and governments about the value of home sprinkler systems. New York is considering home fire sprinkler requirements. Municipalities across the country already require residential sprinklers. California, Maryland and South Carolina were the first states in the nation to adopt the IRC automatic sprinkler system requirements for all new home construction. Additional states are considering similar regulations. A number of states, including New Jersey and Massachusetts, have coalitions whose goal is to in-

crease awareness of the importance of residential sprinklers. However, a number of states have passed or are considering legislation to prohibit sprinkler requirements in local building codes. Reasons include economic concerns and resistance from contractors.




It is the position of the U.S. Fire Administration (USFA) that "all homes should be equipped with both smoke alarms and automatic fire sprinklers, and all families should have and practice an emergency escape plan." USFA

is part of the Federal Emergency Management Agency (FEMA). Their studies indicate that in 2010 alone, residential fires caused \$6.6 billion in property damage.

Most residential fires start in the kitchen. While handheld fire extinguishers can help to prevent spread of fire and reduce damage, they are subject to operator error. Automatic sprinkler systems respond immediately and are more effective. The newest residential sprinklers are very sensitive and are designed to respond more quickly than the commercial types, helping to contain or extinguish the fire while there is still minimal damage.





Costs of residential sprinkler systems may be significant, ranging from \$3,000 to \$15,000, depending on the home. NFPA estimates the average cost for new construction at \$1.61 per square foot, or about the same as new carpeting. Retrofitting existing homes may be more expensive. Maintenance requirements are often no different for sprinklers than for other plumbing systems.

From an insurance company risk assessment standpoint, it might be argued that residential automatic extinguishing systems are designed to save lives, not necessarily buildings. However, studies show that the presence of residential sprinklers greatly reduces the amount of water required to fight the fire as well as the amount of property damage. In addition, sprinkler systems are designed so that only the sprinkler heads in the area of the actual fire will go off.

A study conducted by Fire Planning Associates, Inc. in Bucks County, Pennsylvania showed that average fire damage in non-sprinklered homes was \$179,896, while damage in sprinklered homes averaged only \$14,000. In addition, the study revealed that fire fighting in unsprinklered homes required 25 tons of water (5,974 gallons), contrasted with 340 gallons required in sprinklered home fires. From a life safety standpoint, 90 people died in the non-sprinklered house fires, and no one died in the sprinklered house fires.

Another possible insurance company concern is accidental discharge of the sprinkler system and the resulting water damage. However, the chances of this happening are minimal, and these costs are small in relation to the costs of fire loss, and the human cost of lives lost.

Residential occupancies present the added exposure of fires occurring during periods when no one is awake. In addition to extinguishing systems, residential occupancies need an alarm system to alert residents who may be sleeping. Smoke alarms are required in all new residential construction, and some jurisdictions require that existing homes be retrofitted with smoke alarms.

"Going green" is becoming more and more popular. It is interesting to note that a recent FM Global study determined that fires in sprinklered houses were less detrimental to the environment than fires in non-sprinklered houses.

The debate over the value and practicality of residential sprinkler systems continues. This is an important issue for insurance carriers, as it impacts underwriting eligibility, building replacement costs, and claims severity.

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