

By John Nicholson

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welcoming sprinklers into the home

It is hard to argue against the statistics, the advances in technology, and life-safety benefits of residential sprinklers

AN IN-DEPTH SERIES of articles in the *Boston Globe* last April drew nationwide attention to the gaps in adequacy of fire department response. NFPA's needs assessment of the U.S. fire service in 2001 found that most fire departments in all sizes of communities do not have enough fire stations to provide sufficiently rapid response, and a significant fraction of departments in all but the largest cities respond with only one or two firefighters on board.

These results not only spotlighted the threats to firefighters, they reminded residents of the need to protect themselves against serious harm from fire.

Illustrations by **Jack Desrocher**

NFPA, through its partnership with the Home Fire Sprinkler Coalition (HFSC), recognizes the *Boston Globe* report as another opportunity to publicize the benefits of an underused, yet highly effective, form of life-safety protection: residential sprinklers. While fire sprinklers have protected many public buildings for more than 100 years, less than 1 percent of U.S. single-family dwellings having fires and only 7 percent to 8 percent of U.S. apartments having fires also have fire sprinkler systems, even though more than 80 percent of all fire deaths occur in homes.

Far from being solely a boon for life safety, residential fire sprinklers are a valuable fire protection tool. According to the HFSC, they save lives, reduce property loss, and can help cut homeowner insurance premiums. The HFSC cites the following statistics:

- Home fire sprinklers can contain and may even extinguish a fire in its incipient stage, usually in less time than it would take the fire department to arrive on the scene. [This is why knowledgeable fire safety professionals immediately saw the connection between the *Boston Globe* articles and the value of fire sprinklers.]
- Installing both smoke alarms and a fire sprinkler system reduces the risk of death in a home

The residential sprinkler was developed to address the fire protection needs of small residential compartments with a limited water supply having a primary goal of life safety and to provide adequate time for the occupants to escape from the dwelling.



by fire by 82 percent, relative to having neither.

- Only the sprinkler closest to the fire will activate, spraying water directly on the fire. A study in Scottsdale, Arizona, found that 90 percent of fires are contained by the operation of just one sprinkler.

- Nationally, home fire sprinkler systems add 1 to 1.5 percent, on average, to the total building cost in new construction.

- Home fire sprinklers use only a fraction of the water used by fire department hoses.

- Modern residential sprinklers can be mounted inconspicuously, flush with walls or ceilings.

- The likelihood that a sprinkler will accidentally discharge because of a manufacturing defect is extremely rare. Sprinkler mishaps are generally less likely and less severe than home plumbing system problems.

It is hard to argue against the statistics, the advances in technology, or the life-safety benefits of residential sprinklers.

Fifteen years after Scottsdale, Arizona, began requiring all new homes to have a residential fire sprinkler system, more than 50 percent of the city's homes are now protected with fire sprinkler systems. Data collected by the fire department during that period indicate that 13 lives have been saved and more than \$20 million in property loss has been prevented. During the last three years alone, the average fire loss in homes with sprinklers was \$2,166, compared to \$45,019 for homes without sprinklers.

While the widespread use of residential sprinklers may still be years away, the effort to expand their use continues.

NFPA is a key player in the promotion of residential sprinklers. It is a founding member of the HFSC and a member of the United States Fire Administration's (USFA) National Residential Fire Sprinkler Initiative, and has strong ties to the National Fire Sprinkler Association and the American Fire Sprinkler Association. First and foremost, however, NFPA is the developer of key sprinkler codes.

The standards

NFPA's sprinkler standards include NFPA 13D, *Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*; NFPA 13, *Installation of Sprinkler Systems*, which governs sprinklers in commercial, industrial, and larger residential buildings; and NFPA 13R, *Installation of Sprinkler Systems in Residential*

Occupancies up to and Including Four Stories in Height.

NFPA 13D was created in response to the landmark report on the nation's fire problem, *America Burning*, which pointed out that the high number of fatalities in homes had to decrease and that a home fire sprinkler was needed, says Chris Dubay, NFPA's staff liaison to the committees developing the sprinkler standards.

The residential sprinkler itself, introduced in the 1980 edition of NFPA 13D, was developed to address the fire protection needs of small residential compartments with a limited water supply having a primary goal of life safety and to provide adequate time for the occupants to escape from the dwelling.

"Through the years since, the technology of residential sprinklers has developed to allow more economical protection through larger sprinkler protection areas, targeted flow rates, and a wider choice of piping materials," says Russ Fleming, executive vice-president of engineering for the National Fire Sprinkler Association (NFSA). Fleming is also a member of the NFPA Technical Correlating Committee on Automatic Sprinklers.

Sprinkler manufacturers now produce UL-listed residential fire sprinklers that differ from standard types of fire sprinklers in that they spray water higher on the walls to help in maintaining tenability of the room of fire origin. In addition, residential sprinklers incorporate fast response thermal elements, which respond five times faster than standard response sprinklers.

Changes have also been made to NFPA 13D to allow multi-purpose systems that serve both sprinklers and plumbing fixtures through common lines to use 1/2-inch plumbing pipe. Before the change, residential multi-purpose piping had to be at least 3/4-inch and be listed for sprinkler systems.

NFPA 13D is currently in the annual 2006 revision cycle, and further revisions and advancements are expected.

"NFPA 13D has to walk a fine line between minimizing cost while maintaining an acceptable level of protection," says Roland Huggins, vice-president of engineering for the American Fire Sprinkler Association. Huggins is also a member of the NFPA Technical Correlating Committee on Automatic Sprinklers.

"For instance, there was a proposal to provide sprinklers just in the kitchen, since that's

where the majority of home fires occur," he says. "This was rejected primarily because the majority of fires resulting in fatalities begin in the living room and bedroom areas. Considering that ease of installation was a driving principle in the development of NFPA 13D, one should expect mainly refinements."

At the recent Report on Proposals meeting, Huggins says, the committee clarified how and where the additional domestic water demand should be applied and clarified that it is acceptable to utilize residential wells as the water supply. At the Report on Comments meeting this fall, the committee is expected to review fire test data that is proposing to provide design basis changes that would allow a single sprinkler flowing 0.07 gpm/sf rather than two sprinklers flowing the equivalent of 0.05 gpm/sf. This would result in a 30 percent reduction in water demand, affecting not only piping choice and size but the size of the water meter, as well. The full fire test report and any received public comments will be reviewed by the committee at their meeting in November.

At the 2005 NFPA *World Safety Conference and Exposition*® in Las Vegas last June, the NFPA membership upheld the technical committee recommendation that NFPA 101®, *Life Safety Code*®, and NFPA 5000®, *Building Construction and Safety Code*®, include a provision requiring residential sprinklers in new home construction.

"Opponents of sprinkler protection in single-family homes argue that only older homes have fire problems, but the proposed requirements in NFPA 101 and NFPA 5000 recognize that we've got to start sometime in bringing the protection of homes up to current technology," says Fleming.

The proposed requirements make absolute sense to Dubay.

"We are promoting fire-safe homes and soci-

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HOLLYWOOD SPRINKLERS

TRUE OR FALSE: When fire sprinklers are present in a house that catches fire, only the sprinkler closest to the flames will spray water. If you said false, you've been had by Hollywood. And you're not alone.

According to the nonprofit Home Fire Sprinkler Coalition (HFSC), the widely generated myth that all sprinklers go off at once is the most common misconception about home fire sprinklers. The truth is, only the sprinkler closest to the flames will open to release water, controlling or extinguishing the fire while it is still small. In a recent study, 90% of fires that occurred in sprinklered homes were quickly controlled with a single sprinkler.*

Despite these facts, Hollywood is at it again with two new hit movies that include preposterous scenes where every sprinkler in an entire system sprays water all at once ("The Incredibles" and "Sponge Bob Square Pants"). That just doesn't happen in real life, yet scenes like these are becoming a Hollywood comedy staple, requiring the Coalition to work double-time to refute the fiction.

The sprinkler gags are intended to be humorous, of course, and the scenes do draw laughs. But HFSC Chair Gary Keith says there is nothing funny about turning off homeowners who would otherwise choose to install fire sprinklers to protect themselves and their families from fire.

"If even one homeowner walks away from a theater with second thoughts about installing sprinklers in their home, the movies have done a real disservice to public safety," he says.

Similar scenes are depicted in other films such as "Changing Lanes" with Ben Affleck, "The Matrix" with Keanu Reeves, "Die Hard" with Bruce Willis, "Hocus Pocus" by Disney and even in commercials such as the Doritos commercial with model Ali Landry aired during the Super Bowl.

Reality television might be an answer to the problem. Two popular network shows are helping to counter fire sprinkler myths. FOX TV's "Renovate My Family" and ABC's "Extreme Makeover: Home Edition" have both recently included the installation of home fire sprinklers in broadcast remodeling projects.

"Extreme Makeover" producers are currently working on another sprinkler installation for an upcoming episode and are so impressed with the technology they are considering installing sprinklers in future makeover projects.

HFSC hopes the reality TV market can help the entertainment industry trend away from taking poetic license that damages the good reputation of a proven, life-saving technology. But it's not just about image, says Keith. "Getting the facts about fire safety wrong can have serious consequences."

Every year, more than 3,000 people are killed in home fires. Of all structures, homes are where people are at greatest risk; in fact, eight out of 10 fire deaths occur at home. Smoke alarms are essential to provide early warning, fire sprinklers provide early control of the fire, which can save lives and property.

Sprinklers, which are installed throughout a home along piping typically hidden behind walls and ceilings, work independently. When the temperature from a fire reaches approximately 130-150 degrees, the sprinkler closest to the flames automatically opens and sprays water over the area, providing plenty of time for a family to escape from fire unharmed.



Fire sprinklers are widely viewed as the ultimate fire protection technology.

America Burning, the defining federal report on the nation's fire problem, called for increased fire sprinkler protection in homes decades ago; yet today only two to four percent of residential properties are protected by sprinklers. HFSC blames this sluggish progress in part on the stubborn sprinkler myths that safety advocates have yet to overcome.

"I can appreciate the entertainment value of both these new films," Keith says. "But as a parent who installed sprinklers in my own home in order to protect my family from fire, I am very concerned that the drenched characters in these scenes will have a negative impact on sprinklers."

"Residential fire sprinklers are the best way to significantly lower fire injuries and deaths, and we should be increasing home installations at a much faster pace in order to save more lives," he continues. "When millions of families see movies that undermine the technology, fire sprinklers take an unjustified hit, and that can ultimately cost lives."

To learn more about home fire sprinkler systems, visit HFSC's Web site: www.homefiresprinkler.org.