



C+S and more

## CAMPUS FIRE SAFETY CODE TALK

Campus Fire Safety e-NewZone

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### Living with Sprinklers

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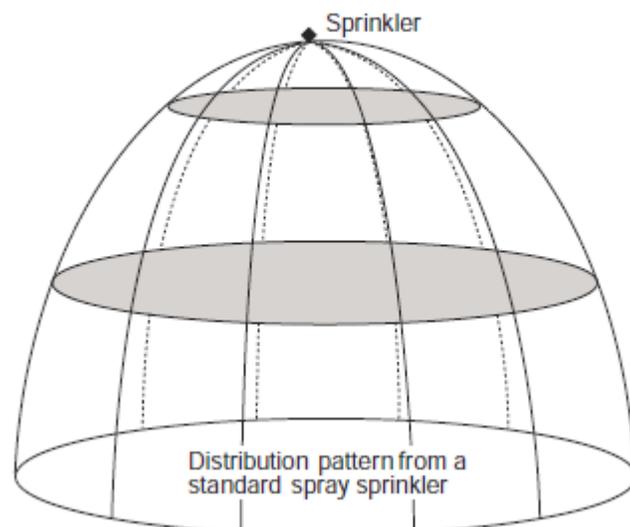
Sprinklers are a staple of almost every college dorm room today but how many college students know how they work or what they really do? Prior to getting involved in the fire protection field, I certainly didn't understand them.

We all know the scene from movies: a fire breaks out, flames lick up against the ceiling, and all of a sudden it's raining indoors as all the sprinklers in the room go off.

It doesn't work that way in real life.

An automatic sprinkler will operate when its heat-activated element reaches a certain temperature, allowing water to discharge through the sprinkler head over the fire. Each sprinkler activates independently to provide water to control the fire. Only those sprinklers close enough to the fire whose heat-actuated elements reach the necessary temperature will activate. In fact, a sprinkler system is designed assuming a finite number of heads will activate during a given fire incident. If all the heads go off at once - as Hollywood likes to suggest - the water pressures required to control the fire couldn't be achieved.

Sprinklers work by performing a few functions. Water discharge provides a cooling effect to the fire, drives away the oxygen the fuel needs to continue burning, and pre-wets nearby combustibles to ensure they will not ignite, preventing the fire from spreading.





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Residential sprinklers are specifically tested to demonstrate their ability to improve tenability in the event of a fire and are listed for use in dwelling units such as homes, apartments, and dorms. Whereas all sprinklers are tested and listed to control or suppress fires, residential sprinklers have specific spray patterns developed for the types of hazards one might find in a home.

Sprinklers have an umbrella shaped pattern. The exact geometry of the spray pattern will vary with the type of sprinkler used, however.

Think of your typical office layout. The majority of the fuel load (quantity of combustibles) can be found towards the center of the room. In a home, the fuel load can generally be found against the walls, such as on bookshelves. The spray pattern for residential sprinklers was developed to accommodate for this type of fuel load. Residential sprinklers spray higher than standard spray sprinklers to pre-wet combustibles along the walls.

Because residential heads have a higher, flatter pattern than standard spray sprinklers, obstructions located near the sprinkler are more able to prevent the water distribution pattern from forming properly than standard spray sprinkler heads located the same distance away from an obstruction. Residential heads must be located further away from obstructions such as beams and columns for this reason. Exact spacing requirements and obstruction rules for different types of sprinklers can be found in NFPA 13, *Standard for the Installation of Sprinkler Systems*.

As mentioned previously, residential sprinklers are tested to demonstrate that they will improve tenability in the room of origin. In other words, sprinklers save lives. Sprinklers not only improve the likelihood that the occupants will be able to evacuate safely, but they also protect our fire service.

Lightweight construction is used in building most of today's homes. This type of construction, although desirable due to its affordability to homebuyers, can be a nightmare for firefighters. Firefighters often cannot be sure of the structural integrity of the building in home fires of buildings with lightweight construction. The strategies



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that must be employed to perform search-and-rescue operations are affected accordingly.



*Examples of residential sprinklers.*

Because residential sprinklers are so effective at controlling a fire and preventing its spread, sprinklers are able to offset some of the increased hazards posed by this type of construction to members of the fire service. In one- and two-family homes with working sprinkler systems, approximately 85% of the time the fire is controlled with a single sprinkler, often limiting damage to a single room. If the fire is controlled while it

is still small, firefighters will be able to perform rescue operations with increased confidence.

On Wednesday, March 26, two members of the fire service were killed in a home structure fire in Boston. Fueled by strong winds, the fire blazed out of control. One cannot help but think of the different ending this fire may have had if this home was protected by a sprinkler system able to limit the fire's growth.

We are a long ways from requiring every home to be retrofitted with a sprinkler system, if that day ever comes. Today, all model building codes require sprinklers in new home construction due to their proven effectiveness of improving occupant safety. Despite the model code requirements, only two states have adopted legislation actually requiring home fire sprinklers in all new residences. Most states require sprinklers in apartment complexes and residential high-rises, but only two require fire sprinklers in single family homes. Although fire sprinklers are a proven technology, there is significant pushback from the home builder lobby.



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By familiarizing ourselves with how sprinklers work and disputing sprinkler myths, we are able to take steps towards improving our overall safety. Sprinklers are a relatively simple technology. Although they are increasingly present in our everyday lives - whether in offices, classrooms, malls, or dorms - they often go unnoticed. In the event of a fire, the difference a sprinkler system can make is indisputable.

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