

## Sprinkler Head Discharge Obstructions and Impediments

Sprinkler systems are designed to deliver cooling water to a fire and to pre-wet the surrounding materials to limit fire spread. A sprinkler system accomplishes this by delivering a specific pattern and flow of water (density) to the surface of a fire. In order to achieve the proper pattern and density, sprinkler designers evaluate the fuel load and the building layout, including any obstructions or impediments that may interfere with the development or delivery of the discharge pattern. Obstructions or impediments prevent cooling water from reaching the fire or from pre-wetting the surrounding fuels.

A sprinkler head is considered to be obstructed when an object prevents the discharge pattern from fully developing or reduces the sprinkler density. In either case, the reduction in sprinkler density and pattern will allow the fire to grow. This growth can lead to further sprinkler activation; however, unless the original fire area is controlled, the fire will continue to spread, which can ultimately lead to a total loss.

### Avoiding Sprinkler Head Obstructions

Changes in the buildings storage arrangements, structural supports, pipes, ducts or other fixtures should be closely examined to prevent creating an obstruction to the sprinkler system. When an obstruction, such as a light fixture, is placed in the discharge pattern, the system's effectiveness will be diminished.

Changes to a building's layout, storage arrangements, or HVAC system should not create obstructions. When evaluating storage arrangements or building layout changes, a qualified sprinkler system installer or the insurance loss control representative should be consulted.

Chapter 8.5 of NFPA 13, Standard for the Installation of Sprinkler Systems, published by the National Fire

Protection Association, Inc. (NFPA), provides general clearance requirements for preventing sprinkler obstructions. In general, these include:

- Do not place anything closer than 18 in (457 mm) from the bottom of a sprinkler.
- Do not locate large obstructions, over 4 ft (1.2 m) wide, such as ducts, open grate floors and conveyors under a sprinkler head.
- Do not install light fixtures, exit signs or other similar items any closer than 4 ft (1.2 m) from a sidewall sprinkler head.
- Do not install cable trays, heating ducts or other large obstructions closer than 3 times its width, to a sprinkler head. (i.e. if the duct is 2 ft (0.6 m) wide, then it should be 6ft (1.8 m) from the sprinkler head.)

The standard also provides additional requirements for clearances based on the type of sprinkler head used and the nature of the potential obstruction.

### Other Impediments

A number of other common impediments to sprinkler head discharge that do not fall into the category of "obstructions," but which can hamper sprinkler head effectiveness, include:

- Painting sprinkler heads. This will cause the sprinkler head to react slowly, or not at all, during a fire.
- Hanging decorations, banners, plants, or any other materials from sprinkler heads.
- Attaching cable trays, ducts, or wiring to sprinkler pipes of sprinkler bracing.
- Replacing sprinkler heads with another type or with one of a different temperature rating.