SPRINKLER OPERATION

The style of the frame and the sprinkler deflector are designed to provide an effective and consistently uniform water discharge spray pattern. Unobstructed spray patterns provide the proper flow rate delivery density (gpm).

Sprinkler heads create a heavy mist of fine water droplets that fall, by gravity, directly onto burning combustibles. These fine water droplets evaporate into steam when heated by the fire. Because the heat of vaporization of water is very high (980 BTU per pound of water), the heat of the fire is removed readily, as the water droplets easily evaporate into steam.

While there are various types of automatic sprinkler systems, they all rely on this same principle of the "cooling effect."

For a sprinkler to operate successfully, it must be close enough to a heat source to either melt a fusible element or fracture a glass bulb. The control features of the sprinkler head are its operation, the orifice size, response characteristics, deflector and it temperature rating

In most sprinkler systems, a single sprinkler head, directly overhead, actuates, at the time of a fire. In many cases, this one head controls or extinguishes a fire; if it cannot, more heat is generated by the fire, and a second head operates.

Modes of Sprinkler Systems Failure

- ☑ Shut water supply valve
- ☑ Broken water main
- ☑ Gravity, suction, or pressure tank empty
- ☑ Failure of a fire pump to start
- ☑ Pump shut down for maintenance or repairs
- ☑ Old style sprinkler heads incapable of providing fine spray required for an effective system
- ☑ Corroded or painted sprinkler heads cannot respond efficiently or quickly
- ☑ Defective dry pipe valve “set” or in closed position
- ☑ Freezing of water anywhere in a dry pipe system
- ☑ Overloading of combustibles (change of occupancy – system inadequate)
- ☑ Water supply incapable of supplying the necessary flow rate or pressure
- ☑ Improperly designed system