

Clearing The Smoke

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Choosing the most appropriate fire suppression system for a mission critical facility is not an easy task. But with a basic understanding of each of the available options, the smoke can be cleared and a decision can be reached with confidence.

Fire suppression systems can be categorized into two main categories: water systems and clean agent systems.

Water systems

Time and time again, water has been proven to be an effective extinguishing agent. Water suppression systems not only perform, they are also inexpensive to install, operate, and maintain.

But, water systems have their disadvantages. Most importantly, water can damage the sensitive equipment that is housed in a mission critical facility. This damaging effect, coupled with the disorder that water causes, can result in extended facility downtime following a fire.

The two basic types of water suppression systems that can be used in a mission critical facility are wet pipe sprinkler systems and pre-action sprinkler systems.

Wet pipe sprinkler systems

Wet pipe sprinkler systems are those that run water through the pipes at all times. The water is released when the heat sensor installed on the ceiling melts.

Perhaps the biggest disadvantage of wet pipe sprinkler systems is that they are heat activated. Wet pipe sprinkler systems do not detect fires and release water until the fire produces intense heat. A fire that is producing intense heat that reaches up to the ceiling is a stage-four fire and has already left its mark.

Another disadvantage to wet pipe sprinkler systems is that the water can be released when a heat sensor is damaged. This means that a simple accident—a piece of equipment being moved, for example, and breaking off the heat sensor—can result in the release of water and damage to the equipment.

Pre-action sprinkler systems

Pre-action sprinkler systems extinguish fires by releasing water, but until a fire is detected, the water in the pipes is held back. Pre-action sprinkler systems will not release water until a sprinkler

head melts and a smoke detector is in alarm. If a sprinkler head is damaged, water is not released.

The biggest benefit of a pre-action sprinkler systems is that it protects against water damage due to leaks. However, the system is still heat activated and does not detect a fire until it is in stage four and has already extensively damaged the facility.

Clean agent suppression systems

Clean agent suppression systems extinguish fires in two ways. First, the Halocarbon agents absorb heat from the fire to the point where combustion can no longer occur. Second, the inert gas agents lower the hazard's oxygen content below the level necessary for combustion.

Clean agent suppression systems have numerous benefits. They extinguish fires in seconds without leaving a residue and are environmentally friendly.

The five basic types of clean agents that can be used in a suppression system include FE-36, Inergen, FE-227, ECARO-25, and Novec 1230.

FE-36

FE-36 is a clean agent that, with one nozzle, is able to protect an area with a ceiling as high as 25 feet. Other agents require stacked nozzles in order to protect such areas. FE-36 is also unique in that it can be put in portable fire extinguishers while other agents require piping networks. Unfortunately, FE-36 is a high-pressure agent.

If the room being protected is not vented correctly, the agent can damage walls and ceilings.

Inergen

Inergen is perhaps the lowest cost (per pound) clean agent. When released, Inergen reduces the room's oxygen to 12.5 percent and increases carbon dioxide to 3 percent. This depletion of the oxygen level is dangerous to occupants. Like FE-36, Inergen is a high-pressure agent and can damage walls and ceiling if the room is not properly vented. Inergen also has a higher concentration by volume (44 percent) than other clean agents and requires more tanks to hold the agent. This translates into loss of floor space.

FE-227

FE-227 is a clean agent that requires less storage space than FE-36 or Inergen. In addition, it is unique because it extinguishes fires by attacking the heat source rather than by depleting the oxygen level. This results in a clean agent that is safe for occupants.

ECARO-25

ECARO-25 requires 20 percent less agent than FE-227, which makes it the agent that requires the least storage space. Like FE-227, ECARO-25 extinguishes fires by attacking the heat source, making it safe to use in occupied areas. ECARO-25 is used extensively in mission critical facilities throughout the United States and Europe.

While ECARO-25 makers claim that it is a direct drop-in replacement of Halon 1301, most cases prove otherwise. Piping networks usually need to be re-calculated and reconfigured.

Novec 1230

Novec 1230 is a clean agent that is stored as a liquid. This unique characteristic enables Novec 1230 to be transported in non-pressurized containers, which means lower cost and more flexibility. However, Novec 1230 is a fairly new agent and has not yet been widely used nor has it had many documented successes.

Water system or clean agent system?

While both water systems and clean agent suppression systems have their advantages and disadvantages, clean agent systems are more commonly used in mission critical facilities because of their ability to extinguish a fire without damaging sensitive electronic equipment. However, many jurisdictions require that a sprinkler system be used. In these cases, we recommend installing a pre-action sprinkler system in addition to a clean agent system. The pre-action system will be fully functional, but will only serve as a backup.

Bick Group has subject matter experts in this and many other topics. Talk to our Fire Protection experts by emailing: jknabe@bickgroup.com