
CAN AN ESFR SPRINKLER SYSTEM KEEP YOU FROM GETTING SOAKED?

As a warehouse professional, you must deal with and make decisions about sprinkler systems for your operation. Insurance companies and particularly local municipalities have become increasingly stringent in their fire protection requirements.

While existing systems are often grandfathered by local authorities, acquiring a Certificate of Occupancy in a new or expanded facility has often translated into the need for a multi-million dollar in-rack sprinkler system in order to satisfy local requirements.

Besides being expensive to install, in-rack sprinkler systems can cause operational problems, and may prevent layout improvements from being made because the sprinkler system inhibits change.

In many cases, greater product losses have resulted from water damage caused by accidentally broken sprinkler heads than from the fires these systems were designed to contain. In addition, making layout changes to an operation with an in-rack system is difficult and expensive because water must be cut off and the system must be drained before the sprinklers can be disassembled and the racks moved. After the racks are moved, the pipes and sprinkler heads must be reconnected, installed and tested. While the work is being done, the area may be left without fire protection.

NEW TECHNOLOGY – ESFR

A new sprinkler technology is changing that. In 1988 the first **EARLY SUPPRESSION FAST RESPONSE (ESFR)** sprinkler system was installed in a warehouse. An ESFR sprinkler system is located in the ceiling structure yet offers fire protection better than in-rack systems.

With ESFR sprinkler heads further away from the fire than the sprinkler heads in an in-rack system, how is that possible? The answer lies in the three ways ESFR systems differ from conventional systems:

A. SPEED

ESFR sprinkler heads sense a fire and begin spraying water in $\frac{1}{2}$ the time of conventional heads. The sooner the system starts to fight the fire, the smaller the fire will be, so it is more likely that the ESFR system will be capable of extinguishing the fire promptly.

B. VOLUME

Conventional heads output water at a rate of about 25 to 30 gallons per minute (gpm), and high output conventional heads (used with hazardous and explosive materials) output approximately 60 gpm. ESFR heads output water at 100 gallons per minute.

C. DROPLET SIZE

ESFR heads emit larger droplets of water with greater momentum than conventional heads. When extra water is forced through conventional heads, it tends to come out as a mist and a greater percentage evaporates than when conventional heads flow at a normal rate. ESFR heads not only output larger amounts of water, but a greater share of the water reaches the fire, hastening the extinguishing process. Conventional systems are generally not designed to extinguish a fire, but rather to keep it from spreading by moistening the area around the fire.

These three factors build upon each other to increase ESFR's efficiency. By detecting the fire sooner, outputting more water, and increasing the likelihood of the water reaching the fire because of the droplet size, ESFR systems are able to compensate for the sprinkler heads being further from the fire.

WHO CAN USE ESFR?

Factory Mutual has approved ESFR for use in warehouses with storage that does not exceed 35 feet in overall height, and with a ceiling height that averages 40 feet or less. (This is general rule, however and in different applications, with different

commodities, and in different municipalities there can be substantial changes in ESFR installations.)

New ESFR specifications are also changing the regulations and applications. It is necessary to work with local code officials or designers familiar with local regulations when designing ESFR systems

In addition to standard and plastic commodities, ESFR is being used for various storage arrangements of empty pallets, rubber tires, roll paper and aerosols

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At present, an in-rack system consists of a conventional ceiling system and in-rack sprinklers. While each operation must be looked at individually to determine the relative cost of ESFR and existing in-rack systems, in new facilities an ESFR system generally costs 30% to 50% less than an in-rack system. Additional savings occur if racks are rearranged or dismantled.

Retrofitting an existing building with ESFR is more difficult to justify, since it generally means totally dismantling the existing ceiling system because conventional pipes do not have the capacity to deliver suffi-

cient water to ESFR heads. The cost analysis in an existing building may swing in the direction of an in-rack system because the ceiling component of the in-rack system is already installed, while for ESFR the cost of removing the system must be included. In some instances, it may still pay to retrofit an ESFR system into an existing facility.

Before making a decision about using ESFR, be sure to consider the product stored, the increased flexibility and the higher potential for reduced fire losses as well as the cost savings.