



Automatic fire sprinkler systems have been used effectively for the protection of property such as mills, factories, warehouses and department stores for well over 130 years.

However, over recent years there has been a growing recognition of their effectiveness in improving levels of life safety in other types of buildings.

Recently reported figures from the Fire Protection Association (FPA) suggest that direct losses from fires in hotels/boarding houses were approaching £4 million which equated to nearly 2.0% of the total cost of all UK fires.

Organisations such as hotel chains have recognised the life safety and property protection benefits of comprehensive sprinkler protection.

The larger hotel chains, notably from the USA, have long since been aware of the benefits of installing sprinkler systems in their hotels worldwide, mainly as a result of high profile fires.

On New Years Day 1986, a fire devastated the twenty-two storey Du Pont Plaza Hotel in Puerto Rico leaving ninety seven dead and property loss of millions of dollars.

The only piece of luck in the tragedy was that the fire broke out in mid afternoon. If the fire had occurred at night when guests were asleep, the death toll could have been a lot higher.

Another high profile fire which, at the time, was dubbed the worst hotel fire in recent American history was at the MGM Grand Hotel in Las Vegas where in 1980, 85 guests were killed. Many

of the dead were killed by smoke inhalation far away from the seat of the fire.

How different these examples were to a more recent blaze in the Westin Hotel, Boston when not a single life was lost and all guests were safely evacuated from a thirty-eight storey hotel fitted with an automatic sprinkler system.

In the UK more and more sprinkler systems are being installed into hotels either during construction or as part of a refurbishment programme.

### Why This Success?

The success in part is due to the simplicity of the sprinkler system: there are no computers or wiring – so no false alarms. The cost of maintenance is extremely low – running to less than £500 per year for the average system. Sprinkler systems have a very long service life, 50 years is common and many systems today were originally installed in the 1920's. This is due to strict adherence to standards for components, design and installation. Systems in the UK are installed to BS EN 12845, an exacting standard which has evolved over the



years and when installed by a BAFSA member company, the client will be provided with a Certificate of Conformity under the third party certification scheme LPS 1048. Due to the strict standards for fire sprinklers and the third party certification, the fire insurance industry will offer significant premium discounts and/or lower policy excesses for premises protected by automatic fire sprinklers.

### **Retrofitting of Hotel Sprinkler Systems**

To develop the design for a hotel, the sprinkler specialist will be required to undertake a comprehensive survey of the building, assessing/ designing the various risk area classification and relating these to appropriate sprinkler head selection, head spacing, water flow rate and discharge density. Together with investigating the available mains water supply to establish any need for sprinkler pumps and water storage. Culminating in a comprehensive set of design/ installation drawings indicating pipework routing design, pipework sizing including pump and tank selection and associated electrical/ alarm wiring and associated builderswork detail.

An important feature of the survey is that the sprinkler specialist liaises with the hotel property manager and other project team members, including the architect to develop the appropriate pipework routing, builderswork details and plant/ housing location. Together with programming the works to dovetail with the operation of the hotel and the time allocated for the works.

### **CPVC Pipework**

With the introduction of LPCB approved CPVC plastic pipework, many retrofit hotel sprinkler systems are made easier to install because of the clean and lightweight nature of the product. CPVC is easy to handle and can be installed without the need for noisy plant such as pipe threading machines etc. Often rooms need to be taken out of service for a day or so.

### **How Do They Work**

It is essential that water supplies, the basis of automatic sprinkler systems, are reliable and guaranteed. This means that water should be supplied from the service main or other dedicated sources of water as specified in BS EN 12845.

An important consideration which should be investigated during the early design process is the



space availability for pumps and tanks should they be required.

The sprinkler heads will be strategically positioned in hotel bedrooms, corridors, back of house areas etc. These heads are connected to the water supply via a network of hydraulically balanced supply pipes which are distributed throughout the hotel utilising the most unobtrusive route possible. In certain circumstances pipework can be concealed by decorative features.

Each sprinkler head is its own heat detector and operates at a predetermined temperature normally 68°C. Once this temperature has been reached, the sprinkler head operates and a fine spray of water is discharged on to the fire.

A common myth about automatic sprinklers is that all the heads operate simultaneously; this is completely untrue. Only the sprinkler heads closest to the fire will operate, thus minimising the water damage. It is estimated by the FPA, that 80% of fires are controlled with 10 sprinkler heads or fewer.

Once the sprinkler installation has been activated, the fire is almost immediately brought under control or extinguished.. The system can also operate local alarms to aid evacuation and alert the fire brigade to the fact that there is a fire on the premises.

## Water Damage

Concerns are occasionally expressed that sprinklers can cause water damage which could be worse than the fire, this is, of course untrue. As only the sprinklers closest to the seat of the fire will operate - and in many cases only one or two sprinklers will actually activate. The water discharged by these few sprinklers is substantially less than the water used by the fire brigade. The FPA have said that in virtually all situations sprinklers will only discharge 10-15% of the amount of water needed by the fire brigade.

Over 70 million sprinklers are installed each year worldwide and every single sprinkler is pressure tested prior to leaving the factory. US, Australian and UK research suggests that fewer than 1 sprinkler in 5 million will fail by discharging water other than in a fire situation.

## Value of Sprinkler Protection

The FPA the UK's national fire safety organisation has said:

“Sprinklers are even better than basic fire detection systems as they offer a simple, effective and relatively cheap method of detecting a fire, raising the alarm and starting to control it automatically. This allows hotel staff to concentrate on their primary task of ensuring that their guests are assisted to a place of safety without delay.”

Many large hotels already have sprinklers systems installed. Although most of these systems are in newly-built hotels, retrofitting need not cause significant business interruption in some types of premises. For example, ski hotels with seasonal trade may be able to install sprinklers in the closed season.

## Automatic Fire Sprinkler Systems

- Deliver water directly to the seat of a fire
- Are relatively inexpensive to install
- Prevent deaths and injury
- Allow design flexibility—for example in provision of travel distances to fire escapes.
- May attract insurance discounts
- Make innovative design concepts a reality
- Minimise water damage





## Facts about Fire Sprinklers:

- No multiple fire deaths in a UK sprinklered building
- Most fires in sprinkler protected buildings are extinguished by eight or fewer sprinkler heads operating.
- Only the sprinkler heads in the immediate vicinity of the fire actually operate.
- Sprinklered buildings prevent fire fighter deaths.
- Sprinklers do not 'false alarm' they will only operate if there is an actual fire.
- For a very small cost an alarm switch can be built-in to the system to call the fire service automatically should the sprinklers operate
- Maintenance costs for sprinklers are very low and the systems have a very long service life
- Sprinklers save lives - and property - and are the only devices which can detect a fire, sound the alarm, call the fire brigade and extinguish or control the fire.
- Despite preconceptions, sprinklers are not difficult or expensive to install and are not unsightly.
- Sprinkler systems installed in full compliance with third party certification standards will usually attract insurance premium discounts.

Presented by:



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