

POSITION PAPER

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Protection of people and environment with sprinkler systems

There is widespread information about loss of life and injuries due to fire in several types of buildings. Carehomes, hospitals, schools, airports, railway stations, homes for the old, underground stations, student homes, museums, exhibition centres, hotels, theatres, cin-

emas and prisons should be especially considered in this respect. There are many instances where sprinkler systems are not considered, although they are a proven life safety measure because authorities are misled by untruthful information.



Position

- Sprinkler systems have a combined fire alarm enabling early arrival of the fire brigade which just has to finalise the job, ensure extinguishment of any residual fire and assist evacuation without risking their lives and the lives of people in the building
- Sprinkler systems will help to keep the escape routes fairly free of smoke
- Sprinkler systems have a proven record in protecting people
- It has been proved over 100 years of experience that sprinkler systems protect life and limit damage in a very effective way.

Working principles of sprinklers

In understanding sprinklers it would be useful to describe the working principles involved: One vital part is the sprinkler itself. Installed in the protected area on water charged pipework, it is closed and sealed with an element sensitive to heat, typically a very strong glass bulb. The complete pipe system is controlled by an alarm valve which keeps the water pressure on a calculated level. In the event of a sprinkler operation the alarm valve senses a pressure loss and supplies water through the pipework to the sprinklers. The glass bulb of the sprinkler head contains a special fluid which expands when subject to heat. In case of a fire, the fluid expands creating pressure, the glass bulb disintegrates and the operated sprinkler immediately delivers water spray to extinguish or suppress the fire in an early stage. Only the sprinklers affected by the fire operate and in most cases just 1 to 4 sprinklers will open. Consequently the total damage is kept to a minimum. Imagine

what damage an uncontrolled fire for 10 to 15 minutes would cause and the amount of water necessary for the fire brigade to use, to get the situation under control.

Some myths about sprinkler systems

Consideration is given below to some of the most common myths about sprinkler systems which may mislead authorities.

(1) The first myth is (almost) as old as the sprinkler industry itself: "When there is a fire, all sprinklers are immediately activated..."

The truth - A sprinkler system fights fires selectively. In the event of a fire, only the sprinklers affected by the heat from the fire operate. All other sprinklers remain shut. Approximately 80% of fires are extinguished or suppressed using up to a maximum of four sprinklers.





(2) The second myth has almost become a legend over the years: "Sprinklers release a huge amount of water and cause water damage as a result..."

This, also, has nothing to do with reality: Sprinklers are constructed only to open when the response temperature at the sprinkler is exceeded. When the temperature exceeds the sprinkler response value a fire has already started. In order to prevent serious damage, the fire is extinguished or suppressed in a specific and targeted manner, with considerably less water than would be used by other means.

(3) The third myth is that belief that "a sprinkler system is superfluous, as buildings are already equipped with portable fire extinguishers..."

Portable fire extinguishers are there to fight fires in their early stages, such as burning waste paper bins. However, this requires the fire to be discovered quickly and someone to take action accordingly.

But what happens outside business hours or at the weekend or when fire spreads rapidly? Sprinklers offer buildings, contents and people around-the-clock protection even when no one is around to operate a fire extinguisher. Even if a fire in a burning waste paper bin spreads rapidly and cannot be tackled using a fire extinguisher, a sprinkler system is capable of tackling that larger fire.

(4) Some more myths

"Sprinklers are too slow to extinguish a fire in its early stages."

In more than 60% of cases, just one or two sprinklers are enough to successfully fight a fire. Summary: Sprinklers can combat fires before they spread.

"Sprinkler systems are too expensive."

For an office building, a sprinkler system would cost roughly the same per square metre floor surface as the carpets laid. In addition to this, cost-effective construction materials can be used when a sprinkler system is installed. Insurance companies also provide incentives for the installation in the form of up to 65% premium discounts.

"Sprinkler systems endanger the jobs of the fire brigades."

As long as there are fires, we will need the fire brigades. Wherever sprinkler systems are in use, the fire brigades will never be confronted with a serious fire scenario, and will not be put at risk by thick smoke or collapsing building sections. This ensures that the fire brigades can concentrate on its most important task: saving lives and evacuating the area.

Fire Engineering Technologies

Sprinkler systems have a proven record in protecting people. This is why sprinkler systems are an ideal element in fire engineering. Already in the early design stages fire engineering should include sprinkler protection in order to reduce the building costs and help protect people and property. If the sprinkler system is considered in the fire engineering, it may be possible to reduce the need or rating of passive fire protection. The installation of a sprinkler system will help in a discussion with building authorities to increase sizes of fire compartments or reduce the number of fire walls. The elimination of barriers will also ensure a quicker evacuation of people from the building.

Fire brigades

Fire brigades very often have to do their work under conditions which are very unfavourable.

Frequently, permanent building staff, e. g. hospital staff may be reduced to save costs, some of the guards which should be present during night shifts or over the weekend may be reduced.

Saving lives and evacuating the people from the hazard is one of the most important tasks of the firemen. During this process they are not able to fight the source of the problem, i. e. the fire itself. Consequently, during that time the fire may grow to a critical stage, which is not only dangerous to the users of the building but also to the rescue forces themselves. A sprinkler system will assist the fire brigade and provide them with the necessary time to evacuate people and extinguish the fire safely.



Reduction of smoke

Once again a very common misunderstanding: **"The biggest problem in the event of a fire is smoke, and not heat. Therefore, sprinklers are not the correct solution..."** Smoke certainly is the main cause of death in fires. A sprinkler system cannot fight smoke, but is extremely effective against its cause: Fire. Observation: there is no smoke without fire. But: where there is no fire, there is no smoke. The sprinkler system will help to keep the escape routes fairly free of smoke so that people can leave the building without difficulties.



Environment

Buildings with sprinkler protection reduce the risk of polluting the environment. Since a fire will be detected in an early stage, the amount of produced smoke and toxic or harmful products is minimised.

A well known incident was the warehouse fire at Sandoz in Switzerland. A comparably small warehouse without sprinkler protection generated a big disaster to the environment.

Are Sprinkler Meant To Protect Property?

Because of the large fire hazard concentrated in certain commercial and industrial applications which are regularly protected with sprinkler systems, these systems are seen as property protection only. This is not correct.

Life, as such, does not burn. People are injured or die in fire situations because property is burning. It is the burning of property that destroys and injures life. Fire sprinkler systems designed, installed and maintained in accordance with appropriate national standards, detect fire rapidly and whilst relatively small, immediately suppress such fires with a drenching spray of water which is discharged only in area of the fire zone. This action by the sprinkler(s) considerably reduces or eliminates the heat and hot gases being generated, thus protecting and saving lives, buildings and contents.

Today sprinkler systems are regularly installed in factories, department stores and warehouses. Here the fire load is very high and, consequently, the installation of a sprinkler system is seen as means to protect the property, i. e. the building and the content of the building. This is true, of course.

Even more important, though, is that a sprinkler system for these applications will protect the users of the building, firefighters entering the building and people in the vicinity. A fire will be extinguished or suppressed, i.e. the heat generated and smoke production will be considerably reduced. This will allow users to safely escape from the building. Should somebody be injured and/or not be able to escape without help, the prevention of fire spread provided by the sprinkler system will allow the time rescue teams need to locate and evacuate the injured and those trapped.

Furthermore, the sprinkler system will allow the fire brigade personnel to do their job in a safer situation and ensure a temperature level which is not critical to the structure of the building. Thus allowing the fire brigade to enter the building to fight the fire from within without having to fear a collapse of the structure. The reduction of extensive heat and smoke by the sprinkler system will hasten the task of the fire brigade to effectively locate and get to the seat of the fire.

Consequently, sprinkler systems should increasingly be used to protect life in industrial and commercial applications, but it is equally vital to also use these systems to protect areas where people congregate. It is even more important to sprinkler protect buildings occupied by people who cannot evacuate quickly enough or without help of others. Examples for such buildings are hospitals, schools, care homes, homes for elder and disabled people, etc.

National or European regulation in respect of the above are much needed.

The loss of the assets may be covered by insurance, the loss of the lives of personnel and firefighters is far beyond compensation.

Infobox: About EUROFEU

EUROFEU, the European Committee of the Manufacturers of Fire Protection Equipment and Fire Fighting Vehicles, is the umbrella organisation of Europe's national associations active in the field of fire protection. EUROFEU is active in establishment and promotion of common policies on matters of mutual interest affecting all aspects of the fire trade in Europe.

The EUROFEU Sprinkler Section is dealing with the systems that use water as fire-fighting agent, especially with sprinkler systems.

The European fire protection industry, represented through EUROFEU, has been committed to strict demands on the quality of its products and services for a long time. Independent third party assessment has been an essential element to ensure effectiveness and reliability of the solutions provided to our customers.