



## Fire protection in laundries

Protection of people, business continuity  
and reputation

Laundries must be considered relatively critical zones in hotels. Firstly, they may have a very high fire load (e.g. amount of textiles) and secondly they provide a high risk because of the possibility of overheated electrical equipment.

Due to the number of deceptive phenomena in such an environment, like steam or dust, fire detectors are recommended which not only guarantee an early warning in case of fire, but also provide a robust response to deceptive phenomena.

In the event of a fire, alerting and evacuating all parties at risk in good time has the highest priority. A fire protection system is needed that ensures rapid, reliable fire detection and activates both the alarm devices and the relevant fire control installations.

Early warning of a fire is essential; not only for protecting people, but also for ensuring business continuity and the reputation of the hotel. However, unnecessary evacuation activities due to false alarms can be counter-productive and must be avoided.

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# Introduction

## Highlights<sup>1</sup>

- The laundry is the second biggest area of fire origin in non-confined hotel and motel fires
- This area is considered a critical zone due to a very high fire load and a high energy consumption
- Approximately one out of every 12 hotels reports a structural fire each year

Almost all machines used in hotel laundries contain some form of heater. Based on the high energy consumption of these appliances and the fire load, the laundry is one of the most dangerous areas in a hotel.

The main causes of fires in laundries are a lack of cleanliness, technical defects and spontaneous combustion of textiles. Even though the fire risk cannot be eliminated completely, the risk can be significantly reduced by simple measures. These include

- Limiting to a minimum those materials which are easily flammable such as paper or cardboard packaging
- Cleaning the laundry area daily, especially removing any accumulations of fluff
- Storing cleaning agents in a dedicated cupboard when they are not being used
- Periodically cleaning the air ducts and exhausts of the electric control cabinets
- Regularly cleaning, checking and maintaining appliances such as washing machines, dryers and ironing presses
- Turning off electrical equipment as soon as it is no longer being used
- Instructing employees in how the machines should be used
- Cleaning oil and grease-stained textiles separately
- Not stacking or packing items of clothing when they are still warm

## Basic conditions

### Objectives

- Preventing the fire from spreading to other hotel areas
- Timely alerting and evacuation of all people at risk
- Preventing unnecessary alerting of guests and the fire brigade

## Typical fire hazards

- An overload or short circuit of an electrical appliance (e.g. washing machine, dryer or ironing press)
- Ignition of dust or fluff through contact with a hot surface
- Spontaneous combustion of textiles: heat can cause an exothermic reaction between oxygen in the air and the unsaturated fatty acids on soiled clothing



## Typical development of a fire

The majority of fires in laundries start with a smoldering phase and progressively generate increasing quantities of visible smoke. If such an incipient fire is detected at an early stage, it can be dealt with easily (e.g. disconnecting the power supply of the electrical equipment concerned or extinguishing smoldering textiles with water). Smaller fires with open flames can also be extinguished with water or a hand-held fire extinguisher.

## Critical Points

- Preventing false alarms due to deceptive phenomena such as
  - Rapid local increase in temperature when opening a dryer
  - Steam from an ironing press
- Preventing delayed fire-detection
  - E.g. by the fire aerosols being diluted by the airflow from the HVAC system.
- Limiting the fire to the burning object or the laundry area
- Alerting all persons in the area that a fire alarm has been activated

<sup>1</sup> NFPA, U.S. Hotel and Motels Structure Fires; U.S. Fire Administration's (USFA's), Hotel and Motel Fires

## Solution

When planning and implementing the fire detection system, the increased fire risk and the deceptive phenomena which occur during the daily operation of the laundry must be borne in mind. The system must not only guarantee early and reliable detection of a fire, it must also respond effectively to deceptive phenomena. The environmental conditions in a laundry are quite different when it is in operation and when it is not in operation. To achieve the best possible protection, the system must be designed to adapt its detection behavior according to these two situations.

### Laundry in operation

- Increased fire risk (electrical appliances, a lot of energy, warmth and medium fire load)
- Deceptive phenomena (steam and heat)
- Manual alarming possible (people present)

When the laundry is in operation, the ASA-neural fire detectors in the vicinity of the machines are set-up to react robustly against the deceptive phenomena expected in these areas, while reacting reliably to a genuine incipient fire.

The smoke detectors installed in areas where minimal influence of deceptive phenomena is expected (folding etc.) are set to react in a balanced manner.

### Laundry not in operation

- Medium fire risk (electrical appliances and medium fire load)
- Normal environmental conditions (no deceptive phenomena)
- Manual alarming not possible (nobody present)

When the laundry is not in operation, all detectors shall be switched to a sensitive mode as they must react quickly and reliably to any incipient fire. The switchover can be achieved automatically, based on the manned/unmanned status of the control panel.

The number and position of the automatic fire detectors are chosen based on the size of the laundry, the areas in which deceptive phenomena occur and the fixtures which prevent uniform propagation of smoke and heat.

In addition to the automatic fire detectors, a manual call point should be installed so that a fire alarm can also be triggered manually.

### Alarming and evacuation

Personnel working in the laundry area must be alerted to any arising emergency situation. Appropriately positioned sounder beacons provide an optimal solution, as they deliver both acoustic and optical warning signals.

In this example, ensuring unobstructed visibility from all areas of the laundry room is more straightforward if ceiling-mounted devices are used. Due to the size of some machines (and the position of some windows), it could be considerably more difficult to find suitable positions for wall mounted devices.



Details	Comments/Notes
<p><b>Automatic fire detectors</b></p> <p>ASA neural fire detectors</p> <p>Smoke detectors</p>	<p>Detector behavior must be adapted according to whether the laundry is in operation or not. A robust response to deceptive phenomena (steam, heat) is required during operating hours, whereas a sensitive response is required at other times.</p> <p>Detectors in the area of the machines</p> <ul style="list-style-type: none"> <li>▪ During hours of operation: Parameter set with a high immunity</li> <li>▪ Outside hours of operation: Parameter set with a sensitive response</li> </ul> <p>Detectors outside the area of the machines</p> <ul style="list-style-type: none"> <li>▪ During hours of operation: balanced</li> <li>▪ Outside hours of operation: high sensitivity</li> </ul> <p>Operation in a high humidity environment</p> <ul style="list-style-type: none"> <li>▪ All detectors require IP protection of at least IP43</li> </ul>
<p><b>Manual call points</b></p> <p>MCPs</p>	<p>Manual call points</p> <ul style="list-style-type: none"> <li>▪ Single or double action (depending on local regulations)</li> <li>▪ IP protection of at least IP43 (for operation in high humidity environments)</li> </ul>
<p><b>Warning devices</b></p> <p>Sounder beacon bases</p>	<p>All detectors should be equipped with sounder beacon bases</p>
<p><b>Manual suppression</b></p> <p>Fire extinguishers</p>	<p>Hand-held fire extinguishers suitable for Fire Category A (solid substances and textiles) are recommended e.g. Foam.</p>
<p><b>Positioning of system elements</b> (see Figure 1)</p>	<p><b>Automatic fire detectors</b></p> <ul style="list-style-type: none"> <li>▪ On the ceiling</li> <li>▪ At least 0.5 m from the wall</li> <li>▪ Away from the airflow of the HVAC system</li> </ul> <p><b>Manual call points</b></p> <ul style="list-style-type: none"> <li>▪ In the laundry area next to the fire exit</li> <li>▪ At a height of 1.4 m ± 0.2 m</li> </ul> <p><b>Hand-held fire extinguishers</b></p> <ul style="list-style-type: none"> <li>▪ In clearly visible and easily accessible positions</li> <li>▪ Handle height 1.0 m ± 0.2 m</li> </ul>
<p><b>Related measures</b></p>	
<p>Trash can with a tight lid made of non-flammable material</p>	

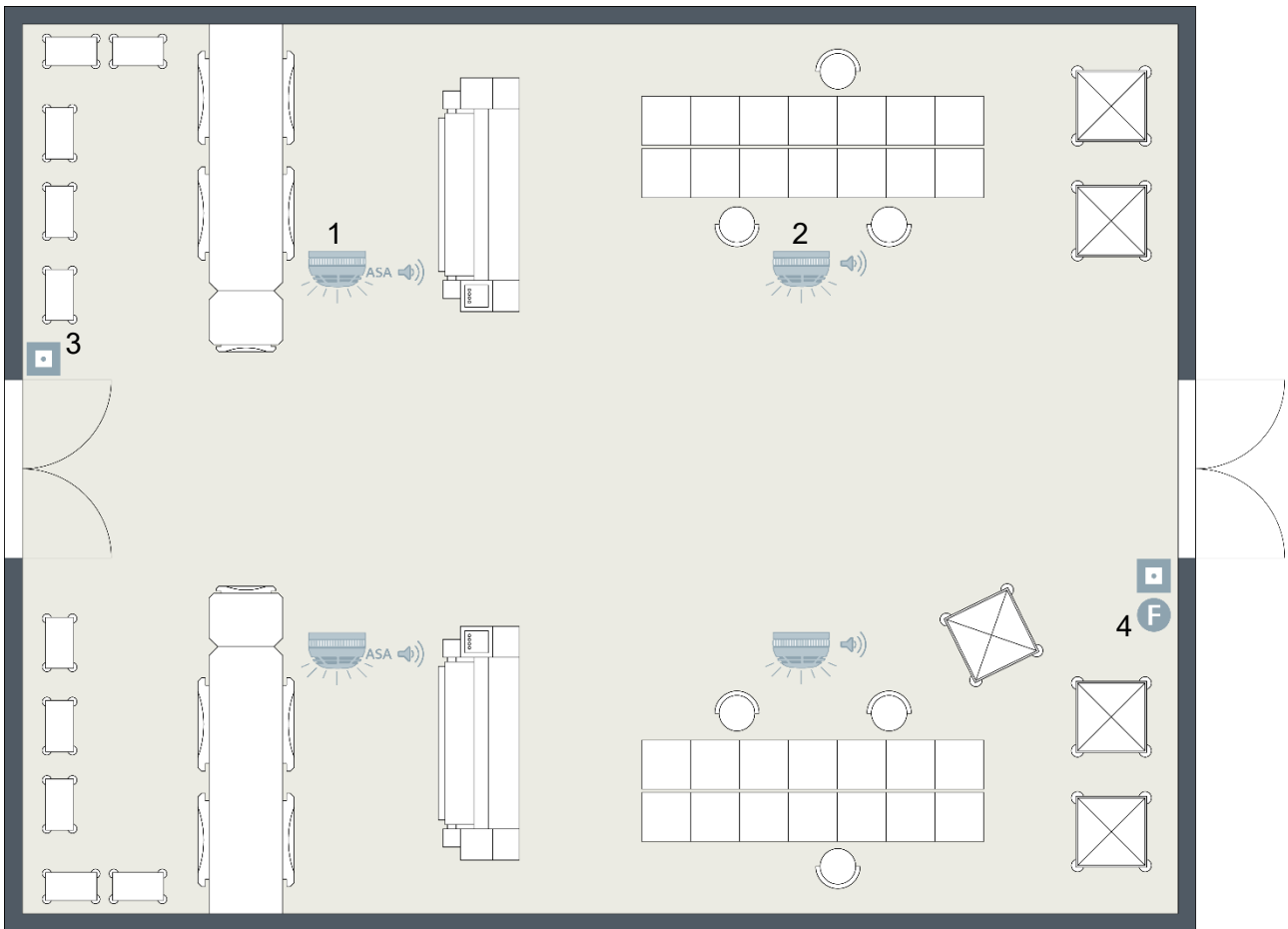


Figure 1 Positioning of system elements

1. ASA neural fire detector with sounder beacon base
2. Smoke detector with sounder beacon base
3. Manual call point
4. Hand-held fire extinguisher



## Practical experience

### Fire detection

Fire damage in laundries which are equipped with suitable fire detectors is generally limited. Early alerting makes it possible for staff to extinguish the fire by simple means (e.g. fire extinguisher) and therefore to limit the damage to a machine or to a small area.

Modern fire detectors are able to make an intelligent signal analysis and the detection behavior can be adapted to the environmental conditions. These properties provide significantly improved protection over conventional fire detectors.

It is important that fire detectors are installed in all areas of the laundry, including the laundry storage area, and that they are set according to the deceptive phenomena present in those areas. This guarantees early fire detection and prevents the triggering of false alarms.

### Alarming and evacuation

When all machines are in operation, the high ambient noise can be a distraction. The sound level of the sounder beacons should be selected to ensure that the alarm will be easily heard even under such circumstances. As a general rule, this is considered to be at least 10dB above the ambient noise level. The "beacon" element of the devices also provides optical reinforcement, which helps to ensure that all persons in the area will be alerted to the danger.

The choice between ceiling-mounted and wall-mounted devices must be made on a case-by-case basis. Optimal visibility from all areas is the overriding criterion, however, installation and wiring considerations should not be overlooked.

It is a well-documented fact that people react more quickly and correctly to spoken announcements, which could significantly improve the efficiency of an evacuation if this were to become necessary. In spite of this, the use of voice sounder beacons would not be recommended in this instance, due to the acoustic environment and the expected noise levels in a laundry. Voice sounder beacons are specifically designed for quieter environments such as hotel guestrooms or offices.

However, where local codes of practice require that a voice alarm system is installed (e.g. in larger hotels), the laundry rooms would also be equipped with appropriately dimensioned loudspeakers. One of the key advantages of such a system is that it can be tailored to provide optimum speech intelligibility even in challenging acoustic environments.

### Unwanted alarms due to deceptive phenomena

Aerosols and increased temperature are the fire characteristics which are detected by a multi-sensor fire detector (optical and thermal). The deceptive phenomena steam generates exactly these two phenomena – aerosols and increased temperature.

Practical experience has shown that the ASA neural fire detector is perfectly suited for use in laundries, thanks to its signal processing with **ASA** technology (ASA = Advanced Signal Analysis) and being able to switch its detection behavior. It changes its detection behavior according to the environmental conditions and therefore guarantees early and reliable fire detection. The risk of false alarms can be practically excluded.

If the ASA neural fire detectors are not installed directly above this area and they are operated with the relevant detector setting, the risk of false alarm due to a significant temperature increase can be practically excluded.

### Interference from the HVAC system

To guarantee reliable fire detection, the fire detectors must be mounted away from the airflow of the HVAC system so that, in the event of a fire, the smoke is not diluted in the vicinity of the detectors.

## ASATEchnology

### For intelligent, reliable fire detection with genuine alarm guarantee

ASATEchnology is a unique technology from Siemens that converts signals into mathematical data which is compared with programmed values in real time using intelligent algorithms. The special signal analysis process is very reliable in preventing false alarms caused by deceptive phenomena, such as steam, tobacco smoke or exhaust emissions. Find out more about **Sinteso** or **Cerberus PRO** fire detectors with ASATEchnology.

## Everything you need for comprehensive fire protection

Incorporated in a concept tailored to your customers' requirements, Siemens and its Solution Partner network provide:

- Early and reliable fire detection solutions, offering an unrivalled financially backed "Genuine Alarm Guarantee".
- Fully forwards and backwards compatible systems, to ensure any system provided is equipped to integrate the latest technology Siemens has to offer.
- Clear and fast alerting and evacuation processes.

All these aspects are at the core of comprehensive fire protection. Only when these are fulfilled can you be assured that people in your buildings are safe and assets and business operations are protected.

In order to offer your customers peace of mind, Siemens and its Solution Partner network have a variety of service and solution offerings that can be tailored to an individual client's needs. To find out more about this, please visit our Web site at [siemens.com/firesafety-markets](https://www.siemens.com/firesafety-markets) or contact your local Siemens organization through the [online contact form](#).

## Share the experience

With our dedicated program for consulting engineers, you can benefit from our extensive application know-how and complete portfolio.

With Siemens, you can offer your customers comprehensive fire safety for any application and environmental condition. Your customers will appreciate this as it enables them to reliably protect people, assets and business processes from fire.

Backed by more than 160 years of experience in the field, our offerings for early detection, reliable alarming, orderly evacuation and safe extinguishing are based on innovative and unique technologies. They provide you with convincing arguments like maximized life safety or environmental friendliness, and open the door to strong, long-term customer relationships. And with Siemens, you gain a reliable partner at your side and benefit from our smart tools, in-depth trainings and personal support – wherever you are, wherever you go.

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Creating environments that care.  
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