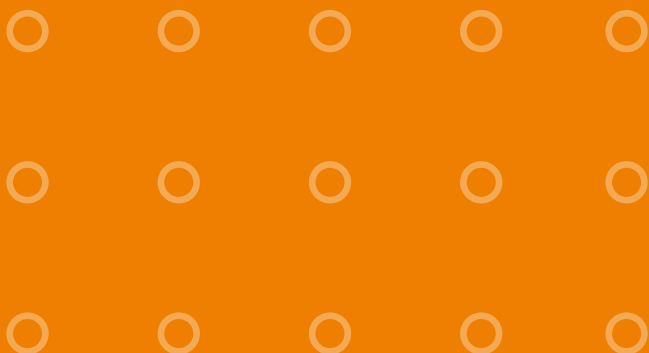
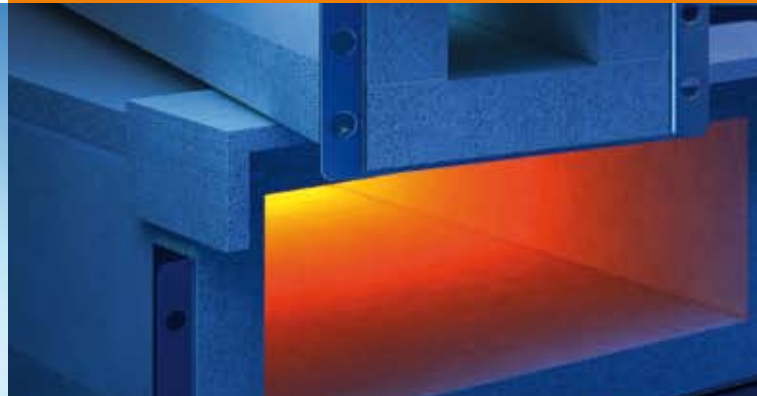


# BSS

## Fire protection systems

Systems and planning aids  
orientated to the protection aims  
for practical and approved mounting

BSS fire protection systems 2008



## OBO. Used by professionals.

*OBO understands what professionals need: perfect solutions for all aspects of an electrical installation. User-friendly, practical products for fast, uncomplicated installation. Add to this a comprehensive training programme and the OBO expert hotline for on-the-spot assistance at the construction site. OBO, the brand with the hot wire to the customer.*

## Systems



Conducting electricity, routing data, controlling energy – with a complete product range of over 30,000 articles OBO offers user-friendly products and practical solutions for a professional data and electrical infrastructure in electrical installations. And as anyone working with OBO quality products knows, one goes hand in glove with the other. On the one hand, we can provide a wide range of products; on the other hand, we can offer networked thinking – something absolutely natural to us as a systems manufacturer.

- ▶ Seamless and complete programme for all aspects of electrical installation
- ▶ Over 30,000 items in seven product units
- ▶ Ongoing product maintenance and further development
- ▶ Proprietary development and production facilities

## Quality



Professionals demand quality. A quality offered by all OBO brand products and services:

- ▶ QA certification to DIN EN ISO 9001:2000
- ▶ Tested material and manufacturing quality
- ▶ Numerous national and international test seals and certificates: GS and VDE marks, UL approvals
- ▶ Active involvement in national and international standardisation bodies
- ▶ Perfect logistical solutions for packing and shipping applications
- ▶ All the products in this catalogue are CE-compliant. This also applies to standard parts such as bolts and nuts, which are components of the respective product system.

# Local

# Support & advice



OBO Bettermann has subsidiaries, regional branches and agencies in over 50 countries. All these offices are there to ensure that OBO can always provide the fastest, best, most local help to its customers.

At OBO, you can be sure of receiving help from expert employees: for individual solutions and application tips and with practical seminars in the OBO training centres and branch offices.

● = Branch   ● = Agency

- |                  |                        |
|------------------|------------------------|
| ● Argentina      | ● Lebanon              |
| ● Australia      | ● Lithuania            |
| ● Austria        | ● Malaysia             |
| ● Belgium        | ● Malta                |
| ● Brazil         | ● Netherlands          |
| ● Bulgaria       | ● New Zealand          |
| ● China          | ● Norway               |
| ● Croatia        | ● Poland               |
| ● Czech Republik | ● Portugal             |
| ● Denmark        | ● Romania              |
| ● Eritrea        | ● Russia               |
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| ● Ireland        | ● Turkey               |
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#### Phone

**+49 (0) 23 73 89-0**

#### Fax

**+49 (0) 23 73 89-2 38**

#### E-mail

**[info@obo.de](mailto:info@obo.de)**

#### Internet

**[www.obo-bettermann.com](http://www.obo-bettermann.com)**

# Futuristic components for tomorrow's building technology

Building Technology by OBO®

## Transient voltage and lightning protection systems

OBO offers an entire product range for reliable protection against lightning and surge damage.

## Fire protection systems

Preventive fire protection is a crucial part of building safety. OBO can offer a complete product range for all application areas of fire protection systems.

Modern buildings are becoming increasingly complex. The requirements for energy and data infrastructure are growing. OBO systems provide the flexible, convenient solution to controlling and operating the diverse functions. Yet increasing complexity creates vulnerability. Our transient and lightning protection systems and fire protection systems offer effective protection for both buildings and the people inside them.

think orange.  
think connected.

#### **OBO BUS and plug-in devices**

The OBO BUS system intelligently controls the diverse functions of a building. OBO's modern plug-in devices offer intelligent solutions to meet the most discerning requirements.

## Protecting lives. Maintaining values. The OBO fire protection systems

Perfect fire protection for all areas: OBO offers a complete programme of professional products for all fire protection applications in buildings – from the cellar to the roof, from a detached house to an industrial complex. In

addition, there is also the knowledgeable advice of an experienced, competent system manufacturer and training courses and seminars held by professionals for professionals.



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# General fire protection principles

## What is fire protection?

In general, fire protection is based on four pillars: construction, systems, organisation in preventive fire protection and, of course, combative fire protection. This division allows more accurate definition of the different areas with their aims.

### 1. Construction fire protection

Depending on the type of use, there are different requirements for buildings. In construction terms, fire sections are created, for example, and components or the position and length of emergency routes defined. The basis is the building regulations and special building regulations of the German federal states. These specify the minimum requirements for buildings with a specific type of use.

### 2. Systems fire protection

The use of special systems minimise fire risks, protect emergency and escape routes and maintain functions. These systems, e.g. sprinklers, fire alarms or safety lighting systems, are either required by law or for private financial interests.

### 3. Organisational fire protection

This area includes the known escape route plans, fire protection regulations and behavioural rules for people in case of fire. The aim is, should an emergency occur, to carry out controlled procedures, in order to minimise as far as possible the risks to personnel and visitors, who are not usually familiar with their surroundings. The creation of a company or plant fire brigade is also one of the organisational measures. Their task is, of course, combative fire protection.

### 4. Combative fire protection

The creation, organisation and maintenance of a fire brigade is part of the

area of combative fire protection. All the vehicles and equipment as well as the functions of the personnel employed are specified. The tasks primarily consist of fighting fires and providing technical assistance. The fire brigades can be either public or private. Each community is obliged to maintain a fire brigade. Companies may have company or plant fire brigades.

All four areas must achieve the protective aims within a specific framework. This may be achieved in a number of ways. However, there is no point in trying to achieve 100% safety. The fire protection measures must be economically viable.



# General fire protection principles

## Fire protection concept



### Protection aims

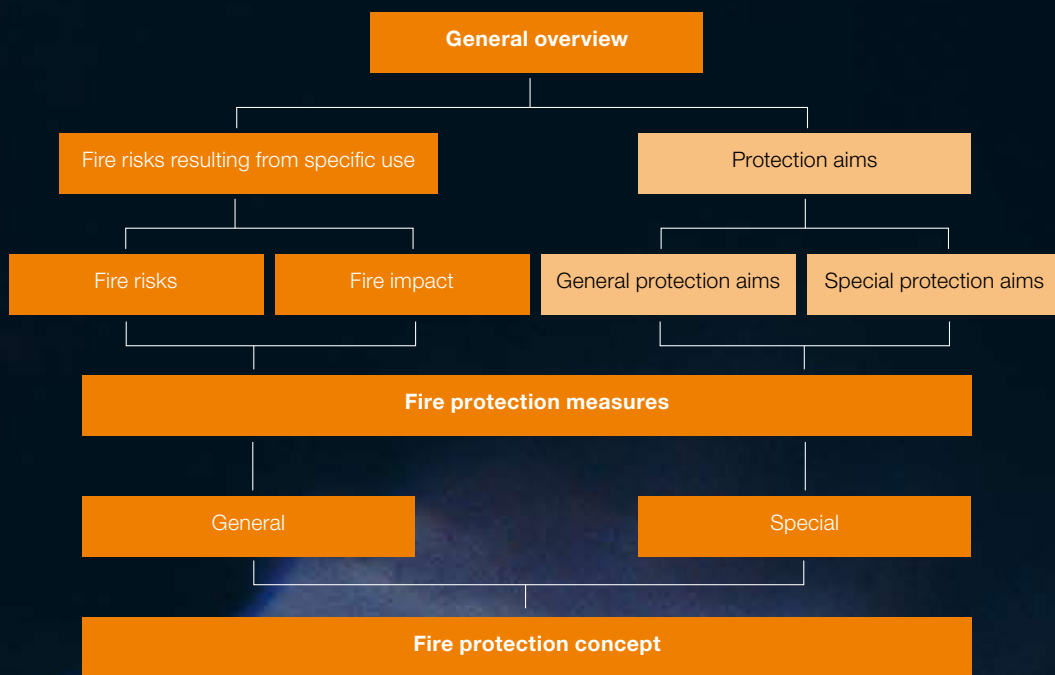
When planning a construction project, the question must be asked: which protection aims are trying to be achieved? Is it primarily about protecting people, e.g. in meeting places, or purely about protecting property? The possible risks and dangers must be evaluated fully.

### Economic aspects

It is wise to combine maximum risk reduction with minimum economic costs. For example, a production facility in the chemicals industry must be protected against failure for the operator, but there is no basic public interest. Requirements by insurers may also lead to special fire protection measures.

### Basic planning principles

Fire protection concepts are used to view the totality of a building and to detect all the risks and dangers. The protection aims for the buildings are specified, based on these definitions. The consequence is that special and general fire protection measures are defined and implemented for the operation of the building. The most important principle is that safe, risk-free operation must be possible.



# General fire protection principles

## Construction law

The devastating city fires in the Middle Ages ensured early on that people began to think about the way in which their towns and cities were built. Slowly, the crowded buildings vanished and so-called regional planning laws were introduced. Even today, these define the distances to be maintained between buildings, in order to prevent the spread of fire.

### MBO – Model Building Regulations

In Germany, the Model Building Regulations are the basis for the erection of any building and the use of building products. As construction law is in the hands of the individual federal states, this basis was, in most states, introduced into the existing statutes as state building regulations.

### General requirements

Paragraph 3 of the MBO lists basic requirements of constructions. It states that a construction must be “arranged, erected, modified and

maintained in such a way that public safety and order as well as life, health and the natural requirements for living are not endangered.” This means both people, property and their surroundings. Depending on the sector involved, the responsibilities are carried by the planners, craftsmen and operators.

### Fire protection in the MBO

Paragraph 14 of the MBO makes the first fire protection requirements. As already described in §3, the building must be erected in such a way as to “prevent the causes and spread of fire and smoke, and allow the rescue of people and animals as well as effective extinguishing measures.” This specifies three important protection aims.

### Master Conductor System Directive MLAR

As a result of the fire at Düsseldorf Airport, the Master Conductor System Directive (MLAR) was completely revised and introduced as technical construction regulations in the appropriate construction laws of the German federal states. These regulations specify the requirements for installations in a building. They apply to electrical, plumbing and heating cable systems but not to ventilation systems. They are used for installations in emergency routes, cable routing through walls and ceilings at the ends of rooms and for systems with electrical function maintenance in case of fire. This puts into practice the protection aims specified by §14 of the MBO.



# General fire protection principles

## Building classes

### Building types

Major fire protection is not a requirement for every building. The model building regulations define various classes of buildings, which must each be viewed differently. Classes 1 to 3 primarily contain smaller buildings, which usually contain few people. Higher buildings below the 22 metre limit can be found in classes 4 and 5.

### Special buildings

Ever larger constructions mean that the requirements also become greater. Special buildings such as industrial buildings, tower blocks and meeting places are regulated by special ordinances. It is perfectly possible that a building complex is divided up into different fire sections, the fire protection of which is viewed and evaluated differently according to the type of use. If there is no special ordinance for a building, then the minimum requirements of the state building regulations apply.

### Construction law – state law

Not all the German federal states have applied the Model Building Regulations and the appropriate ordinances to the same extent. It may be possible that there are differences in the regulations between states. The Master Conductor System Directive is also affected by this: the states have the right to make modifications or apply the regulations as they stand. Therefore, during the planning stage, note should be taken of not only the location of the building but also the valid regulations.



# What happens during a fire?

Often, it is just carelessness – a forgotten candle, an unextinguished cigarette – or a technical defect, which triggers a catastrophe. It is only a short time before a flame becomes a fire – from the first signs to a major incident.

Each year, around 200,000 fires per year in Germany alone can cause billions of euros of damage. Each year, around 600 people die from

the consequences of a fire, 60,000 are injured, 10% of them seriously.

Often underestimated is the devastating effect of the highly toxic and aggressive fire gases. Estimates suggest that around 95% of fire victims die not due to the immediate effects of the fire, but of poisoning from the smoke. Immense property damage is also incurred through the corrosive effects of the gases crea-

ted during a fire. They may cause lasting damage to the structure of a building.



*Sensible protection:  
OBO smoke detectors from the EGS division  
can be integrated in a danger warning  
system with an OBO B.U.S. system.*

## Approximately 95% of all deaths during fires are caused by smoke poisoning.

### Danger 1

#### Rapid spread of the fire

If a fire starts, then it may get out of control very quickly. The flames will soon work their way through all the combustible materials, the temperatures increase and the fire spreads ever further in an explosive manner. During a fire, the chief task of fire brigades, alongside actually fighting the existing flames, is to prevent the fire from spreading to neighbouring buildings or building sections, in order to limit damage.

Construction components such as fire walls, fire resistant ceilings, fire-proof doors, cable insulation and additional measures for preventive fire protection can help to prevent, or at least delay, the spread of fire.

### Danger 2

#### Severe smoke creation

Smoke and soot are an often underestimated source of danger. Depending on which materials catch fire, the combustion process will cause, amongst other things, the production of the toxic gases

- ▶ Carbon monoxide
- ▶ Carbon dioxide
- ▶ Sulphur dioxide

as well as water vapour and soot.

Severe smoke creation in a burning building is not just a risk to the lives and health of the victims, but also impedes the possibility of fighting the fire, as the fire brigade will have trouble localising the source of the fire.

Therefore the aim of preventive fire protection must also be to limit smoke creation to just the affected area.

### Danger 3

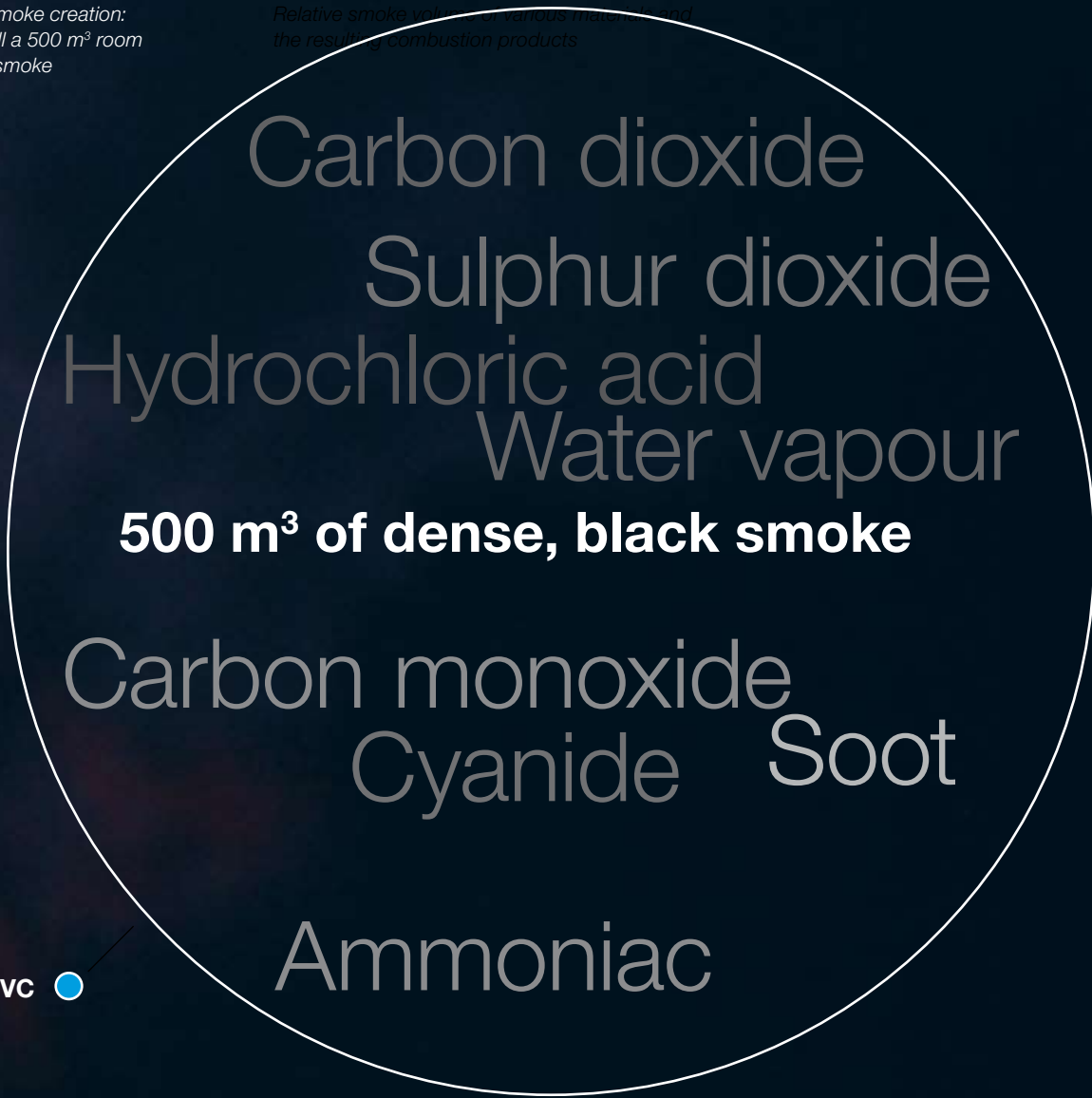
#### Creation of corrosive combustion gases

The subsequent damage of fires, and particularly of cable fires, should not be underestimated. For example, if the PVC cable insulation burns, this creates chlorine gas, which, together with the extinguishing water, creates aggressive hydrochloric acid. This acid enters the concrete, attacks steel reinforcements, and thus damages the building structure, sometimes to a great extent. Often, such subsequent damage considerably exceeds the actual fire damage. Additional corrosive combustion gas products are

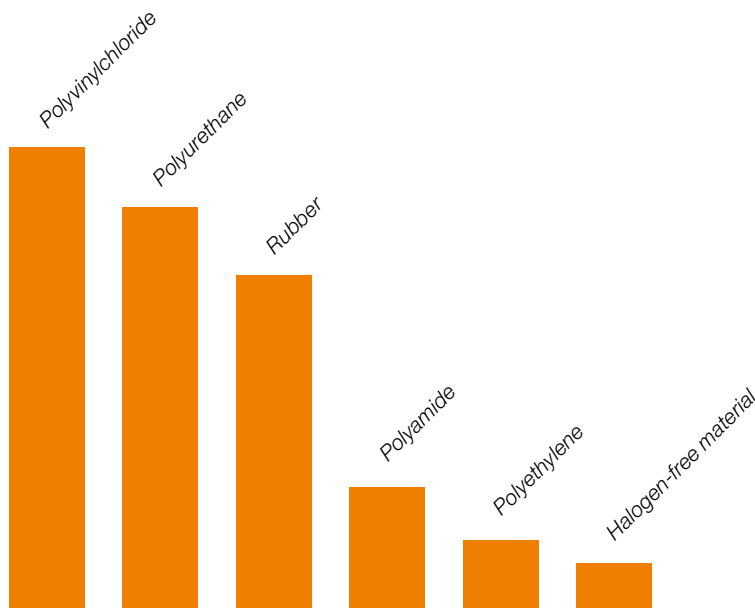
- ▶ Cyanide and
- ▶ Ammoniac

Main danger of smoke creation:  
1 kg of PVC will fill a 500 m<sup>3</sup> room  
with thick, black smoke

Relative smoke volume of various materials and  
the resulting combustion products



1 kg PVC ●



Relative smoke volume of various materials per minute



## The protection aims

### Three steps to effective fire protection



In buildings containing lots of people, preventive measures should be taken for fires, so that nobody is endangered by fire and smoke. There must be a way to leave the building quickly and safely. In such emergencies, people who are unfamiliar with

their surroundings have great difficulty estimating the risks correctly and leaving the building using the most direct route. Therefore, three steps for effective fire protection in buildings are essential.

#### **1st protection aim: Limit the spread of the fire**

The constructive restriction of the fire to specific sections means that the remaining parts of the building are protected for a certain period of time. This allows protection of people and property. The fire brigades can protect additional parts of the building through extinguishing measures.

#### **2nd protection aim: Protect emergency and escape routes**

Making emergency and escape routes fireproof allows safe evacuation. The fire brigades of course use these parts of the building to tackle the fire. Correct design can buy time if there is a fire.

#### **3rd protection aim: Maintain function**

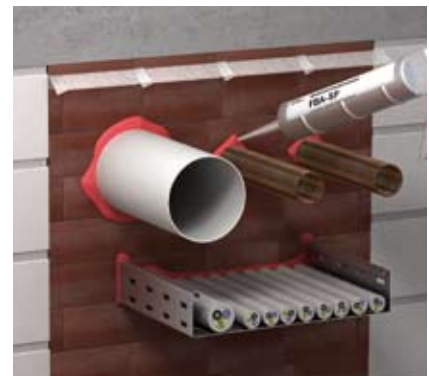
Safe buildings give those present the opportunity to leave the endangered environment as quickly as possible. Safety lighting can also play a vital contribution. If there is a fire, this and other safety-relevant systems must continue to function for a sufficiently long period of time. This also permits effective support of extinguishing measures by the fire brigades.

# 1st protection aim: Limit the spread of the fire. Protect people and property.

Solution: maintenance of the fire sections

## Insulation systems

- ▶ Cable insulation
- ▶ Pipe insulation
- ▶ Combination insulation



## Function of fire walls

Fire walls should ensure that a fire cannot pass to neighbouring buildings or building sections. This creates so-called fire sections. The construction design of these fire walls – materials, fire resistance classes, stress values – is regulated by the state building regulations and DIN standards.

## Running of cables

Electrical cables and pipes may only be run through walls and ceilings at the ends of rooms when there is a guarantee that they do not present an opportunity for fire and smoke to spread. This requirement is fulfilled by insulation systems. These permit the reliable sealing of the ceiling and wall penetrations required for installations against fire and smoke.

## Special requirements

Some of the requirements for cable penetrations combined with insulation are:

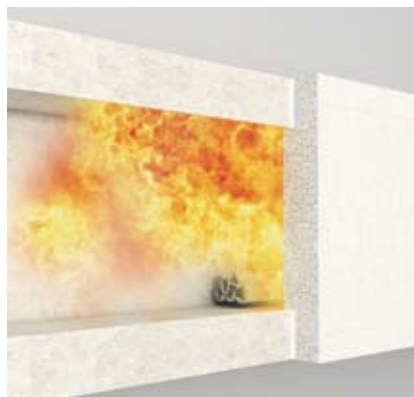
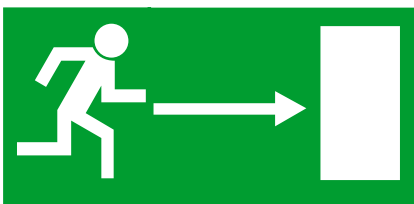
- ▶ The spread of fire and smoke must be prevented.
- ▶ Closing must be guaranteed.
- ▶ no unapproved heating of the surface of the cables and pipes of the insulation surface and any cable support systems being run through.

## 2nd protection aim: People must be able to leave the building safely.

Solution: protection of emergency and escape routes

### Escape route installation systems

- ▶ False ceiling mounting
- ▶ Fire protection ducts



### The Master Conductor System Directive (MLAR) controls installations in emergency and escape routes

There are special regulations for electrical installations in emergency and escape routes. There must be a guarantee that, if there is a fire, these routes can be used to leave the building without any risk. The Construction Supervision Commission of the German Development Ministers' Conference regulates the details of the Master Conductor System Directive (MLAR). This regulation

applies to electrical installations in stairwells, corridors and passages used as emergency routes.

It must always be noted that any fire coming from an electrical installation is not permitted in this area. This requirement can be fulfilled using the following installations:

- ▶ Installation in fire protection duct systems
- ▶ Installation above suspended fire protection ceilings

Fluchtweg-Installations-Systeme	
<b>Fluchtweg-Installation: Deckenmontage mit Kabeltrinnen</b>	
zweifach übereinander Variante zweifach beidseitig Variante zweifach auf einem Ausleger	
<b>Systemparameter im Überblick</b>	
<b>Systemparameter</b> Systemhöhe: 1,5m Systemtiefe: 200mm Systembreite: 100mm Systemgewicht: 10kg/m² Systemdruck: 100Pa Systemtemperatur: 100°C	<b>Baufälle pro Abhängepunkt bzw. Stoß-/Endstelle</b> U-Hängesystem US...

You can find escape route installation systems in the green section of the catalogue.

## 3rd protection aim:

## Important electrical systems must continue to function.

Solution: function maintenance for electrical systems

### Systems

- ▶ Function maintenance systems
- ▶ Fire protection duct systems



### Current for safety equipment even if there is a fire

To ensure that emergency and escape routes remain usable and also important technical equipment such as emergency lighting, fire alarm systems, smoke exhaust systems, etc. in case of fire, it is absolutely essential to provide special protection for the power supply for these systems. The use of special cables and routing systems means that it is possible to maintain the power supply, even in the case of fire, thus guaranteeing the function maintenance.

### Particularly important in public buildings

Function maintenance is particularly important in buildings regularly frequented by large numbers of people. This includes public buildings such as schools, hospitals, meeting places, authorities and underground stations, but also industrial facilities, tower blocks, shopping centres and multi-storey car parks.



### 30 minutes: function maintenance for safe evacuation

The first 30 minutes after the start of a fire play a key role in evacuating a building. During this period, the function maintenance of the following equipment must be guaranteed:

- ▶ Safety lighting systems
- ▶ Lifts with fire controls
- ▶ Fire alarm systems
- ▶ Systems for warning and issuing information
- ▶ Smoke extraction systems



### 90 minutes: function maintenance for effective fire-fighting

To support the fighting of fires, it is important the specific technical equipment can still be supplied with sufficient power 90 minutes after a fire starts in a building. This equipment includes:

- ▶ Water pressure intensification systems for the extinguishing water supply
- ▶ Automatic smoke extraction systems and smoke protection pressure systems
- ▶ Fire brigade lifts
- ▶ Bed lifts in hospitals and similar buildings

# Tested and considered safe

## Safety through fire tests

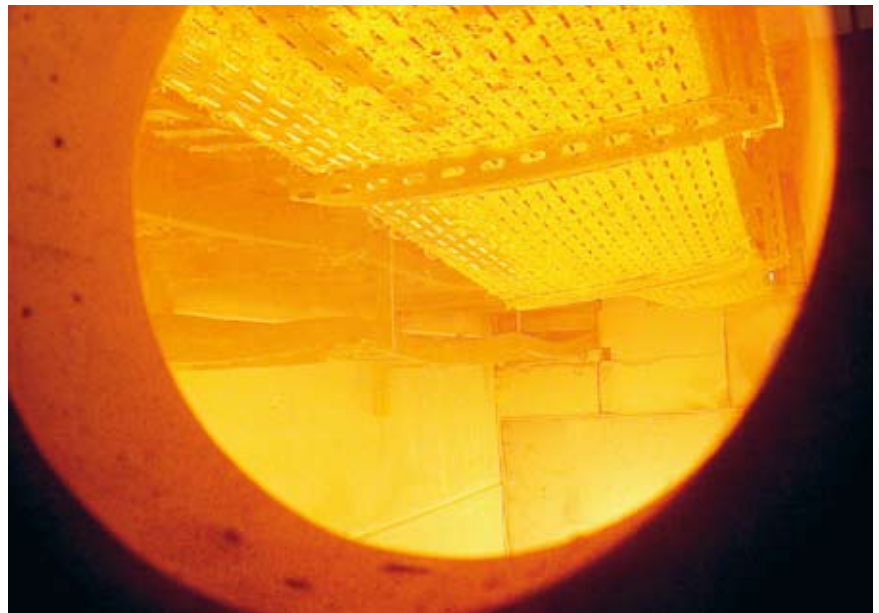
### Fire testing according to DIN 4102

DIN 4102 is a key factor in the proof that products and systems fulfil fire protection requirements for electrical installations. This standard describes in detail the fire tests, which must be carried out in a special test furnace in order to obtain the appropriate test certificates, test reports and approvals.

DIN 4102 "Fire behaviour of building materials and building components" consists of a number of sections. These sections describe terms, requirements for the appropriate materials or components and test criteria and test operations. A test report is created for each fire test carried out, which documents the test and the results. This report serves as the basis for the application for a general construction approval or a test report.

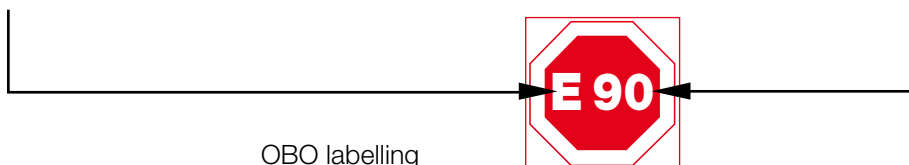
### Safety through testing certificates

All OBO fire protection products are tested according to DIN 4102 and possess the appropriate proofs to provide the user with the greatest possible level of safety. These documents, which contain details of items to be observed during installation and the use of the appropriate products and systems, can be obtained on the Internet at [www.obo.de](http://www.obo.de).



Meaning of the DIN abbreviations and OBO designation

Abbreviation	Meaning of...		Abbreviation	Fire resistance period, at least...
<b>S</b>	Cable insulation	<b>Example</b> The E90 classification means that if there is fire, an electrical cable system can guarantee the power supply to the connected systems for at least 90 minutes – this can be seen in the OBO pictogram.	<b>30</b>	30 minutes
<b>I</b>	Installation shafts and ducts		<b>60</b>	60 minutes
<b>E</b>	Function maintenance of electrical cable systems		<b>90</b>	90 minutes
<b>R</b>	Pipe insulation		<b>120</b>	120 minutes



# Training courses and seminars

## Safety through knowledge



### **OBO fire protection seminars: first-hand knowledge**

With a comprehensive programme of training courses and seminars on the subject of fire protection in electrical engineering, OBO Bettermann is able to support its customers with specialist knowledge from a single source. Current trends and developments are explained along with information on the most important standards and regulations. As well as the theoretical principles, this concerns implementation in everyday situations.

### **Broad range of topics**

The OBO fire protection seminars cover a wide range of subjects, ranging from general basic principles to current practical knowledge on the different product areas. Customer or project-specific seminar topics are also possible.

**The OBO seminar programme can be viewed at any time at: [www.obo.de](http://www.obo.de)**

### **OBO regional sales offices and technical hotline**

The competent OBO regional sales offices are available for individual consultation. The OBO hotline can provide help and assistance for technical problems.

### **Project and system technology: think in networks, work in networks**

The specialists of OBO Projects and System Technology develop and implement convincing solutions for electrical installations, in particular for large-scale projects, in administrative buildings and industrial and systems construction. Here, the requirements for quality and functionality are particularly high, and the topic of fire protection is particularly important in this area.

In the field of fire protection, OBO customers can profit from the experience and the know-how of a globally operative group of companies, which was one of the first to offer tested MLAR systems. At an international level, the OBO trademark stands for innovative products developed and manufactured in-house, and for certified quality and comprehensive service.

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Pipe insulation

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