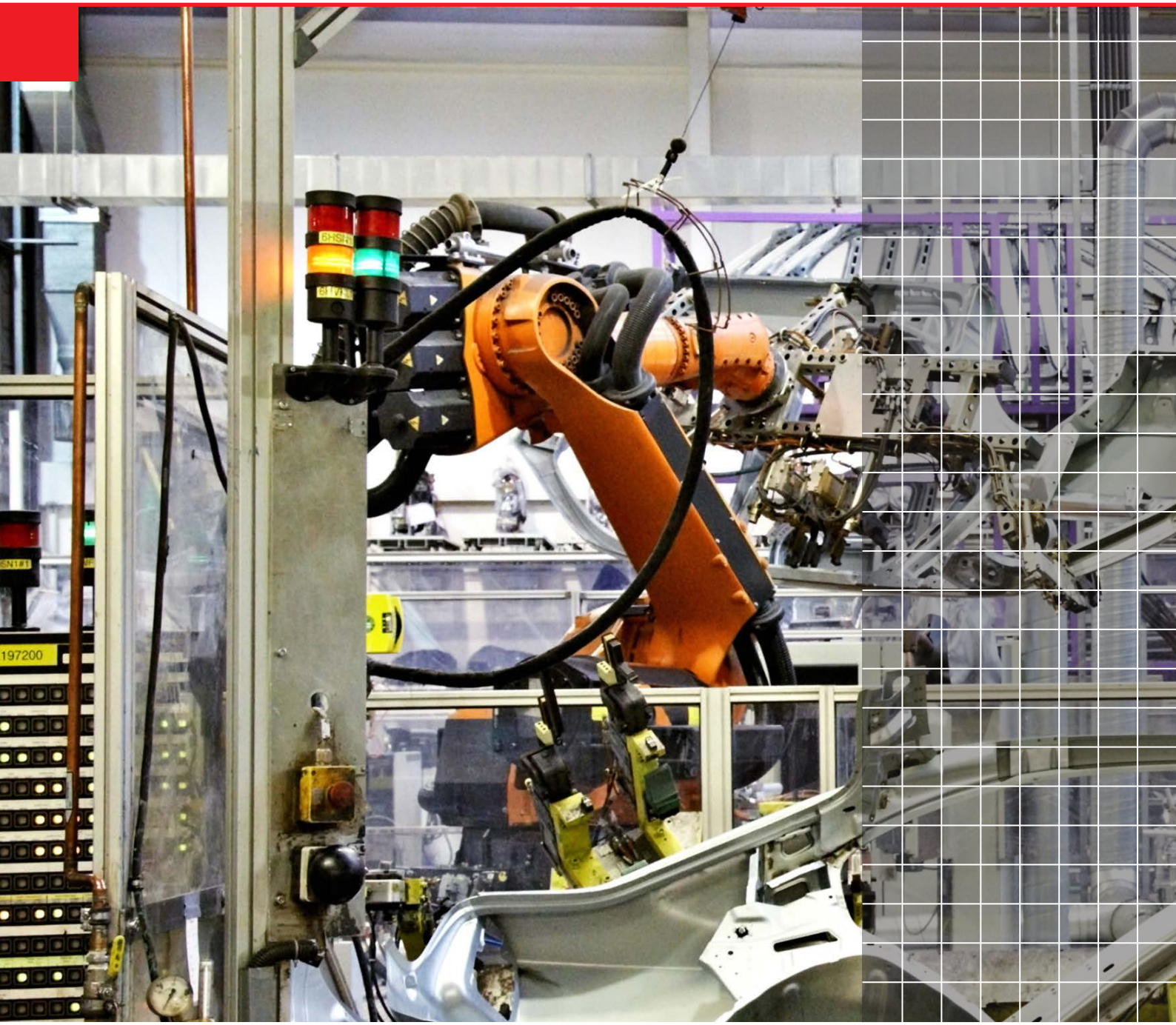
Experts in fire protection

Fire protection solutions for automotive plants



BRANCH SOLUTIONS

AUTOMOTIVE PLANTS

Safety throughout the entire value chain

Many automotive plants continually invest in the modernization and expansion of their production facilities. The requirements for fire protection are particularly high due to the extensive production processes. Special fire protection technologies secure the high asset values against possible damage caused by fire and in addition offer dependable protection of the workforce.

Characteristic of the process of manufacturing an automobile are production processes using complex machinery and systems with ever increasing production speeds and automation levels.

Fires are often caused by technical defects in production systems. Due to the presence of highly flammable materials within production areas and the open construction of production and assembly halls, fires can spread rapidly. Warehouse areas and plant infrastructure, server rooms, control rooms or common rooms and office spaces also present a fire risk.

When a fire occurs due to inadequate or non-existent fire protection measures, extended business disruptions may occur. These will cause substantial costs and, at worst, may cause customers to turn to new suppliers elsewhere, if the delivery delays continue.

*Sprinkler systems** are an important component of building protection for car manufacturing plants. Their basic concept of selective extinguishing satisfies the requirements. In the event of activation, for example, the water is not dispersed throughout the entire production and assembly hall.

A *fire detection system** complements building protection in all areas. The signals from the fire detectors converge in the *fire detection and extinguishing control panel**. This notifies people in danger as well as the fire service and in many cases assumes control and function monitoring of the fire protection systems.

In areas with a high level of movement of people, *smoke and heat venting systems** keep escape and rescue routes clear. In the event of fire, this guarantees clear views and direction as well as fresh air for breathing. In addition to this, *wall mounted hydrant systems** allow an immediate manual fire fighting in these areas. Structural fire protection and the use of *fire extinguishers** complete building protection.

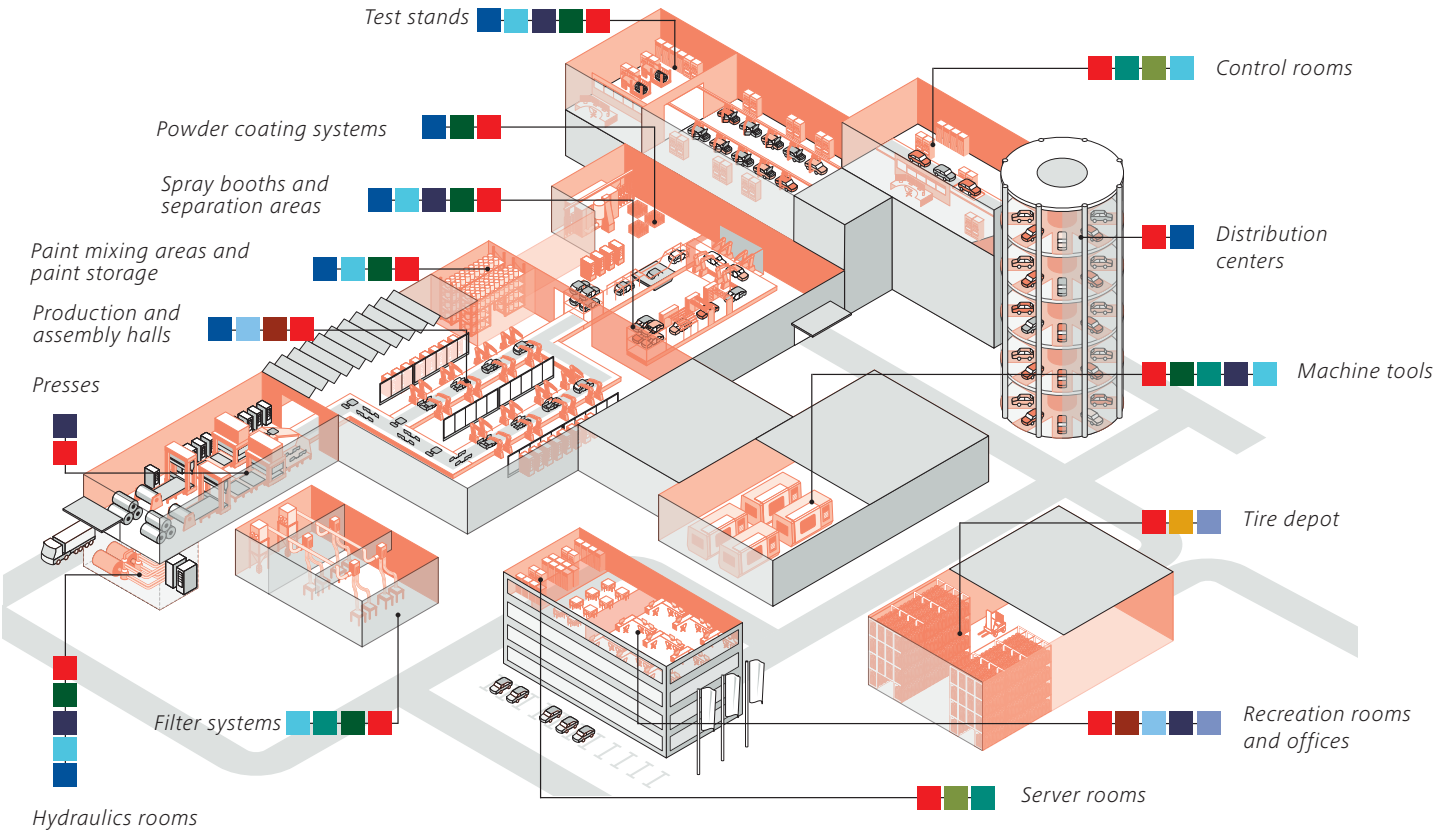
In addition to the basic configuration, other fire protection systems come into operation for total flooding and local protection in automotive plants:

- *Deluge systems**
- *Minifog water mist systems** *(high-pressure and low-pressure)*
- *Foam-based extinguishing systems**
- *Oxeo inert gas systems**
- *Carbon dioxide extinguishing systems**
- *MX 1230 fire extinguishing systems**

* *Technologies are explained on pages 20 to 26.*

Protection zones

Optimal fire protection in automotive plants requires space and equipment protection that is tailored to each protection zone. Minimax can fall back on a unique range of proven and innovative fire protection systems and components. These meet multifaceted requirements and
fit extremely efficiently and economically into the basic configuration of the building protection for a total solution.



- Sprinkler systems
- Deluge systems
- Minifog water mist systems
- Hydrant systems
- ProCon XP
- Foam-based extinguishing systems*
- Oxeo inert gas systems (Ar/N_2)
- Carbon dioxide extinguishing
- MX 1230 fire extinguishing systems (Novec™ 1230)
- Smoke and heat venting systems
- Fire detection systems

Production and assembly halls - optimally protected

Production and assembly halls are typically extensive multi-storey buildings that offer the necessary space for machines and systems. Such halls are often not structurally subdivided, and the individual areas are interconnected by fully-automated conveyor systems.

Risks

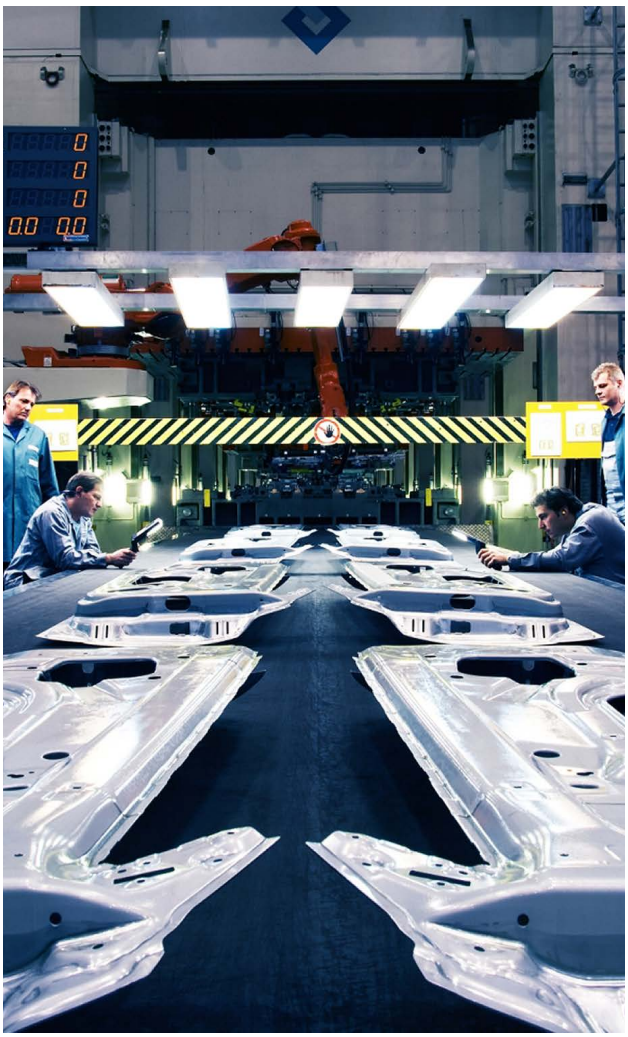
- Technical defects such as short circuits in production facilities
- Highly flammable materials
- Rapid spread of fire due to open spaces and interconnecting conveyor systems

Fire protection

*Sprinkler systems** are often the ideal choice for production and assembly areas.
The *fire detection systems**, *wall mounted hydrant systems** and *smoke and heat venting systems** complete the fire protection.

Hydraulic presses – lots of heat and flammable oil

Hydraulic presses are often used for metal forming. In the process of press hardening, the units that are to be compacted are coated with an oily film before pressing, heated up to the required forming temperature and then pressed into the desired form using a stamp and die. This creates high friction heat. Hence the units to be compacted must subsequently be cooled down in a controlled manner in open oil hardening basins.



Risks

- Leakages in oil pipelines
- High friction heat can ignite the oily film on the units to be compacted
- Highly inflammable oil

Fire protection

The water-saving *Minifog ProCon water mist suppression system** is ideally suited for fire protection. Minifog ProCon impulse nozzles positioned at the press create a fine spray that reaches the fire even in the event of the press having complex geometries.

A fire detection system releases the extinguishing system by means of UniVario flame and heat detectors.

Hydraulics rooms – minimizing fire risk from leakages

The necessary forces for the pressing process are generated in the hydraulics rooms. This requires hydraulic power units, which consist of hydraulic oil tanks, drive motors and pumps Such facilities are generally located in an enclosed hydraulics chamber below the press.

Risks

- Leakages in oil pipelines or shaft seals
- Hot surfaces of the power units
- Igniting oil deposits

Fire protection

In addition to the building protection *Minifog ProCon water mist suppression systems** provide reliable protection for the components of hydraulic power units. If sensitive electronic equipment is present, *carbon dioxide extinguishing systems** alternatively allow a residue-free extinguishing of the components. The control of the extinguishing system is via a fire detection system* using intelligent UniVario flame and heat detectors*.

Spray booths and separation areas – optimally protected

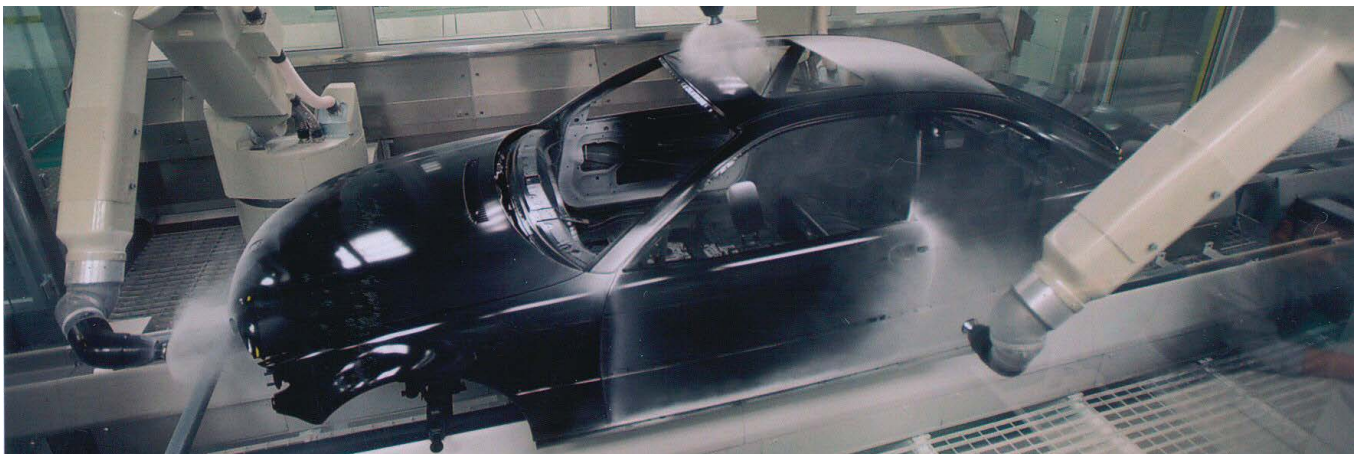
In paint spray systems, primers, base and cover coats or clear paint coats are often applied electrostatically using paint robots on car bodies or larger workpieces. Paint-spray systems typically consist of devices for the preliminary treatment of the vehicles, paint booths with paint robots, cooling zones and drying areas, filter equipment and various work booths for inspection and repairs. Ventilating and aerating systems ensure the necessary atmospheric environment in the paint- and work booths

Risks

- Technical defects in the power supply
- Highly flammable solvent-based paints
- Sparking
- Paint deposits in the drying furnaces

Fire protection

*Sprinkler systems** are often the preferred choice in paint booths, paint driers and manual working cubicles. For paint driers operating at temperatures in excess of 100° C require a sprinkler system with dry pipe system. If the spray booth's equipment – for example filter systems – are particularly sensitive to water, water-saving *Minifog ProCon water mist extinguishing systems** offer a good alternative. Special quick-response YMX *flame detectors** detect the ignition sources and transmit signals to the fire alarm control panel. The control panel in turn sends command impulses for shutting down robots, conveyor systems, the supply of paint, air and solvents and triggers the extinguishing system. The control air of the paint robots is deactivated and instead carbon dioxide is emitted aimed at specifically extinguishing the fire.



Powder coating systems - optimally protected

In a powder coating system, powdered paint particles are applied on to the work pieces to be painted, usually with a spray gun, and subsequently burnt on to the surface. A typical powder coating system consists essentially of a powder booth, a powder enameling furnace and filter systems. In addition, in larger systems, powder recovery systems with ventilation ducts are used for the recycling of excess oversprays.

Risks

- Sparking
- Paint deposits
- Often explosive atmospheres

Fire protection

Powder booths and enameling furnaces are reliably protected by the building protection of a *sprinkler system**. A *fire detection system** allows for an alarm to be issued even earlier. The fire alarm control panel may issue control impulses to shut down individual system components, e.g. the powder supply, high voltage and exhaust air.

A *carbon dioxide extinguishing system** is ideal for the protection of powder recovery systems. Special carbon dioxide extinguishing nozzles are installed upstream of the cyclone and filters in order to suppress the spreading of a fire in the ventilation ducts. Special *spark detectors** respond to even the slightest infrared radiation and transmit a signal to the fire alarm control panel, which in turn activates the extinguishing system.

Machine tool - optimally protected

Machine tools are used for different stages of processing such as drilling, turning, grinding or milling. These are often enclosed machine tools that consist of a work area, transport area and exhaust system. Depending on the material, two processing methods are differentiated: wet processing with the use of cooling lubricants containing oil and dry processing for working workpieces made of light metals.

Risks

- Unintentional build-up of heat
- Highly flammable coolants and lubricants
- Potentially explosive atmosphere at certain concentration levels of dust
- Metal fire when dry processing

Fire protection

Carbon dioxide extinguishing systems*are suitable for wet processing . The extinguishing nozzles may for enclosed machine tools be installed directly within the housing so that a fire can be extinguished precisely and without leaving a residue. An alternative to this is offered by the water-saving *Minifog ProCon XP water mist extinguishing system**. For the dry working of light metals the use of *Oxeo extinguishing systems** with argon extinguishing agent is the right choice. With the extremely inert noble gas argon, interaction with burning metal is excluded. The release of the extinguishing system is via a fire alarm system, in addition to which the fire alarm control panel can send signals to control the equipment.

Filter systems - potentially explosive atmospheres

Filter systems are used whenever the production process generates fumes, or when dusts are released through abrasion. Fine dusts occur for example when milling or cutting plastics or when processing other materials.

Risks

- Explosive atmosphere
- Highly flammable dust in the filter bags

Fire protection

*Carbon dioxide extinguishing systems** are ideal for protecting filter housings against fires. In case of metal extraction, however, the *Oxeo extinguishing system** using the argon extinguishing agent is the right choice to preclude interactions of the extinguishing agent with combustible metal. A *fire detection system** will trigger the extinguishing system.

Test stands – Extreme loads for test units

Test stands are used in automotive manufacturing plants for various purposes. Motor test stands serve to study the basic parameters of an engine; simulation test stands reflect external influences, such as special temperature fluctuations or vibrations, on individual components, while manufacturing test stands regularly check the quality of the cars

Risks

- Extreme loads applied to test units
- Accidental overheating

Fire protection

In addition to *sprinkler systems** *carbon dioxide extinguishing systems** allow extinguishing with a cooling effect for manufacturing test stands without leaving any residues. Motor test stands can be reliably protected with the *Minifog ProCon XP water mist suppression system**. Activation of this extinguishing system is via a*fire detection system** using intelligent *UniVario flame and heat detectors** or *HELIOS AMX5000 aspirating smoke detectors** with individually adjustable response sensitivity.

Paint mixing areas and paint storage areas – preventing spread of fire

In paint storage areas are subject to the particular laws and regulations applicable to hazardous substances areas . These require among other things secure storage, floor protection provided by sumps and extinguishing water retention systems. Often a paint mixing room with a dosing unit forms part of a paint storage area.

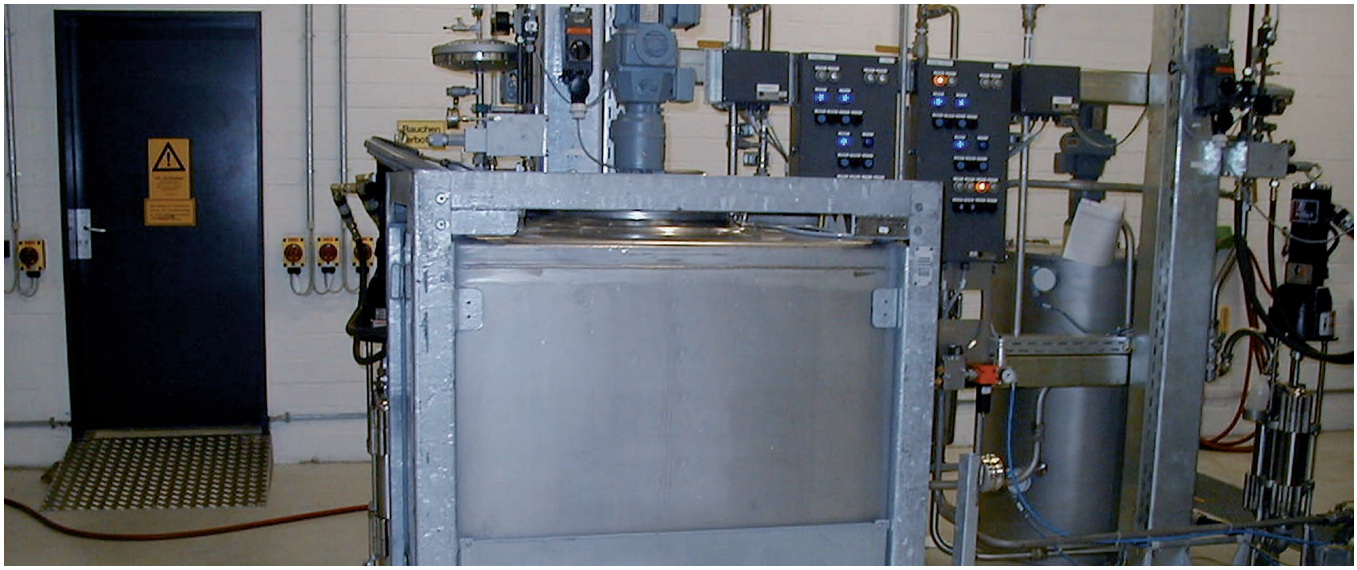
Risks

- Technical defects in storage equipment or a dosing facility
- Overheating of lighting equipment
- High fire load due to the large quantity of flammable paints

Fire protection

*Minifog ProCon XP water mist extinguishing systems** offer reliable protection in paint storage areas. Alternatively *sprinkler systems** with foam proportioner or *carbon dioxide extinguishing systems** or *Oxeo extinguishing systems** allow for residue-free extinguishing of fires.

*Fire alarm systems** activate the extinguishing system using *UniVario flame and heat detectors**.



Tire depots - high fire load under control

Tires are generally stored in bulk storage on specially designed transport pallets These depots are directly connected with production plants through transport facilities.

Risks

- Defective storage equipment or small appliances
- High fire load due to large density of many tires in a confined space

Fire protection

In view of the limited ability to wet the tires and the risk of a very fast development and spread of the resulting fire, this fire risk is best addressed with a *deluge system** with a film-forming foaming additive or alternatively a *foam extinguishing system**. In this regard, Minimax offers a variety of protection concepts tailored to the individual storage conditions in place, e.g. using open large-drop sprinklers. The extinguishing system is triggered by a *fire detection system** using *UniVario flame and heat detectors**.

Distribution centers – individually protected

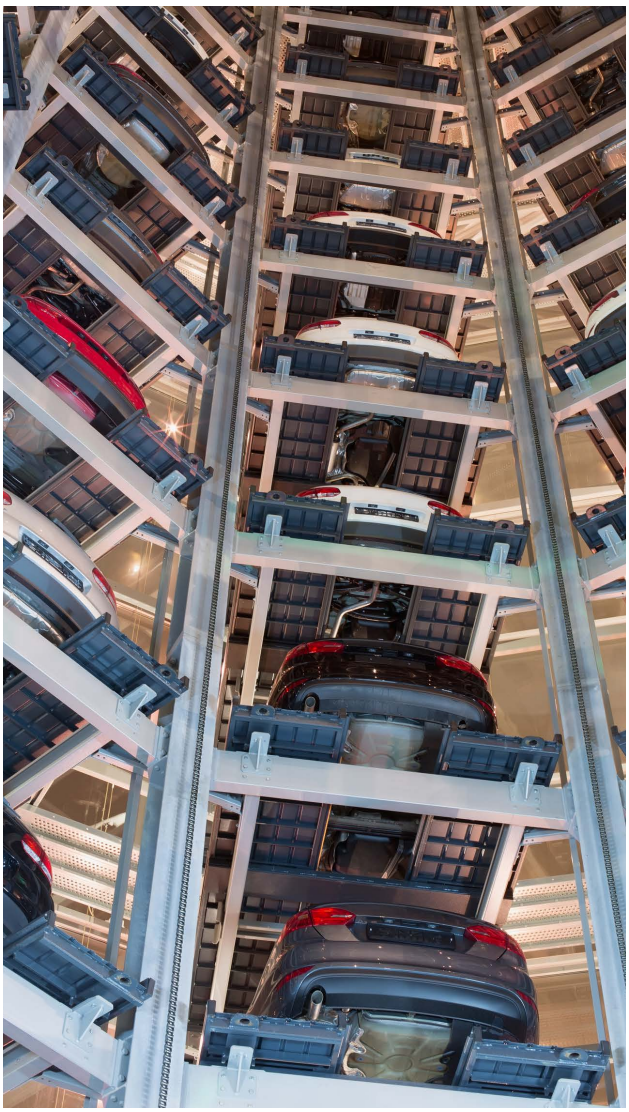
Representative distribution centers in the automotive manufacturing industry are often designed as a multi-level, fully automated parking system. The functional principle of operation and control logic are inspired by a high rack storage system: the vehicles are driven on to a mobile parking platform and parked automatically in a vacant parking bay using a conveyor system combined with shift unit.

Risks

- Short circuits in the vehicle electronics
- Rapid spreading of fire due to the chimney effect of the vertical shafts

Fire protection

Sprinkler systems with rapid-activation sprinklers have in particular proven to be effective for protecting a fully automated distribution center. The sprinklers are installed both below the ceiling and in the parking areas. A *fire detection system** provides even earlier alerting by means of *HELIOS AMX5000 aspirating smoke detectors**.



Control rooms – dependable protected

Control rooms are very sensitive and high-quality facilities which control fundamental production processes. They contain electrical switching and control equipment plus false floors with extensive cabling. Even minor damage can cause substantial operational failures.

Risks

- Short circuits
- Highly flammable materials

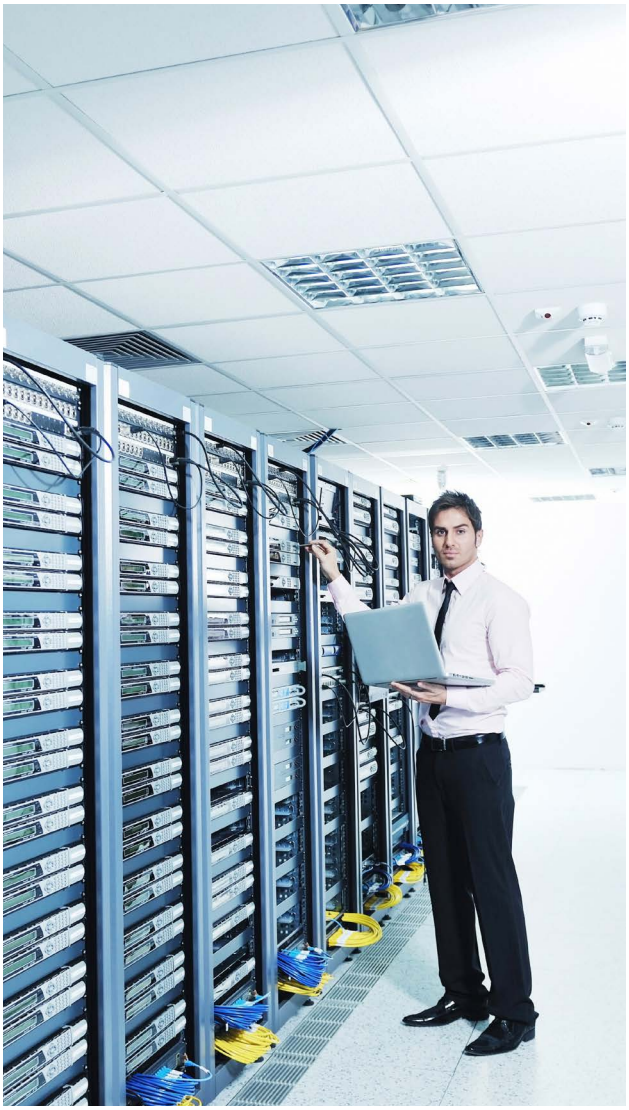
Fire protection

*Oxeo inert gas extinguishing systems** offer reliable protection in control rooms. For smaller control rooms, *MX 1230 extinguishing systems** offer an economic alternative.

The extinguishing system is activated by a *fire detection system** using punctiform smoke detectors or *HELIOS AMX5000 aspirating smoke detectors**.

Server rooms - data optimally protected

Server rooms are important, sensitive areas. In these rooms data of high importance for business operationsis stored, managed and exchanged over the network. The irretrievable loss of this data is through a fire may have considerable economic consequences for productivity or even the future of a company.



Risks

- Overheating of technical equipment
- Defects such as short circuits
- Considerable damage even in the case of small fires

Fire protection

For small to medium-sized server rooms the *MX 1230 extinguishing system** is the ideal solution. It uses the innovative extinguishing agent Novec™ 1230 to extinguish without leaving a residue and requires very little space. *Oxeo extinguishing systems** are ideal for larger server rooms. The extinguishing system is automatically triggered via the earliest possible detection of fire by the *HELIOS AMX5000* smoke aspiration system*.

Recreation rooms and offices - dependable protected

Offices, conference rooms and dining rooms are generally used by staff and guests. In addition, staff members may also retire to break rooms or smoking rooms and to kitchens during work. Corridors run through the entire building, serving as a main traffic route.

Risks

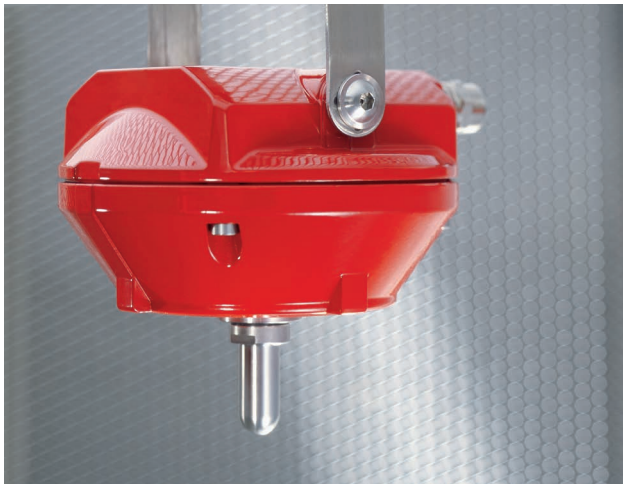
- Defective electrical devices such as projectors or computers
- Overheating of the lighting
- Short circuits at vending machines

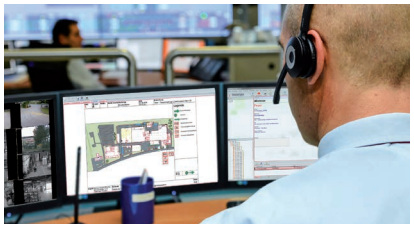
Fire protection

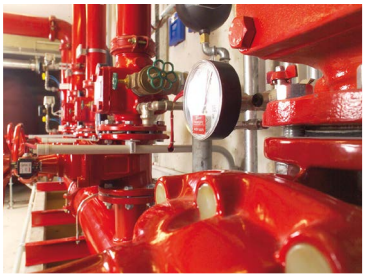
*Minifog EconAqua water mist extinguishing systems** offer space and water-saving protection and can be connected to an existing *sprinkler system** . In areas with higher ceilings, building protection in the form of a *sprinkler system** ensures dependable fire protection. For fire detection and activation of *Minifog EconAqua water mist extinguishing systems**, *fire detection systems** are a sensible complement. *Hydrant systems** and *smoke and heat extraction systems** complete the protection of the building.

Technologies used

Regardless of whether it's sprinkler systems, gas extinguishing systems, fire prevention systems or fire detection systems– Minimax can fall back on a unique range of tested and certified systems from its own development and production facilities.







Structural fire protection –
Blocking off fires
Structural fire protection helps to prevent or contain fires and to secure escape and rescue routes in the event of a fire. This requires subdividing buildings into fire zones that spatially contain the spreading of fires for a defined period. This means that openings are closed off with fire and smoke protection doors, fire protection gates and fire-resistant glazing. Fire protection coatings dependably protect steel constructions against the impact of fire. Minimax solutions for ventilation systems prevent the spreading of smoke and combustion fumes.

Fire Detection and Suppression Control –
Detecting fire hazards and reacting accordingly
Flames, smoke, gas emissions, heat – fire has many facets. Minimax has the right detectors and fire detectors for every kind of manifestation. All signals converge in the fire alarm control panel, which warns people at risk and the fire department and dependably provides all relevant information to the competent bodies. In addition, the fire detection technology controls and monitors in many cases all fire protection systems in the object and electrically triggers the extinguishing systems.

Fire Detection and Suppression Control Panels –
Heart of active fire protection
Fire detection and extinguishing control panels process detection results detected by sensors, control of alarm devices and set off alarms to permanently manned stations and the fire department. They continuously monitor extinguishing systems for functionality and trigger them electrically if necessary. In addition, they communicate with risk management systems or via web interface with Internet-enabled devices. Different model versions, from a compact small panel to sophisticated large control panels make it possible to select the appropriate fire detection and extinguishing control panel.

Fire extinguishers –
A firm grip on fires

Minimax develops and sells a complete range of portable fire extinguishers, such as powder, water, foam and carbon dioxide fire extinguishers. Our products cover the fire classes A, B, C, D and F for all application areas and industries. In the event of a fire, people can respond quickly and contain the fire. In office buildings as well as in production facilities and chemical plants. Minimax fire extinguishers mean added fire protection.

Univario industrial fire detectors –
Fit for every situation

UniVario industrial fire detectors are intelligent, platform-based, microprocessor-controlled fire detectors with robust housing and installation technology for the harshest working conditions. Thanks to a modular design and use of the latest signal processing technology, these devices meet individual specifications in an extraordinarily wide range of uses. Thus they function both indoors and outdoors, in the immediate vicinity of the protected facility or from greater distances, in clean rooms or areas as well as in extremely dirty process conditions.

UniVario YMX5000 –
Fit for every situation

The UniVario YMX5000 industrial fire detector consists of a control unit and up to three offset sensor units for spark and/or fast flame detection. The sensor units are connected to the control unit via cables and so can be installed even with severely restricted available space. The UniVario YMX5000 is ideal for use in a tough industrial environment. Temperature ranges from -40°C to 80°C are standard - up to 105°C is possible. The industrial fire detectors meet individual requirements in a broad spectrum of use.

Hydrant systems – Be prepared for action

Wall hydrants and external hydrants are only the visible end of a dependable extinguishing water supply for manual extinguishing action by fire departments, operator personnel or building occupants. They are visible extension of dependable water supply components designed to fit with local conditions, such as pump systems, underground pipework and filling and drainage stations. These components ensure a dependable supply for safe hydrants.

HELIOS AMX5000 Aspirating Smoke Detectors – Universally applicable

Helios AMX5000 aspirating smoke detectors detect even minute smoldering fires and can be used almost anywhere. They actively draw air samples from the protection zone and analyze them in a measuring chamber. In addition to a pre-signal and contamination assessment, the detector also offers the possibility of adjusting the sensitivity in accordance with the unit's use. Minimax aspirating smoke detectors are multi-functional detectors that respond to various fire characteristics through combined measuring chamber systems. Thus, fires are already detected at an early stage.

Inveron risk management system – Safety at a glance

IInveron is a transparent and user-friendly system for visualizing and operating fire detection, extinguishing and hazard detection systems. All reports and events are automatically merged on a surface and represented graphically on the screen. Inveron offers ideal monitoring especially for sprawling, complex building structures. In addition, the hazard management system supplies operators with a range of additional information and help on individual messages and supporting them in carrying out the required measures.

Carbon dioxide extinguishing systems –
Highly efficient in many situations

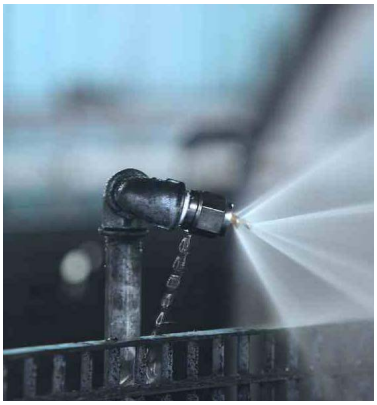
The extinguishing effect of carbon dioxide is caused by the fast displacement of oxygen in the vicinity of the source of the fire and a high heat-retention capacity. Due to their special extinguishing agent properties, carbon dioxide extinguishing systems are not only able to specifically protect entire rooms, but also open facilities. Carbon dioxide is a natural component of the ambient air and electrically non-conductive. Carbon dioxide extinguishing systems requires only little space for storing the extinguishing agent.

Minifog EconAqua Water Mist Systems –

By using innovative low-pressure water mist technology, Minifog EconAqua water mist systems offers particularly effective protection for buildings. Compared to conventional sprinkler systems, EconAqua systems consume up to 85 percent less extinguishing water, which reduces possible water damage to a minimum. The EconAqua pump room can be designed in a considerably more compact form than conventional sprinkler pump rooms. This saves space, on-site costs and makes Minifog EconAqua water mist systems ideal for retrofitting in existing buildings.

MX 1230 fire extinguishing systems –
Efficient and compact

MX 1230 fire extinguishing systems fight fires using the chemical extinguishant Novec™ 1230 by 3M™. This extinguishant is neither corrosive nor electrically conductive. It is thus especially suitable for protecting rooms containing electric and electronic equipment. MX 1230 systems extinguish fires without leaving residue, while offering a high level of personal and environmental protection at the same time. They are particularly suitable for the protection of small and medium-sized rooms, and the extinguishing agent can be stored compactly, either inside the room or in another area.



Minifog ProCon water mist suppression systems –
Efficient – also for open facilities

Minifog ProCon low-pressure water mist extinguishing systems offer particularly efficient fire-fighting for enclosed and open set-ups in industrial environments. ProCon extinguishing nozzles serve to finely spray the extinguishing water. In this way Minifog ProCon systems can manage with up to 70 percent less extinguishing water compared with conventional*deluge systems**. Accordingly, systems can be designed with a smaller scale water supply and pipework This does not only save costs, but also space - a significant advantage in particular for retrofitting.

Minifog ProCon XP water mist suppression systems –
Fire protection for encased systems

Minifog ProCon XP high pressure water mist systems offer excellent fire protection with minimal consumption of extinguishing water, e.g. for systems in confined spaces. Minifog ProCon XP uses approx. 95 percent less extinguishing water compared to conventional spray water extinguishing systems. This extremely low consumption of extinguishing water reduces the risk of water damage and thermal distortion of hot machine parts to a minimum. The water supply unit can be designed in a more compact format. This saves space, on-site costs and facilitates retrofitting in particular.

Oxeo extinguishing systems –
Residue-free fire extinguishing

Oxeo inert gas extinguishing systems fight fires by introducing inert gases, such as argon or nitrogen, and the resulting lowering of the oxygen content. They are particularly suitable for protecting areas with high-quality and sensitive equipment, where residue-free extinguishing - without the use of water, foam or powder extinguishing agent - is to be preferred. Argon and nitrogen are natural constituents of the ambient air and, moreover, non-toxic and non-electrically conductive.

Foam-Based Suppression SystemsLarge-scale dampening –
During a fire, foam extinguishing systems spread large-scale foam blanket through foam pipes, foam monitors, sprinklers or nozzles. The foam is applied on the burning material, extinguishes the fire and serves as a deterrent against re-ignition. Foam extinguishing systems are suitable for protecting high-risk areas, e.g. due to flammable liquids or plastics. The adjustable low to extremely high foaming option offers an optimal extinguishing effect for every type of risk.

Deluge systems –
Fast, with overall coverage
Deluge systems are triggered hydraulically, pneumatically or electrically and disperse water throughout the entire protection zone with open nozzles. In this way they dependably fight fires in rooms and facilities, even if a particularly fast spreading of the fire is to be expected. If necessary, a film-forming foam agent can be added to the extinguishing water. Deluge systems are also installed to keep the fire from spreading to neighboring areas by means of water curtains, or to cool down particularly vulnerable areas through irrigation..

Smoke and heat venting systems –
Clean air and an unobstructed view

Smoke and heat venting systems keep escape and rescue routes open in the event of a fire. The system is triggered manually or automatically by heat or smoke detectors. Pneumatic or electric actuators open skylights, windows or other smoke and heat venting systems. This ensures an unobstructed view and orientation as well as fresh air in the event of a fire. In addition, the system prevents explosion-type flash overs.

Sprinkler systems –
Universal protection

Sprinkler systems detect and report fires and automatically initiate the extinguishing process with water. The underlying principle of selective extinguishing makes them extremely effective: In the event of a fire, only the sprinklers located in the immediate proximity of the fire will be activated. Immediate extinguishing action using water is taken, while the remaining sprinklers remain closed. Sprinkler systems provide dependable fire protection for buildings and industrial plants. For special fire risks, a film-forming foaming agent can be added to the extinguishing water to increase the extinguishing effect.

About Minimax

For more than 110 years, Minimax has been one of the leading brands in fire protection. Qualified and certified staff plan and install modern fire protection systems - in Germany, Europe and the whole world. With its comprehensive service range, Minimax is also at your disposal after installation.

Technologies

Whether it's sprinkler systems, gas extinguishing systems, fire prevention systems or fire detection systems - Minimax can fall back on a unique range of tested and certified components and systems from its own development and production facilities. Our promise: Minimax quality ranges from the simplest *fire extinguisher** to the most complex suppression system. Extensive development work carried out at our fire protection research center ensures our future advanced technologies approach.

Solutions

Recycling facilities, power plants, shops, ships or logistics centers - every industry, every property and every application requires different fire protection solutions. Taking the latest standards into account, our expert teams have years of experience and support each project individually in order to meet the requirements of authorities, insurers and operators. From the engineering of the fire protection system through project management to installation and commissioning, with Minimax you are on the safe side

Service

Regular inspection and maintenance are a fundamental requirement for a fire protection system to remain operational in the long term. The Minimax service team offers the necessary peace of mind by professionally executing all inspections, maintenance and repair work In addition to maintenance, we offer specific measures and programs to ensure that your fire protection equipment continues to function correctly and corresponds to the latest technological developments even after years on standby.

Minimax can fall back on a unique range of proven and innovative fire protection systems for all areas. These meet the multifaceted requirements of the automotive industry and combine extremely efficiently and economically into a total solution.

Fire protection solutions for

- Production and assembly halls
- Presses
- Hydraulics rooms
- Spray booths and separation areas
- Powder coating systems
- Machine tools
- Filter systems
- Test stands
- Paint mixing areas and paint storage areas
- Tire depots
- Distribution center
- Control rooms
- Server rooms
- Recreation rooms and offices

Some of our partners:

...and many more!

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AL33e/03.18/0,3/02.19/HA/WK · Printed in Germany · Subject to technical alterations