



Fire protection solutions for steel plants

*Cool down.
Fire Protection by*

MINIMAX

WELCOME

to the steel industry

The steel industry has reached a new boom since the turn of the millennium. The most prominent country to manufacture steel is China, followed by Japan and the USA. The three key European producers are Russia, Italy and Germany.

A universal material on the rise

Today, steel is one of the most important industrial materials. The steel industry supplies intermediate products, such as hot wide strips, forging parts, sheet metal, rails, long products, wire and pipes, which are then processed further to make end products. Developments in production improve the material properties. Steel can therefore constantly establish new processing possibilities and fields of use. Lightweight construction is one example: thanks to new materials and technologies, the automotive construction sector has been able to reduce the weight of a mid-range vehicle by more than 25 per cent. New steel also meets the ever-increasing safety requirements. Another development is presented by ultra-high strength multiphase steel which can be easily shaped into bodywork and vehicle parts. In recent years, the construction sector has seen innovative facade elements and photovoltaic modules appear on the market, and this has been facilitated by new steel technologies. Household appliances, screens, modes of transport and packaging: steel is everywhere.

Continuous production: Safety is vital

These days, the majority of steel plants run at full capacity. Loss of production and business interruptions can be catastrophic. A fire in production eats up immense sums of money. If a business stops, the economic damage quickly runs into millions. Even small fires can paralyse an entire steel plant. The risk of fire is high: hot rolling mills and cold rolling mills, welding machines, control rooms and hydraulic rooms, oil cellars, cable channels, coating and pickling systems – heat meets flammable materials almost everywhere. Production machines are a particular fire hazard because of flammable liquids such as oil, deposits and hot machine parts that may be ignited by electrical ignition sources. Plant-dependent fire loads such as synthetics, ducts and oil reserves increase the risk. Investments in fire protection are crucial. Minimax has developed its own bespoke protection concepts conforming to regulations for multifaceted fire risks in the steel industry.



INNOVATIVE FIRE PROTECTION SOLUTIONS for steel plants

FOR FEWER DISRUPTIONS

Fire protection solutions recommended by Minimax

Fire protection systems
 Sprinkler systems
 Minifog water mist extinguishing systems (low pressure)
 Water spray systems/sprinkling
 Hydrant systems (interior/exterior)
 Foam extinguishing systems
 Argotec fire extinguishing systems (Ar/N₂)
 Argotec fire extinguishing systems (CO₂)
 MX 1230 fire extinguishing systems (Novec™ 1230)

Hot rolling mills		●	●						
Cold rolling mills		●	●		●	●			
Pickling lines		●			●	●			
Electrolytic coil coating		●			●				
Conveyor belt systems		●	●		●				
Oil tanks			●		●				
Oil cellars	● ¹	●		●	●				
Hydraulic systems		●	●		●	●			
Control rooms					●		●	●	
Cable channels		●	●		●				
Cable rooms					●		●	●	
Coal storage areas (external)				●	●				
Administration/building protection	●	●			●				

¹With foam admixture.

The process chain in a steel plant is designed for maximum efficiency. If one production stage fails, the business stops. Optimal fire protection therefore calls for specialist components for each area of the plant in order to keep downtimes to an absolute minimum. As a full-service provider for fire protection, Minimax offers a solution portfolio which meets the highest requirements down to the finest detail and provides an extremely comprehensive economical solution.

Sprinkler systems: Universal protection

Minimax sprinkler systems offer reliable fire protection in a wide range of applications where human lives and material assets are to be protected against the effects of fires. This applies to hotels as well as meeting rooms, logistics areas and production buildings or warehouses: if a fire starts here, the system is automatically activated during the initial phase, thus preventing the fire from spreading. Only those sprinklers are opened which are in the vicinity of the fire. An alarm is also initiated at a site which is permanently staffed.

Minifog water mist extinguishing systems: Greater safety, less water

During extensive testing in recent years, Minimax has been researching the optimum spectrum of droplets in water extinguishing systems. The result is innovative and efficient Minifog low-pressure water mist extinguishing systems which use less water, but with a water mist for a better extinguishing effect. Minifog EconAqua is used in areas that present a low-level fire hazard such as administrative buildings. With highly optimised (special) sprinklers, this solution reduces the use of extinguishing water by up to 85 per cent. The targeted use of water mist tackles a fire very effectively. Minifog ProCon reduces the use of extinguishing water by approximately 70 per cent and offers optimum

protection for cable ducts and conveyor belt systems. Special Minifog impulse nozzles provide a dense water mist which cools the fire and extinguishes it effectively. Operational downtimes are reduced to a minimum.

Water spray systems: Area-wide spray

Fires start very quickly in rolling mills, coal conveyors and hydraulic systems because fuels and lubricants are subjected to high temperatures. Protection is provided by water spray extinguishing systems. Triggered hydraulically, pneumatically or electrically, the opened nozzles extinguish fire in a matter of seconds. They also cool and reflect the heat – the perfect protection for systems and people.

Hydrant systems: Extinguishing water where it is needed

Wall and external hydrants are merely the visible end of a reliable supply of extinguishing water. Behind the scenes, you will find reliable Minimax water supply components such as filling and draining stations that are adapted to the specific conditions. The Minimax maximat components assure a reliable supply of water to hydrants and therefore often facilitate the quick intervention of fire brigades, operating staff or building users.

Foam extinguishing systems and extinguishing monitors: When access is difficult

No matter where materials such as oil and coal are stored, there are always specific fire risks. It's not just large quantities that are a problem – when solid matter is stored on a mound or in a bunker, it's also the trapped air and difficult access from above that cause problems. In this case, foam which three-dimensionally penetrates into the stored goods or floats on a liquid fire is the most efficient extinguishing agent, as it smothers the fire across a large area. The foam can be supplied by an automatic extinguishing system or it can be applied manually and directly from a safe distance using extinguishing monitors.

Fire detection systems: Instant triggering of the alarm

Flames, smoke, gas emissions, heat – a fire that is spreading is a multifaceted fire. Minimax has the right sensors and fire detectors for every kind of fire. They all instantaneously transmit their signals to a fire detection system via a data bus. The fire detection control panel can also monitor a steel plant, giving a clear view of everything when it comes to fire protection.

Argotec CO₂ fire extinguishing systems: Extinguish fires quickly without leaving any residue

Control systems, motors and hydraulics on machines in a steel plant may well tolerate heat, but in the case of liquid fires and electrical fires in particular, the standard extinguishing agent (water), can often cause more damage than good. In this instance, CO₂ is the extinguishing agent of choice if the aim is to quickly

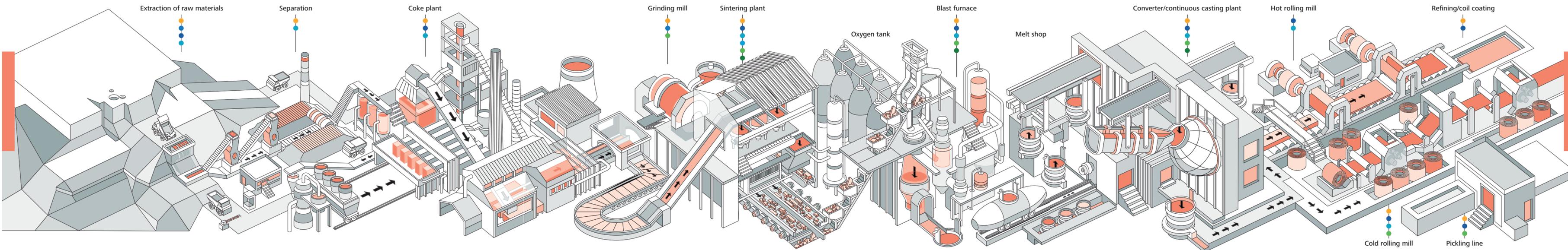
create a dense extinguishing gas cloud for open or semi-open devices which smothers the fire and prevents further damage. Downtimes are kept to a minimum.

Argotec Ar/N₂ fire extinguishing systems: Argon and nitrogen protect electronics

Electrical and electronic switchgears control every process step during production. If they fail because there is a fire, then a whole production line may come to a standstill. To prevent any auxiliary damage from happening during the extinguishing process and to keep any risk to human life to a minimum, Minimax protects walk-in and lockable switch and cable rooms with Argotec extinguishing solutions that use argon and nitrogen. By displacing oxygen, these environmentally friendly and non-toxic gases extinguish electrical fires without leaving any residue.

MX 1230 fire extinguishing systems: Maximum protection for IT systems

The extinguishing agent Novec™ 1230 from 3M™ is one of the key innovations of fire protection in IT rooms. It has primarily been developed to protect IT installations – whilst at the same time assuring a high degree of personal safety and environmental compatibility. Novec™ 1230 extinguishes without leaving any residue and is also available in compact extinguishing systems. It has a broad range of possible applications, from manned control consoles in steel and power plants to fully automatic data centres.



READY FOR ANY CHALLENGE

be it a coke or sintering plant, blast furnace, continuous casting plant, or a hot or cold rolling mill

No matter where steel is produced, you will find heat, flammable materials and sensitive production processes nearby. Whether in the coke plant, sintering plant or blast furnace, all production areas must work together perfectly – seven days a week, 24 hours a day. To prevent operational interruptions, downtimes and subsequent financial losses, fire protection requirements are extremely high. Extensive damage and longer downtimes can really only be prevented in the case of fires that are extinguished in their initial phase.



Coke plant

The process which produces coke and crude gas in the coke plant needs temperatures between 900 and 1,400 degrees Celsius in the coke chambers – these operating conditions

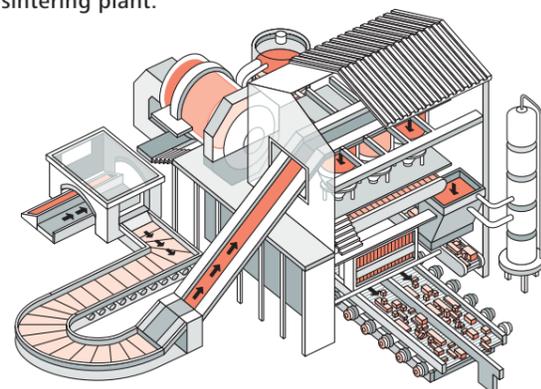
place high demands on personnel and material. Materials such as tar, sulphuric acid, ammonia and naphthalene harbour specific hazards. Not forgetting the huge belts which quickly transport coal and coke through areas of the plant that are difficult to access. Minimax offers a whole range of highly specialised fire protection solutions for these different fire hazards.

Risks: Overheated sleeve bearings which can cause dust particles to ignite. Sparks which are created during maintenance or welding tasks. The spontaneous ignition of wet coal.

Fire protection: Heat detectors, fire gas detectors and multi-criteria detectors reliably monitor the conveyor belts. They detect fires that are about to start and automatically actuate the extinguishing system. Minimax water spray systems are a tried and tested solution in areas where flammable materials are transported. Quick and extensive extinguishing is implemented in the relevant protected area. If only a small amount of water is available, then the Minifog water mist extinguishing system is the perfect alternative.

Sintering plant

From fine-grained raw material to solid iron ore sinter, you will find ore dust, concentrates and aggregates passing through another highly dangerous process in the sintering plant:



the large number of materials, high pressure and repeated high operating temperatures harbour significant fire risks in all the sintering stages. Because the systems work with hydraulic components and because IT-based control units are installed in the switch rooms, these different technologies call for very different protection requirements.

Risks: Burst or leaking hydraulic hoses near hot machine parts. Electrical malfunctions in switch rooms. High temperatures and the risk of liquid gas or oil spreading.

Fire protection: Minimax water extinguishing systems and Minifog water mist extinguishing systems offer effective protection near hydraulic systems and on conveyor systems. A Minimax foam extinguishing system provides very effective protection against the risk of oil fires. Electrical switch rooms are crucial to continued operations: Minimax has developed extinguishing systems such as Argotec and MX 1230 to prevent damage to electronic control components caused by extinguishing agents.

Blast furnace

A furnace works uninterrupted at temperatures of above 1,000 degrees Celsius. Huge quantities of coke keep this system at the correct temperature so that the crude iron can continue to be extracted from mineral ores. In addition to considerations of maintaining operation, plant-specific fire protection must take into account the fact that a speedy shutdown is not likely to be possible, even if there is a fire near the furnace. Deposits on a highly diverse array of elements, oil and other flammable liquids on mobile system components present a huge risk in light of the extremely high operating temperature. Much like the coke plant, it is important to monitor the coke conveyor belts using operationally safe detectors and to fight fires in the early stages using an automatic extinguishing system. In addition to areas with a high fire load, the furnace is also flanked by sensitive technical systems which require



a large spectrum of fire protection systems: just like with the sintering plant, hydraulics and electronics are system parts which require special fire protection solutions.

Risks and fire protection: See sintering plant and coke plant.

Continuous casting plant and ladle turrets

During continuous casting, liquid steel is converted into rolled ingots and slugs. But first it is transported a long way, passing through various processes along the way, from the ladle via the distributor to the mould. Hydraulic and electrical drives, lubricating oil and a good dose of technology ensure movement in the continuous casting plant. Fire, water, air – the elements are in very close proximity to each other, here more than in any other



system part. Steel heated to 1,400 degrees Celsius meets drive technology and electrical systems. Protection is essential so that the steel can flow freely. Minimax fire protection solutions are designed in such a way that the protection of persons and machines during continuous casting complies with the operational requirements.

Risks: Hydraulic oil and lubricating oil can ignite when near a glowing molten mass. Risk of fire to control units and drives near the ladle, distributor and strand guide system.

Fire protection: From the ladle turret to the run-out roller table, it is useful to install object protection measures such as Minifog ObjectProtect water mist extinguishing systems on key system parts such as bearings and drives.

Hot rolling mill

Glowing slabs reach further processing temperatures of between 750 and 1,250 degrees Celsius in the blast furnace. This induces fire risks similar to those of the coke plant and sintering plant. Added to this, hydraulically driven presses and edging stands during roll-out present similar risks to those of the drive components during continuous casting. Leakages in hydraulic pipes

can easily trigger a spray jet or oil mist which easily ignites in such an environment. High temperatures are a constant during rolling, thereby posing an unavoidable source of ignition.

Risks: Hydraulic pipes along the rolling trains and high material temperatures. Risk of malfunctions during fires near control units and drives.

Fire protection: Automatic fire detection on rolling mills is a problem due to the operational disturbance variables such as embers, steam and flying sparks. In certain areas, fire detection is based on staff-intensive video monitoring. In the event of a fire, the extinguishing system is triggered manually. The roll stands are protected by water spray systems.



Cold rolling mill

The cold rolling mill specialises in production precision: reversing stands or tandem mills roll the hot wide strip to the dimensions requested by the customer. This poses a fire protection challenge because the rolling trains are fitted with the latest control and adjustment systems in order to achieve low production tolerances.

Risks: High investments in technology for control and adjustment systems are subjected to fire risks. Extremely high risk of sensitive components malfunctioning in the event of a fire.

Fire protection: A cold rolling mill should be protected by an automatic extinguishing system so that fire damage is reduced to a minimum. Two parallel designs improve safety: a water extinguishing system which can be set up as a fine water spray system in some areas protects drives, frameworks and structures. A gas-based extinguishing system provides additional protection at the roll gap with its sensitive control technology.



READY FOR ANY CHALLENGE

be it a pickling line, electrolytic coil coating system, hot-dip coating system or IT system in any room size

Systems can therefore be run on a long-term basis at a high production workload without the risk of having longer downtimes. Detection: Flame detectors.

Pickling line

Efficient fire protection on a pickling line starts at the descaling unit. With its plastic reservoirs and plastic exhaust air channels, the acid bath which then removes oxide layers from the rolling process on the hot rolled strip presents a considerable fire load for modern systems. If a fire should start here, it will spread very quickly because the chemical pickling process generates large quantities of hydrogen.

Risks: Generation of gas and risk of explosion from chemical processes. Flammable plastic of reservoirs, supply lines and exhaust air system. Detection outside of and within the pickling line (pickling reservoir, exhaust air, etc.)

Fire protection: The fire detection system is an essential component in protecting the pickling line: Minimax nuisance-safe flame detectors detect a fire and activate a defined fire control system – a combination of disconnection, activation of extinguishing areas and exhaust air control. Process parts of the push-pull pickling line, welding machine and exhaust air stack are protected by a Minifog water mist extinguishing system. An Argotec CO₂ object protection system protects the oiler units on the pickling lines. In a matter of seconds, other gas-based extinguishing components can ward off the fire risk in the operational exhaust air system and the build-up of combustible hydrogen concentrations by reducing the concentration of oxygen to less than 6 per cent. The materials of all Minimax components for detectors and extinguishing technology are specifically designed for such aggressive environmental conditions.

Electrolytic coil coating

Bodywork sheets to be supplied to car manufacturers place high demands on steel plants as far as delivery reliability is concerned. Areas such as electrolytic coil coating call for the highest levels of operational safety. If the baths of the individual electrochemical stations



were to be contaminated when extinguishing minor fire incidents, the result would be long idle times. Minimax has developed fire protection solutions for such system parts which assure that production resumes operation again quickly. In this case, fine water spray systems ensure that significantly less extinguishing water is used. Demineralised water is used as the extinguishing agent.

Risks: Flammable plastic system components. Risk of a short circuit caused, for example, by electrolytes in plastic. Hazard caused by bearings and hydraulic oil that has become hot.

Fire protection: Fine water spray systems offer adequate protection for the coating process, while Minifog ObjectProtect with radiation and flame detectors is used to provide object protection. A special extinguishing water tank prevents dirt and salts from getting into the baths. The coating cells and direct area around the cells are extinguished with demineralised water. The materials of extinguishing water tanks and extinguishing components are adapted to the special local conditions. Detection: Similar to the pickling line.

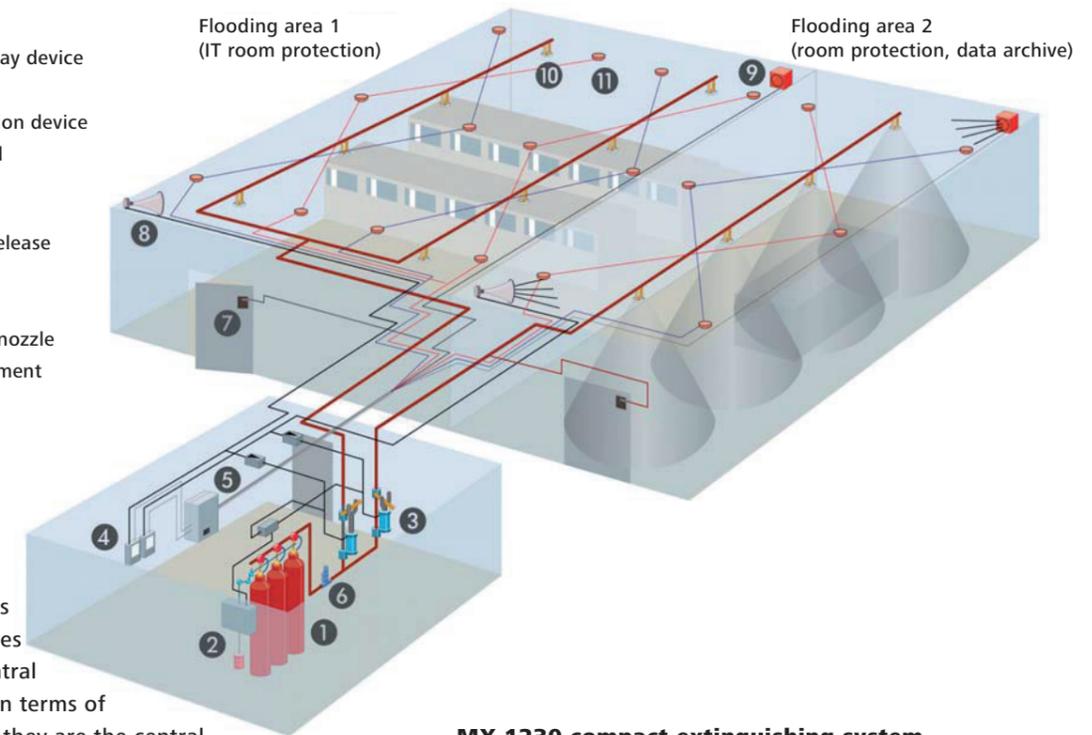
Hot-dip coating

Hot-dip coating lines apply metallic coatings to cold rolled thin sheets. The fire risks here are very similar to those in electrolytic coil coating, but are magnified by the belt furnace in which the glowing material is further processed under protective glass.

Risks and fire protection are the same as for electrolytic coil coating.

Control stations, switch rooms and IT rooms

- 1 Cylinder battery
- 2 Actuation and delay device
- 3 Selector valve
- 4 Pneumatic actuation device
- 5 Fire detection and control panel
- 6 Safety valve
- 7 Pneumatic door release
- 8 Pneumatic horn
- 9 Electric horn
- 10 Room protection nozzle
- 11 Fire detection element



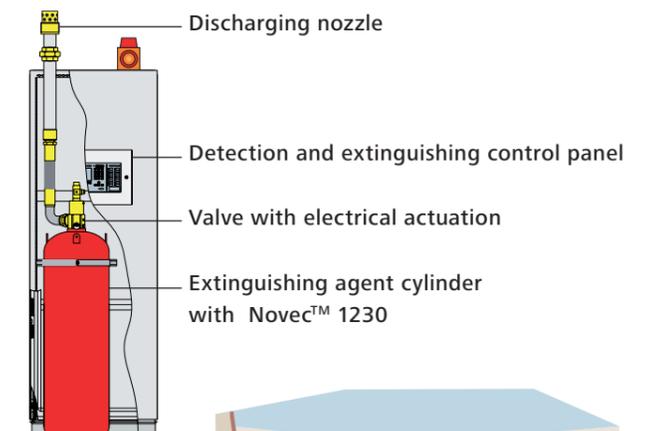
Control stations, switchgear, switch rooms and IT rooms are sensitive facilities with important central control functions. In terms of operational safety, they are the central core of the production chain. The type of extinguishing agent used in these areas is crucial to fire protection. In order to prevent the extinguishing agent from causing damage to the facilities, completely residue-free extinguishing is fundamental.

Risks: Short circuits, overheating of cables or electronic components. Minimum fire damage can cause long operational downtimes. The extinguishing process always poses a hazard to any intact electronics nearby.

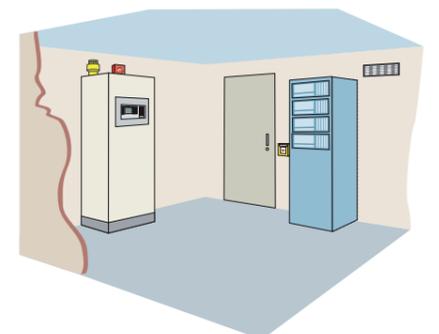
Fire protection: Minimax uses gas-based fire extinguishing systems in technical rooms which can be filled with the non-toxic and therefore harmless gases argon or nitrogen. CO₂ is only used in exceptional circumstances, as it has properties which are harmful to humans. The MX 1230 extinguishing system incorporating the Novec™ 1230 extinguishing agent acts very gently and is designed for server cabinets and server rooms. Smoke detectors or the HELIOS smoke aspirating system for rapid detection triggers the extinguishing mechanism very reliably.

MX 1230 compact extinguishing system

The special advantage of the MX 1230 compact fire extinguishing system is that it comprises a control panel, a supply of extinguishing agent and, if desired, a discharging nozzle, an alarm horn and a flashing light, all in a single unit within a cabinet. This means that the system can be set up in your protected room in a way which saves space and requires minimum assembly and installation.



Developed for computer and server rooms, IT and communication facilities, control rooms and control centres



READY FOR ANY CHALLENGE

be it cable ducts/tunnels,

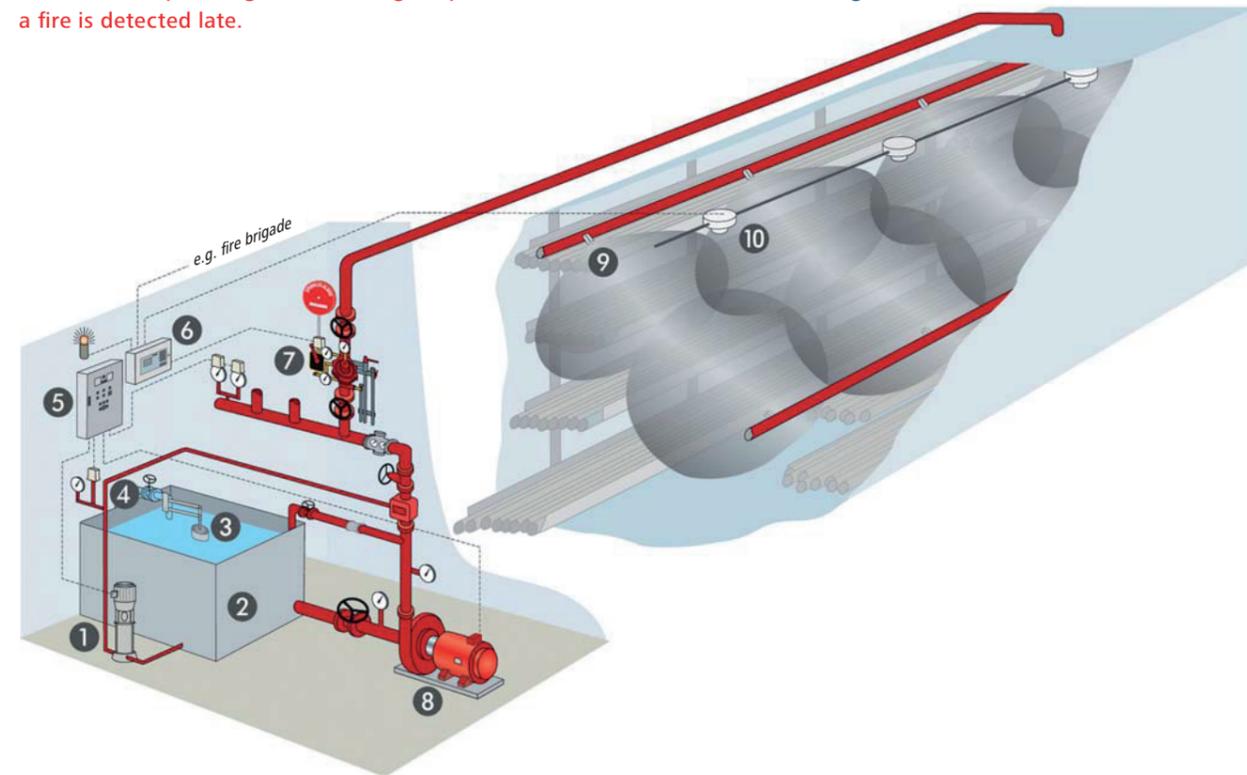
oil/hydraulic cellars or administrative buildings

Cable channels and cable tunnels

Whether for a power supply or data transmission, countless cables are needed to run a steel plant. To protect the cables and make servicing easier, the cables run along ducts and are bundled in cable rooms or galleries. Fires usually start due to lines overheating, and smouldering insulation causes short circuits. A smouldering fire – which is very difficult to put out from the outside – can destroy entire electrical installations. The result is the loss of large operating units.

Risks: Risk to vital lifelines of the production system. Conventional extinguishing methods are unable to keep the fire from spreading. Quick damage expansion when a fire is detected late.

Fire protection: Minimax fire protection for cable channels takes into account the high risk of a fire spreading. Smoke detectors, smoke aspiration systems and linear heat detectors are used for automatic detection in winding and often inaccessible cable channels. The Minimax low-pressure water mist system Minifog ProCon has been specifically designed for existing and newly built cable ducts. Minifog ProCon protects against consequential damage by using only a small amount of water. Gas-based extinguishing systems such as Minimax Argotec are also useful in cable rooms and galleries.



- 1 Jockey pump
- 2 Hopper tank
- 3 Automatic feed mechanism
- 4 Public water connection
- 5 Pump control cabinet
- 6 Fire detection control panel
- 7 Deluge valve set, type FSX
- 8 Sprinkler pump
- 9 Minifog water mist nozzle
- 10 Fire detector



Oil cellars and hydraulic cellars

Leaking hydraulic systems pose a high risk in oil cellars. Shaft seals on hydraulic pumps pose a special risk to the surrounding area. Leaks and subsequent spray fires have often been the cause of fires in the past.

Risks: Risk to central, essential operational system components. Fire spreads quickly when leaking oil is involved.

Fire protection: Sprinkler systems and fine water spray systems with a foaming agent admixture provide reliable protection for hydraulic and oil rooms which are located in the basement of a steel plant. In collaboration with insurance companies and operators, Minimax has developed an approved protection concept with a fine water spray system which safely extinguishes fires on hydraulic pumps in particular.

Administrative buildings and production halls

Overheated, faulty electronic devices are often the cause of fires in administrative buildings. Being able to combat them successfully in the initial stages is the best premise for protecting people, assets and the environment.

Risks: Fires that spread can very quickly affect other parts of the building. On-site monitoring by the staff is not reliable.

Fire protection: Conventional Minimax sprinkler systems which use the relevant fire detection technology provide reliable protection against fire in administrative buildings and production halls. They automatically detect, announce and extinguish fires, thus providing 24-hour protection to rooms which are not used during multi-shift operation. The Minimax Minifog EconAqua extinguishing system is yet another alternative here. By using innovative low-pressure water mist technology, this water mist sprinkler system offers particularly effective protection for buildings. Minifog EconAqua uses up to 85 per cent less water than conventional sprinkler systems.



ECONOMICAL

less means more

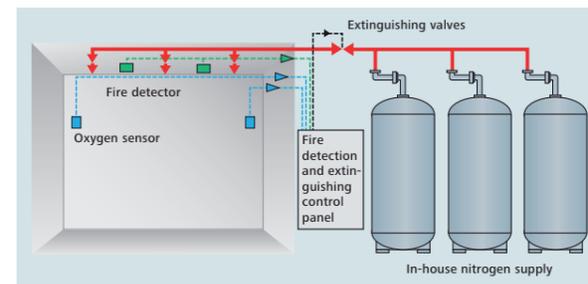
Minifog ProCon: Efficient and water-conserving

In defined applications with low operating pressures, these Minimax low-pressure water mist sprinkler systems achieve comparable water rates to high-pressure fine water spray systems. The extinguishing water is used more efficiently by creating water mist which in turn reduces the amount of water used. Minifog ProCon can be combined with existing water supplies, e.g. sprinkler systems, and can be easily integrated into existing buildings. Due to the robust construction and integrated protective caps, the Minifog nozzles are especially suited to use in areas with more dirt or contaminants. Typical objects to be protected are cable channels and cable rooms, coal conveyors, machinery and turbines.



Unlimited N₂ uses existing nitrogen resources

Wherever steel is produced, you will also find nitrogen, be it as a stirring gas in the furnace or as a by-product in secondary metallurgy. Fed into the pipework of many production systems, N₂ is also an excellent inert gas for fire protection: nitrogen drives away oxygen and smothers fires in the initial phase. Minimax has developed a special low-pressure extinguishing system for undertakings where nitrogen is available in the company-owned pipework. It uses existing resources, thereby saving the space it would otherwise have had to find for supplies of a foaming agent. This very economical solution has system approval (S 310016) from VdS Schadenverhütung GmbH, which is part of the German Insurance Association (GDV) and monitors the suitability of fire protection equipment. In closed technical rooms especially, where IT and control systems, telecommunication technology or extremely fire-sensitive production systems are installed, the gas solution offers considerable advantages in comparison to water extinguishing systems. In the event of a fire, the chances of damage caused by extinguishing agents is virtually zero. Even on machine tools, hydraulic systems, silos, dust filters, turbines and transformers, the so-called neutralisation, i.e. displacement, of oxygen in the air has proven to be an effective extinguishing process. The nitrogen floods the room in a matter of seconds and the flames are gone. The Minimax extinguishing system compensates for the lower pressure in company-owned nitrogen supplies in comparison to N₂ storage cylinders with special extinguishing nozzles and the sensitive electronic control of the extinguishing process. Smoke or flame detectors send a signal to the control panel which in turn opens the extinguishing valves. Oxygen sensors fitted in the room are used so that the system can control a steadily reduced concentration of oxygen. This provides maximum protection especially in rooms where there is little



tightness: if the oxygen content rises, the system automatically supplies more extinguishing gas until the fire is extinguished.

EVERYTHING

UNDER CONTROL

whenever and wherever

Fire detection systems: clarity and flexibility

Reliable protection against fires calls for vigilance.

Minimax technology assumes this role in the steel plant,



24 hours a day. All push button, smoke, heat and flame detectors and extinguishing systems work as part of a network. Intelligent technology evaluates the signals and controls the respective optimum use of extinguishing agents and the notification of staff

and operational units. The modern fire detection control panel FMZ 5000 is at the centre of it all and fulfils all guidelines for steel plants. It has a constant overview of things. It also provides maximum flexibility for technical innovations. The control unit can be programmed to perfectly adapt the system to current and future requirements. The hardware is just as flexible: there is a wide array of "snap and go" function modules for interfaces for any kind of detectors, signal transmitters, valves and control units. Minimax is constantly extending its range of modules. The system will therefore still be state-of-the-art tomorrow. Upon request, the fire detection control panel can feature a ring bus connection which receives signals from up to 126 detectors. Special solutions such as the very disturbance-resistant UniVario industrial detectors can be easily integrated into the system.

WinGuard: the PC as a fire protection monitor

The WinGuard software displays the fire and hazard detection systems clearly on a PC and is used to control key functions. The system integrates safety and building management, thus offering an ideal monitoring function in steel plants with complex system and building structures. WinGuard can also be used to remotely control Minimax fire detection control panels. The user sees additional information and help for each message on the screen and can therefore initiate the necessary measures based on the sound information received.



Maintenance and servicing: service for sustainable safety

Regular inspections are a fundamental requirement in order to guarantee the perfect functioning of your fire protection systems whilst ensuring full operational readiness. Minimax service offers the prompt inspection of all fire protection and extinguishing systems

in strict accordance with the applicable legislation. Such equipment is checked, maintained and, in the event of a fault, repaired with meticulous care by specially trained Minimax staff members. In addition to system servicing, specific measures and programmes exist to ensure that all protective equipment continues to function correctly and corresponds to the latest technological developments, even after years on standby. Legal provisions usually require operators to carry out continuous monitoring procedures on their fire protection systems. If faults are identified, rapid reactions are called for. Minimax offers round-the-clock safety with a sophisticated fault detection management system to ensure that errors and faults are always remedied at top speed, regardless of their location.



TESTIMONIALS

for our fire protection solutions

Based on our experience and expertise, steel sector companies from around the world place their trust in us. Here are just some of our references:



... and many more.

Overview of our services:

Fire protection advice
Fire protection planning
Fire detection systems
Fire detectors
Special detectors
Gas warning systems
Sprinkler systems

Minifog water mist extinguishing systems
Water spray systems
Hydrant systems
Foam extinguishing systems
Argotec fire extinguishing systems
MX 1230 fire extinguishing systems
Unlimited N₂-systems

Special solutions
Fire extinguishers
Maintenance and servicing
Training



Printed in Germany

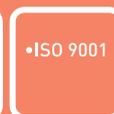


SCC Work Safety

Voluntary participation in regular monitoring

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AL23e/07.11/11/09.11/HA

Photos

Front cover Stahl-Zentrum, ROGESA Roheisengesellschaft Saar mbH
P.2 Stahl-Zentrum, ArcelorMittal
P.2 Stahl-Zentrum, ThyssenKrupp Steel
P.6 Stahl-Zentrum, ArcelorMittal
P.7 Stahl-Zentrum, HKM

We reserve the right to make technical changes.