

Special solutions
DryerProtect

DryerProtect
Fire Protection for
Industrial Dryers

*Cool down.
Fire Protection by*

MINIMAX

RISK

Fire damage to dryers

Continuously flammable materials such as veneers, wood chips, sewage sludge or animal feed are dried in dryers in order to achieve a defined residual moisture content for further processing stages. Dryers are crucial parts of the production process: Material inlet and outlet points as well as extraction-, control- or cooling air ducts connect the dryer to other process areas. In such a networked environment a fire started in a dryer can quickly spread. The result can be costly operational disruptions or even the forced closure of a business.

A fire may have several causes. The materials and build-ups in a dryer can quickly be ignited by overheating, friction or machine break. Sparks or glowing embers from upstream production areas can end up in the dryer via the material feed point and act as the source of a fire there.

Due to the high fire load of the materials and build-ups as well as greases or even heat transfer oil, fires in dryers spread rapidly. In addition this effect is favored by the strong air flow. Sparks or glowing embers can escape via extraction ducts to outside surfaces that are maybe dust-covered or into the filter of a downstream dust-collector. This can lead to fires or even explosions.

To avoid these scenarios, an adapted fire protection solution is required on dryers and their adjacent areas that takes into account the interlinking of the individual process areas.

Operators therefore need a solution which detects fires quickly and fights them specifically on the dryer and related extraction devices. In addition, a protection concept which allows for coordinated fire protection for interlinking production areas would be desirable. Minimax has the right solution: **DryerProtect**.



SOLUTION

DryerProtect

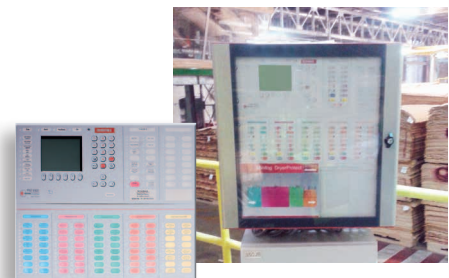
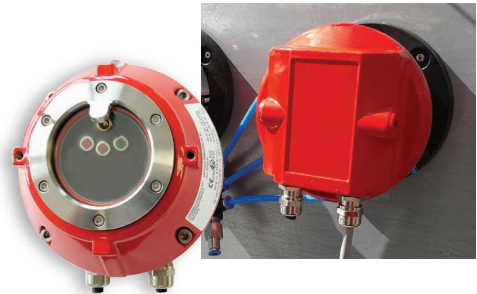
DryerProtect combines fire detection, water mist and spark extinguishing technology to form a holistic solution. This combination provides fire protection which is tailored individually to the requirements of the various protection zones.

Sprinkler systems provide a dependable basic protection for production halls where the dryers have been set up.

To protect the actual dryers against fire, Minifog ProCon water mist systems offer a particularly efficient fire extinguishing technology. ProCon extinguishing nozzles serve to finely spray the extinguishing water. This means that Minifog ProCon systems, compared with conventional deluge systems, consume up to 70 percent less water. 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.

In exhaust and conveyor systems, spark extinguishing systems detect ignition sources and instantly generate a water curtain by means of an extinguishing unit to extinguish sparks or glowing particles. They are always an ideal solution when there is a high risk that sparks or glowing embers will be transported unnoticed to other areas and start a fire there.

UniVario flame detectors and spark detectors are used in the protection zones. Both types of detectors allow for the early detection of fires and hence for a fast response. All signals converge in the fire detection and extinguishing control panel, which warns people at risk and the fire department plus reliably provides all relevant information to the competent bodies. In addition, the fire detection control panel electrically triggers the Minifog ProCon and spark extinguishing systems. Furthermore, it can operate other fire protection systems in the vicinity of the dryers and monitor their functioning.



DESIGN AND

DryerProtect – comprehensive fire protection

DryerProtect combines fire detection, water mist and spark extinguishing technology into a single system. Fire protection for dryers is provided by Minifog ProCon water mist systems, while exhaust devices are best protected by spark extinguishing systems. Joint water supply and joint fire detection and extinguishing control panel can be provided for both systems.

Fire detection and extinguishing with Minifog ProCon

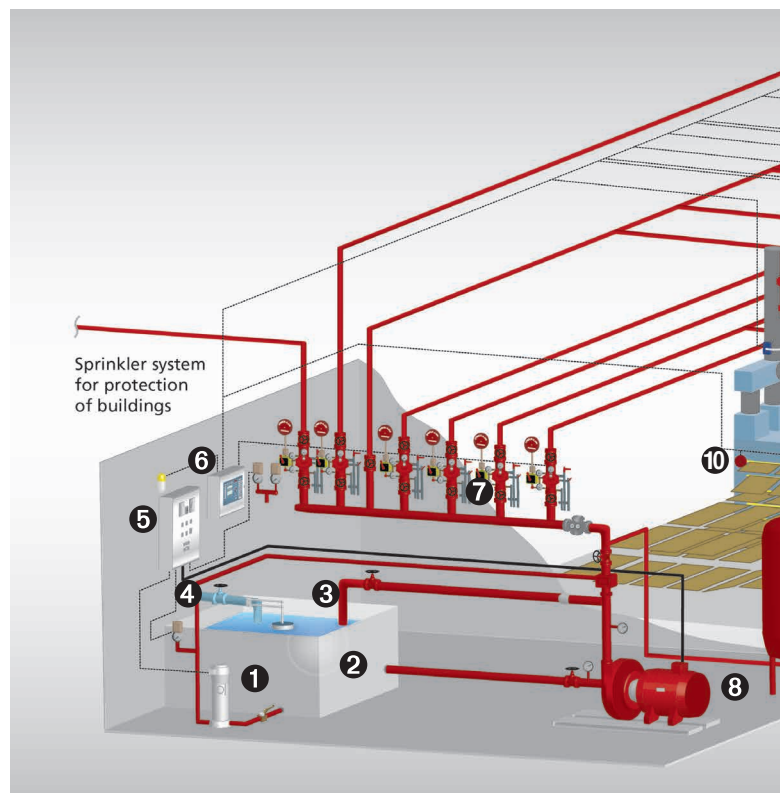
Minifog ProCon is a water mist system which is subdivided into one or more extinguishing zones with corresponding zone partitioning, water supply unit and fire detection- and extinguishing control technology. For fire detection in low temperature areas, FMX5000 IR UniVario flame detectors are used, which allow the rapid detection of emerging fires due to their use of infrared technology. In other areas with higher temperatures, modified model FUX3200 L1 spark and flame detectors with fiber optics are used.

To increase dependability and reduce maintenance costs, detectors with visibility monitoring of the optics should be used by preference. When a certain degree of contamination is exceeded, a warning will be issued. Another option is to use an air purge device - this keeps the optics of the detector clear of dust deposits by means of compressed air.

Fires in or on dryers are extinguished by Minifog ProCon water mist systems, which are based on low pressure technology and disperse the extinguishing water particularly finely across the defined protection zone. The system uses the physical qualities of water more efficiently than conventional deluge systems. The particularly small drops cause an enlargement of the total surface of the extinguishing water and lead to an increase in the contact surface for heat transfer. This significantly improves the cooling capacity of the water. In addition large amounts of steam are immediately created by the very sudden vaporization of the small water droplets in the

vicinity of the flame, which hinder the supply of oxygen to the fire. The extinguishing principle, which works by means of cooling- and smothering effect, allows particularly effective fire-fighting with reduced use of extinguishing water which also brings rapidly spreading fires under control.

To ensure dependable extinguishing of fire, Minifog ProCon impulse nozzles are used, which can be operated with a minimum pressure of only 4 bar at the nozzles. Due to their relatively large discharge openings, they are less susceptible to obstructions caused by impurities in the extinguishing water. As an additional safeguard, each nozzle is fitted with an internally situated fine mesh. Furthermore a robust stainless steel protective cap with safety chain protects against contamination of the nozzle from the outside. Thus, they are ideally suited for use in the harsh environment of a dryer.



- | | |
|---------------------------|--|
| 1 Jockey pump | 4 Town water connection |
| 2 Storage tank | 5 Pump control cabinet |
| 3 Automatic water make-up | 6 Fire detection and extinguishing control panel |

FUNCTION

tion for dryers

Spark detection and extinguishing

Sparks or glowing embers in the exhaust- and conveyor systems of a dryer must be detected and extinguished quickly.

Spark extinguishing systems are the suitable choice for these requirements. Detection is provided by spark detectors of the FUX3001 series. These detectors have a detection spectrum that is tailored specifically for the detection of sparks or hot parts.

If an FUX3001 spark detector detects sparks or glowing embers, the spark detector will activate a high-speed solenoid valve within milliseconds via the fire detection control panel and will release extinguishing water through the flat spray nozzles. In the case of a single spark an optical as well as audible alarm is generated and the time-limited extinguishing activated even without interrupting the production process. If within a configurable time frame several spark signals are detected or a threshold is exceeded, then along with the alarm and continuous extinguishing a

cut-off relay is activated in addition in order to stop the process in a controlled manner.

The deployed type F180 flat spray nozzles generate a fan-shaped water curtain across the total duct cross-section; the detected sparks or glowing embers pass through this curtain and will be cooled or reliably extinguished.

Water supply

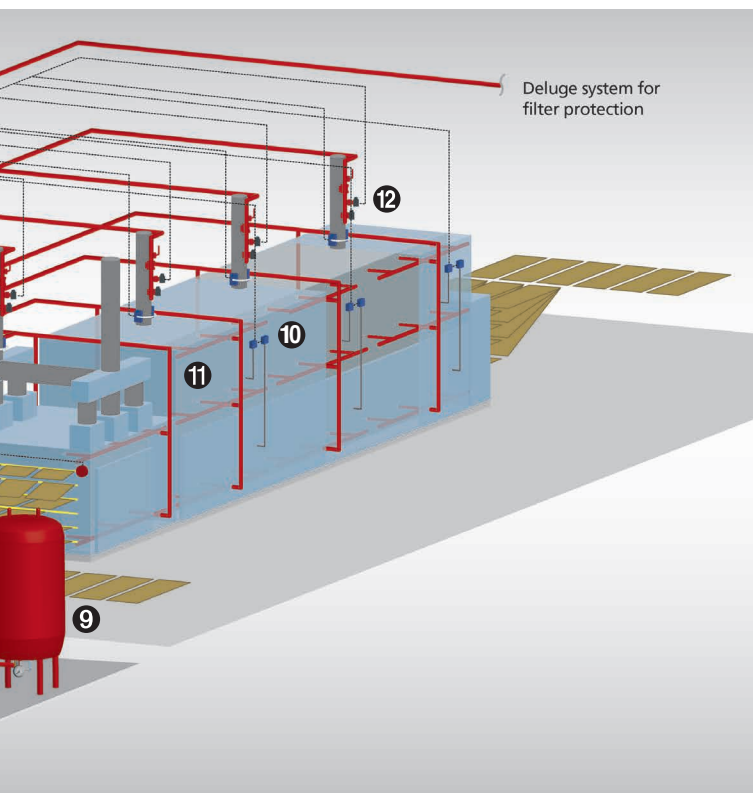
Thanks to the use of the low-pressure system, the Minifog ProCon can typically be supplied cost effectively with extinguishing water through an already existing water supply of a sprinkler or hydrant system. If no existing water supply is available for use, water can be supplied alternatively through a storage tank with an automatic feeding and pump system.

For the operation of the spark extinguishing system, the water supply must be equipped additionally with a pressure accumulator to ensure instantaneous water flow at the required quantity and pressure at the nozzle.

Fire detection and extinguishing control

The FMZ 5000 fire detection and extinguishing control panel is responsible for controlling the fire event. If flame detectors of the Minifog ProCon water mist system or spark detectors of the spark extinguishing system detect a fire, they transmit a signal to the fire detection control panel. It activates the affected extinguishing zone and triggers the extinguishing action and simultaneously releases an acoustic and optical alarm. In addition, potential-free contacts are available at the fire detection and extinguishing control panel to switch off the machine controls in the event of a fault or fire.

All Minimax fire protection systems can be operated by a common fire detection and extinguishing control panel and thus allow unified and user-friendly operation. In order to ensure permanent access to operation and data, the fire detection control panel should preferably be positioned in a permanently manned position.



- ⑦ Deluge valve set
- ⑧ Main pump
- ⑨ Pressure accumulator
- ⑩ Fire detectors

- ⑪ ProCon impulse nozzles
- ⑫ Automatic extinguishing unit for spark extinguishing

ADVANTAGES

at a glance

- ▶ Holistic solution across all processes and for all areas by a single provider
- ▶ A comprehensive solution prevents fire from spreading to adjacent areas
- ▶ All fire protection systems are integrated into one network through a common fire detection and extinguishing control panel
- ▶ Firefighting starts already in the early stages of an emerging fire
 - minor fire and water damage
 - brief business interruptions
- ▶ Low costs for water supply and pipe network installation
- ▶ Ideal for retrofitting



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Photos

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