Experts in fire protection

DryerProtect
Fire protection for industrial dryers

SPECIAL SOLUTIONS

DRYERPROTECT

Fire protection solutions for industrial dryers: DryerProtect

Industrial dryers are used in a wide range of industries where, in a continuous process, they reduce the residual moisture content of combustible preliminary products, such as veneers, wood chips, sewage sludge, or animal feed in preparation for their further processing later in the manufacturing process. The simultaneous presence of large fire loads, various ignition sources, and oxygen can easily initiate a fire, which can very quickly spread undetected in a closed dryer and lead to costly machine damage and business interruptions.

A fire can have many causes. Materials and deposits in a dryer can easily ignite as a result of overheating, friction, sparking, machine breakage, or human error. Sparks or embers from preceding production areas can enter the dryer through the material feed point and provide a source of ignition for the development of a fire.

Due to the high fire load of materials, deposits, and drying residues as well as any lubricants and operating materials used, fires in the dryer spread rapidly and usually unnoticed. The effect can be amplified by strong air currents.

Sparks or embers caused by a fire in a dryer can reach further dust-covered areas or the filter of a downstream dust collection system via exhaust, control, or cooling air pipelines that lead directly to the open air. This can result in fire propagation, or even explosions, beyond the dryer. A comprehensive fire protection solution that is tailored to the dryer and its adjacent areas and takes account of and manages the interfaces to other production areas is required to avoid such scenarios.

Possible interfaces to a dryer can include material feed and discharge areas as well as connected exhaust, control, or cooling air pipelines.

For the operator, it is important to have a reliable fire protection solution that quickly detects and efficiently fights developing fires in order to avoid lengthy downtime after a fire.

Minimax has the solution: **Minifog DryerProtect**

The DryerProtect fire protection system is VdS-certified for this application, meaning that rebates can be obtained under insurance terms.

The system is intended for, among others, the following industrial dryers:

- Belt dryers
- Slat conveyor dryer
- Feed-and-turn dryers
- Veneer dryers

The Minifog DryerProtect system can also be supplied in accordance with ATEX 2014/34/EU for use in Ex zone 22 if this specification is required.

Technologies used

DryerProtect combines advanced and certified fire detection, water mist, and spark extinguishing technology from a single source. The effective and efficient protection of industrial dryers can only be guaranteed by means of a comprehensive and tailored fire protection solution.

Minifog water mist - Fire suppression systems

Minifog water mist suppression systems use the physical characteristics of the water more efficiently than traditional water-based suppression systems. The extinguishing water is finely sprayed by means of special water mist nozzles as well as sprinklers and increased operating pressure. This increases the total surface area of the extinguishing water so that it absorbs heat and evaporates more quickly. The associated cooling and smothering effect enables particularly effective fire fighting with reduced use of extinguishing water. Different system variants that are tailored to the specific application ensure constant optimum building, room, or local protection.

Spark extinguishing systems - Before sparks turn into flames

Spark extinguishing systems detect ignition sources in exhaust and conveyor systems, and the automated suppression system quickly creates a water curtain to extinguish the glowing particles. These are used wherever combustible materials are pneumatically conveyed and at material transfer points where there is a high risk of fires or dust explosions caused by sparks or hot spots. The suppression process normally takes place withoutinterrupting ongoing operation.

Detection
UniVario flame detectors and spark detectors are used in the protection zones. Both detector types enable fire detection and thus rapid action. UniVario detectors transmit their signals to a fire detection and suppression control panel, which alerts the people at risk in the area and the fire department, while also reliably providing relevant information to the responsible authorities.

Clunid FMZ6000 -
Safer. Easier. Universal.
The Clunid FMZ6000 is a modular fire detection and suppression control panel, precisely tailored and assembled to meet specific customer requirements. High operational reliability and simple operation define the unique features of the Clunid generation of control panels.

The possible applications are almost endless. Everything is possible, from standardized and standard-compliant control of complex multi-zone suppression systems to freely programmable, situational fire control systems. As a result, the Clunid FMZ6000 offers highly flexible technology that is ahead of its time.

Design and function

Minifog DryerProtect combines various technologies in a comprehensive fire protection solution for industrial dryers. In the case of fire, downtime and consequential damage are reduced by the fast response behavior, which is insensitive to false alarms, as well as by water-saving extinguishing technology with water mist. The electrical monitoring of the components for correct positioning and functionality increases the operational reliability of the fire protection equipment and thus the availability of production facilities, especially under prevailing harsh environmental conditions.

Fire detection and suppression

Minifog DryerProtect water mist suppression systems spray particularly fine extinguishing water to increase the surface area and thus the contact surface for heat transfer. This optimizes the water's cooling performance. In addition, the rapid evaporation of the water droplets around the flame produces large amounts of vapor, which impedes the supply of oxygen to the fire. An effective combination that can control and extinguish a fire in a matter of seconds.

One integral part of the Minifog protection scheme for dryers is the Minifog water mist nozzle and its highly effective spray pattern. The efficient fire fighting also convinced the approval authorities. Minifog DryerProtect obtained initial VdS approval for the protection of dryers with water mist technology.

Water supply

The Minifog water mist impulse nozzles require a supply pressure of 4 bar. The water supply for existing sprinkler systems is usually sufficient to supply the Minifog DryerProtect – saving space, costs, and facilitating retrofits. The Minifog DryerProtect system can even be operated up to a maximum operating pressure of 16 bar. To operate the spark extinguishing components, the water supply must also be equipped with a pressure tank so that a non-delayed water flow can be guaranteed with the required quantity and corresponding pressure at the F180 spark extinguishing nozzle.

Suppression zone

The special nozzle contour and fine sieve protect Minifog water mist nozzles from clogging, and even allow the use of galvanized pipelines. Specially prepared extinguishing water is no longer necessary. If there is an abrasive atmosphere in the dryer, we recommend using stainless steel pipes. The water mist nozzles are equipped with a protective cap and catch chain against external contamination.

Deluge valve station

In addition to direct manual release at the deluge valve station, the water mist suppression system can also be actuated by hand using manual release elements located in the immediate vicinity of the dryer and in the control room. Once activated, the valve remains in the open position, even if the power supply has been disrupted or damaged as a result of the fire. Not only can the approved Minimax deluge valve stations be opened electrically, but also closed and reopened remotely if necessary. This reduces water use to the absolute minimum. The deluge valve station is placed at the shortest possible, but still safe, distance from the dryer in order to minimize flooding times and ensure safe manual operation for personnel, even in the event of rapid fire propagation.

Fire detection and suppression control technology

Fast and reliable fire detection is crucial wherever there are high temperatures and a high fire risk: Three-channel infrared flame detectors are used to monitor closed areas in the dryer. These are available in different variants, depending on requirements. In areas with lower temperatures, UniVario FMX5000 detectors with a special assembly adapter are used. For higher temperatures, UniVario YMX5000 detectors with a detached sensor system or fiber optics are used to protect the sensitive detector electronics and separate them from the hot area. The permanent use of cost-intensive cooling air for the sensor system is no longer necessary.

An optional purge air unit is available for the detectors. This enables compressed air from an on-site supply to be applied to the optics of the detector in order to extend cleaning intervals. Due to the use of false alarm-proof

1	Spark detector YMX5000	3	Valve unit	5	Horn/flashing light combi-nation	7	Minifog impulse nozzles
2	Flame detector FMX5000 IR	4	Manual release	6	Self-closing extinguishing nozzle		

detectors, viewing windows do not need to be darkened and maintenance dampers can be opened without activating automatic suppression. All flame detectors are equipped with both function and visibility monitoring.

The fire alarm control panel monitors all flame detectors, including their function and visibility monitoring, pressure switches, shut-off devices, and extinguishing valves. The time of each message as well as the start and end of the suppression processes are recorded in a log accurate to the millisecond. All supply lines are monitored separately for wire breaks and short circuits. The FMZ6000 complies with both EN 54 Part 2 and 4 for fire alarm control panels as well as EN 12094 Part 1 for controlling gas-based extinguishing systems. It is also approved by VdS and FM for simultaneous operation as a spark detection, fire alarm and control panel for all types of fire suppression systems.

Preconfigured and coordinated interfaces for machine response were defined with renowned dryer manufacturers. The signals can be transmitted to the dryer's PLC controllers via potential-free contacts or a bus system.

Your benefits with Minimax DryerProtect

- Use of proven Minifog water mist technology with efficient water use and low operating pressures
- Requires up to 70% less extinguishing water than conventional deluge systems
- Proven fully optical detection in combination with self-monitoring for reliable spark and flame detection
- Optional spark extinguishing at interfaces to the dryer
- Flexible system integration in new constructions and existing facilities
- VdS-certified system with system approval

Photos
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Page 3: Stela Laxhuber GmbH
Rear: Stela Laxhuber GmbH
Raute Corp.

Minimax Fire Solutions
International GmbH
Industriestraße 10/12
23840 Bad Oldesloe
Germany
+49 4531 803-0
wood@minimax.de

Publisher:
Minimax GmbH
Industriestraße 10/12
23840 Bad Oldesloe
Germany
+49 4531 803-0
www.minimax.com

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