Experts in fire protection

Minifog PressProtect
Fire Protection Solutions for Industrial Presses

SPECIAL SOLUTIONS

Minifog PressProtect

Varied fire risks, one solution: Minifog PressProtect

During the production of OSB, PB, MDF and HDF boards with continuous or multi-opening presses, combustible materials for example wood chips, fibers, paraffins and adhesives including flammable liquids such as hydraulic and thermal transfer oils are used.

Should these inflammable materials ignite, e.g. by overheating or friction, serious fires can very easily develop, which in severe cases may lead to extensive property damage followed by long undesirable and expensive downtime. Fires also put human life at risk.

In continuous presses fire hazards generally exist on the whole production line. Metallic friction, condensation of volatile substances, oil leaks and fiber deposits particularly in close proximity to the pneumatic exhaust systems, may all assist in starting a fire. From experience the highest risk of fire comes from the press inlet and the press outlet, where amongst others units, such as cleaning, lubrication and extraction systems exist. In the press inlet the entering pre-compressed material mat and the deposits are exposed to strong physical influences, by extreme heat supply and high pressure, and thus may easy ignite. A particularly high number of fires start at the press outlet, where volatile substances leave the extremely hot board and ignite upon contact with oxygen in the air.

In a multiple-opening press the material is heated intensely during the extended period of time spent within the press cycle. As the press is opened, the compressed boards are exposed to oxygen. Should a glowing ember be produced during the pressing sequence, this rapid supply of oxygen may lead to a fire. Deposits on the frame construction will further assist the fire to spread rapidly in the vertical direction (chimney effect). For this reason, it is recommended to include both the press loader and unloader into the extinguishing concept.

Flexible hoses supplying the press with thousand litres of hydraulic and thermal transfer oil create an additional fire risk. As they are subject to mechanical stress during the opening and closing cycle of the press, cracks that may develop causing leakage of pressurized oil can result in a severe fire. As the thermal oil ages, its ignition point sinks, thus considerably increasing the risk of self ignition on hot surfaces as a result of leakage.

A distinct fire risk can also be identified in the pit below the press – e.g. from hydraulic or thermal transfer oil equipment and accumulated fibers and grease. This particular risk should be protected as a separate extinguishing zone with the addition of a special foaming agent.

Spark detection- and extinguishing units can be used for protection of press suction and downstream areas.

The complex design of the press prevents the water spray from the ceiling sprinklers from reaching and wetting the fire in it's interior. Protection with a Minifog PressProtect system will help to protect your production systems from fire damage and expensive downtimes.

Minifog PressProtect systems create fine droplets thus increasing the contact area for heat transfer thereby optimizing the cooling effect of the water. In addition – due to rapid vaporization of the small water droplets within the location of the flame – a large amount of steam is produced, which prevents the oxygen from reaching the fire. An effective combination for rapid control and extinguishment of a fire. Water spray nozzles with their unique spray pattern are an integral part of the Minifog protection concept.

They are positioned in two levels on both sides of the press, as well as in the inlet and outlet, to securely protect the risk areas and minimize water use.

The low volume of water, the special spray pattern and the targeted nozzle arrangement minimize the danger of distortion of hot machine parts – proven under one to one fire tests and metallurgical investigations. Damage is avoided and the press remains in an operable condition. Such efficient fire fighting has also convinced various approval entities. Minifog PressProtect has achieved the first VdS approval for press protection with fine water spray technology. The large international insurance company FM Global has also tested and approved the functionality of the Minifog press protection in fire tests.

Design and function

Minifog PressProtect is subdivided into extinguishing areas with Minifog water spray nozzles, water supply and fire detection and extinguishing control technology with special flame detectors.

Water supply

The Minifog water spray nozzles only require a supply pressure of 4 bar. As the extinguishing system operates under low pressure, connection to a sprinkler system is usually possible, eliminating the requirement for an additional water supply, with a considerable saving on both space and costs and makes also retro-fitting easy. The Minifog PressProtect systems can even be operated up to a maximum operating pressure of 16 bar.

Extinguishing area

The special nozzle contour and fine sieve protect Minifog water mist nozzles from clogging, and even allow the use of galvanized piping.This means that expensive stainless steel pipes or specially treated extinguishing water can be avoided. A cap with retaining chain protects the nozzle from outside contamination. An optional non-stick coating minimizes external contamination of the nozzles in areas particularly susceptible to dirt.

Fire detection- and extinguishing technology

Flexible and temperature resistant fiber optic cables are used for thermally separating the electronic components of the flame detector from these hot areas. The cost intensive provision of permanently necessary cooling air can be avoided.

Thanks to the use of nuisance-safe detectors, limit switches are not required on all maintenance openings which have to deactivate the detectors when opened to avoid false release. The open areas of the press are monitored using false alarm-proof infra-red detectors, which are also equipped with function and visual monitoring systems.

The fire detection control panel monitors all flame detectors, including their function and visual monitoring systems, pressure switch, blocking equipment and extinguishing valves. The time of every alarm, in addition to the start and finish of extinguishing processes, is logged to the millisecond in a storage memory. All lines are monitored separately for wire breaks and short circuits. The FMZ6000 meets the requirements of both EN 54 Part 2 and 4 for fire detection control panels and EN 12094 Part 1 for the control of gas extinguishing systems. It is also approved by VdS and FM for simultaneous use as a flame detector, fire detector and control panel for all types of extinguishing systems. As a result of this, all fire protection tasks can be carried out with just one control panel. All automatic detectors are equipped with an electronic self-monitoring of optical integrity, sending a signal to the control panel in event of contamination: If residues collect on the optical window of the detector, a fault message is displayed on both the detector in question and the fire detection control panel, before the detector "loses its sight". This function makes a considerable contribution to increasing operational safety.

The Minifog PressProtect system is also available for use in Ex Zone 22, in accordance with ATEX 94/9.

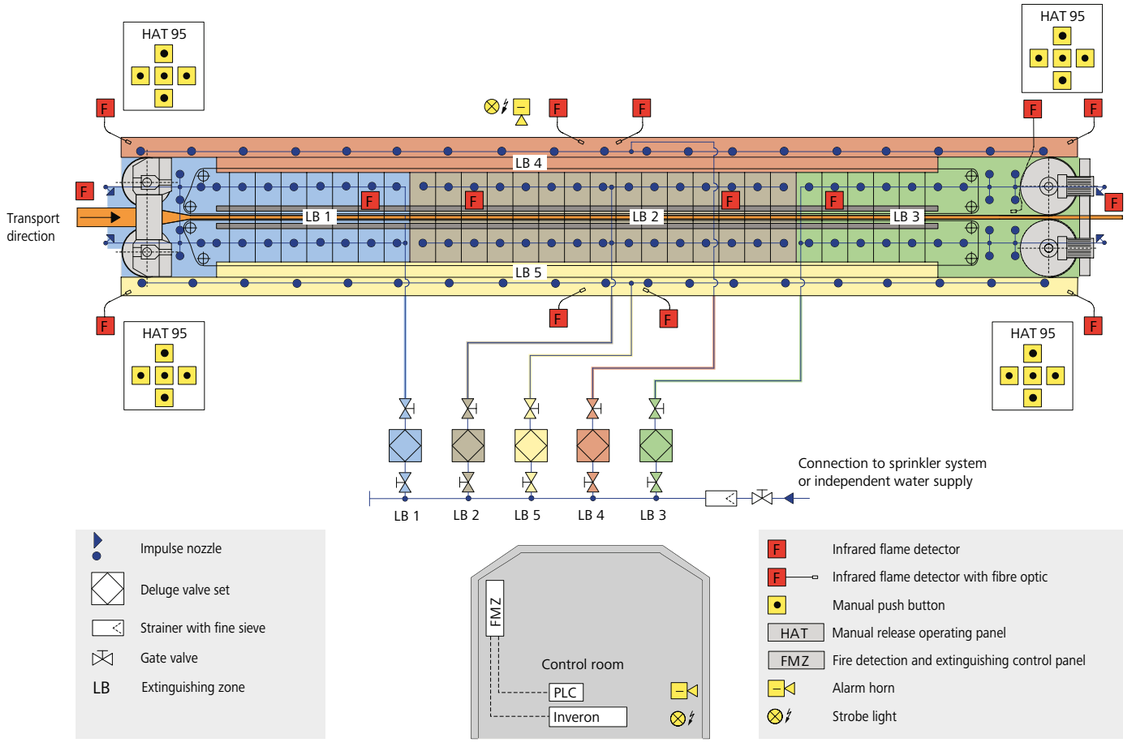
For optimal operating comfort, in addition to alarm transmission and alarm storage, the fire detection control panel can be connected to the Inveron visualisation and alarm management system, which offers the possibility of operating the control panel, display messages optically or graphically on a monitor and forward selected alarms via short text message, email or fax by using a special message module.

Pre-configured and fully coordinated interfaces for the machine reactions were defined in close collaboration with renowned press manufacturers. Signals can be transmitted to the press PLC via potential-free contacts or a bus system.

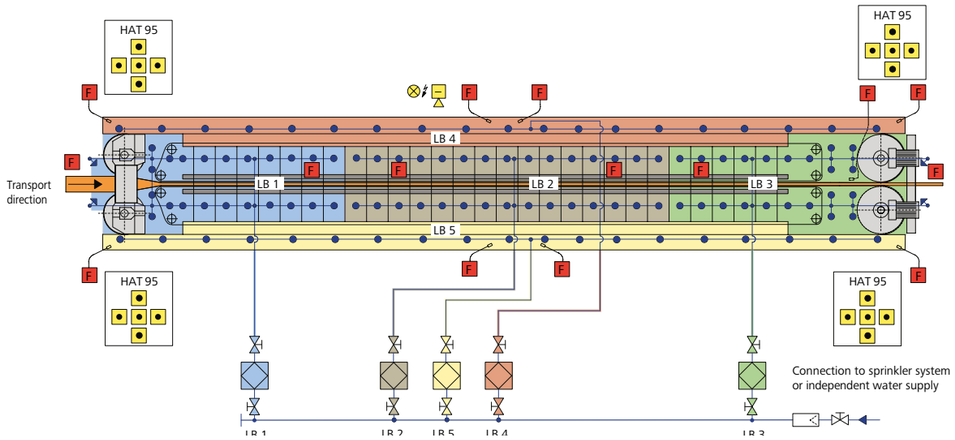
As well as being activated by hand at the water spray deluge valve stations, the Minifog system can be activated by manual release units located in close proximity to the press and in the control room.

The approved Minimax deluge valve stations can be opened and closed by remote control: This enables the use of water to be reduced to an absolute minimum. Once activated, they remain in an open position, even if the electricity supply fails or is damaged as a result of fire.

The distributor with the deluge valve stations is placed at the shortest possible, but still safe, distance from the press in order to minimize flooding times and ensure safe manual operation for personnel, even in the event of a potential flash fire. Central positioning of the valve station is more user-friendly, but decentralized positioning is also possible at the customer's request.



Centralized valve station position (recommended)



Decentralized valve station position (alternative)

Minifog PressProtect water mist systems protect over 350 presses worldwide. There are many reasons for this:

- Highly level of operational safety reliability via visibility-monitored and nuisance safe detectors
- Water-saving water mist technology that minimizes the risk of thermal distortion
- No danger of blockage and contamination of the robust Minifog water spray nozzles
- High flexibility through decentralized or centralized positioning of the valve stations
- No interface problems – fire detection and suppression in a water mist system
- Fast assembly through prefabricated and ready-to-install assemblies
- Simple retrofitting through modular design
- Can be combined with existing water-based fire suppression systems
- Tested and approved by independent institutes in fire tests: VdS Schadenverhütung, FM Global

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