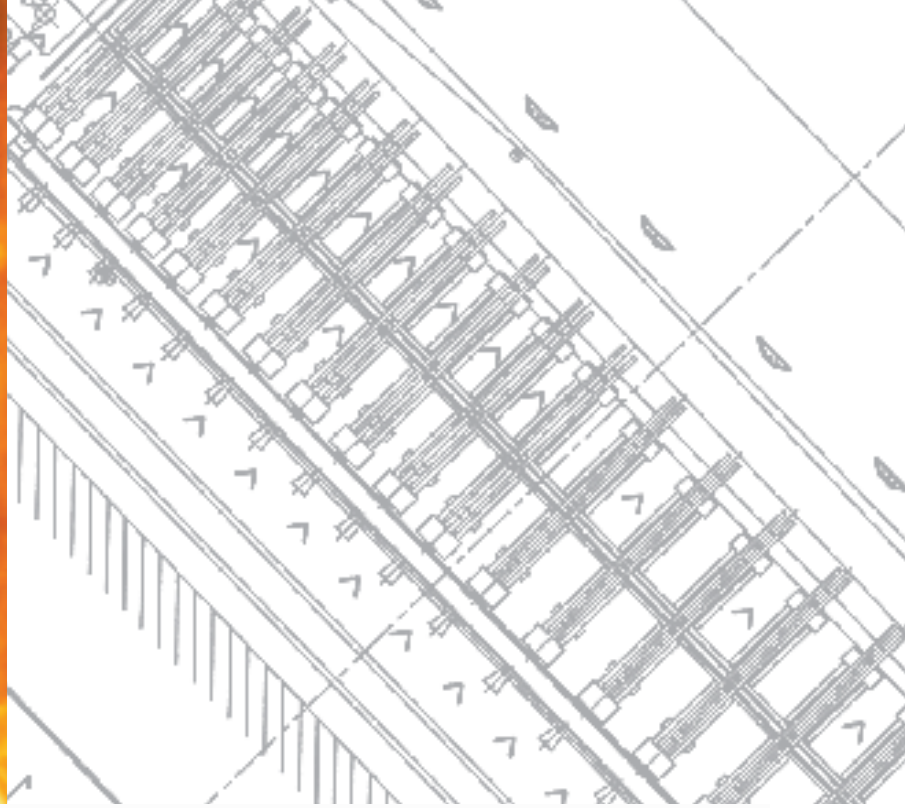


PressGuard

EFFECTIVE AND RELIABLE SOLUTIONS FOR PROTECTION OF PRESSES IN THE BOARD INDUSTRY

PREVENTIVE PROTECTION SYSTEMS FROM
fireflyab
SWEDEN

A Press – The heart of a board plant

Risk scenario

For many board plants throughout the world, a major press fire is a worst case scenario. A fire means long down-time at best. At worst, the consequences may be even more serious, with enormous capital loss as a result.

The board industry has always given high priority to efficient continous or multi-daylight presses. The demand for higher productivity has led to a constant performance improvement usually with customer specific modifications and additions to the press. From a safety point of view this development means that protection systems involving standard solutions often prove inadequate. Effective press protection requires a careful Risk Analysis to point out plant specific hazard zones in order to design a plant specific protection system.

There are many parameters that determines the risk. The main concern is the build-up of dust and leakage of oil and the risk therefore increases with the age of the press. As time passes, there is more oil leakages and it will be more difficult to maintain a clean press. Also, ageing oil becomes increasingly easier to ignite.

Complexity

All presses are different in one way or the other. Depending on press manufacturer, location of frames, temperature settings, press speed, panel thickness, cleaning procedures, press surroundings, extraction techniques, prepress settings and press oil consumption etc. all giving a different condition for a fire scenario. Therefore, the solution against a fire cannot be the same for all presses.

Some parameters that determines the risk as well as the design of a PressGuard system:

- Type of press
- Design of the press
- Condition of the press
- Location of the press
- Design of the exhaust
- Cleaning procedures
- Number of operators
- Oil leakage
- Material build-up
- Electrical cables
- Heating oil transfers
- Press temperatures
- Fire spreading possibilities
- Location of control room

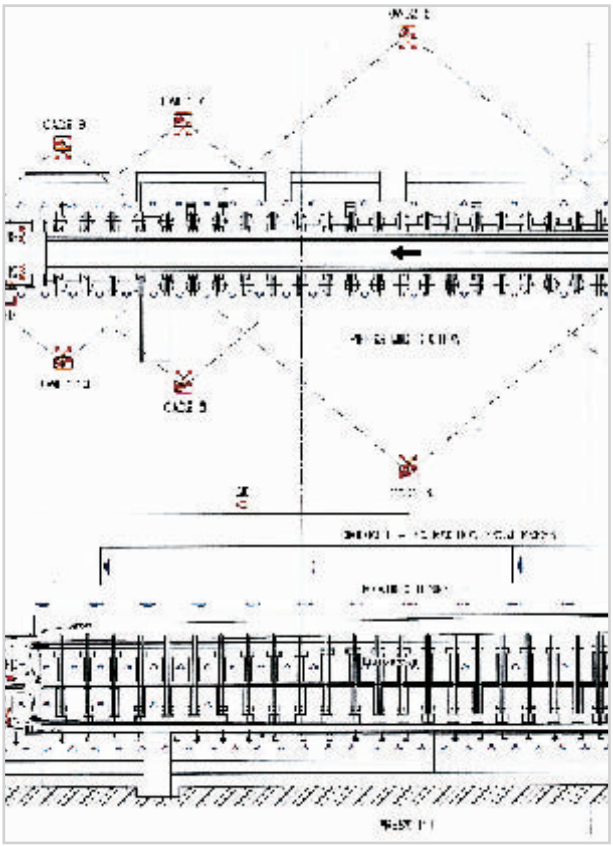
The PressGuard Concept

Risk Analysis

Due to the complexity of a press and the individuality of each specific press, the PressGuard concept from Firefly always starts with a thorough Risk Analysis of the press. The Risk Analysis follows a defined structure, studying all sections of the press, as well as the process parts upstream and downstream of the press. Also the immediate surrounding area where a fire could spread must be taken into consideration. Our engineers are very experienced in risk evaluation which has been developed over many years in dealing with a range of press designs operating under different conditions. By combining this knowledge with that of the customer, we are able to determine a good understanding of the problems and what action to take in order to minimise the risk of fire. The human factor is also an important part of the equation that must be taken into account when analysing a potential risk.

Onsite System Adaption

During an Onsite System Adaption, Firefly will consider aspects of the plant to determine the risks and adapt the solution to suit each specific project.



Customised design

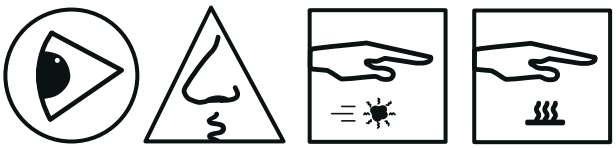
System design is based on the Risk Analysis and the desired safety level. Questions considered are: Where are the most strategic locations for detection? What emphasis do we need to put on extinguishing with consideration to cables, hydraulic and other sensitive systems? Is detection in the extraction system necessary? Should we use steam as an extinguishing agent? All these and many more factors have to be taken into consideration. By adopting this approach the position of each detector and water nozzle can be optimised thus achieving the desired safety level across a plant. Not only the press has the potential of causing a fire. In the PressGuard concept we can also cover other areas of concern such as the fume extraction system, heating oil system and press pit.

Detection

For detectors in a press protection system there are a number of criteria that needs to be fulfilled. There are also different requirements at different areas of the press. Firefly has a wide range of detectors that can meet these requirements.

Flame detection - Avoid false alarms!

The area around the press contains many different disturbance sources that can affect flame detectors. Firefly has designed a solution that is insensitive to false alarms. The detector used for flame detection around a press, OAD (Open Area Detector), is a two-channel UV/IR detector. By combining IR and the UV wavelength the detector will efficiently recognise flames but discriminate other energy sources, such as lamps, sunlight and even arc welding.



IR flame detection

In enclosed volumes, such as heat tunnels, infeed and outfeed boxes, fire can easily become a big problem if time is given for the fire to develope. Therefore, Firefly uses fast acting IR flame detectors that will detect flames at a very early stage without the common problem of being daylight sensitive.

Hot body detection

In a combination with the flame detectors, our IR hot body detectors are used in the extraction ducts from the press. Detecting extracted overheated material gives early warning of an incipient fire. This will also minimise the risk of fires in cyclones or in other process areas downstream in the extraction system. It is very important that these detectors can detect the minimum ignition temperature of the material.

Other detection principles

Another way of detecting a fire is to use temperature sensors. This method is not as fast as flame detection, but could be a cost effective alternative in volumes where the risk is considered to be lower. Firefly's TG detector is an improvement of conventional temperature sensors. It can detect temperature gradients as well as absolute temperatures.


Küsters Press

Efficient extinguishing – The difference between disaster and success

The extinguishing is just as important as detection. Firefly combines several different extinguishing methods, to optimise the effectiveness of the solution. By this approach we can achieve a safe and efficient extinguishing, with a minimum effect on the process. Conventional sprinklers for extinguishing expose the press at a high risk since a deluge of cold water on hot steel may result in a deformation or create electrical problems. After extinguishing with sprinklers, a time consuming clean up follows due to the large amount of water used. Examples of extinguishing methods in the PressGuard system are: water mist, often used around the press, full cone water spray, which is used in ducts and steam for enclosed volumes such as heat tunnels, infeed and outfeed boxes.

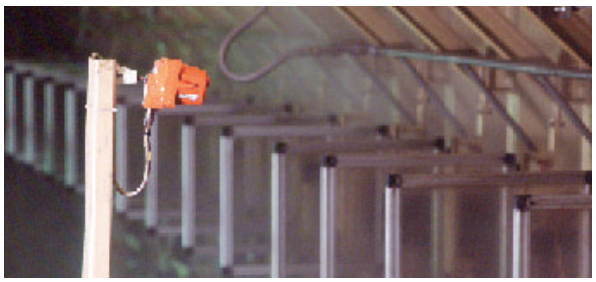
Harmless extinguishing is essential

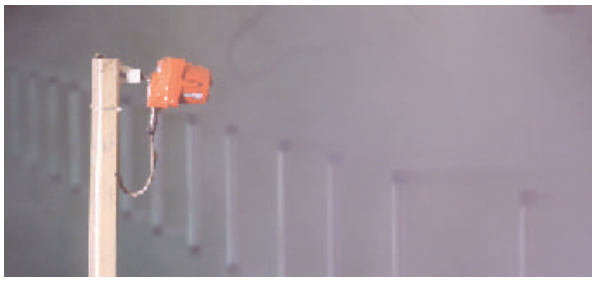
Firefly's philosophy is that extinguishing itself should not cause problems. Even though our system is fully automatic, an operator has the ability to manually activate the system. The Firefly water mist nozzles only consume a fraction of the water volume compared to regular nozzles. Due to this, extinguishing is possible without interrupting production.

The water mist has a specific droplet size designed for extinguishing on hot surfaces. If the droplets are too small they will be swept away by the thermal air flow and if they are too big, the risk for rapid cooling and structural damages of the press increases.

Water mist turns into steam

When using water mist on a hot press the water vaporizes into steam, providing a highly efficient extinguishing effect. The steam effectively quenches the fire and gradually cools down the press. In some cases steam from the process is used for extinguishing in enclosed volumes, as it rapidly spreads and creates an inert atmosphere.





Firefly PressGuard concept

Based on thorough Risk Analysis and Onsite System Adaption, reliable detection and efficient water mist systems. The Firefly concept for protection of presses has become very successful. It is suitable for both continuous presses and multi- or single opening presses in the board industry. By utilising the CUE control units, the solutions are flexible and can easily be integrated with the Firefly preventive protection system against fires and explosions.

· Risk Analysis and onsite system adaption

· Efficient and reliable flame detection

· Fast detection and extinguishing

· Highly efficient water mist with minimal water usage

· Harmless extinguishing

· Self diagnostics

· Flexibility

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FIREFLY – MUCH MORE THAN SPARK DETECTION