

WOOD PANEL SOLUTIONS

How to protect your process from fire and dust explosions



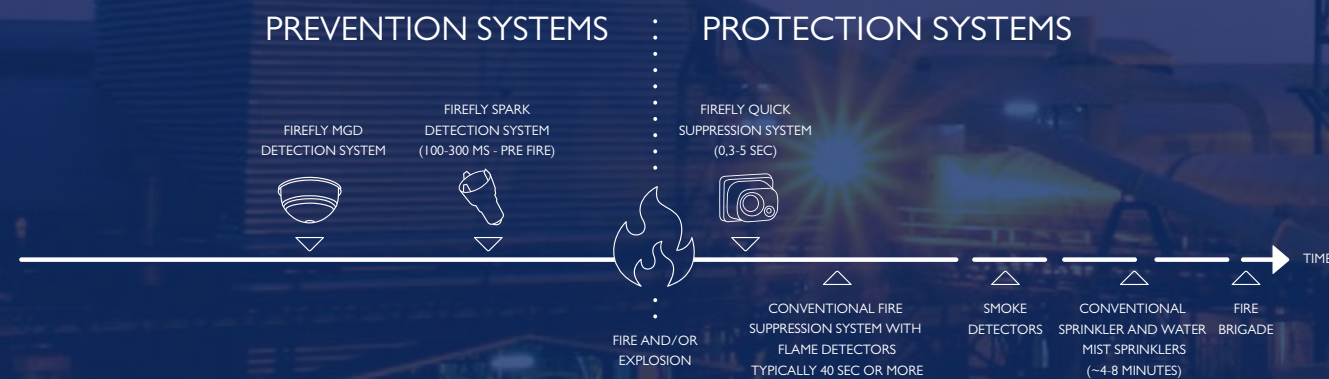
REACHING AN EFFICIENT AND SAFE MANUFACTURING PROCESS

The wood panel industry has a longstanding issue with fires. In many plants, fire incidents happen regularly and leads to costly production losses. In some cases, the consequences are even worse with large damages or personnel injuries.

There are several high-risk areas in which fires or dust explosions may arise. By monitoring and protecting these high-risk areas through an appropriate fire prevention or fire protection system, with a quick response time, fires can be prevented before they cause damages or spread to other areas.

Firefly's unique solutions for a wood panel manufacturing plant combines **preventive** and **protective** systems for optimal safety. All integrated into one control system.

Don't wait until it's too late – contact Firefly today to learn more about our solutions for the wood panel industry.



IGNITION TEMPERATURES AND ENERGIES

Many fire problems in the panel industry are caused by friction, wood is a particularly inflammable material.

The friction itself does not generate sparks, but causes hot surfaces and heated material. If the temperature reaches above the MIT (Minimum Ignition Temperature) of the wood dust, an ignition could occur.

The wood in your process can ignite at different temperatures. A wood dust cloud such as in a dust collector, can ignite from 470°C (752°F). However wood dust in a 'layer', such as in a silo, can ignite from 260°C (482°F). Firefly recognises the differences in ignition temperature in order to effectively protect your plant against costly fires and dust explosions.

Research* clearly shows that (black) hot particles are more frequent sources of ignition within the process industry than expected. Therefore Firefly has developed a unique and patented technology based on Infrared (IR) radiation detection, which makes it possible to detect and eliminate both sparks and hot particles with temperatures down to 250°C / 480°F.

* Prof. Rolf K. Eckhoff, author of "Dust explosions in the process industries" (second edition)

MINIMUM IGNITION TEMPERATURE (MIT) FOR WOOD DUST

Cloud 470°C / 878 °F

Layer 260°C / 500 °F

NOTE THAT A PARTICLE BELOW 650°C IS BLACK.

Source: NFPA (National Fire Protection Association)

” Hot particles can be generated from surfaces that have been heated by friction. A hot particle even the size of a pea may pose a much greater risk than a spark. Even if the temperature of the hot particle is lower than that of a spark, the hot particle will remain dangerous for a longer time.

PROFESSOR ROLF K. ECKHOFF,
Author of "Dust explosions in the
process industries"



SPARK DETECTION SYSTEM FIRE PREVENTION

Firefly's Spark Detection System will, in milliseconds, detect and extinguish ignition sources inside the process, before they cause fire or dust explosion.

Firefly's unique TrueDetect™ technology enables detection of all type of ignition sources such as hot friction particles, sparks and flames. All our detectors are insensitive to ambient light, to avoid unnecessary detections or false positives.

The Spark Detection System is typically combined with a water extinguishing zone, based on Firefly's high-speed and powerful full-cone water spray system. This unique extinguishing concept is designed to cover the entire cross section of a duct or a chute and to penetrate the material flow and air flow.

The Firefly True IR Spark Detection and Extinguishing System is certified according to Factory Mutual (FM)* and Schadenverhütung GmbH (VdS)*.

* FM certificate no. 3060012, Vds approval no. S6990002.



Firefly PowerImpact Extinguishing™

- ⊙ Efficient for extinguishing/cooling of ignition sources in a material flow
- ⊙ Full-cone water spray nozzles
- ⊙ Thoroughly penetrates dense material flow
- ⊙ Activated within milliseconds after detection
- ⊙ Short extinguishing cycles that avoids unnecessary water usage



QUICK SUPPRESSION SYSTEM FIRE PROTECTION

The Firefly Quick Suppression System is designed for extremely quick detection and suppression of flames or fires in and around machinery and in high-risk areas or volumes. The system has been fire tested with the test protocol DFL TMI70307-1261 and verified by the DNV.

Firefly's Quick Suppression System operates with high performance flame detectors and efficient water mist suppression. The Firefly water mist system has remarkable fire suppression capabilities, utilizing a very small amount of water.

The purpose of the Firefly Quick Suppression System is to act quick enough to avoid or significantly reduce damages and production downtime as well as avoiding a fire from escalating and spreading into other areas. Conventional extinguishing methods, for example sprinklers, need large flames generating a high amount of heat to react and an extensive amount of water is needed to extinguish a fire.



FIREFLY EXIMIO™ – INTELLIGENT SYSTEM ARCHITECTURE

The Firefly EXIMIO™ system is an intelligent and decentralized system with a modular system architecture. Detectors and extinguishing equipment are connected to local EXIMIO™ hubs, thus making cable routing and overall installation more efficient and less expensive. It is also easy to add on to the existing system and extend to cover new risk zones if desired.

Operators will control the system via a 12" color touch screen via the IntuVision™ panel - operators interface, that comes as standard in every Firefly EXIMIO™ System. IntuVision™ is easy to use and includes numerous of features and functions, for example ApplicationView™ is where a drawing of the zone will be shown on the screen.

By using IntuVision™ - Desktop, the customer can connect the system to an external computer, for example in the control room.

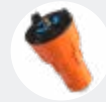
The system is OPC-UA compatible for connection to the customer SCADA system.



PARTICLE BOARD AND PLYWOOD

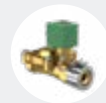
Processes in the particle board industry and the plywood industry are customised in different ways. Different machine types and technologies are used. Hence, the risks must be evaluated and the solutions must be designed specifically for each process.

By tailoring a fire protection system using fast IR-radiation detection and flame detection in combination with effective water spray extinguishing and water mist suppression, Firefly aims to avoid costly fires and dust explosions in the particle board industry as well as in the plywood industry.



PATENTED TRUE IR DETECTORS

Millisecond detection of hot particles, sparks and flames. Firefly's spark detectors are FM approved and insensitive to daylight.



FULL-CONE WATER SPRAY EXTINGUISHING

Powerful extinguishing with a unique nozzle design and placement aimed to penetrate and cover the entire material flow. Activated within milliseconds after detection.



MGD™ DETECTOR

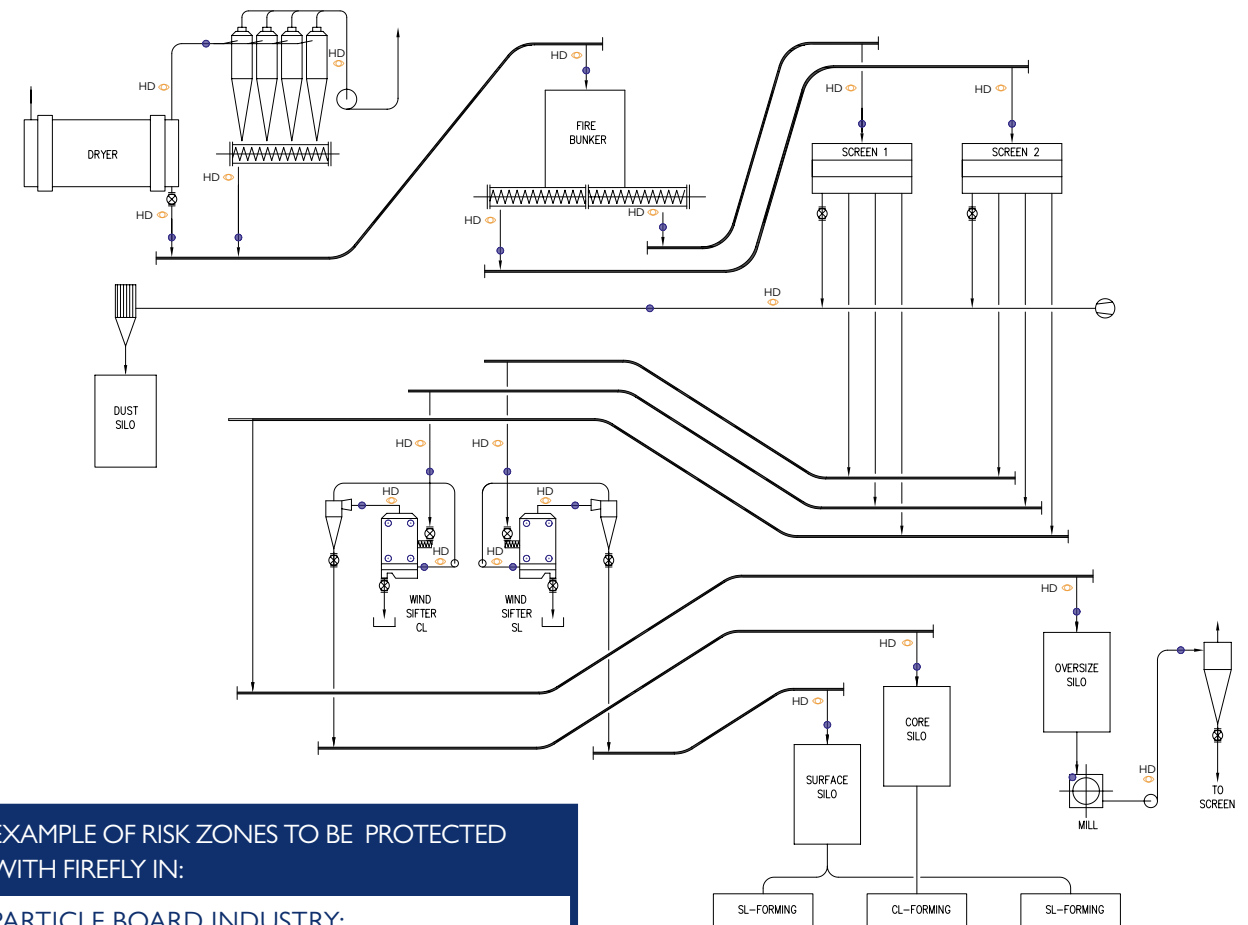
Firefly's MGD™, a gas analyzer, commonly known as "electronic nose", is designed to detect the earliest stages of a combustion process, for example the self-heating process of an organic material. The MGD™ can be installed in the top of the silo or at the outlet tunnel from the silo to give an early warning of a combustion process inside the silo.



A UNIFIED CONTROL SYSTEM

Enabling a good overview of all protected zones. Operators will control the system via IntuVision™, an intuitive user interface with a color touch screen, which comes as a standard in every Firefly System.

FIREFLY PROTECTION SOLUTION FOR PARTICLE BOARD LINE



EXAMPLE OF RISK ZONES TO BE PROTECTED WITH FIREFLY IN:

PARTICLE BOARD INDUSTRY:

Drum dryers, belt dryers, dryer cyclones, screens, mills, wind sifters, silos, lines extractions, sanding/saws/press.

PLYWOOD INDUSTRY:

Veenet dryers, filters, silo, sanding, panel sizing.

- HD400 Detector - Detects spark and hot particles from
- HD250 Detector - Detects spark and hot particles from
- Water spray extinguishing
- Water mist extinguishing

MDF

WIND SIFTER PROTECTION

Experience shows that fire and dust explosions inside wind sifters create huge damage. Large amounts of dry wood particles and oxygen make the environment inside wind sifters ideal for a fire or dust explosion.

A detection and water spray extinguishing system is installed at the inlet to minimise the risk of potential ignition sources entering the wind sifter. Furthermore, water mist is installed inside the wind sifter to take action before a fire can take hold. Similarly, we recommend installation of both detection and extinguishing in the recirculation duct.



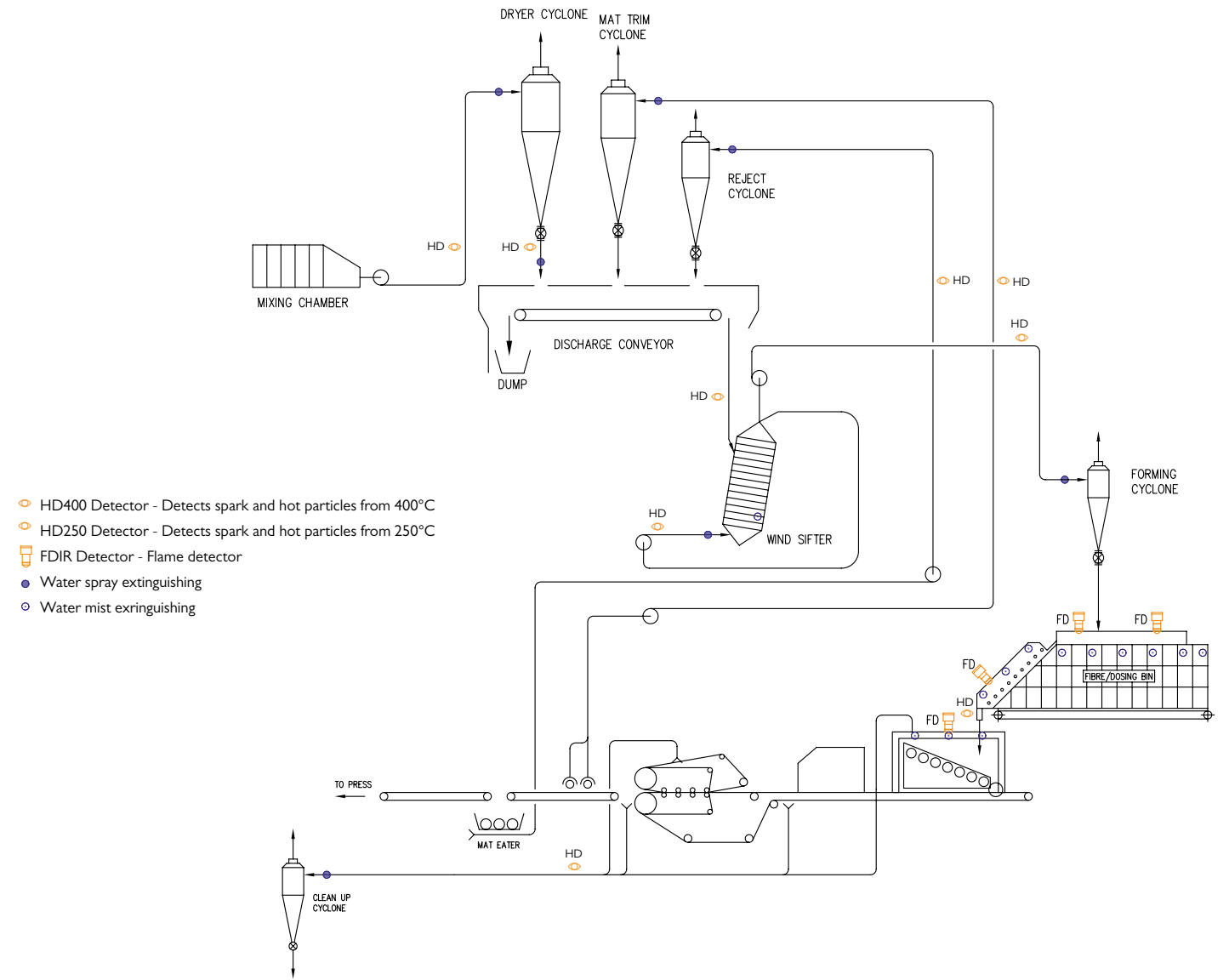
FIBRE/DOSING BIN PROTECTION

When ignition occurs inside a fibre/dosing bin, it often results in a glowing fire. Explosion is however not uncommon either! The wood fibres are very dry which enables easier ignition. It is furthermore difficult to access the material inside the bin: another reason why correct safety measures should be taken in and around this part of your production line.

A detection and water spray extinguishing system is installed at the inlet(s) of the fibre/dosing bin. Flame detection in combination with water mist extinguishing is furthermore installed inside, particularly around the doffing rolls which present a main risk for fire.

EXAMPLE OF RISK ZONES TO BE PROTECTED WITH FIREFLY IN MDF INDUSTRY:

- ⊙ Dryers
- ⊙ Fiber/dosing bins
- ⊙ Wind sifters
- ⊙ Forming stations
- ⊙ Line extraction
- ⊙ Sander
- ⊙ Press



OSB

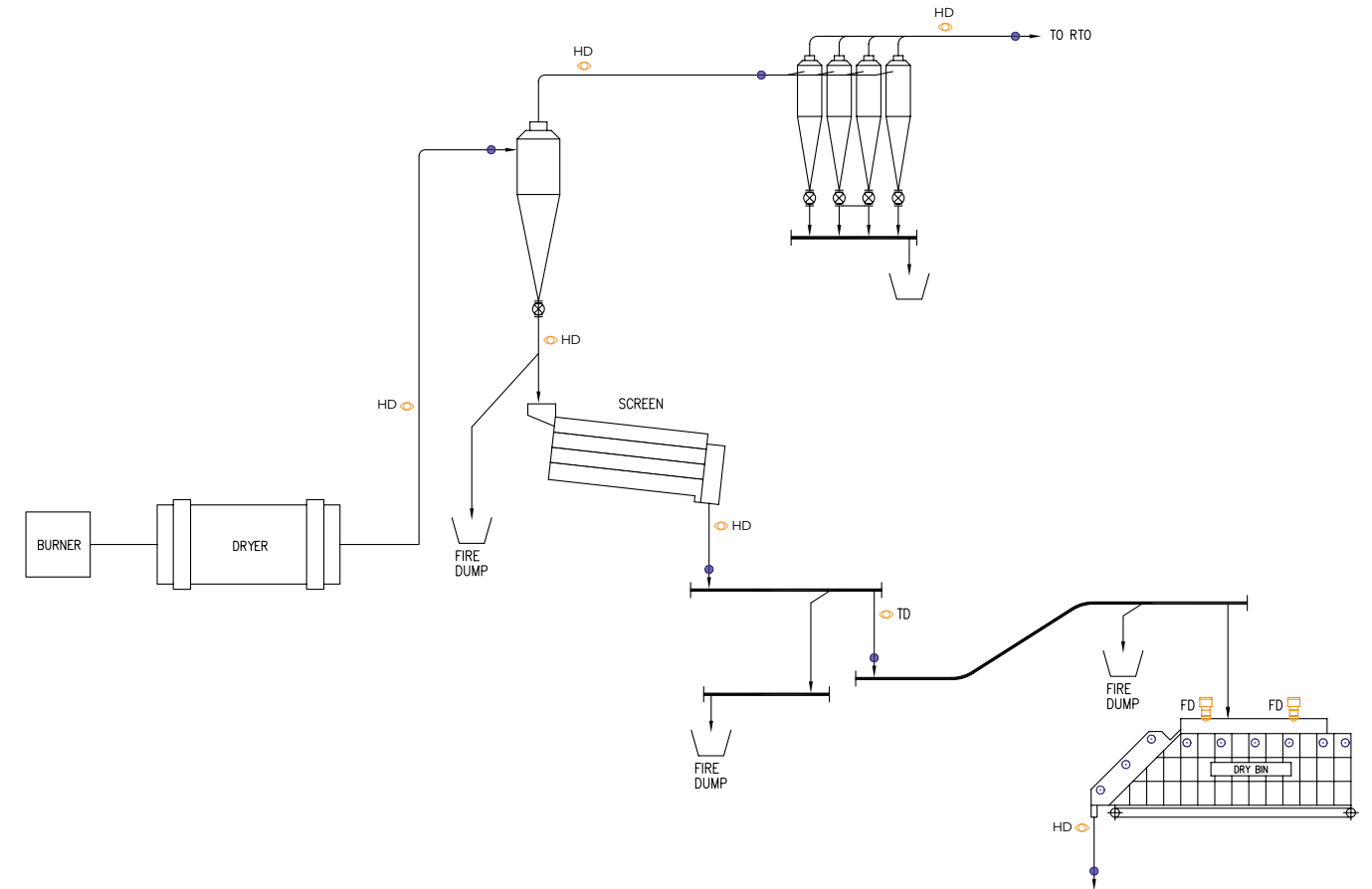
DRY BIN PROTECTION

A dry bin is a vital part of the OSB process. A fire in a dry bin can cause severe downtime. The storage of this dry material over time will become more of a risk. Ignition can therefore occur in this very dry environment.

The Firefly solution for protection of dry bins offers you considerable advantage over a conventional spark detection system. A detection and water spray extinguishing system is installed in a chute prior to the inlet of the dry bin. Our unique detection technology enables detection of potential ignition sources down to very low ignition temperatures. No other conventional spark detection system is able to offer you the same level of protection.

EXAMPLE OF RISK ZONES TO BE PROTECTED WITH FIREFLY IN OSB INDUSTRY:

- ⊙ Dryers
- ⊙ Screening
- ⊙ Dry bin
- ⊙ Extraction
- ⊙ Sander
- ⊙ Press

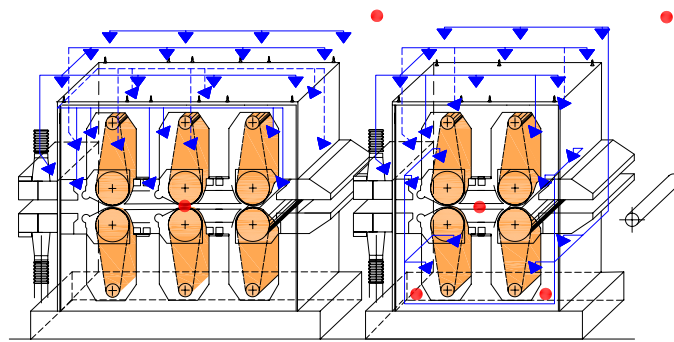


- HD400 Detector - Detects spark and hot particles from 400°C
- FDIR Detector - Flame detector
- Water spray extinguishing
- Water mist extinguishing

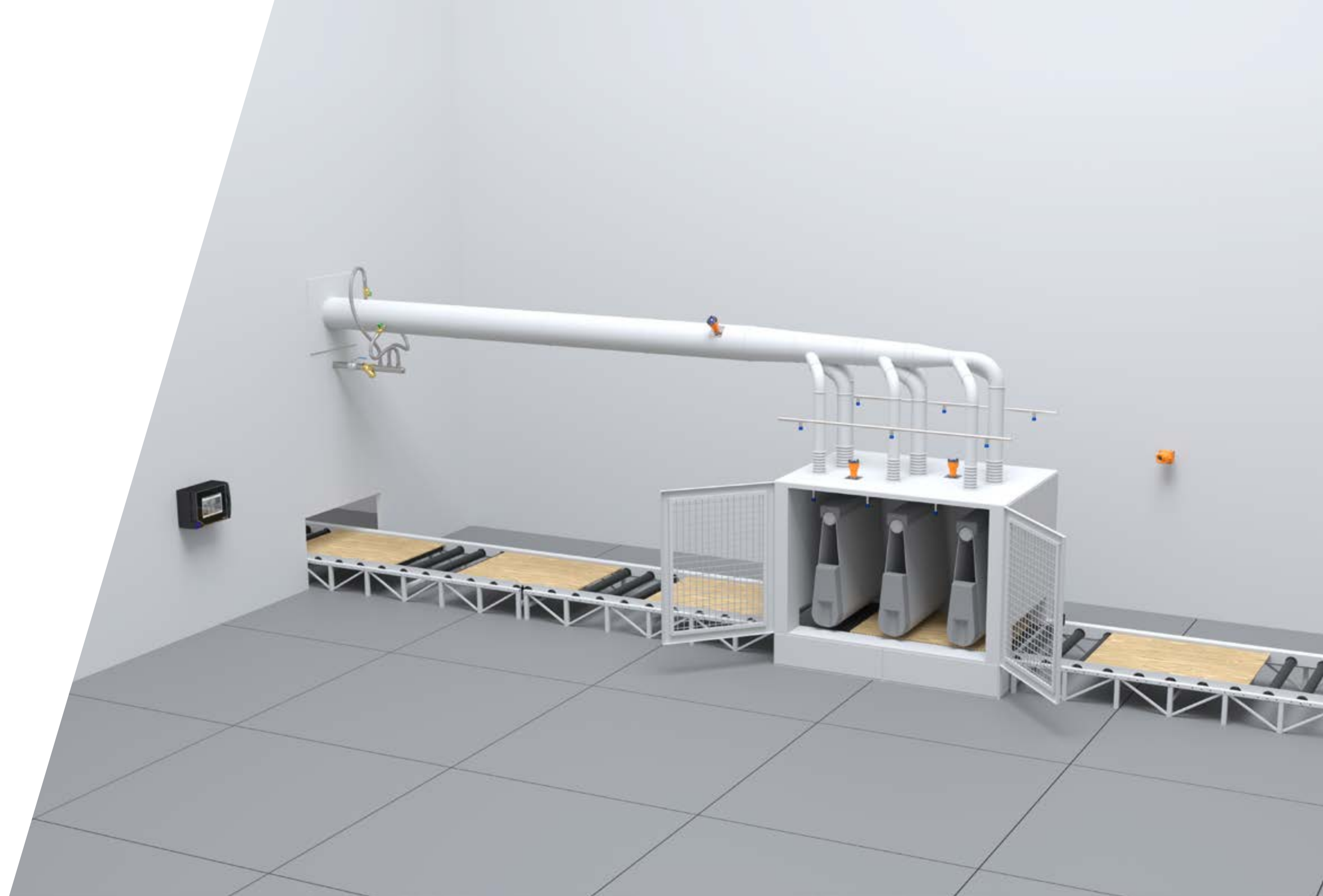
FIREFLY SanderGuard™

The fine dust generated by a sanding machine can, when ignited, give rise to severe dust explosions and rapid spread of fire. Firefly's SanderGuard™ system solution is designed for all types of sanders. Firefly's SanderGuard™ system solution includes quick flame detection inside the sanding machine and water mist suppression, providing optimal protection of this important link in the production chain.

Firefly's SanderGuard™ is designed to quickly indicate a failure inside the machine and, before a fire can take hold, suppress by using a water mist system. The system is designed to quickly cover the enclosed area. It is important to use detectors that are insensitive to daylight since sanders are regularly inspected for purposes of maintenance. Firefly's detectors only detect hot particles such as sparks and glowing particles.



- DETECTION
- ▼ EXTINGUISHING

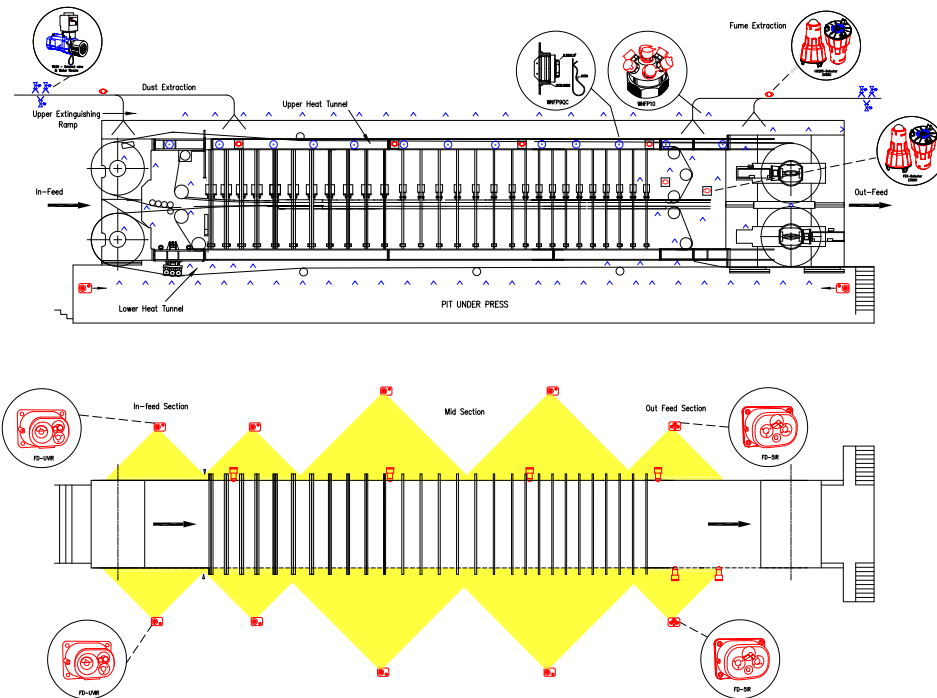


FIREFLY PressGuard®

It is well-known in the wood panel industry that a fire in a press spreads extremely quickly. A small flame can, in just a couple of seconds, develop into a large-scale press fire with devastating consequences/losses.

Combustible material (wood fibres, dust, various types of oil and wax), oxygen and ignition sources (hot surfaces) are always present in and around a press. Considering that these are the parameters needed to start a fire, the question to be asked would not be if a fire will occur in a continuous press, but rather when.

The Firefly PressGuard®, is a Quick Suppression System that consists of a detection- and water mist suppression system. The detection system is built upon a range of different detectors suitable for usage in different areas of a press, this to ensure the best possible accuracy and reaction time. The water mist suppression system uses a lower amount of water to minimise secondary damage/loss.



ABOUT FIREFLY

Firefly is a Swedish company that provides industrial fire prevention and protection systems to the process industry worldwide. Since 1973, Firefly has specialized in creating customized system solutions of the highest technical standards and quality. Based on customer needs and research, Firefly has developed and patented products and solutions, creating a unique portfolio of innovative products and system solutions to increase the level of safety and production output.

The Firefly quality management system is certified according to ISO 9001 and EN ISO/IEC 80079-34. Firefly's products hold national and international third-party certifications through FM, VdS, CSA, DNV, LCIE Bureau Veritas, Delta, and RISE among others.

For more information on our certifications and approvals, please visit: www.firefly.se/about-us/certifications-approvals/

Please contact us if you have questions about fire and explosion risks within your process, our fire preventive team will be happy to share their knowledge and experience.

AS A FIREFLY CUSTOMER YOU RECEIVE



A partnership with our fire prevention teams around the world.



Technical innovation in fire prevention and protection.



Digital progression based on robust safety systems.



Fire prevention and protection through certified technology.

JOIN THE FIREFLY CIRCLE OF SAFETY



WE HAVE FIREFLY USERS FROM MULTIPLE INDUSTRIES ALL OVER THE WORLD



Firefly users in over 80 countries



Firefly's products are available with the following certifications and approvals:



For information on the certifications and approvals each product holds please visit:

www.firefly.se/about-us/certifications-approvals/



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