HAZARDOUS DUST EXPLOSION PROTECTION FOR ALL INDUSTRIES

ProDetec is a specialised Fire & Gas and Hazardous Dust Explosion Protection Engineering Sales & Service Company providing innovative reliable solutions to the Oil & Gas, Chemical, Petrochemical, Manufacturing, Food, Pharmaceutical, Water Treatment and many other industries across Australia and New Zealand.

Our Explosion Prevention & Suppression package for Hazardous & Explosive dust comprises state of the art technologies and systems from around the world however with local approvals.

Our solutions are not sold as individual components, only as complete systems. Since no two applications are the same, every system is tailor-made for the particular duty.

When you are exposed to a risk of fire or dust explosion in your plant, you require a safety system to assist you in covering this risk. This is why our fire and dust explosion safety systems are used in process industry all over Australia & New Zealand for over 25 years.
Every year, thousands of industrial plants suffer from fires and dust explosions. Whenever you produce, handle, store or transport combustible material such as for example wood, tissue or sugar, you are exposed to this risk. The result may be costly production downtime, loss of revenue or in the worst case human injury or loss of life.

A Firefly safety system always consists of three main integrated functionalities: detection, extinguishing and control.

Detection
One of the unique features is Firefly’s patented TrueDetect™ technology. Firefly uses True IR detectors to detect sparks, hot particles and flames in both fall chutes and pneumatic conveying systems. Each Firefly True IR detector is insensitive to daylight and equipped with the Multi-checkpoint technology™, to minimise false alarms and ensure detection quickness and reliability.

Extinguishing
Firefly PowerImpact extinguishing™ and Firefly water mist are integrated parts of a Firefly System. Firefly offers powerful full-cone extinguishing with a unique nozzle design and placement aimed to penetrate and cover the entire material flow inside a fall chute or pneumatic conveying system.

In case flame suppression in or around high risk machinery is required, Firefly offers its non-invasive water mist suppression in order to provide optimal safety for machinery.

In some processes, gas is the most suitable extinguishing agent. Carbon dioxide and nitrogen are excellent extinguishing agents provided that the affected section of the process can be isolated. This is done with the help of Firefly’s fast acting valves with closure times down to 50 ms.

Another extinguishing method used in the Firefly system is mechanical diversion. When an ignition source has been detected, a diverting valve is opened which rapidly re-routes the material flow out of the process flow for collection in a container. The process itself does not even have to be stopped.
**Solutions for the Timber Industry**

**Filters & Silos Protection**
Filters & Silos are key components in the woodworking process. A fire or dust explosion can have devastating consequences. Lengthy downtimes, damage to your machinery and loss of revenue are good examples. Firefly has the ideal solution.

**Planers**
Planers can generate large amounts of flammable material because they are high speed machines with many moving parts. They can generate dangerous ignition sources in the form of sparks and hot particles. Unforeseen interruptions in production due to fire are often very costly.

**Moulders**
A moulder is often installed in a production area adjacent to other machinery. A fire in a moulder can also damage surrounding equipment. Most common causes of fires in a moulder are due to overheating of motors and driving mechanisms, as well as spark generation at the machining heads.

**Sanders**
The fine dust generated, when ignited, give rise to severe dust explosions and rapid spread of fires. The risk of a costly incident increases considerably when the sander becomes blocked, or due to broken or misaligned abrasive belts.

**Band Saw**
Large amounts of waste material often accumulates around the band saw due to its design. This accumulation together with high speed rotating mechanical parts and powerful motors creates a large risk for fire.

**Press Protection Systems**
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The press in a wood panel factory is often seen as the most important investment. The demand for increased productivity has led many factories to make customer specific modifications and additions to their presses. Presses are therefore never exactly alike. As a result, some of these can have a negative effect on particularly maintenance and cleaning procedures. Press protection systems relying on standard solutions often prove inadequate. Effective press protection requires the design of a plant specific system. Firefly has taken all of the above into account when developing the Firefly PressGuard™ system.

[Image of a pipe and valve system]

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SOLUTIONS FOR THE TISSUE INDUSTRIES

Yankee Hood
A small smouldering fire around a dusty Yankee dryer can easily be spread, scattering ignition sources to a larger area. Fires quickly become dangerous & difficult to extinguish. Conventional extinguishing generally require massive amounts of water resulting in loss of production and high clean-up costs.

Doctor Blade
A smouldering fire due to friction or sparks generated at the Doctor Blade is very common. This can be spread in the dusty area around the Doctor Blade.

Webscan
Upstream friction or smouldering particles can create glowing hot spots within the tissue sheet that can rapidly be enclosed within the jumbo roll. It can take hours or even days, but a contaminated roll can burst into flames in the warehouse. Firefly Webscan solution has been the industry standard for years.

Reel-up & Rewinder
This operation generates a lot of dry dust that accumulates on frames and other parts in this area. Shreds of tissue paper around the axes can ignite due to frictional heat. Firefly will swiftly detect flames & extinguish the fire.

Log Saw
Friction or sparks generated during the sharpening of the saw blade can ignite the dust inside the Log saw enclosure. With Firefly’s fast and automatic flame detection inside the enclosure, loss of production & equipment is minimised.
SOLUTIONS FOR OTHER INDUSTRIES

Fire protection in the hygieine industry
Baby diapers and personal sanitary products are produced using similar technology. Pulp is milled and transferred to a forming station where Super Absorbent Polymers (SAP) are added. The pulp is then sucked onto a polymer film by a vacuum system which is effectively a dust extraction system.

Overfeeding or malfunction of the mills can cause ignition, as can problems at the forming head or fan failure. Ignition sources can ignite the product, in the worst case in storage silos or even dust filters. Firefly will avoid ignition in the process by detecting & extinguish sparks and hot particles which could have been produced by the mill or fan.

Fire protection in the Pulp and Paper industry
The pulp and paper industry has been experiencing problems with fire and dust explosions for a long time. Unfortunately as production increases, so does the risk for fire and explosions. Firefly offer several fire protection solutions tailor-made for the pulp and paper industry.

Fire protection in the Bioenergy industry

Pellet Manufacturing
As the pellet industry grows, so do its fire problems. Producing or handling pellets are processes that involve many risks. One of the most common fire risks in the pellet industry is friction. An example: friction can generate overheated material that can create ignition in the conveyor or even worse, inside the cooler.

Power Plant
A power plant has several high-risk areas where a fire or an explosion can occur. Common problems are hot particles and foreign objects (stones, metal pieces etc) in incoming material which can cause ignition in the process. Another common problem is friction due to material build-up, which can occur at several places in the process. Firefly offers fire protection solutions for the whole process; from the dump station and the screener to the silo and the boiler.
Fire protection in the Tobacco industry
Tobacco burns very slowly. This is a fact well-known by the tobacco industry. However, a burning pocket of tobacco can become a costly problem at the primary tobacco production facility or the cigarette factory. The most problematic areas are after dryers and cutters within the primary production area, together with the cigarette makers and dust extraction systems. Firefly offers tailor-made systems for the tobacco industry.

Fire protection within the Recycling industry
Regardless if you shred waste, paper or other material, a fire in your shredder can occur due to several reasons: friction, bearing failure or foreign objects (stones, metal pieces, etc.). A fire in a shredder can spread very quickly. Therefore, a fast acting fire protection system that also can withstand the tough conditions in and around a shredder is required.

Why protect a conveyor belt
Every year, fires occur in belt conveyors worldwide. A fire in a belt conveyor is often hard to extinguish and can spread very quickly. In the worst case it can spread to surrounding material stacks and could last for weeks, causing major loss of revenue and production downtime. A fast acting fire protection system that also can withstand the tough conditions in and around a belt conveyor is required. Firefly’s ConveyorGuard™ is the right solution.

Fire protection in the Food industry
The food industry cannot be generalized as it contains a wide range of processes. One common denominator for the food industry is that its materials are fine, dry, and in most cases organic. These materials can ignite and explode if an ignition source is present in a layer or within a dust cloud.

The codes for the use of equipment in the food industry are very strict. Firefly therefore tailors a protection system to accommodate these parameters. Firefly equipment for the food industry contains of stainless steel and other food-approved materials.

Firefly offers tailor-made systems for various processes in the following industries:
- Milk powder spray dryers
- Cereal production
- Coco / Chocolate industry
- Baked Products
- Grain Mills
- Sugar processing & Storage

SOLUTIONS FOR OTHER INDUSTRIES
**FLASH explosion suppression system**

StuvEx FLASH explosion suppression system is a flexible, modular system consisting of:

- Explosion detectors triggered by static pressure, an increase in pressure, optical monitoring (UV, IR, UV/IR, ...) or a combination of all of these
- A multifunctional modular control unit
- Ultra-fast powder extinguishers in different sizes and with various types of connection flanges depending on the application
- This modular design makes it possible to assemble the optimal configuration, both technical and commercial, for each application.

**Advantages**

- No pressure vessels
- Driven by gas generators with a very long life span (up to ten years)
- A revolutionary communication protocol between the various components, which makes system faults due to EMC radiation on the wiring nearly impossible
- High quality electrical connections due to the use of cables with moulded connectors (worldwide standard available)
- Reduced installation, operating and maintenance costs.

**Extremely fast explosion suppression**

The detector continuously monitors the volume to be protected. In the case of a pressure increase or optical detection (depending on the system configuration and settings), the detector will send a signal to the control unit, which in turn will trigger the gas generators of the extinguishing agent bottles.

Then, within a few milliseconds, the huge amount of gas necessary to inject the extinguishing powder into the installation is produced. The powder kit, the extinguishing agent bottle and the gas generator itself are completely pressure free under normal working conditions. The injection of the extinguishing powder extinguishes the flame front. In addition, there is always enough extinguishing powder provided to make the entire volume inert so that no secondary explosion can occur.

For this reason, the process (and certainly the blowers) must be stopped immediately after Flash explosion suppression system is triggered, in order not to exhaust the extinguishing powder. If this cannot be guaranteed, cut off valves must be installed or supporting measures (such as steam injection) must be taken.

**Explosion suppression for specific industries**

The Flash explosion suppression system is available in various configurations, adapted to your needs. Thus, in addition to the standard solution with the necessary flanges (in normal or stainless steel) simply welded to the equipment, specific solutions also exist for the following:

- Hygienic applications (pharmacy, (baby) food production...), where special attention is given to those materials that come into contact with the product: the surfaces are smooth, without gaps,
- Processes with CIP cleaning, both automatic and manual, up to 300 bar
- Fast installation methods making use of the HPL system, which allow normal installation times to be cut in half
- Weld-free installation methods that make use of the HPL system, which makes prior cleaning of the installation unnecessary
- Vibrating process parts (e.g. fluid bed)
- A combination of the above possibilities.
EARTHING CONTROL

An electrostatic charge can generate while handling conductive liquids or powders. This in turn can lead to electrical charging of conductive objects.

It is not so difficult to regularly check the earthing and grounding of a fixed installation. In mobile installations, like a truck or a barrel of FIBC (Big Bags), the situation is different: the earthing can easily be forgotten. Sometimes, the earth connection gets neglected or does not function properly (a broken cable, dirt, paint, etc.). Therefore you need to constantly check the earthing and grounding with an earthing system.

ISMA - YOUR PARTNER FOR SAFETY AND RISK MANAGEMENT

ProDetec through its association with ISMA, can be your partner for advice related to the protection of your process installation against explosions and fire.

ISMA is a European based independent partner specialising in consulting and scientific research in the area of explosion protection and fire hazards. The scientists and engineers at ISMA offer a unique combination of thorough scientific expertise and wide-ranging practical experience in all types of processes and constructions.

They work closely with a network of worldwide experts in the area of explosions and explosion protection.

ISMA's knowledge and experience are used for the following activities:

• Analysis of installations
• Equipment assessment
• Drawing up an explosion protection document
• Training
• Safety report assessment
• Accident analysis
• Standardisation

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