



IR-GUARD

EFFECTIVE AND RELIABLE SOLUTION
FOR PROTECTION OF INFRARED
DRYERS IN THE PAPER INDUSTRY



IR-Dryers – The most likely source for a fire

A fire can strike any day

For many paper manufacturers throughout the world, a major fire in the paper machine is a worst case scenario. A fire means long downtime at best. At worst, the consequences may be even more serious, with enormous capital loss as a result. The damage after a fire depends on various reasons. One key issue is how fast the fire can be detected and extinguished, early detection and extinguishing is the key to minimise the damage and downtime.



Firefly has been developing and designing preventive protection systems for more than 30 years and we are known all over the world for our expertise on how to prevent industry related fires and dust explosions.

The IR-Dryer is one of the most dangerous and common source of a fire in the paper industry.

Firefly has developed the IR-Guard system to protect one of your most valued link in the production chain.

Complexity

Most drying sections are different in one way or the other. The design varies between different paper machines and IR-dryer manufacturers which means different conditions for a fire.

Some parameters that determines the risk as well as the design of a IR-Guard system:

- Design of the paper machine
- Location of the IR-dryer
- Fire spreading possibilities
- Dust build-up
- Type of dryer
- Cleaning procedures



IR-Guard The Solution

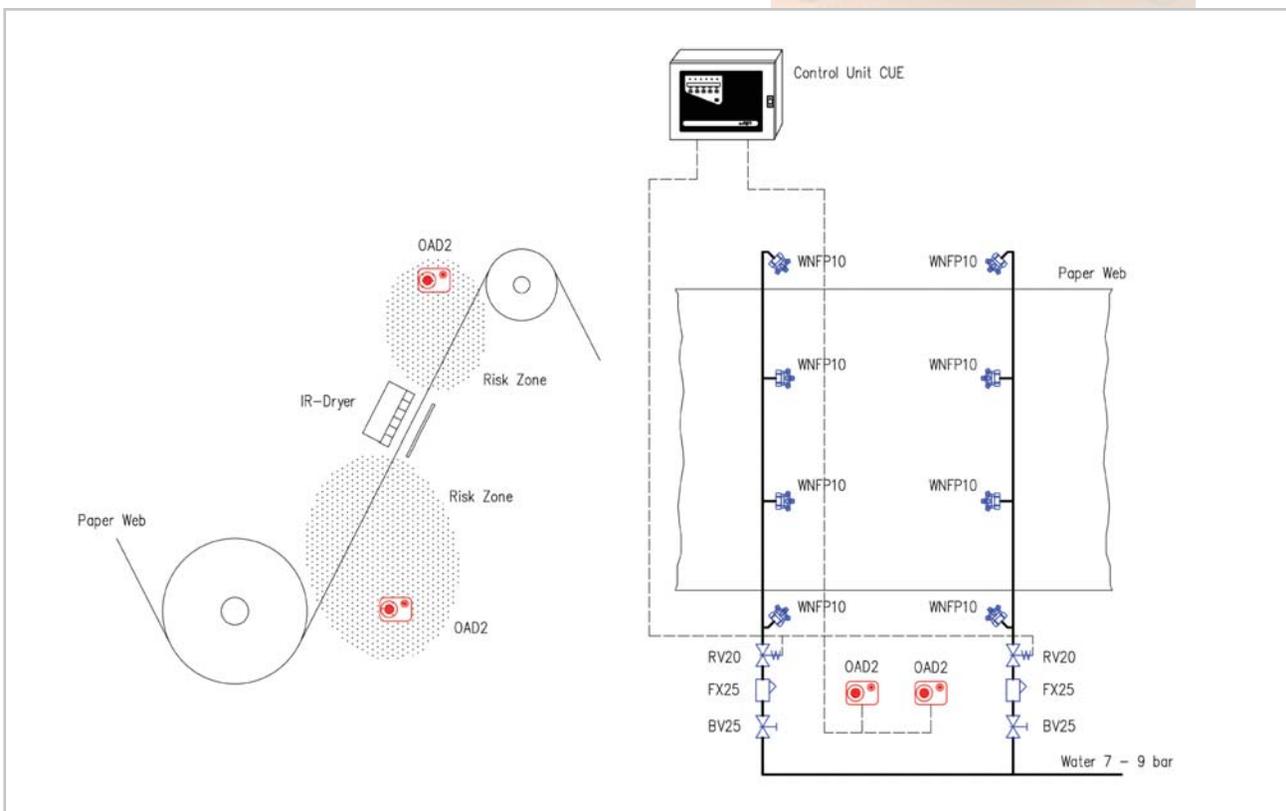
Solution

The Firefly IR-Guard solution consists of flame detectors, web breakage indicator, control unit, water nozzles and comes complete with extensive documentation.



Flame detection – Avoid false alarms

The area around the dryer contains several different disturbance sources that could affect conventional flame detectors. Firefly has therefore designed a solution that is highly insensitive to false alarms. The detector used for flame detection around the dryer, OAD (Open Area Detector), is a two-channel UV/IR detector. By combining IR and UV wavelengths the detector will efficiently identify flames but discriminate other energy sources, such as the IR-dryer lamps, sunlight and even arc welding. By using optical detection, IR-Guard becomes fast, reliable and covers large areas.



Efficient extinguishing – The difference between disaster and success

Extinguishing is as important as detection. Firefly uses water mist or water droplets to optimise the solution. Therefore achieving a safe and efficient extinguishing with a minimum of negative effects.

Conventional sprinklers are slow to react. A large fire is required before sprinklers are activated and when this occurs the fire has already caused damage to the paper machine and the surrounding area.

After extinguishing with sprinklers, a time-consuming clean-up follows due to the large amount of water used.

Harmless extinguishing is essential

Firefly's philosophy is that extinguishing itself must not cause problems. Even though our systems are fully automatic, an operator has the ability to manually activate a system.

Water mist systems develop a specific size of droplets designed for extinguishing in areas with machinery and electrical equipment. If the droplets are too small they will be swept away by the thermal airflow. If they are too big the risk of causing damage to the machinery as well as spreading the fire increases.

The water mist system only consumes a fraction of the water volume compared to the conventional sprinkler system.

Water mist turns into steam

Water mist, as a fire extinguishing medium is gaining ground and has proven to be very effective in fighting and controlling fires. It has a remarkable potential for suppressing fires and causes minimal residual damage.

Water mist systems work by spraying microscopic water droplets onto a fire. This results in efficient extinguishment using nothing more than water. The water removes heat from the fire that in turn creates steam, which displaces the oxygen and ensures that the combustion cannot be sustained.



The facts about water mist

By Factory Mutual Research

Cools the fire area and blocking the heat radiation

Cooling is accomplished due to the greater surface area presented by the quasi-gas created by water mist systems, and the blocking of radiant heat by the many microscopic droplets.

Displacing the oxygen

The atomized droplets are drawn to the base of the fire and flash instantaneously to steam, expanding in volume by 1,700 times, thereby displacing oxygen required for combustion.

Paper web breakage indicator

In case of web breakage, the IR-Guard system can activate the water mist to safeguard the drying area. This minimises the fire risk during process setups. The indicator can either be connected to the existing PLC or the Firefly control unit.

Control

The IR-Guard solution is controlled by a unit that is able to handle 4 OAD flame detectors and the solenoids for the water mist extinguishing zone. The control unit has a clear text display and gives all the necessary feedback for operation of the system as well as system maintenance. It is advisable to forward the alarm and fault signals to the plant's PLC.

