

How to protect your Tissue converting process against fires

Solutions for fire prevention in the tissue paper conversion process, with the latest technology of highest technical standards.

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INTRODUCTION:

The converting process normally generates a lot of dust and other cellulose debris, which can rapidly ignite due to friction, for example in and around bearings and shafts. Tissue strips are especially critical in case they wind up around the shafts. If the converting line or part of the line is enclosed, even more dust accumulates inside the enclosure and the risk of fire increases. Traditional extinguishing systems, such as sprinklers, will not be able to reach these high-risk areas. Firefly, with Tissue Solutions®, offers a range of complete fire prevention and protection solutions, specially designed for both the tissue machine and the complete converting process.

Firefly has launched and obtained the world's first third-party certified Quick Suppression System. It is a complete system designed for extremely quick detection and suppression of flames or fires in and around critical machinery and high-risk areas. The system aims to identify and extinguish the fire in seconds and the purpose is to act quickly enough to avoid or significantly reduce damages and production downtime.

Currently, Firefly has protected more than 200 tissue and converting machines, on five different continents.

Unwinding

The Unwinder area is considered high-risk because:

- It generates a lot of dry dust that can accumulate on bearings, shafts, frames and heated unwind brakes
- A jumbo roll could contain a dangerous ignition source or a dangerous particulate that when unwinding could have access to oxygen and start a fire in the process.
- Strips of tissue paper often end up around the axles and can cause frictional heat that can ignite and cause a fire.

Firefly's Unwinding fire protection solution is designed for quick and efficient detection and suppression of flames. The system consists of FD-UVIR flame detectors on each side of the machine and water mist nozzles that cover the risk area. The atomized water drops will instantly evaporate by the heat of the fire.

Figure 1: Firefly's fire prevention and protection solutions are specially designed for both the tissue machine and the complete converting process.



Figure 2: In the event a jumbo roll contains a dangerous ignition source it can, when exposed to oxygen during the unwinding process, start a fire in the process.



When the small water droplets turn into vapor, it will expand its volume 1,700 times, thus absorbing energy from the fire and displacing the oxygen required for combustion, without causing harm to operators.

This non-invasive suppression method generates a soft cooling effect, using very small amounts of water, avoiding, or significantly reducing damage to machinery, and preventing the fire from intensifying and spreading to other areas. It differs from conventional extinguishing methods because 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.

Embosser and Rewinder

Embossing and winding machines generate considerable amounts of dry dust that accumulates on machine parts and the surrounding area. Friction heat can easily be generated by the machine, which can ignite the accumulated dust and cause a fire.

Firefly's protection solution for the Embosser and Rewinder is designed in the same way as the Unwinding system, with quick and efficient detection and suppression of flames. The system consists of FD-UVIR flame detectors around the machine and water mist nozzles that will cover the high-risk area.

The solutions for the Unwinder, Embosser and Rewinder will be linked together, making it possible to activate more or all zones in case of detection in a critical area of the machine.

Figure 3: Friction heat can easily be generated by the machine, which can ignite the accumulated dust and cause a fire.



Log Saw, Band Saw and Napkin Folding

Fires in these types of enclosures or areas are unfortunately common and costly. Friction and or dangerous particles, including sparks generated during the sharpening of the saw blade can ignite the dust inside the log saw, band saw, or napkin folding enclosure. As enclosures and areas are generally dusty, fires can easily cause equipment damage and production downtime.

For protection of log saw, band saw, or napkin folding machines, Firefly is using the Quick Suppression System concept, based on quick detection and suppression of flames. Thanks to the quick response time of the system, production loss and equipment damage can be minimized.

Water mist, compared to alternative suppression solutions such as CO₂ or powder, is a non-invasive suppression method that will effectively suppress the potential dangers with a minimum effect on your production and is harmless to people.

Water mist has another advantage over CO₂ as it will be efficient even if the enclosure is not air-tight. The CO₂ gas will only suppress a fire when the gas concentration is high enough. In case the gas will leak out of the protected area, the suppression effect will decrease and eventually not be effective at all. As these enclosures usually have openings in the lower parts and extraction in the upper parts, there is a considerable risk that the CO₂ gas concentration will be reduced too quickly.

Personal safety and cost (TCO) are also things to consider when choosing a suppression system.

Dust Filters – Bag Houses

Ignition sources such as sparks and hot particles generated in the tissue mill and the converting process can be extracted into the dust extraction system and cause fires and dust explosions in the dust filter or bag house. It is therefore vital to also protect this part of your process.

Firefly's dust extraction filter protection systems are based on our unique True-IR spark detector HD400 that will detect sparks and hot particles with a temperature down to 400°C (750°F), which is just below the ignition temperature for cellulose dust according to NFPA (National Fire Protection Association). At this temperature the particles are dark, they do not emit light, and Firefly has the only detectors in the world approved by FM Global to detect hot particles from 250°C and 400°C, thanks to its True IR technology.

A water spray extinguishing zone is typically installed downstream of the detectors to eliminate these dangerous particles from entering into the filter or bag house.

Firefly's solutions for fire prevention in tissue and paper conversion processes increase safety in industries around the world.

Figure 4: Firefly's Protection of log saw, band saw or napkin folding consists of extremely quick flame detection in combination with water mist suppression.



About Firefly

Firefly is a Swedish developer of industrial fire prevention and protection systems for process industries worldwide. Since 1973, Firefly has specialized in creating customized system solutions of the highest technical standards and quality, based on customer needs, to increase the level of safety.

Firefly's products hold national and international approvals and certifications. The company is noted on the OMX/NASDAQ First North Exchange in Stockholm, Sweden.

In complement to worldwide sales, Firefly also provides its customers with field service, maintenance and guaranteed long-term spare part supply.

Firefly – Intelligent fire protection that keeps you in production.