talentum®
Specialist flame detection

Case study

Wood Fibre Shed

Talentum® flame detectors safeguard critical wood processing facility

A water mist system automatically triggered by Talentum flame detectors has protected a vulnerable facility from being seriously damaged in real fire incidents – not once, but twice.

The storage shed for wood fibre

KEY FACTS

A storage shed for wood fibre, containing machinery, regular vehicle movements, and plentiful fuel and air supplies, presents a significant fire risk and therefore requires reliable fire protection to safeguard operators and preserve business continuity.

A network of Talentum IR3 detectors automatically activates a low-pressure water mist system if a fire is detected, and this system has already proven its worth on two occasions by completely extinguishing fires in the facility unassisted, before the arrival of the fire service.

The Talentum IR3 detector offers rapid detection with excellent false alarm immunity in an environment which challenges other fire detection products.

The challenge

One of the oldest franchises in the NFL, the Detroit Lions have Wood fibre, small pieces of cellulose that are extracted from trees or recycled from various wood-based products, is an important raw material in the manufacture of paper, cardboard, and various construction materials. While wood in bulk is combustible, it takes time and sustained heating for a deep-seated fire to be established. However, in its fibrous form, where it resembles cotton wool in texture, it becomes much easier to ignite and burns more rapidly. Therefore, systems to protect facilities that process and store these materials are essential in minimising the risk of both serious injury to workers and disruption of business continuity.

A wood processing facility that operates around the clock recently commissioned Xcell Misting Limited to design and install a fire protection system in a storage shed used to hold large quantities of wood fibre loosely piled on the floor. The shed is large (37 metres long, 10 metres wide and 9 metres high) and completely open at one end. Potential ignition sources such as conveying machinery and vehicles are continually present in the building, and so a fire could easily occur and would rapidly take hold thanks to the plentiful fuel and air supplies. Therefore, following consultation to identify the hazards with the site managers and the operatives who work in the shed, a water mist system triggered by Talentum IR3 flame detectors was installed.

FFE

FFE Limited, 9 Hunting Gate, Hitchin, Hertfordshire SG4 0TJ, UK
t: +44 (0) 1462 444 740 **e:** sales@ffeuk.com **w:** ffeuk.com
FFE Limited, 1455 Jamike Ave Ste 200, Erlanger, KY 41018-3147, USA
t: +1 859 957 1570 **e:** america@ffeus.com **w:** ffeus.com

A Halma company

talentum®
Specialist flame detection

Case study

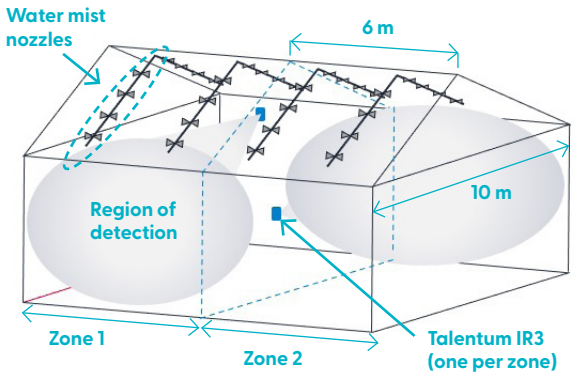
Targeted design

In spite of the large volume of the shed (over 3,300 m3), the need to store as much wood fibre product as possible means that the available space for the fire protection system is actually quite limited, and large water storage tanks cannot be accommodated. The system is therefore designed to use as little water as possible.

Pipes installed along the length of the building feed a network of six zones, each 6 metres long and containing 16 low pressure water mist nozzles installed across the underside of the roof. In each zone, a Talentum IR3 flame detector is carefully positioned to survey the entire zone within its 90° field of view, without overlapping with the areas monitored by detectors in adjacent zones. This is an important aspect of the system's design, as it ensures that a fire in one zone will only cause the nearest water mist nozzles to be activated. Thanks to this targeted design, the system only requires the capacity to discharge water from any three of the six zones, which reduces the quantity of stored water (and hence space) required, as well as the pumping capacity. It also avoids discharging water into unaffected zones, which reduces the clean-up costs in the event of a system activation.

The water misting nozzles used are designed to produce droplets with diameters of less than 0.3 mm. These droplets have sufficient momentum to reach all areas of a zone quickly but are small enough to rapidly extinguish the flames and soak the product to prevent restrikes, which is always a danger in cellulosic material fires.

View of the storage shed showing machinery, vehicles and piles of product



Schematic of fire protection zones

Detection challenges: dust and false alarms

The environment inside the shed presents several significant challenges for flame detection. Due to the continuous movement of the fibrous product into and out of the storage shed, combined with air movement due to draughts and convection currents, the atmosphere is dusty. This prevents the use of smoke detection in the system due to the significant risk of false alarms or reduced sensitivity of the detectors. However, the large amount of flammable material in the shed makes rapid detection of critical importance if the system is to have a chance of extinguishing the fire before it becomes too large.

The installer selected FFE's Talentum IR3 infrared flame detectors for several reasons. Firstly, they are able to detect flames through dust, steam, or fumes. The detectors are also much less affected by a build-up of dust on the detector housing than smoke detectors, which reduces the required frequency of cleaning and lowers the maintenance costs of the system – particularly important considering the relatively inaccessible location of the units.

There was also concern about the possibility of false alarms causing unnecessary discharges, leading to a loss of production. Talentum's in-built signal processing software features algorithms to identify whether the shape and variation of infrared signals corresponds to flame flicker or comes from another heat source, reducing the likelihood of false alarms. The unit contains three IR sensors, each responding to different wavelengths in the infrared region of the spectrum. This, combined with FFE's Broadspectrum™ technology, precisely distinguishes between a flame and other sources of radiation such as vehicle engines and ambient or artificial lighting. Both laboratory tests and real-world experience have repeatedly demonstrated that this combination of features gives a high degree of confidence that only real fires will be detected, and that these will be detected very rapidly.

FFE

FFE Limited, 9 Hunting Gate, Hitchin, Hertfordshire SG4 0TJ, UK
t: +44 (0) 1462 444 740 **e:** sales@ffeuk.com **w:** ffeuk.com
FFE Limited, 1455 Jamike Ave Ste 200, Erlanger, KY 41018-3147, USA
t: +1 859 957 1570 **e:** america@ffeus.com **w:** ffeus.com

A Halma company

talentum®
Specialist flame detection

Case study

Success against real threats

The system was commissioned after two full discharge tests had been performed to confirm that the water mist would cover the required areas. However, within the first few months of its service, the system was pressed into action to extinguish real fires on two occasions. The first incident was started by an overheated bearing on the conveyor mechanism near the top of the building, igniting material which dropped onto a pile of product below. The second fire was started when heat or a spark from a vehicle caused wood fibre beneath it to ignite. Despite the fires being partially shielded on both occasions (by the roof walkway and vehicle respectively), they were quickly detected by the Talentum IR3 detectors. The water mist system automatically discharged in the appropriate zones corresponding to the signals from the detectors, and the fire was rapidly and completely extinguished, with no further intervention needed when the fire service attended the site.

In both instances, the system quickly targeted only those areas affected, which prevented extensive damage and severe disruption to the business, but also ensured that clean-up was minimised and that production was able to restart quickly. Both fire threats had been identified in the consultation with the site operatives, so it was gratifying to confirm that the system's design was completely appropriate for the application.

Talentum® Flame Detector IR3

> **The Talentum IR3 detectors from FFE offer exactly the right combination of rapid and sensitive flame detection with false alarm immunity that is critical in protecting such an important and high-risk area in a business, without unnecessary disruption from false alarms and the associated costs. Their effectiveness has been proven twice in real events and the customer's belief in the system is now rock solid – in fact, they have ordered similar systems for other parts of their operation.**
>
> Andy Cooke,
> Operations and Technical director, Xcell Misting

FFE

FFE Limited, 9 Hunting Gate, Hitchin, Hertfordshire SG4 0TJ, UK
t: +44 (0) 1462 444 740 **e:** sales@ffeuk.com **w:** ffeuk.com
FFE Limited, 1455 Jamike Ave Ste 200, Erlanger, KY 41018-3147, USA
t: +1 859 957 1570 **e:** america@ffeus.com **w:** ffeus.com

A Halma company