

XFlow® water mist system preserves and enhances productivity at a TULIP Sausage factory in Svenstrup Denmark.

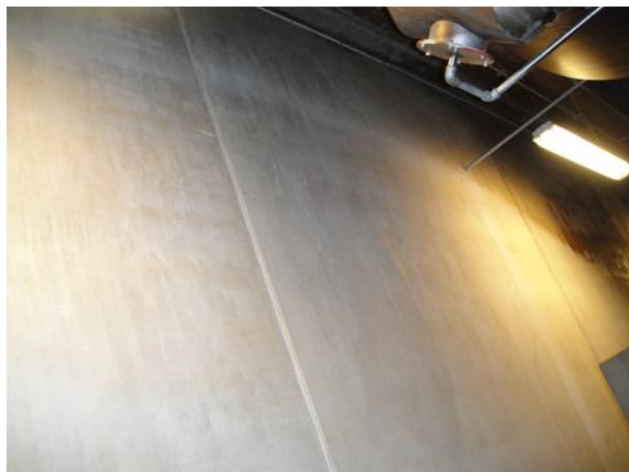
The incident.

After the personnel had left the factory for the weekend a fire broke loose Sunday the 24.th of October 2010 in one of the eleven smoke generators at Tulip's sausage factory in Svenstrup near Aalborg in Denmark.

The detection system, a smoke detector at the entrance to the smoke generator room, detected the fire and signaled an alarm. The alarm signal was responded to by the duty personnel who went to inspect the location and the possible cause of the fire.

Upon arriving at the scene of detection, heavy smoke and a smell of burnt wood chips were distinct; but no fire was found. However, after thorough inspection they established that the one nozzle over the smoke generator, in which the fire had originated, was released. No further nozzles were released, consequently one nozzle had not only prevented the fire from spreading; but had also extinguished the fire.

A clear spray pattern was found on the wall where the water had washed the smoke away, it can be seen from the photo 1.



On the wall the water mist spray pattern can be seen, the wall color is brighter where the water mist has washed down the soot.

Thanks to the fire detection system and the water mist system the production could

continue uninterrupted the Monday after the incident. The potential impediment in production, if the fire had spread to the other smoke generators and then developed to a large fire, could have resulted in a production standstill for a long period and consequently resulting in major losses such as profit, jobs, etc for a longer period.

- A water mist system is a good idea for us and we have installed the system in several factories both in Denmark and abroad. It provides us with a higher safety and a lower risk of water damage, which means, that we are able to resume production earlier than if it had been an ordinary sprinkler, says Flemming Damholt, fire safety officer in the Danish Crown Group.

The company:

Tulip is an affiliate company in the well known DANISH CROWN group of meat processing companies with headquarters in Denmark and production facilities in Denmark, Germany, Sweden, UK and Poland.

The company has been very observant to raise productivity in its meat processing companies due to the heavy competition and one of the measures is to prevent production stops.

As a consequence of three large fires in 2007 and 2008 in slaughterhouses and processing plants in Denmark and Germany, the DANISH CROWN Group has investigated the possibilities of fire prevention and mitigation with cost effective means.

A project was established and several companies were invited to give their proposal of a cost efficient solution for a number of identified fire risks.

One of the identified risks was protection of the smoke generators. And the winning solution was the Novenco Fire Fighting: XFlow® Water Mist System proposed by installation company Dtek.

The installation company:

A solution to protect the fire risk with water mist was proposed by DTEK for several reasons.

The water mist system is very effective in cooling and prevention of a fire spread and can even in some cases extinguish "hidden" fires, consequently, in many cases more effective than a conventional sprinkler solution. A gas solution is impractical where operational personal has to come and go constantly, and it is costly with the closing devices which is necessary with a gas solution.

The water mist system uses less water than sprinklers and works with a low pressure which allow standard pumps, pipes and fittings with easy installation due the small diameter pipes compared to a sprinkler solution.

DTEK designed a system to protect the risk in close cooperation with Novenco Fire Fighting A/S and DANISH CROWN in order to obtain the most effective system for preventing a fire accident from turning into a disaster with long

production stops and also to obtain the most cost effective solution.

Novenco Fire Fighting A/S, XFLOW water mist:

XFLOW water mist is a medium pressure water mist system developed and engineered by Novenco Fire Fighting A/S with headquarters in Næstved, Denmark and project offices in Shanghai, Pusan and Trieste.

The system was originally developed for Marine and Off-shore; but is now rapidly growing into the industry and commercial buildings as a very good alternative to gas and sprinkler systems offering unique features such as good cooling, excellent suppression and extinguishing performances with minimum water and power consumption. Features which are not be met by the conventional systems, it often requires more systems in combination.

The System:

The system was designed by DTEK after DANISH CROWN has considered the risk.

The smoke generators generate the smoke to give the sausages different wood flavors by generating smoke from wood chips. In the smoke generators maintain a smoldering fire which is led to the smoke cabin via an exhaust system. More smoke generators are connected to the same exhaust system and the exhaust pipes are filled with soot and tar which is drained from the exhaust pipe next to the smoke generators.

The smoke generators are filled with wood chips from 25 kg sacks; one generator can contain two sacks, 50 kg of wood chips.

Sacks are stored next to the generators in an adequate quantity to fill during the day.

The purpose of a fire fighting system is at least to control or suppress a fire, if it should occur in one of the smoke generators, and prevent the fire from spreading to the next generator or to the exhaust system.

It was decided to arrange the system with one NHP 18 A nozzle above each of the smoke generators, a closed nozzle with one 57 °C glass bulb for quick release. The system is fed and pressurized from the City

main water supply and with a pilot pump to boost the stand by pressure up to xx bar. If the stand by pressure is lost due to the release of the nozzle, the alarm will go and the City main will supply the flow and pressure to the system.

The pilot pump will give an initial higher pressure just at the time of release and will assist in knocking down the fire.

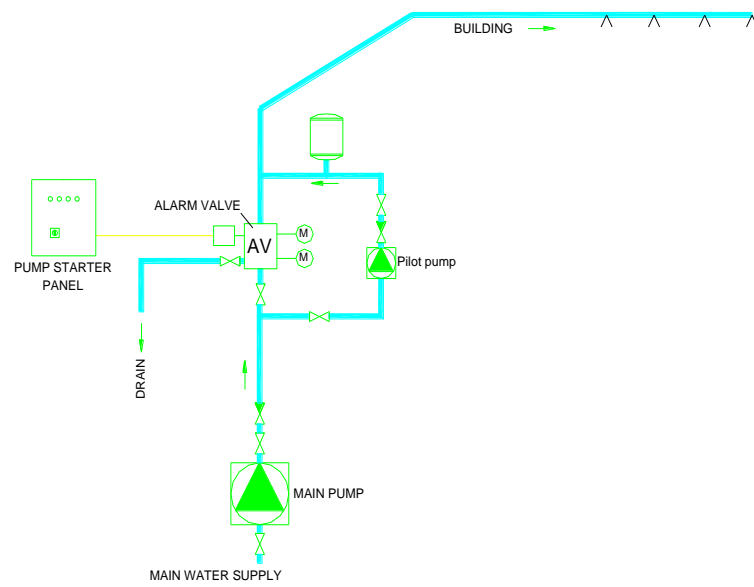


The systems pump station installed by DTEK

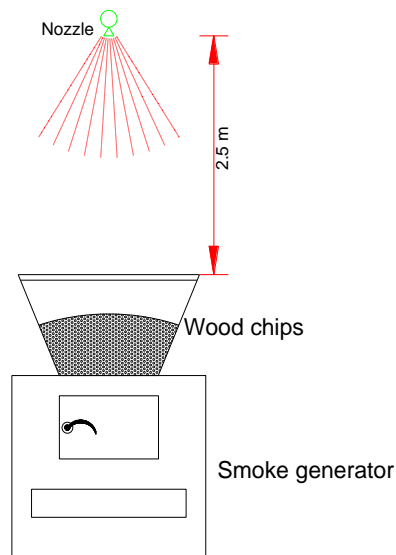


The XFLOW nozzle after release and fire, no visual damage.

A principle diagram of the system can be seen from the below principal sketch fig. 1.



Layout of the system seem in fig. 2





The line of smoke generators in one room.



Wood Chips filled to the funnel of the smoke generator. Fully loaded approx. 50kgs of chips



Lower part of smoke generator with the heated chamber.

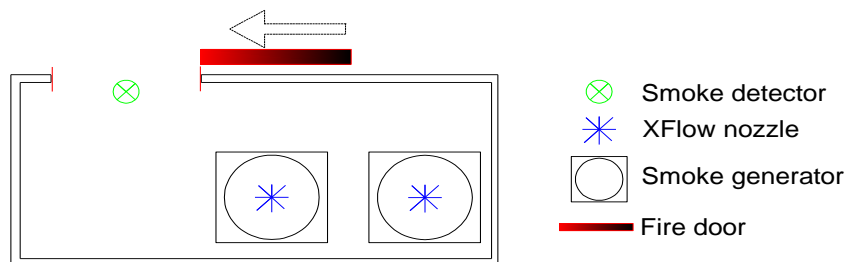


Wood Chips for smoke generator.



Smoke generator, notice the drain of soot from the exhaust.

The position of the smoke detector which generated the first alarm can be seen from the plan in fig. 3



Evaluation:

Even though the system was not fully completed it worked better than expected with the rapid and complete extinguishing. Because the system was not completed, the flow alarm did not give a signal of release of the water mist system; but from the smoke detection system. The time duration from the nozzle release to the smoke alarm signal is unknown; but it may have come shortly after the outbreak of the fire.

When the water mist system is completed, the water mist system will not only function as a rapid suppression/control system and in some cases, as this incident, as an extinguishing system; but also as a rapid detection system. An early detection and suppression will give a very high possibility to minimize the damages to the production system, also because TULIP has invested not only in an active firefighting system, such as the water mist system; but also in fire cells with fire doors to contain the fires.