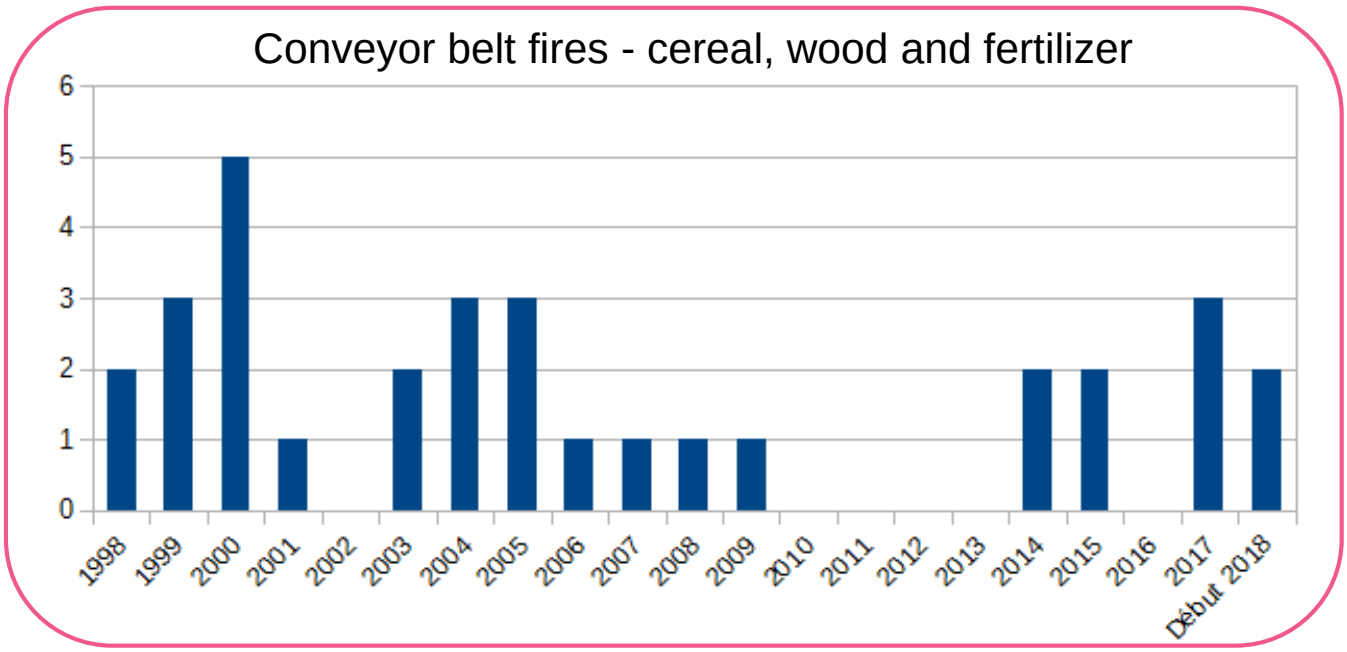
ARIA NEWSFLASH
June 2018

Conveyor belt fires: Are the standards being met?

Conveyor belts used to handle organic materials must meet standards defined by various French ministerial orders and in the State of the Art Guide for silos.
These texts indicate that conveyor belts must comply with standard NF EN ISO 340 or standards NF EN 12881-1 and NF EN 12881-2 (self-extinguishing or flame-retardant conveyor belts).
While these types of accident had seemed to have disappeared, in recent years there have been several occurrences. Are the standards always being met?



The ARIA database contains around 100 accidents involving grain conveying equipment. Of these 100 accidents, 25 involve conveyor belt fires. These accidents were mainly concentrated in between 2000 and 2009, and then this type of event seemed to disappear for five years. Over the last three years, however, a few new cases of conveyor belt fires have been reported.
Similarly, fifty or so accidents involving conveyor equipment were recorded in wood, wood chip and sawdust storage facilities. Among these accidents, five conveyor belt fires had occurred, three happening before 2000 and two in 2017.
Finally, the ARIA database includes seven conveyor belt fires in fertiliser storage facilities: four between 1988 and 2005 and three in 2014 and 2015.

ARIA 51315 - 22/03/2018 - SAONE-ET-LOIRE
A fire broke out in a grain elevator when an employee opened the hatch to clear out the base of an elevator. The employees notified the emergency services. They were able to extinguish the fire with a garden hose using around 100 litres of water. Ten metres of elevator strap had to be replaced. In the days preceding the fire, wheat from a milling customer had been cleaned with a very low flow rate (30 t/h) via the two purifiers, each having a flow rate of 150 t/h. At 30 t/h, the grain is not distributed correctly in the purifiers and accumulates. When the operator began using the scrubbers again at full capacity, one did not drain and the grain only flowed through one scrubber. The grain the backed up and clogged the elevator. The elevator failed and the operator continued operations with another elevator in order to finish loading the truck. The fire broke out the next morning when an employee opened the hatch to clear out the elevator. The flowing grain created an influx of air. The fire-retardant strap eventually began to burn and released a great deal of smoke

ISO 340-compliant conveyor belt
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ARIA 50622 - 14/11/2017 - BOUCHES-DU-RHONE
At around 9 p.m., a fire broke out at a paper mill on a rubber conveyor belt feeding a silo containing 1,000 tonnes of wood chips. The zone's fire alarm was triggered. Three employees, suffering from smoke inhalation, were taken to the hospital. The internal emergency plan was activated and the plant was shut down for two days. The fire was finally extinguished at around 3:50 a.m. A large portion of the fibrocement roof had collapsed. The fire had damaged 150 m² of conveyor belt.
As the fire may have been caused by an electrical malfunction, the installations could not be put back into service until the facility had been secured. Underground water and soil samples were prescribed. An electrical verification report must also be submitted to the Classified Facilities Inspection Authorities.

Burning conveyor belt (© Operator)

ARIA 50299 - 19/06/2017 - GIRONDE
A fire broke out in a sawmill during the night, destroying a rubber conveyor belt used to convey sawdust. The resulting damaged led to a reduction in activity. The operator temporarily interrupted the use of temporary workers.
The fire is said to have been caused by a combination of low air humidity (20%), an accumulation of sawdust on certain parts of the conveyor and a heat source which may have been an overheating bearing. The accumulation of sawdust in the part of the conveyor below ground would have gone undetected because the area is inaccessible for a quick visual inspection from the outside.
The operator has organised an inspection of the underground components of the conveyor belt during periods of low humidity.

ARIA 47052 - 28/08/2015 - HAUTS-DE-SEINE
In a semolina factory, two explosions occurred at 2:15 p.m. in an 80 m³ silo filled with 25 to 30 t of bran. The installation was secured and the internal emergency plan was activated. The emergency services formed a safety perimeter of 300 m. Production was stopped for several days. Windows were broken. The projections were limited to within the facility. More than 75% of the slab covering the silo collapsed and the slab covering the neighbouring silo was fractured and had been lifted off. Property damage was evaluated at 400 k€ and the operating losses at 1,600 k€.
At the time of the accident, the silo was being loaded with wheat residue. A bran blockage at the base of the elevator resulted in an outbreak of fire on the strap and deformation of the elevator head shaft. The strap's speed controller did not stop the elevator. The operator repaired the strap but did not notice the deviation in the elevator head's shaft. The next day, sparks were seen in the shaft's friction zone, causing the bran to catch fire and providing the energy needed to create an explosion in the silo.

ARIA 45932 - 05/11/2014 - PAS-DE-CALAIS
A fire broke out on a rubber conveyor belt in a fertilizer plant. The fire was attributed to a torch cutting operation by a subcontractor tasked with dismantling the equipment in a store undergoing renovation. Black smoke was seen at the scene of the accident. The in-house firefighters were unable to extinguish the fire due to the heavy smoke being released. The operator alerted the public emergency services who were able to bring the fire under control. The operator informed the other facilities on the platform as well as the surrounding municipalities.

These accidents also concern sectors in which conveyor belts are less regulated such as waste treatment facilities, food processing plants, metallurgical plants, steel plants, coking plants, coal-fired power stations, and cement factories, etc.

A few good questions to be asked:

- ✓ *Does the conveyor belt have a certificate attesting to its compliance with NF EN ISO 340 (June 2013), NF EN 12881-1 or NF EN 12881-2?*
- ✓ *Who is the belt manufacturer? (With an equivalent standard, the quality may differ)*
- ✓ *When was it installed on the site?*
- ✓ *What is the service life recommended by the supplier?*
- ✓ *Request copies of the results of the compliance testing reports.*
- ✓ *What maintenance program has been established for the conveyor's mechanical equipment and belt? How is monitoring carried out?*
- ✓ *Although they are self-extinguishing, the belts remain combustible. What recommendations and inspections are conducted in the event of work being performed nearby?*