

Guide for Fire Protection on Conveyor Belts

A complete fire detection solution.

In general, conveyor belts have a risk of fire due to external situations, possible failure of their components and equipment. However, the flammable nature of some products including self-ignition introduces an exceptional hazard requiring special consideration.

Two important areas for Conveyor Belts should be considered:

- Fire prevention
- Automatic detection and extinction.

FIRE PREVENTION

Some products have the property of, under certain conditions, being self-flammable. Some of the worsts on coal powders that can catch fire in a very easy way.

Even for less volatile products it is convenient to include a FP system because in the long term there is always the possibility of a fire.

The code of good practices recommends preventive designs combined with additional action procedures to optimize production resources and therefore economical.

An example of good practice would be to perform periodic dirt cleanings accumulates around conveyor belts. This, together with a good fire detection system, will achieve optimal results to avoid incidents that stop the production of any industry.

FIRE DETECTION

Even with the best preventive measures, fires can happen. The faster a fire is detected and action is taken against it, the lower the costs due to the damage caused.

Considerations to take into account:

- Static fires. They usually occur due to dirt accumulated around the belt or due to the failure of some of belt mechanisms (e.g. rollers).
- Risk in motion. On the product conveyed by the belt.

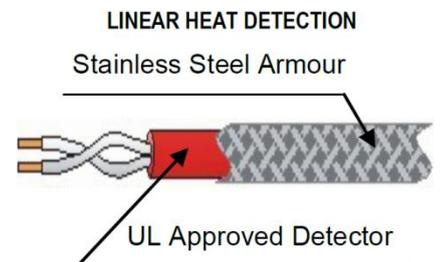
Each of these risks must have different forms of detection in order to have a fast and reliable response. The purpose of this guide is to indicate general solutions, but each risk, place, ... must be taken into account in order to proceed with the correct implementation measures.

Static fires

The potential hazards are: accumulated dirt around the belt and mechanical failure of the rollers causing friction with the belt. Different ways to protect conveyor belts have been tested, with point detectors, flame detectors, infrared beam detectors, pneumatic or bulb detectors, ... But these systems have failed due to the environmental conditions (dust, dirt, humidity / moisture, ...) that exist in this type of facilities. Causing false alarms or detecting a fire too late.



The best solution for detecting this type of fire is the sensor cable, in its different variants: Digital Thermofusor Cable or Fiber Optics.



Sensor cable with armoured fiber



In both cases, it is a robust and reliable solution. They will not give problems with humidity / moisture, dirt, dust, ...

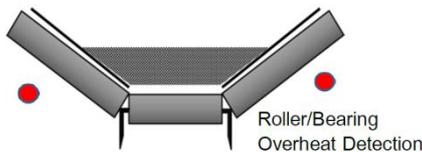
To protect the upper part of the belt, it is recommended to lay a cable through the center of the belt at a height of between 1 and 1.5 m., there are various types of fixings for this.



LHDC and Catenary Wire Support

To protect the bottom of the belts, it is recommended to install sensor cable on the closest part of the rollers above the return belt.

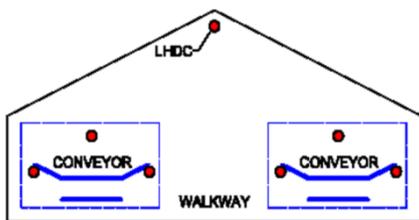
● =LHDC ● Static Fire Detection



Digital LHDC Routing Example—Conveyor

Depending on the type of belt, you have to consider the different types of mounting methods. In most cases, the structure of the belt itself can be used to fix the cable.

Belts that run through galleries may have extra detection on the gallery ceiling.



Cross section of dual conveyor housing

Heat detection in motion (hotspots).

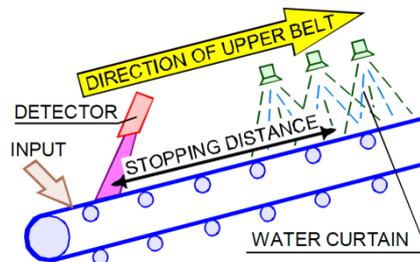
The only way to detect hot spots in the product carried by a belt is through its infrared radiation.



5610 ATEX IR Detector with Compressed Air Inlet for Lens Cleaning System

Infrared radiation occurs for all materials. The wavelength and intensity of the IR depend on the material in question. Our infrared hot spot detector uses filters to detect relatively low temperature energy emissions in moving product.

Our detector is the only one on the market that can detect hot spots from 80°C. The detector is mounted at a height between 1 and 1.5 m., to cover the width of the belt with its optical system. It is capable of detecting hot spots of 30 mm. in diameter and smaller.



- The infrared hot spot detector should be mounted at the beginning of the belt, on transfer towers, and at the loading and unloading points. Once a possible fire is detected, the belt should stop.
- It would be convenient to have a water extinguishing system that was automatically activated so that the fire does not move to another place.

In the case of very long belts and in which it can be considered that there is a high risk of self-combustion of the product carried by the belt, it is recommended to install a hot spot detector for every 50 meters.

It is also recommended to use an air purge line to always keep the detector lenses clean, to avoid false alarms and breakdowns.



For any questions or clarifications about this guide and request for prices and references, you can contact us at the following email addresses: comercial@tasc.es, logistica@tasc.es