

Application Note

Conveyors



Fires on conveyor belt systems are commonly caused by the friction of the belt on seized idlers and rollers or from bearings overheating. In addition the product being transported may already be on fire. The situation becomes even more dangerous because a conveyor belt has the ability to spread a fire over long distances. Linesense digital Linear Heat Detection (LHD) offers a cost effective fire detection solution.

Today's conveyors can be found in a multitude of applications and environments; it can be a short conveyor moving waste material in a recycling centre, ore transported over many kilometres of open countryside or carrying coal in a mine.

Linesense digital LHD is suitable where Standard detection methods would find it difficult to work. Areas where it could be exposed to the effects of wind and rain or high levels of dirt and dust. Environments where other detectors require additional measures to prevent dust blocking sample points or obscuring optics. The long term reliability of digital LHD reduces the need for increased maintenance or holding stock of costly consumable spares.

With the distances that some conveyors transport material reaching many kilometres in length, LHD offers a flexible cost effective solution no matter the size and type of environment.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. conventional fire panel, addressable switch monitor unit or PLC.

The fire detection capability can be enhanced when the LHD is used in conjunction with the Digital Location Interface (DLI). Conveyors can be many kilometres long, so identifying where a fire is located helps speed up decisions.

The DLI has the ability to monitor up to 2,000m or 10,000m of LHD (depending on the unit selected) for both Fire and Fault conditions, when activated it identifies the location of the alarm. The distance in meters is displayed on the 3½ digit LCD and allows for appropriate action to be taken.



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Possible causes of conveyor fires can be:

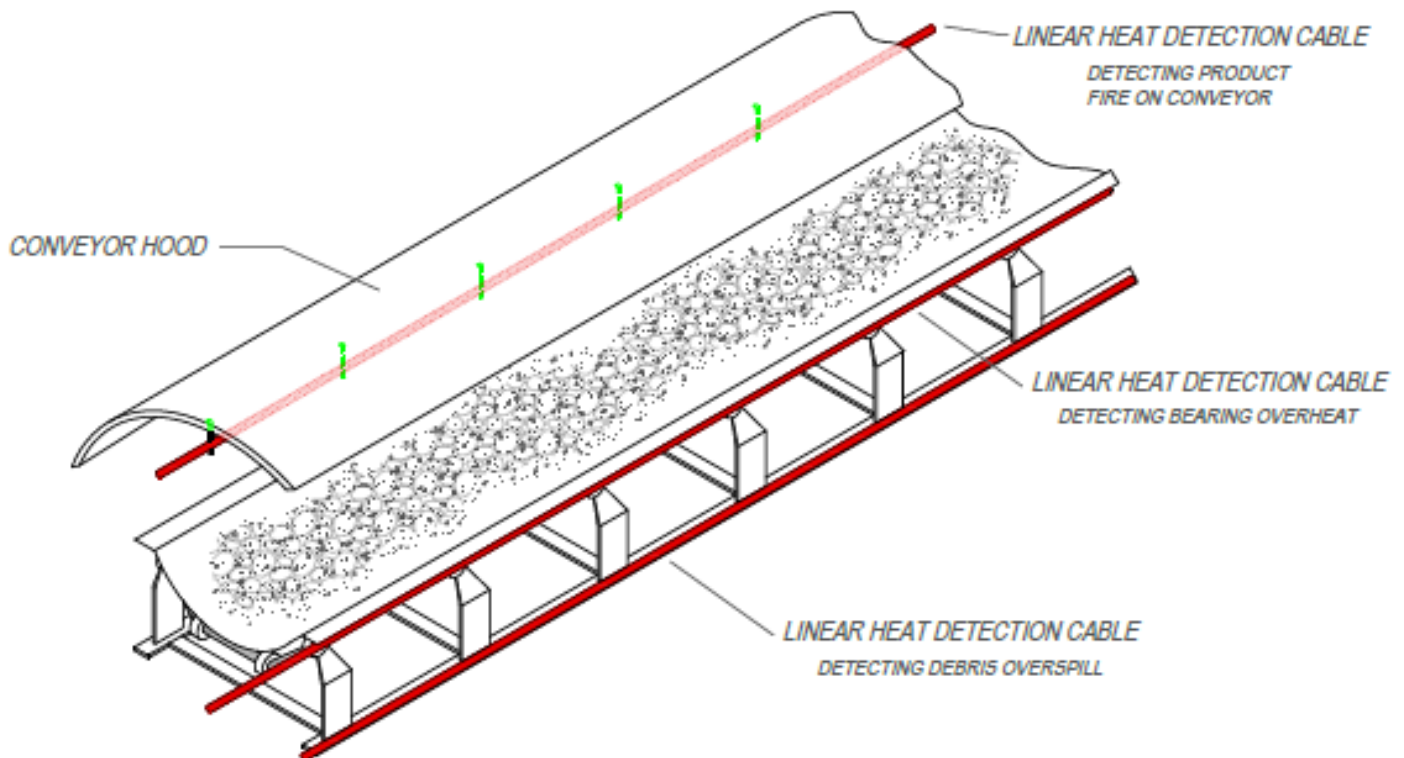
- A pulley seizing due to mechanical failure. The friction of the belt running over the pulley can generate sufficiently high temperatures to ignite the belt or material being transported resulting in a fire.
- Bearings overheating.
- Ignition of the product being transported. Examples being,
 - a) Shredding of waste wood for Biomass power stations may cause sparks leading to a fire in the wood prior to being conveyed.
 - b) Powder River Basin (PRB) coal used in power stations has a high probability of self igniting.
- Fires in product spillage to the sides of the conveyor belt.

The layout and makeup of the conveyors will determine how the LHD is installed and configured. System design should consider:

- LHD cable to be installed close to the bearings of the pulleys and idlers to detect overheating.
- LHD cable to be installed above the conveyor belt to detect any static fires on the belt.
- A length of LHD is also recommended below each side of the conveyor to detect spillage fires
- Local fire regulations.
- Suppression or water deluge zones.

Linesense provide a selection of fixings and clips to retain the Linear Heat Detection (LHD) cable in place. Fixings should be placed at intervals of no more than 1.2m apart.

Where cable ties are used they should be used in conjunction with a neoprene sleeve and not over tightened to prevent damage to the outer sleeve of the LHD.



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