

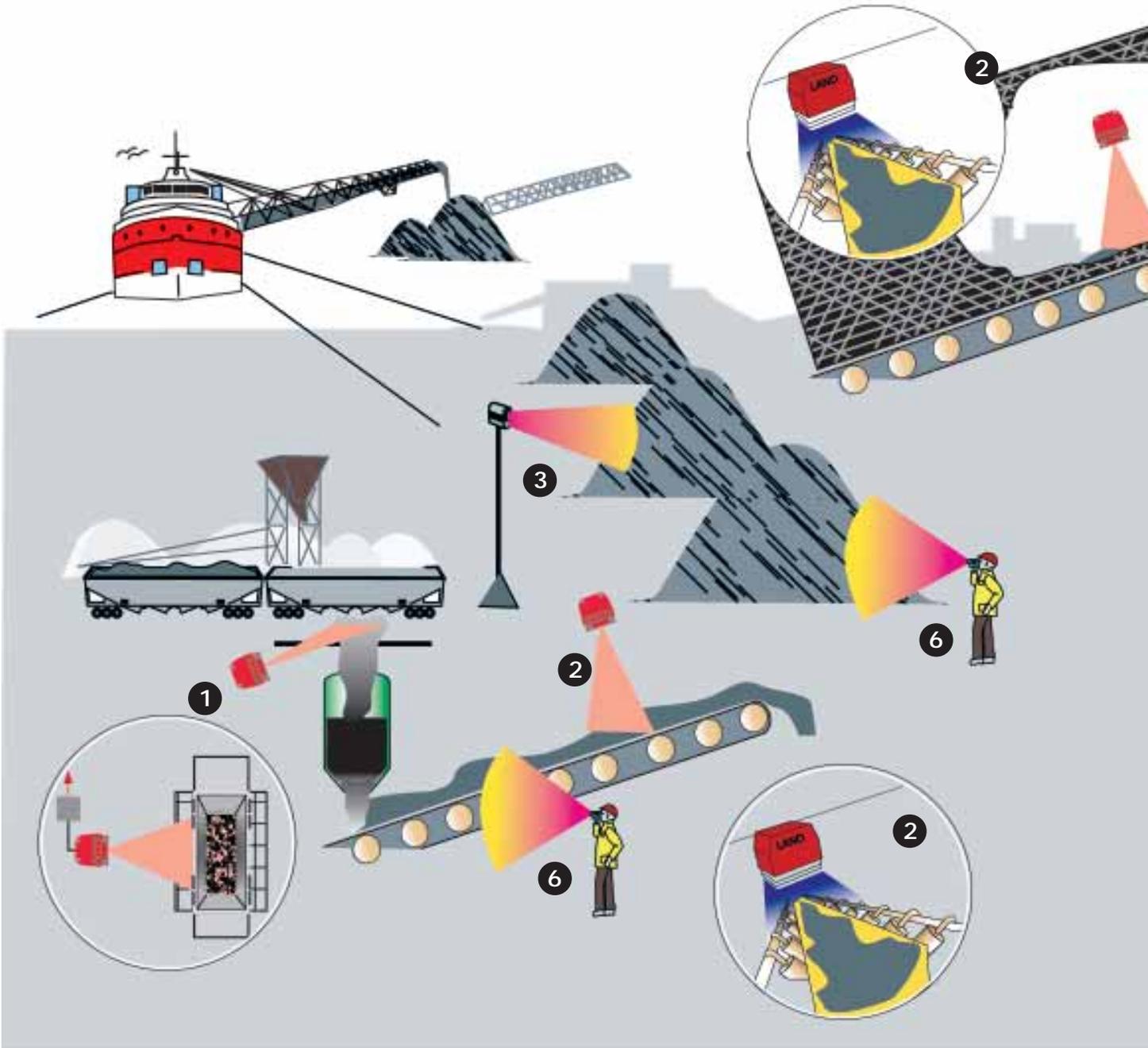
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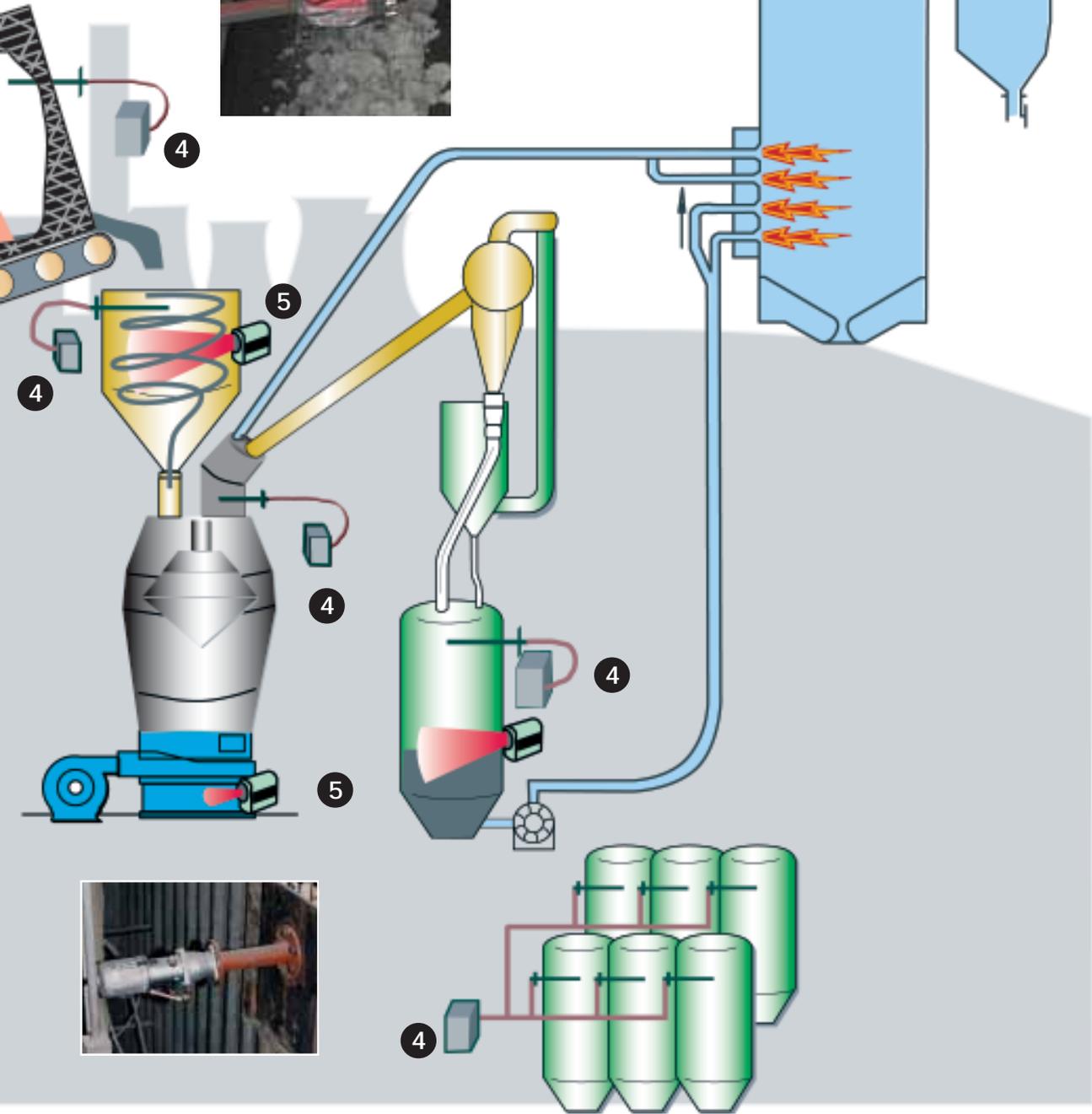
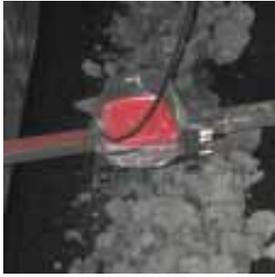
## Coal Fire Detection - Product Range

- 1 **Railcar Fire Detector** - Check and detect hotspots and fires in coal railcars
- 2 **Conveyor Fire Detector** - Early detection of hotspots/fires along the conveyor
- 3 **Coal Pile Fire Detector** - Early detection of hotspots/fires in coal stockyards
- 4 **Mill Fire Detector** - CO monitor for early detection and advance warning of mill/silo and enclosed
- 5 **IR Coal Fire Monitor** - Infrared thermometer for detecting fires on the mill/bunkers
- 6 **Portable Thermal Imager** - Hotspot and fire detection in bunkers/hoppers/silos; and plant integrity



conveyor fires

checking



# Coal Fire Detection Systems

## For all coal handling, processing and storage applications

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Land offer systems for fire detection in the entire coal handling process. Fire detection applications include those in transportation (conveyors), grinding and storage.



### Results of a coal fire

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- Plant damage and possible replacement
- Increased insurance premiums
- Lost production
- Downtime
- Maintenance burden
- Personnel injury



### Why choose the LAND Fire Detection System ?

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- Advance warning - enabling appropriate action to be taken
- Detection method is ideally matched to process requirement
- Sensors are designed for the harsh conditions of coal handling and processing
- Low cost investment to protect plant and personnel
- Product range has been proven in many plants throughout the world
- Explosions and fires are a real threat and should not be ignored
- Product range offer high reliability with minimal maintenance requirements



### What causes spontaneous combustion in coal?

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The risk of fire exists where ever significant amounts of coal are being handled or processed. When coal is in contact with air it oxidizes to form CO and CO<sub>2</sub>. This reaction is exothermic and can lead to the formation of hotspots. These hotspots can lead to fire if left undetected. Carbon monoxide is given off from the earliest stages of combustion (the best method of fire detection); this can later lead to explosions if it builds up in a confined space.

Coal that has been stored for excessive amounts of time has an increased possibility of heating. New coal added on top of old coal can create segregation of particle sizes, which is a major cause of heating.

Many different factors can help lead to spontaneous combustion including:

**Type (i.e. quality, PRB is particularly susceptible)**

**Age**

**Composition (i.e. moisture content)**

**Storage Conditions (i.e. level of oxygen)**

**Processing method (i.e. pulverizing)**



## Detection Applications

Application	Detection/Monitoring Solution
Coal transported on railcars	Railcar Fire Detector
Coal stored in stock piles	Coal Pile Fire Detector
Coal transported along conveyors*	Conveyor Fire Detector
Coal Grinding Mill/Feeder/Bunker/Hopper	Mill Fire Detector
Mill Reject box	Mill Fire Detector; IR Coal Fire Monitor
Coal stored when finely ground	Mill Fire Detector; IR Coal Fire Monitor
General spot checks	Portable Thermal Imager

\*CO monitoring is also effective for fire detection inside enclosed conveyors



### Mill Fire Detector

Monitors the levels of carbon monoxide inside the mill and storage silos. A rapid rise in the levels indicates that combustion is underway. If CO levels reach the pre-set limits then alarms are triggered and preventative action can be taken before a fire starts or an explosion occurs. Fires and explosions can lead to mills having to be replaced, surroundings being repaired (or replaced) and extensive amounts of downtime. The mills reject box should also be monitored.

For complete product details refer to data sheet PDS209



### Coal Pile Fire Detector

Storing coal in large piles has the inherent risk of spontaneous combustion. There are many industry guidelines to the best method for storing coal in piles. These guidelines include avoidance of spontaneous combustion with regard to pile angles, compression and surface smoothing. Even strict adherence to these guidelines (particularly with the more volatile coals) may in some circumstances not be enough. An early warning system to prevent the onset of fire remains the best and most reliable solution.

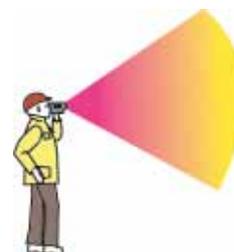
For complete product details refer to data sheet PDS224



### Portable Thermal Imager

Thermal imaging has multiple uses around any coal handling or processing plant. Checking the thermal integrity of the bunker or silo for insulation failures is only one application. Where there is the potential for over-heating and damage as a result, a high resolution thermal image provides the best possible early indication.

For complete product details refer to data sheet PDS225



## Further Information

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## Conveyor Fire Detector

A scanning temperature measurement system which looks at the entire width of the conveyor at any one time is an ideal solution. It scans at a wide angle (the entire conveyor width), at high speed and with a fast response. Every hot spot can be detected as the all surface coal is viewed. The scanner outputs the hottest temperature on the conveyor directly to a suitable customer alarm system.

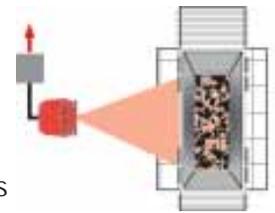


**For complete product details refer to data sheet PDS222**



## Railcar Fire Detector

The system scans the coal as it drops from the railcar through under-track grates into a storage hopper (track hopper). Any hotspot or smouldering coal is detected and fire prevention action can be taken.



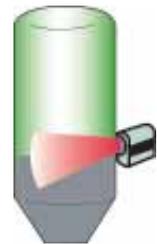
As each rail car arrives at the plant and unloads the coal, the curtain of falling coal is temperature checked using an infrared temperature scanner. This is located trackside and mounted horizontally to view the passing coal as it leaves the railcar. Any hot spots are picked up and used to trigger alarms to prevent widespread fire in the storage hopper or the subsequent conveyor system.

**For complete product details refer to data sheet PDS226**



## IR Coal Fire Monitor

While carbon monoxide (CO) detection offers an earlier warning, infrared thermometry can provide a low cost alternative in the bunker/hopper and the mill reject box. The thermometer can be mounted to view the coal inside the hopper/bunker and give a rapid indication of temperature rise - a warning that fire is imminent. Where thermocouples are used in the reject box, the thermometer is a real alternative, with faster response and greater longevity.



**For complete product details refer to data sheet PDS223**

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Land Instruments International has a comprehensive range of Combustion, Environmental and Temperature Monitoring Instrumentation.



Approval applies to products designed and manufactured in the UK

Approval applies in the USA

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