

APPLICATION NOTE

# Using fixed thermal imaging to identify dangerous hot spots in coal or biomass

## Introduction

Continuous coal and biomass monitoring is an important step in understanding the conditions leading to a fire. Hot spots can flare-up devastating spontaneous combustion, potentially causing thousands of dollars in material loss, dangerous work conditions, and difficult extinguishing options. Prevention is becoming readily available with cost-effective continuous thermal image monitoring as a method for early warning.

## Stay safe with fire prevention

Fires started by spontaneous pile combustion will typically begin in a pile's lowest layers and show few external signals prior to ignition. Bulk storage of coal, processed wood products, paper stockpiles, and other combustible materials all carry similar fire risk. Proper surface monitoring of these piles through continuous hot spot detection with infrared cameras and auto-alarming helps identify the problems and allows corrective action, before they turn into costly and dangerous fires. Set the temperature thresholds and put your trust in the solution to warn of impending combustion.

## Factors in continuous monitoring

Storage of biomass or coal piles must account for regulations on size, pile angles, compression, and surface smoothing. In expansive storage facilities, piles can span hundreds to thousands of feet and require strategic camera mounting on masts in weatherproof enclosures. These variables, along with the movement and utilization of pile material, means that contact temperature probes or handheld cameras are simply not practical solutions for this critical task.

Utility companies using different types of biomass fuel (e.g. agricultural waste) for power generation need tight process control to reduce harmful emissions and ensure proper electricity supply to the power grid.

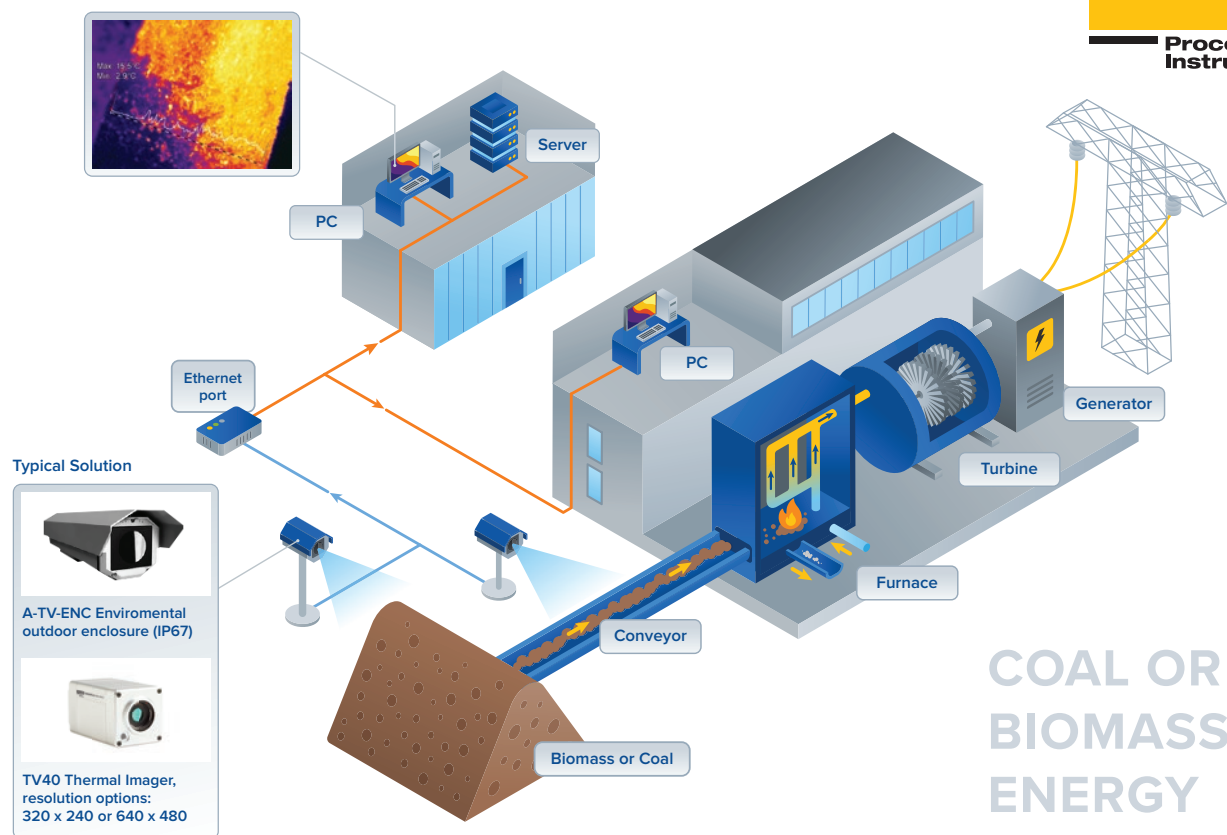


Carbon Monoxide detectors can alarm when fire breaks out in fuel transport upstream of the boiler; but they often give false positive alarms, as the gas is naturally released through material decomposition leading up to entering the boiler.

## The thermal image solution

Fixed thermal imagers, telephoto lenses, and pan and tilt mechanisms help ensure proper coverage across the entire process—from storage piles, to conveyor belts, and right up to the boiler entrance. Taking control of your pile monitoring with thermal cameras allows you to identify and correct hot spots before material ignites.

ThermoView thermal imaging cameras with 320x240 or 640x480 pixel resolution and wide-angle lenses can be strategically mounted and integrated into existing control systems through standard I/O modules or direct communication protocols. Fluke Process Instruments fixed thermal image cameras also allow simultaneous infrared and visible light image capture and automatic image recording.



The ThermoView software allows for quick setup of Areas of Interest (AOIs) for conditions that only trigger alarms when temperatures are outside of set parameters and additional functionality allows for narrowing the alarm window. For example you could set AOIs to alarm only when >30% of an area exceeds a potential hot spot temperature threshold. An on-screen dimensional reference tool also allows for material level estimation.

### Conclusion

When calculating potential risk, personnel safety is the highest priority; but loss of production, property, and precious materials, in addition to damage from extinguishing materials, are all considerations to invest in cost-effective prevention solutions such as continuous thermal imaging. A modest investment now can save millions in losses later.



### Fluke Process Instruments.

**Americas**  
 Everett, WA USA  
 Tel: +1 800 227 8074 (US and Canada only)  
 +1 425 446 6300  
 solutions@flukeprocessinstruments.com

**EMEA**  
 Berlin, Germany  
 Tel: +49 30 4 78 00 80  
 info@flukeprocessinstruments.de

**China**  
 Beijing, China  
 Tel: +8610 6438 4691  
 info@flukeprocessinstruments.cn

**Japan**  
 Tokyo, Japan  
 Tel: +81 03 6714 3114  
 info@flukeprocessinstruments.jp

**Asia East and South**  
 India Tel: +91 22 62495028  
 Singapore Tel: +65 6799 5578  
 sales.asia@flukeprocessinstruments.com

**Worldwide service**  
 Fluke Process Instruments offers services, including repair and calibration. For more information, contact your local office.

**Web:**  
[www.flukeprocessinstruments.com](http://www.flukeprocessinstruments.com)  
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