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Early Smoke Detection in Waste Recycling Facilities

As a population grows so does its production of waste, trash and household garbage. For centuries, this waste has been collected and dumped into a landfill and left to decay. However, as many landfills are being filled (and in some cases overfilled), communities are looking into many waste management alternatives involving various recycling/reuse programs. In many countries, solid household waste/trash is now being collected and carried to a waste incineration plant, rather than being dumped directly in a landfill site. The waste is stored in so-called waste bunkers or transfer stations until it can be destroyed. These waste bunkers can contain thousands of metric tons of solid waste, which is potentially flammable. Self-combustion, heat development due to pressure, spontaneous chemical reactions between the disposals, methane gas-building, are all potential fire creators and concerns at these plants.

Waste station fires can be incredibly hazardous for both the operator and environment. After all, the heavily contaminated firefighting water, which hampers the further processing of the waste by making it harder to burn on purpose, has to be disposed of somehow. And firefighting does not always reach potential fire spots still smoldering somewhere. Think of it like a campfire; the hotter and longer it burned at night, the more lasting the coals will be. You only have to peel off a few layers in the morning for that fire to come right back to life. A waste facilities fire could easily burn for 2-3 weeks if not 100% suppressed. This is why the stored waste has to be permanently moved, mixed and turned by crane operators. It keeps any one spot from becoming too dangerous.

However, even with crane operators constantly moving the waste, fires can still break out because of external sources. With millions of tons of waste to feed that fire, catching a spark before it has time to grow into an inferno is critical! A very early warning detection system in a waste facility could detect:

- Extreme temperatures from incinerators
- High machinery voltages
- High frictional heat sources from large collection and sorting equipment
- Corrosive environments (water and chemical treatments)
- Potentially hazardous atmospheres due to material decomposition
- Dirty processes and dusty environments when processing and storing material

With an actively monitored sampling system, a fully monitored HEPA filter, and sensitivity consistency over time, early warning detection systems are monitoring waste plants 24×7 and providing the necessary safety and protection with as few false alarms as possible. An extremely sensitive system, aspirating smoke detectors (ASD) have a high resistance to intruding objects such as dust, fogging, steam, reflections, sunlight, birds, insects and forklifts, overcoming the weaknesses of traditional detection solutions used in large, open spaces. Aspirating smoke detectors rely on a sampling pipe with multiple holes that filter the samples and remove any contaminants or dust to avoid false alarms. But since they are so sensitive, these detectors can detect smoke before it's visible to the human eye! Furthermore, ASD systems incorporate automatic integrity monitoring to ensure an alert is raised at any time the aspirating smoke detector' ability to detect smoke is compromised, ensuring that no real alarm goes un-rung.

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