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O2 SENSORS CAN IDENTIFY OXYGEN-DEPLETED OR OXYGEN-ENRICHED ENVIRONMENTS, WHICH CAN SIGNIFICANTLY IMPACT THE SPREAD AND SEVERITY OF A FIRE. **55**

FIREFIGHTING EQUIPMENT

A new risk for hazmat teams

Doug Mayer, Business Development, Fire Services Specialist, Blackline Safety, discusses electric vehicle fires



In responding to EV battery fires, connected multi-gas detectors have emerged as a game-changer. These devices leverage cloudconnectivity, location technology, customisable gas cartridges, and advanced analytics. The result is enhanced situational awareness, improved response times, and comprehensive gas detection to get ahead of risk and prevent EV fires from escalating.

Usage of EVs continues to grow exponentially. So do the risks to first responders.

Unexpected, longlasting hazardous off-gases

EVs batteries, primarily lithium-ion, can catch fire and produce gases such as hydrogen fluoride (HF), which are not normally encountered during combustion engine fires. Once a lithium-ion battery catches fire, it can be difficult to extinguish and can continue burning, generating hazardous off gases for several hours. It can even reignite after being put out.

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Responding to EV battery fires requires connected gas detection equipment to ensure the safety of both responders and communities. Traditional gas detectors may not be sufficient for detecting the unique hazards associated with EV fires, emphasising the need for advanced sensors such as lowerexplosive-limit molecular property spectrometers (LEL-MPS), HF sensors, oxygen (02) sensors, and carbon monoxide (CO) sensors.

"This is a new hazard not seen in the industry to date and fire hazmat teams right now run the risk of not having the right gas detection equipment to properly protect them," said Travis Rebello, Firefighter / HazMat Technician

"Knowing what gases are present allows us to make quick decisions that put their safety—and the safety of communities—first."

Early detection critical

In EVs, where the presence of volatile, potential ignition

substances such as fuel or battery electrolytes can escalate a fire incident. Gas detectors with LEL-MPS sensors can provide early warnings by detecting flammable gases, like hydrogen and methane, and trigger an alarm, allowing responders to take immediate action to prevent further escalation. C0 is also generated during heating and fire, providing pre-warning of a potential thermal runaway.

Proactively monitor risk

If an EV battery is at risk of thermal runaway, it needs to be transported to a storage location or facility where gas levels can be continuously monitored to ensure they remain within a safe threshold. Connected area monitors are ideal for this situation. They can be set up where the batteries are being stored and then gas levels can be continuously monitored from any remote location via an online dashboard.

If gas levels rise above a set threshold, alarm notifications will be sent so that a response team

FIREFIGHTING EQUIPMENT

can quell the situation before a fire occurs. And with a 100+ day battery life the portable area monitor can ensure the safety of the batteries' storage for an extended period.

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HAVING THE ABILITY TO DIRECTLY MEASURE POTENTIAL GASES PRESENT WILL ALLOW MEMBERS TO KNOW WHETHER A SITUATION IS IN THE PROCESS OF RUNAWAY OR NOT.

Managing the response

As an EV fire unfolds, 02 sensors can identify oxygen-depleted or oxygen-enriched environments, which can significantly impact the spread and severity of a fire. 02 sensors can assist in evaluating the



effectiveness of fire suppression systems, ensuring a safe environment for responders and civilians.

Also critical are HF sensors, specifically designed to detect these hazardous substances not normally encountered in other combustion engine fires.

"HF is a toxic and corrosive gas that poses severe health risks to both humans and the environment," said Salvesen.

"By integrating HF sensors into gas detection solutions, responders can auickly identify and mitiaate the risks associated with HF gas, enhancing their safety and the effectiveness of fire response efforts."

Flexible equipment for the situation

Given the multiple gas hazards present in EV fires, gas detection equipment that enables multiple sensor combinations and hot swappable cartridaes offers the best protection, allowing first responders to quickly adapt to the situation on scene.

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GAS DETECTORS WITH LEL-MPS SENSORS CAN PROVIDE EARLY WARNINGS BY DETECTING FLAMMABLE GASES, LIKE HYDROGEN AND METHANE. ,,,

"Your standard 4 gas meter may not give you the whole picture in a battery event. A meter that has a different sensor configuration to measure flammability and the presence of these specific toxic gases will go a long way to ensuring members' safety," added Salvesen.

For example, Blackline Safety's G7 wearable connected multigas detectors can detect up to five gases simultaneously (with a portfolio of up to 20 gases to choose from) with swappable cartridges that can be configured to match the situation or address evolving needs.

Real-time visibility, reliable connectivity

Cloud-connected equipment allows incident commanders to see what is happening in real-time-even from a remote command center —so they can make data-informed safety decisions.

For example, instant alerts and notifications of location-stamped gas readings let incident commanders know exactly where gases are present and which personnel are at risk, allowing them to make decisions on where to direct responders and to take immediate action to prevent further escalation.

Data-informed incident management

Connected safety solutions advance EV fire response by providing real-time gas level insights, personnel location information and early toxic and flammable substance detection. This data empowers incident commanders to make informed decisions on evacuation routes and resource allocation.

Gas detectors with LEL-MPS, 02, CO, and HF sensors are crucial as they offer early warning capabilities and enable rapid response to potential fire hazards. They ensure prompt identification of flammable cases, oxvaen levels and toxic substances, thereby preventing fire escalation and safeguarding lives.

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TAKE **COMMAND OF YOUR RESPONSE**



REMOTE VISIBILITY, ON-THE-GROUND PROTECTION

Stay ahead of the risks faced by your responders and communities—whether from flammable, toxic gases or VOCS—