

# OCCUPATIONAL EXPOSURE TO VOCs



## AN INTRODUCTION TO BLACKLINE SAFETY

Blackline Safety is a global safety technology leader. We provide comprehensive live monitoring and wireless gas detection to help teams working in hazardous environments respond to emergencies in real-time and manage efficient evacuations. Our talented team of designers and engineers create and manufacture everything in-house, from wearable technology and personal gas detectors to cloud-hosted infrastructure and web-based interfaces for global industry.

We have created the world's first turnkey, work-anywhere safety monitoring solution that offers wireless, remote gas detection, a two-way speakerphone and live monitoring to meet the demanding safety challenges of organisations in over 200 countries. Our vision is to become the leading supplier of wireless gas detection products in the world, and to that end, we offer the broadest and most complete portfolio in the industry.



**1 worker dies every 30 seconds** due to the exposure of **toxic gases** in the workplace.

*UN Report, 2019*

## MONITORING EMPLOYEE EXPOSURE TO VOCS

**Occupational Hygienists** undertake surveys and evaluate risks to health in the workplace by accurately measuring levels of exposure. Often these are measured through precise specialist equipment that record data.

**Occupational Hygienists** will be concerned with controlling health risks in practical and cost-effective ways by assessing and resolving everyday problems. This will involve looking at the short and long-term health effects, caused by both acute and chronic exposure to hazards and **volatile organic compounds (VOCs)**. This helps an organisation to respond effectively to legislative requirements.

The practice of occupational hygiene is concerned with three kinds of situations:

- Initial studies to assess workers' exposure;
  - Where is the problem and how can it be addressed...
- Follow-up monitoring and data surveillance;
  - How bad is the problem quantitatively...
- Record and Report;
  - On a person-by-person basis...

### Monitoring personnel exposure to hazardous substances while capturing worker exposure data

Exposure assessment aims at determining the level of exposure to VOCs; the concentration, frequency and duration of gas exposure.

In the evaluation of exposure to airborne contaminants, the standard procedure is the assessment of inhalation exposure. This includes the determination of the air concentration that workers are exposed to, or in the case of airborne particles, the air concentration of the relevant fraction, e.g., the "**respirable fraction**" and the duration of the exposure. If routes other than inhalation contribute appreciably to an individual uptake of a chemical, an incorrect judgement may be made by looking only at the inhalation exposure. In such cases, total exposure has to be assessed, and a very useful tool for this is a personal, body worn Photoionisation Detector (PID).

### What are exposure control measures?

Control measures are always a mixture of equipment and ways of working to reduce exposure. The right combination is crucial and no measures, however practical, will work unless they are used properly. This means instructing, training and supervising the workers who are doing the tasks. You need control measures that work and continue to work in order to effectively measure and mitigate exposure challenges that may occur.

### Personal protective equipment (PPE)

It is preferable to remove the risks totally, or change ways of working but if this is not practical, personal protective equipment is often used as part of control measures. This also needs checking and maintenance because, if it fails, it no longer provides protection and exposes the wearer to danger.

Portable gas detectors are classed as a type of Personal Protective Equipment (PPE), designed to keep personnel safe from gas hazards and allow mobile testing of locations before they are entered. These small devices are essential in many areas where gas hazards could occur, because they are the only means of monitoring an operator's breathing zone continuously, whilst stationary or moving.



Monitoring personal exposure



**Blackline Safety's G7c** wearable monitor keeps workers safe in the field by logging **VOC** data in **real time for continuous visibility.**

Monitoring typically means 'air sampling' but it may also involve taking biological samples, e.g. breath or urine. Monitoring normally makes reference to 'Workplace Exposure Limits' (WELs) and these limits should not be exceeded. Photoionisation detectors (PIDs) are the trusted solution to monitor air quality for volatile organic compounds (VOCs). Effective monitoring of VOCs can be achieved by using Blackline Safety's G7c personal device or G7 EXO area monitor. Permissible exposure limits are defined by safety regulations and it is important for businesses with personnel who work in close proximity to toxic VOCs to monitor employee exposure within the WEL limits.

**How do I know if exposures are below the WEL?**

You can only do this by **monitoring**. This means measuring the substance in the air that the worker breathes while the task is underway.

**Daily worker exposure**

A personal unit is assigned to each worker. Continuous monitoring of the worker's breathing zone will alert the wearer when the environment becomes unsafe.

**UNRIVALLED GAS DETECTOR, UNRIVALLED GAS DETECTION**

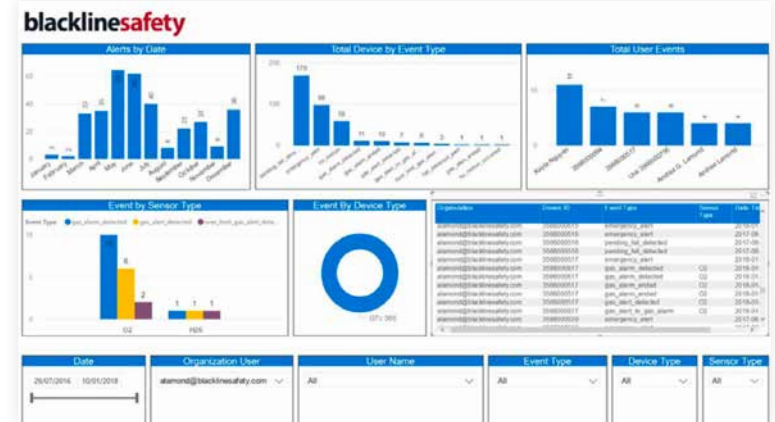
Blackline Safety offers several different alerts to notify users of changes in the environment or to get the user help in the event of a serious exposure. Including real-time readings, real-time alerts, low-gas, high-gas, STEL, TWA, over and under limit alerts.

**G7 and Blackline Analytics:**

G7 devices constantly monitor ambient gas levels and employee location, reporting this data back to the Blackline Safety Network via cellular connectivity.

Data streamed from each G7c and G7 EXO generates a large volume of data that is processed by the Blackline Analytics platform and Blackline Live compliance dashboard.

The graph shows a typical sample of 3 hours worth of exposure data for a user wearing a G7c devices with MiniPID 2 sensor. The peaks indicate that the individual was exposed to an elevated concentration of the target gas. The image shows the location of the exposure. This may or may not result in additional action but now, with the data in hand, an informed decision can be made.

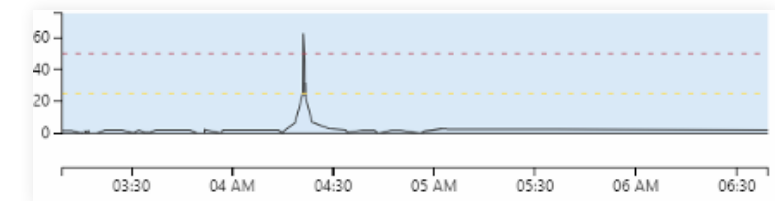


Blackline Analytics delivers critical data:

- G7 and docking station usage
- Calibration and bump test data
- Gas leak heat maps



VOC Readings GPS Location from Blackline Live and Blackline Analytics



VOC readings in a specified time period

## THE ONLY SAFETY SOLUTION THAT WORKS AS HARD AS YOU DO

Blackline Safety's G7c and G7 EXO are now available with an industry-leading PID sensor from world-class sensor vendor — [Ion Science](#). The world's largest manufacturer of PIDs. Ion Science and has been proven to deliver the highest performance through third-party testing. Blackline selected the next-generation 10.6 eV Ion Science MiniPID 2 sensor for use in G7 gas sensor cartridges, chosen for its robustness, low maintenance and long service life. Advantages include improved linearity, humidity resistance and an anti-contamination design compared to competitive offerings.

### G7 scales to fit your business

- Plug-and-play cartridge interface with diffusion and combination diffusion-pump options
- Lifetime sensor warranty
- Over-the-air configuration
- Live location data streaming
- Powerful analytics and reporting interface
- Real-time alerting to a live monitoring team
- Custom emergency response protocols
- Two-way voice calling and messaging
- Fall detection, no-motion, check-in system
- Emergency SOS latch





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