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September 2013

September 2013 Newsletter - Gas Detection

We are thrilled to announce that we placed 46th in the Smart Company Smart50 Awards for 2013, which is up 3 places from our last 2 years placing. We are so excited to be acknowledged by Smart Company as one of the fastest growing companies in Australia and would like to thank them for the award.

Next week we welcome Miriam back to the office after she has spent the past 6 weeks sunning herself in Europe, you will notice her making some improvements to our website in the weeks following her return. Please feel free to let us know what you like or don't like and also if there are any features you would like us to add in the future.

Daniel used one of our new GasClip products the MGC-P to test the air quality on his trip to the royal show and I have to say the results are surprising!

Please remember if you have any questions regarding tests you need to conduct or specific instrumentation please give us a call.

Until next month…
Tyson Grubb

Product of the month: MGC

Day in, day out, your workers have to charge their portable multi gas detectors so they can keep testing for the presence of combustible gases, H2S, CO, and O2. Unfortunately, sometimes they may forget to do so. Gas Clip Technologies can help prevent this safety risk with our new Multi Gas Clip (MGC). It has the longest battery life of any portable gas detector by a long shot.

Gas Detectors
Save Tweety the canary! Use a gas detector.

Gone are the days when you need to bring a canary to tell you if the air is safe to breathe and the area is safe to occupy. Thankfully for the canary, their job has been replaced by gas detectors. Gas Detectors are units that are used to measure the presence or concentration of various gases in the air. They can come in single gas models, which as the name suggests, will measure a single gas, or multi-gas models which will measure up to 5 different gases. Carbon Monoxide (CO), Hydrogen Sulfide (H2S) and Oxygen (O2) are the most widely measured gases.

Lower Explosive Limit (LEL) is another parameter which is commonly measured and this is a measure of the concentration of gases in the air that are capable of causing an explosion.
Gas detectors are primarily used as personal safety devices and they will alert the user with audible and visual alarms once the gas level has exceeded a pre-set limit. To measure different gases, different types of sensors are needed. Sensors for toxic gases are usually either an electrochemical sensor or a metal oxide sensor. For LEL, either a catalytic pellistor sensor or an IR sensor may be used. Although IR sensors can be more expensive upfront they can be used in a wider range of applications. Unlike pellistor sensors, IR sensors are not affected by silicon in the air i.e. if you are using silicon greases or sealants, and they do not require O2 to take a reading, which can limit their use in oil and gas applications where inert environments are used.

Confined space entry is one of the most common applications that gas detectors are used for. The Multi Gas Clip with infrared LEL sensor is a good choice for customers that are going to be using their gas detector frequently with minimal access to power as you can get around 60 days of use from a single charge. For the less frequent user, the Multi Gas Clip with Pellistor Combustible Sensor could be a good choice as it is a bit more cost effective, although the battery life is shorter at 25 hours. Both of these options are suitable for NBN and Telstra work.

Gas Detection Experiment

Air quality is important in all facets of daily life because operating in areas with poor air quality can be detrimental to human health. Noxious gases such as Carbon monoxide (CO), Hydrogen Sulphide (H2S) and explosive gases like Methane (CH4) are some of the most widely measured for air quality in a range of applications.

CO for instance decreases the ability of the blood to transport oxygen, and levels as low as 35ppm can begin to cause physiological effects. Whilst H2S has the potential to irritate eyes at levels as low as 10-20ppm.

Similarly combustible gases (LEL%) such as Methane have the potential to create an explosive environment if there are high enough concentrations present. An example of this occurred in 2011 when a barn exploded due to a high concentration of methane gas ignited after emanating from pig manure and can be seen here.

With the Royal Show being in town we decided to test air quality on a journey into and around the showgrounds using an MGC-P Gas detector. Read on to find out the how we did it and the results!

Equipment used:

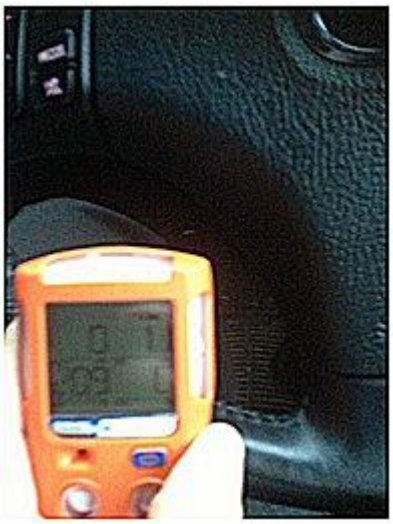
- MGC-P Gas detector (measures H2S, O2, Co and LEL%)

Method:

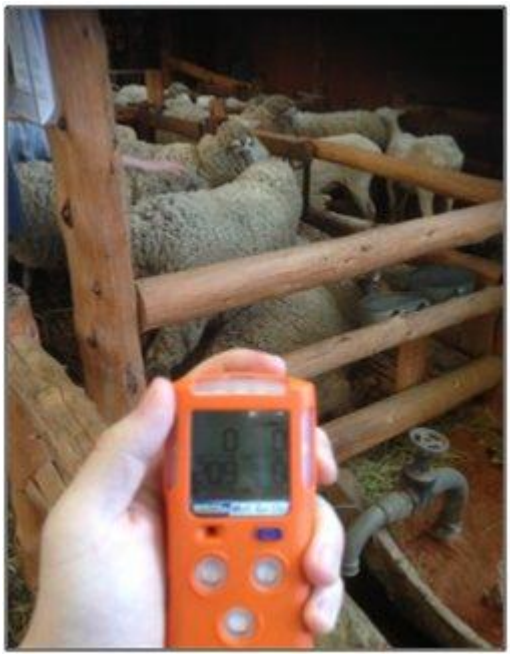
The MGC-P was turned on prior to entering the car. The car was not running at the time to prevent a false result. It was then held in one location in order allow the meter to perform its start-up procedure. Once the LEL%, CO and H2S sensors displayed “0” and the O2 sensor displayed “20.9” indicating sensor stabilisation a base reading was taken and recorded. The car was then entered and started and a passenger kept record of any change in the readings on the way to the showgrounds, any level that presented on the meter was recorded. Once at the showgrounds another reading was taken and recorded prior to entering the showgrounds. Inside the showgrounds readings were taken in a variety of locations. The results are detailed below.

Results:

Area	LEL%	O_2 (ppm)	H_2S (ppm)	CO (ppm)
Base measurement outside car	0	20.9	0	0
Car at intersection outside CBD	0	20.9	0	11
Car travelling behind bus	0	20.9	0	22
Car at built up intersection 2km from showgrounds	0	20.9	0	15
Outside showgrounds	0	20.9	0	0
Dairy Cattle Pavilion	0	20.9	0	0
Steer Shed	0	20.9	0	0
Sheep Pavilion	0	20.9	0	0
Alpaca and goat Pavilion	0	20.9	0	0
Pig Shed	0	20.9	0	0
Main Arena	0	20.9	0	0



A reading inside the car when stopped at an intersection outside the CBD



One of our Scientists taking a measurement in the sheep pavilion

The steer pavilion (take note of the slatted ventilation above the cattle)

Discussion and Conclusion:
All of the results within the showgrounds showed good air quality. It is interesting to note that the area that produced the lowest air quality was in the car on the way into the showgrounds. The 22 ppm CO reading was low enough that it wouldn't cause physiological effects immediately. However it is close to the 8 hour time weighted average exposure limit for CO of 30 ppm as per Worksafe requirements. If the levels were to rise and fall over an 8 hour period to produce a TWA of 30ppm, Worksafe guidelines would not be met.

For LEL% and H2S we were potentially expecting low level results in the livestock areas as CH4 and H2S are produced when manure is stored and undergoes an anaerobic digestive fermentation process. However, as per the results this did not occur and could have been due to a number of factors. This could be due to the significant ventilation of the buildings, the fact the accumulated level of CH4 and H2S were not at high enough concentrations to register or that the manure was not being stored in one place for long enough for the anaerobic fermentation to occur.

Whilst the MGC-P showed there was little difference in air quality between the journey to the showgrounds and the levels within the showgrounds it is important to note that this is a positive as high levels for any of these measurements can pose a risk to human health. This is evidenced by the article from the introduction. There have also been recorded instances of people dying of asphyxiation in manure waste pits due to being overwhelmed by the noxious gases detailed above and an example can be seen here. The MGC-P can be utilised to reduce these risks and provide users with an early indication that hazards are present. If you would like to discuss this experiment further or would like to discuss the use of the MGC-P for your application please call one of friendly scientists on 1300 737 871.

Thank you

from everyone at Instrument Choice - stay tuned for next months issue.

Contact us.

Our experts are happy to help and discuss your project.
Call **1300 737 871** or write an email to customer-service@instrumentchoice.com.au

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