Understanding Gases

Ozone

O_3

Often referred to as O_3, ozone is a gas with an antiseptic smell and no colour that, mostly, forms naturally in the environment.

It is the substance prevalent within the ozone layer; a protective shield that stops the sun's harmful rays (UV-B) penetrating to the earth's surface and damaging life on the planet.

10%

The 10% of O_3 which isn't within the ozone layer is formed through the reaction of nitrogen oxides and volatile organic compounds, or by high energy reactions during lightning storms or air being acted on by x-rays or ultraviolet light.

Nitrogen oxides and volatile organic compounds are emitted from vehicles, industrial facilities, plants, household supplies, cleaning products and refineries, to name a few sources. This process leads to the creation of what is often known as "bad ozone."

What are the dangers of Ozone?

When inhaled, ozone can have a range of harmful effects on the body. As it is colourless gas it is difficult to trace without an effective detection system in place.

Even when relatively small amounts are inhaled, the gas can have a damaging impact on the respiratory tract, causing inflammation and chest pain, alongside coughing, shortness of breath and throat irritation. It can also act as a trigger causing diseases such as asthma to worsen.

O_3 is a dangerous oxidant because it can react explosively with fuels in industrial environments, for example oil and grease, and therefore place staff in harm's way. Low concentrations of ozone can also have an effect upon textiles, fabrics, organic dyes, metals, plastics and paints and cause weathering effects, impacting a business' material, and consequently their bottom line.

How do you detect Ozone?

Employers should ensure, especially within high-risk workplaces, where exposure to ozone is a possibility, that control measures are used. O_3 monitoring is required within all environments where it is present, not just to avoid operational issues and ensure compliance, but also to ensure staff and customer health and wellbeing. The 15 minute EH40 workplace concentration limit is only 0.2ppm, meaning that precautions need to be taken where the tiniest of amounts are expected, and that is a legal requirement.

With varying thresholds for acceptable levels of O_3 set by certifying organisations, implementing flexible detection systems that can span unpredictable changes in ozone levels across varying times of the day, temperature, humidity and seasons is a must. Using an O_3 detector which can measure ozone in the ppb range is one way to reliably detect O_3.

What should you do if you are exposed?

Once exposed to ozone, a person should be taken to a warm and uncontaminated environment and given looser clothing.

Rest is required. If those exposed begin to struggle breathing, oxygen can be given via a first aider. In the case of breathing stopping, then cardiopulmonary resuscitation should be started. Any O_3 poisoning should be treated symptomatically, and it may be required for a prolonged time frame of medical observation to be undertaken.

Emitted from vehicles, industrial facilities, plants, household supplies, cleaning products and refineries

Colourless gas that is difficult to trace without an effective detection system in place

On exposure a person should be taken to a warm and uncontaminated environment and given looser clothing

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