



Dry Ice & COVID-19

How **Analox** are protecting those who are **protecting us**

After the news that **vaccine trials** have been successful in the **fight against COVID-19**, the world is now waiting in anticipation for the roll out to begin and for us all to get back to some kind of normality.

One vaccine in particular caught Analox's eye, the **Pfzier & BioNTech vaccine**. For this vaccine to remain stable in storage and in transport it needs to be kept at extremely low temperatures. This can be done by using dry ice.

So what is dry ice?

Dry ice is **carbon dioxide (CO₂)** in **solid form**, it occurs at a temperature of -78.5°C (109.3°F) and is used to keep **vaccines, food** and **other perishable products cold during shipping or storage**.

One of the fascinating properties of dry ice is that as it warms, it goes from a solid straight into a gas (CO₂), completely skipping the liquid state, a process called **sublimation**.



If dry ice is stored incorrectly and starts to warm up it will begin to fill the air with **Carbon Dioxide**, this can be fatal if no alarm is raised.

So while industries are busy preparing for the launch of the vaccine in the hope of saving lives, Analox and our distributors are planning on **how to protect those who are protecting us.**

Analox spoke to **Dirk Bersch, CEO of Beviclean**, a **long standing Analox distributor**, on how he plans to promote the use of gas detectors to ensure **safe handling and utilisation of dry ice...**

Have you been working with any companies in the supply of analyzers for COVID related activities? If so, what and how?

Using the Analox **CO2Buddy** and **Aspida** products we have been able to measure the amount of CO₂ within the air in enclosed environments. This provides us with a means to precisely measure the amount of gas in the air. Therefore, the user can see and be alerted should there be a need to ventilate the area.

Do you currently supply analyzers for dry ice users? If so who and can you provide any information on historic relationships?

We have customers, such as **Carbo Kohlensäurewerke** and **Carvex**, who measure the CO₂ content in the air when working with dry ice by using fixed installation detectors such as the



Dirk Bersch, CEO of Beviclean

Analox A50 and **Ax60+**. This business relationship of more than 20-years started from the classic application of compressed gases for the beverage industry. It has developed over the years into the application of dry ice for pressure disinfection with CO₂.

What are your views on the COVID vaccine and the storage of it at low temperatures - how would you recommend companies involved in this to protect their staff?

In the hope that vaccines will be available quickly, smooth and safe logistics are required. Dry ice can play an important role in ensuring the effectiveness of the vaccines. It is, of course, imperative that the employees in these segments are protected accordingly. **In my opinion, Analox offers the optimal system for mobile as well as permanently installed personal protection when handling dry ice.**

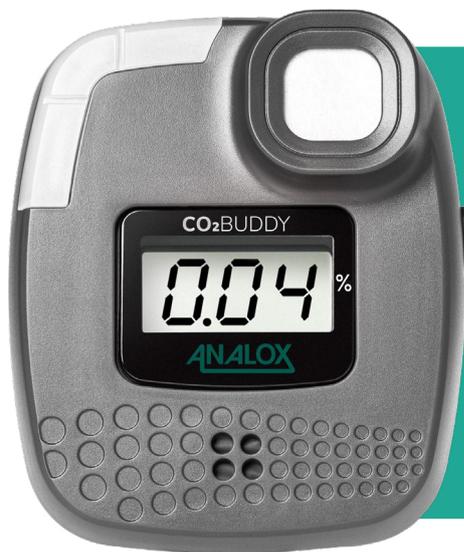
Whether you are **storing** or **transporting dry ice**, **Analox and our distributors** can help keep you and your staff safe in the event of a **CO₂ leak**.

Beviclean GmbH has worked with Analox since the 1990's. They were the driving force behind the **creation and enforcement of CO₂ legislation** within Germany. Offering dispense hygiene and cleaning solutions, Beviclean are a recognized brand on the international stage. Visit **BeviClean.com** for more information.



Dry ice safety solutions

For gas storage areas we offer the **Ax60+** fixed gas analyzer which monitors for **CO₂** and **O₂ deficiency** should you have any inert gases such as liquid nitrogen (LN₂) on site.



For personal monitoring we offer the **CO₂Buddy**, this portable alarm is small and robust, making it ideal for **delivery drivers**.

Get in touch if you'd like to know more!



Dry ice

The **cold** hard facts!



Why is dry ice, called dry ice?

Dry ice is carbon dioxide (CO₂) in solid form. It is a dense snow like substance that changes directly from a solid to a gas, referred to as **sublimation**, without going through a liquid stage. **Therefore, it gets the name 'dry ice'.**

What is sublimation?

Sublimation is when the change of state of a substance transforms from a **solid to gas** without first becoming liquid.

How is it made?

Dry ice manufacturing starts with **liquid carbon dioxide** held under pressure (300 psi) in bulk storage vessels. To begin the process of making dry ice, the liquid CO₂ is sent through an expansion valve into an empty chamber where under normal atmospheric pressure it flashes into CO₂ gas. This change from liquid to gas **causes the temperature to drop quickly**. About 46% of the gas will freeze into dry ice snow. The rest of the CO₂ gas is released into the atmosphere or recovered to be used again. The dry ice snow is then collected in a chamber where it is compressed into blocks, or various sized pellets.

What about shipping dry ice, is it safe?

During shipping, packages must allow for release of carbon dioxide gas. However, any release of CO₂ will create toxic levels of the gas into the environment, a portable CO₂ monitor such as the **CO₂Buddy** can keep you safe on the move. Both the **Department of Transportation (DOT)** and the **International Air Transport Association (IATA)** regulate shipments of dry ice as it is considered a **hazardous material**.

Why is it considered hazardous?

Dry ice is considered hazardous for three reasons:

- 1. Explosion hazard:** dry ice releases a large volume of carbon dioxide gas as it sublimates. If packaged in a container that does not allow for release of the gas, it may explode, causing personal injury or property damage.

- 2. Suffocation hazard:** a large volume of carbon dioxide gas emitted in a confined space may create toxic levels of CO₂ in the atmosphere. Dry ice must be stored in a well-ventilated area to minimize the build-up of carbon dioxide.
- 3. Contact hazard:** dry ice is a cryogenic material that causes severe frostbite upon contact with skin. Thermal gloves must be used if it is necessary to handle dry ice.

If shipping can be dangerous, what about storing dry ice?

Dry ice must be stored in a **well-ventilated location** and placed in a container such as a Styrofoam chest, insulated cooler, or a special cooler designed for the storage of dry ice.

Because of the thermal expansion of dry ice (**half a kilo of dry ice produces approximately 250 litres of gaseous carbon dioxide**), sufficient amount of gaseous carbon dioxide can be released in a sealed container to cause an explosion! Therefore, dry ice must **NEVER** to be stored in any type of tightly sealed devices such as an ultra-low freezer or plastic/glass container.

Dry ice will **sublimate** (turn from solid to a gas) about 2.5 to 4.5 kilos every 24 hours (blocks last longer) in a typical storage cooler. Normal air is composed of 78% nitrogen, 21% oxygen, and only 0.04% carbon dioxide. Concentrations of carbon dioxide in the air that is greater than 0.5% (5000 ppm) can become dangerous.

It's important to take care when using, storing and transporting dry ice, **get in touch with Analox today** to find out how we can **help you and your staff stay safe.**

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