



Carbon dioxide (CO₂).

A valuable product with unique abilities.



Important for life

Life on earth would not be possible without carbon dioxide (CO₂). It is continuously released and absorbed by different processes in the continuous atmospheric cycle, such as photosynthesis, fermentation and rotting, which keep the greenhouse effect at a constant level. The increased amount of carbon dioxide due to the combustion of fossil fuels disrupts the atmospheric cycle. This is the reason why many people associate carbon dioxide with global warming and consider it negative overlooking its general importance.

Does the use of carbon dioxide contribute to global warming?

The answer is NO.

Carbon dioxide is extracted from by-products of combustion or chemical processes. This carbon dioxide would be released directly into the atmosphere if Linde did not capture it and upgrade it to a valuable product. We might say that we borrow carbon dioxide and then use it for something good, replacing environmentally hazardous substances, before it is released to the atmosphere. Carbon dioxide produced as a by-product of different fermentation processes is a part of the natural atmospheric cycle and does not change the greenhouse effect level.

Carbon dioxide is also found in natural deposits. This carbon dioxide is normally recovered in conjunction with mineral water.

The environmentally efficient gas

In many Linde applications, carbon dioxide replaces substances which have a negative impact on the environment. For example, it replaces halons in fire extinguishers and freons (CFCs) in the production of polystyrene and polyurethane foams. These substances destroy the ozone layer in the stratosphere and are forbidden to use. Carbon dioxide is the best alternative agent as it is both quick and effective.

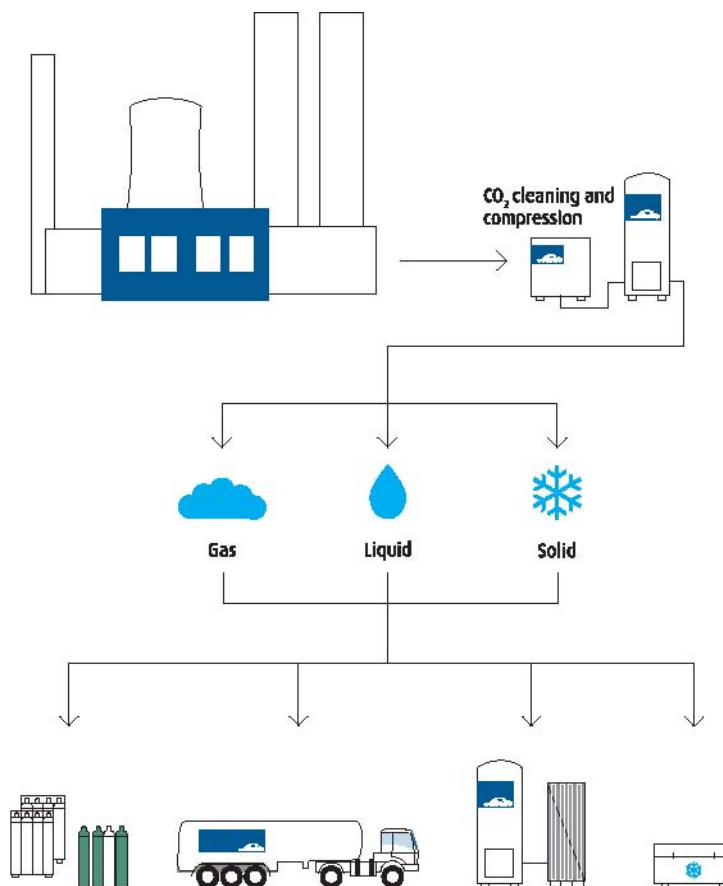
Carbon dioxide is used in swimming pools to neutralise the water instead of hydrochloric acid. The risk of dangerous chlorine gas being formed is reduced, the safety of swimmers is increased and the working environment of the employees is improved. In dry-ice cleaning processes, carbon dioxide works without any further cleaning solvents, which are often harmful or contaminate the surface to be cleaned. Or unique to Linde and Ice Cleaning Environmental Ltd can be used with other environmentally friendly additives. Automobile air conditioning systems which use CO₂ as refrigerant instead of HFCs are not only environmentally friendly but also more economical (lower petrol consumption) than systems using fluorinated greenhouse gases. Replacing diesel-driven chilling units in foodstuffs transport with carbon dioxide units reduces the impact on the environment.

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Production, storage and transport

In industrial production, carbon dioxide is recovered from waste products of the production of ethylene oxide, alcohols and fertilisers. It is captured, cleaned and compressed in several stages and then condensed. Liquid carbon dioxide is stored and distributed in tanks under pressure at low temperature. Smaller quantities of liquid carbon dioxide are stored in gas cylinders.

Carbon dioxide can also be supplied as dry ice. Dry ice is produced from liquid carbon dioxide, which is expanded to form carbon dioxide snow and then compressed to ice. Dry ice is supplied as pellets, blasting pellets, slices or blocks in insulated containers.



The versatile gas

Carbon dioxide has properties which can be used in many different ways without harming the atmospheric cycle. It is therefore not surprising that carbon dioxide is used in products and processes we meet every day:

- In carbonated drinks: improving their lifetime and adding the fresh and sharp taste
- Cooling or freezing of foodstuffs
- Cleaning of drinking water: making it less corrosive
- In greenhouses: increasing growth rates of vegetables
- Neutralisation of waste water before it is released to the environment
- Carbon dioxide as ICEBIZZ™ dry ice pellets is a highly efficient and flexible chilling agent: no additional energy is required for keeping goods cool and fresh
- Shielding gas for welding of steel and in laser cutting processes
- In industrial processes for cooling
- Dry ice blast cleaning is a unique method of cleaning contaminants such as paint, food residue and harmful bacteria from many different surfaces without causing damage

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