



Carbon Monoxide

Product Stewardship Summary

Carbon monoxide is a gas made of one carbon atom and one oxygen atom. Carbon monoxide is best known as a gas that comes from car exhausts, faulty fuel-burning stoves and heating systems. Carbon monoxide is supplied to chemical manufacturers to produce a variety of compounds.

Chemical Identity

- *Chemical Formula: CO*
- *Other names: carbonic oxide, carbon oxide*

Uses and Benefits

Chemical manufacturers use carbon monoxide to make many compounds, including titanium dioxide for paints and food colorings, acetic acid for food additives and plastics, pharmaceuticals, and other chemicals that make additives for fuel and foams in cushions and appliances.

Many food products are packaged with a small amount of the gas to maintain fresh-

ness and enhance shelf life. From salads to bottled water, modified atmosphere technology has been used safely for years. Use of small amounts of carbon monoxide in conjunction with carbon dioxide and/or nitrogen has resulted in increased shelf life. Carbon monoxide has been shown to effectively reduce or inhibit different spoilage and pathogenic bacteria.

Physical and Chemical Properties

Carbon monoxide is a toxic gas that has no color, taste or odor. The gas is flammable when mixed with air at levels of 12.5 to 74 percent, and as a result, is a fire hazard. Carbon monoxide is slightly lighter than air and is slightly soluble in water.

Health Effects

Carbon monoxide is a chemical asphyxiant. It binds easily to hemoglobin and reduces the blood's ability to carry oxygen to the body's tissues. Even small amounts of the gas can pose serious problems. Removing the source of carbon monoxide and introducing oxygen or fresh air can flush away the carbon monoxide over time.

People can be exposed to carbon monoxide without knowing it, because they can't smell the gas. At low concentrations in the air, carbon monoxide causes flu-like effects, including headaches, dizziness, disorientation, nausea and fatigue. Higher concentrations may cause coma, respiratory arrest or death.

Environmental Effects

Carbon monoxide can be manufactured and used safely, without harming the environment. In the United States, most carbon monoxide emissions come from automobile exhaust. Carbon monoxide at low concentrations in water can harm aquatic life.

Exposure Potential and Risk Management Measures

Industrial Use

We ship and store carbon monoxide in high-pressure cylinders, tube trailers and bulk containers. Workers should use sturdy work gloves, safety glasses with side shields, and safety shoes when handling cylinders. Workers should also wear flame-retardant clothing, which provides protection in case of fire.

To prevent adverse effects, it is important to have good ventilation when working with carbon monoxide. According to U.S. Occupational Safety and Health Administration (OSHA) regulations, carbon monoxide in workplace air should not exceed 50 parts per million averaged over an eight-hour work shift. Carbon monoxide detectors with audible and visual alarms can alert personnel to increased levels of carbon monoxide. The monitors should tie into automatic shutoff systems.

When handling carbon monoxide, workers should observe all precautions necessary to handle flammable gas safely. Store carbon monoxide in a cool, dry area that is free from oxidizers or other flammable materials.

Consumer Use

We do not sell carbon monoxide directly to consumers. According to the Centers for Disease Control, carbon monoxide from malfunctioning equipment, such as fuel-burning stoves or heaters, is responsible for more deaths than any other single poison. You can learn more about the dangers of carbon monoxide poisoning and prevention measures on the U.S. [Environmental Protection Agency's \(EPA\) Indoor Air Quality website](#).

Regulatory Information

Several regulations govern the manufacture, sale, transportation, use and disposal of carbon monoxide. These laws vary by country and geographic region. You can find general regulatory information in the [Material Safety Data Sheet](#).

Sources for Additional Information

- [Air Products—MSDS](#)
- [Compressed Gas Association](#)
- [National Fire Protection Association](#)
- [Air Products Safetygrams](#)



Conclusion

A wide variety of industries use carbon monoxide. They can handle it safely without harming the environment when they follow industry and company guidelines.

Contact Information

Emergency Response System

- Tel 1-800-523-9374
(Continental U.S. and Puerto Rico)
- Tel 1-610-481-7711 (other locations)
- 24 hours a day, 7 days a week
- For assistance involving Air Products and Chemicals, Inc. gases and equipment

Technical Information Center

- Tel 1-800-752-1597 (U.S.)
- Tel 1-610-481-8565 (other locations)
- Fax 1-610-481-8690
- E-mail gasinfo@airproducts.com
- Monday–Friday, 8:00 a.m.–5:00 p.m. ET

We developed this Product Stewardship Summary to give you a general overview of the chemical. This Summary is not meant to provide emergency response or medical treatment information. You can find in-depth safety and health information on the [Material Safety Data Sheet](#) for the product.

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