

Chlorine Release Fact Sheet

This 'ready to publish' fact sheet was designed to assist CI member companies with community relations after an incident. Copy this information onto company letterhead and add the appropriate company contacts under "More Information" at the end of the document.

What is chlorine?

Chlorine is one of 90 natural elements, the basic building blocks of our world. Since it is highly reactive, it is usually found bound with other elements, such as sodium, forming sodium chloride which is common table salt.

Chlorine plays a vital role in many key uses and applications:

- Chlorine is used to control bacteria and viruses in drinking water that can cause devastating illnesses such as cholera and typhoid. 98% of modern drinking water systems in the US use chlorine to ensure that drinking water remains safe from bacterial contamination.
- 85% of all pharmaceuticals rely on chlorine chemistry, including medicines that treat heart disease, cancer, AIDS, and many other life-threatening diseases.
- Chlorine chemistry is involved in the production of over 95% of crop protection chemicals.
- Chlorine also plays an important and significant role in the manufacture of thousands of products we depend on every day, accounting for 45% of GMP.

Warning Signs

Chlorine has a low odor threshold of 0.2 – 0.4 ppm or less (parts per million) and is readily detected by most people and identified as smelling like household bleach. To put this in perspective, the concentration of chlorine over a laundry tub where bleach is being used is around 1 ppm in the air. This excellent warning property enables rapid escape from chlorine gas, thus most inhalations are mild to moderate.

Physical Properties of Chlorine Gas

While chlorine may be found as a liquid, it vaporizes quickly under normal atmospheric conditions; therefore, liquid chlorine is typically only found at the source of a leak.

At high concentrations, chlorine is visible as a greenish-yellow gas. Chlorine is heavier than air and may settle in low lying areas.

Effects of Exposure to Chlorine Gas

The effects of various levels of chlorine inhalation vary with the individuals involved. The very young, the elderly, and people with other health problems are most susceptible to the effects of chlorine exposure. Typically reactions after exposure to chlorine may include:

- 0.2 - 0.4 ppm: threshold of odor perception

- 1- 3 ppm: mild mucous membrane irritation, tolerated for up to one hour.
- 5- 15 ppm: moderate irritation of the respiratory tract
- > 30 ppm: immediate chest pain, vomiting, labored breathing and cough
- 40 - 60 ppm: toxic pneumonitis and pulmonary edema
- >430 ppm: lethal over 30 minutes
- >1000 ppm: fatal after a few minutes

First aid is the immediate temporary treatment given to an exposed individual. Reassurance to the individual will help alleviate anxiety. Never give anything by mouth to an unconscious or convulsing person. Do not try to neutralize exposed areas.

Responders should take the necessary precautions to protect themselves from any exposure to chlorine while administering first aid and should move the victim from any contaminated area as quickly as possible.

	Possible Effects	What To Do
Eyes	Irritation, associated burning discomfort, spasmodic blinking, redness, conjunctivitis and tearing.	Hold eyes open and flush with tepid water for at least 15 minutes. Get medical attention.
Skin	Burning sensation and skin irritation, typically at high concentrations.	Immediately flush skin tepid water for 15 minutes or longer. Get medical attention if irritation persists after irrigations or if skin is broken or blistered.
Inhalation	<p>Exposure to low concentrations may cause nasal and respiratory tract irritation. At higher concentrations there may be coughing and difficulty breathing possibly leading to respiratory distress.</p> <p>Any chlorine inhalation in an individual with compromised pulmonary function should be regarded as a severe inhalation and a respiratory emergency.</p>	<p>Evaluate for adequate airway, breathing and circulation after the inhalation. If breathing has apparently ceased, administer cardiopulmonary resuscitation (CPR) immediately.</p> <p>If breathing has not ceased, place in a comfortable position. The person should sit in an upright position with the head and trunk elevated to a 45-60 degree position (unless there is a medical contraindication). Slow, deep breathing should be encouraged. Vital signs (respiratory rate, pulse, and blood pressure) and oxygen saturation should be obtained if trained personnel and equipment are available.</p> <p>Administration of oxygen (humidified if available) by trained personnel is the normal initial medical treatment for individuals exposed to chlorine with any signs of respiratory discomfort or distress. Get medical attention if these signs exist.</p>
Ingestion	Ingestion is unlikely due to the physical state (gaseous).	No adverse effects are anticipated by this route of exposure.

Shelter in Place

Persons in an area affected by a chlorine release may be advised by Local Emergency Authorities to shelter-in-place. This is frequently done to protect people and pets until the risk of exposure to the chemical has passed.

- Take shelter inside the nearest building.
- Close all doors and windows.
- Turn off all fans, air conditioners, furnaces and exterior sources of air, such as the fire place damper.
- As an added layer of protection, consider going to an interior room or hallway in the highest floor in the building. (Because it is heavier than air, chlorine tends to concentrate at lower elevations.) Use duct tape, plastic sheeting or towels to seal doors and windows.
- If you are in your vehicle, close all doors, windows and vents; shut off the heat or air conditioning. Drive away from or perpendicular to the release.
- Stay inside until the “All Clear” is given and listen to the radio or local cable television station for more information.

After the “All Clear” is Given

The effect of an exposure is dependent on the duration and concentration of the exposure. The following provide some general guidance.

- People, pets, and other animals who that experience irritation or any signs of respiratory distress should seek medical attention for evaluation or treatment.
- People can return to normal activities. Windows may be opened, heating/cooling system by be used.
- Fruits and vegetables should be thoroughly washed.
- Plants in the path of a chlorine release may be damaged. Leaves may be bleached and browning and leaf loss may occur with time. Healthy plants will usually recover with time, although yield and growth rate maybe retarded. Additional watering may be beneficial.
- Mechanical and electrical equipment may be harmed by exposures to chlorine. Contact a professional if problems are encountered.

More Information

Local emergency phone number for immediate medical attention: 911
Regional Poison Control Center phone number: 1-800-222-1222

The information provided in this Fact Sheet is not meant to be complete. For more information on first aid, go to www.CL2.com to order Chlorine Institute Pamphlet 63, *First Aid and Medical Management of Chlorine Exposure*, October 2003.

The Chlorine Institute, Inc.
1300 Wilson Boulevard
Arlington, VA 22209
www.CL2.com