

# Fact Sheet

## Chlorine

### What is Chlorine?



Chlorine is a naturally occurring element normally used in industry and found in some household products. It is normally found as a greenish-yellow gas with a strong, irritating odor like household bleach. Chlorine gas can also be stored under pressure as a liquid for transportation and storage. Although chlorine gas is not flammable, it reacts explosively with many common chemicals (*such as alcohols, ammonia, and gasoline*) and may ignite some objects (*such as wood, paper, oil, and clothing*).

### Exposure

Significant exposure is usually associated with industrial processes or accidental spills. Most direct releases of chlorine to the environment are into air and/or water.

- **Breathing** – Inhalation of chlorine gas is the most common route of exposure. This type of exposure has occurred in or near industrial settings as well as in the home. People using chlorine-containing household products (laundry bleach, swimming pool chemicals) are usually not exposed to chlorine gas. *However, one can be exposed to harmful levels of gases containing chlorine if these household products are mixed with acid-containing household products (toilet bowl or drain cleaner) or ammonia-containing household products.*
- **Drinking / Eating** – Treated drinking water contains very low levels of chlorine, but this consumption does not pose a health risk.
- **Touching** – The skin does not absorb chlorine well, but small amounts can pass through the skin when people are exposed to chlorine gas, bleach, or come into contact with water or soil containing high levels of chlorine. Although small amounts of chlorine can pass through the skin, it is eliminated from the body rapidly. Chlorine may irritate or burn the skin, especially moist areas.
- **Eye contact** – Eyes can be exposed to chlorine through a release of chlorine gas to the air or through contact with water that contains chlorine. Moisture on the eye will combine with chlorine to form an acid that can cause further irritation.

**For immediate assistance, call the Poison Control Center Hotline: 1-800-222-1222.**

### Health Effects

The degree of reaction to exposure to any chemical depends on three main factors: the amount one is exposed to, the route of exposure (*breathing, touching, etc.*), and the length of time of the exposure.

#### Short-term or acute effects:

- Short-term exposures to low levels of chlorine in the air rarely lead to any long-lasting lung changes. Any exposure from smelling appropriately treated drinking water or swimming pool water is not harmful.
- Acute or short-term exposure to high concentrations of chlorine can lead to a build-up of fluid in the lungs (pulmonary edema) and severe shortness of breath that could lead to death if untreated. Immediately or within a few hours after breathing chlorine gas, the lungs can become irritated, causing coughing and/or shortness of breath. The amount of time before these symptoms occur is dependent on the amount of chlorine to which one is exposed. (The higher the amount one is exposed to, the shorter the time before symptoms

**DO NOT** mix household bleach with acid-containing or ammonia-containing household chemicals. Dangerous amounts of chlorine or other toxic gases can be released.

are seen.) Exposure may result in nose and throat irritation, watery eyes, coughing, bloody nose, nausea, vomiting, chest pain, and/or lightheadedness.

- Drinking a chlorine solution can cause vomiting, nausea, and throat and stomach irritation. The vomit is likely to have a chlorine smell to it.
- Contact with chlorine gas can severely burn and irritate the eyes and skin upon contact, possibly causing permanent damage. Liquid chlorine solutions (such as bleach) can have vapors that are irritating to the eyes, nose and throat. Chlorine bleach can cause irritation to exposed skin.
- When chlorine vapor or solution comes into contact with moist tissues, such as those found in the nose, eyes, throat, and lungs, it forms an acid (hydrochloric acid) and can damage the exposed tissue.
- Contact with chlorine liquid gas kept under pressure can cause frostbite and chemical burns to the skin.
- The elderly, smokers, and persons with chronic pulmonary disease may be at greatest risk for breathing problems following acute exposure.

#### Long-term (chronic) effects:

- Long-term exposure to low levels of chlorine gas is potentially linked to diseases of the lung (bronchitis, shortness of breath, possible permanent damage) and tooth corrosion.
- No cancer or reproductive effects have been reported from chronic exposure to chlorine.

## Treatment

Treatment involves providing supportive medical care in a hospital setting. There is no antidote to chlorine poisoning.

- **Exposure to a chlorine-containing solution (liquid):** remove all clothing and wash entire body with soap and water. Clothing that would need to be pulled over the head should be cut off the body to avoid further contact with skin. Avoid touching any liquid chlorine solution that is on clothing (chlorine vapor is not carried on contaminated clothing). Seek medical care as soon as possible.
- **If the eyes are burning or vision is blurred:** rinse eyes with plain water immediately for at least 15 minutes, preferably 30 minutes. Seek medical care as soon as possible.
- **If chlorine is ingested:** do not induce vomiting and do not drink fluids. Seek medical care as soon as possible.
- **If skin has come into contact with liquid chlorine** (compressed gas, normally kept under pressure): rinse the affected area immediately with room-temperature water to remove any chlorine. Seek medical care as soon as possible.

## Prevention

Under normal occupational conditions, wear the appropriate protective clothing and make sure that hazard and warning information is posted in the work area.

Under accidental or intentional release conditions, leave the area where the chlorine was released. If outdoors, move upwind from the smell. Find the highest ground as chlorine is heavier than air and sinks. If indoors, leave the building immediately. If the release is not in the immediate area, follow the instruction of the emergency broadcast system or local AM radio station.



#### **For more sources of information on this topic visit or contact:**

ST. CLAIR COUNTY HEALTH DEPARTMENT [www.scchealth.co](http://www.scchealth.co)

MICHIGAN DEPARTMENT OF HEALTH AND HUMAN SERVICES [www.michigan.gov/mdhhs](http://www.michigan.gov/mdhhs)

CENTERS FOR DISEASE CONTROL AND PREVENTION [www.cdc.gov](http://www.cdc.gov) 1-888-246-2675

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH TOXICS AND HEALTH HOTLINE: 1-800-648-6942

MICHIGAN OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (MIOSHA): 517-322-1814

THE AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY: 1-888-422-8737