

Iowa Department of Public Health
Hazardous Substances Emergency Events
Surveillance System

CHLORINE FACTS

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This fact sheet contains information on emergency chlorine releases in Iowa. The information was collected as part of a cooperative program between the federal Agency For Toxic Substances and Disease Registry and the Iowa Department of Public Health. The Hazardous Substances Emergency Events Surveillance (HSEES) System collects data to describe adverse public health effects, such as injuries and evacuations, associated with acute releases of hazardous substances, and to suggest measures to reduce these effects. A clear understanding of how and why chlorine releases occur and proposing ways to prevent them can assist in better training and improve the safety of employees, emergency responders, and the general public.

What is Chlorine?

Chlorine is a greenish yellow gas with a strong suffocating odor. It is used to produce other chemicals such as disinfectants, for bleaching, and for purifying water and sewage. Chlorine is one of the most economical and effective germ killers. It destroys dangerous germs in homes, hospitals, swimming pools, hotels, restaurants, and other public places. These powerful disinfectant qualities result from the chlorine's ability to bond with and destroy the outer surfaces of bacteria and germs.

How Can Chlorine Affect My Health

Exposure to chlorine can occur in the workplace or in the environment following releases to air, water, or land. Effects of chlorine on human health depend on the quantity released and the duration and frequency of exposure. Even breathing small amounts of chlorine for short periods of time can affect the respiratory system. Respiratory symptoms range from coughing and chest pain to water retention in the lungs. In addition, chlorine irritates the skin and the eyes.

Chlorine Releases in Iowa

Although chlorine is not a commonly released chemical in Iowa, the number of injuries associated with its release is high. From 1993 through 1997, HSEES recorded information on 24 chlorine releases, all occurring at fixed facilities. Seven of these releases were associated with 51 victims.

The following items are examples of reported accidents involving chlorine:

- ◆ Two employees on a riverboat casino improperly mixed chemicals and created a chlorine gas. Thirty employees from the kitchen area were taken to the hospital for respiratory irritation. The occupants of the riverboat were all evacuated.
- ◆ A mixer that prepares chlorine for a public swimming pool overflowed. The swimmers had to be evacuated and six of the swimmers were taken by ambulance to the hospital where they were treated for gas inhalation.
- ◆ Employees of a public swimming pool were filling a tank containing chlorine assuming it needed refilling. However, the tank was full and the chlorine overflowed. The pool had to be evacuated. Four employees were treated on the scene for chlorine inhalation and one employee was hospitalized.
- ◆ A reaction between two cleaning agents at a food-processing plant produced chlorine gas. A portion of the plant was evacuated for about two hours and four employees were transported to the hospital.

Guidelines for Protection

Equipment

Store chlorine in a well-ventilated area that has low potential for fire.

Separate and store away from all incompatibles such as flammable gases, vapors, and combustible substances such as gasoline, petroleum products, alcohol-based products, ammonia, sulfur, hydrocarbons, and acetylene.

Protect containers from weather and physical damage.

Inspect and test equipment regularly.

Keep storage areas locked during non-working hours.

Train all workers and handlers of chlorine.

Personal Protective Equipment

Clothing

Wear protective gloves and clothing to prevent skin contact with chlorine. Consult the chlorine manufacturer for recommendations on the most protective glove and clothing material for your operation. All protective clothing (suits, gloves, footwear, and headgear) should be clean and free of oils and grease.

Eye Protection

Wear splash-proof chemical goggles and a face shield when working with liquid chlorine. Gas-proof goggles with a face shield should be worn when there is a potential for gas exposure.

Respiratory Protection

Improper use of respirators is dangerous. Respirators should comply with the National Institute for Occupational Safety and Health (NIOSH) regulations for chlorine and used in accordance with the OSHA Respiratory Protection Standard, 29 CFR (Code of Federal Regulations 1910.134. Respirator use must be limited to individuals who have been adequately trained and fitted for the respirator face piece.

First Aid

Prompt action is essential if there is a chlorine spill or leak. Call 911 immediately and notify company safety personnel.

Eye Contact

Immediately flush the eyes with large amounts of water. Continue without stopping for at least 30 minutes occasionally lifting upper and lower lids. Seek medical attention as soon as possible.

Skin Contact

Quickly remove contaminated clothing and double-bag it. Wash the exposed area with large amounts of soap and water and seek medical attention as soon as possible.

Breathing

Get the exposed person to fresh air. Begin rescue breathing if breathing has stopped and begin CPR if heart action has stopped. Transfer promptly to a medical facility.