

TECH SHEET

EMC Insurance Companies®

Chlorine Safety for Swimming Pool Operators

Chlorine is an effective and economical antibacterial that is used to destroy and deactivate a wide range of bacteria and viruses in homes, hospitals, swimming pools, hotels, restaurants and other public places.

Chlorine used in pool operations is supplied in three forms:

- Sodium hypochlorite—a liquid that in dilute form is commonly known as bleach
- Calcium hypochlorite—a powder or tablet
- Chlorine—a gas supplied in 150-lb. cylinders

Due to the inherent hazards of using any of these compounds containing chlorine, swimming pool operators should be trained in the safe use, handling and storage of these chemicals. This training should include a discussion of the hazards, emergency response procedures, first aid and pool chemical safety rules.

Hazards of Pool-Chlorinating Chemicals

Chlorine—The health effects of chlorine are primarily due to its corrosive properties. The strong oxidizing effects of chlorine cause hydrogen to split from water in moist tissue, resulting in the formation of hydrogen chloride, which produces corrosive tissue damage. Because chlorine is a gas, most exposures occur via inhalation. Low-level exposure will cause eye/skin/airway irritation, sore throat and cough. At higher levels of exposure, signs and symptoms may progress to chest tightness, wheezing, shortness of breath and bronchospasm. Severe exposures may result in fluid accumulation in the lungs, which can occur several hours later and result in death. Eye and skin contact with chlorine gas is also possible. Low-level exposure will cause eye and skin irritation. Higher exposures may result in severe chemical burns or ulcerations. Exposure to compressed liquid chlorine may cause frostbite.

Sodium and Calcium Hypochlorite—The health effects of these two compounds are due primarily to the hypochlorite present in both. Hypochlorite is a

strong oxidizer and corrosive to tissue. Contact with solid calcium hypochlorite will cause irritation to eyes and skin. Duration of exposure and concentration of the solution will determine

the severity of the resulting burns. Dust of calcium hypochlorite can be inhaled, which will irritate the nose and throat. Higher exposures will result in symptoms similar to breathing chlorine gas.

Additional hazard—All three of these compounds are strong oxidizers. They are not explosive or flammable by themselves, but they will support and increase combustion. They also have the potential to react violently with organic materials, such as oil and grease from air compressors, valves and pumps or wood and rags from maintenance work, resulting in fire.



Continued

Basic Pool Chemical Safety Rules

- Always read product labels and follow manufacturer's instructions.
- Store chemicals in a cool, dry, well-ventilated place.
- Keep pool chemicals dry.
- Make sure pool chemicals are inaccessible to unauthorized personnel.
- Avoid chemical mixing.
- Never mix chlorine with any chemical – add each to the pool separately.
- Do not mix old chemicals with fresh chemicals, even if they are the same type.
- Consider separate, designated tools for each chemical.
- Avoid breathing fumes or vapors.
- Wear appropriate personal protective equipment as listed on the label or safety data sheet (SDS).
- Don't buy more pool chemicals than you'll use in a season—they lose effectiveness over time.
- Use the entire product before disposing of the container.
- Keep spilled materials isolated. Follow label directions for cleanup and disposal. Do not put spilled materials back in the original container.
- Do not dispose of spilled material or unused product in the trash or sewer. Do not use floor-sweeping compounds when cleaning up pool chemicals.
- Do not store liquid materials above solid materials to prevent accidental leaking and mixing, although solids can be stored above liquids.
- Do not allow product to contact oil, grease, acid or organic material.
- Do not smoke where pool chemicals are stored or used.
- Do not use dry chemical fire extinguishers (water only).

First Aid for Chlorine Inhalation

- Prompt action is essential. Remove the exposed person to fresh air and get professional medical assistance immediately.
- If the victim is not breathing, begin CPR as soon as possible.
- If breathing, place the victim in a comfortable position—either seated in a chair or lying down with the head and body trunk elevated at a 45 to 60 degree angle.
- Encourage the person to take slow, deep, regular breaths. Administer oxygen as soon as possible.
- Keep the person warm and at rest.

For Additional Information

Centers for Disease Control: www.cdc.gov/niosh

- Swimming Pools – Chlorine

The Chlorine Institute: www.chlorineinstitute.org

- Chlorine for Swimming Pools

Environmental Protection Agency: www.epa.gov

- Safe Storage and Handling of Swimming Pool Chemicals