

EPA Chemical Emergency Preparedness and Prevention Advisory SWIMMING POOL CHEMICALS: Chlorine

This advisory to Local Emergency Planning Committees (LEPCs) suggests that you pay special attention to swimming pool chemicals this summer. Many chemicals used at swimming pools may release chlorine - an extremely hazardous substance (EHS). Careless storing, wetting, mixing, or the contamination of any of these chemicals or the systems used to feed them can cause fires, explosions, burns, and possibly the release of gaseous chlorine, resulting in injuries or death. Facilities should train all employees, including summer employees, on the safe use and potential hazards of these chemicals.

EPA stresses that although mishandling of these chemicals can cause harm, there is no cause for undue alarm about their presence in the community.

One example of an incident involving chemicals that release chlorine was a fire at a chemical distribution facility in Springfield, Massachusetts, on June 17, 1988. Rainwater leaked into a storage room where 600 to 800 cardboard drums, each containing 300 pounds of solid swimming pool chemicals (probably trichloroisocyanuric acid), were kept. The chemicals exploded, starting a fire which set off the sprinkler system. That water soaked the remaining drums and set off more explosions, spreading the fire to other rooms in the building. The fire, explosions, and release to air lasted three days. Over 25,000 people were evacuated; 275 people were sent to the hospital with skin burns and respiratory problems.

HOW POOL CHEMICALS WORK

At many pools, gaseous chlorine (an EHS) is fed directly into pool water to kill bacteria and other microorganisms. Almost all pools using gaseous chlorine use cylinders containing 100 to 150 pounds of chlorine.

At other pools solid, granular, pellet, or stick compounds (e.g., calcium hypochlorite and chlorinated isocyanurates) or liquids (e.g., sodium hypochlorite) are added to the water. In contact with water, these solid and liquid chemicals dissolve and form hypochloric acid or chlorine ions to perform the same disinfecting function as chlorine.

SOME STEPS FOR LEPCs

While emergency response plans are required to address gaseous chlorine (an EHS) in excess of the threshold planning quantity (100 pounds), they are not required to address these compounds under section 302 of the Emergency Planning and Community Right-to-Know Act (commonly known as SARA Title III). However, EPA and the National Response Team's *Hazardous Materials Emergency Planning Guide* (NRT-1) recommend that emergency plans address all hazardous materials that present a risk to the community. Since these compounds can release chlorine and are so widely used, EPA recommends they receive careful attention in both planning and emergency response. EPA suggests that local

emergency planning committees (LEPCs) take the following steps:

- Identify the swimming pool chemicals that will potentially release chlorine gas. The chemical names of these substances are sodium hypochlorite, calcium hypochlorite, and chlorinated cyanic acids. The box below lists some brand names that contain these chemicals.

SOME BRAND NAMES

Calcium Hypochlorite

Olin trademarks for calcium hypochlorite products include:

CCH®	Pace®
Sock It ®	Connstant Chlor®
Prochlor®	Sun Burn®
HTH®	Pulsa®
Sun Burst®	

PPG trademarks for calcium hypochlorite products include:

Induclor®	Pittclor®
Sustain®®	Zappit®
Pittabs®	Repak

Chlorinated Isocyanurates

Olin trademarks for chlorinated isocyanurates include:

CDB®	HTH®
CDB Clearon®	Pace®
Constant Chlof®	Prochlor®
Sun®	

Monsanto trademark for chlorinated isocyanurates is: ACL®

Note: Many of these pool chemicals are sold to processors and repackers who resell under various brand names. Such packages will always identify the product inside by its chemical name.

- Review Title III plans to ensure that facilities handling large quantities of these chemicals are covered and that response issues have been addressed. Facilities that should be checked include:

- Swimming pool chemical distributors;
 - Swimming pool supply stores;
 - Swimming pools located, for example, in health spas, community centers, schools, and country clubs;
 - Public drinking water systems;
 - Waste treatment facilities;’ and
 - Hazardous waste treatment facilities.
- If appropriate, inform owners of residential pools of the hazards related to chlorine.
 - Be sure that the facilities covered by sections 302, 311, and 312 of SARA Title III have provided adequate information about the chemicals on hand directly to the LEPC and local fire departments. Because many swimming pool chemicals may not be listed as extremely hazardous substances and in some cases reporting thresholds may not be met, you may need to ask facility representatives for chemical information. Also, ask about facility emergency response plans, so the LEPC and fire departments can use them to prepare pre-incident plans.

SOME STEPS FOR FACILITIES

- In cooperation with LEPCs and local response officials, ensure attention to storage methods, fire safety systems, and handling and use of chemicals. Be sure that the likelihood of releases during handling and storage is minimized. Look especially at situations where water is a factor since most dry chemicals containing chlorine are reactive with water.
- Be sure the area used to store potential chlorine releasing chemicals is immune to any influx of water from such things as a leaking roof, uncovered windows, leaking pipes, fire sprinklers, hose outlet in the vicinity, splashing from the pool, flooding of the floor (keep the containers off the floor), and the effect of exceptionally high humidity on open containers. Be aware of potential explosive situations. Explosions have been known to occur when a pool user switched from one type of chlorine tablet in a pool chlorinator to a different type without thoroughly

cleaning the device. Even similar chemicals like the chlorinated cyanuric acids may react violently with other types of chlorinated cyanurate compounds or with sodium or calcium hypochlorites.

- Cylinders of chlorine gas should be stored separately from all other compressed gases, hydrocarbons (gasoline or other fuels), ether, turpentine, and metal filings, shavings, or dust. Contact with these substances poses unusual fire and explosion hazards.
- Cylinders of chlorine gas should be stored outdoors or in well-ventilated, detached, or segregated areas of noncombustible construction to prevent extensive damage from explosion and fire.

- Check that no containers are leaking, broken, or torn. Ensure that only one container of a product is unsealed at any time.

- Refer to Department of Transportation (DOT) regulations for types of containers that must be used for shipping swimming pool chemicals -- both in the gaseous as well as the solid compound forms. For example, DOT requires metal barrels or drums and packaging to protect against permeation of moisture for calcium hypochlorite and trichloroisocyanuric acid.
- Ensure an adequate training program to educate all facility personnel on the hazards of chlorine gas as well as chlorine- producing chemicals.

OTHER INFORMATION

Information on chlorine and the Emergency Planning and Community Right-to-Know Act can be found in many readily available sources. The following is a listing of just a few of these sources:

- *Safety Guidelines for Residential Swimming Pool Chlorination (pamphlet 81) and/or Chlorine Safety at Non-residential Swimming Pools (pamphlet 82)*, both available free of charge from The Chlorine Institute, 2001 L Street, NW, Washington, DC 20036, (202) 775-2790. The Chlorine Institute has extensive literature on chlorine and chlorine cylinders.
- *1987 Emergency Response Guidebook*, published by DOT. (The 1990 version is currently being printed.) Copies are available by writing to:

Office of Hazardous Materials Transportation
(DHM-51)
Research and Special Programs Administration
U.S. Department of Transportation
Washington, DC 20590
- Response Information Data Sheets found in CAMEO™ II, a computer-based planning and response management program, that is available from The National Safety Council, 444 N. Michigan Ave., Chicago, IL 60611.
- CHEMTREC, a 24-hour, seven-day a week emergency hotline that provides information and assistance to responders during an emergency. Contact (800) 424-9300 or (202) 483-7616. (**Note: CHEMTREC is for emergency use only.**)
- Your County or State Health Agency.
- Your State Emergency Response Commission.
- EPA's Emergency Planning and Community Right-to-Know Information Hotline at (800) 535-0202, or (202) 479-2449 from Monday to Friday, 8:30 a.m. to 7:30 p.m., Eastern time.

This advisory is the first of a new series which EPA is publishing to alert LEPCs to hazards posed by hazardous substances that have resulted in accidents where death, injury, or evacuations have occurred. LEPCs are responsible for emergency planning for hazardous materials and for collection and managing data on hazardous chemicals present in their community.

Please send comments on this Advisory and suggestions for future subjects to:

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