

Preventing chlorine gas exposure at municipal pools

Chlorine gas leaks at municipal pools can put workers and the public at serious risk. Exposure to high levels of chlorine gas can result in immediate injuries, including eye damage or irreversible lung damage, and even death. Workers at municipal pools that use chlorine should take extra care to prevent chlorine leaks during day-to-day operations, during chlorine delivery, and when changing cylinders.

Day-to-day operations

Consider the following safe work practices:

- Ensure all equipment used to dose chlorine into the pool water is maintained and inspected at regular intervals.
- Wear a full-face respirator with acid gas/chlorine cartridges when doing any maintenance on the chlorination system or when changing cylinders.
- Carry an escape respirator whenever you enter the chlorine enclosure.
- Right outside the chlorine enclosure, install an emergency eyewash station and shower facilities that provide 15–30°C water for at least 15 minutes.
- At the cylinder, install an automatic or remote shut-off device that is linked to an alarm system. A check valve is not sufficient.
- Implement a system to shut down the flow from the cylinder before shutting down the water flow. If possible, interlock (link) the shutdown of the water pumps with the cylinder shut-off device.
- Establish alarm set points as low as possible without interfering with the operation of the pool. Recommended settings are a maximum of 0.25 ppm (low) and 0.50 ppm (high).
- Calibrate fixed monitors as specified in the manufacturer's instructions. Do this at least once a year.

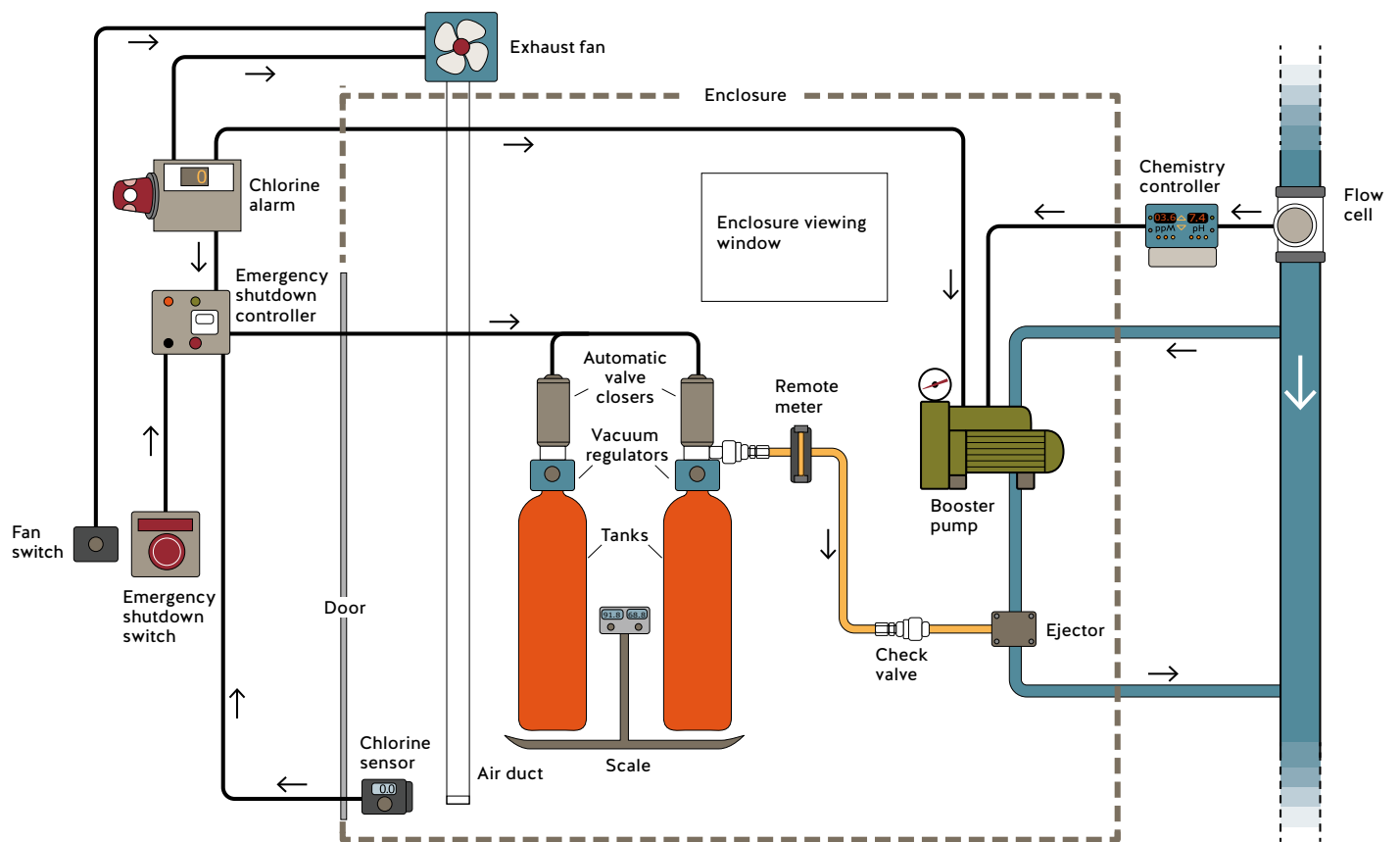
- Bump test fixed monitors and test alarm systems at least monthly to help ensure they are working and set correctly.
- If possible, have a calibrated and tested portable monitor available. If a chlorine leak occurs far from your fixed monitor you'll need a portable monitor to find the source of the leak.
- Inspect, maintain, repair, and replace equipment as specified in the manufacturer's instructions, at a minimum.
- Develop a chlorine exposure control plan that includes written procedures for the safe handling of chlorine. Ensure all workers are trained in these safe work procedures.

Chlorine delivery

When moving chlorine cylinders, take care not to damage the cylinder or valve:

- Move cylinders one at a time.
- Wherever possible, use carts to move cylinders.
- Ensure the work area is clear of clutter and slipping hazards are controlled.
- Ensure the tailgate lift is in good working order. It should be inspected and maintained as specified in the manufacturer's instructions.
- Store cylinders securely in the chlorine enclosure.

Safety controls for a typical chlorine system



Changing cylinders

The following safe work practices can help prevent exposure to chlorine gas when changing cylinders:

- Wear a full-face respirator with acid gas/chlorine cartridges.
- Shut down the flow from the cylinder before shutting down the water flow.
- Inspect valves and pipes to ensure they are clean and not leaking.
- Inspect the cylinder-to-chlorination-system interface for damage that may compromise the seal.
- Use aqueous ammonia to verify the seal is not leaking.

Emergency planning

Develop and implement a written emergency plan including procedures for evacuation and response. Ensure all workers are trained in these procedures.

Include the following in your emergency plan:

- Conduct drills in emergency procedures as often as necessary to ensure workers know and can

perform the procedures. Conduct evacuation and response drills at least once a year.

- Identify evacuation routes with appropriate signage.
- Maintain an up-to-date list with contact information for emergency responders, regulatory agencies, and neighbours. Include procedures to notify these parties in the event of a chlorine gas leak.

Regulation requirements

See the Occupational Health and Safety Regulation and its related guidelines:

- [Section 5.54, Exposure control plan](#)
- [Sections 6.116 to 6.132, Toxic process gases](#)
- [Guidelines G6.116-1 to 6.127](#)

Resources on worksafebc.com

- [Risk Advisory: Chlorine Exposure During Storage or Use](#)
- [Chlorine Safe Work Practices](#)
- [PoolSafe BC: Best Practices Guide](#)