

Wisconsin Recreational Facilities FACT SHEET



Safeguards for Public Pools to Prevent Chemical Release Events

The following is information intended to provide guidance to public pool operators. The Wisconsin Department of Agriculture, Trade and Consumer Protection's (DATCP) goal is to protect and promote the health and safety of Wisconsin pool patrons by preventing their exposure to hazardous chemicals.

What is a chemical release event?

A chemical release is an event caused by the introduction of a hazardous liquid or gas into a pool basin and pool enclosure. It is usually caused by the mixture of chlorine and acid which creates deadly chlorine gas. These events can occur when there is accidental mixing of chemicals from spilled storage containers, deliberate mixing of chemicals, handfeeding chemicals into the pool basin, addition of the improper amounts of chemicals, and back siphoning of the chemicals. In addition, a dangerous situation can occur when chemical feeders continue to feed chlorine and acid into the circulation system when the water circulation has stopped.

How can water circulation stop?

The loss of water circulation can occur two ways - when either the power to the pump is lost or when the pump has lost prime. The loss of power to the pump can be caused by a short circuit, power failure or outage, an operator manually shutting down the system, or mechanical damage to the pump or electrical system. The other cause of lost water circulation is loss of prime to the pump. This can happen when air is introduced into the circulation system from the skimmers or by damaged gaskets or loose fittings of the circulation pump basket lid. Loss of prime can also be caused by a damaged or corroded pump impeller that cannot produce adequate water flow. When either of these events occur, the water flow is lost or significantly decreases, and water is no longer circulating through the system to consistently distribute chemicals safely into the system. If the chemicals continue to feed into a pipe with no water in it, the chemicals can combine to form chlorine gas and, when the circulation does resume, the gas can be pushed out into the pool and pool area.

Why are chemical releases a concern for Wisconsin pool operators?

In 2015, the Centers for Disease Control and Prevention (CDC) analyzed more than 460 death, injury, and illness forms submitted by Wisconsin pool operators. This analysis showed that, at the time of the review, chemical releases accounted for over half of the reported pool-related injuries since 2008. Exposure to a large quantity of chemicals can cause serious health effects, including symptoms of burning and irritation to the skin, eyes, nose, throat, and lungs. It can also cause coughing, wheezing, and vomiting, and also dizziness, headache and fainting. The amount of chemicals and how long a person is exposed to the chemicals will impact the severity of the symptoms. Short-term or permanent long-term side effects, and even death, can occur.

What are safeguards?

Safeguards are operational design features and devices associated with chemical feeding systems that are the primary effective means for preventing overfeeding of chemicals when there is no water flow through the circulation system. Safeguards include antisiphon devices, electrical interlock of the circulation pump with the chemical feeders with a separate disconnect switch, and flow sensors.

How do safeguards protect a pool from a chemical release event?

Depending on the type of chemical feed that is present, all properly functioning safeguards will prevent a chemical release. The electronic interlock of the pump with the chemical feeder prevents feeding of chemicals when the pump has lost power. The flow sensor prevents the chemical feeder from feeding chemicals when there is a significant decrease or loss of water flow. Antisiphon safeguards prevent the back siphoning of chemicals into the system when there is a loss of water flow.

What are the required safeguards that must be present and operational?

- Pools built before February 1, 2009 must have electrical interlock.
- Pools built after February 1, 2009 must have electrical interlock and flow sensing interlock.

What are the requirements for pool operators related to interlock?

- Test interlocks monthly
- Keep a record of the test and results (date of test, results and name of person performing test)
- Whoever is responsible for testing the interlock must be able to describe this process to the Sanitarian when the pool is being inspected. They must be able to describe:
 - Chemical feed locations.
 - How the electrical interlock functions.
 - How the flow sensing interlock functions (if applicable).
 - How monthly testing is performed.
 - Safety measures in place for the monthly testing.

What are guidelines for testing interlocks?

- 1. Make sure no patrons are in the pool or enclosure during any testing of interlocks.**
2. Verify the circulation pump and chemical feeder pumps are electronically interlocked or interconnected:
 - Action: Manipulate the automatic controller for the chlorine and acid feeders to feed chemical. Once the feeders are operating, turn off the power to the circulation pump. You may have to perform this step one chemical feeder at a time.
 - Required result: The disinfection and acid feeder pumps should stop feeding chemicals and all sensors and light indicators on the displays will indicate a power loss.
 - Action: Promptly turn the circulation pump back on.
3. Verify the flow sensor can detect the lack of water flow (for pools built in February 2009 and thereafter):
 - Action: Manipulate the automatic controller for the chlorine and acid feeders to feed chemical. Once the feeders are operating, while the recirculation system is operating. Turn off the flow of water leading to the flow sensor.
 - Required result: The flow sensor will detect the lack of water flow and will signal the disinfectant feeder to stop feeding.
 - Action: turn the flow to the flow sensor back on.
4. If either of the above tests fail, for example, chemical continues to feed when the power or flow is off, work with a pool contractor to repair the interlock so that it functions properly.

A training video that demonstrates steps 1 and 2 listed above, can be viewed at [Chemical Release Training for Public Pool Operators and Inspectors - YouTube](#).