

OxyChem[®]

**The Difference
Is Crystal Clear.**



ACE[®]

**DISINFECTING COMPOSITIONS
FOR POTABLE WATER**

Water treatment professionals want a disinfectant that is safe, effective and easy to use. That is why OxyChem's ACL[®] chlorinated isocyanurates are now available for treatment of potable water. OxyChem's ACL products are available in quick-dissolving granules and long-lasting tablets that offer superior performance, safety, and convenience.

The Chlorine Advantage

Chlorine is the best overall disinfectant, germicide, algaecide and anti-slime agent available. Laboratory tests and years of use have proven that no other disinfectant can match chlorine's performance in all of these areas. For more than a century chlorine has been the choice for water treatment, especially drinking water. It is currently used in over 98% of all municipal water treatment facilities in the United States.

Whether the source of chlorine is elemental chlorine, sodium hypochlorite (bleach), calcium hypochlorite, or chlorinated isocyanurates (ACL's), these products liberate free chlorine when dissolved in water. In solution, free chlorine exists as hypochlorous acid, a chemical with excellent sanitizing and oxidizing properties. Free chlorine readily kills bacteria, algae, fungi and viruses. It also oxidizes and eliminates organic contaminants and converts some soluble metallic impurities into insoluble solids that can be easily removed by filtration.

What is ACL?

ACL is OxyChem's brandname for a family of chlorinated isocyanurates. These products are dry, highly concentrated chlorine-containing solids that have been used in swimming pools since the 1960s. OxyChem's chlorinated isocyanurates have recently been approved by the United States Environmental Protection Agency for routine use in potable water and certified by NSF International under Standard 60 (Drinking Water Treatment Chemicals - Health Effects) for use as drinking water additives.

OxyChem markets four solid products for potable water chlorination: ACL 90 Disinfecting Tablets, and ACL 90, ACL 60 and ACL 56 Disinfecting Granules. Each number reflects the approximate available chlorine content of the product; thus ACL 90 contains about 90% available chlorine.

OxyChem, the world's largest producer of chlorinated isocyanurates, manufactures these products in our ISO 9002 certified plants at Sauget, Illinois and Luling, Louisiana. We are a proven leader in this industry, with over 40 years of experience in the manufacture and use of chlorinated isocyanurates.

Key ACL Advantages

There are distinct differences in chlorine sources. ACL's key advantages are that they are safe, easy to use and dissolve completely to leave the water perfectly clear. They do not cloud the water or promote calcium scaling in either the feed equipment or the treated water.

ACL 90

ACL 90 is trichloroisocyanuric acid or "trichlor" for short. ACL 90 has the highest chlorine content (90%) of any solid oxidizer.

ACL 90 is available in one inch (14 gram) or three inch (200 gram) tablets that dissolve over a period of time for *sustained release*. Used in an automatic feeder, ACL 90 tablets provide a *continuous chlorine output* to the water stream, making them most suitable for continuous feed applications.

ACL 90 is also available as a granular solid that can be fed on a continuous or intermittent basis using a granular feeder. Granular feeders are particularly suitable for larger applications, while tablet feeders are more suitable for smaller applications.

ACL 56 and ACL 60

ACL 56 and ACL 60 are sodium salts of dichloroisocyanuric acid or "dichlor" for short. ACL 56 is a dihydrate and has an available chlorine content of 56%. ACL 60 is anhydrous and has an available chlorine content of 63%.

Both ACL 56 and ACL 60 are quick dissolving granular products that are very soluble in water. They dissolve more completely and at least five times faster than calcium hypochlorite. They are ideal for a single dose or intermittent feed applications and can also be used for continuous chlorination with a granular feeder.

ACL 56 and ACL 60 have an essentially neutral pH. Because of this property, they have little effect on the treated water's pH and alkalinity. Calcium hypochlorite and bleach are highly alkaline which may require a pH adjustment with acid and can lead to increased scaling.

Storage and Packaging

These products have excellent storage stability. Unlike bleach, ACL Disinfecting Tablets and Granules maintain their chlorine content almost indefinitely. OxyChem's line of ACL products are available in a wide range of package sizes.

Handling And Safety

While elemental chlorine (shipped in the liquid state) is an inexpensive and very stable source of chlorine, it is a hazardous material and a leak can be serious. There are numerous restrictions and regulations involved with using elemental chlorine. These regulations add significantly to the cost, so many municipalities are searching for a safer alternative for their water treatment needs.

Sodium hypochlorite solution (bleach) is less hazardous than elemental chlorine but is difficult to handle and has a limited storage life. Bleach contains 15% or less available chlorine. The cost of large storage tanks, diking and shipping such a dilute product adds considerably to the product cost. Spills are hazardous and difficult to contain.

Solid disinfectants have a safety advantage over gaseous or liquid disinfectants since spills or leaks are much easier to contain and clean up. They are also much more stable and concentrated than bleach. ACL 90 tablets are solid, so a spill is easily contained and cleaned up. ACL 60 or 56 granules are also much less of a spill hazard than liquids or gases.



Calcium hypochlorite contributes to scaling or cloudiness in the treated water or can produce calcium sludge in the feeder. It can also be a fire hazard and is classified as a Class 3 Oxidizer by the National Fire Protection Association (NFPA)¹. Calcium hypochlorite will decompose, in a self-sustained reaction, if stored over 125°F (52°C) for an extended period of time. Additionally, calcium hypochlorite has a tendency to drop in available chlorine content over time.

ACL 90 is classified as an NFPA Class 1 Oxidizer. The lowest NFPA rating reflects the fact that ACL 90 does not burn or decompose unless a direct flame or other intense heat source is applied. Once the flame or heat source is removed, ACL 90 stops decomposing.

ACL 60 is an NFPA Class 3 Oxidizer but is stable to higher temperatures than calcium hypochlorite. ACL 56 is an NFPA Class 1 Oxidizer and is not classified as an oxidizer by the United States Department of Transportation (DOT).

OxyChem's ACL products are excellent disinfectants because of the oxidizing power of the contained chlorine. This characteristic also makes these products reactive. It is important to handle and store the products properly so they stay

¹ NFPA 430, Code for the Storage of Liquid and Solid Oxidizers, National Fire Protection Association, Inc, 1 Batterymarch Park, Quincy, MA 02269-9101 USA

uncontaminated and dry until use. Mixing these products with other chemicals or small amounts of water could lead to a reaction. Detailed guidelines for their safe handling and storage are spelled out on the product labels and the Material Data Safety Sheets (MSDS).

Toxicity and Efficacy

The chlorinated isocyanurates liberate cyanuric acid when dissolved in water. Cyanuric acid is useful as a chlorine stabilizer in swimming pools, but for potable water use is simply a carrier for the chlorine. It allows the chlorine to be contained in a solid, stable, dry and safe-to-handle form.

Cyanuric acid has been extensively studied over the past 30 years in support of our ACL registrations with the EPA. These studies show that cyanuric acid is nontoxic. Cyanuric acid is not metabolized in the body. When water containing cyanuric acid is ingested, the cyanuric acid is passed from the body unchanged in the urine. Cyanuric acid is not fetotoxic (toxic to fetuses), teratogenic (causes birth defects), mutagenic, or carcinogenic and does not bioaccumulate. Despite the similarity of names, cyanuric acid has NO relation to cyanide. It is not made from nor will it form cyanide during use.

As part of the extensive review process for approving OxyChem's ACL products for potable water use, the EPA examined both their toxicity and efficacy. Based on the comprehensive database for the chlorinated isocyanurates and cyanuric acid, the U.S. EPA concluded that OxyChem's ACL products are safe and effective for use in potable water treatment.

The full text of the approved labels can be found at the EPA's website (<http://oaspub.epa.gov/pestlabl/ppls.home>) for registration numbers 935-40 (ACL 90 tablets), 935-41 (ACL 60), 935-59 (ACL 90 granules), and 935-42 (ACL 56).

ACL Disinfecting Tablets and Granules are also certified by NSF International under Standard 60 (Drinking Water Treatment Chemicals - Health Effects) for use as drinking water additives. NSF certification is often a requirement for use in municipal water systems. See their website at: <http://www.nsf.org/certified/PwsChemicals/>



Compare Chlorine Products	ACL 90	ACL 56 or ACL 60	Calcium Hypochlorite	Liquid Bleach	Elemental Chlorine (Cl ₂)
High chlorine content	√				√
Easy to use	√	√	√		
No cloudy water	√	√		√	√
No scaling	√	√		√	√
Long storage life	√	√	√		√
No messy spills	√	√	√		
Safe to store & handle	√	√			
Less total dissolved solids	√	√	√		√

ACL Offers Superior Performance, Safety & Convenience

- **A family of dry, highly concentrated chlorine-containing solids which are safe to store and handle**
- **Available in durable tablets or quick-dissolving granules for sustained release, continuous output, single dose or intermittent feed applications**
- **Approved by the U.S. EPA for routine use in potable water**
- **Certified by NSF International under Standard 60 for use as drinking water additives**
- **Dissolves completely, no cloudy water, scaling or sludge**





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