

Market drivers and value

- Every year, thousands of people are sickened by germs in pools and spas
- One of the hardest culprits, *Cryptosporidium*, is less affected by chlorine when cyanuric acid (CYA) levels are high
- CYA is a stabilizer used in sanitizers like trichlor to prevent loss of chlorine due to UV rays
- Chlorine has a **limited ability to kill *Cryptosporidium* when CYA in excess of 9ppm**, and this gets progressively worse as you pass 20ppm and on to 50ppm (similar effect on *Giardia*)
- Model aquatic health code (MAHC) **push to lower CYA limits** in commercial pools
- This will **open new market opportunities** as CYA levels are reduced in commercial pools

Nearly 8 in 10

Outbreaks of gastrointestinal illness associated with treated recreational water (2003-12) are caused by the bacterium *Cryptosporidium*¹

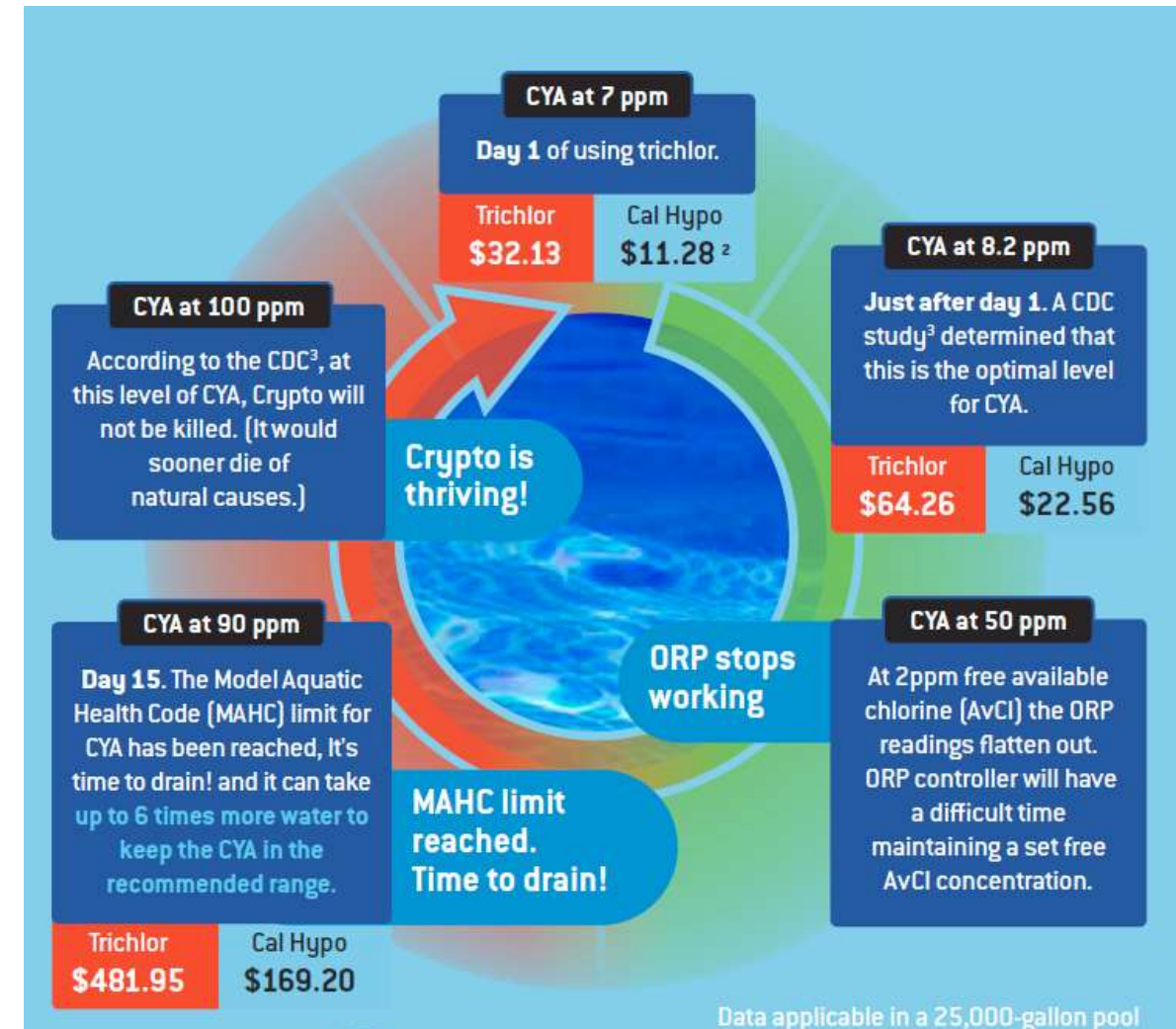


CYA can only be removed through dilution.

So what is the true cost of using trichlor?

- Trichlor continually adds CYA to the system
- Just after day 1, the CYA is at 8.2 ppm, what the CDC considers the optimal level
- If not drained:
 - CYA at 50 ppm will cause ORP to fail
 - CYA at 90 ppm, the MAHC limit is reached – TIME TO DRAIN!
 - Water usage can be up to 6 times the amount of a Cal-hypo sanitized pool
 - Drought conditions and the high cost of water in several regions of the country drives the cost of operation up

A Look at 3 Weeks on Trichlor



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CYA Regulations and Limitations

United States: Trichlor banned on indoor pools in several states and outdoor pools in New York and New Mexico

Germany: The German health code does not allow the use of stabilized sanitizers for indoor and outdoor pools.

Mexico: The Mexican health code does not allow the use of stabilized sanitizers in indoor pools.

Others?



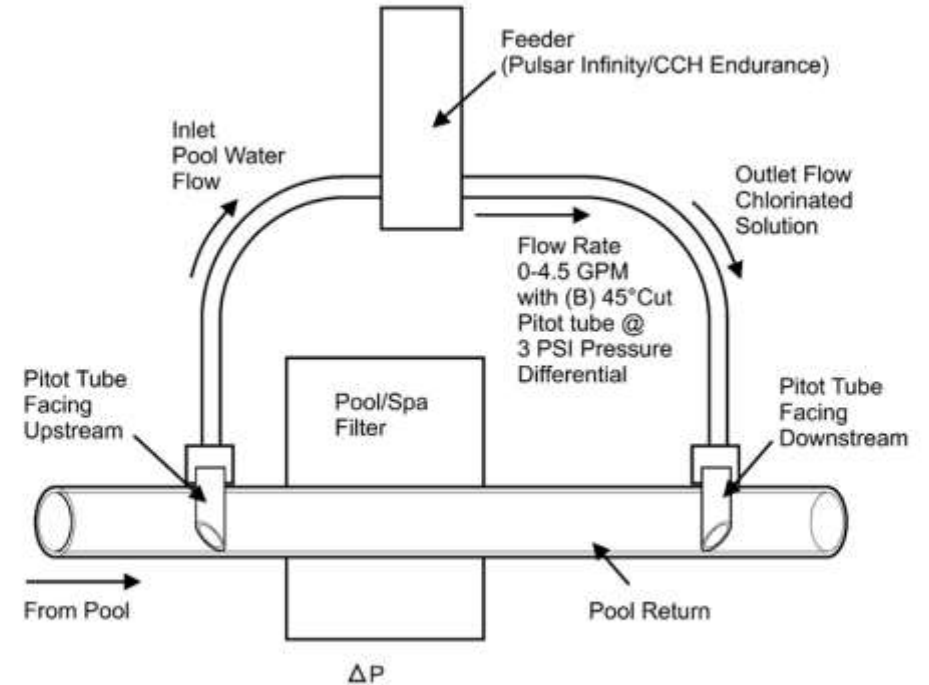
- Patent-pending formulation of calcium hypochlorite with slow dissolving properties
 - The reduction in dissolving rate will allow for the tablets to be used in small to medium commercial pool applications, in **pressurized feeders**, and **reduce the maintenance** and operational requirements needed from facility personnel.
- 3 in 1 product that chlorinates while adding calcium and increasing alkalinity
- Class 2 oxidizer
- Does not contain cyanuric acid (CYA / stabilizer / conditioner)
- Will not interfere with ORP systems
- Will not cause “over stabilization” or “chlorine lock”
- Will not interfere with alkalinity tests
- 68% active with up to a 2 year shelf life
- 265 gram, 2.7” blue colored tablet
- Available in 25 lb. pails
- This product will **compete directly with Trichloroisocyanuric (TCCA) Hypochlorite** and to a smaller extent, Calcium Hypochlorite

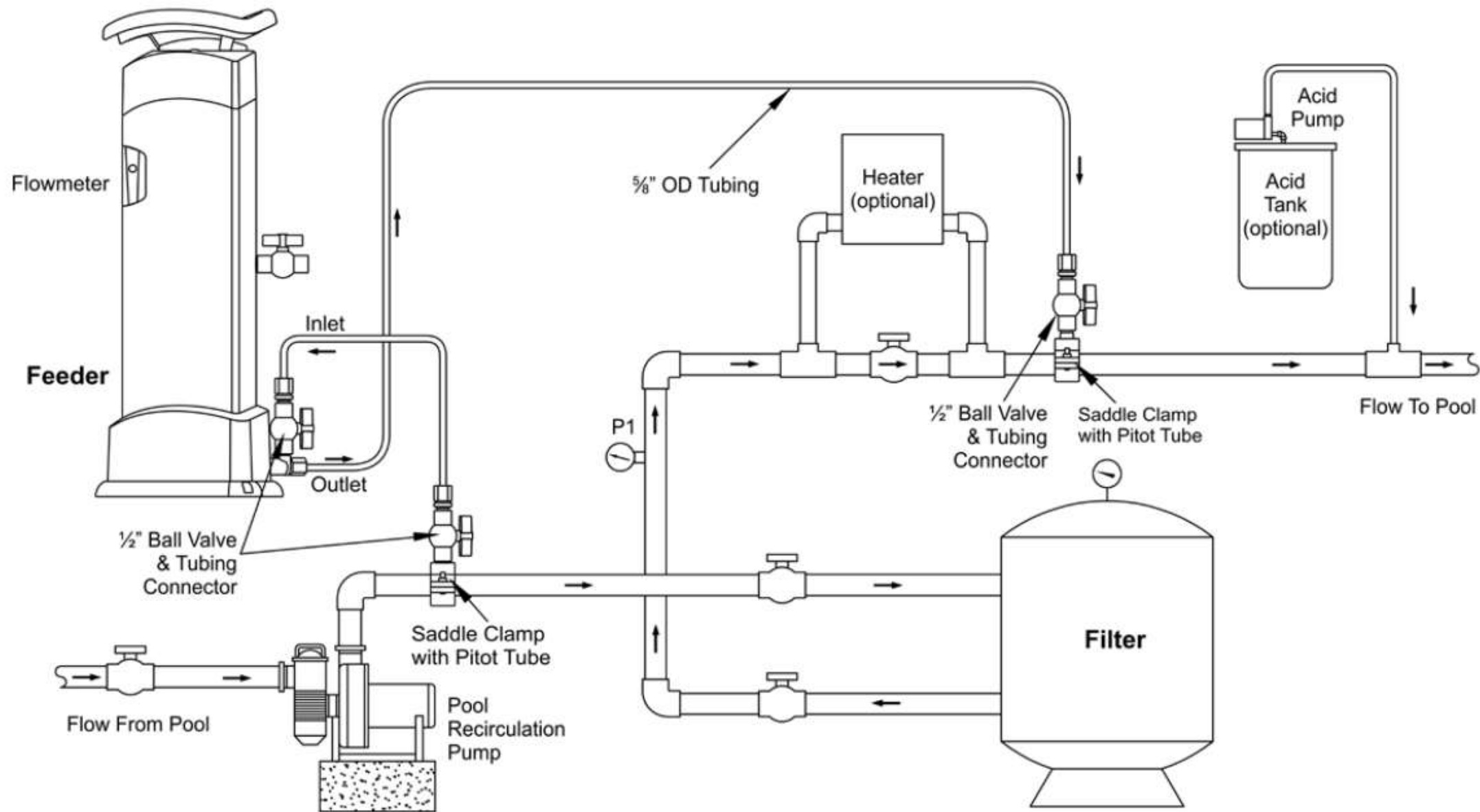


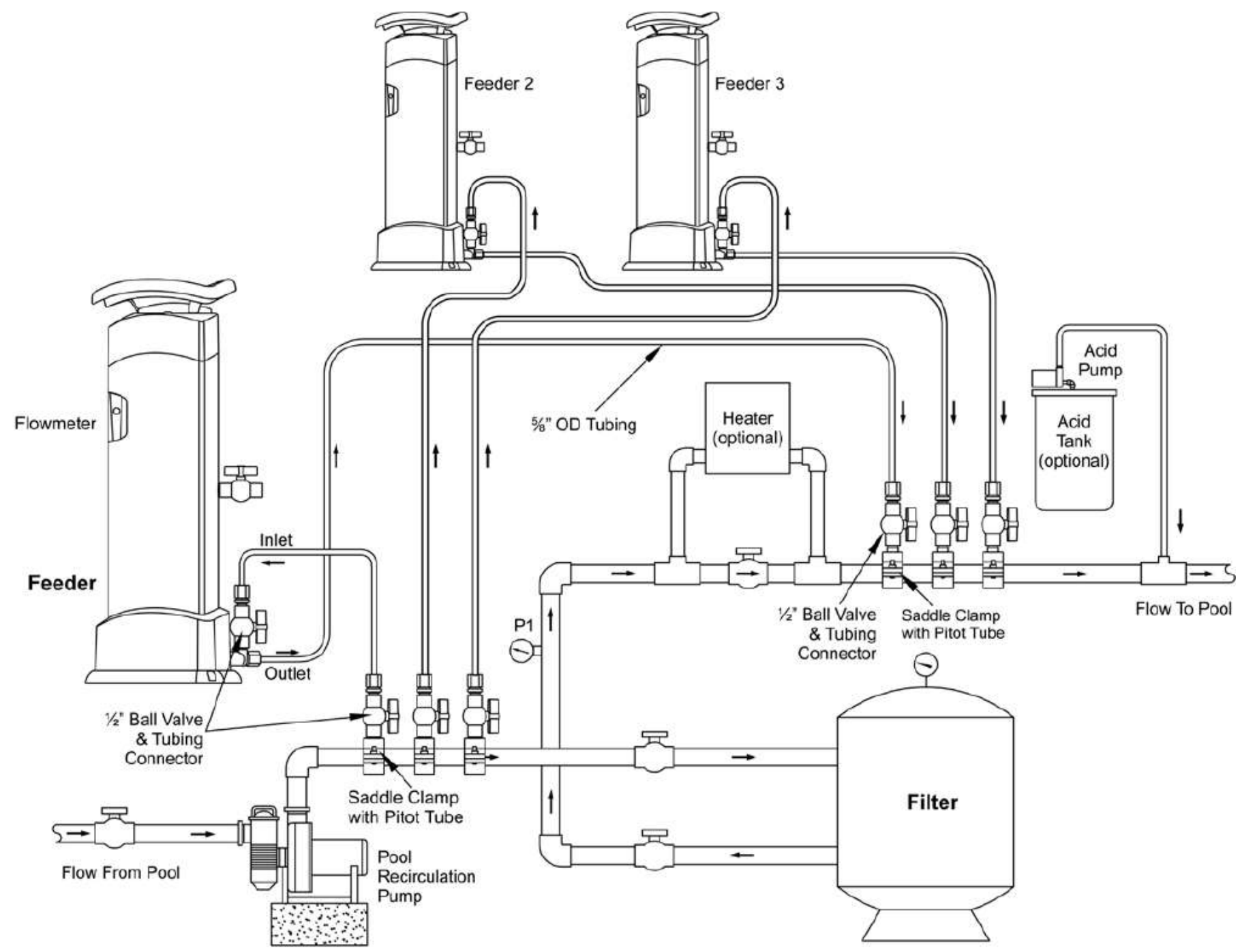
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Feeder Technology

- Injection molded components
- NSF listed PVC material
- Output rate: ~0-9lbs Av. Cl/Day
- Holds 11 tablets @ 265g each
- Feeder specifications:
 - Width: 12"
 - Depth: 13"
 - Height: 31"
 - Weight: 23 lbs. (empty)
 - Tubing size: 5/8" O.D.
- Pressurized feeder
- Pressure differential installation (across pool filter) with pitot tubes
- Patent-pending design that delivers precise control of chlorine output rate



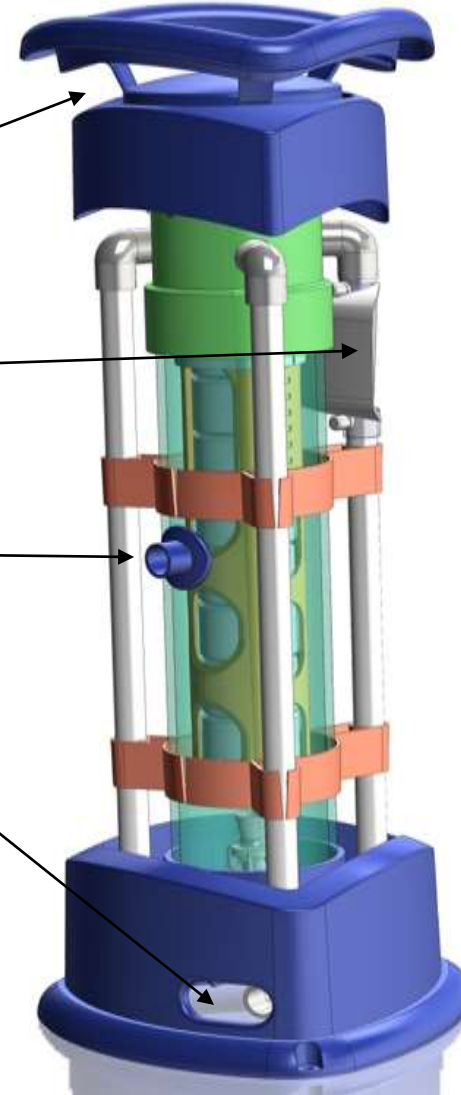




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Feeder Technology

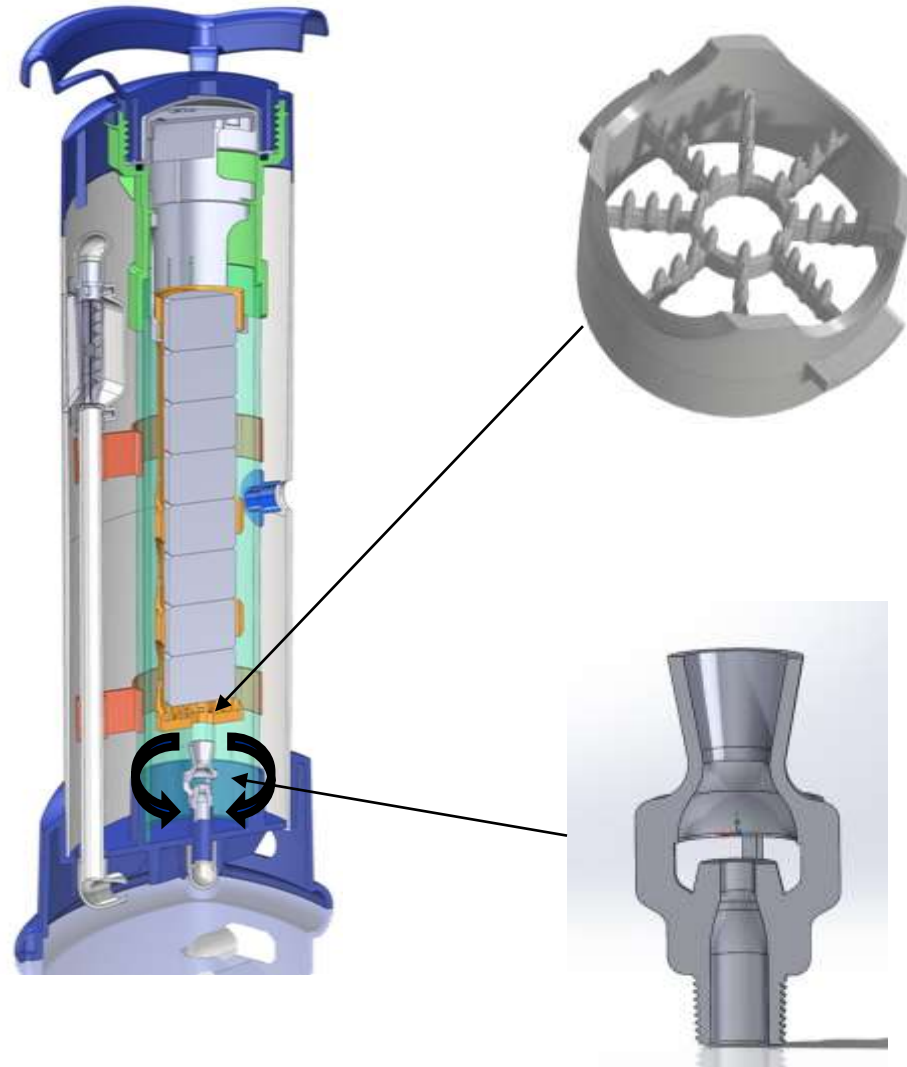
- Pressurized feeder allows it to be plumbed to pressure side of pump down stream of all pumps, filters, heaters and ORP controls.
- Unique thread design on lid creates a positive lid seal with minimal operator effort
- Integrated flowmeter
- Easy ½" NPT connection
- Drain port allows for easy addition of new tablets
- Clean installation with inlet and outlet at base of feeder (inlet has ball valve for flow adjustment)
- Saddle clamps are provided with the feeder
- Can be installed in parallel for larger pools
- Can only be used with CCH® Endurance tablets



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Feeder Technology – Tablet Dissolution

- Stacked tablet design
- Spiked grid allows for even tablet dissolution
- Unique nozzle design
 - Recirculates the flow at the bottom of the feeder
 - Designed to dissolve the bottom of the tablet evenly
 - Concentrates the cal-hypo solution
 - Creates turbulence and flow to move insoluble material through the feeder and out to pool



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Feeder Technology – Output Control

- General Output rate is controlled by:
 - Grid distance from nozzle
 - Grid Distance is adjusted by rotating the height ring to disengage locking feature
 - Chamfered edges allow for easy adjustment



Lonza

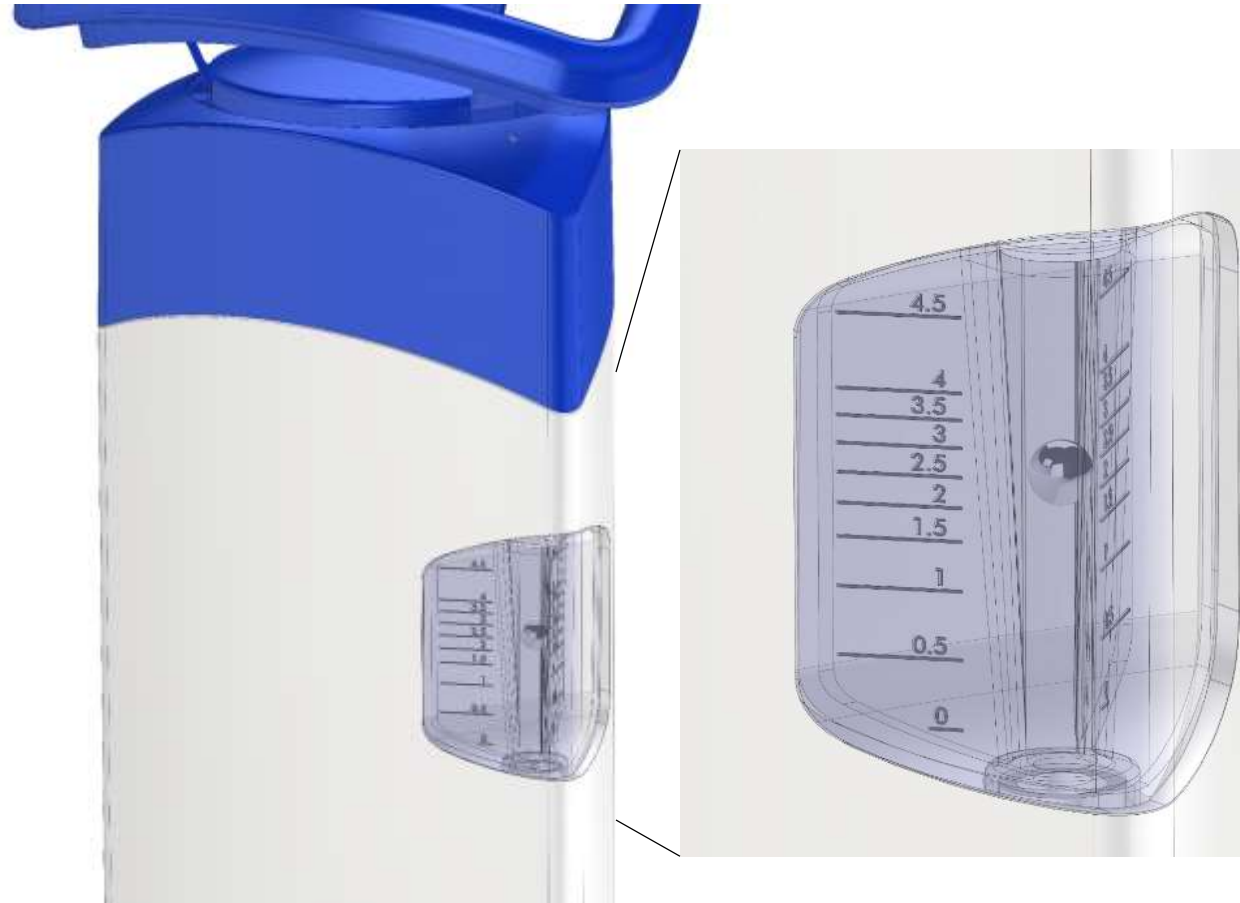
Cartridge Setting	Inlet Flow Rate - gpm (lpm)								
	0.5 (1.9)	1 (3.8)	1.5 (5.7)	2 (7.6)	2.5 (9.5)	3 (11.4)	3.5 (13.2)	4 (15.1)	4.5 (17)
	Output Rate lbs (kg) Av. Cl/Day								
A	*	*	*	*	3.2 (1.5)	3.5 (1.6)	4.5 (2)	5.5 (2.5)	9 (4.1)
B	*	*	*	*	2.9 (1.3)	3.2 (1.5)	4.2 (1.9)	5.2 (2.4)	8.5 (3.9)
C	*	*	*	*	2.6 (1.2)	3.5 (1.6)	3.9 (1.8)	4.9 (2.2)	8 (3.6)
D	*	*	*	2 (0.9)	2.3 (1)	3.2 (1.5)	3.6 (1.6)	4.5 (2)	7.5 (3.4)
E	*	*	*	1.8 (0.8)	2 (0.9)	2.9 (1.3)	3.3 (1.5)	4.2 (1.9)	6.5 (2.9)
F	0.7 (0.3)	1 (0.5)	1.4 (0.6)	1.6 (0.7)	1.8 (0.8)	2.6 (1.2)	3 (1.4)	4 (1.8)	6 (2.7)
G	0.6 (0.3)	0.9 (0.4)	1.2 (0.5)	1.4 (0.6)	1.6 (0.7)	2.3 (1)	2.7 (1.2)	3.8 (1.7)	5.5 (2.5)
H	0.5 (0.2)	0.8 (0.4)	1 (0.5)	1.2 (0.5)	1.4 (0.6)	2 (0.9)	2.4 (1.1)	3.5 (1.6)	5 (2.3)

* Use higher flow rate

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Feeder Technology – Output Control

- Precise output rate is controlled by an Integrated 0 – 4.5 gpm flowmeter with a built in check valve
- Easily integrated with chemical feed automation using optional solenoid kit (1, 2 or 3 feeders)



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Feeder Technology – Safety Features

- Cartridge feature designed to only allow the use of the CCH[®] Endurance 2.7” cal hypo tablets
 - 40 – 44mm thick
- Use of cal hypo eliminates the formation of nitrogen chloride (NCl₃ – causes the “chlorine” odor) associated with trichlor use
- Drain to prevent chlorine spills when adding tablets
- Tablet canister has “load” and “feed” positions to lock into place making addition of tablets easy
- Feeder base designed with seismic restraints



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Feeder Technology - Method of Operation

- Water flows into inlet at base of feeder
- Up through integrated flowmeter
- Back down to base
- Back up through nozzle and tablet stack
- Back down to base
- Out to pool

