

Chemical Operational Parameters

These guidelines set forth the suggested operational parameters for proper chemical treatment and maintenance of swimming pool waters, as accepted by IPSSA, Chemical treatment alone will not produce sanitary pool water. A filtration system in proper operational condition is also required to attain sparkling, clear, polished sanitary water.

	<u>Minimum</u>	<u>Ideal</u>	<u>Maximum</u>	<u>Comments</u>
A. Disinfectant Levels				
1. Free chlorine, ppm	1.0	1.0 – 3.0	3.0	Hot weather/ heavy use may require operation at or near maximum levels. Regular superchlorination is recommended. (See E-1)
2. Combined chlorine, ppm	None	None	0.2	High combined chlorine results in reduced chlorine efficacy. Take remedial action to establish break point chlorination. See Section E-1. <i>Other signs of combined chlorine:</i> • Eye irritation • Sharp chlorinous odor • Algae growth
3. Bromine, ppm	2.0	2 – 4	4.0	Note: Health department officials should be consulted before use.
4. Iodine, ppm		Levels not established		Note: Health department officials should be consulted before use. May discolor water. Ineffective against algae.
B. Chemical Values				
1. pH	7.2	7.4 – 7.6	7.8	If pH is: <u>TOO HIGH</u> •Low chlorine efficiency •Scale formation •Cloudy water •Eye discomfort <u>TOO LOW</u> •Rapid dissipation of disinfectant •Plaster & concrete etching •Eye discomfort •Corrosion of metals •Vinyl liner damage
2. Total Alkalinity, as CaCO ₃ ppm	60	80-100 for Calcium Hypochlorite, Lithium Hypochlorite, & Sodium Hypochlorite 100-120 for Sodium Dichlor, Trochlor, chlorine gas & bromine compounds	180	If total alkalinity is: <u>TOO LOW</u> •pH Bounce •Corrosion tendency <u>TOO HIGH</u> •Cloudy water •Increased scaling potential •pH tends to be too high
3. Total dissolved solids, ppm	300	1000-2000	3000	These values offered as guidelines rather than absolutes. Excessive TDS may lead to hazy water, corrosion of fixtures, etc. and can be reduced by partial draining and addition of fresh water.
4. Calcium hardness, as CaCO ₃ ppm	150	200 – 400	500 – 1000+	Operation at maximum hardness will depend on alkalinity requirements of the sanitizer used. Minimum alkalinity and lower pH must be used with maximum hardness.
5. Heavy metals	None	None	None	If heavy metals are present: •Staining may occur •Water may discolor •Chlorine dissipates rapidly •Filter may plug •May indicate low pH, corrosion, etc.
C. Biological Values				
1. Algae	None	None	None	If algae are observed: •Shock treatment (See E-3) •Supplement with brush and vacuum •Maintain adequate disinfectant residual •Use approved algicide. (See E-3)
2. Bacteria	None	None	Refer to local code	If bacteria count exceeds health dept. limit: Superchlorinate and follow proper maintenance procedures Maintain proper disinfectant residual.
D. Stabilizer (if used)				
1. Cyanuric acid, ppm	10	30-50	150; except where limited by local health dept. to 100	If stabilizer is: <u>TOO LOW</u> •Chlorine residual rapidly destroyed by sunlight <u>TOO HIGH</u> •May exceed health dept. regulations •May reduce chlorine efficacy Note: stabilizer not needed in indoor or brominated pools
E. Remedial Practices				
1. Superchlorination frequency	Monthly	Every other week	Weekly when temp is over 85°F	Note: Some high use pools may need superchlorination 3 times/week or more as a preventative measure or when combined chlorine is > 0.2ppm.
2. Superchlorination to establish break point, dosage in ppm	5	10	-----	When combined chlorine is > 0.2ppm or when eye irritation persists. Repeat as needed.
3. Shock treatment, dosage in ppm	10	-----	-----	Nonchlorine oxidizers are not considered biocidal but may reduce organic contaminants.
4. Clarifying/Floccing frequency	-----	When needed	-----	Follow manufacturer's directions.
5. Algicides		Follow Manufacturer's directions		Use U.S. EPA registered products.
F. Temperature, F°				
		78°-82°	104°	If temp is: <u>TOO HIGH</u> •Excessive fuel use •Increased evaporation •Bather discomfort •Increased scaling potential •Increased use of disinfectants •Increased corrosion potential <u>TOO LOW</u> •Bather discomfort