

TEST DESCRIPTION AND RECOMMENDED RANGES

CHLORINE AND BROMINE	pH	TOTAL ALKALINITY
Chlorine and bromine sanitise pool water by killing over 99% of the bacteria present in the water. They're also effective oxidizers that burn up organic waste such as urine, perspiration and dead bacteria. A weekly shock treatment is required to eliminate weak, ineffective chloramines that are formed during this process.	PH is a measurement of the relative acidity or basicity of pool water. 7 is neutral and pool water should be slightly basic (7.2-7.6). A low pH can cause corrosion and skin and eye irritation. A high pH can cause scale formation and reduce the effectiveness of chlorine. Maintaining a proper pH helps ensure bather comfort and maximises the effectiveness of your chemicals.	Total alkalinity is a measurement of all the alkaline materials in your pool water. These act as a buffering agent, neutralising acids and bases to help prevent a condition known as pH bounce which can cause corrosion and scale formation. Maintaining proper alkalinity is the best way to save on corrective chemicals.
RECOMMENDED RANGE: Chlorine: 1.0 to 3.0ppm / Bromine: 2.0 to 4.0ppm	RECOMMENDED RANGE: pH: 7.2 to 7.6	RECOMMENDED RANGE: Total alkalinity: 80 to 120ppm
WHEN TO TEST: Weekly	WHEN TO TEST: Weekly	WHEN TO TEST: Weekly
POTENTIAL PROBLEMS: • Too low - inadequate sanitation/bacteria & algae growth. • Too high - uneconomical use of sanitiser. • Too high - bleaching of clothing and surface.	POTENTIAL PROBLEMS: • Too low - corrodes surfaces / irritates eyes and skin • Too high - scale deposits / cloudy water / poor sanitiser Efficiency / Irritation eyes and skin.	POTENTIAL PROBLEMS: • Too low - pH difficult to maintain / corrosion tendency • Too high - pH difficult to adjust / potential for scaling

POOL AND SPA WATER TEST PROCEDURE

CHLORINE AND BROMINE TEST	pH TEST	TOTAL ALKALINITY TEST
1 Rinse and fill chlorine / bromine cell (Cl) to mark with water to be tested. 2 Add one DPD No.1 tablet to the right hand cell by tearing open the foil strip without touching the tablets with your fingers. Cap and invert to mix.	1 Rinse and fill pH cell (pH) to mark with water to be tested. 2 Add 5 drops pH-Phenol Red. Cap and invert to mix. 2 Match colour with colour standard. Record as pH units and save sample if pH needs adjustment. If sample colour is between the two values, pH is average of the two. To Lower pH: See acid demand test. To Raise pH: See dosage chart.	1 Rinse and fill sample tube to 25mL mark with water to be Tested. 2 Add 2 drops ALK-10. Swirl to mix. 3 Add 5 drops ALK-20. Swirl to mix. 4 Add ALK-30 counting each drop, count and swirl to mix until colour changes from green to red. 5 Multiply drops in step 4 by 10. Record as parts per million (ppm) total alkalinity. See dosage chart For adjustment.
When contaminants are introduced into pool water, they react with free chlorine to produce combined chlorine and chloramines. Combined chlorine is less effective than free chlorine, usually has a foul smell, and is an eye irritant.		
A shock treatment or superchlorination can increase free chlorine.		
	ACID DEMAND TEST 1 Use treated sample from pH test. 2 Add Acid demand AD-40 counting each drop, mix and compare with colour standards until desired pH is matched. See dosage chart to continue.	• Eq. 4 drops to change = 40 ppm

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REMEMBER	pH DOSAGE CHART	ALKALINITY DOSAGE CHART
1 Keep test kits out of reach of children. 2 Read precautions on all labels. 3 Store test kit in a cool, dark place. 4 Replace solutions once each year. 5 Do not dispose of solutions in pool or spa. 6 Obtain samples 45cm/18" below water surface. 7 Rinse cells before and after each test.		

CHLORINE DOSAGE CHART		TO LOWER pH USING DRY ACID (SODIUM BISULFATE)		TO LOWER pH USING HYDROCHLORIC ACID		TO RAISE pH TO 7.5 USING SODA ASH (SODIUM CARBONATE)				
Volume Of water (liters)	PERCENT AVAILABLE CHLORINE							FROM 7.2	FROM 6.8	FROM 6.5
	5%	10%	12%	60%	65%	75%				
1,000	20 ml	10 ml	8.4 ml	1.8 g	1.5 g	1.2 g	9 g	27 g	36 g	
1,500	30 ml	15 ml	12.6 ml	2.5 g	2.2 g	2.0 g	14 g	42 g	56 g	
5,000	100 ml	50 ml	42 ml	8.2 g	7.0 g	6.7 g	45 g	139 g	184 g	
20,000	400 ml	200 ml	167 ml	33 g	31 g	27 g	186 g	576 g	719 g	
40,000	800 ml	400 ml	334 ml	67 g	61 g	53 g	369 g	1,100 g	1,490 g	
60,000	1.2 L	600 ml	500 ml	100 g	92 g	80 g	575 g	1,680 g	2,210 g	
75,000	1.5 L	750 ml	625 ml	125 g	115 g	100 g	674 g	2,070 g	2,790 g	

CHLORINE DOSAGE CHART		pH		TOTAL ALKALINITY	
Effective use of chlorine is largely dependant on pH. At high pH (>7.6), chlorine's ability to disinfect is significantly reduced. But at Lower pH (7.2 to 7.6), chlorines disinfecting ability is enhanced. Therefore, at lower pH levels, you get more disinfection for your Money.		Lower pH to desired value: Add either dry acid (sodium bisulfate) or Hydrochloric Acid according to chart. Raise pH by adding Sodium Carbonate (soda ash) according to chart. NOTE: An adjustment in pH can change total alkalinity. Recheck Total Alkalinity after pH adjustments. • Sodium bisulfate percentage may vary. Adjust treatment amounts accordingly. • Dosage obtained experimentally using pool water with the Dosage can vary if actual values differ from experimental values.		Lower total alkalinity: Add either dry acid (sodium bisulfate) or Hydrochloric Acid according to chart. Raise Total Alkalinity: Add Hy-Clor Alkalinity Increaser (sodium bicarbonate) According to chart.. NOTE: An adjustment in alkalinity can change pH. Recheck pH after total Alkalinity adjustments. * Sodium bisulfate percentage may vary. Adjust treatments Amounts accordingly.	
REMEMBER: • Keep the pH at 7.6 or below. • Keep the Chlorine level between 1.0 and 3.0 ppm. • Superchlorinate to increase Free Chlorine					
* Chlorine products contain differing rates of available chlorine. adjust dosages accordingly.					

TROUBLE PREVENTION CHART

TROUBLE	SYMPTOM	CAUSE	SOLUTION
SCALE FORMATION	Scale on pool walls & fixtures. Frequent in new in ground pools.	High pH.	Lower pH to 7.2 - 7.6 with Hy-Clor Dry Acid (sodium bisulfate or hydrochloric acid).
		Excess Alkalinity.	Lower alkalinity to 180 - 120 with Hy-Clor Dry (Acidsodium bisulfate or hydrochloric acid).
CORROSION OF METAL PARTS	Metal fixtures in contact with pool water corrode. Rust and copper stains. Coloured water.	Low pH.	Raise pH to 7.2 to 7.6 with Hy-Clor pH Increaser (soda ash).
		Low alkalinity.	Raise alkalinity to 80-120 with Hy-Clor Alkalinity Increaser (sodium bicarbonate).
EXCESS AVAILABLE CHLORINE	Bleached hair and bathing suit. Eye irritation.	Excess chlorine. Old reagents. Inaccurate test.	Add Hy-Clor Dry Acid (sodium bisulfate or sodium thiosulfate). Replace reagents annually. Check test kit results carefully.
CHLORINE ODOUR	Eye irritation. Water has foul odor. Complaints of too much chlorine in the water.	Not enough free chlorine.	Adjust pH to 7.2 - 7.6. Superchlorinate.
EYE AND SKIN IRRITATION	Red eyes and itchy skin.	Chloramines. Not enough free chlorine. Improper pH.	Adjust pH to 7.2 - 7.6. Superchlorinate.
CLOUDY WATER	Hazy, cloudy water. No sparkle.	Early algae growth.	Superchlorinate.
		Poor pool filtration.	Check filter operation.
		High pH.	Lower pH to 7.2 - 7.6 with sodium bisulfate or hydrochloric acid.
		High alkalinity.	Lower alkalinity to 80 - 120 with sodium bisulfate or hydrochloric acid.
COLOURED WATER	Brown.	Iron.	Superchlorinate.
	Black.	Manganese.	Floc pool or sand filter with alum (Not for D.E or cartridge filter).
	Blue-Green.	Copper.	See solution for corrosion of metal parts.
	Green.	Algae.	Adjust pH to 7.2 - 7.6. Superchlorinate.
ALGAE	Green algae: Green water, Slippery pool surfaces and Cloudy water. Black Algae: Spotty patches on Pool sides.	Not enough chlorine.	Adjust pH to 7.2 - 7.6. Superchlorinate. Concrete: Brush Sides and bottom with stainless steel brush. Vinyl Liner: Use soft nylon brush. Use algaeicides.