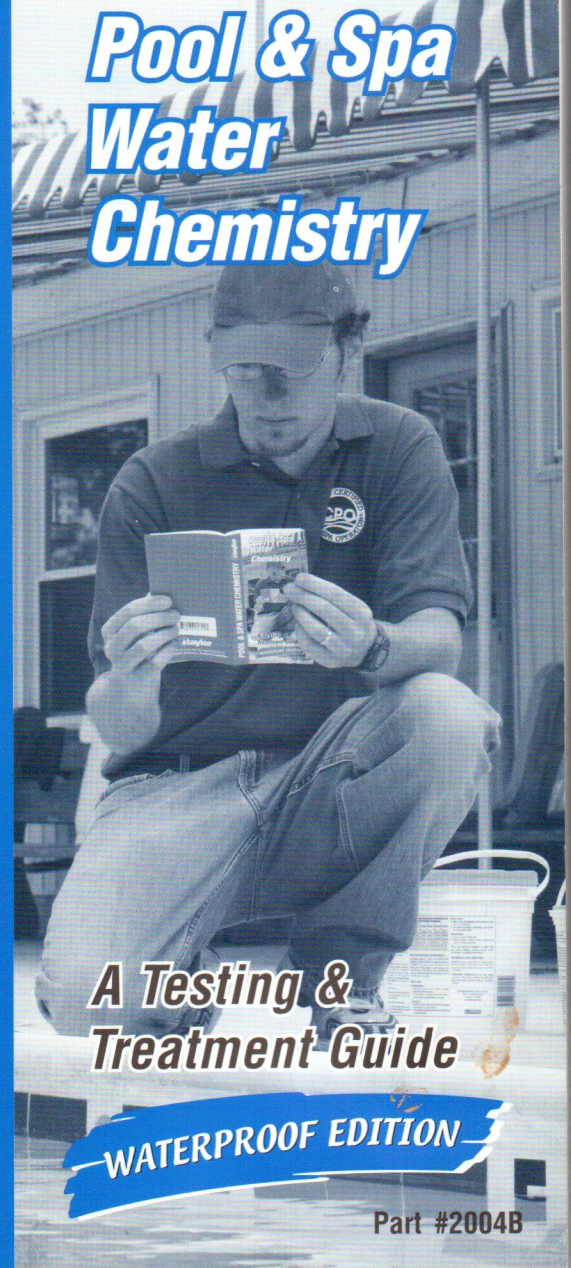


POOL & SPA WATER CHEMISTRY 

Pool & Spa Water Chemistry



***A Testing &
Treatment Guide***

WATERPROOF EDITION

Part #2004B

ADJUSTING TREATMENT LEVELS FOR DIFFERENT STRENGTH CHEMICALS

	tsp.	TBS.	oz.	cup	pt.	qt.	gal.
tsp.	1.0	3.0	6.0	48.0	96.0	192.0	768.0
TBS.	.33	1.0	2.0	16.0	32.0	64.0	256.0
oz.	.16	.5	1.0	8.0	16.0	32.0	128.0
cup	.02	.06	.125	1.0	2.0	4.0	16.0
pt.	.01	.03	.06	.5	1.0	2.0	8.0
qt.	.005	.02	.03	.25	.5	1.0	4.0
gal.	.001	.004	.008	.06	.125	.25	1.0

Treatment table values are based on specific strength chemicals (e.g., sodium carbonate, 100% or calcium chloride, 77%). If the specific treatment chemical used in your pool or spa is a different strength, **you must adjust the treatment amount given.**

For example, using Table J you determine that 24.0 lb. of calcium chloride (at 77%) is needed to increase your calcium hardness level by 100 ppm. However, by checking the label on the bag, it shows that the treatment chemical's strength is 95%—a big difference. To determine how much calcium chloride you'll need, follow the formula below:

$$\text{Treatment Table Strength} \div \text{Label Strength} \times \text{Table Treatment Value} = \text{Adjusted Treatment Value}$$

Using the numbers shown above:

$$77 \div 95 \times 24.0 = 19.5 \text{ lb. of calcium chloride at 95\% strength}$$

This formula can be used for all adjustments for Tables A-J.

SAFETY RULES FOR HANDLING POOL/SPA CHEMICALS

- Always add chemicals to water, **NEVER** water to chemicals.
- Keep chemicals in a cool location away from direct sunlight.
- Never mix chemicals prior to dispensing in pool water.
- Keep muriatic acid, rags, paints, oils, etc., far from chlorine.
- Never re-use emptied chlorine pails for refuse or storage.
- Never combine different chlorine products.
- Never use chemicals in a feeder other than what the manufacturer recommends.
- Never siphon chemicals by mouth.
- Keep all chemicals and test kits out of the reach of children!

TABLE A

Amount of Chlorine Compound to Introduce 1 ppm Chlorine*

Volume of Water - U.S. Gallons							
% Available Chlorine*	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 %	0.51 fl oz	1.28 fl oz	6.40 fl oz	12.8 fl oz	1.60 pt.	2.00 qt.	1.00 gal
12 %	0.43 fl oz	1.07 fl oz	5.33 fl oz	10.7 fl oz	1.33 pt.	1.67 qt.	3.33 qt.
35 %	0.15 oz	0.38 oz	1.91 oz	3.82 oz	7.63 oz	1.19 lb	2.38 lb
45 %	0.12 oz	0.30 oz	1.48 oz	2.97 oz	5.94 oz	14.8 oz	1.85 lb
60 %	0.09 oz	0.22 oz	1.11 oz	2.23 oz	4.45 oz	11.1 oz	1.39 lb
65 %	0.08 oz	0.21 oz	1.03 oz	2.05 oz	4.11 oz	10.3 oz	1.28 lb
75 %	0.07 oz	0.20 oz	0.95 oz	1.77 oz	3.77 oz	9.50 oz	1.17 lb
90 %	0.06 oz	0.15 oz	0.74 oz	1.48 oz	2.97 oz	7.42 oz	14.8 oz
100 %	0.05 oz	0.13 oz	0.67 oz	1.34 oz	2.67 oz	6.68 oz	13.4 oz

(rev. 10/05)

Volume of Water - Liters							
% Available Chlorine*	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
10 %	20.0 mL	40.0 mL	200 mL	400 mL	800 mL	1.00 L	4.00 L
12 %	16.7 mL	33.3 mL	167 mL	333 mL	667 mL	833 mL	3.33 L
35 %	5.71 g	11.4 g	57.1 g	114 g	229 g	286 g	1.14 kg
45 %	4.44 g	8.89 g	44.4 g	88.9 g	178 g	222 g	889 g
60 %	3.33 g	6.67 g	33.3 g	66.7 g	133 g	167 g	667 g
65 %	3.08 g	6.15 g	30.8 g	61.5 g	123 g	154 g	615 g
75 %	2.83 g	5.63 g	28.3 g	56.3 g	113 g	141 g	563 g
90 %	2.22 g	4.44 g	22.2 g	44.4 g	88.9 g	111 g	444 g
100 %	2.00 g	4.00 g	20.0 g	40.0 g	80.0 g	100 g	400 g

(rev. 10/05)

* Chlorine products contain different amounts of available chlorine. See Treatment Table Tips in Chapter 9.

30 ppm Super-Shock Table for Algae Removal*

Volume of Water - U.S. Gallons							
% Available Chlorine*	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 %	15.4 fl oz	1.20 qt	1.50 gal	3.00 gal	6.00 gal	15.0 gal	30.0 gal
12 %	12.8 fl oz	1.00 qt	1.25 gal	2.50 gal	5.00 gal	12.5 gal	25.0 gal
35 %	4.58 oz	11.4 oz	3.58 lb	7.15 lb	14.3 lb	35.8 lb	71.5 lb
45 %	3.56 oz	8.90 oz	2.78 lb	5.56 lb	11.1 lb	27.8 lb	55.6 lb
60 %	2.67 oz	6.68 oz	2.09 lb	4.17 lb	8.35 lb	20.9 lb	41.7 lb
65 %	2.47 oz	6.17 oz	1.93 lb	3.85 lb	7.70 lb	19.3 lb	38.5 lb
75 %	2.27 oz	5.66 oz	1.77 lb	3.53 lb	7.05 lb	17.7 lb	35.3 lb
90 %	1.78 oz	4.45 oz	1.39 lb	2.78 lb	5.56 lb	13.9 lb	27.8 lb
100 %	1.60 oz	4.01 oz	1.25 lb	2.50 lb	5.01 lb	12.5 lb	25.0 lb

(rev. 10/05)

Volume of Water - Liters							
% Available Chlorine*	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
10 %	600 mL	1.20 L	6.00 L	12.0 L	24.0 L	30.0 L	120 L
12 %	500 mL	1.00 L	5.00 L	10.0 L	20.0 L	25.0 L	100 L
35 %	171 g	343 g	1.71 kg	3.43 kg	6.86 kg	8.57 kg	34.3 kg
45 %	133 g	267 g	1.33 kg	2.67 kg	5.34 kg	6.67 kg	26.7 kg
60 %	100 g	200 g	1.00 kg	2.00 kg	4.00 kg	5.00 kg	20.0 kg
65 %	92.3 g	185 g	923 g	1.85 kg	3.69 kg	4.62 kg	18.5 kg
75 %	84.6 g	170 g	846 g	1.70 kg	3.88 kg	4.24 kg	17.0 kg
90 %	66.7 g	133 g	667 g	1.33 kg	2.67 kg	3.33 kg	13.3 kg
100 %	60.0 g	120 g	600 g	1.20 kg	2.40 kg	3.00 kg	12.0 kg

(rev. 10/05)

* Chlorine products contain different amounts of available chlorine. See Treatment Table Tips in Chapter 9.

To Decrease Free Chlorine Using Sodium Thiosulfate 5-Hydrate (100%)*

Volume of Water - U.S. Gallons							
Desired decrease in ppm	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
1 ppm	0.05 oz	0.14 oz	0.68 oz	1.36 oz	2.72 oz	6.80 oz	13.6 oz
2 ppm	0.11 oz	0.27 oz	1.36 oz	2.72 oz	5.44 oz	13.6 oz	27.0 lb
3 ppm	0.16 oz	0.41 oz	2.04 oz	4.08 oz	8.16 oz	20.8 lb	25.5 lb
4 ppm	0.22 oz	0.54 oz	2.72 oz	5.44 oz	10.9 oz	27.0 lb	34.0 lb
5 ppm	0.27 oz	0.68 oz	3.40 oz	6.80 oz	13.6 oz	21.3 lb	42.5 lb
10 ppm	0.54 oz	1.36 oz	6.80 oz	13.6 oz	27.2 oz	42.5 lb	85.0 lb
15 ppm	0.82 oz	2.04 oz	10.2 oz	20.4 oz	40.8 oz	63.8 lb	128.0 lb
20 ppm	1.09 oz	2.72 oz	13.6 oz	27.2 oz	54.4 oz	85.0 lb	170.0 lb
30 ppm	1.63 oz	4.08 oz	20.4 oz	40.8 oz	81.6 oz	128.0 lb	255.0 lb
50 ppm	2.72 oz	6.80 oz	34.0 oz	68.0 oz	136.0 oz	213.0 lb	425.0 lb

(rev. 2/98)

Volume of Water - Liters							
Desired decrease in ppm	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
1 ppm	2.04 g	4.07 g	20.4 g	40.7 g	81.5 g	102 g	407 g
2 ppm	4.07 g	8.15 g	40.7 g	81.5 g	163 g	204 g	815 g
3 ppm	6.11 g	12.2 g	61.1 g	122 g	244 g	306 g	1.22 kg
4 ppm	8.15 g	16.3 g	81.5 g	163 g	326 g	407 g	1.63 kg
5 ppm	10.2 g	20.4 g	102 g	204 g	407 g	509 g	2.04 kg
10 ppm	20.4 g	40.7 g	204 g	407 g	815 g	1.02 kg	4.07 kg
15 ppm	30.6 g	61.1 g	306 g	611 g	1.22 kg	1.53 kg	6.11 kg
20 ppm	40.7 g	81.5 g	407 g	815 g	1.63 kg	2.04 kg	8.15 kg
30 ppm	61.1 g	122 g	611 g	1.22 kg	2.44 kg	3.06 kg	12.2 kg
50 ppm	102 g	204 g	1.02 kg	2.04 kg	4.07 kg	5.09 kg	20.4 kg

(rev. 2/98)

* To convert sodium thiosulfate 5-hydrate (100%) to sodium sulfite, multiply sodium thiosulfate 5-hydrate (100%) value by 1.75.

TABLE D

**To Increase pH Using Soda Ash
(Sodium Carbonate, 100%)
with the Taylor Base Demand Procedure***

Volume of Water - U.S. Gallons							
Drops of Taylor Base Demand Reagent*	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
1 drop	0.21 oz	0.51 oz	2.56 oz	5.13 oz	10.3 oz	1.60 lb	3.20 lb
2 drops	0.41 oz	1.03 oz	5.13 oz	10.3 oz	1.28 lb	3.20 lb	6.41 lb
3 drops	0.62 oz	1.54 oz	7.69 oz	15.4 oz	1.92 lb	4.81 lb	9.61 lb
4 drops	0.82 oz	2.05 oz	10.3 oz	1.28 lb	2.50 lb	6.41 lb	12.8 lb
5 drops	1.03 oz	2.56 oz	12.8 oz	1.60 lb	3.20 lb	8.01 lb	16.0 lb
6 drops	1.23 oz	3.08 oz	15.4 oz	1.92 lb	3.85 lb	9.61 lb	19.2 lb
7 drops	1.44 oz	3.59 oz	1.12 lb	2.24 lb	4.49 lb	11.2 lb	22.4 lb
8 drops	1.64 oz	4.10 oz	1.28 lb	2.56 lb	5.13 lb	12.8 lb	25.6 lb
9 drops	1.85 oz	4.61 oz	1.44 lb	2.88 lb	5.77 lb	14.4 lb	28.8 lb
10 drops	2.05 oz	5.13 oz	1.60 lb	3.20 lb	6.40 lb	16.0 lb	32.0 lb

(rev. 4/04)

Volume of Water - Liters							
Drops of Taylor Base Demand Reagent*	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
1 drop	7.68 g	15.4 g	76.8 g	154 g	307 g	384 g	1.54 kg
2 drops	15.4 g	30.7 g	154 g	307 g	614 g	768 g	3.07 kg
3 drops	23.0 g	46.1 g	230 g	461 g	922 g	1.15 kg	4.61 kg
4 drops	30.7 g	61.4 g	307 g	614 g	1.23 kg	1.54 kg	6.14 kg
5 drops	38.4 g	76.8 g	384 g	768 g	1.54 kg	1.92 kg	7.68 kg
6 drops	46.1 g	92.2 g	461 g	922 g	1.84 kg	2.30 kg	9.22 kg
7 drops	53.8 g	108 g	538 g	1.08 kg	2.15 kg	2.69 kg	10.8 kg
8 drops	61.4 g	123 g	614 g	1.23 kg	2.46 kg	3.07 kg	12.3 kg
9 drops	69.1 g	138 g	691 g	1.38 kg	2.76 kg	3.46 kg	13.8 kg
10 drops	76.8 g	154 g	768 g	1.54 kg	3.07 kg	3.84 kg	15.4 kg

(rev. 9/94)

* Taylor 2000 Series Comparator uses R-0006 Base Demand Reagent (BDR).
Taylor #4024 Test Cell uses R-0862 Base Demand Reagent (BDR).
Taylor Residential Series Comparator uses R-0016 Base Demand Reagent (BDR).

TABLE E

**To Decrease pH Using Muriatic Acid
(20° Baumé / 31.45% HCl)
with the Taylor Acid Demand Procedure***

Volume of Water - U.S. Gallons							
Drops of Taylor Acid Demand Reagent*	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
1 drop	0.37 fl oz	0.92 fl oz	4.58 fl oz	9.16 fl oz	1.15 pt	1.43 qt	2.86 qt
2 drops	0.73 fl oz	1.83 fl oz	9.16 fl oz	1.15 pt	1.15 qt	2.86 qt	1.43 gal
3 drops	1.10 fl oz	2.75 fl oz	13.7 fl oz	1.72 pt	1.72 qt	1.07 gal	2.15 gal
4 drops	1.47 fl oz	3.67 fl oz	1.15 pt	1.15 qt	2.29 qt	1.43 gal	2.86 gal
5 drops	1.83 fl oz	4.58 fl oz	1.43 pt	1.43 qt	2.86 qt	1.79 gal	3.58 gal
6 drops	2.20 fl oz	5.50 fl oz	1.72 pt	1.72 qt	3.44 qt	2.15 gal	4.30 gal
7 drops	2.57 fl oz	6.41 fl oz	1.00 qt	2.00 qt	1.00 gal	2.51 gal	5.01 gal
8 drops	2.93 fl oz	7.33 fl oz	1.15 qt	2.29 qt	1.15 gal	2.86 gal	5.73 gal
9 drops	3.30 fl oz	8.25 fl oz	1.29 qt	2.58 qt	1.29 gal	3.22 gal	6.44 gal
10 drops	3.67 fl oz	9.16 fl oz	1.43 qt	2.86 qt	1.43 gal	3.58 gal	7.16 gal

(rev. 9/94)

Volume of Water - Liters							
Drops of Taylor Acid Demand Reagent*	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
1 drop	14.3 mL	28.6 mL	143 mL	286 mL	573 mL	716 mL	2.86 L
2 drops	28.6 mL	57.3 mL	286 mL	573 mL	1.15 L	1.43 L	5.73 L
3 drops	43.0 mL	85.9 mL	430 mL	859 mL	1.72 L	2.15 L	8.59 L
4 drops	57.3 mL	115 mL	573 mL	1.15 L	2.29 L	2.86 L	11.5 L
5 drops	71.6 mL	143 mL	716 mL	1.43 L	2.86 L	3.58 L	14.3 L
6 drops	85.9 mL	172 mL	859 mL	1.72 L	3.44 L	4.30 L	17.2 L
7 drops	100 mL	200 mL	1.00 L	2.00 L	4.01 L	5.01 L	20.0 L
8 drops	115 mL	229 mL	1.15 L	2.29 L	4.58 L	5.73 L	22.9 L
9 drops	129 mL	258 mL	1.29 L	2.58 L	5.15 L	6.44 L	25.8 L
10 drops	143 mL	286 mL	1.43 L	2.86 L	5.73 L	7.16 L	28.6 L

(rev. 4/04)

* Taylor 2000 Series Comparator uses R-0005 Acid Demand Reagent (ADR).
Taylor #4024 Test Cell uses R-0853 Acid Demand Reagent (ADR).
Taylor Residential Series Comparator uses R-0015 Acid Demand Reagent (ADR).

TABLE F
To Decrease pH Using Dry Acid
(Sodium Bisulfate, 93.2%*)
with the Taylor Acid Demand Procedure**

Volume of Water - U.S. Gallons							
Drops of Taylor Acid Demand Reagent**	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
1 drop	0.49 oz	1.23 oz	6.16 oz	12.3 oz	1.54 lb	3.85 lb	7.70 lb
2 drops	0.99 oz	2.46 oz	12.3 oz	1.54 lb	3.08 lb	7.70 lb	15.4 lb
3 drops	1.48 oz	3.70 oz	1.16 lb	2.31 lb	4.62 lb	11.6 lb	23.1 lb
4 drops	1.97 oz	4.93 oz	1.54 lb	3.08 lb	6.16 lb	15.4 lb	30.5 lb
5 drops	2.46 oz	6.16 oz	1.93 lb	3.85 lb	7.70 lb	19.3 lb	38.5 lb
6 drops	2.96 oz	7.39 oz	2.31 lb	4.62 lb	9.24 lb	23.1 lb	46.2 lb
7 drops	3.45 oz	8.63 oz	2.70 lb	5.39 lb	10.8 lb	27.0 lb	53.9 lb
8 drops	3.94 oz	9.86 oz	3.08 lb	6.16 lb	12.3 lb	30.8 lb	61.6 lb
9 drops	4.44 oz	11.1 oz	3.47 lb	6.93 lb	13.9 lb	34.7 lb	69.3 lb
10 drops	4.93 oz	12.3 oz	3.85 lb	7.70 lb	15.4 lb	38.5 lb	77.0 lb

(rev. 9/94)

Volume of Water - Liters							
Drops of Taylor Acid Demand Reagent**	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
1 drop	18.5 g	36.9 g	185 g	369 g	738 g	923 g	3.69 kg
2 drops	36.9 g	73.8 g	369 g	738 g	1.48 kg	1.85 kg	7.38 kg
3 drops	55.4 g	111 g	554 g	1.11 kg	2.21 kg	2.77 kg	11.1 kg
4 drops	73.8 g	148 g	738 g	1.48 kg	2.95 kg	3.69 kg	14.8 kg
5 drops	92.3 g	185 g	923 g	1.85 kg	3.69 kg	4.61 kg	18.5 kg
6 drops	111 g	221 g	1.11 kg	2.21 kg	4.43 kg	5.54 kg	22.1 kg
7 drops	129 g	258 g	1.29 kg	2.58 kg	5.17 kg	6.46 kg	25.8 kg
8 drops	148 g	295 g	1.48 kg	2.95 kg	5.91 kg	7.38 kg	29.5 kg
9 drops	166 g	332 g	1.66 kg	3.32 kg	6.64 kg	8.31 kg	33.2 kg
10 drops	185 g	369 g	1.85 kg	3.69 kg	7.38 kg	9.23 kg	36.9 kg

(rev. 9/94)

* Sodium bisulfate percentage may vary. See "Tips" in Chapter 9.
 ** Taylor 2000 Series Comparator uses R-0005 Acid Demand Reagent (ADR).
 Taylor #4024 Test Cell uses R-0853 Acid Demand Reagent (ADR).
 Taylor Residential Series Comparator uses R-0015 Acid Demand Reagent (ADR).

TABLE G
To Increase Alkalinity Using Baking Soda
(Sodium Bicarbonate, 100%)

Volume of Water - U.S. Gallons							
Desired increase in ppm	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 ppm	0.90 oz	2.24 oz	11.2 oz	1.40 lb	2.80 lb	7.00 lb	14.0 lb
20 ppm	1.79 oz	4.48 oz	1.40 lb	2.80 lb	5.60 lb	14.0 lb	28.0 lb
30 ppm	2.69 oz	6.72 oz	2.10 lb	4.20 lb	8.41 lb	21.0 lb	42.0 lb
40 ppm	3.59 oz	8.97 oz	2.80 lb	5.60 lb	11.2 lb	28.0 lb	56.0 lb
50 ppm	4.48 oz	11.2 oz	3.50 lb	7.00 lb	14.0 lb	35.0 lb	70.0 lb
60 ppm	5.38 oz	13.4 oz	4.20 lb	8.41 lb	16.8 lb	42.0 lb	84.1 lb
70 ppm	6.28 oz	15.7 oz	4.90 lb	9.81 lb	19.6 lb	49.0 lb	98.1 lb
80 ppm	7.17 oz	1.12 lb	5.60 lb	11.2 lb	22.4 lb	56.0 lb	112 lb
90 ppm	8.07 oz	1.26 lb	6.30 lb	12.6 lb	25.2 lb	63.0 lb	126 lb
100 ppm	8.97 oz	1.40 lb	7.00 lb	14.0 lb	28.0 lb	70.0 lb	140 lb

(rev. 9/94)

Volume of Water - Liters							
Desired increase in ppm	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
10 ppm	33.6 g	67.1 g	336 g	671 g	1.34 kg	1.68 kg	6.71 kg
20 ppm	67.1 g	134 g	671 g	1.34 kg	2.69 kg	3.36 kg	13.4 kg
30 ppm	101 g	201 g	1.01 kg	2.01 kg	4.03 kg	5.04 kg	20.1 kg
40 ppm	134 g	269 g	1.34 kg	2.69 kg	5.37 kg	6.71 kg	26.9 kg
50 ppm	168 g	336 g	1.68 kg	3.36 kg	6.71 kg	8.39 kg	33.6 kg
60 ppm	201 g	403 g	2.01 kg	4.03 kg	8.06 kg	10.1 kg	40.3 kg
70 ppm	235 g	470 g	2.35 kg	4.70 kg	9.40 kg	11.8 kg	47.0 kg
80 ppm	269 g	537 g	2.69 kg	5.37 kg	10.7 kg	13.4 kg	53.7 kg
90 ppm	302 g	604 g	3.02 kg	6.04 kg	12.1 kg	15.1 kg	60.4 kg
100 ppm	336 g	671 g	3.36 kg	6.71 kg	13.4 kg	16.8 kg	67.1 kg

(rev. 9/94)

TABLE H

**To Decrease Alkalinity Using Dry Acid
(Sodium Bisulfate, 93.2%*)**

Volume of Water - U.S. Gallons							
Desired decrease in ppm	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 ppm	1.37 oz	3.44 oz	1.07 lb	2.15 lb	4.30 lb	10.7 lb	21.5 lb
20 ppm	2.75 oz	6.87 oz	2.15 lb	4.30 lb	8.59 lb	21.5 lb	43.0 lb
30 ppm	4.12 oz	10.3 oz	3.22 lb	6.45 lb	12.9 lb	32.2 lb	64.5 lb
40 ppm	5.50 oz	13.7 oz	4.30 lb	8.59 lb	17.2 lb	43.0 lb	85.9 lb
50 ppm	6.87 oz	1.07 lb	5.37 lb	10.7 lb	21.5 lb	53.7 lb	107 lb
60 ppm	8.25 oz	1.29 lb	6.45 lb	12.9 lb	25.8 lb	64.5 lb	129 lb
70 ppm	9.62 oz	1.50 lb	7.52 lb	15.0 lb	30.1 lb	75.2 lb	150 lb
80 ppm	11.0 oz	1.72 lb	8.59 lb	17.2 lb	34.4 lb	85.9 lb	172 lb
90 ppm	12.4 oz	1.93 lb	9.67 lb	19.3 lb	38.7 lb	96.7 lb	193 lb
100 ppm	13.7 oz	2.15 lb	10.7 lb	21.5 lb	43.0 lb	107 lb	215 lb

(rev. 9/94)

Volume of Water - Liters							
Desired decrease in ppm	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
10 ppm	51.5 g	103 g	515 g	1.03 kg	2.06 kg	2.57 kg	10.3 kg
20 ppm	103 g	206 g	1.03 kg	2.06 kg	4.12 kg	5.15 kg	20.6 kg
30 ppm	154 g	309 g	1.54 kg	3.09 kg	6.18 kg	7.72 kg	30.9 kg
40 ppm	206 g	412 g	2.06 kg	4.12 kg	8.24 kg	10.3 kg	41.2 kg
50 ppm	257 g	515 g	2.57 kg	5.15 kg	10.3 kg	12.9 kg	51.5 kg
60 ppm	309 g	618 g	3.09 kg	6.18 kg	12.4 kg	15.4 kg	61.8 kg
70 ppm	360 g	721 g	3.60 kg	7.21 kg	14.4 kg	18.0 kg	72.1 kg
80 ppm	412 g	824 g	4.12 kg	8.24 kg	16.5 kg	20.6 kg	82.4 kg
90 ppm	463 g	927 g	4.63 kg	9.27 kg	18.5 kg	23.2 kg	92.7 kg
100 ppm	515 g	1.03 kg	5.15 kg	10.3 kg	20.6 kg	25.7 kg	103 kg

(rev. 9/94)

*Sodium bisulfate percentage may vary. See Treatment Table Tips in Chapter 9.

TABLE I

**To Decrease Alkalinity Using Muriatic Acid
(20° Baumé / 31.45% HCl)**

Volume of Water - U.S. Gallons							
Desired decrease in ppm	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 ppm	1.02 fl oz	2.56 fl oz	12.8 fl oz	1.60 qt	1.60 qt	3.99 qt	2.00 gal
20 ppm	2.04 fl oz	5.11 fl oz	1.60 qt	1.60 qt	3.20 qt	2.00 gal	3.99 gal
30 ppm	3.07 fl oz	7.67 fl oz	1.20 qt	2.40 qt	1.20 gal	3.00 gal	5.99 gal
40 ppm	4.09 fl oz	10.2 fl oz	1.60 qt	3.20 qt	1.60 gal	3.99 gal	7.99 gal
50 ppm	5.11 fl oz	12.8 fl oz	2.00 qt	3.99 qt	2.00 gal	4.99 gal	9.98 gal
60 ppm	6.13 fl oz	15.3 fl oz	2.40 qt	1.20 gal	2.40 gal	5.99 gal	12.0 gal
70 ppm	7.16 fl oz	1.12 pt	2.80 qt	1.40 gal	2.80 gal	6.99 gal	14.0 gal
80 ppm	8.18 fl oz	1.28 pt	3.20 qt	1.60 gal	3.20 gal	7.99 gal	16.0 gal
90 ppm	9.20 fl oz	1.44 pt	3.59 qt	1.80 gal	3.59 gal	8.99 gal	18.0 gal
100 ppm	10.2 fl oz	1.60 pt	3.99 qt	2.00 gal	3.99 gal	9.98 gal	20.0 gal

(rev. 9/94)

Volume of Water - Liters							
Desired decrease in ppm	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
10 ppm	39.9 mL	79.9 mL	399 mL	799 mL	1.60 L	2.00 L	7.99 L
20 ppm	79.9 mL	160 mL	799 mL	1.60 L	3.20 L	3.99 L	16.0 L
30 ppm	120 mL	240 mL	1.20 L	2.40 L	4.79 L	5.99 L	24.0 L
40 ppm	160 mL	320 mL	1.60 L	3.20 L	6.39 L	7.99 L	32.0 L
50 ppm	200 mL	399 mL	2.00 L	3.99 L	7.99 L	9.98 L	39.9 L
60 ppm	240 mL	479 mL	2.40 L	4.79 L	9.59 L	12.0 L	47.9 L
70 ppm	280 mL	559 mL	2.80 L	5.59 L	11.2 L	14.0 L	55.9 L
80 ppm	320 mL	639 mL	3.20 L	6.39 L	12.8 L	16.0 L	63.9 L
90 ppm	359 mL	719 mL	3.59 L	7.19 L	14.4 L	18.0 L	71.9 L
100 ppm	399 mL	799 mL	3.99 L	7.99 L	16.0 L	20.0 L	79.9 L

(rev. 9/94)

To Increase Calcium Hardness Using Calcium Chloride (77%*)

Volume of Water - U.S. Gallons							
Desired increase in ppm	400 gallons	1,000 gallons	5,000 gallons	10,000 gallons	20,000 gallons	50,000 gallons	100,000 gallons
10 ppm	0.77 oz	1.92 oz	9.61 oz	1.20 lb	2.40 lb	6.01 lb	12.0 lb
20 ppm	1.54 oz	3.85 oz	1.20 lb	2.40 lb	4.81 lb	12.0 lb	24.0 lb
30 ppm	2.31 oz	5.77 oz	1.80 lb	3.61 lb	7.21 lb	18.0 lb	36.1 lb
40 ppm	3.08 oz	7.69 oz	2.40 lb	4.81 lb	9.61 lb	24.0 lb	48.1 lb
50 ppm	3.85 oz	9.61 oz	3.00 lb	6.01 lb	12.0 lb	30.0 lb	60.1 lb
60 ppm	4.62 oz	11.5 oz	3.61 lb	7.21 lb	14.4 lb	36.1 lb	72.1 lb
70 ppm	5.38 oz	13.5 oz	4.21 lb	8.41 lb	16.8 lb	42.1 lb	84.1 lb
80 ppm	6.15 oz	15.4 oz	4.81 lb	9.61 lb	19.2 lb	48.1 lb	96.2 lb
90 ppm	6.92 oz	1.08 lb	5.41 lb	10.8 lb	21.6 lb	54.1 lb	108 lb
100 ppm	7.69 oz	1.20 lb	6.01 lb	12.0 lb	24.0 lb	60.1 lb	120 lb

(rev. 9/94)

Volume of Water - Liters							
Desired increase in ppm	2,000 L	4,000 L	20,000 L	40,000 L	80,000 L	100,000 L	400,000 L
10 ppm	28.8 g	57.6 g	288 g	576 g	1.15 kg	1.44 kg	5.76 kg
20 ppm	57.6 g	115 g	576 g	1.15 kg	2.30 kg	2.88 kg	11.5 kg
30 ppm	86.4 g	173 g	864 g	1.73 kg	3.46 kg	4.32 kg	17.3 kg
40 ppm	115 g	230 g	1.15 kg	2.30 kg	4.61 kg	5.76 kg	23.0 kg
50 ppm	144 g	288 g	1.44 kg	2.88 kg	5.76 kg	7.20 kg	28.8 kg
60 ppm	173 g	346 g	1.73 kg	3.46 kg	6.91 kg	8.64 kg	34.6 kg
70 ppm	202 g	403 g	2.02 kg	4.03 kg	8.06 kg	10.1 kg	40.3 kg
80 ppm	230 g	461 g	2.30 kg	4.61 kg	9.22 kg	11.5 kg	46.1 kg
90 ppm	259 g	518 g	2.59 kg	5.18 kg	10.4 kg	13.0 kg	51.8 kg
100 ppm	288 g	576 g	2.88 kg	5.76 kg	11.5 kg	14.4 kg	57.6 kg

(rev. 9/94)

*Calcium chloride percentage may vary. See Treatment Table Tips in Chapter 9.

Cyanuric Acid Correction to Total Alkalinity

For most waters within recommended pH and cyanuric acid levels, using a cyanuric acid factor (CYA) equal to 0.33 or 0.35 is within experimental error. For waters outside recommended pH levels or waters containing high cyanuric acid levels, it becomes more important to use a CYA from the table below.

1. Select a cyanuric acid factor (CYA) based on measured pH:

pH	CYA
6.5	0.11
7.0	0.22
7.2	0.26
7.4	0.30
7.6	0.33
7.8	0.35
8.0	0.36
8.5	0.38

2. Calculate the carbonate alkalinity (Alk_C) from the measured total alkalinity (Alk_{TA}), measured cyanuric acid (CYA), and selected cyanuric acid factor (CYAf):

$$Alk_C = Alk_{TA} - (CYA \times CYAf)$$

For example: pH = 7.6; Alk_{TA} = 100 ppm; CYA = 40 ppm

$$Alk_C = Alk_{TA} - (CYA \times CYAf)$$

$$Alk_C = 100 - (40 \times 0.33)$$

$$Alk_C = 87 \text{ ppm}$$

(rev. 12/02)