

**APPENDIX P**

# BREAKPOINT SUPERCHLORINATION

**Step 1:** Total Chlorine - Free Chlorine = Combined Chlorine  
 (DPD #3) (DPD #1/#2)

**Step 2:** Combined Chlorine x 10 - Existing FC = ADJUSTMENT





**Step 3:** Use chemical adjustment worksheet below

AMOUNT OF CHEMICAL (FROM APPENDIX B-2 OR PRODUCT LABEL)	ACTUAL POOL VOLUME	DESIRED CHEMICAL CHANGE	TOTAL
↓			
	÷ 10,000 GAL. (FROM APPENDIX B-2 OR PRODUCT LABEL)	÷ PPM (FROM APPENDIX B-2 OR PRODUCT LABEL)	
	X	X	=

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APPENDIX M

# SATURATION INDEX WORKSHEET

	Value	Factor	New Value	Factor
pH				
Temperature				
Calcium Hardness				
Total Alkalinity				
Sub-Total				
Total Dissolved Solids				
Saturation Index				

APPENDIX L

# LANGELIER SATURATION INDEX

Refer to:

**NSPF<sup>®</sup> Pool & Spa Operator<sup>®</sup> Handbook**  
**Chapter 6 - Water Balance**

Temperature		Calcium Hardness Expressed as CaCO <sub>3</sub>		Total Carbonate Alkalinity	
°F	Tf	Ppm	Cf	ppm	Af
32	0.0	25	1.0	25	1.4
37	0.1	50	1.3	50	1.7
46	0.2	75	1.5	75	1.9
53	0.3	100	1.6	100	2.0
60	0.4	125	1.7	125	2.1
66	0.5	150	1.8	150	2.2
76	0.6	200	1.9	200	2.3
84	0.7	250	2.0	250	2.4
94	0.8	300	2.1	300	2.5
105	0.9	400	2.2	400	2.6
		800	2.5	800	2.9

## TDS Factors

Less than 1,000 ppm	1,000 ppm or greater
12.1	12.2

<b>SI</b>	<b>=</b>	<b>pH</b>	<b>+</b>	<b>Tf</b>	<b>+</b>	<b>Cf</b>	<b>+</b>	<b>Af</b>	<b>-</b>	<b>TDSf</b>
Saturation Index		pH as tested		Temperature factor		Calcium factor		Alkalinity factor		TDS factor

APPENDIX N

# CHEMICAL ADJUSTMENT WORKSHEET

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AMOUNT OF CHEMICAL (FROM APPENDIX B-2 OR PRODUCT LABEL)	ACTUAL POOL VOLUME	DESIRED CHEMICAL CHANGE	TOTAL
↓			
↓	$\div 10,000 \text{ GAL.}$ (FROM APPENDIX B-2 OR PRODUCT LABEL)	$\div \text{ PPM}$ (FROM APPENDIX B-2 OR PRODUCT LABEL)	
	X	X	=

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## APPENDIX O

# WATER CHEMISTRY ADJUSTMENT GUIDE

These are commonly accepted chemical parameters do not supersede manufacture's instructions.  
Always consult product labels for specific directions as to chemical adjustments.

Dosages to Treat	10,000 Gallons			40,000 Liters		
	Desired Change			Desired Change		
<b>Increase Chlorine</b>	<b>1 ppm</b>	<b>5 ppm</b>	<b>10 ppm</b>	<b>1 mg/L</b>	<b>5 mg/L</b>	<b>10 mg/L</b>
Chlorine Gas	1.3 oz	6.7 oz	13 oz	40 g	200 g	390 g
Calcium Hypochlorite (67%)*	2 oz	10 oz	1.3 lb	63 g	315 g	630 g
Sodium Hypochlorite (12%)	10.7 fl.oz.	1.7 qts	3.3 qts	330 ml	1.36 L	3.3 L
Lithium Hypochlorite	3.8 oz	1.2 lbs	2.4 lbs	110 g	570 g	1.1 kg
Dichlor (62%)	2.1 oz	10.75 oz	1.3 lbs	65 g	320 g	650 g
Dichlor (56%)	2.4 oz	12 oz	1.4 lbs	72 g	360 g	720 g
Trichlor	1.5 oz	7.5 oz	14 oz	44 g	220 g	440 g
<b>Increase Total Alkalinity</b>	<b>10 ppm</b>	<b>30 ppm</b>	<b>50 ppm</b>	<b>10 mg/L</b>	<b>30 mg/L</b>	<b>50 mg/L</b>
Sodium Bicarbonate	1.4 lbs	4.2 lbs	7.0 lbs	670 g	2.0 kg	3.4 kg
Sodium Carbonate	14 oz	2.6 lbs	4.4 lbs	400 g	1.2 kg	2.0 kg
Sodium Sesquicarbonate	1.25 lbs	3.75 lbs	6.25 lbs	600 g	1.8 kg	3.0 kg
<b>Decrease Total Alkalinity</b>	<b>10 ppm</b>	<b>30 ppm</b>	<b>50 ppm</b>	<b>10 mg/L</b>	<b>30 mg/L</b>	<b>50 mg/L</b>
Muriatic Acid (31.4%)	26 fl.oz.	2.4 qts	1 gal	800 ml	2.4 L	4.0 L
Sodium Bisulfate	2.1 lbs	6.4 lbs	10.5 lbs	1.03 kg	3.1 kg	5.15 kg
<b>Increase Calcium Hardness</b>	<b>10 ppm</b>	<b>30 ppm</b>	<b>50 ppm</b>	<b>10 mg/L</b>	<b>30 mg/L</b>	<b>50 mg/L</b>
Calcium Chloride (100%)	0.9 lbs	2.8 lbs	4.6 lbs	407 g	1.2 kg	2.0 kg
Calcium Chloride (77%)	1.2 lbs	3.6 lbs	6.0 lbs	575 g	1.7 kg	2.9 kg
<b>Increase Stabilizer</b>	<b>10 ppm</b>	<b>30 ppm</b>	<b>50 ppm</b>	<b>10 mg/L</b>	<b>30 mg/L</b>	<b>50 mg/L</b>
Cyanuric Acid	13 oz	2.5 lbs	4.1 lbs	400 g	1.2 kg	2 kg
<b>Neutralize Chlorine</b>	<b>1 ppm</b>	<b>5 ppm</b>	<b>10 ppm</b>	<b>1 mg/L</b>	<b>5 mg/L</b>	<b>10 mg/L</b>
Sodium Thiosulfate	2.6 oz	13 oz	26 oz	79 g	395 g	790 g
Sodium Sulfite	2.4 oz	12 oz	1.5 lbs	71 g	356 g	711 g
Chemical amounts have been rounded off for convenience. Always follow the instructions on the manufacturer's label for exact dosage amounts.						
*Other calcium hypochlorite products are available from 47% to 78%. Remember to follow the label directions for dosage amounts.						