

### **Procedure to Reduce White Build Up on Pool Surface.**

1. Get the pool water tested. It is a good idea to have this test done by an approved water testing laboratory rather than just a pool shop. They have the equipment to do a full water analysis and can advise where the problem more than likely is. –Labs talk a different language to the pool trade, ask the lab to give you Calcium Hardness and Total Alkalinity as calcium carbonate equivalent. This will be more meaningful than bicarbonate ions, calcium ions and so on that are not directly related.
2. From the above water analysis drop the Total Alkalinity down to zero using the appropriate amount of hydrochloric acid, which also drops the pH down. The pH needs to be around the 2.15. Use the attached chart or chemical software to calculate the amount of HCL Acid to add to reach this point. Non-Fume acid is not generally suitable as its strength varies.
3. I would recommend that nobody swim in the pool while this is being done. It can take from a few days to a couple of weeks to dissolve the calcium back into a liquid form depending on how bad the build up is. A low pH will not dissolve any silica that is present as this remains in a solid form and may be unaffected by acid. It also helps once the pH has being dropped to add some Citric Acid to assist with the procedure.
4. Switch off the chlorinator and do not add any chlorine to the water while this is being done however, the filter should be run constantly as this will remove particulate matter as it comes into suspension.
5. Scrub the pool surface each day to help remove any build up.
6. If the pool water goes cloudy add liquid clarifier; and follow the manufacturers recommendations in respect of filtration
7. Backwash the filter as required
8. Inspect pool and repeat if necessary.
9. If any white or brown plating remains it is possible that it is silica based and not calcium. To remove this we need to now increase the pH level.
10. Using Soda Ash increase the pH to between 9 – 10 ppm. Add one kilo of Soda Ash per day to the pool until the pH is back up to around 7.0 ppm. Then add some EDTA which will remove the silica build up.
11. Keep the filter running and the chlorinator turned off
12. Scrub the pool surface each day to help remove any build up.
13. Once the pool shell seems to have cleared add a flocculant and follow manufacturers directions for settling
14. Vacuum the pool to waste and top up
15. Take a reading of the Total Alkalinity (as equivalent calcium carbonate) and the pH.
16. Acid is probably required at this stage to reduce the TA to a more conventional range. We suggest an initial dose of 66% of pool volume in cubic metres, e.g.: Pool Volume = 30 000 litres therefore 30 cubic metres multiplied by 0.66 = 19.8 litres of HCL Acid

17. In all likelihood, the following day, more white powder will drop out of solution after the acid treatment. This too needs to be vacuumed to waste.
18. Test the Total Alkalinity (as equivalent calcium carbonate) and pH again. The Total Alkalinity (as equivalent calcium carbonate) should be coming closer to a normal range, although probably still on the high side. Use the attached chart to calculate the correct amount of acid to drop Total Alkalinity to around 80 mg/l.
19. If all seems clear re balance the water keeping the Total Alkalinity, pH and Calcium Hardness at the lower levels as stated below.

### **Recommended Chemical Balances**

- |   |  |
|---|--|
| • <b>pH – Pool</b>  | 7.0 – 7.2  |
| • <b>pH – Spa</b>   | 7.0 – 7.2  |
| • <b>Total Alkalinity – Pool<br/>(Temporary Hardness)</b> | 80 – 120 ppm   |
| • <b>Total Alkalinity – Spa<br/>(Temporary hardness)</b>  | 80 - 100 ppm   |
| • <b>Calcium Hardness – Pool<br/>(Total Hardness)</b>     | 100 – 200 ppm  |
| • <b>Calcium Hardness – Spa<br/>(Total Hardness)</b>      | 100 ppm  |
| • <b>Free Chlorine</b>                                    | 1 – 3 ppm (non heated pool)<br>2 – 4 ppm (heated pool) |
| • <b>Stabiliser</b>                                       | 30 – 50 ppm  |
| • <b>Saturation Index</b>                                 | -0.2 to +0.2   |

Visit [www.dynamicpool.dynu.com](http://www.dynamicpool.dynu.com) and download a free langalier saturation index calculator for the swimming pool industry.

<b>HCL Acid (33% ww) to add to pool in millitres to achieve a Total Alkalinity of 0 mg/l</b>											
		<b>Starting Total Alkalinity (add two columns together to get readings)</b>									
		<b>10</b>	<b>20</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>90</b>	<b>100</b>
<b>Pool Volume in Cubic Metres (Multiply by 1000 to convert to litres)</b>	<b>1</b>	30	60	90	120	150	180	210	240	270	300
	<b>2</b>	60	120	180	240	300	360	420	480	540	600
	<b>5</b>	150	300	450	600	750	900	1050	1200	1350	1500
	<b>10</b>	300	600	900	1200	1500	1800	2100	2400	2700	3000
	<b>20</b>	600	1200	1800	2400	3000	3600	4200	4800	5400	6000
	<b>30</b>	900	1800	2700	3600	4500	5400	6300	7200	8100	9000
	<b>40</b>	1200	2400	3600	4800	6000	7200	8400	9600	10800	12000
	<b>50</b>	1500	3000	4500	6000	7500	9000	10500	12000	13500	15000
	<b>60</b>	1800	3600	5400	7200	9000	10800	12600	14400	16200	18000
	<b>70</b>	2100	4200	6300	8400	10500	12600	14700	16800	18900	21000
	<b>80</b>	2400	4800	7200	9600	12000	14400	16800	19200	21600	24000
	<b>90</b>	2700	5400	8100	10800	13500	16200	18900	21600	24300	27000
<b>100</b>	3000	6000	9000	12000	15000	18000	21000	24000	27000	30000	

Use Example:

Pool Volume 55000L

Break Apart volume and convert to cubic metres: 50 + 5

TA Reading: 130 mg/l

Break apart TA to get: 100 & 30 mg/l

Read chart for 50 at 100 mg/l = 15000

<b>HCL Acid (33% ww) to add to pool in millitres to achieve a Total Alkalinity of 80 mg/l</b>																	
		<b>Starting Total Alkalinity (add two columns together to get readings)</b>															
		<b>100</b>	<b>110</b>	<b>120</b>	<b>130</b>	<b>140</b>	<b>150</b>	<b>160</b>	<b>170</b>	<b>180</b>	<b>190</b>	<b>200</b>	<b>210</b>	<b>220</b>	<b>230</b>	<b>240</b>	<b>250</b>
<b>Pool Volume in Cubic Metres (Multiply by 1000 to convert to litres)</b>	<b>1</b>	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510
	<b>2</b>	120	180	240	300	360	420	480	540	600	660	720	780	840	900	960	1020
	<b>5</b>	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550
	<b>10</b>	600	900	1200	1500	1800	2100	2400	2700	3000	3300	3600	3900	4200	4500	4800	5100
	<b>20</b>	1200	1800	2400	3000	3600	4200	4800	5400	6000	6600	7200	7800	8400	9000	9600	10200
	<b>30</b>	1800	2700	3600	4500	5400	6300	7200	8100	9000	9900	10800	11700	12600	13500	14400	15300
	<b>40</b>	2400	3600	4800	6000	7200	8400	9600	10800	12000	13200	14400	15600	16800	18000	19200	20400
	<b>50</b>	3000	4500	6000	7500	9000	10500	12000	13500	15000	16500	18000	19500	21000	22500	24000	25500
	<b>60</b>	3600	5400	7200	9000	10800	12600	14400	16200	18000	19800	21600	23400	25200	27000	28800	30600
	<b>70</b>	4200	6300	8400	10500	12600	14700	16800	18900	21000	23100	25200	27300	29400	31500	33600	35700
	<b>80</b>	4800	7200	9600	12000	14400	16800	19200	21600	24000	26400	28800	31200	33600	36000	38400	40800
	<b>90</b>	5400	8100	10800	13500	16200	18900	21600	24300	27000	29700	32400	35100	37800	40500	43200	45900
<b>100</b>	6000	9000	12000	15000	18000	21000	24000	27000	30000	33000	36000	39000	42000	45000	48000	51000	