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Replaces	

Helpful Information for You and Your Pool

Got A Salt Water Chlorinated Pool?

A Discussion About Stable Pool Water Chemistry

Introduction:

Some pools (usually they are saltwater chlorinated) have issues with a white film being deposited on the pool surfaces - floor and walls. If this happens, it's often seen after at least one winter from new (surface) but may show up anytime.
Generally, it is known as "scaling" and it's the deposition of calcium salts, but may include other salts of, barium, magnesium potassium and sodium.
There is also time when the pool water can be "corrosive" meaning it is seeking to draw minerals (calcium and elements) from your pool surface.

This is the result of pool water chemistry being out of balance for a period (for only a few days even) and also due the pool salt used (quality) and the generation of "compounds" in the salt cell itself. Note also salt often used in pools is "industrial" grade, not food grade, so has a range of impurities with in. Sea water (from which pool salt is derived) contains a large variation of compounds, most of which are harmless to health but can create issues in your pool water chemistry.
Salt water comprises on average the following:

Table 9.2 The Major Dissolved Constituents of Seawater

Ion	Cl = 19‰	Percent
Cl	18.980	55.05
Br	0.065	0.19
SO_4	2.649	7.68
HCO_3	0.140	0.41
F	0.001	0.00
H_3BO_3	0.026	0.07
Mg	1.272	3.69
Ca	0.400	1.16
Sr	0.008	0.03
K	0.380	1.10
Na	10.556	30.61
Total	34.477	99.99

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The Pool Surface:
If the painted (inc vinyl, fibreglass) pool's surface is correctly prepared, the application is done to specification and fully cured, then is it is not "attacked" by the chemicals used in your pool in the normal course of usage. (meaning added correctly via dilution as an example).

LSI (Langeleir Saturation Index):
The use of LSI is a very good measure of the overall pool water balance at any time. You can think of it like a "Project Manager" looking after and co ordinating; carpenters, bricklayers, plumbers and electricians etc on a house build. The Project Manager sees everything that goes on and makes sure it's done to specification and on time and on budget etc.

So, you can think of the LSI as looking at ALL the pool water chemistry key components; pH, Temperature, Calcium Hardness, Total Alkalinity, TDS (salt concentration) and CYA and then seeing if they are working well together or not.
If not, then it's quite easy to see where the real issue is and prevent it from developing into a real problem.
A problem that can be expensive and time consuming to fix and if left to run to its logical conclusion, be difficult in the extreme to fix.

Your pool shop should be calculating this every time you take in a water sample and discussing what it means and how to keep it in the correct range namely from **+0.3 to - 0.3.** Higher than 0.3 you can expect to see scale (white powder) forming on all surfaces inc in the plumbing and filtration system. If less than -0.3 then its "corrosive" meaning the pool water is out balance from a calcium perspective and so the water will get back to balance by scavenging calcium from anywhere. (tile grout, vinyl liners and even etching fibreglass, trying to find it).

How often to Water Test:
(get and keep written records for several years)
For water testing, we recommend at least every 2 weeks in summer (weekly – even daily if heavily used) and monthly in winter, for all residential pools. For commercial pools, even more frequently as per local council commercial pool regulations.
In the winter residential pool owners often "forget" they have a pool, and this leads to severe out of balance issues that go undetected for weeks or months. Hence the "issues" present themselves in spring as the swimming season approaches. It's a false economy to forget your pool in winter. It is much better and less expensive to maintain it correctly in the winter.

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Going Away – what to do

If you go away at any time and placing a pool blanket on it with a chlorinator, then turn it right down to 1ppm, otherwise the chlorine gas will collect below the blanket. This will then ruin it along with any paint/vinyl/fibreglass as the gas escapes around the blanket edges.

Understanding how LSI can save you money:

We are not pool water chemists; however, our research and decades of observations indicate how to keep your pool water in balance year-round. Here are 4 calculations re LSI and keeping it more or less in the correct range, and the pool shop should have this off pat. Meaning between +0.3 to - 0.3 as you can see in the 4 tables below. The pool shop may suggest a different balance point(s) as these are but 4 examples.
And generally, CH and TA are relatively stable but still need regular checking.

Stabilised Pool Water Balance Examples:

Below we have 4 examples of stabilised pool water balance.
These show that with fixed CH (Calcium Hardness) and TA (Total Alkalinity) both of which are generally stable throughout the year, you can then focus on pool water temperature and pH, with some CYA checks along the way.
It's straight forward for you to monitor water temperature and pH.

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Sweet Spot for Ca Hardness, Total Alkalinity and pH			
Salt water pool			
Calcium Hardness ppm	300	300	300
Total Alkalinity ppm	250	250	250
pH	7.2 - 7.6	7.2 - 7.6	7.2 - 7.6
Temp C	28	20	12
LSI Result	-0.12 to + 0.27	-0.24 to +0.15	-0.36 to+0.4
CYA	30- 40 ppm always		
Salt	3500 - 4000ppm always		
Calcium Hardness ppm	250	250	250
Total Alkalinity ppm	400	400	400
pH	7.2 - 7.5	7.0 - 7.6	7.2 - 7.8
Temp C	28	20	12
LSI Result	-0.21 to + 0.28	-0.32 to +0.27	-0.36 to+0.34
CYA	30- 40 ppm always		
Salt	3500 - 4000ppm always		
Calcium Hardness ppm	250	250	250
Total Alkalinity ppm	80	80	80
pH	7.6 -8.0	7.7 -8.0	7.8 - 8.0
Temp C	28	20	12
LSI Result	-0.30 to + 0.06	-0.31 to -0.02	-0.36 to-0.18
CYA	30- 40 ppm always		
Salt	3500 - 4000ppm always		
Calcium Hardness ppm	250	250	250
Total Alkalinity ppm	150	150	150
pH	7.3 - 8.0	7.4 - 7.6	7.5 - 8.0
Temp C	28	20	12
LSI Result	-0.32 to + 0.36	-0.34 to +0.25	-0.36 to+0.12

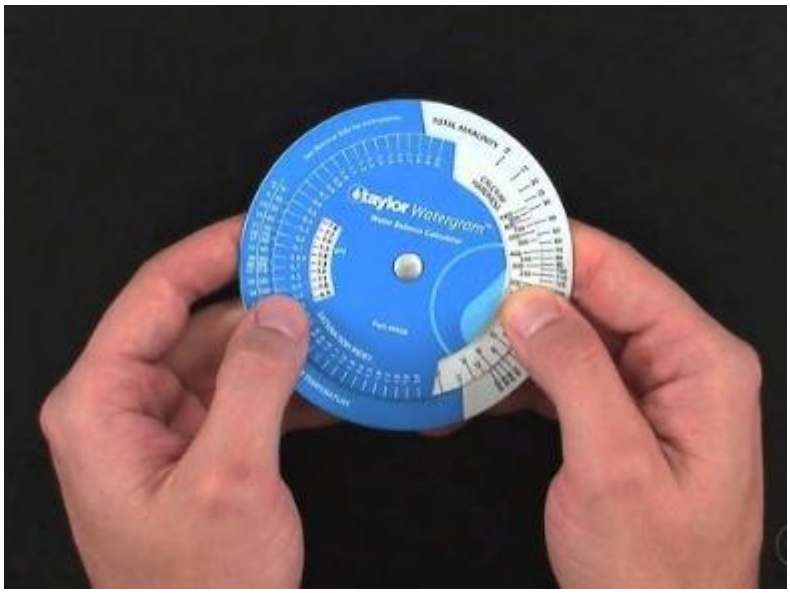
As you can see the TA and CH are basically stable and not that hard to keep so. As you see the Temperature varies over the year and your pH is always rising in a saltwater pool. So, by

monitoring the pH (daily or maybe every day or 2 until you can see the trends) and generally add acid and remeasure pH. In the above tabulations the pH range needs to be carefully monitored as the pool water changes with the seasons.

You can also see that the higher the CH and TA the more balanced is the water pH wise being in the desired range of 7.2 to 7.6. (tables 1&2) With a reasonable CH and lower, TA (tables 3&4) means the pH needs to be kept quite high and in a reduced range, to maintain same balance point as the temperature falls in winter. This makes it harder to keep LSI in balance. In summary you can find your own sweet spot and then monitor the pH and temperature to keep it there.

Here's what was used before Computers did it all! Requires careful study and understanding.

Summary:
We hope this helps you see a way to manage it more easily. Really the pool shop should be doing this, however we suspect they go with what the computer is telling them and not really understand the underlying chemistry and how to make it easy for you. (and save you some money)
To simplify matters, the CH and TA are relatively stable over time, so watch pool water temperatures and rising pH (normal in saltwater pools). Thus, add pool acid to keep pH in the correct range and thus LSI where is meant to be namely +0.3 to -0.3.
Taylors Water Testing to the rescue:



Taylors water balance wheel (get one!)
I also attach a visual version of this from Taylors Water and a video link below:
https://www.youtube.com/watch?v=eC1e7Yu1rPQ
and for your Smart phone an app you can download here:
https://play.google.com/store/apps/details?id=com.elitecrest.orenda&hl=en_NZ