

DAILY WATER CHEMISTRY AND MAINTENANCE

Balanced water chemistry is as critical during the off-season months as it is in season. Water may become aggressive because of rain, snow, and fill water as with the regular use of acid to control pH. Adjust your pH and **Carbonate Alkalinity**¹ frequently; monitor calcium hardness and Cyanuric acid monthly.

DAILY WATER CHEMISTRY AFTER 28 DAYS

Maintain the water chemistry using the **Langelier Saturation Index (LSI)** maintained between **0.0 and + 0.3**.

- Free Chlorine = 1 to 3 ppm
- pH = 7.2 to 7.6
- Calcium hardness = 200 to 400 ppm
- Salt Level = 2500 to 3500 ppm (Salt chlorination ONLY)
- Total Chlorine = 1 to 3 ppm
- Carbonate Alkalinity = 80 to 120 ppm¹
- Cyanuric acid = 30 to 50 ppm
- Sequestering Agent as per Manufacturer's directions
- TDS = 300 to 1800 ppm (Non-salt pools)

The **Langelier Saturation Index (LSI)** must be maintained between **0.0 and +0.3** for day-to-day maintenance after the initial start up procedure has been completed. This will help to reduce the likelihood of problems with the pool surface. Disregarding these LSI parameters promotes leaching, etching and discoloration on the negative (-) side and scaling and discoloration on the positive (+) side.

$$\text{LANGELIER SATURATION INDEX (LSI)} = \text{pH} + \text{Total Alkalinity Factor} + \text{Calcium Hardness Factor} + \text{Temperature Factor} - \text{TDS Factor}$$

Deterioration, discoloration and scaling as a result of the premature or improper use of chemicals and use of chemical feeders are the responsibility of the equipment installer and operator. Feeders other than *Oxidation Reduction Potential (ORP)* types and pH controllers should not be placed in operation for a minimum of 28 days after the start up.

Failure to follow the manufacturer and/or applicator instructions and to control the LSI may cause deleterious effects, which are not the result of improper workmanship or a manufacturer's defect.

LSI CALCULATOR

TA ¹ ppm	CH ppm	Temp F°(C)	TOTAL DISSOLVED SOLIDS (TDS) ppm
FACTOR	FACTOR	FACTOR	FACTOR
5=0.7	75=1.5	32 (0°C)=0.0	Up to 1000= 12.10
25=1.4	100=1.6	37 (3°C)=0.1	1000=12.19
50=1.7	150=1.8	46 (8°C)=0.2	2000=12.29
75=1.9	200=1.9	53 (12°C)=0.3	3000=12.35
100=2.0	300=2.1	60(16°C)=0.4	4000=12.41
125=2.1	400=2.2	66(19°C)=0.5	5000=12.44
150=2.2	800=2.5	76 (24°C)=0.6	
200=2.3	1000=2.6	84 (29°C)=0.7	
300=2.5		94 (34°C)=0.8	
400=2.6		105 (41°C)=0.9	

**EXAMPLE:
POOL WATER CHEMISTRY**
 pH 7.8
 TA 125¹
 CH 300
 TF 90° F (32° C)
 TDS 950

A calculated LSI of 0.0 is considered balanced.
 A calculated (-) negative LSI has corrosive tendencies.
 A calculated (+) positive LSI has scaling tendencies.

CALCULATED LSI	
pH	7.8
TA factor ¹	2.1
CH factor	2.1
Temp factor	.8
Total	+12.8
Subtract TDS Factor	-12.1
LSI =	+0.7 SCALING
Target calculated 0.0 to +0.3	

Use the closest factor to the chemistry reading.

Caution: Research has shown that Cyanuric acid levels of 100 ppm (mg/l) and above may cause permanent deterioration to the pool surface. Excessively high calcium hardness and Cyanuric acid levels should be diluted. DILUTION IS THE LOW COST SOLUTION.

These procedures are sound technical practices in the industry and are advisory and non-binding. The National Plasterers Council does not regulate, control, or monitor the acts of its members or others in terms of compliance to any of the guidelines, recommendations, or other information contained in these technical procedures.

SWIMMING POOL START-UP PROCEDURES

The pool finish will start to **hydrate** immediately after mixing, with the majority of hydration taking place within the first 28 days. This critical time period is when a finish is most susceptible to staining, scaling and discoloration. Proper start-up procedures including timely brushing and constant monitoring and adjusting of the pool water is mandatory. The following recommended start-up method is based on procedures shown to produce the best aesthetic results. Due to unique local water conditions and environmental factors, parts of these recommended start-up procedures may need to be modified to protect the pool finish. *For example:* filling the pool with extremely low calcium hardness, low pH or low total alkalinity levels may necessitate changes to these procedures. Brushing and monitored chemical² adjustments will be mandatory by the homeowner or a trained pool technician **during the service life of any pool surface.** **ALWAYS ADD A CHEMICAL TO WATER, NEVER WATER TO THE CHEMICAL.**

POOL FILLING DAY

- Step 1. Make sure the filtration equipment is operational.
- Step 2. Remove all floor return heads and directional eyeballs (*if appropriate and recommended in your geographical area*).
- Step 3. Based on temperature and type of finish, fill the pool to the middle of the skimmer or specified water level without interruption as rapidly as possible with clean potable water to help prevent a bowl ring. Place a clean rag on the end of the hose, always placed in the deepest area, to prevent damage to the surface material. If a water truck is required, 24 inches (60 cm) of water should be placed at the deepest area for a water cushion. Wheeled devices should not be used in the pool until after 28 days.
- Step 4. At no time should any person or pets be allowed in the pool during the fill. Do not allow any external sources of water to enter the pool to help prevent streaking. It is recommended that you do not swim in the pool until the water is properly balanced.
- Step 5. Test fill water for pH, alkalinity, calcium hardness and metals. Record test results.
- Step 6. Start the filtration system **immediately** when the pool is full to the middle of the skimmer or specified water level.

1st DAY (It's vital to follow these steps in order - prior to proceeding to the next step)

- Step 1. Test pH, alkalinity, calcium hardness and metals. Record test results.
- Step 2. High alkalinity should be adjusted to 80 ppm¹ using pre-diluted Muriatic Acid (31-33% Hydrochloric acid). Always pre-dilute the acid by adding it to a five gallon (19 L) bucket of pool water².
- Step 3. Low alkalinity should be adjusted to 80 ppm¹ using sodium bicarbonate (baking soda)¹.
- Step 4. pH should be reduced to 7.2 to 7.6 adding pre-diluted² Muriatic Acid **if the alkalinity is already 80-100 ppm¹.**
- Step 5. Brush the entire pool surface thoroughly at least twice daily to remove all plaster dust.
- Step 6. Although optional, it is highly recommended to pre-dilute and add a quality sequestering agent using the recommended initial start-up dosage and then the recommended maintenance dosage per the sequestering agent's manufacturer.²
- Step 7. Operate filtration system continuously for a minimum of 72 hours.
- Step 8. DO NOT add chlorine for 48 hours. DO NOT turn on pool heater until there is no plaster dust in the pool.

2nd DAY - Brush the Pool

- Step 1. Test pH, Alkalinity and Calcium Hardness and repeat steps of 1st Day **except** for Step 6.
- Step 2. Once the alkalinity is adjusted to 80ppm and the pH is adjusted to 7.2 to 7.6, then adjust calcium hardness levels to a minimum of 150 ppm. (*Caution: Adjustments requiring more than 20 lbs. of CaCl² should be pre-diluted and added in 10 lbs. increments - morning and afternoon*)

3rd DAY

- Step 1. Test pH, Alkalinity and Calcium Hardness and repeat 1st Day Steps 1 through 6.
- Step 2. Pre-diluted² chlorine may now be added to achieve 1.5 to 3 ppm¹. **NO SALT SHOULD BE ADDED FOR 28 DAYS.**
- Step 3. Brush the entire pool surface thoroughly at least twice daily to remove all plaster dust.

4th THROUGH THE 28th DAY

- Step 1. Test pH, **Carbonate** Alkalinity and Calcium Hardness and repeat 1st Day Steps 1 through 5 every day for 14 days to help prevent the scaling of the pool surface.
- Step 2. On the 7th day, if there is any plaster dust remaining - remove it using a brush pool vacuum.
- Step 3. After the 4th Day - calcium levels should be adjusted slowly over the 28 day period not to exceed 200 ppm¹
- Step 4. After the 4th Day - adjust Cyanuric acid levels to 30 to 50 ppm¹ based on the primary sanitizer of the pool (pre-dissolve² and add through the skimmer).

Purchase *Taking Care of Your Pool* DVD from the National Plasterers Council www.npconline.org or call (866) 483-4672