

Total Alkalinity

Total Alkalinity is a measure of the amount of buffering capacity in the water. It acts as a shock absorber for the pH. If Total Alkalinity is too low, the water is acidic and can corrode equipment and pool surfaces. It also causes pH bounce. The pH will drift down and any adjustments made to it will bounce and be difficult to control. If Total Alkalinity is too high, the water is alkaline and scale buildup and cloudy water can result. The pH will tend to drift up and will be very difficult to adjust.

Total Alkalinity, like pH, is affected by environmental factors. Rain, acidic sanitizers, addition of fill water and other product applications can all change the alkalinity over time. Total Alkalinity should be tested once every three to four weeks.

Proper Total Alkalinity levels vary with the water temperature, the sanitizer used, and the pool finish. Ideal range for Total Alkalinity is from 125 - 150 ppm. NOTE: Recommendations from the ALEX analysis may not exactly match this ideal range. Other values may be acceptable in that they will not damage the pool, cause water problems, or harm bathers. The computer can assess the overall balance of the pool, and the program bases adjustment recommendations on the saturation index. Using this, the low cutoff for Total Alkalinity in the computer program is 105 ppm. For chlorine or bromine pools, levels of Total Alkalinity up to 200 ppm are acceptable, and the high cutoff is 170 for SoftSwim pools. The cutoff is slightly lower for SoftSwim pools due to the foaming tendency of the product and the tendency for pH to drift upward.

High Total Alkalinity

Add Lo 'N Slo or Muriatic acid over a period of several days to lower the total alkalinity to the proper level. Discontinue acid additions if the pH drops below 7.2. Resume the applications where you left off when pH returns to 7.4 - 7.6. pH adjustment should not be necessary, as the alkalinity will tend to pull the pH up.

If the total alkalinity is high and continues to increase, and the pH is low and does not respond to additions of Balance Pak 200, the problem could be [bicarbonate scale](#). This occurs when pools are not allowed to gas off properly, such as in cases where solar covers are being used or the pool is indoor. Trapped gases from solar covers or poor ventilation in indoor pools are reabsorbed into the water and drive the pH down and the TOTAL ALKALINITY up. It can also cause the water to cloud. To balance successfully, remove any covers and/or ventilate as well as possible and begin making adjustments again. Keep the area well ventilated or the cover removed until the water balance is returned to normal. To prevent this problem, remove covers or ventilate indoor pools for several hours a day to allow gasses to escape.

Low Total Alkalinity

Add Balance Pak 100 according to label or ALEX instructions to raise total alkalinity to the recommended level. Note: If the total alkalinity is less than 40 ppm or if more than 4 lbs. per 10,000 gallons is needed, divide Balance Pak 100 additions into thirds, predissolve and add six hours apart.

pH

pH is a measure of the acidity or alkalinity of the water. In pools, pH should be maintained at 7.4 to 7.6 ppm for optimal sanitizer activity, protection of pool surfaces, and bather comfort. In SoftSwim pools, the sanitizer activity is not affected from 7.4 - 7.8.

If the pH drops below 7.4 the water is too acidic. This can corrode pool surfaces and equipment and cause burning eyes and skin irritation for bathers. To raise pH, add Balance Pak 200 according to label instructions.

If the pH above 7.6 (or 7.8 in SoftSwim pools), the water is too alkaline. The sanitizer loses some effectiveness, and minerals can fall out of solution, causing cloudy water, scale buildup, and equipment and surface damage. To lower pH, add Lo 'N Slo or muriatic acid.

Various environmental factors can affect pH, such as airborne contaminants, rain, fill water, pollutants, and swimmers. Other products that are added to the pool for sanitation, oxidation, and balancing can also effect pH. The pH is lowered by the use of products such as trichloro, acid rain, and other environmental contaminants. The pH is raised by use of some shock products as well as swimmers. The ALEX water analysis recommendations take into account the effect that any product it recommends will have on the pH. This is why, in some cases, ALEX may recommend Lo 'N Slo when the pH is already low. Some other product has been recommended that will raise the pH too high, and this is taken into account in the final pH adjustment.

Since the pH changes frequently due to these outside influences, it should be tested at least twice weekly. Make any necessary adjustments to raise or lower it to the proper range. To raise pH, use Balance Pak 200. To lower pH, use Lo 'N Slo.

Bicarbonate Scale and low pH

If the pH is low and does not respond to additions of increaser, check the total alkalinity. If the total alkalinity is high and increasing, the problem could be bicarbonate scale. This occurs when pools are not allowed to gas off properly. Trapped gases from solar covers or poor ventilation in indoor pools are reabsorbed into the water and drive the pH down and the total alkalinity up. It can also cause the water to cloud. It is necessary to remove the cover during next few days while rebalancing the pool. If there is no cover, but the pool is indoor, ventilate the room as well as possible.

Chlorine demand and low pH

Another cause of persistently low pH is chlorine demand. If the pool has a chlorine demand the pH usually stays around 7.2. When the demand is satisfied, the pH can be adjusted.

Stabilizer

Stabilizer (or CYA - cyanuric acid) helps reduce chlorine residual loss from ultraviolet light. The stabilizer level should be maintained at 30 - 40 ppm or higher. Add 1 lb. of [Stabilizer 100](#) per 3,000 gallons to establish 40 ppm. The stabilizer level should not need to be replenished if a

stabilized Chlorine is being used. Stabilizer is only depleted through actual loss of water, such as through backwashing or splashout. Stabilizer is not necessary in spas. Brominated pools cannot be stabilized with Stabilizer 100, and Stabilizer is not needed in SoftSwim pools.

Low Stabilizer

Low stabilizer levels can result in increased chlorine consumption. However, with chlorine demand situations, the stabilizer test reading may be masked. If the stabilizer reading disappears suddenly and a chlorine reading is not being maintained, do not add stabilizer until the chlorine demand has been eliminated.

High Stabilizer

Stabilizer readings higher than 100 ppm have an effect on the total alkalinity test. For every 100 ppm of Cyanuric Acid (CYA), the tested total alkalinity will increase by 30 ppm. However, this 30 ppm is not an effective buffer. This false total alkalinity reading is automatically taken into account with the input when an analysis is performed in ALEX.

High Stabilizer and Health Departments

Many state and local health departments do not allow levels of CYA higher than 100 ppm. While there is some evidence to suggest that higher stabilizer levels do slow down the bactericidal activity in certain water conditions, this is not the case in swimming pool environments. Actually, research shows that in a swimming pool, higher levels of CYA in a properly balanced pool increase the bactericidal activity of chlorine. Levels as high as 200 ppm have been demonstrated not to have a negative impact on overall pool performance.

If you need help in working with your local or state health department concerning this, contact your sales representative or Marketing Services.

Sanitizer Residual Balancing

It is important to maintain a consistent sanitizer level in your pool at all times. Proper sanitizer levels prevent excessive bacterial growth and help keep the pool clear and free of algae.

The proper sanitizer level for your pool depends on the type of sanitizer and sometimes whether it is a commercial or residential system.

Chlorinated Pools

Maintain a free chlorine residual of 1 - 3 ppm with no [combined chlorine](#).

Do not swim if the chlorine residual exceeds 3 ppm.

Brominated Pools

Maintain a total bromine residual of 1 - 3 ppm in residential pools and 3 - 5 ppm in commercial pools.

Do not swim if the bromine residual exceeds 8 ppm.

Mineral Springs Pools

Maintain a free chlorine residual of 1 - 3 ppm with no combined chlorine.

Do not swim if the chlorine residual exceeds 3 ppm.

SoftSwim Pools

Maintain a SoftSwim B residual of 30 - 50 ppm.

This information is designed for use only with the BioGuard® brand products named in this computerized printout, and is correct to the best of BioLab, Inc.'s knowledge. BioLab is not responsible for any use of this printout with products other than the BioGuard® brand products named in this printout, and use of this printout with other products could result in improper or incorrect treatment of the pool water.